

IO-Link Device Library

Release v3.02



Reference Manual

Original Instructions

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.



WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

IMPORTANT Identifies information that is critical for successful application and understanding of the product.

These labels may also be on or inside the equipment to provide specific precautions.



SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.



BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.



ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

The following icon may appear in the text of this document.



Identifies information that is useful and can help to make a process easier to do or easier to understand.

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IO-Link Master (raC_Dvc_1734_4I0LMaster, raC_Dvc_1732E_8I0LMaster, raC_Dvc_5032_8I0LMaster)

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Device Object Libraries Overview

Our Device Object Libraries enable you to easily interface with Rockwell Automation intelligent devices like drives, motion, network switches, sensors, IO and more. The libraries contain tested, documented, and lifecycle-managed objects which can be used with machine builder, process, and packaged libraries or as standalone components. Device objects include HMI faceplates for FactoryTalk View ME/SE and Studio 5000 View Designer® software and provide a user interface that seamlessly integrates with the products.

HMI faceplates are standard display files that provide a common user interface. These are HMI pop-up screens used to display detailed information related to a specific instruction or device. In systems that follow ISA 101.1 design guidelines, faceplates are often referred to as Level 4 displays.

Pre-configured Device Objects include an Add-On Instruction Rung and an HMI Faceplate providing the following benefits:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Detailed Device Data Collection and Delivery
- Enhanced Device Status and Diagnostics
- Common Control Interfaces maximizing Flexible Automation Device Selection & Application Code Reuse

Device Object Use Cases:

- Basic Device Maintenance and Diagnostics
- Virtual Device Operations for Startup and Commissioning
- Operator and Program Control for Velocity Machine and Process Applications



Device Object Libraries may be downloaded from the <u>Product Compatibility</u> <u>and Download Center.</u> Search for "Library".

Application Code Manager

Studio 5000 Application Code Manager is a tool that can be used with Device Object Libraries to streamline project and machine development. This bulk coding tool allows you to easily design and standardize functionality with reusable application code.

Enable more efficient project development with reusable libraries of code:

- Quickly create and deploy projects through our Application Content Libraries
- Import Rockwell provided application content libraries to expedite system development
- Build your own reusable code that can be managed and deployed across your entire enterprise

- Easily configure objects in bulk with reusable code to increase application development, no additional programming is necessary
- Consolidate content for Studio 5000 Logix Designer, FactoryTalk View Studio, FactoryTalk Alarms & Events, FactoryTalk Historian to configure an object a single time and generate content for each of those software packages.

See the section on <u>Using the Library with Application Code Manager</u> for more details.

Other Application Code Libraries This Device Object Library may be used in harmony with other Application Code Libraries including other Device Object Libraries (Network, IO, Power, Safety Device Libraries) or Application Libraries (PlantPAx Process Objects library, Machine Builder Libraries). All libraries are intended to follow similar design philosophies to provide a consistent experience for operators and maintenance staff.

A complete list of Application Code Libraries from Rockwell Automation follows.

| Item | Description |
|---------------------------------------|--|
| PlantPAx Process Library | Rockwell Automation Library of Process Objects provides application templates, Endress + Hauser library objects, Application Code Manager library objects, and tools and utilities for PlantPAx DCS applications. Includes the following: Graphics for built-in instructions HMI images and Help files Logix diagnostic objects Process objects Control strategies Sequencer objects PlantPAx Configuration Tools for Tags, Alarms and Historian Color Change Historian Asset Framework template and objects |
| Machine Builder Libraries | Tested, documented and life-cycle managed library objects and faceplates for use with Studio 5000® Application Code Manager for use primarily with OEM and discrete machine applications. |
| Common Application Libraries | Commonly used application library objects and faceplates for use with Studio 5000® Application Code Manager including basic functions like unit conversion and data collection. |
| Independent Cart Technology Libraries | ICT Libraries for iTRAK and MagneMotion including MagneMover LITE and QuickStick for Studio 5000® Application Code Manager |
| I/O Device Library | Provides objects for Rockwell Automation 1756, 1769, 1734, 1794, 1738, 1732E, 1719, 5069, 5094 I/O modules including pre-configured status and diagnostic faceplates |
| IO-Link Device Library | Provides IO-Link master and sensor objects including pre-configured status and diagnostic faceplates |
| Network Device Library | Provides objects for Stratix® switch and Device Level Ring network objects |
| Power Device Library | Provides objects for discrete, velocity, motion, and power monitor devices |
| Safety Device Library | Provides safety objects to interface with safety I/O |
| Condition Monitoring Device Library | Provides Dynamix [™] -1444 module and machinery Condition Monitoring applications such as motors and pumps. This includes FactoryTalk View [®] SE HMI faceplates and Studio 5000 [®] Application Code Manager implementations. |
| Electrical Protection Device Library | Provides a standard to represent protection devices within your electrical distribution system |

Libraries can be accessed from the <u>Product Compatibility and Download Center.</u>

Software and Firmware Upgrades

When you update software or firmware revisions, we recommend that you verify the impact on performance and memory utilization before implementing the upgrade on the production system. For FactoryTalk® View or ControlLogix® platforms, we recommend that you review the release notes and verify the impact of the upgrade on performance and memory utilization.

You can also verify the compatibility of the upgrade with the installed software and operating systems in use on your system. See the <u>Product Compatibility</u> and <u>Download Center</u>.

Rockwell Automation® Services and Support

System Support offers technical assistance that is tailored for control systems. Some of the features include the following:

- Highly experienced team of engineers with training and systems experience
- Use of online remote diagnostic tools
- Access to otherwise restricted TechConnectSM Knowledgebase content
- 24-hour, 7 days per week, 365 days per year of phone-support coverage upgrade option

For more information, contact your local distributor or Rockwell Automation representative or see <u>http://www.rockwellautomation.com/support</u>.

You can view or download publications at <u>http://www.rockwellautomation.com/literature</u>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation® IO-Link Device Library

The IO-Link Device Library is a tested, documented, and life cycle managed object library. The Device Library provides pre-configured status and diagnostic faceplates and AOI sets for Rockwell Automation® IO-Link Master & Sensors devices. The IO-Link Device Objects may be used with Machine Builder, Process, and Packaged Libraries or as standalone components. IO-Link Device Library add-on instructions objects collect, process, and deliver data between hardware devices and application logic.

The IO-Link Device Library includes Add-On Instructions (AOIs) and HMI Faceplates for Allen-Bradley IO-Link Sensor and Master products.

This document includes the functional requirements of the IO-Link Sensor and IO-Link Master device objects.



The IO-Link Device Library may be downloaded from the <u>Product</u> <u>Compatibility and Download Center.</u> Search for IO-Link Device Library.

Compatibility

Compatible Software

- Studio 5000[®] Logix Designer v30.02.00, v31.02.00, v32.02.01, v33.00.00, v34.01.00, v35.00.00, v36.00.00 for PAC Application Development
- Studio 5000® Application Code Manager v4.0 and later for bulk code configuration
- Studio 5000 View Designer® v8.00 and later for PanelView 5000 Application Development
- FactoryTalk® View Studio v10.00.01 and later for PanelView Plus Application Development and FactoryTalk® View SE Application Development

Compatible Hardware

- PanelView 5500 with v8 or later firmware
- PanelView Plus with v10 or later firmware
- ControlLogix 5580 or ControlLogix 5570 controller with v30.011 or later firmware
- 1732E-8IOLM12R ArmorBlock 8-Channel IO-Link Master Module with v3.012 or later firmware
- 1734-4IOL/K POINT I/O 4-Channel IO-Link Master Module with v1.011 or later firmware

- 5032-8IOLM12DR 8 IO Link Channel, 8 Configurable Channel, 4 Pin Power, M12 Master Module with 2.011 or later firmware.
- 5032-8IOLM12M12LDR 8 IO Link Channel, 8 Configurable Channel, M12L Power, M12 Master Module with 2.011 or later firmware
- 5032-8IOLM12P5DR 8 IO Link Channel, 8 Configurable Channel, 5Pin Power, M12 Master Module with 2.011 or later firmware.
- 1694 Modular Electronic Circuit Protector
- 42AF Long Range General Purpose Sensor
- 42EF RightSight General Purpose Sensor
- 42JT Visi Sight Sensor
- 45CRM Color Registration Mark Sensor
- 45DMS Distance Measurement Sensor
- 46CLR ColorSight True Color Sensor
- 836P Solid-State Pressure Sensor
- 837T Solid-State Temperature Sensor
- 856T Control Tower Stack Light
- 871C Mini Tubular Sensor
- 871FM Mini Flat Pack Sensor
- 871TM Tubular Stainless Steel Sensor
- 873P Analog Output Ultrasonic Sensor
- 875L Capacitive Sensor
- 46DFA Small Aperture Fiber-Optic Amplifier
- 45PLA Polarized Light Array Photoelectric Sensor

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

| Торіс | Page |
|-----------------------------------|------|
| Added 5032 IO-Link Master support | all |

Footprint

Each instruction requires memory footprint within the Logix controller. The following characteristics apply:

- **Definition:** Estimated memory required to store the object definition, including all dependents
- **Instance:** Estimated memory required per object instantiated.
- **Execution (L85E):** Estimated execution time / scan footprint evaluated in 1756-L85E PAC

Device Object Footprint

| Device Object | Definition (kB) | Instance (kB) | Execution (µs) |
|--------------------------|-----------------|---------------|----------------|
| raC_Dvc_1734_4I0LMaster | 28.14 | 4.552 | 52 |
| raC_Dvc_1732E_8I0LMaster | 29.5 | 9.648 | 61 |
| raC_Dvc_5032_8I0LMaster | 33.088 | 10.388 | 30 |
| raC_Dvc_42AF_4I0L | 77.612 | 7.76 | 58 |
| raC_Dvc_42AF_8I0L | 81.628 | 7.848 | 69 |
| raC_Dvc_42AF_Type1_5032 | 70.86 | 8.88 | 55 |
| raC_Dvc_42AF_Type2_5032 | 71.508 | 8.88 | 57 |
| raC_Dvc_42AF_Type3_5032 | 65.384 | 8.864 | 56 |
| raC_Dvc_42EF_4I0L | 66.328 | 7.264 | 96 |

| Device Object | Definition (kB) | Instance (kB) | Execution (µs) |
|--------------------------|-----------------|---------------|----------------|
| raC_Dvc_42EF_8I0L | 68.808 | 7.352 | 96 |
| raC_Dvc_42EF_Type1_5032 | 60.364 | 7.568 | 56 |
| raC_Dvc_42EF_Type2_5032 | 60.404 | 7.568 | 58 |
| raC_Dvc_42EF_Type3_5032 | 60.484 | 7.576 | 59 |
| raC_Dvc_42JT_4I0L | 66.612 | 8.156 | 94 |
| raC_Dvc_42JT_8I0L | 68.912 | 8.244 | 97 |
| raC_Dvc_42JT_Type1_5032 | 61.012 | 9.376 | 50 |
| raC_Dvc_42JT_Type2_5032 | 58.628 | 7.712 | 49 |
| raC_Dvc_42JT_Type3_5032 | 61.136 | 7.72 | 52 |
| raC_Dvc_45CRM_4I0L | 67.784 | 7.368 | 86 |
| raC_Dvc_45CRM_8I0L | 69.576 | 7.444 | 92 |
| raC_Dvc_45CRM_5032 | 64.84 | 7 | 45 |
| raC_Dvc_45DMS_4I0L | 113.684 | 11.168 | 81 |
| raC_Dvc_45DMS_8I0L | 115.652 | 11.256 | 88 |
| raC_Dvc_45DMS_Type1_5032 | 100.88 | 10.576 | 63 |
| raC_Dvc_45DMS_Type2_5032 | 100.964 | 14.688 | 65 |
| raC_Dvc_46CLR_4IOL | 173.884 | 15.42 | 112 |
| raC_Dvc_46CLR_8IOL | 185.268 | 17.42 | 118 |
| raC_Dvc_46CLR_5032 | 140.42 | 9.088 | 100 |
| raC_Dvc_836P_4I0L | 127.376 | 10.512 | 110 |
| raC_Dvc_836P_810L | 132.376 | 10.6 | 132 |
| raC_Dvc_836P_Type1_5032 | 103.332 | 9.936 | 70 |
| raC_Dvc_836P_Type2_5032 | 110.64 | 9.968 | 75 |
| raC_Dvc_837T_4I0L | 107.56 | 9.52 | 104 |
| raC_Dvc_837T_8I0L | 113.472 | 9.608 | 120 |
| raC_Dvc_837T_Type1_5032 | 82.148 | 8.952 | 55 |
| raC_Dvc_837T_Type2_5032 | 89.956 | 8.984 | 58 |
| raC_Dvc_856T_4I0L | 172.500 | 19.552 | 92 |
| raC_Dvc_856T_810L | 174.476 | 20.532 | 98 |
| raC_Dvc_856T_5032 | 179.052 | 16.888 | 90 |
| raC_Dvc_871C_4IOL | 54.412 | 5.92 | 85 |
| raC_Dvc_871C_810L | 55.532 | 7.048 | 82 |
| raC_Dvc_871C_5032 | 47.1 | 6.376 | 65 |
| raC_Dvc_871FM_4I0L | 56.4 | 6.696 | 84 |
| raC_Dvc_871FM_8I0L | 59.808 | 6.784 | 92 |
| raC_Dvc_871FM_Type1_5032 | 53.7 | 7.008 | 40 |
| raC_Dvc_871FM_Type2_5032 | 53.7 | 7.008 | 40 |
| raC_Dvc_871TM_4IOL | 57.26 | 7.688 | 79 |
| raC_Dvc_871TM_810L | 59.136 | 7.756 | 84 |
| raC_Dvc_871TM_5032 | 44.9 | 4.988 | 35 |
| raC_Dvc_873P_4I0L | 109.148 | 9.084 | 97 |
| raC_Dvc_873P_8I0L | 112.428 | 9.26 | 105 |
| raC_Dvc_873P_Type1_5032 | 94.092 | 10.216 | 60 |
| raC_Dvc_873P_Type2_5032 | 91.268 | 10.208 | 64 |
| raC_Dvc_1694_4I0L | 104.256 | 9.172 | 95 |
| raC_Dvc_1694_810L | 106.684 | 9.26 | 98 |
| raC_Dvc_1694_5032 | 114.508 | 10.26 | 70 |
| raC_Dvc_875L_410L | 149.48 | 23.496 | 74 |
| raC_Dvc_875L_810L | 151.832 | 23.672 | 88 |
| raC_Dvc_875L_5032 | 154.1 | 18.52 | 90 |
| raC_Dvc_46DFA_4I0L | 93.828 | 17.944 | 21 |
| | | | |

Device Object Footprint

Device Object Footprint

| Device Object | Definition (kB) | Instance (kB) | Execution (µs) |
|--------------------|-----------------|---------------|----------------|
| raC_Dvc_46DFA_8I0L | 97.56 | 19.216 | 49 |
| raC_Dvc_46DFA_5032 | 99.492 | 11.984 | 60 |
| raC_Dvc_45PLA_4IOL | 96.66 | 16.512 | 45 |
| raC_Dvc_45PLA_8IOL | 101.08 | 16.6 | 121 |
| raC_Dvc_45PLA_5032 | 102.08 | 10 | 70 |

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation[®].

| Resource | Description |
|---|---|
| Rockwell Automation® Library of Process Objects Reference Manual <u>PROCES-RM200</u> | Describes the Add-On Instructions, PlantPAx instructions, and associated faceplates that are available to develop applications. |
| 1732E 8IOL IO-Link Master Module User Manual 1732E-UM007B | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 1734 4IOL IO-Link Master User Manual <u>1734-UM020B</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 5032 8IOL IO-Link Master Module User Manual 5032-UM001B | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 42AF RightSight Photoelectric Sensors User Manual <u>42AF-UM001A</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 42EF RightSight Photoelectric Sensors User Manual <u>42EF-UM001A</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 42JT VisiSight Photoelectric Sensors User Manual <u>42JT-UM001B</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 45CRM Color Registration Mark Sensors Quick Reference 45CRM-QR001A | Provides quick reference information about feature, IO-Link parameter definition, Teach Procedure. |
| 46CLR ColorSight IO-Link Quick Reference <u>46CLR-QR001C</u> | Provides quick reference information about feature, IO-Link parameter definition, Teach Procedure. |
| 836P Solid-state Pressure Switches User Manual 836P-UM001A | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 837T Solid-state Temperature User Manual 837T-UM001A | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 856T Control Tower IO-Link Class B Light and Sound Module Controller User Manual 856T-UM001C | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 871C Miniature Inductive Sensors User Manual 871C-UM001A | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 871FM Miniature Metal Flat Pack Inductive Sensors User Manual 871FM-UM002A | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 871TM Long-range Inductive Sensors User Manual <u>871TM-UM002D</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 873P Ultrasonic Sensors User Manual <u>873P-UM001B</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 1694 Electronic Circuit Protection Module Installation Instructions <u>1694-IN001</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 17321L ArmorBlock 16-Channel IO-Link Hub User Manual <u>17321L-UM001D</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 875L Capacitive Sensors User Manual <u>875-UM001B</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 46DFA Small Aperture Fiber Optic Amplifier <u>46DFA-QR001A</u> | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| 45PLA Polarized Light Array Sensors 45PLA-0R001A | Provides installation instructions, wiring diagrams, configuration, and specifications. |
| Application Code Manager User Manual LOGIX-UM003 | Studio 5000® Application Code Manager user manual. |

Library Components

| | The IO-Link Device Library is a tested, documented, and life cycle managed object library. The Device Library provides pre-configured status and diagnostic faceplates and AOI sets for Allen-Bradley IO-Link Sensors and IO- Link Master Modules. The IO-Link Device Objects may be used with Machine Builder, Process, and Packaged Libraries or as standalone components. IO- Link Device Library add-on instructions objects collect, process, and deliver data between hardware devices and application logic. |
|-----------------------------|--|
| IO-Link Device Instructions | The IO-Link Device Library includes instructions to interface with IO-Link Sensors and IO-Link Master Modules. Each sensor instruction is provided with variations for use with each master module. For example the 42AF Sensor has instructions raC_Dvc_42AF_4IOL for use with the 1734-4IOL POINT I/O 4- Channel IO-Link Master Module, raC_Dvc_42AF_8IOL for use with the 1732E- 8IOLM12R ArmorBlock 8-Channel IO-Link Master Module and raC_Dvc_42AF_Type1_5032 for use with the 5032-8IOLM12M12LDR/A, 5032- 8IOLM12DR, 5032-8IOLM12P5DR 8-Channel IO-Link Master Module.The master module instructions and faceplates are optional for module diagnostics and device summary but can be used independently from the sensor instructions and faceplates. |
| | The instructions included are as follows: |
| | IO-Link Master Modules: <u>1732E</u>-8IOLM12R ArmorBlock 8-Channel IO-Link Master Module <u>1734-4IOL</u>/K POINT I/O 4-Channel IO-Link Master Module <u>5032-8IOLM12DR</u> 8-Channel IO-Link Master Module <u>5032-8IOLM12M12LDR</u> 8-Channel IO-Link Master Module <u>5032-8IOLM12P5DR</u> 8-Channel IO-Link Master Module |
| | IO-Link Sensors: 42AF Long Range General Purpose Sensor 42EF RightSight General Purpose Sensor 42IT Visi Sight Sensor 45CRM Color Registration Mark Sensor 46CLR ColorSight True Color Sensor 871C Mini Tubular Sensor 871FM Mini Flat Pack Sensor 871TM Tubular Stainless Steel Sensor 1694 Modular Electronic Circuit Protector 45DMS Distance Measurement Sensor |

- <u>836P</u> Solid-State Pressure Sensor
- <u>837T</u> Solid-State Temperature Sensor
- <u>856T</u> Control Tower Stack Light
- <u>873P</u> Analog Output Ultrasonic Sensor
- <u>875L</u> Capacitive Sensor
- <u>46DFA</u> Small Aperture Fiber-Optic Amplifier Sensor
- <u>45PLA</u> Polarized Light Array Photoelectric Sensor

There is one type of instruction in this library:

• Device (Dvc): instruction used for devices (e.g. 42AF Sensor).

IO-Link Device Instructions

| Instruction | Compatible Master | Version | Category | Instruction Description |
|--------------------------|--|---------|----------------|---|
| raC_Dvc_1734_4I0LMaster | POINT I/O 1734-4IOL | 3.02 | IO-Link Master | POINT I/O 1734-4IOL 4-Channel IO-Link Master Module |
| raC_Dvc_1732E_8I0LMaster | ArmorBlock 1732E-8I0LM12R | 3.02 | IO-Link Master | ArmorBlock 1732E-8I0LM12R 8-Channel IO-Link Master Module |
| raC_Dvc_5032_8I0LMaster | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 3.02 | IO-Link Master | 5032 8-Channel IO-Link Master Module |
| raC_Dvc_42AF_4IOL | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 42AF Long Range General Purpose Sensor |
| raC_Dvc_42AF_8I0L | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 42AF Long Range General Purpose Sensor |
| raC_Dvc_42AF_Type1_5032 | 5032-810LM12DR 0r | 3.02 | 10-Link Sensor | 42AF Long Range General Purpose Sensor |
| raC_Dvc_42AF_Type2_5032 | 5032-8I0LM12M12LDR/A Or | 3.02 | 10-Link Sensor | 42AF Long Range General Purpose Sensor |
| raC_Dvc_42AF_Type3_5032 | 5032-810LM12P5DR | 3.02 | 10-Link Sensor | 42AF Long Range General Purpose Sensor |
| raC_Dvc_42EF_4I0L | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 42EF RightSight General Purpose Sensor |
| raC_Dvc_42EF_8I0L | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 42EF RightSight General Purpose Sensor |
| raC_Dvc_42EF_Type1_5032 | 5032-8101 M12DR 0r | 3.02 | 10-Link Sensor | 42EF RightSight General Purpose Sensor |
| raC_Dvc_42EF_Type2_5032 | 5032-8I0LM12M12LDR/A Or | 3.02 | 10-Link Sensor | 42EF RightSight General Purpose Sensor |
| raC_Dvc_42EF_Type3_5032 | 5032-810LM12P5DR | 3.02 | IO-Link Sensor | 42EF RightSight General Purpose Sensor |
| raC_Dvc_42JT_4IOL | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 42JT Visi Sight Sensor |
| raC_Dvc_42JT_8IOL | ArmorBlock 1732E-8I0LM12R | 3.02 | IO-Link Sensor | 42JT Visi Sight Sensor |
| raC_Dvc_42JT_Type1_5032 | 5032-8101 M12DR 0r | 3.02 | 10-Link Sensor | 42JT Visi Sight Sensor |
| raC_Dvc_42JT_Type2_5032 | 5032-8I0LM12M12LDR/A Or | 3.02 | IO-Link Sensor | 42JT Visi Sight Sensor |
| raC_Dvc_42JT_Type3_5032 | 5032-810LM12P5DR | 3.02 | IO-Link Sensor | 42JT Visi Sight Sensor |
| raC_Dvc_45CRM_4IOL | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 45C CRM Color Registration Mark Sensor |
| raC_Dvc_45CRM_8IOL | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 45CRM Color Registration Mark Sensor |
| raC_Dvc_45CRM_5032 | 5032-8I0LM12DR Or 5032-8I0LM12M12LDR/A Or 5032-8I0LM12P5DR | 3.02 | IO-Link Sensor | 45CRM Color Registration Mark Sensor |
| raC_Dvc_45DMS_4IOL | POINT I/O 1734-4IOL | 3.02 | IO-Link Sensor | 45DMS Distance Measurement Sensor |
| raC_Dvc_45DMS_8IOL | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 45DMS Distance Measurement Sensor |
| raC_Dvc_45DMS_Type1_5032 | 5032-8I0LM12DR Or | 3.02 | 10-Link Sensor | 45DMS Distance Measurement Sensor |
| raC_Dvc_45DMS_Type2_5032 | 5032-8I0LM12M12LDR/A Or 5032-8I0LM12P5DR | 3.02 | 10-Link Sensor | 45DMS Distance Measurement Sensor |
| raC_Dvc_46CLR_4I0L | POINT I/O 1734-4IOL | 3.02 | IO-Link Sensor | 46CLR ColorSight True Color Sensor |
| raC_Dvc_46CLR_8I0L | ArmorBlock 1732E-8I0LM12R | 3.02 | IO-Link Sensor | 46CLR ColorSight True Color Sensor |
| raC_Dvc_46CLR_5032 | 5032-8I0LM12DR Or 5032-8I0LM12M12LDR/A Or 5032-8I0LM12P5DR | 3.02 | IO-Link Sensor | 46CLR ColorSight True Color Sensor |
| raC_Dvc_836P_4IOL | POINT I/O 1734-4IOL | 3.02 | IO-Link Sensor | 836P Solid-state pressure sensors |
| raC_Dvc_836P_8I0L | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 836P Solid-state pressure sensors 755 |
| raC_Dvc_836P_Type1_5032 | 5032-8I0LM12DR Or | 3.02 | 10-Link Sensor | 836P Solid-state pressure sensors 755 |
| raC_Dvc_836P_Type2_5032 | 5032-810LM12M12LDR/A Or 5032-810LM12P5DR | 3.02 | 10-Link Sensor | 836P Solid-state pressure sensors 755 |
| raC_Dvc_837T_4I0L | POINT 1/0 1734-410L | 3.02 | 10-Link Sensor | 827T Solid-state temperature sensors |

IO-Link Device Instructions

| Instruction | Compatible Master | Version | Category | Instruction Description | |
|--------------------------|--|---------|----------------|--|--|
| raC_Dvc_837T_8I0L | ArmorBlock 1732E-8I0LM12R | 3.02 | IO-Link Sensor | 837T Solid-state temperature sensors | |
| raC_Dvc_837T_Type1_5032 | 5032-8I0LM12DR Or | 3.02 | 10-Link Sensor | 837T Solid-state temperature sensors | |
| raC_Dvc_837T_Type2_5032 | 5032-810LM12M12LDR/A Or 5032-810LM12P5DR | 3.02 | IO-Link Sensor | 837T Solid-state temperature sensors | |
| raC_Dvc_856T_4I0L | POINT I/O 1734-4IOL | 3.02 | IO-Link Sensor | 856T Control Tower Stack Light | |
| raC_Dvc_856T_8I0L | ArmorBlock 1732E-8I0LM12R | 3.02 | IO-Link Sensor | 856T Control Tower Stack Light | |
| raC_Dvc_856T_5032 | 5032-810LM12DR Or 5032-810LM12M12LDR/A Or 5032-810LM12P5DR | 3.02 | 10-Link Sensor | 856T Control Tower Stack Light | |
| raC_Dvc_871C_4IOL | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 871C Mini Tubular Sensor | |
| raC_Dvc_871C_8IOL | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 871C Mini Tubular Sensor | |
| raC_Dvc_871C_5032 | 5032-8I0LM12DR Or 5032-8I0LM12M12LDR/A Or 5032-8I0LM12P5DR | 3.02 | 10-Link Sensor | 871C Mini Tubular Sensor | |
| raC_Dvc_871FM_4I0L | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 871FM Mini Flat Pack Sensor | |
| raC_Dvc_871FM_8IOL | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 871FM Mini Flat Pack Sensor | |
| raC_Dvc_871FM_Type1_5032 | 5032-8I0LM12DR 0r | 3.02 | 10-Link Sensor | 871FM Mini Flat Pack Sensor | |
| raC_Dvc_871FM_Type2_5032 | 5032-810LM12M12LDR/A Or 5032-810LM12P5DR | 3.02 | 10-Link Sensor | 871FM Mini Flat Pack Sensor | |
| raC_Dvc_871TM_4IOL | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 871TM Tubular Stainless Steel Sensor | |
| raC_Dvc_871TM_8I0L | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 871TM Tubular Stainless Steel Sensor | |
| raC_Dvc_871TM_5032 | 5032-8I0LM12DR Or 5032-8I0LM12M12LDR/A Or 5032-8I0LM12P5DR | 3.02 | 10-Link Sensor | 871TM Tubular Stainless Steel Sensor | |
| raC_Dvc_873P_4I0L | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 873P Analog Output Ultrasonic Sensors | |
| raC_Dvc_873P_8I0L | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 873P Analog Output Ultrasonic Sensors | |
| raC_Dvc_873P_Type1_5032 | 5032-8I0LM12DR 0r | 3.02 | 10-Link Sensor | 873P Analog Output Ultrasonic Sensors | |
| raC_Dvc_873P_Type2_5032 | 5032-810LM12M12LDR/A Or 5032-810LM12P5DR | 3.02 | 10-Link Sensor | 873P Analog Output Ultrasonic Sensors | |
| raC_Dvc_1694_4I0L | POINT I/O 1734-4IOL | 3.02 | IO-Link ECP | 1694 Modular Electronic Circuit Protectors | |
| raC_Dvc_1694_810L | ArmorBlock 1732E-8I0LM12R | 3.02 | IO-Link ECP | 1694 Modular Electronic Circuit Protectors | |
| raC_Dvc_1694_5032 | 5032-8I0LM12DR Or 5032-8I0LM12M12LDR/A Or 5032-8I0LM12P5DR | 3.02 | IO-Link ECP | 1694 Modular Electronic Circuit Protectors | |
| raC_Dvc_875L_4I0L | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 875L Capacitive Sensors | |
| raC_Dvc_875L_810L | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 875L Capacitive Sensors | |
| raC_Dvc_875L_5032 | 5032-8I0LM12DR Or 5032-8I0LM12M12LDR/A Or 5032-8I0LM12P5DR | 3.02 | 10-Link Sensor | 875L Capacitive Sensors | |
| raC_Dvc_46DFA_4IOL | POINT I/O 1734-4IOL | 3.02 | 10-Link Sensor | 46DFA Small Aperture Fiber Optic Amplifier Sensors | |
| raC_Dvc_46DFA_8IOL | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 46DFA Small Aperture Fiber Optic Amplifier Sensors | |
| raC_Dvc_46DFA_5032 | 5032-8I0LM12DR Or 5032-8I0LM12M12LDR/A Or 5032-8I0LM12P5DR | 3.02 | 10-Link Sensor | 46DFA Small Aperture Fiber Optic Amplifier Sensors | |
| raC_Dvc_45PLA_4IOL | POINT I/0 1734-410L | 3.02 | 10-Link Sensor | 45PLA Polarized Light Array Sensors | |
| raC_Dvc_45PLA_8I0L | ArmorBlock 1732E-8I0LM12R | 3.02 | 10-Link Sensor | 45PLA Polarized Light Array Sensors | |
| raC_Dvc_45PLA_5032 | 5032-8I0LM12DR Or 5032-8I0LM12M12LDR/A Or 5032-8I0LM12P5DR | 3.02 | 10-Link Sensor | 45PLA Polarized Light Array Sensors | |

Library Folders and Files

When you extract the library from the downloaded .zip folder, you will find the following folder and file structure. Note that some items are generalized with *TYPE* (e.g. Dvc, Opr, Tec) and *OBJECT* (e.g. 45DMS, 46CLR, etc). The major and minor versions are represented by X and Y respectively.

| Level 1 | Level 2 | Level 3 | File Type | Description |
|---|---|--|----------------------------|--|
| Application Example | | | | |
| | IOLinkApplication_ACM_v3_02.xlsx | 1 | XLXS | ApplicationCodeManagerProject |
| | IOLinkApplication_v3_02.ACD | | ACD | Logix Designer Example Project |
| | IOLinkApplication_ME_v3_02.apa | APA | FT View ME Project Archive | |
| | IOLinkApplication_SE_v3_02.apa | | APA | FT View SE Project Archive |
| | IOLinkApplication_VD_3_02.vpd | | | |
| ApplicationCodeManagerLibraries | | | Folder | Application Code Manager files |
| | Attachments (.HZ1 and .txt files) | Folder | ACM Object Attachments | |
| | (RA-LIB)_Device_Asset-Control_GROUP_raC_Dvc_OBJECT_(X.Y).HSL4 | | | ACM Asset-Control Object |
| | (RA-LIB)_Device_Device_GROUP_raC_Dvc_OBJECT_(X.Y).HSL4 | | | ACM Device Object |
| HMI - FactoryTalk View ME | | | | FactoryTalk View ME files |
| | Displays - gfx | | Folder | FT View ME display files |
| | | (raC-X_YY-ME) raC_ <i>TYPE_OBJECT</i> -faceplate.gfx | GFX | Object Faceplate display |
| | Global Objects - ggfx | | Folder | FT View ME Global Object files |
| | | (raC-X-ME) Graphic Symbols - LIBRARY.ggfx | GGFX | Graphic Symbol/Launch Button global objects |
| | | (raC-X-ME) Toolbox - LIBRARY.ggfx | GGFX | Toolbox global objects |
| HMI - FactoryTalk View SE | | | Folder | FactoryTalk View SE files |
| | Displays - gfx | | Folder | FT View SE display files |
| | | (raC-X_YY-SE) raC_ <i>TYPE_OBJECT-</i> faceplate.gfx | GFX | Object Faceplate display |
| | Global Objects - ggfx | | Folder | FT View SE Global Object files |
| | | (raC-X-SE) Graphic Symbols - LIBRARY.ggfx | GGFX | Graphic Symbol/Launch Button global objects |
| | | (raC-X-SE) Toolbox - LIBRARY.ggfx | GGFX | Toolbox global objects |
| HMI - ViewDesigner - vpd | | | Folder | View Designer Files |
| | (raC-X_YY-VD) raC_Dvc_IO-Link.vpd | | | Object faceplate and graphic symbol/launch buttons |
| | raC_Dvc_1732IL_Hubs.vpd | | | Object faceplate and graphic symbol/launch buttons |
| HMI FactoryTalk View Images - png | | | Folder | FT View ME/SE image files |
| | images.png | | PNG | FTView ME/SE images |
| Reference Manuals | | | Folder | Manuals |
| | DEVICE-RM300C-EN-P.pdf | | PDF | Reference manual |
| Studio 5000 Logix Designer Files - L5X | | | Folder | Studio 5000 AOI and RUNG import files |
| | raC_TYPE_OBJECT_X.YY_RUNG.L5X | | | Object rung import |
| | raC_TYPE_0BJECT_X.YY_A0I.L5X | | | Object AOI import |
| Videos | | | | How-to and Operational Overview Videos |
| | How_To_Import_and_Configure_TYPE_Objects_in_FTViewME.mp4 | | | How-to Video |
| | How_To_Import_and_Configure_TYPE_Objects_in_LogixDesigner.mp4 | | | How-to Video |
| | How_To_Import_and_Configure_TYPE_Objects_in_LogixDesigner (5032 Master).mp4 | | | How-to Video |
| | How_To_Configure_TYPE_Objects_in_' | re_TYPE_Objects_in_ViewDesigner.mp4 | | How-to Video |
| | _Objects_in_ACM.mp4 | MP4 | How-to Video | |
| | How_To_Import_and_Configure_TYPE_Objects_in_ACM (5032 Master).mp4 | | | How-to Video |
| | Operational_Overview_of_TYPE_Objects_Faceplate.mp4 | | | Operational Overview video |
| | Operational_Overview_of_TYPE_Objects_Faceplate (5032 Master).mp4 | | | Operational Overview video |

| FTViewStudio_I0LinkLibrary_Tags_3_00.CSV | | FTView ME HMI Tags |
|--|-----|--|
| ReadMe.txt | TXT | Explanation of setup.cmd |
| Setup.cmd | CMD | Application Code Manager setup script to register library |



See the files in the *Application Example* folder to see a functional application that uses all of the IO-Link Device Library instructions. These files are referenced in the Programming Examples for each instruction. The files include a Studio 5000 Logix Designer® controller file, a Studio 5000® Application Code Manager project back-up, and an HMI projects for FactoryTalk® View ME/SE Local Station and Studio 5000 View Designer®.

Visualization Files

Each Add-On Instruction has associated visualization files that provide a common user interface. The IO-Link Device Library supports two HMI options each with their own files supplied:

- FactoryTalk[®] View Machine Edition
- FactoryTalk[®] View Site Edition
- Studio 5000 View Designer®

FactoryTalk View Visualization Files

You must import these files in the following order:

- Images (.png files)
- Global Objects(.ggfx file type)
- HMI faceplates (.gfx file type)

| File Type Abbreviations | FactoryTalk View SE | FactoryTalk View ME | Description | |
|--|--|--|--|--|
| Images (.png) | All .png files in the <i>HMI FactoryTalk View Images - p</i> IMPORTANT: FactoryTalk View application renames extension, but the files retain a .png format. | Common icons that are used in the Global Objects and standard displays for all objects. | | |
| Global objects (.ggfx) | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx (raC-3-ME) Graphic Symbols - IO-L Device.ggfx | | Graphic symbols or launch buttons used to open faceplate displays from other displays. | |
| | (raC-3-SE) Toolbox - IO-Link Device.ggfx | (raC-3-ME) Toolbox - IO-Link Device.ggfx | Common objects used across multiple device faceplates. | |
| Standard displays (.gfx) (raC-3_XX-SE) precedes name of the display. | | (raC-3_XX-ME) precedes name of the display. | e.g. (raC-3_02-ME) raC_Dvc_45DMS- Faceplate.gfx | |

Global object files contain Graphic Symbols that are created once and referenced multiple times on multiple displays in an application. When changes are made to a global object, all instances in the application are automatically updated.

Global objects serve two purposes:

- Toolbox files contain common elements that are used to build faceplate displays.
- Graphic Symbols files contain device symbols or launch buttons that you can use to build your application displays. Select the symbol to open the corresponding faceplate display.

Standard display files, commonly called faceplates, provide a common user interface.

Studio 5000 View Designer Visualization Files

View Designer project files are supplied that contain faceplates and launch buttons for the IO-Link Device Library. The devices are distributed over multiple View Designer Project files grouped by category for PowerDiscrete, PowerVelocity, PowerMotion, and PowerMonitor devices. These files are found in the *HMI* - *ViewDesigner* - *vpd* folder. Inside of the VPD file you will find a the required display files inside of the User-Defined Screens folder.
| Display Type | View Designer Screen | Description |
|--------------|---------------------------------------|---|
| Screen | Toolbox | Graphic symbols or launch buttons used to open faceplate/pop-up displays from other displays. |
| Рор-Ир | raC_Dvc_ precedes name of the pop-up. | Faceplate display for specific device. e.g. raC_Dvc_45DMS_FP |

Basic Faceplate Attributes

Faceplates consist of tabs, and each tab consists of one or more pages. The Home tab is displayed when the faceplate is initially opened. The faceplate provides the means for operators, maintenance personnel, engineers, and others to interact with a device or instruction instance, which includes a view of its status and values. Faceplates may also manipulate an instruction through its commands and settings. Select the appropriate icon on the left of the faceplate to access a specific tab. This section provides an overview of the faceplate attributes that are common across the objects. More details are supplied in the individual section for each object.

Common Status Banner

At the top of all device object faceplates there is a common status banner which provides the following information:

- Ready (green LED icon) or Not Ready (yellow LED icon) status
- Faulted (banner will show Not Ready with fault message)
- Communication Loss



| ltem | Description |
|------|---|
| 1 | Ready state displays green LED icon and grey background. |
| 2 | Faulted state shows yellow LED icon and Not Ready status. |
| 3 | Fault message for latest fault present. Will also display "Virtual" if virtual mode is enabled. |
| 4 | Faulted state shows yellow border around banner. |

Faceplate Navigation

All device object faceplates have navigation tabs on the left side of the faceplate. Navigation tabs may vary based on device type. The active tab will show as a light grey, while an inactive tab will show as a dark grey.





The common tabs are shown below.



Faceplate Revision Notes

By clicking on the open space near the bottom left corner of the faceplate you can momentarily view revision notes and details of the active faceplate. This may be useful in troubleshooting or when communicating with Rockwell Automation Tech Support.



| ltem | Description |
|------|---|
| 1 | Click near the bottom right corner to temporarily open up the revision notes dialogue |
| 2 | Revision number |
| 3 | Faceplate display name |

Launch Buttons

Launch buttons are provided in Global Display (GGFX) files for FactoryTalk View® ME/SE projects. There are two types of launch buttons are provided, shown in below Table. These are used to open HMI faceplate displays or popups.

| Launch Button Style | Image Examples | Usage |
|------------------------|----------------------------|--|
| Basic Text Button | SS | Simple launch button with diagnostic information. |
| Graphical Button | SS SS R NNNN.N mm | Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. |

Diagnostic Icons

Diagnostic icons may be displayed on the graphic buttons for compatible modules. Safety modules are designated with a small guard icon.

| lcon | Image | Visible Condition |
|------------------------|-------|--|
| Communications Failure | 8 | Connection Faulted |
| Fault | × | Any device fault active (module hardware issue) |
| Warning | • | Any device warning active (maintenance required) |
| Not Ready | • | Device Not Ready |
| IO-Link Identification | 0 | Always Visible |



| ltem | Description | Options |
|------|----------------------------|--|
| 1 | Device label. Set to tag.@ | Description by default. Set to Global Parameter #104 for custom label. |
| | Device Fault/Warning Sta | tus |
| 2 | Warning | A |
| | Fault | × |
| | Device communication fa | ilure/Virtual Mode status |
| 3 | Communication Failure | 8 |
| 4 | Device live data variable | - 42AF, 42EF, 42JT, 45PLA, 45CRM, 46CLR, 46DFA, 871C, 871FM, 871TM, 875L: Triggered/Not Triggered Status - 45DMS, 873P: Distance (mm) - 836P: Pressure (Units as per Configuration) - 837T: Temperature (Units as per Configuration) - 856T, 1694, IO-Link Master: Not Applicable |
| 5 | 10-Link Identification | 0 |
| 6 | Device not ready status | • |

Library Versions

Each library object has a revision x.yy where: x is the Major Revision number and yy is the Minor Revision number. Each release of the library comes with release notes that describe the changes that were made since the last release. You can find the revision number of the object in a number of locations as shown below.

| Component | Example | |
|---|--|---|
| The Add-On Instruction in Logix Designer applicationhasrevisioninformationvisible when the instruction is selected in the Controller Organizer. | Class Description Revision Note Vendor Data Type Size Created Created By Edited Edited By Signature ID Protection Type Protection Name Protection Permissions | Standard Photoelectric Sensor 42AF Device Object With + v2.3 .00 Updates: Rockwell Automation 2324 bytes 9/21/2018 12:13:47 AM Not Available 6/2/2022 4:07:41 AM Not Available <none> Source Key Unknown Protection +View, Use</none> |
| The Add-On Instruction Definition General tab shows the revision number along with basic revision notes. Refer to the release notes for complete revision notes. | Add-On Instruction I General Parameters Lo Name: raC_Dvo Description: Photoele Class: Standard Type: 10 Lado Revision Note: Updates Anomalia Vendor: Rockwee Copy all default values o Logic Data Type | Definition - raC_Dvc_42AF_4IOL v2.3 .00 Incal Tags Scan Modes Signature Change History 2-42AF_4IOL eactric Sensor 42AF Device Object With 4IOL eactric Sensor 42AF Device Object With 4IOL d d d d d d d d d d d d d |
| The faceplate in FactoryTalk View software has revision information visible when the pointer is clicked just inside the lower left corner of the faceplate. | 45DMS Revision 2.02 (raC-2_02-ME) raC_Dvc_45DMS-Faceplate Copyright © Rockwell Automation, Inc. All Rights Reserved | |
| The revision number is shown in the file names for GFX, VPD, ACM.HSL4, AOI.L5X, and RUNG.L5X files. | (raC-2_03-ME) raC_Dvc_42AF-Faceplate.gfx (RA-LIB)_Device_Asset-Control_IO-Link_raC_Dvc_42AF_4IOL_(2.3).HSL4 (RA-LIB)_Device_Asset-Control_IO-Link_raC_Dvc_42AF_8IOL_(2.3).HSL4 (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42AF_4IOL_(2.3).HSL4 (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42AF_8IOL_(2.3).HSL4 (raC_Dvc_42AF_4IOL_2.02_AOI.L5X raC_Dvc_42AF_8IOL_2.02_AOI.L5X raC_Dvc_42AF_8IOL_2.02_AOI.L5X raC_Dvc_42AF_8IOL_2.02_RUNG.L5X | |

State Model

The following section will discuss the state model for Device Object. The figure below shows the core logic states.

By default, each state is active for a minimum of 256us to allow for evaluation of state outside of the ADO instance in the user program



Interfaces

Device object interfaces are intended to provide the application programmer a class based harmonized interface for interacting with the device object from user code. Standard control interfaces are used for passing device inputs (Inp), device configuration (Cfg), Settings (Set), Commands (Cmd) and Status (Sts).

The following IO-Link Common Control Interface tags are the primary device program tags to read and write to when interfacing to IO-Link devices. The value of using these tags in your specific application code is that you may use a number of different IO-Link devices such as 42AF, 45DMS, etc without having to update your application device interface tags.

For detailed information on specific interfaces, please refer to the appropriate section in this manual. A list of interface UDTs used in this library follows. Note that *OBJECT* used in the Inp interfaces is replaced with the specific IO-Link sensor device object (e.g. 42AF).

| Interface Class | Object Class | Object Sub-Class | Interface Type | Interface Name (UDT) |
|-----------------|--------------|------------------|----------------|---|
| | 10-Link | 10-Link Devices | Setting | raC_UDT_ItfAD_I0LinkSensor_CtrlSet |
| | | | Command | raC_UDT_ItfAD_I0LinkSensor_CtrlCmd |
| | | | Status | raC_UDT_ItfAD_I0LinkSensor_CtrlSts |
| | | | Information | raC_UDT_ItfAD_I0LinkSensor_Inf |
| | | | Information | raC_UDT_ItfAD_I0LinkSensor_Inf_5032 |
| | | | Interfacing | raC_UDT_ItfAD_IOLinkDevices |
| Control | | 10-Link Master | Config | raC_UDT_ItfAD_4I0L_Master_Cfg |
| | | | Config | raC_UDT_ItfAD_8I0L_Master_Cfg |
| | | | Information | raC_UDT_IOLinkMaster_5032_Diag_Assembly |
| | | 10-Link Device | Input | raC_UDT_ItfAD_OBJECT_Inp_4IOL |
| | | | Input | raC_UDT_ItfAD_OBJECT_Inp_8IOL |
| | | | Input | raC_UDT_ItfAD_ <i>OBJECT</i> _Inp_5032 |
| | | | Config | raC_UDT_IOLink_ <i>OBJECT</i> _Cfg |

Data Types

The following IO-Link Common Control Interface tags are the primary device program tags to read and write to when interfacing to IO-Link devices. The value of using these tags in your specific application code is that you may use a number of different IO-Link devices such as 42EF, 45DMS, etc without having to update your application device interface tags.

raC_UDT_ItfAD_IOLinkSensor_CtrlSet

This is the IO-Link Sensor Common Control Interface User-Defined Data Type for device settings. Its members provide application program access to allow or inhibit commands and settings from the device faceplate or other external sources. The table below shows member names, descriptions, and tag data types.

For example, to inhibit write commands from the device faceplate or other external sources write a 1 to the _InstanceName_CtlrSet.InhibitCmd program tag from your application program. This would prevent a Locate, Reset count, Reset Duration commands from the device faceplate.

| Member | Description | Data Type |
|------------|--|-----------|
| InhibitCmd | 1 = Inhibit user Commands from HMI Faceplate, 0 = Allow Control | BOOL |
| InhibitSet | 1 = Inhibit user Settings from HMI Faceplate, 0 = Allow | BOOL |
| InhibitCfg | 1= Inhibit user Configuration parameters from HMI Faceplate; 0=Allow | BOOL |
| Setpoint | Trigger Setpoint | INT |

raC_UDT_ItfAD_IOLinkSensor_CtrICmd

This is the IO-Link Sensor Common Control Interface User-Defined Data Type for device commands. Its members provide application program access to common device commands. Only write to these common command members to control the device. If you write directly to the device's output command tags directly unexpected device operation could occur.

The table below shows member names, descriptions, and tag data types. Note: Physical & Virtual members are not currently used in the Add-On Instruction and are reserved for future use.

| Member | Description | DataType |
|--------------|---|----------|
| bCmd | Bir Overlay (Visible) covering all subsequent boolean members. | INT |
| ResetWarn | Reset device warning [No warning reset] | BOOL |
| ResetFault | Reset device trip or fault[No Fault reset,- Automatic fault reset only] | BOOL |
| ResetCounter | Reset counter value [1=Reset] | BOOL |
| Locate | Flash sensor LEDs [1=flash] | BOOL |
| Physical | Operate as a physical device | BOOL |
| Virtual | Virtual mode not implemented | BOOL |

raC_UDT_ItfAD_IOLinkSensor_CtrlSts

This is the IO-Link Sensor Common Control interfacing Status tag. By configuring these tags, we can read various status from the device like Ready, Connected, and Available etc. The below table shows detailed information of members used in this UDT tags. Note: Physical & Virtual members are not currently used in the Add-On Instruction and are reserved for future use.

| Input | Description | Data Type |
|--------------|--|---------------|
| eState | Enumerated state value: 0 = Unused 1 = Initializing 2 = Disconnected 3 = Disconnecting 4 = Connecting 5 = Idle 6 = Configuring 7 = Available | DINT |
| FirstWarning | First Warning Event Data | raC_UDT_Event |
| FirstFault | First Fault Event Data | raC_UDT_Event |
| eCmdFail | Not Applicable | DINT |
| bSts | Enumerated state value 0 = Connected 1 = Available 2 = Warning 3 = Faulted 4 = Ready 5 = Active | DINT |
| Connected | 1 = PAC to device connection has been established | BOOL |
| Available | 1 = The device is available for interaction with the user program | BOOL |
| Warning | 1 = A warning is active on the device | BOOL |
| Faulted | 1 = A fault is active on the device | BOOL |
| Physical | 1 = Operating as a physical device | BOOL |
| Virtual | 1 = Operating as a virtual device[Not an output device] | BOOL |

| Input | Description | Data Type |
|-----------------|---|-----------|
| Counter | Displays the sensor counter value when enabled | DINT |
| Data | Primary sensor data value | REAL |
| EU | Data Engineering Unit | STR0020 |
| Triggered | Bitwise Sensor Trigger Status | INT |
| Signal_Strength | 0-65535 Signal strength value reflected by the target | DINT |
| AppSensorName | Application Specific Name | STR0032 |

The *Triggered* INT value is a bitwise representation of the sensors triggered status bits. The number of trigger statuses may vary depending on the sensor type up to 16 statuses. You may reference individual bits by using syntax such as *Triggered.0* to *Triggered.15* for the sensor's connected Trigger no.1 and so on up to 16 triggers respectively.

raC_UDT_ItfAD_IOLinkDevices

This is the IO-Link Device/Sensor interfacing data which provide the command and status related information to the IO-Link Master. The members inside are array of 8 elements. First element of array describe the Sensor status & command data which is connected to Channel '0' of Master.

The below table shows detailed information of members used in this UDT tag.

| Member | Description | Data Type |
|--------------|-------------------|---------------------------------------|
| Ref_Ctrl_Sts | Status Interface | raC_UDT_ItfAD_I0LinkSensor_CtrlSts[8] |
| Ref_Ctrl_Cmd | Command Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlCmd[8] |

raC_UDT_ItfAD_IOLinkSensorInf

This is the IO-Link Device/Sensor interfacing data which provide the Sensor type information to the IO-Link Master. The members inside are array of 8 elements.

The below table shows detailed information of members used in this UDT tag.

| Member | ber Description | |
|-----------------|---|------------|
| bTriggerPresent | Bitwise Trigger Availability Status | INT[8] |
| bDataInfo | Bitwise Data Information Availability Status (0 = Data, 1 = Signal Strength, 2 = Counter, 3 = Locate, 4 = ASN) | SINT[8] |
| bEnable | 10-Link Sensor present on respective channel e.g. bEnable.0 = 1: 10-Link Sensor present on channel 0 | DINT |
| Inf_Lib | Library identifier for HMI navigation | STR0032[8] |
| Inf_Type | Type identifier for HMI navigation | STR0032[8] |

raC_UDT_ItfAD_IOLinkSensorInf_5032

This is the IO-Link Device/Sensor interfacing data which provide the Sensor type information to the 5032 IO-Link Master. The members inside are array of 7 elements.

The below table shows detailed information of members used in this UDT tag.

| Member Description | | Data Type |
|--------------------|--|------------|
| bTriggerPresent | Bitwise Trigger Availability Status | INT[8] |
| bDataInfo | Bitwise Data Information Availability Status (0 = Data, 1 = Signal Strength, 2 = Counter, 3 = Locate, 4 = ASN) | SINT[8] |
| bEnable | IO-Link Sensor present on respective channel e.g. bEnable.0 = 1: IO-Link Sensor present on channel O | DINT |
| Inf_Lib | Library identifier for HMI navigation | STR0032[8] |
| Inf_Type | Type identifier for HMI navigation | STR0032[8] |
| bDisconnect | IO-Link Sensor Connection fault Status e.g. bDissconnect.0 = 1: IO-Link Sensor not connected. | DINT |
| bFault | IO-Link Sensor fault present on respective channel e.g. bFault.0 = 1: IO-Link Sensor fault present on channel O | DINT |

raC_UDT_Event

| Member | Description | Data Type |
|-------------|--|-----------|
| Туре | Event type: 1 = Status 2 = Warning 3 = Fault 4n = User | DINT |
| ID | User definable event ID. | DINT |
| Category | Userdefinablecategory(Electrical,Mechanical,Materials,Utility,etc.). | DINT |
| Action | User definable event action code. | DINT |
| Value | User definable event value or fault code. | DINT |
| Message | Event message text. | STRING |
| EventTime_L | Timestamp (Date/Time format). | LINT |
| EventTime_D | Timestamp (Y,M,D,h,m,s,us). | DINT[7] |

raC_UDT_LookupMember_STR0082

| Member | r Description D | |
|--|-----------------|--------|
| Code Stores the value of device fault code | | DINT |
| Desc Stores the Messages related to fault code | | STRING |

raC_UDT_Dropdown

This is the IO-Link Sensor Common Control Interface User-Defined Data Type for dropdown.

| Input | Description | Data Type |
|---|---|-------------|
| Slider_Min | Slider Minimum | SINT |
| Slider_Max | Slider Maximum | SINT |
| Total_Item_Count | Total Length of Dropdown | SINT |
| List_Shift | Slider Value for Total Length of Dropdown | SINT |
| List_Select | Slider Value for Visible rows of Dropdown | SINT |
| Selected | Slider Value as per Total Count of Dropdown | SINT |
| Selected_Item Selected Item from Dropdown | | INT |
| Animation_Active Dropdown List Visible | | INT |
| Set_Up | Slider Up Command | BOOL |
| Set_Down | Slider Down Command | BOOL |
| Trigger_Tag | After Selection Trigger Bit | BOOL |
| List_Display | Dropdown List Item | STR0020[5] |
| List_Item | Enter Dropdown item names. e.g. Option0, Option1etc | STR0020[16] |

The below table shows detailed information of members used in this UDT tag.

raC_UDT_HEX_Code_LookupMember

| Member Description | | Data Type |
|--------------------|--|-----------|
| Time_Base | Time Base Selection: 0.1, 0.4, 1.6 & 6.4 | REAL |
| Multiplier | Multiplier Number: 0 to 63 | SINT |
| Hex_Code | Hex Code | INT |

Application Code Manager

Architectural Overview

Device libraries, as with most Application Code Libraries are divided into 2 logical groups: either Asset-Control Object or Device Implement Object.

Asset-Control Objects contain the asset definition of an object and any associated content which belongs to the asset. This includes controller tags, add-on instructions, data types, and attachments such as HMI content and documentation. These are found under the (*RA-LIB*) *Device* > *Asset-Control* folder and have names like *raC_Dvc_xxxx* where *xxxx* is the device name.

Device Implement Objects contain an instance of an asset-control object and provide all related configuration of the asset. The Device implement type is the application code (e.g. programming rung). This includes the required controller tags, programs, modules, and FactoryTalk View ME/SE symbols. These are found under the (*RA-LIB*) *Device* > *Device* folder and have names like *raC_LD_Dvc_xxxx* where *xxxx* is the device name. LD stands for ladder logic.



Using the Library

Install the Library

Download the Library

For the latest compatible software information and to download the Rockwell Automation Library, see the <u>Product Compatibility and Download Center</u>.

Search "Device Library" or filter on Application Content to quickly find the library.

| Device Library | All Categories 🗸 All Families 🗸 🭳 | | COMPARE DOWNLOADS | |
|-------------------------------------|--|---|---|--------|
| | Studio 5000 View Designer. Studio 5000 Application Code Manager I/O Module objects are included. Supports 1715, 1740 47205 (47205 5) 4724 4729 4756 4750 4704 5045 | | Condition Monitoring Device Library 1.01.00 | r B |
| (Accessories/Engineering Libraries) | | | O Device Library 5.04.00 | F |
| | | | O-Link Device Library 3.1.00 | B |
| IO-LINK Device Library | cycle managed library of Device Objects for IO-Link Master and Sensor devices. The library provides pre-configured | | C Mettler Toledo Device Library 1.00.00 | r B |
| | status, diagnostic, and configuration HMI faceplates for FactoryTalk® View ME/SE or Studio 5000 View | | Network Device Library 12.03.01 | B |
| | Designer® and Add-On Instructions (AOI). Use with Studio 5000® Application Code Manager. (1734-4IOL, 1732E- | | O Power Device Library 3.05.00 | B |
| | 8IOLM12R, 1694, 42AF, 42EF, 42JT, 45CRM, 45DMS, 45PLA, 46CLR, 46DFA, 836P, 837T, 856T, 871C, 871FM, 871TM, 873P, 875L) (Accessories/Engineering Libraries) | • | Safety Device Library 1.04.00 | F |
| Mettler Toledo Device Library | The Mettler Toledo Device Library is a tested, documented & life-cycle managed library of Device Objects for Automation Weight Indicators. The library provides pre-configured status, diagnostic, and configuration HMI faceplates for FactoryTalk® View ME/SE or Studio 5000 View Designer® and Add-On Instructions (AOI). Use with Studio 5000® Application Code | • | | |

Download & Install Studio 5000® Application Code Manager

Studio 5000[®] Application Code Manager is free to install from Rockwell Automation's <u>Product Compatibility and Download Center</u>.

Search "Application Code Manager" and select the item to download.

FIND DOWNLOADS 💡

| Application Code Manager | All Categories 🗸 🗸 | All Families 🗸 🔍 | 8 | COMPARE |
|------------------------------|--|---|-----------------------------------|--------------------|
| | (Application Content/Engineering Lib | oraries) | Studio 5000 A | pplication Code Ma |
| Independent Cart Technology | Libraries ICT Libraries for iTRAK and MagneM | Notion including | | |
| | MagneMover LITE, QuickStick for Ap (ACM) (Application Content/Enginee | oplication Code Manager ring Libraries) | | |
| Machine Builder Libraries | Tested, documented and life-cycle m and faceplates for use with Studio 50 Manager (ACM) (Application Conten | nanaged library objects 000 Application Code t/Engineering Libraries) | | |
| Process Library | RA Library of Process Objects, Appli Application Code Manager Library, T Integration with Endress+Hauser De Solutions/PlantPAx) | ication Templates, Tools & Utilities, and vices (pre-5.00) (Process | | |
| Studio 5000 Application Code | Manager Engineering design productivity tool automation application development (Software/Software) | focused on rapid leveraging (ACM) | | |
| 5 items found | | MOVE SELECTIONS > | 1 selection | COMPARE |

Extract the downloaded .zip file by running the 4.xx.00-Studio5000_ACM-DVD.exe executable file. This will extract a new folder containing a Setup.exe file which can be run to begin product installation.

Follow the prompts from the splash screen until installation is complete. Note that a SQL server is required for Application Code Manager. SQL Server Express is offered for free and is included in the Application Code Manager installer.

Register Libraries in Studio 5000® Application Code Manager

It is recommended that you use Studio 5000[®] Application Code Manager or the Studio 5000[®] "Import Library Objects" Plug-In Wizard to import device library objects into a Logix 5000 controller project. To use the library in Application Code Manager you must first register the libraries.



Using Studio 5000[®] Application Code Manager is not mandatory although it is highly recommended to reduce the likelihood of configuration errors and simplify the workflow. Alternatively, you can import the RUNG.L5X files directly into a Studio 5000[®] project.



The Lite version of Studio 5000[®] Application Code Manager is free of charge and can be downloaded from the Product Compatibility and Download Centre. None of the features included in the Standard (paid) version are required to use Device Object Libraries.

Register Complete Library Automatically

To automatically register the entire library, find and run the *setup.cmd* file in the root folder of the library files. You will see a windows console appear as the script runs. When it is complete it will display "Deployment Complete". Enter "Y" to exist the console.



Register Individual Library Objects Manually

As an alternative to registering the entire library using the setup.cmd script, you can manually register one or multiple library objects in Studio 5000[®] Application Code Manager. Open up Application Code Manager and view the Registered Libraries panel on the right. Right-click on *Registered Libraries* and select *Register*. Browse to the *ApplicationCodeManagerLibraries* folder within the library files and select any HSL4 files that you would like to register. Note you may select more than one at a time. Once you complete registering the desired objects they will be shown under the (*RA-LIB*) *Device* solution folder.



Importing Logic into Studio 5000[®] Projects

There are multiple methods to using the logic in a Studio 5000 application. For projects that are being developed from scratch using Application Code Manager along with other Application Code Libraries such as the PlantPAx Process Objects Library or the Machine Builder Library, you can continue to use the Device Object Libraries in Application Code Manager. For existing applications where devices are being added, it is recommended to use the Studio 5000 Plug-In "Import Library Objects" Wizard. Alternatively you can import the RUNG.L5X files into your program and configure them manually.



In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "How_To_Import_and_Configure_IO-Link_Device_Objects_in_LogixDesigner.mp4"



It is not recommended to simply import the AOI.L5X files and attempt to build your ownlogic rung. Doing so will increase the likelihood of configuration errors and likely miss logic that is required outside of the Add-On Instruction. AOI files should only be imported when updating an existing application from a previous version of a Device Object Library to a newer one.

Below is a table to capture recommendations on when to use which tool or workflow when importing and configuring device objects.

| Tool/Workflow | Description of when to use | Software Requirements |
|--|---|--|
| Application Code Manager (full application) | Project is developped from scratch using Application Code Manager along with PlantPAx or Machine Builder libraries. | Studio 5000 Logix Designer® Studio 5000® Application Code Manager (Lite) |
| Studio 5000 Plug-In "Import Library Objects" Wizard | Application Code Manager is installed but not required for the entire project. Application has already been developed but some Device Objects need to be added. | Studio 5000 Logix Designer® Studio 5000® Application Code Manager (Lite) |
| Import RUNG.L5X File | Application Code Manager is not installed. Application has already been developed but some Device Objects need to be added. Familiar with rung import workflow. | Studio 5000 Logix Designer® |
| Import AOI.L5X File | Updating existing application that contains an older version of a Device Object AOI. | Studio 5000 Logix Designer® |

Import Library Objects Wizard

The most simple way to import a Device Object into an existing application is to use the Studio 5000 Plug-In "Import Library Objects" wizard. This plug-in requires Application Code Manager to be installed but does not require it to be open or have a project created.

Right click on an item (e.g. Controller, Task, Program, etc) in the Controller Organizer and select *Plug-Ins > Import Library Objects...*



This will launch a small wizard version of Application Code Manager inside of your Studio 5000 Logix Designer[®] Project. In the Registered Libraries panel on the left, find your desired object under *Registered Libraries* > (*RA-LIB*) Device > Device, then follow below steps:

-Add IO-Link Master H/W Module Object. -Add desired IO-Link sensor AOI Objects. -Add IO-Link Master AOI Object.

| I Library Object Import Wizard (localhost\SQLACM.ACM) | | | | | - D' X |
|---|------------------------------------|--|---|----------------------------|--------|
| FILE EDIT VIEW OPTIONS HELP | | | | | |
| Registered Libraries 4 × 0 | Object Configuration × | | | | |
| III Registered Libraries | | | | | |
| > 🚅 (RA-LIB) ACM 2.00 (1776) | _ibrary Object(s) | +=C LD D+= 42 IT 5022 | | | |
| > 📫 (RA-LIB) Common (2) | Master_5032 | 18C_LD_DVC_4231_5032 | | | |
| v 🗐 (RA-LIB) Device (216) | araC LD Dvc 42JT 5032 Description: | raC Dvc 42JT Device Object | | | |
| > 🛋 Asset-Control (118) | ac Dvc 42JT Type1 5032 | | - | | |
| > ControlModule (4) | Catalog Nur | iber: raC_LD_Dvc_42J1_5032 (3.2) - Publis | he | | |
| V L Device (89) | Solution: | (RA-LIB) Device | Task MainTask | V Program: MainProgram | ~ |
| Contactor (1) | | | Hanrusk | | |
| ID Dvc 42AE 4IOL (3.1) | Parameters I | inked Libraries | | | |
| ac LD Dvc 42AF 8IOL (3.1) | | | | | |
| a rac LD Dvc 42EE 4IOL (3.1) | | | | | |
| araC LD Dvc 42EF 8IOL (3.1) | ✓ 00 General | l. | | | |
| araC LD Dvc 42JT 4IOL (3.1) | TagName | | raC_LI | D_Dvc_42JT_5032 | |
| raC_LD_Dvc_42JT_8IOL (3.1) | TagDescrip | tion | raC_D | vc_42JT Device Object | |
| <pre>raC_LD_Dvc_42JT_5032 (3.2)</pre> | RoutineNa | 10 | raC_LI | D_Dvc_42JT_5032 | |
| raC_LD_Dvc_45CRM_4IOL (3.1) | ✓ 01 Module | - Master5032 | | | |
| raC_LD_Dvc_45CRM_8IOL (3.1) | MasterRef | rance | 🛃 M | aster_5032 | |
| raC_LD_Dvc_45DMS_4IOL (3.1) | U2 Module ModuleNer | - Sensor | Modu | C LD Dvo 421T 5022 | |
| raC_LD_Dvc_45DMS_8IOL (3.1) | SonorTun | | 12 I T I | 20_LD_DVC_42J1_5032 | |
| rac_LD_Dvc_45PLA_4IOL (3.1) | ChannelNu | nber | 0 | 20117 | |
| Tac_LD_DVc_45PLA_6IOL (3.1) | ✓ HMI Conf | quration | | | |
| rac_LD_Dvc_46CLR_4IOL (3.1) | Navigation | Button | Graph | icalButton | |
| a rac LD Dvc 46DFA 4IOL (3.1) | SEAssoct | splay | - | | |
| raC LD Dvc 46DFA 8IOL (3.1) | MEAssoct | isplay | - | | |
| arc LD Dvc 836P 4IOL (3.1) | | | | | |
| <pre>raC_LD_Dvc_836P_8IOL (3.1)</pre> | | | | | |
| raC_LD_Dvc_837T_4IOL (3.1) | | | | | |
| raC_LD_Dvc_837T_8IOL (3.1) | | | | | |
| raC_LD_Dvc_856T_4IOL (3.1) | | | | | |
| raC_LD_Dvc_8561_8IOL (3.1) | | | | | |
| Rec_LD_DVc_871C_4IOL (3.1) | | | | | |
| rac_LD_Dvc_871EM_4IOL_(3.1) | | | | | |
| a rac LD Dvc 871FM 8IOL (3.1.) | | | | | |
| araC LD Dvc 871TM 4IOL (3.1) | | | | | |
| raC_LD_Dvc_871TM_8IOL (3.1) | | | | | |
| raC_LD_Dvc_873P_4IOL (3.1) | | | | | |
| raC_LD_Dvc_873P_8IOL (3.1) | | | | | |
| raC_LD_Dvc_875L_4IOL (3.1) | | | | | |
| raC_LD_Dvc_8/5L_8IOL (3.1) | | | | | |
| arc_LD_Dvc_1694_4IOL (3.1) | TagName | | | | |
| ac_LD_Dvc_1094_0IOL (3.1) | Enter the back | ing tag of the main AUI. This will serve as the base | tag name for other tags in this object that | are derived from the base. | |
| ac LD Dvc 1734 40 Master (3.1) | | | | | |
| Kinetix5100 (1) | | | | | |
| > PowerDiscrete (7) | | | | | |
| > PowerMonitor (3) | | Cancel < E | Back Next > | Finish | |
| > iii PowerMotion (8) | | | | | |
| > PowerVelocity (10) | | | | | |

Perform the following configuration:

• Enter a **name** and **description**. Maximum name length can be 22 characters. Note that other parameters such as the RoutineName, TagName, etc will auto-complete based on these fields.

- Assign the **Task** and **Program**.
- Assign the Master Reference by typing or browsing to the instance of the IO-Link Master Module in the controller project (e.g. 1734-4IOL, 1732E-8IOLM12R or 5032-8IOLM12M12LDR/A)
- Enter the **Module Name** as per Sensor used in Application.
- Select the **Sensor Type** as per IODD used in Application (i.e. Type1, Type2 Or Type3).
- Select a **ChannelNumber** which is the IO-Link Master Module channel which the IO-Link sensor or device is connected to.
- The HMI Configuration options are not used in the Plug-In Wizard and can be ignored.
- Click next or click on the *Linked Libraries* tab. Click the *Auto Create* button to automatically create all of the required linked libraries.



You can manually create new linked libraries or point to existing linked libraries if necessary. You may need to do this if you would like to use an older version of library objects when multiple versions are installed in Application Code Manager.

- On the following screen you can select the desired Merge Actions. Generally these can be left with the default actions.
 - Add: used when AOIs don't previously exist in application
 - Overwrite: usually preferred. Used when AOIs previously exist but may or may not be the same revision.
 - Use Existing: used when AOIs previously exist in the application and you do not wish to overwrite the existing items.
- Click next and you can now see any new logic and modules that will be created.
- Click Finish to complete the import.

Import Rung Logic (4IOL, 8IOL Masters)

An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code. To use pre-engineered logic, import each desired RUNG.L5X file into a controller project.

1. In the Studio 5000 Logix Designer® application, open a new or existing project.

| IMPORTANT | Add-On Instruction definitions can be imported, but not updated, online. | |
|-----------|--|--|
|-----------|--|--|

2. Choose or create a new ladder routine to open. Right-click in the routine ladder and choose Import Rungs...

| (Epd) | | | |
|--------|----|-------------------|--------|
| (2.16) | ж | Cut Rung | Ctrl+X |
| | _] | Copy Rung | Ctrl+C |
| | đ | Paste | Ctrl+V |
| | | Delete Rung | Del |
| | B | Add Rung | Ctrl+R |
| | | Edit Rung | Enter |
| | | Edit Rung Comment | Ctrl+D |
| | | Import Rungs | |
| | - | Export Rungs | |

3. Select the desired RUNG and Select Import. The file will have a name like *raC_Dvc_42AF_4IOL_3.02_RUNG.L5X*.

| 💰 Import Rung | I | | | | × |
|---|---|--|-----------------|-------|----------------|
| Look in: | Studio 5000 L | ogix Designer Files -L5X | ✓ ③ | ø 🖻 [| |
| Quick access Desktop Libraries This PC | 웹 raC_Dvc_42A ᠠ raC_Dvc_42AI 웹 raC_Dvc_42AI ᠬ raC_Dvc_42AI | F_4IOL_3.00_AOI.L5X F_4IOL_3.00_RUNG.L5X F_8IOL_3.00_AOI.L5X F_8IOL_3.00_RUNG.L5X | | | |
| Network | File name: Files of type: | raC_Dvc_42AF_4IOL_3.00_F Logix Designer XML Files (*.L | RUNG.L5X 5X) | ~ | Open Cancel |
| | | | | | Help |



Both "RUNG" and "AOI" .L5X files are provided. Import the RUNG file to get all required additional tags, data types, and message configurations.

4. An *Import Configuration* dialogue window will open and display generic Import names which include "_InstanceName". Click the *Find/Replace...* button and replace all instances of "_InstanceName" with your desired device name (e.g. "PhotoSensor101").

| | Import | t Configuration | - raC_Dvc_42AF | 4IOL_3 | 00_RUNG.L5X | | | | | × |
|------------|---|------------------------|--------------------|--------------|----------------------|--------------------|-----------------------|--------------------------|-------------------------------|---|
| 4 | <u>×</u> | Find: Find Within: Imp | oort Name, Final N | ∽ ame, De | scription, Parameter | :e | | | | |
| Imp | ort Con | itent: | | | | | | | | |
| | - 🗐 Pi | rograms | | Config | ure Tag References | | | | | |
| a | I | _ MainProgram | tine (Punac) | | Import Name | | Operation | P | Final Name | • |
| | | Refere | ences | ₹ ! | _AdapterName:1:I | | Undefined | | _AdapterName:1:I | |
| ₹ | | | _InstanceName | | Create | | _InstanceName | | | |
| P | Add-On Instruction:InstanceName_CtrlCmc | | | nd | Create | | _InstanceName_CtrlCmd | | | |
| | | Da | ta Types | | _InstanceName_CtrlSe | et 🛛 | Create | | _InstanceName_CtrlSet | |
| 1 | InstanceName_CtrlSt InstanceName_CtrlSt | | | | S | Create | | _InstanceName_CtrlSts | | |
| | | | | H. | _InstanceName_Inp_I | | Create | | _InstanceName_Inp_I | |
| | | | | H | _InstanceName_Msg_ | Sensor_Data | Create | 빝 | _InstanceName_Msg_Sensor_Data | |
| | InstanceName_Read_Inde | | | | _Index | Create | | _InstanceName_Read_Index | | |
| | | | | | _InstanceName_Read | _Subindex | Create | 븑 | _instanceName_Read_Subindex | |
| | | | | | InstanceName_Write | _inuex Subladev | Create | 片 | | |
| | | | | | Madula Name Cullet | _oublindex | Create | H | | |
| | | Find / Replace | | | | > | | | ModuleName_CtdHf | 1 |
| | | | | | | | | | > | |
| | | Find What: | _InstanceName | | ~ | Find Next | | | | |
| | | | PhotoSensor 10 | 1 | | | | | | |
| | | Replace With: | | 1 | | Replace | | | | |
| | | Use Wildcar | ds | | | Replace All | | | | |
| | | Search curre | ent view only | | | Close | | | | |
| | | Direction: | OUp ● Dow | n | | CIUSE | | | | |
| | | Find Within: | | | | Help | | | | |
| | | Import | Name 🗹 Final | Name | Description | | | | | |
| ∠ F | Preserv | Alias Fo | or 🗌 Data | Туре | Parameter | | | | OK Cancel Help | |
| Rea | dy L | | | | | | | | | |

5. Click the *Find/Replace...* button and replace of "Instance_Description" with your desired description e.g. "Object Detection 101").

| # | Z | Find: Find V | _InstanceName Within: Import Nar | me, Final N | Vame, Description | Find/Replace | | | | | |
|------|----------|-----------------|-------------------------------------|-------------|-------------------|-----------------|-------|-----------|---|--------------------------------|--------------|
| Impo | rt Cor | ntent: | | | | | | | | | |
| | 🗐 P | rogram | IS | | Configure Ta | ag References | | | | | |
| - | · • | - Main | Program | | Impo | ort Name | | Operation | - | Final Name | م 🖌 |
| | | ····· F | References | (ungs) | | AdapterName:1:I | | Undefined | | _AdapterName:1:I | |
| ₹ | | ſ | Final / Danlage | | | | | ~ | | _ModuleName_CtrlInf | ••• |
| đ | | | Find / Replace | | | | | ^ | | _ModuleName_Ctrlltf | |
| 2 | | | Fired Wheeks | Instanc | eDescription | | Find | Nevt | | Photosensor101 | |
| X. | | rrore A | Find what: | | cocochpaon | ~ | Finu | INEXL | | Photosensor101_CtrlCmd | |
| | | 11013/1 | Replace With: | Object [| Detection 101 | ~ | Rep | lace | | Photosensor101_CtrlSet | |
| | | | | | | | | | | Photosensor101_CtrlSts | |
| | | | | IS | | | Repla | ice All | | Photosensor101_Inp_I | |
| | | | Search curre | nt view or | nly | | Ch | | | Photosensor101_Msg_Sensor_Data | |
| | | | Direction: | | Down | | Cit | ise | | Photosensor101_Read_Index | |
| | | | Einel Within . | 0-1 | 0 | | н | elp | | Photosensor101_Read_SubIndex | |
| | | | | | d Final Manua | | | | | Photosensor101_Write_Index | <u> </u> |
| | | | | vame b | | Pescription | | | | Photococcer101 White Cubinday | > |
| | | | Alias For | r [| Data Type | Parameter | | | | | |

6. Click the *Find/Replace...* button and replace of "_AdapterName" with your desired Adapter Module Name e.g. "Racko1").



 Click the *Find/Replace...* button and replace of "_ModuleName" with your desired IO-Link Master Module Name e.g. ("PointIO_4IOL_Master").



 You will need to point the new object to the correct AdapterName module in your project. You can type in or browse for the correct input (:I) tags in your project. In this example our module is called Rack01:1:I



which is the 1734-4IOL module installed in slot 1 of a POINT I/O rack

Click "OK" on the "Import Configuration dialog box". The rung will now 9. be imported into your ladder routine.

| Photosensor101 Input Interface | Object Detection 101 | |
|-----------------------------------|---|---------------------------------------|
| COR | raC Duo 42AE 4IOI | |
| COP Source Deal/01:11/ Fouth | Tac_DVC_42AF_4IOL Destences101 | |
| Doot Destances 101 Inn I Fault | Prior | (Sta Canaastad) |
| Dest PhotosensorToT_inp_t.rauit | Rei_module PointiO_4IOL_master | (Sis_connected) |
| Length | write_index Photosensor101_write_index | · · · · · · · · · · · · · · · · · · · |
| | Read_index Photosensor101_Read_index | (Sts_Available) |
| | write_Subindex Photosensor101_write_Subindex | |
| | Read_Subindex Photosensor101_Read_Subindex | I -{Sts_Warning}- |
| | Msg_Sensor_Data Photosensor101_Msg_Sensor_Data | 4 |
| | Ref_Ctrl_Set Photosensor101_CtrlSet | (Sts_Faulted) |
| | Ref_Ctrl_Cmd Photosensor101_CtrlCmd | 1 |
| | Ref_Ctrl_Sts Photosensor101_CtrlSts | <pre>(Sts_Ready)—</pre> |
| | Inf_Lookup raC_Dvc_42AF_InfTable | 4 |
| | Inp_I Photosensor101_Inp_ | 1 |
| | Inp_ChxTriggered 0 | f |
| | | |
| | Inp_ChxMarginLowAlarm 0 | 1 |
| | | |
| | Inp ChxProximityAlarm 0 | 1 |
| | | |
| | Inp ChxGain 0 | , |
| | | |
| | Inn ChxSignalStrength 0 | |
| | nip_onnoignmonorign | |
| | Inn ChNumber 0 | |
| | np_ontensor | |
| | Perf Ctrl Inf PointIO 4IOI Master Ctrlint | |
| | Pef Ctrl Hf PointiO_4IOL_Master_CtrlH | ŧ |
| | | |

10. Browse the tags and assign it to the input parameters of the imported AOI Rung. For 'Inp_ChNumber' give the channel no. of Master where sensor is connected.

| | Photosensor101 Input | | Object Detection 101 | |
|---|-------------------------|-------------------------------------|--|------------------|
| | COP | raC Dvc 42AF 4IOL | | |
| 0 | Source Rack01:1:I.Fault | raC_Dvc_42AF_4IOL Ref_Module | Photosensor101 | (Ste Connected) |
| | Length 7 | Write Index | Photosensor101 Write Index | (ora_connected) |
| | | Read_Index | Photosensor101_Read_Index | -(Sts_Available) |
| | | Write_SubIndex | Photosensor101_Write_SubIndex | |
| | | Read_SubIndex I | Photosensor101_Read_Subindex | -(Sts_Warning) |
| | | Msg_Sensor_Data Pho | otosensor101_Msg_Sensor_Data | (Cha Faultand) |
| | | Ref_Ctrl_Set | Photosensor101_CtriCmd | -(Sts_Faulted) |
| | | Ref Ctrl Sts | Photosensor101 CtrlSts | (Sts Ready) |
| | | Inf_Lookup | raC_Dvc_42AF_InfTable | |
| | | Inp_I | Photosensor101 Inp I | |
| | | Inp_ChxTriggered | Rack01:1:I.Ch3Triggered | |
| | | Inp_ChxMarginLowAlarm | 0 🖛 Rack01:1:I.Ch3MarginLowAlarm | |
| | | Inp_ChxProximityAlarm | 0 🖛 Rack01:1:I.Ch3ProximityAlarm | |
| | | Inp_ChxGain | 0 🖛 Rack01:1:I.Ch3Gain | |
| | | Inp_ChxSignalStrength | 0 ← Rack01:1:I.Ch3SignalStrength | |
| | | Inp_ChNumber | 0 4 3 | |
| | | Ref_Ctrl_Inf Ref Ctrl Itf | PointIO_4IOL_Master_Ctrllnf PointIO_4IOL_Master_Ctrlltf | |

Import Rung Logic (5032 Master)

An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code. To use pre-engineered logic, import each desired RUNG.L5X file into a controller project.

1. In the Studio 5000 Logix Designer® application, open a new or existing project.

| IMPORTANT Add-On Instru | uction definitions can be imp | orted, but not updated, online. |
|-------------------------|-------------------------------|---------------------------------|
|-------------------------|-------------------------------|---------------------------------|

2. Choose or create a new ladder routine to open. Right-click in the routine ladder and choose Import Rungs...



3. Select the desired RUNG and Select Import. The file will have a name like *raC_Dvc_42AF_4IOL_3.02_RUNG.L5X*.

| 🖇 Import Rung | | | | | \times |
|---|--|---|--------------------------|---|----------|
| Look in: | = 42AF | | O D D | ▼ | |
| Home Desktop Libraries This PC | Name 앱 raC_Dvc_42AF 에 raC_Dvc_42AF 에 raC_Dvc_42AF 에 raC_Dvc_42AF 앱 raC_Dvc_42AF 에 raC_Dvc_42AF 이 raC_Dvc_42AF | ^ Type1_5032_3.02_AOI.L5X Type2_5032_3.02_RUNG.L5X Type2_5032_3.02_AOI.L5X Type3_5032_3.02_RUNG.L5X Type3_5032_3.02_RUNG.L5X Type3_5032_3.02_RUNG.L5X | Status ሮፓሮፓሮፓሮፓሮፓሮፓሮፓ | Date modified 7/3/2024 5:24 PM 7/3/2024 5:24 PM 7/3/2024 5:24 PM 7/3/2024 5:24 PM 7/3/2024 5:24 PM 7/3/2024 5:24 PM | |
| | File name: | | | ∽ Open | |
| | Files of type: | Logix Designer XML Files (*.L5X | () | ~ Cancel | |
| | | | | Help | |



Both "RUNG" and "AOI" .L5X files are provided. Import the RUNG file to get all required additional tags, data types, and message configurations.

4. An *Import Configuration* dialogue window will open and display generic Import names which include "_InstanceName". Click the *Find/Replace...* button and replace all instances of "_InstanceName" with your desired device name (e.g. "Sensor_42EF_Type1").

| MainProgram Import Name Operation Final Name Import Name Operation Final Name Tags InstanceName_Cfg_C Create InstanceName_Ctfg_C Add-On Instructions InstanceName_CtrlCmd Create InstanceName_CtrlCmd Other Components InstanceName_CtrlSts Create InstanceName_CtrlSts Import Name InstanceName_CtrlSts InstanceName_GetSubIndex InstanceName_GetSubIndex Import Name InstanceName InstanceName_SetIndex InstanceName_SetIndex Import Name Import Name Import Name Import Name Import Name Import Name Import Name Import Name </th |
|--|
| Image: Series of the series |
| Image: Constructions InstanceName_Cfg_C Create InstanceName_Cfg_C Image: Constructions InstanceName_CtrlCmd Create InstanceName_CtrlCmd Image: Constructions Image: Constructions Image: Constructions Image: Constructions Image: Constructions Image: Constred in the image: Constructions |
| Add-on Instructions B Data Types Other Components Errors/Warnings Add-on Instructions InstanceName_CtrlSt InstanceName_CtrlSts InstanceName_GetIndex InstanceName_GetIndex InstanceName_GetIndex InstanceName_ModReconfigure InstanceName_SetIndex InstanceName_SetIndex InstanceName_SetIndex InstanceName_SetSubIndex InstanceName_SetSubIndex InstanceName_Ctrlft InstanceName_SetIndex InstanceName_SetIndex InstanceName_SetIndex InstanceName_SetIndex InstanceName_CtrlSts InstanceName_SetIndex InstanceName_SetIndex InstanceName_SetIndex InstanceName_SetIndex InstanceName_CtrlSts InstanceName_ModReconfigure InstanceName_SetIndex InstanceName_SetIndex InstanceName_SetIndex InstanceName_SetIndex InstanceName_CtrlSts InstanceName_SetIndex InstanceName_SetIndex InstanceName_CtrlSts InstanceName_SetIndex InstanceName_SetIndex InstanceName_CtrlSts InstanceName_SetIndex InstanceName_SetIndex InstanceName_CtrlSts InstanceName_SetIndex InstanceName_SetIndex InstanceName_CtrlSts InstanceName_SetIndex InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_SetIndex InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_CtrlSts InstanceName_Ct |
| image: Data Types instanceName_CtrlSet Create instanceName_CtrlSet image: Dother Components instanceName_CtrlSts Create instanceName_CtrlSts image: DistanceName_CtrlSts Create instanceName_CtrlSts image: DistanceName_CtrlSts Create instanceName_GetIndex image: DistanceName_GetIndex Create instanceName_GetIndex image: DistanceName_Inp_i instanceName_ModReconfigure instanceName_ModReconfigure image: DistanceName_SetIndex instanceName_SetIndex instanceName_SetIndex Replace instanceName_CtrlIff instanceName_CtrlIff instanceName_CtrlIff image: Direction: _Up Digeorition _Up Digeorition image: Direction: _Up Digeorition _up Digeorition image: Direction: _Up Digeorition _up Digeoritio |
| Errors/Warnings |
| Image: Search current view only |
| InstanceName_GetSubIndex Create InstanceName_GetSubIndex Find / Replace InstanceName_ModReconfigure Find What: InstanceName InstanceName_ModReconfigure InstanceName InstanceName_SetSubIndex Replace With: Sensor_42EF_Type1 InstanceName_SetSubIndex Use Wildcards InstanceName_SetSubIndex Image: Search current view only Close Direction: Up Dgwn Find Help Halag For Data Type Parameter InstanceName in point of the system of the sy |
| Find / Replace |
| Find What: InstanceName InstanceName_ModReconfigure Figd What: InstanceName InstanceName_MsgData Replace With: Sensor_42EF_Type1 InstanceName_SetModex Image: Sensor_42EF_Type1 Replace Image: |
| Figd What: _InstanceName Eind Next InstanceName_MsgData Rgplace With: Sensor_42EF_Type1 Beplace D _InstanceName_SetBubleAx Use Wildcards Replace All D _MasterName_Ctrlinf Objection: Up Down Close Find Help that already exists in project and is different. Find Help that already exists in project and is different. Aliag For Data Type Parameter |
| Rgplace With: Sensor_42EF_Type1 InstanceName_SetIndex Beplace D InstanceName_SetSubIndex Use Wildcards D MasterName_Ctrlinf Search current view only Image: Child in the set of the |
| Replace With: Sensor_42EF_Type1 Replace InstanceName_SetSubindex Use Wildcards Replace All Image: MasterName_Ctrilinf Search current view only Close Image: MasterName_Ctrilinf Direction: Up Down Find Help that already exists in project and is different. Aliag For Data Type Parameter |
| Use Wildcards Replace All □ MasterName_Ctriint Search current view only □ MasterName_Ctriint Direction: Up O Down Find □ ModuleName:C ✓ Jmport Name ✓ Fingl Name ✓ Description △ Aliag For ○ Data Type Parameter |
| Image: Search current view only Image: Search current view only Direction: Up Dgwn Find Image: Search current view only Image: Search current view only Image: Search current view only Image: Search current view only Image: Search current view only Direction: Up Dgwn Image: Search current view only Image: Search current view only Find Image: Search current view only Find Image: Search current view only Aliag For Data Type Parameter Image: Search current view only Image: Search current view only |
| Search current view only Close Direction: Up Down Find Help V Import Name Fingl Name Description Aliag For Data Type Darameter |
| Direction: Up ● Down Find Help Import Name Import Name Alias For Data Type |
| Find Help that already exists in project and is different. Import Name Final Name Description Aliag For Data Type Parameter |
| ✓ Jmport Name ✓ Fingl Name ✓ Description the tag will be converted if possible and some value expected. △ Aliag For ○ Data Type Parameter |
| Alias For Data Type Parameter |
| |
| |
| |
| |
| |
| |
| |

5. Click the *Find/Replace...* button and replace of "_Instance_Description" with your desired description (e.g. "Object Detection 101").

| Find Within: Import Name, Fina | Name, Description | | |
|--------------------------------|---|--|-------------------------------|
| nport Content: | | | |
| - 🗐 Programs | Configure Tag References | | |
| Program_42EF | Final Name 🔺 🖋 Usage Alias For D | Data Type | Description |
| References | D_InstanceName Local ra | aC_Dvc_42EF_Type1_5032 | _InstanceDescription |
| ✓ Tags | InstanceName_Cfg_ Find / Replace | × Cfg | _InstanceName Configuration |
| Add-On Instructions | InstanceName_Ctrl | StriCmd | _InstanceName Command Inte |
| P - B Data Types | InstanceName_Ctrls Find What: InstanceDescription | Find Next ItrlSet | _InstanceName Setting Interfa |
| G Errors/Warnings | InstanceName_Ctrls | ItriSts | _InstanceName Status Interfac |
| | InstanceName_Get Replace With: Object Detection 101 | Replace | _InstanceName Message Co |
| | InstanceName_Inp_ Use Wildcards | 2 | _InstanceName Input Interface |
| | D _InstanceName_Moc | Replace All | _InstanceName Module Reco |
| | InstanceName_Msg | Close | _InstanceName Messaging D |
| | D _InstanceName_Sett Direction: Up O Down | | _InstanceName Message Co |
| | D_InstanceName_Set | Help | _InstanceName Message Co |
| | MasterName_Ctrlinf | nf_5032 | _MasterName Information Dat |
| | MasterName_Ctrllff Mame Grinal Name Obscri | iption | _MasterName Interface Data |
| | ModuleName:C Alias For Data Type Param | neter | |
| | ModuleName: | | |

6. Click the *Find/Replace...* button and replace of "_MasterName" with your desired 5032 IO-Link Master Module Name (e.g. "Mod_Master_5032_1").

| RUN OK Energy Storage | `∦″ Offline | Path: <none></none> | •, No Edits a | 1 Im | Find: | Dvc_42/ | I-Typ | e1_5032_3.02 | RUNG.L5X | | | |
|-----------------------------|----------------|-----------------------------|---------------|-------------|-------------------------|--|----------|----------------|--|-------------------|---------|---|
| ontroller Organizer | | | ▼ ₽ | | The ment super the | inter a state of the state of t | ionite, | Description | | | | |
| 9 - 8 | | | | Import | Content: | | C | T = D - (- | | | | |
| A Controller Ma | ster 5032 | Test Cases | | 1 | Programs MainProgram | | Conne | jure tag kerel | ences | | | |
| Controller | Tags | | | 8 | B MainRoutine (Runo | is) | | Import Name | | Operation | 69 | Final Name |
| Controller | Fault Hand | ller | | | L- CReferences | · | <u>7</u> | _InstanceN | ame | Create | D | _InstanceName |
| Power-Up | Handler | | | 2 | - 🧭 Tags | | | _InstanceN | ame_Cfg_C | Create | D | _InstanceName_Cfg_C |
| Tasks | | | | -8 | -12 Add-Un Instru | ctions | | _InstanceN | ame_CtrlCmd | Create | D | _InstanceName_CtrlCmd |
| A 🖓 MainTask | | | | 7 | - Other Compon | ients | | _InstanceN | ame_CtrlSet | Create | D | _InstanceName_CtrlSet |
| 4 b MainPro | ogram | | (F. LID.) | | | | - | (| -me_CtrlSts | Create | D | _InstanceName_CtrlSts |
| Parar | meters and | Local Tags | Find / Repla | ce | | | | ^ | ne_GetIndex | Create | B | _InstanceName_GetIndex |
| 🛿 Main | Routine | | | Ma | stochismo | | | | ne_GetSubIndex | Create | D | _InstanceName_GetSubIndex |
| Unschedule | ed | | Figd What: | -140 | sterividine | ~ | | Eind Next | ne_Inp_I | Create | D | _InstanceName_Inp_I |
| > I Motion Group | os | | Replace With | Mod | _Master_5032_1 | | | Renlace | ne_ModReconfigure | Create | D | _InstanceName_ModReconfigure |
| 🕨 💷 Alarm Manag | er | | replace main | 1 | | | | Tehnee | ne_MsgData | Create | D | _InstanceName_MsgData |
| > 📫 Assets | | | Use Wird | ards | | | | Replage All | ne_SetIndex | Create | D | _InstanceName_SetIndex |
| Logical Mode | el | | Search ou | rrent vi | w only | | | | ne_SetSubIndex | Create | D | _InstanceName_SetSubIndex |
| 🖌 🥯 I/O Configura | tion | | 1 | | | | | Close | a_Ctriinf | Create | D | _MasterName_Ctrlinf |
| 4 🖨 1756 Back | plane, 1756 | 5-A7 | Direction: | ΟŪ | p 🖸 Dgwn | | | | a_Ctriltf | Create | D | _MasterName_Ctrllf |
| ₿ [0] 1756 | 5-L85E Mas | ter_5032_Test_Cases | Find | | | | | Help | e:C | Undefined | D | _ModuleName:C |
| 4 🕷 Ethernet | | Allen and the second | Impo 🗹 | t Name | Final Name 🔽 Des | cription | | | and the second s | | | • |
| @ 1756-L8 | ISE Master | 5032_Test_Cases | | | | | | | as in import content us | e a data type tha | t alrea | dy exists in protect and is different. |
| ▲ 1 5032-80 | OLM12M1 | 2LDR/A Mod_Master_5032_1 | | For | ⊡uata Type ⊡Para | ameter | | | 3 | | | |
| ▲ 🕲 10-Li | nk | | | - | | - | _ | may be loct | ta type will be used. Dz Check to ensure tao data | ta values for the | tag wil | I be converted if possible and some value |
| 40. | 42AF-B1M. | AB1-xx (224) Mod_42AF_Type1 | | | | | | may be road. | check to choose tay dotto | conteres as expe | cieu. | |
| . 2. | 42AF-B1M | AC1-xx (220) Mod_42AF_Type2 | | | | | | | | | | |
| 44 | 42AF-P2M | AB1-xx (208) Mod_42AF_Type3 | | | | | | | | | | |
| 1.0. | 42EF-DZJB | AK-XX (105) Mod_42EF_Type1 | | | | | | | | | | |
| 1.0. | 42EF-KZKB | IB-XX (119) MOD_42EF_19pe2 | | | | | | | | | | |
| T' 10 | 42EF+R2Jt | BBT-XX (118) MOD_42EF_Type3 | | | | | | | | | | |
| U 12 | 42/1-620 | ATT-XX (1) MOD_42/1_Type1 | | | | | | | | | | |
| 4 1 EO22 91 | OLM12M1 | 21 DP.(A Mod Mostor 5022.2 | | | | | | | | | | |

7. Click the *Find/Replace...* button and replace of "_ModuleName" with your desired IO-Link Sensor Module Name e.g. ("Mod_42AF_Type1").

| BAN Construction Constructi | ₽ | Import Configuration - raC_Dvc_42 Find: Find: Find: Find Within: Import Name, Final Import Content: | AF_Iyp Name, | e1_5032_3.02 | RUNGL5X | | |
|---|-------------------|---|-----------------|----------------|--------------------------|-------------------|---|
| 4 Controller Marter 5032 Test Cares | | - Programs | Contre | jure Tag Kefer | ences | | |
| Controller Tans Controller Tans | | MainRoutine (Rungs) | | Import Name | | Operation | 🔐 Final Name |
| Controller Fault Handler | | - References | <u>s</u> | _InstanceNa | ime | Create | D _InstanceName |
| Power-I In Handler | | - 🖉 Tags | | _InstanceNa | ime_Cfg_C | Create | InstanceName_Cfg_C |
| 4 STasks | | H Add-On Instructions | ш | _InstanceNa | ime_CtrlCmd | Create | InstanceName_CtrlCmd |
| 4 (? MainTask | | Other Components | | _InstanceNa | me_CtrlSet | Create | InstanceName_CtrlSet |
| A b MainProgram | | · · | | - Listers 41 | me_CtrlSts | Create | InstanceName_CtrlSts |
| Parameters and Local Tags | Find / Replac | e | | × | ne_Getindex | Create | InstanceName_GetIndex |
| 10 MainRoutine | | Made Maria | - | | ne_GetSubIndex | Create | InstanceName_GetSubIndex |
| Unscheduled | Find What: | _modulename | <u> </u> | Eind Next | ne_Inp_I | Create | InstanceName_Inp_I |
| Motion Groups | Realisco With: | Mod 42AF Type1 | 1 | Realaco | ne_ModReconfigure | Create | InstanceName_ModReconfigure |
| 🕨 📁 Alarm Manager | replace with. | | | Debinoe | ne_MsgData | Create | InstanceName_MsgData |
| Assets | Use Wilder | ds | | Replace All | ne_SetIndex | Create | D _InstanceName_SetIndex |
| h Logical Model | Search out | rent view only | | | ne_SetSubIndex | Create | D _InstanceName_SetSubIndex |
| 🖌 🛁 I/O Configuration | June | Telle Telle only | | Close | e_Ctriinf | Create | _MasterName_Ctrlinf |
| IT56 Backplane, 1756-A7 | Direction: | OUp ODgwn | | | e_Ctriltf | Create | _MasterName_Ctritf |
| [9] [0] 1756-L85E Master_5032_Test_Cases | Find | | | Help | e:C | Undefined | ModuleName:C |
| 4 윪 Ethernet | Import | Name 🔽 Final Name 🔽 Description | | | Ke | | |
| In 1756-L85E Master_5032_Test_Cases | 0.1 | 0 | | | ns in import content us | a data tuno tha | already exists in project and is different |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_1 | ∐ Alia <u>s</u> F | or Data Type Barameter | | | go in import content of | . a aata ape ala | |
| ▲ OIO-Link | | | _ | may be last (| ta type will be used. Da | ta values for the | tag will be converted if possible and some values |
| 0 42AF-B1MAB1-xx (224) Mod_42AF_Type1 | | | | may be lost. (| neck to ensure tay udia | converts as expe | Lieu. |
| 2 42AF-B1MAC1-xx (220) Mod_42AF_Type2 | | | | | | | |
| 4 42AF-P2MAB1-xx (208) Mod_42AF_Type3 | | | | | | | |
| 6 42EF-D2JBAK-xx (105) Mod_42EF_Type1 | | | | | | | |
| Y 8 42EF-R2KBB-xx (119) Mod_42EF_Type2 | | | | | | | |
| Y 10 42EF-R2JBBT-xx (118) Mod_42EF_Type3 | | | | | | | |
| 12 42J1-B2LAI1-xx (1) Mod_42JT_Type1 | | | | | | | |
| 14 42J1-F5LE11-xx (11) Mod_42J1_lype2 | | | | | | | |

8. Click "OK" on the "Import Configuration dialog box". The rung will now be imported into your ladder routine.



Using Studio 5000 View Designer®

Using View Designer Project Files

Studio 5000 View Designer® may be used for HMI development for PanelView 5000 applications. Open up your Studio 5000 View Designer® project alongside a second application instance running the required VSD file in the library folder *HMI - ViewDesigner - vpd*.

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk stepby-step through each process. You can refer to the following videos for this section:"How_To_Import_and_Configure_TYPE_-Objects_in_LogixDesigner.mp4" and "How_To_Configure_TYPE_Objects_in_ViewDesigner.mp4"

You will notice there are two screens available under the *User-Defined Screens* folder:

- Toolbox: This has the graphic symbol launch buttons for the faceplate.
- raC_Dvc_xxxxx_FP: This is a faceplate pop-up screen.



To include these files in your project, perform the following steps:

- Copy the entire faceplate _FP screen from the supplied View Designer project to your project application.
- Open the Toolbox screen and copy the desired graphic symbol and paste it into a screen in your project application.



Configuring View Designer Objects

To link the launch button to the faceplate, highlight the button and view the *Events* tab of within the *Properties* pane. Set an Event to *Open popup on release* with the following settings:

- Key: Touch Release
- Open Popup: Select desired faceplate screen
- AOI_Tag (Property Configuration): Browse to AOI backing tag for the device object in your controller file



Using FactoryTalk® View Studio

Import FactoryTalk View Visualization Files

There are several components to import for the visualization files. You import files from the downloaded Rockwell Automation library files via FactoryTalk View ME/SE. All image and display items can be imported either by rightclicking in FactoryTalk View on the Graphic sub-folder (e.g. Displays, Global Objects, Images) or simply dragging and dropping the files into the application.

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk stepby-step through each process. You can refer to the following videos for this section: "How_To_Import_and_Configure_TYPE_-Objects_in_LogixDesigner.mp4" and "How_To_Import_and_Configure_TYPE_Objects_in_FTViewME.mp4"



Import files in this order:

1. Import HMI Images files.

Select all the images in the *HMI FactoryTalk View Images - png* folder and Open.

2. Import Global Object files

Select the global object (.ggfx) files from the \HMI - FactoryTalk View ME\Global Objects - ggfx folder

3. Import HMI Faceplates

Select the faceplate (.gfx) files from the \HMI - FactoryTalk View ME\Displays - gfx folder

Configuring FactoryTalk View Objects

Once the files have been imported into the FactoryTalk View Studio project, you can begin using them in your application. Open the *Global Display (raC-3-ME) Graphic Symbols - IO-Link Device*. Copy the desired launch button style and paste it into a display in your application where you would like to open the faceplate. For more information on graphic symbols, refer to the Graphic Symbols section of the specific device type chapter in this manual.



To configure the graphic symbol launch button, right-click and select *Global Object Parameter Values*. The Global Object Parameter values for the Backing Tag (#102) and Navigation Button Label (#104) are mandatory while the display position values (#120, #121) are optional. You can browse for the tag in your controller project by clicking '...' or manually type them in. These parameters may vary depending on the graphic symbol used, please refer to the Graphic Symbols section of the device type for detailed information. • Launch Button Parameter Configuration e.g. (IO-Link Sensor Faceplate Navigation).

| | Global Obje | ct Parameter Values | | |
|---|-------------|---|-----|---|
| | Name | Value | Tag | Description |
| | #102 | {::[shortcut]Program:IOLink_Program.raC_Dvc_42AF} | ••• | Backing Tag |
| 2 | #104 | raC_Dvc_42AF | ••• | Navigation Button Label |
| 3 | #120 | | ••• | Display's left position (e.g. 100) (optional) |
| 4 | #121 | | ••• | Display's top position (e.g. 100) (optional) |

• Launch Button Parameter Configuration e.g. (IO-Link Master Faceplate Navigation).

| | Name | Value | Tag | Description |
|----|------|---|-----|---|
| 1 | #102 | {::[PAC]Program:MainProgram.Master8IOL_2} | ••• | Add-On Instruction Backing Tag |
| 2 | #104 | Master | ••• | Custom button label. Leave blank to use Tag.@Description |
| 3 | #110 | <pre>{::[PAC]Program:MainProgram836P_1001}</pre> | ••• | CH0 AOI Backing Tag (Enter 0, If there is no sensor connected to the channel) |
| 4 | #111 | 0 | ••• | CH1 AOI Backing Tag (Enter 0, If there is no sensor connected to the channel) |
| 5 | #112 | <pre>{::[PAC]Program:MainProgram45DMS_1001}</pre> | ••• | CH2 AOI Backing Tag (Enter 0, If there is no sensor connected to the channel) |
| 6 | #113 | 0 | ••• | CH3 AOI Backing Tag (Enter 0, If there is no sensor connected to the channel) |
| 7 | #114 | <pre>{::[PAC]Program:MainProgram871FM_1002}</pre> | ••• | CH4 AOI Backing Tag (Enter 0, If there is no sensor connected to the channel) |
| 8 | #115 | 0 | ••• | CH5 AOI Backing Tag (Enter 0, If there is no sensor connected to the channel) |
| 9 | #116 | <pre>{::[PAC]Program:MainProgram42AF_1001}</pre> | ••• | CH6 AOI Backing Tag (Enter 0, If there is no sensor connected to the channel) |
| 10 | #117 | 0 | ••• | CH7 AOI Backing Tag (Enter 0, If there is no sensor connected to the channel) |
| 11 | #120 | | ••• | Display's left position (e.g. 100) (optional) |
| 12 | #121 | | ••• | Display's top position (e.g. 100) (optional) |



These Global Object Parameter Values are automatically configured when you use Studio 5000® Application Code Manager to design and configure your project. Refer to <u>Using Studio 5000® Application Code Manager</u> for more information.

Library Upgrades

Add-On Instruction Upgrades

There are two methods to upgrading existing device object add-on instructions in a project. You can do this either by using the Studio 5000 Plug-In *Import Library Objects* Wizard or by importing individual add-on instruction AOI.L5X files. Both methods are described in the following sections.

Note that all updates to Add-On Instructions must be done with Studio 5000 Logix Designer in OFFLINE mode and a download to the controller is required.

Upgrades Using Studio 5000 Plug-In to Import Library Objects

If Studio 5000 Application Code Manager is installed, you can use the Studio 5000 Plug-In *Import Library Objects* Wizard to update existing Add-On Instructions. For complete information on Studio 5000 Application Code Manager, refer to the section <u>Using Application Code Manager</u>.

Right-click in your controller organizer or within a routine to access *Plug-Ins* > *Import Library Objects...*

| | Open | | |
|---|--------------------|-----------|------------------------|
| ж | Cut | Ctrl+X | |
| Ŋ | Сору | CtrI+C | |
| ĵ | Paste | CtrI+V | |
| | Delete | Delete | |
| 0 | Verify | | |
| | Cross Reference | Ctrl+E | |
| | Browse Logic | Ctrl+L | |
| | Find in Logical Or | ganizer | |
| | Print | Þ | |
| | Export Routine | | |
| | Lock Routine | | |
| | Unlock Routine | | |
| | Properties | Alt+Enter | |
| | Plug-Ins | • | Import Library Objects |
| - | | | Library Designer |

The Library Object Import Wizard dialogue window will open. Under Registered Libraries expend (RA-LIB) Device > Asset-Control and find the desired object and version. Drag the object into the Object Configuration window on the right.

| Ibrary Object Import Wizard (localhost\SQLACM.ACM) | | |
|---|--|--|
| FILE EDIT VIEW OPTIONS HELP | | |
| Ibrary Object Import Wizard (localhost\SQLACM.ACM) FILE EDIT VIEW OPTIONS HELP Registered Libraries # × Obj > (RA-LIB) ACM 2.00 (349) (RA-LIB) Device (157) Ibraries # × Obj > (RA-LIB) Device (157) Asset Control (88) Ibraries # × Obj > (RA-LIB) Device (157) Asset Control (88) Ibraries # × Obj > (RA-LIB) Device (157) Asset Control (88) Ibraries # × Obj > (RA-LIB) Device (157) Asset Control (88) Ibraries # × Obj > (RA-LIB) Covc (1594_4IOL (3.0)) raC_Dvc_1732E_8IOL_Master (3.0) raC_Dvc_21732E_8IOL_Master (3.0) raC_Dvc_42DE_4IOL (3.0) raC_Dvc_42EF_4IOL (3.0) raC_Dvc_42EF_4IOL (3.0) raC_Dvc_42EF_4IOL (3.0) raC_Dvc_42EF_4IOL (3.0) raC_Dvc_45DMS_4IOL (3.0) raC_Dvc_83FP_4IOL (3.0) raC_Dvc_83FP_4IOL (3.0) raC_Dv | t Configuration ry Object(s) _Dvc_42AF_4IOL Name: raC_Dvc_42AF_4 Description: raC_Dvc_42AF_4 Solution: (RA-LIB) Device Parameters 21 1 | OL evice Object - Asset Definitions OL (3.0) - Published |

In the *Merge Actions* window, select the *Action* for the *AddOnIntructionDefinition* to *Overwrite*. This will update any existing instance of the object to the newer version. You may also choose to overwrite any other DataTypes or Tags. Review the release notes of the latest library release to understand what may be impacted. Click next and finish to complete the process.

| Category | Name | Action | Task |
|----------------------------|------------------------------------|----------|------|
| AddOnInstructionDefiniti | on | | |
| AddOnInstructionDefinition | raC_Dvc_42AF_4IOL | Verwrite | |
| DataType | | | |
| DataType | rac_UDT_42AF_Sensor_Data | Verwrite | |
| DataType | raC_UDT_Dropdown | Verwrite | |
| DataType | raC_UDT_Event | Verwrite | |
| DataType | rac_UDT_ltfAD_42AF_Inp_4IOL | Verwrite | |
| DataType | raC_UDT_ltfAD_IOLinkDevices | 🗸 Add | |
| DataType | raC_UDT_ltfAD_IOLinkSensor_CtrlCmd | 🗸 Add | |
| DataType | raC_UDT_ltfAD_IOLinkSensor_CtrlSet | 🗸 Add | |
| DataType | raC_UDT_ltfAD_IOLinkSensor_CtrlSts | 🗸 Add | |
| DataType | raC_UDT_ltfAD_IOLinkSensor_Inf | 🗸 Add | |
| DataType | raC_UDT_LookupMember_STR0082 | Verwrite | |
| DataType | STR0020 | Verwrite | |
| DataType | STR0032 | Verwrite | |
| Tag | | | |
| Tag | raC_Dvc_42AF_InfTable | Verwrite | |

• After Importing the AOI. The AOI references in the routine are affected and need to reconfigure it.

| | 42AF | |
|-------------------------|-------------------------------------|-----------------------|
| COP | raC_Dvc_42AF_4IOL | |
| Source AENTR:1:I.Faul | - raC_Dvc_42AF_4IOL AF_4 | |
| Dest AF_4002_Inp_I.Faul | Ref_Module Master_4 | IOL -(Sts_Connected)- |
| Length | Write_Index AF_4002_Write_In | iex |
| | Read_Index AF_4002_Read_In | lex(Sts_Available) |
| | Write_SubIndex AF_4002_Write_SubIn | iex |
| | Read_SubIndex AF_4002_Read_SubIn | Jex 🛄 –(Sts_Warning)— |
| | Msg_Sensor_Data AF_4002_Msg_Sensor_ | Dat |
| | Ref_Ctrl_Set AF_4002_Ctr | Set -(Sts_Faulted)- |
| | Ref_Ctrl_Cmd AF_4002_Ctrl | md |
| | Ref_Ctrl_Sts AF_4002_Ctr | Sts -(Sts_Ready)- |
| | Inf_Lookup raC_Dvc_42AF_InfTa | ble |
| | Inp_I AF_4002_Ir | Ip_I |
| | Inp_ChxTriggered | ? |
| | | ?? |
| | Inp_ChxMarginLowAlarm | ? |
| | | ?? • |
| | Inp_ChxProximityAlarm | ? |
| | | ?? |
| | Inp_ChxGain | ? |
| | | ?? |
| | Inp_ChxSignalStrength | ? |
| | | ~~~ |
| | inp_cnnumber | 22 |
| | | <u> </u> |
| | Ref_Ctrl_Inf | |
| | Kel_Ctri_ttr | |
| | Unknown AENTR: 11. Un21rigge | oth |
| | Unknown AENTR. LI. Ch2SignalStren | in in |
| | Unknown AENTE:11Ch2MarginLowAL | |
| | Unknown AENTR: 1:1Ch2Broximitr(AL | arm |
| | Unknown ALNTR. T.I. CH2FTOXIMILYAI | 2 |
| | UNNUMI | 2 |

a. Drag and drop the tags from Unknown parameter to specific parameter

| | | 42AF | |
|--------------------------|-----------------------|-------------------------------|-------------------|
| COP | raC_Dvc_42AF_4IOL | | |
| Source AENTR:1:I.Fault | raC_Dvc_42AF_4IOL | AF_4002 | |
| Dest AF_4002_Inp_I.Fault | Ref_Module | Master_4IOL | -(Sts_Connected)- |
| Length 7 | Write_Index | AF_4002_Write_Index | |
| | Read_Index | AF_4002_Read_Index | -(Sts_Available) |
| | Write_SubIndex | AF_4002_Write_SubIndex | |
| | Read_SubIndex | AF_4002_Read_SubIndex | -(Sts_Warning) |
| | Msg_Sensor_Data | AF_4002_Msg_Sensor_Dat | |
| | Ref_Ctrl_Set | AF_4002_CtrlSet | -(Sts_Faulted) |
| | Ref_Ctrl_Cmd | AF_4002_CtrlCmd | |
| | Ref_Ctrl_Sts | AF_4002_CtrlSts | -(Sts_Ready) |
| | Inf_Lookup | raC_Dvc_42AF_InfTable | |
| | Inp_I | AF_4002_lnp_l | |
| | Inp_ChxTriggered | AENTR:1:I.Ch2Triggered | |
| | | 0 🗭 | |
| | Inp_ChxMarginLowAlarm | AENTR:1:I.Ch2MarginLowAlarm | |
| | | | |
| | inp_CnxProximityAlarm | AENTR:1:I.Cn2ProximityAlarm | |
| | las ChuQais | | |
| | inp_cnxGain | AENTR. 1.I.Ch2Gain | |
| | Inn ChySignalStrength | AENTD:1:1 Ch2SignalStrength | |
| | inp_cnxsignalstrength | ALNTR. T.I. Ch23ighai3trength | |
| | Inn ChNumber | 2 | |
| | inp_crintenber | 2 | |
| | Ref Ctrl Inf | 2 | |
| | Ref Ctrl #f | 2 | |
| | Unknown | AENTR: 1:1 Ch2Triggered | |
| | Unknown | AENTR:1:I.Ch2SignalStrength | / |
| | Unknown | AENTR:1:I.Ch2Gain | |
| | Unknown | AENTR:1:I.Ch2MarginLowAlarm | |
| | Unknown | AENTR:1:I.Ch2ProximityAlarm | |
| | Unknown | 2 | |

b. Right click on AOI definition and Remove all unknown parameter.



c. Assign and create new tags for Ref_Ctrl_Inf & Ref_Ctrl_Itf. The tag name, data type and scope should be

| Tag Name | Data Type | Scope |
|---------------------|--------------------------------|------------|
| Master_4IOL_CtrlInf | raC_UDT_ItfAD_IOLinkSensor_Inf | Controller |
| Master_4I0L_Ctrlltf | raC_UDT_ItfAD_IOLinkDevices | Controller |



d. Change the Data type for Ref_Ctrl_Set, Ref_Ctrl_Cmd and Ref_Ctrl_Sts parameter Tags using Right Click and select Edit tag properties. The tag data type should be

| Tag Name | Required Data Type |
|-----------------|------------------------------------|
| AF_4002_CtrlSet | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| AF_4002_CtrlCmd | raC_UDT_ItfAD_I0LinkSensor_CtrlCmd |
| AF_4002_CtrlSts | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |

-(Sts Faulted)-

| | | | Ref_Ctrl_Cmd | Edit "AF_4002_CtrlSet" Properties |
|--------------------------------------|---|-------|---|---|
| | | | Inf_Lookup | rai Find All "AF_4002_CtrlSet" |
| 3 Parameter/ | Local Tag Properties - AF_4002_CtrlSet | × | raC_Dvc_42AF_4IOL raC_Dvc_42AF_4IOL | AF_4002 |
| General | | | Ret_Module Write_Index Read_Index | AF_4002_Write_Index |
| <u>N</u> ame: | AF_4002_CtrlSet | | Write_SubIndex Read_SubIndex | AF_4002_Write_SubIndex AF_4002_Read_SubIndex(Sts_Warning) |
| Description: | AF_4002 Setting Interface | | Msg_Sensor_Data Ref_Ctrl_Set Ref_Ctrl_Cmd | AF_4002 Msg Sensor Data AF_4002_CtrlSet AF_4002_CtrlCmd |
| | | | Ref_Ctrl_Sts Inf_Lookup Inp I | AF_4002_CtrlSts -(Sts_Ready)- raC_DVc_42AF_intTable AF 4002 inp 1 |
| <u>U</u> sage: | Public Parameter V | | Inp_ChxTriggered | AENTR:1:I.Ch2Triggered 0 ← |
| Typ <u>e</u> : | Base ~ <u>C</u> onnection | | Inp_ChxMarginLowAlarm | AENTR:1:I.Ch2MarginLowAlarm 0 |
| Alias <u>F</u> or: | ~ | | Inp ChxGain | AENTR: 1:LCh2Pr0ximityAlam 0 ← AENTR: 1:LCh2Gain |
| Data <u>T</u> ype: | raC_UDT_ltfAD_IOLinkSensor_C | | Inp_ChxSignalStrength | 0 ← AENTR:1:I.Ch2SignalStrength |
| Select Data Ty | pe | × | np_ChNumber | 0 • 2 |
| <u>D</u> ata Types: raC_UDT_ltfAl | D_IOLinkSensor_CtrlSet | OK | Ref_Ctrl_Inf Ref_Ctrl_Itf | Master_4IOL_Ctrlinf Master_4IOL_Ctrlitf |
| raC_UDT_HfAI | D_IOLinkSensor_CtrlCmd | ancel | | |
| raC_UDT_ltfAI | D_IOLinkSensor_CtrlSts D_IOLinkSensor_Inf | Help | | |

Ref_Ctrl_Set

• In order to ensure the HMI faceplate still works properly you will need to update the object's library information stored in the Inf_Lib tag. In the *Controller Organizer* pane under *Assets > Add-On Instructions* expend the device object that was updated. Double-click on *Parameters and Local Tags* to open up the instructions tags.



• In the Add-On Instruction Parameters and Local Tags window, you may notice that the Inf_Lib tag in the add-on instruction definition matches the new library revision number. Click on the down-arrow to the right of the copy button and select *Copy Specified Values...*

| < | 🖓 Add-On Ins | truction Parameters and Local Tag | <mark>js - raC_Dvc_42AF_4IOL 🛛 🗙 🚦</mark> Module Propertie: |
|---|---------------|--|---|
| | Scope: | raC_Dvc_42AF_4IOL → | Show: All Tags |
| | Data Context: | B raC_Dvc_42AF_4IOL <defii p="" ∨<=""></defii> | |
| ľ | Name | | Copy All Values |
| | ▶ Act_Ter | np | Copy Specified Values |

| Default values | of selected parameters a | nd local tags in 'raC_Dvc_4 | 2AF_4IOL' will be copied to s | pecified tags of this type. |
|------------------|--------------------------|-----------------------------|-------------------------------|-----------------------------|
| Specify which v | alues to copy to which t | ags: | | |
| Default Values: | | Tags of type 'raC_Dy | vc 42AE 4IOL' | |
| Parameter | -≡ ▲ Default | | Container | Routine A Loca |
| + Cfg AlignmentM | ode 0 | ▲ AF 4002 | - Main Program | i MainRoutine Rung |
| Cfg_OutputPola | ityInvert0 | | | - |
| Cmd DisableLE | Ds 0 | | | |
| Cmd_EnableLEI | Ds 0 | | | |
| Cmd_LocalTead | hLock 0 | | | |
| Cmd_Locate | 0 | | | |
| Cmd_ResetCour | nt O | | | |
| Cmd ResetDura | tions 0 | × | | |
| E | | _ | | |
| | E ▲ Default | | | |
| ⊕ HMI_Tab | 11 | ^ I | | |
| HMI Version | 0 | | | |
| 🛃 ⊡ Inf_Lib | {} | | | |
| | {} | | | |
| Sts_eEventType | {} | | | |
| | e {} | | | |
| | 0 | | | |

- In the Copy Default Values window, be sure to <u>first uncheck all</u> <u>Parameters and Local Tags</u> by clicking the +/- box in the top right. Failure to do so may result in overwriting settings in the existing objects.
- Check only *Inf_Lib* in the *Local Tag* area. On the right, all affected objects should be selected. Click OK.
- You can now confirm that the *Inf_Lib* tag has been updated to the current library (e.g. 'raC-3_00') by changing the *Data Context* drop-down to a specific device object.

| Data Context: | AF_4002 (MainProgr | ram) 🗸 | ? |
|---------------|--------------------|--------|------------|
| Name | | Value | + |
| ▶ Inf_Lib | | | 'raC-3_00' |

Upgrades by Importing AOI.L5X Files

To upgrade or migrate a project that uses a previous library version to a newer one, the add-on instruction L5X files are supplied. To perform an upgrade to an object perform the following steps:

- Open the controller file. Note changes must be done offline.
- In the Controller Organizer pane right-click on Assets > Add-On Instructions and select Import Add-On Instruction. Navigate to the AOI.L5X file in the Studio 5000 Logix Designer Files - L5X and Open.

| Controller Organizer | | • | Ļ | × | | |
|---|---|---|----------|---|--|--|
| a 📲 | | | | | | |
| Controller Power_v3_00 | | | | | | |
| > 📠 Tasks | | | | | | |
| 🕨 💼 Motion Groups | | | | | | |
| 🕨 💼 Alarm Manager | | | | | | |
| 🔺 🛁 Assets | | | | | | |
| Add-On 🕼 New Add-On Instruction | | | | | | |
| ▲ Import Add-On Instruction | | | | | | |
| 直Lo 发 Cut Ctrl+2 | x | | | | | |
| EPI D Copy Ctrl+(| c | | | | | |
| ▶ ि raC □ D Paste Ctrl+\ | V | | | | | |
| ▶ 🕞 raC_0 Paste With Configuration Ctrl+Shift+\ | V | | | | | |
| ▶ 🕼 raC Opr PF755 Energy | | | | | | |

• You will be prompted that there is an existing version of the instruction that is different. Choose *Overwrite* as the operation and select OK once you have read and understood the warnings. Your existing logic will be updated with the new add-on instruction. Verify that your code compiles and test adequately.
Import Configuration - raC_Dvc_42AF_4IOL_3.00_AOI.L5X

| port Content: | Configure Add-0 | n Instruction Properties | |
|---|-----------------------|---|--|
| ada-On Instructions raC_Dvc_42AF_4IOL Parameters and Local Tags | Import Name: | raC_Dvc_42AF_4IOL | |
| References | Operation: | Overwrite References will be imported as configured in the References folde | ✓ € ³ |
| - 🕞 Errors/Warnings | Final Name: | raC_Dvc_42AF_4IOL | ✓ Collision Details |
| | Description: | 42AF Photoelectric Sensor Device Object With 4IOL Master | ^ |
| | | | 'raC_Dvc_42AF_4IOL' already exists in project and is different. Existing references to the instruction type may be affected including: |
| | Revision: | v3.0 .00 | - logic that calls instruction |
| | Revision Note: | Updates: | - add-on instructions and user- |
| | Vendor: | Rockwell Automation | |
| | Calls to | c_42AF_4IOL' already exists in project and this instruction will be edited to maintain ar on to ensure they will execute correctly wi | d is different. Existing references may be affected. guments passed to existing parameters. Check all of th updates. |
| | If the da values m | ata layout is different, data values for tag ay be lost. Check any tags using this type | s using this type will be converted if possible and so to ensure tag data converts as expected. |
| | | | |

• After Importing the AOI. The AOI references in the routine are affected and need to reconfigure it. Follow the steps from Link

FactoryTalk View Upgrades

To upgrade a device object in a FactoryTalk View ME application, simply import the new faceplate .gfx display file into the application. If any global objects or images have been added or modified, you may need to import these as well. Any unused displays from previous versions may be removed or deleted from the application.

Note that the reference to the faceplate version is set in the Add-On Instruction Local Tag *Inf_Lib* so there does not need to be other modifications to the HMI application.

Studio 5000 View Designer® Upgrades

To upgrade a device object in a Studio 5000 View Designer application, simply import the open the new View Designer .vpd file and copy the raC_Dvc_xxxxx_FP pop-up screen into the existing application. Find any graphic symbol launch buttons in the application that open the faceplate, and update the Action to open the new pop-up screen. Any unused pop-up screens from previous versions may be removed or deleted from the application.

Using Application Code Manager

Overview of Application Code Manager

Studio 5000[®] Application Code Manager is a tool that enables more efficient project development with libraries of reusable code. Application Code Manager creates modular objects with customizable configuration parameters using the reusable content. Application Code Manager can also create the associated visualization, historical and alarming elements for a project.

Studio 5000 Application Code Manager can be easily used along with Rockwell Automation application code libraries such as the PlantPAx Process Objects Library, Machine Builder Library, and Device Object Libraries. For more information on Studio 5000 Application Code Manager, refer to the <u>Application Code Manager User Manual</u>.

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section:"How_To_Import_and_Configure_TYPE_Objects_in_ACM.mp4" or "How_To_Import_and_Configure_TYPE_Objects_in_ACM (5032 Master).mp4"

Creating a New Project

Begin by opening Application Code Manager.



Note: the last project (if any) is opened by default; otherwise a blank screen is displayed.

Create a New Project or open an existing project. Navigate to File > New > Project.

Select the desired project type (e.g. (*RA-LIB*) ACM 2.00 Project - Basic_Project) and fill in the Name and Description.

To add a new controller to a project, in the *Controller Preview* window, rightclick on *Controllers* and select *Add New...*

| Connect Project # > New Project from Existing Project # > Open Project from Existing Project # > Delete > # Recent Projects > # > | FILE | <u>E</u> DIT | TOOLS | VIE | EW <u>H</u> ELP | |
|---|------|---------------|---------------|------------|---|------------|
| New Project # > Open Project from Existing Project Delete > Recent Projects > Exit - | | Connect | | | | |
| Open Project from Existing Project Delete > Recent Projects > Exit - | | New | | • | Project | џ > |
| Delete > Recent Projects > Exit | à | <u>Open</u> | | • | Project from Existing Project | |
| Recent Projects Exit | | Delete | | • | | |
| E <u>x</u> it | | Recent Pro | jects | | | |
| | | E <u>x</u> it | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Controller Preview × | Con | troller F | Previe | 2W | × Class View | |
| Controller Preview × Class View | Con | troller F | Previe | ?W | Class View | |
| Controller Preview × Class View | Con | troller F | Previe | ew Com | Class View | ers |
| Class View Class View Class View Controllers Generate Controllers | Con | troller F | Previe ers | ew Gene | Class View | ers |
| Controller Preview × Class View Controllers Generate Controllers Add New | Con | troller F | Previe ers | ew Gene | Class View Class View Controllers | ers |
| Controller Preview × Class View Controllers Generate Controllers | Con | troller F | Previe ers | ew Gene | Class View Class View Controllers | ən |

Select the desired controller type (e.g. *ControlLogix_Controller, GuardLogix_Controller, CompactLogix_Controller, etc*). Enter a *Name* and *Description* for the controller. Select the appropriate Chassis and Processor configurations.

You can also configure the HMI *AreaPath* and.or *AreaPathME* parameters which will be referenced if you use Application Code Manager to generate FactoryTalk® View ME displays with graphic symbol launch buttons.

| Object Configuration Wiz | ard | ? | × |
|--|---|---|--------|
| Name: | IOLink_Device_v3_0 | | |
| Description: | GuardLogix Safety Controller | | |
| Catalog Number: | GuardLogix_Controller (2.1) - Published | | |
| Solution: | (RA-LIB) ACM 2.00 | | |
| Parameters | | | |
| 2 ↓ | | | |
| ✓ 01 - Controller | | | ^ |
| ChassisName | | Local | |
| Slot | | | |
| SoftwareBevision | | 33 | \sim |
| ProcessorType | | 1756-L84ES | |
| ✓ 02 - HMI | | | |
| AreaPath | | /Area::[shortcut] | |
| AreaPathME | | [shortcut] | |
| ✓ 03 - Historian | | | |
| HistorianPath | | Application/Area:RSLinx Enterprise:[shortcut] | |
| FTLDInterfaceNo | | 1 | |
| Motion Configurabletion | | Enlan | |
| Port Configuration | | Faise | |
| EthernetPort1 Enable | 4 | True | |
| Safety Configuration | n . | 1100 | |
| Safety Level | | SIL2/PLd | |
| Safety_LockApplication | n | False | |
| Safety_ProtectSignatu | re | False | |
| Safety_ConfigureSafe | yIOAlways | False | |
| Time Synchronizat | ion | | |
| TimeSync_Priority1 | | 128 | |
| TimeSunc Prioritu2 | | 128 | |
| 5ize This is the Chassis size of | his Controller | | |
| This is the chassis size of | nis Controller | | |
| | | | |
| | | | |
| | | | |
| | Cancel | << Previous Next >> Finish | |
| | | | |

You can now add in any desired tasks and programs to your controller. Right-Click on the *Tasks* folder underneath your controller in the *Controller Preview* and *Add New Task*. Similarly, right-click on any Task and select *Add New Program*. Complete the desired parameters for Tasks and Programs such as name, type, period, etc.



Adding & Configuring Device Objects

Prior to adding in any Device Objects, ensure you have registered the library in Application Code Manager. Refer to <u>Registering Libraries in Studio 5000</u> <u>Application Code Manager</u> for details.

In Case of 4IOL and 8IOL Masters, When using Studio 5000 Application Code Manager with the IO-Link Device Library, note that you can add IO-Link master module hardware and IO-Link Device Objects; however you must manually add IO-Link sensors/devices to the IO-Link Master Modules after generating the controller code.

Adding IO-Link Master I/O Module

If not already done you may need to add IO-Link Master I/O modules (4IOL, 8IOL or 5032) to your Controller I/O Configuration. This will allow you to link tags in the IO-Link Device Library objects to IO-Link Master Module hardware. Alternatively, you can replace or link these at a later time.

In the *Controller Preview* pane you find the *I/O Configuration* folder underneath your controller. You may add 1732E ArmorBlock IO-Link Master modules directly to the *Ethernet* network or add a remote 1734 POINT I/O rack with a 1734-4IOL IO-Link Master module in the desired slot or add a 5032 8IOL Master Module to the *Ethernet* network. Right-click the desired location and select *Add New*.



You may choose to click on the *Category* filter to easily sort and find *IO-Link* I/O. Selected the desired IO-Link I/O module and click *Next*.



In Case of 1734-4IOL IO-Link Master module, user need to add a remote 1734 POINT I/O rack, then Right Click on Configured Rack and then choose to click on the Category filter to easily sort and find IO-Link I/O. Selected the desired IO-Link I/O module and click Next.

| Object Config | uration Wizard | | | | | | | ? × |
|-------------------------|-----------------------|------------|----------------------------|----------|-------------|----------|-----------|---------------|
| Select a libra | ary | | | | | | | |
| Filter: | | | Show All Revisions | Show All | Libraries | | | |
| Solution | LibraryType | Category 🔻 | CatalogNumber | Family | ContentType | Class | Status | SchemaVersion |
| ⊞ Analog (4 | 1 items) | | | | | | | |
| E Communic | , ation (27 items) | | | | | | | |
| E Distribut (1 | r itema) | | | | | | | |
| [™] Digitai (1 | .5 items) | | | | | | | |
| □ IO-Link (| 4 items) | 10.111 | | 17005 | - | | | |
| (RA-LIB) Device | Module | IO-Link | 1732E-8IOLM12R (3.0) | 1732E | Task | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Module | IO-Link | 5032-8IOLM12DR/A (3.2) | 5032 | Task | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Module | IO-Link | 5032-8IOLM12M12LDR/A (3.2) | 5032 | Task | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Module | IO-Link | 5032-8IOLM12P5DR/A (3.2) | 5032 | Task | Standard | Published | 2.0.0 |
| | | | | | | | | |
| | | | | | | | | |
| | | Cancel | << Previous | Next>> | Fin | ish | | |

For ArmorBlock modules assign a *Name, IPAddress,* and *RPI.* For POINT I/O modules assign the desired *MasterName, Slot* and *RPI* parameters for the module. Click *Finish* to complete.

| | | Name: | PointIO_IOLinkMaster | |
|----------------------------|--------------------------------|----------------------|----------------------------|------------|
| | | Description: | 4 Channel 10-Link Master | |
| | | Catalog Number: | 1734-4IOL (2.3) - Publishe | ł |
| | | Solution: | (RA-LIB) Device | |
| | | Parameters | | |
| | | <mark>₽ </mark> ≵↓ 🖻 | | |
| | | V Module Configura | ation | |
| | | Slot | 3 | |
| | | RPI ChassisName | 20 Back01 | |
| | | Madula Configuration | | |
| | | Module Configuration | 1 | |
| | | | | |
| | | | Cano | el |
| | | | | |
| Object Configuration Wizar | d | | | |
| | | | | |
| Name: | ArmorBlock_IOLinkMaster | | | |
| Description: | 8 Channel IO-Link Master | | | |
| Catalog Number: | 1732E-8IOLM12R (2.3) · Publish | ed | | |
| Solution: | (RA-LIB) Device | | | |
| | | | | |
| Parameters | | | | |
| <u>₹</u> ↓ E | | | | |
| ✓ Module Configuratio | n | | | |
| MasterName | ArmorBlock_IOLinkMast | ter | | |
| IPAddress | 192.168.1.50 | | | |
| RPI | 20 | | | |
| | | | | |
| Module Configuration | | | | |
| | | | | |
| | | | | |
| | Cancel | // Previous | Neutis | Finish |
| | Cancer | VV FIGVIOUS | NCX(22 | 1 11 11611 |
| | | | | |

Object Configuration Wizard

| | ArmorBlock_5032_IOLinkMaster | | | | | |
|-------------------------|---------------------------------------|--|--|--|--|--|
| Description: | 5032 IO-Link Master | | | | | |
| Catalog Number: | 5032-8IOLM12M12LDR/A (3.2) - Publishe | | | | | |
| Solution: | (RA-LIB) Device | | | | | |
| Parameters | | | | | | |
| 21 | | | | | | |
| ✓ 01 Module | | | | | | |
| MasterName IPAddress | ArmorBlock_5032_IOLinkMaster | | | | | |
| RPI | 50 | | | | | |
| | | | | | | |
| | | | | | | |

Adding IO-Link Device Instructions

To add a Device Object into a project, right-click on a Program and Add New...



In the Object Configuration Wizard dialogue window you can click on the Category heading to group objects by category and find IO-Link. Select the desired IO-Link Device object (e.g. raC_Dvc_42AF_8IOL) and click Next.

Note that, 8IOL device objects (e.g. raC_LD_Dvc_42AF_8IOL) must be paired with the 8IOL Master, 4IOL objects (e.g. raC_LD_Dvc_42AF_4IOL) must be paired with the 4IOL Master and 5032 Objects (e.g. raC_LD_Dvc_42AF_Type1) must be paired with 5032 Master.

| Object Config | juration Wizard | | | | | | | ? × |
|----------------|-----------------|----------|-----------------------------|------------------|-------------|----------|-----------|--------|
| Select a lib | ary | | | | | | | |
| Filter: | | | Show All Revisions S | how All Librarie | es | | | |
| Solution | LibraryType | Category | CatalogNumber | Family | ContentType | Class | Status | Schema |
| Informatio | on (1 item) | | | | | | | |
| ⊞ IO-Chann | el (4 items) | | | | | | | |
| IO-Link | (54 items) | | | | | | | |
| (RA-LIB) Devic | e Device | IO-Link | raC_LD_Dvc_42AF_4IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_42AF_8IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_42AF_5032 (3.2) | Logix | Routine | Standard | Published | 2.0.0 |
| (RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_42EF_4IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_42EF_8IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_42EF_5032 (3.2) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_42JT_4IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_42JT_8IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_42JT_5032 (3.2) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_45CRM_4IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_45CRM_8IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_45CRM_5032 (3.2) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_45DMS_4IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| RA-LIB) Devio | e Device | IO-Link | raC_LD_Dvc_45DMS_8IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| | Device | TO Link | | Look | Deuties | Chandrad | Dublehad | 200 |

• Fill in all of the required configuration parameters for the device object. The following example shows a configuration of the raC_LD_42AF_8IOL object.

Perform the following configuration:

- Enter a **name** and **description**. Maximum name length can be 22 characters. Note that other parameters such as the RoutineName, TagName, etc will auto-complete based on these fields.
- Assign the **Task** and **Program**.
- Select a **ChannelNumber** which is the IO-Link Master Module channel that the IO-Link sensor or device is connected to.
- Assign the **MasterName** by typing or browsing to the instance of the IO-Link Master Module in the controller project (e.g. 1734-4IOL or 1732E-8IOLM12R)

| 📴 Select a Reference | | | | | | | | — | | \times |
|---|------------|------------|--------|------------------------|----|----------------|----------|-----------|--------|----------|
| Project - IOLinkv203Prerelease | ^ | Controller | Туре | Object Name | | Object Referen | ces Para | meters | | |
| > 🖕 Histonan | | IOLinkv203 | Module | ArmorBlock_IOLinkMaste | · | Name | Scope | ¥al | | |
| 🗸 🔄 Controllers | | | | - | | CatNum | Object | 1732E-8I | OLM12F | ≀/В |
| ✓ ☐ IOLinky203 ✓ ☐ 1722E.9I01 M12P (2.2.) | | | | | | ProductCode | Object | 1732E-8I | OLM12F | ٤ |
| ArmorBlock_IOLinkMaster | | | | | | ProductType | Object | IO-Link M | laster | |
| 📑 ArmorIOLMasterA | | | | | | | | | | |
| ✓ I 1734-4IOL (2.3) ■ PointIO IOL introductor | | | | | | | | | | |
| | <u>`</u> ۲ | | | _ | | < | | | | > |
| | / | < | | | 20 | L- | | | | |
| Cancel | | << Previou | 15 | Next>> | | Finish | loc | k_IOLinkM | aster | |

The configuration should now be complete with no red X's.

| Object Configuration Wiza | ird | | |
|--|--|----------|-----|
| Name: Description: | PhotoSensor101 raC_Dvc_42AF Device Object |]] | |
| Catalog Number: Solution: | raC_LD_Dvc_42AF_8IOL (2.3) · Published (RA-LIB) Device | Task: T | ask |
| Parameters Linked Librarie | 35 | | |
| Ž↓ OO General RoutineName TagName TagDescription ChannelNumber O1 Module MasterName HMI Configuration SEAssocDisplay MEAssocDisplay Module | PhotoSensor101 PhotoSensor101 raC_Dvc_42AF Device Object 3 ArmorBlock_IOLinkMaster | | |
| | Cancel << | Previous | |

- For HMI Configuration refer to <u>Configuring Displays</u>.
- Click on the *Linked Libraries* tab. Click the *Auto Create* button to automatically create all of the required linked libraries.

| Object Configuration Wiz | ard | ? × |
|--------------------------|---|-------------|
| Name: | PhotoSensor101 | |
| Description: | raC_Dvc_42AF Device Object | |
| Catalog Number: | raC_LD_Dvc_42AF_8IOL (2.3) · Published | |
| Solution: | (RA-LIB) Device Task: Task Program: Program | ~ |
| Parameters Linked Librar | es | Auto Create |
| raC_Dvc_42AF_8IOL | * 🚗 raC_Dvc_424F_810L | |
| | Cancel << Previous Next >> Finish | |

Click Finish to complete the object configuration.

For specific devices details, refer to the appropriate chapter in this manual.

•

Adding IO-Link Master Device Object

You can optionally add an IO-Link Master Module device object (e.g. raC_Dvc_8IOL_Master, raC_Dvc_4IOL_Master, raC_Dvc_5032_Master) to your project. This provides hardware diagnostic information for the master and includes an HMI faceplate to summarize data from each connected sensor. To add an IO-Link Master Object into a project, right-click on a Program and Add New...



In the *Object Configuration Wizard* dialogue window you can click on the *Category* heading to group objects by category and find *IO-Link*. Select the desired IO-Link Master object (e.g. *raC_LD_Dvc_1732E_8IOLMaster* or *raC_LD_Dvc_1734_4IOLMaster* or *raC_LD_Dvc_5032_8IOLMaster*) and click *Next*.

| Object Configu | iration Wizard | | | | | | | ? X |
|-----------------|----------------|-------------------|-----------------------------------|-----------------|-------------|----------|-----------|--------|
| Select a libra | iry | | | | | | | |
| Filter: | | | Show All Revisions Sho | w All Libraries | 3 | | | |
| Solution | LibraryType | Category T | CatalogNumber | Family | ContentType | Class | Status | Schema |
| (RA-LIB) Device | Device | IO-Link | raC_LD_Dvc_875L_4IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Device | IO-Link | raC_LD_Dvc_875L_8IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Device | IO-Link | raC_LD_Dvc_875L_5032 (3.2) | Logix | Routine | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Device | IO-Link | raC_LD_Dvc_1694_4IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Device | IO-Link | raC_LD_Dvc_1694_8IOL (3.1) | Logix | Routine | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Device | IO-Link | raC_LD_Dvc_1694_5032 (3.2) | Logix | Routine | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Device | IO-Link | raC_LD_Dvc_1732E_8IOLMaster (3.1) | ogix | Routine | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Device | IO-Link | raC_LD_Dvc_1734_4IOLMaster (3.1) | ogix | Routine | Standard | Published | 2.0.0 |
| (RA-LIB) Device | Device | IO-Link | raC_LD_Dvc_5032_8IOLMaster (3.2) | ogix | Routine | Standard | Published | 2.0.0 |

Assign your desired Name and Description fields.

| Name: | Dvc_ArmorBlock_IOLinkMaster | | | | |
|---------------------------------------|-------------------------------------|------------|------------|---------|---|
| Description: | raC_Dvc_8IOL_Master Object | | | | |
| Catalog Number: | raC_LD_Dvc_8IOL_Master (2.3) - Publ | lished | | | |
| Solution: | (RA-LIB) Device | Task: Task | ✓ Program: | Program | ~ |
| arameters Linked Librari | es | | | | |
| 2↓ 🖻 | | | | | |
| 00 General | | | | | |
| RoutineName | Dvc ArmorBlock IOLinkMaster | | | | |
| TagName | Dvc_ArmorBlock_IOLinkMaster | | | | |
| TagDescription | raC_Dvc_8IOL_Master Object | | | | |
| Ch0 | · | | | | |
| Ch1 | * | | | | |
| Ch2 | - | | | | |
| Ch3 | * | | | | |
| Ch4 | * | | | | |
| Ch5 | ~ | | | | |
| Ch6 | ~ | | | | |
| Ch7 | → | | | | |
| ✓ 01 Module | | | | | |
| MasterName | 区 MasterName | | | | |
| HMI Configuration | . <u></u> | | | | |
| SEAssocDisplay | * | | | | |
| MEAssocDisplay | * | | | | |

Type in or browse for the IO-Link Sensor/Device objects that are connected to any applicable channels (*Cho, Ch1, etc*). Browse by clicking the ellipses '...' to open the *Select a Reference* window. The center pane will list all IO-Link category objects in your project. Double-click or highlight the desired device and click *Finish*. Continue to process until you have completed all applicable channels. Note that 8IOL device objects (e.g. raC_LD_Dvc_42AF_8IOL) must be paired with the 8IOL Master, 4IOL objects (e.g. raC_LD_Dvc_42AF_4IOL) must be paired with the 4IOL Master and 5032 Device Objects (e.g. raC_LD_Dvc_5032_8IOLMaster) must be paired with the 5032 Master.

| 🕒 Select a Reference | | | | | | | | | | | × |
|------------------------------------|------------|--------|------------------------|---------------------------|--------|---------------|-----------|----------|-------------|-----------|-------|
| Y ☆ Project - 10Linkv203Prerelease | Controller | Туре | Object Name | Object Description | | Object Refere | nces Para | meters | | | |
| > ** Historian | IOLinkv203 | Device | raC_LD_Dvc_4IOL_Maste | r raC_Dvc_4IOL_Master (| Object | Name | Scope | ¥al | Description | DType | CLXDe |
| 🗸 🔄 Controllers | IOLinkv203 | Device | raC_LD_Dvc_8IOL_Maste | r raC_Dvc_8IOL_Master (| Object | ProductType | Object | 46CLR | | String | true |
| IDLinkv203 | IOLinkv203 | | raC_LD_Dvc_46CLR_4IOL | . raC_Dvc_46CLR Device | Object | | | | | | |
| > 1734-4IOL (2.3) | IOLinkv203 | Device | raC_LD_Dvc_45DMS_4IO | raC_Dvc_45DMS Device | Object | | | | | | |
| > 🛐 1734-AENTR/B (2.0) | IOLinkv203 | Device | raC_LD_Dvc_836P_8IOL | raC_Dvc_836P Device C | Dbject | | | | | | |
| > 📴 Program (1.0) | IOLinkv203 | Device | raC_LD_Dvc_871FM_8IO | . raC_Dvc_871FM Device | Object | | | | | | |
| > [] raC_Dvc_46CLR_4IOL (2.3) | IOLinkv203 | Device | Dvc_ArmorBlock_IOLinkM | aster raC_Dvc_8IOL_Master | Object | | | | | | |
| > 📑 raC_Dvc_4IOL_Master (2.3) | | | | | | _ | | | | _ | |
| < > | < | | | | > | < | | | | | > |
| | Cancel | | << Previous | Next>> | | Finish | Selecte | ed Item: | raC_LD_Dvc_ | 46CLR_410 | |

• Type in or browse for the *MasterName*. This is the I/O module (e.g. 1734-4IOL or 1732E-8IOLM12R) instance that was previously created in the I/ O configuration. Browse by clicking the ellipses '...' to open the *Select a Reference* window. In the left window pane, select the instance of the I/O module. Double-click or highlight the desired device and click *Finish*.

| 🕼 Select a Reference – 🗆 🗙 | | | | | | | | | |
|---|------------|--------|-------------------------|---------------|-----------|------------------|--|--|--|
| | Controller | Туре | Object Name | Object Refere | nces Para | meters | | | |
| > 🖕 Historian | IOLinkv203 | Module | ArmorBlock_IOLinkMaster | Name | Scope | ¥al | | | |
| 🗸 🔄 Controllers | | | | CatNum | Object | 1732E-8IOLM12R/B | | | |
| ✓ Fa IOLinky203 ✓ Fa IOLinky203 ✓ Fa I732E.9IOLM12B (2.3) | | | | ProductCode | Object | 1732E-8IOLM12R | | | |
| ArmorBlock_IOLinkMaster | | | | ProductType | Object | IO-Link Master | | | |
| ArmorIOLMasterA | | | | | | | | | |
| ✓ I 1/34-4IUL [2.3] □ PointIO IOLinkMaster | | | | | | | | | |
| PointIOLMasterA | | | | | | | | | |
| PointIOI MasterB | < | | 3 | < | | > | | | |
| Cancel | << Prev | ious | Next>> | Finish | k_ | .IOLinkMaster | | | |

- For HMI Configuration refer to <u>Configuring Displays</u>.
- Once you have completed all sections you can continue.

| bject Configuration Wi | zard |
|---------------------------------------|--|
| Name: | Dvc_ArmorBlock_IOLinkMaster |
| Description: | raC_Dvc_8IOL_Master Object |
| Catalog Number: | raC_LD_Dvc_8IOL_Master (2.3) - Published |
| Solution: | (RA-LIB) Device |
| Parameters Linked Libra | ries |
| 2↓ | |
| ✓ 00 General | |
| RoutineName | Dvc_ArmorBlock_IOLinkMaster |
| TagName | Dvc_ArmorBlock_IOLinkMaster |
| TagDescription | raC_Dvc_8IOL_Master Object |
| Ch0 | raC_LD_Dvc_836P_8I0L |
| Ch1 | raC_LD_Dvc_871FM_8I0L |
| Ch2 | |
| Ch3 | * |
| Ch4 | ~ |
| Ch5 | * |
| Ch6 | * |
| Ch7 | A |
| ✓ 01 Module | |
| MasterName | ArmorBlock IOLinkMaster |
| HMI Configuration | |
| SEAssocDisplay | * |
| MEAssocDisplay | A |
| 01 Module | |
| | Cancel |

• Click on the *Linked Libraries* tab and click *Auto Create*. Complete by clicking *Finish*.

| Object Configuration Wiz | ard | ? × |
|---------------------------|---|-------------|
| Name: | Dvc_ArmorBlock_IOLinkMaster | |
| Description: | raC_Dvc_8I0L_Master Object | |
| Catalog Number: | raC_LD_Dvc_8I0L_Master (2.3) - Published | |
| Solution: | (RA-LIB) Device Task: Task: Program: Program: | ~ |
| Parameters Linked Librari | res raC_Dvc_8I0L_Master | Auto Create |
| | Cancel << Previous Next >> Finish | |

Configuring Displays

Application Code Manager can be used to automatically configure graphic symbol launch buttons for device objects In FactoryTalk View ME or SE. Note that Application Code Manager is not compatible with Studio 5000 View Designer applications.

First you must add Displays to your project. Under the *System View* panel expand *HMI* and right-click on *Displays* to select *Add*. Choose the type of display (e.g. *FTViewME* or *FTViewSE* depending on your project requirements.



| Object Configur | ation Wizard | | | | | | | | | | |
|------------------|------------------|-------------------|----------------------|----------------|-------------|-----------------|-----------|---------------|--------------|--|--|
| Select a librar | Select a library | | | | | | | | | | |
| Filter: | | | | Show All Revis | ions 🗹 Sho | w All Librarie: | S | | | | |
| Solution | LibraryType | Category T | CatalogNumber | Family | ContentType | Class | Status | Schema¥ersion | Owner | | |
| 🗉 Display (4 | items) | | | | | | | | | | |
| (RA-LIB) ACM 2.0 | D HMI | Display | FTViewME (2.2) | Project | | Standard | Published | 2.0.0 | Rockwell Aut | | |
| (RA-LIB) ACM 2.0 | D HMI | Display | FTViewSE (2.2) | Project | | Standard | Published | 2.0.0 | Rockwell Aut | | |
| (RA-LIB) Machine | HMI | Display | FwkB_DisplayME (1.3) | Logix | Task | Standard | Published | 2.0.0 | RockwellAuto | | |
| (RA-LIB) Machine | HMI | Display | FwkB_DisplaySE (1.3) | Logix | Task | Standard | Published | 2.0.0 | Rockwell Aut | | |

In the display object parameter configuration, you must select the *DisplayTemplate* type to match the version of FactoryTalk View application that you are using.

| Name: | FTViewME_Panel | | |
|----------------------|-----------------------------|--|--------|
| Description: | FactoryTalk View ME Display | | |
| Catalog Number: | FTViewME (2.2) · Published | | |
| Solution: | (RA-LIB) ACM 2.00 | | |
| | | | |
| Parameters Displays | | | |
| 🔡 ĝ↓ 🔳 🗔 📄 | | | |
| ✓ 01 - HMI Configura | tion | | |
| DisplayTemplate | | <pre>(RA-TPL)_ACM_2.00_HMI_Display_FTViewME_10.0_(1.0).xml</pre> | \sim |
| BatchImportTemplate | | (RA-TPL)_ACM_2.00_HMI_Display_FTViewME_7.0_(1.0).xml | |
| MaxSymbolWidth | | (RA-TPL)_ACM_2.00_HMI_Display_FTViewME_8.1_(1.0).xml | |
| MaxSymbolHeight | | [[RA-TPL]_ACM_2.00_HMI_Display_FTViewME_8.2_[T.0].xmi [[RA-TPL]_ACM_2.00_HMI_Display_FTViewME_9.0_(1.0).xml | |
| | | (RA-TPL) ACM 2.00 HMI Display FTViewME 10.0 (1.0) xml | |
| | | (RA-TPL)_ACM_2.00_HMI_Display_FTViewME_11.0_(1.0).xml | |

Navigate to the *Displays* tab where you can right-click and *Add New* display.

| Name: | | FTViewSE | | | |
|------------|-----------|-----------------------------|--|--|--|
| Descriptio | on: | FactoryTalk View SE Display | | | |
| Catalog N | umber: | FTViewSE (2.2) · Published | | | |
| Solution: | | (RA-LIB) ACM 2.00 | | | |
| Parameters | Displays | | | | |
| Name | SubObject | Description | | | |
| | Add New | | | | |
| | Сору | | | | |
| | Paste | | | | |
| | Delete | | | | |
| | - | | | | |

Set the desired name and display parameters. Generally all display parameters aside from *Name* can be left as default since this will often be used as a temporary display where object launch buttons are copied from.

| Name: | | | | | | | |
|---------------------|--------------|-----------------------------|------------|--------------|--|--|--|
| Description: | FactoryTal | FactoryTalk View ME Display | | | | | |
| Catalog Number: | FTViewME | FTViewME (2.2) · Published | | | | | |
| Solution: | (RA-LIB) AC | (RA-LIB) ACM 2.00 | | | | | |
| Parameters Displays | | | | | | | |
| Name | DisplayTitle | DisplayLeft | DisplayTop | DisplayWidth | | | |
| 🖻 0 (1 item) | | | | | | | |
| Power_MEv10 | | 0 | 0 | 800 | | | |

Return to your device object configuration and view the *HMI Configuration* section of the parameters. You can browse or type in the HMI_Server_Name.HMI_Display_Name.

| \sim | HMI Configuration | |
|--------|-------------------|---|
| | SEAssocDisplay | FTViewSE_Server.GraphicDisplays.Power_SEv10 |
| | MEAssocDisplay | FTViewME_Panel.GraphicDisplays.Power_MEv10 |

| 6 | 9 Se | lect a Reference | | | | | | — 🗆 | × |
|---|------|----------------------------|------------|-------|----------------|------------|-------------------|--------------|----------|
| ~ | ₿ | Project - Power Device Lit | Controller | Туре | Object Name | Object D | Object References | Parameters | Displays |
| | ÷ | 省 Historian | N/A | HMI | FTViewME_Panel | FactoryTal | Name | DisplayTitle | e Di ^ |
| | | ▲ Alarms ✓ Displays | | | | | 🗏 0 (1 item) | | |
| | | ⇔ FTViewSE_Server I | | | | | Power_MEv10 | | 0 🗸 |
| | > | Controllers | | | | | < | | > |
| | | | | | | | SubObject Referen | nces SubPar | ameters |
| | | | | | | | | | |
| < | | > | < | | | > | | | |
| | | Cancel | << Pre | vious | | vlext>> | Finis | sh | |

If you browse for the display, select the desired display server in the left panel, then click on the *Display* tab in the right panel and select the specific display. Click finish.

This workflow can be followed for either FactoryTalk View ME or SE depending on the project requirements.

Generating Displays

Once you have assigned displays to all of the device objects, you can generate the displays. In the *System View* highlight the desired display server under *HMI* > *Display* and right-click to select *Generate Displays* > *All Displays* or select individual displays. Choose a place to save the generated files and take note of it.



Importing Displays into FactoryTalk View Studio

To import the configured displays, open your FactoryTalk View ME/SE project in FactoryTalk View Studio. Right-click on *Graphic* > *Displays* and select *Import* and *Export...*



Follow the required prompts:

- Import graphic information into displays
- Choose whether or not to backup displays
- Choose either a *Single display import file* (must have an existing or blank display to import into) or *Multiple displays batch import file* if *All Displays* was used to Generate Displays.
- If this is the first time it is recommended to import Multiple displays batch import file and then Create new objects on the display.
- If you have done this before and are updating the imported display after modifying your Application Code Manager project, you can choose *Update existing objects on the display*.
- Browse for the BatchImport.xml file or individual display.xml file.

Open up the newly imported display. Notice that there are graphic symbol launch buttons labeled and configured for each item that was configured in Application Code Manager.



Right-click on the object and select *Global Object Parameters* to view that all of the parameters have been pre-configured for you.

| 🔳 Gle | obal Obje | ct Parameter Values | | × |
|-------|-----------|---|-----|---|
| | Name | Value | Tag | Description |
| 1 | #102 | {::[shortcut]Program:IOLink_Program.raC_Dvc_42AF} | ••• | Backing Tag |
| 2 | #104 | raC_Dvc_42AF | ••• | Navigation Button Label |
| 3 | #120 | | ••• | Display's left position (e.g. 100) (optional) |
| 4 | #121 | | ••• | Display's top position (e.g. 100) (optional) |
| | | | | |
| ٢ | | | | OK Cancel Help |

You may not copy and paste this graphic symbol onto any other display in your application.

Generating Controller Files

Once you have completed configuring your project in Studio 5000 Application Code Manager, you can generate the controller file for use in Studio 5000 Logix Designer. In the *Controller Preview* pane right-click on the controller name within the *Controllers* folder and select *Generate Controller*.

| Controller Preview | × – | Class View 🛛 🕂 🗙 |
|--------------------|---------------------|--|
| 🔺 🛋 Controllers | | 🔺 🛁 Controllers |
| Power_Device | <u>e</u> | Power_Device |
| 👂 🛑 Cont 🔛 | Generate Controller | Program (1.0) |
| ⊆ Powe ⊿ ⊆ Task | Update from ACD/L5X | |
| ▲ 🕒 P | Detach from ACD/L5X | a raC_Dvc_AS281E |
| 4 5 | Merge Controller | Image: A start and a start and a start a s |
| ⊿ 🛁 U | Refresh | ▲ 📴 Task (1.0) ∺ Power Discrete |

In the *Logix Code Generation* dialogue window you will need to check *Create ACD*. You ma also need to check *Overwrite Existing* if this is not the first time generating the controller code.

| 🛓 Logix Code | Generation | | and the second s | | - | | 8 X |
|--------------|---------------------------------|-----------------------------|--|------------------|------------|----------|-----|
| Generate | Name | Save As | Overwrite Existing | ACM Project Data | Create ACD | Status | |
| V | Power_Device | Power_Device | V | | | | |
| | | | | | | | |
| | | | | | | | |
| Save Path: | C:\Users\Public\Documents\Rockv | vell Automation\Studio 5000 | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | Close | Can | cel Op | en Folder | Generate | |
| | | | | | - | | |

Once the controller file is generated, you can navigate to the location set in *Save Path* and open your file. Note that all of the configuration that was done in Application Code Manager is now shown in your Logix Designer ACD file.

Exporting Attachments Application Code Libraries not only contain Logix code, but also contain Visualization collateral and associated documentation. Every Asset library contains at least a reference manual (RM). Those libraries which have associated Visualization content also have all required global objects (GO), images, static displays and View Designer applications added as attachments. In this manner the user can generate only the necessary visualization and documentation for the objects included in the project.

In Application Code Manager, all of the attachments are associated with the device objects in the (*RA-LIB*) *Device* > *Asset-Control* folder. These can be accessed both through the full Application Code Manager software, or via the Studio 5000 Plug-In "Import Library Objects".

To access the attached files, right click on the objects (e.g. raC_Dvc_42AF_8IOL) and select *Extract Attached Files*.

| 2 Library Object Import Wizard (localhost\SQLACM.ACM) | | — — × |
|--|-------------------------|---|
| FILE EDIT VIEW OPTIONS HELD | | |
| HEE EDIT VIEW OFTIONS HEEF | | |
| Registered Libraries | Content Configuration × | |
| Septitered Libraries 0 × > iff Registered Libraries 0 > iff Registered Libraries 0 <td>Content Configuration ×</td> <td>Name: Descriptor: Catalog Nunbor: Solution:</td> | Content Configuration × | Name: Descriptor: Catalog Nunbor: Solution: |
| | | |
| | | |
| | | Cancel < Back Next > Finish |

Select the destination folder on your computer, and select OK. An Extract Attachments dialog will show the extraction status.

The extracted folder will contain the following:

- Reference Manual
- Required Images
- View Designer Faceplate Files
- FactoryTalk View Machine Edition Display
- FactoryTalk View Machine Edition Global Objects
- FactoryTalk View Site Edition Display
- FactoryTalk View Site Edition Global Objects

Using the IO-Link Device Library with Other Application Code Libraries

Application Code LibrariesThe IO-Link Device Library is can be used alongside other Application Code
Libraries.The IO Device Library is recommended to be used along with the IO-Link
Device Library if Studio 5000 Application Code Manager is used for project
development. This will allow you to add IO-Link Master modules to the
controller I/O Configuration..The Machine Builder Library and PlantPAx Process Object Library application-
level library objects may be used in the same applications with the device-level
objects in the IO-Link Device Library. At this time there are no direct
dependencies or interaction points between these libraries. They may be used
independently from one another but within the same application.Other libraries utilize the common device interface UDTs to interact with

Other libraries utilize the common device interface UDTs to interact with device level objects. In the case of the IO-Link Device Library you may programmatically reference the Status (Sts), Command (Cmd), and Setting (set) interfaces of the instructions. This is covered in detail in <u>Interfaces</u> section of this document.

42AF - RightSight Photoelectric Sensor (raC_Dvc_42AF_4IOL, raC_Dvc_42AF_8IOL, raC_Dvc_42AF_Type1_5032, raC_Dvc_42AF_Type2_5032, raC_Dvc_42AF_Type3_5032)

Overview

The 42AF RightSight Photoelectric Sensor device object (raC_Dvc_42AF_4IOL, raC_Dvc_42AF_8IOL, raC_Dvc_42AF_Type1_5032, raC_Dvc_42AF_Type3_5032) includes HMI faceplates which displays device information including:

- Sensor data
- Sensor diagnostics
- Sensor configuration and parameters
- Process data trending
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk stepby-step through each process. You can refer to the following videos for this section: "Operational_Overview_of_42AF_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.
- **Setpoint:** Setpoint will allow the operators to enter the signal value required for the sensor output to turn ON upon target detection.
- **Polarity:** This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate).
- Teach: Offers the different teach functions.

Functional Description

The 42AF RightSight Photoelectric Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Chapter 6 42AF - RightSight Photoelectric Sensor (raC_Dvc_42AF_4I0L, raC_Dvc_42AF_8I0L, raC_Dvc_42AF_Type1_5032, raC_Dvc_42AF_Type2_5032,

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with Five versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import | | |
|-------------|--|--|--------------------------------------|---------------------------------------|--|--|
| 42AF | POINT 1/0 1734-410L | 42AF-B1MAB1-xx, 42AF-B1MAB2-xx, 42AF-B1MAC1-xx, 42AF-N1MAC1-xx, 42AF-P2MAB1-xx, 42AF-R1MAB1-xx | raC_Dvc_42AF_410L_3.02_A01.L5X | raC_Dvc_42AF_4I0L_3.02_RUNG.L5X | | |
| | ArmorBlock 1732E-8I0LM12R | 42AF-B1MAB1-xx, 42AF-B1MAB2-xx, 42AF-B1MAC1-xx, 42AF-N1MAC1-xx, 42AF-P2MAB1-xx, 42AF-R1MAB1-xx | raC_Dvc_42AF_810L_3.02_A01.L5X | raC_Dvc_42AF_8I0L_3.02_RUNG.L5X | | |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | 42AF-B1MAB1-xx, 42AF-B1MAB2-xx | raC_Dvc_42AF_Type1_5032_3.02_A0I.L5X | raC_Dvc_42AF_Type1_5032_3.02_RUNG.L5X | | |
| | | 42AF-B1MAC1-xx, 42AF-N1MAC1-xx | raC_Dvc_42AF_Type2_5032_3.02_A0I.L5X | raC_Dvc_42AF_Type2_5032_3.02_RUNG.L5X | | |
| | | 42AF-P2MAB1-xx, 42AF-R1MAB1-xx | raC_Dvc_42AF_Type3_5032_3.02_A0I.L5X | raC_Dvc_42AF_Type3_5032_3.02_RUNG.L5X | | |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 42AF | Display | (raC-3_02-ME) raC_Dvc_42AF-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_42AF-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 42AF | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) | | | |
|--------------------------|--|--|---|--|--|--|
| | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42AF_4IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42AF_4I0L_(3.2) | | | |
| 42AF | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42AF_8IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42AF_8IOL_(3.2) | | | |
| | 5070 0101 MI0DD | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42AF_Type1_5032_(3.2) | | | | |
| | 5032-810LM12DR 5032-810LM12M12LDR/A | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42AF_Type2_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42AF_5032_(3.2 | | | |
| | | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42AF_Type3_5032_(3.2) | | | | |

Device Definition (raC_Dvc_42AF_4IOL, raC_Dvc_42AF_8IOL)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



- 2. Specify the Application Specific Name e.g. CapDetect_101
- 3. Select the Process Data Input as Triggered, Margin, Proximity, Gain, Signal.

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | | Process Data Input | | Data Storage |
|---------|---------|---------------|----------------|------------------------------|----------------------|--------|--|--------|--------------|
| D | IO-Link | Allen-Bradley | 42AF-P2MAB1-D4 | CapDetect_100 | Exact M | ~ | Triggered,Margin,Proximity,Gain,Signal | \sim | Enable ADC |
| 1 | 10-Link | Allen-Bradley | 42AF-P2MAB1-D4 | CapDetect_101 | Exact M | \sim | Triggered,Margin,Proximity,Gain,Signal | \sim | Enable ADC |
| 2 | IO-Link | | | | | | | | |
| 3 | 10-Link | | | | | | | | |
| 4 | 10-Link | | | | | | | | |
| 5 | 10-Link | | | | | | | | |
| 6 | 10-Link | | | | | | | | |
| 7 | 10-Link | | | | | | | | |
| c | | | | | | | | | |

Device Definition (raC_Dvc_42AF_Type1_503 2, raC_Dvc_42AF_Type2_5032 , raC_Dvc_42AF_Type3_5032

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| Chergy Storage Cherg | Redundancy 년 : | Favorites Ac | HF +F () (0) (L) | Alarms Bit | Module D | Definition | | | | |
|---|---|------------------|----------------------------|-------------------|------------|------------|--------------------|---------------------------------------|------------|-------|
| roller Organizer 🗸 🖡 | × 🖞 Module Properties: EN2 | 2TR (5032-8IOLM1 | 2M12LDR 2.011) × | | Series: | | A | ~ | | |
| 9 <u></u> | General | General | | | Revision: | | 2 | V 011 | | |
| Controller Master_IOLink_5032 | Connection | | | | Electronic | Kevina: | Connetible | | | |
| Controller Fault Handler | Channels | Type: | 5032-8I0LM12M12LDR 8 IC |)-Link Channel, 8 | Connection | | Compauble | mouure | × | |
| Power-Up Handler | - 00 - IO-Link - 01 - Digital Output | Vendor: | Rockwell Automation/Allen- | -Bradley | Connectio | | Data | | | |
| Tasks | - 02 - 10-Link | Parent: | EN2TR | | | | | | | |
| MainTask | 03 - Digital Input 04 - IO-Link | Name: | Mod_Master5032 | | | | | | Chan | nel |
| Unscheduled | 06 - IO-Link | Description: | | A | | | IO-Link | | Mode | Types |
| Motion Groups | - 10 - 10 - Link | | | w | Port | Channel | Class B Enabled | Channel Mode | | e. |
| Alarm Manager | - 12 - IO-Link | | | | | | Lindbird | | | -Lin |
| Assets | Internet Protocol | Module Definit | ion | | 1 | 0 | 1 | IO Link | | 2 |
| Add-Un Instructions | - Port Configuration | | L | Change | 0 | 1 | | Digital Output, Short Circuit, No Loa | ad V V V | |
| Trands | - Network | Series: | A | | 1 | 2 | | IO-Link | ~ 1 1 | 1 |
| Logical Model | Servers | Revision: | 2.011 | | - | 3 | | Digital Input | × 1 1 | - |
| I/O Configuration | | Electronic Key | ing: Compatible N | Iodule | 2 | 4 | | IO-Link Disabled | | 1 |
| 1756 Backplane, 1756-A10 | | Connection | Data | N. P. C. | | 6 | | IO-Link | | 1 |
| ▲ 🖞 [1] 1756-EN2TR EN2TR | | Connection: | Data | | 3 | 7 | | Disabled | ~ / | |
| ▲ 器 Ethernet | | | | | 4 | 8 | | IO-Link | ~ 1 1 | 1 |
| 1756-EN2TR EN2TR | | | | | 4 | 9 | | Disabled | ~ J J | |
| ▶ ¶ 5032-8IOLM12M12LDR/A Mod Master5032 | | | | | 5 | 10 | | IO-Link | ~ | 1 |
| @ 191 1756-185E Master IOI ink 5032 | | | | | | 11 | | Disabled | × | |
| * Ethernet | | | | | 6 | 12 | | Disabled | | 1 |
| @ 1756-185E Master IOI ink 5032 | | | | | | 14 | | IO-Link | ~ / / | 1 |
| a may cose musici_roemic_oose | | | | | 7 | 40 | † U | Disabled | | - |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 42AF, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 42AF Sensor.
 - ✓ □ I/O Configuration
 ▷ □ 1756 Backplane, 1756-A7
 ▲ Ethernet
 □ 1756-L85E Master_5032_Test_Cases
 □ 5032-8IOLM12M12LDR/A Mod_Master_5032_1
 ▲ 10-Link
 ◎ 0 42AF-B1MAB1-xx (224) Mod_42AF_Type1
 ◎ 2 42AF-B1MAC1-xx (220) Mod_42AF_Type2
 ◎ 4 42AF-P2MAB1-xx (208) Mod_42AF_Type3
 6 42EF-D2JBAK-xx (105) Mod_42EF_Type1
 8 42EF-R2KBB-xx (119) Mod_42EF_Type2
 10 42EF-R2JBBT-xx (118) Mod_42EF_Type3
 □ 12 42JT-B2LAT1-xx (1) Mod_42JT_Type1
 □ 14 42JT-F5LET1-xx (11) Mod_42JT_Type2
- 3. Configure the parameters of sensor from configuration tab from AOP of the 42AF sensor.

| Controller Organizer 🗸 🕈 🗙 | Module Properties: Mo | d_Master5032:4 (42AF-B1MAC1-xx (2 | 220) 1.1) | × | | | |
|--|-----------------------|---|-----------|------------------------|-------|----------|-------------|
| a • | General | Configuration | | | | | |
| Unscheduled | Connection | oomigaradon | | | | | |
| Motion Groups | Device Info | | | | | | |
| 🕨 💻 Alarm Manager | Configuration | Name | R/W | Value | Units | Style | Description |
| A Ssets | - Parameters | Identification | | | | | |
| Add-On Instructions | LVentLog | Over Specific Information Application encodes | | Mant Gamaan | | | |
| Data Types | | Application-specific rag | | Test Sensor | | | |
| Trends | | User Tag 2 | DV | | | | |
| b Logical Model | | ▲ Parameter | | | | | |
| ▲ ⊆ I/O Configuration | | Operation Configuration | | | | | |
| 4 = 1756 Packalana 1756 A10 | | ▲ Triggered | | | | | |
| | | Sensing Distance | rw 🖂 | 1200 | mm | Decim: ~ | |
| | | Suppression Distance | rw 🖂 | 1200 | mm | Decim: ~ | |
| 4 as Ethernet | | Polarity | rw | Not Inverted 🗸 | | | |
| 1756-EN2TR EN2TR | | Pin 2 Mode | rw | Disabled 🖂 | | | |
| 5032-8IOLM12M12LDR/A Mod_Master5032 | | Phy Mode | rw | Auto Detect 🖂 | | | |
| 🖌 😒 IO-Link | | Sensor Configuration | | B 1 10 1 | | | |
| 🔮 0 1694-PFD1244 (304) Mod_1694 | | Suppression Mode | rw | Background Suppression | | | |
| 2 42JT-D2LAT1-xx (3) Mod_42JT | | Counter / Timer | TW | 0.0 🗸 | ms | | |
| 4 42AF-B1MAC1-xx (220) Mod 42AF | | Counter | | | | | |
| 6 45DMS-B8LAT1-D4 (228) Mod 45DMS | | Mode | rw. | Enabled V | | | |
| 8 46CI R-D5I AC3-D5 (296) Mod 46CI R | | Timer | | | | | |
| \$ 10.8751-M16vv30-vv (309) Mod 8751 | | Mode | rw | Enabled V | | | |
| 12 856T_R2/I/C (207) Mod 856T | | - | | | | | |
| -14 9720 D19AID2 000 D5 (312) Mod 9720 | | Insert Factory Defaults | | | | | |
| 14 0/3P-0 TOAIP2-900-03 (213) MO0_8/3P | | | | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_42AF_4IOL, raC_Dvc_42AF_8I0L)

| InOut | Function / Description | DataType |
|-----------------|--|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_42AF_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlCmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_Ctrl_Inf | IO-Link Device Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | IO-Link Device Command, Status | raC_UDT_ItfAD_IOLinkDevices |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[20] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_42AF_Inp_4IOL Or raC_UDT_ItfAD_42AF_Inp_8IOL |

Input Data

| Input | Function/Description | DataType |
|-------------------------------|---|----------|
| Cfg_AlignmentMode | Alignment Mode; 0 = Disabled, 1 = Enabled, 2 = Enabled for 120s, 3 = Enabled for 240s | SINT |
| Cfg_OutputPolarityInverted | Output Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | SINT |
| Cmd_ResetCount | Counter Reset Command | BOOL |
| Cmd_ResetDurations | Duration Reset Command | BOOL |
| Cmd_TeachCancel | Duration Reset Command | BOOL |
| Cmd_TeachPrecision_ShowTarget | Teach Precision Show Target Command | BOOL |
| Cmd_TeachStatic_Background | Teach Static Background Command | BOOL |
| Cmd_TeachStatic_ShowTarget | Teach Static Show Target Command | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity Alarm of Senor | BOOL |

| Input | Function/Description | DataType |
|-----------------------|---|----------|
| Inp_ChxSignalStrength | Signal Strength of Sensor | DINT |
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |
| Set_Setpoint | Enter Setpoint Value To Turn ON Sensor Output | DINT |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_EnableLEDs | LED Indicator; O= Disable, 1= Enable | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Val_AlignmentModeEnable | Alignment Mode Status; 0 = Disabled, 1 = Enabled, 2 = Enabled for 120s, 3 = Enabled for 240s | INT |
| Val_Contrast | Sensor Contrast Level | INT |
| Val_NotTriggeredDuration | Sensor Output OFF Duration | INT |
| Val_OperatingHrsSinceInception | Operating Hours Since Inception | DINT |
| Val_OperatingHrsSincePowerUp | Operating Hours Since Power Up | DINT |
| Val_OutputPolarityInverted | Output Polarity Status, 0 = Not Inverted, 1 = Inverted | INT |
| Val_PercentSP | Setpoint in Percent | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Setpoint | Setpoint Value To Turn ON Sensor Output | DINT |
| Val_TeachStep | Teach Step | INT |
| Val_TemperatureCurrent | Internal Temperature Of Sensor | SINT |
| Val_TemperatureMaxSinceInceptio n | Maximum Temperature Since Inception | SINT |
| Val_TemperatureMaxSincePowerU p | Maximum Temperature Since Power Up | SINT |
| Val_TemperatureMinSinceInceptio | Minimum Temperature Since Inception | SINT |
| Val_TemperatureMinSincePowerU p | Minimum Temperature Since Power Up | SINT |

| Output | Function/Descritpion | DataType |
|---------------------------|--|----------|
| Val_Trigger_Counter | Sensor Counter Value | SINT |
| Val_TriggeredDuration | Sensor Output ON Duration | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data (raC_Dvc_42AF_Type1_503 2, raC_Dvc_42AF_Type2_5032 , raC_Dvc_42AF_Type3_5032

)

| InOut | Function / Description | DataType |
|-----------------------|--|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_42AF_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlCmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_Ctrl_Inf | IO-Link Device Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | IO-Link Device Command, Status | raC_UDT_ItfAD_IOLinkDevices |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_42AF_Inp_5032 |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_42AF_Type1_Cfg or raC_UDT_IOLink_42AF_Type2_Cfg or raC_UDT_IOLink_42AF_Type3_Cfg |

Input Data

| Input | Function/Description | DataType |
|-------------------------------|---|----------|
| Cfg_AlignmentMode | Alignment Mode; 0 = Disabled, 1 = Enabled, 2 = Enabled for 120s, 3 = Enabled for 240s | SINT |
| Cfg_OutputPolarityInverted | Output Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | SINT |
| Cmd_ResetCount | Counter Reset Command | BOOL |
| Cmd_ResetDurations | Duration Reset Command | BOOL |
| Cmd_TeachCancel | Duration Reset Command | BOOL |
| Cmd_TeachPrecision_ShowTarget | Teach Precision Show Target Command | BOOL |
| Cmd_TeachStatic_Background | Teach Static Background Command | BOOL |
| Cmd_TeachStatic_ShowTarget | Teach Static Show Target Command | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |

| Input | Function/Description | DataType |
|-----------------------|---|----------|
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity Alarm of Senor | BOOL |
| Inp_ChxSignalStrength | Signal Strength of Sensor | DINT |
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |
| Set_Setpoint | Enter Setpoint Value To Turn ON Sensor Output | DINT |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |
Output Data

| Output | Function/Descritpion | DataType |
|------------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_AlignmentModeEnable | Alignment Mode Status; 0 = Disabled, 1 = Enabled, 2 = Enabled for 120s, 3 = Enabled for 240s | |
| Val_Contrast | Sensor Contrast Level | INT |
| Val_NotTriggeredDuration | Sensor Output OFF Duration | INT |
| Val_OperatingHrsSinceInception | Operating Hours Since Inception | DINT |
| Val_OperatingHrsSincePowerUp | Operating Hours Since Power Up | DINT |
| Val_OutputPolarityInverted | Output Polarity Status, 0 = Not Inverted, 1 = Inverted | INT |
| Val_PercentSP | Setpoint in Percent | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Setpoint | Setpoint Value To Turn ON Sensor Output | DINT |
| Val_TeachStep | Teach Step | INT |
| Val_TemperatureCurrent | Internal Temperature Of Sensor | SINT |
| Val_TemperatureMaxSinceInceptio | Maximum Temperature Since Inception | SINT |
| Val_TemperatureMaxSincePowerU p | J Maximum Temperature Since Power Up | |
| Val_TemperatureMinSinceInceptio | Minimum Temperature Since Inception | SINT |
| Val_TemperatureMinSincePowerU p | Minimum Temperature Since Power Up | SINT |

| Output | Function/Descritpion | DataType |
|---------------------------|--|----------|
| Val_Trigger_Counter | Sensor Counter Value | SINT |
| Val_TriggeredDuration | Sensor Output ON Duration | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 42AF device object connected to channel #3 of a POINT I/O 1734-4IOL IO-Link Master module named *Point_IO_4IOLMater* in slot #1 of a POINT I/O adapter named *Racko1*.

| Sensor 101 Input | | | |
|-----------------------------|-----------------------|-------------------------------|-----------------|
| Interface | | Sensor 101 | |
| COP | raC_Dvc_42AF_4IOL | | |
| Source Rack01:1:I.Fault | raC_Dvc_42AF_4IOL | Sensor_101 | |
| Dest Sensor_101_Inp_I.Fault | Ref_Module | Point_IO_4IOLMater | (Sts_Connected) |
| Length 7 | Write_Index | Sensor_101_Write_Index | |
| | Read_Index | Sensor_101_Read_Index | {Sts_Available} |
| | Write_SubIndex | Sensor_101_Write_SubIndex | · · · · · · |
| | Read_SubIndex | Sensor_101_Read_SubIndex | -{Sts_Warning} |
| | Msg_Sensor_Data | Sensor_101_Msg_Sensor_Data | (Ob. Excited) |
| | Ref_Ctrl_Set | Sensor_101_CtriSet | -(Sts_Faulted) |
| | Ref_Ctrl_Sto | Sensor 101 CtriSte | (Stel Boody) |
| | Inf Lookup | raC Dvc 424E InfTable | ois_rteauy/ |
| | Inn I | Sensor 101 Inn I | |
| | Inp ChxTriggered | Rack01:1:1.Ch3Triggered | |
| | | 0 🕈 | |
| | Inp_ChxMarginLowAlarm | Rack01:1:I.Ch3MarginLowAlarm | |
| | | - 0 🕈 | |
| | Inp_ChxProximityAlarm | Rack01:1:I.Ch3ProximityAlarm | |
| | | 0 🕈 | |
| | Inp_ChxGain | Rack01:1:I.Ch3Gain | |
| | | 0 🖛 | |
| | Inp_ChxSignalStrength | Rack01:1:I.Ch3SignalStrength | |
| | las Obligation | 0 | |
| | inp_Cnivumber | 3 | |
| | Pof Ctrl Inf | Roint IO 4IOI Master Ctrlinf | |
| | Ref Ctrl Itf | Point IO 4IOI Master Ctriliff | |
| | 1.00_001_0 | - ont_to_stormaster_ound | |

The following example uses the 42AF device object connected to channel #4 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*



The following example uses the 42AF Sensor Type 1 device object connected to channel #0 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master5032*



The following example uses the 42AF Sensor Type 2 device object connected to channel #2 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master5032*

| Sensor_42AF_Type2 Input Interface COP Source Mod_42AF_Type2:I Dest Sensor_42AF_Type2_Inp_I Length 1 | Sensor_42AF_Type2 Configuration Interface Device Access Locks Data COP Source Mod_42AF_Type2.C Device_Access_Locks Dest Sensor_42AF_Type2_Cfg_C.Device_Access_Locks Length 27 | Sensor_42AF_Type2 raC_Dvc_42AF_Type2_50 Ref_Module Mod_42AF_Type2 Ref_MsgCustSetIdx Sensor_42AF_Type2_SetIndex Ref_MsgCustSetIdx Sensor_42AF_Type2_SetIndex Ref_MsgCustSetIdx Sensor_42AF_Type2_SetIndex Ref_MsgCustSetIsUbldx Sensor_42AF_Type2_GetSubIndex Ref_MsgCustGetSubIdx Sensor_42AF_Type2_GetSubIndex Ref_MsgData Sensor_42AF_Type2_MsgData Ref_Ctrl_Sts Sensor_42AF_Type2_CtrlSts Ref_Ctrl_Sts Sensor_42AF_Type2_CtrlSts Ref_Ctrl_Inf Mod_Master_5032_1 CtrlInf Inp_1 | (Sts_Connected) (Sts_Available) (Sts_Warning) (Sts_Faulted) (Sts_Ready) |
|--|--|--|---|
| | | COP Source Sensor_42AF_Type2_Cfg_C.Device_A Dest Mod_42AF_Type2:C.Device_A Length | ccess_Locks ccess_Locks ccess_Locks 27 |

The following example uses the 42AF Sensor Type 3 device object connected to channel #4 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master5032*



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|------------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_LightSens | Not Triggered | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration | | |
|---------------------------|----------------|--|---|--|--|
| AOG_42AF_ Launch | Not Triggered | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Security Image: Security Image: Security Image: Security Image: Security Image: Security | | |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Name | Usage 📰 👻 | Alias For Base Tag | Data Type | Description |
|---|-----------|--------------------|-------------------------------|---|
| Sensor_42JT_Type1_Cfg_C | Local | | raC_UDT_IOLink_42JT_Type1_Cfg | Sensor_42JT_Type1 Configuration Interface |
| Sensor_42JT_Type1 | Local | | raC_Dvc_42JT_Type1_5032 | Sensor_42JT_Type1 |
| Sensor_42EF_Type3_Inp_I | Local | | raC_UDT_IOLink_42EF_Inp_5032 | Sensor_42EF_Type3 Input Interface |
| Sensor_42EF_Type3_Cfg_C | Local | | raC_UDT_IOLink_42EF_Type3_Cfg | Sensor_42EF_Type3 Configuration Interface |
| Sensor_42EF_Type3 | Local | | raC_Dvc_42EF_Type3_5032 | Sensor_42EF_Type3 |
| Sensor_42EF_Type2_Inp_I | Local | | raC_UDT_IOLink_42EF_Inp_5032 | Sensor_42EF_Type2 Input Interface |
| Sensor_42EF_Type2_Cfg_C | Local | | raC_UDT_IOLink_42EF_Type2_Cfg | Sensor_42EF_Type2 Configuration Interface |
| Sensor_42EF_Type2 | Local | | raC_Dvc_42EF_Type2_5032 | Sensor_42EF_Type2 |
| Sensor_42EF_Type1_Inp_I | Local | | raC_UDT_IOLink_42EF_Inp_5032 | Sensor_42EF_Type1 Input Interface |
| Sensor_42EF_Type1_Cfg_C | Local | | raC_UDT_IOLink_42EF_Type1_Cfg | Sensor_42EF_Type1 Configuration Interface |
| Sensor_42EF_Type1 | Local | | raC_Dvc_42EF_Type1_5032 | Sensor_42EF_Type1 |
| Sensor_42AF_Type3_Inp_I | Local | | raC_UDT_IOLink_42AF_Inp_5032 | Sensor_42AF_Type3 Input Interface |
| Sensor_42AF_Type3_Cfg_C | Local | | raC_UDT_IOLink_42AF_Type3_Cfg | Sensor_42AF_Type3 Configuration Interface |
| Sensor_42AF_Type3 | Local | | raC_Dvc_42AF_Type3_5032 | Sensor_42AF_Type3 |
| Sensor_42AF_Type2_Inp_I | Local | | raC_UDT_IOLink_42AF_Inp_5032 | Sensor_42AF_Type2 Input Interface |
| Sensor_42AF_Type2_Cfg_C | Local | | raC_UDT_IOLink_42AF_Type2_Cfg | Sensor_42AF_Type2 Configuration Interface |
| Sensor_42AF_Type2 | Local | | raC_Dvc_42AF_Type2_5032 | Sensor_42AF_Type2 |
| Sensor_42AF_Type1_Inp_I | Local | | raC_UDT_IOLink_42AF_Inp_5032 | Sensor_42AF_Type1 Input Interface |
| Sensor_42AF_Type1_Cfg_C | Local | | raC_UDT_IOLink_42AF_Type1_Cfg | Sensor_42AF_Type1 Configuration Interface |
| Sensor_42AF_Type1 | Local | | raC_Dvc_42AF_Type1_5032 | Sensor_42AF_Type1 |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description | | | | |
|------|--|--|--|--|--|
| 1 | Banner- Ready Status | | | | |
| 2 | Application Specific Name - Read from device | | | | |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED | | | | |
| 4 | Trigger Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds | | | | |
| 5 | Signal Strength (%) Sparkline Trend The spark line shows the signal strength value over last 30 seconds | | | | |
| 6 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function. | | | | |
| 7 | Process Data Triggered Duration (ms): Displays the amount of time that the sensor output has been ON. To show the trigger duration on faceplate, required to make Timer Mode Enabled setting in AOP in Logix Designer. Not Triggered Duration (ms): Displays the amount of time that the sensor output has been OFF. To show the trigger duration on faceplate, required to make Timer Mode Enabled setting in AOP in Logix Designer. Trigger Counter: Displays the sensor counter value when enabled. The counter value increments every time the sensor is triggered this process data element can count up to 65535 and can be reset via reset count button from config tab. Refer to Appendix B for additional information about index. To show the trigger count on faceplate, required to make Counter Mode Enabled setting in AOP in Logix Designer. Signal Strength (%): Signal Strength provides the raw measurement value of the amount of light reflected from the target. Contrast: Displays the difference between the light signal levels that the sensor read the last time the output was ON versus the last time the output was OFF. | | | | |



Note: In Case of, 5032 Master, changes made to the Application Specific Name require pressing the 'Config Apply' button in the Config tab to update the sensor parameters.

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description |
|------|---|
| 1 | Internal Temperature Bar Graph Green Indicators: Min/Max since inception (lifetime) Purple Indicators: Min/Max since power up Light Blue Triangle Indicator: Current value |
| 2 | Internal Temperature Current Value |
| 3 | Operating Hours Since Inception (lifetime) |
| 4 | Operating Hours Since Power Up |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action decisions. One trend is displayed for Setpoint and Signal Strength.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Setpoint & Signal strength.

| 42AF Ph | notoelectric Sensor | × |
|------------------------|------------------------|----------|
| $\widehat{\mathbf{w}}$ | Ready | |
| | Trend and Spark Limits | \times |
| | Signal Strength Scale | |
| | Minimum 0.00 | |
| | Maximum 100.00 | |
| | | |
| | | |
| | | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Trigger Settings
- Local Settings
- Teach Settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config Apply</u>" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| _0001 | | |
|-------------------|-------------------|-----------------------------|
| 💦 🔳 Ready | | |
| Parameter Se | tings | |
| ✓ Setpoint: | 393 | Reset |
| Output Polarity: | Inverted | Reset |
| Alignment Mode | e: Not Applicable | Durations |
| | | Config Apply |
| | | LED's Setting |
| Teach Settings | | Disable Conable Local Teach |
| | | Unlock 💭 🖿 Lock |
| | | |

Parameter Settings

Setpoint - Allows operators to enter the signal value required for the sensor output to turn ON (threshold) upon target detection. That means that the sensor signal level must be higher than the threshold for the output to turn ON. The default value for this parameter is 1000 with acceptable values between 1000 and 65535.

Output Polarity - Polarity changes the sensor output to operate as Not Inverted (Light Operate) and Inverted (Dark Operate). Click on output polarity dropdown selector object to switch between Light On & Dark On.

Alignment Mode - This parameter changes the sensor user interface to operate in alignment mode. The alignment mode uses the green and orange LEDs of the sensor to visually indicate the strength of the light signal that is reflected back from the object. Click on alignment mode drop-down selector object to switch between Enable & Disable

Trigger Settings

Reset Count - Allows users to reset the counter function, it will reset the sensor counts to zero.

Reset Duration - Allows users to reset the timer function, it will reset Duration Triggered & Duration Not Triggered time.

Local Settings

Disable/Enable LEDs - This parameter allows operators to turn OFF or turn ON the User Interface LEDs (green and orange LEDs). This parameter is ideal for applications where turning OFF the LEDs is desired to accommodate the application.

Local Teach Parameters - This section allow user to lock / unlock device local parameterization. Touch Lock/Unlock Toggle switch to Lock Local Parameterization

Teach Settings

Teach Settings display includes the Teach Methods, Teach Command & Teach Cancel buttons. Touch on the Teach Settings navigation button to access the Teach Settings tab.

- Teach tab includes the following functions.
- Teach mode selection dropdown menu
- Teach procedure flow buttons
- Teach Cancel Button

| 42AF | | | × |
|--------------|--------|------------|-----------------|
| Ready | | | |
| Teach | | | \times |
| Static Teach | V | | |
| | | | |
| | Show | Show | |
| | Target | Background | |
| | | | Teach Cancel |

Teach mode - This parameter selects the desired mode.

Static Teach - The first method is Static Teach, which is intended for applications where the web can be stopped, or for more challenging applications.

4. Place the target in front of the sensor and send the command to **"Static Teach - Show Target"**.

- 5. Show the background where the target will be present and then send the command **"Static Teach Show Background"**.
- 6. To cancel the procedure, you can send the **"Teach Cancel"** command at any point.

Precision Teach - The Precision Teach is intended for applications where the precise setting of the distance is more critical. This teach method is also recommended for contrast applications.

1. Place the target in front of the sensor and send the command to **"Precision Teach – Show Target"**.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.



If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.



After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description_Test, |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_42AF_4I0L, raC_Dvc_42AF_8I0L, raC_Dvc_42AF_Type1_5032, raC_Dvc_42AF_Type2_5032, raC_Dvc_42AF_Type3_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |

Implementation Objects: raC_LD_Dvc_42AF_4IOL, raC_LD_Dvc_42AF_8IOL



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_Dvc_42AF_Type1_5032, raC_Dvc_42AF_Type2_5032, raC_Dvc_42AF_Type3_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-----------------|---------------------|------------------|----------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 42AF), This name depends upon the TagName assigned to object. |
| SensorType | 42AF-B1MAB1-xx | 42AF-B1MAB1-xx | 42AF-B1MAB1-xx | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-------------------|-----------------|---------------|----------------------|--|
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|-------------------------|-------------------|----------|-----------------|----------|
| raC_Dvc_42AF_4I0L | raC_Dvc_42AF_4IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_42AF_8I0L | raC_Dvc_42AF_810L | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_42AF_Type1_5032 | raC_Dvc_42AF_5032 | 3.2 | (RA-LIB) Device | IO-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|--|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FIViewME\Global Ubject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE) Graphic Symbols - IU-Link Device.ggfx | [ProjectName]\Visualization\F ViewSE\Global Ubject - ggfx |
| V3_raC_Dvc_42AF | Faceplate ME | (raC-3_xx-ME) raC_Dvc_42AF-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_42AF | Faceplate SE | (raC-3_xx-SE) raC_Dvc_42AF-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

42EF - RightSight Photoelectric Sensor (raC_Dvc_42EF_4IOL, raC_Dvc_42EF_8IOL, raC_Dvc_42EF_Type1_5032, raC_Dvc_42EF_Type2_5032, raC_Dvc_42EF_Type3_5032)

Overview

The 42EF RightSight Photoelectric Sensor device object (raC_Dvc_42EF_4IOL, raC_Dvc_42EF_8IOL, raC_Dvc_42EF_Type1_5032, raC_Dvc_42EF_Type2_5032, raC_Dvc_42EF_Typs3_5032) includes HMI faceplates which displays device information including:

- Sensor data
- Sensor diagnostics
- Sensor configuration and parameters
- Process data trending
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk stepby-step through each process. You can refer to the following videos for this section: "Operational_Overview_of_42EF_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.
- **Setpoint:** Setpoint will allow the operators to enter the signal value required for the sensor output to turn ON upon target detection.
- **Polarity:** This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate).

Functional Description

The 42EF RightSight Photoelectric Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Chapter 7 42EF - RightSight Photoelectric Sensor (raC_Dvc_42EF_4I0L, raC_Dvc_42EF_8I0L, raC_Dvc_42EF_Type1_5032, raC_Dvc_42EF_Type2_5032,

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix[®] firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with five versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|--|--------------------------------------|---------------------------------------|
| | P0INT I/0 1734-4I0L | 42EF-D2JBAK-xx, 42EF-D2KBAK-xx, 42EF-D2JPAK-xx, 42EF-P2JBB-xx, 42EF-P2KBB-xx, 42EF-P2JBB-xx, 42EF-R2JBBT-xx, 42EF-R2JBB-xx, 42EF-R2KBBT-xx, 42EF-R2KBB-xx, 42EF-R2MNBT-xx, 42EF-R2MNB-xx, 42EF-R2MPBT-xx, 42EF-S1KBA-xx, 42EF-S1JBA-xx, 42EF-S1KBA-xx, 42EF-S1MPA-xx | raC_Dvc_42EF_4I0L_3.02_A0I.L5X | raC_Dvc_42EF_4IOL_3.01_RUNG.L5X |
| 42EF | ArmorBlock 1732E-8I0LM12R | 42EF-D2JBAK-xx, 42EF-D2KBAK-xx, 42EF-D2JPAK-xx, 42EF-P2JBB-xx, 42EF-P2KBB-xx, 42EF-P2JBB-xx, 42EF-R2JBBT-xx, 42EF-R2JBB-xx, 42EF-R2KBBT-xx, 42EF-R2KBB-xx, 42EF-R2MNBT-xx, 42EF-R2MNB-xx, 42EF-R2MPBT-xx, 42EF-S1KBA-xx, 42EF-S1JBA-xx, 42EF-S1KBA-xx, | raC_Dvc_42EF_810L_3.02_A01.L5X | raC_Dvc_42EF_810L_3.01_RUNG.L5X |
| | 5032-810LM12DR | 42EF-D2JBAK-xx, 42EF-D2KBAK-xx, 42EF-D2MPAK-xx, 42EF-P2JBB-xx, 42EF-P2KBB-xx, 42EF-P2MPB-xx, 42EF-S1JBA-xx, 42EF-S1KBA-xx, 42EF-S1MPA-xx | raC_Dvc_42EF_Type1_5032_3.02_A0I.L5X | raC_Dvc_42EF_Type1_5032_3.02_RUNG.L5X |
| | 5032-810LM12P12LDR/A 5032-810LM12P5DR | 42EF-R2JBB-xx, 42EF-R2KBBT-xx, 42EF-R2KBB-xx, 42EF-R2MNBT-xx, 42EF-R2MNB-xx, 42EF-R2MPBT-xx, 42EF-R2MPB-xx | raC_Dvc_42EF_Type2_5032_3.02_A01.L5X | raC_Dvc_42EF_Type2_5032_3.02_RUNG.L5X |
| | | 42EF-R2JBBT-xx | raC_Dvc_42EF_Type3_5032_3.02_A0I.L5X | raC_Dvc_42EF_Type3_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 42EF | Display | (raC-3_02-ME) raC_Dvc_42EF-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_42EF-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 42EF | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementatio n Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------------------|--|--|---|
| | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42EF_4I0L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42EF_4IOL_(3.2) |
| ArmorBlock 1732E-8I0LM12R 42EF | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42EF_8I0L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42EF_8IOL_(3.2) | |
| | | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42EF_Type1_5032_(3.2) | |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42EF_Type2_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42EF_5032_(3.2) |
| | | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42EF_Type3_5032_(3.2) | |

Device Definition (raC_Dvc_42EF_4IOL, raC_Dvc_42EF_8IOL)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



- 2. Specify the Application Specific Name e.g. CapDetect_101
- 3. Select the Process Data Input as *Triggered*, *Margin*, *Proximity*, *Gain*, *Signal*.

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | | Process Data Input | Data Stor | age |
|---------|---------|---------------|----------------|------------------------------|----------------------|--------|--|-----------|-----|
| 0 | 10-Link | Allen-Bradley | 42EF-D2KBAK-A2 | CapDetect_100 | Exact M | \sim | Triggered.Margin.Proximity.Gain.Signal | Enable AD | C |
| 1 | IO-Link | Allen-Bradley | 42EF-P2JBB-A2 | CapDetect_101 | Exact M | \sim | Triggered, Margin, Proximity, Gain, Signal 💦 🗸 | Enable AD | C |
| 2 | IO-Link | | | | T | | | 1 | |
| 3 | IO-Link | | | | | | | | |
| 4 | IO-Link | | | | | | | | |
| 5 | IO-Link | | | | | | | | |
| 6 | IO-Link | | | | | | | | |
| 7 | 10-Link | | | | | | | | |
| < | | | | | | | | | |





Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

2. Whichever channels are selected for 42EF, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 42EF Sensor.

- I/O Configuration
 1756 Backplane, 1756-A7
 Ethernet

 1756-L85E Master_5032_Test_Cases
 5032-8IOLM12M12LDR/A Mod_Master_5032_1
 10-Link
 0 42AF-B1MAB1-xx (224) Mod_42AF_Type1
 2 42AF-B1MAC1-xx (220) Mod_42AF_Type2
 4 42AF-P2MAB1-xx (208) Mod_42AF_Type3
 6 42EF-D2JBAK-xx (105) Mod_42EF_Type1
 8 42EF-R2KBB-xx (119) Mod_42EF_Type2
 10 42EF-R2JBBT-xx (118) Mod_42EF_Type3
 12 42JT-B2LAT1-xx (1) Mod_42JT_Type1
 14 42JT-F5LET1-xx (11) Mod_42JT_Type2
- 3. Configure the parameters of sensor from configuration tab from AOP of the 42EF sensor.



Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|-----------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |

| Condition | Description |
|----------------------------------|---|
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_42EF_4IOL, raC_Dvc_42EF_8I0L)

| InOut | Function / Description | DataType |
|-----------------|--|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_42EF_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlCmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_Ctrl_Inf | 10-Link Device Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf |
| Ref_Ctrl_Itf | 10-Link Device Command, Status | raC_UDT_ItfAD_IOLinkDevices |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[20] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_42EF_Inp_4IOL Or raC_UDT_ItfAD_42EF_Inp_8IOL |

Input Data

| Input | Function/Description | DataType |
|-------------------------------|---|----------|
| Cfg_AlignmentMode | Alignment Mode; 0 = Disabled, 1 = Enabled, 2 = Enabled for 120s, 3 = Enabled for 240s | SINT |
| Cfg_OutputPolarityInverted | Output Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | SINT |
| Cmd_ResetCount | Counter Reset Command | BOOL |
| Cmd_ResetDurations | Duration Reset Command | BOOL |
| Cmd_TeachCancel | Duration Reset Command | BOOL |
| Cmd_TeachPrecision_ShowTarget | Teach Precision Show Target Command | BOOL |
| Cmd_TeachStatic_Background | Teach Static Background Command | BOOL |
| Cmd_TeachStatic_ShowTarget | Teach Static Show Target Command | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity Alarm of Senor | BOOL |

| Input | Function/Description | DataType |
|-----------------------|---|----------|
| Inp_ChxSignalStrength | Signal Strength of Sensor | DINT |
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |
| Set_Setpoint | Enter Setpoint Value To Turn ON Sensor Output | DINT |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_EnableLEDs | LED Indicator; O= Disable, 1= Enable | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Val_AlignmentModeEnable | Alignment Mode Status; 0 = Disabled, 1 = Enabled, 2 = Enabled for 120s, 3 = Enabled for 240s | INT |
| Val_Contrast | Sensor Contrast Level | INT |
| Val_NotTriggeredDuration | Sensor Output OFF Duration | INT |
| Val_OperatingHrsSinceInception | Operating Hours Since Inception | DINT |
| Val_OperatingHrsSincePowerUp | Operating Hours Since Power Up | DINT |
| Val_OutputPolarityInverted | Output Polarity Status, 0 = Not Inverted, 1 = Inverted | INT |
| Val_PercentSP | Setpoint in Percent | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Setpoint | Setpoint Value To Turn ON Sensor Output | DINT |

| Output | Function/Descritpion | DataType |
|--------------------------------------|--|----------|
| Val_TeachStep | Teach Step | INT |
| Val_TemperatureCurrent | Internal Temperature Of Sensor | SINT |
| Val_TemperatureMaxSinceInceptio n | Maximum Temperature Since Inception | SINT |
| Val_TemperatureMaxSincePowerUp | Maximum Temperature Since Power Up | SINT |
| Val_TemperatureMinSinceInception | Minimum Temperature Since Inception | SINT |
| Val_TemperatureMinSincePowerUp | Minimum Temperature Since Power Up | SINT |
| Val_Trigger_Counter | Sensor Counter Value | SINT |
| Val_TriggeredDuration | Sensor Output ON Duration | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data
(raC_Dvc_42EF_Type1_503
2,
raC_Dvc_42EF_Type2_5032
,
raC_Dvc_42EF_Type3_5032InOut Data.Inout...<td

)

| InOut | Function / Description | DataType |
|-----------------------|--|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_42EF_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_I0LinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_I0LinkSensor_CtrICmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_Ctrl_Inf | 10-Link Device Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | IO-Link Device Command, Status | raC_UDT_ItfAD_IOLinkDevices |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_42EF_Inp_5032 |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_42EF_Type1_Cfg or raC_UDT_IOLink_42EF_Type2_Cfg or raC_UDT_IOLink_42EF_Type3_Cfg |

Input Data

| Input | Function/Description | DataType |
|----------------------------|---|----------|
| Cfg_AlignmentMode | Alignment Mode; 0 = Disabled, 1 = Enabled, 2 = Enabled for 120s, 3 = Enabled for 240s | SINT |
| Cfg_OutputPolarityInverted | Output Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | SINT |
| Cmd_ResetCount | Counter Reset Command | BOOL |
| Cmd_ResetDurations | Duration Reset Command | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity Alarm of Senor | BOOL |
| Inp_ChxSignalStrength | Signal Strength of Sensor | DINT |
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |

| Input | Function/Description | DataType |
|-------------------|---|----------|
| Set_Setpoint | Enter Setpoint Value To Turn ON Sensor Output | DINT |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_AlignmentModeEnable | Alignment Mode Status; 0 = Disabled, 1 = Enabled, 2 = Enabled for 120s, 3 = Enabled for 240s | INT |
| Val_Contrast | Sensor Contrast Level | INT |
| Val_NotTriggeredDuration | Sensor Output OFF Duration | INT |
| Val_OperatingHrsSinceInception | Operating Hours Since Inception | DINT |
| Val_OperatingHrsSincePowerUp | Operating Hours Since Power Up | DINT |
| Val_OutputPolarityInverted | Output Polarity Status, 0 = Not Inverted, 1 = Inverted | INT |
| Val_PercentSP | Setpoint in Percent | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Setpoint | Setpoint Value To Turn ON Sensor Output | DINT |
| Val_TemperatureCurrent | Internal Temperature Of Sensor | SINT |
| Val_TemperatureMaxSinceInceptio | Maximum Temperature Since Inception | SINT |
| Val_TemperatureMaxSincePowerU p | Maximum Temperature Since Power Up | SINT |
| Val_TemperatureMinSinceInceptio n | Minimum Temperature Since Inception | SINT |
| Val_TemperatureMinSincePowerU p | Minimum Temperature Since Power Up | SINT |
| Val_Trigger_Counter | Sensor Counter Value | SINT |
| Val_TriggeredDuration | Sensor Output ON Duration | INT |

Chapter 7 42EF - RightSight Photoelectric Sensor (raC_Dvc_42EF_4lOL, raC_Dvc_42EF_8lOL, raC_Dvc_42EF_Type1_5032, raC_Dvc_42EF_Type2_5032,

| Output | Function/Descritpion | DataType |
|---------------------------|--|----------|
| Val_SignalStrengthOn | Signal Strength On Value | DINT |
| Val_SignalStrengthOff | Signal Strength Off Value | DINT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 42EF device object connected to channel #3 of a POINT I/O 1734-4IOL IO-Link Master module named *PointIO_4IOL_Master* in slot #8 of a POINT I/O adapter named *Racko1*.



The following example uses the 42EF device object connected to channel #0 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.



The following example uses the 42EF Sensor Type 1 device object connected to channel #6 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master5032_*1



The following example uses the 42EF Sensor Type 2 device object connected to channel #8 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod Master*5032 1

| Sensor_42EF_Type2 Input Interface | Sensor_42EF_Type2 Configuration Interface Device Access Locks Data | Sensor_42EF_Type2 |
|--------------------------------------|---|---|
| COP | COP | raC_Dvc_42EF_Type2_5032 |
| Source Mod_42EF_Type2:1 | Source Mod_42EF_Type2:C.Device_Access_Locks | raC_Dvc_42EF_Type2_50 Sensor_42EF_Type2 |
| Dest Sensor_42EF_Type2_Inp_1 | Dest Sensor_42EF_Type2_Ctg_C.Device_Access_Locks | Ref_Module Mod_42EF_Type2 -(Sts_Connected)- |
| Length | Length Z3 | Rei_IvisgCustSetidx Sensor_42EF_Type2_SetIndex |
| | | Ref_MsgCustSetSubldy Sensor 42EF Type2_GetIndex Cits_Available |
| | | Ref MsgModReconfigure Sensor 42EF Type2 ModReconfigure(Sts Warning) |
| | | Ref MsgData Sensor 42EF Type2 MsgData |
| | | Ref_Ctrl_Set Sensor_42EF_Type2_CtrlSet -(Sts_Faulted)- |
| | | Ref_Ctrl_Cmd Sensor_42EF_Type2_CtrlCmd |
| | | Ref_Ctrl_Sts Sensor_42EF_Type2_CtrlSts -(Sts_Ready) |
| | | Ref_Ctrl_Inf Mod_Master_5032_1_CtrlInf |
| | | Inf Leakup raC Duo 42EE InfTable |
| | | Inn L Sensor 42EF Type2 Inn L |
| | | Cfa C Sensor 42EF Type2 Cfa C |
| | | Inp ChNumber 8 |
| | | ' |
| | | · · · · · · · · · · · · · · · · · · · |
| | | |
| | | COP |
| | | Source Sensor_42EF_Type2_Cfg_C.Device_Access_Locks |
| | | Dest Mod_42EF_Type2:C.Device_Access_Locks |
| | | Length 23 |
| | | |

The following example uses the 42EF Sensor Type 3 device object connected to channel #10 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master5032_*1



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|------------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_LightSens | Not Triggered | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration | | |
|---------------------------|----------------|--|---|--|--|
| AOG_42EF_ Launch | Not Triggered | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Security Image: Security Image: Security Image: Security Image: Security Image: Security Image: Security Image: Security | | |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Name | Usage 📰 👻 | Alias For | Base Tag | Data Type | Description |
|-------------------------|-----------|-----------|----------|-------------------------------|---|
| Sensor_42JT_Type1_Cfg_C | Local | | | raC_UDT_IOLink_42JT_Type1_Cfg | Sensor_42JT_Type1 Configuration Interface |
| Sensor_42JT_Type1 | Local | | | raC_Dvc_42JT_Type1_5032 | Sensor_42JT_Type1 |
| Sensor_42EF_Type3_Inp_I | Local | | | raC_UDT_IOLink_42EF_Inp_5032 | Sensor_42EF_Type3 Input Interface |
| Sensor_42EF_Type3_Cfg_C | Local | | | raC_UDT_IOLink_42EF_Type3_Cfg | Sensor_42EF_Type3 Configuration Interface |
| Sensor_42EF_Type3 | Local | | | raC_Dvc_42EF_Type3_5032 | Sensor_42EF_Type3 |
| Sensor_42EF_Type2_Inp_I | Local | | | raC_UDT_IOLink_42EF_Inp_5032 | Sensor_42EF_Type2 Input Interface |
| Sensor_42EF_Type2_Cfg_C | Local | | | raC_UDT_IOLink_42EF_Type2_Cfg | Sensor_42EF_Type2 Configuration Interface |
| Sensor_42EF_Type2 | Local | | | raC_Dvc_42EF_Type2_5032 | Sensor_42EF_Type2 |
| Sensor_42EF_Type1_Inp_I | Local | | | raC_UDT_IOLink_42EF_Inp_5032 | Sensor_42EF_Type1 Input Interface |
| Sensor_42EF_Type1_Cfg_C | Local | | | raC_UDT_IOLink_42EF_Type1_Cfg | Sensor_42EF_Type1 Configuration Interface |
| Sensor_42EF_Type1 | Local | | | raC_Dvc_42EF_Type1_5032 | Sensor_42EF_Type1 |
| Sensor_42AF_Type3_Inp_I | Local | | | raC_UDT_IOLink_42AF_Inp_5032 | Sensor_42AF_Type3 Input Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Trigger Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 5 | Signal Strength (%) Sparkline Trend The spark line shows the signal strength value over last 30 seconds |
| 6 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| | Process Data |
| 7 | - Triggered Duration (ms): Displays the amount of time that the sensor output has been ON. To show the trigger duration on faceplate, required to make Timer Mode Enabled setting in AOP in Logix Designer. |
| | - Not Triggered Duration (ms): Displays the amount of time that the sensor output has been OFF. To show the trigger duration on faceplate, required to make Timer Mode Enabled setting in AOP in Logix Designer. |
| | - Trigger Counter: Displays the sensor counter value when enabled. The counter value increments every time the sensor is triggered this process data element can count up to 65535 and can be reset via reset count button from config tab. Refer to Appendix B for additional information about index. To show the trigger count on faceplate, required to make Counter Mode Enabled setting in AOP in Logix Designer. |
| | - Signal Strength (%): Signal Strength provides the raw measurement value of the amount of light reflected from the target. |
| | - Contrast: Displays the difference between the light signal levels that the sensor read the last time the output was ON versus the last time the output was OFF. |
| | - Gain: Displays the excess gain above the sensor threshold to ensure reliable detection of the target. |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name require pressing the 'Config Apply' button in the Config tab to update the sensor parameters. |

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description |
|------|---|
| 1 | Internal Temperature Bar Graph Green Indicators: Min/Max since inception (lifetime) Purple Indicators: Min/Max since power up Light Blue Triangle Indicator: Current value |
| 2 | Internal Temperature Current Value |
| 3 | Operating Hours Since Inception (lifetime) |
| 4 | Operating Hours Since Power Up |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.
Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action decisions. One trend is displayed for Setpoint and Signal Strength.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Setpoint & Signal strength.

| 42EF PI | otoelectric Sensor | X |
|------------------------|------------------------|----------|
| $\widehat{\mathbf{w}}$ | Ready | |
| | Trend and Spark Limits | \times |
| | Signal Strength Scale | |
| | Minimum O | |
| | Maximum 100 | |
| | | |
| | | |
| | | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Trigger Settings
- Local Settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| EF_12002 | × |
|-------------------------------|--------------------|
| Ready | |
| Parameter Settings | Trigger Settings |
| Setpoint: 1000.00 | Reset Count |
| Output Polarity: Not Inverted | Reset Durations |
| Alignment Mode: Disabled | Config Apply |
| | LED's Setting |
| | Disable 💷 Enable |
| | Local Teach |
| | Unlock 💭 Lock |
| | |

Parameter Settings

Setpoint - Allows operators to enter the signal value required for the sensor output to turn ON (threshold) upon target detection. That means that the sensor signal level must be higher than the threshold for the output to turn ON. The default value for this parameter is 1000 with acceptable values between 1000 and 65535.

Output Polarity - Polarity changes the sensor output to operate as Not Inverted (Light On) and Inverted (Dark On). Click on output polarity drop-down selector object to switch between Light On & Dark On.

Alignment Mode - This parameter changes the sensor user interface to operate in alignment mode. The alignment mode uses the green and orange LEDs of the sensor to visually indicate the strength of the light signal that is reflected back from the object. Click on alignment mode drop-down selector object to switch between Enable & Disable

Trigger Settings

Reset Count - Allows users to reset the counter function, it will reset the sensor counts to zero.

Reset Duration - Allows users to reset the timer function, it will reset Duration Triggered & Duration Not Triggered time.

Local Settings

Disable/Enable LEDs - This parameter allows operators to turn OFF or turn ON the User Interface LEDs (green and orange LEDs). This parameter is ideal for applications where turning OFF the LEDs is desired to accommodate the application.

Local Teach Parameters - This section allow user to lock / unlock device local parameterization. Touch Lock/Unlock Toggle switch to Lock Local Parameterization

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| EF_120 | 02 | | × |
|--------|------------------|--------------|------------------|
| | Ready | | |
| 8 | Parameter Settin | igs | Trigger Settings |
| ~ | Setpoint: | 1000.00 | Reset Count |
| P | Output Polarity: | Not Inverted | Reset |
| 1 | Alignment Mode: | Disabled | Config Apply |
| | | | LED's Setting |
| | | | Disable 🔲 Enable |
| | | | Local Teach |
| | | | Unlock 🔎 Lock |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.



After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_42EF_4I0L, raC_Dvc_42EF_8I0L, raC_Dvc_42EF_Type1_5032, raC_Dvc_42EF_Type2_5032, raC_Dvc_42EF_Type3_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_42EF_4IOL, raC_LD_Dvc_42EF_8IOL Implementation Objects: raC_Dvc_42EF_Type1_5032,

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

raC_Dvc_42EF_Type2_5032, raC_Dvc_42EF_Type3_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-----------------|---------------------|------------------|----------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 42EF), This name depends upon the TagName assigned to object. |
| SensorType | 42EF-D2JBAK-xx | 42EF-D2JBAK-xx | 42EF-D2JBAK-xx | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |

| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM |
|-------------------|-----------------|--|----------------------|--|
|-------------------|-----------------|--|----------------------|--|



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|---|-------------------|----------|-----------------|----------|
| raC_Dvc_42EF_4I0L | raC_Dvc_42EF_4IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_42EF_8I0L | raC_Dvc_42EF_8IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_42EF_Type1_5032 Or raC_Dvc_42EF_Type2_5032 Or raC_Dvc_42EF_Type3_5032 | raC_Dvc_42EF_5032 | 3.2 | (RA-LIB) Device | IO-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|--|--|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME) Graphic Symbols - Io-link Device.ggfx | {ProjectName}\Visualization\FTViewME\Global Object - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE) Graphic Symbols - Io-link Device.ggfx | {ProjectName}\Visualization\FIViewSE\Global Object - ggfx |
| V3_raC_Dvc_42EF | Faceplate ME | (raC-3_xx-ME) raC_Dvc_42EF-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_42EF | Faceplate SE | (raC-3_xx-SE) raC_Dvc_42EF-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_IO_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

Chapter 7 42EF - RightSight Photoelectric Sensor (raC_Dvc_42EF_4I0L, raC_Dvc_42EF_8I0L, raC_Dvc_42EF_Type1_5032, raC_Dvc_42EF_Type2_5032, raC_Dvc_42EF_Type3_5032, raC_Dvc_5032, raC_

42JT - VisiSight Photoelectric Sensor (raC_Dvc_42JT_4IOL, raC_Dvc_42JT_8IOL, raC_Dvc_42JT_Type1_5032, raC_Dvc_42JT_Type2_5032, raC_Dvc_42JT_Type3_5032)

Overview

The 42JT VisiSight Photoelectric Sensor device object (raC_Dvc_42JT_4IOL, raC_Dvc_42JT_8IOL, raC_Dvc_42JT_Type1_5032, raC_Dvc_42JT_Type2_5032, raC_Dvc_42JT_Type3_5032) includes HMI faceplates which displays device information including:

- Sensor data
- Sensor diagnostics
- Sensor configuration and parameters
- Device Fault log

Primary device object configuration functions include:

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_42JT_Objects_Faceplate.MP4"

- **Setpoint:** Setpoint will allow the operators to enter the signal value required for the sensor output to turn ON upon target detection.
- **Polarity:** This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate).
- Teach: Offers the different teach functions.

Functional Description

The 42JT VisiSight Photoelectric Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with five versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|---|--------------------------------------|---------------------------------------|
| 42JT | POINT 1/0 1734-410L | 42JT-B2LAT1-xx, 42JT-B2LAT2-xx, 42JT-C2LAT1-xx, 42JT-R9LAT1-xx, 42JT-R8LAT1-xx, 42JT-F5LET1-xx, 42JT-P8LAT1-xx, 42JT-D8LAT1-xx, 42JT-P2LAT1-xx, 42JT-D2LAT1-xx, 42JT-B8LAT1-xx | raC_Dvc_42JT_410L_3.02_A01.L5X | raC_Dvc_42JT_410L_3.02_RUNG.L5X |
| | ArmorBlock 1732E-810LM12R | 42JT-B2LAT1-xx, 42JT-B2LAT2-xx, 42JT-C2LAT1-xx, 42JT-R9LAT1-xx, 42JT-R8LAT1-xx, 42JT-F5LET1-xx, 42JT-P8LAT1-xx, 42JT-D8LAT1-xx, 42JT-P2LAT1-xx, 42JT-D2LAT1-xx | raC_Dvc_42JT_810L_3.02_A01.L5X | raC_Dvc_42JT_810L_3.02_RUNG.L5X |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | 42JT-B2LAT1-xx, 42JT-B2LAT2-xx, 42JT-C2LAT1-xx, 42JT-R9LAT1-xx, 42JT-R8LAT1-xx | raC_Dvc_42JT_Type1_5032_3.02_A0I.L5X | raC_Dvc_42JT_Type1_5032_3.02_RUNG.L5X |
| | | 42JT-F5LET1-xx, 42JT-P8LAT1-xx, 42JT-D8LAT1-xx | raC_Dvc_42JT_Type2_5032_3.02_A0I.L5X | raC_Dvc_42JT_Type2_5032_3.02_RUNG.L5X |
| | | 42JT-P2LAT1-xx, 42JT-D2LAT1-xx | raC_Dvc_42JT_Type3_5032_3.02_A0I.L5X | raC_Dvc_42JT_Type3_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 42JT | Display | (raC-3_02-ME) raC_Dvc_42JT-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_42JT-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 42JT | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|--|--|---|
| | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_42JT_410L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42JT_4IOL_(3.2) |
| 42JT | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_42JT_810L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42JT_8IOL_(3.2) |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42JT_Type1_5032_(3.2) | |
| | | RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42JT_Type2_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_42JT_5032_(3.2) |
| | | RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_42JT_Type3_5032_(3.2) | |

Device Definition (raC_Dvc_42JT_4I0L, raC_Dvc_42JT_8I0L)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...

| Module Properties: Local (1732 | -8IOLM12R 3.001) 🗙 🗎 M | lainProgram - MainRoutine |
|--|---|--|
| General* Connection Module Info Internet Protocol Port Configuration Network Time Sync Fault/Program Action Configuration IO-Link | IO-Link □ - ① 1732E-8IOL12MR// □ - ② Ch 0 - IO-Link □ - ③ Ch 1 - IO-Link □ - ③ Ch 2 - IO-Link □ - ③ Ch 3 - IO-Link □ - ⓒ Ch 3 - IO-Link □ - ⓒ Ch 4 - IO-Link □ - ⓒ Ch 5 - IO-Link □ - ⓒ Ch 6 - IO-Link □ - ⓒ Ch 7 - IO-Link | A Common Change Properties Register IODD Device 42J Description Pho |
| | 🦾 🌚 Ch 7 - 10-Link | Description PI |

2. Specify the Application Specific Name e.g. 42JT_101

| unannel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storage | | Change Device |
|---------|---------|---------------|----------------|------------------------------|----------------------|--------------------|--------------|---|------------------|
| 1 | 10-Link | Allen-Bradley | 42JT-B2LAT1-P4 | 42JT_101 | Exact M 🗸 | | Enable ADC | ~ | |
| I | IO-Link | | | | | | | | |
| 1 | 10-Link | | | | | | | | |
| 1 | 10-Link | | | | | | | | |
| I | 10-Link | | | | | | | | |
| I | 10-Link | | | | | | | | |
| 1 | 10-Link | | | | | | | | |
| 1 | 10-Link | | | | | | | | |

Device Definition (raC_Dvc_42JT_Type1_503 2, raC_Dvc_42JT_Type2_5032

raC_Dvc_42JT_Type3_5032) The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass

information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| Energy Storage 1/0 Offline . No Forces . No Edits | Redundancy | Favorites A | dd-On PlantPAx Saf | ety Alarms Bit | Module (| Definition | | | | |
|--|-------------------------|-----------------|------------------------|---------------------|------------|------------|------------|---------------------|------------|----------|
| rroller Organizer 🗸 🕈 | × Module Properties: EN | 2TR (5032-8IOLM | 12M12LDR 2.011) × | | Series: | | A | <u> </u> | | |
| Controller Master_IOLink_5032 | Connection | General | | | Revision: | | 2 | | | |
| Controller Tags | Module Info | Type: | 5032-8IOLM12M12LDR | BIO-Link Channel, 8 | Electronic | : Keying: | Compatible | Module | \sim | |
| Controller Fault Handler | - 00 - IO-Link | Vendor: | Rockwell Automation/Al | en-Bradley | Connectio | on: | Data | | \vee | |
| Power-Up Handler | 01 - Digital Output | Parent: | EN2TR | | | | | | | |
| Tasks | - 02 - IO-Link | Name: | Mod Master5032 | | | | | | | |
| • Mainlask • MainProgram | - 04 - IO-Link | Nume. | | | | | ĺ | | Ch | annel |
| Unscheduled | 06 - 10-Link | Description: | | A | | | IO-Link | | Mod | le Types |
| Motion Groups | - 10 - 10-Link | | | | Port | Channel | Class B | Channel Mode | | • |
| Alarm Manager | - 12 - IO-Link | | · | | | | Enabled | | ā | DO |
| Assets | 14 - IO-Link | Module Defini | tion | | 1 | | | a and a second | | 0 |
| Add-On Instructions | - Port Configuration | | | Change | 0 | 0 | - L | O-Link | | 1 1 |
| Data Types | Network | Series: | A | | | 2 | | IO-Link | | 1 1 |
| Trends | - Time Sync | Revision: | 2 011 | | 1 | 3 | | Digital Input | ~ 1 | 1 |
| Logical Model | Servers | Flashnasia Ka | uiner Commetibi | | 2 | 4 | | IO-Link | < < | 11 |
| I/O Configuration | | Electronic ke | ying: Compaudi | e module | _ | 5 | 0 | Disabled | × | V |
| 1/56 Backplane, 1/56-A10 | | Connection: | Data | | 3 | 7 | | IU-LINK Disabled | × | 1 1 |
| U [1] I/30-ENZIK ENZIK | | | | | | 8 | | IO-Link | ~ 1 | 1 1 |
| | | | | | 4 | 9 | | Disabled | ~ J | 1 |
| | | | | | 5 | 10 | | IO-Link | × 1 | 11 |
| F [0] 175C L05E Marter JOLink F000 | | | | | | 11 | | Disabled | × 1 | 1 |
| Le [9] 1756-L85E Master_IOLINK_5032 | | | | | 6 | 12 | | IO-Link | ~ / | 1 1 |
| as Ethernet | | | | | _ | 13 | | Disabled | × . | V |
| Ta 1756 LOSE Martine IOLinia 5000 | | | | | | 14 | | IO*LIIIN | | VIV |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 42JT, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 42JT Sensor.
 - ▲ ≤ I/O Configuration
 - 🔺 📟 1756 Backplane, 1756-A7
 - [0] 1756-L85E Master_5032_Test_Cases
 - ▲ 🔓 Ethernet
 - 1756-L85E Master_5032_Test_Cases
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_1
 - 🔺 🛇 IO-Link
 - 🐐 0 42AF-B1MAB1-xx (224) Mod_42AF_Type1
 - 2 42AF-B1MAC1-xx (220) Mod_42AF_Type2
 - 4 42AF-P2MAB1-xx (208) Mod_42AF_Type3
 - 6 42EF-D2JBAK-xx (105) Mod_42EF_Type1
 - 8 42EF-R2KBB-xx (119) Mod_42EF_Type2
 - ₱ 10 42EF-R2JBBT-xx (118) Mod 42EF Type3
 - 12 42JT-B2LAT1-xx (1) Mod_42JT_Type1
 - 14 42JT-F5LET1-xx (11) Mod_42JT_Type2
 - ¹ 5032-8IOLM12M12LDR/A Mod_Master_5032_2
 ¹ O-Link
 ¹ 0 42JT-P2LAT1-xx (4) Mod_42JT_Type3

3. Configure the parameters of sensor from configuration tab from AOP of the 42JT sensor.

| 🗎 MainProgram - MainRouti | ine 🚦 Module Properties: Mod_M | laster_5032_1:1 | 2 (42JT-B2LAT1-xx (1) |) 1.1) × | | |
|---------------------------|--------------------------------|---|---|--|--|---|
| General | Configuration | | | | | |
| Connection | g | | | | | |
| Device Info | Nama | DAV | Velue | 0 | Ohula | Description |
| Parameters | Name | R/W | value | Units | Style | Description |
| EventLog | User Specific Information | | | | | |
| | Application-specific Tag | DW | *** | | | |
| | ▲ Parameter | | | | | |
| | Operation Configuration | | | | | |
| | ▲ Triggered | | | | | |
| | Set Point 1 Value | rw 🖂 | 0 | Dec | cim <u>~</u> | |
| | Polarity | rw | Not Inverted (LO) 🖂 | | | |
| | Datice Access Locks | | | | | |
| | Local User Interface | DW | Unlocked V | | Th | his lock prevents the access to the device setting |
| | | | | I | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |
| | Insert Factory Defaults | | | | | |
| | MainProgram - MainRout | MainProgram - MainRoutine Module Properties: Mod M General Connection Device Info Configuration Parameters Event Log Vent Log Insert Factory Defaults | MainProgram - MainRoutine MainProgram - MainRoutine General Connection Device Info Configuration Parameters Event Log Parameter Paramet | MainProgram - MainRoutine Module Properties: Mod_Master_5032_1:12 (42JT-B2LAT1-xx (1) General Configuration Configuration Parameters Event Log Value Value | MainProgram - MainRoutine Module Properties: Mod_Master_5032_1:12 (42/T-B2LAT1-xx (1) 1.1) × General Configuration Parameters Event Log Aldentification Algeration Algeration <td>MainProgram - MainRoutine Module Properties: Mod_Master_5032_1:12 (42JT-82LAT1-xx (1) 1.1) × General Configuration Parameters Event Log Parameters Event Log Parameters Event Log Polarity rw vigered Polarity rw vigered Polarity rw voluce bucks Polarity rw voluce bucks Polarity rw voluce bucks Polarity rw voluce bucks A Device Interface Polarity rw voluce bucks A Device Access Locks Local User Interface rw Unlocked rt Tataanter</td> | MainProgram - MainRoutine Module Properties: Mod_Master_5032_1:12 (42JT-82LAT1-xx (1) 1.1) × General Configuration Parameters Event Log Parameters Event Log Parameters Event Log Polarity rw vigered Polarity rw vigered Polarity rw voluce bucks Polarity rw voluce bucks Polarity rw voluce bucks Polarity rw voluce bucks A Device Interface Polarity rw voluce bucks A Device Access Locks Local User Interface rw Unlocked rt Tataanter |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_42JT_4I0L, raC_Dvc_42JT_8I0L)

| InOut | Function / Description | DataType |
|-----------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_42JT_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlCmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_Ctrl_Inf | IO-Link Device Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | IO-LinkDeviceCommand,StatusInterface | raC_UDT_ItfAD_IOLinkDevices |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[20] |
| Inp_I | Device Object Inputs | raC_UDT_ltfAD_42JT_lnp_4l0L Or raC_UDT_ltfAD_42JT_lnp_8l0L |

Input Data

| Input | Function/Description | DataType |
|-------------------------------|---|----------|
| Cfg_Gain | Gain; 0 = Low, 1 = High | SINT |
| Cfg_LightSource | Light Source; 0 = OFF, 1 = ON | SINT |
| Cfg_OutputPolarityInverted | Polarity; 0 = Inverted, 1 = Not Inverted | SINT |
| Cmd_DynamicTeachStart | Dynamic Teach Start Command | BOOL |
| Cmd_DynamicTeachStop | Dynamic Teach Stop Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_PrecisionTeach | Precision Teach Command | BOOL |
| Cmd_StaticTeachShowBackground | Static Teach Background Command | BOOL |
| Cmd_StaticTeachShowTarget | Static Teach Mark Command | BOOL |
| Cmd_TeachApply | Teach Apply Command | BOOL |
| Cmd_TeachCancel | Teach Cancel Command | BOOL |
| Cmd_TeachModeStart | Teach Mode Start Command | BOOL |
| Set_Setpoint | Enter Setpoint Value To Turn ON Sensor Output | BOOL |
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChxMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |

Output Data

| Output | Function/Descritpion | DataType |
|-------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Val_Gain | Gain Status; 0 = Low, 1 = High | INT |
| Val_LightSource | Light Source Status; 0 = OFF, 1 = ON | DINT |
| Val_OutputPolarityInverted | Polarity Status; 0 = Inverted, 1 = Not Inverted | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Setpoint | Setpoint Value To Turn ON Sensor Output | DINT |
| Val_TeachMode | Teach Mode Status; 0 = Static, 1 = Dynamic, 2 = Precision | INT |
| Val_TeachStep | Teach Step | INT |
| raC_Dvc_ADFramework_ DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_42JT_Type1_503 2, raC_Dvc_42JT_Type2_5032 I raC_Dvc_42JT_Type3_5032)

| InOut | Function / Description | DataType |
|-----------------------|----------------------------------|------------------------------------|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_42JT_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |

Chapter 8 42JT - VisiSight Photoelectric Sensor (raC_Dvc_42JT_4l0L, raC_Dvc_42JT_8l0L, raC_Dvc_42JT_Type1_5032, raC_Dvc_42JT_Type2_5032,

| InOut | Function / Description | DataType |
|--------------|--|---|
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlCmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_Ctrl_Inf | IO-Link Device Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf_5032 |
| Ref_Ctrl_ltf | IO-Link Device Command, Status | raC_UDT_ItfAD_IOLinkDevices |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_42JT_Inp_5032 |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_42JT_Type1_Cfg or raC_UDT_IOLink_42JT_Type2_Cfg or raC_UDT_IOLink_42JT_Type3_Cfg |

| Input | Function/Description | DataType |
|-------------------------------|---|----------|
| Cfg_Gain | Gain; 0 = Low, 1 = High | SINT |
| Cfg_LightSource | Light Source; 0 = 0FF, 1 = 0N | SINT |
| Cfg_OutputPolarityInverted | Polarity; 0 = Inverted, 1 = Not Inverted | SINT |
| Cmd_DynamicTeachStart | Dynamic Teach Start Command | BOOL |
| Cmd_DynamicTeachStop | Dynamic Teach Stop Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_PrecisionTeach | Precision Teach Command | BOOL |
| Cmd_StaticTeachShowBackground | Static Teach Background Command | BOOL |
| Cmd_StaticTeachShowTarget | Static Teach Mark Command | BOOL |
| Cmd_TeachApply | Teach Apply Command | BOOL |
| Cmd_TeachCancel | Teach Cancel Command | BOOL |
| Cmd_TeachModeStart | Teach Mode Start Command | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Set_Setpoint | Enter Setpoint Value To Turn ON Sensor Output | BOOL |
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChxMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |

Input Data

Output Data

| Output | Function/Descritpion | DataType |
|--------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; O=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |

Chapter 8 42JT - VisiSight Photoelectric Sensor (raC_Dvc_42JT_4I0L, raC_Dvc_42JT_8I0L, raC_Dvc_42JT_Type1_5032, raC_Dvc_42JT_Type2_5032,

| Output | Function/Descritpion | DataType |
|----------------------------|---|----------|
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_Gain | Gain Status; 0 = Low, 1 = High | INT |
| Val_LightSource | Light Source Status; 0 = 0FF, 1 = 0N | DINT |
| Val_OutputPolarityInverted | Polarity Status; 0 = Inverted, 1 = Not Inverted | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Setpoint | Setpoint Value To Turn ON Sensor Output | DINT |
| Val_TeachMode | Teach Mode Status; 0 = Static, 1 = Dynamic, 2 = Precision | INT |
| Val_TeachStep | Teach Step | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 42JT device object connected to channel #9 of a POINT I/O 1734-4IOL IO-Link Master module in slot #1 of a POINT I/O adapter named _*AdapterName*.

| Sensor_101 Input Interface | | Sensor 101 | |
|---|---|--|--|
| COP Source Rack01:9:I.Fault – Dest Sensor_101_Inp_I.Fault Length 7 | raC_Dvc_42JT_4IOL raC_Dvc_42JT_4IOL Ref_Module Write_Index Read_Index Write_SubIndex Read_SubIndex Msg_Sensor_Data Ref_Ctrl_Set Ref_Ctrl_Crnd Ref_Ctrl_Sts Inf_Lookup Inp_1 | Sensor_101 PointIO_4IOL_Master - Sensor_101_Write_Index Sensor_101_Read_Index Sensor_101_Write_SubIndex Sensor_101_Read_SubIndex Sensor_101_Msg_Sensor_Data Sensor_101_CtrlSet - Sensor_101_CtrlSet - Sensor_101_CtrlSts - raC_Dvc_42JT_InfTable Sensor_101_Inp_I | (Sts_Connected)— (Sts_Available)— (Sts_Warning)— (Sts_Faulted)— (Sts_Ready)— |
| | Inp_ChxTriggered Inp_ChxMarginLowAlarm Inp_ChNumber Ref_Ctrl_Inf Ref_Ctrl_Itf | Rack01:9:I.Ch2Triggered 0 Rack01:9:I.Ch2MarginLowAlarm 0 2 PointlO_4IOL_Master_CtrlInf PointlO_4IOL_Master_CtrlIff | |

The following example uses the 42JT device object connected to channel #2 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.



The following example uses the 42JT Sensor Type 1 device object connected to channel #12 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_1*.



The following example uses the 42JT Sensor Type 2 device object connected to channel #14 of a ArmorBlock 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_1*.



The following example uses the 42JT Sensor Type 3 device object connected to channel #0 of a ArmorBlock 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_2*.



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|------------------------|---------------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_LightSens | SS Not Triggered | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|----------------|---|---|
| AOG_42JT_ Launch | Not Triggered | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Properties Animations Events A General Events AOL_Tag Appearance Position and Size Security |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Name | | | Descriptio | n | | Usage | -8 🔺 | Data Type |
|-------------------------|---------------|-------------|--------------|--------|--|--------|---|------------------------------------|
| Sensor_102 Sensor | | Sensor 102 | :nsor 102 | | Local | | raC_Dvc_42JT_8IOL | |
| Sensor_102_Inp_I | | | Sensor_102 | Input | Interface | Local | | rac_UDT_ItfAD_42JT_Inp_8IOL |
| Sensor_102_CtrlCmd | | | Sensor_102 | Comr | mand Interface | Public | | raC_UDT_ItfAD_IOLinkSensor_CtrlCmd |
| Sensor_102_CtrlSet | r_102_CtrlSet | | Sensor_102 | Settin | g Interface | Public | | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Sensor_102_CtrlSts | | | Sensor_102 | Status | Interface | Public | | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Name | Usage | == A | lias For Bas | e Tag | Data Type | | Descrip | tion |
| Sensor_42JT_Type3_Inp_I | Local | | | | raC_UDT_IOLink_42JT_Inp_50 | 32 | Sensor_ | 42JT_Type3 Input Interface |
| Sensor_42JT_Type3_Cfg_C | Local | | | | raC_UDT_IOLink_42JT_Type3 | _Cfg | g Sensor_42JT_Type3 Configuration Interfa | |
| Sensor_42JT_Type3 | Local | | | | raC_Dvc_42JT_Type3_5032 | | Sensor_ | 42JT_Type3 |
| Sensor_42JT_Type2_Inp_I | Local | | | | raC_UDT_IOLink_42JT_Inp_5032 Sensor_42JT_Type2 Input Interface | | 42JT_Type2 Input Interface | |
| Sensor_42JT_Type2_Cfg_C | Local | | | | raC_UDT_IOLink_42JT_Type2_Cfg Sensor_4 | | 42JT_Type2 Configuration Interface | |
| Sensor_42JT_Type2 | Local | | | | raC_Dvc_42JT_Type2_5032 Sensor_42JT_Type2 | | 42JT_Type2 | |
| Sensor_42JT_Type1_Inp_I | Local | | | | raC_UDT_IOLink_42JT_Inp_5032 Sensor_42JT_Type1 Input Interface | | 42JT_Type1 Input Interface | |
| Sensor_42JT_Type1_Cfg_C | Local | | | | raC_UDT_IOLink_42JT_Type1_Cfg Se | | Sensor_42JT_Type1 Configuration Interface | |
| Sensor_42JT_Type1 | Local | | | | raC_Dvc_42JT_Type1_5032 | | Sensor_ | 42JT_Type1 |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|--|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Trigger Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name require pressing the 'Config Apply' button in the Config tab to update the sensor parameters. |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Local Settings
- Teach Settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| | JT | _14002 | | | | | | × | |
|---|-----|--------|-----------------|--------------|---|------|-------------------|---|---|
| | 1 | - ú | Ready | | | | | | |
| | 5 | 3 Par | rameter Setting | IS | | | | ← | 4 |
| 1 | | Set | point | 1000 | | | Teach Settings | | |
| 2 | - 1 | Out | tput Polarity | Not Inverted | V | Gain | Low Gain | • | 5 |
| 3 | - 1 | Ligh | ht Source | On | V | | Config Apply | | |
| | | | | | | | Local Teach | | |
| | | | | | | | Unlock Lock | | |
| | | | | | | | | | 6 |

| item | Description |
|------|---|
| 1 | Setpoint: This parameter allows you to enter the threshold of when the sensor output turns ON. Valid setpoint ranges vary by specific sensor type: 42JT-D2x: 201000 42JT-P2x: 601000 42JT-B2LAT2x: 025000 42JT-B2LAT1x: 028000 42JT-B8LAT1x: 031700 |
| 2 | Output Polarity: Polarity changes the sensor output to operate as Light On(Non Inverted) and Dark On (Inverted). |
| 3 | Light Source: Turn the sensor Light Source ON or OFF. |
| 4 | Teach Settings: Launch the teach settings window. |
| 5 | Gain: Current gain level of the sensor to operate in high or low conditions. A high gain helps ensure that the sensor is able to detect targets with good reflectivity at longer ranges or verify that targets with low reflectivity are also detected at shorter ranges. |
| 6 | Local Teach Unlock/Lock Toggle Switch: Locks unauthorized people from changing the sensor settings using the local device push buttons.Toggle the lock/unlock button to prevent parameterization using local push buttons. |

Teach Settings

Teach Settings display includes the Teach Methods, Teach Command & Teach Cancel buttons. Touch on the Teach Settings navigation button to access the Teach Settings tab.

Teach tab includes the following functions:

- Teach mode selection drop-down menu (Static/Dynamic/Precision)
- Teach procedure flow buttons
- Teach cancel button

The operator must complete each stage to teach sensor successfully. During the teach process the operator must complete the current stage prior to the next stage being made available to operator. At any stage of teaching, the process can be canceled by pressing cancel button. When operator cancels the teach process, all completed stages are cleared and the teach process will restart from initial stage.



| ltem | Description |
|------|--|
| 1 | Teach Mode: - Static - Dynamic - Precision Teach |
| 2 | Teach procedure flow buttons |
| 3 | Teach setting window close button |
| 4 | Cancel: To cancel the procedure, you can send the "Teach Cancel" command at any point. |

Teach mode - This parameter selects the desired mode.

| 42JT PH | otoelectric Sensor | × |
|---------|---|-----------------|
| | Ready | |
| 8 | Teach Settings | \times |
| - | Static Teach | |
| | Show Target > Show Background > Teach Apply | |
| | | Teach Cancel |

Static Teach - The first method is Static Teach, which is intended for applications where the web can be stopped, or for more challenging applications.

- 1. Place the target in front of the sensor and send the command to **"Static Teach Show Target"**.
- 2. Show the background where the target will be present and then send the command **"Static Teach Show Background"**.

3. To cancel the procedure, you can send the **"Teach Cancel"** command at any point.



Dynamic Teach - The second method is Dynamic Teach, which is intended for applications where the web can be Running.

| 42JT Ph | otoelectric Sensor | × |
|------------------------|---------------------------|-----------------|
| $\widehat{\mathbf{w}}$ | Ready | |
| <i>(</i>) | Teach Settings | × |
| 1 | Precision Teach | |
| | Show Target > Teach Apply | |
| | | Teach Cancel |

Precision Teach - The Precision Teach is intended for applications where the precise setting of the distance is more critical. This teach method is also recommended for contrast applications.

1. Place the target in front of the sensor and send the command to **"Precision Teach – Show Target"**.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| Ready | | | |
|------------------|--------------|------|-------------------|
| Parameter Settin | qs | | |
| Setpoint | 100 | | Teach Settings |
| Output Polarity | Not Inverted | Gain | Low Gain |
| Light Source | On | V | Config Apply |
| | | | Local Teach |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| JT_140 | 02 | | | × |
|--------|------------------|--------------|------|-------------------|
| 俞 | E Ready | | | |
| P | Parameter Settin | ys | | |
| ! | Setpoint | 1000 | | Teach Settings |
| | Output Polarity | Not Inverted | Gain | Low Gain |
| | Light Source | On | V | Config Apply |
| | | | | Local Teach |
| | | | | Unlock 💭 Lock |
| | | | | |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault. **Note**, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_42JT_4I0L, raC_Dvc_42JT_8I0L, raC_Dvc_42JT_Type1_5032, raC_Dvc_42JT_Type2_5032, raC_Dvc_42JT_Type3_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_42JT_4IOL, raC_LD_Dvc_42JT_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_Dvc_42JT_Type1_5032, raC_Dvc_42JT_Type2_5032, raC_Dvc_42JT_Type3_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-------------------|---------------------|------------------|----------------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 42JT), This name depends upon the TagName assigned to object. |
| SensorType | 42JT-B2LAT1-xx | 42JT-B2LAT1-xx | 42JT-B2LAT1-xx | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|-------------------------|-------------------|----------|-----------------|----------|
| raC_Dvc_42JT_4I0L | raC_Dvc_42JT_4IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_42JT_8I0L | raC_Dvc_42JT_8IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_42JT_Type1_5032 | raC_Dvc_42JT_5032 | 3.2 | (RA-LIB) Device | IO-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_42JT | Faceplate ME | (raC-3_xx-ME) raC_Dvc_42JT-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_42JT | Faceplate SE | (raC-3_xx-SE) raC_Dvc_42JT-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_I0Link | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_IO_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

871FM - Mini Flat Pack Sensor (raC_Dvc_871FM_4I0L, raC_Dvc_871FM_8I0L, raC_Dvc_871FM_Type1_5032, raC_Dvc_871FM_Type2_5032)

The 871FM Mini Flat Pack Sensor device object (raC_Dvc_871FM_4IOL,

raC_Dvc_871FM_8IOL, raC_Dvc_871FM_Type1_5032, raC_Dvc_871FM_Type2_5032) includes HMI faceplates which displays device information including: Sensor data • Sensor diagnostics Sensor configuration and parameters Process data trending Device Fault log In the Library there is a folder named Videos which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_871FM_Objects_Faceplate.MP4" Primary device object configuration functions include: • **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other. Polarity: This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate). **Functional Description** The 871FM Mini Flat Pack Sensor Sensor pre-configured Device Objects: Collect, Process and Deliver Data between Smart Devices and Application Logic Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency All these features provide quick feedback, shorten recovery time, and simplify implementation. **Required Files** Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Overview

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix[®] firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with four versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/ Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import | |
|-----------------|--|--|---------------------------------------|--|--|
| | | 871FM-M10BA30-xxxx, 871FM-M7BA20-xxxx, 871FM-MV10BA30-xxxx, 871FM-MV7BA20-xxxx | | raC_Dvc_871FM_4I0L_3.02_RUNG.L5X | |
| | POINT I/O 1734-4IOL | 871FM-M1NP5-AP3, 871FM-M1NP5-E2, 871FM-M2NP5-AP3, 871FM-M2NP5-E2, 871FM-M2NP8-E2, 871FM-M2NP8-P3 | raC_Dvc_871FM_410L_3.02_A01.L5X | | |
| | | 871FM-M10BA30-xxxx, 871FM-M7BA20-xxxx, 871FM-MV10BA30-xxxx, 871FM-MV7BA20-xxxx | | | |
| 871FM | Armorbiock 1732E- 810LM12R | 871FM-M1NP5-AP3, 871FM-M1NP5-E2, 871FM-M2NP5-AP3, 871FM-M2NP5-E2, 871FM-M2NP8-E2, 871FM-M2NP8-P3 | raC_Dvc_871FM_810L_3.02_A01.L5X | raC_Dvc_871FM_810L_3.02_RUNG.L5X | |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 871FM-M10BA30-xxxx, 871FM-M7BA20-xxxx, 871FM-MV10BA30-xxxx, 871FM-MV7BA20-xxxx | raC_Dvc_871FM_Type1_5032_3.02_A0I.L5X | raC_Dvc_871FM_Type1_5032_3.02_RUNG.L5X | |
| | | 871FM-M1NP5-AP3, 871FM-M1NP5-E2, 871FM-M2NP5-AP3, 871FM-M2NP5-E2, 871FM-M2NP8-E2, 871FM-M2NP8-P3 | raC_Dvc_871FM_Type2_5032_3.02_A01.L5X | raC_Dvc_871FM_Type2_5032_3.02_RUNG.L5X | |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 871FM | Display | (raC-3_02-ME) raC_Dvc_871FM-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_871FM-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 871FM | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) | |
|--------------------------|--|--|--|--|
| 871FM | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_871FM_410L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_871FM_4IOL_(3.2) | |
| | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_871FM_810L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_871FM_8IOL_(3.2) | |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_871FM_Type1_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_871FM_8IOL_(3.2) | |
| | | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_871FM_Type2_5032_(3.2) | | |

Device Definition (raC_Dvc_871FM_4I0L, raC_Dvc_871FM_8I0L)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



- 2. Specify the Application Specific Name e.g. *MetalDetect_101*
- 3. Select the Process Data Input as *Triggered*, *Margin*, *Proximity*, *Gain*, *Signal*.

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storage |
|---------|---------|---------------|------------------|------------------------------|----------------------|--|--------------|
| D | IO-Link | Allen-Bradley | 871FM-M10BA30-E2 | MetalDetect_100 | Exact M 🗸 | Triggered, Margin, Proximity, Gain, Signal 🛛 🗸 | Enable ADC |
| 1 | 10-Link | Allen-Bradley | 871FM-MV10BA30-F | MetalDetect_101 | Exact M 🗸 | Triggered, Margin, Proximity, Gain, Signal 🗸 🗸 | Enable ADC |
| 2 | IO-Link | | | | | | |
| 3 | IO-Link | | | | | | |
| 4 | IO-Link | | | | | | |
| 5 | IO-Link | | | | | | |
| 6 | IO-Link | | | | | | |
| 7 | 10-Link | | | | | | |
| < . | | | | | | | |

Device Definition (raC_Dvc_871FM_Type1_503 2, raC_Dvc_871FM_Type2_503 2)

The device must be configured with the correct device definition. Proper

device configuration enables the required cyclic device data to pass

information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)
| gy Storage Offline I. No Forces by No Edits | Redundancy | Favorites Ac | id-On PlantPAx Saf | ety Alarms Bit | Module [| Definition | | | | |
|---|---|------------------|-------------------------|-----------------|------------|------------|------------|--------------------------------------|------------|----------|
| er Organizer 🗸 🗘 🗧 | Module Properties: EN2 | 2TR (5032-8IOLM1 | 2M12LDR 2.011) × | | Series: | | A | Y | | |
| | General | General | | | Revision: | | 2 | ∨ 011 ♠ | | |
| ontroller Master_IOLINK_5032 | - Connection - Module Info | Type | 5032-8101 M12M12LDP | IO-Link Channel | Electronic | Keying: | Compatible | Module | × | |
| Controller Fault Handler | Channels | Vondori | Redevel Automatica (All | on-Bradley | Connectio | n: | Data | | | |
| Power-Up Handler | - 00 - IO-Link - 01 - Digital Output | Parenti | ENOTE AUTOMOTION A | en-bradley | Johnsono | | | | | |
| isks | 02 - 10-Link | Parent: | ENZIK | | | | | | | |
| MainTask | - 03 - Digital Input | Name: | Mod_Master5032 | | | | _ | 1 | | annel |
| p mainProgram | 06 - IO-Link | Description: | | ۵. | | | IOJ ink | | Mo | de Types |
| lotion Groups | | | | | Port | Channel | Class B | Channel Mode | - | • |
| larm Manager | - 12 - IO-Link | | | v | | | Enabled | | ā | E B |
| sets | 14 - IO-Link | Module Definit | ion | | | | | | _ | Ó |
| Add-On Instructions | - Port Configuration | | | Change | 0 | 0 | | IO-Link | ~ / | 1 1 |
| Data Types | - Network | Series: | A | | - | 2 | | Digital Output, Short Circuit, No Lo | | 1 1 |
| Trends | Time Sync | Posicion: | 2.011 | | 1 | 3 | | Digital Input | × • | 1 |
| gical Model | - Servers | Nevision. | 2.011 | | | 4 | 0 | IO-Link | ~ 1 | 11 |
| O Configuration | | Electronic Key | ing: Compatibl | e Module | 2 | 5 | | Disabled | \sim | 1 |
| 1756 Backplane, 1756-A10 | | Connection: | Data | | 3 | 6 | | IO-Link | ~ / | 1 1 |
| 1 [1] 1756-EN2TR EN2TR | | | | | | 1 | | Uisabled | × | 1 |
| 4 ដឹង Ethernet | | | | | 4 | 9 | | Disabled | V V | 4 4 |
| 1756-EN2TR EN2TR | | | | | | 10 | | IO-Link | VJ | 11 |
| 5032-8IOLM12M12LDR/A Mod_Master5032 | | | | | 5 | 11 | | Disabled | ~ 1 | 1 |
| @ [9] 1756-L85E Master_IOLink_5032 | | | | | 6 | 12 | | IO-Link | ~ 1 | 11 |
| Ethernet | | | | | 0 | 13 | | Disabled | × | 1 |
| E 1756-185E Master IOLink 5032 | | | | | - | 14 | | IO-Link | ~ J | 1 1 |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

2. Whichever channels are selected for 871FM, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 871FM Sensor.



3. Configure the parameters of sensor from configuration tab from AOP of the 871FM sensor.

| Controller Organizer 💌 🕈 🗙 | l | 🔋 MainProgram - MainRou | utine | Module Properties: Mod_M | laster_ | 5032_3:10 (871FM-M10BA30-x | xxx (20 | 00) 1.1) | × |
|---|---|-------------------------|-------|---|---------|----------------------------|---------|----------|-------------|
| ð 🦷 | | General | Col | ofiguration | | | | | |
| Controller Master 5032 Test Cases | | Connection | | ingulation | | | | | |
| Tasks | | Device Info | _ | 1 | | | | | |
| Motion Groups | | Configuration | | Name | R/W | Value | Units | Style | Description |
| Alarm Manager | | Parameters | | Identification | | | | | |
| Ascets | | EventLog | | User Specific Information | | | | | |
| h Logical Model | | | - | Application-specific Tag | rw | *** | | | |
| | | | - | User Tag 1 | rw | <u> </u> | | | |
| | | | - | Oser Tag 2 | IW | | | | |
| ▲ I/56 Backplane, 1/56-A/ | | | - | Operation Configuration | | | | | |
| P [0] 1/56-L85E Master_5032_lest_Cases | | | | Triggered | | | | | |
| ▲ 🛣 Ethernet | | | | Polarity | rw | Not Inverted ~ | | | |
| ITTS6-L85E Master_5032_Test_Cases | | | | Pin 2 Mode | rw | Disabled 🗸 | | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_1 | | | | Phy Mode | rw | Auto Detect 🗸 | | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_2 | | | | Counter / Timer | | | | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_3 | | | | Counter | | | | | |
| 🖌 🚫 IO-Link | | | | Mode | rw | Disabled 🗸 | | | |
| 0 836P-D1xxxA36PP-D4 (182) Mod 836P Type2 | | | | Timer | | | | | |
| 2 837T-D3xxxxxPA-D4 (207) Mod 837T Type1 | | | | Mode | rw | Disabled 🗸 | | | |
| 4 837T-D3yyyyyPP-D4 (206) Mod 837T Type? | | | | Observation | | | | | |
| 4 656T P241C (207) Mod 956T | | | - | Device Monitoring | | 1. Deschution | | | |
| 0 0501-5240C (297) MOU_0501 | | | - | Excess Gain Resolution | rw | TX Resolution | | | |
| ** 8 8/1C-DTNP4-AP3 (80) MOD_8/TC | | | | Senice Function | | | | | |
| IU 8/TEM-MTUBA30-XXXX (200) Mod_8/TEM_Type1 | | | | | | | | | |
| 2 12 871FM-M1NP5-AP3 (129) Mod_871FM_Type2 | | | Ir | sert Factory Defaults | | | | | |
| # 14 871TM-M10NP18-A2 (101) Mod_871TM | | | - | | | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_871FM_4I0L, raC_Dvc_871FM_8I0L)

| 1-0-1 | | D. A. T |
|-----------------|---|---|
| Inout | Function / Description | рата гуре |
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_871FM_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_871FM_Inp_4IOL Or raC_UDT_ItfAD_871FM_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |

Input Data

| Input | Function/Description | DataType |
|------------------------|--|----------|
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChXMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity Alarm of Senor | BOOL |
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxSiganalStrength | Signal Strength of Sensor | DINT |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_OutputPolarity | Set Output Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_ResetCount | Counter Reset Command | BOOL |
| Cmd_ResetDurations | Duration Reset Command | BOOL |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Active | Device active status: 1= output power structure is active | BOOL |
| Sts_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Val_Contrast | Sensor Contrast Level | INT |
| Val_NotTriggeredDuration | Sensor Output OFF Duration | DINT |
| Val_OperatingHrsSinceInception | Operating Hours Since Inception | DINT |
| Val_OperatingHrsSincePowerUp | Operating Hours Since Power Up | DINT |
| Val_OutputPolarity | Output Polarity Status, 0 = Not Inverted, 1 = Inverted | SINT |
| Val_PercentSP | Setpoint in Percent | DINT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Setpoint | Setpoint Value To Turn ON Sensor Output | INT |
| Val_TemperatureCurrent | Internal Temperature Of Sensor | INT |
| Val_TemperatureMaxSinceInception | Maximum Temperature Since Inception | INT |
| Val_TemperatureMaxSincePowerUp | Maximum Temperature Since Power Up | INT |
| Val_TemperatureMinSinceInception | Minimum Temperature Since Inception | SINT |
| Val_TemperatureMinSincePowerUp | Minimum Temperature Since Power Up | INT |
| Val_Trigger_Counter | Sensor Counter Value | DINT |
| Val_TriggeredDuration | Sensor Output ON Duration | DINT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data (raC_Dvc_871FM_Type1_503 2, raC_Dvc_871FM_Type2_503 2)

| InOut Data |
|------------|
|------------|

| InOut | Function / Description | DataType |
|-----------------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_871FM_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_871FM_Type1_Inp_5032 Or raC_UDT_IOLink_871FM_Type2_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_871FM_Type1_Cfg Or raC_UDT_IOLink_871FM_Type2_Cfg |

Input Data

| Input | Function/Description | DataType |
|------------------------|--|----------|
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChXMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity Alarm of Senor | BOOL |
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxSiganalStrength | Signal Strength of Sensor | DINT |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_OutputPolarity | Set Output Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_ResetCount | Counter Reset Command | BOOL |
| Cmd_ResetDurations | Duration Reset Command | BOOL |

| Input | Function/Description | DataType |
|------------------------|--|----------|
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_Contrast | Sensor Contrast Level | INT |
| Val_NotTriggeredDuration | Sensor Output OFF Duration | DINT |
| Val_TriggeredDuration | Sensor Output ON Duration | DINT |
| Val_OperatingHrsSinceInception | Operating Hours Since Inception | DINT |
| Val_OperatingHrsSincePowerUp | Operating Hours Since Power Up | DINT |
| Val_OutputPolarity | Output Polarity Status, 0 = Not Inverted, 1 = Inverted | SINT |
| Val_PercentSP | Setpoint in Percent | DINT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Setpoint | Setpoint Value To Turn ON Sensor Output | INT |
| Val_TemperatureCurrent | Internal Temperature Of Sensor | INT |
| Val_TemperatureMaxSinceInception | Maximum Temperature Since Inception | INT |
| Val_TemperatureMaxSincePowerUp | Maximum Temperature Since Power Up | INT |
| Val_TemperatureMinSinceInception | Minimum Temperature Since Inception | SINT |
| Val_TemperatureMinSincePowerUp | Minimum Temperature Since Power Up | INT |

| Output | Function/Descritpion | DataType |
|---------------------------|--|----------|
| Val_Trigger_Counter | Sensor Counter Value | DINT |
| Val_TriggeredDuration | Sensor Output ON Duration | DINT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 871FM device object connected to channel #0 of a POINT I/O 1734-4IOL IO-Link Master module in slot #7 of a POINT I/O adapter named *Rack*01.

| COP raC_Dvc_8/1FM_4/OL | |
|---|------------------|
| Source Rack01:7:LFault raC_Dvc_871FM_4IOL Sensor871FM_101 | |
| Dest Sensor871FM_101_Inp_I.Fault Ref_Module PointIO_4IOL_Master | -(Sts_Connected) |
| Length 7 Write_Index Sensor871FM_101_Write_Index | |
| Read_index Sensor871FM_101_Read_index | -(Sts_Available) |
| Write_Subindex Sensor871FM_101_Write_Subindex [] | (0) |
| Read_Subindex Sensors/TFM_101_Read_Subindex | -(Sts_vvarning)— |
| Msg_sensor_Data_Sensor_Data_Sensor_Data_ | (Ohr Friday) |
| Ref_ctr_Set Sensors/TFM_101_ctrSet | -(SIS_Faulted) |
| Rejudicina Sensora TEM Inf. Children | Ste Deady |
| | (Sta_reduy) |
| | |
| Inp. ChyTrignered Back01/71 Ch0Trignered | |
| 0+ | |
| Inp ChxMarginLowAlarm Rack01;7:I.Ch0MarginLowAlarm | |
| 0+ | |
| Inp_ChxProximityAlarm Rack01:7:I.Ch0ProximityAlarm | |
| 0 🔶 | |
| Inp_ChxGain Rack01:7:I.Ch0Gain | |
| 0 | |
| Inp_ChxSignalStrength Rack01:7:I.Ch0SignalStrength | |
| 0+ | |
| Inp_ChNumber 0 | |
| | |
| Ref_Ctrl_Inf PointIQ_4IOL_Master_Ctrlinf | |
| Ret_Ctr_ltt PointiO_4IOL_Master_Ctriltt | |
| | |
| .] | |

The following example uses the 871FM device object connected to channel #1 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.

| Sensor871FM_102 Input Interface Sessor 102 COP Source Armor_800L_MasterB1.Fault Dest Sensor871FM_102_Inp_IFault Length Sensor871FM_102_MasterB 32 Sensor871FM_102_MasterB Write_Index Sensor871FM_102_Write_Index Ref_Modex Sensor871FM_102_Read_Index Sensor871FM_102_Write_Subindex Sts_Available)- Write_Index Sensor871FM_102_Mrite_Subindex Sensor871FM_102_Write_Subindex Sts_Available)- Write_Index Sensor871FM_102_Urite_Subindex Sts_Faulted) Sts_Kavailable)- Write_Index Sensor871FM_102_Urite_Subindex Sts_Faulted) Sts_Kavailable)- Write_Index Sensor871FM_102_Urite_Subindex Sts_Faulted) Sts_Kavailable)- Write_Subindex Sensor871FM_102_Urite_Subindex Sts_Faulted) Sts_Kavailable)- Write_Subindex Sensor871FM_102_Urite_Subindex Sts_Faulted) Sts_Kavailable)- Write_Subindex Sensor871FM_102_Urite_Subindex Sts_Kavailable)- Sts_Kavailable)- Msg_Sensor_Data Sensor871FM_102_Urite_Subindex Sts_Kavailable)- Sts_Kavailable)- Inf_Lokup rac_Dro_871FM_102_Urite_Inf Sts_Kavailable)- Sts_Kavailable)- Sts_Kavailable)- Inp_ChxRadinLowAlarm Armor_810L_Maste | _ | | | | |
|---|---|-----------------------------------|-----------------------|--|-------------------|
| Input Interface Sesnor 102 COP Source Armor_8IOL_MasterB1.Fault Dest Sensor871FM_102_Inp_1Fault raC_Dvc_871FM_8IOL Length 32 Red_Index Sensor871FM_102_Write_Index Write_Subindex Sensor871FM_102_Write_Subindex Read_Index Sensor871FM_102_Read_Index Write_Subindex Sensor871FM_102_Read_Index Write_Subindex Sensor871FM_102_Read_Index Write_Subindex Sensor871FM_102_Read_Index Msg_Sensor_Data Sensor871FM_102_Read_Subindex Msg_Sensor_Data Sensor871FM_102_CtriCket Ref_Ctrl_Set Sensor871FM_102_CtriCket Ref_Ctrl_Set Sensor871FM_102_CtriCket Inp_1 Sensor871FM_102_CtriCket Inp_1 Sensor871FM_102_CtriCket Inp_1 Sensor871FM_102_CtriCket Inp_ChxTriggered Armor_8I0L_MasterB1Ch1MarginLowAlarm 0 Inp_ChxRepain Inp_ChxRepain Armor_8I0L_MasterB1Ch1SignalStrength 0 Inp_ChxSignalStrength Armor_8I0L_MasterB1Ch1SignalStrength 0 Inp_ChxSignalStrength Armor_8I0L_MasterB_Ctriff 1 Ref_Ctrl_If Ar | 1 | Sensor871FM_102 | | | |
| COP raC_Dvc_871FM_80L Source Armor_80L_MasterB1Faut Length raC_Dvc_871FM_80L Sensor871FM_102 | | Input Interface | | Sesnor 102 | |
| Source Armor_BIOL_MasterB:IFault raC_Dvc_871FM_BIOL Sensor871FM_102_Imp_IFault Dest Sensor871FM_102_inp_IFault Ref_Module Armor_BIOL_MasterB Write_index Sensor871FM_102_Write_index (Sts_Available) Write_Subindex Sensor871FM_102_Write_index (Sts_Available) Write_Subindex Sensor871FM_102_Read_index (Sts_Available) Write_Subindex Sensor871FM_102_Write_Subindex (Sts_Available) Write_Subindex Sensor871FM_102_CtriXet (Sts_Warning) Msg_Sensor_Data Sensor871FM_102_CtriSt (Sts_Faulted) Ref_Ctrl_Sts Sensor871FM_102_CtriSts (Sts_Faulted) Inf_Lookup raC_Dvc_871FM_infTable (Sts_Ready) Inf_Lookup raC_Dvc_871FM_infTable (Sts_Ready) Inp_ChxTriggered Armor_8IOL_MasterB:ICh1MarginLowAlarm (Sts_Ready) Inp_ChxGain Armor_8IOL_MasterB:ICh1SignalStrength (Inp_ChxGainStrength (Inp_ChxGainStrength Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB:ICh1SignalStrength (Inp_ChNumber Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB:ICh1SignalStrength (Inp_ChNumber Inp_ChNumber 1 | | COP | raC_Dvc_871FM_8IOL | | |
| Dest Sensor871FM_102_inp_LFault Ref_Module Armor_8l0L_MasterB -(Sts_Connected) Read_index Sensor871FM_102_Write_Subindex -(Sts_Available) Write_Subindex Sensor871FM_102_Write_Subindex -(Sts_Available) Write_Subindex Sensor871FM_102_Write_Subindex -(Sts_Warning) Read_Subindex Sensor871FM_102_Write_Subindex -(Sts_Warning) Mag_Sensor_Data Sensor871FM_102_Urite_Subindex -(Sts_Faulted) Ref_Ctrl_Sta Sensor871FM_102_Urite_Subindex -(Sts_Faulted) Ref_Ctrl_Sta Sensor871FM_102_Urite_Subindex -(Sts_Faulted) Inf_Lookup raC_Dvc_871FM_102_Urite_MasterB: -(Sts_Faulted) Inf_Lookup raC_Dvc_871FM_102_Urite_MasterB: -(Sts_Faulted) Inp_Chx/RaignLowAlarm Armor_8I0L_MasterB:I.Ch1MarginLowAlarm -(Sts_Ready) Inp_Chx/RaignLowAlarm Armor_8I0L_MasterB:I.Ch1ProximityAlarm -(Sts_Ready) Inp_Chx/RaignLowAlarm Armor_8I0L_MasterB:I.Ch1ProximityAlarm -(Sts_Ready) Inp_Chx/RaignLowAlarm Armor_8I0L_MasterB:I.Ch1SignalStrength -(Sts_Ready) Inp_Chx/RaignLowAlarm Armor_8I0L_MasterB:I.Ch1SignalStrength -(Sts_Ready) < | | Source Armor_8IOL_MasterB:I.Fault | raC_Dvc_871FM_8IOL | Sensor871FM_102 | |
| Length 32 Write_Index Sensor871FM_102_Write_Index | | Dest Sensor871FM_102_Inp_I.Fault | Ref_Module | Armor_8IOL_MasterB | -(Sts_Connected)- |
| Read_Index Sensor871FM_102_Read_Index | | Length 32 | Write_Index | Sensor871FM_102_Write_Index | |
| Write_Subindex Sensor871FM_102_Write_Subindex | | | Read_Index | Sensor871FM_102_Read_Index | -(Sts_Available) |
| Read_Sublacx Sensor871FM_102_Read_Sublackar | | | Write_SubIndex | Sensor871FM_102_Write_Subindex | |
| Msg_Sensor_Data Sensor871FM_102_Msg_Sensor_Data Ref_Ctrl_Set Sensor871FM_102_CtrlSet Ref_Ctrl_Sts Sensor871FM_102_CtrlSts Inf_Lookup raC_Dvc_871FM_102_CtrlSts Inf_Lookup raC_Dvc_871FM_102_trlSts Inp_ChxTriggered Armor_8IOL_MasterB:LCh1Triggered Inp_ChxTriggered Armor_8IOL_MasterB:LCh1MarginLowAlarm 0 Inp_ChxSignalStrength Inp_ChXURger Armor_8IOL_MasterB:LCh1Gain 0 Inp_ChxSignalStrength Armor_8IOL_MasterB:LCh1SignalStrength 0 Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB:LCh1SignalStrength | | | Read_SubIndex | Sensor871FM_102_Read_SubIndex | -(Sts_Warning) |
| Ref_Ctrl_St Sensor871FM_102_CtrlSt -(Sts_Faulted) Ref_Ctrl_Cmd Sensor871FM_102_CtrlSts -(Sts_Faulted) Ref_Ctrl_Sts Sensor871FM_102_CtrlSts -(Sts_Ready) Inf_Lookup raC_Dvc_871FM_102_lnp_1 -(Sts_Ready) Inp_I Sensor871FM_102_lnp_1 -(Sts_Ready) Inp_ChxTriggered Armor_8IOL_MasterB1.Ch1MarginLowAlarm -(Sts_Ready) Inp_ChxMarginLowAlarm Armor_8IOL_MasterB1.Ch1ProximityAlarm -(Sts_Ready) Inp_ChxCrsGain Armor_8IOL_MasterB1.Ch1ProximityAlarm -(Sts_Ready) Inp_ChxGain Armor_8IOL_MasterB1.Ch1SignalStrength -(Sts_Ready) Inp_ChxSignalStrength Armor_8IOL_MasterB1.Ch1SignalStrength -(Sts_Ready) Inp_ChNumber 1 -(Sts_Ready) -(Sts_Ready) Ref_Ctrl_Inf Armor_8IOL_MasterB1.Ch1ProximityAlarm -(Sts_Ready) Inp_ChNumber 1 -(Sts_Ready) -(Sts_Ready) Ref_Ctrl_Inf Armor_8IOL_MasterB1.Ch1SignalStrength -(Sts_Ready) Inp_ChNumber 1 -(Sts_Ready) -(Sts_Ready) | | | Msg_Sensor_Data | Sensor871FM_102_Msg_Sensor_Data | |
| Ref_Ctrl_Cnd Sensor871FM_102_CtrlCnd Ref_Ctrl_Sts Sensor871FM_102_LnTable Inf_Lookup rac_Dvc_871FM_102_lnp_1 Inp_J Sensor871FM_102_lnp_1 Inp_ChxTriggered Armor_8IOL_MasterB:LCh11Triggered 0 0 Inp_ChxMarginLowAlarm Armor_8IOL_MasterB:LCh1MarginLowAlarm 0 0 Inp_ChxReain Armor_8IOL_MasterB:LCh1ProximityAlarm 0 0 Inp_ChxReain Armor_8IOL_MasterB:LCh1Gain 0 0 Inp_ChxSignalStrength Armor_8IOL_MasterB:LCh1SignalStrength 0 0 Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB:LCh1Inf Ref_Ctrl_Inf Armor_8IOL_MasterB:LCh1Inf Ref_Ctrl_Inf Armor_8IOL_MasterB:LCh1Inf Ref_Ctrl_Inf Armor_8IOL_MasterB:LCh1Inf | | | Ref_Ctrl_Set | Sensor871FM_102_CtrlSet | -(Sts_Faulted) |
| Ref_CtrL_fs Sensor871FM_InTable Inf_Lookup raC_Dvc_871FM_InTable Inp_I Sensor871FM_InTable Inp_ChxTriggered Armor_8IOL_MasterB:I.Ch1Triggered 0 0 Inp_ChxMarginLowAlarm Armor_8IOL_MasterB:I.Ch1MarginLowAlarm 0 0 1np_ChxProximityAlarm Armor_8IOL_MasterB:I.Ch1ProximityAlarm 0 0 1np_ChxGain Armor_8IOL_MasterB:I.Ch1SignalStrength 0 0 1np_ChXUmber 1 1np_ChNumber 1 Ref_CtrL_Inf Armor_8IOL_MasterB:I.Ch1SignalStrength Ref_CtrL_Inf Armor_8IOL_MasterB:I.Ch1SignalStrength Ref_CtrL_Inf Armor_8IOL_MasterB:I.Ch1SignalStrength Ref_CtrL_Inf Armor_8IOL_MasterB:I.Ch1SignalStrength | | | Ref_Ctrl_Cmd | Sensor871FM_102_CtrlCmd | |
| Inf_Lookup raC_Dvc_871FM_infTable Inp_1 Sensor871FM_102_Inp_1 Inp_ChxTriggered Armor_8IOL_MasterB:1.Ch1Triggered 0 Inp_ChxMarginLowAlarm Armor_8IOL_MasterB:1.Ch1MarginLowAlarm 0 Inp_ChxGain Armor_8IOL_MasterB:1.Ch1ProximityAlarm 0 Inp_ChxGain Armor_8IOL_MasterB:1.Ch1Gain 0 Inp_ChxSignalStrength Armor_8IOL_MasterB:1.Ch1SignalStrength 0 Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB_Ctrlinf Ref_Ctrl_Itf Armor_8IOL_MasterB_Ctrlinf | | | Ref_Ctrl_Sts | Sensor871FM_102_CtrlSts | -(Sts_Ready) |
| Inp_J Sensor871FM_102_Inp_I Inp_ChxTriggered Armor_8IOL_MasterB:I.Ch1Triggered Inp_ChxMarginLowAlarm Armor_8IOL_MasterB:I.Ch1MarginLowAlarm Inp_ChxProximityAlarm Armor_8IOL_MasterB:I.Ch1ProximityAlarm Inp_ChxGain Armor_8IOL_MasterB:I.Ch1SignalStrength Inp_ChxSignalStrength Armor_8IOL_MasterB:I.Ch1SignalStrength Inp_ChNumber 1 Ref_Ctri_Inf Armor_8IOL_MasterB_Ctrlinf Ref_Ctri_Inf Armor_8IOL_MasterB_Ctrlinf Ref_Ctri_Itf Armor_8IOL_MasterB_Ctrlinf | | | Inf_Lookup | raC_Dvc_871FM_InfTable | |
| Inp_ChxTriggered Armor_8IOL_MasterB:LCh1Triggered 0 0 Inp_ChxMarginLowAlarm Armor_8IOL_MasterB:LCh1MarginLowAlarm 0 0 Inp_ChxProximityAlarm Armor_8IOL_MasterB:LCh1ProximityAlarm 0 0 Inp_ChxGain Armor_8IOL_MasterB:LCh1Gain 0 0 Inp_ChxSignalStrength Armor_8IOL_MasterB:LCh1SignalStrength 0 0 Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB.Ctrlinf Ref_Ctrl_Iff Armor_8IOL_MasterB.Ctrlinf | | | Inp_I | Sensor871FM_102_Inp_I | |
| 0 Inp_ChxMarginLowAlarm Armor_8IOL_MasterB:1.Ch1MarginLowAlarm 0 Inp_ChxProximityAlarm Armor_8IOL_MasterB:1.Ch1ProximityAlarm 0 Inp_ChxGain Armor_8IOL_MasterB:1.Ch1SignalStrength 0 Inp_ChxSignalStrength 1np_ChxUmber 1 Ref_Ctri_Inf Armor_8IOL_MasterB_CtriInf Ref_Ctri_Itf Armor_8IOL_MasterB_CtriInf | | | Inp_ChxTriggered | Armor_8IOL_MasterB:I.Ch1Triggered | |
| Inp_ChxMarginLowAlarm Armor_8IOL_MasterB:1.Ch1MarginLowAlarm 0 0 Inp_ChxProximityAlarm Armor_8IOL_MasterB:1.Ch1ProximityAlarm 0 0 Inp_ChxGain Armor_8IOL_MasterB:1.Ch1Gain 0 0 Inp_ChxSignalStrength 0 1np_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf Ref_Ctrl_Itf Armor_8IOL_MasterB_CtrlInf | | | | 0 💠 | |
| Inp_ChxProximityAlarm Armor_8IOL_MasterB:1.Ch1ProximityAlarm Inp_ChxGain Armor_8IOL_MasterB:1.Ch1ProximityAlarm Inp_ChxSignalStrength Armor_8IOL_MasterB:1.Ch1SignalStrength Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf Ref_Ctrl_Itf Armor_8IOL_MasterB_CtrlInf | | | Inp_ChxMarginLowAlarm | Armor_8IOL_MasterB:I.Ch1MarginLowAlarm | |
| Inp_ChxProximityAlarm Armor_8IOL_MasterB:1.Ch1ProximityAlarm Inp_ChxGain Armor_8IOL_MasterB:1.Ch1Gain Inp_ChxSignalStrength 0 ← Inp_ChxSignalStrength 0 ← Inp_ChNumber 1 Ref_Ctr1_Inf Armor_8IOL_MasterB_Ctr1Inf Ref_Ctr1_Itf Armor_8IOL_MasterB_Ctr1Inf | | | | 0 💠 | |
| Inp_ChxGain Armor_8IOL_MasterB:ICh1Gain Inp_ChxSignalStrength 0 + Inp_ChxUmber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf Ref_Ctrl_Itf Armor_8IOL_MasterB_CtrlInf | | | Inp_ChxProximityAlarm | Armor_8IOL_MasterB:I.Ch1ProximityAlarm | |
| Inp_ChxGain Armor_8I0L_MasterB:LCh1Gain O Inp_ChxSignalStrength Armor_8I0L_MasterB:LCh1SignalStrength O Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8I0L_MasterB_CtrlInf Ref_Ctrl_Itf Armor_8I0L_MasterB_CtrlItf | | | | 0 💠 | |
| Inp_ChxSignalStrength Armor_8IOL_MasterB:LCh1SignalStrength Inp_ChNumber 0 + Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf Ref_Ctrl_Itf Armor_8IOL_MasterB_CtrlItf | | | Inp_ChxGain | Armor_8IOL_MasterB:I.Ch1Gain | |
| Inp_ChxSignalStrength Armor_8IOL_MasterB:LCh1SignalStrength 0 ← Inp_ChNumber 1 Ref_Ctri_Inf Armor_8IOL_MasterB_CtriInf Ref_Ctri_Itf Armor_8IOL_MasterB_CtriItf | | | | 0 🖛 | |
| 0 ← Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf Ref_Ctrl_Itf Armor_8IOL_MasterB_CtrlItf | | | Inp_ChxSignalStrength | Armor_8IOL_MasterB:I.Ch1SignalStrength | |
| Inp_ChNumber 1 Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf Ref_Ctrl_Itf Armor_8IOL_MasterB_CtrlItf | | | | 0 🖛 | |
| Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf Ref_Ctrl_Itf Armor_8IOL_MasterB_CtrlItf | | | Inp_ChNumber | 1 | |
| Ref_Ctrl_Inf Armor_BIOL_MasterB_Ctrlinf Ref_Ctrl_Itf Armor_BIOL_MasterB_CtrlItf | | | | | |
| Ref_Ctrl_ttf Armor_8lOL_MasterB_Ctrlltf | | | Ref_Ctrl_Inf | Armor_8IOL_MasterB_CtrlInf | |
| | | | Ref_Ctrl_ltf | Armor_8IOL_MasterB_Ctrlltf | |
| | | | | | |

The following example uses the 871FM Type1 Sensor device object connected to channel #0 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_3.*



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

Graphic Symbol Name Graphic Symbol Description **Global Object Parameter Values** #102: AOI Backing Tag Instance (e.g. Faceplate navigation button with string tag label. {::[PAC]Program::IOLinkProgram._InstanceName}) This launch button graphic object allows the user #104:Custom button label. Leave blank to use GO_LaunchFP to navigate to the device object faceplate. s...s Tag.@Description The text on the button face is set to the parameter #120: Display's left position (e.g. 100) (optional) #104. #121: Display's top position (e.g. 100) (optional) Faceplate navigation button with string tag label. This launch button graphic object allows the #102: AOI Backing Tag Instance (e.g. user to navigate to the device object faceplate. {::[PAC]Program::IOLinkProgram._InstanceName Graphic button can be used in schematic style displays where a GO_LaunchGfx_IndSens #104:Custom button label. Leave blank to use system/network diagram is shown. Tag.@Description When available, basic module #120: Display's left position (e.g. 100) (optional) diagnostics and a live value is #121: Display's top position (e.g. 100) (optional) displayed. The text on the button face is set to Not Triggered the parameter #104.

FactoryTalk View ME/SE Graphic Symbols

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|----------------|--|---|
| AOG_871FM_ Launch | | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Second system Image: Second system Properties Animations Image: Second system A General Image: Second system Image: Second system AOI_Tag Image: Second system Image: Second system MainProgram.Sensor_871FM Image: Second system Image: Second system |
| | Not Triggered | | > Appearance |
| | | | Position and Size |
| | | | Security |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Sensor871FM_102 | Sesnor 102 |
|-------------------------|-----------------------------------|
| Sensor871FM_102_CtrlCmd | Sensor871FM_102 Command Interface |
| Sensor871FM_102_CtrlSet | Sensor871FM_102 Setting Interface |
| Sensor871FM_102_CtrlSts | Sensor871FM_102 Status Interface |
| Sensor871FM_102_Inp_I | Sensor871FM_102 Input Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Trigger Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 5 | Signal Strength (%) Sparkline Trend The spark line shows the signal strength value over last 30 seconds |
| 6 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| | Process Data |
| 7 | - Triggered Duration (ms): Displays the amount of time that the sensor output has been ON. To show the trigger duration on faceplate, required to make Timer Mode Enabled setting in AOP in Logix Designer. |
| | - Not Triggered Duration (ms): Displays the amount of time that the sensor output has been OFF. To show the trigger duration on faceplate, required to make Timer Mode Enabled setting in AOP in Logix Designer. |
| | - Trigger Counter: Displays the sensor counter value when enabled. The counter value increments every time the sensor is triggered this process data element can count up to 65535 and can be reset via reset count button from config tab. Refer to Appendix B for additional information about index. To show the trigger count on faceplate, required to make Counter Mode Enabled setting in AOP in Logix Designer. |
| | - Signal Strength (%): Signal Strength provides the raw measurement value of the amount of light reflected from the target. |
| | - Contrast: Displays the difference between the light signal levels that the sensor read the last time the output was OFF. |
| | - Gain: Displays the excess gain above the sensor threshold to ensure reliable detection of the target. |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name require pressing the 'Config Apply' button in the Config tab to update the sensor parameters. |

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description |
|------|---|
| 1 | Internal Temperature Bar Graph Green Indicators: Min/Max since inception (lifetime) Purple Indicators: Min/Max since power up Light Blue Triangle Indicator: Current value |
| 2 | Internal Temperature Current Value |
| 3 | Operating Hours Since Inception (lifetime) |
| 4 | Operating Hours Since Power Up |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action decisions. One trend is displayed for Setpoint and Signal Strength.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Setpoint & Signal strength.

| Trend and Spar | k Limits | × |
|-----------------|----------|---|
| Signal Strength | Scale | |
| Minimum | 0 | |
| Maximum | 100 | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Local Settings

• Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.



Parameter Settings

Output Polarity - Polarity changes the sensor output to operate as Not Inverted (Light On) and Inverted (Dark On). Click on output polarity drop-down selector object to switch between Light On & Dark On.

Trigger Settings

Reset Count - Allows users to reset the counter function, it will reset the sensor counts to zero.

Reset Duration - Allows users to reset the timer function, it will reset Duration Triggered & Duration Not Triggered time.

Local Settings

Disable/Enable LEDs - This parameter allows operators to turn OFF or turn ON the User Interface LEDs (green and orange LEDs). This parameter is ideal for applications where turning OFF the LEDs is desired to accommodate the application.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.



If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.



After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_871FM_4I0L, raC_Dvc_871FM_8I0L, raC_Dvc_871FM_Type1_5032, raC_Dvc_871FM_Type2_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_871FM_4IOL, raC_LD_Dvc_871FM_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| SensorType | | | | Select the sensor type as per version of the device. |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_871FM_Type1_5032, raC_LD_Dvc_871FM_Type2_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-------------------|---------------------|--------------------|--------------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 871FM), This name depends upon the TagName assigned to object. |
| SensorType | 871FM-M10BA30-xxxx | 871FM-M10BA30-xxxx | 871FM-M10BA30-xxxx | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|--------------------------|--------------------|----------|-----------------|----------|
| raC_Dvc_871FM_410L | raC_Dvc_871FM_4IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_871FM_810L | raC_Dvc_871FM_8IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_871FM_Type1_5032 | raC_Dvc_871FM_5032 | 3.2 | (RA-LIB) Device | IO-Link |

Configured HMI Content

| HMI Content Instance Name Description | |
|---------------------------------------|--|
|---------------------------------------|--|

| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_871FM | Faceplate ME | (raC-3_xx-ME) raC_Dvc_871FM-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_871FM | Faceplate SE | (raC-3_xx-SE) raC_Dvc_871FM-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_I0Link | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

871C - Mini Tubular Sensor (raC_Dvc_871C_4IOL, raC_Dvc_871C_8IOL, raC_Dvc_871C_5032)

Overview

The 871C Mini Tubular Sensor device object (raC_Dvc_871C_4IOL, raC_Dvc_871C_8IOL, raC_Dvc_871C_5032) includes HMI faceplates which displays device information including:

- Sensor data
- Diagnostic Data
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_871C_Objects_Faceplate.MP4"

Primary device object configuration functions include:

• **Timer Settings:** This function helps to manipulating the output of the sensor in relation to timing. It is useful for precision applications where the output of the sensor must be precisely triggered at a certain time.

Functional Description

The 871C Mini Tubular Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|---|--------------------------------|---------------------------------|
| | P0INT I/0 1734-4I0L | 871C-D1NP4-AP3, 871C-DM1NP3-AP3, 871C-DM1NP4-AP3, 871C-M1NP4-AP3, 871C-DM1NP3-AP3 871C-D1NP4-E2, 871C-D1NP5-E2, 871C-DM1NP3-E2, 871C-D1NP5-E2, 871C-M1NP4-E2, 871C-M1NP5-E2, 871C-MM1NP3-E2, 871C-MM1NP4-E2 871C-D1NP5-P3, 871C-DM1NP4-P3, 871C-M1NP5-P3, 871C-MM1NP4-P3 | raC_Dvc_871C_4I0L_3.02_A0I.L5X | raC_Dvc_871C_410L_3.02_RUNG.L5X |
| 871C | ArmorBlock 1732E-8I0LM12R | 871C-D1NP4-AP3, 871C-DM1NP3-AP3, 871C-DM1NP4-AP3, 871C-M1NP4-AP3, 871C-D1NP4-E2, 871C-D1NP5-E2, 871C-D1NP4-E2, 871C-D1NP5-E2, 871C-D1NP3-E2, 871C-M1NP5-E2, 871C-M1NP4-E2, 871C-M1NP5-E2, 871C-MM1NP3-E2, 871C-MM1NP4-E2 871C-D1NP5-P3, 871C-DM1NP4-P3, 871C-M1NP5-P3, 871C-MM1NP4-P3 | raC_Dvc_871C_810L_3.02_A01.L5X | raC_Dvc_871C_810L_3.02_RUNG.L5X |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | 871C-D1NP4-AP3, 871C-DM1NP3-AP3, 871C-DM1NP4-AP3, 871C-M1NP4-AP3, 871C-D1NP4-E2, 871C-D1NP5-E2, 871C-D1NP4-E2, 871C-D1NP5-E2, 871C-DM1NP3-E2, 871C-DM1NP4-E2, 871C-M1NP4-E2, 871C-M1NP5-E2, 871C-MM1NP3-E2, 871C-MM1NP4-E2 871C-D1NP5-P3, 871C-DM1NP4-P3, 871C-M1NP5-P3, 871C-MM1NP4-P3 | raC_Dvc_871C_5032_3.02_A01.L5X | raC_Dvc_871C_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View

ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 871C | Display | (raC-3_02-ME) raC_Dvc_871C-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_871C-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 871C | (raC-3_02-VD) raC_Dvc_IOLink.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|--|---|---|
| | Point I/o 1734-410L | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_871C_410L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_871C_4IOL_(3.2) |
| 871C | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_87IC_8IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_871C_8IOL_(3.2) |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_871C_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_871C_5032_(3.2) |

Device Definition (raC_Dvc_871C_410L, raC_Dvc_871C_810L)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



2. Apply the following Channel Configuration for 871C.

| 10-1 | | | | opeoine nume | Reying | | | Device |
|------|---------|---------------|-----------------|--------------|-----------|------------|---|--------|
| | -Link / | Allen-Bradley | 871C-MM1NP3-AP3 | | Exact M 🗸 | Enable ADC | ~ | |
| IO-I | -Link / | Allen-Bradley | 871C-D1NP4-E2 | | Exact M 🗸 | Enable ADC | ~ | |
| IO-I | -Link | | | | | | | |
| IO-I | -Link | | | | | | | |
| IO-I | -Link | | | | | | | |
| IO-I | -Link | | | | | | | |
| 10-1 | -Link | | | | | | | |
| 10-1 | -Link | | | | | | | |

Device Definition (raC_Dvc_871C_5032)

The device must be configured with the correct device definition. Proper

device configuration enables the required cyclic device data to pass

information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| OK Pain: AB_E1H-1\10.112.131.147\8acxplane\9* Energy Storage Offline No Forces No Edits | ト 茜 日 1 A. Redundancy - 回 | Favorites A | dd-On PlantPAx Safe | ety Alarms Bit | Module [| Definition | | | | |
|---|------------------------------|-----------------|-------------------------|--------------------|------------|------------|------------|--|------------|--|
| troller Organizer | 🛛 🗶 🖞 Module Properties: EN | 2TR (5032-8IOLM | 12M12LDR 2.011) × | | Corioc: | | 1 | | | |
| a= = | General | General | | | Revision | | 2 | 011 | | |
| Controller Master_IOLink_5032 | Connection | | | | Electronic | Keving | 2 | | | |
| Controller Tags | - Channels | Type: | 5032-8IOLM12M12LDR 8 | IO-Link Channel, 8 | cieccionic | . Keying. | Compatible | Module | × | |
| Controller radii Handler Power-I In Handler | - 00 - 10-Link | Vendor: | Rockwell Automation/All | en-Bradley | Connectio | n: | Data | | | |
| Tasks | | Parent: | EN2TR | | | | | | | |
| • • MainTask | - 03 - Digital Input | Name: | Mod_Master5032 | | - | | | | - 6 | |
| MainProgram | 04 - 10-Link | Description: | | | | | | | Channel | |
| Unscheduled | | | | | - | | IO-Link | Chanal Made | mode types | |
| Motion Groups | 10 - IO-Link | | | v | Port | Channel | Enabled | Channel Mode | - 0 | |
| Alarm Manager | 12 - IO-Link 14 - IO-Link | Madula Dafini | tion | | | | | | | |
| Assets | Internet Protocol | Module Dellili | 1011 | | | 0 | 1 | IO-Link | | |
| Add-On Instructions | -Port Configuration | | | Change | 0 | 1 | | Digital Output, Short Circuit, No Load | × 1 1 | |
| Trends | - Network | Series: | A | | 1 | 2 | | IO-Link | ~ 1 1 | |
| Logical Model | Servers | Revision: | 2.011 | | - | 3 | | Digital Input | ~ / / | |
| I/O Configuration | | Electronic Ke | ving: Compatible | e Module | 2 | 4 | | IO-Link Disabled | | |
| ■ 1756 Backplane. 1756-A10 | | Connection | Data | | | 6 | - | IO-Link | · / / | |
| ▲ 🖞 [1] 1756-EN2TR EN2TR | | Connection: | Data | | 3 | 7 | U | Disabled | ~ 1 | |
| ▲ 쓞 Ethernet | | | | | 4 | 8 | | IO-Link | ~ 1 1 | |
| 1756-EN2TR EN2TR | | | | | - | 9 | | Disabled | ~ 1 1 | |
| 5032-8IOLM12M12LDR/A Mod Master5032 | | | | | 5 | 10 | | IO-Link Disabled | × | |
| @ [9] 1756-L85E Master IOLink 5032 | | | | | - | 12 | 1000 | Disabled IOJ ink | | |
| A Ethernet | | | | | 6 | 12 | | Disabled | | |
| @ 1756-L85E Master IOLink 5032 | | | | | - | 14 | | IO-Link | ~ 1 1 | |
| | | | | | 1 | 15 | | Disabled | ~ / | |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 871C, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 871C Sensor.
 - - 🛯 📟 1756 Backplane, 1756-A7
 - [0] 1756-L85E Master_5032_Test_Cases
 - ₄ 🖧 Ethernet
 - P 1756-L85E Master_5032_Test_Cases
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_1
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_2
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_3
 - A 🛇 IO-Link
 - 0 836P-D1xxxA36PP-D4 (182) Mod_836P_Type2
 - 2 837T-D3xxxxxPA-D4 (207) Mod_837T_Type1
 - 4 837T-D3xxxxxxPP-D4 (206) Mod_837T_Type2
 - 6 856T-B24LC (297) Mod_856T
 - 78 871C-D1NP4-AP3 (80) Mod_871C
 - 10 871FM-M10BA30-xxxx (200) Mod_871FM_Type1
 - 12 871FM-M1NP5-AP3 (129) Mod_871FM_Type2
 - 4 871TM-M10NP18-A2 (101) Mod_871TM

3. Configure the parameters of sensor from configuration tab from AOP of the 871C sensor.

| iontroller Organizer 👻 👎 🗙 🛃 Module Properties: Mod_Master_5032_3:8 (871C-D1NP4-AP3 (80) 1.0) 🛛 🗙 | | | | | | | | | |
|---|--|-------------|-----|-----------------------------------|------|------------------------------|-------|-----------|-------------|
| ð 📲 | | General | Cor | nfiguration | | | | | |
| Controller Master_5032_Test_Cases | | Connection | _ | 5 | | | | | |
| 🕨 🚎 Tasks | | Device Info | | Nama | DAM | Value | Unite | Chula II | Description |
| Motion Groups | | Parameters | | Name | R/VV | Value | Units | Style | Description |
| 🕨 🚎 Alarm Manager | | EventLog | | Operation Configuration | | | | | |
| Assets | | | | ▲ Triggered | | | | | |
| 🗽 Logical Model | | | | Polarity (changes viewable in SIO | . rw | Not Inverted (Normally Ope 🖂 | | | |
| 🔺 🖼 I/O Configuration | | | | Counter / Timer | | | | | |
| 🖌 🚍 1756 Backplane, 1756-A7 | | | | ⊿ Timer | | | | | |
| [0] 1756-L85E Master_5032_Test_Cases | | | | Mode | nv | No Timer 🗸 | | | |
| ⊿ 器 Ethernet | | | - | Base lime | nv | 0.1 🗹 | ms | Desiminar | |
| In 1756-L85E Master_5032_Test_Cases | | | | Multiplier | IW | <u> </u> | | Decim | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_1 | | | | | | | | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_2 | | | | | | | | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_3 | | | | | | | | | |
| ⊿ 😒 IO-Link | | | | | | | | | |
| 0 836P-D1xxxA36PP-D4 (182) Mod_836P_Type2 | | | | | | | | | |
| 2 837T-D3xxxxxxPA-D4 (207) Mod 837T Type1 | | | | | | | | | |
| \$ 4 837T-D3xxxxxxPP-D4 (206) Mod 837T Type2 | | | | | | | | | |
| 6 856T-B24LC (297) Mod 856T | | | | | | | | | |
| ~ 8 871C-D1NP4-AP3 (80) Mod_871C | | | | | | | | | |
| 10 871FM-M10BA30-xxxx (200) Mod_871FM_Type1 | | | | | | | | | |
| 12 871FM-M1NP5-AP3 (129) Mod 871FM Type2 | | | | | | | | | |
| سور 14 871TM-M10NP18-A2 (101) Mod 871TM | | | In | sert Factory Defaults | | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_871C_410L, raC_Dvc_871C_8I0L)

| InOut | Function / Description | DataType |
|-----------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_871C_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_871C_Inp_4IOL Or raC_UDT_ItfAD_871C_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |

Input Data

| Input | Function/Description | DataType |
|------------------|---|----------|
| Inp_ChXTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_BaseTime | Set Time Base for setting delay; 0= 0.1 ms, 1 = 0.4 ms, 2 = 1.6 ms, 3 = 6.4 ms | DINT |
| Cfg_TimerMode | Set the Timer Mode; 0 = No Timer, 1 = Off Delay, 2 = On Delay, 3 = On Delay and Off Delay | DINT |
| Set_Multiplier | Set Multiplier for setting delay; 0 to 63 | INT |
| Cmd_ResetCount | Counter Reset Command | BOOL |

Output Data

| Output | Function/Descritpion | DataType |
|---------------|--|----------|
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Active | Device active status: 1= output power structure is active | BOOL |

| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Val_BaseTime | Value for Time Base for setting delay; 0=0.1ms, 1 = 0.4 ms, 2 = 1.6 ms, 3 = 6.4 ms | INT |
| Val_Counter | Sensor Counter Value | INT |
| Val_Multiplier | Value of Multiplier for setting delay; 0 to 255 | INT |
| Val_TimerMode | Value of the Timer Mode; 0 = No Timer, 1 = Off Delay, 2 = On Delay, 3 = On Delay and Off Delay | INT |
| Val_TemperatureCurrent | Actual internal Sensor Temperature | REAL |
| Val_TemperatureMaxSinceInception | Maximum internal sensor temperature over whole sensor lifetime | REAL |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_871C_5032)

| InOut | Function / Description | DataTyne |
|-----------------------|---|--|
| | | |
| Ref_Module | Reference to module in I/U tree | MUDULE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_871C_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_871C_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_871C_Cfg |

Input Data

| Input | Function/Description | DataType |
|----------------------------|---|----------|
| Inp_ChXTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_BaseTime | Set Time Base for setting delay; 0= 0.1 ms, 1 = 0.4 ms, 2 = 1.6 ms, 3 = 6.4 ms | DINT |
| Cfg_TimerMode | Set the Timer Mode; 0 = No Timer, 1 = Off Delay, 2 = On Delay, 3 = On Delay and Off Delay | DINT |
| Set_Multiplier | Set Multiplier for setting delay; 0 to 63 | INT |
| Cmd_ResetCount | Counter Reset Command | BOOL |
| Cmd_ApplyConfigurati on | Module reconfigure Command | BOOL |

Output Data

| Output | Function/Descritpion | DataType |
|---------------|--|----------|
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |

| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Sts_Ready | Device is Ready | BOOL |
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_BaseTime | Value for Time Base for setting delay; 0= 0.1 ms, 1 = 0.4 ms, 2 = 1.6 ms, 3 = 6.4 ms | INT |
| Val_Counter | Sensor Counter Value | INT |
| Val_Multiplier | Value of Multiplier for setting delay; 0 to 255 | INT |
| Val_TimerMode | Value of the Timer Mode; O = No Timer, 1 = Off Delay, 2 = On Delay, 3 = On Delay and Off Delay | INT |
| Val_TemperatureCurrent | Actual internal Sensor Temperature | REAL |
| Val_TemperatureMaxSinceInception | Maximum internal sensor temperature over whole sensor lifetime | REAL |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 871C device object connected to channel #3 of a POINT I/O 1734-4IOL IO-Link Master module in slot #5 of a POINT I/O adapter named *Racko*1.



The following example uses the 871C device object connected to channel #0 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.



The following example uses the 871C device object connected to channel #0 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_3.*



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|----------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_IndSens | ss | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Graphic Symbol Description **Property Configuration Graphic Symbol** Name 2 Properties Animations Events S....S ▲ General The supplied launch button in View Designer is used to ::PAC VD A0G_871C_Launch AOI_Tag ζź navigate to the faceplate in a user application. \MainProgram.Sensor_871C Not Triggered Appearance **Position and Size** Security

Studio 5000 View Designer Graphic Symbols

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Þ | Sensor871C_101 | Sensor 101 |
|---|------------------------|----------------------------------|
| Þ | Sensor871C_101_Inp_I | Sensor871C_101 Input Interface |
| Þ | Sensor871C_101_CtrlCmd | Sensor871C_101 Command Interface |
| Þ | Sensor871C_101_CtrlSet | Sensor871C_101 Setting Interface |
| Þ | Sensor871C_101_CtrlSts | Sensor871C_101 Status Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data.



| ltem | Description |
|------|--|
| 1 | Banner- Ready Status |
| 2 | Sensor Name |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Trigger Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 5 | Trigger Counter |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name |

require pressing the 'Config Apply' button in the Config tab to update the sensor parameters.

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.

| 871C Ser | nsor | | X |
|----------|--|--------------------------------------|---|
| | Ready | | |
| 8 | Maximum Temperature Since Inception | Actual Temperature Since Power Up | |
| P | 70.4 °C | 31.5 °C | |
| 1 | 1 | 1 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | 1 | 2 | |

| ltem | Description | |
|------|--|--|
| 1 | Provides maximum internal sensor temperature over the sensor lifetime. | |
| 2 | Live internal sensor temperature when read. | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section include

- Parameter Settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| 2 | | | |
|-------------|---|---|--|
| Read | ly | | |
| Parameter S | ettings | | |
| Mode | Off Delay | V | Reset Count |
| Base Time | 0.1 | ms | Config Apply |
| Multiplier | 0 | | |
| | | | |
| | | | |
| | 2 Parameter S Mode Base Time Multiplier | 2 Ready Parameter Settings Mode Off Delay Base Time 0.1 Multiplier 0 | 2 Ready Parameter Settings Mode Off Delay Base Time 0.1 Multiplier 0 |

Base Time- While sensing the Target if user wants to add Time delay, it is added with combination of base time and multiplier. Here unit of Base time is milliseconds. Click on Base Time drop-down selector object to select different Base times like 0.1, 0.4, 1.6 and 6.4

Multiplier- While counting the object if user wants to add Time delay, it is added with combination of base time and multiplier. This parameter allows you to enter the Multiplier values.

Mode- The switching timer is a useful function for manipulating the output of the sensor in relation to timing. It is useful for precision applications where the output of the sensor must be precisely triggered at a certain time. Click on Mode drop-down selector object to select different Timer modes like No Timer, Off Delay, On Delay and On Delay and Off Delay

Reset Count - Allows users to reset the counter function, it will reset the sensor counts to zero

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.
| C_12002 | 2 | | | × | | | |
|---------|-------------|----------|----------|----------------|--|--|--|
| | Ready | | | | | | |
| Ð | Parameter S | ettings | | | | | |
| P | Mode | No Timer | W | Reset Count | | | |
| 1 | Base Time | 0.1 | ms | Config Apply | | | |
| | Multiplier | 0 | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| 12002 | | | |
|------------|-----------|----|----------------|
| Rea | ady | | |
| Parameter | Settings | | |
| 3 Mode | Off Delay | V | Reset Count |
| Base Time | 0.1 | ms | Config Apply |
| Multiplier | 0 | | |
| | | | |
| | | | |
| | | | |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_871C_4IOL, raC_Dvc_871C_8IOL

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_871C_410L, raC_LD_Dvc_871C_810L, raC_LD_Dvc_871C_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_871C_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|---|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |

| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
|-------------------|------------------|------------------|-------------------|--|
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 871C), This name depends upon the TagName assigned to object. |
| SensorType | 871C-D1NP4-AP3 | 871C-D1NP4-AP3 | 871C-D1NP4-AP3 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|-------------------|-------------------|----------|-----------------|----------|
| raC_Dvc_871C_410L | raC_Dvc_871C_410L | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_871C_8IOL | raC_Dvc_871C_810L | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_871C_5032 | raC_Dvc_871C_810L | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_871C | Faceplate ME | (raC-3_xx-ME) raC_Dvc_871C-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_871C | Faceplate SE | (raC-3_xx-SE) raC_Dvc_871C-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_I0Link | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

871TM - Tubular Stainless Steel Sensor (raC_Dvc_871TM_4IOL, raC_Dvc_871TM_8IOL, raC_Dvc_871TM_5032)

Overview

The 871TM Tubular Stainless Steel Sensor device object (raC_Dvc_871TM_4IOL, raC_Dvc_871TM_8IOL, raC_Dvc_871TM_5032) includes HMI faceplates which displays device information including:

- Sensor data
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_871TM_Objects_Faceplate.MP4"

Primary device object configuration functions include:

• **Timer Settings:** This function helps to manipulating the output of the sensor in relation to timing. It is useful for precision applications where the output of the sensor must be precisely triggered at a certain time.

Functional Description

The 871TM Tubular Stainless Steel Sensor Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix[®] firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/ Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-----------------|---|---|----------------------------------|----------------------------------|
| | POINT I/O 1734-4IOL | 871TM-M10NP18-A2, 871TM-M10NP18-D4, 871TM-M20NP30-A2, 871TM-M20NP30-D4 871TM-M3NP8-D4, 871TM-M3NP8-D4 871TM-M3NP8-J2, 871TM-M3NP8-P3 871TM-M6NP12-A2, 871TM-M6NP12-A7, 871TM-M6NP12-D4, 871TM-N6NP8-J2 871TM-M10NP12-A2, 871TM-M10NP12-D4 871TM-M20NP18-A2, 871TM-M20NP18-D4 871TM-M40NP30-A2, 871TM-M40NP30-D4 871TM-N6NP8-D4, 871TM-N6NP8-P3 | raC_Dvc_871TM_410L_3.02_A01.L5X | raC_Dvc_871TM_4IOL_3.02_RUNG.L5X |
| 871TM | 871TM-M10NP18-A2, 871TM-M10NP18-D4, 871TM-M20NP30-A2, 871TM-M20NP30-D4 871TM-M3NP8-D4, 871TM-M3NP8-D4 871TM-M3NP8-J2, 871TM-M3NP8-P3 TM ArmorBlock 1732E-8I0LM12R 871TM-M6NP12-A2, 871TM-M6NP12-A7, 871TM-M6NP12-D4, 871TM-M6NP3-J2 871TM-M10NP12-D4, 871TM-M6NP12-D4, 871TM-M10NP12-A2, 871TM-M6NP12-D4, 871TM-M20NP18-D4, 871TM-M20NP18-A2, 871TM-M40NP30-D4 871TM-M40NP30-A2, 871TM-M40NP30-D4 871TM-M6NP8-D4, 871TM-N6NP8-P3 | raC_Dvc_871TM_810L_3.02_A01.L5X | raC_Dvc_871TM_810L_3.02_RUNG.L5X | |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | 871TM-M10NP18-A2, 871TM-M10NP18-D4, 871TM-M20NP30-A2, 871TM-M20NP30-D4 871TM-M3NP8-D4, 871TM-M3NP8-D4 871TM-M3NP8-J2, 871TM-M3NP8-P3 871TM-M6NP12-A2, 871TM-M6NP12-A7, 871TM-M6NP12-D4, 871TM-N6NP8-J2 871TM-M10NP12-D4, 871TM-M10NP12-D4 871TM-M20NP18-A2, 871TM-M20NP18-D4 871TM-M40NP30-A2, 871TM-M40NP30-D4 871TM-N6NP8-D4, 871TM-N6NP8-P3 | raC_Dvc_871TM_5032_3.02_A01.L5X | raC_Dvc_871TM_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and

FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 871TM | Display | (raC-3_02-ME) raC_Dvc_871TM-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_871TM-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 871TM | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|--|--|--|
| | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_87ITM_4IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_871TM_4IOL_(3.2) |
| 871TM | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_871TM_8IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_871TM_8IOL_(3.2) |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_87ITM_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_871TM_5032_(3.2) |

Device Definition (raC_Dvc_871TM_4I0L, raC_Dvc_871TM_8I0L)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



2. Apply the following Channel Configuration for 871TM.

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | | Process Data Input | Data Storage | | Chang Device |
|---------|---------|---------------|------------------|------------------------------|----------------------|--------|--------------------|--------------|---|-----------------|
| 0 | 10-Link | Allen-Bradley | 871TM-M3NP8-D4 | | Exact M | \sim | | Enable ADC | ~ | |
| 1 | 10-Link | Allen-Bradley | 871TM-N20NP18-A2 | | Exact M | \sim | | Enable ADC | ~ | |
| 2 | IO-Link | | | | | | | | | |
| 3 | 10-Link | | | | | | | | | |
| 4 | 10-Link | | | | | | | | | |
| 5 | 10-Link | | | | | | | | | |
| 6 | 10-Link | | | | | | | | | |
| 7 | 10-Link | | | | | | | | | |

Device Definition (raC_Dvc_871TM_5032)

The device must be configured with the correct device definition. Proper

device configuration enables the required cyclic device data to pass

information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| Energy Storage Mo Energy Storage Mo Edite | Redundancy II | Eavorites A | dd.On PlantPAy Safe | ty Alarms Rit | Module L | Definition | | | | |
|---|--------------------------------------|-----------------|--------------------------|--------------------|------------|------------|------------|--|------------|-----|
| ntroller Organizer | Module Properties: EN2 | 2TR (5032-8IOLM | 12M12LDR 2.011) × | iy rumo bit | Corioci | | | | | |
| 9 | General | General | | | Devisions | | A | 011 | | |
| Controller Master_IOLink_5032 | Connection | | | | Revision: | | 2 | | | |
| Controller Tags | Module Info | Type: | 5032-8IOLM12M12LDR 8 | IO-Link Channel, 8 | Electronic | : Keying: | Compatible | Module | \sim | |
| Controller Fault Handler | - 00 - IO-Link | Vendor: | Rockwell Automation/Alle | en-Bradley | Connectio | in: | Data | | ~ | |
| Power-Up Handler | 01 - Digital Output | Parent: | EN2TR | | | | | | | |
| a Tasks | - 02 - IO-Link 02 - Digital legut | Name | Mod Mactor5022 | | | | | | | |
| A it Main lask | - 04 - 10-Link | Name. | mou_moster 5052 | | | | | | Chan | nel |
| | 06 - IO-Link | Description: | | | | | IO Link | | Mode T | уре |
| Motion Groups | 08 - 10 - Link | | | | Port | Channel | Class B | Channel Mode | | 0 |
| Alarm Manager | - 12 - 10-Link | | | v | | | Enabled | | āß | ink |
| Assets | - 14 - 10-Link | Module Defini | tion | | 1 | | | | | C. |
| Add-On Instructions | Internet Protocol | | | Change | 0 | 0 | | IO-Link | ~ / / | |
| 🕨 🛑 Data Types | - Network | Series: | A | | | 1 | | Digital Output, Short Circuit, No Load | × 1 1 | - |
| Trends | - Time Sync | Devision: | | | 1 | 3 | | Digital Input | × | - |
| Logical Model | - Servers | Revision: | 2.011 | | - | 4 | 0 | IO-Link | ~ / / | 1 |
| I/O Configuration | | Electronic Ke | ying: Compatible | Module | 2 | 5 | | Disabled | ~ 1 | |
| 1756 Backplane, 1756-A10 | | Connection: | Data | | 3 | 6 | | IO-Link | ~ / / | 1 |
| ▲ 🖞 [1] 1756-EN2TR EN2TR | | | | | _ | 1 | | Disabled | × 1 | - |
| ⊿ ‰ Ethernet | | | | | 4 | 9 | | Disabled | | - |
| 1756-EN2TR EN2TR | | | | | - | 10 | | IO-Link | ~ / / | 1 |
| 5032-8IOLM12M12LDR/A Mod_Master5032 | | | | | 5 | 11 | | Disabled | ~ / / | Ľ |
| @ [9] 1756-L85E Master_IOLink_5032 | | | | | 6 | 12 | | IO-Link | ~ 1 1 | 1 |
| ▲ 盐 Ethernet | | | | | × | 13 | | Disabled | ~ / | |
| IP 1756-L85E Master_IOLink_5032 | | | | | 7 | 14 | | IO-Link | × | 1 |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 871TM, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 871TM Sensor.
 - 4 📼 1756 Backplane, 1756-A7 [] [0] 1756-L85E Master_5032_Test_Cases ▲ 器 Ethernet P 1756-L85E Master_5032_Test_Cases 5032-8IOLM12M12LDR/A Mod_Master_5032_1 5032-8IOLM12M12LDR/A Mod_Master_5032_2 5032-8IOLM12M12LDR/A Mod_Master_5032_3 A 🛇 IO-Link 🖥 0 836P-D1xxxA36PP-D4 (182) Mod_836P_Type2 2 837T-D3xxxxxPA-D4 (207) Mod_837T_Type1 4 837T-D3xxxxxxPP-D4 (206) Mod_837T_Type2 6 856T-B24LC (297) Mod_856T 78 871C-D1NP4-AP3 (80) Mod_871C 10 871FM-M10BA30-xxxx (200) Mod_871FM_Type1 2 12 871EM-M1NP5-AP3 (129) Mod_871EM_Type2 # 14 871TM-M10NP18-A2 (101) Mod_871TM 5032-8IOLM12M12LDR/A Mod_Master_5032_4
- 3. Configure the parameters of sensor from configuration tab from AOP of the 871TM sensor.

| Controller Organizer 🛛 🔻 🕇 🗙 | Ĭ | MainProgram - MainRouti | ine | Module Properties: Mod_Master_5032 | _3:14 | 871TM-M10NP18-A2 (101) 1. | D) × | | |
|---|---|-------------------------|-----|---------------------------------------|-------|------------------------------|-------|-------|-------------|
| | | General | Cor | figuration | | | | | |
| Controller Master_5032_Test_Cases | | Connection | | | | | | | |
| 🕨 🛑 Tasks | | - Device Info | | Nama | DAM | Value | Unite | Chula | Description |
| Motion Groups | | - Conliguration | - | Name | ROW | value | Onits | Style | Description |
| 🕨 🛑 Alarm Manager | | -Event Log | - | Parameter Operation Configuration | | | | | |
| Assets | | | | Triggered | | | | | |
| 🗽 Logical Model | | | | Polarity (changes viewable in SIO | TW | Not Inverted (Normally Ope V | | | |
| 🔺 🚅 I/O Configuration | | | | ⊿ Timer | | | 4 | | |
| 🖌 🚍 1756 Backplane, 1756-A7 | | | | Enable | rw | On 🗸 | | | |
| [0] 1756-L85E Master_5032_Test_Cases | | | | Mode | rw | No Timer 🗸 | ļ | | |
| 4 뷺 Ethernet | | | | Base Time | rw | 0.1 🗸 | ms | | |
| 1756-L85E Master 5032 Test Cases | | | | Multiplier | rw | ⊻0 | | Decim | |
| 5032-8/0LM12M12LDR/A Mod Master 5032 1 | | | | | | | | | |
| 5032-8IOLM12M12LDR/A Mod Master 5032 2 | | | | | | | | | |
| 5032-8IOLM12M12LDR/A Mod Master 5032 3 | | | | | | | | | |
| 4 🕲 10-1 ink | | | | | | | | | |
| 0.836P-D1xxxA36PP-D4 (182) Mod.836P Type2 | | | | | | | | | |
| 2 837T-D3vvvvvvPA-D4 (207) Mod 837T Type1 | | | | | | | | | |
| 4 837T_D3vvvvvvPD_D4 (206) Mod_837T_Tupe2 | | | | | | | | | |
| 6 856T_B24LC (207) Mod 856T | | | | | | | | | |
| 23.9.971C D1ND4 AD2 (90) Mod 971C | | | | | | | | | |
| ** 6 67 IC-D INP4-AP3 (60) MOU_67 IC | | | | | | | | | |
| 10 87 IFM-M IOBASU-XXXX (200) Mod_87 IFM_IVPET 0 40 874FM MANPE AD2 (400) M = 1.074FM T = 2. | | | | | | | | | |
| 12 8/1FM-M1NP5-AP3 (129) Mod_8/1FM_Type2 | | | In | sert Factory Defaults | | | | | |
| I 4 8/11M-M10NP18-A2 (101) Mod_8/11M | | | _ | | | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| Enablein False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_871TM_4I0L, raC_Dvc_871TM_8I0L)

| In0ut | Function / Description | DataType |
|-----------------|--|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_871TM_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inf_Lookup_HEX | List Entry for Timer and Multiplier Selection | raC_UDT_Hex_Code_LookupMember[2] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_871TM_Inp_4IOL Or raC_UDT_ItfAD_871TM_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |

Input Data

| Input | Function/Description | DataType |
|--------------------|---|----------|
| Inp_ChXTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_BaseTime | Set Time Base for setting delay; 0= 0.1 ms, 1 = 0.4 ms, 2 = 1.6 ms, 3 = 6.4 ms | INT |
| Cfg_Enable | Set for Enabling Timer Modes; 0 = 0N, 1 = 0FF | DINT |
| Cfg_TimerMode | Set the Timer Mode; 0 = No Timer, 1 = Off Delay, 2 = On Delay, 3 = On Delay and Off Delay | SINT |
| Set_Multiplier | Set Multiplier for setting delay; 0 to 63 | INT |
| Cmd_ResetDurations | Duration Reset Command | BOOL |

Output Data

| Output | Function/Descritpion | DataType |
|---------------|--|----------|
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |

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| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Sts_Ready | Device is Ready | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; O=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Val_BaseTime | Value for Time Base for setting delay; 0= 0.1 ms, 1 = 0.4 ms, 2 = 1.6 ms, 3 = 6.4 ms | INT |
| Val_Enable | Value for Enabling Timer Modes; 0 = 0N, 1 = 0FF | DINT |
| Val_Counter | Sensor Counter Value | INT |
| Val_TimerMode | Value of the Timer Mode; 0 = No Timer, 1 = Off Delay, 2 = On Delay, 3 = On Delay and Off Delay | INT |
| Val_TemperatureCurrent | Actual internal Sensor Temperature | REAL |
| Val_TemperatureMaxSinceInception | Maximum internal sensor temperature over whole sensor lifetime | REAL |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_871TM_5032)

| InOut | Function / Description | DataType |
|-----------------------|---|--|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_I0LinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_871TM_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_871TM_Cfg |

Input Data

| Input | Function/Description | DataType |
|----------------------------|---|----------|
| Inp_ChXTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_BaseTime | Set Time Base for setting delay; 0= 0.1 ms, 1 = 0.4 ms, 2 = 1.6 ms, 3 = 6.4 ms | INT |
| Cfg_Enable | Set for Enabling Timer Modes; 0 = 0N, 1 = 0FF | DINT |
| Cfg_TimerMode | Set the Timer Mode; 0 = No Timer, 1 = Off Delay, 2 = On Delay, 3 = On Delay and Off Delay | SINT |
| Set_Multiplier | Set Multiplier for setting delay; 0 to 63 | INT |
| Cmd_ApplyConfigurati on | Module reconfigure Command | BOOL |

Output Data

| Output | Function/Descritpion | DataType |
|---------------|---|----------|
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |

| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_BaseTime | Value for Time Base for setting delay; 0= 0.1 ms, 1 = 0.4 ms, 2 = 1.6 ms, 3 = 6.4 ms | INT |
| Val_Enable | Value for Enabling Timer Modes; 0 = 0N, 1 = 0FF | SINT |
| Val_TimerMode | Value of the Timer Mode; O = No Timer, 1 = Off Delay, 2 = On Delay, 3 = On Delay and Off Delay | SINT |
| Val_Multiplier | Value of Multiplier for setting delay; 0 to 63 | SINT |
| Val_TemperatureMaxSinceInception | Maximum internal sensor temperature over whole sensor lifetime | REAL |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 871TM device object connected to channel #3 of a POINT I/O 1734-4IOL IO-Link Master module in slot #5 of a POINT I/O adapter named *Racko*1.



The following example uses the 871TM device object connected to channel #1 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.



The following example uses the 871TM device object connected to channel #14 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_3*.



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|----------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_IndSens | ss | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|--------------------|--|---|
| AOG_871TM _Launch | 0G_871TM Launch | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Second system Image: Second system Properties Image: Second system Image: Second system Image: Second system Image: Second system Image: Second system Image: Second system Image: Second system Image: Second system Image: Second system < |
| | | | Appearance Position and Size |
| | | | > Security |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| E | Sensor871TM_102 | Sensor 102 |
|---|-------------------------|-----------------------------------|
| Þ | Sensor871TM_102_CtrlCmd | Sensor871TM_102 Command Interface |
| Þ | Sensor871TM_102_CtrlSet | Sensor871TM_102 Setting Interface |
| Þ | Sensor871TM_102_CtrlSts | Sensor871TM_102 Status Interface |
| Þ | Sensor871TM_102_Inp_I | Sensor871TM_102 Input Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data.



| ltem | Description |
|------|--|
| 1 | Banner- Ready Status |
| 2 | Sensor Name |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Trigger Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section include Timer Settings.



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| TM_600 | 12 | | | | × |
|--------|--------------|-----|----|------|--------------|
| | Read | lу | | | |
| P | Timer Settin | gs | | | |
| 1 | Enable | On | V | Mode | No Timer |
| | Base Time | 0.4 | ms | | Config Apply |
| | Multiplier | 40 | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Enable- The enable parameter must be ON to enable the switching timer mode. In Off mode the timer setting parameters are disable.

Base Time- While sensing the Target if user wants to add Time delay, it is added with combination of base time and multiplier. Here unit of Base time is milliseconds. Click on Base Time dropdown selector object to select different Base times like 0.1, 0.4, 1.6 and 6.4

Multiplier- While counting the object if user wants to add Time delay, it is added with combination of base time and multiplier. This parameter allows you to enter the Multiplier values.

Mode- The switching timer is a useful function for manipulating the output of the sensor in relation to timing. It is useful for precision applications where the output of the sensor must be precisely triggered at a certain time. Click on Mode drop-down selector object to select different Timer modes like No Timer, Off Delay, On Delay and On Delay and Off Delay

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| TM_600 | 2 | | | | X |
|--------|---------------|-----|----|------|--------------|
| | Ready | / | | | |
| P | Timer Setting | s | | | |
| 1 | Enable | On | ▼ | Mode | No Timer |
| | Base Time | 0.1 | ms | | Config Apply |
| | Multiplier | 40 | | | |
| | | | | | |
| | | | | | |
| | | | | | |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| 002 | | | |
|-----------|---------|------|--------------|
| F F | eady | | |
| Timer S | ettings | | |
| Enable | On | Mode | No Timer |
| Base Tir | 0.4 | ms | Config Apply |
| Multiplie | 40 | | |
| | | | |
| | | | |
| | | | |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.

| Sensor 1 | 102 | |
|----------|---|---|
| | Not Ready Data Invalid | |
| 82 | Details | × |
| <u> </u> | 1998-01-06 18:06:00 | 7 |
| | Description / Action Check CIP messaging error | |
| | | - |
| | | |

Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_871TM_4I0L, raC_Dvc_871TM_8I0L, raC_Dvc_871TM_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_871TM_4IOL, raC_LD_Dvc_871TM_8IOL, raC_LD_Dvc_871TM_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_871TM_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-----------------|---------------------|------------------|------------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 871TM), This name depends upon the TagName assigned to object. |
| SensorType | 871TM-M10NP18-A2 | 871TM-M10NP18-A2 | 871TM-M10NP18-A2 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |

| ChannelNumber | | | Select the Channel Number where the sensor is connected. |
|-------------------|-----------------|-------------------|---|
| Navigation Button | GraphicalButton | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|--------------------|--------------------|----------|-----------------|----------|
| raC_Dvc_871TM_410L | raC_Dvc_871TM_4IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_871TM_8IOL | raC_Dvc_871TM_8IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_871TM_5032 | raC_Dvc_871TM_5032 | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_871TM | Faceplate ME | (raC-3_xx-ME) raC_Dvc_871TM-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_871TM | Faceplate SE | (raC-3_xx-SE) raC_Dvc_871TM-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

45CRM - Color Registration Mark Sensor (raC_Dvc_45CRM_4IOL, raC_Dvc_45CRM_8IOL, raC_Dvc_45CRM_5032)

Overview

The 45CRM Color Registration Mark Sensor device object (raC_Dvc_45CRM_4IOL, raC_Dvc_45CRM_8IOL, raC_Dvc_45CRM_5032) includes HMI faceplates which displays device information including:

- Sensor data
- Sensor diagnostics
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_45CRM_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Profile selection:** Profile setup will allow the operators to set the one of the profile from five. Each profile contains the Mark & Background Color value required for the sensor output to turn ON upon target detection.
- **Polarity:** This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate).
- Teach: Offers the different teach functions.

Functional Description

The 45CRM Color Registration Mark Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplate's for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix[®] firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|-----------------------------------|---------------------------------|----------------------------------|
| | POINT 1/0 1734-410L | 45CRM-4LHT1-D4, 45CRM-4LHT2-D4 | raC_Dvc_45CRM_4I0L_3.02_A0I.L5X | raC_Dvc_45CRM_4IOL_3.02_RUNG.L5X |
| 45CRM | ArmorBlock 1732E-810LM12R | 45CRM-4LHT1-D4, 45CRM-4LHT2-D4 | raC_Dvc_45CRM_8I0L_3.02_A0I.L5X | raC_Dvc_45CRM_8IOL_3.02_RUNG.L5X |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 45CRM-4LHT1-D4, 45CRM-4LHT2-D4 | raC_Dvc_45CRM_5032_3.02_A0I.L5X | raC_Dvc_45CRM_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 45CRM | Display | (raC-3_02-ME) raC_Dvc_45CRM-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_45CRM-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 45CRM | (raC-3_02-VD) raC_Dvc_IOLink.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|--|--|--|
| 45CRM | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_45CRM_4IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_45CRM_4IOL_(3.2) |
| | ArmorBlock 1732E-810LM12R | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_45CRM_8I0L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_45CRM_8IOL_(3.2) |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_45CRM_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_45CRM_5032_(3.2) |

Device Definition (raC_Dvc_45CRM_4IOL, raC_Dvc_45CRM_8IOL)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



2. Specify the Application Specific Name e.g. *WhiteMark_100*.

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storage | | Chang Device |
|---------|---------|---------------|----------------|------------------------------|----------------------|--------------------|--------------|---|-----------------|
| 0 | 10-Link | Allen-Bradley | 45CRM-4LHT2-D4 | WhiteMark_100 | Exact M 🗸 | | Enable ADC | ~ | |
| 1 | 10-Link | Allen-Bradley | 45CRM-4LHT1-D4 | Whitemark_101 | Exact M 🗸 | | Enable ADC | ~ | |
| 2 | 10-Link | | | | | | | | |
| 3 | 10-Link | | | | | | | | |
| 4 | 10-Link | | | | | | | | |
| 5 | 10-Link | | | | | | | | |
| 6 | 10-Link | | | | | | | | |
| 7 | 10-Link | | | | | | | | |
| | | | | | | | | | |

Device Definition (raC_Dvc_45CRM_Type1_50 32, raC_Dvc_45CRM_Type2_50 32)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction. 1. Go to Properties of 5032-8IOLM12M12LDR/A Master Module >>

General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| OK Path: AB_ETH-1\10.112.131.147\Backplane\9* Energy Storage Offline INo Forces No Edits | 동 급 《 & Redundancy 반 | Favorites A | H⊢ H+ () (0) (L) dd-On PlantPAx Safi | etv Alarms Bit | Module [| Definition | | | |
|--|-----------------------------|-----------------|---|--------------------|-------------|------------|---------------|--|----------|
| troller Organizer | 4 × 🖞 Module Properties: EN | 2TR (5032-8IOLM | 12M12LDR 2.011) × | | Series: | | 4 | | |
| a | General | General | | | Revision | | 2 | 011 | |
| Controller Master_IOLink_5032 | Connection | | | | Floctropic | Kauinau | 2 | | |
| Controller Tags Controller South Uppeller | Channels | Type: | 5032-8IOLM12M12LDR 8 | IO-Link Channel, 8 | ciecu offic | wynny. | Compatible | Module | × |
| Controller Fault Handler | - 00 - IO-Link | Vendor: | Rockwell Automation/All | en-Bradley | Connectio | n: | Data | | |
| Tasks | | Parent: | EN2TR | | | | | | |
| A C MainTask | - 03 - Digital Input | Name: | Mod_Master5032 | | | | | | |
| MainProgram | | Description: | | | | | | | Channel |
| Unscheduled | | | | | | | IO-Link | | Mode Typ |
| Motion Groups | 10 - IO-Link | | | v | Port | Channel | Enabled | Channel Mode | |
| Alarm Manager | | Madula Defini | | | | | a de se ances | | |
| Assets | - Internet Protocol | Module Delini | 1011 | | 1— | 0 | ſ | IO-Link | |
| Add-On Instructions | - Port Configuration | | | Change | 0 | 1 | | Digital Output, Short Circuit, No Load | V J J |
| Trends | - Network | Series: | A | × | 1 | 2 | | IO-Link | ~ 」 」 |
| Logical Model | Servers | Revision: | 2.011 | | - | 3 | | Digital Input | × |
| I/O Configuration | 224284884 | Electronic Key | ving: Compatibl | e Module | 2 | 4 | | Disabled | |
| = 1756 Backplane, 1756-A10 | | Connection | Data | | | 6 | | IO-Link | ~ / / |
| ▲ 🖞 [1] 1756-EN2TR EN2TR | | Connection. | Data | | 3 | 7 | | Disabled | × 1 |
| ▲ 뷺 Ethernet | | | | | 4 | 8 | | IO-Link | ~ / / |
| 1756-EN2TR EN2TR | | | | | _ | 9 | | Disabled | ~ 1 1 |
| 5032-8IOLM12M12LDR/A Mod_Master5032 | | | | | 5 | 10 | | IO-Link Disabled | × |
| @ [9] 1756-L85E Master IOLink 5032 | | | | | | 12 | 1.000 | Disabled IOJ ink | |
| A & Ethernet | | | | | 6 | 13 | | Disabled | V J |
| P 1756-L85E Master IOLink 5032 | | | | | - | 14 | | IO-Link | ~ / / |
| | | | | | 1 | 15 | | Disabled | ~ 1 |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 45CRM, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 45CRM Sensor.
 - ▲ ≤ I/O Configuration
 - ▲ 1756 Backplane, 1756-A7
 [□] 1756-L85E Master_5032_Test_Cases
 - 🔺 쁆 Ethernet
 - 1756-L85E Master_5032_Test_Cases
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_1
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_2
 - 🛾 🛇 IO-Link

0 42JT-P2LAT1-xx (4) Mod 42JT Type3

- 2 45CRM-4LHT1-D4 (71) Mod_45CRM
- 4 45DMS-B8LAT1-D4 (228) Mod_45DMS_Type1
- 6 45DMS-B8LGT1-D5 (230) Mod_45DMS_Type2
- 🛿 8 45PLA-P2LPT1-F4 (301) Mod_45PLA
- 10 46CLR-D5LAC1-D5 (294) Mod_46CLR
- 🔪 12 46DFA-L2LBT1-xx (291) Mod_46DFA
- 14 836P-D1xxxA14PA-D4 (177) Mod_836P_Type1

3. Configure the parameters of sensor from configuration tab from AOP of the 45CRM sensor.

| Controller Organizer 🗸 🗸 🗶 | 🗎 MainProgram - MainRou | tine 🖞 Module Properties: Mod_Master_5032_2:2 (45CRM-4LHT1-D4 (71) 1.0) 🛛 🗙 |
|--|-------------------------|---|
| J = | General | Configuration |
| Controller Master_5032_Test_Cases | Connection | |
| 🕨 🗰 Tasks | Device Info | |
| Motion Groups | - Configuration | Name R/W Value Units Style Description |
| 🕨 🛲 Alarm Manager | EventLog | ✓ Identification |
| Assets | | Application Specific Name nv ··· |
| h Logical Model | | User Tag 1 nv V 0 Decim V |
| 🔺 ⊆ I/O Configuration | | User Tag 2 rw 🗹 0 Decim 🗸 |
| 🛽 📼 1756 Backplane, 1756-A7 | | A Parameter |
| [0] 1756-L85E Master_5032_Test_Cases | | Operation Configuration |
| ▲ 器 Ethernet | | ▲ Inggered |
| ITTS6-L85E Master_5032_Test_Cases | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_1 | | Service Function |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_2 | | Sensor Test Operation rw Normal Operation - No Test 🗸 |
| A 😒 IO-Link | | Locator Indicator nw Normal Indication 🗸 |
| 🛢 0 42JT-P2LAT1-xx (4) Mod_42JT_Type3 | | Local Operation Status rw Unlock 🗸 |
| 2 45CRM-4LHT1-D4 (71) Mod_45CRM | | |
| 4 45DMS-B8LAT1-D4 (228) Mod_45DMS_Type1 | | |
| 6 45DMS-B8LGT1-D5 (230) Mod_45DMS_Type2 | | |
| 8 45PLA-P2LPT1-F4 (301) Mod_45PLA | | |
| 🎁 10 46CLR-D5LAC1-D5 (294) Mod_46CLR | | |
| 12 46DFA-L2LBT1-xx (291) Mod_46DFA | | |
| 14 836P-D1xxxA14PA-D4 (177) Mod_836P_Type1 | | Transf Forstern Defaulter |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_3 | | Insert Factory Defaults |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_45CRM_4IOL, raC_Dvc_45CRM_8I0L)

| InOut | Function / Description | DataType |
|-----------------|--|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_45CRM_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[20] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_45CRM_Inp_4IOL Or raC_UDT_ItfAD_45CRM_Inp_8IOL |
| Ref_Ctrl_Inf | Interfacing Data from Configured Sensors | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_ltf | InformationDatafromConfiguredSensors | raC_UDT_ItfAD_I0LinkDevices |

Input Data

| Input | Function/Description | DataType |
|----------------------------|---|----------|
| Inp_ChXTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_OutputPolarityInverted | Output Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cfg_ProfileSelection | Set value for Profile Selection | SINT |
| Cmd_DynamicTeach | Dynamic Teach Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_ReadAndStoreSettings | Read and Store Settings Command | BOOL |
| Cmd_StaticTeachBackground | Static Teach Background Command | BOOL |
| Cmd_StaticTeachMark | Static Teach Mark Command | BOOL |
| Cmd_TeachEvaluate | Teach Evaluate Command | BOOL |
| Cmd_TeachModeButton | Start Teach Mode Button Command | BOOL |

Output Data

| Output | Function/Descritpion | DataType |
|-------------------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_LocalTeachLock | Local Parameterization; O= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Val_CurrProfile | Displays the Current Profile | SINT |
| Val_CurrTeachMode | Unique Parameter Name for auto - discovery | INT |
| Val_OutputPolarityInverted | Displays the Current Profile | INT |
| Val_ProfileSelection | Displays Teach Mode | INT |
| Val_TeachStep | Teach Step Value | INT |
| raC_Dvc_ADFramework_DV_L D | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_45CRM_5032)

| InOut | Function / Description | DataType |
|-----------------------|----------------------------------|--|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_45CRM_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[20] |

| In0ut | Function / Description | DataType |
|--------------|--|-------------------------------------|
| Inp_I | Device Object Inputs | raC_UDT_IOLink_45CRM_Inp_5032 |
| Ref_Ctrl_Inf | Interfacing Data from Configured Sensors | raC_UDT_ItfAD_I0LinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | Information Data from Configured Sensors | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_45CRM_Cfg |

Input Data

| Input | Function/Description | DataType |
|----------------------------|---|----------|
| Inp_ChXTriggered | Triggered Status of Sensor | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_OutputPolarityInverted | Output Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cfg_ProfileSelection | Set value for Profile Selection | SINT |
| Cmd_DynamicTeach | Dynamic Teach Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_ReadAndStoreSettings | Read and Store Settings Command | BOOL |
| Cmd_StaticTeachBackground | Static Teach Background Command | BOOL |
| Cmd_StaticTeachMark | Static Teach Mark Command | BOOL |
| Cmd_TeachEvaluate | Teach Evaluate Command | BOOL |
| Cmd_TeachModeButton | Start Teach Mode Button Command | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |

Output Data

| Output | Function/Descritpion | DataType |
|---------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |

| | | - |
|----------------------------|--|----------|
| Output | Function/Descritpion | DataType |
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_CurrProfile | Displays the Current Profile | SINT |
| Val_CurrTeachMode | Unique Parameter Name for auto - discovery | INT |
| Val_OutputPolarityInverted | Displays the Current Profile | INT |
| Val_ProfileSelection | Displays Teach Mode | INT |
| Val_TeachStep | Teach Step Value | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |
Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 45CRM device object connected to channel #3 of a POINT I/O 1734-4IOL IO-Link Master module named *Point_IO_4IOLMater* in slot #1 of a POINT I/O adapter named *Racko1*.

| Sensor45CRM_101 Input Interface Sensor 101 COP raC_Dvc_45CRM_4IOL Sensor45CRM_101 Source Rack01:11.Fault raC_Dvc_45CRM_4IOL Sensor45CRM_101 Dest Sensor45CRM_101_Inp_I.Fault Ref_Module PointIO_4IOL_Master -(Sts_Connected) Write_Index Sensor45CRM_101_Write_Index -(Sts_Available) -(Sts_Available) Write_SubIndex Sensor45CRM_101_Read_SubIndex -(Sts_Faulted) Ref_Ctrl_Sts Sensor45CRM_101_CtrlSts -(Sts_Faulted) Inf_Lookup raC_Dvc_45CRM_101_Inp_I -(Sts_Ready) Inp_ChNumber 2 - - Ref_Ctrl_Inf Rack01_CtrlInf - Ref_Ctrl_Itf Rack01_CtrlInf - Ref_Ctrl_Inf Rack01_CtrlInf - Ref_Ctrl_Inf Rack01_CtrlInf - Ref_Ctrl_Inf | | | |
|---|------------------------------------|---|------------------|
| COP raC_Dvc_45CRM_4IOL Source Rack01:11.Fault Dest Sensor45CRM_101_inp_I.Fault Ref_Ctrl_Ctrl_Sts Virite_Subindex Sensor45CRM_101_Read_index Write_Subindex Sensor45CRM_101_Read_index Write_Subindex Sensor45CRM_101_Read_index Msg_Sensor_Data Sensor45CRM_101_CtrlSet Ref_Ctrl_Set Sensor45CRM_101_CtrlSet Ref_Ctrl_Sts Sensor45CRM_101_CtrlSet Inf_Lookup raC_Dvc_45CRM_101_CtrlSet Inp_ChxTriggered Rack01:11.Ch2Triggered Np_ChXIriggered Rack01_CtrlInf Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itt Rack01_CtrlInf | Sensor45CRM_101 Input Interface | Sensor 101 | |
| Source Rack01:1:1.Fault raC_Dvc_45CRM_4I0L Sensor45CRM_101 | COP | raC_Dvc_45CRM_4IOL | |
| Dest Sensor45CRM_101_Inp_I.Fault Length Ref_Module PointIO_4IOL_Master -(Sts_Connected) Write_Index Sensor45CRM_101_Write_Index - -(Sts_Available) Write_Subindex Sensor45CRM_101_Read_Subindex - -(Sts_Available) Write_Subindex Sensor45CRM_101_Read_Subindex - -(Sts_Available) Write_Index Sensor45CRM_101_Read_Subindex - -(Sts_Available) Write_Index Sensor45CRM_101_Read_Subindex - -(Sts_Available) Write_Index Sensor45CRM_101_Read_Subindex - -(Sts_Available) Write_Index Sensor45CRM_101_Read_Subindex - - Ref_Ctrl_Sts Sensor45CRM_101_CtrlSts - - Inf_Lookup raC_Dvc_45CRM_101_InfTable - - Inp_ChNumber 2 - - - Ref_Ctrl_Inf Rack01_CtrlInf Rack01_CtrlInf - Ref_Ctrl_Itf Rack01_CtrlInf - - | Source Rack01:1:I.Fault | raC_Dvc_45CRM_4IOL Sensor45CRM_101 | |
| Length 7 Write_Index Sensor45CRM_101_Write_Index Read_Index Sensor45CRM_101_Read_Index Write_SubIndex Sensor45CRM_101_Read_subIndex Read_SubIndex Sensor45CRM_101_Read_subIndex Read_SubIndex Sensor45CRM_101_Read_subIndex Read_SubIndex Sensor45CRM_101_Read_subIndex Read_SubIndex Sensor45CRM_101_CtrlSet Ref_Ctrl_Set Sensor45CRM_101_CtrlSet Ref_Ctrl_Sts Sensor45CRM_101_CtrlSts Inf_Lookup raC_Dvc_45CRM_101_DrL Inp_ChXUrgered Rack01:11.Ch2Triggered Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itt Rack01_CtrlInf | Dest Sensor45CRM_101_Inp_I.Fault | Ref_Module PointIO_4IOL_Master | -(Sts_Connected) |
| Read_Index Sensor45CRM_101_Read_Index | Length 7 | Write_Index Sensor45CRM_101_Write_Index | |
| Write_SubIndex Sensor45CRM_101_Write_SubIndex | - | Read Index Sensor45CRM 101 Read Index | (Sts Available) |
| Read_SubIndex Sensor45CRM_101_Read_SubIndex (Sts_Warning) Msg_Sensor_Data Sensor45CRM_101_Msg_Sensor_Data (Sts_Warning) Ref_Ctrl_Set Sensor45CRM_101_CtrlSet -(Sts_Faulted) Ref_Ctrl_Sts Sensor45CRM_101_CtrlSts -(Sts_Ready) Inf_Lookup raC_Dvc_45CRM_101_Inp_I -(Sts_Ready) Inp_I Sensor45CRM_101_Inp_I -(Sts_Ready) Inp_ChXTriggered Rack01:11:Lch2Triggered 0 + Inp_ChNumber 2 Ref_Ctrl_Inf Rack01_CtrlInf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlInf | | Write SubIndex Sensor45CRM 101 Write SubIndex | |
| Msg_Sensor_Data Sensor45CRM_101_Msg_Sensor_Data Ref_Ctrl_Set Sensor45CRM_101_CtrlSet Ref_Ctrl_Ctrd Sensor45CRM_101_CtrlSts Ref_Ctrl_Sts Sensor45CRM_101_CtrlSts Inf_Lookup raC_Dvc_45CRM_101_Inp_I Inp_I Sensor45CRM_101_Inp_I Inp_ChNumber 2 Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlInf | | Read SubIndex Sensor45CRM 101 Read SubIndex | {Sts Warning} |
| Ref_Ctrl_Set Sensor45CRM_101_CtrlSet -(Sts_Faulted) Ref_Ctrl_Cmd Sensor45CRM_101_CtrlCmd -(Sts_Faulted) Ref_Ctrl_Sts Sensor45CRM_101_CtrlSts -(Sts_Ready) Inf_Lookup raC_Dvc_45CRM_InfTable -(Sts_Ready) Inp_I Sensor45CRM_101_inp_I -(Sts_Ready) Inp_ChXTriggered Rack01:11.Ch2Triggered -(Sts_Ready) Inp_ChNumber 2 - Ref_Ctrl_Inf Rack01_CtrlInf Reck01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlInf - | | Msg Sensor Data Sensor45CRM 101 Msg Sensor Data | |
| Ref_Ctrl_Cmd Sensor45CRM_101_CtrlCmd Ref_Ctrl_Sts Sensor45CRM_101_CtrlSts Inf_Lookup raC_Dvc_4SCRM_InfTable Inp_I Sensor45CRM_101_Inp_I Inp_ChXTriggered Rack01:1:1.Ch2Triggered Inp_ChNumber 2 Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlInf | | Ref Ctrl Set Sensor45CRM 101 CtrlSet | -{Sts Faulted} |
| Ref_Ctrl_Sts Sensor45CRM_101_CtrlSts -(Sts_Ready) Inf_Lookup raC_Dvc_45CRM_InfTable -(Sts_Ready) Inp_I Sensor45CRM_101_Inp_I - Inp_ChxTriggered 0 ← 2 Inp_ChNumber 2 - Ref_Ctrl_Inf Ref_Ctrl_Inf Rack01_CtrlInf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlInf - | | Ref Ctrl Cmd Sensor45CRM 101 CtrlCmd | |
| Inf_Lookup raC_Dvc_45CRM_InfTable Inp_I Sensor45CRM_101_Inp_I Inp_ChxTriggered Rack01:1:I.Ch2Triggered 0 ← Inp_ChNumber 2 Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlInf | | Ref Ctrl Sts Sensor45CRM 101 CtrlSts | -{Sts Ready}- |
| Inp_I Sensor45CRM_101_inp_I Inp_ChxTriggered Rack01:1:I.Ch2Triggered Inp_ChNumber 0 + Inp_ChNumber 2 Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlInf | | Inf Lookup raC Dvc 45CRM InfTable | |
| Inp_ChxTriggered Rack01:1:I.Ch2Triggered Inp_ChNumber 0 + Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlInf | | Inp I Sensor45CRM 101 Inp I | |
| Inp_ChNumber 0 Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlItf | | Inp ChxTriggered Rack01:1:I.Ch2Triggered | |
| Inp_ChNumber 2 Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlItf | | 0 | |
| Ref_Ctrl_Inf Rack01_CtrlInf Ref_Ctrl_Itf Rack01_CtrlItf | | Inp. ChNumber 2 | |
| Ref_Ctrl_InfRack01_CtrlInfRef_Ctrl_ItfRack01_CtrlItf | | | |
| Ref_Ctrl_Itf Rack01_CtrlItf | | Ref. Ctrl. Inf. Rack01 Ctrlinf | |
| Kol_out_u Kokot_outu | | Ref Ctrl ltf Rack01_Ctrlltf | |
| | | | |

The following example uses the 45CRM device object connected to channel #0 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*



The following example uses the 45CRM device object connected to channel #2 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_2.*



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|---------------------------------|----------------|---|---|
| GO_LaunchFP | × SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_ColorSens 45CRM | Not Triggered | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration | |
|---------------------------|---------------------|--|---|--|
| AOG_45CRM _Launch | SS Not Triggered | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Properties Animations Image: Properties Image: Properties Image: Properties Image: Properis Image: Properties< | |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| I | Name | Description | Usage 🔡 🔺 | Data Type | I |
|---|---|-----------------------------------|-----------|------------------------------------|---|
| I | Sensor45CRM_102 | Sensor 102 | Local | raC_Dvc_45CRM_8IOL | I |
| 1 | Sensor45CRM_102_Inp_I | Sensor45CRM_102 Input Interface | Local | raC_UDT_ItfAD_45CRM_Inp_8IOL | I |
| 1 | Sensor45CRM_102_CtrlCmd | Sensor45CRM_102 Command Interface | Public | raC_UDT_ItfAD_IOLinkSensor_CtrlCmd | I |
| 1 | Sensor45CRM_102_CtrlSet | Sensor45CRM_102 Setting Interface | Public | raC_UDT_ItfAD_IOLinkSensor_CtrlSet | I |
| I | Sensor45CRM_102_CtrlSts | Sensor45CRM_102 Status Interface | Public | raC_UDT_ItfAD_IOLinkSensor_CtrlSts | I |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |

| ltem | Description |
|------|---|
| 4 | Trigger Sparkling Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 5 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 6 | Current Profile Current Profile displays the Current Profile Name and their Mark & Background color code values which is downloaded/read from/to Sensor |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name or Locate Toggle Switch require pressing the 'Config Apply' button in the Config tab to update the sensor parameters. |



The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Local Settings
- Profile Settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| | CF | M_8004 Ready | | × |
|---|----|-------------------------------|-----------------------|----------------|
| 1 | | Output Polarity: Not Inverted | Config App | ly |
| | | | | |
| 2 | | Profile Settings | Local Setti Unlock | ng Lock 4 3 |

| ltem | Description |
|------|--|
| 1 | Output Polarity: Polarity changes the sensor output to operate as Light On(Non Inverted) and Dark On (Inverted). |
| 2 | Profile Settings: Launch the Profile settings window. |
| 3 | Local Teach Unlock/Lock Toggle Switch: Locks unauthorized people from changing the sensor settings using the local device push buttons.Toggle the lock/unlock button to prevent parameterization using local push buttons. |

Profile Settings

Profile Settings display includes the Select Profile dropdown menu to select up to 5 profiles, Rename Profile and Teach Settings buttons. Touch on the Rename Profile button to change the profile name e.g. Profile 1- Candy Green.

| Sensor | 102 | × |
|------------------------|---------------------------|-------------------|
| $\widehat{\mathbf{w}}$ | Ready | |
| Ş | Profile Setup | \times |
| - | Select Profile: Profile 1 | Teach Settings |
| | Rename Profile | |
| | | |

Note: Profiles are Stored in the Logix Designer and user can select and download the Profile to the sensor whenever needed.

**** All Profiles values are stored by teaching the Mark and Background color of that profile using Teach Settings.

Teach Settings

Teach Settings display includes the Teach Methods, Teach Commands & Teach Read & Store buttons. Touch on the Teach Settings navigation button to access the Teach Settings tab.

Teach tab includes the following functions:

- Teach mode selection drop-down menu (Static/Dynamic)
- Teach procedure flow buttons
- Teach values Read & Store button

The operator must complete each stage to teach sensor successfully. During the teach process the operator must complete the current stage prior to the next stage being made available to operator.



| ltem | Description |
|------|--|
| 1 | Teach Mode: - Static - Dynamic |
| 2 | Teach procedure flow buttons |
| 3 | Read & Store: Stored the Mark & background values to the Selected Profile. |

Static Teach

| Sensor | 102 | × |
|------------|---|--------------|
| | Ready | |
| <i>Ş</i> 9 | Teach | × |
| : | Static V | |
| | Start > Teach Mark > Teach Background > | Evaluate |
| | | Read & Store |

The first method is Static Teach, which is intended for applications where the web can be stopped, or for more challenging applications.

- 1. Click on Start Button to Start the Procedure.
- 2. Place the Mark under the sensor light Spot to teach the color of the Mark.
- 3. Click on Teach Mark Button.
- 4. Place the Background under the sensor light Spot to teach the color of the Background.
- 5. Click on Teach Background Button.
- 6. Click on Evaluate Button.
- 7. Click on Read and Store Colors Button to store Mark and Background color values into Profile which is selected in the Profile Setup window.

Dynamic Teach

| Sensor | 102 | × |
|------------------------|----------------------------|--------------|
| $\widehat{\mathbf{w}}$ | Ready | |
| <i>S</i> | Teach | × |
| | Dynamic | |
| | Start > Dynamic > Evaluate | |
| | | Read & Store |

The Second method is Dynamic Teach, which is intended for applications where the web can be Running.

- 1. Click on Start button to Start the procedure.
- 2. Place the target and background in front of the sensor at the speed of the application.
- 3. Click on Dynamic Teach button
- 4. Click on Evaluate button
- 5. Click on Read and Store Colors Button to store Mark and Background color values into Profile which is selected in the Profile Setup window.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| | nz 💼 Read | iy | | | > |
|---|--------------|-----|------------|-------|--------------|
| B | Timer Settin | gs | | | |
| ļ | Enable | On | V N | /lode | No Timer |
| | Base Time | 0.1 | ms | | Config Apply |
| | Multiplier | 40 | | | |
| | | | | | |
| | | | | | |
| | | | | | |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| Ready | | |
|------------------|--------------|--------------|
| Parameter Set | ings | |
| Output Polarity: | Not Inverted | Config Apply |
| | | |
| | | |
| | | |
| | | |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.

| (2) | | | | | | |
|-----|-----------------|------------------------|------------------------------|--|--|--|
| | Severity | Time | Description | | | |
| | Active Fault | 2023-03-24 11:10:59 | Sensor is disconnected | | | |
| | Fault | 2023-03-24 11:10:36 | A short circuit was detected | | | |
| | Fault | 2023-03-24 11:10:19 | Sensor Power Fault | | | |
| | Fault | 2023-03-24 11:09:58 | A short circuit was detected | | | |

| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_45CRM_4I0L, raC_Dvc_45CRM_8I0L, raC_Dvc_45CRM_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_45CRM_4IOL, raC_LD_Dvc_45CRM_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_45CRM_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-------------------|---------------------|------------------|-------------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 45CRM), This name depends upon the TagName assigned to object. |
| SensorType | 45CRM-4LHT1-D4 | 45CRM-4LHT1-D4 | 45CRM-4LHT1-D4 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|--------------------|--------------------|----------|-----------------|----------|
| raC_Dvc_45CRM_4I0L | raC_Dvc_45CRM_4IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_45CRM_8IOL | raC_Dvc_45CRM_8IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_45CRM_5032 | raC_Dvc_45CRM_5032 | 3.2 | (RA-LIB) Device | IO-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|------------------------------|--|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |

| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
|------------------|-------------------------------|---|
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_45CRM | Faceplate ME | (raC-3_xx-ME) raC_Dvc_45CRM-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_45CRM | Faceplate SE | (raC-3_xx-SE) raC_Dvc_45CRM-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_I0Link | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

836P - Solid-State Pressure Sensor (raC_Dvc_836P_4I0L, raC_Dvc_836P_8I0L, raC_Dvc_836P_Type1_5032, raC_Dvc_836P_Type2_5032)

Overview

The 836P Solid-State Pressure Sensor device object (raC_Dvc_836P_4IOL, raC_Dvc_836P_8IOL, raC_Dvc_836P_Type1_5032, raC_Dvc_836P_Type2_5032) includes HMI faceplates which displays device information including:

- Sensor data
- Sensor diagnostics
- Process data trending
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_836P_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.
- **Polarity:** This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate).

The 836P Solid-State Pressure Sensor Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Functional Description

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with four versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/ Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-----------------|-------------------------------|---|--------------------------------|---------------------------------|
| 836P | POINT 1/0 1734-410L | 836P-D1xxxA14PA-D4, 836P-D1xxxA20PA-D4, 836P-D1xxxA30PA-D4, 836P-D1xxxA36PA-D4, 836P-D1xxxB10PA-D4, 836P-D1xxxB14PA-D4, 836P-D1xxxB10PA-D4, 836P-D1xxxB14PA-D4, 836P-D1xxxB20PA-D4, 836P-D2xxxA36PA-D4, 836P-D2xxxA30PA-D4, 836P-D2xxxA36PA-D4, 836P-D2xxxA30PA-D4, 836P-D2xxxA36PA-D4, 836P-D2xxxA30PA-D4, 836P-D2xxxB14PA-D4, 836P-D2xxxB10PA-D4, 836P-D2xxxB36PA-D4, 836P-D2xxxB10PA-D4, 836P-D2xxxB36PA-D4, 836P-D2xxxB10PA-D4, 836P-D2xxxB36PA-D4, 836P-D2xxxB10PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC36PA-D4, 836P-D2xxxC30PA-D4, 836P-D1xxxA14PP-D4, 836P-D1xxxA30PP-D4, 836P-D1xxxA14PP-D4, 836P-D1xxxA36PP-D4, 836P-D1xxxB10PP-D4, 836P-D1xxxA36PP-D4, 836P-D1xxxA30PP-D4, 836P-D1xxxA36PP-D4, 836P-D1xxxA30PP-D4, 836P-D1xxxA36PP-D4, 836P-D2xxxA30PP-D4, 836P-D1xxxA36PP-D4, 836P-D2xxxA30PP-D4, 836P-D2xxxA36PP-D4, 836P-D2xxxA30PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxA30PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxXC30PP-D4, 836P-D | raC_Dvc_836P_410L_3.02_A01.L5X | raC_Dvc_836P_410L_3.02_RUNG.L5X |
| | ArmorBlock 1732E- 810LM12R | 836P-D1xxxA14PA-D4, 836P-D1xxxA20PA-D4, 836P-D1xxxA30PA-D4, 836P-D1xxxA36PA-D4, 836P-D1xxxA60PA-D4, 836P-D1xxxB10PA-D4, 836P-D1xxxB14PA-D4, 836P-D1xxxB20PA-D4, 836P-D1xxxB25PA-D4, 836P-D1xxxB30PA-D4, 836P-D2xxxA30PA-D4, 836P-D2xxxA36PA-D4, 836P-D2xxxA30PA-D4, 836P-D2xxxA36PA-D4, 836P-D2xxxA30PA-D4, 836P-D2xxxB25PA-D4, 836P-D2xxxB20PA-D4, 836P-D2xxxB25PA-D4, 836P-D2xxxB30PA-D4, 836P-D2xxxB36PA-D4, 836P-D2xxxB30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxB30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC10PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC36PA-D4, 836P-D2xxxC50PA-D4, 836P-D2xxxC36PA-D4, 836P-D2xxxC50PA-D4, 836P-D1xxxA30PP-D4, 836P-D1xxxA30PP-D4, 836P-D1xxxA60PP-D4, 836P-D1xxxB30PP-D4, 836P-D1xxxA60PP-D4, 836P-D1xxxB30PP-D4, 836P-D1xxxA30PP-D4, 836P-D1xxxB30PP-D4, 836P-D1xxxA30PP-D4, 836P-D1xxxB30PP-D4, 836P-D1xxxA30PP-D4, 836P-D1xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D1xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D1xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxA36PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxXC30PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxXC30PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxXC30PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxXC30PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxXC30PP-D4, 836P-D2xxXC36PP-D4, 836P-D2xxXC30PP-D4, 836P-D | raC_Dvc_836P_810L_3.02_A01.L5X | raC_Dvc_836P_810L_3.02_RUNG.L5X |

| Device/ Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-----------------|--|---|--------------------------------------|---------------------------------------|
| 836P | 5032-8I0LM12DR 5032- 8I0LM12M12LDR/A 5032-8I0LM12P5DR | 836P-D1xxxA14PA-D4, 836P-D1xxxA20PA-D4, 836P-D1xxxA30PA-D4, 836P-D1xxxA36PA-D4, 836P-D1xxxA30PA-D4, 836P-D1xxxB14PA-D4, 836P-D1xxxB10PA-D4, 836P-D1xxxB14PA-D4, 836P-D1xxxB20PA-D4, 836P-D1xxxB25PA-D4, 836P-D1xxxB30PA-D4, 836P-D2xxxA36PA-D4, 836P-D2xxxA30PA-D4, 836P-D2xxxA36PA-D4, 836P-D2xxxB30PA-D4, 836P-D2xxxB14PA-D4, 836P-D2xxxB30PA-D4, 836P-D2xxxB30PA-D4, 836P-D2xxxB30PA-D4, 836P-D2xxxB36PA-D4, 836P-D2xxxB30PA-D4, 836P-D2xxxB36PA-D4, 836P-D2xxxB30PA-D4, 836P-D2xxxB36PA-D4, 836P-D2xxxB50PA-D4, 836P-D2xxxC10PA-D4, 836P-D2xxxC14PA-D4, 836P-D2xxxC10PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC36PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC36PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC36PA-D4, 836P-D2xxxC30PA-D4, 836P-D2xxxC30PA-D4, 836P-D | raC_Dvc_836P_Type1_5032_3.02_A0I.L5X | raC_Dvc_836P_Type1_5032_3.02_RUNG.L5X |
| 0.00 | 5032-8I0LM12DR 5032- 8I0LM12M12LDR/A 5032-8I0LM12P5DR | 836P-D1xxxA14PP-D4, 836P-D1xxxA20PP-D4, 836P-D1xxxA30PP-D4, 836P-D1xxxA36PP-D4, 836P-D1xxxB10PP-D4, 836P-D1xxxB14PP-D4, 836P-D1xxxB10PP-D4, 836P-D1xxxB25PP-D4, 836P-D1xxxB30PP-D4 836P-D2xxxA14PP-D4, 836P-D2xxxA36PP-D4, 836P-D2xxxA10PP-D4, 836P-D2xxxA36PP-D4, 836P-D2xxxB10PP-D4, 836P-D2xxxB14PP-D4, 836P-D2xxxB10PP-D4, 836P-D2xxxB36PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB36PP-D4, 836P-D2xxxB30PP-D4, 836P-D2xxxB36PP-D4, 836P-D2xxxB10PP-D4, 836P-D2xxxB36PP-D4, 836P-D2xxxB10PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxC10PP-D4, 836P-D2xxxC30PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2xxxC36PP-D4, 836P-D2 | raC_Dvc_836P_Type2_5032_3.02_A0I.L5X | raC_Dvc_836P_Type2_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 836P | Display | (raC-3_02-ME) raC_Dvc_836P-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_836P-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI* - *ViewDesigner* - *vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 836P | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) | | |
|--------------------------|------------------------------|---|---|--|--|
| 836P | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_836P_410L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_836P_4IOL_(3.2) | | |
| | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_836P_810L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_836P_8I0L_(3.2 | | |
| | 5032-810LM12DR | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_836P_Type1_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_836P_5032_(3.2) | | |
| | 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_836P_Type2_5032_(3.2) | | | |

Device Definition (raC_Dvc_836P_4I0L, raC_Dvc_836P_8I0L)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



2. Specify the Application Specific Name e.g. SupplyPressure_100

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storage |
|---------|---------|---------------|--------------------|---------------------------|----------------------|--------------------|--------------|
|) | 10-Link | Allen-Bradley | 836P-D1NMGB20PP-D4 | SupplyPressure_100 | Exact M 🗸 | | Enable ADC |
| 1 | 10-Link | Allen-Bradley | 836P-D1GMGB20PP-D4 | SupplyPressure_101 | Exact M 🗸 | | Enable ADC |
| 2 | IO-Link | | | | | | |
| 3 | 10-Link | | | | | | |
| 4 | 10-Link | | | | | | |
| 5 | 10-Link | | | | | | |
| 6 | 10-Link | | | | | | |
| 7 | 10-Link | | | | | | |
| c | | | | | | | |

Device Definition (raC_Dvc_836P_Type1_503 2, raC_Dvc_836P_Type2_5032)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass

information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| OK Path. As_Et P1(L112.131.147/64000panely9************************************ | Redundancy 1 | Favorites A | dd-On PlantPAx Safe | ty Alarms Bit | Module (| Definition | | | | |
|---|-----------------------|---------------|--------------------------|--------------------|------------|------------|------------|--|---------------|----------|
| | Module Properties. En | | | | Series: | | A | × | | |
| Controller Master IOI ink 5032 | General | General | | | Revision: | | 2 | ∨ 011 🔹 | | |
| Controller Tags | - Module Info | Type: | 5032-8IOLM12M12LDR 8 | IO-Link Channel, 8 | Electronic | : Keying: | Compatible | Module | \sim | |
| Controller Fault Handler | Channels | Vendor: | Rockwell Automation/Alle | en-Bradley | Connectio | on: | Data | | $\overline{}$ | |
| Power-Up Handler | - 01 - Digital Output | Parent: | EN2TR | | | | | | | |
| Tasks | | Name | Mod Mactor5022 | | | | | | | |
| Main lask | - 03 - Digital input | Name: | mou_master 5052 | | | | | | Cha | nnel |
| | 06 - 10-Link | Description: | | ۵. | | | IO-I ink | | Mode | Types |
| Motion Groups | | | | | Port | Channel | Class B | Channel Mode | | • |
| Alarm Manager | - 12 - IO-Link | | | | | | Enabled | | Ξ | S T |
| Assets | - 14 - IO-Link | Module Defini | tion | | 1 | | | | | 10.1 |
| Add-On Instructions | Internet Protocol | | | Change | 0 | 0 | | IO-Link | ~ / . | 1 1 |
| Data Types | - Network | Series: | A | | | 1 | | Digital Output, Short Circuit, No Load | V J . | <u>/</u> |
| Trends | - Time Sync | Bauicianu | | | 1 | 3 | - | Digital Input | | |
| Logical Model | L. Servers | Revision: | 2.011 | | | 4 | 0 | IO-Link | ~ . | 1 1 |
| I/O Configuration | | Electronic Ke | ying: Compatible | Module | 2 | 5 | | Disabled | \sim . | 1 |
| 1756 Backplane, 1756-A10 | | Connection: | Data | | 3 | 6 | | IO-Link | × 1 . | 1 1 |
| 1] 1756-EN2TR EN2TR | | | | | _ | 7 | | Disabled | × . | / |
| ▲ 윪 Ethernet | | | | | 4 | 8 | | IU-LINK Disphiad | × . | 11 |
| 1756-EN2TR EN2TR | | | | | | 10 | | IO-I ink | | 1 1 |
| 5032-8IOLM12M12LDR/A Mod_Master5032 | | | | | 5 | 11 | | Disabled | ~ / | |
| [9] 1756-L85E Master_IOLink_5032 | | | | | | 12 | 0 | IO-Link | ~ . | 11 |
| 윪 Ethernet | | | | | 6 | 13 | | Disabled | V . | 1 |
| @ 1756-L85E Master_IOLink_5032 | | | | | 7 | 14 | | IO-Link | × . | 11 |
| | | | | | 1 1 | 15 | | Disabled | V I | 1 |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

2. Whichever channels are selected for 836P, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 836P Sensor.



3. Configure the parameters of sensor from configuration tab from AOP of the 836P sensor.



Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_836P_4I0L, raC_Dvc_836P_8I0L)

| InOut | Function / Description | DataType |
|--|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_836P_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_836P_Inp_4IOL Or raC_UDT_ItfAD_836P_Inp_8IOL |
| Ref_Ctrl_Inf Sensor Type Information Interface | | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |

Input Data

| Input | Function/Description | DataType |
|------------------------|---|----------|
| Inp_ChxTriggered1 | Triggered Status When the Pressure is equal to Defined Pressure Set for Trigger1 | BOOL |
| Inp_ChxTriggered2 | Triggered Status When the Pressure is equal to Defined Pressure Set for Trigger2 | BOOL |
| Inp_ChxPressure | Displays Pressure Value of the Sensor | INT |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_DisplayModePA | Set type of Information shown on Unit Display; O=Current Pressure, 1=Highest Pressure, 2=Low Pressure, 3=Triggered1 Set Pressure, 4=Triggered1 Reset Pressure, 7=Display OFF | DINT |
| Cfg_DisplayModePP | Set type of Information shown on Unit Display; O=Current Pressure, 1=Highest Pressure, 2=Low Pressure, 3=Triggered1 Set Pressure, 4=Triggered1 Reset Pressure, 5=Triggered2 Set Pressure, 6=Triggered2 Reset Pressure, 7=Display OFF | DINT |
| Cfg_DisplayRotation | Set the change of orientation of the status indicator by 180°; O=Default, 1=Rotate 180 Degrees | DINT |
| Cfg_MeasuringtUnit | Set Measuring Unit; 0=Bar, 1=Mpa, 2=kPa, 3=psi, 4= kg/cm ² | DINT |
| Cfg_OperatingModeTrig1 | Set Operating Modes for Triggered1 Output; 0=Hysteresis, 1=Window | INT |
| Cfg_OperatingModeTrig2 | Set Operating Modes for Triggered2 Output; O=Hysteresis, 1=Window | INT |
| Cfg_UpdateRate | Set Sensor Display Update Rate; 0=1Hz, 1=2Hz, 2=5 Hz, 3=10Hz | SINT |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Set_TrendPressMaxValue | Trend Tab Max value for VD/ME/SE faceplate | REAL |

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| Input | Function/Description | DataType |
|------------------------|--|----------|
| Set_TrendPressMinValue | Trend Tab Min value for VD/ME/SE faceplate | REAL |
| Set_Trig1OffDelay | Set the Delay Value for the change of state from ON to OFF for the Triggered1 | DINT |
| Set_Trig10nDelay | Set the Delay Value for the change of state from OFF to ON for the Triggered1 | DINT |
| Set_Trig1RP | Set the value of system pressure that turns the sensor output OFF for Trigger1 | REAL |
| Set_Trig1SP | Set the value of system pressure that turns the sensor output ON for Trigger1 | REAL |
| Set_Trig2OffDelay | Set the Delay Value for the change of state from ON to OFF for the Triggered2 | DINT |
| Set_Trig2OnDelay | Set the Delay Value for the change of state from OFF to ON for the Triggered2 | DINT |
| Set_Trig2RP | Set the value of system pressure that turns the sensor output OFF for Trigger2 | REAL |
| Set_Trig2SP | Set the value of system pressure that turns the sensor output ON for Trigger2 | REAL |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_CatPA | Catalog of Connected Sensor; 0=PP, 1=PA | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Val_MeasuringUnit | Displays the Pressure Measurement Unit; 0=Bar, 1=Mpa, 2=kPa, 3=psi, 4= kg/cm ² | INT |
| Val_Mode | As per Connected Sensor Catalog | INT |
| Val_OperatingHrsSinceInception | Displays the Total Sensor Operating Hours since the sensor was first powered ON | DINT |
| Val_OperatingModeTrig1 | Displays Operating Modes for Triggered1 Output; 0=Hysteresis, 1=Window | INT |
| Val_OperatingModeTrig2 | Displays Operating Modes for Triggered2 Output; O=Hysteresis, 1=Window | INT |
| Val_Pressure | Displays Pressure Value of the Sensor | REAL |
| Val_PressureConverted | Displays Converted Pressure Value of the Sensor | REAL |
| Val_PressureMaxSinceReset | Displays Highest Recorded Pressure Value since the last pressure reset | REAL |
| Val_PressureMinSinceReset | Displays Lowest Recorded Pressure Value since the last pressure reset | REAL |
| Val_Rotation | Displays the change of orientation of the status indicator by 180°; 0=0 Deg, 1=Rotate 180 Degrees | INT |
| Val_RPRangeMax | Sensor ResetPoint Maximum Range in Trend | REAL |
| Val_RPRangeMaxUnit | Sensor ResetPoint Unitwise Maximum Range in Trend | REAL |
| Val_RPRangeMin | Sensor ResetPoint Minimum Range in Trend | REAL |
| Val_RPRangeMinUnit | Sensor ResetPoint Unitwise Minimum Range in Trend | REAL |
| Val_SPRangeMax | Sensor SwitchPoint Maximum Range in Trend | REAL |
| Val_SPRangeMaxUnit | Sensor SwitchPoint Unitwise Maximum Range in Trend | REAL |
| Val_SPRangeMin | Sensor SwitchPoint Minimum Range in Trend | REAL |
| Val_SPRangeMinUnit | Sensor SwitchPoint Unitwise Minimum Range in Trend | REAL |

| Output | Function/Descritpion | DataType |
|---------------------------|---|----------|
| Val_Trig1OffDelay | Displays the Delay Value for the change of state from ON to OFF for the Triggered1 | DINT |
| Val_Trig1OnDelay | Displays the Delay Value for the change of state from OFF to ON for the Triggered1 | DINT |
| Val_Trig1RP | Displays the value of system pressure that turns the sensor output OFF for Trigger1 | REAL |
| Val_Trig1SP | Display the value of system pressure that turns the sensor output OFF for Trigger1 | REAL |
| Val_Trig2OffDelay | Displays the Delay Value for the change of state from ON to OFF for the Triggered2 | DINT |
| Val_Trig2OnDelay | Displays the Delay Value for the change of state from OFF to ON for the Triggered2 | DINT |
| Val_Trig2RP | Displays the value of system pressure that turns the sensor output OFF for Trigger2 | REAL |
| Val_Trig2SP | Display the value of system pressure that turns the sensor output OFF for Trigger2 | REAL |
| Val_UpdateRate | Displays Sensor Display Update Rate; 0=1Hz, 1=2Hz, 2=5 Hz, 3=10Hz | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data (raC_Dvc_836P_Type1_503 2, raC_Dvc_836P_Type2_5032)

| InOut D |) ata |
|---------|--------------|
|---------|--------------|

| InOut | Function / Description | DataType |
|-----------------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_836P_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_836P_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf_5032 |
| Ref_Ctrl_ltf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_836P_Type1_Cfg or raC_UDT_IOLink_836P_Type2_Cfg |

Input Data

| Input | Function/Description | DataType |
|------------------------|---|----------|
| Inp_ChxTriggered1 | Triggered Status When the Pressure is equal to Defined Pressure Set for Trigger1 | BOOL |
| Inp_ChxTriggered2 | Triggered Status When the Pressure is equal to Defined Pressure Set for Trigger2 | BOOL |
| Inp_ChxPressure | Displays Pressure Value of the Sensor | INT |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_DisplayModePA | Set type of Information shown on Unit Display; O=Current Pressure, 1=Highest Pressure, 2=Low Pressure, 3=Triggered1 Set Pressure, 4=Triggered1 Reset Pressure, 7=Display OFF | DINT |
| Cfg_DisplayModePP | Set type of Information shown on Unit Display; O=Current Pressure, 1=Highest Pressure, 2=Low Pressure, 3=Triggered1 Set Pressure, 4=Triggered1 Reset Pressure, 5=Triggered2 Set Pressure, 6=Triggered2 Reset Pressure, 7=Display OFF | DINT |
| Cfg_DisplayRotation | Set the change of orientation of the status indicator by 180°; D=Default, 1=Rotate 180 Degrees | DINT |
| Cfg_MeasuringtUnit | Set Measuring Unit; 0=Bar, 1=Mpa, 2=kPa, 3=psi, 4= kg/cm ² | DINT |
| Cfg_OperatingModeTrig1 | Set Operating Modes for Triggered1 Output; O=Hysteresis, 1=Window | INT |
| Cfg_OperatingModeTrig2 | Set Operating Modes for Triggered2 Output; O=Hysteresis, 1=Window | INT |
| Cfg_UpdateRate | Set Sensor Display Update Rate; 0=1Hz, 1=2Hz, 2=5 Hz, 3=10Hz | SINT |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |

| Input | Function/Description | DataType |
|------------------------|--|----------|
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Set_TrendPressMaxValue | Trend Tab Max value for VD/ME/SE faceplate | REAL |
| Set_TrendPressMinValue | Trend Tab Min value for VD/ME/SE faceplate | REAL |
| Set_Trig1OffDelay | Set the Delay Value for the change of state from ON to OFF for the Triggered1 | DINT |
| Set_Trig1OnDelay | Set the Delay Value for the change of state from OFF to ON for the Triggered1 | DINT |
| Set_Trig1RP | Set the value of system pressure that turns the sensor output OFF for Trigger1 | REAL |
| Set_Trig1SP | Set the value of system pressure that turns the sensor output ON for Trigger1 | REAL |
| Set_Trig2OffDelay | Set the Delay Value for the change of state from ON to OFF for the Triggered2 | DINT |
| Set_Trig2OnDelay | Set the Delay Value for the change of state from OFF to ON for the Triggered2 | DINT |
| Set_Trig2RP | Set the value of system pressure that turns the sensor output OFF for Trigger2 | REAL |
| Set_Trig2SP | Set the value of system pressure that turns the sensor output ON for Trigger2 | REAL |
| | | |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_CatPA | Catalog of Connected Sensor; 0=PP, 1=PA | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_MeasuringUnit | Displays the Pressure Measurement Unit; 0=Bar, 1=Mpa, 2=kPa, 3=psi, 4= kg/cm ² | INT |
| Val_Mode | As per Connected Sensor Catalog | INT |
| Val_OperatingHrsSinceInception | Displays the Total Sensor Operating Hours since the sensor was first powered ON | DINT |

| Output | Function/Descritpion | DataType |
|---------------------------|--|----------|
| ···· | Displays Operating Modes for Triggered1 Output: O=Hysteresis | |
| Val_OperatingModeTrig1 | 1=Window | INT |
| Val_OperatingModeTrig2 | Displays Operating Modes for Triggered2 Output; O=Hysteresis, 1=Window | INT |
| Val_Pressure | Displays Pressure Value of the Sensor | REAL |
| Val_PressureConverted | Displays Converted Pressure Value of the Sensor | REAL |
| Val_PressureMaxSinceReset | Displays Highest Recorded Pressure Value since the last pressure reset | REAL |
| Val_PressureMinSinceReset | Displays Lowest Recorded Pressure Value since the last pressure reset | REAL |
| Val_Rotation | Displays the change of orientation of the status indicator by 180°; D=0 Deg, 1=Rotate 180 Degrees | INT |
| Val_RPRangeMax | Sensor ResetPoint Maximum Range in Trend | REAL |
| Val_RPRangeMaxUnit | Sensor ResetPoint Unitwise Maximum Range in Trend | REAL |
| Val_RPRangeMin | Sensor ResetPoint Minimum Range in Trend | REAL |
| Val_RPRangeMinUnit | Sensor ResetPoint Unitwise Minimum Range in Trend | REAL |
| Val_SPRangeMax | Sensor SwitchPoint Maximum Range in Trend | REAL |
| Val_SPRangeMaxUnit | Sensor SwitchPoint Unitwise Maximum Range in Trend | REAL |
| Val_SPRangeMin | Sensor SwitchPoint Minimum Range in Trend | REAL |
| Val_SPRangeMinUnit | Sensor SwitchPoint Unitwise Minimum Range in Trend | REAL |
| Val_Trig1OffDelay | Displays the Delay Value for the change of state from ON to OFF for the Triggered1 | DINT |
| Val_Trig10nDelay | Displays the Delay Value for the change of state from OFF to ON for the Triggered1 | DINT |
| Val_Trig1RP | Displays the value of system pressure that turns the sensor output OFF for Trigger1 | REAL |
| Val_Trig1SP | Display the value of system pressure that turns the sensor output OFF for Trigger1 | REAL |
| Val_Trig2OffDelay | Displays the Delay Value for the change of state from ON to OFF for the Triggered2 | DINT |
| Val_Trig2OnDelay | Displays the Delay Value for the change of state from OFF to ON for the Triggered2 | DINT |
| Val_Trig2RP | Displays the value of system pressure that turns the sensor output OFF for Trigger2 | REAL |
| Val_Trig2SP | Display the value of system pressure that turns the sensor output OFF for Trigger2 | REAL |
| Val_UpdateRate | Displays Sensor Display Update Rate; 0=1Hz, 1=2Hz, 2=5 Hz, 3=10Hz | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 836P device object connected to channel #2 of a POINT I/O 1734-4IOL IO-Link Master module in slot #1 of a POINT I/O adapter named *Racko*1.

| | Sensor836P_101 Input Interface | | Sensor 836P 101 | |
|---|-----------------------------------|-------------------|--------------------------------|------------------------|
| | COP | raC_Dvc_836P_4IO | L | |
| ł | Source Rack01:1:I.Fault | raC_Dvc_836P_4I0 | L Sensor836P_101 | |
| | Dest Sensor836P_101_Inp_I.Fault | Ref_Module | PointIO_4IOL_Master | -(Sts_Connected)- |
| | Length 7 | Write_Index | Sensor836P_101_Write_Index | |
| | | Read_Index | Sensor836P_101_Read_Index | -(Sts_Available) |
| | | Write_SubIndex | Sensor836P_101_Write_SubIndex | |
| | | Read_SubIndex | Sensor836P_101_Read_SubIndex | -(Sts_Warning) |
| | | Msg_Sensor_Data | Sensor836P_101_Msg_Sensor_Data | |
| | | Ref_Ctrl_Set | Sensor836P_101_CtrlSet | -(Sts_Faulted) |
| | | Ref_Ctrl_Cmd | Sensor836P_101_CtrlCmd | (a) a () |
| | | Ref_Ctrl_Sts | Sensor836P_101_CtrlSts | <pre>Sts_Ready)—</pre> |
| | | Int_Lookup | raC_DVC_836P_Inflable | |
| | | inp_i | Sensor836P_101_Inp_I | |
| | | inp_cnx1riggered1 | Racku1:1:I.Cn21riggered1 | |
| | | les ObsTrisseredo | De el 04/4/ ChOTriese et do | |
| | | inp_cnx1riggered2 | Racku1:1:1.Ch21riggered2 | |
| | | Inn ChyBronouro | Dook01:1:1 Ch2Bropouro | |
| | | inp_cnxPressure | Rackut. I.I.Ch2Pressure | |
| | | Inn ChNumber | 2 | |
| | | inp_crimatioer | 2 | |
| | | Ref Ctrl Inf | PointIO 4IOI Master Ctrllof | |
| | | Ref Ctrl ltf | PointIO_4IOI_Master_Ctrllff | |
| | | - tot_out_ht | | 1 |

The following example uses the 836P device object connected to channel #0 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.

| Sensor_836P_102 | | |
|-----------------------------------|--|-------------|
| Input Interface | Sensor 102 | |
| COP | raC_Dvc_836P_8IOL | |
| Source Armor_8IOL_MasterB:I.Fault | raC_Dvc_836P_8IOL Sensor_836P_102 | |
| Dest Sensor_836P_102_Inp_I.Fault | Ref_Module Armor_8IOL_MasterB -(Sts_0 | Connected) |
| Length 32 | Write_Index Sensor_836P_102_Write_Index | |
| | Read_Index Sensor_836P_102_Read_Index(Sts_A | Available)— |
| | Write_SubIndex Sensor_836P_102_Write_SubIndex | |
| | Read_SubIndex Sensor_836P_102_Read_SubIndex(Sts_V | Narning)— |
| | Msg_Sensor_Data Sensor_836P_102_Msg_Sensor_Data | |
| | Ref_Ctrl_Set Sensor_836P_102_CtrlSet -(Sts_F | Faulted)— |
| | Ref_Ctrl_Cmd Sensor_836P_102_CtrlCmd | |
| | Ref_Ctrl_Sts Sensor_836P_102_CtrlSts -(Sts_F | Ready)— |
| | Inf_Lookup raC_Dvc_836P_InfTable | |
| | Inp_I Sensor_836P_102_Inp_I | |
| | Inp_ChxTriggered1 Armor_8IOL_MasterB:I.Ch0Triggered1 | |
| | 0 🗭 | |
| | Inp_ChxTriggered2 Armor_8IOL_MasterB:I.Ch0Triggered2 | |
| | 0 🖛 | |
| | Inp_ChxPressure Armor_8IOL_MasterB:I.Ch0Pressure | |
| | 0. | |
| | Inp_ChNumber 0 | |
| | Dof Ctrl Inf Armer 2001 MasterB Ctrlinf | |
| | Def Ctrl Hf Armor SIOL MasterB CtrlHf | |
| | ATTIOLOUL Masterb_ctritt | |

The following example uses the 836P Type1 Sensor device object connected to channel #14 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named Mod_Master_5032_2.

| Sensor_836P_Type1 Input Interface COP Source Mod_836P_Type11 Dest Sensor_836P_Type1_Inp_1 Length 1 | Sensor_836P_Type1 Configuration Interface Device Access Locks Data COP Source Mod_836P_Type1CDevice_Access_Locks Dest Sensor_836P_Type1_Cfg_C.Device_Access_Locks Length 10 | raC_Dvc_836P_Type1_5032 raC_Dvc_836P_Type1_50 Ref_Module Ref_MsgCustSetIdx Ref_MsgCustSetIdx Ref_MsgData Ref_Ctrl_Set Ref_Ctrl_Set Ref_Ctrl_Sts Ref_Ctrl_Sts Ref_Ctrl_Ift Ref_Ctrl_Ift | Sensor_836P_Type1 Sensor_836P_Type1 Mod_836P_Type1 Sensor_836P_Type1_SetIndex sensor_836P_Type1_CetIndex sensor_836P_Type1_CotIndex Sensor_836P_Type1_ChtCl Sensor_836P_Type1_ChtCl Sensor_836P_Type1_ChtCl Sensor_836P_Type1_ChtCl Sensor_836P_Type1_ChtCl Sensor_836P_Type1_ChtCl Sensor_836P_Type1_ChtCl Mod_Master_5032_2_Cthtlf | -(Sts_Connected)- -(Sts_Available) -(Sts_Waming) -(Sts_Faulted) -(Sts_Ready) |
|---|--|---|---|--|
| | | Inp_I Cfg_C Inp_ChNumber | Sensor_836P_Type1_Inp_I Sensor_836P_Type1_C1g_C 14 | Access_Locks Access_Locks 10 |

The following example uses the 836P Type2 Sensor device object connected to channel #0 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named Mod_Master_5032_3.



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|-----------------------|------------------------------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description#120: Display's left position(e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_PresSens | SS SILIS NINNN.NNN kg/cm2 | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|--------------------------------|--|---|
| AOG_836P_ Launch | SS S NNNNN.NNN kg/cm2 | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Properties Animations Events Animations Events EVENTS AOL_Tag Image: PAC_VD mail Image: PAC_VD mail AOL_Tag Image: PAC_VD mail Image: PAC_VD ma |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Sensor_836P_102 | Sensor 102 |
|-------------------------|-----------------------------------|
| Sensor_836P_102_CtrlCmd | Sensor_836P_102 Command Interface |
| Sensor_836P_102_CtrlSet | Sensor_836P_102 Setting Interface |
| Sensor_836P_102_CtrlSts | Sensor_836P_102 Status Interface |
| Sensor_836P_102_Inp_I | Sensor_836P_102 Input Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Trigger1 Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 5 | Trigger2 Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 6 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 7 | Process Data - Pressure: Displays the current pressure value along with unit. |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name or Locate Toggle Switch require pressing the 'Config Apply' button in the Config tab to update the sensor parameters. |

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description | | | |
|------|---|--|--|--|
| 1 | Pressure Bar Graph Purple Indicators: Min/Max since power up Light Blue Triangle Indicator: Current value | | | |
| 2 | Pressure Current Value | | | |
| 3 | Operating Hours Since Inception | | | |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action decisions. One trend is displayed for Pressure.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Pressure.

| Sensor 1 | ensor 102 | | | | |
|------------------------|------------------------|---|--|--|--|
| $\widehat{\mathbf{w}}$ | Ready | | | | |
| | Trend and Spark Limits | × | | | |
| | Pressure Scale | | | | |
| ! | Minimum -14.500 PSI | | | | |
| | Maximum 14.500 PSI | | | | |
| | | | | | |
| | | | | | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Trigger Settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| Press_1 | 4003L | | | × | | | |
|---------|---------------------|--------------|---------------------|-----------------------------------|--|--|--|
| | Ready | | | | | | |
| Ð | Parameter Settings | | | | | | |
| ~ | Update Rate | 5 Hz | Display Mode | Current Pressure | | | |
| S) | Display Units | PSI | Display Rotation | O deg | | | |
| | Trigger Settings | Config Apply | | Local Parameter Unlock Om Lock | | | |



Update Rate- The Update rate will allow the operators to change how often the sensor display is updated. Available options are 1 Hz, 2 Hz, 5 Hz, and 10 Hz. The default rate is 5 Hz.

Display Mode- The Display Mode will allow the operators to change the type of information that should be shown on the unit display. Operators can select – Current Pressure, Highest Pressure, Lowest Pressure, Triggered 1 Set Pressure, Triggered 1 Reset Pressure, Triggered2 Set Pressure (only available in 2 PNP models), Triggered2 Reset Pressure (only available in 2 x PNP models) and Display OFF.

Display Units- This parameter allows you to change the pressure measurement that is shown in the sensor display. Acceptable units are psi, bar, MPa, kPa, and kg/cm2. The default display unit for these sensors is psi.

Display Rotation- This parameter allows operators to change the orientation of the status indicator by 180°. This feature is deal for applications where the display may be in a direction that's not visible to the operator and needs to be rotated for ease of use

Lock/Unlock- This parameter keeps unauthorized people from changing the sensor settings when using the local push buttons. Toggle the lock/unlock button to prevent parameterization using local push buttons.
| 4003L | | |
|------------------|-----------|------------|
| Ready | | |
| Trigger Settings | | |
| | Trigger 1 | Trigger 2 |
| Switch Point | 14.50 PSI | 14.50 PSI |
| Reset Point | -1.02 PSI | 13.10 PSI |
| Operating Mode | Window | Hysteresis |
| On Delay | ms | ms |
| Off Delay | 0 ms | 0 ms |

The Trigger settings divided into sections:

- Trigger 1 Visible for Single output sensor
- Trigger 2 Visible for two output sensor

Switch Point- Triggered1 Switch Point/Window High-Condition 1: Sets the system Pressure that turns the sensor output ON when operating in Hysteresis Mode. Or turns the sensor output OFF when the system Pressure exceeds the set value in Window Mode. The operating mode for Triggered1 can be changed by modifying the Function parameter.

To set the desired Set-point value please refer the pressure range of the 836P pressure sensor from the user manual

Reset Point- Triggered1 Reset Point/Window Low-Condition 2: Sets the system Pressure that turns the sensor output OFF when operating in Hysteresis Mode. Or it turns the sensor output ON when the system Pressure exceeds the set value in Window Mode. The operating mode for Triggered1 can be changed by modifying the Function parameter. Touch within the Reset Point window to change the value. To set the desired Reset point value please refer the pressure range of the 836P pressure sensor from the user manual.

On Delay- Delays the change of state from OFF to ON for the Triggered1 parameter (Output1 in SIO) for up to 32 seconds when the polarity is defined as Normally Open. This parameter helps operators filter out unwanted Pressure peaks in their systems.

Off Delay- Delays the change of state from ON to OFF for the Triggered1 parameter (Output1 in SIO) for up to 32 seconds when the polarity is defined as Normally Open. This parameter helps operators filter out unwanted Pressure peaks in their systems. **Operating Mode-** This parameter defines the operating mode for Triggered1 sensor output. The output can be configured to operate in the following modes.

• Hysteresis Mode: Output1 and the Triggered1 process data parameter turn ON when the Pressure value is higher than the Switch Point. And turns OFF when the Pressure value is lower than the reset point.

• Window Mode: Output1 and the Triggered1 process data parameter turn ON when the Pressure value is between the Switch Point and the Reset Point. It turns OFF when the Pressure value is higher than the Switch Point or lower than the Reset Point.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| Press_1 | 14003L | | | X |
|---------|---------------------|--------------|---------------------|-----------------------------------|
| | Ready | | | |
| Ð | Parameter Sett | ings | | |
| ~ | Update Rate | 5 Hz | Display Mode | Current Pressure |
| S) | Display Units | PSI | Display Rotation | O deg |
| | Trigger Settings | Config Apply | | Local Parameter Unlock Om Lock |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.



After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code ManagerIO-Link Device Library objects can be set-up and configured using Studio 5000Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_836P_4I0L, raC_Dvc_836P_8I0L, raC_Dvc_836P_Type1_5032, raC_Dvc_836P_Type2_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_836P_4IOL, raC_LD_Dvc_836P_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_836P_Type1_5032, raC_LD_Dvc_836P_Type2_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-----------------|---------------------|------------------|-------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 836P), This name depends upon the TagName assigned to object. |

| SensorType | 836P-D1xxxA14PA-D4 | 836P-D1xxxA14PA-D4 | 836P-D1xxxA14PA-D4 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
|-------------------|--------------------|--------------------|--------------------|--|
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|-------------------------|-------------------|----------|-----------------|----------|
| raC_Dvc_836P_4IOL | raC_Dvc_836P_4IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_836P_8IOL | raC_Dvc_836P_8IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_836P_Type1_5032 | raC_Dvc_836P_5032 | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_836P | Faceplate ME | (raC-3_xx-ME) raC_Dvc_836P-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_836P | Faceplate SE | (raC-3_xx-SE) raC_Dvc_836P-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |

| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
|-----------------------|------------------|---------------------------------------|--|
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

837T - Solid-State Temperature Sensor (raC_Dvc_837T_4IOL, raC_Dvc_837T_8IOL, raC_Dvc_837T_Type1_5032, raC_Dvc_837T_Type2_5032)

Overview

The 837T Solid-State Temperature Sensor device object (raC_Dvc_837T_4IOL, raC_Dvc_837T_8IOL, raC_Dvc_837T_Type1_5032, raC_Dvc_837T_Type2_5032) includes HMI faceplate's which displays device information including:

- Sensor data
- Sensor diagnostics
- Process data trending
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_837T_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.
- **Polarity:** This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate).

The 837T Solid-State Temperature Sensor Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Functional Description

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix[®] firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the */Studio 5000 Logix Designer Files - L5X/* folder in the library. Each device is supplied with four versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|---|--------------------------------------|---------------------------------------|
| | POINT 1/0 1734-410L | 837T-D3xxxxxxxPA-D4, 837T-D3xxxxxxxPP-D4 | raC_Dvc_837T_410L_3.02_A01.L5X | raC_Dvc_837T_410L_3.02_RUNG.L5X |
| | ArmorBlock 1732E-8I0LM12R | 837T-D3xxxxxxxPA-D4, 837T-D3xxxxxxxPP-D4 | raC_Dvc_837T_8I0L_3.02_A0I.L5X | raC_Dvc_837T_810L_3.02_RUNG.L5X |
| 837T | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | 837T-D3xxxxxxPA-D4 | raC_Dvc_837T_Type1_5032_3.02_A0I.L5X | raC_Dvc_837T_Type1_5032_3.02_RUNG.L5X |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | 837T-D3xxxxxxPP-D4 | raC_Dvc_837T_Type2_5032_3.02_A0I.L5X | raC_Dvc_837T_Type2_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 837T | Display | (raC-3_02-ME) raC_Dvc_837T-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_837T-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 837T | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) | |
|--------------------------|------------------------------|---|--|--|
| | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_837T_4IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_837T_4IOL_(3.2) | |
| 837T | ArmorBlock 1732E-8IOLM12R | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_837T_8IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_837T_8IOL_(3.2) | |
| | 5032-810LM12DR | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_837T_Type1_5032_(3.2) | (PALLE) Davice Davice ICL ink ref LD Dvc 9377 5032 (3.2) | |
| | 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_837T_Type2_5032_(3.2) | 1/14-LID/_DEVICE_DEVICE_IU-LIIIN_I dC_LD_DVC_03/1_3032_(3.2) | |

Device Definition (raC_Dvc_837T_4IOL, raC_Dvc_837T_8IOL)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



2. Specify the Application Specific Name e.g. VesselTemp_100

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storage | |
|---------|---------|---------------|-----------------|---------------------------|----------------------|--------------------|--------------|---|
|) | 10-Link | Allen-Bradley | 837T-D3N14B25PA | VesselTemp_100 | Exact M 🗸 | | Enable ADC | |
| 1 | 10-Link | Allen-Bradley | 837T-D3G12B25PP | VesselTemp_101 | Exact M 🗸 | | Enable ADC | • |
| 2 | 10-Link | | | | | | | |
| 3 | 10-Link | | | | | | | |
| 4 | 10-Link | | | | | | | |
| 5 | 10-Link | | | | | | | |
| 6 | IO-Link | | | | | | | |
| 7 | IO-Link | | | | | | | |
| c | | | | | | | | |

Device Definition (raC_Dvc_837T_Type1_503 2, raC_Dvc_837T_Type2_5032)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction. 1. Go to Properties of 5032-8IOLM12M12LDR/A Master Module >>

. Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| OK Path: AB_ETH-1\10.112.131.147\Backplane\9* Energy Storage IO Offfine No Forces No Edits | 옥 뷺 티 역 & Redundancy 태양 이 | Favorites Ad | ⊣⊢ ++ () (0) (L) d-On PlantPAx Safet | ty Alarms Bit | Module [| Definition | | | | |
|---|------------------------------|-----------------|---|-------------------|------------|------------|--------------------|--------------------------------------|----------------------------------|------------|
| troller Organizer 🔹 🕈 🗙 | Module Properties: EN2 | TR (5032-8IOLM1 | 2M12LDR 2.011) × | | Series: | | A | V | | |
| | General | General | | | Revision: | | 2 | V 011 📥 | | |
| Controller Master_IOLink_5032 | Connection Module Info | Tunar | 5022 8101 M12M12LDB 8 | IO Link Channel R | Electronic | Keying: | Comnatible | Module | ~ | |
| Controller Fault Handler | Channels | Vendor: | Rockwell Automation/Allo | n-Bradley | Connectio | n: | Data | | | |
| Power-Up Handler | | Parent: | EN2TR | in brouley | L | | | | السن | |
| Tasks | - 02 - IO-Link | Name | Mod Mactor5022 | | | | | | | |
| ▲ €* Mainlask ▶ 5 MainProgram | - 04 - IO-Link | Name: | mou_master 2022 | | | | | | C | hannel |
| Unscheduled | 06 - 10-Link | Description: | | | | | IO-Link | | Мо | de Type |
| Motion Groups | - 10 - 10 - Link | | | w | Port | Channel | Class B Enabled | Channel Mode | | Q |
| Alarm Manager | 12 - IO-Link | | | | | | Enubicu | | ā | Lin D |
| Assets | Internet Protocol | Module Definit | on | Churry | 1— | 0 | | IOJ ink | _ 1 _ | 2 |
| Data Types | Port Configuration | | 70 | Change | 0 | 1 | | Digital Output, Short Circuit, No Lo | ad 🗹 🗸 | 1 |
| Trends | - Network | Series: | A | | 1 | 2 | | IO-Link | ~ 1 | 1 1 |
| l ogical Model | Servers | Revision: | 2.011 | | _ | 3 | | Digital Input | <u> </u> | 1 |
| I/O Configuration | 2000 AND A | Electronic Key | ing: Compatible | Module | 2 | 5 | | Disabled | | 1 |
| = 1756 Backplane, 1756-A10 | | Constantion (| р Р.н. | | - | 6 | _ | IO-Link | · ~ J | <i>J J</i> |
| ▲ ¶ [1] 1756-FN2TR FN2TR | | Connection: | Data | | 3 | 7 | | Disabled | ~ | 1 |
| A 🛱 Ethernet | | | | | 12 | 8 | | IO-Link | ~ J | 1 1 |
| 1 1756-ENIZTR ENIZTR | | | | | 4 | 9 | | Disabled | × 1 | 1 |
| ▶ # 5022 9/01M12M12LDP/A Mod Master5022 | | | | | 5 | 10 | | IO-Link | ~ 1 | 1 1 |
| TOL 1756 LOSE Mactor JOLink 5022 | | | | | | 11 | | Disabled | ✓ ✓ | 1 |
| P Therest | | | | | 6 | 12 | | IO-Link | ✓ ✓ | 11 |
| | | | | | | 13 | | UISabled IO Link | <u> </u> | |
| IP 1/56-L85E Master_IOLINK_5032 | | | | | 7 | 14 | | IO-LIIK | <u> </u> | 11 |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 837T, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 837T Sensor.
 - - 🖌 📟 1756 Backplane, 1756-A7
 - [0] 1756-L85E Master_5032_Test_Cases
 - ▲ 🔓 Ethernet
 - P 1756-L85E Master_5032_Test_Cases
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_1
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_2
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_3
 - A OIO-Link
 - 0 836P-D1xxxA36PP-D4 (182) Mod_836P_Type2
 - 2 837T-D3xxxxxxPA-D4 (207) Mod_837T_Type1
 - 4 837T-D3xxxxxxPP-D4 (206) Mod_837T_Type2
 - 6 856T-B24LC (297) Mod_856T
 - 78 871C-D1NP4-AP3 (80) Mod_871C
 - I0 871FM-M10BA30-xxxx (200) Mod_871FM_Type1
 - 12 871FM-M1NP5-AP3 (129) Mod_871FM_Type2
 - @ 14 871TM-M10NP18-A2 (101) Mod_871TM

3. Configure the parameters of sensor from configuration tab from AOP of the 837T sensor.

| Controller Organizer 👻 🕈 🗙 | 📙 MainProgram - MainRouti | ne 🔋 Module Properties: Mod_Master_5032_3:2 (8: | 37T-D | ЗххххххххРА-D4 (207) 1.1) 🚿 | | | |
|---|---------------------------|---|-------|-----------------------------|-------|----------|---|
| a •= | General | Configuration | | | | | |
| ▶ @ raC_Dvc_871C_5032 | Connection | | | | | | |
| ▶ @ raC_Dvc_871TM_5032 | Device Info | Nama | DAM | Value | Unito | Stulo | Description |
| Image: | Parameters | Name | POVV | value | Units | Style | Description |
| raC_Dvc_873P_Type2_5032 | Event Log | User Specific Information | | | | | |
| raC_Dvc_875L_5032 | | Application-specific Tag | rw | *** | | | |
| 🕨 🛑 Data Types | | ▲ Parameter | 1 1 | | | | |
| Trends | | ▲ Triggered1 | | | | | |
| h₅ Logical Model | | Triggered1 Switch Point / Window High - Co | rw | 176.0 | ۴F | Float 🗸 | Hysteresis: Set point Triggered1 / window : wind |
| ▲ Section 4 Sec | | Triggered1 Reset Point / Window Low - Con | rw | 175.0 | ۴F | Float V | Hysteresis: Reset point Triggered1 / window : wi |
| ▲ 💷 1756 Backplane, 1756-A7 | | On Delay | rw | <u>∽</u> 0 | ms | Decimi ~ | Set Delay Triggered1 |
| [0] 1756-L85E Master_5032_Test_Cases | | Off Delay | rw | <u>∽</u> (| ms | Decim | Reset Delay Inggered I |
| ▲ 윪 Ethernet | | Device Access | | | | | |
| 1756-L85E Master_5032_Test_Cases | | Password | rw | V 0 | | Decim: ~ | Password for Display |
| 5032-8IOLM12M12LDR/A Mod Master 5032 1 | | Local User Interface | rw | Unlocked 🗸 | | | This lock prevents the access to the device setti |
| 5032-8IOLM12M12LDR/A Mod Master 5032 2 | | Service Function | | | | | |
| 5032-8IOI M12M12LDR/A Mod Master 5032 3 | | Unit | rw | Fahrenheit 🗸 | | | Temperature Unit |
| 10-1 ink | | Display Rotation | ſW | Default 🗠 | | | Rotation of Display |
| 0.836P-D1vvvA36PP-D4 (182) Mod 836P Type2 | | Mode | rw | Current Temperature | | | Choice of Displayed Value |
| 1 2 837T-D3vvvvvPA-D4 (207) Mod 837T Type1 | | Locator indicator | rw | 0π ⊻ | | | The display shows Location indicator and is flash |
| 4 927T-D2xxxxxvPD-D4 (206) Mod 927T Type? | | | | | | | |
| 6 856T_B24IC (207) Mod 856T | | | | | | | |
| 29 971C D1NDA AD2 (90) Mod 971C | | | | | | | |
| ** 0 07 IC*D INF**AF3 (00) W00_07 IC *(10.971EM_M10DA20_vage (200) Mod_971EM_Tupo1 | | Insert Factory Defaults | | | | | |
| | | | | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_837T_4I0L, raC_Dvc_837T_8I0L)

| InOut | Function / Description | DataType |
|-----------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_837T_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_837T_Inp_4IOL Or raC_UDT_ItfAD_837T_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_ltf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |

Input Data

| Input | Function/Description | DataType |
|------------------------|---|----------|
| Inp_ChxTriggered1 | Triggered Status When the Temprature is equal to Defined Temperature Set for Trigger1 | BOOL |
| Inp_ChxTriggered2 | TriggeredStatusWhentheTemperatureisequaltoDefinedTemperature Set for Trigger2 | BOOL |
| Inp_ChxTemperature | Displays Temperature Value of the Sensor | INT |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_DisplayModePA | Set type of Information shown on Unit Display; O=Current Temperature, 1=Highest Temperature, 2=Low Temperature, 3=Triggered1 Set Temperature, 4=Triggered1 Reset Temperature, 5=Display OFF | DINT |
| Cfg_DisplayModePP | Set type of Information shown on Unit Display: 0=Current Temperature, 1=High Temperature, 2=Low Temperature, 3=Triggered1 Set Temperature, 4=Triggered1 Reset Temperature, 5=Triggered2 Set Temperature, 6=Triggered2 Reset Temperature, 7=Display OFF | DINT |
| Cfg_DisplayRotation | Set the change of orientation of the status indicator by 180°; O=Default, 1=Rotate 180 Degrees | DINT |
| Cfg_MeasuringtUnit | Set Measuring Unit; 0=Celsius, 1=Fahrenheit | DINT |
| Cfg_OperatingModeTrig1 | Set Operating Modes for Triggered1 Output; O=Hysteresis, 1=Window | INT |
| Cfg_OperatingModeTrig2 | Set Operating Modes for Triggered2 Output; O=Hysteresis, 1=Window | INT |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_ResetTemp | Reset Command for Temperature | BBOL |
| Set_TrendTempMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |

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| Input | Function/Description | DataType |
|-----------------------|---|----------|
| Set_TrendTempMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |
| Set_Trig10ffDelay | Set the Delay Value for the change of state from ON to OFF for the Triggered1 | DINT |
| Set_Trig10nDelay | Set the Delay Value for the change of state from OFF to ON for the Triggered1 | DINT |
| Set_Trig1RP | Set the value of system Temperature that turns the sensor output OFF for Trigger1 | REAL |
| Set_Trig1SP | Set the value of system Temperature that turns the sensor output ON for Trigger1 | REAL |
| Set_Trig2OffDelay | Set the Delay Value for the change of state from ON to OFF for the Triggered2 | DINT |
| Set_Trig2OnDelay | Set the Delay Value for the change of state from OFF to ON for the Triggered2 | DINT |
| Set_Trig2RP | Set the value of system Temperature that turns the sensor output OFF for Trigger2 | REAL |
| Set_Trig2SP | Set the value of system Temperature that turns the sensor output ON for Trigger2 | REAL |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_CatPA | Catalog of Connected Sensor; 0=PP, 1=PA | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; O=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Val_MeasuringUnit | Displays the Temperature Measurement Unit; 0=Celsius, 1=Fahrenheit | INT |
| Val_Mode | As per Connected Sensor Catalog | INT |
| Val_OperatingHrsSinceInception | Displays the Total Sensor Operating Hours since the sensor was first powered ON | DINT |
| Val_OperatingModeTrig1 | Displays Operating Modes for Triggered1 Output; O=Hysteresis, 1=Window | INT |
| Val_OperatingModeTrig2 | Displays Operating Modes for Triggered2 Output; O=Hysteresis, 1=Window | INT |
| Val_Temperature | Displays Temperature Value of the Sensor | REAL |
| Val_ChTemprature | Displays Converted Temperature Value of the Sensor | REAL |
| Val_TemperatureMaxSinceReset | Displays Highest Recorded Temperature Value since the last Temperature reset | REAL |
| Val_TemperatureMinSinceReset | Displays Lowest Recorded Temperature Value since the last Temperature reset | REAL |
| Val_Rotation | Displays the change of orientation of the status indicator by 180°; 0=0 Deg, 1=Rotate 180 Degrees | INT |
| Val_RPRangeMax | Sensor ResetPoint Maximum Range in Trend | REAL |
| Val_RPRangeMaxUnit | Sensor ResetPoint Unitwise Maximum Range in Trend | REAL |
| Val_RPRangeMin | Sensor ResetPoint Minimum Range in Trend | REAL |
| Val_RPRangeMinUnit | Sensor ResetPoint Unitwise Minimum Range in Trend | REAL |
| Val_SPRangeMax | Sensor SwitchPoint Maximum Range in Trend | REAL |
| Val_SPRangeMaxUnit | Sensor SwitchPoint Unitwise Maximum Range in Trend | REAL |
| Val_SPRangeMin | Sensor SwitchPoint Minimum Range in Trend | REAL |
| Val_SPRangeMinUnit | Sensor SwitchPoint Unitwise Minimum Range in Trend | REAL |

| Output | Function/Descritpion | DataType |
|---------------------------|--|----------|
| Val_Trig1OffDelay | Displays the Delay Value for the change of state from ON to OFF for the Triggered1 | DINT |
| Val_Trig1OnDelay | Displays the Delay Value for the change of state from OFF to ON for the Triggered1 | DINT |
| Val_Trig1RP | Displays the value of system Temperature that turns the sensor output OFF for Trigger1 | REAL |
| Val_Trig1SP | Display the value of system Temperature that turns the sensor output OFF for Trigger1 | REAL |
| Val_Trig2OffDelay | Displays the Delay Value for the change of state from ON to OFF for the Triggered2 | DINT |
| Val_Trig2OnDelay | Displays the Delay Value for the change of state from OFF to ON for the Triggered2 | DINT |
| Val_Trig2RP | Displays the value of system Temperature that turns the sensor output OFF for Trigger2 | REAL |
| Val_Trig2SP | Display the value of system Temperature that turns the sensor output OFF for Trigger2 | REAL |
| Val_UpdateRate | Displays Sensor Display Update Rate; 0=1Hz, 1=2Hz, 2=5 Hz, 3=10Hz | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_837T_Type1_503 2, raC_Dvc_837T_Type2_5032)

| InOut | Function / Description | DataType |
|-----------------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_837T_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_I0LinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_837T_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_837T_Type1_Cfg or raC_UDT_IOLink_837T_Type2_Cfg |
| | | |

Input Data

| Input | Function/Description | DataType |
|------------------------|---|----------|
| Inp_ChxTriggered1 | Triggered Status When the Temprature is equal to Defined Temperature Set for Trigger1 | BOOL |
| Inp_ChxTriggered2 | Triggered Status When the Temperature is equal to Defined Temperature Set for Trigger2 | BOOL |
| Inp_ChxTemperature | Displays Temperature Value of the Sensor | INT |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_DisplayModePA | Set type of Information shown on Unit Display; O=Current Temperature, 1=Highest Temperature, 2=Low Temperature, 3=Triggered1 Set Temperature, 4=Triggered1 Reset Temperature, 5=Display OFF | DINT |
| Cfg_DisplayModePP | Set type of Information shown on Unit Display; 0=Current Temperature, 1=High Temperature, 2=Low Temperature, 3=Triggered1 Set Temperature, 4=Triggered1 Reset Temperature, 5=Triggered2 Set Temperature, 6=Triggered2 Reset Temperature, 7=Display OFF | DINT |
| Cfg_DisplayRotation | Set the change of orientation of the status indicator by 180°; D=Default, 1=Rotate 180 Degrees | DINT |
| Cfg_MeasuringtUnit | Set Measuring Unit; 0=Celsius, 1=Fahrenheit | DINT |
| Cfg_OperatingModeTrig1 | Set Operating Modes for Triggered1 Output; 0=Hysteresis, 1=Window | INT |
| Cfg_OperatingModeTrig2 | Set Operating Modes for Triggered2 Output; O=Hysteresis, 1=Window | INT |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_ResetTemp | Reset Command for Temperature | BBOL |

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| Function/Description | DataType |
|---|---|
| Module reconfigure Command | BOOL |
| Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Trend Tab Min value for VD/ME/SE faceplate | DINT |
| Set the Delay Value for the change of state from ON to OFF for the Triggered1 | DINT |
| Set the Delay Value for the change of state from OFF to ON for the Triggered1 | DINT |
| Set the value of system Temperature that turns the sensor output OFF for Trigger1 | REAL |
| Set the value of system Temperature that turns the sensor output ON for Trigger1 | REAL |
| Set the Delay Value for the change of state from ON to OFF for the Triggered2 | DINT |
| Set the Delay Value for the change of state from OFF to ON for the Triggered2 | DINT |
| Set the value of system Temperature that turns the sensor output OFF for Trigger2 | REAL |
| Set the value of system Temperature that turns the sensor output ON for Trigger2 | REAL |
| | Function/DescriptionModule reconfigure CommandTrend Tab Max value for VD/ME/SE faceplateTrend Tab Min value for VD/ME/SE faceplateSet the Delay Value for the change of state from ON to OFF for the Triggered1Set the Delay Value for the change of state from OFF to ON for the Triggered1Set the value of system Temperature that turns the sensor output OFF for Trigger1Set the value of system Temperature that turns the sensor output ON for Trigger2Set the Delay Value for the change of state from ON to OFF for the Triggered2Set the Delay Value for the change of state from ON to OFF for the Triggered2Set the value of system Temperature that turns the sensor output OFF for Trigger2Set the value of system Temperature that turns the sensor output OFF for Trigger2 |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_CatPA | Catalog of Connected Sensor; 0=PP, 1=PA | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; O=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_MeasuringUnit | Displays the Temperature Measurement Unit; O=Celsius, 1=Fahrenheit | INT |
| Val_Mode | As per Connected Sensor Catalog | INT |
| Val_OperatingHrsSinceInception | Displays the Total Sensor Operating Hours since the sensor was first powered ON | DINT |

| Output | Function/Descritpion | DataType |
|------------------------------|--|----------|
| Val_OperatingModeTrig1 | Displays Operating Modes for Triggered1 Output; O=Hysteresis, 1=Window | INT |
| Val_OperatingModeTrig2 | Displays Operating Modes for Triggered2 Output; O=Hysteresis, 1=Window | INT |
| Val_Temperature | Displays Temperature Value of the Sensor | REAL |
| Val_ChTemprature | Displays Converted Temperature Value of the Sensor | REAL |
| Val_TemperatureMaxSinceReset | Displays Highest Recorded Temperature Value since the last Temperature reset | REAL |
| Val_TemperatureMinSinceReset | Displays Lowest Recorded Temperature Value since the last Temperature reset | REAL |
| Val_Rotation | Displays the change of orientation of the status indicator by 180°; O=O Deg, 1=Rotate 180 Degrees | INT |
| Val_RPRangeMax | Sensor ResetPoint Maximum Range in Trend | REAL |
| Val_RPRangeMaxUnit | Sensor ResetPoint Unitwise Maximum Range in Trend | REAL |
| Val_RPRangeMin | Sensor ResetPoint Minimum Range in Trend | REAL |
| Val_RPRangeMinUnit | Sensor ResetPoint Unitwise Minimum Range in Trend | REAL |
| Val_SPRangeMax | Sensor SwitchPoint Maximum Range in Trend | REAL |
| Val_SPRangeMaxUnit | Sensor SwitchPoint Unitwise Maximum Range in Trend | REAL |
| Val_SPRangeMin | Sensor SwitchPoint Minimum Range in Trend | REAL |
| Val_SPRangeMinUnit | Sensor SwitchPoint Unitwise Minimum Range in Trend | REAL |
| Val_Trig1OffDelay | Displays the Delay Value for the change of state from ON to OFF for the Triggered1 | DINT |
| Val_Trig1OnDelay | Displays the Delay Value for the change of state from OFF to ON for the Triggered1 | DINT |
| Val_Trig1RP | Displays the value of system Temperature that turns the sensor output OFF for Trigger1 | REAL |
| Val_Trig1SP | Display the value of system Temperature that turns the sensor output OFF for Trigger1 | REAL |
| Val_Trig2OffDelay | Displays the Delay Value for the change of state from ON to OFF for the Triggered2 | DINT |
| Val_Trig2OnDelay | Displays the Delay Value for the change of state from OFF to ON for the Triggered2 | DINT |
| Val_Trig2RP | Displays the value of system Temperature that turns the sensor output OFF for Trigger2 | REAL |
| Val_Trig2SP | Display the value of system Temperature that turns the sensor output OFF for Trigger2 | REAL |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 837T device object connected to channel #0 of a POINT I/O 1734-4IOL IO-Link Master module in slot #1 of a POINT I/O adapter named *Racko*1.

| Sensor 101 |
|--|
| raC_Dvc_837T_4IOL |
| raC_Dvc_837T_4IOL Sensor837T_101 |
| Ref_Module PointIO_4IOL_Master -(Sts_Connected)- |
| Write_Index Sensor837T_101_Write_Index |
| Read_Index Sensor837T_101_Read_Index(Sts_Available)- |
| Write_SubIndex Sensor837T_101_Write_SubIndex |
| Read_SubIndex Sensor837T_101_Read_SubIndex(Sts_Warning)- |
| Msg_Sensor_Data Sensor837T_101_Msg_Sensor_Data |
| Ref_Ctrl_Set Sensor837T_101_CtrlSet -(Sts_Faulted)- |
| Ref_Ctrl_Cmd Sensor837T_101_CtrlCmd |
| Ref_Ctrl_Sts Sensor837T_101_CtrlSts -(Sts_Ready)- |
| Inf_Lookup raC_Dvc_837T_InfTable |
| Inp_I Sensor837T_101_Inp_I |
| Inp_ChxTriggered1 Rack01:1:I.Ch0Triggered1 |
| 0 🗭 |
| Inp_ChxTriggered2 Rack01:1:I.Ch0Triggered2 |
| 0 🗭 |
| Inp_ChxTemperature Rack01:1:I.Ch0Temperature |
| 0 🔶 |
| Inp_ChNumber 0 |
| |
| Ref_Ctrl_Inf PointIO_4IOL_Master_CtrlInf |
| Ref_Ctrl_Itf PointIO_4IOL_Master_CtrlItf |
| |
| |

The following example uses the 837T device object connected to channel #1 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.

| Sensor837T_102 Input | | | | |
|-------------------------------------|--|--|--|--|
| Interface | Sensor 102 | | | |
| COP | raC Due 827T 801 | | | |
| Correct Armen Olol, Manhardhi Fault | | | | |
| Source Armor_OUL_MasterBilFault | | | | |
| Dest Sensor8371_102_Inp_I.Fault | Ret_Module Armor_SIUL_MasterB (Sts_Connected)- | | | |
| Length 32 | Write_Index Sensor837T_102_Write_Index | | | |
| | Read_Index Sensor837T_102_Read_Index(Sts_Available) | | | |
| | Write_SubIndex Sensor837T_102_Write_SubIndex | | | |
| | Read_SubIndex Sensor837T_102_Read_SubIndex(Sts_Warning) | | | |
| | Msg_Sensor_Data Sensor837T_102_Msg_Sensor_Data | | | |
| | Ref Ctrl Set Sensor837T 102 CtrlSet -(Sts Faulted)- | | | |
| | Ref Ctrl Cmd Sensor837T 102 CtrlCmd | | | |
| | Ref Ctrl Sts Sensor837T 102 CtrlSts -(Sts Ready)- | | | |
| | Inf Lookup raC Dvc 837T InfTable | | | |
| | Inp I Sensor837T 102 Inp I | | | |
| | Inp. ChyTriggered1 Armor 8IOL MasterBil Ch1Triggered1 | | | |
| | | | | |
| | Inn. ChyTrianarad? Armar 901. ManterBit Ch1Trianarad? | | | |
| | http://wasterb.i.cin/http://wa | | | |
| | Les Chulterenseiture Armen BIOL Mante-Dil Ch4Terresenture | | | |
| | Inp_cnxTemperature Armor_SIOL_Masterb:1.cn1Temperature | | | |
| | 0 🗭 | | | |
| | Inp_ChNumber 1 | | | |
| | | | | |
| | Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf | | | |
| | Ref_Ctrl_ltf Armor_8IOL_MasterB_Ctrlltf | | | |
| | | | | |

The following example uses the 837T Type1 Sensor device object connected to channel #2 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named Mod_Master_5032_3.



The following example uses the 837T Type2 Sensor device object connected to channel #4 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named Mod_Master_5032_3.



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|-----------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}] #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_TempSens | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

FactoryTalk View ME/SE Graphic Symbols

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|----------------|--|----------------------------------|
| AOG_837T_ Launch | SS | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Properties Animations Events |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Sensor837T_102 | Sensor 102 |
|------------------------|----------------------------------|
| Sensor837T_102_CtrlCmd | Sensor837T_102 Command Interface |
| Sensor837T_102_CtrlSet | Sensor837T_102 Setting Interface |
| Sensor837T_102_CtrlSts | Sensor837T_102 Status Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Trigger1 Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 5 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 6 | Process Data - Temperature: Displays the current Temperature value along with unit. |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name of Locate Toggle Switch require pressing the 'Config Apply' button in the Config tab |

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.

to update the sensor parameters.



| ltem | Description | |
|------|--|--|
| 1 | Temperature Bar Graph Purple Indicators: Min/Max since power up Light Blue Triangle Indicator: Current value | |
| 2 | Temperature Current Value | |
| 3 | Operating Hours Since Inception | |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action decisions. One trend is displayed for Temperature.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Temperature.

| Sensor 1 | 02 | × |
|------------------------|------------------------|---|
| $\widehat{\mathbf{w}}$ | Ready | |
| | Trend and Spark Limits | × |
| 3 | Temperature Scale | |
| | Minimum -14.500 °C | |
| | Maximum 14.500 °C | |
| | | |
| | | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Trigger Settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| Ready | | |
|---------------------|--------------|-------------------------------|
| Parameter Set | tings | |
| Display Mode | Current Temp | Trigger Settings |
| Display Unit | Celsius 🔻 | Config Apply |
| Display Rotation | O deg | Reset High-Lov Temperature |
| | | Local Paramete |

Parameter Settings

Display Mode- The Display Mode will allow the operators to change the type of information that should be shown on the unit display. Operators can select – Current Temperature, Highest Temperature, Lowest Temperature, Triggered 1 Set Temperature, Triggered 1 Reset Temperature, Triggered2 Set Temperature (only available in 2 PNP models), Triggered2 Reset Temperature (only available in 2 x PNP models) and Display OFF.

Display Units- This parameter allows you to change the Temperature measurement that is shown in the sensor display. Acceptable units are psi, bar, MPa, kPa, and kg/cm2. The default display unit for these sensors is psi.

Display Rotation- This parameter allows operators to change the orientation of the status indicator by 180°. This feature is deal for applications where the display may be in a direction that's not visible to the operator and needs to be rotated for ease of use

Lock/Unlock- This parameter keeps unauthorized people from changing the sensor settings when using the local push buttons. Toggle the lock/unlock button to prevent parameterization using local push buttons.

Reset High-Low Temperature- This parameter resets the high and low temperature values stored in the sensor since the last device Reset

| p_10002L | | |
|------------------|----------------------|---|
| Ready | | |
| Trigger Settings | | × |
| | Trigger 1 | |
| Switch Point | 40.0 °C | |
| Reset Point | 20.0 °C | |
| Operating Mode | Hysteresis 🛛 🖤 | |
| On Delay | 500 ms | |
| Off Delay | 1000 ms Config Annly | |

The Trigger settings divided into sections:

- Trigger 1 Visible for Single output sensor
- Trigger 2 Visible for two output sensor

Switch Point- Triggered1 Switch Point/Window High-Condition 1: Sets the system Temperature that turns the sensor output ON when operating in Hysteresis Mode. Or turns the sensor output OFF when the system Temperature exceeds the set value in Window Mode. The operating mode for Triggered1 can be changed by modifying the Function parameter.

To set the desired Set-point value please refer the Temperature range of the 837T Temperature sensor from the user manual

Reset Point- Triggered1 Reset Point/Window Low-Condition 2: Sets the system Temperature that turns the sensor output OFF when operating in Hysteresis Mode. Or it turns the sensor output ON when the system Temperature exceeds the set value in Window Mode. The operating mode for Triggered1 can be changed by modifying the Function parameter. Touch within the Reset Point window to change the value. To set the desired Reset point value please refer the Temperature range of the 837T Temperature sensor from the user manual.

On Delay- Delays the change of state from OFF to ON for the Triggered1 parameter (Output1 in SIO) for up to 32 seconds when the polarity is defined as Normally Open. This parameter helps operators filter out unwanted Temperature peaks in their systems.

Off Delay- Delays the change of state from ON to OFF for the Triggered1 parameter (Output1 in SIO) for up to 32 seconds when the polarity is defined as Normally Open. This parameter helps operators filter out unwanted Temperature peaks in their systems. **Operating Mode-** This parameter defines the operating mode for Triggered1 sensor output. The output can be configured to operate in the following modes.

• Hysteresis Mode: Output1 and the Triggered1 process data parameter turn ON when the Temperature value is higher than the Switch Point. And turns OFF when the Temperature value is lower than the reset point.

• Window Mode: Output1 and the Triggered1 process data parameter turn ON when the Temperature value is between the Switch Point and the Reset Point. It turns OFF when the Temperature value is higher than the Switch Point or lower than the Reset Point.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| Parameter Set | tings | |
|---------------------|--------------|-------------------------------|
| Display Mode | Current Temp | Trigger Settings |
| Display Unit | Celsius 🔻 | Config Apply |
| Display Rotation | O deg | Reset High-Lov Temperature |
| | | Local Paramete |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.



After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_837T_4IOL, raC_Dvc_837T_8IOL, raC_Dvc_837T_Type1_5032, raC_Dvc_837T_Type2_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_837T_4IOL, raC_LD_Dvc_837T_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_837T_Type1_5032, raC_LD_Dvc_837T_Type2_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-----------------|---------------------|------------------|-------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 837T), This name depends upon the TagName assigned to object. |

| SensorType | 837T-D3xxxxxxPA-D4 | 837T-D3xxxxxxPA- D4 | 837T-D3xxxxxxPA-D4 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
|-------------------|--------------------|------------------------|--------------------|--|
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|-------------------------|-------------------|----------|-----------------|----------|
| raC_Dvc_837T_4IOL | raC_Dvc_837T_4IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_837T_8IOL | raC_Dvc_837T_8IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_837T_Type1_5032 | raC_Dvc_837T_8IOL | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject-ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_837T | Faceplate ME | (raC-3_xx-ME) raC_Dvc_837T-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_837T | Faceplate SE | (raC-3_xx-SE) raC_Dvc_837T-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |

| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
|-----------------------|------------------|---------------------------------------|--|
| V3_RM_raC_Dvc_IO_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |
856T - 856T Control Tower Stack Light (raC_Dvc_856T_4I0L, raC_Dvc_856T_8I0L, raC_Dvc_856T_5032)

Overview

The 856T Control Tower Stack Light device object (raC_Dvc_856T_4IOL, raC_Dvc_856T_8IOL, raC_Dvc_856T_5032) includes HMI faceplate's which displays device information including:

- Sensor data
- Sensor diagnostics
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_8567_Objects_Faceplate.MP4"

Primary device object configuration functions include:

Functional Description

Required Files

The 856T Control Tower Stack Light Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplate's for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is

defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|---------------------------|--------------------------------|---------------------------------|
| | POINT I/O 1734-410L | 856T-B24LC | raC_Dvc_856T_4I0L_3.02_A0I.L5X | raC_Dvc_856T_4I0L_3.02_RUNG.L5X |
| 0507 | ArmorBlock 1732E-8I0LM12R | 856T-B24LC | raC_Dvc_856T_8I0L_3.02_A0I.L5X | raC_Dvc_856T_8I0L_3.02_RUNG.L5X |
| 8561 | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 856T-B24LC | raC_Dvc_856T_5032_3.02_A0I.L5X | raC_Dvc_856T_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 856T | Display | (raC-3_02-ME) raC_Dvc_856T-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_856T-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 856T | (raC-3_02-VD) raC_Dvc_IOLink.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|--|---|---|
| | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_856T_410L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_856T_4IOL_(3.2) |
| 856T | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_856T_810L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_856T_8IOL_(3.2) |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_856T_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_856T_5032_(3.2) |

Device Definition (raC_Dvc_856T_4I0L, raC_Dvc_856T_8I0L)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



2. Specify the Application Specific Name e.g. TowerLight_M100

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | | Process Data Input | Data Storage | | Chan Devid |
|---------|---------|---------------|------------|------------------------------|----------------------|--------|--------------------|--------------|---|---------------|
| D | 10-Link | Allen-Bradley | 856T-B24LC | TowerLight_M100 | Exact M | \sim | | Enable ADC | ~ | |
| 1 | 10-Link | Allen-Bradley | 856T-B24LC | TowerLight_M101 | Exact M | \sim | | Enable ADC | ~ | |
| 2 | 10-Link | | | | | | | | | |
| 3 | 10-Link | | | | | | | | | |
| 4 | 10-Link | | | | | | | | | |
| 5 | 10-Link | | | | | | | | | |
| 6 | 10-Link | | | | | | | | | |
| 7 | 10-Link | | | | | | | | | |

Device Definition (raC_Dvc_856T_5032)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass

information from the device into the add-on instruction.

1. Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| Energy Storage Offline . No Forces . No Edits | 유 Redundancy 태 | Favorites | + + + + + + + + + + + + + + + + + + + | (0) (L) x Safety Alarms Bit | Module I | Definition | | | | | |
|---|---------------------------|-----------------|---------------------------------------|--------------------------------|------------|------------|------------|--|------------|----------|----|
| troller Organizer 🔹 🖡 | × 🖞 Module Properties: EN | 2TR (5032-8IOLM | 112M12LDR 2.0 | 11) × | Series: | | A | ¥ | | | |
| Controller Master JOLink 5022 | General | General | | | Revision: | | 2 | V 011 | | | |
| Controller Master_IOLINC_5052 Octorplier Tags | Module Info | Type: | 5032-810I M12N | 1121 DR 8 IO-Link Channel, 8 | Electronic | : Keying: | Compatible | Module | ~ | | |
| Controller Fault Handler | Channels | Vondor | Pachwoll Autom | ation/Allon-Bradlay | Connectio | on: | Data | | | | |
| Power-Up Handler | - 01 - Digital Output | Parent: | ENOTR | adony silen and diey | | | | | | | |
| Tasks | 02 - 10-Link | rarent. | | | | | | | | | |
| () MainTask | - 03 - Digital Input | Name: | Mod_Mastersu | 32 | | í i | | 1 | | hannel | ĩ. |
| P b MainProgram | 06 - IO-Link | Description: | | | | | IO Link | | Mo | de Types | 5 |
| | 08 - IO-Link | | | | Port | Channel | Class B | Channel Mode | | • | 1 |
| Alarm Manager | 12 - 10-Link | | - | Ψ | | | Enabled | | ā | DO | |
| Assets | 14 - IO-Link | Module Defin | ition | | 1 | | | | _ | 101 | |
| Add-On Instructions | Internet Protocol | | | Change | 0 | 0 | | IO-Link | ~ / | 11 | 1 |
| 🛑 Data Types | - Network | Series: | А | | | 1 | | Digital Output, Short Circuit, No Load | <u> </u> | 1 | - |
| Trends | - Time Sync | Paulaian | | | 1 | 3 | - | Digital Input | × | 1 | 1 |
| Logical Model | Servers | Revision: | 2. | 011 | - | 4 | - | IO-Link | ~ / | 11 | 1 |
| I/O Configuration | | Electronic Ke | eying: O | ompatible Module | 2 | 5 | | Disabled | \sim | 1 | 1 |
| 1756 Backplane, 1756-A10 | | Connection: | D | ata | 3 | 6 | | IO-Link | ~ , | 11 | 1 |
| 1] [1] 1756-EN2TR EN2TR | | | | | | 7 | | Disabled | \sim | 1 | 1 |
| ▲ 뷺 Ethernet | | | | | 4 | 8 | | IO-Link | × 1 | 11 | 4 |
| 1756-EN2TR EN2TR | | | | | | 9 | | Disabled | × 1 | ~ | - |
| 5032-8IOLM12M12LDR/A Mod Master5032 | | | | | 5 | 10 | - | Disabled | × √ | 11 | - |
| @ 191 1756-L85E Master IOLink 5032 | | | | | | 12 | | IOJ ink | V V | 1 1 | |
| 去 Ethernet | | | | | 6 | 13 | | Disabled | V | | 1 |
| | | | | | | 14 | - | IO-Link | V 1 | 11 | 1 |
| 1756-185E Master IOLink 5032 | | | | | | | | | | | - |



Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 856T, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 856T Sensor.
 - I/O Configuration IT56 Backplane, 1756-A7 [0] 1756-L85E Master_5032_Test_Cases ▲ 器 Ethernet P 1756-L85E Master_5032_Test_Cases 5032-8IOLM12M12LDR/A Mod_Master_5032_1 5032-8IOLM12M12LDR/A Mod_Master_5032_2 5032-8IOLM12M12LDR/A Mod_Master_5032_3 A OIO-Link 🛿 0 836P-D1xxxA36PP-D4 (182) Mod_836P_Type2 2 837T-D3xxxxxxPA-D4 (207) Mod_837T_Type1 4 837T-D3xxxxxxPP-D4 (206) Mod_837T_Type2 6 856T-B24LC (297) Mod_856T 78 871C-D1NP4-AP3 (80) Mod 871C 10 871FM-M10BA30-xxxx (200) Mod_871FM_Type1 12 871FM-M1NP5-AP3 (129) Mod_871FM_Type2 # 14 871TM-M10NP18-A2 (101) Mod_871TM
- 3. Configure the parameters of sensor from configuration tab from AOP of the 856T sensor.

| Controller Organizer | 🗕 🕈 🔻 📜 | MainProgram - MainRouti | ne 🚦 Module Properties: Mod_Maste | er_5032_3:6 (856T | -B24LC (297) 1.1) × | | |
|---|---------|--|---|--|--|-------------|-------------|
| d = | | General | Configuration | | | | |
| ▶ 個 raC_Dvc_871C_5032 | | Connection | | | | | |
| | | – Connection – Device Info – Configuration – Parameters – Fault/Program Actions – Event Log | Name Identification Application-specific Information Application-specific Tag Parameter Module Configuration Module Type Cortic Configuration Circuit 1 Cycle Counter Oricuit 2 | R/W rw rw | Value Value Volue Volue Volue Volue Volue Volue No Module Volue Volu | Jnits Style | Description |
| ▲ O-Link ■ 0 836P-D1xxxA36PP-D4 (182) Mod_836P_Type2 ♥ 2 837T-D3xxxxxA36PP-D4 (207) Mod_837T_Type1 ♥ 4 837T-D3xxxxxxPP-D4 (206) Mod_837T_Type2 | | | Cycle Counter Circuit 3 Cycle Counter Circuit 4 Cycle Counter | | | | |
| | | | Insert Factory Defaults | TW | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_856T_4I0L, raC_Dvc_856T_8I0L)

| InOut | Function / Description | DataType |
|-----------------------|--|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_856T_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_I0LinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_856T_Inp_4IOL Or raC_UDT_ItfAD_856T_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Out_ChxControlModule1 | Control Module1; Bit 0 = Behaviour, Bit 1 = Behaviour, Bit 2 = Behaviour, Bit 3 = Color/ Sound, Bit 4 = Color/Sound, Bit 5 = Color/ Sound | SINT |
| Out_ChxControlModule2 | Control Module2; Bit 0 = Behaviour, Bit 1 = Behaviour, Bit 2 = Behaviour, Bit 3 = Color/ Sound, Bit 4 = Color/Sound, Bit 5 = Color/ Sound | SINT |
| Out_ChxControlModule3 | Control Module3; Bit 0 = Behaviour, Bit 1 = Behaviour, Bit 2 = Behaviour, Bit 3 = Color/ Sound, Bit 4 = Color/Sound, Bit 5 = Color/ Sound | SINT |
| Out_ChxControlModule4 | Control Module4; Bit 0 = Behaviour, Bit 1 = Behaviour, Bit 2 = Behaviour, Bit 3 = Color/ Sound, Bit 4 = Color/Sound, Bit 5 = Color/ Sound | SINT |
| Out_ChxControlModule5 | Control Module5; Bit 0 = Behaviour, Bit 1 = Behaviour, Bit 2 = Behaviour, Bit 3 = Color/ Sound, Bit 4 = Color/Sound, Bit 5 = Color/ Sound | SINT |
| Out_ChxControlModule6 | Control Module6; Bit 0 = Behaviour, Bit 1 = Behaviour, Bit 2 = Behaviour, Bit 3 = Color/ Sound, Bit 4 = Color/Sound, Bit 5 = Color/ Sound | SINT |
| Out_ChxControlModule7 | Control Module7; Bit 0 = Behaviour, Bit 1 = Behaviour, Bit 2 = Behaviour, Bit 3 = Color/ Sound, Bit 4 = Color/Sound, Bit 5 = Color/ Sound | SINT |
| | | |

Input Data

| Input | Function/Description | DataType |
|--------------------|--|----------|
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxAlarmStatus | Configure Device Object Input Alarm Status | INT |
| Set_VibCalibPeriod | Vibration Calibration Period Set Value | REAL |

| Input | Function/Description | DataType |
|-----------------------|--|----------|
| Set_VibWarningLimitX | Vibration X-axis Warning Limit Set Value | REAL |
| Set_VibWarningLimitY | Vibration Y-axis Warning Limit Set Value | REAL |
| Set_VibWarningLimitZ | Vibration Z-axis Warning Limit Set Value | REAL |
| Cfg_DD1ControlOutput1 | Control Output1 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput2 | Control Output2 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput3 | Control Output3 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput4 | Control Output4 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput5 | Control Output5 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput6 | Control Output6 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput7 | Control Output7 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD2ControlOutput1 | Control Output1 Color or Sound; O = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput2 | Control Output2 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput3 | Control Output3 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput4 | Control Output4 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput5 | Control Output5 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput6 | Control Output6 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput7 | Control Output7 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_ModuleType1 | Module Type1; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType2 | Module Type2; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType3 | Module Type3; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType4 | Module Type4; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |

| Input | Function/Description | DataType |
|-----------------------|--|----------|
| Cfg_ModuleType5 | Module Type5; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType6 | Module Type6; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType7 | Module Type7: 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_VibCalibStartStop | Vibration calibration Start/Stop Command | INT |
| Cmd_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_InhibitCfg | Disable Configuration inputs from external sources | BOOL |
| Sts_InhibitCmd | Disable Command inputs from external sources | BOOL |
| Sts_InhibitSet | Disable Setting inputs from external sources | BOOL |
| Val_ClassAVoltage | Class A power supply voltage | REAL |
| Val_ClassBVoltage | Class B (auxiliary) power supply voltage | REAL |
| Val_CurrentModuleType1 | Module Type1; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType2 | Module Type2; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType3 | Module Type3; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType4 | Module Type4: 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType5 | Module Type5; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType6 | Module Type6; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType7 | Module Type7; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_OperatingHrsSinceInception | Indicates the time the IO-link module has been functional since first powered | DINT |
| Val_OperatingHrsSincePowerUp | Indicates the amount of time the IO-link module has been functional since last power cycle | DINT |
| Val_TemperatureCurrent | Current internal temperature of the IO-Link module since powerup or last power cycle | INT |

| Output | Function/Descritpion | DataType |
|--------------------------------|--|----------|
| Val_TemperatureMaxSincePowerUp | Maximum internal temperature of the IO-Link module since powerup or last power cycle | INT |
| Val_TemperatureMinSincePowerUp | Minimuminternal temperature of the IO-Link module since powerup or last power cycle | INT |
| Val_VibAvgXAxis | The average vibration value for X-axis | REAL |
| Val_VibAvgYAxis | The average vibration value for Y-axis | REAL |
| Val_VibAvgZAxis | The average vibration value for Z-axis | REAL |
| Val_VibCalibPeriod | Vibration Calibration Period | REAL |
| Val_VibCalibStatusData | The functional state of the calibration process once activated | SINT |
| Val_VibMaxLifetimeXAxis | The average vibration value for X-axis | REAL |
| Val_VibMaxLifetimeYAxis | The average vibration value for Y-axis | REAL |
| Val_VibMaxLifetimeZAxis | The average vibration value for Z-axis | REAL |
| Val_VibMaxSPUXAxis | The maximum vibration value for X-axis since powerup | REAL |
| Val_VibMaxSPUYAxis | The maximum vibration value for Y-axis since powerup | REAL |
| Val_VibMaxSPUZAxis | The maximum vibration value for Z-axis since powerup | REAL |
| Val_VibWarningLimitX | Vibration threshold limit value of X-axis | REAL |
| Val_VibWarningLimitY | Vibration threshold limit value of Y-axis | REAL |
| Val_VibWarningLimitZ | Vibration threshold limit value of Z-axis | REAL |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_856T_5032)

| InOut | Function / Description | DataType |
|-----------------------|---|--|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_856T_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_856T_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf_5032 |
| Ref_Ctrl_ltf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Out_O | Device Object Output | raC_UDT_IOLink_856T_PdataOut_5032 |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_856T_Cfg |

Input Data

| Input | Function/Description | DataType |
|-----------------------|---|----------|
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxAlarmStatus | Configure Device Object Input Alarm Status | INT |
| Set_VibCalibPeriod | Vibration Calibration Period Set Value | REAL |
| Set_VibWarningLimitX | Vibration X-axis Warning Limit Set Value | REAL |
| Set_VibWarningLimitY | Vibration Y-axis Warning Limit Set Value | REAL |
| Set_VibWarningLimitZ | Vibration Z-axis Warning Limit Set Value | REAL |
| Cfg_DD1ControlOutput1 | Control Output1 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput2 | Control Output2 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput3 | Control Output3 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput4 | Control Output4 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput5 | Control Output5 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput6 | Control Output6 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD1ControlOutput7 | Control Output7 Module Behaviors; 0 = OFF, 1 = ON Steady, 2 = Slow Flash, 3 = Fast Flash | INT |
| Cfg_DD2ControlOutput1 | Control Output1 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |

| Input | Function/Description | DataType |
|------------------------|---|----------|
| Cfg_DD2ControlOutput2 | Control Output2 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput3 | Control Output3 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput4 | Control Output4 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput5 | Control Output5 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput6 | Control Output6 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_DD2ControlOutput7 | Control Output7 Color or Sound; 0 = Red, 1 = Reserved, 2 = Yellow, 3 = Green, 4 = Blue, 5 = Cyan (Turquoise), 6 = Magenta, 7 = White, 8 = Sound1, 9 = Sound2, 10 = Sound3, 11 = Sound4, 12 = Sound5, 13 = Sound6, 14 = Sound7, 15 = Reserved | INT |
| Cfg_ModuleType1 | Module Type1; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType2 | Module Type2; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType3 | Module Type3; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType4 | Module Type4; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType5 | Module Type5; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType6 | Module Type6; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_ModuleType7 | Module Type7; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Cfg_VibCalibStartStop | Vibration calibration Start/Stop Command | INT |
| Cmd_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_InhibitCfg | Disable Configuration inputs from external sources | BOOL |
| Sts_InhibitCmd | Disable Command inputs from external sources | BOOL |
| Sts_InhibitSet | Disable Setting inputs from external sources | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_ClassAVoltage | Class A power supply voltage | REAL |
| Val_ClassBVoltage | Class B (auxiliary) power supply voltage | REAL |
| Val_CurrentModuleType1 | Module Type1; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType2 | Module Type2; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | |
| Val_CurrentModuleType3 | Module Type3; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType4 | Module Type4; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType5 | Module Type5; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType6 | Module Type6; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_CurrentModuleType7 | Module Type7; 0 = No Module, 1 = Steady Light, 2 = Multi-function Light, 3 = Rotating Light, 4 = Multi-color Light, 5 = Steady/Flash beacon, 6 = Strobe beacon, 7 = Rotating beacon, 8 = Multi-color beacon, 9 = Piezo Electric Sound, 10 = Transducer Sound, 11 = Recordable Sound | INT |
| Val_OperatingHrsSinceInception | Indicates the time the IO-link module has been functional since first powered | DINT |

| Output | Function/Descritpion | DataType |
|------------------------------------|--|----------|
| Val_OperatingHrsSincePowerUp | Indicates the amount of time the IO-link module has been functional since last power cycle | DINT |
| Val_TemperatureCurrent | Current internal temperature of the IO-Link module since powerup or last power cycle | INT |
| Val_TemperatureMaxSincePowerU p | Maximum internal temperature of the IO-Link module since powerup or last power cycle | INT |
| Val_TemperatureMinSincePowerU p | Minimum internal temperature of the IO-Link module since powerup or last power cycle | INT |
| Val_VibAvgXAxis | The average vibration value for X-axis | REAL |
| Val_VibAvgYAxis | The average vibration value for Y-axis | REAL |
| Val_VibAvgZAxis | The average vibration value for Z-axis | REAL |
| Val_VibCalibPeriod | Vibration Calibration Period | REAL |
| Val_VibCalibStatusData | The functional state of the calibration process once activated | SINT |
| Val_VibMaxLifetimeXAxis | The average vibration value for X-axis | REAL |
| Val_VibMaxLifetimeYAxis | The average vibration value for Y-axis | REAL |
| Val_VibMaxLifetimeZAxis | The average vibration value for Z-axis | REAL |
| Val_VibMaxSPUXAxis | The maximum vibration value for X-axis since powerup | REAL |
| Val_VibMaxSPUYAxis | The maximum vibration value for Y-axis since powerup | REAL |
| Val_VibMaxSPUZAxis | The maximum vibration value for Z-axis since powerup | REAL |
| Val_VibWarningLimitX | Vibration threshold limit value of X-axis | REAL |
| Val_VibWarningLimitY | Vibration threshold limit value of Y-axis | REAL |
| Val_VibWarningLimitZ | Vibration threshold limit value of Z-axis | REAL |
| Out_ChxControlModule1 | Control Module1; Bit 0 = Behavior, Bit 1 = Behavior, Bit 2 = Behavior, Bit 3 = Color/Sound, Bit 4 = Color/Sound, Bit 5 = Color/Sound | SINT |
| Out_ChxControlModule2 | Control Module2; Bit 0 = Behavior, Bit 1 = Behavior, Bit 2 = Behavior, Bit 3 = Color/Sound, Bit 4 = Color/Sound, Bit 5 = Color/Sound | SINT |
| Out_ChxControlModule3 | Control Module3; Bit 0 = Behavior, Bit 1 = Behavior, Bit 2 = Behavior, Bit 3 = Color/Sound, Bit 4 = Color/Sound, Bit 5 = Color/Sound | SINT |
| Out_ChxControlModule4 | Control Module4; Bit 0 = Behavior, Bit 1 = Behavior, Bit 2 = Behavior, Bit 3 = Color/Sound, Bit 4 = Color/Sound, Bit 5 = Color/Sound | SINT |

| Output | Function/Descritpion | DataType |
|---------------------------|--|----------|
| Out_ChxControlModule5 | Control Module5; Bit 0 = Behavior, Bit 1 = Behavior, Bit 2 = Behavior, Bit 3 = Color/Sound, Bit 4 = Color/Sound, Bit 5 = Color/Sound | SINT |
| Out_ChxControlModule6 | Control Module6; Bit 0 = Behavior, Bit 1 = Behavior, Bit 2 = Behavior, Bit 3 = Color/Sound, Bit 4 = Color/Sound, Bit 5 = Color/Sound | SINT |
| Out_ChxControlModule7 | Control Module7; Bit 0 = Behavior, Bit 1 = Behavior, Bit 2 = Behavior, Bit 3 = Color/Sound, Bit 4 = Color/Sound, Bit 5 = Color/Sound | SINT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 856T device object connected to channel #2 of a POINT I/O 1734-4IOL IO-Link Master module in slot #3 of a POINT I/O adapter named *Racko*1.



The following example uses the 856T device object connected to channel #4 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.

| Sensor856T_102 Input | | | |
|-----------------------------------|-----------------------|--|------------------|
| Interface | | Sensor 102 | |
| COP | raC Dvc 856T 8IOL | | 1 |
| Source Armor 8IOL MasterB:I.Fault | raC Dvc 856T 8IOL | Sensor856T 102 | |
| Dest Sensor856T_102_Inp_I.Fault | Ref_Module | Armor_8IOL_MasterB | -(Sts_Connected) |
| Length 32 | Write_Index | Sensor856T_102_Write_Index | |
| | Read_Index | Sensor856T_102_Read_Index | -(Sts_Available) |
| | Write_SubIndex | Sensor856T_102_Write_SubIndex | |
| | Read_SubIndex | Sensor856T_102_Read_SubIndex | -(Sts_Warning) |
| | Msg_Sensor_Data | Sensor856T_102_Msg_Sensor_Data | |
| | Ref_Ctrl_Set | Sensor856T_102_CtrlSet | -(Sts_Faulted) |
| | Ref_Ctrl_Cmd | Sensor856T_102_CtrlCmd | |
| | Ref_Ctrl_Sts | Sensor856T_102_CtrlSts | -(Sts_Ready) |
| | Inf_Lookup | raC_Dvc_8561_Inflable | |
| | inp_i | Sensor8561_102_inp_1 | |
| | inp_CnxAlarmStatus | Armor_SIUL_MasterB1.Cn4AlarmStatus | |
| | lan ChNumber | 0- | |
| | inp_cnivumber | 4 | |
| | Out ChyControlModule7 | Armor 801 MasterB:0 Ch4ControlModule7 | |
| | Out_ChxControlModule6 | Armor_8IOL_MasterB:O.Ch4ControlModule6 | |
| | Out_ChxControlModule5 | Armor_8IOL_MasterB:O_Ch4ControlModule5 | |
| | Out_ChxControlModule4 | Armor_8IOL_MasterB:O_Ch4ControlModule4 | |
| | Out_ChxControlModule3 | Armor 8IOL MasterB:O Ch4ControlModule3 | |
| | Out ChxControlModule2 | Armor 8IOL MasterB:O.Ch4ControlModule2 | |
| | Out ChxControlModule1 | Armor 8IOL MasterB:O.Ch4ControlModule1 | |
| | Ref Ctrl Inf | Armor_8IOL_MasterB_Ctrllnf | |
| | Ref_Ctrl_ltf | Armor_8IOL_MasterB_Ctrltf | |
| | | | 2 |

The following example uses the 856T device object connected to channel #12 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master5032*.



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|-----------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_TempSens | | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|---|---|----------------------------------|
| AOG_856T_ Launch | SS X X X X X X X X X X X X X | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Properties Animations Events |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| ▶ Sensor856T_102 | Sensor 102 |
|------------------------|----------------------------------|
| Sensor856T_102_CtrlCmd | Sensor856T_102 Command Interface |
| Sensor856T_102_CtrlSet | Sensor856T_102 Setting Interface |
| Sensor856T_102_CtrlSts | Sensor856T_102 Status Interface |
| Sensor856T_102_Inp_I | Sensor856T_102 Input Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data. 1

| Sensor ' | 102 | × | |
|----------------|---------------|-----------------------|---|
| | Ready | | |
| \mathfrak{V} | Module 7 Type | No Module Rock-IOLink | _ |
| (J) | Module 6 Type | No Module | - |
| ! | Module 5 Type | Multi-color beacon | |
| | Module 4 Type | Steady Light | |
| | Module 3 Type | Steady Light | |
| | Module 2 Type | Multi-function Light | |
| | Module 1 Type | Rotating Light | |
| | | | |

| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Configured module type on Tower Light |
| 3 | Non Configured module type on Tower Light |
| 4 | Application Specific Name - Read from device |
| | Note: In Case of 5032 Master, changes made to the Application Specific Name |



Note: In Case of, 5032 Master, changes made to the Application Specific Name require pressing the 'Config Apply' button in the Config tab to update the sensor parameters.

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description |
|------|--|
| 1 | Temperature Bar Graph Purple Indicators: Min/Max since power up Light Blue Triangle Indicator: Current value |
| 2 | Temperature Current Value |
| 3 | Operating Hours Since Inception |
| 4 | Operating Hours Since PowerUp |
| 5 | Class A Voltage |
| 6 | Class B Voltage |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| 001 | | |
|---------------|----------------------|------------------------|
| Ready | Connection Faulted | |
| Module 7 Type | No Module | |
| Module 6 Type | No Module | Settings |
| Module 5 Type | No Module | Control Output Display |
| Module 4 Type | Rotating beacon | Unitock |
| Module 3 Type | Multi-function Light | Config Apply |
| Module 2 Type | Steady Light | Vibration |
| Module 1 Type | Multi-color beacon | Settings |

Parameter Settings

Module Type- Based on installed module on Tower light user can configure the module using module type selection. The following options list is available.

- 1. Steady Light
- 2. Multi-function Light
- 3. Rotating Light
- 4. Multi-color Light
- 5. Steady/Flashing beacon
- 6. Strobe beacon
- 7. Rotating beacon
- 8. Multi-color beacon
- 9. Piezo Electric Sounder
- 10. Transducer Sounder
- 11. Recordable Sound

Control Output Display Lock/Unlock- The Toggle button is used to Lock and Unlock the Control Output Display settings. If it is Unlock, then it will allow the user to choose the Control Output function from the HMI.

Control Output Settings- Based on the light or Sound module connected in each circuit, the output color and sound can also be configured.

| Sensor | 102 | | | |
|------------------------|------------------|-----------|------|---|
| $\widehat{\mathbf{w}}$ | Ready | | | |
| \mathfrak{P} | Control Output 7 | OFF | | |
| Þ | Control Output 6 | OFF | | |
| 1 | Control Output 5 | ON Steady | Blue | V |
| | Control Output 4 | OFF | | |
| | Control Output 3 | OFF | | |
| | Control Output 2 | OFF | | |
| | Control Output 1 | OFF | | |

Vibration Setting- To set Vibration indication which used to alert about unusual mechanical behavior when the IO-Link module detects vibration above certain threshold values.

Vibration settings divided into sections:

• Calibration

| | • | ÷ • | • |
|-----|--------|-----|-----|
| • W | arning | Lin | nıt |

| 856T - 10 | 01 | X |
|-----------|-----------------------------------|----------------------|
| | Ready Connection Faulted | |
| 19 19 | Calibration Period 1.0 h | Start Calibration |
| 1 | Calibration Status Not Calibrated | Stop Calibration |
| | | Config Apply |
| | 2 > | |

Calibration Period- The Calibration Period allows you to enter the time in which the IO-Link module gathers vibration samples to compute and obtain the vibration thresholds per axis.

Calibration Status- Calibration Status shows the functional state of the calibration process once activated.

Start, Stop Calibration - To start & Stop the calibration click the button



Warning Limit- The Warning Limit for X-axis, Y-axis, Z-axis allows you to enter a desired vibration threshold.

Average- Provides the average vibration value for each X, Y and Z axis.

Maximum Since Power Up- Provides the maximum vibration value for each X, Y and Z axis, since power up.

Maximum Lifetime- Provides the maximum vibration value for each X, Y and Z axis, since inception.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| Parameter Se | ttings | |
|---------------------|--------------|-------------------------------|
| Display Mode | Current Temp | Trigger Settings |
| Display Unit | Celsius 🔻 | Config Apply |
| Display Rotation | O deg | Reset High-Lov Temperature |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| Config Apply |
|--------------|
| |
| |
| |
| |
| |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.

| | Severity | Time | Description |
|--------------|-----------------|------------------------|-------------------------------|
| <u>9</u> | Active Fault | 1998-03-24 01:10:09 | Tower Light Power Fault |
| | Fault | 1998-03-24 01:09:51 | A short circuit was detected. |
| | Fault | 1998-03-24 00:13:42 | Tower Light is disconnected |
| | Fault | 1998-03-23 23:05:01 | Tower Light KeyingFault |

| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_856T_4I0L, raC_Dvc_856T_8I0L, raC_Dvc_856T_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_856T_4IOL, raC_LD_Dvc_856T_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_856T_5032

| Parameter Name De | efault Value I | nstance Name | Definition | Description |
|-------------------|----------------|--------------|------------|-------------|
| | | | | |

| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
|-------------------|---------------------|------------------|-------------------|--|
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 856T), This name depends upon the TagName assigned to object. |
| SensorType | 856T-B24LC | 856T-B24LC | 856T-B24LC | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|-------------------|-------------------|----------|-----------------|----------|
| raC_Dvc_856T_4IOL | raC_Dvc_856T_4IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_856T_8IOL | raC_Dvc_856T_8IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_856T_5032 | raC_Dvc_856T_5032 | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |

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| Launch Button SE {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
|--|---|
|--|---|

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_856T | Faceplate ME | (raC-3_xx-ME) raC_Dvc_856T-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_856T | Faceplate SE | (raC-3_xx-SE) raC_Dvc_856T-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_I0Link | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

873P - Analog Output Ultrasonic Sensor (raC_Dvc_873P_4IOL, raC_Dvc_873P_8IOL, raC_Dvc_873P_Type1_5032, raC_Dvc_873P_Type2_5032)

Overview

The 873P Analog Output Ultrasonic Sensor device object (raC_Dvc_873P_4IOL, raC_Dvc_873P_8IOL, raC_Dvc_873P_Type1_5032, raC_Dvc_873P_Type2_5032) includes HMI faceplate's which displays device information including:

- Sensor data
- Sensor diagnostics
- Process data trending
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_873P_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.
- **Polarity:** This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate).

The 873P Analog Output Ultrasonic Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplate's for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Functional Description

Device Objects include Add-On Instructions (AOIs) and HMI faceplate's. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with four versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/ Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-----------------|--|--|--|---------------------------------------|
| | POINT 1/0 1734-410L | 873P-D18AI-2200-D5, 873P-D18AI-400-D5, 873P-D18AI-900-D5, 873P-D18AIP2-900-D5, 873P-D18AV-2200-D5, 873P-D18AV-400-D5, 873P-D18AV-900-D5, 873P-D30AI-2500-D5, 873P-D30AI-3500-D5, 873P-D30AI-2500-D5, 873P-D30AIP2-2500-D5, 873P-D30AV-2500-D5, 873P-D30AIP2-6000-D5, 873P-D30AV-2500-D5, 873P-D30AV-5500-D5, 873P-D30AV-6000-D5, 873P-D30AV2-2500-D5, 873P-D30AV-6000-D5, 873P-D30AV2-2500-D5, 873P-D30AV-6000-D5, 873P-D30AVP2-2500-D5, 873P-D30AV-6000-D5, 873P-D18P1-2200-D4, 873P-D18P1-400-D4, 873P-D18P1-2200-D4, 873P-D18P2-2200-D5, 873P-D18P1-2200-D4, 873P-D18P2-900-D5, 873P-D18P2-400-D5, 873P-D18P2-900-D5, 873P-D30P1-2500-D4, 873P-D30P1-3500-D4, 873P-D30P1-2500-D4, 873P-D30P2-2500-D5, 873P-D30P1-2500-D5, 873P-D30P2-2500-D5, 873P-D30P1-2500-D5, 873P-D30P2-2500-D5, 873P-D30P2-3500-D5, 873P-D30P2-6000-D5 | raC_Dvc_873P_410L_3.02_A01.L5X | raC_Dvc_873P_410L_3.02_RUNG.L5X |
| 873P | ArmorBlock 1732E- 8IOLM12R | 873P-D18AI-2200-D5, 873P-D18AI-400-D5, 873P-D18AI-900-D5, 873P-D18AIP2-900-D5, 873P-D18AV-2200-D5, 873P-D18AV-400-D5, 873P-D18AV-900-D5, 873P-D30AI-2500-D5, 873P-D30AI-3500-D5, 873P-D30AI-2500-D5, 873P-D30AIP2-2500-D5, 873P-D30AV-2500-D5, 873P-D30AV2-2500-D5, 873P-D30AV-2500-D5, 873P-D30AV2-2500-D5, 873P-D30AV-6000-D5, 873P-D30AV2-2500-D5, 873P-D30AV-6000-D5, 873P-D30AV2-2500-D5, 873P-D30AV-6000-D5, 873P-D30AVP2-2500-D5, 873P-D30AV-6000-D5, 873P-D30AVP2-2500-D5, 873P-D30AV-6000-D5, 873P-D30AVP2-6000-D5 873P-D18P1-2200-D4, 873P-D18P1-400-D4, 873P- D18P1-900-D4, 873P-D18P2-200-D5, 873P-D18P2-400-D5, 873P-D18P2-900-D5, 873P-D30P1-2500-D4, 873P-D30P1-3500-D4, 873P-D30P1-6000-D4, 873P-D30P2-2500-D5, 873P- D30P2-3500-D5, 873P-D30P2-6000-D5 | raC_Dvc_873P_810L_3.02_A01.L5X | raC_Dvc_873P_8I0L_3.02_RUNG.L5X |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 873P-D18AI-2200-D5, 873P-D18AI-400-D5, 873P-D18AI-900-D5, 873P-D18AIP2-900-D5, 873P-D18AV-2200-D5, 873P-D18AV-400-D5, 873P-D18AV-900-D5, 873P-D30AI-2500-D5, 873P-D30AI-3500-D5, 873P-D30AI-6000-D5, 873P-D30AIP2-2500-D5, 873P-D30AIP2-3500-D5, 873P-D30AIP2-6000-D5, 873P-D30AV-2500-D5, 873P-D30AV-3500-D5, 873P-D30AV-6000-D5, 873P-D30AVP2-2500-D5, 873P-D30AV-6000-D5, 873P-D30AVP2-2500-D5, 873P-D30AVP2-3500-D5, 873P-D30AVP2-2500-D5, 873P-D30AVP2-3500-D5, 873P-D30AVP2-6000-D5 | raC_Dvc_873P_Type1_5032_3.02_ A0I.L5X | raC_Dvc_873P_Type1_5032_3.02_RUNG.L5X |
| | | 873P-D18P1-2200-D4, 873P-D18P1-400-D4, 873P-D18P1-900-D4, 873P-D18P2-2200-D5, 873P-D18P2-400-D5, 873P-D18P2-900-D5, 873P-D30P1-2500-D4, 873P-D30P1-3500-D4, 873P-D30P1-6000-D4, 873P-D30P2-2500-D5, 873P- D30P2-3500-D5, 873P-D30P2-6000-D5 | raC_Dvc_873P_Type2_5032_3.02_ A0I.L5X | raC_Dvc_873P_Type2_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 873P | Display | (raC-3_02-ME) raC_Dvc_873P-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_873P-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 873P | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|------------------------------|---|--|
| | Point I/o 1734-410L | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_873P_410L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_873P_4IOL_(3.2) |
| 077D | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_873P_810L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_873P_8IOL_(3.2) |
| 0755 | 5032-810LM12DR | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_873P_Type1_5032_(3.2) | (DA-LID) Davido Davido ID-Link rat LD Dvo 973D 5039 (3.9) |
| | 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_873P_Type2_5032_(3.2) | (NA-LID)_DEVICE_DEVICE_ID-LINK_I 4C_LD_DVC_0/3F_3032_(3.2) |

Device Definition (raC_Dvc_873P_4IOL, raC_Dvc_873P_8IOL)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



2. Specify the Application Specific Name e.g. DistanceSensor_100

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | | Process Data Input | Data Storage | |
|---------|---------|---------------|-------------------|---------------------------|----------------------|--------|--------------------|--------------|---|
|) | 10-Link | Allen-Bradley | 873P-D18AV-900-D5 | DistanceSensor_100 | Exact M | \sim | | Enable ADC | ~ |
| 1 | 10-Link | Allen-Bradley | 873P-D18AV-900-D5 | DistanceSensor_101 | Exact M | \sim | | Enable ADC | ~ |
| 2 | 10-Link | | | | | | | | |
| 3 | 10-Link | | | | | | | | |
| 4 | 10-Link | | | | | | | | |
| 5 | 10-Link | | | | | | | | |
| 6 | 10-Link | | | | | | | | |
| 7 | 10-Link | | | | | | | | |
| c | | | | | | | | | |

Device Definition (raC_Dvc_873P_Type1_503 2, raC_Dvc_873P_Type2_5032)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| K Pain: AB_E1H=1(10.112.131.147)Backplane(9-10.1120)Backplane(9-1000)Backplane(9-1000)Backp | Redundancy 태 | Favorites Ad | ⊣⊢ +/⊢ ()⊢ (u)- (u)- ld-On PlantPAx Safet | y Alarms Bit | Module I | Definition | | | | |
|--|---|----------------|--|--------------------|------------|------------|--------------------|---|--------|------------------|
| Big Her - Matter JOLINC, SU2 IN Matter SU2 Communications Total and the supervised and the supervise | | | | | Series: | | A | × | | |
| | General | General | | | Revision: | | 2 | v 011 🚔 | | |
| Controller Master_IOLink_5032 | Connection Module Info | _ | | | Electronic | : Kevina: | Compatible | Madula | ~ | |
| troller Master_IOLink_5032 Controller Fault Handler bower-Up Handler s & MainTask & MainProgram Inscheduled tion Groups m Manager ets | E Channels | i ype: | 5032-810LM12M12LDR 8 . | IO-LINK Channel, 8 | Connactio | | Data | mount | | |
| Power-Up Handler | - 00 - IO-Link - 01 - Digital Output | Vendor: | Rockwell Automation/Alle | n-Bradley | connectio | | Vala | | Ľ | |
| Tasks | - 02 - 10-Link | Parent: | EN2TR | | | | | | | |
| (* MainTask | - 03 - Digital Input | Name: | Mod_Master5032 | | | | | | 1 | 2 |
| HainProgram | | Description: | | | | | | | Cha | annel e Types |
| Unscheduled | 08 - IO-Link | | | | Port | Channel | IO-Link Class B | Channel Mode | | A |
| Notion Groups | 10 - IO-Link | | | W | , on | Channer | Enabled | chainer mode | 5 | o ¥ |
| | - 14 - IO-Link | Module Definit | ion | | | | | | | 0-1-0 |
| Add-On Instructions | Internet Protocol | | | Change | - | 0 | | IO-Link | ~ / | 1 1 |
| Data Types | Port Configuration | Carlos | | | 0 | 1 | | Digital Output, Short Circuit, No Lo | ad 🗹 🗸 | 1 |
| Trends | - Time Sync | Series. | A | | 1 | 2 | | IO-Link | × 1 | 1 1 |
| ogical Model | Servers | Revision: | 2.011 | | | 3 | | Digital Input | × | 1 1 |
| O Configuration | | Electronic Key | ing: Compatible | Module | 2 | 5 | | Disabled | ~ | 1 |
| 1756 Backplane, 1756-A10 | | Connection | Data | | 2 | 6 | | IO-Link | ~ / | 11 |
| ▲ 🖞 [1] 1756-EN2TR EN2TR | | Someeton. | Cont | | 3 | 7 | | Disabled | \sim | 1 |
| ▲ 윪 Ethernet | | | | | 4 | 8 | | IO-Link | ~ J | 1 1 |
| 1756-EN2TR EN2TR | | | | | - | 9 | | Disabled | ~ 1 | 1 |
| 5032-8IOLM12M12LDR/A Mod_Master5032 | | | | | 5 | 11 | | Disabled | \sim | 11 |
| [9] 1756-L85E Master_IOLink_5032 | | | | | - | 12 | | IO-Link | ~ / | J J |
| 器 Ethernet | | | | | 6 | 13 | | Disabled | ~ | 1 |
| @ 1756-L85E Master_IOLink_5032 | | | | | 7 | 14 | | IO-Link | ~ J | 1 1 |
| | | | | | 1 1 | | | and the second se | | |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

2. Whichever channels are selected for 873P, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 873P Sensor.



3. Configure the parameters of sensor from configuration tab from AOP of the 873P sensor.
| Controller Organizer | ▼ Ŧ × [| Module Properties: M | od_Master_5032_4:0 (873P-D18AIP2-90 | 00-D5 (| (213) 1.1) × | | | |
|--|---------|----------------------|--|---------|------------------------|-------|----------|---|
| a 📲 | | General | Configuration | | | | | |
| Controller Master_5032_Test_Cases | | Connection | j | | | | | |
| 🕨 🗰 Tasks | | - Device Info | | Davi | | | | D 11 |
| Motion Groups | | - Configuration | Name | R/W | Value | Units | Style | Description |
| 🕨 💻 Alarm Manager | | - Event Log | Identification | | | | | |
| Assets | | | Application-specific Tag | nv . | | | | |
| h Logical Model | | | User Tag 1 | rw - | | | | |
| ▲ | | | User Tag 2 | rw i | | | | |
| ▲ 💷 1756 Backplane, 1756-A7 | | | ✓ Parameter | | | | | |
| [0] 1756-185E Master 5032 Test Cases | | | Output configuration | | | | | |
| A & Ethernet | | | Analog Output Slope | rw | Analog signal rising 🖂 | | | Output configuration [OUT 2] |
| In 1756-195E Master 5022 Test Cases | | | Analog Output 2 | | | | | |
| ■ 1/30-LOSE Master_5032_Test_Cases | | | Analog Start Point 2 (AS | rw 🖂 | 100 | mm | Decim: ~ | Analogue start point 2. [ASP2] must be smaller t |
| b U 5052-6IOLWI I2WI I2LDR/A Mod_Master_5052_1 | | | Analog End Point 2 (AEP2) | rw 🗠 | ⊴ 900 | mm | Decim | Analogue end point 2. [AEP2] must be greater th |
| I SU32-8IULM12M12LDR/A MOD_Master_SU32_2 | | | ✓ Signal | | MEAL | | | Filter an annual time of the mean and simpled |
| D 5032-8I0LM12M12LDK/A Mod_Master_5032_3 | | | Suppression Mode | TW DV | Background Deflection | | | Priter of response time of the measured signal, L Background Suppression |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_4 | | | Sound Cone Width | rw | normal sound cone | | | Dackground Suppression |
| A 🐼 IO-Link | | | ∡ Teach | | | | | |
| 0 873P-D18AIP2-900-D5 (213) Mod_873P_Type1 | | | Select Trigger | rw | SSC1 🗸 | | | Teach selection |
| 2 873P-D18P1-400-D4 (314) Mod_873P_Type2 | | | Suppression Distance | rw 🖂 | 900 | mm | Decim: ~ | Distance to background. Value must be greater t |
| % 4 875L-M16xx30-xx (309) Mod_875L | | | ✓ Triggered1 | | | | | |
| 🔮 6 1694-PFD1244 (304) Mod_1694 | | | SP1 | rw 🖻 | 100 | mm | Decim: ~ | |
| | | | SP2 | TW _ | 100 | mm | Decim: ~ | |
| | | | Insert Factory Defaults | | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_873P_4I0L, raC_Dvc_873P_8I0L)

| InOut | Function / Description | DataType |
|-----------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_873P_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_873P_Inp_4IOL Or raC_UDT_ItfAD_873P_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |

Input Data

| Input | Function/Description | DataType |
|--------------------|--|----------|
| Inp_ChxTriggered1 | Triggered Status When the Temprature is equal to Defined Temperature Set for Trigger1 | BOOL |
| Inp_ChxTriggered2 | Triggered Status When the Temperature is equal to Defined Temperature Set for Trigger2 | BOOL |
| Inp_ChxDistance | Displays Distance in mm – non-adjustable | DINT |
| Inp_ChNumber | Configured Channel Number for Master | SINT |
| Inp_ChxTemperature | Current Internal Temperature | DINT |
| Cfg_Filter | Filter; 0= Off, 1= Low, 2= Medium, 3= High | INT |
| Cfg_T1Mode | Trigger1 Mode; 0= Deactivated, 1= Single Point, 2= Window, 3= Two Point | INT |
| Cfg_T2Mode | Trigger2 Mode; 0= Deactivated, 1= Single Point, 2= Window, 3= Two Point | INT |
| Cfg_TeachSp | Teach Setpoint; 0= Set Point1, 1= Set Point2 | INT |
| Cfg_TeachTrigCh | Teach Triggered Channel; 0= Triggered1, 1= Triggered2 | SINT |
| Cmd_AnalogSlope | Analog Output Slope Rising/Falling Cmd | BOOL |
| Cmd_BGMode | Suppression Mode Reflect/Suppress Cmd | BOOL |
| Cmd_EnableCounter | Counter Disabled/Enabled Cmd | BOOL |
| Cmd_EnableLEDs | Indicator Disabled/Enabled Cmd | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |

| Input | Function/Description | DataType |
|-----------------------|--|----------|
| Cmd_Locate | Locator Disable/Enable Cmd | BOOL |
| Cmd_ResetCount | Counter Reset Cmd | BOOL |
| Cmd_SoundCone | Sound Cone Width Narrow/Normal Cmd | BOOL |
| Cmd_T1ActiveLow | Trigger1 Logic High/Low Active Cmd | BOOL |
| Cmd_T2ActiveLow | Trigger2 Logic High/Low Active Cmd | BOOL |
| Cmd_TeachApply | Teach Apply Cmd | BOOL |
| Set_AnalogEnd | Analog End Point Set Value | INT |
| Set_AnalogStart | Analog Start Point Set Value | INT |
| Set_Suppression | Suppression Mode Set Value | INT |
| Set_T1Hysteresis | Trigger1 Hysteresis Set Value | INT |
| Set_T10ffDelay | Trigger1 Switch-Off delay Set Value | INT |
| Set_T10nDelay | Trigger1 Switch-On delay Set Value | INT |
| Set_T1Sp1 | Trigger1 SetPoint1 Set Value | INT |
| Set_T1Sp2 | Trigger1 SetPoint2 Set Value | INT |
| Set_T2Hysteresis | Trigger2 Hysteresis Set Value | INT |
| Set_T2OffDelay | Trigger2 Switch-Off delay Set Value | INT |
| Set_T2OnDelay | Trigger2 Switch-On delay Set Value | INT |
| Set_T2Sp1 | Trigger2 SetPoint1 Set Value | INT |
| Set_T2Sp2 | Trigger2 SetPoint2 Set Value | INT |
| Set_TrendDistMaxValue | Trend Tab Distance Max for VD/ME/SE Faceplate (Below Val_RangeMax) | DINT |
| Set_TrendDistMinValue | Trend Tab Distance Min for VD/ME/SE Faceplate (Above Val_RangeMin) | DINT |
| Set_TrendTempMaxValue | Trend Tab Temperature Max for VD/ME/SE Faceplate (-20 To 70) | DINT |
| Set_TrendTempMinValue | Trend Tab Temperature Min for VD/ME/SE Faceplate (-20 To 70) | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_AnalogSlope | Analog Output Slope; O= Rising, 1= Falling | BOOL |
| Sts_BGMode | Suppression Mode; 0= Reflection, 1= Suppression | BOOL |
| Sts_EnableCounter | Counter Enable; 0= Disable, 1= Enable | BOOL |
| Sts_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | BOOL |
| Sts_SoundCone | Sound Cone; 0= Normal, 1= Narrow | BOOL |
| Sts_T1ActiveLow | Trigger1 Logic Active; 0= Low, 1=High | BOOL |
| Sts_T2ActiveLow | Trigger2 Logic Active; 0= Low, 1=High | BOOL |
| Val_AnalogEnd | Analog End Point | INT |
| Val_AnalogStart | Analog Start Point | INT |
| Val_Filter | Filter Selected | INT |
| Val_HysteresisMax | Hysteresis Maximum Selected | DINT |
| Val_OperatingHours | Operating Hours | INT |
| Val_PowerCycles | Number of Power Cycle | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Suppression | Suppression Distance | INT |
| Val_T1Hysteresis | Trigger1 Hysteresis | INT |
| Val_T1Mode | Trigger1 Operating Mode Selected | INT |
| Val_T10ffDelay | Trigger1 Switch-Off Delay | INT |
| Val_T10nDelay | Trigger1 Switch-On Delay | INT |
| | | |

| Output | Function/Descritpion | DataType |
|----------------------------------|--|----------|
| Val_T1Sp1 | Trigger1 Setpoint1 | INT |
| Val_T1Sp2 | Trigger1 Setpoint2 | INT |
| Val_T2Hysteresis | Trigger2 Hysteresis | INT |
| Val_T2Mode | Trigger2 Operating Mode Selected | INT |
| Val_T20ffDelay | Trigger2 Switch-Off Delay | INT |
| Val_T20nDelay | Trigger2 Switch-On Delay | INT |
| Val_T2Sp1 | Trigger2 Setpoint1 | INT |
| Val_T2Sp2 | Trigger2 Setpoint2 | INT |
| Val_TeachTrig | Teach Trigger Channel Selected | INT |
| Val_TemperatureMaxSinceInception | Maximum Temperature Since Inception | DINT |
| Val_TemperatureMaxSincePowerUp | Maximum Temperature Since Power Up | DINT |
| Val_TemperatureMinSinceInception | Minimum Temperature Since Inception | DINT |
| Val_TemperatureMinSincePowerUp | Minimum Temperature Since Power Up | DINT |
| Val_TriggerCount | Trigger Counter | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data (raC_Dvc_873P_Type1_503 2, raC_Dvc_873P_Type2_5032)

| InOut D |) ata |
|---------|--------------|
|---------|--------------|

| In0ut | Function / Description | DataType |
|-----------------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_873P_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_873P_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf_5032 |
| Ref_Ctrl_ltf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_873P_Type1_Cfg Or raC_UDT_IOLink_873P_Type2_Cfg |

Input Data

| Input | Function/Description | DataType |
|--------------------|---|----------|
| Inp_ChxTriggered1 | Triggered Status When the Temprature is equal to Defined Temperature Set for Trigger1 | BOOL |
| Inp_ChxTriggered2 | Triggered Status When the Temperature is equal to Defined Temperature Set for Trigger2 | BOOL |
| Inp_ChxDistance | Displays Distance in mm – non-adjustable | DINT |
| Inp_ChNumber | Configured Channel Number for Master | SINT |
| Inp_ChxTemperature | Current Internal Temperature | DINT |
| Cfg_Filter | Filter; 0= Off, 1= Low, 2= Medium, 3= High | INT |
| Cfg_T1Mode | Trigger1 Mode; 0= Deactivated, 1= Single Point, 2= Window, 3= Two Point | INT |
| Cfg_T2Mode | Trigger2 Mode; 0= Deactivated, 1= Single Point, 2= Window, 3= Two Point | INT |
| Cfg_TeachSp | Teach Setpoint; 0= Set Point1, 1= Set Point2 | INT |
| Cfg_TeachTrigCh | Teach Triggered Channel; 0= Triggered1, 1= Triggered2 | SINT |
| Cmd_AnalogSlope | Analog Output Slope Rising/Falling Cmd | BOOL |
| Cmd_BGMode | Suppression Mode Reflect/Suppress Cmd | BOOL |
| Cmd_EnableCounter | Counter Disabled/Enabled Cmd | BOOL |

| Input | Function/Description | DataType |
|------------------------|--|----------|
| Cmd_EnableLEDs | Indicator Disabled/Enabled Cmd | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Cmd | BOOL |
| Cmd_ResetCount | Counter Reset Cmd | BOOL |
| Cmd_SoundCone | Sound Cone Width Narrow/Normal Cmd | BOOL |
| Cmd_T1ActiveLow | Trigger1 Logic High/Low Active Cmd | BOOL |
| Cmd_T2ActiveLow | Trigger2 Logic High/Low Active Cmd | BOOL |
| Cmd_TeachApply | Teach Apply Cmd | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Set_AnalogEnd | Analog End Point Set Value | INT |
| Set_AnalogStart | Analog Start Point Set Value | INT |
| Set_Suppression | Suppression Mode Set Value | INT |
| Set_T1Hysteresis | Trigger1 Hysteresis Set Value | INT |
| Set_T10ffDelay | Trigger1 Switch-Off delay Set Value | INT |
| Set_T10nDelay | Trigger1 Switch-On delay Set Value | INT |
| Set_T1Sp1 | Trigger1 SetPoint1 Set Value | INT |
| Set_T1Sp2 | Trigger1 SetPoint2 Set Value | INT |
| Set_T2Hysteresis | Trigger2 Hysteresis Set Value | INT |
| Set_T2OffDelay | Trigger2 Switch-Off delay Set Value | INT |
| Set_T2OnDelay | Trigger2 Switch-On delay Set Value | INT |
| Set_T2Sp1 | Trigger2 SetPoint1 Set Value | INT |
| Set_T2Sp2 | Trigger2 SetPoint2 Set Value | INT |
| Set_TrendDistMaxValue | Trend Tab Distance Max for VD/ME/SE Faceplate (Below Val_RangeMax) | DINT |
| Set_TrendDistMinValue | Trend Tab Distance Min for VD/ME/SE Faceplate (Above Val_RangeMin) | DINT |
| Set_TrendTempMaxValue | Trend Tab Temperature Max for VD/ME/SE Faceplate (-20 To 70) | DINT |
| Set_TrendTempMinValue | Trend Tab Temperature Min for VD/ME/SE Faceplate (-20 To 70) | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|---------------|--|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |

| Output | Function/Descritpion | DataType |
|------------------------|---|----------|
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_AnalogSlope | Analog Output Slope; 0= Rising, 1= Falling | BOOL |
| Sts_BGMode | Suppression Mode; O= Reflection, 1= Suppression | BOOL |
| Sts_EnableCounter | Counter Enable; 0= Disable, 1= Enable | BOOL |
| Sts_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | BOOL |
| Sts_SoundCone | Sound Cone; 0= Normal, 1= Narrow | BOOL |
| Sts_T1ActiveLow | Trigger1 Logic Active; 0= Low, 1=High | BOOL |
| Sts_T2ActiveLow | Trigger2 Logic Active; 0= Low, 1=High | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_AnalogEnd | Analog End Point | INT |
| Val_AnalogStart | Analog Start Point | INT |
| Val_Filter | Filter Selected | INT |
| Val_HysteresisMax | Hysteresis Maximum Selected | DINT |
| Val_OperatingHours | Operating Hours | INT |
| Val_PowerCycles | Number of Power Cycle | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Suppression | Suppression Distance | INT |
| Val_T1Hysteresis | Trigger1 Hysteresis | INT |
| Val_T1Mode | Trigger1 Operating Mode Selected | INT |
| Val_T10ffDelay | Trigger1 Switch-Off Delay | INT |
| Val_T10nDelay | Trigger1 Switch-On Delay | INT |
| Val_T1Sp1 | Trigger1 Setpoint1 | INT |
| Val_T1Sp2 | Trigger1 Setpoint2 | INT |
| Val_T2Hysteresis | Trigger2 Hysteresis | INT |
| Val_T2Mode | Trigger2 Operating Mode Selected | INT |
| Val_T2OffDelay | Trigger2 Switch-Off Delay | INT |

| Output | Function/Descritpion | DataType |
|------------------------------------|--|----------|
| Val_T20nDelay | Trigger2 Switch-On Delay | INT |
| Val_T2Sp1 | Trigger2 Setpoint1 | INT |
| Val_T2Sp2 | Trigger2 Setpoint2 | INT |
| Val_TeachTrig | Teach Trigger Channel Selected | INT |
| Val_TemperatureMaxSinceInceptio | Maximum Temperature Since Inception | DINT |
| Val_TemperatureMaxSincePowerU p | Maximum Temperature Since Power Up | DINT |
| Val_TemperatureMinSinceInceptio | Minimum Temperature Since Inception | DINT |
| Val_TemperatureMinSincePowerU p | Minimum Temperature Since Power Up | DINT |
| Val_TriggerCount | Trigger Counter | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference. The first rung is required and the others are optional.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 873P device object connected to channel #2 of a POINT I/O 1734-4IOL IO-Link Master module in slot #1 of a POINT I/O adapter named *Racko*1.



The following example uses the 873P device object connected to channel #2 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_Master*.

| Sensor873P_102 Input Interface Sensor102 COP raC_Dvc_873P_8/0L Sensor873P_102 Dest Sensor873P_102_inp_LFault Length Armor_8/0L_MasterB 32 Ref_Module Armor_8/0L_MasterB Write_index Sensor873P_102_Write_block Sis_Connected)— Write_subindex Sensor873P_102_Write_block Sis_Available)— Write_Subindex Sensor873P_102_Write_block Sis_Warning)— Red_Crtr_St Sensor873P_102_Ctrictet Sis_Faulted)— Msg_Sensor_Data Sensor873P_102_Ctrictet Sis_Faulted)— Ref_Crtr_St Sensor873P_102_Ctrictet Sis_Ready)— Inf_Lookup raC_Dvc_873P_i02_InfTable Sis_Ready)— Inf_Lookup raC_Dvc_873P_i02_InfTable Sis_Ready)— Inp_ChxTrigger1 Armor_8/0L_MasterB:LCh2Trigger1 0 Inp_ChxTrigger2 Armor_8/0L_MasterB:LCh2Temperature 0 Inp_ChxDistance Armor_8/0L_MasterB:LCh2Temperature 0 Inp_ChxImger4 Armor_8/0L_MasterB:LCh2Temperature 0 Inp_ChxImger5 0 0 0 Inp_ChxImger6 Armor_8/0L_MasterB:LCh2Temperature 0 <t< th=""><th></th><th></th><th></th></t<> | | | |
|--|--|---|--|
| COP raC_Dvc_873P_8IOL Sensor873P_102 Sensor873P_10 | Sensor873P_102 Input Interface | Sensor 102 | |
| Ref_Ctrl_ttr Armor_8IOL_Masterb_Ctrlitt | COP Source Armor_8IOL_MasterB:I.Fault Dest Sensor873P_102_Inp_I.Fault Length 32 | Sensor 102 raC_Dvc_873P_8loL Sensor873P_102 Ref_Module Armor_8loL_MasterB Write_index Sensor873P_102_Write_index Read_index Sensor873P_102_Write_index Write_subindex Sensor873P_102_Write_index Read_index Sensor873P_102_Write_index Write_subindex Sensor873P_102_Write_index Read_subindex Sensor873P_102_Write_subindex Msg_Sensor_Data Sensor873P_102_CtriSt Ref_Ctrl_Sts Sensor873P_102_CtriSts Inf_Lookup raC_Dvc_873P_102_Inf_able Inp_ChxTrigger1 Armor_8IOL_MasterB:ICh2Trigger2 Inp_ChxTrigger2 Armor_8IOL_MasterB:ICh2Trigger2 Inp_ChxDistance O Inp_ChxUmber 0 Inp_ChxUmber 0 Ref_Ctrl_Inf Armor_8IOL_MasterB:CtrlInf Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf | |

The following example uses the 873P Type 1 Sensor device object connected to channel #0 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_4*.



The following example uses the 873P Type 2 Sensor device object connected to channel #2 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_4*.



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|------------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_UltraSens | | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|----------------|---|----------------------------------|
| AOG_873P_ Launch | SS | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Properties Animations Events |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the .*@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Sensor873P_102 | Sensor 102 |
|------------------------|----------------------|
| Sensor873P_102_CtrlCmd | Sensor873P_102 Com |
| Sensor873P_102_CtrlSet | Sensor873P_102 Setti |
| Sensor873P_102_CtrlSts | Sensor873P_102 Stat |
| Sensor873P_102_Inp_I | Sensor873P_102 Inpu |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status 1 & 2 OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Trigger1 & 2 Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 5 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 6 | Process Data: Displays the Distance value along with unit. |
| 7 | Process Data: Displays the Temperature value along with unit. |
| 8 | Process Data: Displays the Trigger Count value. |
| | |



Note: In Case of, 5032 Master, changes made to the Application Specific Name require pressing the 'Config Apply' button in the Config tab to update the sensor parameters.

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description |
|------|---|
| 1 | Device Temperature Bar Graph Purple Indicators: Min/Max since power up Light Blue Triangle Indicator: Current value |
| 2 | Device Temperature Current Value |
| 3 | Number of Power Cycle |

Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action decisions. Two trends are displayed. One for Distance and the other for temperature.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Scaling.

| Sensor 1 | 102 | | X |
|------------------------|------------------------|---------------|--------|
| $\widehat{\mathbf{w}}$ | Ready | | |
| | Trend and Spark Limits | | × |
| N S | Distance Scale | Temperature S | cale |
| ! | Minimum 100 | mm Minimum | -20 °C |
| | Maximum 900 | mm Maximum | 70 °C |
| | | | |
| | | | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Trigger Settings
- Teach Settings
- Reset Counts
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| Ready | | |
|---|--|-----------------------------------|
| Parameter Settings Analog Output Slope | Signal Settings | Local Settings |
| Start Point | Filter Low | LEDs Disable Chat |
| End Point 850 mm | Sound Cone Width | Parameter Lock Unlock Om Lock |
| Signal Slope Rising 🕞 Falling | Suppression Mode Reflect Om Suppres | Trigger Counter Disable 🔵 Enat |
| Trigger | Teach Reset | Config Apply |

Parameter Settings

Analog Output Slope- Applied to configure an analog output when the sensor is operated in the Standard I/O (SIO) mode.

| ltem | Description |
|--------------|---|
| Signal Slope | Use toggle button to select Rising / Falling of Analog signal slope. •Rising- Analog value increases with increasing distance. •Falling- Analog value decreases with increasing distance. |
| Start Point | Set the Analog Starting Point (ASP) value to define an analog range. |
| End Point | Set the Analog Ending Point (AEP) value to define an analog range. |

Signal Setting-

| Item | Description |
|------------------|--|
| Filter | Click the Filter Dropdown object & choose one of the filter. The filter feature is applied for non-static objects such as liquid with a turbulent surface. |
| Suppression Mode | Use toggle button to select the Background reflection / Background Suppression |
| Sound Cone Width | Allows for the adjustment of the acoustic beam width. A narrow sound cone has around 10% beam width reduction compared to the normal sound cone. |

Local Setting-

| ltem | Description |
|-----------------|---|
| LED's | Allows you to turn off or disable indicators at operation. Default is 'enabled.' |
| Parameter Lock | Applied to Lock or Unlock the teach button. • Lock: Teach button which is mounted on device is disabled/locked. • Unlock: Teach button which is mounted on device is enabled. |
| Trigger Counter | Use toggle button to Enable or disable this function. Default is 'disabled' |

Trigger Settings

| Ready | | |
|------------------|-----------------|-----------------|
| Trigger Settings | | > |
| | Trigger 1 | Trigger 2 |
| Operating Mode | Deactivated 🛛 🔻 | Deactivated 🛛 🔻 |
| SP1 (Far) | 100 mm | 900 mm |
| SP2 (Near) | 100 mm | 100 mm |
| Hysteresis | 5 | 5 Config App |
| On Delay | 0 ms | 0 ms |
| Off Delay | 0 ms | 0 ms |
| Logic Active | Low 🔲 High | Low 🔲 High |

Operating Mode- There are four operation modes for each trigger/output

- Single Point
- Window
- Two Point
- Deactivated

SP1 (Far)- To set Switching point 1 click on input field and enter the value.

SP2 (Near)- To set Switching point 2 click on input field and enter the value.

Hysteresis- To set Hysteresis click on input field and enter the value.

On Delay- The On Delay defines the desired delay for the output to turn ON once a target has been detected.

Off Delay- The Off Delay defines the desired delay for the output to turn OFF once a target has left the detection area.

Logic Active- Use the toggle button to select the High Active (Normally Open) / Low Active (Normally Closed).

Teach Settings-

- 1. Choose Trigger 1 or 2
- 2. Select Set Point 1 or 2
- 3. Set Background Suppression Distance Value
- 4. Press Teach Apply Button

| Sensor ' | 102 | X |
|------------------------|--|---|
| $\widehat{\mathbf{w}}$ | Ready | |
| \$ \/ | Teach Settings | |
| 8 | Triggered1 V Set Point 1 V Teach Apply | |
| : | Background Suppresion Distance 900 mm | |
| | | |
| | | |

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| Dist_14 | 002L | | × |
|----------|---------------------|-------------------------------|------------------|
| 俞 | Ready | | |
| Ð | Parameter Settings | | |
| 11 | Analog Output Slope | Signal Settings | Local Settings |
| <u> </u> | Start Point | | LEDs |
| P | 150 mm | | Disable 🛑 Enable |
| 1 | End Point | Sound Cone Width | Parameter Lock |
| | 850 mm | Normal 🔵 Narrow | Unlock 💭 Lock |
| | Signal Slope | Suppression Mode | Trigger Counter |
| | Rising 🗩 Falling | Reflect Om Suppres | Disable 🗩 Enable |
| | Trigger Settings | Teach Reset Settings Count | Config Apply |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| 873P - 1001 | | |
|---------------------|--------------------|-----------------|
| Ready | | |
| Parameter Settings | | |
| Analog Output Slope | Signal Settings | Local Settings |
| - Start Point | | LEDs |
| 3 150 mm | Filter Off | Disable Chable |
| End Point | Sound Cone Width | Parameter Lock |
| 850 mm | Normal Marrow | Unlock Cock |
| Signal Slope | Suppression Mode | Trigger Counter |
| Rising 🗩 Falling | Reflect Om Suppres | Disable Chable |
| Trigger | Teach Reset | Config Apply |
| Settings | Settings Count | |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_873P_4IOL, raC_Dvc_873P_8IOL, raC_Dvc_873P_Type1_5032, raC_Dvc_873P_Type2_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_873P_4IOL, raC_LD_Dvc_873P_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_873P_Type1_5032, raC_LD_Dvc_873P_Type2_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-----------------|---------------------|--------------------|--------------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 873P), This name depends upon the TagName assigned to object. |
| SensorType | 873P-D18AI-2200-D5 | 873P-D18AI-2200-D5 | 873P-D18AI-2200-D5 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |

| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
|--|-----------------|--|-------------------|---|
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |
| Note that if the tag names are manually entered or not linked to input channel | | | | |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|-------------------------|-------------------|----------|-----------------|----------|
| raC_Dvc_873P_4I0L | raC_Dvc_873P_4IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_873P_8IOL | raC_Dvc_873P_8IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_873P_Type1_5032 | raC_Dvc_873P_5032 | 3.2 | (RA-LIB) Device | IO-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_873P | Faceplate ME | (raC-3_xx-ME) raC_Dvc_873P-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_873P | Faceplate SE | (raC-3_xx-SE) raC_Dvc_873P-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_I0Link | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

1694 - 1694 Modular Electronic Circuit Protector (raC_Dvc_1694_4I0L, raC_Dvc_1694_8I0L, raC_Dvc_1694_5032)

Overview

The 1694 Modular Electronic Circuit Protector device object (raC_Dvc_1694_4IOL, raC_Dvc_1694_8IOL, raC_Dvc_1694_5032) includes HMI faceplate's which displays device information including:

- Sensor data
- Sensor I/O
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_1694_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- Provides overall status and device monitoring parameters for power feed 1694-PMD and each channel controlled by Electronic Circuit Protection device.
- Allows you to change the device parameters offered by 1694 Electronic Circuit Protection system.
- Provides diagnostics parameter information, those parameters facilitate troubleshooting if device does not work correctly.

Functional Description

The 1694 Modular Electronic Circuit Protector Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplate's for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix[®] firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|---------------------------|--------------------------------|---------------------------------|
| | POINT I/O 1734-4IOL | 1694-PFD1244 | raC_Dvc_1694_410L_3.02_A01.L5X | raC_Dvc_1694_4I0L_3.02_RUNG.L5X |
| 1694 | ArmorBlock 1732E- 8IOLM12R | 1694-PFD1244 | raC_Dvc_1694_810L_3.02_A01.L5X | raC_Dvc_1694_810L_3.02_RUNG.L5X |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 1694-PFD1244 | raC_Dvc_1694_5032_3.02_A01.L5X | raC_Dvc_1694_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL or 8IOL versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 1694 | Display | (raC-3_02-ME) raC_Dvc_1694-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_1694-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 1694 | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementa tion Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|---------------------------|--|---|---|
| | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_IO-Link_raC_Dvc_1694_4I0L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_1694_4I0L_(3.2) |
| 1694 | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_10-Link_raC_Dvc_1694_810L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_1694_8IOL_(3.2) |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_1694_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_1694_5032_(3.2) |

Device Definition (raC_Dvc_1694_4I0L, raC_Dvc_1694_8I0L)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



2. Specify the Application Specific Name e.g. SensorProtection_100

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storage | |
|---------|---------|---------------|--------------|---------------------------|----------------------|--------------------|--------------|--|
|) | IO-Link | Allen-Bradley | 1694-PFD1244 | SensorProtection_100 | Exact M 🗸 | | Enable ADC | |
| | 10-Link | Allen-Bradley | 1694-PFD1244 | SensorProtection_101 | Exact M 🗸 | | Enable ADC | |
| ! | 10-Link | | | | | | | |
| } | 10-Link | | | | | | | |
| Ļ | 10-Link | | | | | | | |
| j | 10-Link | | | | | | | |
| ; | 10-Link | | | | | | | |
| , | 10-Link | | | | | | | |
| C | | | | | | | | |

Device Definition (raC_Dvc_1694_5032)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| Energy Storage Offline . No Forces . No Edits | 、 赤 C A Redundancy ビー | Favorites A | dd-On PlantPAx Safe | ity Alarms Bit | Module I | Definition | | | | |
|--|---------------------------|-----------------|-------------------------|--------------------|------------|------------|--------------------|--|----------------------------------|--------|
| troller Organizer 🗸 🕈 | × 🚺 Module Properties: EN | 2TR (5032-8IOLM | 12M12LDR 2.011) × | | Series: | | A | ×. | | |
| 0 | General | General | | | Revision: | | 2 | 011 | | |
| Controller Master_IOLink_5032 | Connection | | | | Floctropic | Kaulaat | 2 | <u> </u> | | |
| | Channels | Type: | 5032-8IOLM12M12LDR 8 | IO-Link Channel, 8 | Electronic | . Keynig. | Compatible | Module | ~ | |
| Controller Fault Handler | 00 - 10-Link | Vendor: | Rockwell Automation/All | en-Bradley | Connectio | on: | Data | | \sim | |
| Tasks | 01 - Digital Output | Parent: | EN2TR | | | | | | | |
| O MainTask | - 03 - Digital Input | Name: | Mod_Master5032 | | | | - | | | |
| MainProgram | 04 - 10-Link | Description: | - | | | | | | Cha | nnel |
| Unscheduled | | and the second | | - | | | IO-Link | | Mode | e Type |
| Motion Groups | 10 - IO-Link | | | v | Port | Channel | Class B Enabled | Channel Mode | | _۳ |
| Alarm Manager | | | | | | | a service of the | | | |
| Assets | Internet Protocol | Module Defin | tion | | 1— | 0 | 1 | IO Link | | |
| Add-On Instructions | Port Configuration | | | Change | 0 | 1 | - | Digital Output, Short Circuit, No Load | v v | 1 |
| Data Types | - Network | Series: | A | | | 2 | | IO-Link | ~ 1 | 1 1 |
| Inclusion Model | - Servers | Revision: | 2.011 | | | 3 | | Digital Input | × 1 | 1 |
| | | Electronic Ke | ving: Compatible | Module | 2 | 4 | | IO-Link Disabled | ✓ ✓ | 11 |
| = 1756 Backplane 1756-A10 | | | - | | - | 6 | - | IOJ ink | × · | 1 1 |
| 1130 Backplane, 1130 A10 1111 1756_EN2TR EN2TR | | Connection: | Data | | 3 | 7 | - 0 | Disabled | ~ | 1 |
| A & Ethernet | | | | | | 8 | | IO-Link | ~ 1 | 1 1 |
| 1 1756-EN2TR EN2TR | | | | | 4 | 9 | | Disabled | ~ 1 | 1 |
| ▶ ¶ 5032-800 M12M12LDR/A Mod Macter5032 | | | | | 5 | 10 | _ | IO-Link | × 1 | 1 1 |
| 1 JUL 1756 L95E Moster JOLink 5022 | | | | | | 11 | | Disabled | × 1 | 1 |
| La [9] 1730-LOJE MIdSIEL_IOLITIK_3032 | | | | | 6 | 12 | | IO-Link Disabled | ~ / | 1 1 |
| Ta 1756 LOEE Master JOLink 5022 | | | | | | 10 | 1000 | IO-Link | × · | 1 1 |
| IP 1700-LODE MIRSTER_IULINK_DU32 | | | | | 7 | 16 | | Disabled | | |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 1694 you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 1694 Sensor.
 - I/O Configuration
 I756 Backplane, 1756-A7

 [0] 1756-L85E Master_5032_Test_Cases
 IT56-L85E Master_5032_Test_Cases
 I5032-8IOLM12M12LDR/A Mod_Master_5032_1
 I5032-8IOLM12M12LDR/A Mod_Master_5032_2
 I5032-8IOLM12M12LDR/A Mod_Master_5032_3
 I5032-8IOLM12M12LDR/A Mod_Master_5032_4
 S032-8IOLM12M12LDR/A Mod_Master_5032_4
 S032-8IOLM12M12LDR/A Mod_Master_5032_4
 S032-8IOLM12M12LDR/A Mod_Master_5032_4
 S032-8IOLM12M12LDR/A Mod_Master_5032_4
 S032-8IOLM12M12LDR/A Mod_Master_5032_4
 IO-Link
 IO-Link
 IO-Link
 IS032-8IOLM18AIP2-900-D5 (213) Mod_873P_Type1
 2 873P-D18AIP2-900-D5 (213) Mod_873P_Type2
 IS084875L
 IG1640-PFD1244 (304) Mod_1694
- 3. Configure the parameters of sensor from configuration tab from AOP of the 1694 sensor.

| Controller Organizer 👻 🖣 🗙 | 📙 MainProgram - MainRoutin | 🛯 🗍 Module Properties: Mod_Master_5 | 032_4:6 (16 | 94-PFD1244 (304) 1.1) | ĸ | |
|---|----------------------------|-------------------------------------|----------------|-----------------------|-------|--|
| a •= | General | Configuration | | | | |
| Controller Master_5032_Test_Cases | Connection | 5 | | | | |
| 🕨 📹 Tasks | - Device Info | News | Davi | Malua | Unite | Otale Description |
| Motion Groups | Configuration | Name | R/W | value | Units | Style Description |
| 🕨 💻 Alarm Manager | - Fault/Program Actions | Leas Specific Information | | | | |
| Assets | EventLog | Application-specific Tag | DW | *** | | |
| 🗽 Logical Model | | A Parameter | | | | |
| ✓ ≤ I/O Configuration | | ✓ System Configuration | | | | |
| ▲ 💷 1756 Backplane, 1756-A7 | | Power Save | TW | OFF 🗸 | | Set Power Save to On or Off |
| © 101 1756-185E Master 5032 Test Cases | | Output State During Communica | . rw | ON 🗸 | | ON - Outputs of all the Circuit Protectors remain |
| A Se Ethernet | | ✓ Parameters Ch01 | | | | |
| Tatt 1756-195E Master 5022 Test Cases | | Settings | | | | |
| ► 1750-L05L Master_5052_Test_Cases | | Trip Limit | TW 🗹 | 10 | A [| Decim |
| U 5032-8IOLMT2MT2LDR/A MOD_Master_5032_1 | | Warning Limit | rw 🗹 | 80 | % [| Decim |
| J 5032-8I0LM12M12LDR/A Mod_Master_5032_2 | | PLC Control | rw | ON 🗠 | | ON - Device is controlled by the PLC, OFF - Devi |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_3 | | ✓ Parameters Ch02 | | | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_4 | | Settings | n u [1] | 10 | A [| Desiminer Report on Neminal Current, Depends on the Davi |
| ▲ 😒 IO-Link | | Warning Limit | | 10 | M L | Decimity Based on % of Nominal Current, Bange 50, 100% |
| 40 0 873P-D18AIP2-900-D5 (213) Mod_873P_Type1 | | PI C Control | nv · | | 70 1 | ON - Davide is controlled by the PLC. OFF - Davi |
| Je 2 873P-D18P1-400-D4 (314) Mod_873P_Type2 | | Parameters Ch03 | TW. | | | on bence is controlled by the rise, on rise ben |
| % 4 875L-M16xx30-xx (309) Mod_875L | | ✓ Settings | | | | |
| 6 1694-PFD1244 (304) Mod 1694 | | Trip Limit | TW V | 10 | A [| Decim; V Based on Nominal Current. Depends on the Devi |
| | | Warning Limit | rw 🖂 | 80 | % [| Decim V Based on % of Nominal Current. Range 50100% |
| | | Insert Factory Defaults | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| Enablein False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data(raC_Dvc_1694_4IOL, raC_Dvc_1694_8IOL)

InOut Data

| InOut | Function / Description | DataType |
|-------------------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Ref_Msg_Read_Index_Sync | Message Configuration Read | MESSAGE |
| Ref_Msg_Data | Message Configuration Data | raC_UDT_1694_Msg_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_I0LinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | aC_UDT_ItfAD_IOLinkSensor_CtrlCmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_I0LinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_ltfAD_1694_Inp_4IOL Or raC_UDT_ltfAD_1694_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Out_O | 1694_4IOL Out Data | raC_UDT_ItfAD_1694_Out_4IOL |

Input Data

| Input | Function/Description | DataType |
|-----------------------|--|----------|
| Cfg_ChannelSelection | Select Channel Number | DINT |
| Cfg_ResetTrip | Trip Reset Alarm | INT |
| Cmd_PLCControlTrigger | Allows user to define if a particular channel can be controlled by PLC | BOOL |
| Cmd_Refresh | Allows user to update values | BOOL |
| Cmd_ResetAvgMemory | Average Memory Reset Command | BOOL |
| Cmd_ResetFault | Update Channel Values | BOOL |
| Cmd_ResetMaxMemory | Maximum Memory Reset Command | BOOL |
| Cmd_ResetMinMemory | Minimum Memory Reset Command | BOOL |
| Cmd_ResetTripCounter | Trip Counter Reset Command | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Set_Triplimit | Allows user to define Current Trip Limit value for adjustable Electronic Over-current Protection module | SINT |
| Set_WarningLimit | Allows user to define current value (warning limit) for the channel | SINT |

Output Data

| Output | Function/Descritpion | DataType |
|-------------------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_InhibitCfg | Disable Configuration inputs from external sources | BOOL |
| Sts_InhibitCmd | Disable Command inputs from external sources | BOOL |
| Sts_InhibitSet | Disable Setting inputs from external sources | BOOL |
| Sts_PLCControlTrigger | Displays if a particular channel is controlled by PLC | BOOL |
| Val_AvgCurrent | Provides value of average measured current for particular channel since first power ON or last device reset | REAL |
| Val_DeviceType | Provides type of each type of Electronic Overcurrent Protection Module attached to Power Feed | DINT |
| Val_LastTripType | Provides reason of last trip for particular channel | SINT |
| Val_MaxCurrent | Provides value of highest measured current for particular channel since first power ON or last device reset | REAL |
| Val_MaxVoltage | Provides value of highest measured voltage for particular channel since first power ON or last device reset | REAL |
| Val_MinCurrent | Provides value of lowest measured current for particular channel since first power ON or last device reset | REAL |
| Val_MinVoltage | Provides value of lowest measured voltage for particular channel since first power ON or last device reset | REAL |
| Val_PLCControl | PLC Control Status for particular channel | INT |
| Val_ReqStep | Step Update | INT |
| Val_TripCounter | Counter Value | DINT |
| Val_Triplimit | Displays Current Trip Limit value for adjustable Electronic Overcurrent Protection module | SINT |
| Val_WarningLimit | Displays current value (warning limit) for particular channel when the LED starts blinking | SINT |
| raC_Dvc_ADFramework_ DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data(raC_Dvc_1694_5032)

InOut Data

| InOut | Function / Description | DataType |
|-------------------|---------------------------------|----------|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |

| InOut | Function / Description | DataType |
|-------------------------------|---|-------------------------------------|
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustGetSubIdx_S ync | Message Configuration Read | MESSAGE |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Ref_Msg_Data | Message Configuration Data | raC_UDT_1694_Msg_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | aC_UDT_ItfAD_IOLinkSensor_CtrlCmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_1694_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Out_O | 1694_4IOL Out Data | raC_UDT_ItfAD_1694_Out_4IOL |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_1694_Cfg |

Input Data

| Input | Function/Description | DataType |
|------------------------|--|----------|
| Cfg_ChannelSelection | Select Channel Number | DINT |
| Cfg_ResetTrip | Trip Reset Alarm | INT |
| Cmd_PLCControlTrigger | Allows user to define if a particular channel can be controlled by PLC | BOOL |
| Cmd_Refresh | Allows user to update values | BOOL |
| Cmd_ResetAvgMemory | Average Memory Reset Command | BOOL |
| Cmd_ResetFault | Update Channel Values | BOOL |
| Cmd_ResetMaxMemory | Maximum Memory Reset Command | BOOL |
| Cmd_ResetMinMemory | Minimum Memory Reset Command | BOOL |
| Cmd_ResetTripCounter | Trip Counter Reset Command | BOOL |
| Cmd_ApplyConfiguration | nfiguration Module reconfigure Command | |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Set_Triplimit | Allows user to define Current Trip Limit value for adjustable Electronic Over-current Protection module | SINT |
| Set_WarningLimit | Allows user to define current value (warning limit) for the channel | SINT |

Output Data

| Output | Function/Descritpion | DataType |
|------------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_InhibitCfg | Disable Configuration inputs from external sources | BOOL |
| Sts_InhibitCmd | Disable Command inputs from external sources | BOOL |
| Sts_InhibitSet | Disable Setting inputs from external sources | BOOL |
| Sts_PLCControlTrigger | Displays if a particular channel is controlled by PLC | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_AvgCurrent | Provides value of average measured current for particular channel since first power ON or last device reset | REAL |
| Val_DeviceType | Provides type of each type of Electronic Overcurrent Protection Module attached to Power Feed | DINT |
| Val_LastTripType | Provides reason of last trip for particular channel | SINT |

| . | | |
|-------------------------------|---|----------|
| Uutput | Function/Descritpion | Datalype |
| Val_MaxCurrent | Provides value of highest measured current for particular channel since first power ON or last device reset | REAL |
| Val_MaxVoltage | Provides value of highest measured voltage for particular channel since first power ON or last device reset | REAL |
| Val_MinCurrent | Provides value of lowest measured current for particular channel since first power ON or last device reset | REAL |
| Val_MinVoltage | Provides value of lowest measured voltage for particular channel since first power ON or last device reset | REAL |
| Val_PLCControl | PLC Control Status for particular channel | INT |
| Val_ReqStep | Step Update | INT |
| Val_TripCounter | Counter Value | DINT |
| Val_Triplimit | Displays Current Trip Limit value for adjustable Electronic Overcurrent Protection module | SINT |
| Val_WarningLimit | Displays current value (warning limit) for particular channel when the LED starts blinking | SINT |
| raC_Dvc_ADFramework_ DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference. The first rung is required and the others are optional.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 1694 device object connected to channel #2 of a POINT I/O 1734-4IOL IO-Link Master module in slot #5 of a POINT I/O adapter named *Racko*1.



The following example uses the 1694 device object connected to channel #0 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.

| Device1694_102 Input Interface COP Source Armor_8IOL_MasterB1.Fault Dest Device1694_102_Inp_I.Fault Length 32 | Device1694_102 Input Interface COP Source Armor_8IOL_MasterB:ICh0InputVoltage Dest Device1694_102_Inp_I.Ch_Data[0] Length 1 | Device1694_102 Input Interface COP Source Armor_8IOL_MasterB:I.Ch0GeneralStatus Dest Device1694_102_Inp_I.Ch_Data[1] Length 22 Length | evice1694_102_Out_O IOL_MasterB:O.Ch0On 2 |
|--|--|--|---|
| | | CB 102 raC_Dvc_1694_8/0L raC_Dvc_1694_8/0L raC_Dvc_1694_8/0L Device1694_102_Write_Index Write_Index Device1694_102_Write_Index Read_Index Device1694_102_Write_SubIndex Write_SubIndex Device1694_102_Read_Index_Sync Read_SubIndex Device1694_102_Read_Index_Sync Ref_Msg_Read_Index_Sync Device1694_102_Read_Index_Sync Ref_Msg_Data Device1694_102_CtrlSts Ref_Ctrl_Sts Device1694_102_CtrlSts Inf_Lookup raC_Dvc_1694_InfTable Inp_1 Device1694_102_Ing_ Inp_ChNumber 0 Out_0 Device1694_102_Out_0 Ref_Ctrl_Iff Armor_8I0L_Master_CtrlInf Ref_Ctrl_Iff Armor_8I0L_Master_CtrlInf | <pre></pre> |

The following example uses the 1694 device object connected to channel #0 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named Mod_Master_5032_4.



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See Basic Launch Button Attributes section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|---------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_MECP | SS C | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|---|--|------------------------|
| A06_1694_L aunch | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Properties Image: Properties Image: Properties Animations Events A General Image: PAC_VD main Image: PAC_VD main AOI_Tag Image: PAC_VD main Image: PAC_VD main Image: PAC_VD main | |
| | | | Appearance |
| | | | Position and Size |
| | | | > Security |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the .*@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Device1694_102 | CB 102 |
|------------------------|----------------------------------|
| Device1694_102_CtrlCmd | Device1694_102 Command Interface |
| Device1694_102_CtrlSet | Device1694_102 Setting Interface |
| Device1694_102_CtrlSts | Device1694_102 Status Interface |
| Device1694_102_Inp_I | Device1694_102 Input Interface |
| Device1694_102_Out_O | Device1694_102 Output Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the basic control functions.


| ltem | Description | | | |
|------|--|--|--|--|
| 1 | Banner- Ready Status | | | |
| 2 | Channel Status-Based on the status of channel, the status indicator changes its color. If the Channel O1 is ON, the indicator turns from gray to blue. | | | |
| 3 | Current- The Current field provides the channel XX current value. Unit 'A' | | | |
| 4 | Voltage- The Voltage field provides the channel XX voltage value. Unit 'V' | | | |
| 5 | PLC Control- The Off-On toggle button is used to switch the respective channel On or Off, depending on the PLC Control mode. | | | |
| 6 | Channel Description- Description field provides feasibility for operator to enter (input field) the channel descriptions, based on the device connected to respective channel | | | |
| 7 | Channel is not configured (Device is not connected) | | | |
| 8 | Page 1 to 4- The page buttons allow to toggle back and forth between 1 to 16 channel status information | | | |
| 9 | Application Specific Name - Read from device | | | |
| 10 | Channel Faulted- Channel Faulted Description with yellow rectangle highlighted & Reset button | | | |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name require pressing the 'Config Apply' button in the Config tab to update the sensor | | | |

I/O Tab

I/O tab provides the Current and Average voltage value of the each channel. which helps ensure that sensors are operating correctly. It displays the Trip counter & Last trip type.

parameters.



| ltem | Description | | | |
|------|--|--|--|--|
| 1 | Channel number- Dropdown selector object to select different channels | | | |
| 2 | Minimum Current-Provides value of lowest measured current for channel since first power ON or last device/statistics reset. | | | |
| 3 | Maximum Current- Provides value of highest measured current for channel since first power ON or last device reset. | | | |
| 4 | Average Current- Provides value of average measured current for channel since first power ON or last device reset. | | | |
| 5 | Minimum Voltage- Provides value of lowest measured voltage for channel since first power ON or last device reset. | | | |
| 6 | Maximum Voltage- Provides value of highest measured voltage for channel since first power ON or last device reset | | | |
| 7 | Last Trip Type- Last Trip Type provides reason of device trip for each channel, below are the different reasons: • Not Triggered • Channel Short Circuit • Channel Overload • Device Internal Fault | | | |
| 8 | Trip Counter- Provides number of trips for channel counted since first device use or last reset | | | |
| 9 | Refresh- Refresh Button to update the values. | | | |

Configure Tab

The configuration tab displays the Device parameter settings, Reset buttons as well as enabling the user to read data from the Device.



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| Ready | | |
|---------------|-----------------------------------|-------------------------------|
| Channel 3 | ▼ () | Reset Maximum Value Memory |
| Device type | 1 Channel Fixed Current Threshold | Reset Average Value Memory |
| Denice type | i onamo, i ince caroni micenola | Reset Trip Counter |
| Trip Limit | 4.00 A | Reset Minimum Value Memory |
| Warning Limit | 80.00 % | Config Apply |
| PLC Control | Disable Chable | |

Parameter Settings

Channel Selection- Used to select different Channel.

Device Type- The Device Type provides information about Electronic Overcurrent Protection Module type attached to the Power Feed module:

- 1694 IO-Link With 1 Channel, Fixed Current Threshold
- 1694 IO-Link With 2 Channel, Fixed Current Threshold
- 1694 IO-Link With 4 Channel, Fixed Current Threshold
- 1694 IO-Link With 2 Channels, Adjustable Current Threshold

Trip Limit- Trip Limit allows user to define Current Trip Limit value for adjustable Electronic Overcurrent Protection module. When this value exceeds in the circuit of each channel, then device will go into trip state.

- For fixed protection modules, this value is read only.
- For Adjustable Protection Modules, the trip limit value can be set from the faceplate.

Warning Limit- Warning Limit allows user to define current value (warning limit) for the channel.

PLC Control- PLC Control mode allows user to define if a particular channel can be controlled by PLC.

Reset Button- The Reset Buttons are used to reset the Minimum, Maximum, Average Value Memory and Trip Counter.

| Button | Description |
|-------------------------------|--|
| Reset Maximum Value Memory | Allows user to reset maximum value memory of voltage and current statistics for channel. If channel is controlled by 2-channels module then both channels will be reset |
| Reset Minimum Value Memory | Allows user to reset minimum value memory of voltage and current statistics for channel. If channel is controlled by 2-channels module then both channels will be reset |
| Reset Average Value Memory | Allows user to reset average value memory of voltage and current statistics for channel. If channel is controlled by 2-channels module then both channels will be reset. |
| Reset Trip Counter | Allows user to reset trip counter for channel. If channel is controlled by 2- channels module then both channels will be reset |

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| nsor_1694 | | |
|---------------|-----------------------------------|-------------------------------|
| Ready | | |
| Channel 3 | ▼ (5 | Reset Maximum Value Memory |
| Device type | 1 Channel Fixed Current Threshold | Reset Average Value Memory |
| | | Reset Trip Counter |
| Trip Limit | 4.00 A | Reset Minimum Value Memory |
| Warning Limit | 80.00 % | Config Apply |
| PLC Control | Disable Cnable | |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.



After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.

| | Severity | Time | Description |
|----------|-----------------|------------------------|---|
| <u> </u> | Active Fault | 1998-03-25 20:12:27 | Configuration Fault |
|) — | Fault | 1998-03-25 04:05:01 | CH03 - Hardware switch is in OFF position |
| | Fault | 1998-03-25 04:05:01 | CH02 - Hardware switch is in OFF position |
| | Fault | 1998-03-25 04:04:41 | CH01 - Hardware switch is in OFF position |
| | 1 | <u> </u> | |

| ltem | Description | |
|------|--|--|
| 1 | Banner | |
| 2 | ast fault is in first row and show in bold if active | |
| 3 | Yellow border visible when a fault is active | |
| 4 | Fault severity | |
| 5 | Fault event time | |
| 6 | 6 4 most recent fault/warning event messages | |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_1694_4I0L, raC_Dvc_1694_8I0L, raC_Dvc_1694_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_1694_410L, raC_LD_Dvc_1694_810L

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|---|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------|---------------|------------|--|
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_1694_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-------------------|---------------------|------------------|-------------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 1694), This name depends upon the TagName assigned to object. |
| SensorType | 1694-PFD1244 | 1694-PFD1244 | 1694-PFD1244 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|-------------------|-------------------|----------|-----------------|----------|
| raC_Dvc_1694_410L | raC_Dvc_1694_4IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_1694_8IOL | raC_Dvc_1694_8IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_1694_5032 | raC_Dvc_1694_5032 | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {0bjectName}_G0_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {0bjectName}_G0_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_1694 | Faceplate ME | (raC-3_xx-ME) raC_Dvc_1694-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_1694 | Faceplate SE | (raC-3_xx-SE) raC_Dvc_1694-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

45DMS - Distance Measurement Sensor (raC_Dvc_45DMS_4IOL, raC_Dvc_45DMS_8IOL, raC_Dvc_45DMS_Type1_5032, raC_Dvc_45DMS_Type2_5032)

Overview The 45DMS Distance Measurement Sensor device object (raC Dvc_45DMS_4IOL, raC_Dvc_45DMS_8IOL, raC_Dvc_45DMS_Type1_5032, raC_Dvc_45DMS_Type2_5032) includes HMI faceplate's which displays device information including: Sensor data Sensor diagnostics Process data trending Sensor configuration and parameters Device Fault log In the Library there is a folder named Videos which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_45DMS_Objects_Faceplate.MP4" Primary device object configuration functions include: • **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other. Polarity: This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate). **Functional Description** The 45DMS Distance Measurement Sensor pre-configured Device Objects: Collect, Process and Deliver Data between Smart Devices and Application Logic Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency All these features provide quick feedback, shorten recovery time, and simplify implementation. **Required Files** Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with four versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|-------------------------------------|---------------------------------------|--|
| | POINT 1/0 1734-410L | 45DMS_B8LAT1_D4, 45DMS_B8LGT1_D5 | raC_Dvc_45DMS_4I0L_3.02_A0I.L5X | raC_Dvc_45DMS_4IOL_3.02_RUNG.L5X |
| 45DMS | ArmorBlock 1732E-8I0LM12R | 45DMS_B8LAT1_D4, 45DMS_B8LGT1_D5 | raC_Dvc_45DMS_8I0L_3.02_A0I.L5X | raC_Dvc_45DMS_8IOL_3.02_RUNG.L5X |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 45DMS_B8LAT1_D4 | raC_Dvc_45DMS_Type1_5032_3.02_A0I.L5X | raC_Dvc_45DMS_Type1_5032_3.02_RUNG.L5X |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 45DMS_B8LGT1_D5 | raC_Dvc_45DMS_Type2_5032_3.02_A01.L5X | raC_Dvc_45DMS_Type2_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Type FactoryTalk View ME Faceplate | | FactoryTalk View SE Faceplate |
|-----------------|---------------------------------------|--|--|
| 45DMS | Display | (raC-3_02-ME) raC_Dvc_45DMS-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_45DMS-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Chapter 18 45DMS - Distance Measurement Sensor (raC_Dvc_45DMS_4I0L, raC_Dvc_45DMS_8I0L, raC_Dvc_45DMS_Type1_5032,

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate | | | | |
|-------------|-------------------------------------|--|--|--|--|
| 45DMS | (raC-3_02-VD) raC_Dvc_I0Link.vpd | | | | |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) | | |
|--------------------------|------------------------------|--|--|--|--|
| | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_45DMS_410L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_45DMS_4IOL_(3.2) | | |
| 45DMS | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_45DMS_810L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_45DMS_8IOL_(3.2) | | |
| | 5032-810LM12DR | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_45DMS_Type1_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_45DMS_5032_(3.2) | | |
| | 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_45DMS_Type2_5032_(3.2) | | | |

Device Definition (raC_Dvc_45DMS_4IOL, raC_Dvc_45DMS_8IOL)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



- 2. Specify the Application Specific Name e.g. Distance_100
- 3. Select the Process Data Input as Triggered1, Triggered2, SignalScore, Distance, SignalQuality.

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storag |
|---------|---------|---------------|-----------------|------------------------------|----------------------|--|-------------|
|) | 10-Link | Allen-Bradley | 45DMS-B8LAT1-D4 | Distance_100 | Exact M 🗸 | Triggered1,Triggered2,SignalScore,Distance,SignalQuality < | Enable ADC |
| I | 10-Link | Allen-Bradley | 45DMS-B8LAT1-D4 | Distance_200 | Exact M 🗸 | Triggered1, Triggered2, SignalScore, Distance, SignalQuality ~ | Enable ADC |
| 2 | IO-Link | | | | | | |
| } | 10-Link | | | | | | |
| t I | 10-Link | | | | | | |
| 5 | 10-Link | | | | | | |
| 5 | 10-Link | | | | | | |
| 7 | 10-Link | | | | | | |
| () | | | | | | | |

Device Definition (raC_Dvc_45PLA_Type1_50 32, raC_Dvc_45PLA_Type2_503 2)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass

information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| Energy Storage | Redundancy | Favorites A | dd-On PlantPAx Safe | ity Alarms Bit | Module (| Definition | | | | | |
|---|----------------------------|-----------------|-------------------------|--------------------|------------|------------|------------|---------------------------------------|------------|---------|--|
| troller Organizer 💌 🖡 | × 🕴 Module Properties: EN2 | 2TR (5032-8IOLM | 12M12LDR 2.011) × | | Series: | | A | × | | | |
| 0 | General | General | | | Revision: | | 2 | V 011 | | | |
| Controller Master_IOLink_5032 | Connection | | | | Flectronic | Kevina | Compatible | | | | |
| Controller lags | Channels | Type: | 5032-8IOLM12M12LDR 8 | IO-Link Channel, 8 | | | Compatible | Module | | | |
| Power-Un Handler | 00 - IO-Link | Vendor: | Rockwell Automation/All | en-Bradley | Connectio | on: | Data | | \leq | | |
| Tasks | 01 - Digital Output | Parent: | EN2TR | | | | | | | | |
| A 🗘 MainTask | - 03 - Digital Input | Name: | Mod_Master5032 | | | | | 1 | - | | |
| MainProgram | | Description: | | | | | | | Ch | annel | |
| Unscheduled | | | | | Deat | Channel | IO-Link | Characterist | MOC | le Type | |
| Motion Groups | 10 - IO-Link | | | w | Роп | Channel | Enabled | Channel Mode | - | o | |
| Alarm Manager | | Module Defin | tion | | | | | | | 0 1 | |
| Assets | Internet Protocol | module Denn | uun | Change | | 0 | 1 | IO-Link | ~ 1 | v - | |
| | - Port Configuration | 2. 4 | | Change | 0 | 1 | | Digital Output, Short Circuit, No Loa | ad 🖂 🗸 | 1 | |
| Trends | Network | Series: | A | | 1 | 2 | | IO-Link | ~ 1 | 1 1 | |
| logical Model | Servers | Revision: | 2.011 | | | 3 | | Digital Input | × 1 | 1 | |
| VO Configuration | | Electronic Ke | ying: Compatible | Module | 2 | 4 | | Disabled | ~ ~ | 1 | |
| 1756 Backplane, 1756-A10 | | Connection | Data | | | 6 | _ | IO-Link | ~ 1 | 1 1 | |
| ▲ 🖞 [1] 1756-EN2TR EN2TR | | Connection. | Data | | 3 | 7 | | Disabled | ~ | 1 | |
| A B Ethernet | | | | | 4 | 8 | | IO-Link | ~ 1 | 1 1 | |
| 1756-EN2TR EN2TR | | | | | - | 9 | | Disabled | ~ J | 1 | |
| 5032-8IOLM12M12LDR/A Mod Master5032 | | | | | 5 | 10 | | IO-Link | × 1 | 1 1 | |
| @ 191 1756-185E Master 10Link 5032 | | | | | | 11 | | Uisabled | × | 1 | |
| | | | | | 6 | 12 | | Disabled | × • | v v | |
| a 1756 L95E Mactor IOLink 5022 | | | | | _ | 13 | - | IO-I ink | · · / / | | |
| IN THE REPORT OF THE REPORT OF THE REPORT | | | | | 7 | | | | | | |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 45DMS, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 45DMS Sensor.
 - 🔺 🛋 I/O Configuration
 - IT56 Backplane, 1756-A7
 [0] 1756-L85E Master_5032_Test_Cases
 - ▲ 器 Ethernet
 - 1756-L85E Master_5032_Test_Cases
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_1
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_2
 - ✓ OIO-Link
 0 42JT-P2LAT1-xx (4) Mod_42JT_Type3
 2 45CRM-4LHT1-D4 (71) Mod 45CRM
 4 45DMS-B8LAT1-D4 (228) Mod_45DMS_Type1
 6 45DMS-B8LGT1-D5 (230) Mod_45DMS_Type2
 8 45PLA-P2LPT1-F4 (301) Mod_45PLA
 10 46CLR-D5LAC1-D5 (294) Mod_46DFA
 12 46DFA-L2LBT1-xx (291) Mod_46DFA
 ◎ 14 836P-D1xxxA14PA-D4 (177) Mod_836P_Type1
 5032-8IOLM12M12LDR/A Mod_Master_5032_3
 - 5032-010LIMT2LDR/A MOU_Master_5032_3
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_4

3. Configure the parameters of sensor from configuration tab from AOP of the 45DMS sensor.

| Controller Organizer 🔹 🕈 🛧 | 🔋 woaule Properties: wo | a_iviast | er_5052_2:4 (450/WIS-DOLATT- | V4 (2) | 20) 1. | .u | | | |
|--|-------------------------|----------|---|--------|--------|----------------|-------|----------|-------------|
| ð = | General | Con | figuration | | | | | | |
| Controller Master_5032_Test_Cases | - Connection | | | | | | | | |
| Tasks | - Device Info | | | | | | | | |
| Motion Groups | Configuration | | Name | R/W | | Value | Units | Style | Description |
| Alarm Manager | Parameters | | Identification | | | | | | |
| Assets | Lvencog | | User Specific Information | | | 45 70 40 | | | |
| b Logical Model | | | Application-specific rag | rw | | 45DMS | | | |
| ▲ = U/O Configuration | | | Teach-In Operation | | | | | | |
| ■ 1756 Packalano 1756 A7 | | | Teach (Static, Precision, F |)vnami | | | | | |
| = 1750 Backplane, 1750-A7 | | | Teach Channel | rw | 1 | Triggered 1 🗸 | | | |
| P [0] 1730-LOSE Master_3052_Test_Cases | | | Operation Configuration | | | | | | |
| The second secon | | | Triggered 1 | | | | | | |
| III 1756-L85E Master_5032_lest_Cases | | | Switchpoint 1 | ſW | \sim | 3000 | mm | Decim: \ | • |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_1 | | | Switchpoint 2 | rw | \sim | 3100 | mm | Decim: \ | 1 |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_2 | | | Туре | rw | | Auto PNP/NPN 🗠 | | | |
| A 🛇 IO-Link | | | Polarity | rw | | Not Inverted 🗸 | | | |
| 🛢 0 42JT-P2LAT1-xx (4) Mod_42JT_Type3 | | | Mode | rw | _ | Hysteresis 🗠 | | D | |
| 2 45CRM-4LHT1-D4 (71) Mod_45CRM | | | Counter On Delay | rw | | 0 | | Decim: V | |
| 4 45DMS-B8LAT1-D4 (228) Mod_45DMS_Type1 | | | Off Delay | TW DW | × · | 0 | me | Decim | |
| 6 45DMS-B8LGT1-D5 (230) Mod_45DMS_Type2 | | | One Shot | TW | V | 0 | ms | Decim: V | |
| 8 45PLA-P2LPT1-F4 (301) Mod 45PLA | | | Frequency Monitor | rw | | 0.0 | Hz | Float | |
| 10 46CLR-D5LAC1-D5 (294) Mod 46CLR | | | Triggered 2 | | | | | | |
| 12 46DEA-L2L BT1-xx (291) Mod 46DEA | | | Switchpoint 1 | ſW | \sim | 3000 | mm | Decim: \ | |
| 14 836P-D1yyy 14PA-D4 (177) Mod 836P Type1 | | | | | | | | | |
| 5022 9/01 M12M12LDP/A Mod Marter 5022 2 | | In | sert Factory Defaults | | | | | | |
| B 2025-010EIMT210112EDTV A MOU_MIDSTEL_2022_2 | | | | | | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_45DMS_4IOL, raC_Dvc_45DMS_8I0L)

| InOut | Function / Description | DataType |
|-----------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_45DMS_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_45DMS_Inp_4IOL Or raC_UDT_ItfAD_45DMS_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |

Input Data

| Input | Function/Description | DataType |
|---------------------------|--|----------|
| Inp_ChxTriggered1 | Triggered Status When the Temprature is equal to Defined Temperature Set for Trigger1 | BOOL |
| Inp_ChxTriggered2 | Triggered Status When the Temperature is equal to Defined Temperature Set for Trigger2 | BOOL |
| Inp_ChxDistance | Displays Distance in mm – non-adjustable | INT |
| Inp_ChxSignalQuality | Signal Quality 0100% | SINT |
| Inp_ChxSignalQualityScore | adjustable via index 196(0xC4) | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_AveragingFilter | Averaging Filter; 0 = Disabled, 110 = 10100 Measurements | SINT |
| Cfg_MeasurementMode | Measurement Mode; 0 = Negative Slope, 1 = Positive Slope | SINT |
| Cfg_Pin2Input | Pin 2 Input; 0 = Disabled, 1 = Enabled | SINT |
| Cfg_TeachChannel | Teach Channel; 0 or 1 = Triggered 1, 2 = Triggered2 | SINT |
| Cfg_Trig1_OperMode | Trigger1 Operation Mode; 0 = Off, 1 = Hysteresis, 2 = Window, 3 = Adjustable Hysteresis | SINT |
| Cfg_Trig1_Polarity | Trigger 1 Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cfg_Trig2_OperMode | Trigger2 Operation Mode Status; 0 = Off, 1 = Hysteresis, 2 = Window, 3 = Adjustable Hysteresis | SINT |
| Cfg_Trig2_Polarity | Trigger 2 Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |

| Innut | Function (Description | DeteTune |
|-------------------------------|--|----------|
| Input | runction/Description | DataType |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_TeachApply | Teach Apply Command | BOOL |
| Cmd_TeachCancel | Teach Cancel Command | BOOL |
| Cmd_TeachDynamic_Start | Teach Dynamic Start Command | BOOL |
| Cmd_TeachDynamic_Stop | Teach Dynamic Stop Command | BOOL |
| Cmd_TeachPrecision_ShowTarget | Teach Precision Show Target Command | BOOL |
| Cmd_TeachStatic_Background | Teach Static Background Command | BOOL |
| Cmd_TeachStatic_ShowTarget | Teach Static Show Target Command | BOOL |
| Set_Offset | Enter Offset to define an offset from the current measured value | INT |
| Set_SignalQualityLev | Enter Signal Quality to define level of reflectivity | INT |
| Set_TrendDistMaxValue | Trend Tab Distance Max for VD/ME/SE Faceplate | INT |
| Set_TrendDistMinValue | Trend Tab Distance Min for VD/ME/SE Faceplate | INT |
| Set_Trig1_OFFDelay | Enter Trigger1 OFF delay for the Output to turn OFF after target left Detection Area | DINT |
| Set_Trig1_ONDelay | Enter Trigger1 ON delay for the Output to turn ON, once target has been detected | DINT |
| Set_Trig1_SP1 | Enter First SetPoint For Triggered1 | INT |
| Set_Trig1_SP2 | Enter Second SetPoint For Triggered1 | INT |
| Set_Trig2_OFFDelay | Enter Trigger2 OFF delay for the Output to turn OFF after target left Detection Area | DINT |
| Set_Trig2_ONDelay | Enter Trigger2 ON delay for the Output to turn ON, once target has been detected | DINT |
| Set_Trig2_SP1 | Enter First SetPoint For Triggered2 | INT |
| Set_Trig2_SP2 | Enter Second SetPoint For Triggered2 | INT |

Chapter 18 45DMS - Distance Measurement Sensor (raC_Dvc_45DMS_4IOL, raC_Dvc_45DMS_8IOL, raC_Dvc_45DMS_Type1_5032,

Output Data

| Output | Function/Descritpion | DataType |
|--|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | _Located Locator Indicator; 1= Located | |
| al_AveragingFilter Averaging Filter Status; 0 = Disabled, 110 = 10100 Measurements | | INT |
| Val_MeasurementMode | Measurement Mode Status; 0 = Negative Slope, 1 = Positive Slope | |
| Val_Offset | Offset Offset Value to define an offset from the current measured value | |
| /al_OperatingHrsSinceInception Operating Hours Since Inception | | DINT |
| al_Pin2Input Pin 2 Input Status; 0 = Disabled, 1 = Enabled | | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | INT |
| Val_RangeMin | Sensor Minimum Range in Trend | INT |
| Val_SignalQualityLev | Signal Quality Level Value defines level of Reflectivity | INT |
| Val_TeachChannel | Teach Channel Value; 0 or 1 = Triggered 1, 2 = Triggered2 | INT |
| Val_TeachStep | Teach Step | INT |
| Val_TemperatureCurrent | Internal Temperature Of Sensor | INT |
| Val_TemperatureMaxSinceInception | Maximum Temperature Since Inception | INT |
| Val_TemperatureMaxSincePowerUp | Maximum Temperature Since Power Up | INT |
| Val_TemperatureMinSinceInception | Minimum Temperature Since Inception | INT |
| Val_TemperatureMinSincePowerUp | Minimum Temperature Since Power Up | INT |
| Val_Trig1_Mode | Trigger1 Operation Mode Status; 0 = Off, 1 = Hysteresis, 2 = Window, 3 = Adjustable Hysteresis | INT |
| Val_Trig1_OFFDelay | Trigger1 OFF delay Value for the Output to turn OFF after target left Detection Area | DINT |
| Val_Trig1_ONDelay | Trigger1 ON delay Value for the Output to turn ON, once target has been detected | DINT |
| Val_Trig1_Polarity | Trigger 1 Polarity; 0 = Not Inverted, 1 = Inverted | INT |

Chapter 18 45DMS - Distance Measurement Sensor (raC_Dvc_45DMS_4I0L, raC_Dvc_45DMS_8I0L, raC_Dvc_45DMS_Type1_5032,

| Output | Function/Descritpion | DataType |
|---------------------------|--|----------|
| Val_Trig1_SP1 | First SetPoint Value For Triggered1 | INT |
| Val_Trig1_SP2 | Second SetPoint Value for Triggered1 | INT |
| Val_Trig2_Mode | Trigger2 Operation Mode Status; 0 = Off, 1 = Hysteresis, 2 = Window, 3 = Adjustable Hysteresis | INT |
| Val_Trig2_OFFDelay | Trigger2 OFF delay Value for the Output to turn OFF after target left Detection Area | DINT |
| Val_Trig2_ONDelay | Trigger2 ON delay Value for the Output to turn ON, once target has been detected | DINT |
| Val_Trig2_Polarity | Trigger 2 Polarity; 0 = Not Inverted, 1 = Inverted | INT |
| Val_Trig2_SP1 | First SetPoint Value For Triggered2 | INT |
| Val_Trig2_SP2 | Second SetPoint Value for Triggered2 | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_45DMS_Type1_50 32, raC_Dvc_45DMS_Type2_50 32)

| InOut | Function / Description | DataType |
|-----------------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_45DMS_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_I0LinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_45DMS_Type1_Cfg or raC_UDT_IOLink_45DMS_Type2_Cfg |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_45DMS_Type1_Cfg or raC_UDT_IOLink_45DMS_Type2_Cfg |

Input Data

| Input | Function/Description | DataType |
|---------------------------|---|----------|
| Inp_ChxTriggered1 | Triggered Status When the Temprature is equal to Defined Temperature Set for Trigger1 | BOOL |
| Inp_ChxTriggered2 | Triggered Status When the Temperature is equal to Defined Temperature Set for Trigger2 | BOOL |
| Inp_ChxDistance | Displays Distance in mm – non-adjustable | INT |
| Inp_ChxSignalQuality | Signal Quality 0100% | SINT |
| Inp_ChxSignalQualityScore | adjustable via index 196(0xC4) | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Cfg_AveragingFilter | Averaging Filter; 0 = Disabled, 110 = 10100 Measurements | SINT |
| Cfg_MeasurementMode | Measurement Mode; 0 = Negative Slope, 1 = Positive Slope | SINT |
| Cfg_Pin2Input | Pin 2 Input; 0 = Disabled, 1 = Enabled | SINT |
| Cfg_TeachChannel | Teach Channel; 0 or 1 = Triggered 1, 2 = Triggered2 | SINT |
| Cfg_Trig1_OperMode | Trigger1 Operation Mode; 0 = Off, 1 = Hysteresis, 2 = Window, 3 = Adjustable Hysteresis | SINT |
| Cfg_Trig1_Polarity | Trigger 1 Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cfg_Trig2_OperMode | Trigger2 Operation Mode Status; 0 = Off, 1 = Hysteresis, 2 = Window, 3 = Adjustable Hysteresis | SINT |
| Cfg_Trig2_Polarity | Trigger 2 Polarity; 0 = Not Inverted, 1 = Inverted | SINT |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |

| Input | Function/Description | DataType |
|-------------------------------|--|----------|
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_TeachApply | Teach Apply Command | BOOL |
| Cmd_TeachCancel | Teach Cancel Command | BOOL |
| Cmd_TeachDynamic_Start | Teach Dynamic Start Command | BOOL |
| Cmd_TeachDynamic_Stop | Teach Dynamic Stop Command | BOOL |
| Cmd_TeachPrecision_ShowTarget | Teach Precision Show Target Command | BOOL |
| Cmd_TeachStatic_Background | Teach Static Background Command | BOOL |
| Cmd_TeachStatic_ShowTarget | Teach Static Show Target Command | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Set_Offset | Enter Offset to define an offset from the current measured value | INT |
| Set_SignalQualityLev | Enter Signal Quality to define level of reflectivity | INT |
| Set_TrendDistMaxValue | Trend Tab Distance Max for VD/ME/SE Faceplate | INT |
| Set_TrendDistMinValue | Trend Tab Distance Min for VD/ME/SE Faceplate | INT |
| Set_Trig1_OFFDelay | Enter Trigger1 OFF delay for the Output to turn OFF after target left Detection Area | DINT |
| Set_Trig1_ONDelay | Enter Trigger1 ON delay for the Output to turn ON, once target has been detected | DINT |
| Set_Trig1_SP1 | Enter First SetPoint For Triggered1 | INT |
| Set_Trig1_SP2 | Enter Second SetPoint For Triggered1 | INT |
| Set_Trig2_OFFDelay | Enter Trigger2 OFF delay for the Output to turn OFF after target left Detection Area | DINT |
| Set_Trig2_ONDelay | Enter Trigger2 ON delay for the Output to turn ON, once target has been detected | DINT |
| Set_Trig2_SP1 | Enter First SetPoint For Triggered2 | INT |
| Set_Trig2_SP2 | Enter Second SetPoint For Triggered2 | INT |

Output Data

| Output | Function/Descritpion | DataType |
|----------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |

Chapter 18 45DMS - Distance Measurement Sensor (raC_Dvc_45DMS_4IOL, raC_Dvc_45DMS_8IOL, raC_Dvc_45DMS_Type1_5032,

| Output | Function/Descritpion | DataType |
|--|---|----------|
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_AveragingFilter | Averaging Filter Status; 0 = Disabled, 110 = 10100 Measurements | INT |
| Val_MeasurementMode | Measurement Mode Status; 0 = Negative Slope, 1 = Positive Slope | INT |
| /al_Offset Offset Value to define an offset from the current measured va | | INT |
| Val_OperatingHrsSinceInception | Operating Hours Since Inception | DINT |
| Val_Pin2Input | Pin 2 Input Status; 0 = Disabled, 1 = Enabled | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | INT |
| Val_RangeMin | Sensor Minimum Range in Trend | INT |
| Val_SignalQualityLev | Signal Quality Level Value defines level of Reflectivity | INT |
| Val_TeachChannel | Teach Channel Value; 0 or 1 = Triggered 1, 2 = Triggered2 | INT |
| Val_TeachStep Teach Step | | INT |
| Val_TemperatureCurrent | Internal Temperature Of Sensor | INT |
| Val_TemperatureMaxSinceInceptio | Maximum Temperature Since Inception | INT |
| Val_TemperatureMaxSincePowerU p | Maximum Temperature Since Power Up | INT |
| Val_TemperatureMinSinceInceptio | Minimum Temperature Since Inception | INT |
| Val_TemperatureMinSincePowerU p | Minimum Temperature Since Power Up | INT |
| Val_Trig1_Mode | Trigger1 Operation Mode Status; 0 = Off, 1 = Hysteresis, 2 = Window, 3 = Adjustable Hysteresis | INT |
| Val_Trig1_OFFDelay | Trigger1 OFF delay Value for the Output to turn OFF after target left Detection Area | DINT |
| Val_Trig1_ONDelay | Trigger1 ON delay Value for the Output to turn ON, once target has been detected | DINT |
| Val_Trig1_Polarity | Trigger 1 Polarity; 0 = Not Inverted, 1 = Inverted | INT |
| Val_Trig1_SP1 | First SetPoint Value For Triggered1 | INT |
| Val_Trig1_SP2 | Second SetPoint Value for Triggered1 | INT |
| Val_Trig2_Mode | Trigger2 Operation Mode Status; 0 = Off, 1 = Hysteresis, 2 = Window, 3 = Adjustable Hysteresis | INT |
| Val_Trig2_OFFDelay | Trigger2 OFF delay Value for the Output to turn OFF after target left Detection Area | DINT |
| Val_Trig2_ONDelay | Trigger2 ON delay Value for the Output to turn ON, once target has been detected | DINT |
| Val_Trig2_Polarity | Trigger 2 Polarity; 0 = Not Inverted, 1 = Inverted | INT |
| Val_Trig2_SP1 | First SetPoint Value For Triggered2 | INT |
| Val_Trig2_SP2 | Second SetPoint Value for Triggered2 | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 45DMS device object connected to channel #2 of a POINT I/O 1734-4IOL IO-Link Master module in slot #1 of a POINT I/O adapter named *Racko1*.



The following example uses the 45DMS device object connected to channel #6 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.

| Sensor45DMS_102 | |
|-----------------------------------|--|
| Input Interface | Sensor 102 |
| COP | raC_Dvc_45DMS_8IOL |
| Source Armor_8IOL_MasterB:I.Fault | raC_Dvc_45DMS_8IOL Sensor45DMS_102 |
| Dest Sensor45DMS_102_Inp_I.Fault | Ref_Module Armor_8IOL_MasterB -(Sts_Connected)- |
| Length 32 | Write_Index Sensor45DMS_102_Write_Index |
| | Read_Index Sensor45DMS_102_Read_Index (Sts_Available)- |
| | Write_SubIndex Sensor45DMS_102_Write_SubIndex |
| | Read_SubIndex Sensor45DMS_102_Read_SubIndex(Sts_Warning) |
| | Msg_Sensor_Data Sensor45DMS_102_Msg_Sensor_Data |
| | Ref_Ctrl_Set Sensor45DMS_102_CtrlSet (Sts_Faulted) |
| | Ref_Ctrl_Cmd Sensor45DMS_102_CtrlCmd |
| | Ref_Ctrl_Sts Sensor45DMS_102_CtrlSts -(Sts_Ready)- |
| | Inf_Lookup raC_Dvc_45DMS_InfTable |
| | Inp_I Sensor45DMS_102_Inp_I |
| | Inp_ChxTriggered1 Armor_8IOL_MasterB:I.Ch6Triggered1 |
| | 0 🖛 |
| | Inp_ChxTriggered2 Armor_8IOL_MasterB:I.Ch6Triggered2 |
| | 0 🖛 |
| | Inp_ChxSignalQualityScore Armor_8IOL_MasterB:I.Ch6SignalQualityScore |
| | 0 🖛 |
| | Inp_ChxDistance Armor_8IOL_MasterB:I.Ch6Distance |
| | 0 🗰 |
| | Inp_ChxSignalQuality Armor_8IOL_MasterB:I.Ch6SignalQuality |
| | 0 🔶 |
| | Inp_ChNumber 6 |
| | |
| | Ref_Ctrl_Inf Armor_8IOL_MasterB_CtrlInf |
| | Ref_Ctrl_ltf Armor_8IOL_MasterB_Ctrlltf |
| | |

Note: If tags for Triggered1, Triggered2, Signal Quality Score, Distance, and Signal Quality are missing after importing the AOI into Master 4IOL or 8IOL models, modify the 'Process Input Data' parameter within the AOP.

| eneral | 10-Link | | | | | | | | | | |
|---|-----------|------------|-------------|--------------|---------------------------------|----------------------|--|---|----------------|---|------------------|
| - Module Info - Internet Protocol - Port Configuration - Network - Time Sync - Fault/Program Action Configuration | 🖃 🗍 173 | E-8IOL12N | IR/A | | | | | | | | |
| | Change Cl | nannel Coi | nfiguration | | | | | | | | |
| | Chan | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | | Data Storage | | Change Device |
| ink | 0 | IO-Link | | | | | | | | | |
| | 1 | IO-Link | Allen-Brad | 42AF-B1MAC1 | *** | Exact Y | Triggered,Margin,Proximity,Gain,Signal | Y | Backup/Restore | ~ | |
| | 2 | IO-Link | | | | | | | | | |
| | 3 | IO-Link | | | | | | | | | |
| | 4 | IO-Link | Allen-Brad | 45PLA-P2LPT1 | *** | Exact V | Triggered,Margin,Proximity,Gain,Signal | V | Backup/Restore | V | |
| | 5 | IO-Link | Allen-Brad | 45DMS-B8LAT | 45DMS | Exact Y | Triggered1,Triggered2,SignalScore,Distance,SignalQuality | Y | Backup/Restore | ~ | |
| | 6 | IO-Link | | | | | | | | | |
| | 7 | IO-Link | | | | | | | | | |

The following example uses the 45DMS Tyep1 Sensor device object connected to channel #4 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_2*.



The following example uses the 45DMS Tyep2 Sensor device object connected to channel #6 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named Mod_Master_5032_2. Sensor_45DMS_Type2 Configuration Interface Device Sensor_45DMS_Type2 Input Interface Access Locks Data Sensor_45DMS_Type2 COP COP raC_Dvc_45DMS_Type2_5032 Source Mod_45DMS_Type2:C.Device_Access_Locks Dest Sensor_45DMS_Type2_Cfg_C.Device_Access_Locks raC_Dvc_45DMS_Type2_5... Ref_Module Source Mod_45DMS_Type2:I Sensor_45DMS_Type2 Dest Sensor_45DMS_Type2_Inp_I Mod_45DMS_Type2 Ref_MsgCustSetIdx Sensor_45DMS_Type2_SetIndex 22 Length Length Ref_MsgCustGetIdx Sensor_45DMS_Type2_GetIndex Ref_MsgModReconfigure Sensor_45DMS_Type2_ModReconfigure Ref_MsgData Sensor_45DMS_Type2_MsgData Ref_Ctrl_Set Sensor_45DMS_Type2_CtrlSet Ref Ctrl Cmd Sensor_45DMS_Type2_CtrlCmd Sensor_45DMS_Type2_CtrlSts Ref_Ctrl_Sts Ref_Ctrl_Inf Mod_Master_5032_2_Ctrlinf Mod_Master_5032_2_Ctrlltf raC_Dvc_45DMS_InfTable Ref Ctrl Itf Inf_Lookup Inp_I Cfg_C Sensor_45DMS_Type2_Inp_I Sensor_45DMS_Type2_Cfg_C Inp_ChNumber COP Source Sensor_45DMS_Type2_Cfg_C.Device_Access_Locks Dest Mod_45DMS_Type2:C.Device_Access_Locks Length 22

Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|------------------------------------|----------------|---|--|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_LightSens WithData | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #105:Live Data Engineering Unit #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|----------------------|--|---|
| AOG_45PLA _Launch | SS C NNNN.N mm | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Security Image: Security Image: Security Image: Security Image: Security Image: Security |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Sensor45DMS_102 | Sensor 102 |
|---|-----------------------------------|
| Sensor45DMS_102_CtrlCmd | Sensor45DMS_102 Command Interface |
| Sensor45DMS_102_CtrlSet | Sensor45DMS_102 Setting Interface |
| Sensor45DMS_102_CtrlSts | Sensor45DMS_102 Status Interface |
| Sensor45DMS_102_Inp_1 | Sensor45DMS_102 Input Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status 1 & 2 OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Trigger1 Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 5 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 6 | Process Data: Displays the current Temperature value along with unit. |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name require pressing the 'Config Apply' button in the Config tab to update the sensor parameters. |

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description |
|------|---|
| 1 | Device Temperature Bar Graph Purple Indicators: Min/Max since power up Light Blue Triangle Indicator: Current value |
| 2 | Device Temperature Current Value |
| 3 | Operating Hours Since Inception |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action decisions. One trend is displayed for Distance.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Distance.

| Sensor 1 | 02 | × |
|------------------------|------------------------|---|
| $\widehat{\mathbf{w}}$ | Ready | |
| | Trend and Spark Limits | × |
| | Distance Scale | |
| | Minimum 60 mm | |
| | Maximum 120 mm | |
| | | |
| | | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Trigger Settings
- Teach Settings
- Configuration Apply Settings





In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

Parameter Settings

Measurement Mode- The Measurement Mode parameter enables operators to invert the measurement from Positive slope to Negative Slope.

Averaging Filter- The Averaging Filter parameter allows operators to average multiple measurements, inside of the sensor with the goal of providing a more stable measurement.

Pin 2 Input- The pin two Input parameter allows operators to enable or disable the pin two Input available on catalog number, 45DMS-B8LAT1-D4.

Signal Quality Level- Signal Quality Level accepts values from 10 to 90% and can help operators understand the level of reflectivity, which may be acceptable or could affect your application.

Offset- - The Offset parameter allows operators to define an offset from the current measured value. Operators can choose between -5000 to +5000 as an offset.

Local Teach- The Local Teach toggle button is used to Enable or disable the local push button to prevent undesired teach on the sensors.

Trigger Settings

| Sensor | 102 | | X |
|------------------------|------------------|--------------|--------------|
| $\widehat{\mathbf{w}}$ | Ready | | |
| % | Trigger Settings | | × |
| \sim | | Trigger 1 | Trigger 2 |
| P | Operating Mode | Hysteresis | Disabled |
| 1 | Switch Point 1 | 1200 mm | 2000 mm |
| | Switch Point 2 | 1400 mm | 2500 mm |
| | Polarity | Not Inverted | Not Inverted |
| | On Delay | 1000 ms | 2000 ms |
| | Off Delay | 1500 ms | 2500 ms |

The Trigger settings divided into sections:

- Trigger 1
- Trigger 2

Operating Mode- The operating mode parameter enables operators to define the desired output mode for Trigger 1 & Trigger 2. These modes can be Hysteresis, Window & Adjustable Hysteresis.

Switch Point 1- Switch point 1 defines the first set point value for Trigger 1 & Trigger 2. The Hysteresis mode uses the value of switch point 1 to determine when the output will be ON or OFF depending on the Polarity setting. For this setting, the sensor will only detect objects between the minimum distance and the set point distance. Any higher reflectivity objects will be ignored beyond this point.

Switch Point 2- - Switch point 2 defines the second set point value for Trigger 1 & Trigger 2. Switch Point1 & Switch Point2 parameter can accept values between 60 and 5000 and is expressed in mm. The Window mode uses the values of switch point 1 and switch point 2 to determine when the output will be ON or OFF depending on the polarity settings. Only objects between switch point 1 and switch point 2 will be detected while objects outside of these distances will be ignored.

Polarity value- The Polarity value can either be Not-Inverted or Inverted. Not-Inverted means that the output will turn ON when the target is within the expected set points. Inverted means that the output will turn OFF when the target is within the expected set points.

On Delay- The On Delay defines the desired delay for the output to turn ON once a target has been detected.

Off Delay- The Off Delay defines the desired delay for the output to turn OFF once a target has left the detection area.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| 450 | DMS - 1001 | | |
|-----|----------------------|----------------|-----------------------|
| | Ready | | |
| Ð | Parameter Settings | | |
| ~ | Measurement Mode | Positive Slope | Trigger Settings |
| 63 | Averaging Filter | Disabled | Teach Settings |
| | Pin 2 Input | Disabled | Config Apply |
| | Signal Quality Level | 10 | |
| | Offset | 4500 | Local Teach Unlock |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| 450 | DMS - 1001 | | |
|------------|----------------------|-------------------|---------------------|
| | Ready | | |
| Ð | Parameter Settings | | |
| ~ | Measurement Mode | Negative Slope | Trigger Settings |
| <i>(</i>) | Averaging Filter | Disabled V | Teach Settings |
| | Pin 2 Input | Disabled | Config Apply |
| | Signal Quality Level | 10 | Local Teach |
| | Offset | 4500 | Unlock Cock |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.

| | Sensor 102 | | | | | | | |
|---|------------|------------------------|------------------------------|------------------------|------------------------------|--|--|--|
| 1 | | $\widehat{\mathbf{w}}$ | Not Ready Connection Faulted | | | | | |
| | | | Severity | Time | Description | | | |
| 2 | | <u>~</u> | Active Fault | 1998-07-22 01:10:53 | Sensor is disconnected | | | |
| 3 | | , ! | Fault | 1998-07-22 01:10:40 | A short circuit was detected | | | |
| | | | Fault | 1998-07-22 01:10:29 | Sensor Data Invalid | | | |
| | | | Fault | 1998-07-22 00:42:17 | Sensor is disconnected | | | |
| | | | | <u> </u> | L | | | |
| | | | | | | | | |
| | | | 4 | 5 | 6 | | | |

| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_45DMS_4IOL, raC_Dvc_45DMS_8IOL, raC_Dvc_45DMS_Type1_5032, raC_Dvc_45DMS_Type2_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_45DMS_4IOL, raC_LD_Dvc_45DMS_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Sensor Type | | | | Select sensor type of 45DMS as per device catalog no. |
| MasterName | MasterName | [MasterName] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_45DMS_Type1_5032, raC_LD_Dvc_45DMS_Type2_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------|---------------|-------------|---|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |

| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
|-------------------|---------------------|------------------|-------------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 45DMS), This name depends upon the TagName assigned to object. |
| SensorType | 45DMS_B8LAT1_D4 | 45DMS_B8LAT1_D4 | 45DMS_B8LAT1_D4 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|--------------------------|--------------------|----------|-----------------|----------|
| raC_Dvc_45DMS_4I0L | raC_Dvc_45DMS_4IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_45DMS_8I0L | raC_Dvc_45DMS_8IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_45DMS_Type1_5032 | raC_Dvc_45DMS_5032 | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_45DMS | Faceplate ME | (raC-3_xx-ME) raC_Dvc_45DMS-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_45DMS | Faceplate SE | (raC-3_xx-SE) raC_Dvc_45DMS-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_IO_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

Chapter 18 45DMS - Distance Measurement Sensor (raC_Dvc_45DMS_4I0L, raC_Dvc_45DMS_8I0L, raC_Dvc_45DMS_Type1_5032,
46CLR - ColorSight True Color Sensor (raC_Dvc_46CLR_4I0L, raC_Dvc_46CLR_8I0L, raC_Dvc_46CLR_5032)

Overview

The 46CLR ColorSight True Color Sensor device object (raC_Dvc_46CLR_4IOL, raC_Dvc_46CLR_8IOL, raC_Dvc_46CLR_5032) includes HMI faceplate's which displays device information including:

- Sensor data
- Snapshots of Sensor Parameter
- Sensor diagnostics
- Process data trending
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_46CLR_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.
- **Polarity:** This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate).

Functional Description

The 46CLR ColorSight True Color Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplate's for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplate's. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix[®] firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|---|---------------------------------|----------------------------------|
| 46CLR | POINT 1/0 1734-410L | 46CLR-D5LAC1-D5, 46CLR-D5LAC2-D5, 46CLR-D5LAC3-D5 | raC_Dvc_46CLR_410L_3.02_A01.L5X | raC_Dvc_46CLR_410L_3.02_RUNG.L5X |
| | ArmorBlock 1732E-8IOLM12R | 46CLR-D5LAC1-D5, 46CLR-D5LAC2-D5, 46CLR-D5LAC3-D5 | raC_Dvc_46CLR_810L_3.02_A01.L5X | raC_Dvc_46CLR_810L_3.02_RUNG.L5X |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 46CLR-D5LAC1-D5, 46CLR-D5LAC2-D5, 46CLR-D5LAC3-D5 | raC_Dvc_46CLR_5032_3.02_A01.L5X | raC_Dvc_46CLR_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 46CLR | Display | (raC-3_02-ME) raC_Dvc_46CLR-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_46CLR-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 46CLR | (raC-3_02-VD) raC_Dvc_IOLink.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|--|--|--|
| 46CLR | Point I/o 1734-410L | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_46CLR_4IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_46CLR_4IOL_(3.2) |
| | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_46CLR_8I0L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_46CLR_8IOL_(3.2) |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_46CLR_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_46CLR_5032_(3.2) |

Device Definition (raC_Dvc_46CLR_4IOL, raC_Dvc_46CLR_8IOL)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



- 2. Specify the Application Specific Name e.g.
- 3. Select the Process Data Input as Triggered, QualityScore, SignalQuality.

| hange Channel Configuration X | | | | | | | | |
|-------------------------------|--|---------------|-----------------|------------------------------|----------------------|--|----------------|------------------|
| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storage | Change Device |
| 0 | 10-Link | Allen-Bradley | 46CLR-D5LAC1-D5 | 46CLR_100 | Exact M 🗸 | Triggered, QualityScore, SignalQuality 🗸 | Enable ADC 🗸 🗸 | |
| 1 | 10-Link | Allen-Bradley | 46CLR-D5LAC3-D5 | 46CLR_101 | Exact M 🗸 | Triggered, QualityScore, SignalQuality 🗸 | Enable ADC 🗸 🗸 | |
| 2 | IO-Link | | | | | | | |
| 3 | 10-Link | | | | | | | |
| 4 | 10-Link | | | | | | | |
| 5 | 10-Link | | | | | | | |
| 6 | 10-Link | | | | | | | |
| 7 | 10-Link | | | | | | | |
| < | | | | | | | | > |
| Discove | Discover Devices Path: Unable to display. Project has not been online yet. OK Cancel | | | | | | | |

Device Definition (raC_Dvc_46CLR_5032)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| OK Pain: AB_E1H-1\10.112.131.147\8acxplane\9* Energy Storage Offline No Forces No Edits | ト 茜 日 1 A. Redundancy - 回 | Favorites A | dd-On PlantPAx Safe | ety Alarms Bit | Module [| Definition | | | |
|---|------------------------------|-------------------------|-------------------------|--------------------|------------|------------|------------|--|----------|
| troller Organizer | 🛛 🗶 🖞 Module Properties: EN | 2TR (5032-8IOLM | 12M12LDR 2.011) × | | Corioc: | | 1 | | |
| a= = | General | General | | | Revision | | 2 | 011 | |
| Controller Master_IOLink_5032 | Connection | | | | Electronic | Keving | 2 | | |
| Controller Tags | - Channels | Type: | 5032-8IOLM12M12LDR 8 | IO-Link Channel, 8 | cieccionic | . Keying. | Compatible | Module | × |
| Controller radii Handler Power-I In Handler | - 00 - 10-Link | Vendor: | Rockwell Automation/All | en-Bradley | Connectio | n: | Data | | |
| Tasks | | Parent: | EN2TR | | | | | | |
| • • MainTask | - 03 - Digital Input | Name: | Mod_Master5032 | | - | | | | - 6 |
| MainProgram | 04 - 10-Link | Description: | - | | | | | | Channel |
| Unscheduled | | a transferration of the | | | | | IO-Link | | wode typ |
| Motion Groups | 10 - IO-Link | | | v | Port | Channel | Enabled | Channel Mode | - 0 |
| Alarm Manager | 12 - IO-Link 14 - IO-Link | Madula Dafini | tion | | | | | | |
| Assets | Internet Protocol | module Denni | 1011 | | | 0 | 1 | IO-Link | |
| Add-On Instructions | -Port Configuration | | | Change | 0 | 1 | | Digital Output, Short Circuit, No Load | × 1 1 |
| Trends | - Network | Series: | A | | 1 | 2 | | IO-Link | ~ 1 1 |
| Logical Model | Servers | Revision: | 2.011 | | - | 3 | | Digital Input | ~ / / |
| I/O Configuration | | Electronic Ke | ving: Compatible | e Module | 2 | 4 | | IO-Link Disabled | |
| ■ 1756 Backplane. 1756-A10 | | Connection | Data | | | 6 | - | IO-Link | · / / |
| ▲ 🖞 [1] 1756-EN2TR EN2TR | | Connection: | Data | | 3 | 7 | U | Disabled | ~ 1 |
| ▲ 쓞 Ethernet | | | | | 4 | 8 | | IO-Link | ~ / / |
| 1756-EN2TR EN2TR | | | | | - | 9 | | Disabled | ~ 1 1 |
| 5032-8IOLM12M12LDR/A Mod Master5032 | | | | | 5 | 10 | | IO-Link Disabled | × |
| @ [9] 1756-L85E Master IOLink 5032 | | | | | - | 12 | 1000 | Disabled IOJ ink | |
| A Ethernet | | | | | 6 | 12 | | Disabled | |
| @ 1756-L85E Master IOLink 5032 | | | | | - | 14 | | IO-Link | ~ 1 1 |
| | | | | | 1 | 15 | | Disabled | ~ / |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 46CLR, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 46CLR Sensor.
 - ▲ ≤ I/O Configuration
 - 🛽 📼 1756 Backplane, 1756-A7
 - [9] [0] 1756-L85E Master_5032_Test_Cases
 - ▲ 쁆 Ethernet
 - 1756-L85E Master_5032_Test_Cases
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_1
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_2

🛾 🔗 IO-Link

- 0 42JT-P2LAT1-xx (4) Mod_42JT_Type3
- 2 45CRM-4LHT1-D4 (71) Mod_45CRM
- 4 45DMS-B8LAT1-D4 (228) Mod_45DMS_Type1
- 6 45DMS-B8LGT1-D5 (230) Mod_45DMS_Type2
- 8 45PLA-P2LPT1-F4 (301) Mod_45PLA
- 10 46CLR-D5LAC1-D5 (294) Mod_46CLR
- 🔪 12 46DFA-L2LBT1-xx (291) Mod_46DFA
- 🛚 14 836P-D1xxxA14PA-D4 (177) Mod_836P_Type1

3. Configure the parameters of sensor from configuration tab from AOP of the 46CLR sensor.

| Controller Organizer 🗸 🗸 🗙 | 🖞 Module Properties: Mo | vd_Master_5032_2:10 (46CLR-D5LAC1-D5 (294) 1.1) × |
|--|-------------------------|---|
| ð " | General | Configuration |
| Controller Master_5032_Test_Cases | - Connection | |
| Tasks | Device Info | |
| Motion Groups | - Configuration | Name R/W Value Units Style Description |
| Alarm Manager | - Parameters | Identification |
| | EventLog | ✓ User Specific Information |
| k Logical Model | | Application-specific Tag TW 46CLR |
| | | Parameter Teach la Operation |
| ■ 1/0 Configuration | | Teach (Standard, Color Scon) |
| ▲ I/56 Backplane, 1/56-A/ | | Teach Channel pw Color Channel One V |
| P [0] 1756-L85E Master_5032_Test_Cases | | Detection Mode nw Color Mode > |
| ⊿ 🚠 Ethernet | | ✓ Operation Configuration |
| 1756-L85E Master_5032_Test_Cases | | Triggered1 - Color Channel One |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_1 | | Tolerance rw Tolerance Level 4 V |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_2 | | Polarity rw Not Inverted 🗸 |
| A 🛇 IO-Link | | Operation rw Disabled 🗸 |
| 0 42JT-P2LAT1-xx (4) Mod 42JT Type3 | | Intensity Evaluation rw On 🖂 |
| 2 45CRM-4LHT1-D4 (71) Mod 45CRM | | Counter rw 🗹 0 Decim |
| 4 45DMS-R9LAT1-D4 (229) Mod 45DMS Type1 | | On Delay w 🗹 0 ms Decim |
| 6 45DMS-BOLATI-D4 (220) Mod_45DMS_type1 | | Off Delay rw 🗹 0 ms Decimi 🗸 |
| | | One Shot rw 🗹 0 ms Decimi 🗸 |
| 8 45PLA-P2LP11-F4 (301) MOd_45PLA | | Combine Color Channel I rw Disabled 🗸 |
| 10 46CLR-D5LAC1-D5 (294) Mod_46CLR | | ✓ Iriggered2 - Color Channel Iwo |
| 12 46DFA-L2LBT1-xx (291) Mod_46DFA | | I olerance nw I olerance Level 4 🗹 |
| 14 836P-D1xxxA14PA-D4 (177) Mod_836P_Type1 | | Incert Eactory Defaulte |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_3 | | Insert Factory Deradits |
| | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_46CLR_4IOL, raC_Dvc_46CLR_8IOL)

| InOut | Function / Description | DataType |
|-----------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Write_Index | Message Configuration Write | MESSAGE |
| Read_Index | Message Configuration Read | MESSAGE |
| Write_SubIndex | Message Configuration Write | MESSAGE |
| Read_SubIndex | Message Configuration Read | MESSAGE |
| Msg_Sensor_Data | Messaging Data | raC_UDT_46CLR_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_46CLR_Inp_4IOL Or raC_UDT_ItfAD_46CLR_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |

Input Data

| Input | Function/Description | DataType |
|----------------------------|---|----------|
| Cfg_DetectionMode | Set the detection mode; O=Colour Mode, 1=Best Fit Mode | SINT |
| Cfg_Snapshot | Snapshot Command Storing for Signal Values | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_IntensityEvaluationCh1 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel1; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh2 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel2; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh3 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel3; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh4 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel4; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh5 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel5; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh6 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel6; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh7 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel7; 0=0ff, 1=0n | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_OperationCh1 | Enables or disables the operation of Channel 1; 0=Disabled, 1=Enabled | BOOL |
| Cmd_OperationCh2 | Enables or disables the operation of Channel 2; 0=Disabled, 1=Enabled | BOOL |

| Input | Function/Description | DataType |
|---------------------------|--|----------|
| Cmd_OperationCh3 | ${\tt Enables}\ {\tt or}\ {\tt disables}\ {\tt the}\ {\tt operation}\ {\tt of}\ {\tt Channel}\ {\tt 3}; {\tt 0=Disabled}, {\tt 1=Enabled}$ | BOOL |
| Cmd_OperationCh4 | ${\tt Enables}\ {\tt or}\ {\tt disables}\ {\tt the}\ {\tt operation}\ {\tt of}\ {\tt Channel}\ {\tt 4}; {\tt 0=Disabled}, {\tt 1=Enabled}$ | BOOL |
| Cmd_OperationCh5 | Enables or disables the operation of Channel 5; 0=Disabled, 1=Enabled | BOOL |
| Cmd_OperationCh6 | Enables or disables the operation of Channel 6; 0=Disabled, 1=Enabled | BOOL |
| Cmd_OperationCh7 | Enables or disables the operation of Channel 7; 0=Disabled, 1=Enabled | BOOL |
| Cmd_PolarityCh1 | Set the Polarity of Channel 1; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh2 | Set the Polarity of Channel 2; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh3 | Set the Polarity of Channel 3; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh4 | Set the Polarity of Channel 4; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh5 | Set the Polarity of Channel 5; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh6 | Set the Polarity of Channel 6; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh7 | Set the Polarity of Channel 7; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_ResetCountCh1 | Counter Reset Command for Channel1 | BOOL |
| Cmd_ResetCountCh2 | Counter Reset Command for Channel2 | BOOL |
| Cmd_ResetCountCh3 | Counter Reset Command for Channel3 | BOOL |
| Cmd_ResetDurationsCh1 | Duration Reset Command for Channell | BOOL |
| Cmd_ResetDurationsCh2 | Duration Reset Command for Channel2 | BOOL |
| Cmd_ResetDurationsCh3 | Duration Reset Command for Channel3 | BOOL |
| Cmd_TeachApply | Teach Apply Command | BOOL |
| Cmd_TeachCancel | Teach Cancel Command | BOOL |
| Cmd_TeachColorScanStart | Teach Color Scan Start Command | BOOL |
| Cmd_TeachColorScanStop | Teach Color Scan Stop Command | BOOL |
| Cmd_TeachStandard | Teach Standard Command | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxSignalQuality | Reflects the strength of the return signal reflected from the target | INT |
| Inp_ChxSignalQualityScore | Indicate if the signal strength is higher or lower than a defined threshold | BOOL |
| Inp_ChxTriggered1 | Triggered Status of channel 1 of Sensor | BOOL |
| Inp_ChxTriggered2 | Triggered Status of channel 2 of Sensor | BOOL |
| Inp_ChxTriggered3 | Triggered Status of channel 3 of Sensor | BOOL |
| Inp_ChxTriggered4 | Triggered Status of channel 4 of Sensor | BOOL |
| Inp_ChxTriggered5 | Triggered Status of channel 5 of Sensor | BOOL |
| Inp_ChxTriggered6 | Triggered Status of channel 6 of Sensor | BOOL |
| Inp_ChxTriggered7 | Triggered Status of channel 7of Sensor | BOOL |
| Set_CounterCh1 | Defines the desired number of counts for the discrete output to turn ON for Ch O1 | DINT |
| Set_CounterCh2 | Defines the desired number of counts for the discrete output to turn ON for Ch 02 | DINT |

| Input | Function/Description | DataType |
|---------------------------|---|----------|
| Set_CounterCh3 | Defines the desired number of counts for the discrete output to turn \ensuremath{ON} for Ch $\ensuremath{O3}$ | DINT |
| Set_GreenToleranceCh1 | Sets the color threshold tolerance for the green color for channel 1 | REAL |
| Set_GreenToleranceCh2 | Sets the color threshold tolerance for the green color for channel $\ensuremath{2}$ | REAL |
| Set_GreenToleranceCh3 | Sets the color threshold tolerance for the green color for channel 3 | REAL |
| Set_GreenToleranceCh4 | Sets the color threshold tolerance for the green color for channel 4 | REAL |
| Set_GreenToleranceCh5 | Sets the color threshold tolerance for the green color for channel ${\bf 5}$ | REAL |
| Set_GreenToleranceCh6 | Sets the color threshold tolerance for the green color for channel $\boldsymbol{6}$ | REAL |
| Set_GreenToleranceCh7 | Sets the color threshold tolerance for the green color for channel 7 | REAL |
| Set_IntensityToleranceCh1 | Sets the color threshold tolerance for the intensity for channel 1 | REAL |
| Set_IntensityToleranceCh2 | Sets the color threshold tolerance for the intensity for channel 2 | REAL |
| Set_IntensityToleranceCh3 | Sets the color threshold tolerance for the intensity for channel 3 | REAL |
| Set_IntensityToleranceCh4 | Sets the color threshold tolerance for the intensity for channel 4 | REAL |
| Set_IntensityToleranceCh5 | Sets the color threshold tolerance for the intensity for channel 5 | REAL |
| Set_IntensityToleranceCh6 | Sets the color threshold tolerance for the intensity for channel 6 | REAL |
| Set_IntensityToleranceCh7 | Sets the color threshold tolerance for the intensity for channel 7 | REAL |
| Set_RedToleranceCh1 | Sets the color threshold tolerance for the red color for channel 1 | REAL |
| Set_RedToleranceCh2 | Sets the color threshold tolerance for the red color for channel 2 | REAL |
| Set_RedToleranceCh3 | Sets the color threshold tolerance for the red color for channel 3 | REAL |
| Set_RedToleranceCh4 | Sets the color threshold tolerance for the red color for channel 4 | REAL |
| Set_RedToleranceCh5 | Sets the color threshold tolerance for the red color for channel ${\bf 5}$ | REAL |
| Set_RedToleranceCh6 | Sets the color threshold tolerance for the red color for channel 6 | REAL |
| Set_RedToleranceCh7 | Sets the color threshold tolerance for the red color for channel 7 | REAL |
| Set_TeachChannel | Select Teach Channel | INT |
| Set_ToleranceCh1 | Sets the color tolerance levels for Channel 1 | INT |
| Set_ToleranceCh2 | Sets the color tolerance levels for Channel 2 | INT |
| Set_ToleranceCh3 | Sets the color tolerance levels for Channel 3 | INT |
| Set_ToleranceCh4 | Sets the color tolerance levels for Channel 4 | INT |
| Set_ToleranceCh5 | Sets the color tolerance levels for Channel 5 | INT |
| Set_ToleranceCh6 | Sets the color tolerance levels for Channel 6 | INT |
| Set_ToleranceCh7 | Sets the color tolerance levels for Channel 7 | INT |

Output Data

| Output | Function/Descritpion | DataType |
|------------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Val_Blue | Displays the blue component of the color under detection | REAL |
| Val_BlueSnapshot1 | Used for Storing Blue parameter value for snapshot 1 | REAL |
| Val_BlueSnapshot2 | Used for Storing Blue parameter value for snapshot 2 | REAL |
| Val_BlueSnapshot3 | Used for Storing Blue parameter value for snapshot 3 | REAL |
| Val_Counter | Counter Value | DINT |
| Val_DetectionCounterSinceInception | Displays the number of targets that have been detected since the sensor has been in operation | DINT |
| Val_DetectionMode | Displays the detection mode; O=Colour Mode, 1=Best Fit Mode | SINT |
| Val_EnableLEDs | LED Indicator; O= Disable, 1= Enable | SINT |
| Val_Green | Displays the green component of the color under detection | REAL |
| Val_GreenSnapshot1 | Used for Storing Green parameter value for snapshot 1 | REAL |
| Val_GreenSnapshot2 | Used for Storing Green parameter value for snapshot 2 | REAL |
| Val_GreenSnapshot3 | Used for Storing Green parameter value for snapshot 3 | REAL |
| Val_GreenTolerance | Display the color threshold tolerance for the green color | REAL |
| Val_Intensity | Displays the intensity of the color under detection | REAL |
| Val_IntensityEvaluation | Display value of the sensor to consider evaluating the intensity of the color as part of the color detection ; 0=0ff, 1=0n | INT |
| Val_IntensitySnapshot1 | Used for Storing intensity parameter value for snapshot 1 | REAL |
| Val_IntensitySnapshot2 | Used for Storing intensity parameter value for snapshot 2 | REAL |
| Val_IntensitySnapshot3 | Used for Storing intensity parameter value for snapshot 3 | |
| Val_IntensityTolerance | Display the value of color threshold tolerance for the intensity | REAL |

| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Val_OperatingHrsSinceInception | Displays the number of hours that the sensor has been continuously in operation | DINT |
| Val_Operation | Display the operation state of channel; O=Disabled, 1=Enabled | INT |
| Val_Polarity | Displays the polarity of channel; 0 = Not Inverted, 1=Inverted | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Red | Displays the red component of the color under detection | REAL |
| Val_RedSnapshot1 | Used for Storing Red parameter value for snapshot 1 | REAL |
| Val_RedSnapshot2 | Used for Storing Red parameter value for snapshot 2 | REAL |
| Val_RedSnapshot3 | Used for Storing Red parameter value for snapshot 3 | REAL |
| Val_RedTolerance | Display the value of color threshold tolerance for the respective color | REAL |
| Val_TeachChannel | Displays the number of channel selected | INT |
| Val_TeachStatus | Displays the status of Teach mode | INT |
| Val_TeachStep | Teach Step | INT |
| Val_TemperatureCurrent | Displays the internal temperature information available in the sensor | SINT |
| Val_TemperatureMaxSinceInception | Pption Reflects the maximum temperature inside of the microprocessor die of the Sensor since inception | |
| Val_TemperatureMaxSincePowerUp | Reflects the maximum temperature inside of the microprocessor die of the sensor since the last power up | SINT |
| Val_TemperatureMinSinceInception | MinSinceInception Reflectstheminimumtemperatureinsideofthemicroprocessordie of the sensor since inception | |
| Val_TemperatureMinSincePowerUp | Jp Reflectstheminimumtemperatureinsideofthemicroprocessordie of the sensor since the last power up | |
| Val_Tolerance | Displays the color tolerance levels for Channel | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_46CLR_5032)

| InOut | Function / Description | DataType |
|-----------------------|---|--|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_46CLR_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_46CLR_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_46CLR_Cfg |

Input Data

| Input | Function/Description | DataType |
|--------------------------------|--|----------|
| Cfg_DetectionMode | Set the detection mode; O=Colour Mode, 1=Best Fit Mode | SINT |
| Cfg_Snapshot | Snapshot Command Storing for Signal Values | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_IntensityEvaluationCh 1 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel1; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh 2 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel2; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh 3 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel3; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh 4 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel4; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh 5 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel5; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh 6 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel6; 0=0ff, 1=0n | BOOL |
| Cmd_IntensityEvaluationCh 7 | Allows the sensor to consider evaluating the intensity of the color as part of the color detection for Channel7; 0=0ff, 1=0n | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |

| Input | Function/Description | DataType |
|---------------------------|---|----------|
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_OperationCh1 | Enables or disables the operation of Channel 1; O=Disabled, 1=Enabled | BOOL |
| Cmd_OperationCh2 | Enables or disables the operation of Channel 2; O=Disabled, 1=Enabled | BOOL |
| Cmd_OperationCh3 | Enables or disables the operation of Channel 3; O=Disabled, 1=Enabled | BOOL |
| Cmd_OperationCh4 | Enables or disables the operation of Channel 4; O=Disabled, 1=Enabled | BOOL |
| Cmd_OperationCh5 | Enables or disables the operation of Channel 5; O=Disabled, 1=Enabled | BOOL |
| Cmd_OperationCh6 | Enables or disables the operation of Channel 6; O=Disabled, 1=Enabled | BOOL |
| Cmd_OperationCh7 | Enables or disables the operation of Channel 7; O=Disabled, 1=Enabled | BOOL |
| Cmd_PolarityCh1 | Set the Polarity of Channel 1; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh2 | Set the Polarity of Channel 2; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh3 | Set the Polarity of Channel 3; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh4 | Set the Polarity of Channel 4; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh5 | Set the Polarity of Channel 5; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh6 | Set the Polarity of Channel 6; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_PolarityCh7 | Set the Polarity of Channel 7; 0=Not Inverted, 1=Inverted | BOOL |
| Cmd_ResetCountCh1 | Counter Reset Command for Channel1 | BOOL |
| Cmd_ResetCountCh2 | Counter Reset Command for Channel2 | BOOL |
| Cmd_ResetCountCh3 | Counter Reset Command for Channel3 | BOOL |
| Cmd_ResetDurationsCh1 | Duration Reset Command for Channel1 | BOOL |
| Cmd_ResetDurationsCh2 | Duration Reset Command for Channel2 | BOOL |
| Cmd_ResetDurationsCh3 | Duration Reset Command for Channel3 | BOOL |
| Cmd_TeachApply | Teach Apply Command | BOOL |
| Cmd_TeachCancel | Teach Cancel Command | BOOL |
| Cmd_TeachColorScanStart | Teach Color Scan Start Command | BOOL |
| Cmd_TeachColorScanStop | Teach Color Scan Stop Command | BOOL |
| Cmd_TeachStandard | Teach Standard Command | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxSignalQuality | Reflects the strength of the return signal reflected from the target | INT |
| Inp_ChxSignalQualityScore | Indicate if the signal strength is higher or lower than a defined threshold | BOOL |
| Inp_ChxTriggered1 | Triggered Status of channel 1 of Sensor | BOOL |
| Inp_ChxTriggered2 | Triggered Status of channel 2 of Sensor | BOOL |
| Inp_ChxTriggered3 | Triggered Status of channel 3 of Sensor | BOOL |
| Inp_ChxTriggered4 | Triggered Status of channel 4 of Sensor | BOOL |

| Input | Function/Description | DataType |
|---------------------------|---|----------|
| Inp_ChxTriggered5 | Triggered Status of channel 5 of Sensor | BOOL |
| Inp_ChxTriggered6 | Triggered Status of channel 6 of Sensor | BOOL |
| Inp_ChxTriggered7 | Triggered Status of channel 7of Sensor | BOOL |
| Set_CounterCh1 | Defines the desired number of counts for the discrete output to turn ON for Ch O1 | DINT |
| Set_CounterCh2 | Defines the desired number of counts for the discrete output to turn ON for Ch O2 | DINT |
| Set_CounterCh3 | Defines the desired number of counts for the discrete output to turn ON for Ch O3 | DINT |
| Set_GreenToleranceCh1 | Sets the color threshold tolerance for the green color for channel 1 | REAL |
| Set_GreenToleranceCh2 | Sets the color threshold tolerance for the green color for channel 2 | REAL |
| Set_GreenToleranceCh3 | Sets the color threshold tolerance for the green color for channel 3 | REAL |
| Set_GreenToleranceCh4 | Sets the color threshold tolerance for the green color for channel 4 | REAL |
| Set_GreenToleranceCh5 | Sets the color threshold tolerance for the green color for channel 5 | REAL |
| Set_GreenToleranceCh6 | Sets the color threshold tolerance for the green color for channel 6 | REAL |
| Set_GreenToleranceCh7 | Sets the color threshold tolerance for the green color for channel 7 | REAL |
| Set_IntensityToleranceCh1 | Sets the color threshold tolerance for the intensity for channel 1 | REAL |
| Set_IntensityToleranceCh2 | Sets the color threshold tolerance for the intensity for channel 2 | REAL |
| Set_IntensityToleranceCh3 | Sets the color threshold tolerance for the intensity for channel 3 | REAL |
| Set_IntensityToleranceCh4 | Sets the color threshold tolerance for the intensity for channel 4 | REAL |
| Set_IntensityToleranceCh5 | Sets the color threshold tolerance for the intensity for channel 5 | REAL |
| Set_IntensityToleranceCh6 | Sets the color threshold tolerance for the intensity for channel 6 | REAL |
| Set_IntensityToleranceCh7 | Sets the color threshold tolerance for the intensity for channel 7 | REAL |
| Set_RedToleranceCh1 | Sets the color threshold tolerance for the red color for channel 1 | REAL |
| Set_RedToleranceCh2 | Sets the color threshold tolerance for the red color for channel 2 | REAL |
| Set_RedToleranceCh3 | Sets the color threshold tolerance for the red color for channel 3 | REAL |
| Set_RedToleranceCh4 | Sets the color threshold tolerance for the red color for channel 4 | REAL |
| Set_RedToleranceCh5 | Sets the color threshold tolerance for the red color for channel 5 | REAL |
| Set_RedToleranceCh6 | Sets the color threshold tolerance for the red color for channel 6 | REAL |
| Set_RedToleranceCh7 | Sets the color threshold tolerance for the red color for channel 7 | REAL |
| Set_TeachChannel | Select Teach Channel | INT |
| Set_ToleranceCh1 | Sets the color tolerance levels for Channel 1 | INT |
| Set_ToleranceCh2 | Sets the color tolerance levels for Channel 2 | INT |
| Set_ToleranceCh3 | Sets the color tolerance levels for Channel 3 | INT |
| Set_ToleranceCh4 | Sets the color tolerance levels for Channel 4 | INT |
| Set_ToleranceCh5 | Sets the color tolerance levels for Channel 5 | INT |
| Set_ToleranceCh6 | Sets the color tolerance levels for Channel 6 | INT |
| Set_ToleranceCh7 | Sets the color tolerance levels for Channel 7 | INT |

Output Data

| Output | Function/Descritpion | DataType |
|--|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_Blue | Displays the blue component of the color under detection | REAL |
| Val_BlueSnapshot1 | Used for Storing Blue parameter value for snapshot 1 | REAL |
| Val_BlueSnapshot2 | Used for Storing Blue parameter value for snapshot 2 | REAL |
| Val_BlueSnapshot3 | Used for Storing Blue parameter value for snapshot 3 | REAL |
| Val_Counter | Counter Value | DINT |
| Val_DetectionCounterSinceIncepti on | Displays the number of targets that have been detected since the sensor has been in operation | DINT |
| Val_DetectionMode | Displays the detection mode; O=Colour Mode, 1=Best Fit Mode | SINT |
| Val_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | SINT |
| Val_Green | Displays the green component of the color under detection | REAL |
| Val_GreenSnapshot1 | Used for Storing Green parameter value for snapshot 1 | REAL |
| Val_GreenSnapshot2 | Used for Storing Green parameter value for snapshot 2 | REAL |
| Val_GreenSnapshot3 | Used for Storing Green parameter value for snapshot 3 | REAL |
| Val_GreenTolerance | Display the color threshold tolerance for the green color | REAL |
| Val_Intensity | Displays the intensity of the color under detection | REAL |
| Val_IntensityEvaluation | Display value of the sensor to consider evaluating the intensity of the color as part of the color detection ; 0=0ff, 1=0n | INT |
| Val_IntensitySnapshot1 | Used for Storing intensity parameter value for snapshot 1 | REAL |
| Val_IntensitySnapshot2 | Used for Storing intensity parameter value for snapshot 2 | REAL |
| Val_IntensitySnapshot3 | Used for Storing intensity parameter value for snapshot 3 | REAL |

| Output | Function/Descritpion | DataType |
|------------------------------------|---|----------|
| Val_IntensityTolerance | Display the value of color threshold tolerance for the intensity | REAL |
| Val_OperatingHrsSinceInception | Displays the number of hours that the sensor has been continuously in operation | DINT |
| Val_Operation | Display the operation state of channel; O=Disabled, 1=Enabled | INT |
| Val_Polarity | Displays the polarity of channel; 0 = Not Inverted, 1=Inverted | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Red | Displays the red component of the color under detection | REAL |
| Val_RedSnapshot1 | Used for Storing Red parameter value for snapshot 1 | REAL |
| Val_RedSnapshot2 | Used for Storing Red parameter value for snapshot 2 | REAL |
| Val_RedSnapshot3 | Used for Storing Red parameter value for snapshot 3 | REAL |
| Val_RedTolerance | Display the value of color threshold tolerance for the respective color | REAL |
| Val_TeachChannel | Displays the number of channel selected | INT |
| Val_TeachStatus | Displays the status of Teach mode | INT |
| Val_TeachStep | Teach Step | INT |
| Val_TemperatureCurrent | Displays the internal temperature information available in the sensor | SINT |
| Val_TemperatureMaxSinceInceptio | Reflects the maximum temperature inside of the microprocessor die of the Sensor since inception | SINT |
| Val_TemperatureMaxSincePowerU p | Reflects the maximum temperature inside of the microprocessor die of the sensor since the last power up | SINT |
| Val_TemperatureMinSinceInceptio | Reflects the minimum temperature inside of the microprocessor die of the sensor since inception | SINT |
| Val_TemperatureMinSincePowerU p | Reflects the minimum temperature inside of the microprocessor die of the sensor since the last power up | SINT |
| Val_Tolerance | Displays the color tolerance levels for Channel | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference. The first rung is required and the others are optional.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 46CLR device object connected to channel #2 of a POINT I/O 1734-4IOL IO-Link Master module in slot #8 of a POINT I/O adapter named *Racko1*.



The following example uses the 46CLR device object connected to channel #4 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.

| Sensor46CLR_102 | | Sensor 102 | |
|----------------------------------|---------------------------|--|---------------|
| input internace | | Sensor Tu2 | |
| COP | FaC_DVC_46CLR_8IOL | 0 | |
| Source Armor_SIUL_MasterB1.Fault | rac_DVc_46CLR_8IOL | Sensor46CLR_102 | (a) |
| Dest Sensor46CLR_102_Inp_I.Fault | Ret_Module | Armor_SIUL_MasterB | Sts_Connected |
| Length 32 | Write_index | Sensor40CLR_102_Write_index | Oto Acceleta |
| | Read_Index | Sensor46CLR_102_Read_Index(| Sts_Available |
| | Write_SubIndex | Sensor46CLR_102_Write_Subindex | |
| | Read_SubIndex | Sensor46CLR_102_Read_Subindex | Sts_Warning> |
| | Msg_Sensor_Data | Sensor46CLR_102_Msg_Sensor_Data | |
| | Ref_Ctrl_Set | Sensor46CLR_102_CtrlSet | Sts_Faulted)- |
| | Ref_Ctrl_Cmd | Sensor46CLR_102_CtrlCmd | |
| | Ref_Ctrl_Sts | Sensor46CLR_102_CtrlSts | (Sts_Ready)— |
| | Inf_Lookup | raC_Dvc_46CLR_InfTable | |
| | Inp_I | Sensor46CLR_102_Inp_I | |
| | Inp_ChxTriggered1 | Armor_8IOL_MasterB:I.Ch4Triggered1 | |
| | | 0 🖛 | |
| | Inp_ChxTriggered2 | Armor_8IOL_MasterB:I.Ch4Triggered2 | |
| | | 0 🖛 | |
| | Inp_ChxTriggered3 | Armor_8IOL_MasterB:I.Ch4Triggered3 | |
| | | 0 🕈 | |
| | Inp ChxTriggered4 | Armor 8IOL MasterB:I.Ch4Triggered4 | |
| | 12 33 | | |
| | Inp ChxTriggered5 | Armor 8IOL MasterB:I.Ch4Triggered5 | |
| | | 0.4 | |
| | Inn ChxTriggered6 | Armor 8IOL MasterB1Ch4Tringered6 | |
| | mp_onstriggerede | | |
| | Inn ChyTriggered7 | Armor SIOL MasterB:I Ch4Triogered7 | |
| | inp_enxtriggerear | Annoi_bloc_indisterb.i.en4ringgered/ | |
| | Inn ChySignalQualitySoora | Armer SIQL MasterBil Ch4SignalQualitySoore | |
| | inp_cnxsignalqualityscore | Arnot_ooL_masterb.i.cn+3ignalouality3core | |
| | Inc. ChysSignalOuglity | Armer RIOL MasterBil Ch4SissalOuslitu | |
| | inp_cnxsignalouality | Armor_oloL_masterb.i.cn43ignalouality | |
| | las Obligation | 0- | |
| | mp_CnNumber | 4 | |
| | 14.1.51 | | |
| | Val_Blue | 0.0 🖛 | |
| | Val_Green | 0.0 🕈 | |
| | Val_Intensity | 0.0 🖛 | |
| | Val_Red | 0.0 🕈 | |
| | Ref_Ctrl_Inf | Armor_8IOL_MasterB_Ctrlinf | |
| | Ref_Ctrl_ltf | Armor_8IOL_MasterB_Ctrlltf | |

The following example uses the 46CLR device object connected to channel #10 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_2*.



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|---------------------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_ColorSens 46CLR | Not Triggered | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|---------------------|--|---|
| AOG_46CLR _Launch | SS Not Triggered | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Properties Animations Image: Properties Image: Properties Image: Properties Image: Properties Image: Properties AOL_Tag Image: Properties Image: AOL_Tag Image: Properties Image |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| | - |
|---|-----------------------------------|
| Sensor46CLR_102 | Sensor 102 |
| Sensor46CLR_102_CtrlCmd | Sensor46CLR_102 Command Interface |
| Sensor46CLR_102_CtrlSet | Sensor46CLR_102 Setting Interface |
| Sensor46CLR_102_CtrlSts | Sensor46CLR_102 Status Interface |
| Sensor46CLR_102_Inp_I | Sensor46CLR_102 Input Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status Channel 1 to 7 |
| 4 | Trigger1 to 7 Sparkline Trend The spark line shows trigger ON/OFF status over last 30 seconds |
| 5 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 6 | Process Data: Displays the Bar graph of Red, Green, Blue and Intensity. |
| 7 | Process Data: Displays the value of Red, Green, Blue and Intensity. |
| 8 | Process Data: Displays the threshold value of Red, Green, Blue and Intensity. |
| 9 | Channel selection 1 to 7 |



Note: In Case of, 5032 Master, changes made to the Application Specific Name or Locate Toggle Switch require pressing the 'Config Apply' button in the Config tab to update the sensor parameters.

Snapshot

The Snapshot tab is used to save up to three independent snapshots of the color profile. This can be used during commissioning, configuration, or troubleshooting as a method of saving a color reference of a particular object. Each snapshot can be assigned a short name using a string entry.

| 46CLR | | | | | | X |
|-------|-----------|----------------|------------|--------------|------------|---|
| | Ready | | | | | |
| 6 | | Current | Snapshot1 | Snapshot2 | Snapshot3 | |
| | Intensity | 17.70 % | 15.34 % | 6 15.38 | % 15.38 | % |
| ~ | Red | 48.16 % | 37.68 % | 6 37.44 | % 37.68 | % |
| P | Green | 32.43 % | 37.41 % | 6 37.44 | % 37.44 | % |
| 1 | Blue | 19.37 % | 24.84 % | 24.84 | % 24.84 | % |
| | Name | | snapshot 1 | snapshot 2 | snapshot 3 | |
| | | | | 6 | 6 | |

Snapshot 1- Once you click on button under Snapshot1, the value is captured and stored in the Snapshot1 displays.

Snapshot 2- Once you click on button under Snapshot1, the value is captured and stored in the Snapshot2 displays.

Snapshot 3- Once you click on button under Snapshot1, the value is captured and stored in the Snapshot1 displays.

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description | | | | | | |
|------|---|--|--|--|--|--|--|
| 1 | Internal Temperature Bar Graph Green Indicators: Min/Max since inception (lifetime) Purple Indicators: Min/Max since power up Light Blue Triangle Indicator: Current value | | | | | | |
| 2 | Internal Temperature Current Value | | | | | | |
| 3 | Operating Hours Since Inception (lifetime) | | | | | | |
| 4 | Detection Counter Since Inception | | | | | | |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Trend Tab

This tab shows trend of Red, Green, Blue and Intensity Values. Also it contains numeric displays for of Red, Green, Blue and Intensity Values.

| | - | Red | 48.18 | % | _ | Blue | 19.39 | % |
|-----|---|-------|-------|---|---|-----------|-------|---|
| 100 | - | Green | 32.45 | % | _ | Intensity | 17.68 | % |
| | | | | | | | | |
| | | | | | | | | |
| 50 | | | | | _ | | | |
| | | | | | | | | |
| | | - | | | | | | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Parameter Settings
- Trigger Settings
- Local Settings
- Teach settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| .R_20 | 08L | | |
|-------|-------------------------|------------------------------|------------------|
| Ś | Ready | | |
| 5 | Parameter Settings - Cl | 1 | Trigger Settings |
| 9 | Threshold | | Reset Count |
| ~ | Red 50.01 | % Channel Enable 💻 🗌 | Reset |
| 3 | Green 40.00 | % Invert Polarity 🔿 🗩 | Duration |
| - | Intensity 29.99 | % Intensity Evaluation | Config Apply |
| 1 | Counter 0 | | LED'S |
| | Tolerance: 1 - Finest (| 🔵 4 - Default 🌘 9 - Widest 🔿 | Disable 🛑 Enable |
| | | | Local Teach |
| | Teach Settings | 234567 | Unlock 🗩 Lock |

Parameter Settings

We can set the Parameter Settings for each channel separately. Each page corresponds to each channel 1 through 7. For accessing individual channel, user need to use the page navigation button.

Analog Output Slope- Applied to configure an analog output when the sensor is operated in the Standard I/O (SIO) mode. Trigger Settings

Red Threshold- Sets the color threshold tolerance for the respective color. The default value for this parameter is 1.59 with acceptable values between 0 and 100.

Green Threshold- Sets the color threshold tolerance for the respective color. The default value for this parameter is 1.59 with acceptable values between 0 and 100.

Intensity Threshold- Sets the color threshold for the intensity. The default value for this parameter is 1.83 with acceptable values between 0 and 100.

Channel Enable- Enables or disables the operation of the selected channel.

Invert Polarity- Sets the polarity of the of the selected channel. The polarity could be either not inverted or inverted.

Intensity Evaluation- Enables or disables the sensor to consider evaluating the intensity of the color as part of the color detection.

Tolerance- Sets the color tolerance levels of the selected channel. The operator can set zero as the finest tolerance while level nine is the widest tolerance.

Trigger Settings

We can set the Trigger Settings for each channel separately. For accessing individual channel, user need to use the page navigation button.

Disable/Enable LEDs- This parameter allows operators to turn OFF or turn ON the User Interface LEDs (green and orange LEDs). This parameter is ideal for applications where turning OFF the LEDs is desired to accommodate the application.

Local Teach Parameters - This section allow user to lock / unlock device local parameterization. Touch Lock/Unlock Toggle switch to Lock Local Parameterization.

Teach Settings.

Teach Settings display includes the Teach Methods, Teach Command & Teach Cancel buttons. Touch on the Teach Settings navigation button to access the Teach Settings tab. We can teach each channel separately. For accessing individual channel, user need to use the page navigation button.

Teach Tab include the following functions:

- Teach mode selection and Teach Detection mode Dropdown menu
- Teach procedure flow buttons
- Teach Apply and Cancel Button.

| 46CLR | Ready | × |
|-----------------|--|-----------------|
| 6 | Teach Settings - Ch1 | × |
| V | Color Scan V Color Mode | V |
| <i>چ</i> ر ! | Color Scan Start Color Scan Stop Teach Apply | |
| | | Teach Cancel |

Teach mode- This parameter selects the desired mode.

Color Scan Teach - The first method is Color Scan Teach, enables you to teach and detect objects with various colors and individual colors to each channel.

- 4. Place the target in front of the field of view of the sensor and send the command **"Color Scan Start"**. Move the color targets that you want to teach as needed until all desired colors are presented in the field of view of the sensor.
- 5. Send the command "Color Scan Stop" to stop the color scan process.
- 6. Send the command **"Teach Apply"** to finalize the teach process.
- 7. To cancel the procedure, you can send the **"Teach Cancel"** command at any point.

Standard Teach - The second method is Standard Teach.

- 8. Place the target in front of the sensor. Send the command **"Standard Teach Show Color"** to start the teach process.
- 9. Send the command **"Teach Apply"** to finalize the teach process
- 10. To cancel the procedure, you can send the **"Teach Cancel"** command at any point.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| 46CLR - 1001 | | |
|-----------------------|---|-------------------|
| Ready | | |
| Parameter Settings - | Ch1 | Trigger Settings |
| Threshold | | Reset Count |
| Red 20.61 |] % Channel Enable | Reset Duration |
| 3 Intensity 10.01 | % Invert Polarity % Intensity Evaluation | Config Apply |
| Counter 0 |] | LED'S |
| Tolerance: 1 - Finest | O 4 - Default I 9 - Widest O | Disable Enable |
| Teach Settings | 234567 | Unlock Cock |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| a 460 | CLR - 1001 | | |
|--------------|-----------------------|----------------------------|--------------------|
| | Ready | | |
| 6 | Parameter Settings | - Ch1 | Trigger Settings |
| Ð | Threshold | | Reset Count |
| ~ | Red 20.6 | 61 % Channel Enable | Reset |
| 3 | Green 14.9 | 99 % Invert Polarity | Duration |
| 0 | Intensity 10.0 | 1 % Intensity Evaluation | Config Apply |
| 1 | Counter | 0 | LED'S |
| | Tolerance: 1 - Finest | 🔘 4 - Default 🔘 9 - Widest | O Disable C Enable |
| | Teach Settings | 2 3 4 5 6 | Local Teach |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.

| | Sei | nsor2 | | | \times |
|---|-----|-----------------|------------------------|----------------------------------|----------|
| 1 | 6 | 🕁 📒 Not | Ready Confi | guration In Progress | |
| | | Severity | Time | Description | |
| 2 | No. | Active Fault | 1998-01-05 02:54:21 | Sensor Configuration In Progress | |
| | E | S Fault | 1998-01-05 02:54:04 | Sensor Power Fault | |
| 3 | | Fault | 1998-01-05 02:53:52 | A short circuit was detected | |
| | | Fault | 1998-01-05 02:53:35 | Sensor Configuration Fault | |
| | | | <u> </u> | | |
| | | | | | |
| | | 4 | 5 | 6 | |

| ltem | Description | | | | | | |
|------|---|--|--|--|--|--|--|
| 1 | Banner | | | | | | |
| 2 | Last fault is in first row and show in bold if active | | | | | | |
| 3 | Yellow border visible when a fault is active | | | | | | |
| 4 | Fault severity | | | | | | |
| 5 | Fault event time | | | | | | |
| 6 | 4 most recent fault/warning event messages | | | | | | |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_46CLR_4IOL, raC_Dvc_46CLR_8IOL, raC_Dvc_46CLR_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_46CLR_4IOL, raC_LD_Dvc_46CLR_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_46CLR_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|---|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |

| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
|-------------------|------------------|------------------|-------------------|--|
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 46CLR), This name depends upon the TagName assigned to object. |
| SensorType | 46CLR-D5LAC1-D5 | 46CLR-D5LAC1-D5 | 46CLR-D5LAC1-D5 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|--------------------|--------------------|----------|-----------------|----------|
| raC_Dvc_46CLR_4I0L | raC_Dvc_46CLR_4IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_46CLR_8IOL | raC_Dvc_46CLR_8IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_46CLR_5032 | raC_Dvc_46CLR_8I0L | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |

| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
|------------------|-------------------------------|---|
|------------------|-------------------------------|---|

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_46CLR | Faceplate ME | (raC-3_xx-ME) raC_Dvc_46CLR-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_46CLR | Faceplate SE | (raC-3_xx-SE) raC_Dvc_46CLR-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_I0Link | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

875L - Capacitive Sensors (raC_Dvc_875L_4I0L, raC_Dvc_875L_8I0L, raC_Dvc_875L_5032)

Overview

The 875L Capacitive Sensor device object (raC_Dvc_875L_4IOL, raC_Dvc_875L_8IOL, raC_Dvc_875L_5032) includes HMI faceplate's which displays device information including:

- Sensor data
- Sensor diagnostics
- Process data trending
- Sensor configuration and parameters
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_875L_Objects_Faceplate.MP4"

Primary device object configuration functions include:

• **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.

Functional Description

The 875L Capacitive Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix[®] firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|--|--------------------------------|---------------------------------|
| 875L | POINT I/O 1734-4IOL | 875L_M16xx30-xx, 875L_M8xx18-xx, 875L_N12xx18-xx, 875L_N25xx30-xx | raC_Dvc_875L_4I0L_3.02_A0I.L5X | raC_Dvc_875L_410L_3.02_RUNG.L5X |
| | ArmorBlock 1732E- 8IOLM12R | 875L_M16xx30-xx, 875L_M8xx18-xx, 875L_N12xx18-xx, 875L_N25xx30-xx | raC_Dvc_875L_810L_3.02_A01.L5X | raC_Dvc_875L_810L_3.02_RUNG.L5X |
| | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 875L_M16xx30-xx, 875L_M8xx18-xx, 875L_N12xx18-xx, 875L_N25xx30-xx | raC_Dvc_875L_5032_3.02_A0I.L5X | raC_Dvc_875L_5032_3.02_RUNG.L5X |

FactoryTalk® View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk® View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk® View ME Faceplate | FactoryTalk® View SE Faceplate |
|-----------------|---------------|--|--|
| 875L | Display | (raC-3_02-ME) raC_Dvc_875L-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_875L-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 875L | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|--|---|---|
| 875L | Point I/o 1734-410L | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_875L_410L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_875L_4I0L_(3.2) |
| | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_875L_810L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_875L_8IOL_(3.2) |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_875L_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_875L_5032_(3.2) |

Device Definition (raC_Dvc_875L_4I0L, raC_Dvc_875L_8I0L)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



2. Specify the Application Specific Name e.g. Tank Level 1001

Device Definition (raC_Dvc_875L_5032)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)



Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

2. Whichever channels are selected for 875L you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 875L Sensor.



3. Configure the parameters of sensor from configuration tab from AOP of the 875L sensor.

| Controller Organizer 🗸 🗸 🗸 | ųΧ | 🗎 MainProgram - MainRou | tine 📋 | Module Properties: Mod_Mast | er_5032 | _4:4 (875L-M16xx30-xx (309) | 1.1) → | () | |
|--|----|-------------------------|--------|-----------------------------|---------|------------------------------|--------|----------|-------------|
| a • | | General | Confi | auration | | | | | |
| Controller Master_5032_Test_Cases | | Connection | _ | 5 | | | | | |
| 🕨 🛑 Tasks | | - Device Info | | N | Day | N-L. | 11-3- | 01.1 | Description |
| Motion Groups | | Configuration | | Name | R/W | value | Units | Style | Description |
| 🕨 📕 Alarm Manager | | EventLog | | Identification | | | | | |
| Assets | | Lionzog | | Application-specific Tag | DW | *** | | | |
| the Logical Model | | | | User Tan 1 | nv | <u> </u> | | | |
| ▲ 🗐 I/O Configuration | | | | User Tag 2 | rw | | | | |
| ▲ (■ 1756 Backplane 1756-A7 | | | | Parameter | | | | | |
| III 101 1756-185E Master 5032 Test Cases | | | | Triggered 1 | | | | | |
| 4 Sethernet | | | | Phy Mode | nw | PNP 🗸 | | | |
| En 1756 LOSE Martin 5022 Tart Care | | | | Input Selector 1 | rw | SSC 1 🖂 | | | |
| Le 1/30-L83E Master_5032_Test_Cases | | | | Logic function | N | Direct 🗸 | ļ | | |
| D 5032-8IOLM12M12LDR/A Mod_Master_5032_1 | | | | Timer Mode | ſW | Disabled Timer 🗸 | | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_2 | | | | Timer Scale | ſW | Milliseconds 🗸 | ļ | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_3 | | | | Timer Value | NV | ✓ 0 | | Decim: 🗸 | |
| 5032-8IOLM12M12LDR/A Mod Master 5032 4 | | | | Polarity | ſW | Not inverted (Normal Open) 🗸 | | | |
| A 🕲 IO-Link | | | | Triggered 2 | | | | | |
| -1-0 0720 D19AID2 000 D5 (212) Mod 0720 Type1 | | | | Phy Mode | ſW | Disabled Output 🗸 | | | |
| 99 0 073F-D TORIF2-900-D3 (213) MOU_073F_Type1 | | | | Input Selector 2 | rw | Deactivated 🗸 | | | |
| 32 8/3P-D18P1-400-D4 (314) Mod_8/3P_Type2 | | | | Logic function | NV | Direct 🗸 | | | |
| 54 875L-M16xx30-xx (309) Mod_875L | | | | Timer Mode | ſW | Disabled Timer 🗸 | | | |
| 🔮 6 1694-PFD1244 (304) Mod_1694 | | | | Timer Scale | N | Milliseconds 🗸 | ļ | | |
| | | | | Timer Value | ſW | ✓ 0 | | Decim: 🗸 | |
| | | | Inse | rt Factory Defaults | | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_875L_4I0L, raC_Dvc_875L_8I0L)

| InOut | Function / Description | DataType | | |
|----------------------|---|---|--|--|
| Ref_Module | Reference to module in I/O tree | MODULE | | |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE | | |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE | | |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE | | |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE | | |
| Ref_MsgData | Messaging Data | raC_UDT_875L_Sensor_Data | | |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set | | |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd | | |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts | | |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] | | |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_875L_Inp_4IOL Or raC_UDT_ItfAD_875L_Inp_8IOL | | |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf | | |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices | | |

Input Data

| Input | Function/Description | DataType |
|--------------------------------|--|----------|
| Inp_ChxTriggered1 | Status Triggered 1 Sensor | BOOL |
| Inp_ChxTriggered2 | Status Triggered 2 Sensor | BOOL |
| Inp_ChxAnalogValue | Analog Value Dielectric Data | INT |
| Inp_ChxSwitchingSignalChannel1 | Status Switching Signal Channel 1Status Switching Signal Channel 1 | BOOL |
| Inp_ChxSwitchingSignalChannel2 | Status Switching Signal Channel 2 | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxTemperatureAlarm | Status Temperature Alarm | BOOL |
| Inp_ChxMarginAlarm1 | Status Margin Alarm 1 | BOOL |
| Inp_ChxMarginAlarm2 | Status Margin Alarm 2 | BOOL |
| Inp_ChxShortCircuit | Status Short Circuit | BOOL |
| Cfg_AdjustmentMode | Adjustment MethodDrop-Down; 0= Disabled, 1= Trimmer Input, 2= Teach By Wire | INT |
| Cfg_SensorApplication | Sensor Application Drop-Down: 0= Full Scale Range 1= Liquid Level 2= Plastic Pellets | INT |
| Cfg_SSC1_Mode | SSC1Mode; O= Deactivated, 1= Single Point, 2= Window, 3= Two Point | INT |
| Cfg_SSC1_SwitchingLogic | SSC1 Switching Logic; 0= High Active 1= Low Active | INT |
| Cfg_SSC2_SwitchingLogic | SSC1 Switching Logic; 0= High Active 1= Low Active | INT |
| Input | Function/Description | DataType |
|--------------------------|--|----------|
| Cfg_T1_InputSelector | Trigger1InputSelector; 0=Deactivated, 1=SSC1, 2=SSC2, 3=Margin Alarm 1 4= Margin Alarm 2 5= Temp Alarm 6= Ext Logic Input | INT |
| Cfg_T1_LogicalFunction | 0= Direct 1= AND 2= OR 3= XOR | INT |
| Cfg_T1_PhysicalMode | Trigger1 Mode; 0= Disabled Output, 1= PNP, 2= NPN, 3= Push-Pull | INT |
| Cfg_T1_Polarity | Trigger1 Polarity Mode; 0= Not Inverted (N.O.) 1= Inverted (N.C.) | INT |
| Cfg_T1_TimerMode | Trigger1Timer Mode; 0= Disabled, 1= T-On Delay, 2= T-Off Delay, 3= T-On/T-Off Delay 4= One-Shot Leading 5= One-Shot Trailing | INT |
| Cfg_T1_TimerScale | Trigger 1 Timer Scale: 0= Milliseconds 1= Seconds 2= Minutes | INT |
| Cfg_T2_InputSelector | Trigger2 InputSelector; 0= Deactivated, 1= SSC1, 2= SSC2, 3= Margin Alarm14= Margin Alarm 2 5= Temp Alarm 6= Ext Logic Input | INT |
| Cfg_T2_LogicalFunction | 0= Direct 1= AND 2= OR 3= XOR | INT |
| Cfg_T2_PhysicalMode | Trigger2 Mode; 0= Disabled Output, 1= PNP, 2= NPN, 3= Push-Pull | INT |
| Cfg_T2_Polarity | Trigger2 Polarity Mode; 0= Not Inverted (N.O.) 1= Inverted (N.C.) | SINT |
| Cfg_T2_TimerMode | Trigger2 Timer Mode; 0= Disabled, 1= T-On Delay, 2= T-Off Delay, 3= T-On/T-Off Delay 4= One-Shot Leading 5= One-Shot Trailing | INT |
| Cfg_T2_TimerScale | Trigger 2 Timer Scale: 0= Milliseconds 1= Seconds 2= Minutes | INT |
| Cfg_Teach_SSC | Teach SSC Mode; 1= SSC 1 2= SSC 2 | INT |
| Cmd_EnableLED | LED Disable/Enable Command | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_SP1_DTStart | SP1 - Dynamic Taech Start Command | BOOL |
| Cmd_SP1_DTStop | SP1 - Dynamic Taech Stop Command | BOOL |
| Cmd_SP1_SingleVal | SP1 - Single Value Teach Command | BOOL |
| Cmd_SP1_TwoVal_TP1 | SP1 - Two Value Trigger Point 1 Teach Command | BOOL |
| Cmd_SP1_TwoVal_TP2 | SP1 - Two Value Trigger Point 2 Teach Command | BOOL |
| Cmd_SP2_DTStart | SP2 - Dynamic Taech Start Command | BOOL |
| Cmd_SP2_DTStop | SP2 - Dynamic Taech Stop Command | BOOL |
| Cmd_SP2_SingleVal | SP2 - Single Value Teach Command | BOOL |
| Cmd_SP2_TwoVal_TP1 | SP2 - Two Value Trigger Point 1 Teach Command | BOOL |
| Cmd_SP2_TwoVal_TP2 | SP2 - Two Value Trigger Point 2 Teach Command | BOOL |
| Cmd_TeachApply | Teach Apply Command | BOOL |
| Cmd_TeachCancel | Teach Cancel Command | BOOL |
| Set_FilterScaler_SP | Filter Scaler Setpoint 1255 | INT |
| Set_PDC_Data | Process Data Enable Disable Settings | DINT |
| Set_PDC_EnableDisable_SP | Process data configuration disable enable settings | DINT |
| Set_SafeLimitSSC1 | Safe Limit SSC1 Setpoint 0100 | INT |
| Set_SafeLimitSSC2 | Safe Limit SSC2 Set point 0100 | INT |
| Set_SparkMaxValueT1 | Spark T1 Max value for VD/ME/SE Faceplate | INT |
| Set_SparkMaxValueT2 | Spark T2 Max value for VD/ME/SE Faceplate | INT |

| Input | Function/Description | DataType |
|-----------------------|--|----------|
| Set_SparkMinValueT1 | Spark T1 Min value for VD/ME/SE Faceplate | INT |
| Set_SparkMinValueT2 | Spark T2 Min value for VD/ME/SE Faceplate | INT |
| Set_SSC_CH1_Hyst_SP | SSC Channel 1 Hysteresis Setpoint 1100 | INT |
| Set_SSC_CH1_SP1 | SSC Channel 1 Setpoint 1 010000 | INT |
| Set_SSC_CH1_SP2 | SSC Channel 1 Setpoint 2 010000 | INT |
| Set_SSC_CH2_Hyst_SP | SSC Channel 2 Hysteresis Set point 1100 | INT |
| Set_SSC_CH2_SP1 | SSC Channel 2 Setpoint 1 010000 | INT |
| Set_SSC_CH2_SP2 | SSC Channel 2 Setpoint 2 010000 | INT |
| Set_TempHighThreshold | Temperature Threshold High -50150 | INT |
| Set_TempLowThreshold | Temperature Threshold Low -50150 | INT |
| Set_TrendMaxValue | Trend max value for VD/ME/SE Faceplate | INT |
| Set_TrendMinValue | Trend min value for VD/ME/SE Faceplate | INT |
| Set_Trig1_SP1 | SP1 value for trigger 1 Spark trend VD/ME/SE Faceplate | INT |
| Set_Trig1_SP2 | SP2 value for trigger 1 Spark trend VD/ME/SE Faceplate | INT |
| Set_Trig1_TimerValue | Timer value 1 setpoint032,767 | INT |
| Set_Trig2_SP1 | SP1 value for trigger 2 Spark trend VD/ME/SE Faceplate | INT |
| Set_Trig2_SP2 | SP1 value for trigger 2 Spark trend VD/ME/SE Faceplate | INT |
| Set_Trig2_TimerValue | Timer value 2 setpoint032,767 | INT |

Output Data

| Output | Function/Descritpion | DataType |
|--------------------------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_EnableLED | LED Status, O=Disable, 1=Enable | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Val_AdjustmentModeEnable | Adjustment Method; O= Disabled, 1= Trimmer Input, 2= Teach By Wire | SINT |
| Val_AnalogValueT1 | Spark Trigger 1 Analog Value | INT |
| Val_AnalogValueT2 | Spark Trigger 2 Analog Value | INT |
| Val_FilterScaler_SP | Filter Scaler value | INT |
| Val_MinutesAbvMaxTemp | Minutes above Maximum Temperature | DINT |
| Val_MinutesBelMinTemp | Minutes below Minimum Temperature | DINT |
| Val_NumberPowerCycles | Number of Power Cycles | DINT |
| Val_OperatingHrsSinceInception | Operating Hours Since Inception | DINT |
| Val_RangeMax | Sensor Maximum Range in Trend | INT |
| Val_RangeMin | Sensor Minimum Range in Trend | INT |
| Val_SafeLimitSSC1_SP | Safe limit SSC1 | SINT |
| Val_SafeLimitSSC2_SP | Safe limit SSC2 | SINT |
| Val_SensorApplicationEnable | Sensor Application; O= Full Scale Range 1= Liquid Level 2= Plastic Pellets | SINT |
| Val_SSC_CH1_Hyst | SSC Channel 1 Hysteresis | INT |
| Val_SSC_CH1_SP1 | SSC Channel 1 SP1 | INT |
| Val_SSC_CH1_SP2 | SSC Channel 1 SP2 | INT |
| Val_SSC_CH2_Hyst | SSC Channel 2 Hysteresis | INT |
| Val_SSC_CH2_SP1 | SSC Channel 2 SP1 | INT |
| Val_SSC_CH2_SP2 | SSC Channel 2 SP2 | INT |
| Val_SSC1_Mode | SSC1 Mode; O= Deactivated, 1= Single Point, 2= Window, 3= Two Point | SINT |

| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Val_SSC1_SwitchingLogic | SSC1 Switching Logic; 0= High Active 1= Low Active | SINT |
| Val_SSC2_Mode | SSC2 Mode; O= Deactivated, 1= Single Point, 2= Window, 3= Two Point | SINT |
| Val_SSC2_SwitchingLogic | SSC2 Switching Logic; 0= High Active 1= Low Active | SINT |
| Val_T1_InputSelector | Trigger1InputSelector; 0=Deactivated, 1=SSC1, 2=SSC2, 3=Margin Alarm 1 4= Margin Alarm 2 5= Temp Alarm 6= Ext Logic Input | SINT |
| Val_T1_LogicalFunction | Logical Function T1; 0= Direct 1= AND 2= OR 3= XOR | SINT |
| Val_T1_PhysicalMode | Trigger1 Physical Mode; 0= Disabled Output, 1= PNP, 2= NPN, 3= Push-Pull | SINT |
| Val_T1_Polarity | Trigger1 Polarity Mode Selected | SINT |
| Val_T1_Timer | Trigger 1 Timer value | INT |
| Val_T1_TimerMode | Trigger1 Timer Mode; 0= Disabled, 1= T-On Delay, 2= T-Off Delay, 3= T-On/T-Off Delay 4= One-Shot Leading 5= One-Shot Trailing | SINT |
| Val_T1_TimerScale | Trigger1 Timer Scale Mode Selected | SINT |
| Val_T2_InputSelector | Trigger2 InputSelector; 0= Deactivated, 1= SSC1, 2= SSC2, 3= Margin Alarm 1 4= Margin Alarm 2 5= Temp Alarm 6= Ext Logic Input | SINT |
| Val_T2_LogicalFunction | Logical Function T2; 0= Direct 1= AND 2= OR 3= XOR | SINT |
| Val_T2_PhysicalMode | Trigger2 Physical Mode; O= Disabled Output, 1= PNP, 2= NPN, 3= Push-Pull | SINT |
| Val_T2_Polarity | Trigger2 Polarity Mode Selected | SINT |
| Val_T2_Timer | Trigger 2 Timer value | INT |
| Val_T2_TimerMode | Trigger 2 Timer Mode; 0= Disabled, 1= T-On Delay, 2= T-Off Delay, 3= T-On/T-Off Delay 4= One-Shot Leading 5= One-Shot Trailing | SINT |
| Val_T2_TimerScale | Trigger2 Timer Scale Mode Selected | SINT |
| Val_Teach_SSC | Teach SSC Mode Selected | INT |
| Val_TeachStep | Teach Step Value | INT |
| Val_TemperatureCurrent | Current temperature | INT |
| Val_TemperatureMaxSinceInception | Maximum temperature - All time high | INT |
| Val_TemperatureMaxSincePowerUp | Maximum temperature since power up | INT |
| Val_TemperatureMinSinceInception | Minimum temperature - All time low | INT |
| Val_TemperatureMinSincePowerUp | Minimum temperature since power up | INT |
| Val_TempHighThreshold | Temperature high threshold | INT |
| Val_TempLowThreshold | Temperature low threshold | INT |
| Val_Trig1_SP1 | First SetPoint Value For Triggered1 | INT |
| Val_Trig1_SP2 | Second SetPoint Value for Triggered1 | INT |
| Val_Trig2_SP1 | First SetPoint Value For Triggered2 | INT |
| Val_Trig2_SP2 | Second SetPoint Value for Triggered2 | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_875L_5032)

| | | D . T |
|-----------------------|---|--|
| InUut | Function / Description | Data i ype |
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_875L_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Set |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensorDiscrete_Cmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[2] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_875L_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_875L_Cfg |

Input Data

| Input | Function/Description | DataType |
|--------------------------------|---|----------|
| Inp_ChxTriggered1 | Status Triggered 1 Sensor | BOOL |
| Inp_ChxTriggered2 | Status Triggered 2 Sensor | BOOL |
| Inp_ChxAnalogValue | Analog Value Dielectric Data | INT |
| Inp_ChxSwitchingSignalChannel1 | Status Switching Signal Channel 1Status Switching Signal Channel 1 | BOOL |
| Inp_ChxSwitchingSignalChannel2 | Status Switching Signal Channel 2 | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxTemperatureAlarm | Status Temperature Alarm | BOOL |
| Inp_ChxMarginAlarm1 | Status Margin Alarm 1 | BOOL |
| Inp_ChxMarginAlarm2 | Status Margin Alarm 2 | BOOL |
| Inp_ChxShortCircuit | Status Short Circuit | BOOL |
| Cfg_AdjustmentMode | Adjustment MethodDrop-Down; 0= Disabled, 1= Trimmer Input, 2= Teach By Wire | INT |
| Cfg_SensorApplication | Sensor Application Drop-Down: 0= Full Scale Range 1= Liquid Level 2= Plastic Pellets | INT |
| Cfg_SSC1_Mode | SSC1Mode; O= Deactivated, 1= Single Point, 2= Window, 3= Two Point | INT |

| Input | Function/Description | DataType |
|--------------------------|--|----------|
| Cfg_SSC1_SwitchingLogic | SSC1 Switching Logic; 0= High Active 1= Low Active | INT |
| Cfg_SSC2_SwitchingLogic | SSC1 Switching Logic; 0= High Active 1= Low Active | INT |
| Cfg_T1_InputSelector | Trigger1 InputSelector; 0= Deactivated, 1= SSC1, 2= SSC2, 3= Margin Alarm 1 4= Margin Alarm 2 5= Temp Alarm 6= Ext Logic Input | INT |
| Cfg_T1_LogicalFunction | 0= Direct 1= AND 2= OR 3= XOR | INT |
| Cfg_T1_PhysicalMode | Trigger1 Mode; O= Disabled Output, 1= PNP, 2= NPN, 3= Push- Pull | INT |
| Cfg_T1_Polarity | Trigger1 Polarity Mode; 0= Not Inverted (N.O.) 1= Inverted (N.C.) | INT |
| Cfg_T1_TimerMode | Trigger1 Timer Mode; 0= Disabled, 1= T-On Delay, 2= T-Off Delay, 3= T-On/T-Off Delay 4= One-Shot Leading 5= One-Shot Trailing | INT |
| Cfg_T1_TimerScale | Trigger 1 Timer Scale: 0= Milliseconds 1= Seconds 2= Minutes | INT |
| Cfg_T2_InputSelector | Trigger2 InputSelector; 0= Deactivated, 1= SSC1, 2= SSC2, 3= Margin Alarm 1 4= Margin Alarm 2 5= Temp Alarm 6= Ext Logic Input | INT |
| Cfg_T2_LogicalFunction | O= Direct 1= AND 2= OR 3= XOR | INT |
| Cfg_T2_PhysicalMode | Trigger2 Mode; O= Disabled Output, 1= PNP, 2= NPN, 3= Push- Pull | INT |
| Cfg_T2_Polarity | Trigger2 Polarity Mode; 0= Not Inverted (N.O.) 1= Inverted (N.C.) | SINT |
| Cfg_T2_TimerMode | Trigger2 Timer Mode; 0= Disabled, 1= T-On Delay, 2= T-Off Delay, 3= T-On/T-Off Delay 4= One-Shot Leading 5= One-Shot Trailing | INT |
| Cfg_T2_TimerScale | Trigger 2 Timer Scale: 0= Milliseconds 1= Seconds 2= Minutes | INT |
| Cfg_Teach_SSC | Teach SSC Mode; 1= SSC 1 2= SSC 2 | INT |
| Cmd_EnableLED | LED Disable/Enable Command | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_SP1_DTStart | SP1 - Dynamic Taech Start Command | BOOL |
| Cmd_SP1_DTStop | SP1 - Dynamic Taech Stop Command | BOOL |
| Cmd_SP1_SingleVal | SP1 - Single Value Teach Command | BOOL |
| Cmd_SP1_TwoVal_TP1 | SP1 - Two Value Trigger Point 1 Teach Command | BOOL |
| Cmd_SP1_TwoVal_TP2 | SP1 - Two Value Trigger Point 2 Teach Command | BOOL |
| Cmd_SP2_DTStart | SP2 - Dynamic Taech Start Command | BOOL |
| Cmd_SP2_DTStop | SP2 - Dynamic Taech Stop Command | BOOL |
| Cmd_SP2_SingleVal | SP2 - Single Value Teach Command | BOOL |
| Cmd_SP2_TwoVal_TP1 | SP2 - Two Value Trigger Point 1 Teach Command | BOOL |
| Cmd_SP2_TwoVal_TP2 | SP2 - Two Value Trigger Point 2 Teach Command | BOOL |
| Cmd_TeachApply | Teach Apply Command | BOOL |
| Cmd_TeachCancel | Teach Cancel Command | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Set_FilterScaler_SP | Filter Scaler Setpoint 1255 | INT |
| Set_PDC_Data | Process Data Enable Disable Settings | DINT |
| Set_PDC_EnableDisable_SP | Process data configuration disable enable settings | DINT |

| Input | Function/Description | DataType |
|-----------------------|--|----------|
| Set_SafeLimitSSC1 | Safe Limit SSC1 Setpoint 0100 | INT |
| Set_SafeLimitSSC2 | Safe Limit SSC2 Set point 0100 | INT |
| Set_SparkMaxValueT1 | Spark T1 Max value for VD/ME/SE Faceplate | INT |
| Set_SparkMaxValueT2 | Spark T2 Max value for VD/ME/SE Faceplate | INT |
| Set_SparkMinValueT1 | Spark T1 Min value for VD/ME/SE Faceplate | INT |
| Set_SparkMinValueT2 | Spark T2 Min value for VD/ME/SE Faceplate | INT |
| Set_SSC_CH1_Hyst_SP | SSC Channel 1 Hysteresis Setpoint 1100 | INT |
| Set_SSC_CH1_SP1 | SSC Channel 1 Setpoint 1 010000 | INT |
| Set_SSC_CH1_SP2 | SSC Channel 1 Setpoint 2 010000 | INT |
| Set_SSC_CH2_Hyst_SP | SSC Channel 2 Hysteresis Set point 1100 | INT |
| Set_SSC_CH2_SP1 | SSC Channel 2 Setpoint 1 010000 | INT |
| Set_SSC_CH2_SP2 | SSC Channel 2 Setpoint 2 010000 | INT |
| Set_TempHighThreshold | Temperature Threshold High -50150 | INT |
| Set_TempLowThreshold | Temperature Threshold Low -50150 | INT |
| Set_TrendMaxValue | Trend max value for VD/ME/SE Faceplate | INT |
| Set_TrendMinValue | Trend min value for VD/ME/SE Faceplate | INT |
| Set_Trig1_SP1 | SP1 value for trigger 1 Spark trend VD/ME/SE Faceplate | INT |
| Set_Trig1_SP2 | SP2 value for trigger 1 Spark trend VD/ME/SE Faceplate | INT |
| Set_Trig1_TimerValue | Timer value 1 setpoint032,767 | INT |
| Set_Trig2_SP1 | SP1 value for trigger 2 Spark trend VD/ME/SE Faceplate | INT |
| Set_Trig2_SP2 | SP1 value for trigger 2 Spark trend VD/ME/SE Faceplate | INT |
| Set_Trig2_TimerValue | Timer value 2 setpoint032,767 | INT |

Output Data

| Output | Function/Descritpion | DataType |
|----------------|---|----------|
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_Ready | Device is Ready | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Connected | Device is connected to the Programmable Controller | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; O=Allow | BOOL |

| Output | Function/Descritpion | DataType |
|--------------------------------|--|----------|
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_EnableLED | LED Status, 0=Disable, 1=Enable | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_AdjustmentModeEnable | Adjustment Method; 0= Disabled, 1= Trimmer Input, 2= Teach By Wire | SINT |
| Val_AnalogValueT1 | Spark Trigger 1 Analog Value | INT |
| Val_AnalogValueT2 | Spark Trigger 2 Analog Value | INT |
| Val_FilterScaler_SP | Filter Scaler value | INT |
| Val_MinutesAbvMaxTemp | Minutes above Maximum Temperature | DINT |
| Val_MinutesBelMinTemp | Minutes below Minimum Temperature | DINT |
| Val_NumberPowerCycles | Number of Power Cycles | DINT |
| Val_OperatingHrsSinceInception | Operating Hours Since Inception | DINT |
| Val_RangeMax | Sensor Maximum Range in Trend | INT |
| Val_RangeMin | Sensor Minimum Range in Trend | INT |
| Val_SafeLimitSSC1_SP | Safe limit SSC1 | SINT |
| Val_SafeLimitSSC2_SP | Safe limit SSC2 | SINT |
| Val_SensorApplicationEnable | Sensor Application; 0= Full Scale Range 1= Liquid Level 2= Plastic Pellets | SINT |
| Val_SSC_CH1_Hyst | SSC Channel 1 Hysteresis | INT |
| Val_SSC_CH1_SP1 | SSC Channel 1 SP1 | INT |
| Val_SSC_CH1_SP2 | SSC Channel 1 SP2 | INT |
| Val_SSC_CH2_Hyst | SSC Channel 2 Hysteresis | INT |
| Val_SSC_CH2_SP1 | SSC Channel 2 SP1 | INT |
| Val_SSC_CH2_SP2 | SSC Channel 2 SP2 | INT |
| Val_SSC1_Mode | SSC1 Mode; O= Deactivated, 1= Single Point, 2= Window, 3= Two Point | SINT |
| Val_SSC1_SwitchingLogic | SSC1 Switching Logic; 0= High Active 1= Low Active | SINT |
| Val_SSC2_Mode | SSC2 Mode; 0= Deactivated, 1= Single Point, 2= Window, 3= Two Point | SINT |
| Val_SSC2_SwitchingLogic | SSC2 Switching Logic; 0= High Active 1= Low Active | SINT |
| Val_T1_InputSelector | Trigger1 InputSelector; 0= Deactivated, 1= SSC1, 2= SSC2, 3= Margin Alarm 1 4= Margin Alarm 2 5= Temp Alarm 6= Ext Logic Input | SINT |
| Val_T1_LogicalFunction | Logical Function T1; 0= Direct 1= AND 2= OR 3= XOR | SINT |
| Val_T1_PhysicalMode | Trigger1 Physical Mode; 0= Disabled Output, 1= PNP, 2= NPN, 3= Push-Pull | SINT |
| Val_T1_Polarity | Trigger1 Polarity Mode Selected | SINT |
| Val_T1_Timer | Trigger 1 Timer value | INT |
| Val_T1_TimerMode | Trigger1 Timer Mode; 0= Disabled, 1= T-On Delay, 2= T-Off Delay, 3= T-On/T-Off Delay 4= One-Shot Leading 5= One-Shot Trailing | SINT |

| Output | Function/Descritpion | DataType |
|------------------------------------|--|----------|
| Val_T1_TimerScale | Trigger1 Timer Scale Mode Selected | SINT |
| Val_T2_InputSelector | Trigger2 InputSelector; 0= Deactivated, 1= SSC1, 2= SSC2, 3= Margin Alarm 1 4= Margin Alarm 2 5= Temp Alarm 6= Ext Logic Input | SINT |
| Val_T2_LogicalFunction | Logical Function T2; 0= Direct 1= AND 2= OR 3= XOR | SINT |
| Val_T2_PhysicalMode | Trigger2 Physical Mode; O= Disabled Output, 1= PNP, 2= NPN, 3= Push-Pull | SINT |
| Val_T2_Polarity | Trigger2 Polarity Mode Selected | SINT |
| Val_T2_Timer | Trigger 2 Timer value | INT |
| Val_T2_TimerMode | Trigger 2 Timer Mode; 0= Disabled, 1= T-On Delay, 2= T-Off Delay, 3= T-On/T-Off Delay 4= One-Shot Leading 5= One-Shot Trailing | SINT |
| Val_T2_TimerScale | Trigger2 Timer Scale Mode Selected | SINT |
| Val_Teach_SSC | Teach SSC Mode Selected | INT |
| Val_TeachStep | Teach Step Value | INT |
| Val_TemperatureCurrent | Current temperature | INT |
| Val_TemperatureMaxSinceInceptio | Maximum temperature - All time high | INT |
| Val_TemperatureMaxSincePowerU p | Maximum temperature since power up | INT |
| Val_TemperatureMinSinceInceptio | Minimum temperature - All time low | INT |
| Val_TemperatureMinSincePowerU p | Minimum temperature since power up | INT |
| Val_TempHighThreshold | Temperature high threshold | INT |
| Val_TempLowThreshold | Temperature low threshold | INT |
| Val_Trig1_SP1 | First SetPoint Value For Triggered1 | INT |
| Val_Trig1_SP2 | Second SetPoint Value for Triggered1 | INT |
| Val_Trig2_SP1 | First SetPoint Value For Triggered2 | INT |
| Val_Trig2_SP2 | Second SetPoint Value for Triggered2 | INT |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 875L device object connected to channel #2 of a POINT I/O 1734-4IOL IO-Link Master module in slot #13 of a POINT I/O adapter named *Racko1*.

| | | Sensor 875L 1001 | |
|----------------------------------|---------------------------------|--|-------------------|
| COP | raC | Dvc 875L 4IOL | 1 |
| - Copy File | 875L Capacitance Measurement S | ensor Object With 4IOL Master | |
| Source Rack01:13:I.Fault | raC_Dvc_875L_4IOL | Sensor875L_1001 | -(Sts_Connected)- |
| Dest Sensor875L_1001_Inp_I.Fault | Ref_Module | PointIO_4IOL_Master | |
| Length 7 | Ref_MsgCustSetIdx | Sensor875L_1001_CustSetIdx | -(Sts_Available) |
| _ | Ref_MsgCustGetIdx | Sensor875L_1001_CustGetIdx | |
| | Ref_MsgCustSetSubldx | Sensor875L_1001_CustSetSubldx | (Sts_Warning)— |
| | Ref_MsgCustGetSubldx | Sensor875L_1001_CustGetSubldx | |
| | Ref_MsgData | Sensor875L_1001_MsgData | -(Sts_Faulted) |
| | Ref_Ctrl_Set | Sensor875L_1001_CtrlSet | |
| | Ref_Ctrl_Cmd | Sensor875L_1001_CtrlCmd | -(Sts_Ready) |
| | Ref_Ctrl_Sts | Sensor875L_1001_CtrlSts | |
| | Inf_Lookup | raC_Dvc_875L_InfTable | |
| | Inp_I | Sensor875L_1001_Inp_I | |
| | Inp_ChxAnalogValue | Rack01:13:I.Ch2AnalogValue | |
| | | 0 🗲 | |
| | Inp_ChxSwitchingSignalChannel_1 | Rack01:13:I.Ch2SwitchingSignalChannel_1 | |
| | | 0 🗲 | |
| | Inp_ChxSwitchingSignalChannel_2 | Rack01:13:I.Ch2SwitchingSignalChannel_2 | |
| | | 0 🗲 | |
| | Inp_ChxMarginAlarm_1 | Rack01:13:I.Ch2MarginAlarm_1 | |
| | | 0 ← | |
| | Inp_ChxMarginAlarm_2 | Rack01:13:I.Ch2MarginAlarm_2 | |
| | | • | |
| | Inp_ChxTemperatureAlarm | Rack01:13:I.Ch2TemperatureAlarm | |
| | | | |
| | inp_cnxshortcircuit | RackU1:13:I.Ch2ShortCircuit | |
| | Inc. ChuTrissened4 | Deel/04/42/I Ch2Tricensed 4 | |
| | inp_cnxtriggered1 | Rackut. 15.1.Ch21hggered_1 | |
| | Inc. ChyTricograd2 | Deek01:12:1 Ch2Trisserred 2 | |
| | inp_cnxtriggered2 | Rackut. 15.1.Ch21hggered_2 | |
| | Inp. ChNumber | 2 | |
| | inp_crimaniber | 2 | |
| | Ref Ctrl Inf | PointIO 4IOI Master Otrilof | |
| | Def Ctrl Hf | PointiO_4IOL_Master_Ctrilli PointiO_4IOL_Master_Ctrilli | |
| | Rei_cui_iu | Pointio_4ioL_master_Ctrift | |

The following example uses the 875L device object connected to channel #6 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor 8IOL MasterB*.

| 275L Jacob Date | | 0 0751 4004 | |
|-----------------------------------|--|--|-----------------------------|
| 875L Input Data | | Sensor 875L 1001 | |
| COP | | -raC_Dvc_875L_8IOL | |
| Copy File | 875L Capacitance Measurement S | ensor Object With 8IOL Master | |
| Source Armor_8IOL_MasterB:I.Fault | raC_Dvc_875L_8IOL | Sensor875L_1001 | <pre>(Sts_Connected)—</pre> |
| Dest Sensor875L_1001_Inp_I.Fault | Ref_Module | Armor_8IOL_MasterB | |
| Length 40 | Ref_MsgCustSetIdx | Sensor875L_1001_CustSetIdx | (Sts_Available)— |
| | Ref_MsgCustGetIdx | Sensor875L_1001_CustGetIdx | 1 |
| | Ref_MsgCustSetSubldx | Sensor875L_1001_CustSetSubldx | (Sts_Warning)— |
| | Ref_MsgCustGetSubldx | Sensor875L_1001_CustGetSubldx |] |
| | Ref_MsgData | Sensor875L_1001_MsgData | -(Sts_Faulted) |
| | Ref_Ctrl_Set | Sensor875L_1001_CtrlSet | |
| | Ref_Ctrl_Cmd | Sensor875L_1001_CtrlCmd | -(Sts_Ready) |
| | Ref_Ctrl_Sts | Sensor875L_1001_CtrlSts | |
| | Inf_Lookup | raC_Dvc_875L_InfTable | |
| | Inp_I | Sensor875L_1001_Inp_I | |
| | Inp_ChxAnalogValue | Armor_8IOL_MasterB:I.Ch3AnalogValue | |
| | | 0 🗲 | |
| | Inp_ChxSwitchingSignalChannel_1 | Armor_8IOL_MasterB:I.Ch3SwitchingSignalChannel_1 | |
| | | 0 🗲 | |
| | Inp_ChxSwitchingSignalChannel_2 | Armor_8IOL_MasterB:I.Ch3SwitchingSignalChannel_2 | |
| | | 0 🗲 | |
| | Inp_ChxMarginAlarm_1 | Armor_8IOL_MasterB:I.Ch3MarginAlarm_1 | |
| | | 0 ← | |
| | Inp_ChxMarginAlarm_2 | Armor_8IOL_MasterB:I.Ch3MarginAlarm_2 | |
| | | 0 ← | |
| | Inp_ChxTemperatureAlarm | Armor_8IOL_MasterB:I.Ch3TemperatureAlarm | |
| | | 0 ← | |
| | Inp_ChxShortCircuit | Armor_8IOL_MasterB:I.Ch3ShortCircuit | |
| | | 0 ← | |
| | Inp_ChxTriggered1 | Armor_8IOL_MasterB:I.Ch3Triggered_1 | |
| | | 0 ← | |
| | Inp_ChxTriggered2 | Armor_8IOL_MasterB:I.Ch3Triggered_2 | |
| | | 0 🗧 | |
| | Inp_ChNumber | 3 | |
| | | | |
| | Ref_Ctrl_Inf | Armor_8IOL_MasterB_CtrlInf | |
| | Ref_Ctrl_ltf | Armor_8IOL_MasterB_Ctrltf | |

The following example uses the 875L device object connected to channel #4 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_4.*



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

| FactoryTalk View ME/SE Graphic Symbols | |
|--|--|
|--|--|

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|----------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_CapSens | ss | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | | | | P | roperty (| Configuration | |
|---------------------------|----------------|---|-------------|------------------|-----------------|--------------------|-----------|--------------------------------------|--|
| AOG_875L_ Launch | Ss S€ | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Prop A G | erties eneral | Animations I | % Events | çờ | ::PAC_VD \MainProgram.Sensor_875L | |
| | Not Triggered | | ⊳ А | ppear | ance | | | | |
| | | | ⊳ Po | ositior | n and Size | | | | |
| | | | Þ Se | ecurity | y | | | | |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Name | Description | Usage 📰 🛆 |
|------|-----------------------------------|-----------|
| | Sensor 875L 1001 | Local |
| | Sensor875L_1001 Command Interface | Public |
| | Sensor875L_1001 Setting Interface | Public |
| | Sensor875L_1001 Status Interface | Public |
| | | |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status 1 & 2 OFF (0) = Gray LED ON (1) = Blue LED |
| | Depending on Input Selector 1 & 2 for Trigger 1 & 2 settings it will displays the Deactivated, SSC1, SSC2, Margin Alarm 1, Margin Alarm 2, Temperature Alarm, External Logic Input. |
| 4 | Trigger1 & 2 Sparkline Trend The spark line shows dielectric values (blue) and set-points (gray) over last 30 seconds. |
| 5 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 6 | Process Data: Displays the current Dielectric value. |
| 7 | Switching Signal CH 1 & 2 OFF (0) = Gray LED ON (1) = Blue LED |
| 8 | Margin Alarm 1 & 2 OFF (0) = Gray LED ON (1) = Blue LED |



Trend Spark 1 & 2 changed its Spark line (blue) parameter depending on input selector of trigger 1 & 2. Input selector is selected as a Temperature then Spark Line (blue) incorporate with current temperature value and Set-points(gray) incorporate with High & Low threshold value.



Note: In Case of, 5032 Master, changes made to the Application Specific Name require pressing the 'Config Apply' button in the Config tab to update the sensor parameters.

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description |
|------|--|
| 1 | Device Temperature Bar Graph Purple Indicators: Min/Max since power up Green Indicators: Min/Max since inception Light Blue Triangle Indicator: Current value |
| 2 | Device Temperature Current Value |
| 3 | Operating Hours Since Inception |
| 4 | Minutes above maximum temperature |
| 5 | Short Circuit OFF (0) = Gray LED ON (1) = Blue LED |
| 6 | Number of Power Cycle |
| 7 | Minutes below minimum temperature |
| 8 | Temperature Alarm OFF (0) = Gray LED ON (1) = Blue LED |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action decisions. One trend is displayed for Distance.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Distance.



Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into five pages with Teach Settings:

- Parameter Settings
- Process Data Enable Settings
- Switching Signal Channel Settings
- Trigger Settings 1
- Trigger Settings 2
- Teach Settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

Parameter Settings

| L875_14 | 002L | | | X |
|------------------------|--------------------|----------------------|-------------------|----------------|
| $\widehat{\mathbf{w}}$ | Ready | | | |
| Ð | Parameter Settings | • | Safe ON/OFF Limit | |
| ~ | Adjustment Method | Trimmer Input | SSC1 10 % | |
| B | | | SSC2 10 % | Config Apply |
| ! | Sensor Application | Full Scale Range 🛛 🔻 | Filter Scaler 1 | |
| | Temperature Alarn | n | | |
| | High 120 | "C | | Local Settings |
| | Low -30 | *C | | LEDS 🔿 |
| | | 2 3 4 | 5 > | |

Adjustment Method- The Adjustment Method parameter enables operators to select local/remote adjustment of Teach sensor. To enable teach from IO-Link choose it to Disabled.

Sensor Application- Depending on the application operator may select one of the three presets.

Temperature Alarm- This setting means that the sensor gives an alarm in the maximum or minimum temperature is exceeded.

Safe ON/OFF Limit- The sensor has a built-in safety margin that helps adjust the sensing up to the set-points with an additional safe margin. The factory settings are set to two times the standard hysteresis of the sensor.

Local Settings LEDs- The Local Settings LEDs toggle button is used to Enable or disable the LED of the device.

Teach Settings- To navigate the Teach Settings operation.

Process Data Enable Settings

Toggle buttons used to enable or access the cyclic process data variable

| 002L | | | |
|----------------------|----------|-------------------|----------|
| Ready | | | |
| Process Data Enable | Settings | | |
| Analog Value | -0 | Margin Alarm 1 | - |
| Switching Output 1 | -0 | Margin Alarm 2 | ` |
| Switching Output 2 | -0 | Temperature Alarm | 0 |
| Switching Signal Ch1 | - | Short Circuit | |
| Switching Signal Ch2 | - | | |
| | (1 | 345> | Config |

Switching Signal Channel Settings

| 75_14 | 4002L | | > |
|-------|---------------------|-----------------|------------------|
| S | E Ready | | |
| S) | Switching Signal Cl | hannel Settings | |
| ~ | | Channel 1 | Channel 2 |
| ~ | Mode | Single Point | Deactivated 🛛 💙 |
| 1 | Switching Logic | High Active | High Active |
| 2 | Set Point 1 | 1000 | 1000 |
| | Set Point 2 | 10000 | 10000 |
| | Hysteresis | 5 % | 5 % |
| | | | 5 > Config Apply |

Mode- Operator selects the switching behavior used to create more advanced output.

Switching Logic- High Active or Low active output switching logic.

Set Point 1- Set point 1 defines the first set point value for SSC.

Set Point 2- Set point 2 defines the second set point value for SSC. Its disabled when Mode is selected as Single Point.

Hysteresis- In SSC1 and SSC2 - single point mode and in windows mode the hysteresis can be set 1...100% of the actual switching value.

Trigger 1 settings

| 1 | Frigger 1 Settin | gs | | | |
|---|------------------|--------------|----------------|--------------|--|
| | Physical Mode | PNP | Logic Function | Direct | |
| | Input Selector | SSC 1 | Timer Mode | Disabled | |
| | Polarity | Not Inverted | Timer Scale | Milliseconds | |
| | | | Timer Value | 0 | |

Physical Mode- Physical mode has various settings like Deactivated, PNP, NPN, Push-Pull. It decides the switching outputs operate.

Input Selector- This function block allows you to select any of the signals from the sensor front to the Channel A or B. Channel A and B: Can select between SSC1, SSC2, margin alarm 1, margin alarm 2, temperature alarm, and external input.

Polarity- The Polarity value can either be Not-Inverted or Inverted. Not-Inverted means that the output will turn ON when the target is within the expected set points. Inverted means that the output will turn OFF when the target is within the expected set points.

Logic Function-In the logic function block, the selected signals from the input selector can be added a logic function directly without using a PLC - which makes decentralize decisions possible. The logic functions available are AND, OR, XOR, and gated SR-FF.

Timer Mode- Selects which type of timer function is introduced on the Switching Output. Any one of the following is possible: T-On Delay, T-Off Delay, T-On/T-Off Delay, One-Shot Leading, One-Shot Trailing.

Timer Scale- Parameter defines if the delay specified in the Timer delay should be in milliseconds, seconds, or minutes.

Timer Value- Parameter defines the actual duration of the delay. The delay can be set to any integer value from 1... 32,767.

Trigger 2 settings

| Trigger 2 Setti | ngs | | | |
|-----------------|-----------------|----------------|--------------|--|
| Physical Mode | Disabled Output | Logic Function | Direct | |
| Input Selector | Deactivated | Timer Mode | Disabled | |
| Polarity | Not Inverted | Timer Scale | Milliseconds | |
| | | Timer Value | 0 | |

Physical Mode- Physical mode has various settings like Deactivated, PNP, NPN, Push-Pull, External input (Active high/Pull-down), External input (Active low/pull up), or External Teach input. It decides the switching outputs operate.

Input Selector- This function block allows you to select any of the signals from the sensor front to the Channel A or B. Channel A and B: Can select between SSC1, SSC2, margin alarm 1, margin alarm 2, temperature alarm, and external input.

Polarity- The Polarity value can either be Not-Inverted or Inverted. Not-Inverted means that the output will turn ON when the target is within the expected set points. Inverted means that the output will turn OFF when the target is within the expected set points.

Logic Function-In the logic function block, the selected signals from the input selector can be added a logic function directly without using a PLC - which makes decentralize decisions possible. The logic functions available are AND, OR, XOR, and gated SR-FF.

Timer Mode- Selects which type of timer function is introduced on the Switching Output. Any one of the following is possible: T-On Delay, T-Off Delay, T-On/T-Off Delay, One-Shot Leading, One-Shot Trailing.

Timer Scale- Parameter defines if the delay specified in the Timer delay should be in milliseconds, seconds, or minutes.

Timer Value- Parameter defines the actual duration of the delay. The delay can be set to any integer value from 1... 32,767.

Teach settings

| 875L 1001 | | X |
|----------------|--|--|
| Ready | | |
| Teach | | × |
| Single Point | SSC 1 | Dynamic V |
| | Hysteresis 5 % | |
| | | |
| Teach Start | > Teach Stop | > Teach Apply |
| | Teach Cancel | |
| | 875L 1001 Ready Teach Single Point Teach Teach | Teach Teach Single Point Teach Teach Teach Teach SSC 1 Hysteresis 5 % Teach Start Teach Teach Teach Teach |

In order to configure the window for teaching operations effectively, there are several options available. The window encompasses three drop-down menus that provide users with the flexibility to select the desired configuration for their specific teaching requirements. Based on the chosen configuration settings, relevant Teach command buttons are dynamically displayed, empowering users to initiate the teaching process. It's important to note that only one button or command remains active at any given time during the teach operation. Additionally, users have the option to interrupt the teach operation and cancel the settings by utilizing the dedicated cancel button/command.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| 875 | 5L - 1001 | | | |
|-----|----------------------|----------|-------------------|--------------|
| ŵ | Ready | | | |
| 8 | Process Data Enable | Settings | | |
| ~ | Analog Value | | Margin Alarm 1 | - |
| P | Switching Output 1 | -0 | Margin Alarm 2 | •• |
| ļ | Switching Output 2 | | Temperature Alarm | 0 |
| | Switching Signal Ch1 | - | Short Circuit | 0 |
| | Switching Signal Ch2 | — | | |
| | | < 1 | 3 4 5 > | Config Apply |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| 875 | iL - 1001 | | | - 0 🗙 |
|-----|--------------------|------------------|-------------------|----------------|
| | Ready | | | |
| Ð | Parameter Settings | | Safe ON/OFF Limit | Teach |
| ~ | Adjustment Method | Disabled | SSC1 15 | % |
| B | ſ | | SSC2 11 | % |
| ! | Sensor Application | Full Scale Range | Filter Scaler 1 | |
| | Temperature Alarm | 1 | | Local Settings |
| | High 121 | °C | | LEDs |
| | Low -29 | °C | | Config Apply |
| | | | 5 > | cound view. |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_875L_4I0L, raC_Dvc_875L_8I0L, raC_Dvc_875L_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_875L_410L, raC_LD_Dvc_875L_810L

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|---|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------|---------------|------------|--|
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Sensor Type | | | | Select sensor type of 875L as per device catalog no. |
| MasterName | MasterName | [MasterName] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_875L_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-------------------|---------------------|------------------|-------------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 875L), This name depends upon the TagName assigned to object. |
| SensorType | 875L-M8xx18-xx | 875L-M8xx18-xx | 875L-M8xx18-xx | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|-----------|----------------|----------|----------|----------|
| | | | | |

| raC_Dvc_875L_4I0L | raC_Dvc_875L_4I0L | 3.2 | (RA-LIB) Device | 10-Link |
|-------------------|-------------------|-----|-----------------|---------|
| raC_Dvc_875L_810L | raC_Dvc_875L_8IOL | 3.2 | (RA-LIB) Device | IO-Link |
| raC_Dvc_875L_5032 | raC_Dvc_875L_810L | 3.2 | (RA-LIB) Device | IO-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|---|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME)GraphicSymbols-IO-LinkDevice.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_875L | Faceplate ME | (raC-3_xx-ME) raC_Dvc_875L-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_875L | Faceplate SE | (raC-3_xx-SE) raC_Dvc_875L-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_I0Link | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_IO_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

46DFA - Small Aperture Fiber-optic Amplifier (raC_Dvc_46DFA_4IOL, raC_Dvc_46DFA_8IOL, raC_Dvc_46DFA_5032)

Overview

The 46DFA small aperture fiber-optic amplifier sensor device object (raC_Dvc_46DFA_4IOL, raC_Dvc_46DFA_8IOL, raC_Dvc_46DFA_5032) includes HMI faceplates which displays device information including:

- Sensor data
- Sensor diagnostics
- Sensor configuration and parameters
- Process data trending
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_46DFA_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.
- **Setpoint:** Setpoint will allow the operators to enter the signal value required for the sensor output to turn ON upon target detection.
- **Polarity:** This function changes the sensor output to operate as Not-Inverted (Light Operate) and Inverted (Dark Operate).

The 46DFA small aperture fiber-optic amplifier sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Functional Description

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix[®] firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|---------------------------|---------------------------------|----------------------------------|
| | POINT I/O 1734-4IOL | 46DFA-L2LBT1-xx | raC_Dvc_46DFA_4I0L_3.02_A0I.L5X | raC_Dvc_46DFA_4I0L_3.02_RUNG.L5X |
| (005) | ArmorBlock 1732E-8I0LM12R | 46DFA-L2LBT1-xx | raC_Dvc_46DFA_8I0L_3.02_A0I.L5X | raC_Dvc_46DFA_8IOL_3.02_RUNG.L5X |
| 46DFA | 5032-8I0LM12DR 5032-8I0LM12M12LDR/A 5032-8I0LM12P5DR | 46DFA-L2LBT1-xx | raC_Dvc_46DFA_5032_3.02_A0I.L5X | raC_Dvc_46DFA_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the /HMI FactoryTalk View Images - png/ folder of the library. FactoryTalk View ME files are stored in the /HMI - FactoryTalk View ME/ library folder and FactoryTalk® View SE files are stored in the /HMI - FactoryTalk View SE library folder.

Note that a single faceplate is used for either the 4IOL or 8IOL versions of the Add-On Instruction.

| Device/Item Type Factory Faceplat | | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|--------------------------------------|---------------|--|--|
| 46DFA | Display | (raC-3_02-ME) raC_Dvc_46DFA-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_46DFA-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 46DFA | (raC-3_02-VD) raC_Dvc_I0Link.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|--|--|--|
| 46DFA | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_46DFA_410L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_46DFA_4IOL_(3.2) |
| | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_46DFA_8I0L_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_46DFA_8IOL_(3.2) |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_10- Link_raC_Dvc_46DFA_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_46DFA_5032_(3.2) |

Device Definition (raC_Dvc_46DFA_4IOL, raC_Dvc_46DFA_8IOL)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...

| General | IO-Link |
|--------------------|-------------------------------|
| Connection | |
| Module Info | □··· 1732E-8IOL12MR/A Common |
| Internet Protocol | 🚊 🖓 📀 Ch 0 - IO-Link |
| Port Configuration | 🗞 46DFA-L2 |
| Network | Change |
| Time Sync | Ch 2 - IO-Link Properties |
| | 🗞 Ch 3 - IO-Link |
| Configuration | Ch 4 - IO-Link Register IODD |
| IO Link | |

- 2. Specify the Application Specific Name e.g. Light 1001
- 3. Select the Process Data Input as *Triggered*, *Margin*, *Proximity*, *Gain*, *Signal*.

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storage |
|---------|---------|---------------|-----------------|------------------------------|----------------------|--|-----------------------------------|
|) | 10-Link | Allen-Bradley | 46DFA-L2LBT1-A2 | Light 1001 | Exact M 🗸 | Triggered,Margin,Proximity,Gain,Signal | Backup/Restor |
| | 10-Link | | | | | | |
| 2 | IO-Link | | | | | | |
| } | IO-Link | | | | | | |
| t I | 10-Link | | | | | | |
| ; | 10-Link | | | | | | |
| 5 | IO-Link | | | | | | |
| 7 | IO-Link | | | | | | |
| c i | | | | | | | |

Device Definition (raC_Dvc_46DFA_5032)

The device must be configured with the correct device definition. Proper

device configuration enables the required cyclic device data to pass

information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| OK Path: AB_E1H=1(10.112.131.147(BBCKplane(9* Energy Storage Offline . No Forces . No Edits | 、赤 ロ 、 A Redundancy 「」 | Favorites A | dd-On PlantPAx Safe | ty Alarms Bit | Module (| Definition | | | | |
|--|---------------------------|-----------------|--------------------------|--------------------|--|------------|--------------------|--|-----------------------|------|
| troller Organizer 🗸 🕈 | × 🚺 Module Properties: EN | 2TR (5032-8IOLM | 2M12LDR 2.011) × | | Series: | | | | | |
| 0 | General | General | | | Revision' | | 2 | 011 | | |
| Controller Master_IOLink_5032 | - Connection | | | | Revision. | Waltan | 2 | | | |
| Controller Tags | Channels | Type: | 5032-8IOLM12M12LDR 8 | IO-Link Channel, 8 | Electronic | . keying: | Compatible | Module | ~ | |
| Controller Fault Handler | 00 - IO-Link | Vendor: | Rockwell Automation/Alle | en-Bradley | Connectio | on: | Data | | $\mathbf{\mathbf{x}}$ | |
| rower-op nantiter | - 01 - Digital Output | Parent: | EN2TR | | | | | | | |
| A Ch MainTask | - 03 - Digital Input | Name: | Mod_Master5032 | | | | | 10 | | |
| b MainProgram | - 04 - IO-Link | Description: | | 120 | | | | | Channe | el |
| Unscheduled | | beschpton | | A. | | | IO-Link | | Mode Ty | pe |
| Motion Groups | 10 - IO-Link | | | v | Port | Channel | Class B Enabled | Channel Mode | | ę |
| Alarm Manager | - 12 - IO-Link | | | | | | Lindbird | | | -Lin |
| Assets | Internet Protocol | Module Definit | tion | | ــــــــــــــــــــــــــــــــــــــ | 0 | - 1 | 101-1 | | 0 |
| Add-On Instructions | Port Configuration | | | Change | 0 | 1 | | Digital Output: Short Circuit: No Load | | - |
| Data lypes | - Network | Series: | A | | | 2 | | IO-Link | ~ 1 1 | 1 |
| Interios Nodel | - Servers | Revision: | 2.011 | | 1 | 3 | | Digital Input | × 1 1 | |
| LOgical Model | | Electronic Key | ring: Compatible | Module | 2 | 4 | | IO-Link | ~ / / | 1 |
| 1756 Backplane 1756-A10 | | Electronic Rej | - | module | - | 6 | 1000 | Disabled IO-Link | | |
| 1130 backplane, 1130 A10 1111 1756-EN2TR EN2TR | | Connection: | Data | | 3 | 7 | | Disabled | ~ 1 | Ť |
| A & Ethernet | | | | | | 8 | | IO-Link | ~ 1 1 | 1 |
| 1 1756-EN2TR EN2TR | | | | | 4 | 9 | | Disabled | ~ 1 1 | |
| ▶ 1 5032-8IOI M12M12LDR/A Mod Master5032 | | | | | 5 | 10 | | IO-Link | ~ 1 1 | 1 |
| 9 1756-185E Master IOLink 5032 | | | | | | 11 | | Disabled | × | |
| A & Ethemet | | | | | 6 | 12 | | Disabled | | 1 |
| 1756-185E Master IOI ink 5032 | | | | | - | 14 | - | IO-Link | - J J | 7 |
| e 1750 cose master_rounk_2022 | | | | | 7 | 15 | | Disabled | | |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 46DFA, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 46DFA Sensor.
 - ▲ 🗐 I/O Configuration
 - 🛯 💷 1756 Backplane, 1756-A7
 - [0] 1756-L85E Master_5032_Test_Cases
 - 4 쁆 Ethernet
 - 1756-L85E Master_5032_Test_Cases
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_1
 - 5032-8IOLM12M12LDR/A Mod_Master_5032_2

🛾 🛇 IO-Link

- 0 42JT-P2LAT1-xx (4) Mod_42JT_Type3
- 2 45CRM-4LHT1-D4 (71) Mod_45CRM
- 4 45DMS-B8LAT1-D4 (228) Mod_45DMS_Type1
- 6 45DMS-B8LGT1-D5 (230) Mod_45DMS_Type2
- # 8 45PLA-P2LPT1-F4 (301) Mod_45PLA
- https://www.accience.com/accience/accie
- 🔪 12 46DFA-L2LBT1-xx (291) Mod_46DFA
- 14 836P-D1xxxA14PA-D4 (177) Mod_836P_Type1

3. Configure the parameters of sensor from configuration tab from AOP of the 46DFA sensor.

| Controller Organizer 👻 🕈 🗙 | 📙 MainProgram - MainRouti | ine 👖 Module Properties: Mod_Ma | ster_! | 5032_2:12 (46DFA-L2LBT1-xx (| 291) 1 | .1) × | |
|--|---------------------------|---|--------|------------------------------|--------|----------|-------------|
| ð • | General | Configuration | | | | | |
| Controller Master_5032_Test_Cases | Connection | 3 | | | | | |
| Tasks | - Device Info | News | DAM | Value | 11.44 | 0.4 | Description |
| Motion Groups | Parameters | Name | R/VV | Value | Units | Style | Description |
| 🕨 🛑 Alarm Manager | EventLog | Identification User Specific Information | | | | | |
| Assets | | Application-specific Tag | DW. | ** | | | |
| h Logical Model | | User Tag 1 | rw | | | | |
| ✓ ≤ I/O Configuration | | User Tag 2 | rw | | | | |
| ▲ 💷 1756 Backplane, 1756-A7 | | Parameter | | _ | | | |
| 0 10 1756-185E Master 5032 Test Cases | | Operating Configuration | | | | | |
| | | Triggered (Normal) | | | | | |
| Tat 1756-195E Master 5022 Test Cases | | Set Point - Threshold 1 | rw | ✓ 1000 | | Decim: ~ | J |
| ■ 1750-L05L Master_5052_Test_Cases | | Set Point - Threshold 2 | rw | ⊻ 300 | | Decim | |
| B 5052-6IOLIMI 2201/22DR/A Midd_Master_5052_1 B 5052-0IOLIMI 2201/22DR/A Midd_Master_5052_2 | | Polanty | rw | Not Inverted ~ | | | |
| 5032-8IOLM I2M I2LDK/A Mod_Master_5032_2 | | Function | rw | Hysteresis V | | Desim | |
| 1 🐼 IO-Link | | Pin 2 Tuno | TW DW | Disabled V | | Decima | |
| 0 42JT-P2LAT1-xx (4) Mod_42JT_Type3 | | A Sensor Configuration | TW | Disabled | | | |
| 2 45CRM-4LHT1-D4 (71) Mod_45CRM | | MarginLevel - Low Multipl | DW | 0.5 🗸 | | | |
| 4 45DMS-B8LAT1-D4 (228) Mod_45DMS_Type1 | | MarginLevel - High Multip | rw | 1.2 🗸 | | | |
| 6 45DMS-B8LGT1-D5 (230) Mod_45DMS_Type2 | | Response Time | rw | 500 uS 🗸 | | | |
| 8 45PLA-P2LPT1-F4 (301) Mod_45PLA | | Light Source | rw | Enabled 🗸 | | | |
| 10 46CLR-D5LAC1-D5 (294) Mod_46CLR | | Light Source Mode | rw | Auto 🗸 | | | |
| 🔪 12 46DFA-L2LBT1-xx (291) Mod_46DFA | | Light Source Adjustment | rw | Power Level 15 🗸 | | | |
| 14 836P-D1xxxA14PA-D4 (177) Mod_836P_Type1 | | | | | | | |
| 5032-8IOLM12M12LDR/A Mod_Master_5032_3 | | Insert Factory Defaults | | | | | |

Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| Enablein False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_46DFA_4IOL, raC_Dvc_46DFA_8I0L)

| InOut | Function / Description | DataType |
|----------------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_46DFA_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_I0LinkSensor_CtrICmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[20] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_46DFA_Inp_4IOL Or raC_UDT_ItfAD_46DFA_Inp_8IOL |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |

Input Data

| Input | Function/Description | DataType |
|----------------------------|---|----------|
| Cfg_DisplayIndication | Display Indication;0 – Standard Indication (Default),1 – Percentage Indication, 2 – Zero Offset Indication, 3 – Counter Mode Indication | SINT |
| Cfg_DisplayRotation | Display Rotation; 0 - Normal 1 - Rotate 180° | SINT |
| Cfg_Function | Function; 1 - Hysteresis, 2 - Window Mode | SINT |
| Cfg_LightSource | Light Source; 0 - Light Source ON (Default) 1 - Light Source OFF | SINT |
| Cfg_LightSourceAdj | Light Source Adjustment; 1 – 1250 µs Settings 1 – 5500 µs – 32 ms Settings | SINT |
| Cfg_LightSourceMode | Light Source Mode; 0 - Auto (Default) 1 - Manual | SINT |
| Cfg_MarginLevelHM | Margin Level – High Multiplier; 0 – 1.2 X (Default), 1 – 1.5 X, 2 – 2.0 X, 3 – 3.0 X, 4 – 4.0 X, 5 – 5.0 X | SINT |
| Cfg_MarginLevelLM | Margin Level – Low Multiplier; 0 – 0.5 X (Default), 1 – 0.6 X, 2 – 0.7 X, 3 – 0.8 X | SINT |
| Cfg_OutputPolarityInverted | Output Polarity; 0 - Not Inverted (Default) 1 - Inverted | SINT |
| Cfg_Pin2Type | Pin 2 type; 0 - Disabled, 1 - PNP, 2 - NPN | SINT |
| Cfg_ResponseTime | Response Time; Ο - 50 μS, 1 - 500 μs (Default), 2 - 4 mS, 3 - 32 ms | SINT |

| Input | Function/Description | DataType |
|---------------------------|--|----------|
| Cmd_Cancel | Teach Cancel - Cancels the Teach Process Command | BOOL |
| Cmd_CountReset | Count Reset | BOOL |
| Cmd_DynamicTeachStart | Dynamic Teach Start Command | BOOL |
| Cmd_DynamicTeachStop | Dynamic Teach Stop Command | BOOL |
| Cmd_LocalInterfaceLock | Device Access Locks. Local User Interface Lock; 1 = Locked | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_MaxSensitivityTeach | Teach the maximum sensitivity of the sensor Command | BOOL |
| Cmd_PBLock | Local Push Button Lock Command | BOOL |
| Cmd_PrecisionTeachStart | Teach the desired set point to ensure detection Command | BOOL |
| Cmd_StaticTeachBackground | Learn signal level while target is not present Command | BOOL |
| Cmd_StaticTeachTarget | Learn threshold while target is present Command | BOOL |
| Cmd_TeachStartButton | Start Teach command | BOOL |
| Cmd_WindowStartTeach | Teach SP1 when operating in Window Mode Command | BOOL |
| Cmd_WindowStopTeach | Teach SP2 when operating in Window Mode Command | BOOL |
| EnableIn | Enable Input - System Defined Parameter | BOOL |
| Inp_ChNumber | Configured Channel Number for Master | SINT |
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxMarginLowAlarm | Margin Low alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity alarm of Sensor | BOOL |
| Inp_ChxSignalStrength | Signal Strength of Sensor | INT |
| Inp_ChxTriggered | Triggered status of Sensor | BOOL |
| Set_Threshold1SP | Set Point - Threshold 1 | INT |
| Set_Threshold2SP | Set Point - Threshold 2 | INT |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_PBLock | Local Push Button Lock; 1= Locked | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Val_Count | Sensor Count Value | INT |
| Val_CounterEN | Counter Enable; O= Disabled, 1= Enabled | SINT |
| Val_Display_Ind | Display Indicatio; 0 - Standard Indication (Default) 1 - Percentage Indication | SINT |
| Val_Display_Rot | Display Rotation; 0 - Normal 1 - Rotate 180° | SINT |
| Val_Function | Function; 1-Hysteresis 2- Window Mode | SINT |
| Val_LightSource | Light Source; 0 - Light Source ON (Default) 1 - Light Source OFF | SINT |
| Val_LightSourceAdj | Light Source Adjustment; 1 – 1250 µs Settings 1 – 5500 µs – 32 ms Settings | SINT |
| Val_LightSourceMode | Light Source Mode; 0 - Auto (Default) 1 - Manual | SINT |
| Val_MarginLevelHigh | Margin Level – High Multiplier; 0 – 1.2 X (Default), 1 – 1.5 X, 2 – 2.0 X, 3 – 3.0 X, 4 – 4.0 X, 5 – 5.0 X | SINT |
| Val_MarginLevelLow | Margin Level – Low Multiplier; 0 – 0.5 X (Default), 1 – 0.6 X, 2 – 0.7 X, 3 – 0.8 X | SINT |
| Val_OperatingHours_Inception | Operation Hours - Since Inception | DINT |
| Val_OperatingHours_PowerUp | Operation Hours – Since Power-Up | DINT |
| Val_OutputPolarityInverted | Polarity; O – Not Inverted (Default) 1 – Inverted | SINT |
| Val_Pin2Type | Pin 2 type; 0 - Disabled, 1 - PNP, 2 - NPN | SINT |

| Output | Function/Descritpion | DataType |
|----------------------------|--|----------|
| Val_ResponseTime | Response Time; 0 - 50 µS, 1 - 500 µs (Default), 2 - 4 mS, 3 - 32 ms | SINT |
| Val_SpeedActual | Speed Actual – Since Power Up | DINT |
| Val_SpeedMax | Speed Maximum - Since Power Up | DINT |
| Val_Teach_Status | Teach-in Status | SINT |
| Val_TeachSelection | Teach type selection | SINT |
| Val_TeachStep | Teach Step Value | DINT |
| Val_TempActual | Actual Temperature – Since Power Up | SINT |
| Val_TempMax_SinceInception | Maximum Temperature Since Inception | SINT |
| Val_TempMax_SincePowerUp | Maximum Temperature Since Power Up | SINT |
| Val_TempMin_SinceInception | Minimum Temperature Since Inception | SINT |
| Val_TempMin_SincePowerUp | Minimum Temperature Since Power Up | SINT |
| Val_Threshold1 | Set Point - Threshold 1 | INT |
| Val_Threshold2 | Set Point - Threshold 2 | INT |
| Val_Trigger_Counter | Trigger count | DINT |
| Val_Voltage_MaxPowerUp | Voltage Maximum - Since Power Up | REAL |
| Val_Voltage_MinPowerUp | Voltage Minimum – Since Power Up | REAL |
| Val_VoltageActual | Voltage Actual | REAL |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |
Add-On Instruction I/O Data InOut Data (raC_Dvc_46DFA_5032)

| InOut | Function / Description | DataType |
|-----------------------|---|-------------------------------------|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_46DFA_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensor_CtrICmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSAGE |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[20] |
| Inp_I | Device Object Inputs | raC_UDT_IOLink_46DFA_Inp_5032 |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ltfAD_IOLinkSensor_Inf_5032 |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_46DFA_Cfg |

Input Data

| Input | Function/Description | DataType |
|----------------------------|---|----------|
| Cfg_DisplayIndication | Display Indication;0 – Standard Indication (Default),1 – Percentage Indication, 2 – Zero Offset Indication, 3 – Counter Mode Indication | SINT |
| Cfg_DisplayRotation | Display Rotation; 0 - Normal 1 - Rotate 180° | SINT |
| Cfg_Function | Function; 1 - Hysteresis, 2 - Window Mode | SINT |
| Cfg_LightSource | Light Source; 0 - Light Source ON (Default) 1 - Light Source OFF | SINT |
| Cfg_LightSourceAdj | Light Source Adjustment; 1 – 1250 µs Settings 1 – 5500 µs – 32 ms Settings | SINT |
| Cfg_LightSourceMode | Light Source Mode; 0 - Auto (Default) 1 - Manual | SINT |
| Cfg_MarginLevelHM | Margin Level – High Multiplier; 0 – 1.2 X (Default), 1 – 1.5 X, 2 – 2.0 X, 3 – 3.0 X, 4 – 4.0 X, 5 – 5.0 X | SINT |
| Cfg_MarginLevelLM | Margin Level – Low Multiplier; O – 0.5 X (Default), 1 – 0.6 X, 2 – 0.7 X, 3 – 0.8 X | SINT |
| Cfg_OutputPolarityInverted | Output Polarity; O - Not Inverted (Default) 1 - Inverted | SINT |

| Input | Function/Description | DataType |
|---------------------------|--|----------|
| Cfg_Pin2Type | Pin 2 type; 0 - Disabled, 1 - PNP, 2 - NPN | SINT |
| Cfg_ResponseTime | Response Time; Ο - 50 μS, 1 - 500 μs (Default), 2 - 4 mS, 3 - 32 ms | SINT |
| Cmd_Cancel | Teach Cancel - Cancels the Teach Process Command | BOOL |
| Cmd_CountReset | Count Reset | BOOL |
| Cmd_DynamicTeachStart | Dynamic Teach Start Command | BOOL |
| Cmd_DynamicTeachStop | Dynamic Teach Stop Command | BOOL |
| Cmd_LocalInterfaceLock | Device Access Locks. Local User Interface Lock; 1 = Locked | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Command | BOOL |
| Cmd_MaxSensitivityTeach | Teach the maximum sensitivity of the sensor Command | BOOL |
| Cmd_PBLock | Local Push Button Lock Command | BOOL |
| Cmd_PrecisionTeachStart | Teach the desired set point to ensure detection Command | BOOL |
| Cmd_StaticTeachBackground | Learn signal level while target is not present Command | BOOL |
| Cmd_StaticTeachTarget | Learn threshold while target is present Command | BOOL |
| Cmd_TeachStartButton | Start Teach command | BOOL |
| Cmd_WindowStartTeach | Teach SP1 when operating in Window Mode Command | BOOL |
| Cmd_WindowStopTeach | Teach SP2 when operating in Window Mode Command | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| EnableIn | Enable Input - System Defined Parameter | BOOL |
| Inp_ChNumber | Configured Channel Number for Master | SINT |
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxMarginLowAlarm | Margin Low alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity alarm of Sensor | BOOL |
| Inp_ChxSignalStrength | Signal Strength of Sensor | INT |
| Inp_ChxTriggered | Triggered status of Sensor | BOOL |
| Set_Setpoint | Setpoint | INT |
| Set_Threshold1SP | Set Point - Threshold 1 | INT |
| Set_Threshold2SP | Set Point - Threshold 2 | INT |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |

Output Data

| Output Function/Descritpion | | DataType |
|------------------------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_PBLock | Local Push Button Lock; 1= Locked | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_Count | Sensor Count Value | INT |
| Val_CounterEN | Counter Enable; 0= Disabled, 1= Enabled | SINT |
| Val_Display_Ind | Display Indicatio; O – Standard Indication (Default) 1 – Percentage Indication | SINT |
| Val_Display_Rot | Display Rotation; 0 - Normal 1 - Rotate 180° | SINT |
| Val_Function | Function; 1-Hysteresis 2 - Window Mode | SINT |
| Val_LightSource | Light Source; 0 - Light Source ON (Default) 1 - Light Source OFF | SINT |
| Val_LightSourceAdj | Light Source Adjustment; 1 – 1250 µs Settings 1 – 5500 µs – 32 ms Settings | SINT |
| Val_LightSourceMode | Light Source Mode; 0 - Auto (Default) 1 - Manual | SINT |
| Val_MarginLevelHigh | Margin Level – High Multiplier; 0 – 1.2 X (Default), 1 – 1.5 X, 2 – 2.0 X, 3 – 3.0 X, 4 – 4.0 X, 5 – 5.0 X | SINT |
| Val_MarginLevelLow | Margin Level – Low Multiplier; 0 – 0.5 X (Default), 1 – 0.6 X, 2 – 0.7 X, 3 – 0.8 X | SINT |
| Val_OperatingHours_Inception | Operation Hours – Since Inception | DINT |
| Val_OperatingHours_PowerUp | Operation Hours - Since Power-Up | DINT |
| Val_OutputPolarityInverted | Polarity; O – Not Inverted (Default) 1 – Inverted | SINT |
| Val_Pin2Type | Pin 2 type; 0 - Disabled, 1 - PNP, 2 - NPN | SINT |

| Output | Function/Descritpion | DataType |
|----------------------------|--|----------|
| Val_ResponseTime | Response Time; 0 - 50 µS, 1 - 500 µs (Default), 2 - 4 mS, 3 - 32 ms | SINT |
| Val_SpeedActual | Speed Actual – Since Power Up | DINT |
| Val_SpeedMax | Speed Maximum - Since Power Up | DINT |
| Val_Teach_Status | Teach-in Status | SINT |
| Val_TeachSelection | Teach type selection | SINT |
| Val_TeachStep | Teach Step Value | DINT |
| Val_TempActual | Actual Temperature – Since Power Up | SINT |
| Val_TempMax_SinceInception | Maximum Temperature Since Inception | SINT |
| Val_TempMax_SincePowerUp | Maximum Temperature Since Power Up | SINT |
| Val_TempMin_SinceInception | Minimum Temperature Since Inception | SINT |
| Val_TempMin_SincePowerUp | Minimum Temperature Since Power Up | SINT |
| Val_Threshold1 | Set Point - Threshold 1 | INT |
| Val_Threshold2 | Set Point - Threshold 2 | INT |
| Val_VoltageNoise | Voltage Noise Value Vpp | SINT |
| Val_Voltage_MaxPowerUp | Voltage Maximum - Since Power Up | REAL |
| Val_Voltage_MinPowerUp | Voltage Minimum – Since Power Up | REAL |
| Val_VoltageActual | Voltage Actual | REAL |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung.L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 46DFA device object connected to channel #0 of a POINT I/O1734-4IOLM IO-Link Master module in slot #13 of a POINT I/O adapter.



The following example uses the 46DFA device object connected to channel #0 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module.

| 46DFA Input | | |
|--------------------------------|---|-------------------|
| Interface | 46DFA 1001 | |
| COP | raC_Dvc_46DFA_8IOL |] |
| Source _ModuleName:I.Fault | raC_Dvc_46DFA_8IOLInstanceName | |
| Dest _InstanceName_Inp_I.Fault | Ref_Module _ModuleName | -(Sts_Connected)- |
| Length 32 | Ref_MsgCustSetIdxInstanceName_SetIndex | |
| | Ref_MsgCustGetIdx _InstanceName_GetIndex | -(Sts_Available) |
| | Ref_MsgCustSetSubldx _InstanceName_SetSubIndex | |
| | Ref_MsgCustGetSubldxInstanceName_GetSubIndex | -(Sts_Warning) |
| | Ref_MsgData _InstanceName_Msg_Sensor_Data | |
| | Ref_Ctrl_SetInstanceName_CtrlSet | -(Sts_Faulted) |
| | Ref_Ctrl_Cmd _InstanceName_CtrlCmd | |
| | Ref_Ctrl_StsInstanceName_CtrlSts | -(Sts_Ready) |
| | Inf_Lookup raC_Dvc_46DFA_InfTable | |
| | Inp_IInstanceName_Inp_I | |
| | Inp_ChxTriggered _ModuleName:I.Ch0Triggered | |
| | 1 🖛 | |
| | Inp_ChxMarginLowAlarm _ModuleName:I.Ch0MarginLowAlarm | |
| | 0 🖛 | |
| | Inp_ChxProximityAlarm _ModuleName:I.Ch0ProximityAlarm | |
| | 0 🖛 | |
| | Inp_ChxGain _ModuleName:I.Ch0Gain | |
| | 1 🖛 | |
| | Inp_ChxSignalStrength _ModuleName:I.Ch0SignalStrength | |
| | 0 🖛 | |
| | Inp_ChNumber 0 | |
| | | |
| | Ref_Ctrl_InfModuleName_CtrlInf | |
| | Ref_Ctrl_ltfModuleName_Ctrlltf | |



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|--------------------------|--------------------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_LRIndSensor | SS C Not Triggered | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName }) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration | |
|---------------------------|--------------------------|--|---|--|
| AOG_46DFA _Launch | SS S Not Triggered | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Properties Animations Events General AOL_Tag PAC_VD MainProgram.Sensor_46DFA | |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the *.@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Name | -8 | Usage | Description | |
|-----------------------|----|--------|------------------|-------------|
| ▶ _InstanceName | | Local | 46DFA 1001 | |
| _InstanceName_CtrlCmd | | Public | 46DFA Comman | d Interface |
| _InstanceName_CtrlSet | | Public | 46DFA Setting In | terface |
| InstanceName_CtrlSts | | Public | 46DFA Status Int | erface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Threshold Sparkline Trend The spark line shows Signal Strength, threshold 1 and threshold 2 values over last 30 seconds |
| 5 | Margin low alarm status OFF (0) = Gray LED ON (1) = Blue LED |
| 6 | Proximity alarm status OFF (0) = Gray LED ON (1) = Blue LED |
| 7 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 8 | - Function: Displays the operation mode of the sensor output and the available options are "Hysteresis" or "Window". |
| | Process Data |
| | - Signal Strength (%): Signal Strength provides the raw measurement value of the amount of light reflected from the target. |
| 9 | - Gain: Displays the excess gain above the sensor threshold to ensure reliable detection of the target. |
| | - When the Counter Value is enabled, the parameter reflects the sensor count amount. If the counter functionality is disabled, then "Disabled" text is seen. |
| | |
| | Note: In Case of, 5032 Master, changes made to the Application Specific Name |



Note: In Case of, 5032 Master, changes made to the Application Specific Name or Locate Toggle Switch require pressing the 'Config Apply' button in the Config tab to update the sensor parameters.

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description |
|------|--|
| 1 | Internal Temperature Bar Graph |
| 2 | Internal Temperature Current Value |
| 3 | Voltage Bar Graph |
| 4 | Voltage Current Value |
| 5 | Speed Bar Graph |
| 6 | Speed Current Value |
| 7 | Operating Hours Since Power Up |
| 8 | Operating Hours Since Inception (lifetime) |

Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action

decisions. One trend is displayed for Signal Strength, Threshold 1 and Threshold 2.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Threshold Setpoints & Signal strength.

| 46DFA 1 | 001 | X |
|------------------------|------------------------|---|
| $\widehat{\mathbf{w}}$ | Ready | |
| \mathfrak{O} | Trend and Spark Limits | × |
| ~ | Minimum 2000 | |
| 1 | Maximum 4000 | |
| | | |
| | | |
| | | |

Configure Tab

The configuration tab displays the sensor parameter settings, as well as enabling the user to read data from the sensor.

The configuration section is divided into :

• Operating Configuration

- Local device access Locks
- Reset Count
- Teach Settings
- Sensor Configuration (Page 2)
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| Ready | | | | |
|---------------------------|--------|------------|--------------|-----|
| Operating Configuration | | | | |
| Set Point - Threshold 1 | 200.00 | Pin 2 Type | Disabled | 1 |
| Set Point - Threshold 2 | 50.00 | Function | Window | 1 |
| | | Polarity | Not Inverted | 1 |
| Local Device Access Locks | | | | |
| Push Button Lock | | | | |
| User Interface Lock 🔿 🗩 | | Config | I Apply | |
| | 1 | 2) Re | eset Te | ach |

Operating Configuration

Setpoint Threshold 1 - Allows operators to enter the signal value required for the sensor output to turn ON (threshold) upon target detection. That means that the sensor signal level must be higher than the threshold for the output to turn ON.

Setpoint Threshold 2 - This parameter is updated when the window teach procedures are executed. The default value for this parameter is 300.

Pin 2 Type- Changes the output type on pin 2. The sensor default when connected using the AOP is disabled and the output can be changed to operate as PNP only or NPN only.

Function - Allows operator to change the operation mode of the sensor output to 'Hysteresis' or 'Window'. Hysteresis mode turns the sensor output ON after the received signal level is higher than the Threshold 1 parameter, while Window mode turns the output ON while the received signal level is between Threshold 1 and Threshold 2.

Polarity - This parameter allows the user to change the sensor output to operate as non-inverted or inverted.

Local Device access Locks

Push Button Lock- This parameter allows operators to Lock the local push button on the sensor. The push button can be unlocked locally following the unlock procedure.

User Interface Lock- This parameter locks the local user interface and implements an IO-Link controlled lock. This means that the operator cannot unlock the sensor locally even if the unlock procedure is implemented using the push button.

Reset Count

This button allows user to reset the count value already stored in sensor.

Teach Settings

This button navigates to teach settings screen. The available teach methods are:

Static Teach- Press the 'Teach Start' button to initiate the Teach Process.

Place the target in front of the sensor and between the reflectors. Send the 'Teach Target' Command, then remove the target blocking the reflector.

The Teach in status will update to 'wait for command'.

Show the reflector where the target is present and then send 'Teach Background' Command.

The 'Static teach' process is complete and 'Teach in status' will be displayed as 'Idle'.

Dynamic Teach- Press the 'Teach Start' button to begin the Teach Process.

While the object is moving in front of the field of view of the sensor, send 'Dynamic Start' command.

The Teach in status will be displayed as 'Wait for Command' for few seconds.

Send the 'Dynamic Stop' command.

The dynamic teach process is completed.

Precision Teach- Place the target in front of the field of view of the sensor and then send 'Precision Start' command.

The 'Teach in status' will be displayed as 'Teach SP1 success' for few seconds.

The 'Precision teach' process is complete.

Max Sensitivity- Place the target in front of the field of view of the sensor and then send 'Max Sensitivity' command.

The 'Teach in status' will be displayed as 'Busy' for few seconds.The 'Maximum sensitivity' teach process is now complete.

Window Teach- Place the target in front of the field of view of the sensor and send 'Window Start' command. The 'Teach in status' will be displayed as 'Wait for Command' for few seconds.

Keep the target from the field of view of the sensor and send 'Window Stop' command.The 'Window Teach' teach process is now complete.

Sensor Configuration



Margin Level Low Multiplier- Allows you to define when the green LED should start flashing to reflect a signal level that is below the threshold. The default value for this parameter is 0.8 with multiple selection options from 0.5...0.8 in increments of 01X.

Margin Level High Multiplier- Allows you to define when the green LED can stop flashing to reflect a signal level that is higher than the threshold. The default value for this parameter is 1.5 with multiple selections that could reach a maximum of 5X.

Display Rotation- Changes the orientation of the LED display. The default setting is standard orientation.

Display Indication- Changes how the received light information is displayed in the sensor LED and received signal strength process data parameter.

Response Time- Changes the sensor response time to increase or decrease the amount of light received by the sensor. The default response time is 500 µs.

Light Source Adjustment- Changes the LED intensity. When operating in 50 μ s Response Time, the maximum intensity that can be set is 12. Operation on response times higher than 50 μ s, can be set up to 15.

Light Source Mode-Enables automatic or manual operation of the sensor LED intensity. The default parameter is Auto.

Light Source- Enables or disables the light source of the sensor. The default value is ON.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.

| Sensor Configuration | | | |
|------------------------------|-----------|-------------------------|---------|
| Margin Level Low Multiplier | 0.6 | Response Time | 500 uS |
| Margin Level High Multiplier | 1.2 | Light Source Adjustment | PL 15 |
| Display Rotation | Default 🛛 | Light Source Mode | Auto |
| Display Indication | Percent | Light Source | Enabled |
| | | | |

If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| Ready | | | |
|------------------------------|------------|-------------------------|---------|
| Sensor Configuration | | | |
| Margin Level Low Multiplier | 0.5 | Response Time | 500 uS |
| Margin Level High Multiplier | 1.2 | Light Source Adjustment | PL 15 |
| Display Rotation | Default 🛛 | Light Source Mode | Auto |
| Display Indication | Standard 🔻 | Light Source | Enabled |
| | | Config Apply | |
| | / 1 | | |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.

| | | Severity | Time | Description |
|----------|---|-----------------|------------------------|------------------------|
| | 2 | Active Fault | 1998-01-06 18:06:00 | Sensor Data Invalid |
| , | ļ | Fault | 1998-01-01 00:41:19 | Sensor Hardware Fault |
| | | Fault | 1998-01-01 00:40:32 | Sensor Data Invalid |
| | | Fault | 1998-01-01 00:40:16 | Sensor is disconnected |

| ltem | Description |
|------|---|
| 1 | Banner |
| 2 | Last fault is in first row and show in bold if active |
| 3 | Yellow border visible when a fault is active |
| 4 | Fault severity |
| 5 | Fault event time |
| 6 | 4 most recent fault/warning event messages |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.

| 46DFA 100 | 1 | X |
|------------------------|---|----------|
| $\widehat{\mathbf{w}}$ | Not Ready Data Invalid | |
| | Details | × |
| | 1998-01-06 18:06:00 | |
| <i>S</i> ! | Description / Action Check CIP messaging error | |
| | | • |

Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_46DFA_4I0L, raC_Dvc_46DFA_8I0L, raC_Dvc_46DFA_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_46DFA_4IOL, raC_LD_Dvc_46DFA_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Sensor Type | | | | Select sensor type of 46DFA as per device catalog no. |
| MasterName | MasterName | [MasterName] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_46DFA_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-----------------|---------------------|------------------|-------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 46DFA), This name depends upon the TagName assigned to object. |

| SensorType | 46DFA-L2LBT1-xx | 46DFA-L2LBT1-xx | 46DFA-L2LBT1-xx | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |
|-------------------|-----------------|-----------------|-------------------|--|
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| Navigation Button | GraphicalButton | | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|--------------------|--------------------|----------|-----------------|----------|
| raC_Dvc_46DFA_4I0L | raC_Dvc_46DFA_4IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_46DFA_8I0L | raC_Dvc_46DFA_8IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_46DFA_5032 | raC_Dvc_46DFA_5032 | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|--|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME) Graphic Symbols - Io-link Device.ggf> | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE)Graphic Symbols - Io-link Device.ggf> | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_46DFA | Faceplate ME | (raC-3_xx-ME) raC_Dvc_46DFA-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_46DFA | Faceplate SE | (raC-3_xx-SE) raC_Dvc_46DFA-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_IO_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |

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| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |
|-------------------|---------------|---------------------------------------|--|
| , | | , , , , , , , | - , , , , , , , , , , , , , , , , , , , |

45PLA - Polarized Light Array Photoelectric Sensor (raC_Dvc_45PLA_4I0L, raC_Dvc_45PLA_8I0L, raC_Dvc_45PLA_5032)

Overview

The 45PLA Polarized Light Array Photoelectric Sensor device object (raC_Dvc_45PLA_4IOL, raC_Dvc_45PLA_8IOL, raC_Dvc_45PLA_5032) includes HMI faceplates which displays device information including:

- Sensor data
- Sensor diagnostics
- Sensor configuration and parameters
- Process data trending
- Device Fault log

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_45PLA_Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.
- **Health:** View device health such as run-hours and temperature.
- **Sensor Configuration:** Configure general sensor parameters including local LED and lock settings, process data enable/disable, and adjustment method & sensor application.
- Teach: Offers the different teach functions.

Functional Description

The 45PLA Polarized Light Array Photoelectric Sensor pre-configured Device Objects:

- Collect, Process and Deliver Data between Smart Devices and Application Logic
- Provide Device Status & Diagnostics Faceplates for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplates. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the /*Studio 5000 Logix Designer Files - L5X*/ folder in the library. Each device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with each IO-Link Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Compatible IO-Link Sensor | Add-On Instruction | Rung Import |
|-------------|--|---------------------------|---------------------------------|----------------------------------|
| | POINT I/O 1734-410L | 45PLA-P2LPT1-F4 | raC_Dvc_45PLA_410L_3.02_A01.L5X | raC_Dvc_45PLA_4I0L_3.02_RUNG.L5X |
| | ArmorBlock 1732E-8I0LM12R | 45PLA-P2LPT1-F4 | raC_Dvc_45PLA_8I0L_3.02_A0I.L5X | raC_Dvc_45PLA_8IOL_3.02_RUNG.L5X |
| 45PLA | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | 45PLA-P2LPT1-F4 | raC_Dvc_45PLA_5032_3.02_A01.L5X | raC_Dvc_45PLA_5032_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder

Note that a single faceplate is used for either the 4IOL, 8IOL & 5032 versions of the Add-On Instruction.

| Device/Item | Туре | FactoryTalk® View ME Faceplate | FactoryTalk® View SE |
|-----------------|---------------|--|--|
| 45PLA | Display | (raC-3_02-ME) raC_Dvc_45PLA-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_45PLA-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |

| | 1 | | |
|---------|---------------|--|--|
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|-------------|-------------------------------------|
| 45PLA | (raC-3_02-VD) raC_Dvc_IOLink.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / *ApplicationCodeManagerLibraries*/ folder of the library. The files included are as follows:

| Implementation Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|--------------------------|--|--|--|
| | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_45PLA_4IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_45PLA_4IOL_(3.2) |
| 45PLA | ArmorBlock 1732E-8IOLM12R | (RA-LIB)_Device_Asset-Control_IO- Link_raC_Dvc_45PLA_8IOL_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_45PLA_8IOL_(3.2) |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | (RA-LIB)_Device_Asset- Control_IOLink_raC_Dvc_45PLA_5032_(3.2) | (RA-LIB)_Device_Device_IO-Link_raC_LD_Dvc_45PLA_5032_(3.2) |

Device Definition (raC_Dvc_45PLA_4I0L, raC_Dvc_45PLA_8I0L)

The device must be configured with the correct device definition. Proper device configuration enables the required cyclic device data to pass information from the device into the add-on instruction.

1. Click on Change...



- 2. Specify the Application Specific Name e.g. Sensor_1001
- 3. Select the Process Data Input as Triggered, Margin, Proximity, Gain, Signal.

| Channel | Mode | Vendor | Device | Application Specific Name | Electronic Keying | Process Data Input | Data Storage | |
|---------|---------|---------------|-----------------|------------------------------|----------------------|--|--------------|--|
| 0 | 10-Link | | | | | | | |
| 1 | 10-Link | | | | | | | |
| 2 | 10-Link | Allen-Bradley | 45PLA-P2LPT1-F4 | Sensor_1001 | Exact M 🗸 | Triggered, Margin, Proximity, Gain, Signal | Enable ADC | |
| 3 | 10-Link | | | | | | | |
| c | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Device Definition (raC_Dvc_45PLA_5032)

The device must be configured with the correct device definition. Proper

device configuration enables the required cyclic device data to pass

information from the device into the add-on instruction.

 Go to Properties of 5032-8IOLM12M12LDR/A Master Module >> General >> Click on Change... and Configure the required channels as a IO-Link configuration. (Only even nos. of channel can be configured as a IO-Link)

| Energy Storage No Forces No Edits | Redundancy IV | Favorites A | Id-On PlantPAx Safe | atv Alarms Bit | Module [| Definition | | | | |
|-------------------------------------|--------------------------------------|------------------|-------------------------|--------------------|------------|------------|------------|--|---|-----|
| troller Organizer | Module Properties: EN2 | 2TR (5032-8IOLM1 | 2M12LDR 2.011) × | Ay Fulling Dit | Carlos | | 1 | | | |
| 0= | General | General | | | Series: | | A | 011 | | |
| Controller Master_IOLink_5032 | - Connection | | | | Revision: | 2.5 | 2 | | | |
| Controller Tags | Module Info | Type: | 5032-8IOLM12M12LDR 8 | IO-Link Channel, 8 | Electronic | : Keying: | Compatible | Module | ~ | |
| Controller Fault Handler | - 00 - IO-Link | Vendor: | Rockwell Automation/All | en-Bradley | Connectio | n: | Data | | \sim | |
| Power-Up Handler | 01 - Digital Output | Parent: | EN2TR | | | | | | | |
| I lasks | - 02 - 10-Link 03 - Digital Input | Name: | Mod Master5032 | | | | | | | |
| ▶ 5 MainProgram | - 04 - IO-Link | Description | | | | | | | Chan | nel |
| Unscheduled | 06 - IO-Link | Description: | | | | | IO-Link | | Mode T | ype |
| Motion Groups | | | | - | Port | Channel | Class B | Channel Mode | | e |
| Alarm Manager | 12 - IO-Link | | <u>.</u> | | | | Enabled | | ā 8 | E |
| Assets | 14 - IO-Link | Module Definit | ion | <u> </u> | 1 | | | | | 10. |
| Add-On Instructions | Internet Protocol | | | Change | 0 | 0 | | IO-Link | ~ / / | 1 |
| 🖻 🛑 Data Types | - Network | Series: | А | | - | 1 | | Digital Output, Short Circuit, No Load | <u> </u> | . |
| Trends | - Time Sync | Posicion: | 2.011 | | 1 | 3 | | Digital Input | · · · · | - |
| ⊾ Logical Model | - Servers | Revision. | 2.011 | | | 4 | 0 | IO-Link | ~ / / | 1 |
| I/O Configuration | | Electronic Key | ing: Compatible | e Module | 2 | 5 | | Disabled | ~ v | |
| 1756 Backplane, 1756-A10 | | Connection: | Data | | 3 | 6 | | IO-Link | ~ / / | 1 |
| I] [1] 1756-EN2TR EN2TR | | | | | | 1 | | Uisabled | × 1 | - |
| ▲ 黇 Ethernet | | | | | 4 | 9 | | Disabled | | 1 |
| 1 1756-EN2TR EN2TR | | | | | | 10 | | IO-Link | ~ | 1 |
| 5032-8IOLM12M12LDR/A Mod_Master5032 | | | | | 5 | 11 | | Disabled | ~ / / | |
| @ [9] 1756-L85E Master_IOLink_5032 | | | | | 6 | 12 | | IO-Link | ~ 」 」 | 1 |
| 4 蔬 Ethernet | | | | | _ | 13 | | Disabled | ✓ ✓ | |
| I 1756-185E Master IOI ink 5032 | | | | | 7 | 14 | | IO-Link | × 1 1 | 1 |

Note: If Sensor is Class B, Then, User should select the IODD for Class B and Tick on "IO-Link Class B Enabled Check box, Shown in above image (Applicable for Channel No. 2,3,6 & 7).

- 2. Whichever channels are selected for 45PLA, you can find them, in IO-Link of 5032 Master. Expand the IO-Link tree and select the 45PLA Sensor.
 - I/O Configuration 4 🕮 1756 Backplane, 1756-A7 [9 [0] 1756-L85E Master 5032 Test Cases ▲ 윪 Ethernet ITTEL INTERNATION INTERNATIA INTERNATIA INTERNATIA INTERNATIA INTERNATIA IN 5032-8IOLM12M12LDR/A Mod_Master_5032_1 5032-8IOLM12M12LDR/A Mod_Master_5032_2 A OIO-Link 0 42JT-P2LAT1-xx (4) Mod_42JT_Type3 2 45CRM-4LHT1-D4 (71) Mod_45CRM 4 45DMS-B8LAT1-D4 (228) Mod_45DMS_Type1 6 45DMS-B8LGT1-D5 (230) Mod 45DMS_Type2 8 45PLA-P2LPT1-F4 (301) Mod_45PLA 10 46CLR-D5LAC1-D5 (294) Mod_46CLR 🔪 12 46DFA-L2LBT1-xx (291) Mod_46DFA 14 836P-D1xxxA14PA-D4 (177) Mod_836P_Type1

3. Configure the parameters of sensor from configuration tab from AOP of the 45PLA sensor.



Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| EnableIn False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_45PLA_4I0L, raC_Dvc_45PLA_8I0L)

| InOut | Function / Description | DataType |
|----------------------|---|---|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgCustSetSubIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetSubIdx | Message Configuration Read | MESSAGE |
| Ref_MsgData | Messaging Data | raC_UDT_45PLA_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | 10-Link Device Command Interface | raC_UDT_ItfAD_I0LinkSensor_CtrlCmd |
| Ref_Ctrl_Sts | 10-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_Ctrl_Inf | IO-Link Device Type Information Interface | raC_UDT_ItfAD_IOLinkSensor_Inf |
| Ref_Ctrl_Itf | 10-LinkDeviceCommand,StatusInterface | raC_UDT_ItfAD_IOLinkDevices |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[20] |
| Inp_I | Device Object Inputs | raC_UDT_ltfAD_45PLA_Inp_4IOL Or raC_UDT_ltfAD_45PLA_Inp_8IOL |

Input Data

| Input | Function/Description | DataType |
|--------------------------------|---|----------|
| Cfg_BeamMode | Beam Mode; 0 - Object Detection - Six Beams, 1 - Object Detection - Five Beams, 2 - Object Detection - Four Beams, 3 - Object Detection - Three Beams, 4 - Object Detection - Two Beams, 5 - Object Detection - One Beam, 8 - Gap Detection - Six Beams, 9 - Gap Detection - Five Beams, 10 - Gap Detection - Four Beams, 11 - Gap Detection - Three Beams, 12 - Gap Detection - Two Beams, 13 - Gap Detection - One Beam | DINT |
| Cfg_MarginLevelHighlMultiplier | Margin Level-High Multiplier; 10 - 1.0, 11 - 1.1, 12 - 1.2, 15 - 1.5, 20 - 2.0, 50 - 5.0, 100 - 10.0, 150 - 15.0 | DINT |
| Cfg_MarginLevelLowMultiplier | Margin Level-Low Multiplier; 0 - 0.8, 1 - 0.7, 2 - 0.6, 3 - 0.5 | SINT |
| Cfg_Mode | Mode; 0 - PNP, 1 - NPN | SINT |
| Cfg_OperatingFrequency | Operating Frequency; 0 - 1 (800 uS), 1 - 2 (860 uS) | SINT |
| Cfg_Pin2Mode | Pin 2 Mode; O - Disable, 1 - PNP-Not Inverted, 2 - PNP-Inverted, 3 - NPN-Not Inverted, 4 - NPN-Inverted, 5 - Remote Teach Input, 6 - Independent Control PNP, 7 - Independent Control NPN | DINT |
| Cfg_Polarity | Polarity; 0 - Not Inverted, 1 - Inverted | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_ResetCount | Counter Reset Command | BOOL |
| Cmd_TeachApply | Teach Apply Command | BOOL |

| Input | Function/Description | DataType |
|-------------------------------------|--|----------|
| Cmd_TeachPrecisionShowReflector | Teach Precision Show Reflector Command | BOOL |
| Cmd_TeachStandardShowReflector | Teach Standard Show Reflector Command | BOOL |
| Cmd_TeachStart | Teach Start Command | BOOL |
| Cmd_TeachStaticShowReflector | Teach Static Show Reflector Command | BOOL |
| Cmd_TeachStaticShowTarget | Teach Static Show Target Command | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity Alarm of Senor | BOOL |
| Inp_ChxSignalStrength | Indicates the reflectivity level of the reflector | DINT |
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |
| Set_Beam1Emitter1LEDIntensity | Set the LED Intensity for Beam One for Emitter1 | DINT |
| Set_Beam1Receiver1ThresholdEmitter1 | Set the Threshold for Beam One Receiver1 for Emitter1 | DINT |
| Set_Beam2Emitter2LEDIntensity | Set the LED Intensity for Beam Two and Three for Emitter2 | DINT |
| Set_Beam2Receiver1ThresholdEmitter2 | Set the Threshold for Beam Two Receiver1 for Emitter2 | DINT |
| Set_Beam3Receiver2ThresholdEmitter2 | Set the Threshold for Beam Three Receiver2 for Emitter2 | DINT |
| Set_Beam4Emitter3LEDIntensity | Set the LED Intensity for Beam Four and Five for Emitter3 | DINT |
| Set_Beam4Receiver2ThresholdEmitter3 | Set the Threshold for Beam Four Receiver2 for Emitter3 | DINT |
| Set_Beam5Receiver3ThresholdEmitter3 | Set the Threshold for Beam Five Receiver3 for Emitter3 | DINT |
| Set_Beam6Emitter4LEDIntensity | Set the LED Intensity for Beam Six for Emitter4 | DINT |
| Set_Beam6Receiver3ThresholdEmitter4 | Set the Threshold for Beam Six Receiver3 for Emitter4 | DINT |
| Set_MarginBooster | Set the multiplier factor that applies to the LEDs current value | DINT |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|-------------------------------------|--|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_CounterEnabled | Counter Enabled Indication; O= Disable, 1= Enable | BOOL |
| Sts_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; O=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Val_Beam1Emitter1LEDIntensity | Displays the LED intensity for Emitter1 for Beam One | DINT |
| Val_Beam1Receiver1ThresholdEmitter1 | Display the Threshold for Beam One Receiver1 for Emitter1 | |
| Val_Beam2Emitter2LEDIntensity | Display the LED Intensity for Beam Two and Three for Emitter2 | DINT |
| Val_Beam2Receiver1ThresholdEmitter2 | Display the Threshold for Beam Two Receiver1 for Emitter2 | |
| Val_Beam3Receiver2ThresholdEmitter2 | Display the Threshold for Beam Three Receiver2 for Emitter2 | DINT |
| Val_Beam4Emitter3LEDIntensity | Display the LED Intensity for Beam Four and Five for Emitter3 | DINT |
| Val_Beam4Receiver2ThresholdEmitter3 | Display the Threshold for Beam Four Receiver2 for Emitter3 | DINT |
| Val_Beam5Receiver3ThresholdEmitter3 | Display the Threshold for Beam Five Receiver3 for Emitter3 | DINT |
| Val_Beam6Emitter4LEDIntensity | Display the LED Intensity for Beam Six for Emitter4 | DINT |
| Val_Beam6Receiver3ThresholdEmitter4 | Display the Threshold for Beam Six Receiver3 for Emitter4 | DINT |
| Val_BeamMode | Beam Mode Status; 0 - Object Detection - Six Beams, 1 - Object Detection - Five Beams, 2 - Object Detection - Four Beams, 3 - Object Detection - Three Beams, 4 - Object Detection - Two Beams, 5 - Object Detection - One Beam, 8 - Gap Detection - Six Beams, 9 - Gap Detection - Five Beams, 10 - Gap Detection - Four Beams, 11 - Gap Detection - Three Beams, 12 - Gap Detection - Two Beams, 13 - Gap Detection - One Beam | |
| Val_Counter | Display Counter Value | DINT |
| Val_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | SINT |
| Val_MarginBooster | Display the multiplier factor that applies to the LEDs current value | DINT |
| Val_MarginLevelHighMultiplier | Margin Level-High Multiplier Status; 10 - 1.0, 11 - 1.1, 12 - 1.2, 15 - 1.5, 20 - 2.0, 50 - 5.0, 100 - 10.0, 150 - 15.0 | INT |

| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Val_MarginLevelLowMultiplier | Margin Level-Low Multiplier Status; 0 - 0.8, 1 - 0.7, 2 - 0.6, 3 - 0.5 | INT |
| Val_Mode | Mode Status; O - PNP, 1 - NPN | INT |
| Val_OperatingFrequency | Operating Frequency Satus; 0 - 1 (800 uS), 1 - 2 (860 uS) | INT |
| Val_OperatingHrsSinceInception | Displays the number of hours that the sensor has been continuously in operation | DINT |
| Val_OperatingHrsSincePowerUp | Displays the number of targets that have been detected since the sensor has been in operation | DINT |
| Val_Pin2Mode | Pin 2 Mode Status; O - Disable, 1 - PNP-Not Inverted, 2 - PNP- Inverted, 3 - NPN-Not Inverted, 4 - NPN-Inverted, 5 - Remote Teach Input, 6 - Independent Control PNP, 7 - Independent Control | DINT |
| Val_Polarity | Displays the polarity of channel; 0 = Not Inverted, 1=Inverted | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Speed | Display the the actual frequency of detection in Hertz | DINT |
| Val_TeachStep | Teach Step | INT |
| Val_Temperature | Displays the internal temperature information available in the sensor | |
| Val_TemperatureMaxSinceInception | Reflects the maximum temperature inside of the microprocessor die of the sensor since inception | SINT |
| Val_TemperatureMaxSincePowerUp | Reflects the maximum temperature inside of the microprocessor die of the sensor since the last power up | |
| Val_TemperatureMinSinceInception | Reflects the minimum temperature inside of the microprocessor die of the sensor since inception | |
| Val_TemperatureMinSincePowerUp | Reflects the minimum temperature inside of the microprocessor die of the sensor since the last power up | |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Add-On Instruction I/O Data InOut Data (raC_Dvc_45PLA_5032)

| InOut | Function / Description | DataType |
|-----------------------|--|------------------------------------|
| Ref_Module | Reference to module in I/O tree | MODULE |
| Ref_MsgCustSetIdx | Message Configuration Write | MESSAGE |
| Ref_MsgCustGetIdx | Message Configuration Read | MESSAGE |
| Ref_MsgModReconfigure | Message Module Reconfigure | MESSEAG |
| Ref_MsgData | Messaging Data | raC_UDT_45PLA_Sensor_Data |
| Ref_Ctrl_Set | IO-Link Device Setting Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSet |
| Ref_Ctrl_Cmd | IO-Link Device Command Interface | raC_UDT_ItfAD_IOLinkSensor_CtrICmd |
| Ref_Ctrl_Sts | IO-Link Device Status Interface | raC_UDT_ItfAD_IOLinkSensor_CtrlSts |
| Ref_Ctrl_Inf | 10-Link Device Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf |
| Ref_Ctrl_Itf | IO-Link Device Command, Status | raC_UDT_ItfAD_IOLinkDevices |
| Inf_Lookup | Code / Description List Entry | raC_UDT_LookupMember_STR0082[20] |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_45PLA_Inp_5032 |
| Cfg_C | Device Object Configuration | raC_UDT_IOLink_45PLA_Cfg |

Input Data

| Input | Function/Description | DataType |
|--------------------------------|---|----------|
| Cfg_BeamMode | Beam Mode; 0 - Object Detection - Six Beams, 1 - Object Detection - Five Beams, 2 - Object Detection - Four Beams, 3 - Object Detection - Three Beams, 4 - Object Detection - Two Beams, 5 - Object Detection - One Beam, 8 - Gap Detection - Six Beams, 9 - Gap Detection - Five Beams, 10 - Gap Detection - Four Beams, 11 - Gap Detection - Three Beams, 12 - Gap Detection - Two Beams, 13 - Gap Detection - One Beam | DINT |
| Cfg_MarginLevelHighlMultiplier | Margin Level-High Multiplier; 10 - 1.0, 11 - 1.1, 12 - 1.2, 15 - 1.5, 20 - 2.0, 50 - 5.0, 100 - 10.0, 150 - 15.0 | DINT |
| Cfg_MarginLevelLowMultiplier | Margin Level-Low Multiplier; 0 - 0.8, 1 - 0.7, 2 - 0.6, 3 - 0.5 | SINT |
| Cfg_Mode | Mode; 0 - PNP, 1 - NPN | SINT |
| Cfg_OperatingFrequency | Operating Frequency; 0 - 1(800 uS), 1 - 2 (860 uS) | SINT |
| Cfg_Pin2Mode | Pin 2 Mode; 0 - Disable, 1 - PNP-Not Inverted, 2 - PNP- Inverted, 3 - NPN-Not Inverted, 4 - NPN-Inverted, 5 - Remote Teach Input, 6 - Independent Control PNP, 7 - Independent Control NPN | DINT |
| Cfg_Polarity | Polarity; 0 - Not Inverted, 1 - Inverted | SINT |
| Cmd_DisableLEDs | Indicator Disabled Command | BOOL |
| Cmd_EnableLEDs | Indicator Enabled Command | BOOL |
| Cmd_LocalTeachLock | Parameters Unlock/Lock Cmd | BOOL |
| Cmd_Locate | Locator Disable/Enable Command | BOOL |
| Cmd_ResetCount | Counter Reset Command | BOOL |

| Input | Function/Description | DataType |
|---|--|----------|
| Cmd_TeachApply | Teach Apply Command | BOOL |
| Cmd_TeachPrecisionShowReflector | Teach Precision Show Reflector Command | BOOL |
| Cmd_TeachStandardShowReflector | Teach Standard Show Reflector Command | BOOL |
| Cmd_TeachStart | Teach Start Command | BOOL |
| Cmd_TeachStaticShowReflector | Teach Static Show Reflector Command | BOOL |
| Cmd_TeachStaticShowTarget | Teach Static Show Target Command | BOOL |
| Cmd_ApplyConfiguration | Module reconfigure Command | BOOL |
| Inp_ChNumber | Configured Channel number for Master | SINT |
| Inp_ChxGain | Gain of Sensor | INT |
| Inp_ChxMarginLowAlarm | Margin Low Alarm of Sensor | BOOL |
| Inp_ChxProximityAlarm | Proximity Alarm of Senor | BOOL |
| Inp_ChxSignalStrength | Indicates the reflectivity level of the reflector | DINT |
| Inp_ChxTriggered | Triggered Status of Sensor | BOOL |
| Set_Beam1Emitter1LEDIntensity | Set the LED Intensity for Beam One for Emitter1 | DINT |
| Set_Beam1Receiver1ThresholdEmitter | Set the Threshold for Beam One Receiver1 for Emitter1 | DINT |
| Set_Beam2Emitter2LEDIntensity | Set the LED Intensity for Beam Two and Three for Emitter2 | DINT |
| Set_Beam2Receiver1ThresholdEmitte r2 | Set the Threshold for Beam Two Receiver1 for Emitter2 | DINT |
| Set_Beam3Receiver2ThresholdEmitte r2 | Set the Threshold for Beam Three Receiver2 for Emitter2 | DINT |
| Set_Beam4Emitter3LEDIntensity | Set the LED Intensity for Beam Four and Five for Emitter3 | DINT |
| Set_Beam4Receiver2ThresholdEmitte r3 | Set the Threshold for Beam Four Receiver2 for Emitter3 | DINT |
| Set_Beam5Receiver3ThresholdEmitte r3 | Set the Threshold for Beam Five Receiver3 for Emitter3 | DINT |
| Set_Beam6Emitter4LEDIntensity | Set the LED Intensity for Beam Six for Emitter4 | DINT |
| Set_Beam6Receiver3ThresholdEmitte r4 | Set the Threshold for Beam Six Receiver3 for Emitter4 | DINT |
| Set_MarginBooster | Set the multiplier factor that applies to the LEDs current value | DINT |
| Set_TrendMaxValue | Trend Tab Max value for VD/ME/SE faceplate | DINT |
| Set_TrendMinValue | Trend Tab Min value for VD/ME/SE faceplate | DINT |

Output Data

| Output | Function/Descritpion | DataType |
|---|--|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_bNotReady | Enumerated state value: 0 = Reserved 1 = Device not connected 2 = Device not available 3 = Device is faulted 4 - 31 = Reserved | DINT |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_CounterEnabled | Counter Enabled Indication; 0= Disable, 1= Enable | BOOL |
| Sts_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_InhibitCfg | 1=Inhibit user Configuration Parameters from HMI Faceplate; 0=Allow | BOOL |
| Sts_InhibitCmd | 1=Inhibit user Commands from HMI Faceplate; 0=Allow Control | BOOL |
| Sts_InhibitSet | 1=Inhibit user Settings from HMI Faceplate; 0=Allow | BOOL |
| Sts_LocalTeachLock | Local Parameterization; 0= Unlock, 1= Locked | BOOL |
| Sts_Located | Locator Indicator; 1= Located | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_ApplyConfiguration | Module Reconfigure Request On Status | BOOL |
| Val_Beam1Emitter1LEDIntensity | Displays the LED intensity for Emitter1 for Beam One | DINT |
| Val_Beam1Receiver1ThresholdEmitter 1 | Display the Threshold for Beam One Receiver1 for Emitter1 | DINT |
| Val_Beam2Emitter2LEDIntensity | Display the LED Intensity for Beam Two and Three for Emitter2 | DINT |
| Val_Beam2Receiver1ThresholdEmitter 2 | Display the Threshold for Beam Two Receiver1 for Emitter2 | DINT |
| Val_Beam3Receiver2ThresholdEmitte r2 | Display the Threshold for Beam Three Receiver2 for Emitter2 | DINT |
| Val_Beam4Emitter3LEDIntensity | Display the LED Intensity for Beam Four and Five for Emitter3 | DINT |
| Val_Beam4Receiver2ThresholdEmitte r3 | Display the Threshold for Beam Four Receiver2 for Emitter3 | DINT |
| Val_Beam5Receiver3ThresholdEmitte r3 | Display the Threshold for Beam Five Receiver3 for Emitter3 | DINT |
| Val_Beam6Emitter4LEDIntensity | Display the LED Intensity for Beam Six for Emitter4 | DINT |
| Val_Beam6Receiver3ThresholdEmitte r4 | Display the Threshold for Beam Six Receiver3 for Emitter4 | DINT |
| Val_BeamMode | Beam Mode Status; O - Object Detection - Six Beams, 1 - Object Detection - Five Beams, 2 - Object Detection - Four Beams, 3 - Object Detection - Three Beams, 4 - Object Detection - Two Beams, 5 - Object Detection - One Beam, 8 - Gap Detection - Six Beams, 9 - Gap Detection - Five Beams, 10 - Gap Detection - Four Beams, 11 - Gap Detection - Three Beams, 12 - Gap Detection - Two Beams, 13 - Gap Detection - One Beam | DINT |
| Val_Counter | Display Counter Value | DINT |
| Val_EnableLEDs | LED Indicator; 0= Disable, 1= Enable | SINT |

| Output | Function/Descritpion | DataType |
|----------------------------------|---|----------|
| Val_MarginBooster | Display the multiplier factor that applies to the LEDs current value | DINT |
| Val_MarginLevelHighMultiplier | Margin Level-High Multiplier Status; 10 - 1.0, 11 - 1.1, 12 - 1.2, 15 - 1.5, 20 - 2.0, 50 - 5.0, 100 - 10.0, 150 - 15.0 | INT |
| Val_MarginLevelLowMultiplier | Margin Level-Low Multiplier Status; 0 - 0.8, 1 - 0.7, 2 - 0.6, 3 - 0.5 | INT |
| Val_Mode | Mode Status; O - PNP, 1 - NPN | INT |
| Val_OperatingFrequency | Operating Frequency Satus; 0 - 1 (800 uS), 1 - 2 (860 uS) | INT |
| Val_OperatingHrsSinceInception | Displays the number of hours that the sensor has been continuously in operation | DINT |
| Val_OperatingHrsSincePowerUp | Displays the number of targets that have been detected since the sensor has been in operation | DINT |
| Val_Pin2Mode | Pin 2 Mode Status; O - Disable, 1 - PNP-Not Inverted, 2 - PNP- Inverted, 3 - NPN-Not Inverted, 4 - NPN-Inverted, 5 - Remote Teach Input, 6 - Independent Control PNP, 7 - Independent | DINT |
| Val_Polarity | Displays the polarity of channel; 0 = Not Inverted, 1=Inverted | INT |
| Val_RangeMax | Sensor Maximum Range in Trend | DINT |
| Val_RangeMin | Sensor Minimum Range in Trend | DINT |
| Val_Speed | Display the the actual frequency of detection in Hertz | DINT |
| Val_TeachStep | Teach Step | INT |
| Val_Temperature | Displays the internal temperature information available in the sensor | SINT |
| Val_TemperatureMaxSinceInception | Reflects the maximum temperature inside of the microprocessor die of the sensor since inception | SINT |
| Val_TemperatureMaxSincePowerUp | Reflects the maximum temperature inside of the microprocessor die of the sensor since the last power up | SINT |
| Val_TemperatureMinSinceInception | Reflects the minimum temperature inside of the microprocessor die of the sensor since inception | SINT |
| Val_TemperatureMinSincePowerUp | Reflects the minimum temperature inside of the microprocessor die of the sensor since the last power up | |
| raC_Dvc_ADFramework_DV_LD | Unique Parameter Name for auto - discovery | BOOL |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung .L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 45PLA device object connected to channel #2 of a POINT I/O 1734-4IOL IO-Link Master module named *Point_IO_4IOLMaster* in slot #14 of a POINT I/O adapter named *Racko1*.



The following example uses the 45PLA device object connected to channel #3 of a ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*



The following example uses the 45PLA device object connected to channel #8 of a 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_2*



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|------------------------|----------------|---|---|
| GO_LaunchFP | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: AOI Backing Tag Instance (e.g. {::[PAC]Program::IOLinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_LightSens | Not Triggered | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g. {::[PAC]Program::I0LinkProgramInstanceName}) #104:Custom button label. Leave blank to use Tag.@Description #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration | |
|---------------------------|---------------------|--|---|--|
| AOG_45PLA _Launch | SS Not Triggered | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Properties Animations Image: Events AGeneral Image: Events Image: Events AOL_Tag Image: Events Image: Events AOL_Tag | |

Faceplates

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _InstanceName.@description, the .@description extended tag property of the Add-On Instruction instance. This is userconfigurable from controller/program tags in Studio 5000 Logix Designer.

| | Name | -8 🔺 | Usage | Data Type | | | Description | _ |
|--------|---------------------|-------|--------|------------------------------------|----------|---------------------------------|--------------|--------------|
| | Sensor_1002 | | Local | raC_Dvc_45F | PLA_8IOL | | Sensor 45PLA | |
| | Sensor_1002_CtrlCmd | | Public | raC_UDT_ItfAD_IOLinkSensor_CtrICmd | | _InstanceName Command Interface | | |
| Name | | Usage | -8 | ·▼ Alias For | Base Tag | Data Type | | Description |
| Sensor | _45PLA | Local | | | | raC_Dvc_45PLA_5032 | | Sensor_45PLA |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data and the Locate button.



| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Application Specific Name - Read from device |
| 3 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED |
| 4 | Signal Strength Sparkline Trend The spark line shows the signal strength value. |
| 5 | Margin Low Alarm indicates, when the target Signal is marginal and about to fail. Proximity Alarm indicates, if there is a target in the background that may be in close proximity to the threshold. |
| 6 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 7 | The Beam Mode defines the number of active beams and operation logic that is applied to the state of the beams. |
| 8 | Process Data Signal strength indicates the reflectivity level of the reflector, which makes this feature ideal for continuous monitoring. Gain displays the excess gain above the sensor threshold to confirm reliable detection of the target. When the Counter Value is enabled, the parameter reflects the sensor count amount. If the counter functionality is disabled, then "Disabled" text is seen. |



Note: In Case of, 5032 Master, changes made to the Application Specific Name or Locate Toggle Switch require pressing the 'Config Apply' button in the Config tab to update the sensor parameters.

Health Tab

Health tab provides different diagnostic information of sensor which helps ensure that sensors are operating correctly.



| ltem | Description | | | | |
|------|---|--|--|--|--|
| 1 | Speed Bar Graph Blue Triangle Indicator: Current value | | | | |
| 2 | Speed Current Value | | | | |
| 3 | Internal Temperature Bar Graph Green Indicators: Min/Max since inception (lifetime) Purple Indicators: Min/Max since power up Blue Triangle Indicator: Current value | | | | |
| 4 | Internal Temperature Current Value | | | | |
| 5 | Operating Hours Since Power Up | | | | |
| 6 | Operating Hours Since Inception (lifetime) | | | | |



Inception/Lifetime values are recorded since the first time the sensor was ever powered ON. These value are retained and not reset during default factory reset. Power Up values are reset to zero and recorded new each time the sensor is power cycled.

Trend Tab

Trends display values over time, often used to compare similar or related values and to allow operators to predict future states to make control action decisions. Trend is displayed for Signal Strength.



Trend Settings Screen

We can set trend limits using configuration tab by clicking on the *Settings* button present on trend screen. This sub screen display contains two numeric input elements that allow the user to enter the minimum and maximum values to be used on the Trend screen for Signal strength.

| Sensor 4 | ISPLA | \times |
|------------------------|------------------------|----------|
| $\widehat{\mathbf{w}}$ | Ready | |
| | Trend and Spark Limits | \times |
| ~~ 3 | Signal Strength Scale | |
| ! | Minimum 0 | |
| | Maximum 65535 | |
| | | |
| | | |

Configure Tab

The configuration tab displays the various parameter settings and options, as well as enabling the user to read data from the sensor.

The configuration section is divided into sections:

- Operation Configuration
- Sensor Configuration
- Teach Settings
- Configuration Apply Settings



In case of 5032 Master, "<u>Config</u> Apply" Button on Configure tab should be pressed compulsory after updating parameters on faceplate.

| PLA_40 | 01 | | | × |
|------------------------|-----------|-----------------|-----------|-------------------|
| $\widehat{\mathbf{w}}$ | 🔳 Re | ady | | |
| 8 | Operation | n Configuration | | Parameter Lock |
| 1~ | | Intensity | Threshold | Unlock 💭 Lock |
| (2) | Beam 1 | 767 | 900 | LEDs |
| P | Beam 2 | 767 | 900 | Disable 🔎 Enable |
| 1 | Beam 3 | 767 | 900 | Reset |
| | Beam 4 | 767 | 900 | Count |
| | Beam 5 | 767 | 900 | Teach Settings |
| | Beam 6 | 767 | 900 | Carfie Analy |
| | | | < 🔳 2 👌 | Config Apply |

Operation Configuration

Intensity and Threshold - Allows the user to set the LED intensity and Threshold for Beam-1 to Beam-6.

Local Teach Parameters - This section allow user to lock / unlock device local parameterization. Touch Lock/Unlock Toggle switch to Lock Local Parameterization

Disable/Enable LEDs - This parameter allows operators to turn OFF or turn ON the User Interface LEDs (green and orange LEDs). This parameter is ideal for applications where turning OFF the LEDs is desired to accommodate the application.

Reset Count - Allows users to reset the counter function, it will reset the sensor counts to zero.

| PLA_40 | 01 | | | | × |
|--------|-----------------------------------|--------------|-------------------|---------------------|---|
| ŵ | Ready | | | | |
| Ð | Sensor Configu | ıration | | | |
| ~ | Margin Level - Low Multiplier | 0.8 | Beam Mode | Obj Detect - 6 Beam | ▼ |
| Þ | Margin Level - High Multiplier | 1.0 | Pin 2 Mode | Disable | |
| 1 | Operating Frequency | 1 | Mode | PNP | ▼ |
| | Polarity | Not Inverted | Margin Booster | | |
| | | < | | Config Apply | |

Sensor Configuration

Margin Level- Low Multiplier - Allows the user to defines the signal level at which the green LED starts flashing, indicating it is below the threshold.

Margin Level- High Multiplier - Allows the user to determines when the green LED can stop flashing, indicating a signal level higher than the threshold.

Operating Frequency - In certain applications, where it's necessary to place two 45PLA sensors in close proximity, their emission may interfere with each other. Adjusting the operating frequency helps mitigate such interference.

Polarity - Allows the user to change the sensor output to operate as Non-Inverted or Inverted.

Beam Mode - Allows the user to define the number of active beams and operation logic that is applied to the state of the beams.

Pin2 Mode - Allows the user to enables the operation of the output on pin 2 in IO-Link Mode.

Mode - Allows the user to change the output mode to operate as PNP or NPN.

Margin Booster - Allows the user to indicate the multiplier factor that applies to the current value of the LEDs.

Teach Settings

Teach Settings display includes the Teach Mode, Teach procedure flow buttons, and Teach Apply button. Touch on the Teach Settings navigation button to access the Teach Settings tab.

Teach tab includes the following functions.

• Teach mode selection dropdown menu

• Teach procedure flow buttons

| Re | ady | | |
|-----------|---------------|-----------|------------------|
| Operation | Configuration | | Parameter Lock |
| | Intensity | Threshold | Unlock 🗩 Lock |
| Beam 1 | 767 | 900 | LEDs |
| Beam 2 | 767 | 900 | Disable 🔵 Enable |
| Beam 3 | 767 | 900 | Pasat |
| Beam 4 | 767 | 900 | Count |
| Beam 5 | 767 | 900 | Teach |
| Beam 6 | 767 | 900 | Jettings |

| Sensor 4 | 45PLA | \times |
|------------------------|--|----------|
| $\widehat{\mathbf{w}}$ | Ready | |
| | Teach Settings | \times |
| ~~ {} | Static V | |
| ļ | Teach Start Show Target Show Reflector Teach Apply | |

Teach mode - This parameter selects the desired mode.

Static Teach - The first method is Static Teach.

- 1. Press the **"Teach Start"** button to initiate the Teach Process
- 2. Place the target in front of the sensor while ensuring it is placed in between the reflector. Press the **"Show Target"** command button. Once the target has been displayed, remove it from obstructing the reflector.
- 3. Show the reflector where the target is present and then press the **"Show Reflector"** button.
- 4. Send the **"Teach Apply"** command to finalize the teach process.

Standard Teach - The second method is Standard Teach.

1. Press the **"Teach Start"** button to begin the Teach Process.

- 2. Place the reflector in front of the sensor's field of view and send **"Show Reflector"** command.
- 3. Press the **"Teach Apply"** button to finalize the teach process.

Precision Teach - The third method is Precision Teach.

- 1. Press the **"Teach Start"** button to begin the Teach Process.
- 2. Place the reflector in front of the sensor's field of view and send the **"Show Reflector"** command.
- 3. Send the **"Teach Apply"** command to finalize the teach process.

Configuration Apply Settings

Config Apply - This Button allows user to Update the configuration parameters after modifying the parameters on faceplate.

Ideally, "Config Apply" button on Configuration tab is disabled, as shown in below image.



If User Changes any Parameter from Configuration Tab, then, "Config apply" Button is Enabled. For updating the desired change in Sensor, user needs to Click on "Config Apply" Button, as shown in below image.

| Re Re | ady | | |
|-----------|-----------------|-----------|------------------|
| Operation | n Configuration | | Parameter Lock |
| | Intensity | Threshold | Unlock 🔵 Lock |
| Beam 1 | 767 | 900 | LEDs |
| Beam 2 | 767 | 900 | Disable 🔵 Enable |
| Beam 3 | 767 | 900 | Deset |
| Beam 4 | 767 | 900 | Count |
| Beam 5 | 767 | 900 | Teach |
| Beam 6 | 767 | 900 | Settings |

After updating the Parameters, "Config Apply" Button gets disabled still there is any parameter change by the User.

Fault Warning Tab

The Fault Warning tab displays information for up to four faults for the device. The fault table displays the Severity level (Fault, Warning or Active Fault), time (and date) and a description of the fault.

Note, only row 1 will display the "Active Fault" in the severity column if there is a current active fault, else it will display the last fault. Rows 2-4 only display past faults and warnings, not an active fault.



| ltem | Description | | | | |
|------|---|--|--|--|--|
| 1 | Banner | | | | |
| 2 | Last fault is in first row and show in bold if active | | | | |
| 3 | Yellow border visible when a fault is active | | | | |
| 4 | Fault severity | | | | |
| 5 | Fault event time | | | | |
| 6 | 4 most recent fault/warning event messages | | | | |

Click on any row in the fault table to view fault details. The details window provides a more detailed description and possible action steps to remedy condition.



Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_45PLA_4I0L, raC_Dvc_45PLA_8I0L, raC_Dvc_45PLA_5032

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_45PLA_4IOL, raC_LD_Dvc_45PLA_8IOL

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| ChannelNumber | | | | Select the Channel Number where the sensor is connected. |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_45PLA_5032

| Parameter Name | Default Value | Instance Name | Definition | Description |
|-----------------|---------------------|------------------|-----------------|--|
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| MasterReferance | | [Master5032] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ModuleName | Mod_{ObjectName} | Mod_{ObjectName} | Module | Select the sensor series (i.e. 45PLA), This name depends upon the TagName assigned to object. |
| SensorType | 45PLA-P2LPT1-F4 | 45PLA-P2LPT1-F4 | 45PLA-P2LPT1-F4 | Select the sensor from drop down list. with this selection, AOI type of the sensor is generated in ACD. (i.e. Type1, Type2 or Type3) |

| ChannelNumber | | | Select the Channel Number where the sensor is connected. |
|-------------------|-----------------|-------------------|---|
| Navigation Button | GraphicalButton | HMI Configuration | Select the Launch Button Type for Generate the HMI through ACM. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|--------------------|--------------------|----------|-----------------|----------|
| raC_Dvc_45PLA_4I0L | raC_Dvc_45PLA_4IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_45PLA_8I0L | raC_Dvc_45PLA_8IOL | 3.2 | (RA-LIB) Device | 10-Link |
| raC_Dvc_45PLA_5032 | raC_Dvc_45PLA_5032 | 3.2 | (RA-LIB) Device | 10-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------|--------------------|--|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewME\Global Object - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_45PLA | Faceplate ME | (raC-3_xx-ME) raC_Dvc_45PLA-Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_45PLA | Faceplate SE | (raC-3_xx-SE) raC_Dvc_45PLA-Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_IO_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

IO-Link HUB

Overview

The IO-Link HUB device object (raC_Dvc_1732IL_10X6M12, raC_Dvc_1732IL_16CFGM12M12L, raC_Dvc_1732IL_IB16M12_8IOL) includes HMI faceplate's which displays device information including:

- Module description, status, and faults
- Channel description, status

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_*IO-Link_HUB_*Objects_Faceplate.MP4"

Required Files

IO Device Objects include HMI faceplates. There is no controller programming required other than the creation of the I/O module in the project. If using FactoryTalk® View ME/SE you must also import the tag import file *FTViewStudio_IOLinkLibrary_Tags_3_00.CSV* to support navigation on faceplates.

FactoryTalk View HMI Files

FactoryTalk View ME/SE applications require importing the desired device faceplates in addition to all images located in the */HMI FactoryTalk View Images* - *png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|---------------------|---------|--|--|
| 1732IL_10X6M12 | Display | (raC-3_01-ME) raC_Dvc_1732IL_10X6M12-Faceplate.gfx | (raC-3_01-SE) raC_Dvc_1732IL_10X6M12-Faceplate.gfx |
| 1732IL_16CFGM12M12L | Display | (raC-3_01-ME) raC_Dvc_1732IL_16CFGM12M12-Faceplate.gfx | (raC-3_01-SE) raC_Dvc_1732IL_16CFGM12M12-Faceplate.gfx |
| 1732IL_IB16M12 | Display | (raC-3_01-ME) raC_Dvc_1732IL_IB16M12-Faceplate.gfx | (raC-3_01-SE) raC_Dvc_1732IL_IB16M12-Faceplate.gfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| I | Device/Item | Studio 5000 View Designer Faceplate |
|---|-------------|-------------------------------------|
| | IO-Link HUB | raC_Dvc_1732IL_Hubs.vpd |

Graphic Symbols Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays.

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|---------------------|----------------|---|---|
| GO_LaunchFP10X6HUB | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #106. | #102: Faceplate Display Name e.g. (raC-3_00-ME) raC_Dvc_XXXX_XXX- Faceplate or (raC-3_00-SE) raC_Dvc_XXXX_XXXX-Faceplate #103: 10 Module Input Tag e.g. {::[Topic Name]Local:1:} #104: 10 Module Output Tag e.g. {::[Topic Name]Local:1:0} #105: Channel No e.g. (07) #106: Custom button label e.g.g (HUB_100) #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchFP16CFGHUB | \$\$ | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #106. | #102: Faceplate Display Name e.g. (raC-3_00-ME) raC_Dvc_XXXX_XXXF Faceplate or (raC-3_00-SE) raC_Dvc_XXXX_XXXXF-Faceplate #103: 10 Module Input Tag e.g. {::[Topic Name]Local:1:1} #104: 10 Module Output Tag e.g. {::[Topic Name]Local:1:0} #105: Channel No e.g. (07) #106: Custom button label e.g. (HUB_101) #130: Channel0 Configuration (Input =I, Output =0) #131: Channel1 Configuration (Input =I, Output =0) #132: Channel2 Configuration (Input =I, Output =0) #133: Channel3 Configuration (Input =I, Output =0) #134: Channel4 Configuration (Input =I, Output =0) #135: Channel5 Configuration (Input =I, Output =0) #136: Channel6 Configuration (Input =I, Output =0) #137: Channel7 Configuration (Input =I, Output =0) #138: Channel8 Configuration (Input =I, Output =0) #139: Channel9 Configuration (Input =I, Output =0) #140: Channel10 Configuration (Input =I, Output =0) #142: Channel9 Configuration (Input =I, Output =0) #145: Channel9 Configuration (Input =I, Output =0) #142: Channel12 Configuration (Input =I, Output =0) #145: Channel15 Configuration (Input =I, Output =0) #145: Channel14 Configuration (Input =I, Output =0) #145: Channel15 Configuration (Input =I, Output =0) #145: Channel14 Configuration (Input =I, Output =0) #145: Channel15 Configuration (Input =I, Output |
| GO_LaunchFPIB16HUB | \$\$ | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: Faceplate Display Name e.g. (raC-3_00-ME) raC_Dvc_XXXX_XXX- Faceplate or raC-3_00-SE) raC_Dvc_XXXX_XXX-Faceplate #103: 10 Module Input Tag e.g. {::[Topic Name]Local:1:I} #104: Channel No e.g. (07) #105: Custom button label e.g.g (HUB_102) #120: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |

FactoryTalk View ME/SE Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Configured Pa | ramete | er |
|------------------------|----------------|--|---------|---|
| | | This IO-Link Hub is connected to the Channel 0 of 1732E-8IOL | Master | module named "MASTER1" |
| | | Global Object Parameter Values | | |
| | | Name Value | Tag | |
| GO_LaunchFP10X6HUB | | 1 #102 (raC-3_00-ME) raC_Dvc_1732IL_10X6M12-Faceplate | ••• | Faceplate Display Name e.g. (raC-5_00-ME) raC_Dvc_ |
| | SS | 2 #103 {::[PAC]MASTER1:I} | ••• | IO Module Input Tag e.g. {::[Topic Name]Local: 1:I} |
| | | 3 #104 {::[PAC]MASTER1:0} | ••• | IO Module Output Tagle.g. {::[Topic Name]Local: 1:0} |
| | | 5 #106 HUB 100 | | Custom button label. |
| | | 6 #120 | ••• | Display's left position (e.g. 100) (optional) |
| | | 7 #121 | ••• | Display's top position (e.g. 100) (optional) |
| | | This IO-Link Hub is connected to the Channel 1 of 1734-410L Mas adapter module named "AENTR1" | ter mod | lule installed in the "Slot 13" of the communication |
| | | Name Value | Tag | |
| | | 1 #102 (raC-3_00-ME) raC_Dvc_1732IL_16CFGM12M12L-Fa | ••• | Faceplate Display Name e.g. (raC-5_00-ME) raC_Dvc_ |
| | | 2 #103 {::[PAC]AENTR1:13:1} 3 #104 {::[PAC]AENTR1:13:0} | | IO Module Input Tagle.g. {::[Topic Name]Local: 1:1} |
| | | 4 #105 1 | ••• | Channel No |
| | | 5 #106 HUB_101 | ••• | Custom button label. |
| | | 6 #130 I 7 #121 I | ••• | Channel0 Configuration (Input =I, Output =O) |
| | | 8 #132 O | | Channel2 Configuration (Input =1, Output =0) |
| GO_LAUTICITY IDCF GHUB | SS | 9 #133 O | ••• | Channel3 Configuration (Input =I, Output =O) |
| | | 10 #134 I | ••• | Channel4 Configuration (Input =I, Output =O) |
| | | 11 #135 I | ••• | Channel5 Configuration (Input =I, Output =O) |
| | | 13 #137 0 | | Channels Configuration (Input =1, Output =0) |
| | | 14 #138 I | ••• | Channel8 Configuration (Input =I, Output =O) |
| | | 15 #139 I | ••• | Channel9 Configuration (Input =I, Output =O) |
| | | | ••• | Channel 10 Configuration (Input =I, Output =O) |
| | | 17 #141 O | | Channel 11 Configuration (Input =1, Output =0) Channel 12 Configuration (Input =1, Output =0) |
| | | 19 #143 I | ••• | Channel 13 Configuration (Input =I, Output =O) |
| | | 20 #144 O | ••• | Channel14 Configuration (Input =I, Output =O) |
| | | 21 #145 O | ••• | Channel15 Configuration (Input =I, Output =O) |
| | | 23 #121 | | Display's top position (e.g. 100) (optional) |
| | | This IO Link llub is connected to the Channel 2 of 1772E 0101 | Maatar | modulo normod "MACTED1" |
| | | | nastei | |
| | | Global Object Parameter Values | | × |
| | | Name Value | Tag | |
| GO-Tanucut LiriqHDR | 8.8 | 1 #102 (raC-3_00-ME) raC_Dvc_1732IL_IB16M12-Faceplate | | Faceplate Display Name e.g. (raC-5_00-ME) raC_Dvc |
| | 00 | 2 #103 {::[PAC]MASTER1:I} | ••• | IO Module Input Tag e.g. {::[Topic Name]Local: 1:I} |
| | | 3 #104 2 | ••• | Channel No |
| | | 4 #105 HUB_102 | ••• | Custom button label. |
| | | 5 #120 6 #121 | | Display's ten position (e.g. 100) (optional) |
| | | | | pipping a top position (e.g. 100) (optional) |

Configuring FactoryTalk View Objects

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration | |
|------------------------|----------------|-------------------------|--|----------|
| | | | This IO-Link Hub is connected to the Channel O of 1732E-8IOL Master module named "MASTERI" | |
| | | | Name: grp_LB_10X6M12_4IOL | |
| | | | Type: PanelDeviceGroup | |
| | | | The second secon | |
| | | | Touch Press | , |
| | | | Ones Require | ~ |
| | | | Uper Popup. | |
| | | | | |
| | | | Property Configuration: | - |
| | | | ChXCh0 C3 PAC.MASTER1. Ch0Ch1 | |
| | | | Chychia ĉă "PAC.MASTERI:O.Ch0Ch0 | |
| | | | Chychili Cá ::PAC.MASTER1:0.Ch0Ch1 | |
| | | | Chychia Chychia | |
| | | The supplied launch | ChYCh12 9/3 ChYCh13 Có ::PAC.MASTER1:O.Ch0Ch3 | |
| 10X6M12 | | DUTTONINVIEWDESIGNER | Chychia chychi | |
| | 0110 | the faceplate in a user | Chychits chi ::PAC.MASTER1:0.Ch0Ch5 | |
| | 0 | application. | Chych2 Chych2 Chych2 | |
| | 13.0 | | Chych3 čš ::PAC.MASTER1:I.Ch0Ch3 | |
| | | | ChXCh4 Čੱ ::PAC.MASTER1:I.Ch0Ch4 | |
| | | | ChXCh5 čੱ ::PAC.MASTER1:I.Ch0Ch5 | |
| | | | ChXCh6 čý ::PAC.MASTER1:I.Ch0Ch6 | |
| | | | ChXCh7 Čੱ ::PAC.MASTER1:I.Ch0Ch7 | |
| | | | ChXCh8 C5 ::PAC.MASTER1:I.Ch0Ch8 | |
| | | | ChXCh9 Cj ::PAC.MASTER1:I.Ch0Ch9 | |
| | | | ChXModuleActuatorPwrLow Çź ::PAC.MASTER1:I.Ch0ModuleActuatorPwrLov | w |
| | | | ChXModuleInputError ¢ゔ ::PAC.MASTER1:I.Ch0ModuleInputError | |
| | | | ChXModuleOutputError ¢ặ ::PAC.MASTER1:I.Ch0ModuleOutputError | |
| | | | ChXModuleSensorPwrLow ¢5 ::PAC.MASTER1:I.Ch0ModuleSensorPwrLow | |
| | | | Module_Tag_I ¢ž ::PAC.MASTER1:I | |
| | | | Status_ChxFault ¢jj ::PAC.MASTER1:I.Status.Ch0Fault | |
| | | | This IO-Link Hub is connected to the Channel O of 1732E-8IOL Master module named "Master8IO Name: gro LB IB16M12 4IOL | L_48″ |
| | | | Type: PanelDeviceGroup | |
| | | | Properties Animations | |
| | | | ☆ Touch Press | × |
| | | The supplied launch | Open Popup: | × |
| | 0::0 | buttoninViewDesigner | User-Defined Screens\raC_Dvc_1732IL_IB16M12_FP | • |
| IB16M12 | | is used to navigate to | Property Configuration: | |
| | | annlication | ChxCh0_Ch7 ¢ģ ::PAC.Master8IOL_48:I.Ch0Ch0_Ch7 | |
| | | | ChxCh8_Ch15 ¢5 #PAC.Master8IOL_48:I.Ch0Ch8_Ch15 | |
| | | | ChxModuleActuatorPwrLow ¢5 | |
| | | | ChxModuleInputError ¢3 ::PAC.Master8IOL_48:I.Ch0ModuleInputError | |
| | | | ChxModuleOutputError ¢3 ::PAC.Master8IOL_48:I.Ch0ModuleOutputError | |
| | | | ChxModuleSensorPwrLow ÇĞ ::PAC.Master8IOL_48:I.Ch0ModuleSensorPwrLow | |
| | | | Module_Tag_I Çğ ::PAC.Master8IOL_48:I | |
| | | | Status_ChxFault ¢5 ::PAC.Master8IOL_48:I.Status.Ch0Fault | |
| | | | | |

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | | Property | Configuration | |
|------------------------|----------------|-------------------------|--|----------------|--|-------|
| | | | This IO-Link Hub is connected to the C | Channel 1 of 1 | 732E-8IOL Master module named "MASTER | " |
| | | | Properties | | | ▼ 🗆 × |
| | | | Name: grp LB 16CFGM12M12L | | | |
| | | | Type: PanelDeviceGroup | | | |
| | | | | | | |
| | | | Properties Animations Events | | | |
| | | | ☆ Touch Press | | | × |
| | | | Open Popup: | | | × |
| | | | User-Defined Screens\raC Dvc 1732 | 2IL 16CFGM12 | M12L FP | • |
| | | | Property Configuration: | | | |
| | | | ChXCh0 | č'á | ::PAC.MASTER:I.Ch1Ch0 | |
| | | | ChXCh1 | čá | ::PAC.MASTER:I.Ch1Ch1 | |
| | | | ChXCh10 | č'ó | ::PAC.MASTER:O.Ch1Ch10 | |
| | | | ChXCh11 | č'ó | ::PAC.MASTER:O.Ch1Ch11 | |
| | | | ChXCh12 | čö | ::PAC.MASTER:O.Ch1Ch12 | |
| | | | ChXCh13 | čá | ::PAC.MASTER:O.Ch1Ch13 | |
| | | | ChXCh14 | çă | ::PAC.MASTER:O.Ch1Ch14 | |
| | | | ChXCh15 | ¢'ó | ::PAC.MASTER:O.Ch1Ch15 | |
| | | | ChXCh2 | č'á | ::PAC.MASTER:I.Ch1Ch2 | |
| | | | ChXCh3 | çíá | ::PAC.MASTER:I.Ch1Ch3 | |
| | | | ChXCh4 | ç'á | ::PAC.MASTER:I.Ch1Ch4 | |
| | | | ChXCh5 | ¢'á | ::PAC.MASTER:I.Ch1Ch5 | |
| | | huttoninViewDesigner | ChXCh6 | ¢;ó | ::PAC.MASTER:I.Ch1Ch6 | |
| 16CFGM12M12L | 0::0 | is used to navigate to | ChXCh7 | ¢'á | ::PAC.MASTER:I.Ch1Ch7 | |
| | | the faceplate in a user | ChXCh8 | ¢,́ź | ::PAC.MASTER:I.Ch1Ch8 | |
| | 6.1.6 | application. | ChXCh9 | ¢,́ź | ::PAC.MASTER:I.Ch1Ch9 | |
| | (Curke | | ChXModuleActuatorPwrLow | ¢;ó | ::PAC.MASTER:I.Ch1ModuleActuatorPwrLow | |
| | | | ChXModuleInputError | ¢;ó | ::PAC.MASTER:I.Ch1ModuleInputError | |
| | | | ChXModuleOutputError | Ç,Ź | ::PAC.MASTER:I.Ch1ModuleOutputError | |
| | | | ChXModuleSensorPwrLow | çõ | ::PAC.MASTER:I.Ch1ModuleSensorPwrLow | |
| | | | IOCfg_Ch0 | | | |
| | | | IOCfg_Ch1 | | 1 | |
| | | | IOCfg_Ch10 | ¢;ò | 0 | |
| | | | IOCfg_Ch11 | çò | 0 | |
| | | | IOCfg_Ch12 | ¢,2 | 0 | |
| | | | IOCfg_Ch13 | ¢;ò | 0 | |
| | | | IOCfg_Ch14 | ¢2 | 0 | |
| | | | IOCfg_Ch15 | ć,ć | 0 | |
| | | | IOCfg_Ch2 | | | |
| | | | IOCfg_Ch3 | | 1 | |
| | | | IOCfg_Ch4 | | | |
| | | | IOCfg_Ch5 | | | |
| | | | IOCfg_Ch6 | | 1 | |
| | | | IOCfg_Ch7 | | 1 | |
| | | | IOCfg_Ch8 | | 1 | |
| | | | IOCfg_Ch9 | | | |
| | | | Module_Tag_I | çò | CPAC, MASTERI | |
| | | | Status_ChXFault | çõ | PACIMAS TERIIStatus.Ch Trault | |
| | | | | | | |

Faceplates

1732IL_IB16M12

The 1732IL_IB16 is the 16 Channel Digital Input IO-Link Hub. The main tab of the faceplate is the Home tab, which displays information regarding the Input channels. The banner at the top of the faceplate displays module status and fault information.

| ŵ_ | Te Re | eady | | | |
|--------|-------|--------------------|---|------|--------------------|
| | 1 0 | Infeed Valve1 Open | 1 | 8 🖂 | At Start position |
| | I 1 | Infeed Valve2 Open | 1 | 9 🗔 | At End Position |
| | →I 2 | Infeed Valve3 Open | 1 | 10 🔳 | Conveyor1 at Speed |
| | 1 3 | Infeed Valve4 Open | 1 | 11 🔳 | Conveyor2 at Speed |
| | 1 4 | Infeed Valve5 Open | 1 | 12 🗌 | Conveyor3 at Speed |
| | I 5 | Conveyor1 Ready | 1 | 13 🔳 | Conveyor1 at Jam |
| | 16 | Conveyor2 Ready | 1 | 14 🗔 | Conveyor2 at Jam |
| | 1 7 | Conveyor3 Ready | 1 | 15 🗔 | Conveyor3 at Jam |

| ltem | Description | |
|------|------------------------------------|--|
| 1 | Faceplate title bar | #106: Custom button label e.g. (HUB_100) |
| | Module ready status. | |
| 2 | GREEN = Ready | Ready |
| | YELLOW = Module Fault/Not Ready | Not Ready |
| | Channel Status | |
| | BLUE = Active/High | - |
| 3 | GREY = Inactive/Low | |
| | Faulted Condition | |
| 4 | I: Digital Input Channel | |
| 6 | Channeldescription:Ch.@Description | |

1732IL_10X6M12

The 1732IL_10X6M12 is the 10 Channel Digital Input, 6 Channel Digital Output IO-Link Hub. The main tab of the faceplate is the Home tab, which displays information regarding the I/O channels. The banner at the top of the faceplate displays module status and fault information.



| ltem | Description | |
|------|------------------------------------|-----------|
| 1 | Faceplate title bar | |
| | Module ready status. | |
| 2 | GREEN = Ready | Ready |
| | YELLOW = Module Fault/Not Ready | Not Ready |
| | Channel Status | |
| | BLUE = Active/High | |
| 3 | GREY = Inactive/Low | |
| | Faulted Condition | 1 1 🗔 |
| 4 | I: Digital Input Channel | |
| 5 | 0: Digital Output Channel | |
| 6 | Channeldescription:Ch.@Description | |

1732IL-16CFGM12M12L

The 1732IL-16CFGM12M12L is the 16 Channel Configurable Digital Input / Output IO-Link Hub. The main tab of the faceplate is the Home tab, which displays information regarding the I/O channels. The banner at the top of the faceplate displays module status and fault information.



| ltem | Description | |
|------|------------------------------------|-----------|
| 1 | Faceplate title bar | |
| | Module ready status. | |
| 2 | GREEN = Ready | Ready |
| | YELLOW = Module Fault/Not Ready | Not Ready |
| | Channel Status | |
| | BLUE = Active/High | - |
| 3 | GREY = Inactive/Low | |
| | Faulted Condition | |
| 4 | I: Digital Input Channel | |
| 5 | 0: Digital Output Channel | |
| 6 | Channeldescription:Ch.@Description | |

IO-Link Master (raC_Dvc_1734_4I0LMaster, raC_Dvc_1732E_8I0LMaster, raC_Dvc_5032_8I0LMaster)

Overview

The IO-Link Master device object (raC_Dvc_1734_4IOLMaster, raC_Dvc_1732E_8IOLMaster, raC_Dvc_5032_8IOLMaster) includes HMI faceplate's which displays device information including:

- Sensor Trigger data
- Sensor Locate & Navigation
- Event & Time
- Channel Status (Non-IO Link Channels)

In the Library there is a folder named *Videos* which contains many How-To and Operational Overview Videos which walk step-bystep through each process. You can refer to the following videos for this section: "Operational_Overview_of_*IO-Link_Master_*Objects_Faceplate.MP4"

Primary device object configuration functions include:

- **Locate:** This function helps to locate the sensors using the device's LED in large machines where there are several sensors close to each other.
- **Navigation:** This is used to Navigate the sensor object with respective to that channel.(Applicable for FTView ME/SE Faceplate & Not for View Designer Faceplate)

Functional Description

The IO-Link Master Device Objects:

- Collect, Process and Deliver Data between Smart Devices as well as Non-IO Link Devices and Application Logic
- Provide Device Status & Diagnostics Faceplate's for Machine Startup, Commissioning, Operations, and Maintenance
- Include Common HMI Faceplate Components, Device States, and Control Interfaces providing Application Development and Operation Efficiency

All these features provide quick feedback, shorten recovery time, and simplify implementation.

Required Files

Device Objects include Add-On Instructions (AOIs) and HMI faceplate's. The revision number (e.g. 1.01) used in filenames can change as new revisions are created.

Controller Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

The Add-On Instruction must be imported into the controller project to be used in the controller configuration. These can be imported as Add-On Instruction files, or as part of the Rung Import or Import Library Objects wizard.

All Add-On Instruction and Rung Import files can be found in the */Studio 5000 Logix Designer Files - L5X/* folder in the library. IO-Link Master device is supplied with three versions of Add-On Instructions (AOI) and Rung import files - one for compatibility with 1734-4IOL Master Module second for compatibility with 1732E-8IOL Master Module and third for compatibility with 5032-8IOL Master Module. You must select the appropriate AOI for the master module being used.

| Device/Item | Compatible IO-Link Master | Add-On Instruction | Rung Import |
|----------------|--|---------------------------------------|--|
| | POINT I/O 1734-4IOL | raC_Dvc_1734_4I0LMaster_3.02_A0I.L5X | raC_Dvc_1734_4I0LMaster_3.02_RUNG.L5X |
| | ArmorBlock 1732E-8I0LM12R | raC_Dvc_1732E_8I0LMaster_3.02_A0I.L5X | raC_Dvc_1732E_8I0LMaster_3.02_RUNG.L5X |
| IU-Link Master | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | raC_Dvc_5032_810LMaster_3.02_A01.L5X | raC_Dvc_5032_8I0LMaster_3.02_RUNG.L5X |

FactoryTalk View HMI Files

FactoryTalk View ME or SE applications require importing the desired device faceplates in addition to all Global Object (ggfx) files and all images located in the */HMI FactoryTalk View Images - png/* folder of the library. FactoryTalk View ME files are stored in the */HMI - FactoryTalk View ME/* library folder and FactoryTalk View SE files are stored in the */HMI - FactoryTalk View SE/* library folder.

| Device/Item | Туре | FactoryTalk View ME Faceplate | FactoryTalk View SE Faceplate |
|-----------------|---------------|--|--|
| 1734-410L | Display | (raC-3_02-ME) raC_Dvc_1734_4I0L-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_1734_4I0L-Faceplate.gfx |
| 1732E-8IOL | Display | (raC-3_02-ME) raC_Dvc_1732E_8I0L-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_1732E_8I0L-Faceplate.gfx |
| 5032-8IOL | Display | (raC-3_02-ME) raC_Dvc_5032_8I0L-Faceplate.gfx | (raC-3_02-SE) raC_Dvc_5032_8I0L-Faceplate.gfx |
| Graphic Symbols | Global Object | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx |
| Toolbox | Global Object | (raC-3-ME) Toolbox - IO-Link Device.ggfx | (raC-3-SE) Toolbox - IO-Link Device.ggfx |

Studio 5000 View Designer HMI Files

All Studio 5000 View Designer Files can be found in the */HMI - ViewDesigner - vpd/* folder of the library.

| Device/Item | Studio 5000 View Designer Faceplate |
|----------------|-------------------------------------|
| 10-Link Master | (raC-3_02-VD) raC_Dvc_IOLink.vpd |

Studio 5000 Application Code Manager Files

Studio 5000 Application Code Manager (ACM) can be optionally used if it is installed. All devices can be easily registered in the ACM repositories by running the *setup.cmd* file located in the root folder of the library.

Individual HSL4 files are provided as an alternative to running the setup.cmd to allow users to manually register specific implementation objects. Each object has two files - an Asset Control file and a Device file. The Asset Control files include attachments of all required files for that object. The Device files are used to actually add that device into a Studio 5000 project and these reference the Asset Control files.

All Studio 5000 Application Code Manager files can be found in the / ApplicationCodeManagerLibraries/ folder of the library. The files included are as follows:

| Implementa tion Object | Compatible IO-Link Master | Asset Control File (.HSL4) | Device File (.HSL4) |
|---------------------------|--|---|--|
| IO-Link Master | POINT I/O 1734-4IOL | (RA-LIB)_Device_Asset-Control_IO-Link_raC_Dvc_1734_4I0L_Master_(3.2) | (RA-LIB)_Device_Module_IO-Link_1734-4IOL_(3.2) |
| | ArmorBlock 1732E-8I0LM12R | (RA-LIB)_Device_Asset-Control_IO-Link_raC_Dvc_1732E_8I0L_Master_(3.2) | (RA-LIB)_Device_Module_IO-Link_1732E-8I0LM12R_(3.2) |
| | 5032-810LM12DR 5032-810LM12M12LDR/A 5032-810LM12P5DR | (RA-LIB)_Device_Asset-Control_IO-Link_raC_Dvc_5032_8IOL_Master_(3.2) | (RA-LIB)_Device_Module_IO-Link_5032- 8IOLMaster_(3.2) |

Device Definition (raC_Dvc_1734_4I0LMaster, raC_Dvc_1732E_8I0LMaster)

The device must be configured with the correct device definition. Proper device configuration enables the required device data to pass information from the device into the add-on instruction.

- When using 1732E-8IOLM12R/B 8 Channel IO-Link Master, its required to change Data Connection in the Module Definition.
- 1. Click on Change...

| Module Properties: Local (1732E- | 8IOLM12R 3.001) × | | |
|---|--|--|------------------------|
| General* | General | | |
| - Connection - Module Info - Internet Protocol - Port Configuration - Network - Fault/Program Action - Configuration - IO-Link | Type: : Vendor: F Parent: L Name: [Description: [| 1732E-8IOLM12R 8 Channel I Rockwell Automation/Allen-Bra .ocal 8IOL | O-Link Master adley |
| | Module Definition | , | |
| | Series: | в | Change |
| | Revision: | 3.001 | |
| | Electronic Keying | : Compatible Module | |
| | Connection: | Data | |

2. Click on *Connection* and select the *Timestamp Data*

| Module Definition | | | | | × |
|--|--------------------|-------------------------|-------------------------|--|---|
| Series: Revision: Electronic Keying: | B 3 Compatib | ✓ ✓ 001 le Module | × | | |
| Connection: | Data | | ~ | | |
| | Data | | | | |
| | Timestan | np Data | | | |
| | | | | | |
| | Channel | Mode | | | ĺ |
| | 0 | IO-Link | \sim | | İ |
| | 1 | IO-Link | \sim | | |
| | 2 | IO-Link | \sim | | |
| | 3 | IO-Link | <u> </u> | | [|
| | 4 | IO-LINK | ~ | | |
| | 6 | IO-Link | | | |
| | 7 | IO-Link | $\overline{\mathbf{v}}$ | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| ОК | Can | cel | Help | | |

Device Definition (raC_Dvc_5032_8I0LMaster)

The device must be configured with the correct device definition. Proper device configuration enables the required device data to pass information from the device into the add-on instruction.

- When using 5032-8IOLM12M12LDR 8 Channel IO-Link Master, its required to change Data Connection in the Module Definition.
- 1. Click on Change...

| - General* | General | | | | _ |
|---|--|--|------------------------------------|-------------|---|
| Connection Module Info Channels - O0 - IO-Link - 01 - Digital Input - 02 - IO-Link - 03 - Digital Input - 04 - IO-Link - 06 - IO-Link - 09 - Digital Input - 10 - IO-Link - 11 - Digital Input - 12 - IO-Link | Type: Vendor: Parent: Na <u>m</u> e: Descri <u>p</u> tion: | 5032-8IOLM12M12LDR 8 IO-Link Channel, 8 Config Rockwell Automation/Allen-Bradley Local_01 Mod_Master_5032_1 | | nfigur E | |
| - Internet Protocol - Port Configuration - Network - Time Sync - Servers | Series: Revision: Electronic K Connection: | eying: | A 2.011 Compatible M Data | Module | |

2. User need to assign Channel modes as per their desired hardware connection to 5032 Master. Below table shows the available Channel modes in 5032 Master Module



Channel Nos. 0,2,4,6,8,10.12 & 14 can only be assigned as a IO-Link.

| Channel Mode | Description |
|---|--|
| Disabled | Channel is Disabled. |
| Digital Output, Short Circuit, No Load | Channel is Configured as a Digital Output. |
| Digital Input | Channel is Configured as a Digital Input. |
| IO-Link | Channel is Configured as a IO-Link |
| Digital Output | Channel is Configured as a Digital Output. |
| Digital Input, Counter | Channel is Configured as a Digital Input. |
| Digital Input, Fallback | Channel is Configured as a Digital Input. |
| Digital Output, Short Circuit | Channel is Configured as a Digital Output. |
| Digital Input, Timestamp | Channel is Configured as a Digital Input. |
| Digital Input, Timestamp, Fallback | Channel is Configured as a Digital Input. |



Operations

The IO-Link Device objects provide only physical operation mode. There is no virtual device mode offered.

Execution

The following table explains the handling of instruction execution conditions.

| Condition | Description |
|----------------------------------|---|
| Enableln False (false rung) | Processing for EnableIn False (false rung) is handled the same as if the device were taken out of service by Command. The device outputs are de-energized and the device is shown as Program Out of Service on the HMI. All alarms are cleared. |
| Powerup (prescan, first scan) | On prescan, any commands that are received before first scan are discarded. The device is de-energized. On first scan, the device is treated as if it were returning from Hand command source: the instruction state is set based on the position feedback that is received from the device. If the feedback is valid for one position, the device is set to that position. If the device does not have position feedback or the position feedback is invalid, the device is set to the 'unknown/powerup' state. The command source is set to its default, either Operator or Program (unlocked). |
| Postscan | No SFC Postscan logic is provided. |

Add-On Instruction I/O Data InOut Data (raC_Dvc_1734_4I0LMaster, raC_Dvc_1732E_8I0LMaster)

| InOut | Function / Description | DataType |
|-------------------|--|--|
| Ref_MsgCustGetIdx | Channel Assemblies Read | MESSAGE |
| Ref_MsgData | Channel Status Modes information | raC_UDT_IOLinkMaster_5032_Diag_ Assembly |
| Ref_Ctrl_Inf | Sensor Type Information Interface | raC_UDT_ItfAD_I0LinkSensor_Inf |
| Ref_Ctrl_Itf | Device Command, Status Information Interface | raC_UDT_ItfAD_IOLinkDevices |
| Ref_Module | Reference to module in I/O tree | MODULE |
| Inp_I | Device Object Inputs | raC_UDT_ItfAD_4I0L_Master_Inp / raC_UDT_ItfAD_4I0L_Master_Inp |

Output Data

| Output | Function/Descritpion | DataType |
|----------------|---|----------|
| Sts_Active | Device active status: 1 = output power structure is active | BOOL |
| Sts_Available | Device is available for interaction with user code | BOOL |
| Sts_Connected | Device is connected to the Programmable Automation Controller | BOOL |
| Sts_Faulted | Device faulted status: 1 = an active fault exists | BOOL |
| Sts_Ready | Device is ready to perform primary function | BOOL |
| Sts_Warning | Device warning status: 1 = an active alarm or warning exists | BOOL |
| Sts_InhibitCmd | Disable Command inputs from external sources | BOOL |
| Sts_InhibitSet | Disable Setting inputs from external sources | BOOL |
| Sts_eNotReady | Device Not Ready Status | DINT |
| Sts_bNotReady | Bitwise device 'not ready' reason O: Reserved 1: Master Communication Loss 2: Master Not Available 3: Faulted 4 - 31: Reserved | DINT |
| Sts_bFaultCh | Bitwise Channel faulted status 1 = an active fault exists | INT |

Programming Example

Fully configured device on a rung is provided below for reference.

Note that this programming example is the same code that is imported when either importing the supplied rung.L5X files or when using Application Code Manager or the Studio 5000 Import Library Objects wizard plug-in.

The following example uses the 4IOL IO-Link Master device object connected with the module POINT I/O 1734-4IOL IO-Link Master module named *PointIO_4IOL_Master* in slot #3 of a POINT I/O adapter named *Racko1*.

| Master4IOL_101 Configuration | Master4IOL_101 Input | Manhar 401, 404 |
|---------------------------------|---------------------------|---|
| Internace | litterrace | Master 40L 101 |
| COP | COP | raC_Dvc_1734_4IOL |
| Source Rack01:3:C | Source Rack01:3:1 | raC_Dvc_1734_4IOL Master4IOL_101 |
| Dest Master4IOL_101_Cfg_C | Dest Master4IOL_101_Inp_I | Ref_Module PointIO_4IOL_Master -(Sts_Connected)- |
| Length 1 | Length 1 | Ref_Ctrl_Inf PointIO_4IOLMaster_CtrlInf -(Sts_Available)- |
| | | Ref_Ctrl_ltf PointIO_4IOLMaster_Ctrlltf -(Sts_Warning)- |
| | | Cfg_C Master4IOL_101_Cfg_C -(Sts_Faulted)- |
| | | Inp_I Master4IOL_101_Inp_I -(Sts_Ready)- |
| | | |

The following example uses the IO-Link Master device object connected to ArmorBlock 1732E-8IOLM12R IO-Link Master module in named *Armor_8IOL_MasterB*.



The following example uses the IO-Link Master device object connected to 5032-8IOLM12M12LDR/A IO-Link Master module in named *Mod_Master_5032_1*.



Graphic Symbols

Graphic Symbols are used as launch buttons within HMI applications to open up faceplate displays. See <u>Basic Launch Button Attributes</u> section for details on configuration and indicators.

| Graphic Symbol Name | Graphic Symbol | Description | Global Object Parameter Values |
|----------------------------------|-------------------|--|--|
| GO_LaunchFPMaster | S5 X | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g.{::[PAC]Program::IOLinkProgramInstanceName}) #104: Custom button label. Leave blank to use Tag.@Description #110: CH0 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #111: CH1 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #112: CH2 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #113: CH3 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #113: CH3 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #114: CH4 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #115: CH5 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #116: CH6 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH7 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH7 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH7 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH7 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH7 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_4IOL_8IOLMa ster | SS | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g.{::[PAC]Program::IOLinkProgramInstanceName}) #104: Custom button label. Leave blank to use Tag.@Description #110: CH0 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #111: CH1 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #112: CH2 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #113: CH3 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #113: CH3 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #114: CH4 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #114: CH4 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #115: CH5 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #116: CH6 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH7 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH7 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH7 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #112: Display's left position (e.g. 100) (optional) #121: Display's top position (e.g. 100) (optional) |
| GO_LaunchGfx_5032Master | SS X X X | Faceplate navigation button with string tag label. This launch button graphic object allows the user to navigate to the device object faceplate. Graphic button can be used in schematic style displays where a system/network diagram is shown. When available, basic module diagnostics and a live value is displayed. The text on the button face is set to the parameter #104. | #102: A0I Backing Tag Instance (e.g.{::[PAC]Program::IOLinkProgramInstanceName}) #104: Custom button label. Leave blank to use Tag.@Description #110: CH0 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #111: CH2 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #112: CH4 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #113: CH6 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #114: CH8 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #115: CH10 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #116: CH12 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #116: CH12 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #116: CH12 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #116: CH12 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH14 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #117: CH14 A0I Backing Tag (Enter 0, If there is no sensor connected to the channel) #112: Display's top position (e.g. 100)(optional) #121: Display's top position (e.g. 100)(optional) |

FactoryTalk View ME/SE Graphic Symbols



Note that for unused channels enter 0 value.

Studio 5000 View Designer Graphic Symbols

| Graphic Symbol Name | Graphic Symbol | Description | Property Configuration |
|---------------------------|------------------------|---|---|
| AOG_4IOL_L aunch | SS | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Properties Animations Events A General Events AOL_Tag Image: Constraint of the second se |
| AOG_8IOL_L aunch | SS X X X | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Properties Animations Events |
| AOG_5032_ Launch | SS X X X X | The supplied launch button in View Designer is used to navigate to the faceplate in a user application. | Image: Security Image: Security Image: Security Image: Security Image: Security Image: Security Image: Security Image: Security |

Faceplates (raC_Dvc_1734_4I0LMaster, raC_Dvc_1732E_8I0LMaster)

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the .*@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| · | |
|----------------------|--|
| Master4IOL_101 | Master 4IOL 101 |
| Master4IOL_101_Cfg_C | Master4IOL_101 Configuration Interface |
| Master4IOL_101_Inp_I | Master4IOL_101 Input Interface |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data.

| | Master | × | |
|------------|---|-----------|-----|
| 1 | Ready Channel Fault Exist | | — 2 |
| | Trigger | Data | |
| 3 | К СНО СТО | 1.00 Bar | — 5 |
| 4 <u> </u> | CH1 Channel is not configured for IO-Link or Disabled | | |
| | CH2 🔲 🗌 | 245.00 mm | |
| | CH3 Channel is not configured for IO-Link or Disabled | | |
| 7 | →〈 ■ 2 〉 | | |

| ltem | Description |
|------|---|
| 1 | Banner- Ready Status |
| 2 | Channel Fault - There is a fault one or more channel |
| 3 | Channel Faulted |
| 4 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED Depending on type of sensor connected to channel the no. of trigger signal are appear. Total 16 Trigger available on display. |
| 5 | Process Data: Displays the process value and its units. |
| 6 | Channel is not configured for IO-Link or Disabled |
| 7 | Navigation Page 1- Ch0 to Ch3. Page 2- Ch4 to Ch7 Page 3- Ch8 to Ch11 Page 4- Ch12 to Ch15 |

Located

The Locate tab is the second tab of the faceplate. It provides the each channels App Sensor Name, Counter, Signal Strength, Location and Navigation to the respective IO-Link device object.



| ltem | Description |
|------|---|
| 1 | Application Specific Name - Read from device |
| 2 | Counter- Displays the sensor counter value |
| 3 | Signal Strength- Displays the Signal Strength Value |
| 4 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function |
| 5 | Object: Navigate to the Sensor Object for more detailed information |



The View Designer faceplate object lacks the capability of Object Navigation.
Fault Warning Tab

The Fault Warning tab displays information of first fault with time stamp captured for each IO-Link Channel device.



| ltem | Description | | | |
|------|--------------------------|--|--|--|
| 1 | Last fault description | | | |
| 2 | Last fault Time captured | | | |

Faceplates (raC_Dvc_5032_8I0LMaster)

There are basic faceplate attributes that are common across all instructions. See <u>Basic Faceplate Attributes on page 37</u>.

The faceplate title is linked to _*InstanceName.@description*, the .*@description* extended tag property of the Add-On Instruction instance. This is user-configurable from controller/program tags in Studio 5000 Logix Designer.

| Name | ▲ Data Type | Description | Constant |
|-----------------|-------------------------------|-------------------------|----------|
| ▶ Master1 | raC_Dvc_5032_8IOLMaster | Master_5032 | |
| ▶ Master1_Inp_I | rac_UDT_ItfAD_5032_Master_Inp | Master1 Input Interface | |

Home

The Home tab is the main tab of the faceplate. It provides the status of the IO-Link device along with sensor process data.



| ltem | Description |
|------|--|
| 1 | Banner- Ready Status |
| 2 | Channel Fault - There is a fault for one or more channels (In this Case, CHO is Faulted) |
| 3 | Channel Faulted (In this Case, CHO is Faulted) |
| 4 | Trigger Status OFF (0) = Gray LED ON (1) = Blue LED Depending on type of sensor connected to channel the no. of trigger signal are appear. Total 16 Trigger available on display. |
| 5 | Process Data: Displays the process value and its units. |
| 6 | Channel is not configured for IO-Link, But Configured for Other Modes. Below is the List of Other Modes : -Disabled -Digital Output, Short Circuit, No Load -Digital Input -Digital Output -Digital Input, Counter -Digital Input, Fallback -Digital Output, Short Circuit -Digital Input, Timestamp -Digital Input, Timestamp, Fallback |
| 7 | Navigation Page 1- ChO to Ch3. Page 2- Ch4 to Ch7 Page 3- Ch8 to Ch11 Page 4- Ch12 to Ch15 |

In Addition to above status, There are few more conditions explained below:



Shown Status and description messages are explained by Assuming that, User already configured the Master and Sensor hardware in their Project. as shown in below image:



5032 Master is in Fault/Disconnected State



| ltem | Description | | |
|------|--|--|--|
| 1 | Banner- Not Ready Status | | |
| 2 | Message- Master Communication Loss | | |
| 3 | Channel Description: No Data Available | | |

Sensor AOI is not Configuring in PLC Logic.



In the above image, we can find the CH8 description. This description appears when Sensor and Master hardware is configured and AOI is not configured in PLC logic.

Locate

The Locate tab is the second tab of the faceplate. It provides the each channels App Sensor Name, Counter, Signal Strength, Location and Navigation to the respective IO-Link device object.



| ltem | Description | | | | | |
|------|---|--|--|--|--|--|
| 1 | Application Specific Name - Read from device | | | | | |
| 2 | Counter- Displays the sensor counter value | | | | | |
| 3 | Signal Strength- Displays the Signal Strength Value | | | | | |
| 4 | Locate toggle switch Locate the sensor in large machines where there are several sensors close to each other. When Located, the sensor user interface (green and orange LEDs) start flashing synchronously until the operator disables this function | | | | | |
| 5 | Object: Navigate to the Sensor Object for more detailed information | | | | | |
| 6 | Channel is not configured for IO-Link, But Configured for Other Modes. Below is the List of Other Modes : -Disabled -Digital Output, Short Circuit, No Load -Digital Input -Digital Output -Digital Input, Counter -Digital Input, Fallback -Digital Output, Short Circuit -Digital Input, Timestamp -Digital Input, Timestamp -Digital Input, Timestamp, Fallback | | | | | |

The View Designer faceplate object lacks the capability of Object Navigation.

In Addition to above status, There are few more conditions explained below:



Shown Status and description messages are explained by Assuming that, User already configured the Master and Sensor hardware in their Project. as shown in below image:







| ltem | Description | | |
|------|--|--|--|
| 1 | Banner- Not Ready Status | | |
| 2 | Message- Master Communication Loss | | |
| 3 | Channel Description: No Data Available | | |

Sensor AOI is not Configuring in PLC Logic.



In the above image, we can find the CH8 description. This description appears when Sensor and Master hardware is configured and AOI is not configured in PLC logic.

Fault Warning Tab

The Fault Warning tab displays information of first fault with time stamp captured for each IO-Link Channel device.



| ltem | Description | | | |
|------|---|--|--|--|
| 1 | Last fault description (In this Case, CH2 is Faulted) | | | |
| 2 | Last fault Time captured (In this Case, CH2 is Faulted) | | | |

In Addition to above status, There are few more conditions explained below:



Shown Status and description messages are explained by Assuming that, User already configured the Master and Sensor hardware in their Project. as shown in below image:





| | Master | _5032 | | | | × | |
|---|--------|-------|------------------------|----------------|------------|----------|---|
| 1 | | | Not Ready Master Commu | unication Loss | | | 2 |
| | | | Event | | Time | | |
| 3 | ! | | Connection Faulted | | 2024-07-16 | 18:16:59 | |
| 4 | | → CH1 | No Data Available | | | | |
| | | CH2 | Connection Faulted | | 2024-07-16 | 18:16:59 | |
| | | CH3 | No Data Available | | | | |
| | | | | 1234 | | | |

| ltem | Description |
|------|---|
| 1 | Banner- Not Ready Status |
| 2 | Message- Master Communication Loss |
| 3 | Channel Description: Connection Faulted (AOI for Sensor Connected on CHO is running in PLC Logic). |
| 4 | Channel Description: No Data Available (AOI for Sensor Connected on CH2 is not running in PLC Logic). |

Sensor AOI is not Configuring in PLC Logic.



In the above image, we can find the CH8 description. This description appears when Sensor and Master hardware is configured and AOI is not configured in PLC logic.

Application Code Manager

IO-Link Device Library objects can be set-up and configured using Studio 5000 Application Code Manager.

Refer to the section <u>Using Application Code Manager</u> for complete details.

Definition Objects: raC_Dvc_1734_4I0LMaster, raC_Dvc_1732E_8I0LMaster

This object contains the AOI definition and used as linked library to implement object. There is one definition and per add-on instruction to support each IO-Link Master Module. This gives flexibility to choose to instantiate only definition and create custom implement code. User may also create their own implement library and link with this definition library object.

Implementation Objects: raC_LD_Dvc_1734_4I0LMaster, raC_LD_Dvc_1732E_8I0LMaster

| Parameter Name | Default Value | Instance Name | Definition | Description |
|---------------------------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| MasterName | MasterName | [MasterName] | Module | Select the IO-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| ChO_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. O. |
| Ch1_AOI_BackingTagRefe rence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 1. |
| Ch2_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 2. |
| Ch3_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 3. |
| Ch4_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 4. |
| Ch5_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 5. |
| Ch6_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 6. |
| Ch7_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 7. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Implementation Objects: raC_LD_Dvc_5032_8I0LMaster

| Parameter Name | Default Value | Instance Name | Definition | Description |
|----------------------------------|---------------------|------------------|-------------|--|
| RoutineName | {ObjectName} | {RoutineName} | Routine | Enter Routine name. Routine will be created and Object implement rung(s) inserted. A JSR will be inserted in MainRoutine. If routine name already exists, then object will be inserted into existing routine. By default, parameter is set to Object Name. |
| TagName | {ObjectName} | {TagName} | Backing Tag | Enter the backing tag of the main AOI. This will serve as the base tag name for other tags in this object that are derived from the base. |
| TagDescription | {ObjectDescription} | {TagDescription} | | Tag Description of the main AOI backing tag |
| MasterName | MasterName | [MasterName] | Module | Select the IU-Link master module. If connecting to a non-library object module, enter the name of the master only. Note: entering non-library object modules will result in the parameter displaying a red X. This will still generate properly as long as the entered name exists in the project. |
| Ch0_A0I_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. O. |
| Ch2_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 2. |
| Ch4_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 4. |
| Ch6_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 6. |
| Ch8_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 8. |
| Ch10_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 10. |
| Ch12_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 12. |
| Ch14_AOI_BackingTagRef erence | | | Module | Select the AOI Tag for the Sensor Connected on Channel No. 14. |



Note that if the tag names are manually entered or not linked to input channel tags a red 'X' will be shown beside the parameter. This is acceptable and the program can still be generated.

Linked Libraries

| Link Name | Catalog Number | Revision | Solution | Category |
|------------------------|-------------------------|----------|-----------------|----------|
| raC_Dvc_1734_4I0LMater | raC_Dvc_1734_4I0LMaster | 3.2 | (RA-LIB) Device | 10-Link |

| raC_Dvc_1732E_8I0LMaster | raC_Dvc_1732E_8I0LMaster | 3.2 | (RA-LIB) Device | IO-Link |
|--------------------------|--------------------------|-----|-----------------|---------|
| raC_Dvc_5032_8I0LMaster | raC_Dvc_5032_8I0LMaster | 3.2 | (RA-LIB) Device | IO-Link |

Configured HMI Content

| HMI Content | Instance Name | Description |
|------------------|-------------------------------|---|
| Launch Button ME | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button ME | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |
| Launch Button SE | {ObjectName}_GO_LaunchTextFP | Global Object configured callout instance Text Button |
| Launch Button SE | {ObjectName}_GO_LaunchGraphFP | Global Object configured callout instance Graphical Button |

Attachments

| Name | Description | File Name | Extraction Path |
|-----------------------------|--------------------|--|---|
| V3_raC_Dvc_Global | Graphic Symbols ME | (raC-3-ME) Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewME\GlobalObject - ggfx |
| V3_raC_Dvc_Global | Graphic Symbols SE | (raC-3-SE) Graphic Symbols - IO-Link Device.ggfx | {ProjectName}\Visualization\FTViewSE\Global Object - ggfx |
| V3_raC_Dvc_1734_4I0LMaster | Faceplate ME | (raC-3_xx-ME) raC_Dvc_1734-4I0LMaster_Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_1734_4I0LMaster | Faceplate SE | (raC-3_xx-SE) raC_Dvc_1734-4I0LMaster_Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_1732E_8I0LMaster | Faceplate ME | (raC-3_xx-ME) raC_Dvc_1732E-8I0LMaster_Faceplate.gfx | {ProjectName}\Visualization\FTViewME\Displays - gfx |
| V3_raC_Dvc_1732E_8I0LMaster | Faceplate SE | (raC-3_xx-SE) raC_Dvc_1732E-8I0LMaster_Faceplate.gfx | {ProjectName}\Visualization\FTViewSE\Displays - gfx |
| V3_raC_Dvc_IOLink | View Designer | (raC-3_xx-VD) raC_Dvc_IOLink.vpd | {ProjectName}\Visualization\ViewDesigner - vpd |
| V3_RM_raC_Dvc_I0_Link | Reference Manual | DEVICE-RM300C-EN-P.pdf | {ProjectName}\Documentation |
| V3_I0_Link_Images | HMI Image Set | HMI FactoryTalk View Images - png.zip | {ProjectName}\Visualization\Images - png |

Rockwell Automation Support

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|---|---|------------------------------|
| Local Technical Support Phone Numbers | Locate the telephone number for your country. | <u>rok.auto/phonesupport</u> |
| Technical Documentation Center | Quickly access and download technical specifications, installation instructions, and user manuals. | rok.auto/techdocs |
| Literature Library | Find installation instructions, manuals, brochures, and technical data publications. | <u>rok.auto/literature</u> |
| Product Compatibility and Download Center (PCDC) | Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes. | rok.auto/pcdc |

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Waste Electrical and Electronic Equipment (WEEE)



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