SIEMENS

SIMATIC HMI

WinCC V8.0 WinCC/PerformanceMonitor

System Manual

Printout of the Online Help

03/2023
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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ **DANGER**
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ **WARNING**
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ **CAUTION**
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ **WARNING**
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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WinCC/PerformanceMonitor - Installation Notes 1

1.1 Preface

Overview

The Installation Notes manual contains important information on the scope of delivery, licenses and steps for installing or uninstalling PerformanceMonitor (PMO).

Scope of Delivery

Components supplied:

You will receive the following components:

- DVD PMO V8.0
  WinCC/PerformanceMonitor V8.0
  Information Server Excel-Add-Ins 2016
- Required licenses

Note

Hardware and software requirements

For hardware and software prerequisites to install PMO V8.0, refer WinCC Information System > Installation Notes > WinCC installation requirements. All WinCC advanced options follow the same requirements as WinCC.

Note

Windows 10 OS version 1607

The Windows 10 OS version 1607 is not recommended to use as it has some issue due to which some PMO Services will not work properly.

1.2 Performance data

The following values serve as a guideline and depend on the hardware used as well as the data change per unit of time.

Recommendation: Use a maximum of 5,000 archive tags

The following calculation examples show how you reach the quantity of 5,000 archive tags:

- Example 1:
  10 operands per equipment and 500 equipments
  10 operands x 500 equipments = 5,000 archive tags
- Example 2:
  20 operands and five items of context information per equipment and 200 items of equipment
  (20 operands + 5 items of context information) x 200 items of equipment = 5,000 archive tags

Recommendation: Display the equipments in several runtime controls

Three equipments with 10 operands each are calculated in the following calculation example. The values of the operands are collected with a cycle of one seconds.

If you display these three equipments in a runtime control with an evaluation time of one hour, 108,000 values have to be calculated and displayed.

Example hardware configuration

The determined performance data are based on the following hardware configuration:

Processor	Intel I5-3470 (Quad Core with 3.2 GHz)
Main memory	16 GB
Operating system	Microsoft Windows Server 2016 Standard (64-bit)
Hard disk	500 GB • System partition (drive C:): 150 GB • Data partition (drive D:): 350 GB
Process Historian database	1 TB

Example configuration data

The determined performance data are based on the configuration:

Objects in the PerformanceMonitor Configuration Studio	**Number**
Equipments	10
KPI per Equipment	6
Operands per KPI	10
Context information per Equipment	3

Objects in the process picture	**Number**
PerformanceView control	1
Equipment in the PerformanceView control	3

Determined performance data with logging cycle of 1 minute

The following surcharge times have been determined in the PerformanceView control based on the hardware configuration and configuration data listed above:

Table 1-1 Measured system surcharge time with 60 archived values per hour

Evaluated time period	Without context change	Context change between two values	Context change between four values
1 hour	Approx. 1 second	Approx. 1 second	Approx. 1 second
24 hours	Approx. 1.x seconds	Approx. 3 seconds	Approx. 3.x seconds

Table 1-2 Measured system surcharge time with 3600 archived values per hour

Evaluated time period	Without context change	Context change between two values	Context change between four values
1 hour	< 2 seconds	Approx. 2 seconds	Approx. 4 seconds
24 hours	Approx. 51 seconds	Approx. 111 seconds	Approx. 222 seconds

Restrictions for virtual machines due to performance and capacity limits

This section includes information on the tested performance and capacity limits.

Configuration/Supported limits

The supported limits and configuration of physical machines can be applied. When these supported limits are exceeded, you may experience unexpected results, a significant drop in performance and other negative consequences. Changing the configuration (e.g. multiple hubs, no fixed reservation of work memory) may result in loss of performance and can therefore not be guaranteed.

1.3 Licenses

The following table shows the licensing model for the WinCC PerformanceMonitor.

An archive tag corresponds to one of the following objects whose values are saved in the Process Historian component of WinCC:

- Operand
- Status value of a structured operand
- Context information

Name on license data storage medium	Number of logging tags	License type
WinCC PerformanceMonitor Basic	30	Single license
WinCC PerformanceMonitor Log[1]	30 / 100 / 300 / 1000	Count Relevant License

Name on license data storage medium	Number of logging tags	License type
WinCC PerformanceMonitor Upgrade[2] • WinCC DowntimeMonitor 6.2/7.0 to WinCC PerformanceMonitor V7.2	60	Upgrade License
WinCC PerformanceMonitor Upgrade[3] • WinCC PerformanceMonitor V7.2 to WinCC PerformanceMonitor V8.0	-	Upgrade License
WinCC PerformanceMonitor Upgrade[4] • WinCC PerformanceMonitor V7.3 to WinCC PerformanceMonitor V8.0	-	Upgrade License
WinCC PerformanceMonitor Upgrade[5] • WinCC PerformanceMonitor V7.4 to WinCC PerformanceMonitor V8.0	-	Upgrade License
WinCC PerformanceMonitor Upgrade[6] • WinCC PerformanceMonitor V7.5 to WinCC PerformanceMonitor V8.0	-	Upgrade License

1 In addition to "WinCC PerformanceMonitor" license.

2 Allows upgrade of the WinCC DowntimeMonitor 6.2 / 7.0 to WinCC PerformanceMonitor V7.2. Includes a "WinCC PerformanceMonitor" license and a "WinCC PerformanceMonitor Log" license with a total of 60 logging tags. An upgrade to PerformanceMonitor V7.3 must be purchased separately.

3 Authorizes an upgrade of **one** licensed version of the PerformanceMonitor V7.2 to PerformanceMonitor V8.0

4 Authorizes an upgrade of **one** licensed version of the PerformanceMonitor V7.3 to PerformanceMonitor V8.0

5 Authorizes an upgrade of **one** licensed version of the PerformanceMonitor V7.4 to PerformanceMonitor V8.0

6 Authorizes an updrade of **one** licensed version of the PerformanceMonitor V7.5 to PerformanceMonitor V8.0

1.4 Installation basics

PerformanceMonitor components

During installation of the PerformanceMonitor, you can select the following components using the "User-defined installation" option. Only the components "Editor and Service" and "Controls" are installed as part of the "Package installation".

Component	Description	PerformanceMonitor server		PerformanceMonitor client	
		Mandatory	Optional	Mandatory	Optional
Editor and Service	Installs the PerformanceMonitor and the required services.	Yes[1, 2]	-	-	-
Controls	Installs the following Runtime controls for output of the KPI or operands: • WinCC PerformanceViewControl • WinCC PerformanceGanttControl • WinCC PerformanceTableControl	Yes	-	Yes	-
Controls (plug-in)	Installs the plug-in for the WinCC/WebNavigator server. You can only install the plug-in if the WinCC/WebNavigator server has already been installed.	-	Yes	-	Yes[3]
Report (templates)	Installs the report templates for use in the SIMATIC Information Server.	-	Yes	-	Yes
Information Server - MS Excel Add-Ins 2014 and 2016[5]	Installs the Excel add-in to output the calculated KPIs in MS Excel. The SIMATIC Information Server is required as data source. MS Excel 2007, 2010, 2013 and 2016 are supported. Requirement: .NET-Framework 4.5 is installed.	-	Yes	-	Yes

1 The installation on a client without its own project has not been approved.

2 A Runtime license and a WinCC client project is required on a WinCC client with its own project.

3 Required on the WebNavigator client if the PerformanceMonitor controls are not installed. Then install the plug-in from the download area of the Web Navigation interface.

4 The installation is not necessary if a central Process Historian is available in the network and the results of the PerformanceMonitor are to be saved on the central Process Historian.

5 Can also be installed separately on a standard PC. Standard PC requires access to SIMATIC Information Server and PerformanceMonitor Server.

Report generation with SIMATIC Information Server

The Information Server must be installed in order to generate reports.

You can install the required components using the setup of WinCC.

Installation sequence

If you want to use the report generation feature of the Information Server, perform the following installation sequence:

1. WinCC
2. Information Server 2014 SP3 Update 4
3. PerformanceMonitor
4. Configuring the PerformanceMonitor server

Supplementary installation of the SIMATIC Information Server

When you install the Information Server after the PerformanceMonitor, perform the following installation sequence:

1. WinCC
2. PerformanceMonitor
3. Configuring the PerformanceMonitor server
4. Information Server 2014 SP3 Update 4
5. Retro-installation of the PerformanceMonitor component, "Report (Templates)"

See also

Installing PerformanceMonitor (Page 12)

1.5 Installing PerformanceMonitor

Introduction

The PerformanceMonitor server saves the calculated KPIs in one of two storage locations:

- Common Archiving Configuration: Included with PerformanceMonitor. Common Archiving Configuration will be the dafault storage location, if Central Process Historian is configured, then also the data will be archived to Common Archiving Configuration for quick access.
- Central Process Historian Server: Installation via setup of the Process Historian Server 2020 SP2 Latest version.

The installation of a PerformanceMonitor client is completed after the PerformanceMonitor setup and rebooting the PC.

NOTICE
Restart of PC required after installation Make sure that a restart does not have a negative impact on the operation of your plant prior to installation. A restart is required after installation of the PerfomanceMonitor. If you are installing the PerformanceMonitor on a WinCC server with process connection, the connection to the process is interrupted by the restart. Recommendation: Install the PerformanceMonitor on a separate PC without process connection.

Requirement

WinCC V8.0 is installed on the WinCC server.

Procedure

1. Insert the PerformanceMonitor DVD into the DVD drive.
2. Double-click the "Setup.exe" file in the "DVD" folder.
   The setup program is started.
3. Select the required setup language and follow the instructions.
4. Select "User-defined installation" to install a PerformanceMonitor server.
5. Select either "Package installation" or "User-defined installation" to install a PerformanceMonitor client.
6. Confirm your entries.
   The PerformanceMonitor is installed.
7. Restart your PC.

Migrating the Data from Local Process Historian to Common Archiving Server

When user is upgrading PerformanceMonitor to V8.0, a default “Process Historian DB Migrator” dialogue box opens for migrating the data from Local Process Historian server to Common Archiving.

To migrate the from Local Process Historian to Common Archiving follow the steps:

1. Click the “Browse” button on “WinCC project path for migration” and select the destination path for data files.
2. Click the “Browse” button on “PH database path for migration” and select the path where the Local Process Historian data files were stored.

3. Click the “Browse” button on “PH database log file path for migration” and select the destination path for log files.
4. Click "Migrate".

The data from Local Process Historian is transferred to Common Archiving. A migration complete dialog box will appear after the complete data is migrated.

User can also open the “Process Historian DB Migrator” dialogue box for data transfer from the below location.

C:\Program Files (x86)\Siemens\WinCC\PerformanceMonitor\bin

Note

If PH DB Migrator is being used by multiple projects, then each project need to be migrated separately with the same PH DB files. Also, all the data from the PH DB will be transferred to the common archiving DB of individual project.

Result

The PerformanceMonitor is installed.

After the initial start of the PerformanceMonitor, connect to Common Archiving server or "Central Process Historian server" as per requirement, either you connect to any centralized PH or not, PMO will be connected to common archiving DB.

Uninstalling PerformanceMonitor

1. Insert the PerformanceMonitor DVD into the DVD drive.
2. Double-click the "Setup.exe" file in the "DVD" folder.
   The setup program is started.
3. Select the required setup language and follow the instructions.
4. Select "Uninstall".
5. Confirm your entries.
   The PerformanceMonitor is uninstalled.
6. Restart your PC.

See also

PH Database Installation Wizard (https://support.industry.siemens.com/cs/us/en/view/109475338/74159375371)

Process Historian (http://support.automation.siemens.com/WW/view/en/67501588/133300)

Database installation wizard (https://support.industry.siemens.com/cs/us/en/view/109475338/74159375371)

1.6 Upgrading PMO

Introduction

You can upgrade to PMO V8.0 through an upgrade installation. You need to upgrade licenses of PMO prior to V8.0 to the current version.

If you currently have PMO V7.2 or higher installed on your system, you can perform the upgrade installation.

Upgrade preparation

Backing up a WinCC project

Make a backup copy of your project before upgrading PMO.

Restart PC before installing the update

Restart the PC before installing the update to PMO V8.0.

Procedure to upgrade licenses

1. Open Automation License Manager.
2. Transfer the upgrade license keys to the drvie where the current version licenses are available.
3. In the menu bar, select "License Key > Upgrade". This operation will merge the old license and the upgrade license into one new license.

WinCC/PerformanceMonitor - Release Notes 2

2.1 Notes on PerformanceMonitor

Introduction

These release notes contain important information.

The statements in these release notes take precedence over information provided in the manuals and in the online help.

Read these release notes carefully as they contain useful information.

Defense in depth

See the notes on "Industrial Security" on the Siemens website:

http://www.industry.siemens.com/topics/global/de/industrial-security/konzept/Seiten/defense-in-depth.aspx (http://www.industry.siemens.com/topics/global/en/industrial-security/concept/Pages/defense-in-depth.aspx)

Faulty import after character change

When you change entries in an exported Excel spreadsheet from capital letters to lower-case letters after an import, the new import of the changed table will be faulty.

Documentation for working with time ranges

Contrary to what is stated in the documentation under "Output KPIs > Basics for output of KPIs", the duration with reference point is not calculated starting at any random time in the past.

Use a specific time in the past to calculate the duration with reference point.

Examples for the functions POW and EXP in the formula editor

You can, for example, use the following format for the functions POW and EXP:

- Pow(o1,2)
- Exp(o1)

o1 is the operand in this case.

Local Process Historian server is removed and Common Archiving server is introduced

From V8.0, Local Process Historian server is removed, and Common Archiving Configuration is introduced.

See also

http://www.industry.siemens.com/topics/global/de/industrial-security/konzept/Seiten/defense-in-depth.aspx (http://www.industry.siemens.com/topics/global/en/industrial-security/concept/Pages/defense-in-depth.aspx)

2.2 Service and Support

2.2.1 Warnings

Safety notes

Warning notice system

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⚠ DANGER
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⚠ WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.

⚠ CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

Note

is an important information about the product, the way to handle the product or the respective part of the documentation and we wish to especially bring this to your notice.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use

Note the following:

⚠ WARNING

Proper use of Siemens products

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Trademarks

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Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit

http://www.siemens.com/industrialsecurity

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

http://www.siemens.com/industrialsecurity

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described.

Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions. Suggestions for improvement are welcomed.

The statements in the online documentation are more binding than the statements in the manuals and PDF files.

Please follow the Release Notes and Installation Notes. The information in these Release Notes and Installation Notes has priority over that in the manuals and online help with regard to legal validity.

Siemens AG

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SIMATIC Human Machine Interfaces

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2.2.2 GDPR - General Data Protection Regulations

Siemens takes data privacy principles, such as the privacy by design and default principle, into account when developing its products and services.

For this product SIMATIC WinCC V7.5 incl. Options this means the following:

Personal data processed by the Application

This product collects and processes the following personal data:

- User name, i. e. Login, which may directly contain or establish a reference to the family name and/or first name
- Timestamps: date / time of login, logoff and access
  In the WinCC Option for Process Control application "Split Screen Manager", the login timestamp and user name are saved without encryption with the picture management data.
  In the WinCC/WebNavigator diagnostic page, logged in users and timestamps are saved without encryption.
- Location data (time zone)
- Computer name
- IP addresses
- MAC addresses
- E-mail addresses (WinCC Options)
- In case of using UMC, additional personal data can be added in the tool, e. g. telephone numbers or addresses.
  This data is not needed for the product functionality and should not be stored on the same medium.

If the user links the above mentioned data with other data, e. g. shift plans, or stores personal data on the same medium, e. g. hard disk, and thus establishes a personal reference, the user must ensure compliance with data protection regulations.

Purposes

The above data is required for the following purposes:

- Access protection and security measures (e. g. Login, IP address)
- Process synchronization and integrity (e. g. time zone information, IP addresses)
- Archiving system for traceability and verification of processes (e. g. access timestamps)
- Message system for traceability and availability (e. g. e-mail notification)

The storage of data is appropriate and limited to what is necessary, as it is essential to identify the authorized operators and process events.

Data configuration

The customer may configure the data collected via the product as follows:

- Display data in process pictures
- Data output in form of reports, e. g. for printing or display as electronic file
- Data collection and evaluation in form of graphics, e. g. for KPI analysis

Deletion policy

The product does not provide an automatic deletion of the above data.

If necessary, these can be deleted manually if desired. To do this, please refer to the product documentation or contact customer support.

Securing of data

The above data will not be stored anonymously or pseudonymized, because the purpose of access and event identification cannot be achieved otherwise.

The above data is secured by adequate technical measures, such as:

- Encryption of log data
- Storing the process data in access-protected SQL databases
  The user must ensure the access protection as part of their process configuration.

2.2.3 Customer Support

Customer Support and Technical Support

You can reach the SIMATIC hotlines at the times specified in the following table. The SIMATIC hotline employees speak German and English. The Authorization hotline offers French, Italian or Spanish customer support in addition to German and English.

Technical support

Nuremberg	(GMT +1:00)
Service Hours	Monday - Friday, 8:00 to 17:00 (CET/CEST)
Phone	+49 (0)911 895 7222
Fax	+49 (0)911 895 7223
E-mail	http://www.siemens.com/automation/support-request (http://www.siemens.com/automation/support-request) (http://www.siemens.com/automation/support-request)

An overview of the Technical Support is available at the following URL:

- http://support.automation.siemens.com/WW/view/en/16605032 (http://support.automation.siemens.com/WW/view/en/16605032)

Automation Value Card (AVC)

The Automation Value Card (AVC) provides extended Technical Support and is available 24 hours every day of the week. Information on the AVC can be found at the following URL:

- http://support.automation.siemens.com/WW/view/en/21981898 (http://support.automation.siemens.com/WW/view/en/21981898)

SIMATIC Customer Online Support

Service and Support

An overview of the support offering for our products is available at the following URL:

- http://www.siemens.com/automation/service&support (http://www.siemens.com/automation/service&support)

In Product Support, for example, you will find downloads of firmware updates, service packs and useful utilities.

Online Help is available so that you can successfully use the Support offering. Open the Online Help by selecting the corresponding button on the Internet site or at the following URL:

- http://support.automation.siemens.com/WW/support/html_00/help/Online_Hilfe.htm (http://support.automation.siemens.com/WW/support/html_76/help/Online_Hilfe.htm)

WinCC FAQs

WinCC Online Support with information on FAQs (Frequently Asked Questions) may also be found at the following URL:

- http://support.automation.siemens.com/WW/view/de/10805548/133000 (http://support.automation.siemens.com/WW/view/en/10805583/133000)

Technical Forum

The Technical Forum supports exchange with other SIMATIC users. It is available at the following URL:

- http://www.siemens.com/automation/csi/forum (http://www.siemens.de/automation/csi_en/forum)

Technical documentation for SIMATIC products

You can find a guide to the technical documentation provided for individual SIMATIC products and systems at the following URL:

- http://www.siemens.com/simatic-tech-doku-portal (http://www.siemens.com/simatic-tech-doku-portal)

Contact person database

To contact your local agent, search our contact database at the following URL:

- http://www.automation.siemens.com/partner/index.asp (http://www.automation.siemens.com/partner/index.asp?lang=en)

Product Information

SIMATIC WinCC

Go to the following URL for additional information about WinCC products:

- http://www.siemens.com/wincc (http://www.siemens.com/wincc)

SIMATIC Products

Go to the following URL for additional information about SIMATIC products:

- http://www.siemens.com/simatic (http://www.siemens.com/simatic)

See also

Internet: Support Request (http://www.siemens.com/automation/support-request)

Internet: Technical support (http://support.automation.siemens.com/WW/view/en/16605032)

Internet: Automation Validation Card (AVC) (http://support.automation.siemens.com/WW/view/en/21981898)

Internet: Service and Support (http://www.siemens.com/automation/service&support)

Internet: WinCC FAQs (http://support.automation.siemens.com/WW/view/en/10805583/133000)

Internet: Support Technical Forum (http://www.siemens.de/automation/csi_en/forum)

Internet: Support Online Help (http://support.automation.siemens.com/WW/support/html_76/help/Online_Hilfe.htm)

Internet: Technical documentation for SIMATIC products (http://www.siemens.com/simatic-tech-doku-portal)

Internet: Contact person database (http://www.automation.siemens.com/partner/index.asp?lang=en)

Internet: Information about WinCC (http://www.siemens.com/wincc)

Internet: SIMATIC Products (http://www.siemens.com/simatic)

http://www.siemens.com/automation/support-request (http://www.siemens.com/automation/support-request)

2.2.4 Support Request

Dear customer

In order to provide you with fast and effective support, please complete the "Support Request" form online on the Internet. Describe the problem in as much detail as possible. We would appreciate if you would provide us with all project data, so that we can reproduce the error situation or shorten the turn-around time.

Before filling out the support request, check whether your configured quantity structure is within the range of tested quantity structures (see topic "Performance Data").

Support Request form

The Support Request form is available at the following URL:

- http://www.siemens.com/automation/support-request (http://www.siemens.com/automation/support-request)

When filling out the report, you will be guided through several steps, which will ask about all required information.

A detailed description of the Support Request can be found at the following URL:

- http://support.automation.siemens.com/WW/view/en/16605654 (http://support.automation.siemens.com/WW/view/en/16605654)

Procedure

1. Open the "Support Request" form using the link on the Internet. Step 1 "Select product" is displayed:
2. Enter the project name in the "Product/Order number" box. Upper/lower case is not relevant. Search for parts of the product name or enter the full product name in the correct order. You can e. g. search for the following terms:
   - "WinCC Runtime"
   - "WinCC DataMonitor"
   - "WinCC webnavigator"
   - "Connectivity"
   The found products are offered in the "Product selection" field.
3. Select the desired product and click on "Next" to switch to step 2 "Select use case".
4. Select a use case or describe your specific use case in the "Other application case" field.
5. Press "Next" to switch to step 3 "Our solutions".
   Suggested solutions and FAQs for the selected key words are listed.
   Once you have found a suggested solution for your problem, you can close the form in the browser.
   If you did not find any applicable suggested solutions, press "Next" to switch to step 4 "Describe problem".
6. Describe your problem as exactly as possible in the "Details" field.
   Pay particular attention to the following questions and comments. Please also check the WinCC installation and configuration with regard to the following references.
   If you have any idea what has caused the error, please let us know. No detail should be omitted, even if you consider it unimportant.
   - Was the configuration data created with older WinCC versions?
   - How can the error be reproduced?
   - Are other programs running simultaneously with WinCC?
   - Have you deactivated the screen saver, virus checker and power management function?
   - Search the computer for log files (WinCC\Diagnose*.log, drwatson.log, drwtsn32.log). The log files are needed for error analysis. Thus, be sure to send the log files as well.
7. Use the "Search" button to upload your affected project and the log files (e. g. as a Zip file) to the Support Request.
   Press "Next" to switch to step 5 "Provide contact information".
8. Enter your contact information.
   Read the privacy notice and choose whether your personal data should be permanently saved.
   Press "Next" to switch to step 6 "Summary & Send".
9. Press the "Print" button if you would like to print the support request.
   You close the support request by clicking the "Send" button.
   Your data will be transmitted to Customer Support and processed there.

Thank you for your cooperation. We hope that we can be of assistance in solving your problems.

Your WinCC Team

See also

Internet: Error report (http://www.siemens.com/automation/support-request)

Internet: Overview of Support Request (http://support.automation.siemens.com/WW/view/en/16605654)

WinCC/PerformanceMonitor - Documentation 3

3.1 Basics

3.1.1 Basics about the PerformanceMonitor

Motivation

Up to now, you have calculated the relevant characteristics for controlling your plant outside WinCC and displayed them graphically in supplemental tools, such as Excel.

You can use the PerformanceMonitor to identify deviations and optimization potential earlier. In this way, you can cut costs and reduce downtimes.

Use

Using the WinCC PerformanceMonitor option, you can integrate the calculations and representations of key performance indicators (KPIs) in WinCC.

The PerformanceMonitor provides support for plant controlling and helps you to substantiate decisions with KPIs:

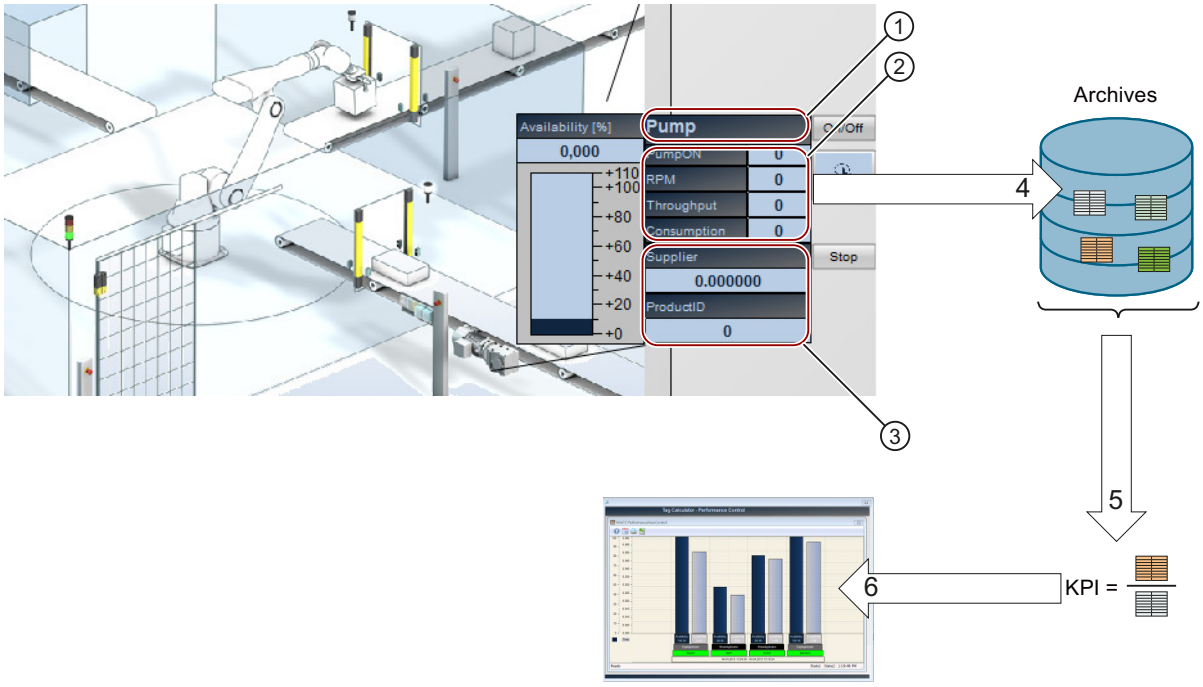
- Management and quality assurance
  Complete transparency for all machines as basis for optimizing plant productivity.
- Servicing and maintenance
  Support through calculation of characteristics, cyclically and triggered by process events.
- Line management and plant operator
  The operator is always kept up-to-date by graphical display of the characteristics.

The PerformanceMonitor uses the tools and user interfaces you know from WinCC. Use of the existing infrastructure reduces the administration and configuration overhead.

How it works

The PerformanceMonitor calculates the KPIs based on the process values available in WinCC. To visualize the evaluations, you can use the available WinCC configuration options, for example, the Graphics Designer.

The following figure shows the visualization of data from the plant. Key performance indicators are later calculated from this data and displayed graphically:



① The plant section is represented as "Equipment" in the PerformanceMonitor Configuration Studio. KPIs are calculated for the equipment.

② WinCC tags which are connected to operands in the PerformanceMonitor Configuration Studio. An operand is an input parameter of KPIs.

③ Additional context information, e.g. Supplier or product identifier (ProductID). The context information is important for the subsequent evaluation of the calculated KPIs.

④ The operands associated with the WinCC tags are stored in the archive. The number of operands and the amount of context information stored depends on the licensing.

⑤ You can use these operands to calculate the KPIs for a period of time specified at the time of evaluation.

⑥ You can also evaluate the calculated KPIs in Runtime and/or in WinCC reports or in Information Server reports in graphical or tabular form.

See also

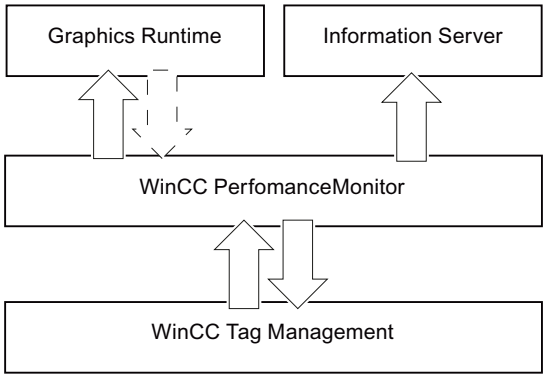
PerformanceMonitor Configuration Studio (Page 35)

WinCC/PerformanceMonitor - Getting Started (http://support.automation.siemens.com/WW/view/en/82523701/133300)

3.1.2 Use in the WinCC environment

Overview

The figure below shows the use of the PerformanceMonitor in the WinCC environment:



WinCC Tag Management	Connect operands to WinCC tags (read values)
WinCC Performance-Monitor	PerformanceMonitor Configuration Studio for configuring KPIs, equipment, operands, structured operands, etc. Runtime controls for evaluating and displaying the calculated KPIs. Configuration in the Graphics Designer.
Graphics Runtime Information Server	Operands store the recorded values in Common Archiving. The KPIs are calculated and shown in tabular/graphical form for a specific query by a control.

Configuration examples

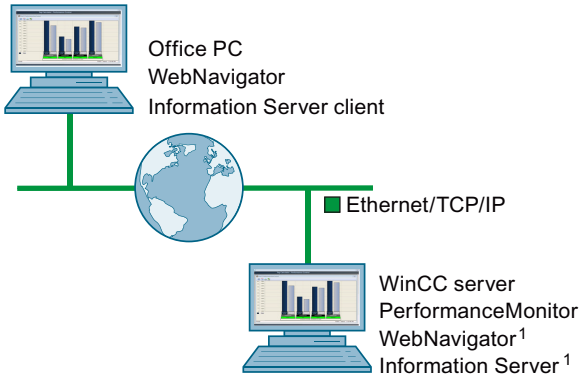
The PC needs to be restarted after installation of the PerformanceMonitor. The following is recommended for integration of the PerformanceMonitor into an existing infrastructure:

- Provide an additional server for the PerformanceMonitor.
- You can also install the PerformanceMonitor on a PC without process connection.

All of the following configuration examples also show the use of the Information Server and the WebNavigator server.

Single station system

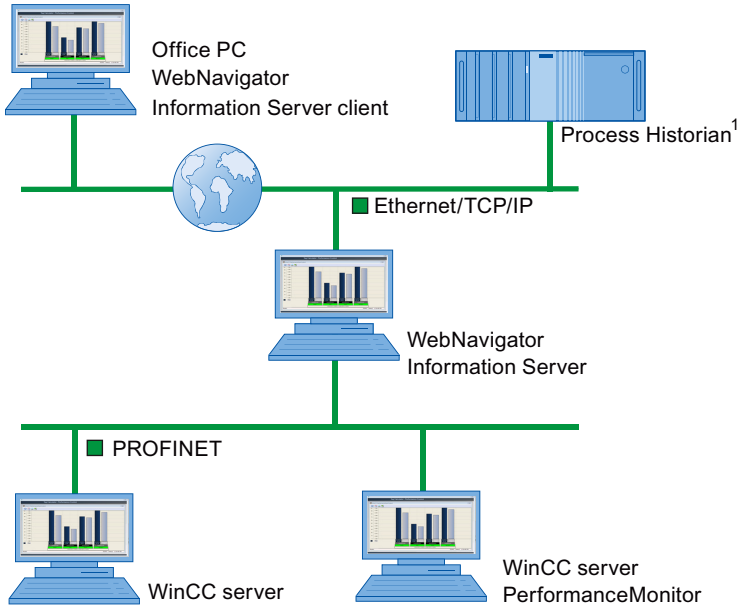
The figure below shows the use of the PerformanceMonitor in a single-user system.
The single-user solution is only suitable for small scale projects. The optional packages Information Server and WebNavigator server place an additional load on performance:



1 Optional. Separate station recommended.

Client/server system: Access via WinCC clients

The figure below shows the integration of the PerformanceMonitor into an existing client/server system. WinCC/Server is installed in addition on the PC with the PerformanceMonitor. You can use it to access the functions of the PerformanceMonitor from all WinCC clients in Runtime.



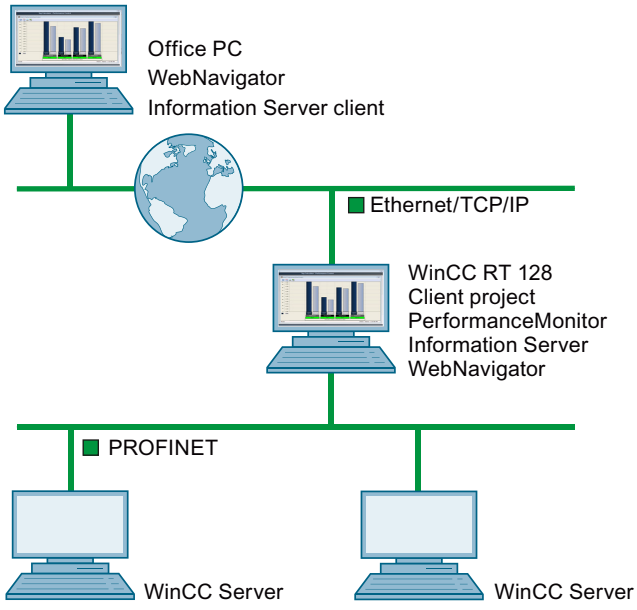
1 Optional. The use of a central Process Historian is supported in all shown configuration examples.
For more information about using the Process Historian, refer to the documentation for the "SIMATIC Process Historian".

Note

Archiving data of a single-user installation (local archiving) into another single-user installation (local archiving) is not allowed.

Client/server system: Using WinCC/Config RT 128 TAG

The figure below shows the integration of the PerformanceMonitor into an existing client/server system. WinCC/Config-RT 128 TAG is installed in addition on the PC with the PerformanceMonitor. Access to the functions of the PerformanceMonitor in Runtime is therefore limited to this PC.



3.1.3 Objects in the PerformanceMonitor

Overview

To calculate and display KPIs and the associated information, the PerformanceMonitor uses the following objects:

Object	Definition	Use/evaluation in WinCC
Equipment	Represents a freely-definable plant or plant unit.	You assign to each piece of equipment the desired KPIs that are calculated for the equipment.
KPI ("Key Performance Indicator")	A key performance indicator is calculated as required for a defined time period.	You define the KPI from one or more operands and KPIs - independent of the equipment.
Operand	Saves a value with a time stamp in Common Archiving.	Obtains its value from a WinCC tag or a formula.
Structured operand	Saves a state with a time stamp in Common Archiving.	Contains a list of states that are assigned values or value ranges. You can evaluate the states in calculations.

Object	Definition	Use/evaluation in WinCC
Operand formula	Calculates a value from process values. The result is returned to an operand.	Required for calculation of a value which is not provided by the controller, for example.
Context information	Defines criteria that describe a piece of equipment in more detail, for example: • Manufacturer • Product • Batch • Operator	Required for detailed evaluation in a report or plant picture. Not required for pure calculation of KPIs.

See also

PerformanceMonitor Configuration Studio (Page 35)

3.1.4 Type and instance concept

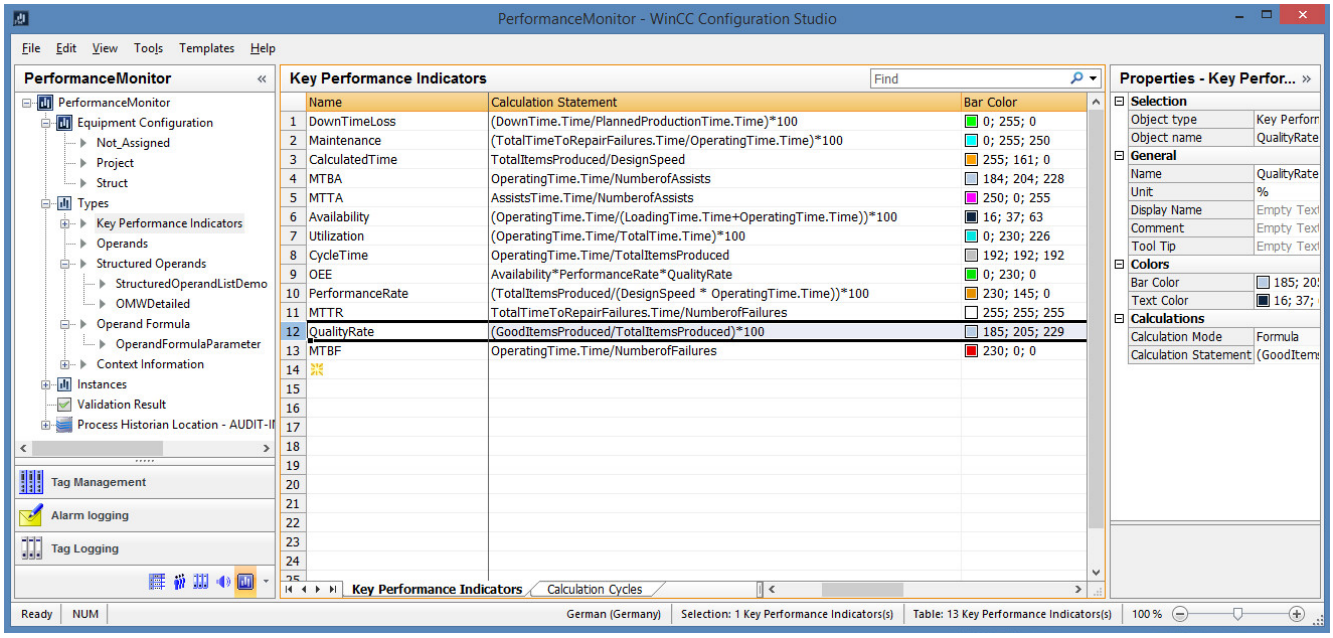
Introduction

The PerformanceMonitor uses a type and instance concept.

Types

You create operands, operand formulas, structured operands, KPIs, and context information as types with unique names:

- You define the calculation formula for KPIs.
- You define the calculation formula and the evaluation type for operand formulas.
- You define the evaluation type for operands.
- You define the available entries for structured operands and context information.

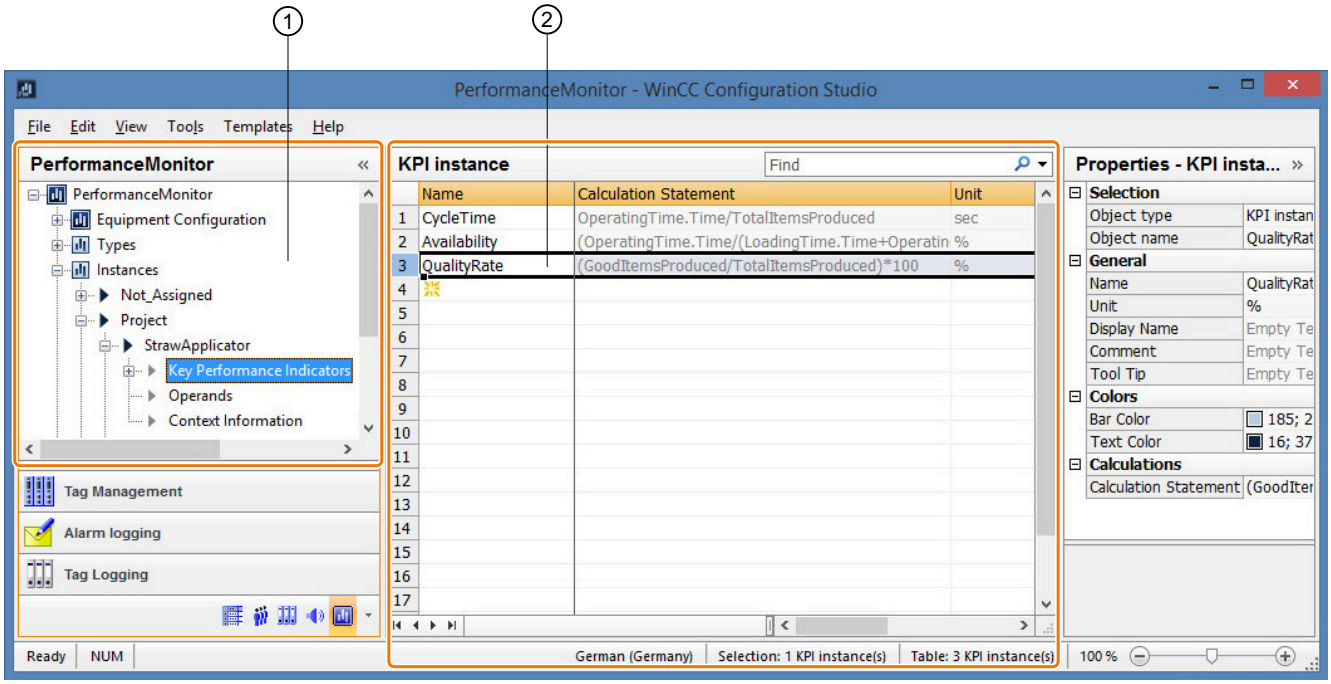


Example: To determine the quality of products produced in three production lines of a factory building, set only the KPI "QualityRate" as well as the two operands "GoodItemsProduced" and "TotalItemsProduced". Then you define the KPI: "QualityRate = (GoodItemsProduced / TotalItemsProduced)*100".

Instances

Once you have mapped your plant in PerformanceMonitor with equipment, you assign the KPI types to the equipment. One instance of each object is generated for this. At each place of use, you configure the object instances and assign values, tags or operand formulas to them.

Example: At each place of use of the KPI "QualityRate", you assign the corresponding WinCC tags to the operand instances "GoodItemsProduced" and "TotalItemsProduced".



① The pieces of equipment defined are listed in tree form under "Instances".

② The KPI types already assigned to this equipment are displayed as instances in the working area. The operands that are used in the calculation statement of KPIs are automatically added in operand instances.

Subsequent modification of types

Changes made to types affect all object instances: If, for example, you change the name or color of a type, all instances are updated automatically. The parameter assignment is retained.

If you change the calculation formula of a KPI type, you must re-configure the newly added operands at the instance. Deleted operands in the calculation formula are automatically removed from the instance.

3.1.5 Output options for KPIs in Runtime

You can output the operands and KPIs as follows:

- In WinCC Runtime using Runtime controls
- In WinCC Runtime using the "Print" button
- In the SIMATIC Information Server
- In WinCC/WebNavigator

See also

PerformanceMonitor Controls for displaying the KPIs (Page 107)

Creating a PerformanceMonitor report in the Information Server (Page 142)

3.2 Elements and basic settings

3.2.1 PerformanceMonitor Configuration Studio

Function

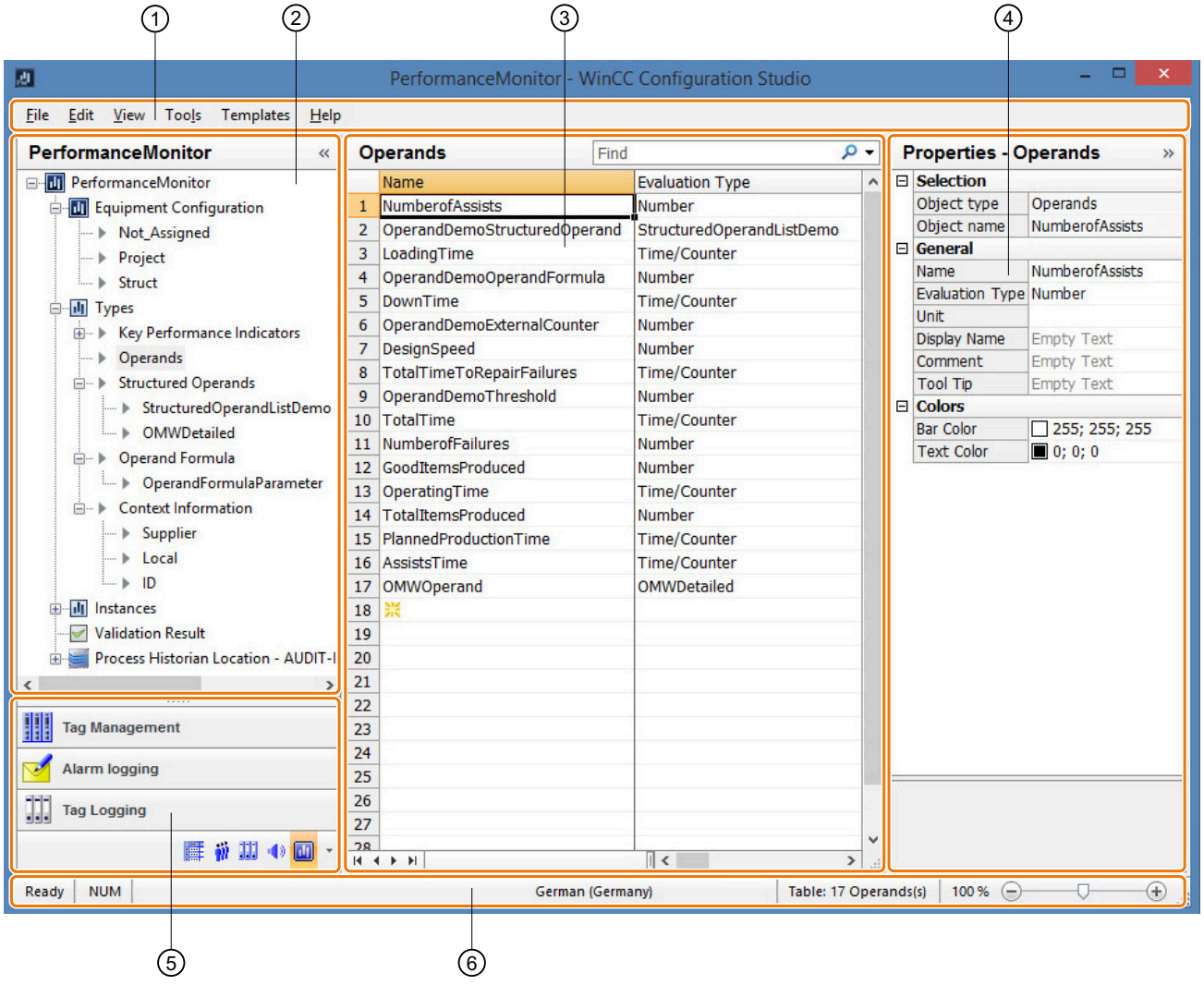
The PerformanceMonitor Configuration Studio is the user interface of the PerformanceMonitor. You enter all the information used to calculate the desired KPIs for your plant in this interface.

Opening PerformanceMonitor

When you open a WinCC project after installing the PerformanceMonitor, the PerformanceMonitor icon appears in the navigation area of the WinCC Explorer. Double-click the PerformanceMonitor icon.

Layout

The PerformanceMonitor Configuration Studio consists of the following areas:



① Menu bar:
The menu bar contains commands to perform common functions in the PerformanceMonitor Configuration Studio.

② Navigation area:

The navigation area displays the objects of the PerformanceMonitor in a tree view.

- Equipment configuration
  You define the plant units to be analyzed under "Equipment configuration". You can combine individual components or machines to a group (plant line). An equipment group is used for structuring during configuration. The grouping has no effect in Runtime. You can assign a KPI to this piece of equipment (component or machine) once directly. The KPI is still available for other equipment.
- Types
  You define the following object types under "Types":
  - KPIs
  - Operands
  - Structured operands
  - Operand formulas
  - Context information
- Instances
  You assign KPIs and context information to a piece of equipment and assign parameters to the object instance under "Instances".

③ Table area:

The table area displays the data records of the objects that are selected in the navigation area.

In quick search, you search the table area for operand entries.

④ "Properties" window:

The "Properties" window displays the properties of a data record.

⑤ Navigation bar:

In the navigation bar, you switch between the WinCC editors.

⑥ Status bar:

The status bar shows the various states of the PerformanceMonitor Configuration Studio.

Menu commands in the menu bar

The menu bar contains some of the commands that you can call in the PerformanceMonitor Configuration Studio. Commands that you cannot use in the current situation are disabled (displayed in gray). Commands that you can call from the shortcut menu are described in the individual sections in which they are used.

The following tables show the commands in the menu bar and their functions:

"File" menu

Command	Function
Save	Saves all settings in the PerformanceMonitor Configuration Studio.
Project Documentation - Setup	No function.
Project Documentation - Preview	No function.
Project Documentation - Print	No function.
Close	Closes the PerformanceMonitor Configuration Studio.

"Edit" menu

Command	Function
Copy	Copies the selected column content.
Paste	Pastes the copied column content.
Undo	Undo the performed change(s). Up-to 15 undo operations are supported. Keyboard shortcut: CTRL+Z.
Repeat	Redo the performed change(s). Up-to 15 redo operations are supported. Keyboard shortcut: CTRL+Y.
Import	Imports data from a TXT file, XML file or XLSX file.
Export	Exports the column content to a TXT file or XLSX file.

Note

Undo and redo for imported files and templates

"View" menu

Command	Function
Input language	Changes the input language.
Color scheme	Changes the color setting in the PerformanceMonitor Configuration Studio.

"Tools" menu

Command	Function
Macros	Opens a dialog box in which you can create macros.
Visual Basic Editor	Opens the Visual Basic Editor.

"Templates" menu

Command	Function
Indicators	Pre-defined KPIs are created to which you can assign parameters.
Structured operands	A pre-defined structured operand is created and configured according to the OMAC standard. The parameter assignment can be changed.

"Help" menu

Command	Function
Contents and Index	Opens the online help of the PerformanceMonitor.
Info about WinCC Configuration Studio	Opens an information window for the WinCC Configuration Studio.

Reporting of user actions

User actions, such as the import of configuration data, are saved in the log file. The log file is stored in the following directory:

- C:\ProgramData\Siemens\Logs\PerformanceMonitor

The log file is created on configuration changes, import/export or when starting Runtime.

See also

Exporting and importing configuration data (Page 96)

3.2.2 Managing the PerformanceMonitor Configuration Studio

Changing the interface language

The interface language of the PerformanceMonitor Configuration Studio depends on the WinCC user interface language.

To change the interface language, select your desired language in the WinCC Explorer in the "Tools > Language..." menu bar.

Changing text input mode

With text input mode, you define the reaction that occurs when changing display texts.

When a text is entered, a check is performed to determine whether the text already exists in the Text Library. If the text is already present, the "Text Input Mode" window opens.

1. Select the "View > Change Text Input Mode" command.
2. Activate the desired text input mode.

The following texts of object properties from the PerformanceMonitor are stored in the text library:

- Display name
- Comment
- Tooltip

Switching the sorting order in columns

By default, the sorting order in columns corresponds to the order in which you created the objects. To change the sorting order, double-click on the title bar of the relevant column.

Each double-click switches the sorting order as follows:

- Alphabetically from A to Z
- Alphabetically from Z to A
- Without sorting (initial state)

Showing and hiding columns

You can show and hide individual columns. The configuration data of hidden columns is retained.

Showing columns

To hide a displayed column, select the "Hide" command in the shortcut menu of the column header.

Hiding columns

To display a hidden column, select the "Unhide > [column header]" command in the shortcut menu of the column header.

The following columns are hidden by default:

- Comments
- Bar color
- Text color
- Tooltip

Edit and save entries

The PerformanceMonitor Configuration Studio supports functions such as "Search and Replace" and "Copy and Paste" - also to and from MS Excel. Object names are automatically incremented when they are pasted.

To save the configuration data, select the entry "Save" in the menu bar under "File".

Implicit configuration updates between server and client

In scenarios where PMO is available both at the server and client side, any changes made in PMO configuration data in the server side can be updated automatically in PMO at the client side using "Implicit Update" option in WinCC CS. This option updates PMO configuration data such as equipment, KPIs, operands, structured operands, etc., through packages.

See also

Exporting and importing configuration data (Page 96)

3.2.3 Formula editor

Function

In the formula editor, you enter a formula, the result of which is returned to a KPI or operand. The result of a formula is either a logical value (BOOLEAN) or a number. To immediately check a formula for plausibility during its entry, use only logical or arithmetic operators.

You use the formula editor for the following objects in the PerformanceMonitor:

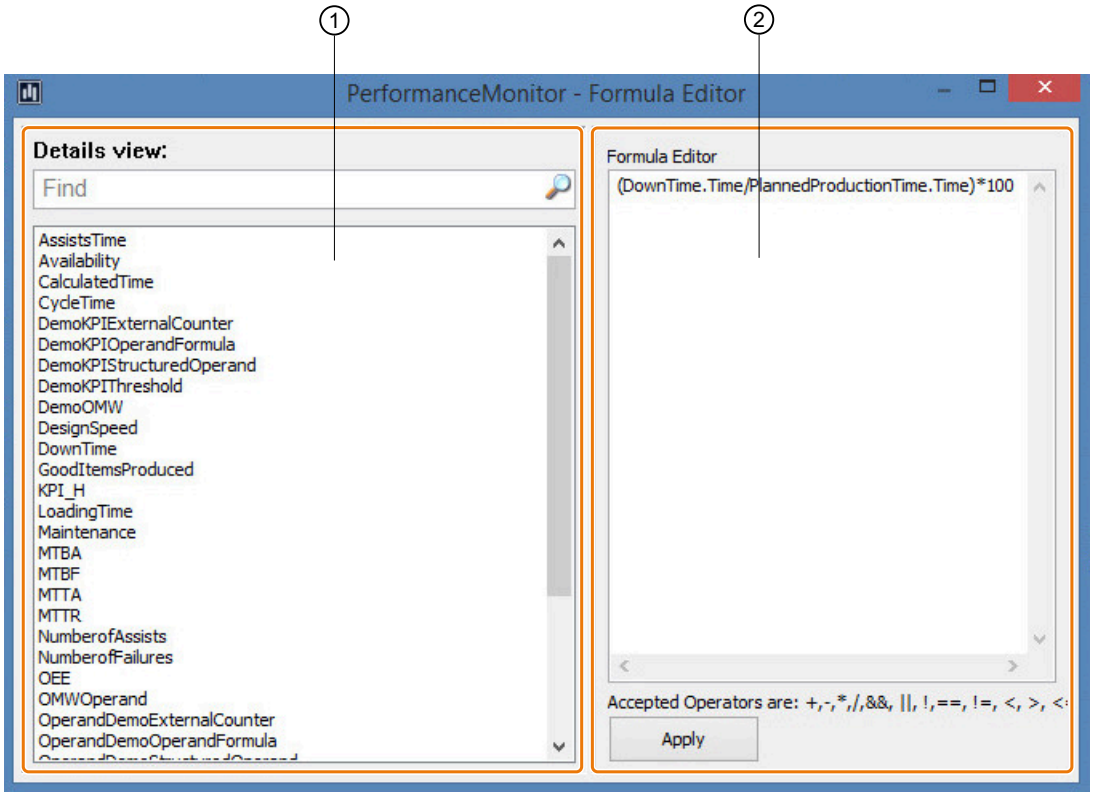
- KPIs
- Operand formulas

Opening the formula editor

1. In the navigation area of the PerformanceMonitor, select the "Key Performance Indicators" or "Operand formulas" object under "Types".
2. In the table area, select the row of the "Calculation Statement" column in which you want to use the formula editor.
   Alternatively, select any row in the line in which you want to use the formula editor, and select the column next to the "Calculation formula" entry in the "Properties" window.
3. Click the button "...".
   The formula editor opens.

Structure

The formula editor consists of the following areas:



① Details view:
Your configured KPIs and operands are listed in the detail view. Drag-and-drop the required KPIs and operands from the Details view into the formula editor.
The quick search enables you to search the Details view for entries.

② Formula Editor:
The formula editor supports Intellisense as you type.

Rules for using operators

If you only use logical operators in a formula, all values are interpreted as Boolean:

- Value <> 0 → TRUE
- Value = 0 → FALSE

If you only use arithmetic operators in a formula, all values are interpreted as arithmetic:

- FALSE = 0
- TRUE = 1

If you use typecast commands, make sure you convert the values correctly. The following typecast commands are supported:

- `ToInt`
- `ToBool`
- `ToFloat`

3.3 Working with the PerformanceMonitor

3.3.1 Procedures for the KPI definition

Possible procedures

You are not bound to a fixed workflow for defining and evaluating the KPIs for your plant.

The work steps can also be allocated to multiple persons, e.g. a manager and a configuration engineer:

- The manager defines the equipment, KPIs, operands and the calculation.
- The configuration engineer assigns the KPIs to the equipment and interconnects the operands with WinCC tags.

Notes on structuring the plant

The PerformanceMonitor calculates the KPIs and checks the evaluations but not the plausibility. The user is responsible for ensuring that the KPI definition is feasible and for linking the relevant parameters/process values.

3.3.2 Configuration support

Introduction

Objects in the PerformanceMonitor Configuration Studio have the following relationships:

- Operand types belong to KPI types
- Context information belongs to equipment
- Calculation formulas belong to KPIs types
- Operand formulas are used at operand instances
- KPI types and context information are used in equipment

Suggestions for configuration sequences

Object types:

1. Configure operand types
2. Configure operand formulas (optional)
3. Configure KPI types
   - Define the calculation formula
   - Define the calculation cycles (optional)
4. Configure context information types
5. Configure equipment

Object instances:

1. Assign KPI types to the equipment
2. Assign parameters to context information instances
3. Assign parameters to operand instances
   - Connect WinCC tags
   - Assign parameters to the calculation type
4. Assign parameters to the cyclic calculation of KPI instances (optional)

Templates

In PerformanceMonitor, you can find the "DownTimeMonitor" template in the menu bar under "Templates > Indicators". This template automatically generates typical KPIs that you can configure.

OMAC templates

If you want to configure according to the OMAC standard, you can use the OMAC templates.

You can find the OMAC templates in the menu bar of the PerformanceMonitor under "Templates > Structured Operands". The following templates are at your disposal:

Templates	Description
OMAC_V3_Gruppierung	A structured operand called "OMW" is automatically created and configured. The parameter assignment can be changed.
OMAC_V3_Detail	A structured operand called "OMWDetailed" is automatically created and configured. The parameter assignment can be changed. More detailed template as "OMAC_V3_Gruppierung".

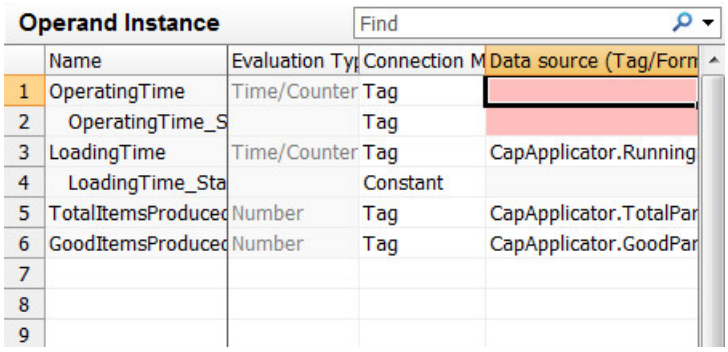
Note

Undo-redo changes when downloading a template

When you download a template, PMO will clear the list of undo redo changes made currently in the configuration.A Confirmation dialog appears before clearing the undo and redoes changes.

Incomplete configurations

Incomplete configurations are highlighted in color in the PerformanceMonitor Configuration Studio. The figure below shows KPI types with calculation formula in which one or more operand types are not yet configured:



The incorrect results are collected in a list. You directly access the location of the error by clicking the entry.

Validity check

The PerformanceMonitor always checks your entries for validity. If an operand is no longer valid due to changes, for example, or when instance assignment problems occur, the messages are visible in the validation result. You can find the "validation result" in the navigation bar of the PerformanceMonitor.

Notes on calculating KPIs

The time it takes to calculate KPIs mainly depends on the following factors:

- Time period
- Number of recorded values
- Number of KPIs to be calculated

The following is recommended for the calculation of KPIs:

- Use values in the range of seconds or higher as the update cycle.
- Calculate KPIs for a time period of up to one day on a WinCC client, for example, evaluations at the end of a shift.
- Calculate longer time periods on PCs without a process connection, for example, evaluations over weeks or months.

3.3.3 Connecting PerformanceMonitor with the Process Historian server

Introduction

Depending on the configuration, the PerformanceMonitor saves the calculated KPIs in one of two storage locations:

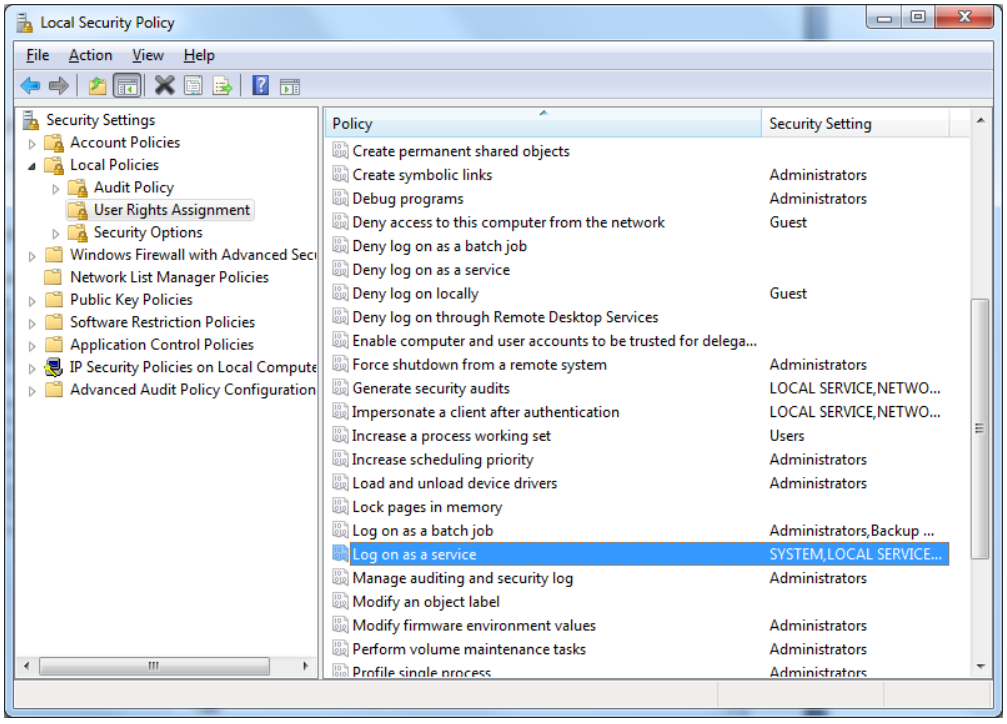
- Common Archiving Configuration: Included with PerformanceMonitor. Common Archiving Configuration will be the default storage location. If Centralized Process Historian is configured, then the data will also be archived to Common Archiving for quick access.
- Central Process Historian server: Installation via setup of the Process Historian Server 2020 SP2 Latest version.

After installation of the PerformanceMonitor, if required you can connect to an available Process Historian. You can change the connection at any time.

NOTICE
Delayed start of Runtime When the Process Historian storage location is not configured correctly, activation of Runtime is delayed for up to 10 minutes when starting the PIService.ITagCalculatorCS. When using controls in Runtime, messages are displayed that point out an incorrect configuration.

Requirement

- PerformanceMonitor is started
- Connect with central Process Historian:
  - A user with the same name is created on both PCs in the Windows user management.
  - User is member of the "Administrators" group or has administrator rights
  - User or "Administrators" group is member of the local safety directive "Log on as a service".



  - User is created on the central Process Historian in "MS SQL Server Management" under "Security > Logins" and has the "public" and "sysadmin" rights.
  - Central Process Historian is available

Procedure

Automatic listing of the Process Historian storage location

1. In the navigation area of the PerformanceMonitor, select "Process Historian storage location > Automatic".
2. Select "Start search" in the shortcut menu.
   The PCs with a Process Historian installation are listed.
3. In the table area, select the complete line of the PC to which you want to connect.
4. Select "Apply" in the shortcut menu.

Note

The search can be terminated anytime with the "Stop search" option in the shortcut menu.

Manual input of the Process Historian storage location

1. In the navigation area of the PerformanceMonitor, select "Process Historian storage location > Manual".
2. In the table area, enter the PC name on which a Process Historian is installed.
   The "Data source" column is filled automatically after correct input of the PC name.
3. In the table area, select the complete line of the PC to which you want to connect.
4. Select "Apply" in the shortcut menu.

Note

Possible loss of PerformanceMonitor data when archiving on central Process Historian

Data is lost in the following cases:

- The central Process Historian is shut down. While the central Process Historian is being shut down, re-start the operator station on which the PerformanceMonitor is running. The data of the central Process Historian in the period between the shutdown and restart of the operator station is **irretrievably** lost.
  Example: The central Process Historian is shut down on October 1, 2014 at 12 noon, and restarts on October 2, 2014 at 12 noon. You restart the operator station on 2 October 2014 at 10 am. The data between 1 October 2014 12:00:00 h and 2 October 2014 10:00:00 h is lost.
- 90% or more of the hard disk space of the central Process Historian is occupied. The central Process Historian is automatically deactivated. The data from the queue is lost when the central Process Historian restarts.
  Note: Central Process historian data will be lost, but Common Archiving will always have a copy of the data which will be used for any KPI calculation.

Remedy: If the central Process Historian is not available, make sure to avoid restarting the operator station on which the PerformanceMonitor is running.

Result

The PerformanceMonitor is connected with the selected Process Historian. As soon as you activate the project, the calculated KPIs are saved in the Process Historian.

Logon with different system account

If you are connected to the Process Historian, you are logged on with your system account by default.

To log on with a different system account, follow these steps:

1. In the navigation area of the PerformanceMonitor, select "Process Historian storage location > Logon".
2. Clear the check box in the column "LocalHost".
3. Enter the account with which you want to log on in the "Account" column.
4. You change your password by clicking the "..." button in the "Password" column.

3.3.4 Central Process Historian

The SIMATIC Process Historian a high-performance, central archiving system for the SIMATIC WinCC SCADA system and PCS 7 process control system. The Process Historian uses Microsoft SQL Server.

You can save and archive all calculated KPIs and operands on a central server in real-time. The data can be from to different PCS 7 or WinCC projects.

This section provides you with an overview of the general functionalities of the Process Historian.

Note

You can find detailed information about the SIMATIC Process Historian in the "Process Historian - Administration" online help.

3.3.4.1 Management Console - Overview

Introduction

The Management Console includes several dashboards that are available for configuration of Process Historian and for information/diagnostics of the system. The Management Console is installed with Process Historian and started automatically at logon. For a manual start, open the Management Console with C:\Program Files (x86)\Siemens\ProcessHistorian\bin\ProcessHistorian.msc.

Note

Certificate verification by Internet Explorer

In Internet Explorer, under "Internet Options > Advanced > Security", deactivate the option "Check for publisher's certificate revocation". If this option is activated, it can slow down opening of the Process Historian and cause error messages.

Dashboards - Overview

The following table shows the dashboards of the Management Console and their tasks:

Dashboard	Tasks
Process Historian Management	• Display of basic information about hardware and performance of PC and operating system • Display of status and current activity of the Process Historian server • Display of the license status • Redundancy status • Changing the operating state
Plant structure	• Display of incorporated projects • Display of the OS server systems • Display of the PC name
Data sources	• Display for each individual data source of when configuration data and runtime data was last transferred to the Process Historian • Deletion of the configuration data of the projects • Setting a lock to prevent deletion of configuration data
I/O systems	• Display of the available input and output devices • Display of the memory space used • Detailed information about the load
Diagnostics	• Diagnostic messages of the Process Historian • Messages from the event display of the operating system
Backup/Restore	• Display of the archive segments • Creating segment backups • Restoring backed-up segments • Removing segments
Compression	• Display of the compression state • Configuration of the number of uncompressed archive segments
Segmentation	• Display of the current segmentation setting • Changing the segmentation settings
Database backup	• Manual creation of full database backups • Automatic, continuous creation of full database backups
Redundancy (is not supported by the Process Historian component)	• Display of the redundancy status • Switchover / disconnection of principal (master) and mirror (stand-by) • Redundancy configuration
Licensing	• Display of the current license status of server and project
SIMATIC Batch Backup/Restore	• Display of the selected batch data • Create backups of batch data • Restoring backed-up batch data

3.3.4.2 Operating states of the Process Historian

Overview of operating states

The following table provides an overview of the operating states of the Process Historian database and the color code of the associated icons in the status bar:

Symbol	Process Historian operating state	Description
	Active	In the "Active" operating state, the Process Historian archives data. You can request data from the OS Server or the Information Server.
	ActiveRecovery	In the "ActiveRecovery" operating state, the Process Historian requests data from an OS Server for a recognized period without archiving the data. The preceding and subsequent operating state is "Active".
	Starting ActiveRecovery	This operating state starts "ActiveRecovery".
	Stopping ActiveRecovery	This operating state terminates "ActiveRecovery" and is the intermediate state between "ActiveRecovery" and "Active".
	Disabled	The Process Historian changes to the "Disabled" operating state in the case of maintenance tasks where access to the database is limited. The maintenance tasks can include the creation or the backup/recovery of segments. The system is offline in this operating state. Access via the network is not possible.
	Locked	The Process Historian server is in "Locked" operating state, for example, because the hard disk space has reached its capacity limit. In this operating state, the Process Historian server can no longer be switched to "Enabled". No more values are archived. Read access to stored values is possible.
	Disabling	"Disabling" is the intermediate state between "Active" and "Disabled".
	Error	The "Error" operating state occurs when an error has been detected or when there is no connection to the SIMATIC Process HistorianServer service.
	Inactive	No data is archived in the "Inactive" operating state. In this operating state, you can carry out updates, maintenance work to the Process Historian PC or a restart of the PC.
	Shut down	The intermediate state between "Active" and "Inactive".
	Starting	The intermediate state between "Inactive" and "Active".
	Paused	Mirror paused. The database is synchronized with the principal.The database of the mirror is used exclusively by theprincipal. Access from other applications is not possible.

Commands

You can give the Process Historian the following commands by using the shortcut menu of the icon in the status bar:

- Start
- Shut down
- Start recovery

NOTICE
Disable the Process Historian server before shutting down You must disable the Process Historian server before shutting down the computer on which the Process Historian server is running. There are two options available to you: • In the start screen of the Process Historian Management Console, select the "Shut down" status. • In the shortcut menu of the status bar of the Process Historian, select the "Shut down" command. The "Inactive" status is displayed.

"Locked" operating state of the Process Historian server

If insufficient disk space is available on a monitored drive, the maintenance service sets the Process Historian server to the "Locked" operating state.

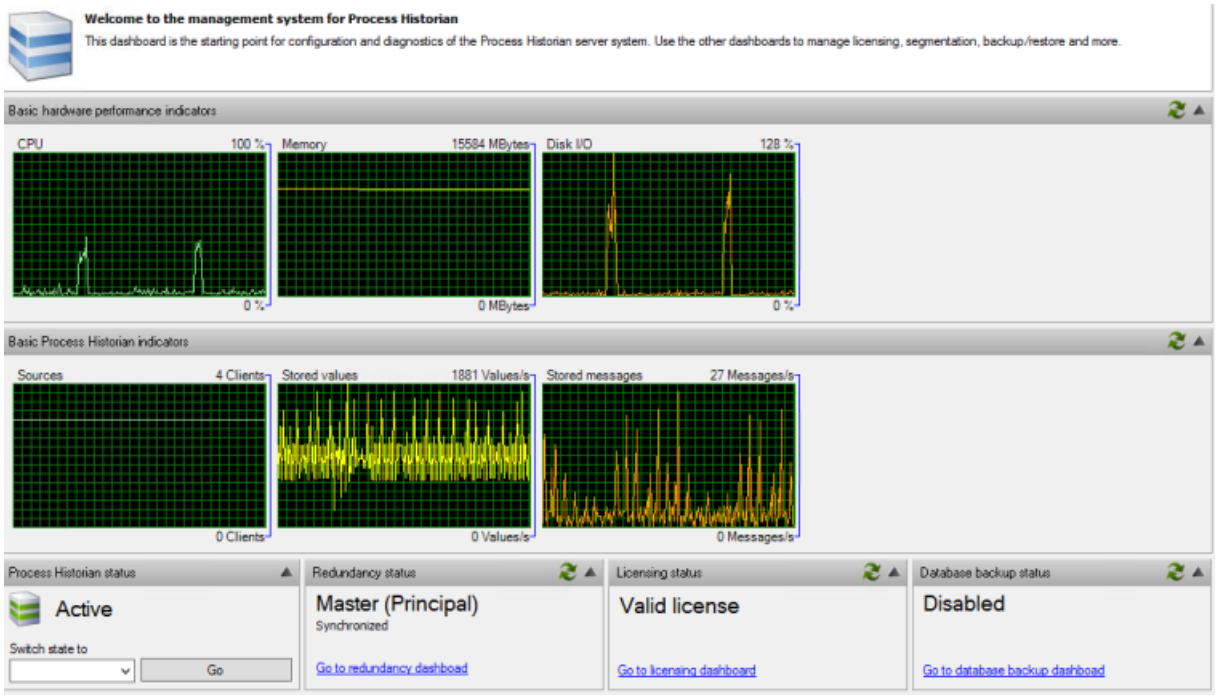
In this operating state, the Process Historian server can no longer be set to "Active". The maintenance service can set the Process Historian server to "Active" again only when free space has been increased.

NOTICE
Avoiding the "Locked" operating state To ensure enough free space is available for the operation of the Process Historian, regularly check the currently available space in the "I/O systems" dashboard. Determine which automatic mechanisms for reducing the used space can be activated in the dashboards.

3.3.4.3 Central overview of the Process Historian Server

Overview

The "Process Historian Management" dashboard provides an overview of the basic information about the Process Historian. Configuration and diagnostics information of the Process Historian are displayed together here.



The following information is displayed on the "Process Historian Management" dashboard:

- Monitoring the PC:
  - Processor load (CPU)
  - Available RAM
  - Hard disk load (Disk I/O)
- Process Historian:
  - Number of connected data sources
  - Stored tags per second
  - Stored messages per second
- Operating state of Process Historian server: Here you can change the operating mode:
  - Start
  - Shut down
  - Start recovery
- Redundancy status of Process Historian: Here you can update the status

- Licensing status of Process Historian: Here you can update the status
- Automatic backup of Process Historian: Here you can update the status

Note

Display in percent

Percentage values displayed can exceed 100 % for a short time. These values are determined by a statistical extrapolation from mean values. They do not correspond to the real values.

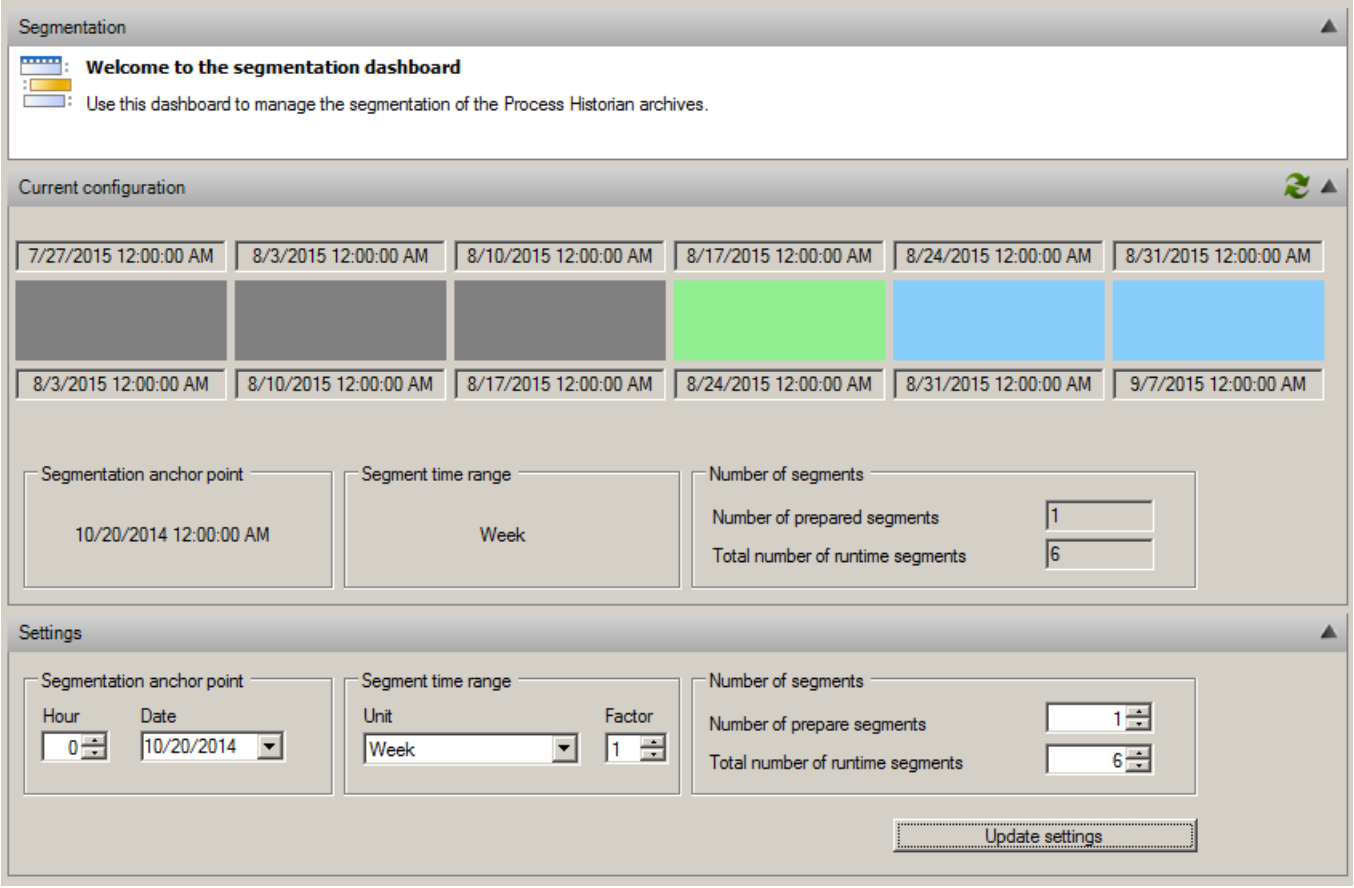
3.3.4.4 Configuring segments

Introduction

The "Segmentation" dashboard provides an overview of the current configuration of the segmentation.

The following default settings are used for segmentation when setting up the Process Historian:

Segment time range	One week
Total number of Runtime segments	Five
Number of future segments	One



The runtime segments include the following segments that are color-coded:

- A segment in green receives the data with the current time stamp.
- Future segments in blue are already reserved for future data.
- Segments in gray for process data with an older time stamp.

Configuration of the segmentation

You configure the segmentation of the Process Historian archives in the "Settings" area.

1. Segmentation anchor point:
   - Hour
   - Date
2. Time period for segments:
   - Unit (period)
   - Factor
3. Number of segments:
   - Number of future segments
   - Total number of Runtime segments

Depending on the configuration limits, the amount of data on the hard disk per segment can be very large. This is especially true for uncompressed Runtime segments. When the segments are created, the estimated required memory space is calculated taking into account the size of the previous segments and reserved for future segments.

The segments for historical data generated by the migration are initially created with minimal size. When data is imported, the segments are automatically enlarged by the SQL server.

The optimum settings for the segmentation are a compromise between the occupied memory space and the number of uncompressed data segments to be reserved.

Note

The Process Historian database is switched automatically to the "Disabled" operating state to allow changes to the segmentation to be carried out. After the settings have been accepted, the database changes back to the "Active" operating state automatically.

Result

The segmentation of the Process Historian database is configured.

The time range of the archived data that is available as read-only depends on the number of Runtime segments plus the number of archive segments that are not set offline.

3.3.4.5 Compressing segments

Introduction

Internal compression of the archive segments includes the tables of the archive tags and reduces the memory requirements of the Process Historian server. Uncompressed segments have the advantage of delivering data faster when archived data is accessed.

On the "Compression" dashboard, you can see the current compression state as well as the number of uncompressed segments. The default setting is "0" uncompressed segments. Compression then begins with the first archive segment.

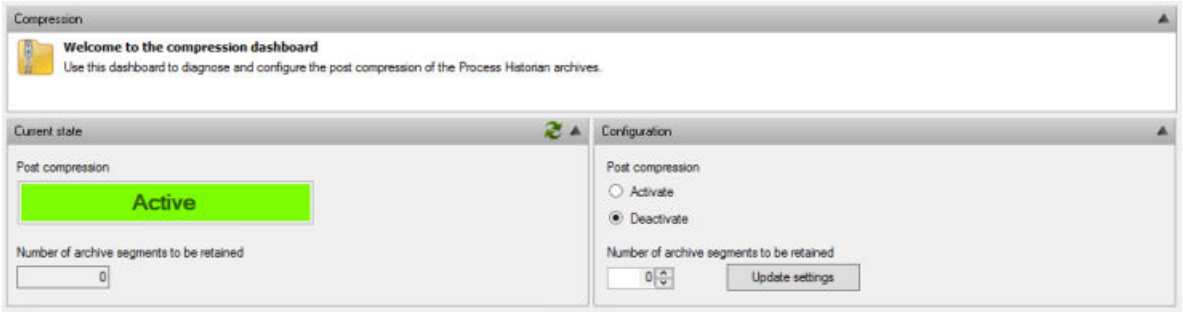
The reduction in memory requirements through compression depends on the saved values. For example, if a value does not change over an extended period of time, the compression factor is high. If a value changes constantly, the compression ratio is lower. A compression factor of "5" is a conservative assumption.

Note

The archive segments are compressed automatically in the background.

Procedure

1. Select the "Compression" dashboard in the navigation of the management console.



2. Select the "Activate" option in the 'Configuration' area for 'Post compression'.
3. Specify the number of uncompressed segments you want to keep in the "Configuration" area.
4. Click "Apply".
5. The "Current status" area indicates whether compression is enabled and, if so, as of which segment.

Note

The memory requirements may increase when you make changes to the default setting.

Result

The settings for the compression of archive segments have been reconfigured.

3.3.4.6 Backup of segments

Introduction

The storage space of the Process Historian is continuously filled with data. If the free space falls below a limit value, the Process Historian is set to the "Locked" operating state and archiving is stopped.

To ensure that you have enough free space available again in time, you can:

- Back up the segments manually or automatically
- Set the backed-up segments "Offline" or swap them out, thereby removing them from the Process Historian

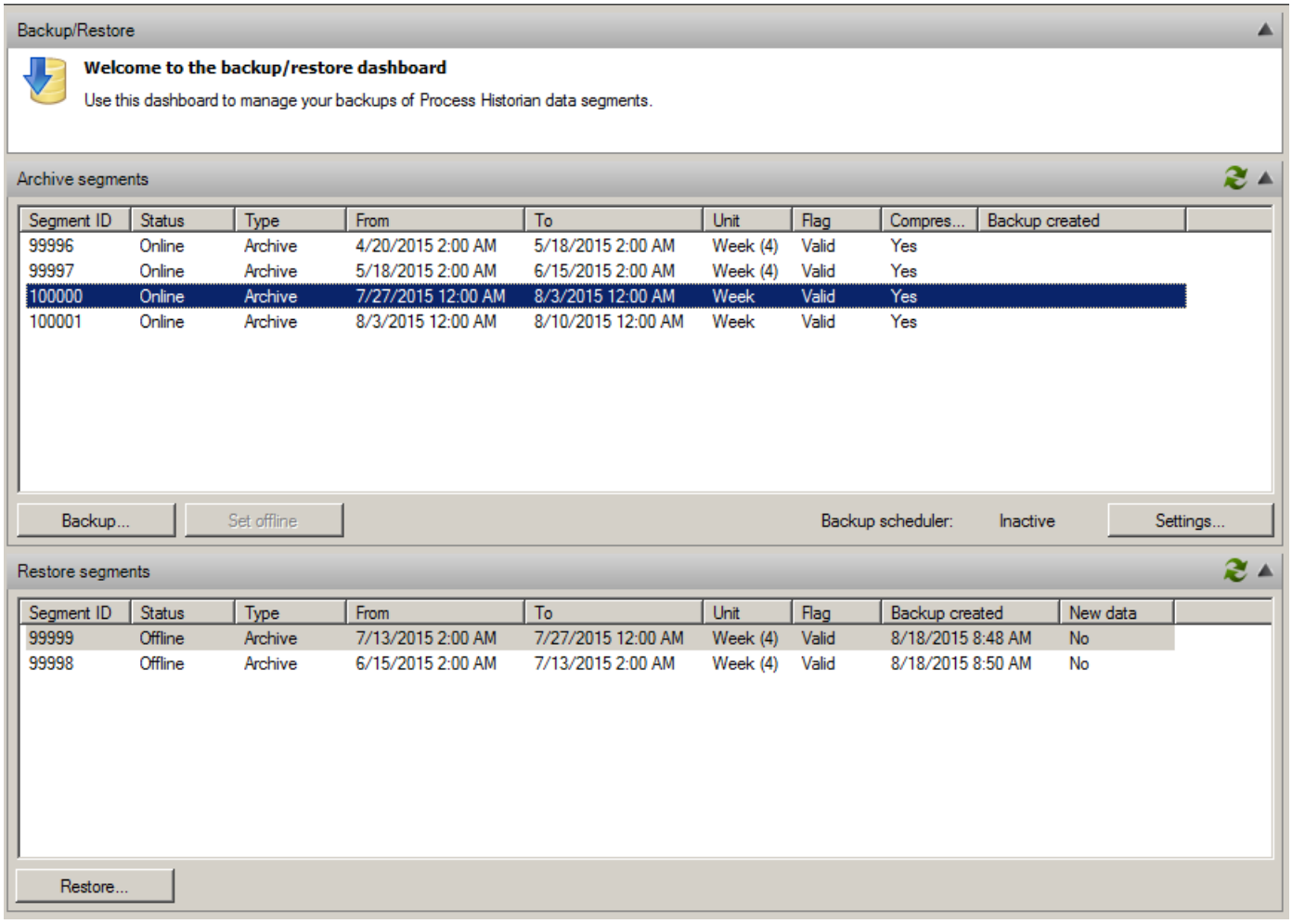
The backed-up data is initially available in the backup file as well as in the Process Historian database. The segment data is only removed from the database, thus freeing up hard disk memory on the database drives, when the segment is set "Offline" or the respective option is enabled in automatic scheduling.

You can also specify for automatic backup planning a number of delayed segments that are set "Offline" at a later time. The existing data of the delayed segments therefore remains available "Online" longer.

Overview

All archive segments of the Process Historian are displayed in the "Backup/Restore" dashboard:

- Segments with the status "Online" can be backed up manually or automatically
- Segments already backed up with the "Offline" status can be restored. You can find additional information on this in Restoring segments (Page 60).



When an archive segment is backed up, the Runtime data is stored in the backup file. The stored data includes:

- Process values
- Messages
- Configuration data on the process values and messages
- Aggregation data

Note

No access to the database when executing the following functions in the segments:

- During the preparation of a segment
- During the backup of a segment
- During the restoration of a segment
- When the segment is set offline

Requirement

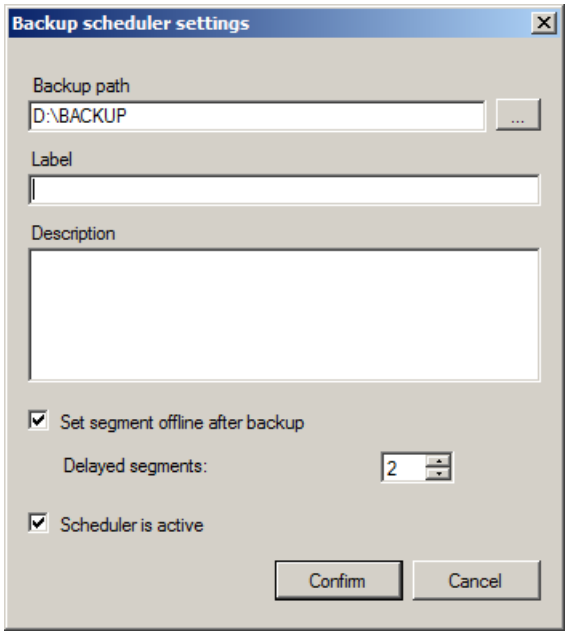
- The segment to be backed up has the "Archive" status.
- When compression is enabled for the archive segments, the archive segments must be completely compressed prior to the backup.

Backing up segments manually

1. Select segment to be backed up in the "Archive segments" area.
2. Click the "Backup" button to launch backup.
3. Select the backup path for the backup file in the "Backup segment" dialog box that opens.
4. Click "Backup".

Backing up segments automatically and setting them "Offline"

1. Click the "Settings" button in the "Archive segments" area.
2. Select the backup path for the backup file in the "Backup segment" dialog box that opens. You can specify further identifiers and descriptions for the backup such as the name or number of the data medium.



3. To set segments offline automatically after the backup, select the "Set segment offline after backup" option.
4. Set the number of delayed segments that are to remain available "Online". This extends the period during which you have read access to the archived data.
5. You can enable automatic backup by selecting the "Scheduler is active" option.
6. Click "Confirm".

3.3.4.7 Restoring segments

If you want to access data that is stored in an archived and already swapped out segment, you must restore the segment. When restoring segments, you must select the backup file that matches the segment.

Requirement

- The matching backup files for the segments to be restored exist.
- The Process Historian is in the "Active" operating state.

Procedure

1. Select the "Backup/Restore" dashboard in the navigation of the Management Console.
2. Select the segment you want to restore in the "Restore segments" area.
3. Click on the "Restore" button.
4. In the "Restore segment" dialog, select the corresponding backup file for the segment you want to restore.
5. Click "Restore".

Result

The restored segments are displayed in the "Archive segments" area on the "Backup/Restore" dashboard.

You can access the data of the restored segment from the WinCC Server, WinCC Client or the Information Server.

Note

If you have created more than one backup of a segment, you can only use the last backup file created to restore the segment.

3.3.4.8 Setting segments "Offline"

Introduction

When a Runtime segment turns into an archive segment, you can back up the archive segment. After successful backup, you can set the archive segment from the Process Historian "Offline". You can only set individual segments "Offline".

After setting a segment "Offline", only the information on restoring the backed up segment is stored in the Process Historian.

You can configure automatic setting to "Offline" together with the automatic backup.

Requirement

- A backup has already been created for the segment.
- The segment has been marked as "valid" in the "Backup/Restore" dashboard. A segment is marked as "invalid", for example, when additional Runtime data for the segment has accumulated after the creation of a backup. In this case, create a backup of the relevant segment again. You can find additional information on this in Backup of segments (Page 57).

Procedure

1. Select the "Backup/Restore" dashboard in the navigation of the Management Console.
2. In the "Archive segments" area, select the segment that you want to set "Offline".
3. Click the "Set offline" button.
   - The entries of the selected segments are moved to the "Restore segments" view.
   - The memory space for these segments is released. You can check the amount of gained space in the "I/O systems" dashboard.

Note

Checking the disk space

To ensure enough free space for the Process Historian during operation, repeat these steps regularly.

Result

The segment is set "Offline" in the Process Historian database.

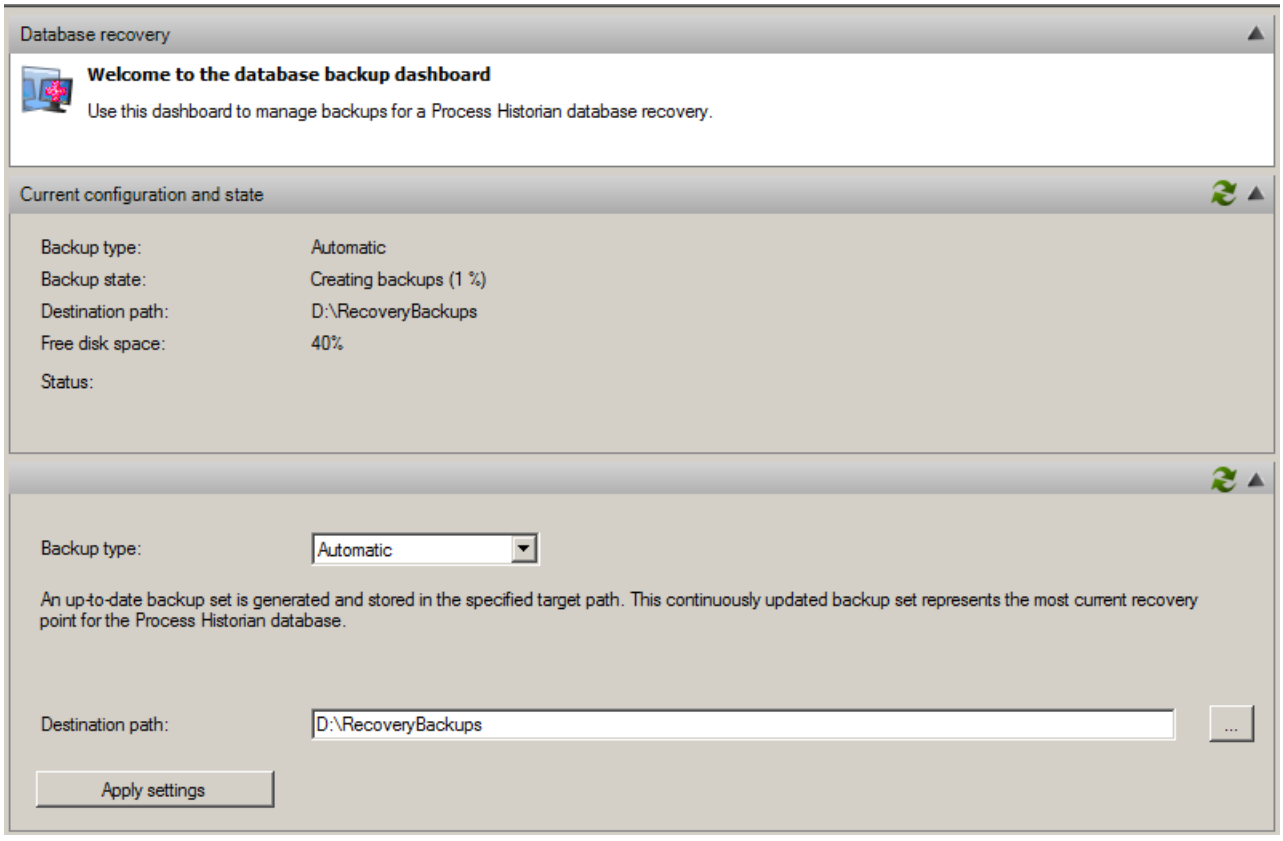
3.3.4.9 Backing up the database

Overview

You can use the "Database backup" dashboard to create a full backup of the database with the time stamp of backup creation.

The "Current configuration and state" area displays the following information:

- Configured backup type
- Backup state: Progress of the backup copy
- Destination path of backup copies
- Free disk space
- Status



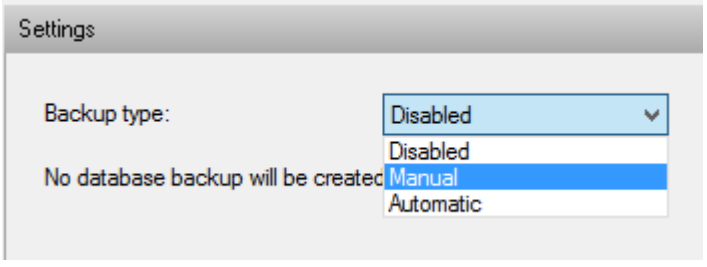
Backing up the database

The data of the Process Historian database is stored in multiple data groups. A backup of the database consists of many individual created files that can contain the following:

- Backup of a single data group
- Backup of the current status of the transaction log after the backup of a data group

The files are created in a specified cycle. If all available data groups are stored in files, the status for this database is displayed as "100%". You can restore the database using these files.

You can select from three options for database backup in the "Settings" area:



- "Disable": The "Database backup" function is disabled.
- "Manual": If all data groups have been saved once to files, the status is displayed as "100%". This completes the database backup. A recovery of the backed up files restores the data up to the time at which the last data group was saved.
- "Automatic": If all data groups have been saved once to files, the status is displayed as "100%". Recovery with the current database backup is possible only from this point in time.
  In contrast to "Manual", a backup is then continuously made to other files for the oldest data group or a data group that has been changed in the meantime. For this, the oldest backup of this data group is deleted so that the hard disk space does not increase infinitely. Recovery is always possible up to the time at which the last data group was saved.

Storing the database backup

Defining the path

1. Enter the required drive in the "Destination path" field and a folder with the database name as path.
2. Click "Apply settings". In an overview window you will find the steps to be performed after confirmation.
3. Check your entries.
4. Confirm with "OK" if all the entries are correct. The database is backed up.

Storage with automatic backup

The database backup is stored in the specified destination path for the first time. The next backup is saved in the same destination path and the previous backup is deleted. To prevent the loss of previous backups, enter a new destination path when you start the automatic backup.

Example:

The Process Historian-database has the name "HistorianStorage". The destination path is "D:\RecoveryBackups". The backup is saved in the destination path "D:\RecoveryBackups\HistorianStorage".

Storage with manual backup

The database backup is stored in the specified destination path. The time stamp with date and time is part of the storage name of the backup.

Example:

The Process Historian database has the name "HistorianStorage". Backup was started on 31 May 2014 at 18:00 hours. This results in the following path and name for the backup: "D:\RecoveryBackups\20140531_1800_HistorianStorage ".

You can save all future backups that you create manually in the same destination path. The existing backups are not changed or deleted.

Storage medium

We recommend that you always store the database backup on a separate drive.

The following external drives can be used as storage media for the backups:

- USB hard disk
- Network drive via ISCSI. You can find information about ISCSI from Microsoft at:
  - ISCSI (https://technet.microsoft.com/en-us/library/ee338476(v=ws.10).aspx)

Sufficient memory must be available on the selected storage medium for a complete backup.

Note

Memory requirements

If less than 20 GB are free on the drive, a warning is displayed on the control system.

A warning is output by the control system and the backup is aborted if there is less than 10 GB available on the drive.

Incomplete backups

If the backup type is changed during backup creation, an incomplete backup cannot be resumed. Incomplete backups cannot be used for recovery.

If there are write errors for the database backup on the drive, it may not be possible to perform a recovery.

Recovery - Recovering a database

With a recovery, you restore the state of the database in the Process Historian to the time at which the data group was last backed up to a file.

You recover the database with the "Database Installation Wizard". Before recovery is started, the database backup is checked for completeness. The recovery process starts only if the backup is complete, which means the backup status is "100%".

Note

The name of the destination path is important in a recovery. The name must match the database name. Recovery is not possible when the path is renamed, and an error message is output.

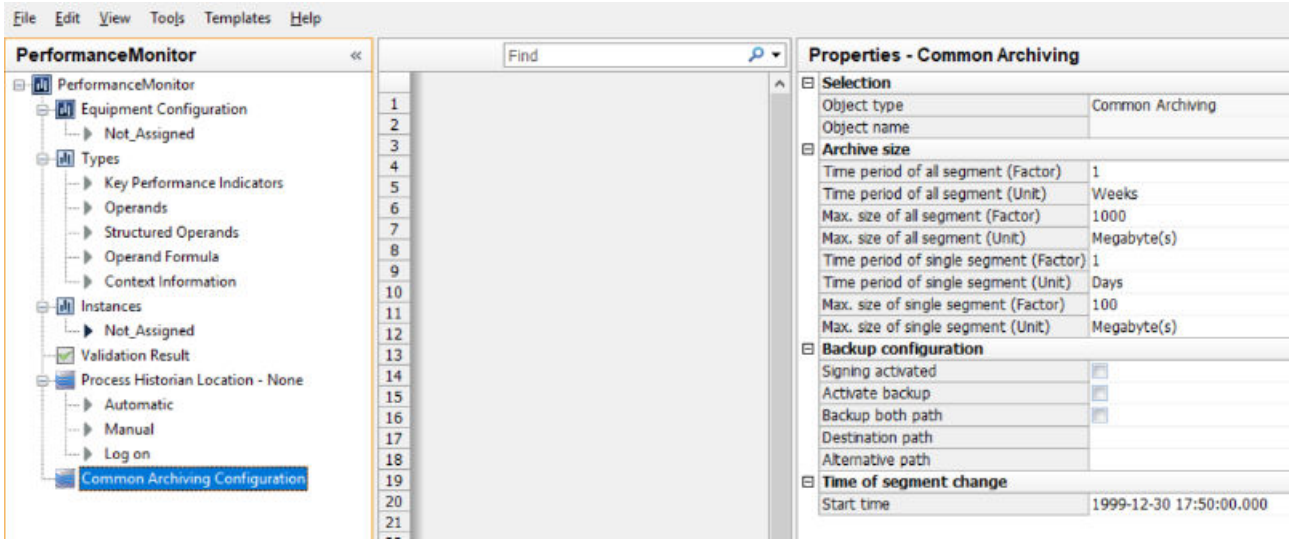
3.3.5 Common Archiving Configuration

3.3.5.1 Common Archiving Configuration

Introduction

In PerformanceMonitor's version V8.0, Local Process Historian server was removed, and Common Archiving Configuration is introduced. In Common Archiving configuration, data is stored in the segments. In case of data loss entire data will not be lost, only a particular segment is lost. User do not need to install Common Archiving configuration separately, along with WinCC installation, Common Archiving Configuration will be available.

After installing the PerformanceMonitor, by default PerformanceMonitor is configured to the Common Archving Server. If required, user can newly configure Central Process Historian server or existing users of Central Process Historian server can continue to use Central Process Historian server. If required user can configure both Common Archiving and Central Process Historan, in that case data will be stored in both the servers.



3.3.5.2 Segmentation Configuration for Common Archiving

In Common Archiving, for effecient use of memory, data from runtime is stored in the segments. User can choose how they want the data to be stored. For example, if the single segment is 100 MB and the total segment size is 1000MB, then after every 100MB of trail logs a new segment will be created. At the same time the previous segment will be backed up to the specified backup location. It will work like this till the 10th segment where we reach the total segment size of 1000MB. At this point, the oldest created segment will be overwritten with the latest log entries.

For configuring Common Archiving segments follow the below procedure:

1. Open PerformanceMonitor, in the navigation area, select “Common Archiving Configuration”.
   On the right side of the page, “Properties – Common Archiving” is displayed, the details of each item are listed below:

Category	Items	Description
Selection	Object type	By default, the object type will be Common Archiving.
	Object name	Enter a name for the segment.

Category	Items	Description
Archive size	Time period of all segment (Factor)	Total time duration of all the segment to overwrite the oldest single segment. Enter total time duration which must be at least two times of the Time period of a single segment (Factor). If you enter the same number as of Time period for single segment, a caution dialogue box appears saying "The factor of time period of all segments is an integer multiple of the factor of time period of the single segment. The segment time period will be correspondingly modified". If you click "OK", the data in "Time period of all segments (factor)" will be modified to a multiple of two of the time period of the single segment (factor).
	Time period of all segment (Unit)	Select the unit for "Time period of all segements", this can be Hour(s), Day(s), Week(s), Year(s). Select the same unit that you have selected for the Time period of single segment.
	Max. size of all segment (Factor)	Maximum size of the database in which the oldest single segment has to be overwritten if this value is exceeded. Enter maximum size of the database which is at least two times greater than the Max. size of single segment (Factor), if you enter a same number as of Max. size of single segment, a Caution dialogue box opens saying "The factor of maximum size of all segments has to be atleast double the factor of maximum size of the single segment. The factor of max. size of all segment will be modified". If you click "OK", the data in Max. size of all segment (Factor) will be modified to double of the Max. size of single segment.
	Max. size of all segment (Unit)	Select the unit of the size for "Max. size of all segment", this can be Megabyte(s) or Gigabyte(s).

Category	Items	Description
		Select the same unit that you have selected in Max. size of single segment (Unit)
	Time period of single segment (Factor)	Enter a required number to specify the time period of a single segment.
	Time period of single segment (Unit)	Select the unit for the time period of a segment, for example, Hour(s), Day(s), Week(s) and so on.
	Max. size of single segment (Factor)	Maximum size of a single segment after which a new single segment needs to be created.
	Max. size of single segment (Unit)	Select the unit of the size for "Max. size of single segment", this can be Megabyte(s) or Gigabyte(s).
Backup configuration	Signing activated	Activates signing of the transferred backup files. Based on the signature, the system recognizes whether an archive backup file has been changed after its transfer.
	Activate backup	Click the check box to activate the backup, this activates the transfer of database segments to the directories specified under "Destination path" and / or "Alternative destination path".
	Backup both path	Click the check box to activate Backup both path, this activates the transfer of database segments to both directories specified under "Destination path" and "Alternative destination path".
	Destination path	Browse and select the destination path to store the data in segments.
	Alternative path	Defines an alternative destination path on which the archive backup files are stored.
Time of segment change	Start time	Enter the time from when you want to start the segmentation.

The PerformanceMonitor is connected to the Common Archiving. As soon as you activate the project, the data will be stored in Common Archiving server.

Note

In upgrade scenario, migration of old PH DB data can result in creation of multiple segments one after other. This may lead to movement of some segments to the default backup path.

Automatic Linking to an Archive

1. Add the archive files to the "ProjectName\CommonArchiving" directory.
2. In Runtime, the message archive is automatically linked to the project.

If signing has been activated, modified, signed off archive files are not automatically linked. A WinCC system message is generated and an entry is added to the Windows event log in the "Application" section.

3.3.6 Creating object types

3.3.6.1 Basics of object types

Operand type

At the operand type, you define one of the following methods of analysis via the "Evaluation type":

- "Number": Value analysis. The recorded values are displayed or calculated over a period of time, e.g. minimum, maximum or average.
- "Timer/Counter": Time series analysis. An operand of the "Timer/Counter" type counts states based on a configured limit. The following is determined during the calculation depending on the "Evaluation type" of the operand instance:
  - Time : "How long was a value above a certain value?"
  - Counters: "How often was a value above a certain value?"

    Note

    Use the "Number" "Evaluation type" to record values of "External Counting".
- "Structured operand": Similar to time series analysis. You map the state model of a plant in a structured operand by assigning states to numerical values or number ranges. Each state is treated as an operand.

Operand formula

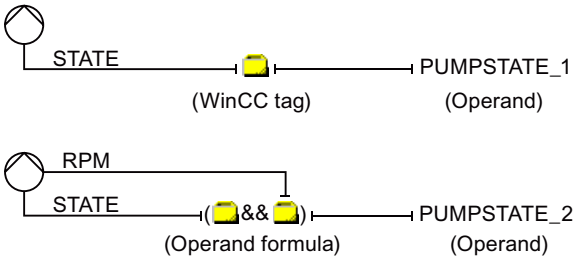
In the operand formula, you calculate from one or more process values a value that is not provided by the process. You assign the result of the operand formula to an operand instance instead of a WinCC tag.

Example:

The "PUMPSTATE" operand type is used to store the operating mode of various pumps. A type "A" pump supplies the operating mode directly. Another pump of the type "B" supplies the speed (RPM) as well.

With a type "A" pump, the pump is considered activated when the operating mode signals "ON". With a type "B" pump, the speed is also relevant. The operating mode is considered "ON" only when the speed exceeds a certain value and the operating mode signals "ON". The WinCC tags for speed and operating mode are logically linked in the operand formula.

To be able to evaluate the operating mode with an operand type only, you can connect the "PUMPSTATE_1" operand instance directly to the WinCC tag. You connect the "PUMPSTATE_2" operand instance to the operand formula.



KPI type

In the KPI type, you define a formula to calculate multiple operands, constants or KPIs.

Context information type

You use context information types to store metadata for your equipment. Context information types are relevant for the evaluation of KPIs. A context information type corresponds to a category, e.g. "Manufacturer","Type" or "Operator". Based on detailed context information, for example, you can show why the plant has failed more frequently with a product of "Manufacturer A".

The following table shows examples for context information types:

Context information	Entries for each piece of context information[1]	
	"String" data type	"Number" data type
Manufacturer	Manufacturer A Manufacturer B	-
Type	-	100 457 900
Operator	Operator 1 Operator 2 Operator 3	-

[1] Select an entry for each use of a context information instance at a piece of equipment. Alternatively, you can also refer to the entry from a WinCC tag.

See also

Creating an operand type (Page 77)

Creating a structured operand type (Page 80)

Creating a KPI type (Page 82)

Creating equipment (Page 83)

Creating the context information type (Page 84)

Example: Using an operand of "Timer/Counter" type (Page 92)

Example: Using an operand of the type "External counter" (Page 93)

3.3.6.2 Cyclic output of a KPI calculation in WinCC tag

Introduction

You can calculate a KPI cyclically in Runtime and store the result in a WinCC tag with a process connection. In this way, for example, you can create a line dashboard or store the values in WinCC Tag Logging.

The calculation is always performed cyclically from the current point in time to a definable point in time in the past.

Calculation methods

The following calculation methods are available:

Calculation methods	Description
Cyclic - interrupted	The KPI is calculated once within a cycle.
Cyclic - continuous	The KPI is calculated cyclically as of a specific point in time.
Cyclic - interval	The KPI is calculated cyclically with an interval.

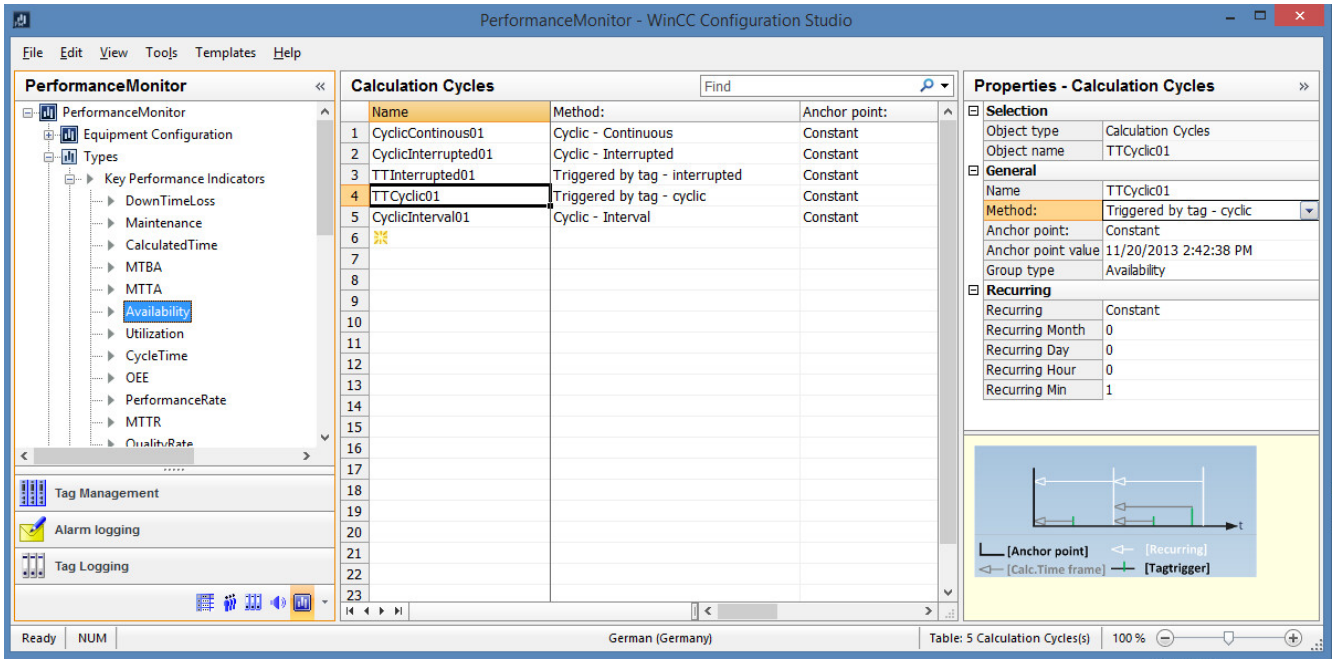
Calculation methods	Description
Tag controlled - cyclic	When the trigger occurs, the KPI is calculated within a cycle until the start of the cycle.
Tag controlled - interrupted	When the trigger fires, the KPI is calculated for the specified time period.

The following additional configuration options are available depending on the calculation method:

Configuration options	Description
Interval	Time period that is calculated starting with the trigger or the anchor point.
Calculated time period	Time period which is calculated starting with the anchor point.
Return	Time period of one cycle. The time period for the "Return" must be greater than the time period for the "Interval".
Anchor point	Point in time as of which the calculation for the next occurrence of the point in time is performed (constant). The anchor point can also be set as tag.

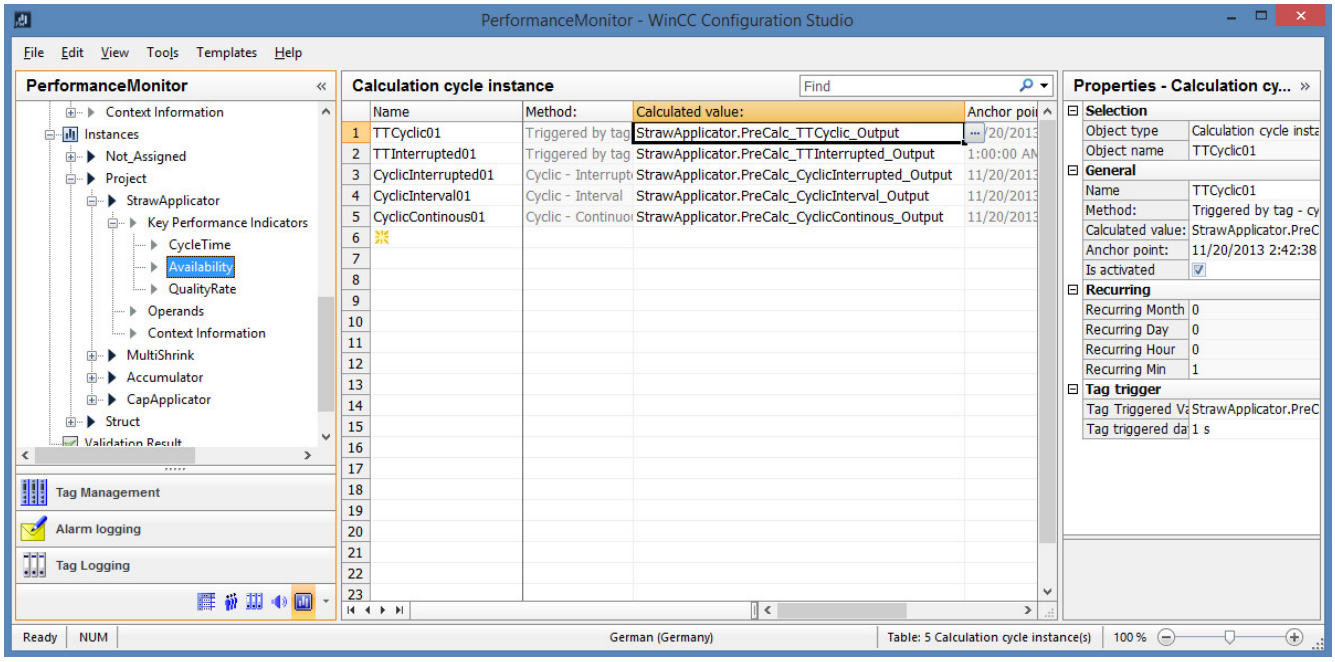
Principle

You define the required calculation cycles for each KPI type. You define how often and for how long values are calculated for each calculation cycle. The following figure shows a KPI type with three calculation cycles:



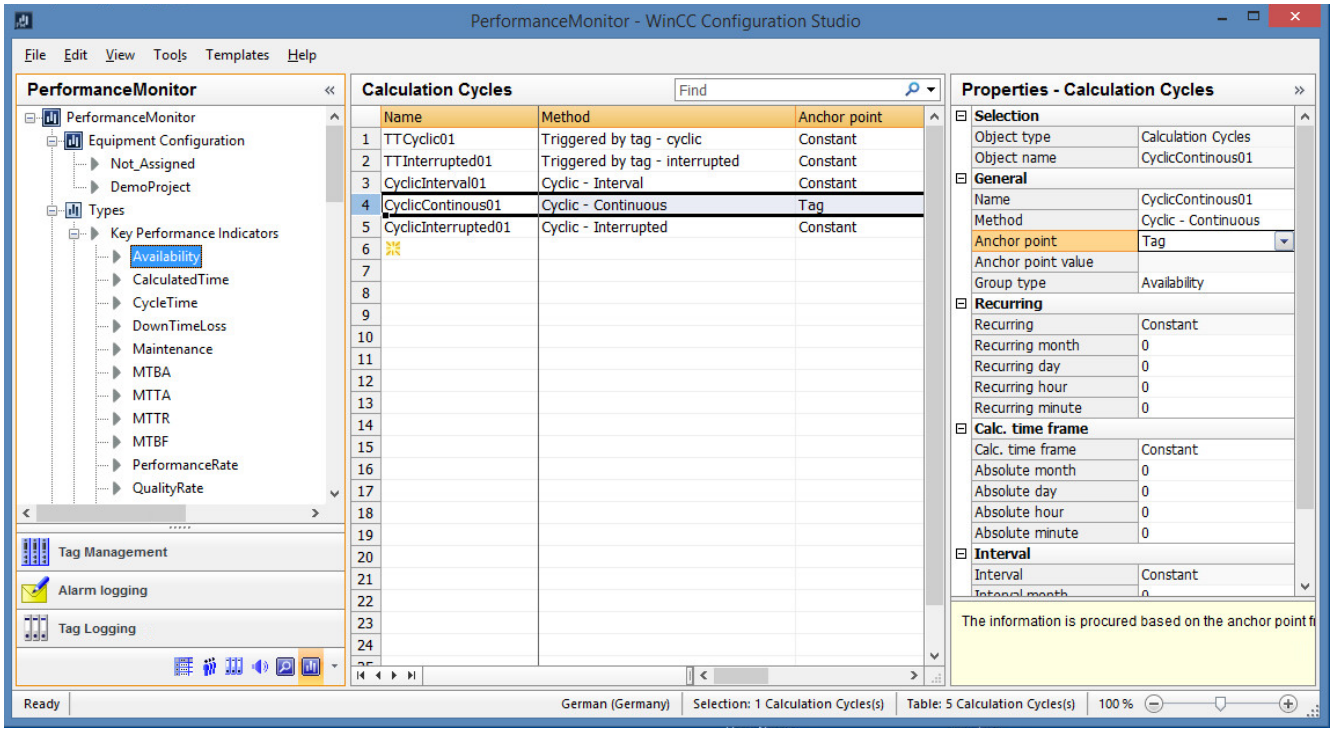
Always enter the constant of the anchor point in "Anchor point value" in the format "MM/DD/YYYY". If you enter an invalid value (for example "13" for month) the values of "DD" and "MM" get swapped after modifying.

You then select the required calculation cycles at the KPI instance. For each calculation cycle, you select the WinCC tag in which the calculation result is stored. The following figure shows a KPI instance with three calculation cycles:

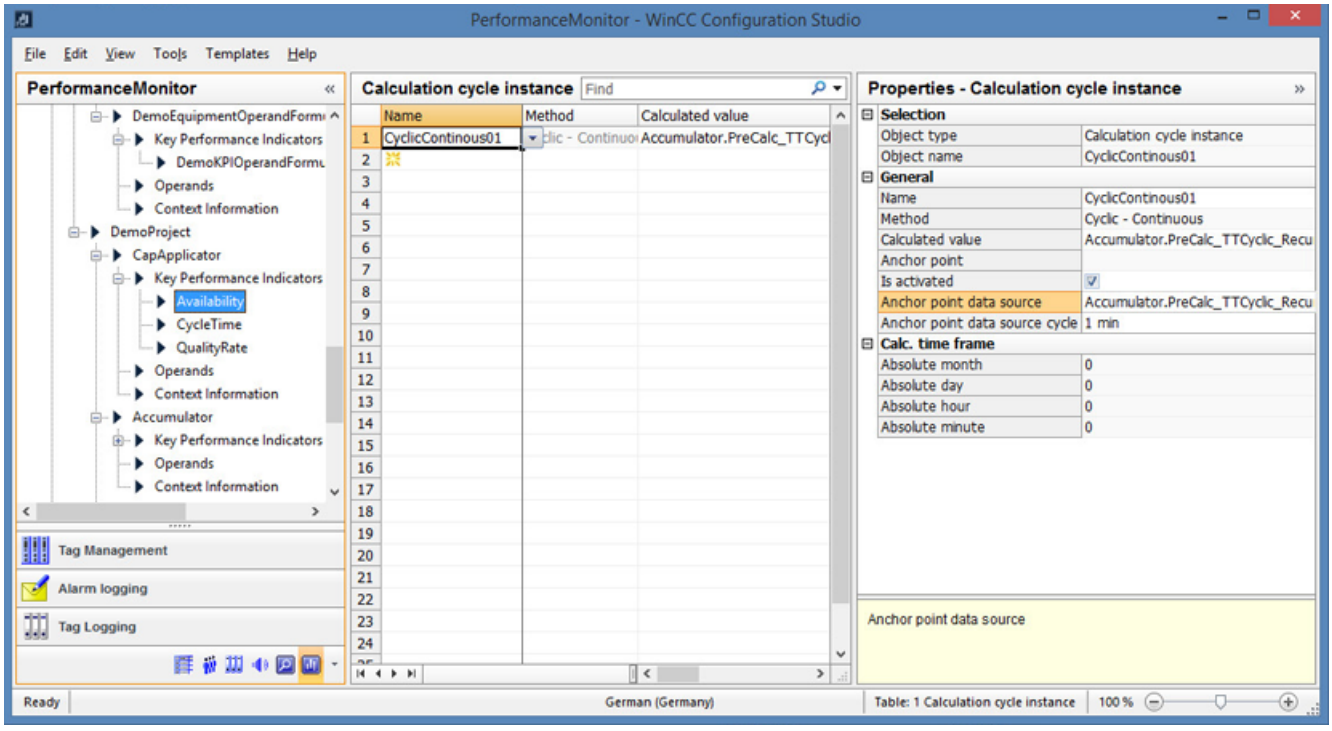


Setting anchor point as tag

You define the anchor point for a calculation cycle as tag if you want to control it with a CPU. Select the entry "Tag" in the properties under "Anchor point".



At the KPI instance, you select the required tag in the properties under "Anchor point data source". Under "Calculated value", you select the target tag.



Requirements for specification of a tag duration

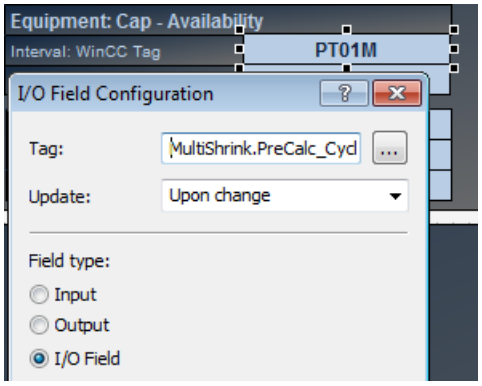
If you want to define the duration of a WinCC tag, the tag must meet the following requirements:

- Data type: Text tag, 16-bit character set
- Format of the time information: **P**nnYnnMnnWnnD**T**nnHnnMnnS according to ISO 8601
  "P" initiates the specification of a duration.
  "P" initiates the specification of a time of day.

The following table shows an example for specifying time durations:

Format	Duration
P2Y10M15DT10H30M20S	2 years 10 months 15 days 10 hours 30 minutes 20 seconds
P6W	6 weeks
PT72H	72 hours
P120D	120 days

The following figure shows the use of a WinCC tag to specify a variable time range. The time range is written to the WinCC tag via an IO field:



See also

Creating a KPI type (Page 82)

Sample project for WinCC/PerformanceMonitor (http://support.automation.siemens.com/WW/view/en/74509647)

3.3.6.3 Creating an operand type

Introduction

At the operand type, you define one of the following analysis methods using the "Evaluation type":

Evaluation type	Analysis method	Description
Number	Value analysis	The recorded values are displayed or calculated over a period of time, e.g. minimum, maximum or average.
Timer/Counter	Time series analysis	An operand of the "Timer/Counter" type counts states based on a configured limit. The following is determined during the calculation depending on the "Evaluation type" of the operand instance: • Time: How long was a value above a certain value? • Counter: How often was a value above a certain value?
Structured operand	Time series analysis	You map the state model of a plant in a structured operand by assigning states to numerical values or number ranges. Each state is treated as an operand.

Note

Use the "Number" "Evaluation type" to record values of "External Counting".

Requirement

If you want to assign a structured operand type to an operand type, you first have to create a structured operand type.

You can find additional information under:

- Structured operand type (Page 80)

Procedure

1. Navigate to "Types > Operands" in the navigation area.
2. Select the next empty cell under "Name" in the table area and enter the name of the operand type.
3. Select the "Evaluation type". When a structured operand type is created, it is displayed in the evaluation type and can be selected.
4. If necessary, make the following settings in the "Properties" window:
   - Bar color and text color for display in the Runtime control
   - Display name for the display in the Runtime control
   - Unit
   - Comment
   - Tooltip

Note

Alternative method for creating an Operand

You can right-click on the "Operand" node in the navigation area to create a new Operand.

Using an operand type in a KPI formula

For the operand type to appear in the calculation of a KPI, the operand type must be used in a KPI formula.

Display in the formula editor

Each state is considered a separate operand. When you enter a formula, the value can be addressed via "Operand.status.time" or "Operand.status.counter".

You can find additional information under:

- Creating a KPI type (Page 82)

See also

Name (Page 165)

Evaluation type (Page 166)

Basics of object types (Page 70)

Example: Using an operand of "Timer/Counter" type (Page 92)

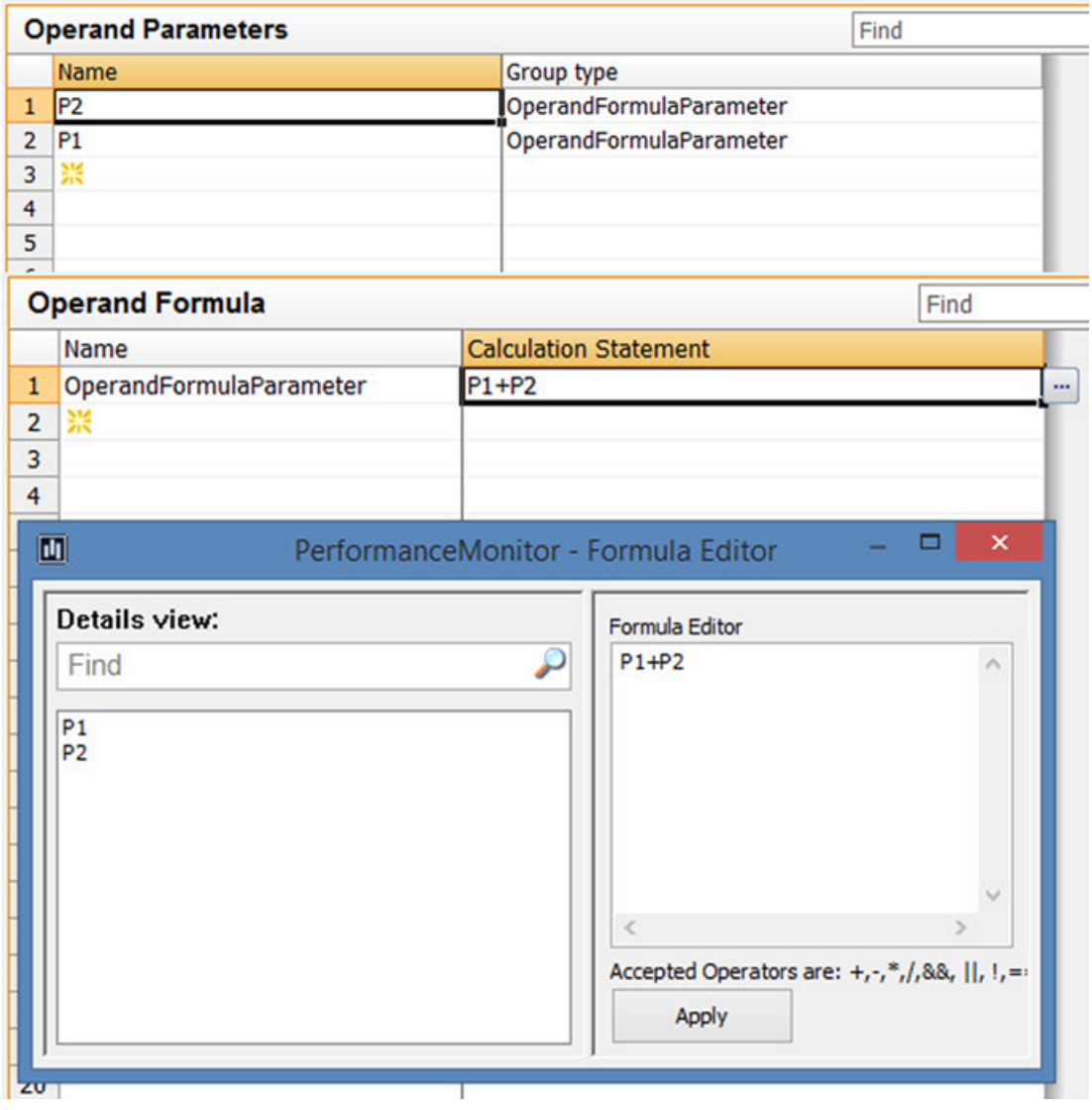
Example: Using an operand of the type "External counter" (Page 93)

Assigning parameters to an operand instance of the type "External counter" (Page 90)

3.3.6.4 Creating an operand formula

Introduction

In the operand formula, you calculate from multiple process values that is not provided by the process. You create a parameter with a data type for each process value to be processed. You then define a calculation formula from the parameters.



Procedure

1. In the navigation area, go to "Types > Operand Formula".
2. Enter the name of the operand formula under the "Name" column.
3. Select the "Evaluation type".
4. Select the created operand formula in the navigation area and create one or more operand parameters.
   You can also right-click on the operand formula to create operand parameters.
5. Navigate back to the "Operand formula" type in the navigation area.
6. Click the "..." button under the "Calculation Statement" column to enter the formula. The "PerformanceMonitor - Formula Editor" window opens.
7. Drag-and-drop the required operand parameters from "Details view:" section to "Formula Editor" section.

See also

Name (Page 165)

Calculation formula (Page 166)

Evaluation type (Page 166)

Data type (operand formula) (Page 166)

3.3.6.5 Creating a structured operand type

Import state model from XML file

To import an existing OMAC state model, select the menu command "Templates > Structured Operands > [Name]" in the PerformanceMonitor.

The XML files are located in the WinCC installation directory under "PerformanceMonitor\bin".

Procedure

1. Navigate to "Types > Structured Operands" in the navigation area.
2. Select the next empty cell under "Name" in the table area and enter the name of the structured operand type.
3. Select the "Structured Operand Entries" tab in the table area.
   Alternatively, navigate to your newly created structured operand in the navigation area under "Types > Structured Operands".

4. Specify the parameters "Min", "Max" and "Group type".
5. If necessary, make the following settings in the "Properties" window:
   - Bar color and text color for display in the Runtime control
   - Display name for the display in the Runtime control
   - Unit
   - Comment
   - Tooltip

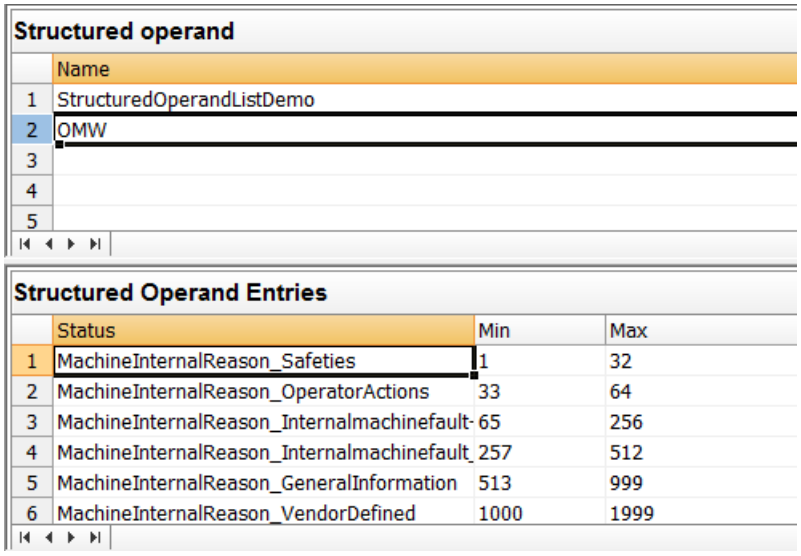
Note

Alternative method for creating/editing a Structured Operand

You can right-click on the "Structured Operand" node in the navigation area to create a new Structured Operand. You can also right-click on the created Structured Operand to rename, copy, paste, delete and to add a new Structured Operand Entry.

Result

The list with the entries for a structured operand has been defined.



Assigning structured operand type to an operand type

For the structured operand to appear in the calculation of a KPI, the structured operand type must be assigned to an operand type. To do so, select a structured operand type with the "Evaluation type".

You can find additional information under:

- Creating an operand type (Page 77)

See also

Basics of object types (Page 70)

Name (Page 165)

Status (Page 166)

MinMax (Page 167)

3.3.6.6 Creating a KPI type

Introduction

In the "Key Performance Indicator" type, you define a formula to calculate multiple operands, constants or KPIs. You define the calculation cycles in the created KPI.

Requirement

Operand types have been created.

Procedure

1. Navigate to "Types > Key Performance Indicators" in the navigation area.
2. Select the first empty cell under "Name" in the table area and enter the name of the KPI type.
3. Open the formula editor in the "Calculation Statement" column with the "..." button and define the calculation formula with which the KPI is being calculated.
   The created operand types that you can use for the calculation are displayed in the Details view in the formula editor.
4. If necessary, make the following settings in the "Properties" window:
   - Bar color and text color for display in the Runtime control
   - Display name for the display in the Runtime control
   - Unit
   - Comment
   - Tooltip
5. Select the "Calculation Cycles" tab in the table area.
   Alternatively, navigate to your newly created KPI in the navigation area under "Types > Key Performance Indicators".
6. Specify the parameters "Name", "Method" and "Group type".
7. For a cyclic calculation in Runtime, select the "Anchor point" from which the calculation is to be performed cyclically.

Note

Alternative method for creating/editing a KPI

You can right-click on the "Key Performance Indicators" node in the navigation area to create a new KPI. You can also right-click on the created KPI to rename, copy, paste, delete and to add a new Calculation Cycle.

See also

Name (Page 165)

Calculation formula (Page 166)

Unit (Page 166)

Creating an operand type (Page 77)

Basics of object types (Page 70)

Cyclic output of a KPI calculation in WinCC tag (Page 72)

3.3.6.7 Creating equipment

Introduction

Equipment has one of two forms in the PerformanceMonitor Configuration Studio:

- Plant
- Group

You can assign one or more "Plant" equipment forms to the "Group" equipment form. In this way, you can define, for example, simple production lines with one hierarchy level.

Equipment Groups

	Name
1	Not_Assigned
2	Project
3	Struct
4	
5	

Equipments

	Name	Group type
1	StrawApplicator	Project
2	MultiShrink	Project
3	Accumulator	Project
4	CapApplicator	Project
5	StructuredOperand	Struct
6		

Procedure

1. Click "Equipment Configuration" in the navigation area.
2. Select the first empty cell under "Name" and enter the name of the equipment group.
3. Select the "Equipments" tab in the table area.
   Alternatively, navigate to your newly created equipment group in the navigation area under "Equipment Configuration".
4. Select the first empty cell under "Name" and enter the name of the equipment.
   The "group type" is set automatically after entering the name. The "group type" can be changed at any time.
5. If necessary, make the following settings in the "Properties" window:
   - Bar color and text color for display in the Runtime control
   - Display name for the display in the Runtime control
   - Unit
   - Comment
   - Tooltip

Note

Alternative method for creating/editing an Equipment

You can right-click on the "Equipment" node in the navigation area to create a new Equipment Group or a new Equipment. You can also rename, copy, paste and delete the created Equipment.

See also

Name (Page 165)

Grouping (Page 165)

Basics of object types (Page 70)

3.3.6.8 Creating the context information type

Introduction

Context information is evaluation and filter criteria that describe a piece of equipment in detail. You assign context information to sort or filter the display of KPIs depending on the equipment according to these criteria.

You can create context information in the following way, for example:

- Create a list with the pre-defined values.
- Use a WinCC tag in which information from the plant is stored.

Procedure

1. Navigate to "Types > Context Information" in the navigation area.
2. Select the first empty cell under "Name" in the table area and enter the name of the context information type.
3. If you want to read in the entries for the context information from a WinCC tag in Runtime, select the data type of the WinCC tag under "Data type".
4. Select the "Context information entries" tab in the table area.
   Alternatively, navigate to your newly created context information in the navigation area under "Types > Context information".
5. Select the first empty cell under "Name" and enter the name of the context information entry. The "group type" is set automatically after entering the name. The "group type" can be changed at any time.
6. If necessary, make the following settings in the "Properties" window:
   - Bar color and text color for display in the Runtime control.
   - Display name for the display in the Runtime control
   - Comment
   - Tooltip

Note

Alternative method for creating/editing the Context Information

You can right-click on the "Context Information" node in the navigation area to create a new Context Information. You can also right-click to rename and delete the created Context Information.

See also

Basics of object types (Page 70)

3.3.7 Configuring object instances

3.3.7.1 Assigning the KPI type to equipment

Introduction

You assign KPIs to one or more items of equipment using drag-and-drop.

Requirement

- KPI type and associated operand types have been defined.
- The equipment has been created.

Procedure

1. Navigate to "Instances > [Equipment Group] > [Equipment] > Key Performance Indicator" in the navigation area.
2. Navigate to "Types > Key Performance Indicators" in the navigation area and drag the required Key Performance Indicator to the instance.

Result

The operand types used in the KPI types are available under "Instances > [Group] > [Equipment] > Key Performance Indicator > Operands".

To assign parameters to the KPI instance, link the operand instances to values, tags or operand formulas.

Note

Deleting KPI instance

To delete a KPI instance, right-click on the KPI and click "Delete".

3.3.7.2 Configuring a KPI instance

Introduction

Depending on the associated KPI type, a KPI instance may contain cyclic calculations. In the instance, connect your created calculation cycle to a WinCC tag.

Requirement

- KPI is assigned to equipment.
- Calculation cycle is defined in the KPI.
- The KPI instance is selected.
- The WinCC tags for the value supply have been created.

Procedure

1. Navigate to "Instances > [Equipment Group] > [Equipment] > Key Performance Indicators" in the navigation area.
2. Select the required KPI.
3. In the "Name" column, select the previously defined calculation cycle.

4. Click the ".." button in the "Calculated value" column.
   The "tag selection" dialog is displayed.
5. Select the required WinCC tag for your calculation.
6. Confirm your selection with "OK".

3.3.7.3 Configuring an operand instance of the "Timer/Counter" type

Requirement

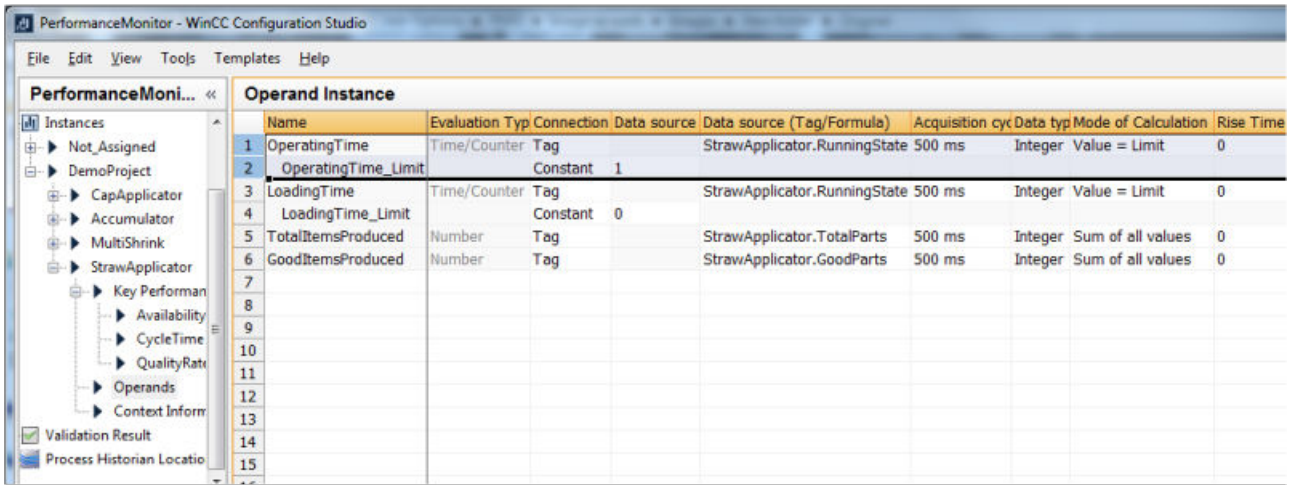
- The path "Instances > [Equipment Group] > [Equipment] > Operands" is displayed in the navigation area.
- The operand type has the "Timer/Counter" evaluation type.
- KPI with this operand instance is assigned to an item of equipment.

Procedure

1. Navigate to "Instances > [Equipment Group] > [Equipment] > Operands".
2. Select the "Connection mode" in the operand instance.
3. Enter the "Data source" depending on the selected "Connection mode".
4. Select the "Acquisition cycle".
5. Select the "Data type".
6. Select the required "Calculation mode".
7. If necessary, enter the "Rise Time".

Result

The operand instance of the "Timer/Counter" type is configured.



See also

Assigning the KPI type to equipment (Page 85)

Connection mode (Page 168)

Connect with (Page 168)

Data source (Page 169)

Data source cycle (Page 169)

Data type (operand instance) (Page 169)

Calculation mode (Page 169)

Rise Time [sec] (Page 170)

Example: Using an operand of "Timer/Counter" type (Page 92)

3.3.7.4 Configuring an operand instance of the "Number" type

Requirement

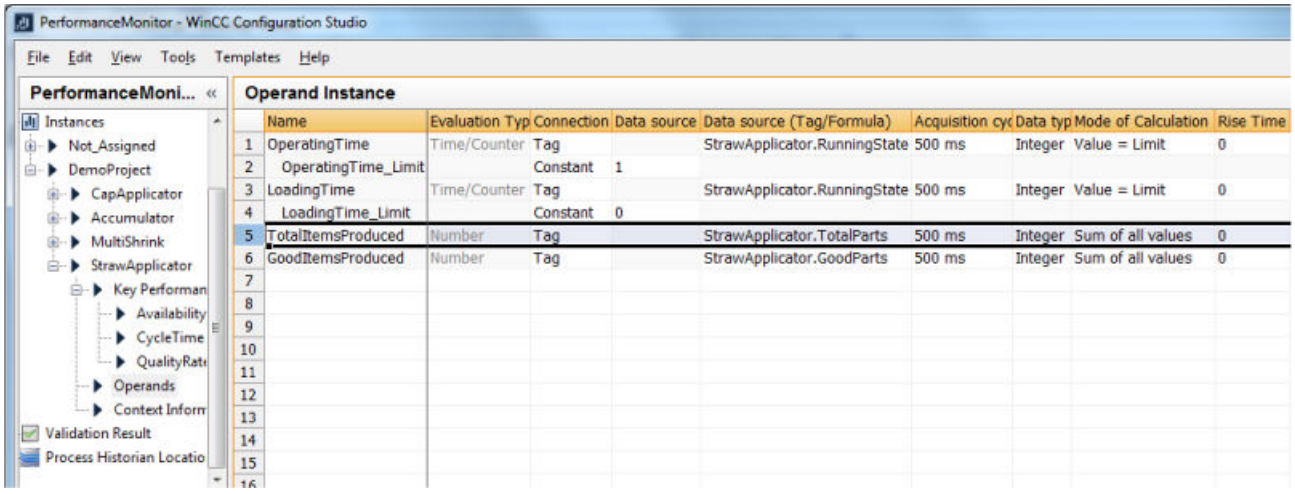
- The path "Instances > [Equipment Group] > [Equipment] > Operands" is displayed in the navigation area.
- The operand type has the "Number" evaluation type.
- KPI with this operand instance is assigned to an item of equipment.

Procedure

1. Navigate to "Instances > [Equipment Group] > [Equipment] > Operands".
2. Select the "Connection mode" in the operand instance.
3. Enter the "Data source" depending on the selected "Connection mode".
4. Select the "Acquisition cycle".
5. Select the "Data type".
6. Select the required "Calculation mode".

Result

The operand instance of the "Number" type is configured.



See also

Assigning the KPI type to equipment (Page 85)

Connection mode (Page 168)

Connect with (Page 168)

Data source (Page 169)

Data source cycle (Page 169)

Data type (operand instance) (Page 169)

Calculation mode (Page 169)

3.3.7.5 Configuring an operand instance of structured operand type

Requirement

- The path "Instances > [Equipment Group] > [Equipment] > Operands" is displayed in the navigation area.
- The operand type has the "Structured Operand" evaluation type.

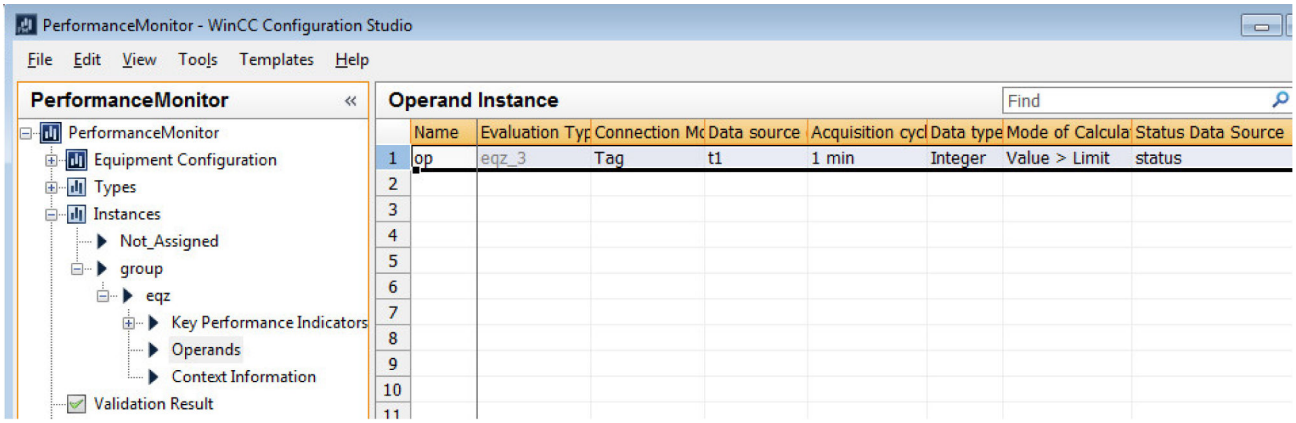
Procedure

1. Navigate to "Instances > [Equipment Group] > [Equipment] > Operands".
2. Select the "Connection mode" in the operand instance.
3. Enter the "Data source" depending on the selected "Connection mode".
4. Select the "Acquisition cycle".

5. Select the "Data type".
6. Select the required "Calculation mode".
7. Select the "Status Data Source".
8. If necessary, enter the "Rise Time".

Result

The operand instance of the "Structured Operand" type is configured.



3.3.7.6 Assigning parameters to an operand instance of the type "External counter"

Requirement

- The path "Instances > [Equipment Group] > [Equipment] > Operands" is displayed in the navigation area.
- The operand type has the "Number" evaluation type.
- KPI with this operand instance is assigned to an item of equipment.

Procedure

1. Navigate to "Instances > [Equipment Group] > [Equipment] > Operands".
2. Select the connection mode "Tag" in the operand instance.
3. Under "Data source (Tag/Formula)", select the tag that stores the counter value.
4. Select the "Data type".

5. Select the entry "External counting" under "Calculation mode".
6. Configure the external counter. You need to define the counting range for "Counter minimum" and "Counter maximum" operand instances either by selecting "Tag" or "Constant" or "Unlimited" options of the "Connection Mode" in the Configuration Studio.
   - Unlimited: The default value "999999999999999" is set as maximum value.
   - Constant: You select a value between "0" and default value "999999999999999".
   - Tag: The tag value is applied as minimum/maximum value. Values higher than "999999999999999" will always be reset to the default value "999999999999999".

   When a recorded value is smaller than the preceding value, the default value "999999999999999" is used for the difference calculation. This occurs when the maximum value is reached and the counter is reset. You must configure the calculation time range such that the counter reset is not included.

Note

WinCC tag

To save the current counter value, select the WinCC tag that triggers the event under "Counter save event".

The values of the WinCC tags for saving and resetting the counter status must be set by either the operator or the controller. The corresponding event in the PerformanceMonitor is triggered only by this external value change. If you want to save and then reset the current counter value, select the WinCC tag that triggers the event.

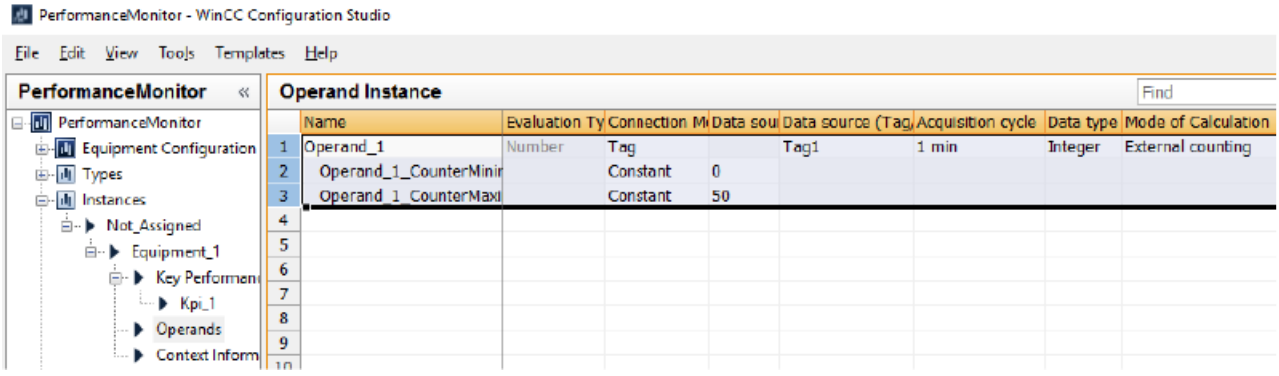
Note

Minimum and maximum external counter values

The limits (maximum and minimum) of an external counter are considered for KPI calculation only when the delta value (previous value - current value) is less than zero, that is a negative value.

Result

The operand instance of the type "External counter" is configured.



See also

Assigning the KPI type to equipment (Page 85)

Connection mode (Page 168)

Connect with (Page 168)

Data source (Page 169)

Data source cycle (Page 169)

Data type (operand instance) (Page 169)

Calculation mode (Page 169)

Example: Using an operand of the type "External counter" (Page 93)

3.3.7.7 Configuring context information

Introduction

You assign context information to equipment with drag-and-drop. Context information, for example, can include the "Manufacturer" of the respective item of equipment.

Procedure

1. Navigate to "Instances > [Equipment Group] > [Equipment] > Context information" in the navigation area.
2. Navigate to "Types > Context Information" in the navigation area and drag the required context information to the instance.
3. Under "Connection mode", select the type of data supply.
4. Select the data source under "Data source".

See also

Connect with (Page 168)

Data source (Page 169)

Data source cycle (Page 169)

3.3.7.8 Example: Using an operand of "Timer/Counter" type

Introduction

The speed of a motor is used to determine when the motor is considered "on" and when it is "off".

Requirement

An operand type of "Timer/Counter" type has been created.

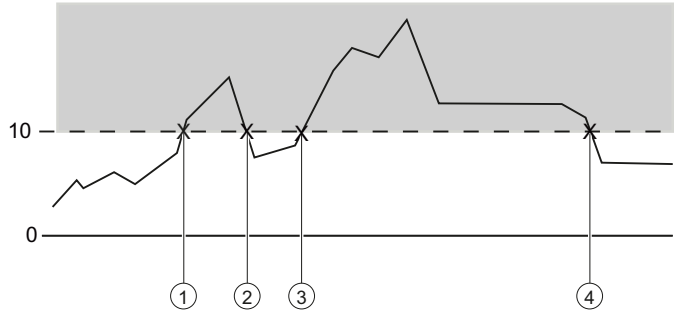
Procedure

Depending on the data type of the operand, you define the limit or range that is interpreted as the Boolean value "true" as the "calculation method".

When the motor is operated at a constant speed, select "Greater than [value]" as the "Limit". When the motor speed is more irregular, select "Within [range specification]", for example, as the "Limit". You can also eliminate minor speed variations at the range limits by entering a time period under "Settling time". The "Limit" must then be present for at least the length of the "Settling time" before the status is saved.

Result

The following figure shows the course of a process value that is linked to an operand. Value changes above and below the defined limits are ignored.



① High limit violation. The "On" state is stored with a time stamp in the operands.
② Low limit violation. The "Off" state is stored with a time stamp in the operands.
③ High limit violation. The "On" state is stored with a time stamp in the operands.
④ Low limit violation. The "Off" state is stored with a time stamp in the operands.

See also

Configuring an operand instance of the "Timer/Counter" type (Page 87)

Basics of object types (Page 70)

Creating an operand type (Page 77)

3.3.7.9 Example: Using an operand of the type "External counter"

Introduction

A plant produces two different types of products.

The plant runs 24 hours in a three-shift operation.

The counter is processed in the controller, example, Count or Reset.

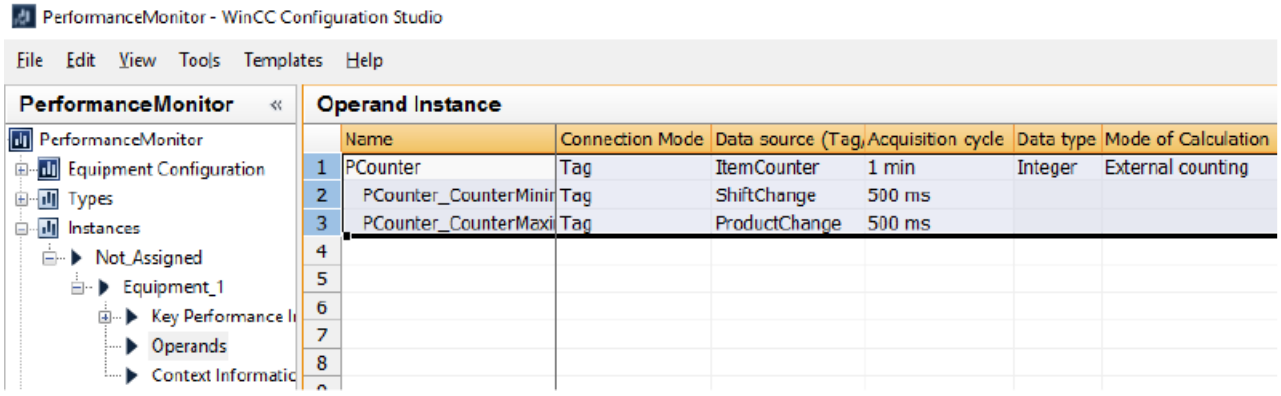
Requirement

- An operand type "PCounter" of the "Number" type has been created.
- KPI type "ProductCounter" with formula "PCounter*1" has been created.
- The following external WinCC tags have been created:
  - ItemCounter: Tag for querying the counter value from the PLC
  - ShiftChange: Tag for triggering the "Shift change" event
  - ProductChange: Tag for triggering the "Product change" event

Procedure

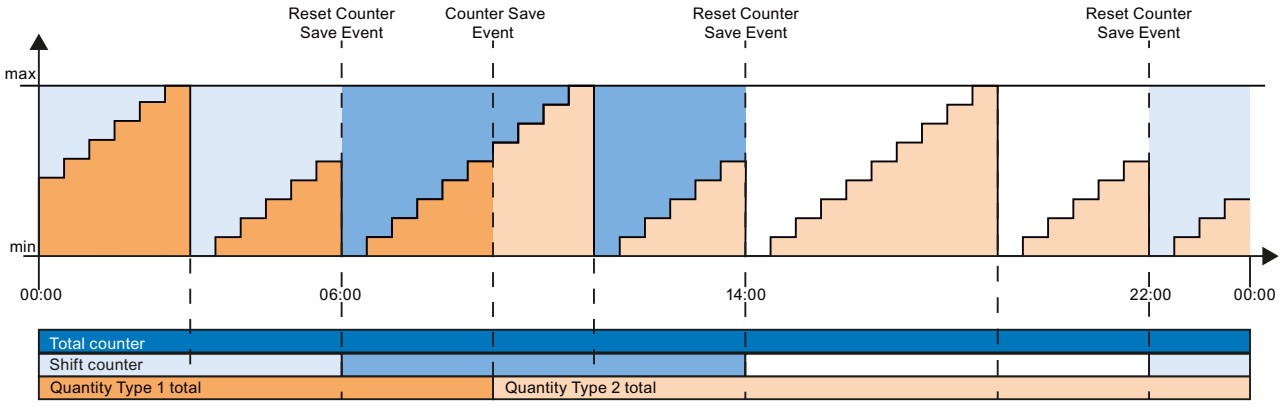
In the object properties of the operand, select "External counting" as the mode of calculation.

Configure the external counter as shown below:



Result

The figure below shows the various counter values stored in the operand over a period of 24 hours:



Total counter	WinCC tag ""ItemCounter" that is connected to the "Data source (Tag/Formula)" field.
Shift counter	WinCC tag "ShiftChange" that is connected to the "Data source (Tag/Formula)" field. Event is triggered at the end of a shift. The current counter value is saved with time stamp in the operand and then reset.
Product counter	WinCC tag "ProductChange" that is connected to the "Data source (Tag/Formula)" field. Event is triggered at a product change. The current counter value is saved with time stamp in the operand. You can determine the correct result in the evaluation only when you save the counter value along with the change of context.

See also

Assigning parameters to an operand instance of the type "External counter" (Page 90)

Basics of object types (Page 70)

Creating an operand type (Page 77)

3.3.7.10 Relating mode of calculation and connection mode

Introduction

The following table explains the different modes of calculation available and their relationship with connection modes:

Connection mode	Data type	Mode of calculation
Time/Counter	Float/Integer	• Value > Limit • Value >= Limit • Valur < Limit • Value <= Limit • Value = Limit • Value != Limit • Value in range • Value not in range
Time/Counter	Bool	• Value = Limit • Value != Limit
Number	Float/Integer	• Maximum value • Minimum value • Average value • Sum of all values • Time-weighted average value • Time-weighted sum of all values • External counting
Structured operand	Not applicable	Not applicable

Note

Mode of calculation is disabled for Structured operands as the range of the values are managed by the structured operand entires based on user configuration.

3.3.8 Exporting and importing configuration data

3.3.8.1 Basics

Introduction

You can export all configuration data from the PerformanceMonitor Configuration Studio to the following file formats:

- TXT
- XLSX

To save configuration time, you can distribute these configuration files over several WinCC projects, for example, and import them into the PerformanceMonitor Configuration Studio.

Automatic validation of the configuration data

Before the import, the plausibility of the files is checked with regard to the validity and logic of the configuration data. We distinguish between the following results:

- Import possible
- Import not possible

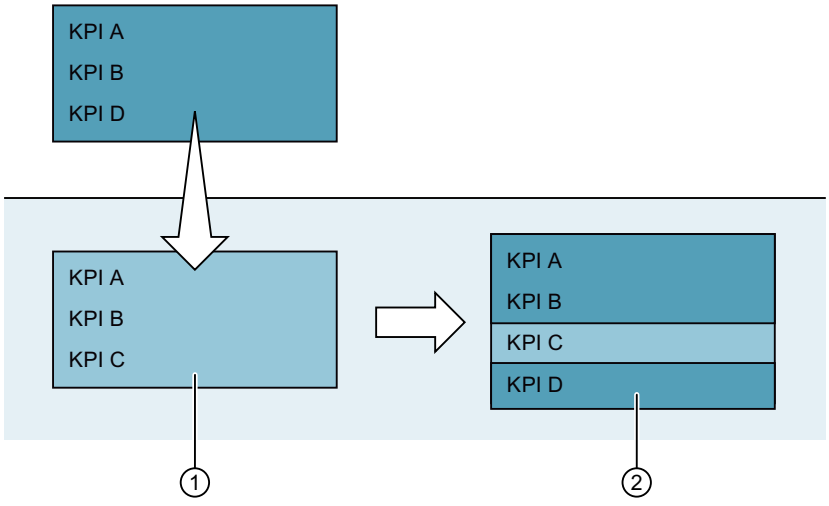
Errors during the import are logged in the following log file:
C:\ProgramData\Siemens\Logs\PerformanceMonitor

Import possible

Result of the plausibility check: The file structure is valid. The configuration data is error-free:

- The configuration data is imported in full.
- Configuration data with the same name already existing in the PerformanceMonitor Configuration Studio is overwritten during the import.
- Configuration data with names not contained in the file are retained unchanged.

The figure below shows in schematic form the import of three KPIs into an existing configuration:



① Configuration data in PerformanceMonitor Configuration Studio before the import.

② Configuration data in PerformanceMonitor Configuration Studio after the import. The configuration data of KPIs "A", "B" and "D" were overwritten during import. The configuration data of KPI "C" is also unchanged after the import.

Import not possible

Result of the plausibility check: The file structure of the import file is invalid.

- Logic testing of the configuration data is not executed.
- File is not imported.

See also

Exporting configuration data (Page 98)

Importing configuration data (Page 98)

3.3.8.2 Exporting configuration data

Requirement

Configuration data is contained in the PerformanceMonitor Configuration Studio .

Procedure

1. Select "Edit > Export" in the menu bar.
   The file selection dialog opens.
2. Enter a file name for the export file.
3. Select the required file format.
4. Navigate to preferred storage location.
5. Click "Export".

Result

The configuration data is exported to a file. You can adapt the contents of the file, if necessary.

See also

Basics (Page 96)

Importing configuration data (Page 98)

3.3.8.3 Importing configuration data

Introduction

You can only select one import file per import.

Note

Existing configuration data is overwritten during the import

Configuration data with the same name already existing in the PerformanceMonitor Configuration Studio is overwritten during the import.

When you import a file, PMO will clear the list of undo-redo changes done in the configuration. A Confirmation dialog appears before clearing the undo and redoes changes.

Requirement

- The import file with exported configuration data is stored in the file system.
- Import file is valid.

Procedure

1. Select "Edit > Import" in the menu bar.
   The file selection dialog opens.
2. Select the file for import.
   The plausibility of the configuration data is checked. That data that is imported depends on the result of the plausibility check.
3. Click "Import".
4. Save the configuration with <Ctrl+S> or select "File > Save" in the menu bar.
5. If necessary, create the WinCC tags whose names are used in the newly imported configuration data.

Result

All valid configuration data is imported.

See also

Basics (Page 96)

Exporting configuration data (Page 98)

3.3.9 Accessing PMO controls with VBS

Introduction

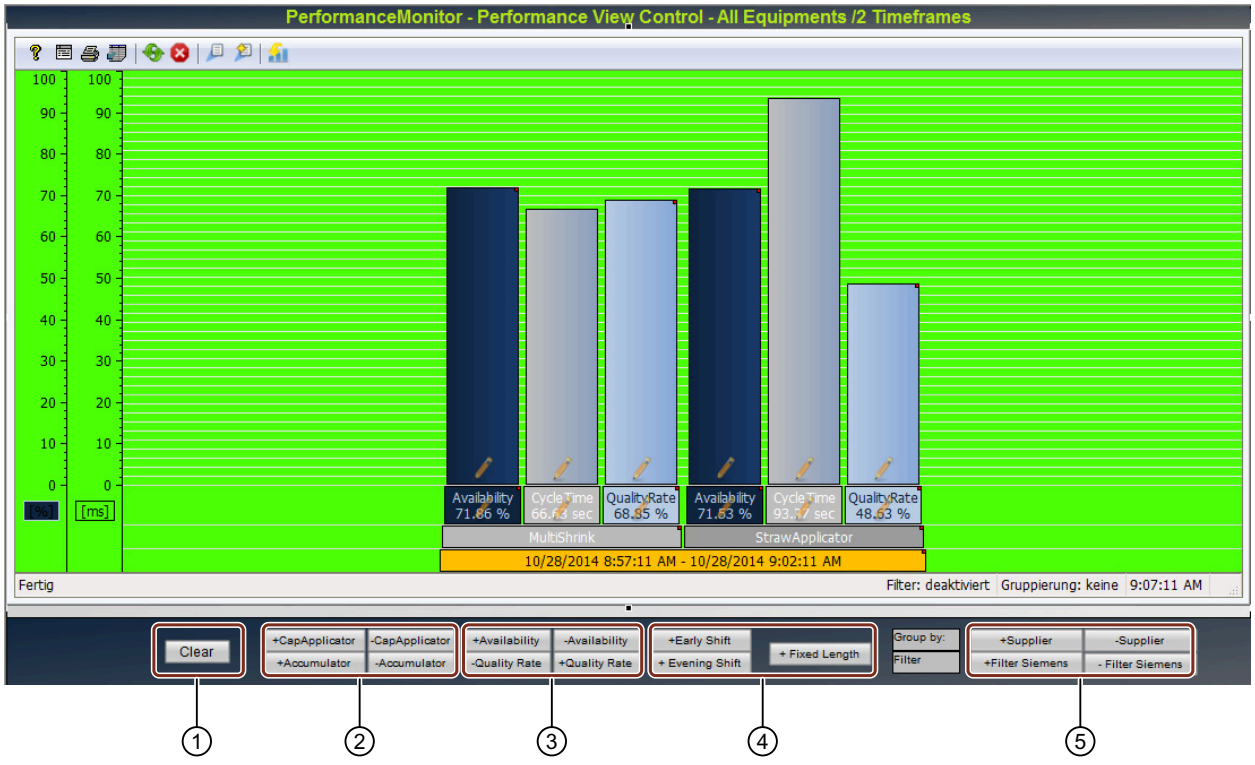
The controls of the PerformanceMonitor support the dynamization with local VB scripts, in particular for the following configuration settings:

- Add/remove equipment
- Add/remove KPIs
- Add/remove operands
- Configure time range
- Grouping
- Filtering
- Sorting

You can implement individual configuration options with VB scripts, for example, without the user having to open the configuration dialog of a control in Runtime.

Example

The figure below uses the PerformanceViewControl as an example to demonstrate how its configuration can be implemented without using the configuration dialog in Runtime. The VB scripts are configured as local scripts on buttons.



① Deleting all contents
Code example "ClearContents"

② Adding/removing two items of equipment to/from the existing configuration
Code example "AddRemoveEquipment"

③ Adding/removing two KPIs to/from the existing configuration
Code example "AddRemoveKPI"

④ Switching between two time ranges
Code example "ConfigureTimeFrame"

⑤ Grouping and filtering by context information
Code example "GroupAndFilterByContextInformation"

Access to contents of a control

The following PerformanceMonitor objects are included in lists which you access with the following methods:

- Equipment: Access with "GetEquipmentCollection".
- KPIs: Access with "GetKPICollection".
- Operands: Access with "GetOperandCollection".

- Time ranges: Access with "GetTimeFrameCollection".
- Filters: Access with "GetSpecFilterCollection".

Note

Additional information on access to control methods and properties is available in the WinCC information system under the keyword "VBS reference".

Example "ClearContents"

In the following example, all the contents are removed from the control:

```
Sub OnClick(ByVal Item)
' Define variables
    Dim perfCtrl, equipments, eq, kpis, kpi, filters, filterItem

' Initialize variables
    Set perfCtrl = ScreenItems("PerfomanceViewControl1")
    Set equipments = perfCtrl.GetEquipmentCollection()
    Set kpis = perfCtrl.GetKPICollection()
    Set filters = perfCtrl.GetSpecFilterCollection()

' Remove all contents from control
    For Each eq In equipments
        equipments.RemoveItem(eq.Name)
    Next
    For Each kpi In kpis
        kpis.RemoveItem(kpi.Name)
    Next
    For Each filterItem In filters
        filters.RemoveItem(filterItem.Name)
    Next

' Re-initialize control
    perfCtrl.ContextGroupBy = Empty
    perfCtrl.ReloadData
End Sub
```

Example "AddRemoveEquipment"

In the following example, the equipment "CapApplicator" is added:

```
Sub OnClick(ByVal Item)
    Dim perfCtrl, equipments

    Set perfCtrl = ScreenItems("PerfomanceViewControl1")
    Set equipments = perfCtrl.GetEquipmentCollection()

' Add equipment using the method "AddItem"
    equipments.AddItem("CapApplicator")

' Re-initialize control
    perfCtrl.ReloadData
End Sub
```

In the following example, the equipment "CapApplicator" is removed:

```
Sub OnClick(ByVal Item)
    Dim perfCtrl, equipments

    Set perfCtrl = ScreenItems("PerfomanceViewControl1")
    Set equipments = perfCtrl.GetEquipmentCollection()

' Remove equipment using the method "RemoveItem"
    equipments.RemoveItem("CapApplicator")

' Re-initialize control
    perfCtrl.ReloadData
End Sub
```

Example "AddRemoveKPI"

In the following example, the KPI "Availability" is added:

```
Sub OnClick(ByVal Item)
    Dim perfCtrl, kpis

    Set perfCtrl = ScreenItems("PerfomanceViewControl1")
    Set kpis = perfCtrl.GetKPICollection()

' Add KPI using the method "AddItem"
    kpis.AddItem("Availability")

' Re-initialize control
    perfCtrl.ReloadData
End Sub
```

In the following example, the KPI "Availability" is removed:

```
Sub OnClick(ByVal Item)
    Dim perfCtrl, kpis

    Set perfCtrl = ScreenItems("PerfomanceViewControl1")
    Set kpis = perfCtrl.GetKPICollection()

' Remove KPI using the method "RemoveItem"
    kpis.RemoveItem("Availability")

' Re-initialize control
    perfCtrl.ReloadData
End Sub
```

Example "ConfigureTimeFrame"

In the following example, a fixed time range is defined from which the calculated KPIs are displayed:

```
Sub OnClick(ByVal Item)
    Dim perfCtrl, Timeframes, TimeframeItem, timeframe

    Set perfCtrl = ScreenItems("PerfomanceViewControl1")
    Set Timeframes = perfCtrl.GetTimeFrameCollection()

' Remove every existing time frame"
    For Each timeframe in TimeFrames
        TimeFrames.RemoveItem(timeframe.Name)
    Next

' Create new timeframe with static start and end
    Timeframes.AddItem("Early Shift")
    Set TimeframeItem = Timeframes("Early Shift")
    With perfCtrl
        .TimeframeBarWindow = "BarWindow1"
        .TimeframeMode = 0 'MODE_BEGIN_TO_END
        .TimeframeBegin: CDate("11/08/2014 05:00:00 AM")'Start time for the request
        .TimeframeEnd: CDate("11/08/2014 01:00:00 PM")'Endtime for the request
    End With

' Re-initialize control
    perfCtrl.ReloadData
End Sub
```

Example "GroupAndFilterByContextInformation"

In the following example, existing context information is grouped according to specific context information:

```
Sub OnClick(ByVal Item)
    Dim perfCtrl

    Set perfCtrl = ScreenItems("PerfomanceViewControl1")
    perfCtrl.ContextGroupBy = "Supplier"

' Re-initialize control
    perfCtrl.ReloadData
End Sub
```

In the following example, the context information is also filtered:

```
Sub OnClick(ByVal Item)
    Dim perfCtrl, specifications, filterItem

    Set perfCtrl = ScreenItems("PerfomanceViewControl1")
    Set specifications = perfCtrl.GetSpecFilterCollection()

' Add new filter
    specifications.AddItem("FilterEqualsTo")

'Configure filter "Supplier = Siemens"
    Set filterItem = specifications("FilterEqualsTo")
    With filterItem
        .SpecId = "Supplier" 'Defines the context information's category
        .Operator = 0 ' meaning "="
        .Operand = "Siemens" 'Defines the value
    End With

    perfCtrl.ContextGroupBy = "Supplier"

' Re-initialize control
    perfCtrl.ReloadData
End Sub
```

See also

GetEquipmentCollection method (Page 171)

GetKPICollection method (Page 172)

GetOperandCollection method (Page 173)

GetSpecFilterCollection method (Page 174)

GetTimeFrameCollection method (Page 175)

3.4 Outputting KPIs

3.4.1 Basics on outputting KPIs

Introduction

You output KPIs in a picture or a report in the following controls:

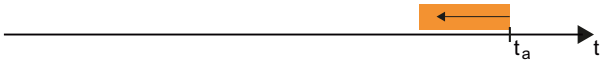
- WinCC PerformanceViewControl
- WinCC PerformanceGanttControl
- WinCC PerformanceTable Control

You can also use the SIMATIC Information Server or WinCC/WebNavigator.

Time ranges

A time range is the basis for outputting a KPI. You define a time range based on a time t and a time duration. The KPIs are calculated from the acquired operands within this time range.

- Time period with a relative start time



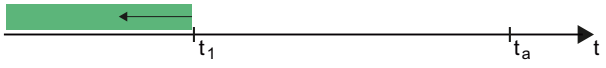
t_a Current time

- Start time and duration

t_a Current time

t_1 Any time in the past

- Time period with reference time



t_a Current time

t_1 Any time in the past

- Static time range

t_a Current time

t_1 Start time

t_2 End time

Application example: Cause and effect of a fault signal from two days ago should be determined. To determine the cause, define a "Time period with reference time". To determine the effects, define a "Start time and duration".

Note

Locked Internal/external PH

Wrong KPI calculation happens due to missing data for a time range, when internal/external PH is locked.

Compare

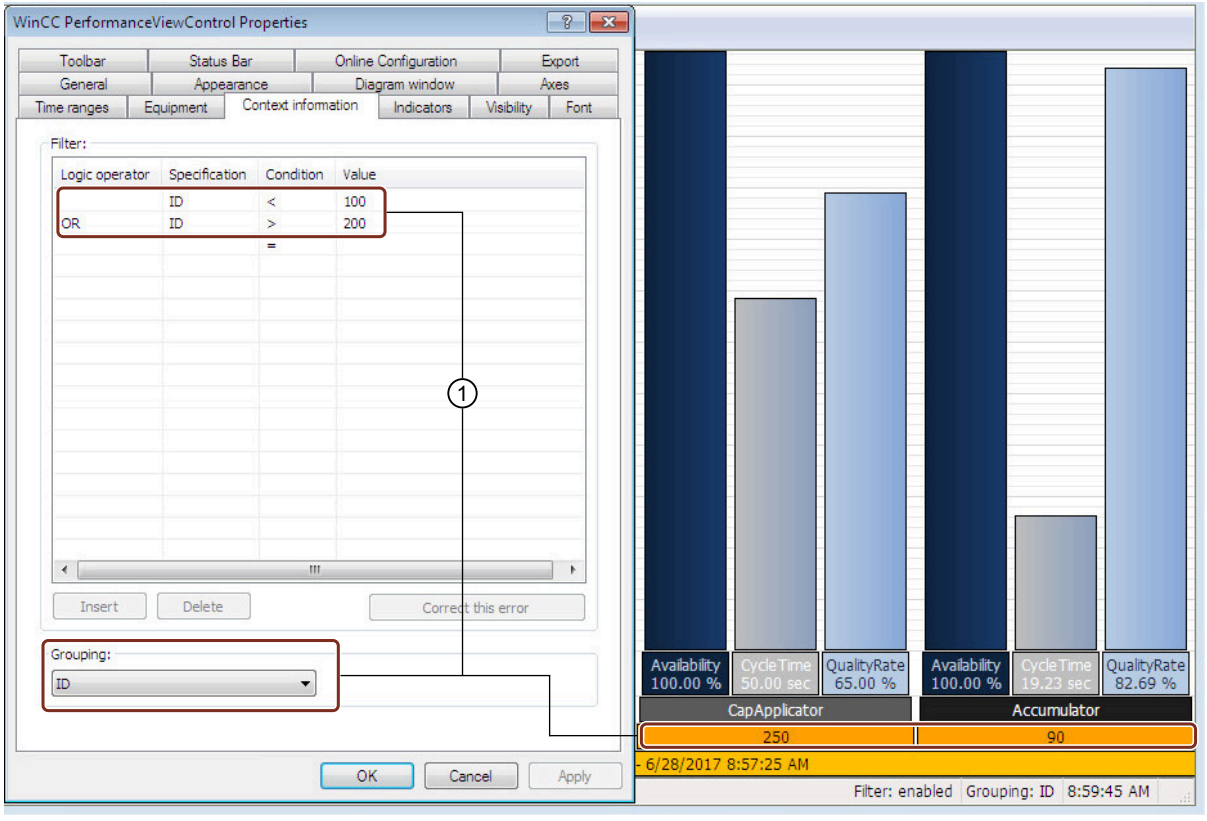
With a comparison, you display a KPI in two time axes with different time ranges, for example, the current month and the previous month.

Filtering and grouping

You define the filters and the grouping of the equipment as well as the context information in the configuration dialog of the control in the "Context Information" tab:

- "Filtering" involves limiting the time range to one or more items of context information.
- "Grouping" involves placing the KPIs in groups according to context information.

The figure below shows the grouping according to context information "Supplier".

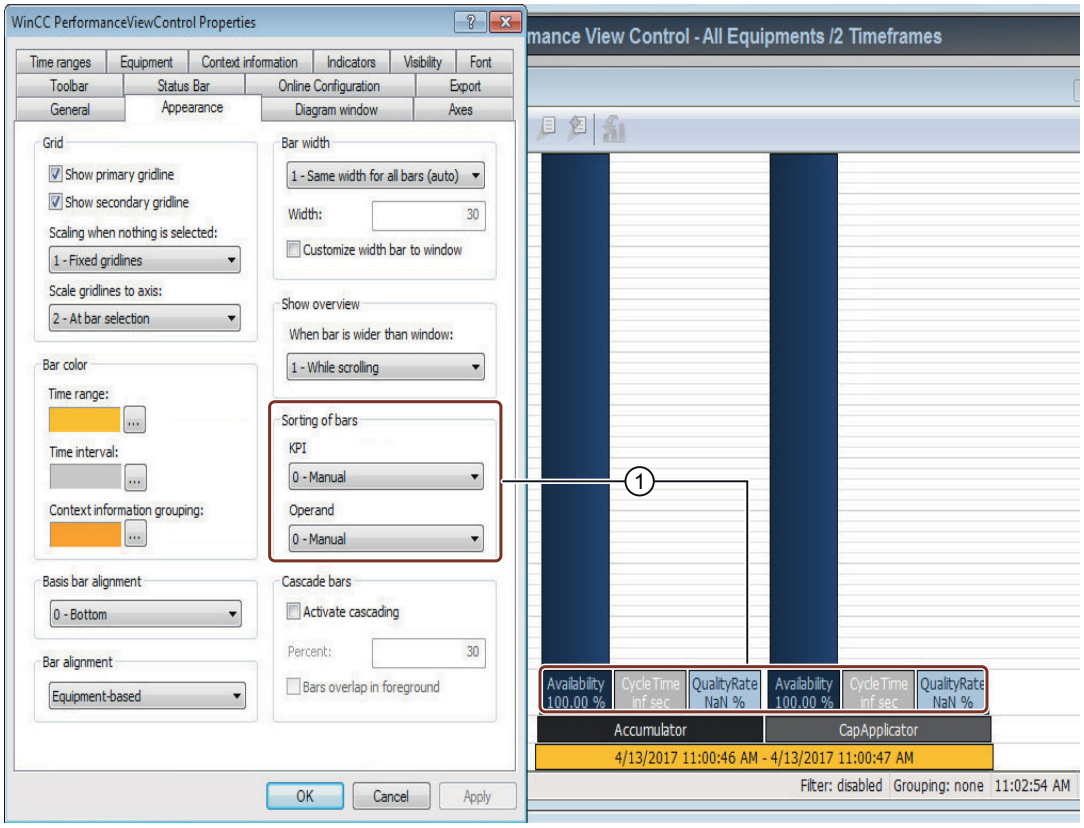


Sorting

You specify the sequence of operands and KPIs separately for KPIs and operands in the "Display" tab under "Sorting of bars" in the configuration dialog.

- When you select "0 - Manual", the sequence defined in the "Indicators" or "Operands" tab is used for sorting.
- In the PerformanceViewControl, sorting by operands is only possible with active "Drilldown".

The following figure shows the sorting of KPIs by ascending values:



3.4.2 PerformanceMonitor Controls for displaying the KPIs

Introduction

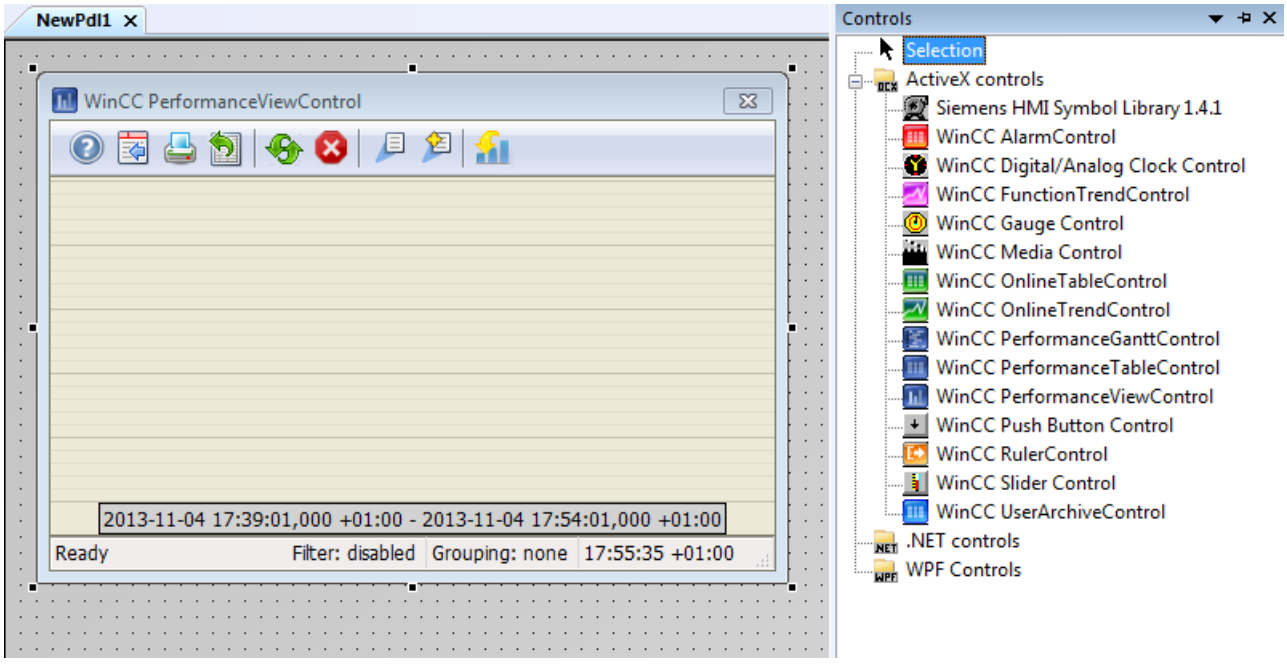
You can use the following WinCC controls for output:

- **WinCC PerformanceViewControl** and **WinCC PerformanceGanttControl** for graphical output of KPIs in a performance chart
  Use these output options for continuous evaluation and analysis of KPIs and/or operands.
- **WinCC PerformanceTableControl** for tabular output of the raw data of the operands.
  Use this output option to correct the raw data, for example, when incorrect data is recorded.

You can find more information on configuring controls in the WinCC online help in the WinCC Information System.

Requirement

To use the controls for the WinCC PerformanceMonitor in the Graphics Designer, you must add the controls via the "ActiveX controls" shortcut menu before using them for the first time. The controls are then available under "ActiveX controls". You can drag-and-drop the controls into the screen.



Safety aspects

Take into consideration the assignment of permissions during configuration. Restrict the configuration options in Runtime as needed.

You can find additional information on this topic in the WinCC Online Help in the WinCC Information System under "Working with WinCC > Configuration of the User Administration".

See also

Basics on outputting KPIs (Page 105)

3.4.3 Configuring the Report designer

The WinCC PerformanceMonitor provides the following objects for the Report Designer:

- Layouts:
  - @Performance Monitor Control - Picture
  - @Performance Monitor Control - Table
- Print jobs:
  - @Performance Monitor Table Control - Table
  - @Performance Monitor Gantt Control - Picture
- Controls for output in reports and logs
  - CCAxPerformanceGanttControl
  - CCAxPerformanceTableControl
  - CCAxPerformanceViewControl

3.4.4 WinCC PerformanceViewControl

3.4.4.1 Configuring WinCC PerformanceViewControl

Introduction

You can configure a graphical output of KPIs or operands in a WinCC PerformanceViewControl.

Requirement

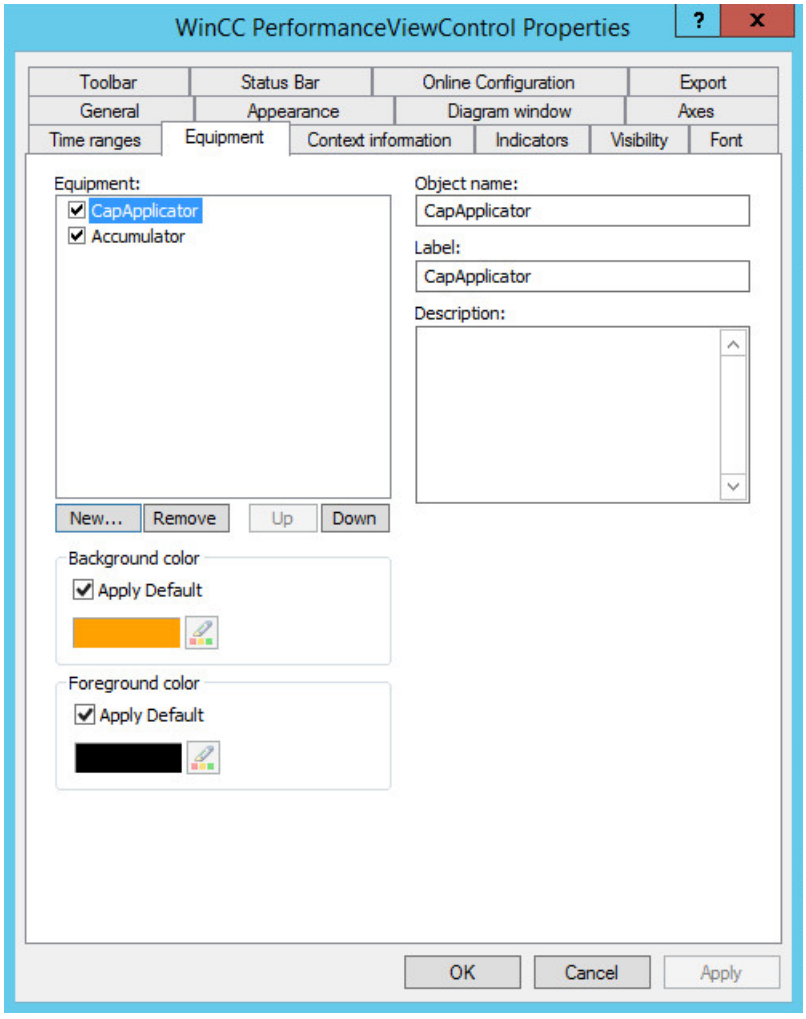
- WinCC Graphics Designer in WinCC is open.
- KPIs, operands, equipment and context information is completely configured.

Procedure

1. Insert the "WinCC PerformanceViewControl" in a process picture.
2. Open the configuration dialog with a double-click on the WinCC PerformanceViewControl.
3. Define the parameters in the following tabs:

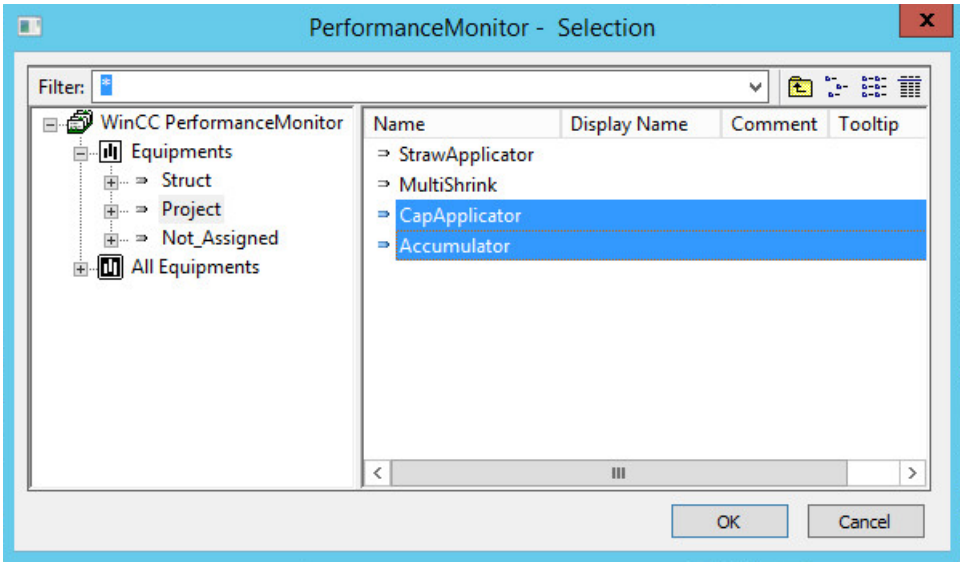
"Equipment" tab

Define the equipment for which you want to display the KPIs and operands in the performance chart.


WinCC PerformanceViewControl Properties
Toolbar
Status Bar
Online Configuration
Export
General
Appearance
Diagram window
Axes
Time ranges
Equipment
Context information
Indicators
Visibility
Font
Equipment:
CapApplicator
Accumulator
Object name:
CapApplicator
Label:
CapApplicator
Description:
New...
Remove
Up
Down
Background color
Apply Default
Foreground color
Apply Default
OK
Cancel
Apply

To add a new equipment, follow the steps given below:

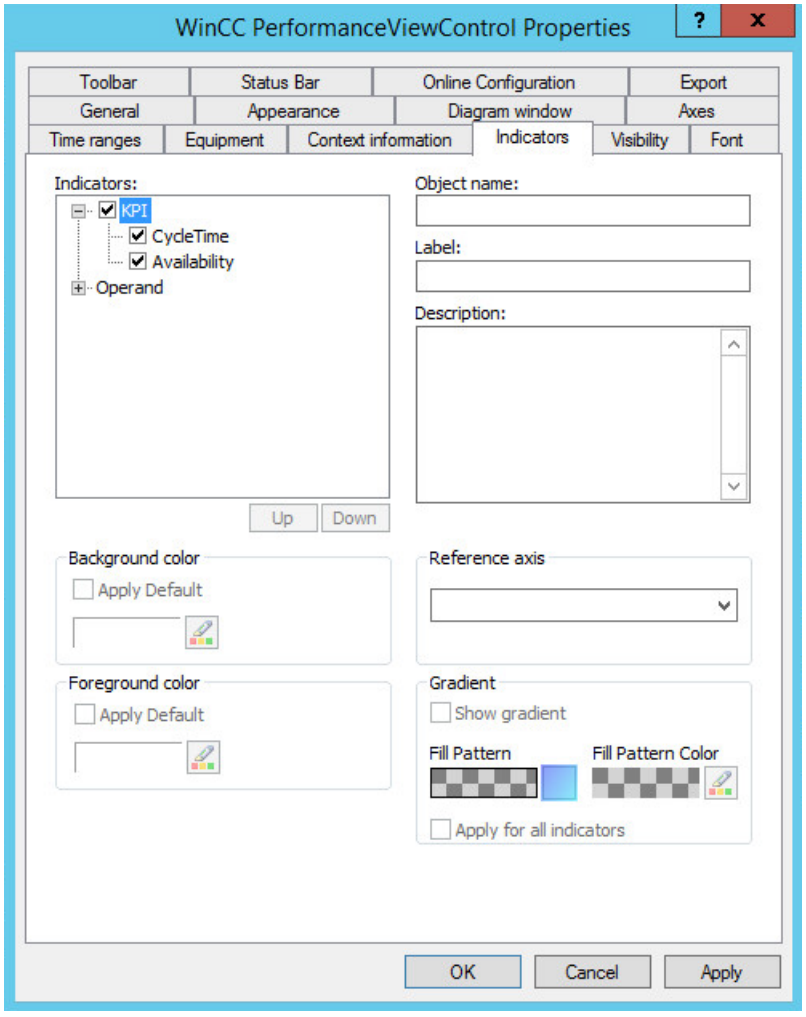
1. Click on "New..." below the "Equipment" list.
   The "PerformanceMonitor - Selection" dialog opens.
2. Select the desired equipment.
   Multiple selection with <Ctrl> is possible. The KPIs associated with the equipment are added automatically.



3. Click "OK" to confirm your selection.
4. In the "Equipments" list, specify the sequence for the display in the performance chart with the "Up" and "Down" buttons.
5. Edit the other display properties, such as color or object name (optional).

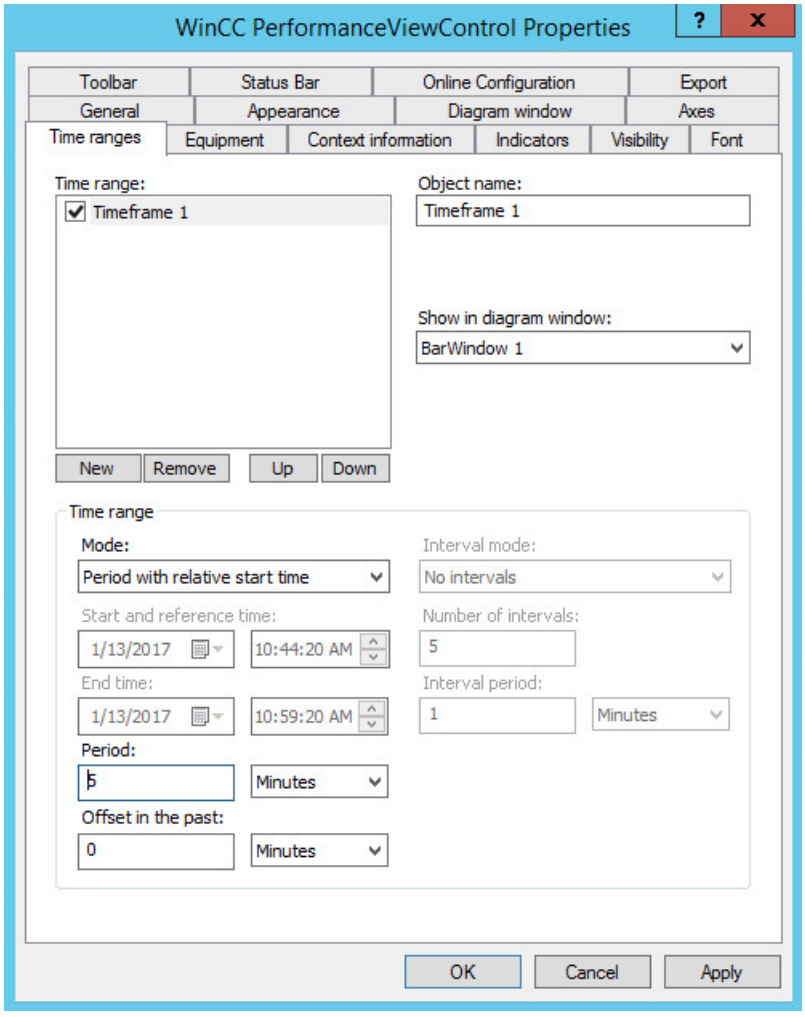
"Indicators" tab

Define the KPIs that you want to evaluate in the performance chart. Under "Gradient", enter the fill pattern and fill pattern color of the bars.



"Time ranges" tab

Define the time periods for the performance chart.



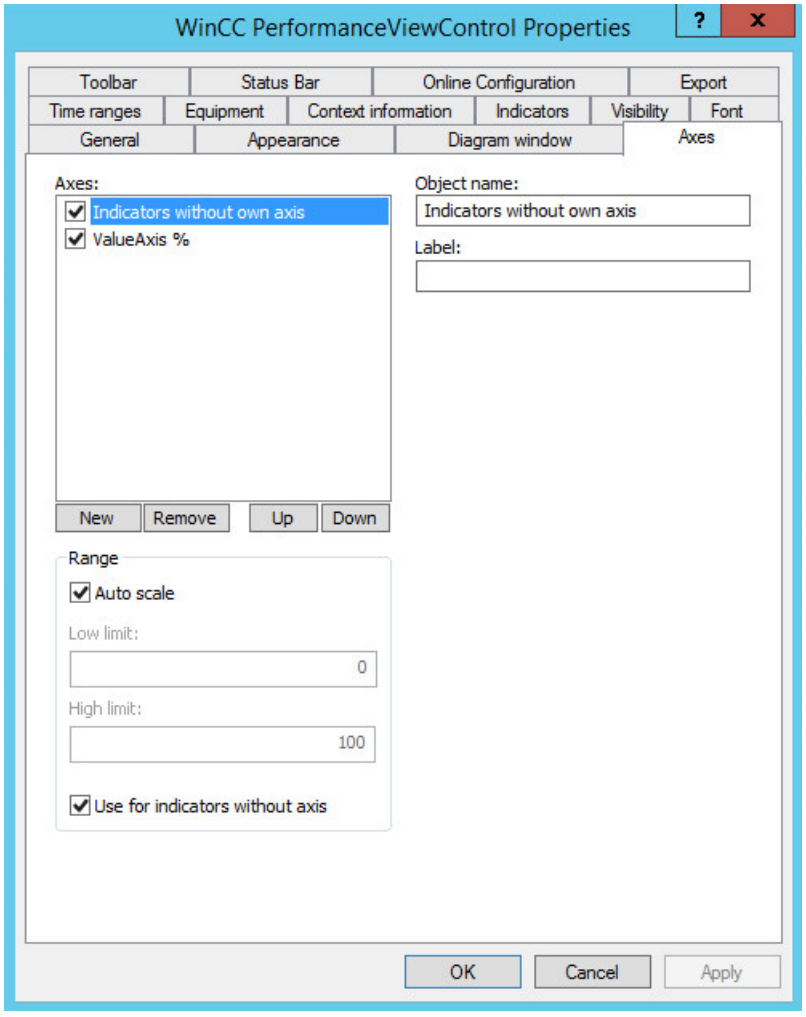
1. Set the number and sequence of time ranges in the "Time range" list.
2. Enter the duration for each list entry in the "Time range" section. If necessary, also specify a starting point or reference point.
3. Edit the other display properties, such as object name (optional).

You can find additional information on defining time ranges under:

- Basics

"Axes" tab

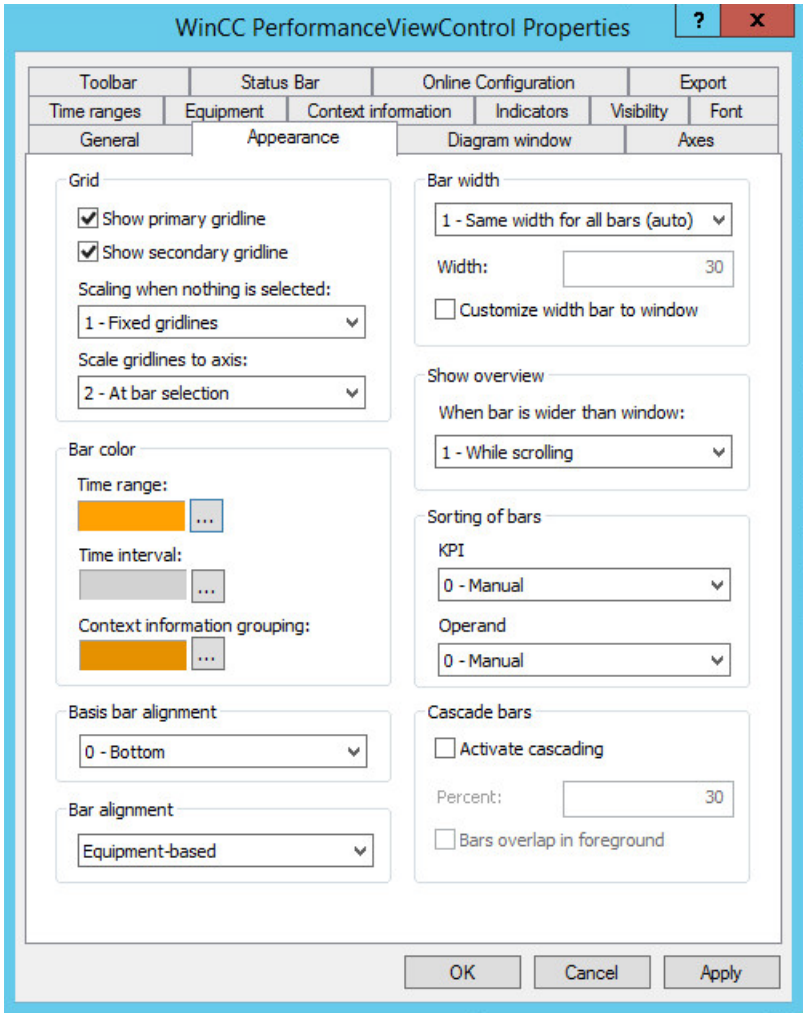
Define the type, scale and label of the axes in the performance chart. Note that the axes can be assigned to both KPIs and operands.



1. Set the number and sequence of axes in the "Axes" list.
2. Enter a scaling for each list entry in the "Range" section.
3. Edit the other display properties, such as object name (optional).

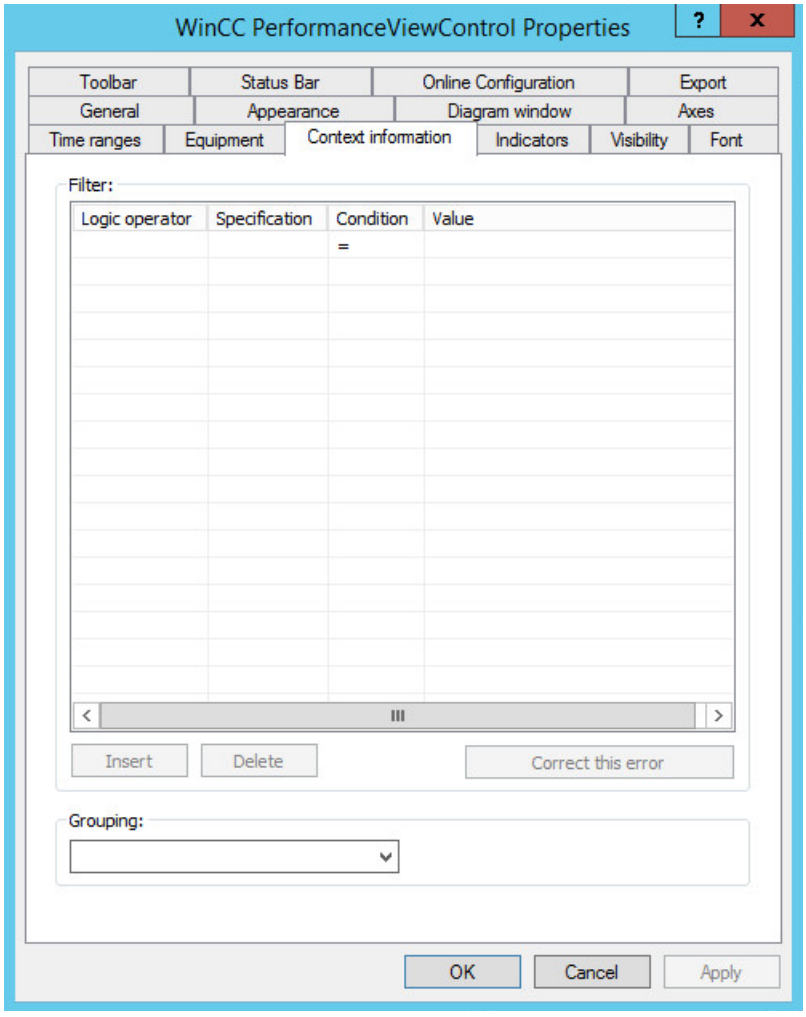
"Appearance" tab

Define the bar appearance for display in the performance chart. If you want to let the bars to overlap, select the entry "Activate cascading" under "Cascade bars" and enter a percentage value.



"Context information" tab

If necessary, define filter criteria and/or grouping for the display in the performance chart in the "Context information" tab. You can define or change both filtering and grouping in Runtime.



Note

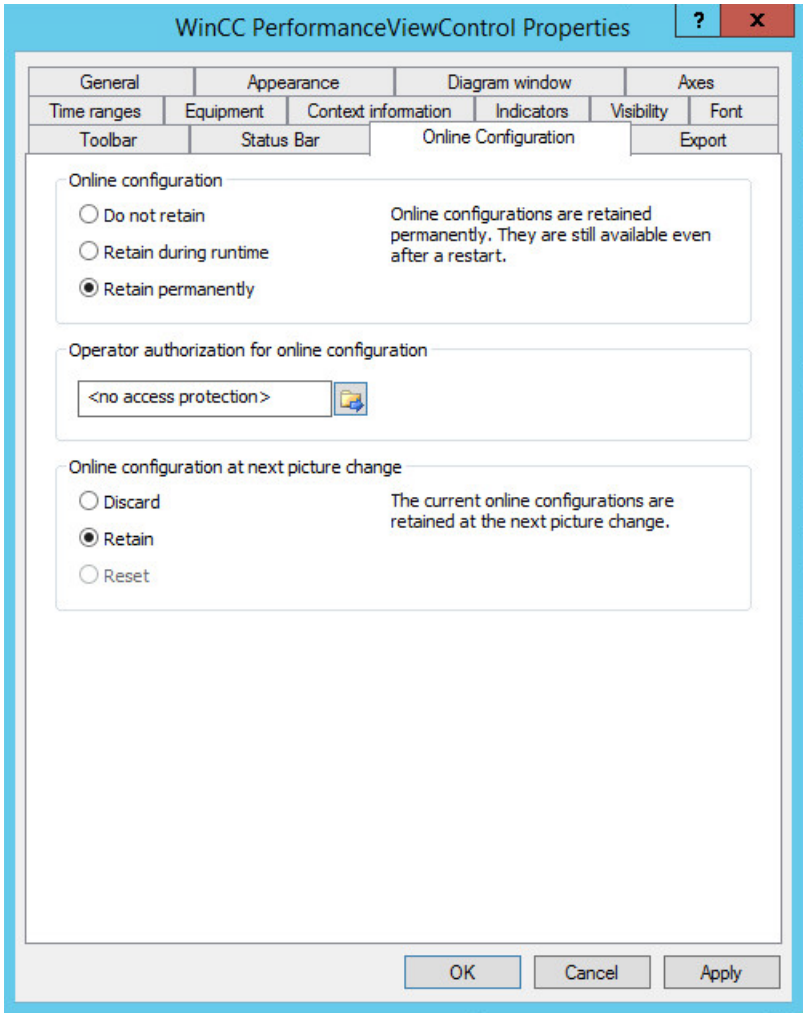
Filtering and grouping influence on the performance

Configuring filters and groupings, affects the calculation time for the output in the Runtime Control.

It is suggested to test the configuration without connecting to the process.

"Online Configuration" tab

Select appropriate options to retain the configurations done through the control. You can also save or discard the configurations at the next picture change.



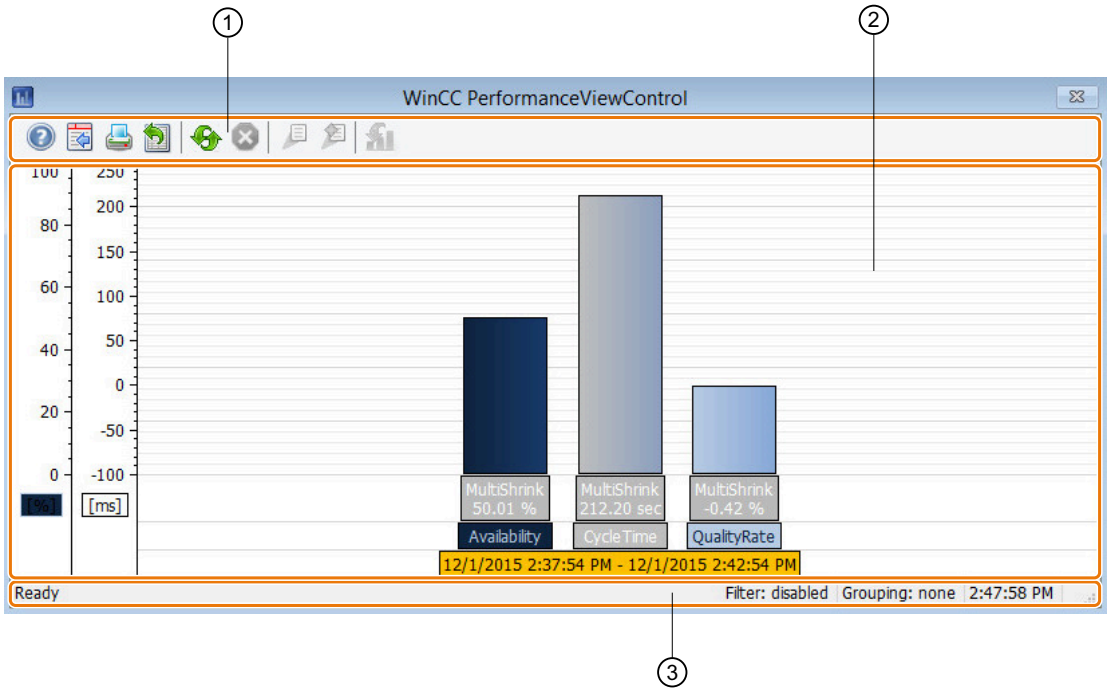
See also

Basics on outputting KPIs (Page 105)

3.4.4.2 Operating WinCC PerformanceViewControl in Runtime

Structure of WinCC PerformanceViewControl

The WinCC PerformanceViewControl is used for graphical display of KPI results in a performance chart. It consists of the following areas:



① Toolbar

The toolbar contains buttons to perform special functions in the WinCC PerformanceViewControl. Depending on the configuration, the following buttons are available for operation:

Button	Tooltip	Description
	Help	Opens the help file of the WinCC PerformanceViewControl.
	Configuration dialog	Opens the configuration dialog for editing the properties of the WinCC PerformanceViewControl.
	Print	Prints the displayed values. You define the print job that is used for printing in the "General" tab of the configuration dialog.
	Exporting data	Exports selected data to a CSV file.
	Reloading	Refreshes the view in the control.
	Cancel	Stops the evaluation in the control.

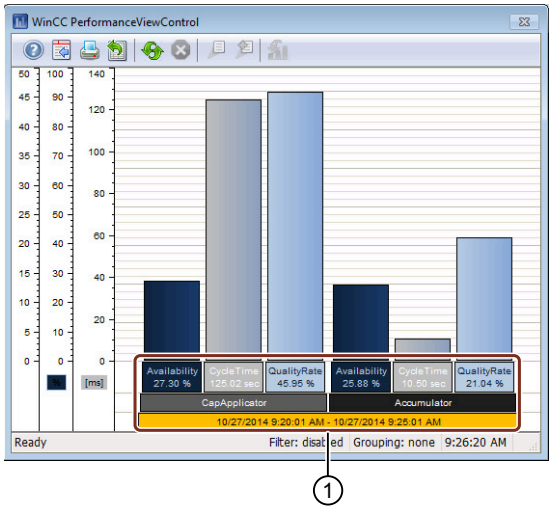
Button	Tooltip	Description
	Show comments	Select the KPI or operand. Click "Reload" and then "Show comments".
	Create new comment	Select the KPI or operand. Click "Create new comment" and enter the comment text.
	Drilldown	Select the KPI and click "Drilldown". The assigned operands of the KPI are displayed.

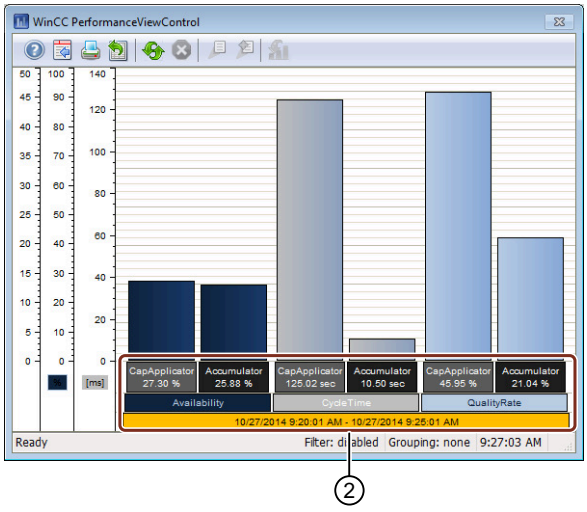
② Display area

The selected equipment with its KPIs is displayed in the display area. The associated operands are displayed with "Drilldown".

Group display

Select the command "Based on > Indicators" or "Based on > Equipment" from the shortcut menu of the displayed KPIs to group the KPIs based on indicators or equipments.





① Calculated KPIs grouped by "Equipment"

② Calculated KPIs grouped by "KPIs"

③ Status bar

The status bar shows the various states of the WinCC PerformanceViewControl.

3.4.5 WinCC PerformanceGanttControl

3.4.5.1 Configuring WinCC PerformanceGanttControl

Introduction

You can configure a graphical output of KPIs or operands in a WinCC PerformanceGanttControl.

Requirement

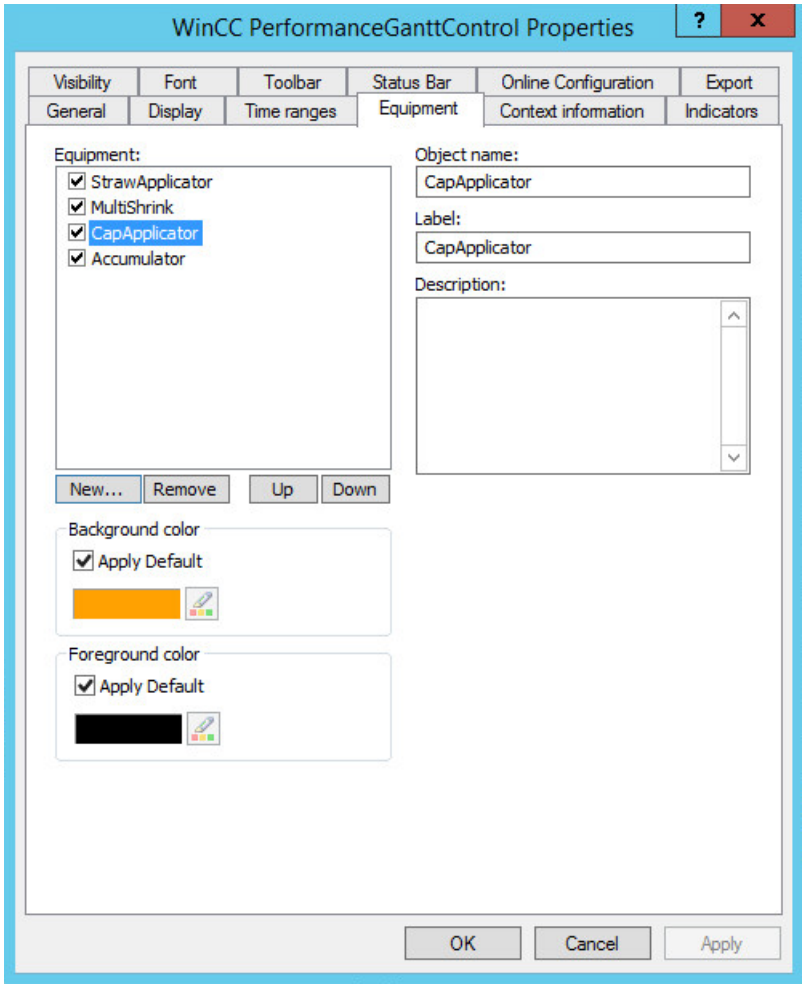
- The Graphics Designer in WinCC is open.
- KPIs, operands, equipment and context information is completely configured.

Procedure

1. Insert the "WinCC PerformanceGanttControl" in a process picture.
2. Open the configuration dialog with a double-click on the WinCC PerformanceGanttControl.
3. Define the parameters in the following tabs:

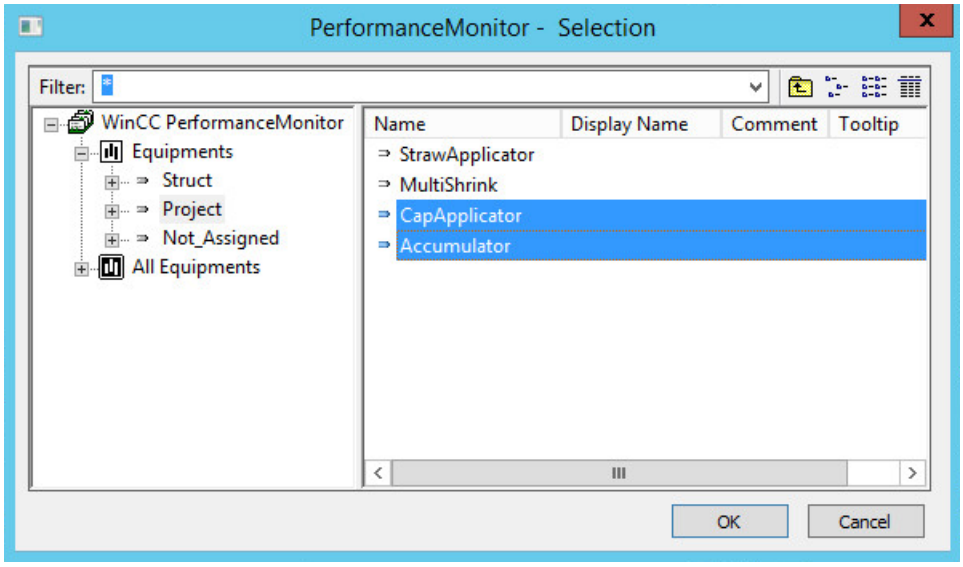
"Equipment" tab

Define the equipment for which you want to display operands in the performance chart.


WinCC PerformanceGanttControl Properties
Visibility
Font
Toolbar
Status Bar
Online Configuration
Export
General
Display
Time ranges
Equipment
Context information
Indicators
Equipment:
StrawApplicator
MultiShrink
CapApplicator
Accumulator
Object name:
CapApplicator
Label:
CapApplicator
Description:
New...
Remove
Up
Down
Background color
Apply Default
Foreground color
Apply Default
OK
Cancel
Apply

To add a new equipment, follow the steps given below:

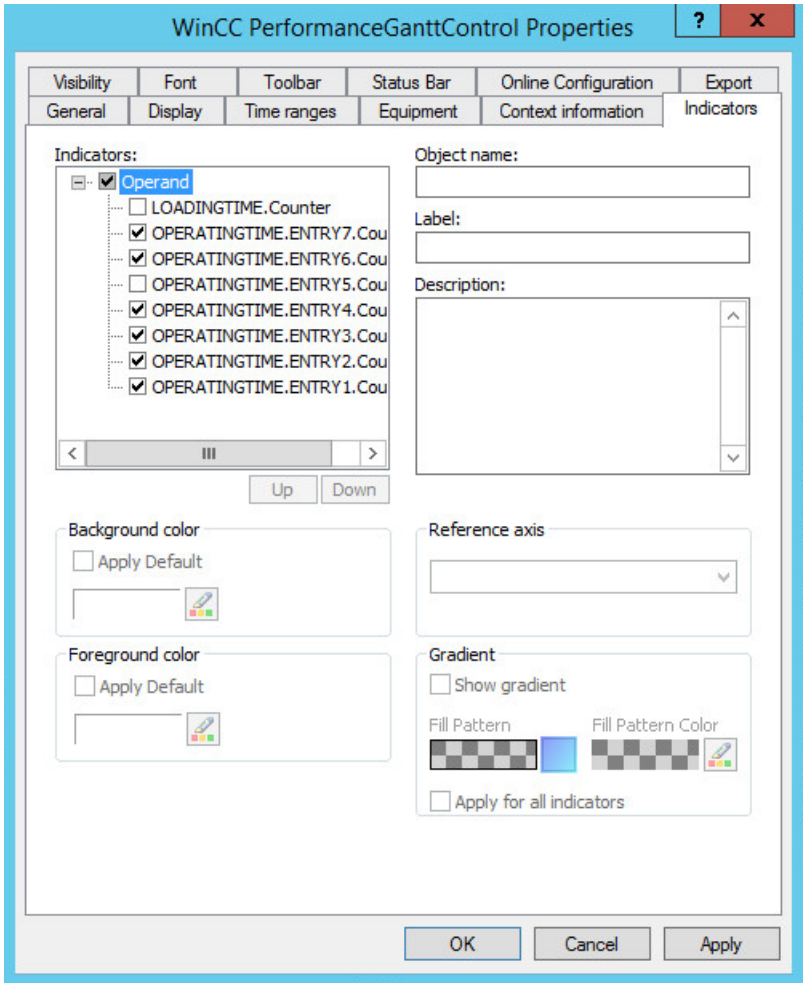
1. Click on "New..." below the "Equipment" list.
   The "PerformanceMonitor - Selection" dialog opens.
2. Select the desired equipment.
   Multiple selection with <Ctrl> is supported. The KPIs associated with the equipment are added automatically.



3. Click "OK" to confirm your selection.
4. In the "Equipments" list, specify the sequence for the display in the performance chart with the "Up" and "Down" buttons.
5. Edit the other display properties, such as color or object name (optional).

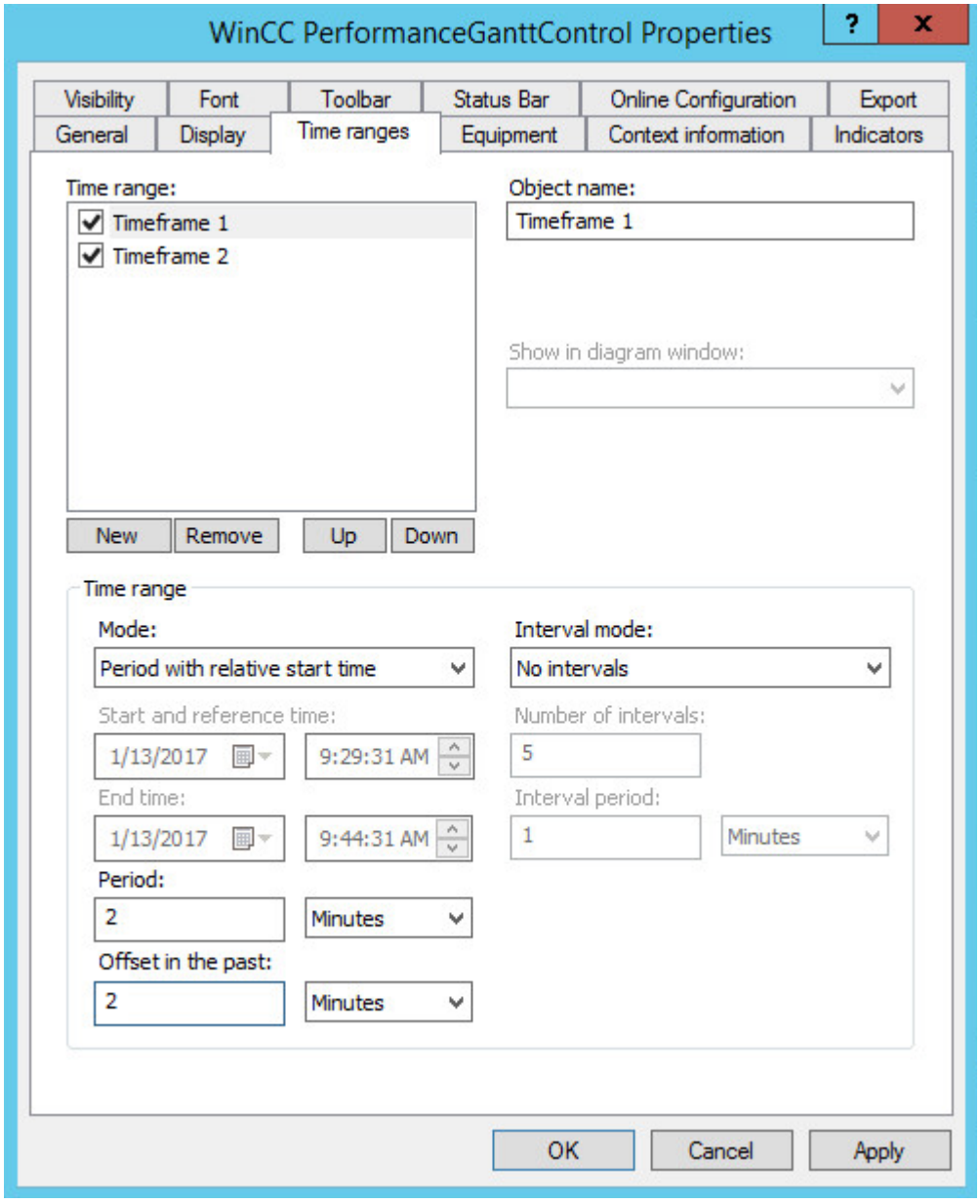
"Indicators" tab

Define the operands that you want to evaluate in the performance chart. All operands that are assigned to the KPI of the selected equipment are listed in the "Indicators" list.



"Time ranges" tab

Define the time periods for the performance chart.



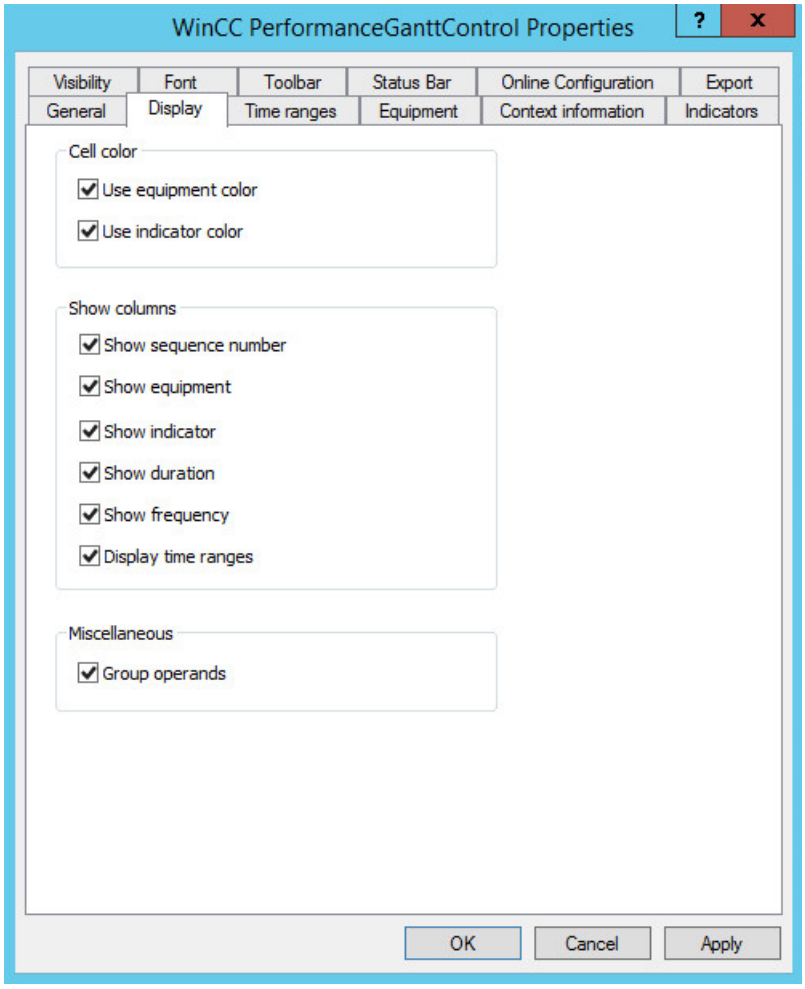
1. Set the number and sequence of time ranges in the "Time range" list.
2. Enter the duration for each entry in the "Time range" section. If necessary, specify a starting point or reference point.
3. Edit the other display properties, such as object name (optional).

You can find additional information on defining time ranges under:

- Basics

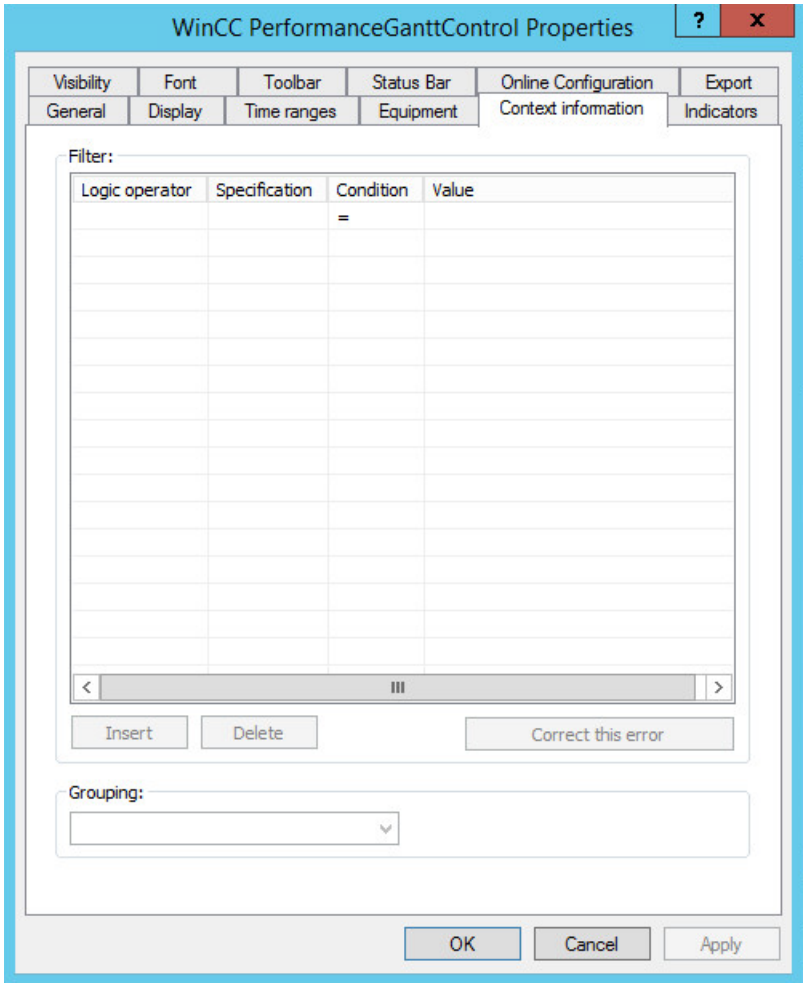
"Display" tab

Define the display in the performance chart. If you want to display all structured operands in a row, enable the entry "Group structured operands" under "Miscellaneous".



"Context information" tab

If necessary, define filter criteria and/or grouping for the display in the performance chart. You can also configure the filtering and grouping in Runtime.



Note

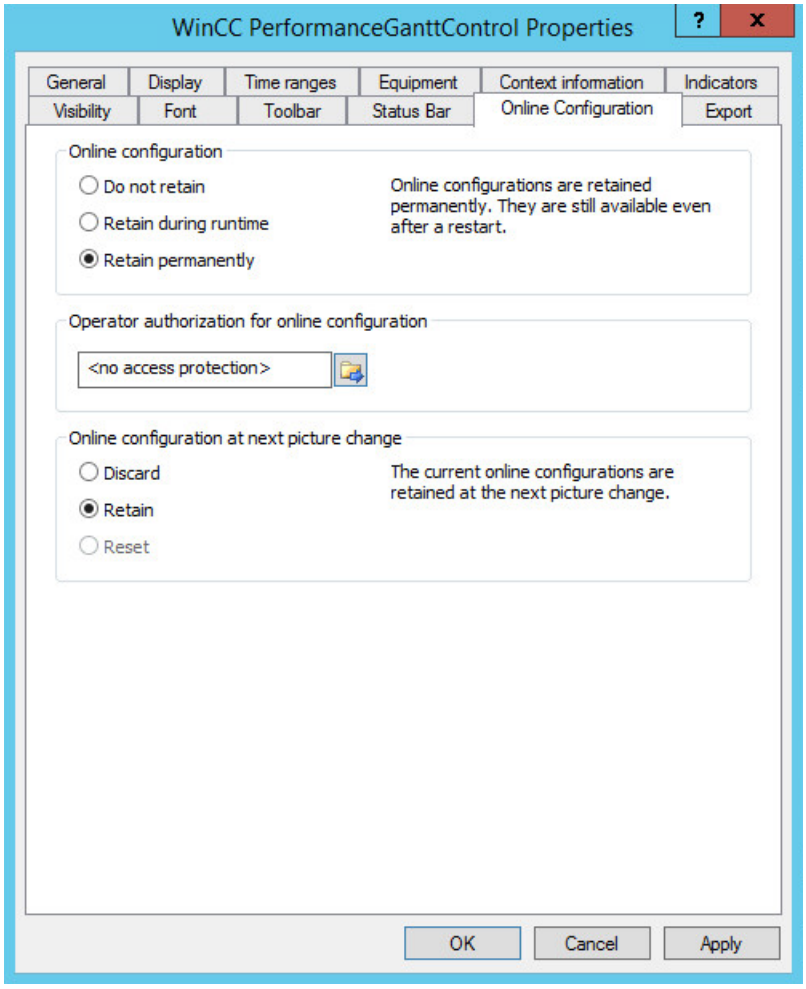
Filtering and grouping influence on the performance

Configuring filters and groupings, affects the calculation time for the output in the Runtime Control.

It is suggested to test the configuration without connecting to the process.

"Online Configuration" tab

Select appropriate options to retain the configurations done through the control. You can also save or discard the configurations at the next picture change.



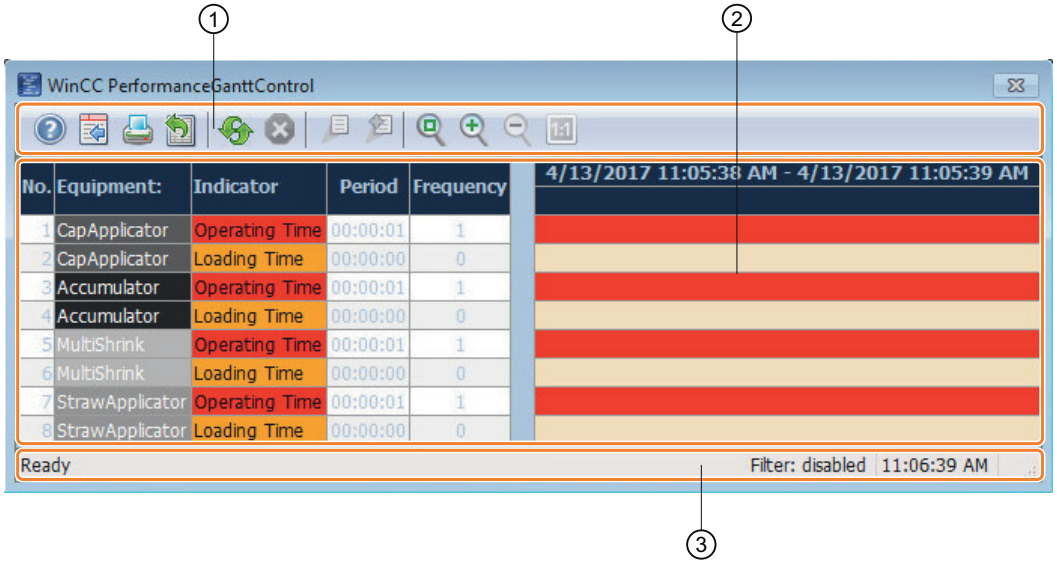
See also

Basics on outputting KPIs (Page 105)

3.4.5.2 Operating WinCC PerformanceGanttControl in Runtime

Structure of WinCC PerformanceGanttControl

The WinCC PerformanceGanttControl is used for graphical display of KPI results in a performance chart. It consists of the following areas:



① Toolbar

The toolbar contains buttons to perform special functions in the WinCC PerformanceGanttControl. Depending on the configuration, the following buttons are available for operation:

Button	Tooltip	Description
	Help	Opens the help file of the WinCC PerformanceGanttControl.
	Configuration dialog	Opens the configuration dialog for editing the properties of the WinCC PerformanceGanttControl.
	Print	Prints the displayed values. You define the print job that is used for printing in the "General" tab of the configuration dialog.
	Exporting data	Exports selected data to a CSV file.
	Zoom area	You define an area by dragging the mouse into the display area to enlarge the desired area.
	Zoom in	Enlarges the display.
	Zoom out	Reduces the display.
	Original view	Switches from zoomed display back to the standard view.

Button	Tooltip	Description
	Reloading	Refreshes the view in the control.
	Cancel	Stops the evaluation in the control.
	Show comments	Select the timeline of the operand. Click "Reload" and then "Show comments".
	Create new comment	Select the timeline of the operand. Click "Create new comment" and enter the comment text.

② Display area

The selected equipment with its operands are displayed.

- The "Period" column shows the duration of the "On" status in the viewed time period.
- The "Frequency" column shows the number of status changes in the viewed time period.

To display a user-defined tooltip, use the mouse to point to the timeline of an operand.

③ Status bar

The status bar shows the various states of the WinCC PerformanceGanttControl.

3.4.6 WinCC PerformanceTableControl

3.4.6.1 Configuring WinCC PerformanceTableControl

Introduction

You configure the tabular output of operands in the configuration dialog using the WinCC PerformanceTableControl.

Requirement

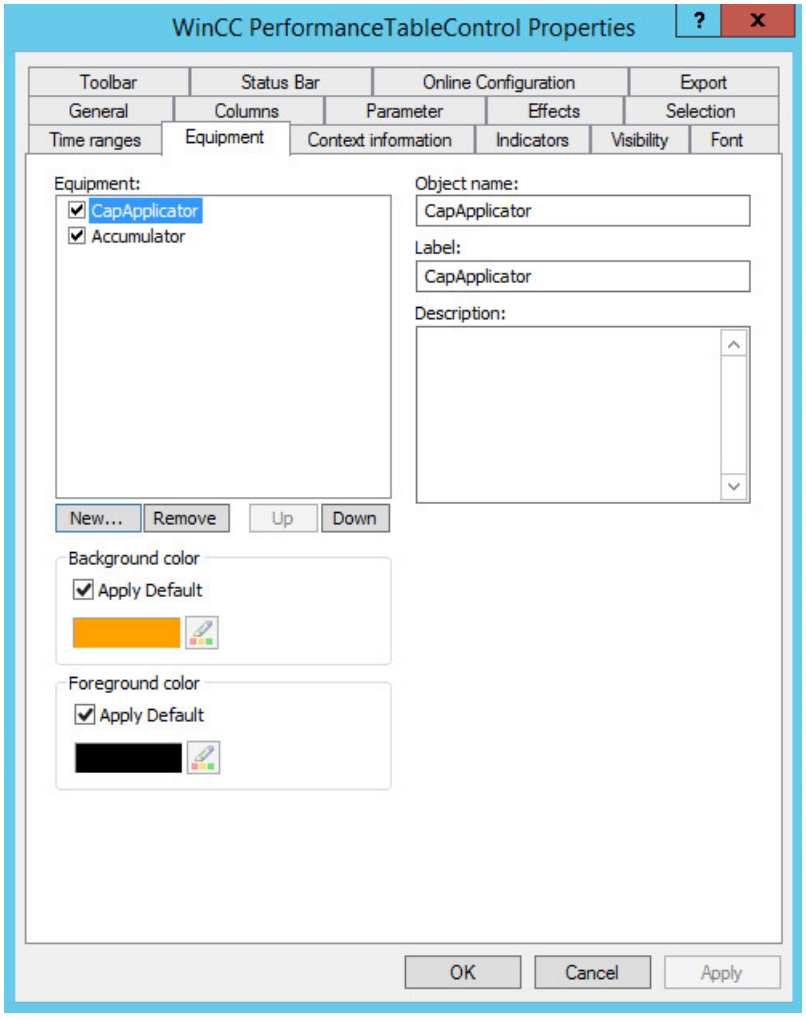
- The Graphics Designer in WinCC is open.
- KPIs, operands, equipment and context information is completely configured.

Procedure

1. Insert the "WinCC PerformanceTableControl" in a process picture.
2. Open the configuration dialog with a double-click on the WinCC PerformanceTableControl.
3. Define the parameters in the following tabs:

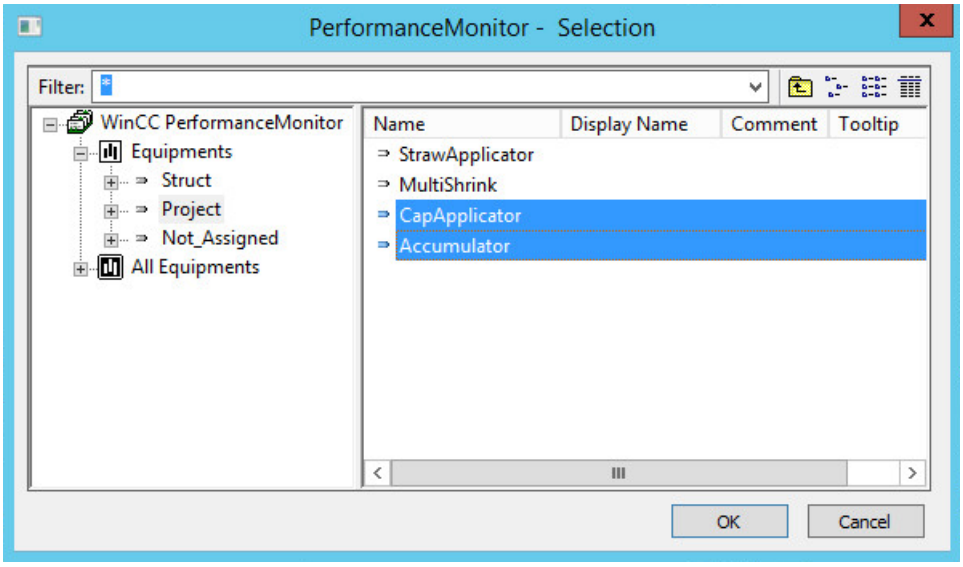
"Equipment" tab

Define the equipment for which you want to output the operands in the table.



To add a new equipment, follow the steps given below:

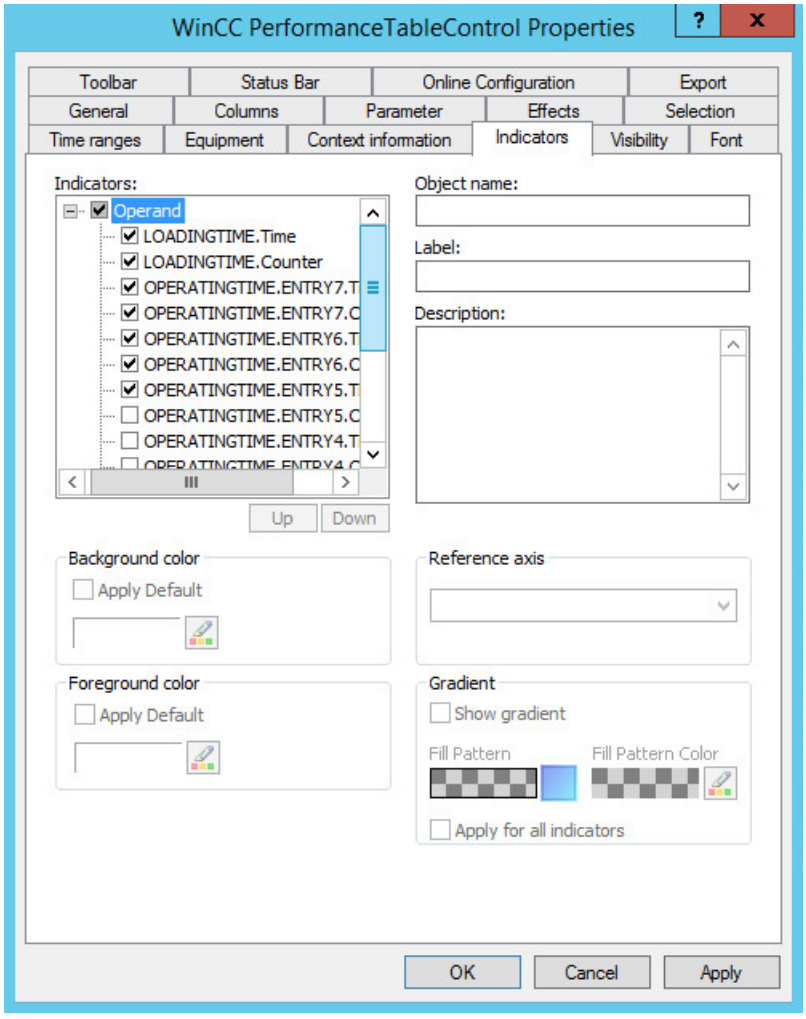
1. Click on "New..." below the "Equipment" list.
   The "PerformanceMonitor - Selection" dialog opens.
2. Select the desired equipment.
   Multiple selection with <Ctrl> is supported. The KPIs associated with the equipment are added automatically.



3. Click "OK" to confirm your selection.
4. In the "Equipments" list, specify the sequence for the display in the performance chart with the "Up" and "Down" buttons.
5. Edit the other display properties, such as color or object name (optional).

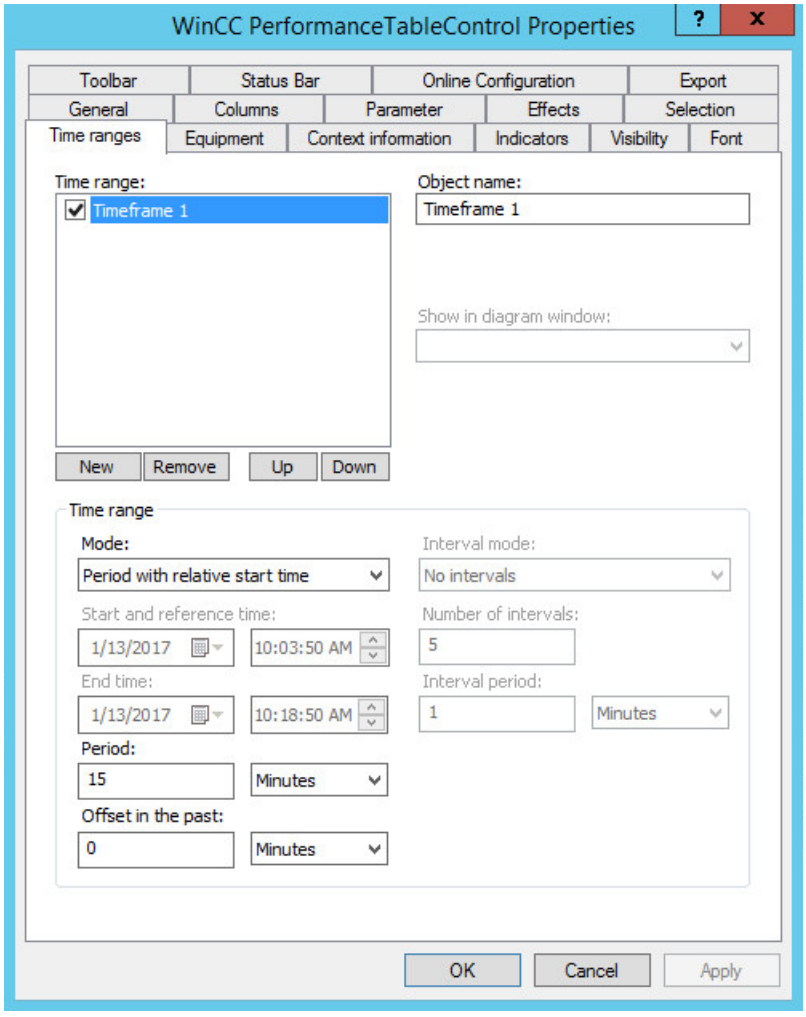
"Indicators" tab

Define the operands for which you want to output the raw data (value and time stamp) in the table.



"Time ranges" tab

Define the time ranges for which the raw data is to be output.



1. Set the number and sequence of time ranges in the "Time range" list.
2. Enter the duration for each entry in the "Time range" section. If necessary, specify a starting point or reference point.

   Note

   If the number of records in the Table Control for the given timeframe exceeds 1,000,000 (one million) entries, a message "Crossed record limits (max. 1000000)" will be shown in the status bar during runtime.

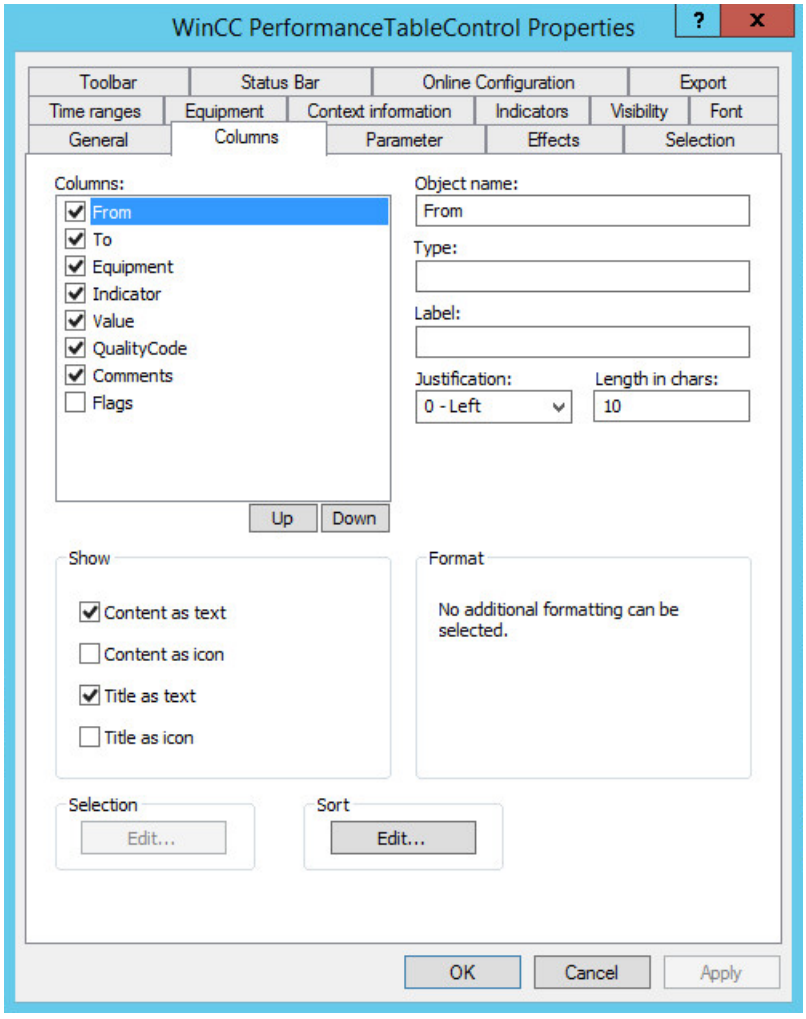
3. Edit the other display properties, such as object name (optional).

You can find additional information on defining time ranges under:

- Basics

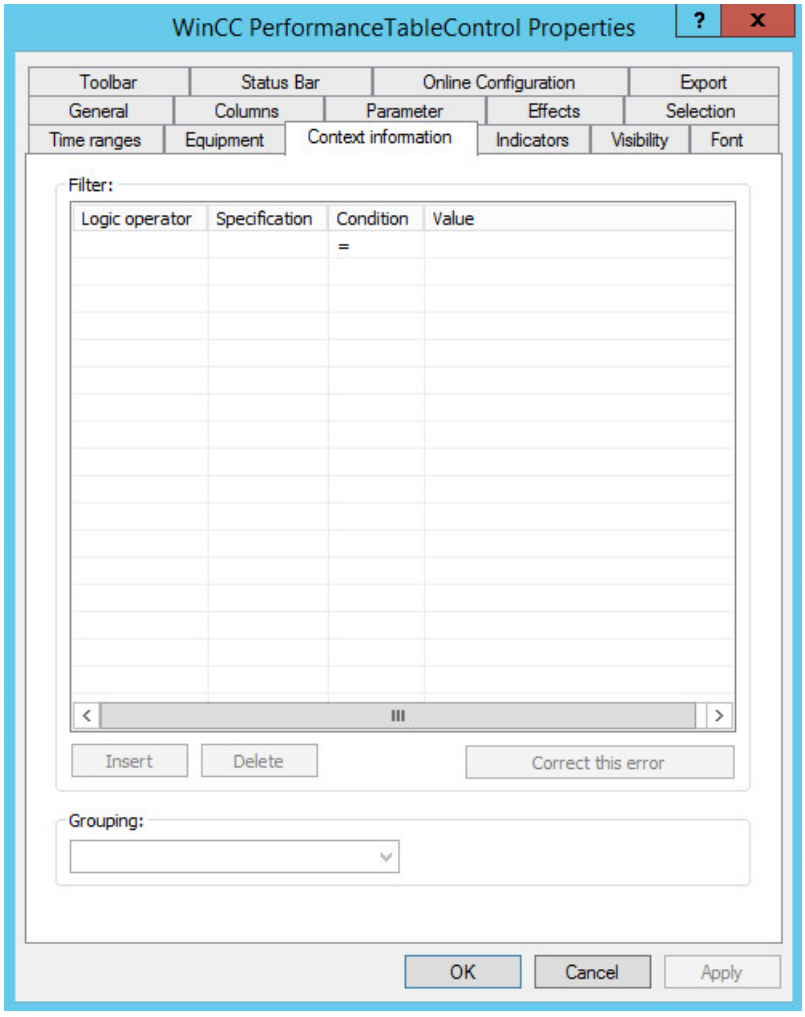
"Columns" tab

Define the number, labeling and appearance of the table columns.



"Context information" tab

If necessary, define the filter criteria for tabular output. You can define or change the filtering in Runtime. Grouping is not possible in the tabular output.



Note

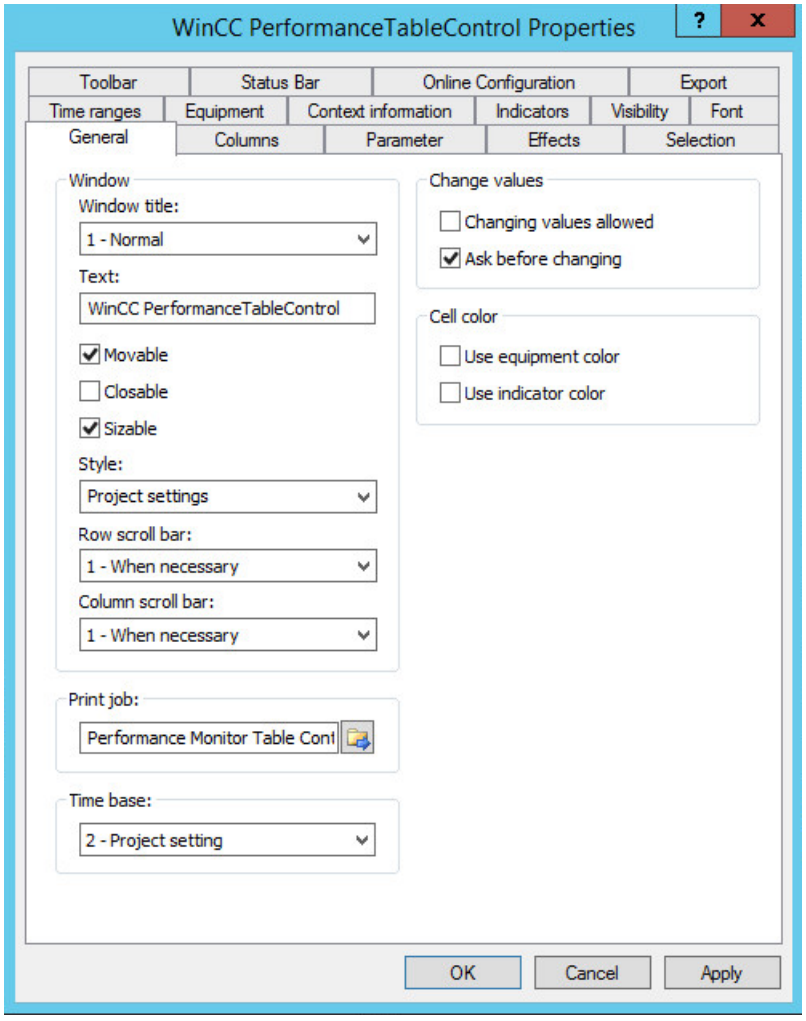
Filtering and grouping influence on the performance

Configuring filters and groupings, affects the calculation time for the output in the Runtime Control.

It is suggested to test the configuration without connecting to the process.

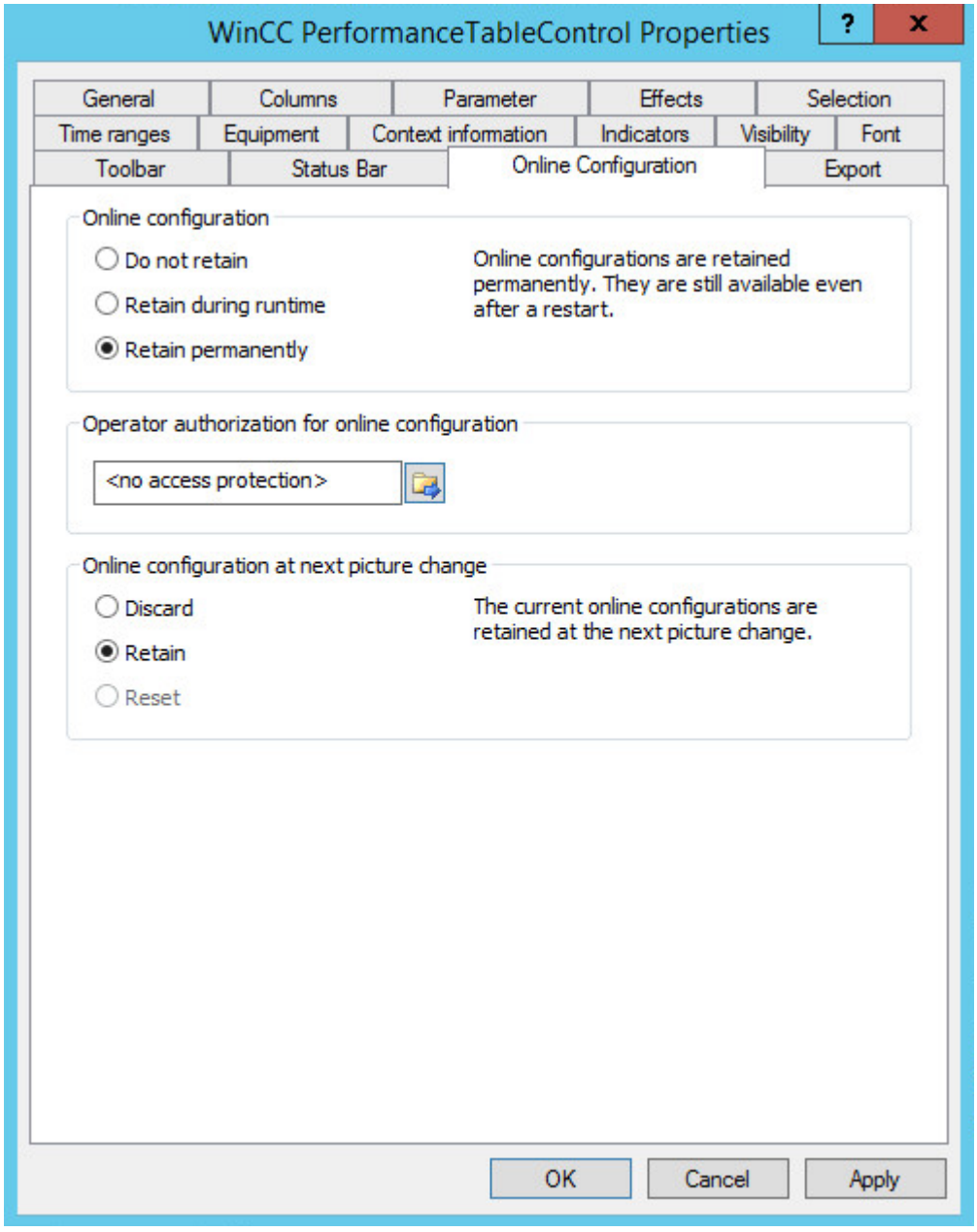
"General" Tab

Under "Change values", define whether a user is allowed to change the displayed values in Runtime. The user must have the permission "Change values".



"Online Configuration" tab

Select appropriate options to retain the configurations done through the control. You can also save or discard the configurations at the next picture change.



See also

Basics on outputting KPIs (Page 105)

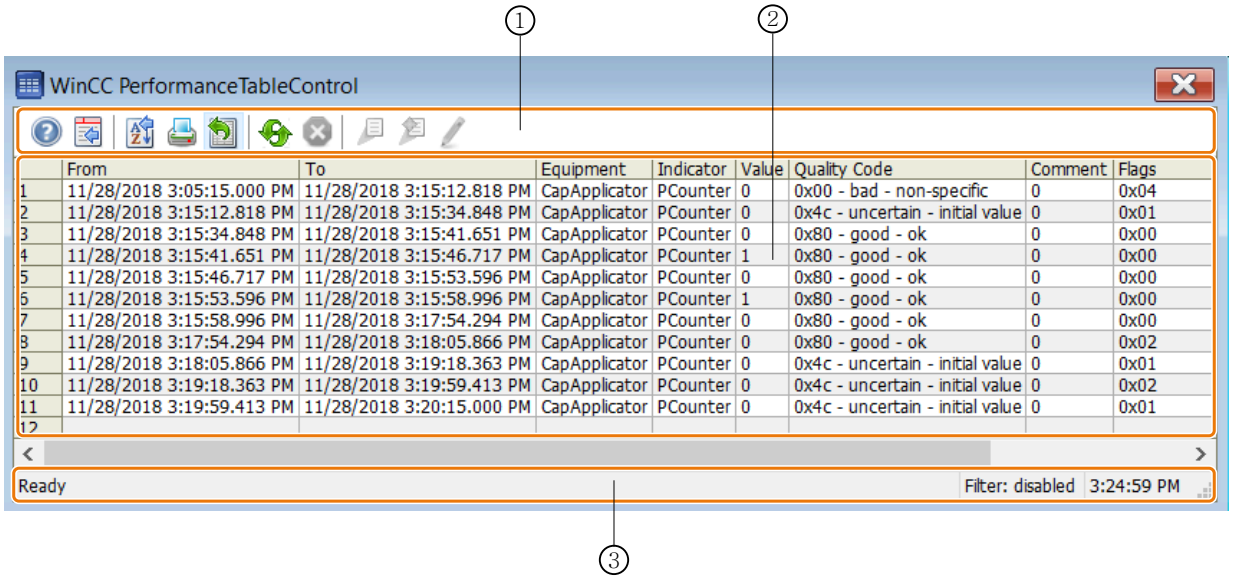
3.4.6.2 Operating WinCC PerformanceTableControl in Runtime

Note

The following operator actions are supported in the WebNavigator.

Structure of WinCC PerformanceTableControl

The WinCC PerformanceTableControl is used for tabular output of raw data of the operands. It consists of the following areas:



① Toolbar

The toolbar contains buttons to perform special functions in the WinCC PerformanceTableControl. Depending on the configuration, the following buttons are available for operation:

Button	Tooltip	Description
	Help	Opens the help of the WinCC PerformanceTableControl.
	Configuration dialog	Opens the configuration dialog for editing the properties of the WinCC PerformanceTableControl.
	Sort dialog	Opens a dialog for setting user-defined sorting.
	Print	Prints the displayed values. You define the print job that is used for printing in the "General" tab of the configuration dialog.
	Exporting data	Exports selected data to a CSV file.
	Reloading	Refreshes the view in the control.
	Cancel	Stops the evaluation in the control.
	Show comments	Select the require line. Click "Reload" and then "Show comments".

Button	Tooltip	Description
	Create new comment	Select the required line. Click "Create new comment" and enter the comment text.
	Change values	Activates the "Change values" mode, if you have the necessary authorization. Edit the values in the "Value" column and confirm with <Return>. The authorization is activated in the "General" tab of the configuration dialog.

② Display area

The selected equipment with its operands are displayed in the display area.

The "Indicator" column displays the name of the operands and their values.

For structured operands, the "Indicator" column displays the structured operand names and their respective entries if the configured tag value falls within the overall range given in the structured operand entries.

If the tag value does not fall within the overall range given in the structured operand entries, then the status is displayed with a prefix "Undefined".

Timestamps in PerformaceTableControl is displayed in the format HH:MM:SS.SSS to provide more clarity on multiple entries made within the same second. Micro-seconds are not editable.

③ Status bar

The status bar shows the various states of the WinCC PerformanceTableControl.

3.4.7 Configuring PMO controls through drag-and-drop method

Introduction

The drag-and-drop method can be used to configure the WinCC Performance View/Table/Gantt controls in the Graphics Designer for configured equipment in the PMO CS. Through this method you can skip on a number of steps involved while configuring data for the controls.

Procedure

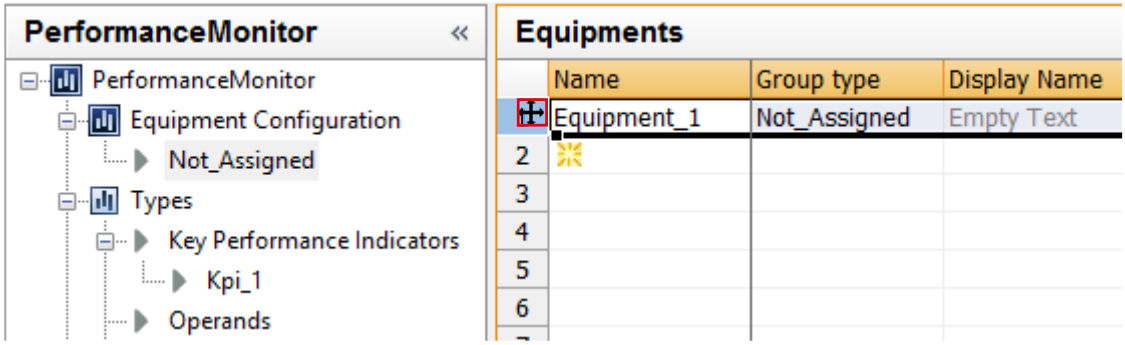
Prerequisite

- The equipment to drag-and-drop from PMO CS to GD must be completely configured with KPIs, operands and so on. The instance of the equipment should also be configured.

Procedure

1. Open WinCC Graphics Designer.
2. In PMO CS navigation area under "Equipment Configuration", open the equipment to drag-and-drop onto GD.

3. Select the entire row of the required equipment.
4. Point the cursor closer to the equipment name grid, the cursor icon changes.



5. Drag-and-drop (left-click and drag-and-drop) the equipment on the opened PDL file in GD. By default, the WinCC Performance View Control opens with populated data like the operands, KPIs, that was configured in CS.
   To populate data for other PMO controls through drag-and-drop method, right-click and drag-and-drop the equipment onto GD. A popup dialog appears with the following options to select the type of desired WinCC Performace Control:
   - WinCC Performance Table Control
   - WinCC Performance View Control
   - WinCC Performance Gantt Control

3.4.8 Exporting Runtime data

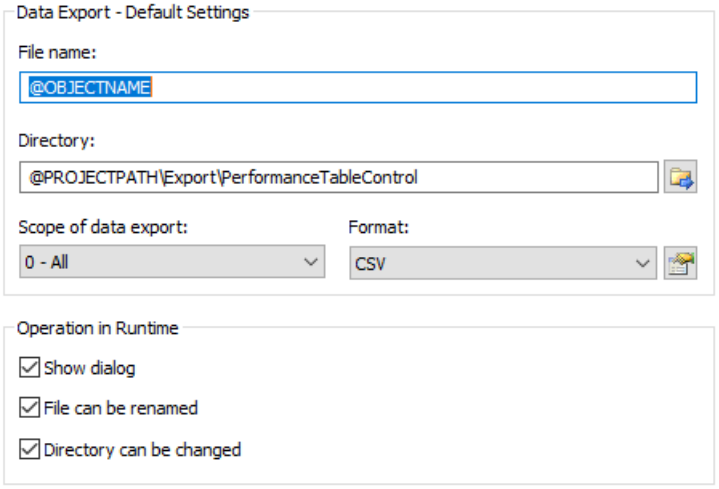
The runtime data displayed in the WinCC Performance Controls is exported using a button function. You may set up the operation of exporting runtime data in the configuration dialog.

Requirement

- A fully configured Performance (View/Table/Gantt) Control open in WinCC Graphics Designer.
- The properties window of the desired PerformanceMonitor Control is open.

Configuring runtime data export

1. Go to the "Export" tab.



2. In the "Data Export – Default Settings" section, a standard file name and directory are entered by default.
   The file name can be made up of the freely defined name and the following placeholder:
   @OBJECTNAME - Object name of the controls
   @CURRENTDATE - Current date
   @CURRENTTIME - Current time
3. CSV is the currently available data export format. Click  to specify the delimiter and file format in the CSV file.
4. Select the scope of the data export:
   - "0 - All" - All runtime data is exported
   - "1 - Selection" - Selected runtime data is exported. This option is applicable only for PerformanceMonitorTable and PerformanceMonitorView controls.
5. The "Operation in Runtime" section permits you to perform certain actions during runtime to export data.
   The actions are:
   - "Show dialog" – Selecting this check box displays the "Export" tab during runtime, allowing the user to view the settings configured before runtime. Unselecting the check box will not display the tab.
   - "Filename can be checked" – Selecting this check box permits the user to change the filename during runtime.
   - "Directory can be changed" - Selecting this check box permits the user to change the directory during runtime.
6. Click "APPLY > OK".
7. Go to the "Toolbar" tab to activate the "Export data" button function for runtime.

Exporting data during runtime

You may export all or selected data to the desired file at runtime using the button 

3.4.9 Outputting KPIs in the Information Server

3.4.9.1 Creating a PerformanceMonitor report in the Information Server

Introduction

PerformanceMonitor supports the creation of reports in the SIMATIC Information Server.

For more information about this topic, refer to the documentation for the Information Server.

Requirement

The WinCC project is activated in Runtime.

Procedure

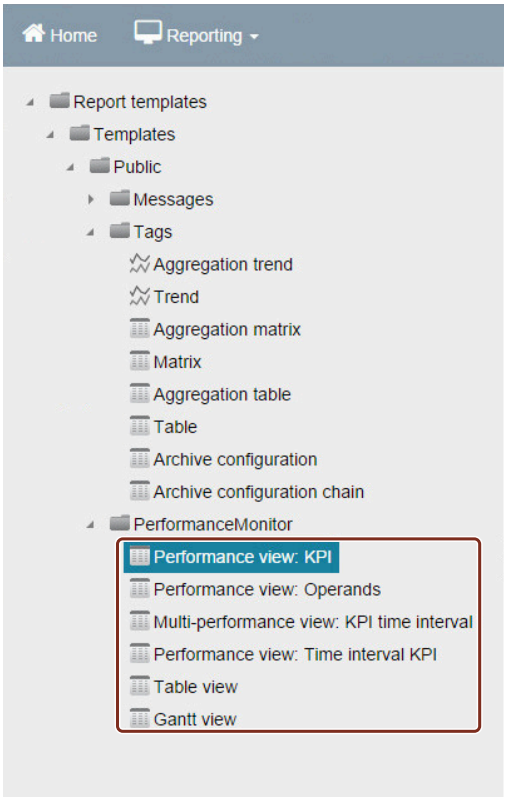
1. Connect to the home page of the Information Server and log on.
2. Under "Administration", select the SQL server instance ".\WinCC" as "Data source".

From PMO V8.0, you must select "WinCC" as a data source, although you might have configured Centralized PH database in PMO for data archiving and calculation.

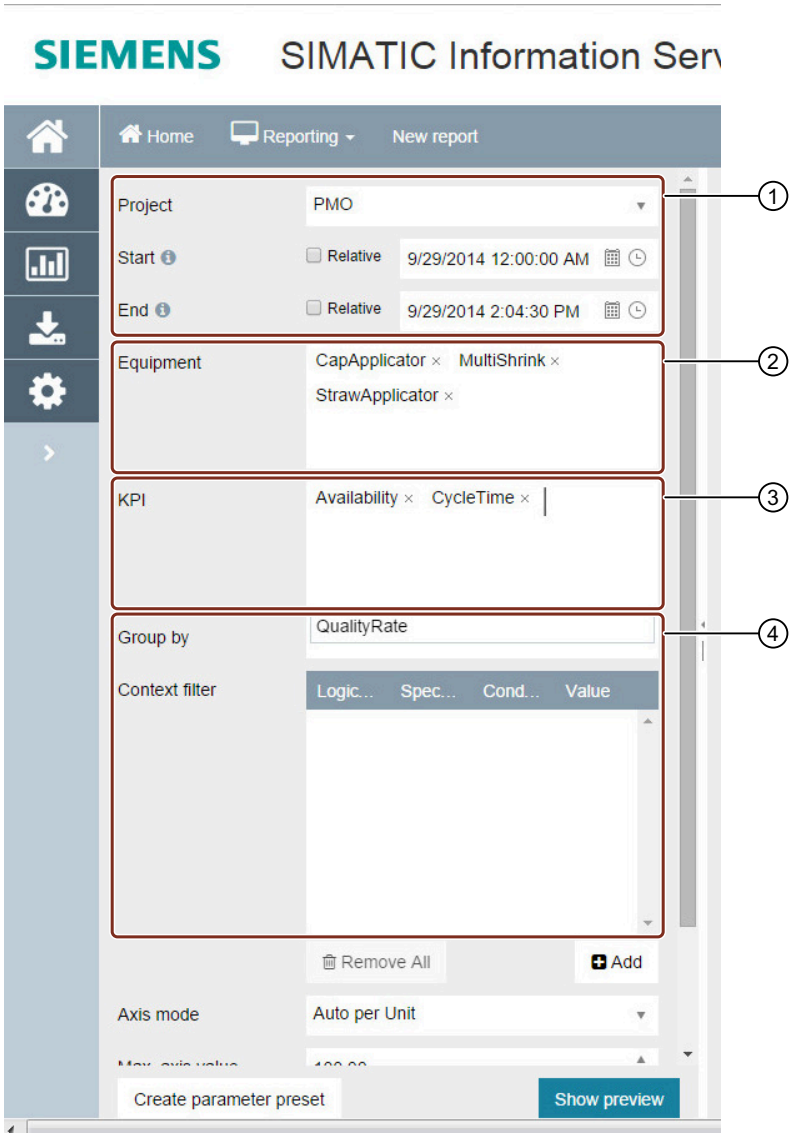
Note

By default, all the data get archived to Common Archiving. Nevertheless, if centralized PH is configured, then the complete set of data for the requested time period will be fetched from the PH and not from the Common Archiving.

3. Select the desired project.
   The available templates of the PerformanceMonitor are listed under "Reporting".



4. Based on a template, create the required report, for example "Performance view: KPI".



① Select the project and time range.
② Select the equipment for which KPIs are to be evaluated.
③ Select KPIs to be evaluated in the report.
④ Group and filter on the basis of available context information.

5. Click "Show report".

See also

Output of KPIs via Excel add-in (Page 145)

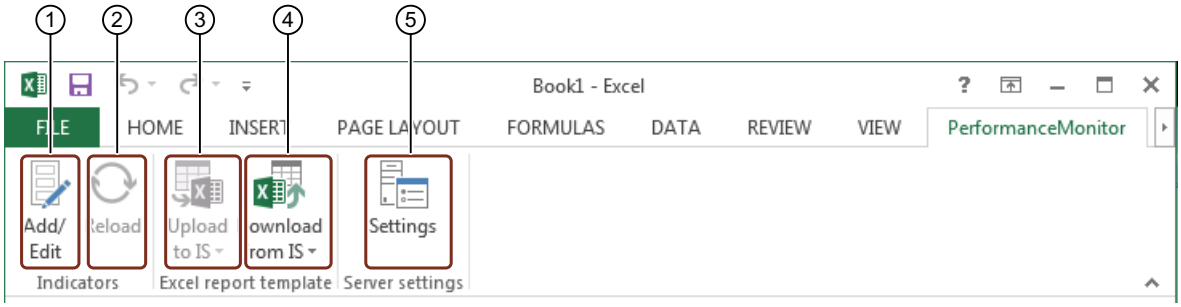
3.4.9.2 Output of KPIs via Excel add-in

Introduction

You can output the calculated KPIs in Microsoft Excel with the Excel add-in of the PerformanceMonitor. The Excel add-in uses the Information Server as data source. Use the Report Templates of the Information Server in the "Office" format as templates. You can also save these Report Templates locally.

You can find additional information about installing Excel add-ins in the document "PerformanceMonitor - Installation Notes".

The figure below shows the operator controls of the Excel add-in:



① Opens the dialog for selecting the project and the KPIs contained in it.

② Refreshes the data in the spreadsheet.

③ Saves the template:

- When you click the "Excel" icon, the template is saved on the Information Server.
- Click "Upload to IS" to save the template in the file system.

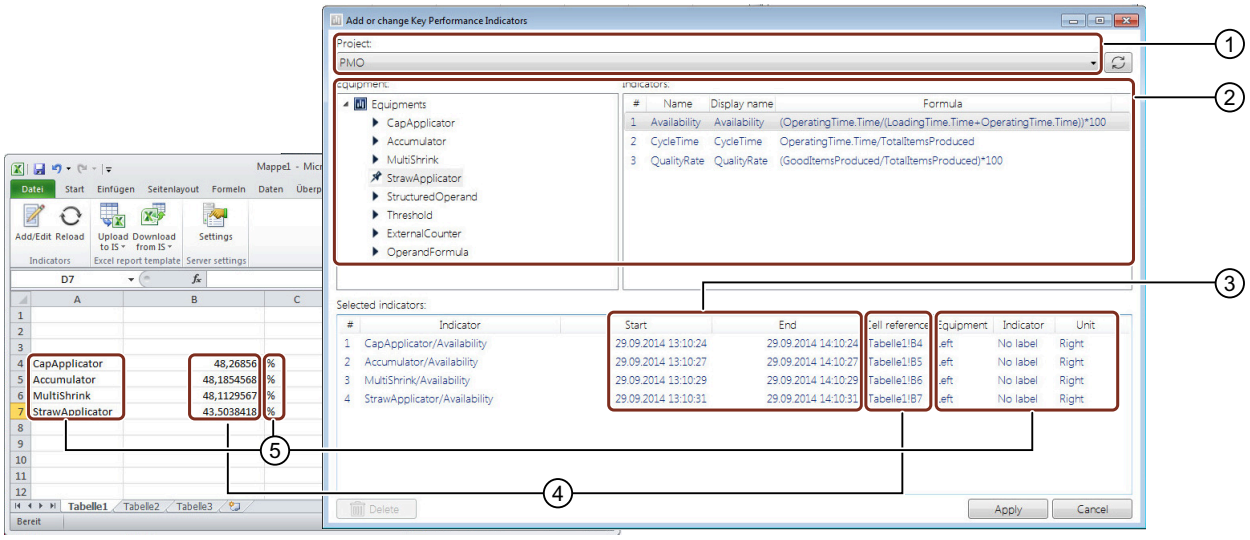
④ Opens an existing template:

- When you click the "Excel" icon, the template is uploaded to the Information Server.
- Click "Download from IS" to save the template in the file system.

⑤ Opens the dialog with the connection settings to the Information Server.

Note: If the Information Server supports the secure connection via "HTTPS", also enable "SSL".

The figure below shows how an individual KPI with additional information is arranged in a spreadsheet:



① Selection of the project from which the Information Server data is retrieved.

② Display of the available equipment and KPIs in the selected project.

③ Selection of the time range from which the calculated data is requested.

Note: You can reference cells in the spreadsheet instead of entering the date. Set the following date format for the respective cells: "DD:MM:YYYY HH:MM:SS":

④ Specifies the cell to which the calculated KPI value is written.

⑤ Specifies the cells to which the additional information of the KPI is written (optional). You can use this additional information to implement titles, for example.

Requirement

- The Excel add-in is installed.
- The Information Server is available.
- The URL of the Information Server is known.
- Microsoft Excel is open.

Procedure

1. Enter the connection data of the Information Server.
2. If you want to use an existing report template:
   - Click "Download from IS"
     The "Download from IS Server" dialog opens.
   - Navigate to the required folder under "Folders".
   - Select the required template under "Templates".

3. Select the KPIs whose results you want to display:
   - Click "Add/Edit".
     The "Add or change Key Performance Indicators" dialog opens.
   - Select the project whose data you want to display.
   - Select the KPIs for each equipment whose calculation results you want to display.
   - Assign the time period to each KPI under "Selected indicators" as well as the cell in which the calculated value is displayed.
4. To save the report result:
   - Click "Upload to IS".
     The "Download from IS Server" dialog opens.
   - Navigate to the required folder under "Folders".
   - Enter the name of the template under "Template name".

See also

Creating a PerformanceMonitor report in the Information Server (Page 142)

3.4.9.3 Creating a custom template

Introduction

When you install the PerformanceMonitor on a computer with an Information Server installation, you can create custom templates for reports. The database of the Information Server contains procedures that you can use to access the data of the PerformanceMonitor.

To create such a template, you need the "Business Intelligence Development Studio" development environment. You can use an existing template from the Information Server as a basis for the template.

"Dataset" object

In order to use the data from the PerformanceMonitor in the custom template, you need "Dataset" type objects with the following names:

- "Results": Contains the calculation results
- "Equipments": Contains the IDs of the equipment (optional)
- "KPIs": Contains the names of the KPIs (optional)
- "Operands": Contains the names of the operands (optional)

You create the content for each of these objects with an SQL query from the PerformanceMonitor database.

SQL queries for filling out the "Dataset" type objects

You can fill out the "Results" with the following SQL query:

```
exec PM.udsp_TCCalculateKPIWithLCID @eqIds, @kpiNames, @operandNames,
@from, @to, @filter, @context, @lcid
```

You can fill out "Equipments" with the following SQL queries:

```
exec PM.udsp_TCGetAllEquipmentsWithLCID 1033
```

You can fill out the "KPIs" with the following SQL query:

```
exec pm.udsp_TCGetKPINamesOfEquipmentsWithLCID @eqId, 1033
```

You can fill out the "Operands" with the following SQL query:

```
exec PM.udsp_TCGetOperandNamesOfEquipmentsWithLCID @eqId, 1033
```

See also

Step 2: Creating and publishing a template (Page 155)

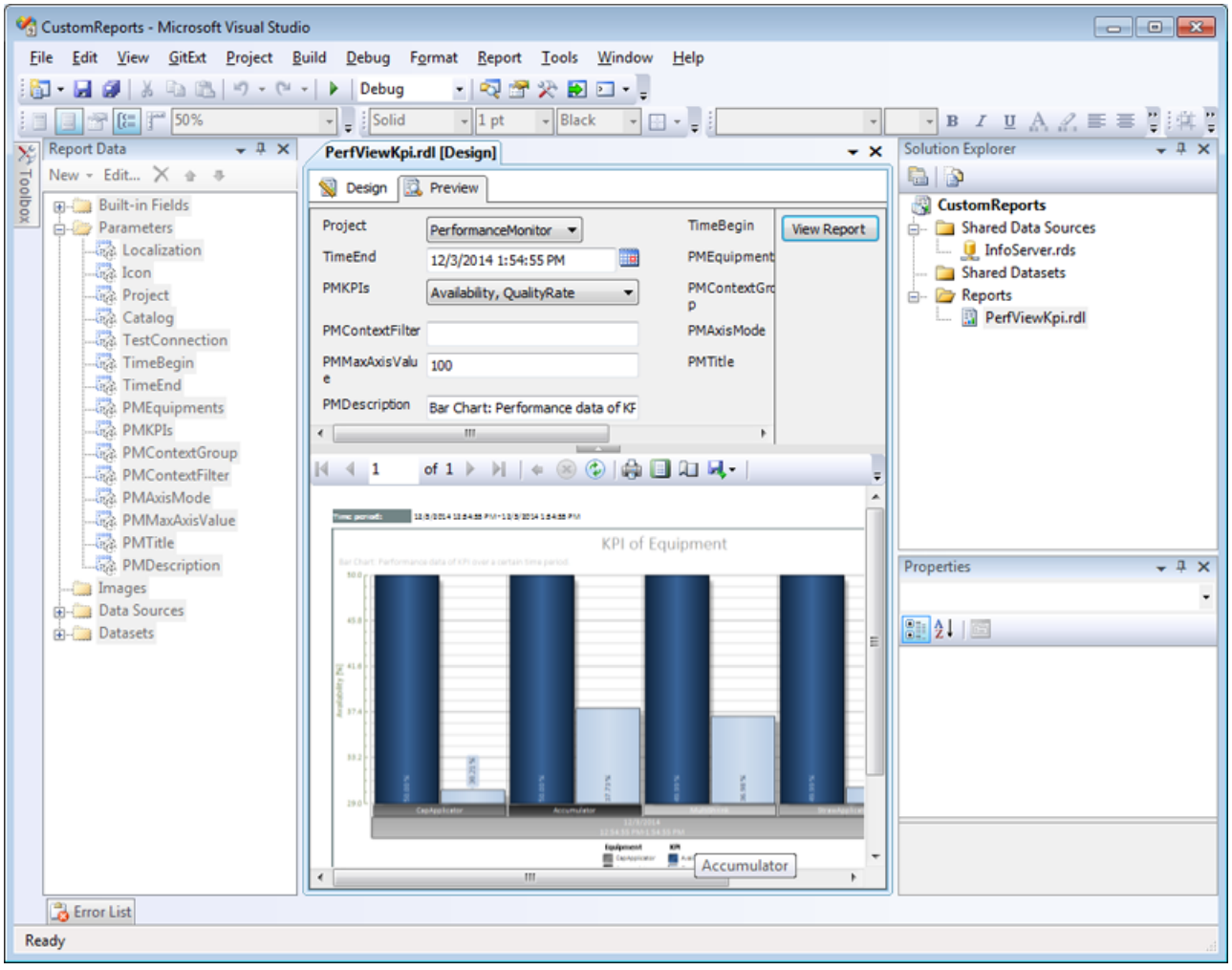
3.4.9.4 Example: Creating a custom template for outputting KPIs

Example: Creating a custom template for outputting KPIs

Task

This example shows you how you can create a custom template for the information server on the basis of an existing template. The "Availability" KPI for all available equipment is queried in this template.

The template is created in the "SQL Server Business Intelligence Development Studio" development environment. You can find additional information in the Internet (https://technet.microsoft.com/en-us/library/ms173767(v=sql.105).aspx).



Requirement

- The following applications are installed on your computer:
  - PerformanceMonitor IS Templates
  - Information server
  - SQL Server Business Intelligence Development Studio (version 2008 or later)
- You need to be familiar with the "SQL Server Business Intelligence Development Studio".

Overview of the steps involved

Step 1: Creating a Report server project

1. Creating a Report server project
2. Defining a data source
3. Integrating the existing template into the project
4. Preparing a template

Step 2: Creating and publishing a template

1. Creating an "Equipment" dataset
2. Creating a "Results" dataset
3. Configuring the output of the calculated data
4. Testing the template (optional)
5. Publishing the template on the Information server
6. Creating a report

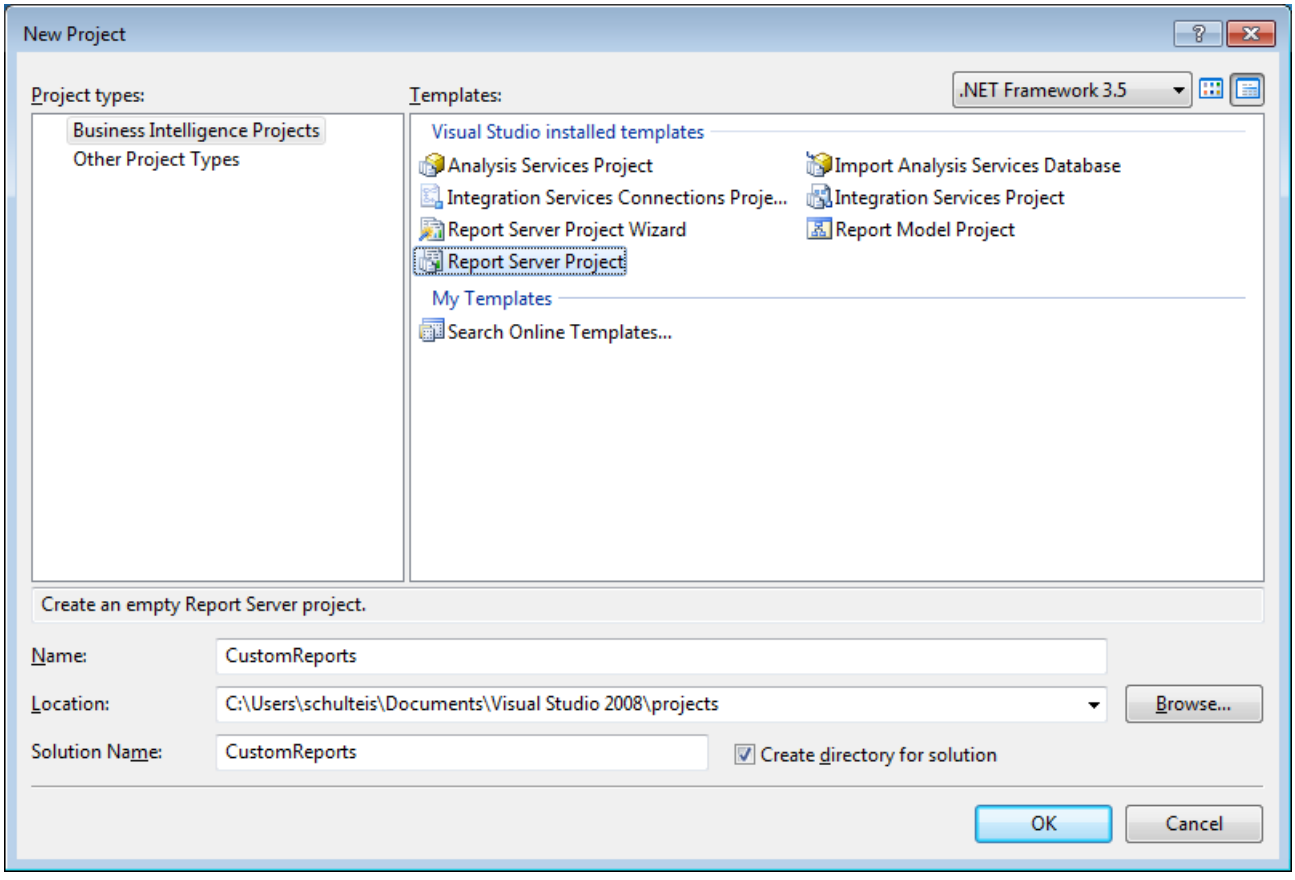
See also

Step 1: Creating a Report server project (Page 151)
Step 2: Creating and publishing a template (Page 155)

Step 1: Creating a Report server project

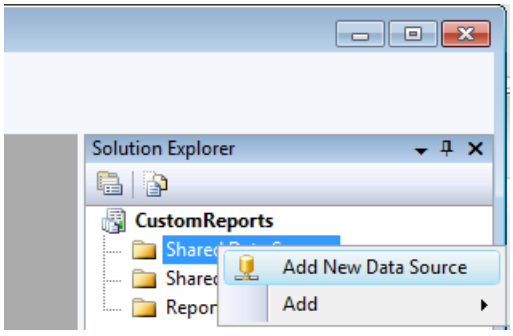
Creating a Report server project

1. Start the "SQL Server Business Development Intelligence Studio".
2. Create a new project using the menu command "File > New > Project...", for example "CustomReports".
   - Select "Business Intelligence Projects" as the project type.
   - Select "Report Server Project" as the template.
   - Select ".NET Framework 3.5".



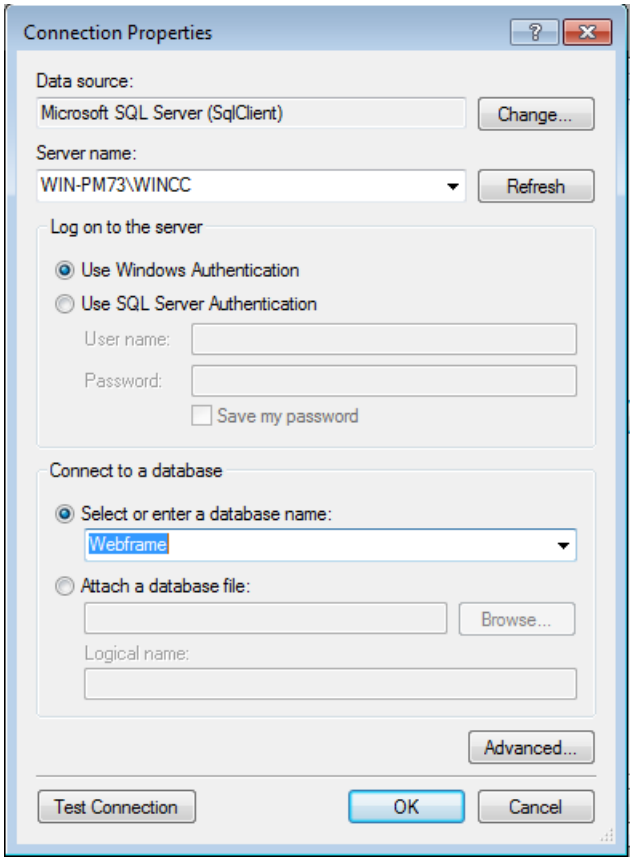
Defining a data source

1. Select the "Add New Data Source" command from the shortcut menu of "Shared Data Sources" in the "Solution Explorer".

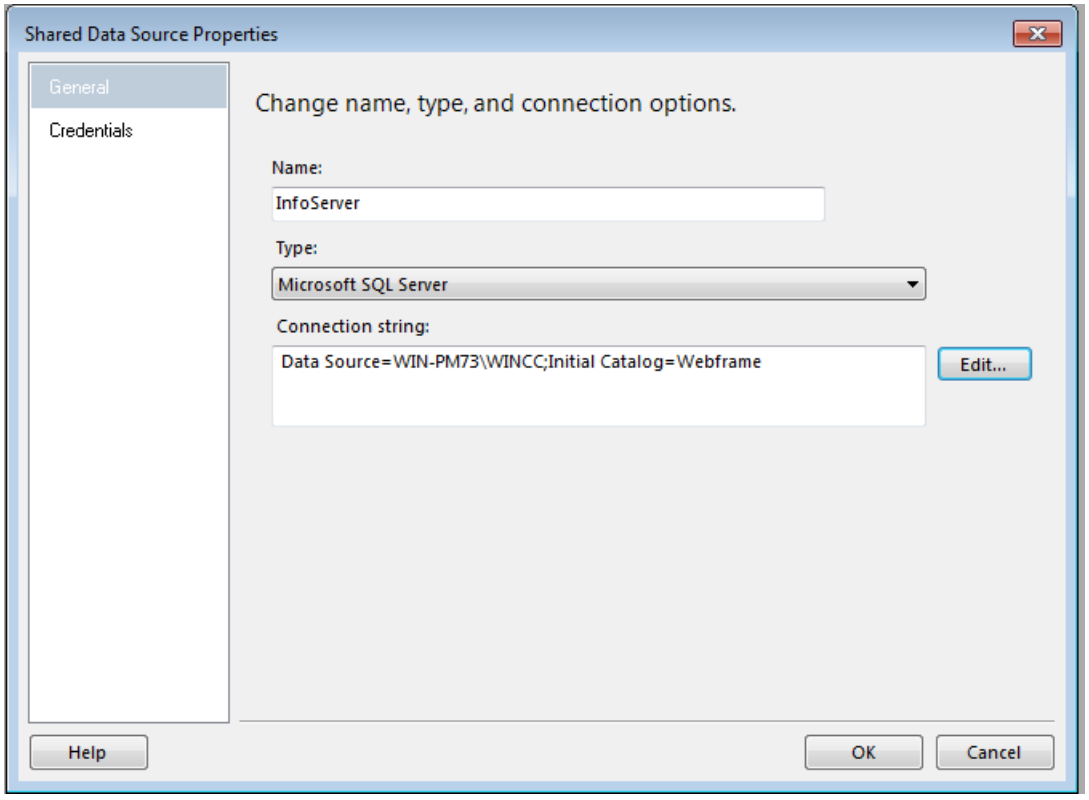


   The "Shared Data Source Properties" dialog opens.

2. Enter a name and select "Microsoft SQL Server" as the type.
3. Use "Edit..." to define the "Connection String".
   The "Connection Properties" dialog opens.
   - Select the computer on which the Information server is installed under "Server name".
   - Activate "Use Windows Authentication".
   - Select the entry "Webframe" as the database name.

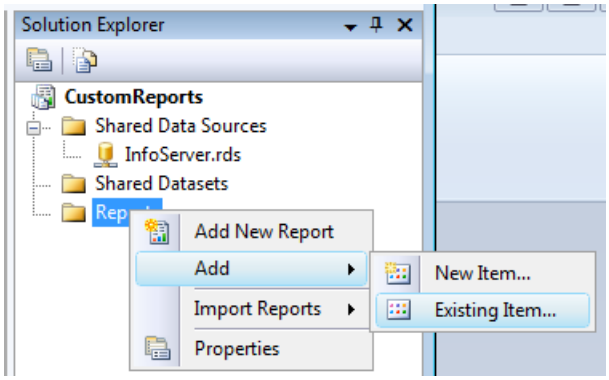


Interim result: The "Connection String" is entered.



Integrating the existing template into the project

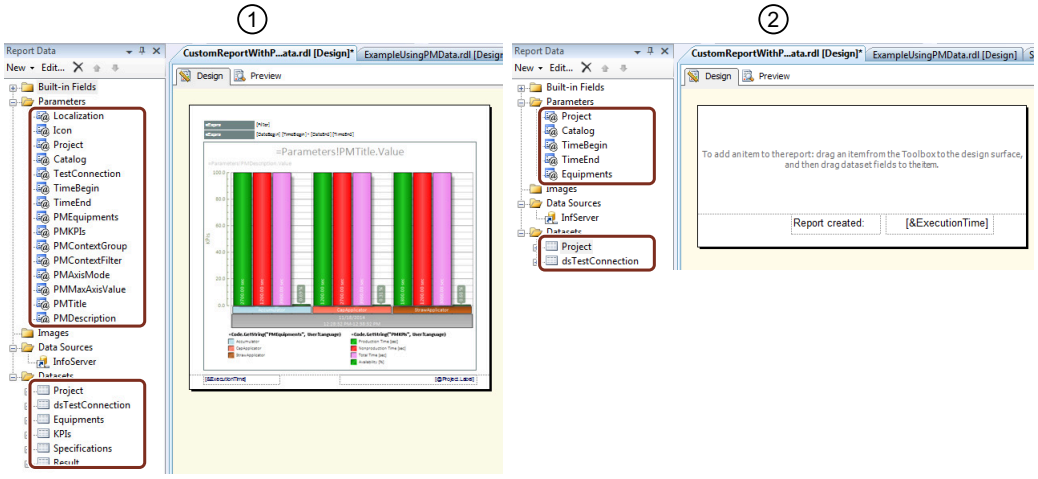
1. Select the "Add > Existing Item..." command from the shortcut menu of "Reports" in the "Solution Explorer".



   The "Add Existing Item - <Project designation>" dialog opens.

2. Select the desired template, for example "PerfViewKpi.rdl" in the "PerformanceMonitor" directory of the installation directory of the Information server.

3. Delete the unneeded "Parameters" and "Datasets" in the copy as shown in the following figure.



① Status before deleting the unneeded "Parameters" and "Datasets"

② Status after deleting

Note

Displaying the report preview in the development environment

Enter the proxy catalog name of the Information server in the Report server project to ensure that the correct preview is displayed in the development environment under "Preview" instead of an error message.

You can find additional information in the "Testing a template" section under "Step 2: Creating and publishing a template (Page 155)".

Result

The Report server project has been created. The next step involves creating the template and publishing it on the Information server.

See also

Example: Creating a custom template for outputting KPIs (Page 148)

Step 2: Creating and publishing a template

Requirement

"Step 1" of the example has been completed.

Creating an "Equipment" dataset

The following Query is used to fill out the "Equipments" Dataset with the equipment available in the database:

```
DECLARE @RC int
DECLARE @storedProcedure nvachar(256)

SET @storedProcedure = '[' + @Catalog + '].PM.udsp_TCGetAllEquipmentsWithLCD'

EXECUTE @RC = @storedProcedure 1033
```

1. Select the "Add Dataset" command from the shortcut menu of "Datasets" in the "Report Data" area.
   The "Dataset Properties" dialog opens.
2. Enter "Equipments" as the name under "Query".
3. Under "Query Type", select the "Text" option and enter the "Query" shown above.

Creating a "Results" dataset

The following query creates a table in the "Results" Dataset, which is filled out with the data available in the PerformanceMonitor. You can use this table to make SQL queries for data relevant for the template.

```
DECLARE @sp nvarchar(256)
DECLARE @operandNames nvarchar(max)
SET @sp = '[' + @Catalog + '].PM.udsp_TCCalculateKPIWithLCID'
SET @operandNames = ''
DECLARE @table table (eqId uniqueidentifier, eqName varchar(256),
                      eqDisplay nvarchar(256), eqForecolor nvarchar(100),
                      eqBackcolor nvarchar(100), eqComment nvarchar(max),
                      eqToolTip nvarchar(256), resId uniqueidentifier,
                      resName nvarchar(256), resDisplayName nvarchar(256),
                      resType int, resValue float, resMax float, resMin float,
                      resGroup nvarchar(256), resBackcolor nvarchar(100),
                      resForecolor nvarchar(100), resFormula nvarchar(max),
                      resAxis nvarchar(256), resFrom datetime, resTo datetime,
                      resUnit nvarchar(50), resComment nvarchar(max),
                      resToolTip nvarchar(256), detId uniqueidentifier,
                      detName nvarchar(256), detDisplayName nvarchar(256),
                      detType int, detValue float, detMax float, detMin float,
                      detGroup nvarchar(100), detBackcolor nvarchar(100),
                      detForecolor nvarchar(100), detAxis nvarchar(256),
                      detUnit nvarchar(100), detComment nvarchar(max),
                      detToolTip nvarchar(256))
INSERT INTO @table EXEC @sp @eqIds, @kpiNames, @operandNames, @from, @to, @filter,
                        @context, @lcid
select distinct eqDisplay, resDisplayName, resValue from @table
```

1. Select the "Add Dataset" command from the shortcut menu of "Datasets" in the "Report Data" area.
   The "Dataset Properties" dialog opens.
2. Enter "Results" as the name under "Query".
3. Under "Query Type", select the "Text" option and enter the "Query" shown above.

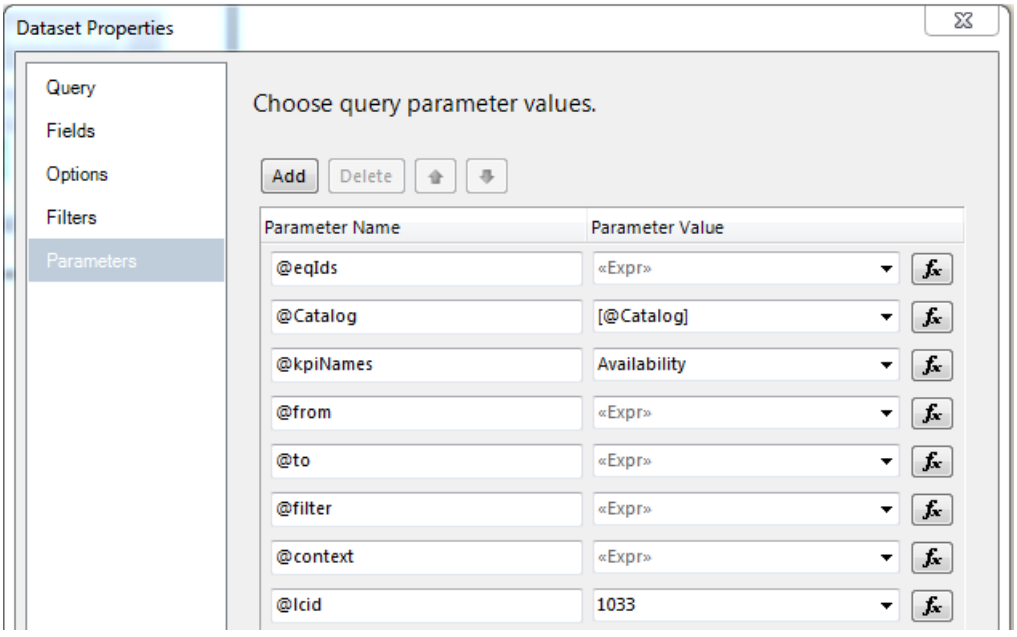
4. Define the following parameters under "Parameter":

Parameter	Value
@eqIds	=Join(Parameters!Equipments.Value, ",") [1]
@Catalog	=Parameters!Catalog.Value [1]
@kpiNames	Availability
@from	=Parameters!TimeBegin.Value [1]
@to	=Parameters!TimeEnd.Value [1]
@filter	=String.Empty [1]
@context	=String.Empty [1]
@lcid	1033 [2]

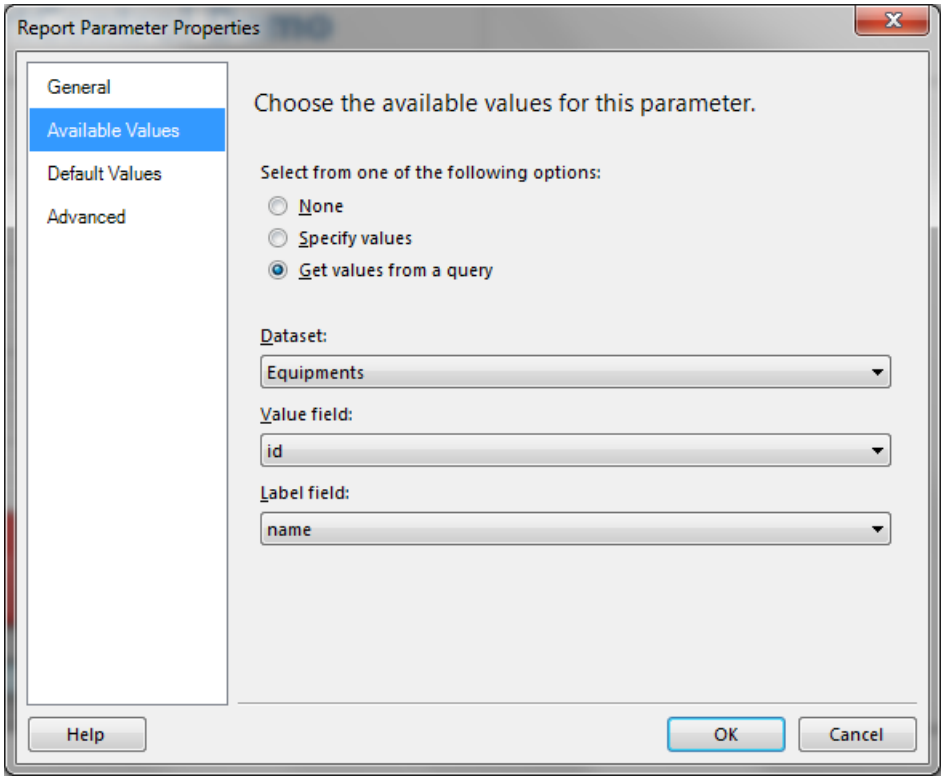
[1] Enter this expression via the "Expression" dialog.

[2] Language ID for English

Interim result:



5. Close the "Dataset Properties" dialog.
   The "Equipments" parameter is automatically created under "Parameters" in the "Report Data" area.
6. Open the "Equipments" parameter and configure the parameter as shown below:

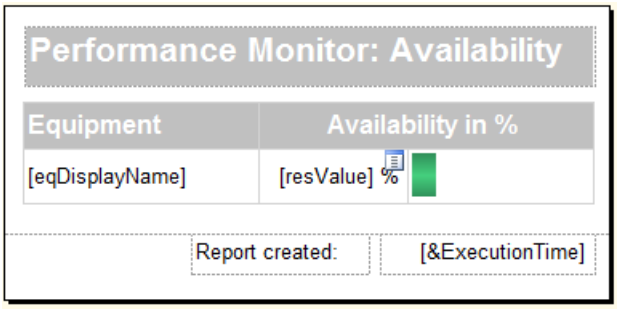


Configuring the output of the calculated data

You can use a table to output the "Availability" KPI for the selected equipment in the template. You can also set the availability graphically using a bar.

1. Insert the "Table" Control with three columns in "Visual Studio Toolbox".
2. Connect the first two columns as follows:
   - Column 1: [eqDisplayName]
   - Column 2: [resValue]
3. Insert the "DataBar" Control in the third column.
4. Connect the "DataBar" Control to [resValue].

Interim result:



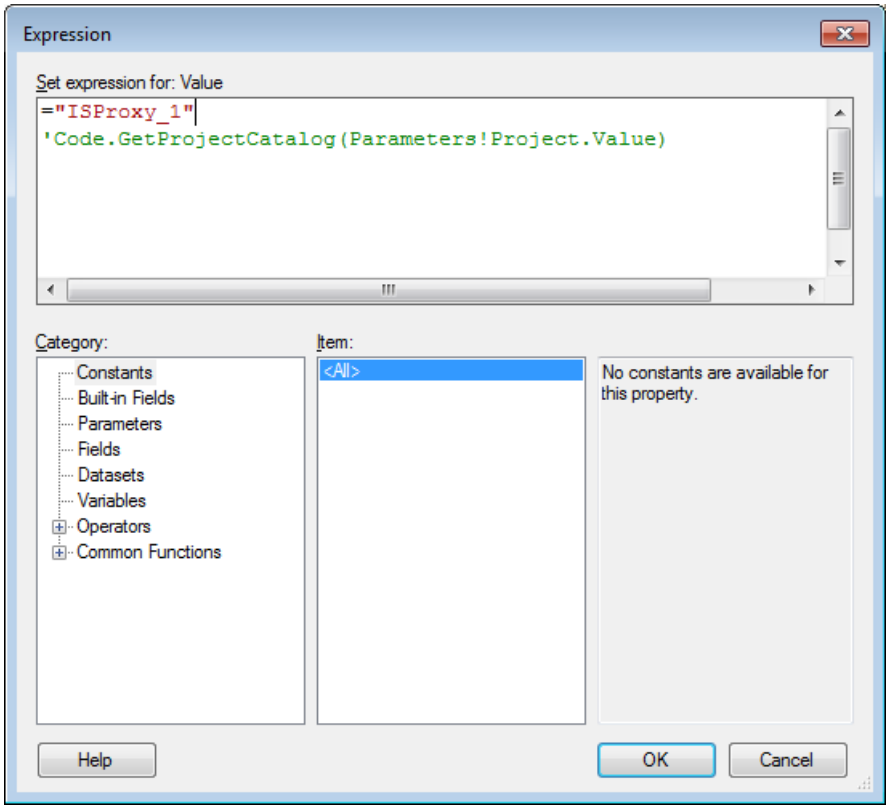
Testing the template (optional)

Before you publish the template on the website of the Information server, you should test its functionality using the preview function. The following steps are required for the preview to be displayed correctly in the development environment:

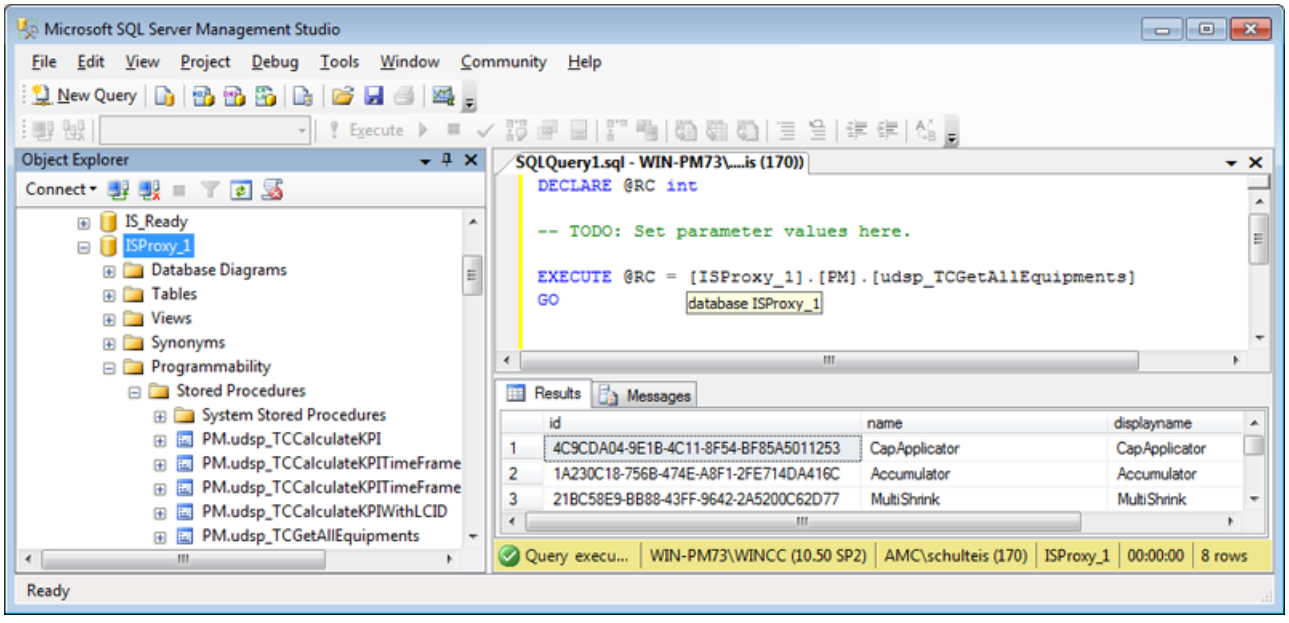
1. Copy the "Siemens.InformationServer.Common.ExternalResources.dll" class library from the installation directory of the Report server into the following directory:
   - "Program Files (x86)\Microsoft Visual Studio 9.0\Comon 7\IDE\Private Assemblies"
2. Add the reference to the class library in the "CustomReports" project:
   - Select the "Reports" entry under "Properties".
   - Under "Assemblies", create the reference to the class library from the "Private Assemblies" directory.

3. Enter the static name of the data source for the PerformanceMonitor data:
   - Under "Report Data", open the "@Catalog" object under "Parameters".
     The "Report Parameter Properties" dialog opens.
   - Under "Default Values", use the "Expression" dialog to enter the following expression:
     "=ISProxy_1".

– Comment out the existing expression:

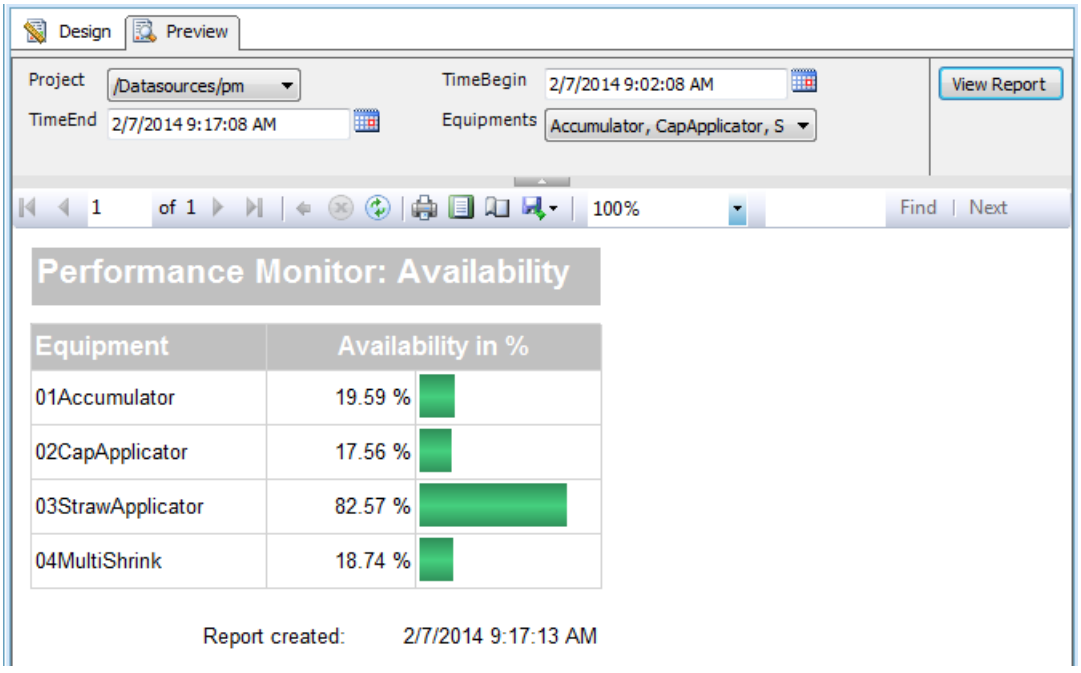


Note: If you do not know the name of the proxy catalog, connect to the instance of the SQL Server in the SQL Server Management Studio. You can determine the name of the proxy catalog there:



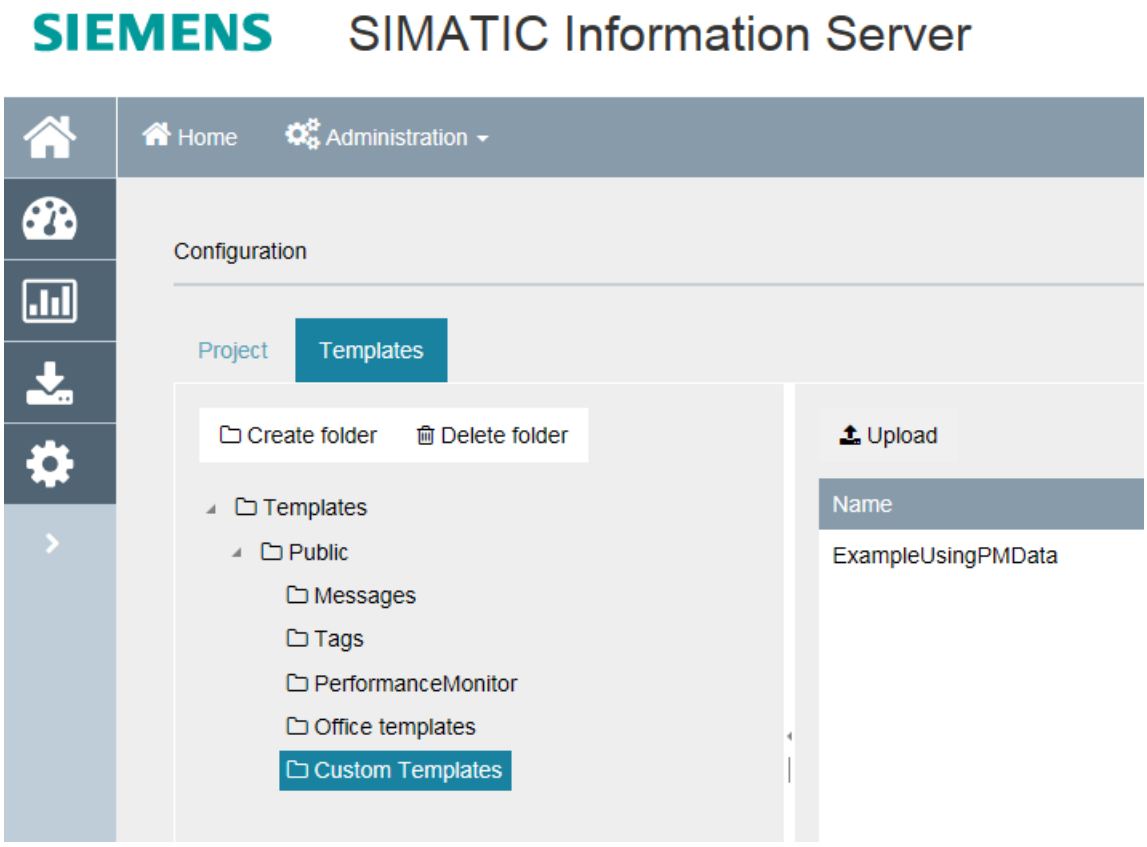
4. Switch to the "Preview" tab.
5. Select the desired equipment and click on "View Report".

Interim result:



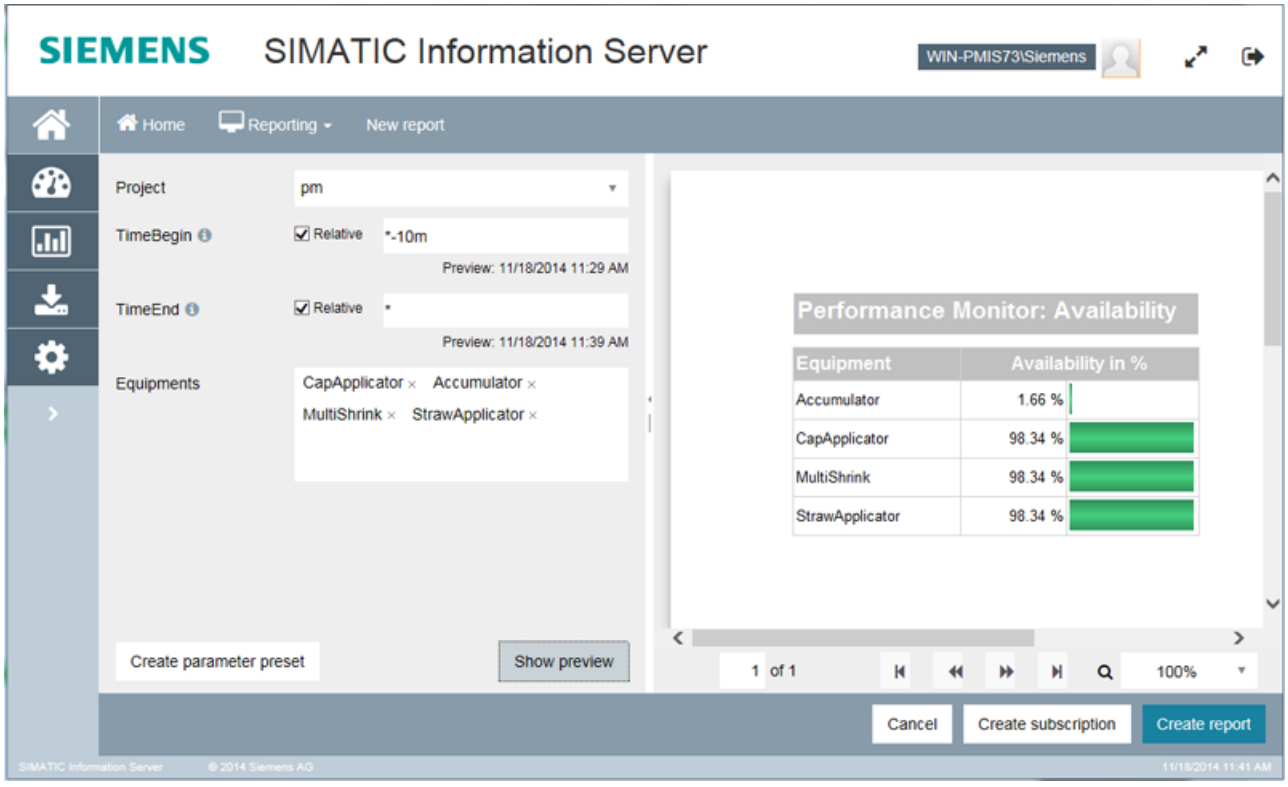
Publishing the template on the Information server

1. When you have tested the template in the development environment:
   - Under "Report Data", open the "@Catalog" object under "Parameters".
     The "Report Parameter Properties" dialog opens.
   - Under "Default Values", use the "Expression" dialog to delete the "=ISProxy_1" expression or comment it out.
   - Comment the "=Code.GetProjectCatalog(Parameters!Project.Value)" expression back in again.
2. Log on to the Information server.
3. Press "Upload" to load the newly created template to the folder of your choice.



Creating a report

1. Finally, create the report.



See also

Creating a custom template (Page 147)

Step 1: Creating a Report server project (Page 151)

Example: Creating a custom template for outputting KPIs (Page 148)

3.5 Reference

3.5.1 Syntax for formulas

Syntax

<Operand>[Operator]<Operand>

Arithmetic operators

The following arithmetic operators are permitted:

Operator	Function
+	Addition
-	Subtraction
*	Multiplication
/	Division
exp	Exponential function
pow	Power function

Logic operators

The following logical operators are permitted:

Operator	Function
&&	Logical AND operation
||	Logical OR operation
!	Negation
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to
=	Equal to

3.5.2 PerformanceMonitor Configuration Studio

3.5.2.1 Types

Name

Uniquely identifies the object within the PerformanceMonitor Configuration Studio and is language-neutral.

Use the following characters: "A...Z", "0...9" and "_".

See also

PerformanceMonitor Configuration Studio (Page 35)

Grouping

Defines an item of equipment as an equipment group or assigns the equipment to an existing equipment group.

When you create new equipment, the equipment is assigned by default to the group "Not assigned".

Calculation formula

Shows the formula for calculating the KPI type.

You can edit the formula in the formula editor.

Evaluation type

Defines the purpose of the operand type:

- Timer/Counter: Time series analysis. The time series analysis is used to determine how long or how often a value has changed.
- Number: Value analysis. Value analysis is used to compress or calculate recorded values from a time period, for example, to calculate an average or a sum.
- <Structured operand list>: Defines the operand type as "Structured operand type".

Note

Select the "Number" type, if you acquire the values of an external counter in an operand.

See also

Calculation mode (Page 169)

Unit

Defines an arbitrary unit for the object.

The unit is exclusively used as additional information. During calculations, ensure that the dimensions of the operands and KPIs in question are correct.

Data type (operand formula)

Defines the data type of the parameter.

The value of the WinCC tag must match the data type of the parameter.

Status

Defines the status value of a structured operand.

You assign a value range to each status.

See also

MinMax (Page 167)

MinMax

Defines the value range for the list entry of a structured operand.

The value ranges of multiple list entries should not overlap. Negative values are not permissible.

The following table shows a permissible value definition for list entries:

Status	Min.	Max.
On	1	1
Off	0	0
Error	2	10
Unknown	11	256

See also

Status (Page 166)

Data type (context information)

Defines the data type of the WinCC tag from which the context information is read in Runtime.

If you enter the list entries for context information in the PerformanceMonitor Configuration Studio, the data type is not evaluated.

Title

Defines a list entry for context information.

The list entry is language-neutral.

Display name

Language-dependent display name for the object in Runtime.

You can enter/modify/view display names for the same object in all the languages installed with WinCC under "Translation - Display name" table in the "Properties" window.

The specified names are stored in the text library in columns of the respective languages.

You select the configuration language under "View > Languages".

Comment

Language-dependent comment for an object type.

The comment is displayed only in the PerformanceMonitor Configuration Studio.

You can enter/modify/view comments for the same object in all the languages installed with WinCC under "Translation - Comment" table in the "Properties" window.

This column is hidden by default.

See also

Display name (Page 167)

Tooltip

Language-dependent tooltip for an object type. You can enter/modify/view the tooltip for the same object for all the languages installed with WinCC under "Translation - Tooltip" table in the "Properties" window.

The tooltip is displayed only in Runtime.

This column is hidden by default.

See also

Display name (Page 167)

Bar color

Bar color with which the object is displayed in Runtime or with which a report is displayed graphically.

This column is hidden by default.

Text color

Text color with which the labels are displayed in Runtime or with which a report is displayed graphically.

This column is hidden by default.

3.5.2.2 Instances

Connection mode

Type of data supply.

Specifies the type of data source, example, WinCC tag or constant.

See also

Data source (Page 169)

Connect with

See also

Connection mode (Page 168)

Data source

Value of an operand or context information instance.

The value you can enter depends on the "Connection mode":

- WinCC tag
- Constant
- Formula (operand only)
- Entry list (context information only)

For operands with the "Timer/Counter" evaluation type, enter the limit or range using this field.

See also

Evaluation type (Page 166)

Connection mode (Page 168)

Data type (operand instance) (Page 169)

Data source cycle

Cycle with which the value under "Data source" is queried.

All cycles defined in WinCC are available.

Data type (operand instance)

Data type of the operand.

The value under "Data source" must match the data type.

See also

Data source (Page 169)

Calculation mode

Evaluation rule for the operand.

The evaluation rule depends on the "Evaluation type":

- "Evaluation type" = "Number"
  Performs a calculation for an evaluation over the specified time period:

Calculation mode	Result
Maximum	Returns the maximum detected value from the specified time period.
Minimum	Returns the smallest recorded value from the specified time period.
Average	Returns the average of all recorded values from the specified time period.
Sum	Returns the sum of all recorded values from the specified time period.
Product	Returns the product of all recorded values from the specified time period.
External counter	The operand gets its value from an "external counter", which is processed in the controller, e.g. Count or Reset. Assign parameters to the counting in the object properties of the operand.

- "Evaluation type" = "Timer/Counter"
  Defines a condition that is interpreted as an edge change of a state.
  Enter the limit or area of the edge change under "Data source".
  A pending value is evaluated based on the specified condition. The following must apply in order to the value with time stamp:
  - The defined condition is true.
  - An edge transition has occurred.

See also

Evaluation type (Page 166)

Rise Time [sec] (Page 170)

Example: Using an operand of the type "External counter" (Page 93)

Status Data Source

The "Status Data Source" field holds the value of the status operand. This field is enabled only when the "Evaluation Type" is a structure operand type.

Select the "Status Data Source" field, a tag browser window opens to assign a tag to display the value of the status operand.

Rise Time [sec]

It is the switching time.

A value must be present for at least the time specified before the condition under "Calculation mode" is evaluated.

The switching time must be greater than or equal to the cycle time under "Data source cycle".

See also

Calculation mode (Page 169)

Data source cycle (Page 169)

Equipment Type

Displays the equipment name to which the objects such as KPIs, Operands and Context Information belong to.

3.5.3 VBS Reference

3.5.3.1 Methoden

GetEquipmentCollection method

Function

Returns the list of all equipment objects of the specified control as "ICCAxCollection" type.

Syntax

```
Expression.GetEquipmentCollection()
```

Expression

Required. An expression that returns an object of the "ScreenItem" type.

Parameters

--

Features and functions of the ICCAxCollection

The following properties are available for the ICCAxCollection:

- Count
- Item

The following methods are available for the ICCAxCollection:

- AddItem(vName) As Object
- RemoveItem(vIndex)

Example

```
Dim perfCtrl
Dim equipments
Dim eq
Set perfCtrl = ScreenItems("Control2")
Set equipments = perfCtrl.GetEquipmentCollection
For Each eq in equipments
If eq.Name = "MultiShrink" Then
     equipments.removeItem(eq.Name)
     End If
Next
equipments.AddItem("QualityRate")
```

See also

Accessing PMO controls with VBS (Page 99)

GetKPICollection method

Function

Returns the list of all KPI objects of the specified control as "ICCAxCollection" type.

Syntax

```
Expression.GetKPICollection()
```

Expression

Required. An expression that returns an object of the "ScreenItem" type.

Parameters

--

Features and functions of the ICCAxCollection

The following properties are available for the ICCAxCollection:

- Count
- Item

The following methods are available for the ICCAxCollection:

- AddItem(vName) As Object
- RemoveItem(vIndex)

Example

```
Dim perfCtrl
Dim kpis
Dim kpi
Set perfCtrl = ScreenItems("Control1")
Set kpis = perfCtrl.GetKPICollection
For Each kpi in kpis
If kpis.Name = "MultiShrink" Then
     kpis.removeItem(kpis.Name)
     End If
Next
kpis.AddItem("QualityRate")
perfCtrol.ReloadData
```

See also

Accessing PMO controls with VBS (Page 99)

GetOperandCollection method

Function

Returns the list of all operand objects of the specified control as "ICCAxCollection" type.

Syntax

```
Expression.GetOperandCollection()
```

Expression

Required. An expression that returns an object of the "ScreenItem" type.

Parameters

--

Features and functions of the ICCAxCollection

The following properties are available for the ICCAxCollection:

- Count
- Item

The following methods are available for the ICCAxCollection:

- AddItem(vName) As Object
- RemoveItem(vIndex)

Example

```
Dim perfCtrl
Dim operands
Dim op
Set perfCtrl = ScreenItems("Control2")
Set operands = perfCtrl.GetOperandCollection
For Each op in operands
If op.Name = "OperatingTime.Time" Then
     operands.removeItem(op.Name)
     End If
Next
perfCtrol.ReloadData
```

See also

Accessing PMO controls with VBS (Page 99)

GetSpecFilterCollection method

Function

Returns the list of all filters of the specified control as "ICCAxCollection" type.

Syntax

```
Expression.GetSpecFilterCollection()
```

Expression

Required. An expression which returns a "ScreenItem" type object.

Parameters

--

Features and functions of the ICCAxCollection

The following properties are available for the ICCAxCollection:

- Count
- Item

The following methods are available for the ICCAxCollection:

- AddItem(vName) As Object
- RemoveItem(vIndex)

Example

```
Dim perfCtrl
Dim specifications
Dim filterItem

Set perfCtrl = ScreenItems("Control2")
Set specifications = perfCtrl.GetSpecFilterCollection()
Set filterItem = specifications.AddItem("FilterEqualsTo")

With filterItem
    .SpecId = "Supplier"
    .Operator = 0
    .Operand = "Siemens"
End With
```

See also

SpecId property (Page 182)

Operator property (Page 181)

Operand-property (Page 181)

LogicOP property (Page 181)

Accessing PMO controls with VBS (Page 99)

GetTimeFrameCollection method

Function

Returns the list of all time ranges of the specified control as "ICCAxCollection" type.

Syntax

```
Expression.GetTimeFrameCollection()
```

Expression

Required. An expression which returns a "ScreenItem" type object.

Parameter

--

Features and functions of the ICCAxCollection

The following properties are available for the ICCAxCollection:

- Count
- Item

The following methods are available for the ICCAxCollection:

- AddItem(vName) As Object
- RemoveItem(vIndex)

Example

```
Dim perfCtrl
Dim Timeframes
Dim timeframe

Set perfCtrl = ScreenItems("Control2")
Set Timeframes = perfCtrl.GetTimeFrameCollection()

For Each timeframe In Timeframes
    Timeframes.RemoveItem(timeframe.Name)
Next

Timeframes.AddItem("Refence Time with fixed length ")
Set TimeframeItem = Timeframes("Refence Time with fixed length ")

With perfCtrl
    .TimeframeMode = 3
    .TimeframeBegin = CDate("7/30/2014 03:00:00 PM ")
    .TimeframeLength=3
    .TimeframeLengthUnit=2
    .IntervalMode= 1
    .IntervalCount=3
End With
```

See also

IntervalMode property (Page 179)
IntervalCount property (Page 179)
IntervalLength property (Page 180)
IntervalLengthUnit property (Page 180)
TimeframeBegin property (Page 182)
TimeframeEnd property (Page 182)
TimeframeInPast property (Page 183)
TimeframeInPastUnit property (Page 183)
TimeframeLength property (Page 183)

TimeframeLengthUnit property (Page 184)

TimeframeMode property (Page 184)

Accessing PMO controls with VBS (Page 99)

Export method

Function

Executes the "Export" key function of the specified control.

Syntax

```
Ausdruck.Export()
```

Expression

Required. An expression that returns an object of the "ScreenItem" type.

Parameters

--

ShowHelp method

Function

Executes the "Help" key function of the specified control.

Syntax

```
Ausdruck.ShowHelp()
```

Expression

Required. An expression that returns an object of the "ScreenItem" type.

Parameters

--

ShowPropertyDialog method

Function

Executes the "Configuration dialog" key function of the specified control.

Syntax

```
Expression.ShowProperty-Dialog()
```

Expression

Required. An expression that returns an object of the "ScreenItem" type.

Parameters

--

3.5.3.2 Properties

A - K

BeginGroup property

Function

Returns the current status of a button in the toolbar. BOOLEAN. Read access.

TRUE, if the object belongs to a group.

BarSortModeOperand property

Function

Defines the sorting of the operand bar or returns the value. Value range 0-3. Write/read access.

0=Manual

1=Value, ascending

2=Value, descending

3=Alphabetic

BarSortModeKPI property

Function

Defines the sorting of the KPI bar or returns the value. Value range 0-3. Write/read access.

0=Manual

1=Value, ascending

2=Value, descending

3=Alphabetic

ContextGroupBy property

Function

Defines the value according to which the context information for the specified object is grouped or returns the set value. STRING. Write/read access.

IconID property

Function

Returns the ID of an icon in the status bar. LONG. Read access.

IntervalMode property

Function

Defines whether the data of a time range is queried in intervals or returns the value. Value range: 0-2. Write/Read access.

0=No intervals

1=A specific number of intervals

2=A specific time period for intervals

See also

GetTimeFrameCollection method (Page 175)

IntervalCount property

Function

Defines the number of intervals with which a time range is queried or returns the value. LONG. Write/read access.

See also

GetTimeFrameCollection method (Page 175)

IntervalLength property

Function

Defines the length of the intervals with which a time range is queried or returns the value. LONG. Write/read access.

See also

GetTimeFrameCollection method (Page 175)

IntervalLengthUnit property

Function

Defines the unit for the duration of the intervals with which a time range is queried or returns the value. Value range 0-3. Write/read access.

0=Seconds

1=Minutes

2=Hours

3=Days

See also

GetTimeFrameCollection method (Page 175)

L - Z

Locked property

Function

Returns the current status of a button in the toolbar. BOOLEAN. Read access.

TRUE, if the object is disabled.

LogicOP property

Function

Returns the value for a logic operation. Value range 0-4. Read access.

0=None

1=OPEN PAREN

2=CLOSE PAREN

3=AND

4=OR

See also

GetSpecFilterCollection method (Page 174)

Operand-property

Function

Defines the specified value as filter or returns the value set as filter. STRING. Write/read access.

See also

GetSpecFilterCollection method (Page 174)

Operator property

Function

Returns the value for a logical comparison operator. Value range 0-6. Read access.

0=EQUAL

1=NOTEQUAL

2=LESS

3=LESSOREQUAL

4=GREATER

5=GREATEROREQUAL

6=LIKE

See also

GetSpecFilterCollection method (Page 174)

SpecId property

Function

Returns the ID of the specified "DataItem" object configured in the project (product ID, manufacturer ID). STRING. Read access.

See also

GetSpecFilterCollection method (Page 174)

TimeframeBegin property

Function

Defines the start time for the calculation and display of data or returns the value. DATE. Write/read access.

See also

GetTimeFrameCollection method (Page 175)

TimeframeEnd property

Function

Defines the end point for the calculation and display of data or returns the value. DATE. Write/read access.

See also

GetTimeFrameCollection method (Page 175)

TimeframeInPast property

Function

Defines the length of the offset of a time range in the past or returns the value. LONG. Write/read access.

See also

GetTimeFrameCollection method (Page 175)

TimeframeInPastUnit property

Function

Defines the time unit for the offset of a time range in the past or returns the value. Value range: 0-3. Write/Read access.

0=Seconds

1=Minutes

2=Hours

3=Days

See also

GetTimeFrameCollection method (Page 175)

TimeframeLength property

Function

Defines the length of the time range for the calculation and display of data or returns the value. LONG. Write/read access.

See also

GetTimeFrameCollection method (Page 175)

TimeframeLengthUnit property

Function

Defines the time unit for the definition of a time range or returns the value. Value range: 0-3. Write/Read access.

0=Seconds

1=Minutes

2=Hours

3=Days

See also

GetTimeFrameCollection method (Page 175)

TimeframeMode property

Function

Defines the mode in which the data of the configured time range is queried or returns the value. Value range: 0-3. Write/Read access.

0=Start and end time

1=Start time and duration

2=Duration with relative start time

3=Duration with reference time

See also

GetTimeFrameCollection method (Page 175)

UseDefaultBackColor property

Function

Defines whether the standard background color is used for the specified object or returns the value. BOOLEAN. Write/read access.

TRUE: The standard background color is used.

FALSE: The user-defined background color is used.

UseDefaultForeColor property

Function

Defines whether the standard foreground color (text color) is used for the specified object or returns the value. BOOLEAN write-read access.

TRUE: The standard foreground color is used.

FALSE: The user-defined foreground color is used.

UserDefined property

Function

Returns a value which shows whether the specified button was enabled or disabled by the user. BOOLEAN. Read access.

TRUE if the button was enabled or disabled by the user.

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