

SIEMENS

SIMATIC

Embedded Automation SIMATIC IPC427C Bundles, SIMATIC HMI IPC477C Bundles

Manual

Introduction

1

Product overview

2

Initial startup

3

User tasks

4

Restoring and maintenance

5

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
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.
CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.
NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

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 for the specific task, 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 adhered to. The information in the relevant documentation must be observed.

Trademarks

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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.

Table of contents

1	Introduction	5
2	Product overview	9
2.1	Hardware configurations	9
2.2	Software configurations	12
3	Initial startup	13
3.1	Overview	13
3.2	First boot	14
3.3	Touch screen calibration.....	15
3.4	Pre-configurations	18
3.4.1	General information	18
3.4.2	Pre-configured -HMI PROFINET/PROFIBUS (PN/DP)	19
3.4.3	Pre-configured -RTX, -HMI/RTX PROFINET (PN RT)	20
3.4.4	Pre-configured -RTX, -HMI/RTX PROFIBUS (DP)	21
3.5	Licensing	23
4	User tasks	25
4.1	Overview	25
4.2	Creating the STEP 7 project and configuring the hardware	26
4.3	Configuring the Windows Ethernet interface	29
4.4	Configuring the WinCC flexible project.....	31
4.5	Downloading PC Station components	32
4.6	Managing the Enhanced Write Filter	35
4.7	Creating a system image	37
5	Restoring and maintenance	41
5.1	Restoring the initial configuration.....	41
5.2	Repairs or replacement of parts.....	42
5.3	Notes.....	43
5.3.1	WinAC Data Storage when executing WinAC ODK programs	43
5.3.2	OP/ S7 connections do not function	43
5.3.3	Replacement of the CompactFlash card for the Embedded PC.....	44
5.3.4	Backup battery	44
	Index	45

Introduction

Purpose of the documentation

This documentation describes the unique features and pre-installed system configuration of the following SIMATIC Embedded Bundles:

- SIMATIC IPC427C-HMI
- SIMATIC IPC427C-RTX
- SIMATIC IPC427C-HMI/RTX
- SIMATIC IPC427C-RTX F
- SIMATIC HMI IPC477C-HMI
- SIMATIC HMI IPC477C-RTX
- SIMATIC HMI IPC477C-HMI/RTX
- SIMATIC HMI IPC477C-RTX F

Definition

In this documentation, the following terms are used to specify the different pre-installed system configuration of the following SIMATIC Embedded PCs:

- **SIMATIC Embedded Bundles:** This term is used to mean both PCs, the SIMATIC IPC427C and the SIMATIC HMI IPC477C with all possible pre-installed system configurations.
- **SIMATIC IPC427C Bundles:** This term is used to mean the PC alone with all its possible pre-installed system configurations.
- **SIMATIC HMI IPC477C Bundles:** This term is used to mean the PC alone with all its possible pre-installed system configurations.
- **Windows Embedded:** This term is used to mean the "Windows Embedded Standard 2009" operating system.
- **Distributed I/O:** This term is used to mean PROFIBUS and PROFINET.

Target group

This documentation is intended for engineers, programmers, and maintenance personnel with general knowledge of automation systems and programmable logic controllers.

Required background

To understand this documentation, you require a general knowledge of automation engineering. Basic knowledge of the following is also necessary:

- Windows operating systems
- Automation systems
- PC-based automation with WinAC RTX
- STEP 7 basic software, particularly:
 - Working with the SIMATIC Manager
 - Hardware configuration with HW Config

Location of the documentation

The documentation can be found on the Documentation DVD. The documentation is not installed on fixed storage media.

Guide

The present document consists of instructive sections and a reference section. The documentation covers the following subject topics:

- Product overview
- Initial startup
- User Tasks
- Restoring and Maintenance

Position in the information landscape

You can find additional information in the following documents:

Documentation for	Brief description of relevant content
<i>WinCC flexible 2008 Runtime</i>	This manual describes the complete functionality of WinCC flexible RT 2008. Available on the Internet (http://support.automation.siemens.com/WW/view/en/18795593).
<i>WinCC flexible 2008 - Communication, Part 1 and Part 2</i>	These manuals describe communication between WinCC flexible RT 2008 and controllers. Part 1 available on the Internet (http://support.automation.siemens.com/WW/view/en/18797552). Part 2 available on the Internet (http://support.automation.siemens.com/WW/view/en/18797249).
<i>WinCC flexible 2008 Compact / Standard / Advanced</i>	This manual provides you with a complete overview of configuring with WinCC flexible. The manual supports you when creating new projects, during configuration, and when transferring a project to an HMI device. Available on the Internet (http://support.automation.siemens.com/WW/view/en/18796010).
<i>WinAC RTX 2009 - Windows Automation Center (WinAC) RTX</i>	This manual describes the complete functionality of WinAC RTX. Available on the Internet (http://support.automation.siemens.com/WW/view/en/10805641/133300).

Documentation for	Brief description of relevant content
<i>WinAC Time Synchronization</i>	This manual describes the configuration and operation of WinAC Time Synchronization. Available on the Internet (http://support.automation.siemens.com/WW/view/en/22205381/0/en).
<i>SIMATIC NET 2008 - Manual Collection</i>	This set of manuals provides you with information about SIMATIC NET and industrial communications. Available on the Internet (http://support.automation.siemens.com/WW/view/en/10806083/133300).
<i>SIMATIC Industrial PC - SIMATIC IPC427C</i>	This manual contains information on commissioning and using the SIMATIC IPC427C. Available on the Internet (http://support.automation.siemens.com/WW/view/en/37028954/0/en).
<i>SIMATIC Industrial PC - SIMATIC HMI IPC477C / HMI IPC477C PRO</i>	This manual contains information on commissioning and using the SIMATIC HMI IPC477C. Available on the Internet (http://support.automation.siemens.com/WW/view/en/37443499/0/en).

Service & Support on the Internet

A guide to the technical documentation offered for the various SIMATIC products and systems is available on the Internet

(http://www.automation.siemens.com/simatic/portal/html_76/techdoku.htm).

In addition to our documentation pool, we offer our complete online knowledge base on the Internet (<http://www.siemens.com/automation/service&support>). There you will find:

- The newsletter, which is constantly updated to provide you with the latest information about your products
- The right documents via our Search function under Service & Support
- The bulletin board, a worldwide knowledge exchange for users and experts.
- Your local representative for Automation & Drives in our representatives database
- Information about on-site services, repairs, spare parts, and lots more.

Product overview

2.1 Hardware configurations

The SIMATIC Embedded Bundles introduce new hardware configurations and deliver pre-installation of all software and software license keys.

For SIMATIC Embedded Bundles the following exchangeable CompactFlash card is available:

- 4 GB CompactFlash, Windows Embedded and software pre-installed
- 8 GB CompactFlash, Windows Embedded and software pre-installed

SIMATIC IPC427C Bundles

The SIMATIC IPC427C Bundles are available in the following configurations:

- Processor
 - Celeron M with 1.2 GHz, PN RT
 - Celeron M with 1.2 GHz, PROFIBUS
 - Core2Solo with 1.2 GHz, PN RT
 - Core2Solo with 1.2 GHz, PROFIBUS
 - Core2Duo with 1.2 GHz, PN RT
 - Core2Duo with 1.2 GHz, PROFIBUS
- RAM
 - 1 GB
 - 2 GB
 - 4 GB
- Mass storage

If internal mass storage is available, the operating system and programs are installed on this internal mass storage.

 - 4 GB CompactFlash (internal)
 - 8 GB CompactFlash (internal)
 - 32 GB Solid-State-Disk (internal)
 - 80 GB HDD SATA (additional)
 - 4 GB CompactFlash (exchangeable)
 - 8 GB CompactFlash (exchangeable)

- Software configurations:
 - Windows Embedded, RTX
 - Windows Embedded, HMI
 - Windows Embedded, HMI/RTX
 - Windows Embedded, RTX F

The SIMATIC IPC427C Bundles **with WinAC RTX F** are available with the following configuration:

- Intel Core2Duo, PROFIBUS
- 2 GByte RAM
- 8 GByte CompactFlash
- WinAC RTX F + SIMATIC NET software preinstalled

SIMATIC HMI IPC477C Bundles

The SIMATIC HMI IPC477C Bundles are available the following configurations:

- Processor
 - Celeron M with 1.2 GHz, PROFINET (RT); 2x1 GBit
 - Celeron M with 1.2 GHz, PROFIBUS DP 12; 2x1 GBit
 - Core2Solo with 1.2 GHz, PROFINET (RT); 2x1 GBit
 - Core2Solo with 1.2 GHz, PROFIBUS DP 12; 2x1 GBit
 - Core2Duo with 1.2 GHz, PROFINET (RT); 2x1 GBit
 - Core2Duo with 1.2 GHz, PROFIBUS DP 12; 2x1 GBit

- RAM
 - 1 GB
 - 2 GB
 - 4 GB

- Mass storage

If internal mass storage is available the operating system and programs are installed on this internal mass storage.

- 2 GB CompactFlash (internal)
 - 4 GB CompactFlash (internal)
 - 8 GB CompactFlash (internal)
 - 32 GB Solid-State-Disk (internal)
 - 4 GB CompactFlash (exchangeable)
 - 8 GB CompactFlash (exchangeable)
- Software configurations:
 - Windows Embedded, RTX
 - Windows Embedded, HMI
 - Windows Embedded, HMI/RTX
 - Windows Embedded, RTX F

SIMATIC HMI IPC477C monitor sizes

The SIMATIC HMI IPC477C is available with the following monitor sizes:

- 12" Touch
- 12" Key
- 15" Touch (also for SIMATIC HMI IPC477C PRO)
- 15" Key
- 19" Touch (also for SIMATIC HMI IPC477C PRO)

The SIMATIC HMI IPC477C Bundles **with WinAC RTX F** are available with the following configuration:

- 12", 15" or 19" Touch Screen
- Intel Core2Duo, PROFIBUS
- 2 GByte RAM
- 8 GByte CompactFlash
- WinAC RTX F + SIMATIC NET software preinstalled

2.2 Software configurations

Software bundle configurations

The SIMATIC Embedded Bundles software configurations offer the capability for PROFINET or PROFIBUS communication:

- HMI
- RTX
- HMI/RTX
- RTX F

All software configurations are on CompactFlash cards or SSD. You can use the CompactFlash cards with pre-installed software on the SIMATIC IPC427C Bundle or SIMATIC HMI IPC477C Bundle hardware.

The "Getting Started" chapter of the WinAC RTX documentation describes PROFINET and PROFIBUS communication.

Note

The user interface for Windows Embedded is English. The control panel and all other dialogs are always in English.

Initial startup

3.1 Overview

Basic procedure

To proceed the initial startup follow these steps:

- First boot (Page 14): Follow the instructions on the screen.
- Touch screen calibration (Page 15): Calibrate the touch screen.
- Your pre-configured systems are available.
- **Further software:** Now you can install further software.
- Licensing (Page 23): Transfer the license key with the Automation License Manager.

In the following sections you will find detailed information on the steps involved during the initial startup.

3.2 First boot

The SIMATIC Embedded Bundles include the WinAC RTX or HMI installation. No further installation is necessary.

Note

The first System startup can take longer than usual for the basic commissioning. You will see a blue screen for several minutes.

Errors and warnings can be displayed in the status bar, with the first and second switch on of the first basic commissioning or after a restore procedure. They have no effect on the operation of the device and can be ignored.

Procedure

The First Boot Agent of Windows Embedded runs the first time you start the PC and finalizes the installation. You do not have to perform any additional configuration.

1. Connect the device to the 24 V DC power supply.

The PC performs a self test. During the self test, this message appears: "Press <F2> to enter Setup or <Esc> to show Bootmenu"

2. Wait until this message is cleared.
3. Then follow the instructions on the screen.

After the First Boot Agent completes, the PC requests a reboot.


4. After you have entered all the necessary information and the operating system is configured, you are prompted to restart the system.
5. Acknowledge the prompt with "Yes".

Note

When you turn on the PC now, the user interface of the Windows Embedded operating system is automatically opened when the startup routine is completed.

Exchanging the CompactFlash card

The CompactFlash card is already pre-installed internally. In some situations, it may be necessary to exchange it.

 CAUTION
CompactFlash cards can only be exchanged on hardware systems with identical processors.

3.3 Touch screen calibration

While the "SIMATIC PC Wizard" is running different drivers will be installed. The wizard automatically identifies and chooses the type of SIMATIC Embedded Bundle.

Procedure

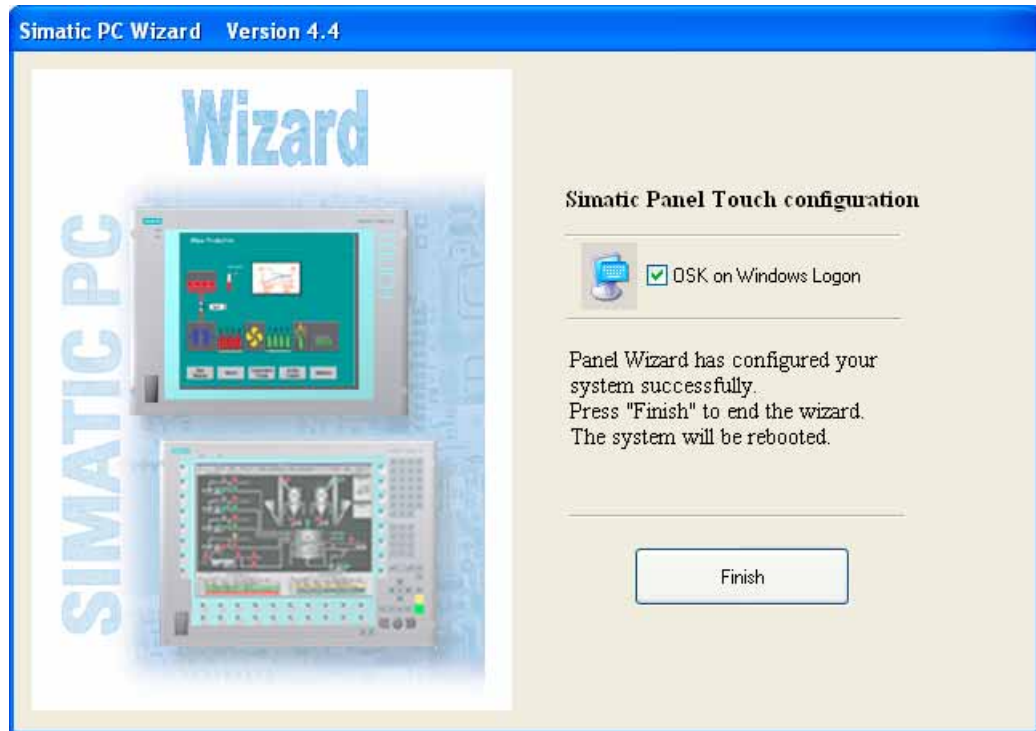
To calibrate the Touch Screen, proceed as follows:

1. Click on the dialog window of the wizard.

The calibration starts.



2. Calibrate the Touch Screen.
3. Click on "OSK on Windows Logon", if you want the Windows screen keyboard to be displayed when you logon.
4. Click "Finish".

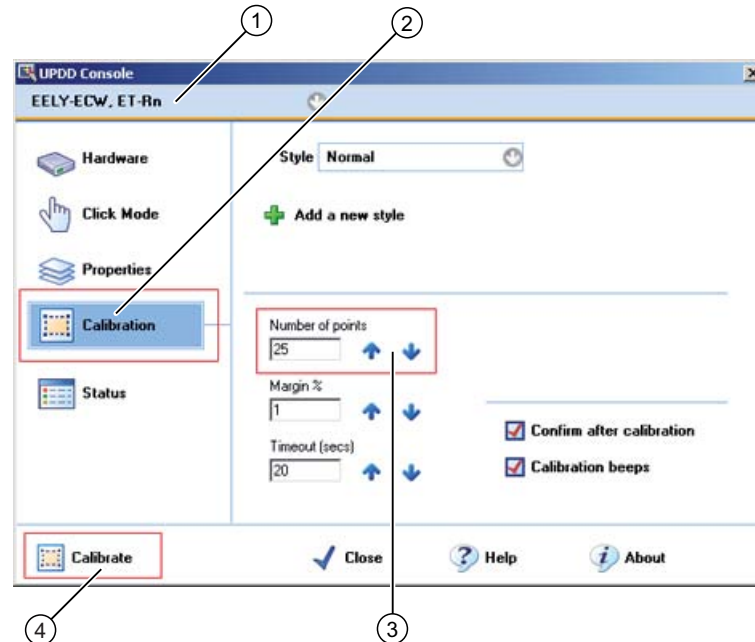


Recalibrating the Touch Screen

If the touch screen does not react as expected when touched, repeat the calibration.

1. Select **Start > Programs > UPDD > Settings**.

The "UPDD Console" dialog box opens.



2. Select the screen (1) you want to calibrate.
3. Click on "Calibration" (2).
4. Enable "25-point calibration" (3).
5. Confirm with "Calibrate" (4).

The calibration mask is output on the selected display.

6. Touch the blue arrow.
7. Confirm all input prompts (arrows, or crosses in the center) until the complete screen has been calibrated.

WARNING

Incorrect operation

If you touch the touch screen while configuring it or if the screen saver is active, the SIMATIC process visualization software, e.g. ProTool/Pro, will carry out the functions that happen to be behind it.

CAUTION

Only touch one point on the touch screen and not several points at one time. You may otherwise trigger unintended reactions. Do not touch the screen in the following situations: during the booting process, when plugging or unplugging USB components while Scandisk is running

3.4 Pre-configurations

3.4.1 General information

After the calibration of the Touch Screen the pre-configurations are available.

Notes on all pre-configuration

The following information applies to all pre-configurations.

NOTICE
The Windows Firewall is enabled. All necessary SIMATIC protocols are registered as exceptions. You can use the CP 5611 or the Industrial Ethernet interface to download STEP 7 projects.

You do not have to perform any additional configuration in the PC Station or in WinLC Properties. WinLC RTX submodules communicate in the RTX environment, and the PC Station components communicate in the Windows Embedded environment.

NOTICE
If for any reason you need to reconfigure your PC Station with the Station Configuration Editor, you must choose "IE General" for the Industrial Ethernet interface.

You can connect other devices such as a mouse, keyboard, or storage device to the hardware platform through the USB ports. You can connect a monitor through the DVI-I interface. A monitor, USB mouse, and USB keyboard are necessary only for user interaction with the controller or with other software. To use the restore DVD, you need a 'USB DVD-ROM drive. You do not need a storage device for WinLC RTX operation except when restoring your installation.

The hardware platform contains NVRAM. You can use this non-volatile RAM for retentive data storage. WinAC RTX is pre-configured to store up to 128 Kbytes of retentive data in this integrated, battery-buffered NVRAM of the hardware platform.

If the retentive data is greater than 128 Kbytes, you must select "File storage" for WinAC data storage. The hardware platform uses a CompactFlash card for file storage. In order to save retentive data in a power loss situation, protect your system with an Uninterruptible Power Supply (UPS).

Typically, you use the Enhanced Write Filter (EWF) to protect the C:\ drive of the CompactFlash card; however, you must take care to manage the EWF if you use the C:\ drive for any file storage. Typically, you leave the EWF disabled for the D:\ drive. File storage on the D:\ drive thus requires no special handling.

Refer to the WinAC RTX documentation for information on configuring WinAC data storage.

In addition to this documentation, you can find technical specifications and other information in the SIMATIC Embedded Bundles product documentation. Refer to the accompanying WinAC RTX documentation for a complete description of WinAC RTX and how to use it for PC-based Automation solutions. The Introduction (Page 5) of this documentation lists other manuals that may be useful.

3.4.2 Pre-configured -HMI PROFINET/PROFIBUS (PN/DP)

The -HMI PN/DP software package includes the Windows Embedded operating system, WinCC flexible RT as well as integrated CP 5611 and Industrial Ethernet communication interfaces. All software is pre-installed on your hardware platform and pre-configured. You do not have to perform any additional installation or configuration; however, you can use the SIMATIC PC Wizard to adjust your PC display preferences.

-HMI configuration

The -HMI PN/DP software package does not include a PC Station configuration. You transfer WinCC flexible projects directly from the engineering station to WinCC flexible RT on the hardware platform. You can perform transfers over the following channels:

- Default:
 - Serial
 - Industrial Ethernet
- Optionally configurable:
 - MPI
 - USB

You can connect other devices such as a mouse, keyboard, or storage device to the hardware platform via the USB ports. To use the restore DVD (Page 41), you need a USB DVD-ROM drive. You do not need these USB devices for general operation.

The hardware platform uses a CompactFlash card for data storage. Typically, you use the Enhanced Write Filter (EWF) to protect the C:\ drive of the CompactFlash card; however, you must take care to manage the EWF (Page 35) if you use the C:\ drive for any file storage. For WinCC flexible RT, a D:\ drive on the CompactFlash card with the EWF disabled is recommended.

In addition to this documentation, you can find technical specifications and other information in the SIMATIC Embedded Bundles product documentation. Refer to the Introduction (Page 5) for a summary of other documentation that may be useful.

3.4.3 Pre-configured -RTX, -HMI/RTX PROFINET (PN RT)

The PN software package includes the Windows Embedded operating system, WinAC RTX, and integrated IE General. All software is pre-installed on your hardware platform and pre-configured. You do not have to perform any additional installation or configuration.

Software and interface configurations for SIMATIC use

Index	Software	Hardware location
1	OPC Server	
2	WinLC RTX	
	IF1	
	IF2	IE General
	IF3	
	IF4	
3	IE General	PN/IND.ETHERNET (LAN) X2 P2
4	WinCC flexible RT *1)	
5		

*1) WinCC flexible RT for –HMI/RTX configurations only



- ① PN/IND.ETHERNET (LAN) X2 P1
- ② PN/IND.ETHERNET (LAN) X2 P2

Figure 3-1 Connection components of a SIMATIC IPC427C Bundle

SIMATIC Embedded Bundle interface default settings

Interface	Configuration	Usage
ETHERNET 1 (IE General, PROFINET)		
IP address	0.0.0.0	WinLC RTX use: <ul style="list-style-type: none"> • PROFINET IO Controller • CBA • S7 communications • OUC
Subnet mask	255.255.255.0	
ETHERNET 2 (IE General, Windows communication)		
IP address	192.168.1.2	Windows use: <ul style="list-style-type: none"> • For SIMATIC PG or SIMATIC HMI access • S7 communications • For standard Windows Ethernet communication
Subnet mask	255.255.255.0	

3.4.4 Pre-configured -RTX, -HMI/RTX PROFIBUS (DP)

The -RTX DP software package includes the Windows Embedded operating system, WinAC RTX software package, and integrated CP 5611 and Industrial Ethernet communication interfaces. All software is pre-installed on your hardware platform and pre-configured. You do not have to perform any additional installation or configuration.

Software and Interface configurations for SIMATIC use

Index	Software	Hardware location
1	OPC Server	
2	WinLC RTX *1)	
	IF1 CP 5611	MPI/DP X2 (FIELDBUS X3)
	IF2 IE General	PN/IND.ETHERNET (LAN) X2 P1
	IF3	
	IF4	
3	IE General	PN/IND.ETHERNET (LAN) X2 P2
4	WinCC flexible RT *2)	
5		

*1) also applies to WinLC RTX F

*2) WinCC flexible RT for -HMI/RTX configurations only



- ① PN/IND.ETHERNET (LAN) X2 P1
- ② PN/IND.ETHERNET (LAN) X2 P2
- ③ MPI/DP X2 (FIELDBUS X3)

Figure 3-2 Connection components of a SIMATIC HMI IPC477C Bundle

SIMATIC Embedded Bundle Interface default settings

Interface	Configuration	Usage
ETHERNET 1 (IE General, PROFINET)		
IP address	0.0.0.0	WinLC RTX use: <ul style="list-style-type: none"> • PROFINET IO Controller • CBA • S7 communications • OUC
Subnet mask	255.255.255.0	
ETHERNET 2 (IE General, Windows communication)		
IP address	192.168.1.2	Windows use: <ul style="list-style-type: none"> • For SIMATIC PG or SIMATIC HMI access • S7 communications • For standard Windows Ethernet communication
Subnet mask	255.255.255.0	
PROFIBUS		
PROFIBUS address	2	WinLC RTX use: <ul style="list-style-type: none"> • PROFIBUS DP Master • S7 communications
Baud rate	1.5 Mbps	

3.5 Licensing

License key

The license key is located on a USB stick that ships with the product. The Automation License Manager is installed on the SIMATIC Embedded Bundles.

Installing the license key

1. Select the **Start > SIMATIC > License Management > Automation License Manager** menu command. You can also open the Automation License Manager from the desktop.
2. Install the license key according to the instructions in the online help of the Automation License Manager.

Installing the license key from a remote computer

The Automation License Manager must be installed on both computers. To install the license key from a remote computer (such as your Engineering PC) via a network, follow these steps.

1. Select the **Start > SIMATIC > License Management > Automation License Manager** menu command. You can also open the Automation License Manager from the desktop.
2. Choose the menu command **Edit > Connect Computer**.
The "Connect Computer" dialog is opened.
3. Enter the name of the computer or the port you want to connect to.
4. Confirm with "OK".
5. Transfer the license with drag and drop.
The license key is transferred.

User tasks

4.1 Overview

This section covers the following topics:

- "Creating the STEP 7 project and configuring the hardware" (Page 26): This topic describes how to create a project, add a PC Station (-RTX/RTX F) or HMI Station (-HMI/RTX) to it, and configure the hardware configuration to correspond to the default configuration of the SIMATIC Embedded Bundle.
- "Configuring the Windows Ethernet Interface" (Page 29): This topic explains the locations of the Ethernet connections and how to configure the IP addresses for these connections.
- "Configuring the WinCC flexible Project" (Page 31): You must configure your WinCC flexible project with the WinCC flexible ES (engineering station) software, and transfer this project from the engineering station computer to WinCC flexible RT on the SIMATIC Embedded Bundle. This topic describes how to change the WinCC flexible RT settings on the SIMATIC Embedded Bundle after this transfer is complete.
- "Downloading PC Station components" (Page 32): This topic explains what to do if you need to change and download the configuration of the PC Station (for example, if you want to add WinCC flexible to the configuration, or if you want to download the OPC Server configuration).
- "Managing the Enhanced Write Filter" (Page 35): The Enhanced Write Filter (EWF) is a Windows Embedded utility for protecting a CompactFlash card. CompactFlash cards allow a limited number of write accesses. This topic describes how to use the EWF manager.
- "Creating a System Image" (Page 37): After you have configured the SIMATIC Embedded Bundle for your application, you can create an image of your system. If necessary, you can use this image later to restore your custom application to your system. This topic explains how to perform this task.

4.2 Creating the STEP 7 project and configuring the hardware

This topic applies only to the SIMATIC IPC427C-RTX/ -RTX F/ -HMI/RTX and SIMATIC HMI IPC477C-RTX/ -RTX F/ -HMI/RTX and is not applicable for the SIMATIC IPC427C-HMI and SIMATIC HMI IPC477C-HMI.

The following tasks are required to use a STEP 7 project in your SIMATIC Embedded Bundle:

1. Create a STEP 7 project.
2. Add a PC Station (-RTX/ -RTX F) or HMI Station (-HMI/RTX) to the project.
3. Configure the hardware to correspond to the default configuration.
4. Before downloading the program and configuration, comply with the required conditions for program and configuration downloads.
5. Finalize your SIMATIC Embedded Bundle for operation by enabling the Enhanced Write Filter (EWF) and documenting any special settings.

Note

When using SIMATIC IPC427C-RTX/ -RTX F/ -HMI/RTX or SIMATIC HMI IPC477C-RTX/ -RTX F/ -HMI/RTX, you must configure the hardware to correspond to the default configuration. You do not need to configure hardware in STEP 7 for the SIMATIC IPC427C-HMI and SIMATIC HMI IPC477C-HMI.

NOTICE

You will find some basic projects for your configurations in the root of the SIMATIC Embedded Bundle Manual Collection DVD.

To use the project, import the file "Embedded" in the SIMATIC Manager, by selecting **File > Retrieve** from the main menu.

Hardware configuration

The initial configuration of the SIMATIC IPC427C-RTX/ -RTX F/ -HMI/RTX and SIMATIC HMI IPC477C-RTX/ -RTX F/ -HMI/RTX, as shown below, includes the following components:

-HMI/RTX configuration:

The figures below show the STEP 7 configuration for the -HMI/RTX with PROFIBUS DP and PROFINET communications processors:

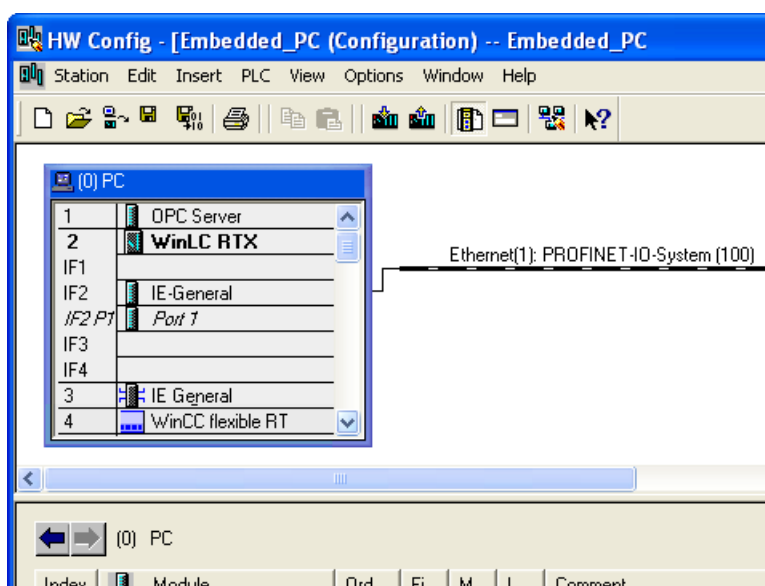


Figure 4-1 -HMI/RTX PN RT STEP 7 configuration

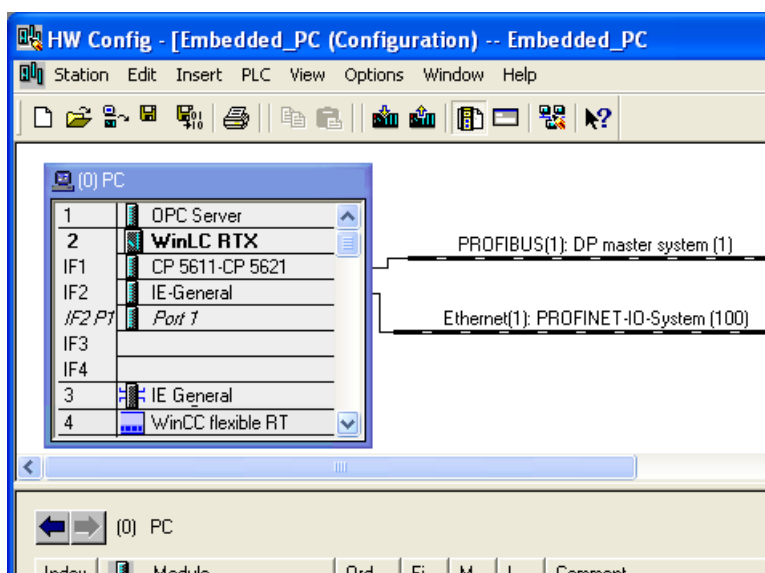


Figure 4-2 -HMI/RTX DP STEP 7 configuration

-RTX Configuration:

The figures below show the STEP 7 configuration for the -RTX with PROFIBUS DP and PROFINET communications processors:

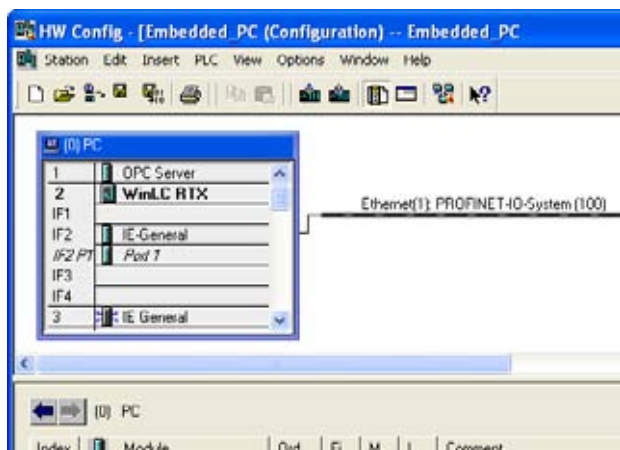


Figure 4-3 -RTX PN RT STEP 7 configuration

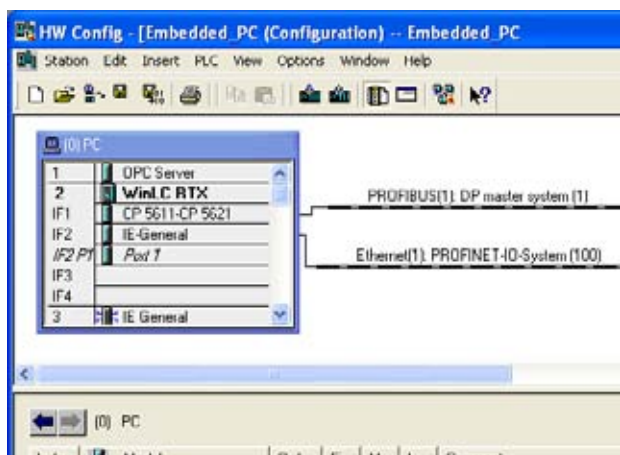


Figure 4-4 -RTX DP STEP 7 configuration

To change property settings for any object in the PC Station, right-click the object in the PC Station, and select the "Object Properties" menu command. STEP 7 displays a properties dialog in which you can make any necessary changes.

When you configure the Industrial Ethernet interface "IE General" in Index 3 in the PC Station, make sure that you use the IP address and subnet mask configured in the Windows Control Panel of the target SIMATIC IPC427C-RTX/ -RTX F/ -HMI/RTX or SIMATIC HMI IPC477C-RTX/ -RTX F/ -HMI/RTX product. The default IP address is 192.168.1.2 and the default subnet mask is 255.255.255.0. If you use a different IP address, subnet mask, or if you use a gateway, configure these values in both the Windows network configuration and in STEP 7. See the topic "Configuring the Windows Ethernet interface (Page 29)" for more information.

Creating programs for WinLC RTX (WinAC RTX)

In the SIMATIC Manager, you create the PLC programs for WinLC RTX in the same way that you create PLC programs for any other SIMATIC controller.

4.3 Configuring the Windows Ethernet interface

This topic applies only to the SIMATIC IPC427C-RTX/ -RTX F/ -HMI/RTX and SIMATIC HMI IPC477C-RTX/ -RTX F/ -HMI/RTX and is not applicable for the SIMATIC IPC427C-HMI and SIMATIC HMI IPC477C-HMI. The physical locations of the Ethernet connections of the SIMATIC IPC427C differ from those of the SIMATIC HMI IPC477C. Pre-configuration of the Ethernet connections, however, is identical for both SIMATIC Embedded Bundles.

Note

The Ethernet address and subnet mask of the Ethernet interface used with Windows will not be changed by a download of a STEP 7 project into the PC-Station.

To specify the Ethernet address for the interface used with Windows and SIMATIC communication, follow these steps:

1. Open the Windows control panel.
2. From the control panel, open: **Network Connections > Local Area Network**
3. Click the Properties button on the "Local Area Connection Status" dialog.
4. Scroll to and double-click the "Internet Protocol (TCP/IP)" connection from the list.
5. In the "Internet Protocol (TCP/IP) Properties" dialog, select the radio button for "Use the following IP address," and enter the required IP address and subnet mask (the default values are "192.168.1.2" for the "IP address" box and "255.255.255.0" for the "Subnet mask" box):

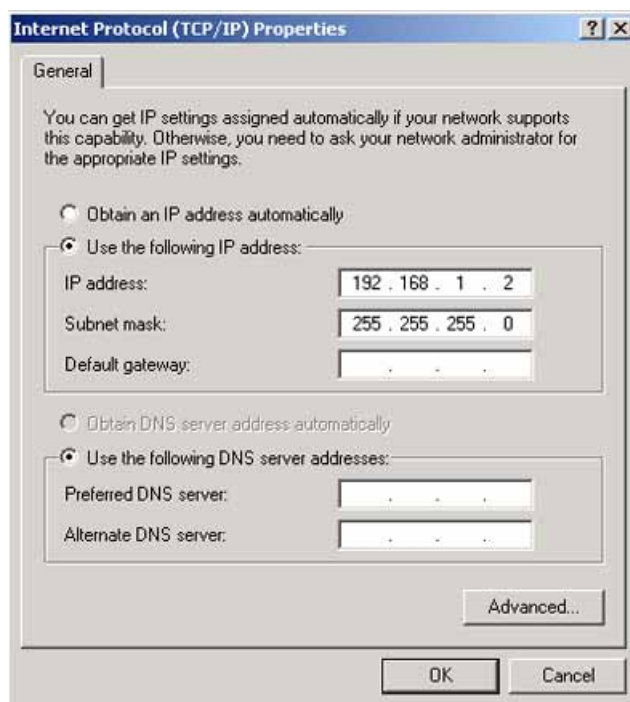


Figure 4-5 Ethernet Control Panel configuration

6. Click OK in the "Internet Protocol (TCP/IP) Properties" and "Local Area Connection Properties" dialog, and close the remaining dialogs.

Entering the selected IP address in your STEP 7 project

If you choose a different IP address, subnet mask, or gateway for the Ethernet interface, you must configure this IP address or other parameters for the SIMATIC Embedded Bundles and for the IE General properties in STEP 7. To configure the IP address in STEP 7, follow these steps:

1. Right-click IE General in PC Station index 3 in the hardware configuration of your STEP 7 project.
2. Select Object Properties from the context menu.
3. Click the Properties button from the "General" tab of the Properties - IE General dialog.
4. Enter the IP address from the "Parameters" tab of the "Properties - Ethernet interface IE General" dialog. You can also specify a subnet mask or gateway address from this dialog:

IE General properties in STEP 7

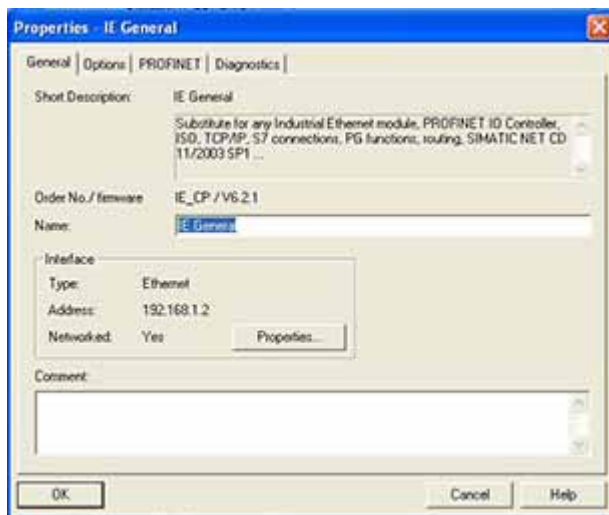


Figure 4-6 STEP 7 IP address: IE General properties in STEP 7

4.4 Configuring the WinCC flexible project

SIMATIC IPC427C-HMI/-HMI/RTX and SIMATIC HMI IPC477C-HMI/-HMI/RTX include WinCC flexible Runtime (RT), with the Recipe and Archive options. The license key for the other WinCC flexible RT options is also included.

You must configure your WinCC flexible project with the WinCC flexible ES (engineering station) software, and transfer this project from the engineering station computer to WinCC flexible RT on the SIMATIC Embedded Bundles. WinCC flexible ES is a separate product and does not ship with SIMATIC IPC427C-HMI/-HMI/RTX or SIMATIC HMI IPC477C-HMI/-HMI/RTX.

The runtime configuration file settings for the default administrator user ("Administrator") are pre-configured to D:\ locations. If you create a new Windows user on the SIMATIC Embedded Bundles, the new user will automatically receive the same runtime configuration file settings as the default administrator user ("Administrator"). You do not need to change the runtime settings for the "Administrator" default user or for a new Windows user. For WinCC flexible RT, a D:\ drive on the CompactFlash card with the Enhanced Write Filter (Page 35) (EWF) disabled is required.

Changing the WinCC flexible runtime settings

To change the runtime settings for a new Windows user follow these steps:

1. Log on to the PC with the new Windows user name and password.
2. Select the Start > Programs > Startup menu command to modify the RT Loader settings.
3. In the Directories group box, change the locations for "Configuration file" and "Configuration backup file" to D:\ drive locations, but do not modify the "Autostart application" location:

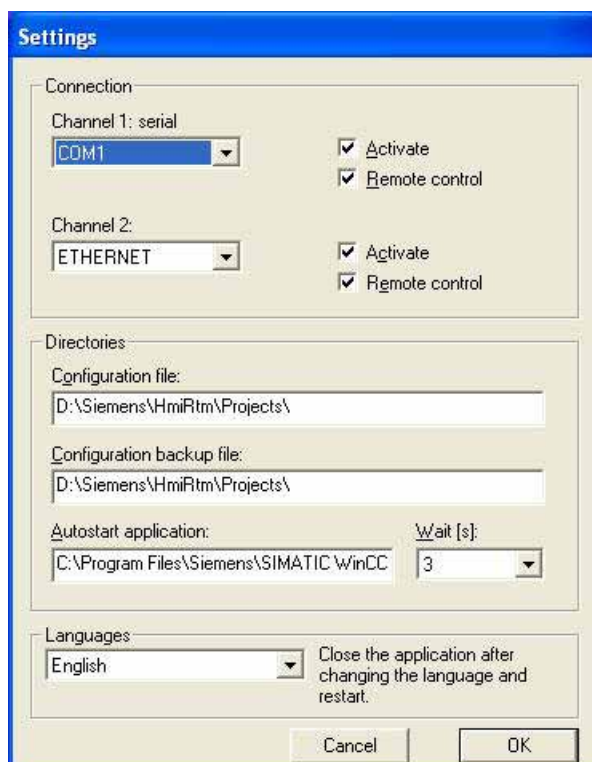


Figure 4-7 WinCC flexible RT Loader Settings

4.5 Downloading PC Station components

4. Click OK.

Your runtime settings are now configured to be retained after a reboot.

NOTICE
If you ever restore your SIMATIC IPC427C-HMI/-HMI/RTX or SIMATIC HMI IPC477C-HMI/-HMI/RTX from a custom system image DVD (Page 37) or from the restore DVD (Page 41) and subsequently create a new Windows user, you must again change the runtime settings to D:\ drive locations.

The default settings for recipes and archives also specify file locations on the C:\ drive. If you use these options, change these default settings to specify file locations on the D:\ drive as well. Refer to the WinCC flexible Engineering Station documentation for help with configuring recipes and archives.

4.5 Downloading PC Station components

Required conditions for program and configuration download

Check the following conditions before you download:

Download task	Required conditions
Complete the download of the PC Station	Make sure that the Enhanced Write filter is in the Disabled state.
Download PC station components	Make sure that you are logged in as an administrator.
Download PLC program of WinLC RTX only	With the standard configuration, you can download the PLC program at any time.
Download configuration data of WinLC RTX and the CP 5611 or CP 1616	With the standard configuration, you can download the configuration data of WinAC RTX at any time. If any of the configuration data affects configuration information of the entire PC Station (such as changing address and bus settings of the PROFIBUS interface associated with WinAC RTX), perform a complete download of the PC Station.
Download configuration data for the OPC Server or IE_General	The download is only possible if the Write filter is in the Disabled state.

Procedure

If you need to change and download the configuration of the PC Station (for example, if you want to add WinCC flexible to the configuration, or if you want to download the OPC-Server configuration), follow these steps:

1. Commit existing data to the flash card and disable the Enhanced Write Filter (EWF) by entering the following command from the command prompt:
ewfmgr c: -commitanddisable
2. Reboot your computer.
3. Click the Enable Station button in the Station Configuration Editor.
If the Station Configuration Editor displays a Disable Station button, then the Station is already enabled.
4. From STEP 7, download the PC Station or PC Station components for your project or add WinCC flexible RT to the configuration.
5. Re-enable the Enhanced Write Filter by entering the following command from the command prompt:
ewfmgr c: -enable
6. Reboot your computer.

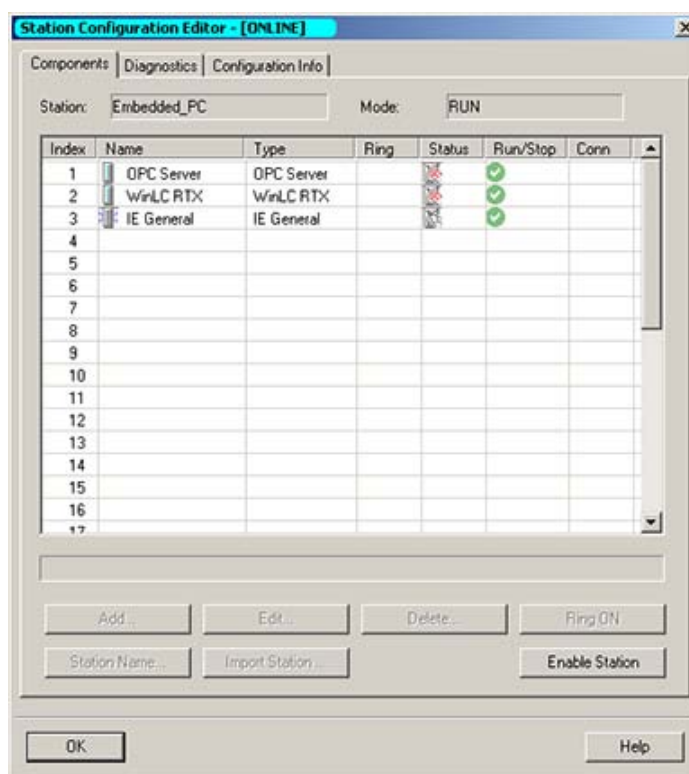


Figure 4-8 Downloading PC Station components

Note

You cannot load the WinCC flexible RT via PROFINET or PROFIBUS if the interfaces are submodules of WinAC RTX. In this case, you must load the WinCC flexible RT project via a second Ethernet interface or by USB transfer.

Finalizing your SIMATIC Embedded Bundle for operation

To finalize your SIMATIC IPC427C-RTX/ -HMI/RTX or SIMATIC HMI IPC477C-RTX/ -HMI/RTX for operation, the following steps are recommended:

- Set the Enhanced Write Filter to the "Enabled" state for the C:\ drive.
- Document any special settings (for example, changes to the IP address) for the SIMATIC Embedded Bundle that you made during your application development. Store them along with your STEP 7 or WinCC flexible project.

NOTICE
Leaving the Enhanced Write Filter in the default "Disabled" state may lead to an early failure of the CompactFlash card, due to ongoing write access of the operating system. See the topic "Managing the Enhanced Write Filter (Page 35)" for details.

4.6 Managing the Enhanced Write Filter

Definition

The Enhanced Write Filter (EWF) is a Windows Embedded utility for protecting a CompactFlash card. CompactFlash cards allow a limited number of write accesses. When the Enhanced Write Filter is enabled, Windows Embedded writes no data to the CompactFlash card. Instead, the file writes are kept in virtual memory.

Functionality

No difference is apparent to you when you view file contents. File information appears the same whether it actually resides on the CompactFlash card or in virtual memory. The difference in file storage is evident when you reboot the computer or it loses power. All data in virtual memory is lost, and the computer restarts with the file contents of the CompactFlash card.

You can manage the EWF to maintain data that must be retained after a reboot. If you disable the EWF, all file writes go to the CompactFlash card. This does result in the persistence of all data after a power loss; however, it causes the most stress over time to the CompactFlash card.

NOTICE

The Enhanced Write Filter default setting of the D:\ and C:\ drive on the SIMATIC Embedded Bundles is "Disabled". To protect the CompactFlash card from early failure due to continuous writes, enable the EWF for the C:\ drive after you have finished the development of applications on the C:\ drive.

You can also commit all data that is stored in virtual memory to the CompactFlash card at any point in time, using one of the following commands:

- **commit**: The "commit" EWF command writes all data that has accumulated in virtual memory at that moment in time to the CompactFlash card. The CompactFlash card is not disabled.
- **commitanddisable**: The "commitanddisable" EWF command disables the EWF and then writes all data that has accumulated in virtual memory to the CompactFlash card. Typically, this command is followed by an enable command to once again protect the CompactFlash card.

To use the Enhanced Write Filter manager, follow these steps:

1. Open a command prompt window.
2. Enter "ewfmgr" followed by a drive designation and a command as illustrated.
3. Reboot the computer for the command to take effect.

NOTICE

After you enter commands, you must reboot the computer for the ewfmgr commands to take effect.

The ewfmgr commands that are applicable are shown below, as applied to the C:\ drive:

Enable the EWF:

Command: ewfmgr c: -enable



Commit data to CompactFlash:

Command: ewfmgr c: -commit



Commit data to CompactFlash and disable the EWF:

Command: ewfmgr c: -commitanddisable



Note that the initial state of the Enhanced Write Filter is "disabled". Following a "commitanddisable" command, use the "enable" command to protect the CompactFlash card. All subsequent data writes will go to virtual memory.

Note

If the Enhanced Write Filter was shut down before downloading to WinLC RTX, you must click the "Enable/Disable Station" button in the Station Configuration Editor.

Replacing the CompactFlash card

In order to ensure a correct restart of WinLC RTX on a SIMATIC Embedded Bundle after replacing the CompactFlash card, perform one of the following steps:

- Disable the EWF for the CompactFlash drive before replacing the CompactFlash card and enable it after the first start of WinLC RTX.
- Store the WAF file (retentive data) on a drive on which the EWF is disabled.

Otherwise the next time you start WinAC RTX, it will start with an unbuffered startup.

File-Based Write Filter (FWBF)

You can use also an FBWF to protect a CompactFlash card. You can find further information about the FBWF in the internet ([http://msdn.microsoft.com/en-us/library/aa940926\(WinEmbedded.5\).aspx](http://msdn.microsoft.com/en-us/library/aa940926(WinEmbedded.5).aspx)).

4.7 Creating a system image

After you have configured the SIMATIC Embedded Bundle for your application, you can create an image of your system. You can use this image later to restore your custom application to your system, if necessary.

Create the system image (custom restore DVD) after you have performed any customization tasks required by your application, such as those listed below:

- Download of a STEP 7 user program and configuration of WinAC RTX (SIMATIC IPC427C-RTX/ -HMI/RTX or SIMATIC HMI IPC477C-RTX/ -HMI/RTX only)
- Transfer of a WinCC flexible project
- Configuration of WinAC Data Storage (SIMATIC IPC427C-RTX/ -HMI/RTX or SIMATIC HMI IPC477C-RTX/ -HMI/RTX only)
- Modification of the initial configuration from the Station Configuration Editor
- Installation of any custom software or data files

NOTICE

You cannot recover the pre-installed WinAC RTX license key on the SIMATIC Embedded Bundle from the custom restore DVD. Use the Automation License Manager to remove the WinAC RTX license key, as well as any other SIMATIC license keys, prior to making a custom restore DVD. Also note that if you plan to use the custom restore DVD for more than one installation, each SIMATIC license key is valid for one and only one computer.

Use the Image Creator to make your system image. The Image Creator is part of the tool "SIMATIC PC/PG Image and Partition Creator" available from Siemens. You can find ordering information for the Image Creator in the A&D Mall. (<http://mall.automation.siemens.com/>) Refer to the Image Creator instructions for additional help on making and restoring system images.

Example of making an -RTX restore DVD using a SIMATIC IPC427C Bundle

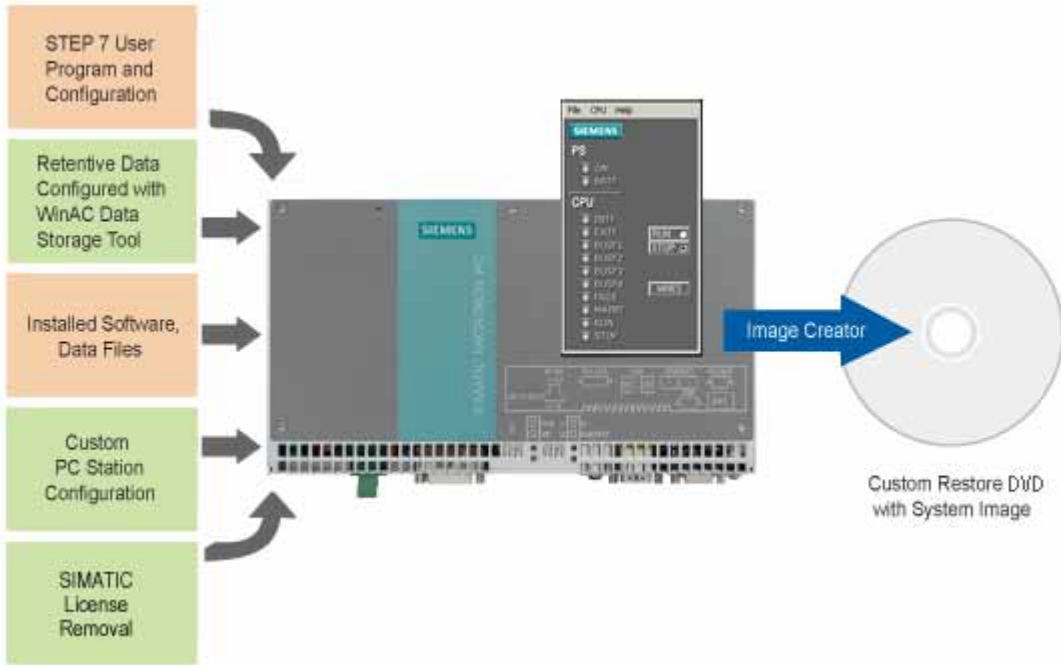


Figure 4-9 Example of making an -RTX restore DVD using a SIMATIC IPC427C Bundle

Example of making an -HMI/RTX restore DVD using a SIMATIC HMI IPC477C Bundle

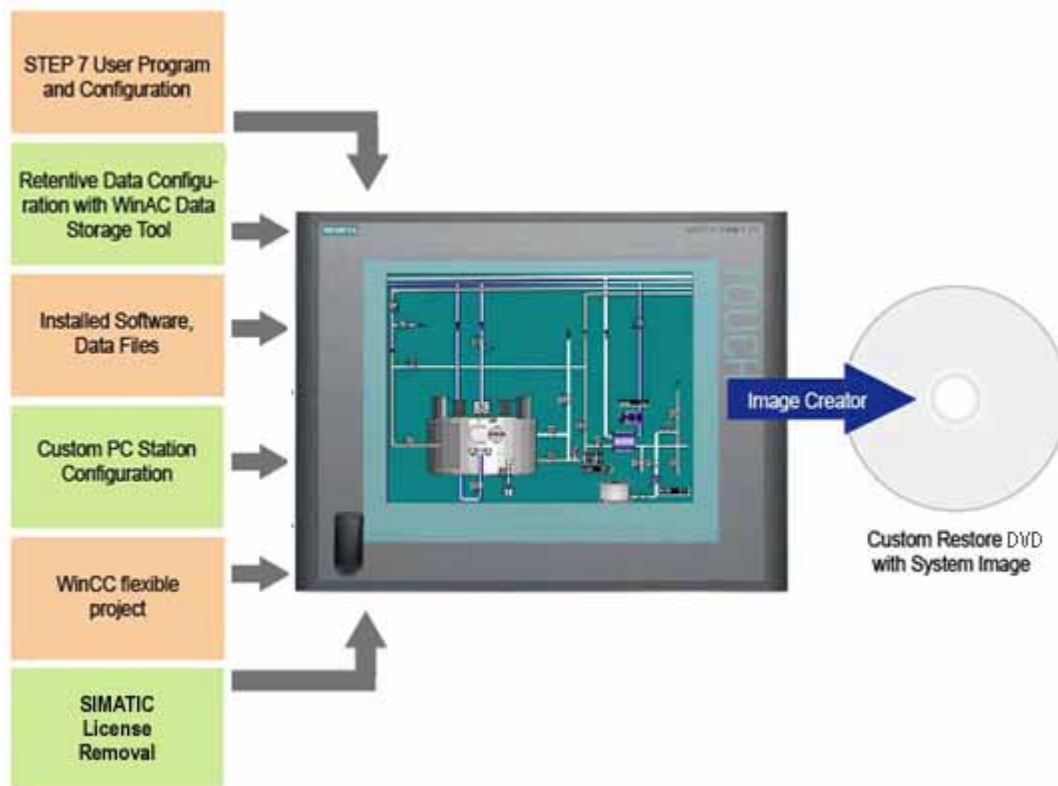


Figure 4-10 Example of making an -HMI/RTX restore DVD using a SIMATIC HMI IPC477C Bundle

This system image on a custom restore DVD is useful if you need to restore all of the files and registry settings for your application. You can also use the BIOS Manager tool to save BIOS settings if you changed them from the initial settings.

If your system hardware fails, you can then restore your application from this system image (custom restore DVD), and, if applicable, restore the BIOS settings that you saved.

Restoring and maintenance

5.1 Restoring the initial configuration

The SIMATIC Embedded Bundle product release includes a restore DVD without license key that you can use to restore your system to the initial configuration. You can also restore from a custom restore DVD that includes all of your files and registry settings, as described in the topic "Creating a system image (Page 37)".

CAUTION**Restore process with an internal and exchangeable mass storage**

When restoring a SIMATIC Embedded Bundle that includes internal and exchangeable mass storage. The operating system is automatically stored on the exchangeable mass storage medium. If you want to store it on the internal mass storage medium, you will need to remove the exchangeable mass storage first.

Effectiveness

Restoring from the restore DVD removes any applications or data files stored on the SIMATIC Embedded Bundle. A restore also erases license keys and reloads the registry with initial values. A restore also clears all WinAC RTX load memory and retentive data from the SIMATIC IPC427C-RTX/ -HMI/RTX or SIMATIC HMI IPC477C-RTX/ -HMI/RTX.

Restore process

To restore your initial configuration from the SIMATIC Embedded Bundle restore DVD, follow these steps:

1. Use the Automation License Manager to transfer the WinCC flexible license key or the WinAC RTX license key from your SIMATIC Embedded Bundle to a storage device, for example, a USB stick.
2. Connect a USB DVD-ROM drive to your SIMATIC Embedded Bundle, and insert the restore DVD.
3. Follow the instructions to restore from the restore DVD.
4. Transfer the license key(s) from the storage device to the SIMATIC Embedded Bundle.

After the restore process completes, your system consists of the initial configuration of the SIMATIC Embedded Bundle.

5.2 Repairs or replacement of parts

Send to repair

If you need to send your SIMATIC Embedded Bundle to a repair center, follow these steps beforehand:

1. Move your licenses to an external storage device, for example, a USB stick or diskette.
2. Create a backup of your CompactFlash card.
3. Save or make a note of your BIOS settings, if you changed them from the initial settings.

Receive from repair

When you receive your SIMATIC Embedded Bundle from the repair center, follow these steps to restore it:

1. Set the correct BIOS settings.
2. Restore your CompactFlash card from your backup.
3. Move the licenses from the external storage device back to the SIMATIC Embedded Bundle.

5.3 Notes

5.3.1 WinAC Data Storage when executing WinAC ODK programs

Protecting data during power loss

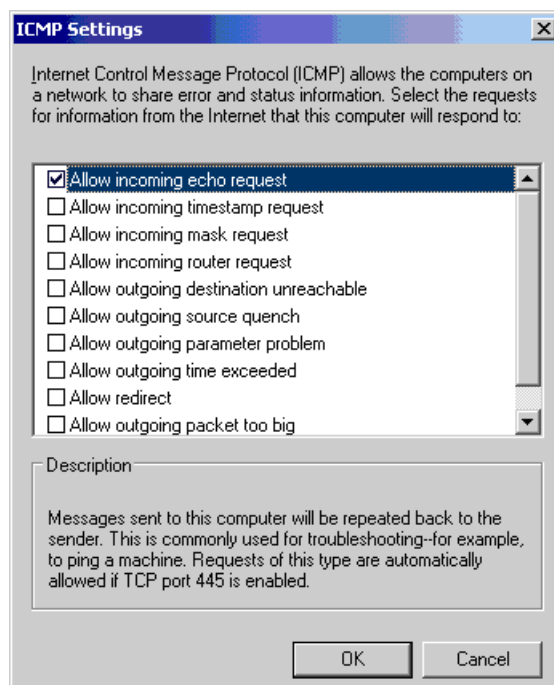
The WinAC Data Storage allows you to configure the integrated NVRAM of the SIMATIC Embedded Bundle for retentive data storage. WinAC ODK programs, however, can interfere with storing retentive data on NVRAM.

If you are executing a WinAC ODK program on a computer that has the "NVRAM Storage" choice available, choose "File Storage" from the WinAC Data Storage tool for the retentive data and use a UPS (Uninterruptible Power Supply). This action protects the data during a power loss.

5.3.2 OP/ S7 connections do not function

OP/ S7 connections from remote device

If OP/ S7 connections from remote devices do not function, check whether the "Allow incoming echo request" check box is selected in the ICMP Settings dialog. (**Windows Firewall > Advanced > ICMP Settings**)



5.3.3 Replacement of the CompactFlash card for the Embedded PC

Procedure

If you have configured the WinAC data storage on a SIMATIC Embedded Bundle, to be NVRAM, and you need to replace the CompactFlash card, follow these steps:

1. Replace the CompactFlash card in the SIMATIC Embedded Bundle.
2. Perform a memory reset (MRES) after you restart WinAC RTX.
3. Reload the STEP 7 user program and configuration.

5.3.4 Backup battery

Backup battery replacement

If you use the NVRAM of a SIMATIC Embedded Bundle for retentive data storage, change the backup battery at least every five years. If the system clock is slowing down, this indicates that the backup battery is failing.

Index

A

Automation License Manager, 37

C

Commitanddisable (EWF command), 35
Committing data to the CompactFlash card, 18, 19
CompactFlash card, 35
 protecting, 18, 19
 replacing, 36
 usage, 18, 19
Configuration
 pre-configured -HMI PN/DP, 19
 pre-configured -RTX DP, 21
 restoring, 41
 STEP 7 Project, 26
 storing retentive data, 18
 WinAC Data Storage, 18
 Windows Ethernet interface, 29
Contact information, 5
Creating a system image, 37
Custom restore DVD, 37
Customer service, 5

D

Data storage, 18
Definitions, 5
Documentation, 5
Downloading PC Station components, 33
DVD-ROM drive, 18, 19

E

Enable (EWF command), 35
Enhanced Write Filter, 35
Ethernet configuration, 29
EWF, 35
Ewfmgr commands, 35

F

File storage, retentive data, 18

G

Gateway, 30

H

Hardware configuration, 27
-HMI PN/DP, 19

I

Image Creator, 37
Initial startup
 CompactFlash card, 14
 First boot, 14
 Overview, 13
 Touch Screen calibration, 15
Installation
 installed configuration of -HMI PN/DP, 19
 installed configuration of -RTX DP, 21
Internet Web sites (Siemens), 5
IP addresses, 28

L

Licensing, 23
Local area network, 29

M

Manuals, 5

N

Network connections, 29
NVRAM, 18

P

PC Station components
 downloading, 33
PROFINET
 hardware, 10, 11
Properties, Ethernet interface, 30

R

- Recalibrating Touch Screen, 17
- Recover license key, 37
- Required background, 5
- Restore DVD, 37
- Restoring initial configuration, 41
- Retentive data
 - configuring storage, 18
- Router, 30
 - RTX DP, 21

S

- Siemens contact information, 5
- SIMATIC Embedded PC software configurations, 12
- SIMATIC HMI IPC477C
 - Hardware, 10
 - Monitor sizes, 11
- SIMATIC IPC427C Hardware, 9
- SIMATIC PC/PG Image and Partition Creator, 37
- STEP 7 Project configuration, 26
- Storing retentive data, configuring, 18
- Subnet mask, 28
- Support, 5
- System image, creating, 37

T

- Target group, 5
- TCP/IP properties, 29
- Technical support, 5

U

- USB devices, 18, 19

W

- Web sites (Siemens), 5
- WinAC Data Storage, 18
- WinAC RTX, 21
- WinCC flexible Runtime (RT), 19, 31
- Windows Ethernet interface, 29