SIEMENS

SIMATIC

Process Control System PCS 7 PCS 7 BOX

Manual

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Danger
indicates that death, severe personal injury or substantial property damage will result if proper precautions are not taken.

Warning
indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.

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

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Note the following:

Warning
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Disclaimer of Liability

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

Siemens Aktiengesellschaft A5E00272813-01

Preface

Purpose of the SIMATIC PCS 7 BOX Manual

This manual provides information about the components, areas of application, design possibilities and commissioning of SIMATIC PCS 7 BOX.

The following basic question are addressed:

- What is SIMATIC PCS 7 BOX?
- What components does SIMATIC PCS 7 BOX contain?
- What software is pre-installed on a SIMATIC PCS 7 BOX station?
- What are the areas of application for SIMATIC PCS 7 BOX?
- How is SIMATIC PCS 7 BOX used?
- What configuration variants can be implemented with SIMATIC PCS 7 BOX?
- How is SIMATIC PCS 7 BOX commissioned and configured?
- How are projects configured with SIMATIC PCS 7 BOX?

The electronic form of the "SIMATIC PCS 7 BOX" manual is located on the CD "Process Control System PCS 7 - Electronic Manuals". You can read and print it using the Acrobat Reader.

The "SIMATIC PCS 7 BOX" electronic manual can be called up with the Windows command **Start > SIMATIC > Documentation > English > SIMATIC PCS 7 BOX**.

The online help can be called up with the Windows command **Start > SIMATIC > Documentation > English > PCS 7 - Basic Documentation > Configuration - SIMATIC PCS 7 BOX** or with the SIMATIC Manager menu command **Help > Help Topics > Configuration - SIMATIC PCS 7 BOX**.

Required Knowledge

This manual is intended for personnel involved in the fields of configuration, commissioning, and service.

The manual requires the reader to have basic knowledge about the PC/programming device and Windows 2000. You should also be familiar with the functions and configurations of SIMATIC S7 (S7-400, STEP 7), SIMATIC NET and SIMATIC PCS 7.

Scope of Validity

This SIMATIC PCS 7 BOX manual applies to the software package, SIMATIC PCS 7 V6.0 SP3.

Further Support

If you have any technical questions, please get in touch with your Siemens representative or agent responsible.

You will find your contact person at:

http://www.siemens.com/automation/partner

You will find a guide to the technical documentation offered for the individual SIMATIC Products and Systems here at:

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

Training Centers

Siemens offers a number of training courses to familiarize you with the Process Control System PCS 7 and SIMATIC S7 automation system. Please contact your regional training center or our central training center in D 90327 Nuremberg, Germany for details:

Telephone: +49 (911) 895-3200.

Internet: http://www.sitrain.com

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The languages of the SIMATIC Hotlines and the authorization hotline are generally German and English.		

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- The newsletter, which constantly provides you with up-to-date information on your products.
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Information on field service, repairs, spare parts and more under "Services".

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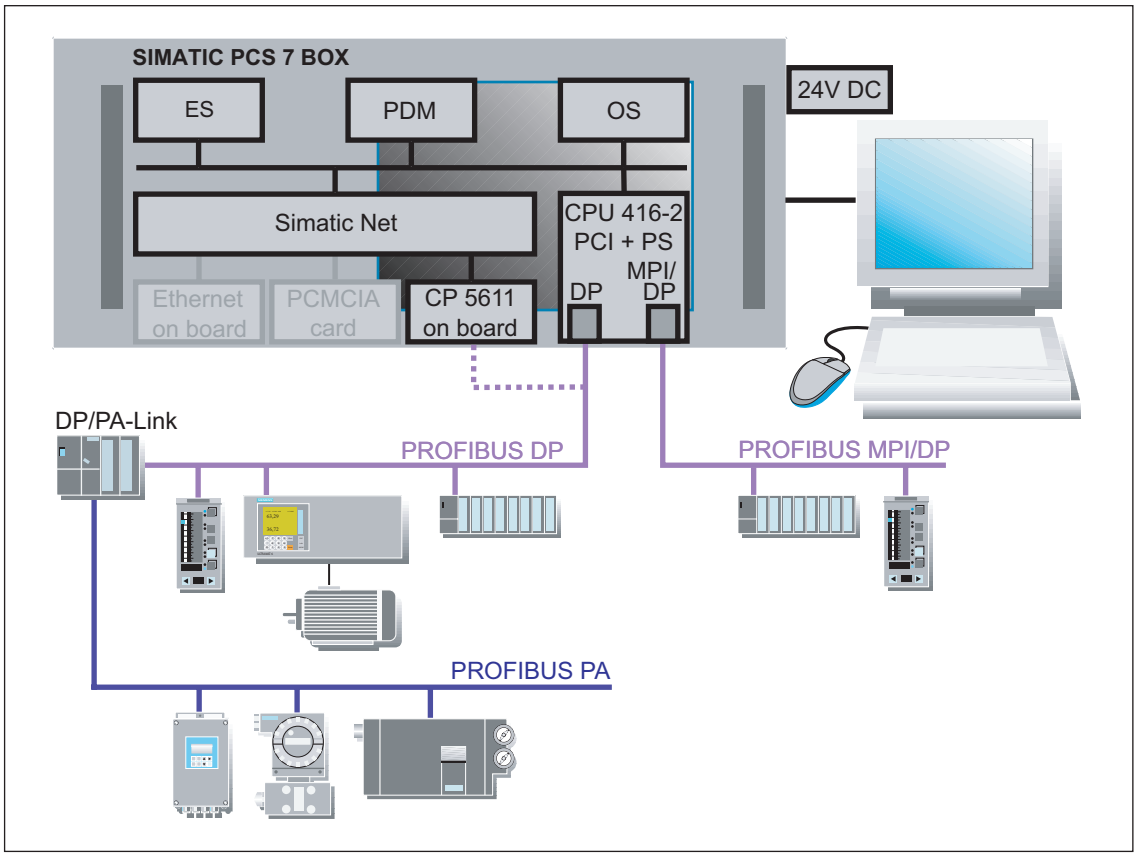
1 What is SIMATIC PCS 7 BOX?

SIMATIC PCS 7 BOX is a complete process control system consisting of an engineering station (ES), operator station (OS) and automation system (AS). SIMATIC PCS 7 BOX enables connection to distributed I/O via the integrated AS in the form of a "CPU 416-2 PCI" PC card. SIMATIC PCS 7 BOX enables you to economically construct an autonomous process control system with all of the necessary components and standard software SIMATIC PCS 7 V6.0 SP3.

SIMATIC PCS 7 BOX was especially designed for small-scale plants and stand-alone stations (package units) that can be used for agitators, mixers or water treatment stations. SIMATIC PCS 7 BOX is also very attractive as a beginning system for first-time users of SIMATIC PCS 7. You can also use SIMATIC PCS 7 BOX with an external engineering station or integrate it into an existing PCS 7 process control system. In the following illustration, SIMATIC PCS 7 BOX is shown as a single station variant.



Note

This documentation contains important information about commissioning and configuration of SIMATIC PCS 7 BOX.
The configuration of the automation and visualization conforms to the standards of SIMATIC PCS 7. Please use the following manuals for configuration within the SIMATIC PCS 7 V6.0 SP3 software:

- PCS 7 Configuration Manual; Engineering System
- PCS 7 Configuration Manual; Operator station

2 Concept and Areas of Application

2.1 SIMATIC PCS 7 BOX Concept

In regard to price and design, SIMATIC PCS 7 BOX represents a convenient, complete process control system that can be put into operation quickly and easily. SIMATIC PCS 7 BOX offers an economic and comprehensive entry-level hardware solution for process automation, especially for engineering offices configured with SIMATIC PCS 7. As a package unit, SIMATIC PCS 7 BOX can be installed directly at the location of the automation process since it has been designed for environmental operating conditions.

2.2 Areas of Application for SIMATIC PCS 7 BOX

SIMATIC PCS 7 BOX is suitable for the following areas of application:

- Autonomous small plants
- Subprocess units (package units) with integrated HMI units
- Testing, educational and training systems
- Research facilities

You can take advantage of a modern process control system by fully integrating the software into SIMATIC PCS 7. Above all, this applies to the following:

- External installation of the SIMATIC PCS 7 BOX engineering station
- Establishing AS-AS communication using SIMATIC PCS 7 BOX in a PCS 7 network

3 Structure of SIMATIC PCS 7 BOX

3.1 Hardware Components of SIMATIC PCS 7 BOX

SIMATIC PCS 7 BOX is supplied with the following standard hardware.

Technical Specifications of the Box PC 620

Device/Component	Model
Processor	Intel Pentium III; 1.26 GHz, 133 MHz FSB, 512KB SLC; PROFIBUS/MPI; TTY
Main memory	1GB SDRAM-133 (including graphic memory)
Hard disk	80 GB HDD EIDE Partitions: C:\ 10 GB PCS 7 partition NTFS; D:\ 70 GB user partition NTFS
DVD-ROM/CD-R/RW	8/8/24 speed combo drive
Graphics	8MB AGP; 1280 x 1024 at 85 Hz
Ethernet	100 Mbps Fast Ethernet; RJ45 on board
PROFIBUS	CP 5611 compatible on board
Automation system (AS) and PS extension board	Installed as PCI card, SIMATIC S7 CPU 416-2 PCI with firmware version 3.4 DC 5 V for power supply for CPU 416-2 PCI DC 12 V for power supply for PC fan
Serial port	RS232; 9-pin; COM2
Standard ports for	Mouse, keyboard and printer
Floppy drive	3,5 " 1.44 MB
External power supply unit	24 volt DC industrial power supply 85 W

Accessories

- PROFIBUS connector to CPU 416-2 for two DP cables
- Power supply cable for PS extension board and internal PC power unit
- Batteries
- MONITOR
- German or international keyboard
- Recovery CD
- Windows 2000 Professional, Service Pack 4 Multi-language (MUI)

Optional Components

- Ethernet interface CP1512 as PCMCIA plug-in card
- DP cable for connecting to distributed I/O

3.2 Software Components of SIMATIC PCS 7 BOX

Preinstalled Software Components of SIMATIC PCS 7 BOX

- Windows 2000 Professional with Service Pack 4 Multi-language
- Software components of SIMATIC PCS 7 - PCS 7 Toolset CD
  - PCS 7 Single Station consisting of all PCS 7 software components
  - SIMATIC Process Device Manager (PDM)
- Software "WinAC 3.4 for SIMATIC S7 CPU 416-2 PCI"

Authorizations Required for SIMATIC PCS 7 BOX

Authorizations are based on the configuration used and number of process objects (PO). You activate the preinstalled SIMATIC PCS 7 V6.0 SP3 software with the corresponding authorization diskette.

- Configuration variants: SIMATIC PCS 7 BOX as AS/ES/OS station, single station system

Software components	**Small-scale authorization Number of PO/Tags**	**Large-scale authorization Number of PO/Tags**
ES (Engineering Station)	250	2000
OS (Operator Station, WinCC)	250	2000

- Configuration variants: SIMATIC PCS 7 BOX as AS/OS station with external ES and in a PCS 7 network

Software components	**Small-scale authorization Number of PO/Tags**	**Large-scale authorization Number of PO/Tags**
OS (Operator Station, WinCC)	250	2000

- Process Device Manager

  The pre-installed PDM software on the SIMATIC PCS 7 BOX station is activated by an authorization that must be purchased separately.

Note about Authorizations

An authorization of SIMATIC PCS 7 provides the right to use products. This right takes the form of a:

- CoL (Certificate of License) – a legal proof of the ownership of a copyrighted SIMATIC PCS 7 software product
- Authorization code (license key) – technical form of the authorization installed on the PC

Accessories

- Restore CD Windows 2000 SP4 Multi-language (MUI)
- Internet Explorer 6.0 + SP1
- MS SQL Server 2000 + SP3
- SIMATIC PCS 7 product CDs and the corresponding authorization diskette for activating SIMATIC PCS 7 software

3.3 Compatibility to SIMATIC PCS 7

Functional Compatibility to SIMATIC PCS 7

- CPU 416-2 PCI can communicate with another AS 41x via communication blocks (interconnected in CFC) and physically via the Industrial Ethernet interface integrated in Box PC 620.
- CPU 416-2 PCI can communicate with an OS server via the on-board Industrial Ethernet interface in Box PC 620.
- The "Compile and Download Objects" function in SIMATIC Manager can be used for the configured CPU 416-2 PCI.
- The time synchronization of the CPU 416-2 PCI can be configured similar to the S7-41x CPUs in HW Config.
  The time synchronization between the OS and CPU within the Box PCs can be established in the WinAC time synchronization dialog via a central clock (clock master) on the plant bus (Industrial Ethernet) or via the local PC clock of the Box PCs.

Special Features as Compared to SIMATIC PCS 7

- CPU 416-2 PCI is listed in the catalog V6.0 SP3 in HW Config under SIMATIC PC Station\CPU 416- 2 PCI.
- Remote Engineering via Industrial Ethernet – The SIMATIC PCS 7 BOX CPU can be loaded and diagnosed from a PCS 7 engineering station connected to the on-board Ethernet interface in the Box PC.

Restrictions Compared to SIMATIC PCS 7

- The "Download Changes to the OS Online" function cannot be performed with the "SIMATIC PCS 7 BOX as single station system" configuration variant. The function can be used with the configuration variants "SIMATIC PCS 7 BOX with external engineering" and "SIMATIC PCS 7 BOX in PCS 7 network".
- The "Configure in Run" (CiR) feature is not possible.
- It is not possible to load the PC station in run mode.

3.4 Configuration Variants for SIMATIC PCS 7 BOX

3.4.1 Configuration Possibilities

The following three configuration variants are recommended for the Box PC 620:

- SIMATIC PCS 7 BOX as single station system (single station variant) with AS/ES/OS
- SIMATIC PCS 7 BOX as AS/OS with an external ES
- SIMATIC PCS 7 BOX as AS/OS in a PCS 7 network

Note

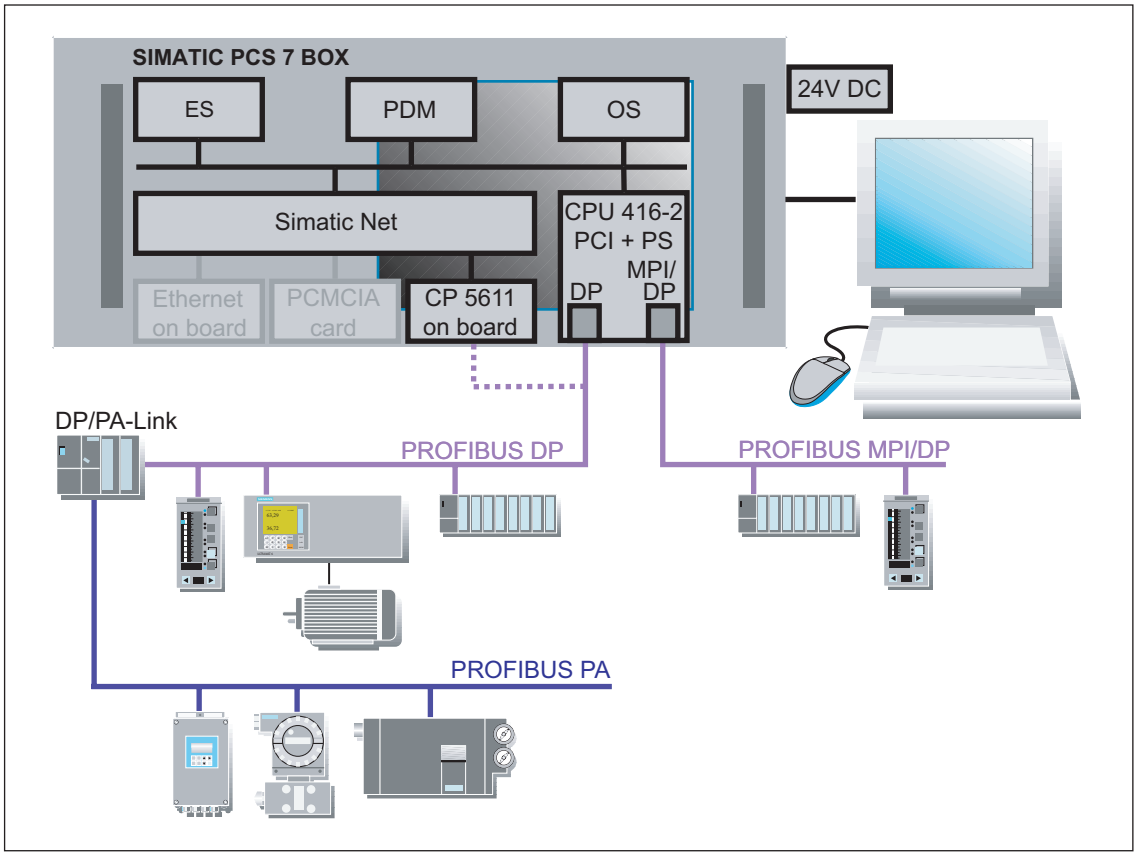
In all three configuration variants, the OS with WinCC should be regarded as a single station OS and not a client/server system.

Additional Information

- SIMATIC PCS 7 BOX as Single Station System
- SIMATIC PCS 7 BOX with External Engineering Station
- SIMATIC PCS 7 BOX in a PCS 7 network

3.4.2 SIMATIC PCS 7 BOX as Single Station System

The Box PC 620 serves as a combination PCS 7 engineering station and runtime operator station. The automation function operates on the CPU 416-2 PCI integrated in the Box PC 620 as a PCI card. The process I/Os are connected via the integrated PROFIBUS DP interface of the CPU 416-2 PCI. Intelligent field devices are configured via the on-board CP 5611 standard interface of the Box PC 620.



You can activate the complete preinstalled PCS 7 software (Engineering and Runtime) and the PDM (Process Device Manager) with the corresponding authorization for this configuration.

Note

The authorization for the PDM must be ordered separately.

Mode of Operation

The station (Box PC 620 with integrated AS in the form of a CPU 416-2 PCI) is not networked from the viewpoint of the PCS 7 project. You create and edit your PCS 7 project on this station and download the PCS 7 project from the ES to the OS and CPU 416-2 PCI. The program created with SIMATIC PCS 7 operates in runtime on the OS/WinCC and CPU 416-2 PCI.

You can use the Process Device Manager to access the PROFIBUS line and its stations/devices via the special on-board CP5611 interface. In the SIMATIC Manager, you can access the integrated CPU 416-2 PCI via the PCI interface just like in standard SIMATIC PCS 7.

Note

For more information, read the note in the Chapter "Special Features about the CPU 416-2 PCI Interfaces".

Changes can be made in runtime as usual with PCS 7.

There are no restrictions for the PCS 7 programs that can be created.

Restrictions

The following functions are not possible with the SIMATIC PCS 7 BOX as a single station system:

- The time synchronization between the OS/WinCC and CPU 416-2 PCI can only be implemented in this configuration variant using the WinAC time synchronization from the PC clock since no external clock can be connected.
- The PROFIBUS DP/MPI interface of the CPU 416-2 PCI is fully functional but the capacity of the PROFIBUS DP/MPI interface is limited. It is recommended to only connected I/O stations that do not require PDM operation to this interface.
- Plant changes during ongoing operation using CiR (Configuration in Run) cannot be performed.
- Configuration changes to the OS cannot be downloaded online.

Special Features of the CPU 416-2 PCI DP Interface

The PROFIBUS DP interface of the CPU 416-2 PCI is fully functional and the capacity of the PROFIBUS DP interface is unrestricted. It is recommended to connected devices that can be controlled by the PDM only to this interface. You can connect all I/O station types certified for use in SIMATIC PCS 7.

To be able to access and configure distributed I/O devices via the PDM, a communication connection must be established between the on-board CP 5611 interface and the PROFIBUS DP line.

Note

The access points in the "S7ONLINE (STEP 7)" in the "Set PG/PC Interface" dialog must be set for the ES/STEP 7 or PDM. For ES/Step7, the access point must be set to "PC-internal (local)" – this addresses the PCI interface of the CPU 416-2 PCI. For PDM, the access point must be set to "CP5611 (MPI)".

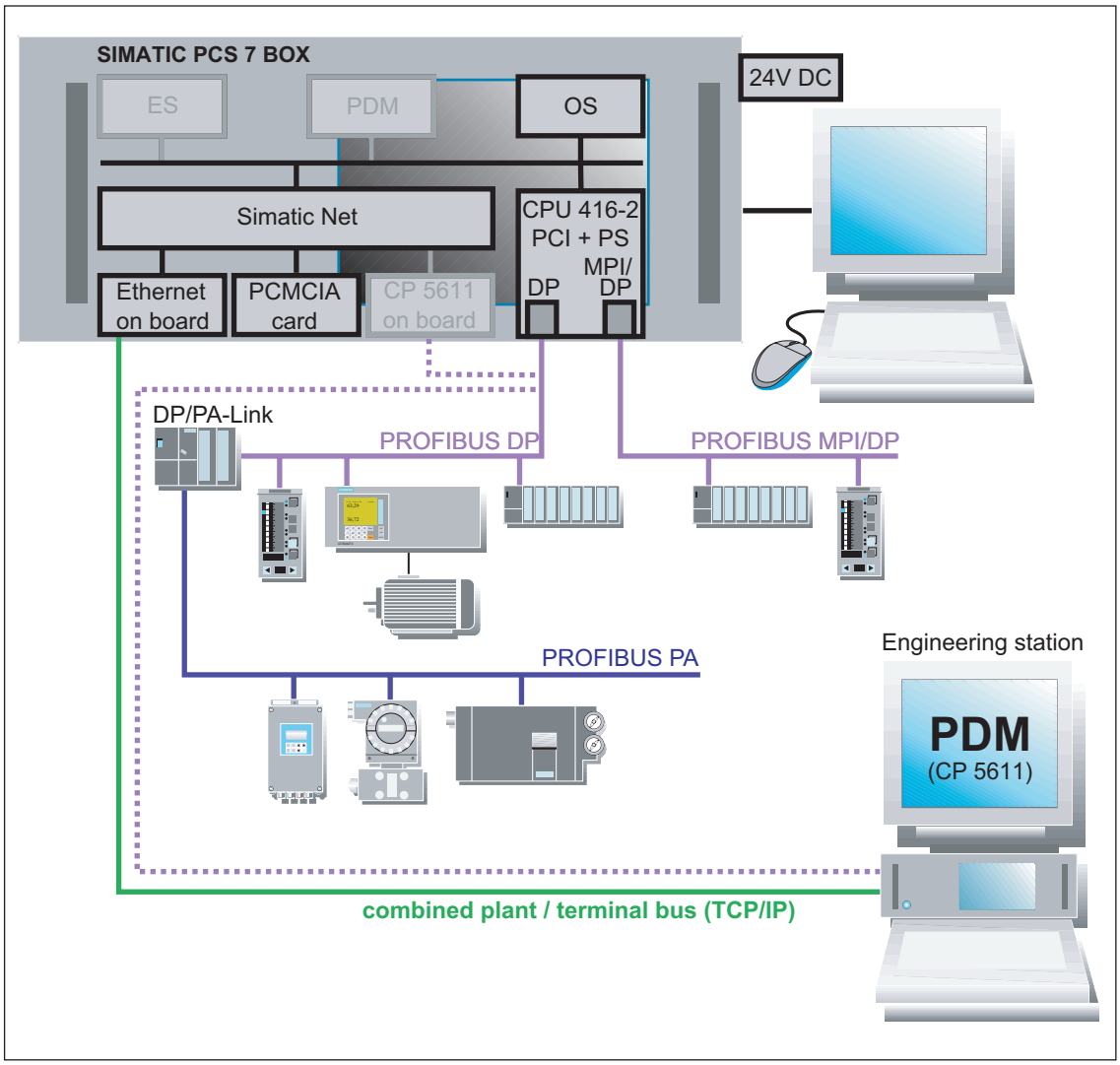
If the ES/Step7 tries to access the CPU when the access point is set to CP5611, it attempts to establish the communication via the DP line – and this is not allowed. The access points can only be changed when no communication is taking place over the respective interface.

Additional Information

Connection to PROFIBUS

3.4.3 SIMATIC PCS 7 BOX with External Engineering Station

In this configuration variant, the Box PC 620 is used with runtime components consisting of the AS/OS single station system and without an engineering authorization. The engineering for the SIMATIC PCS 7 BOX station is performed on an engineering station outside the Box PC 620. The engineering data must be downloaded to the CPU 416-2 PCI integrated in the Box PC 620 and the visualization data must be downloaded to the OS (WinCC) integrated in the Box PC 620.



Mode of Operation

You can activate the complete preinstalled PCS 7 software (Runtime) and the PDM (Process Device Manager) with the corresponding authorization for this configuration.

Note

The authorization for the PDM must be ordered separately.

The connection of the PDM (through the external ES or on the SIMATIC PCS 7 BOX station) determines whether or not the PDM can be activated on the SIMATIC PCS 7 BOX station with the authorization.

The external ES must be networked with the SIMATIC PCS 7 BOX station (Box PC 620). An Ethernet network card is therefore required in the external ES. The on-board Ethernet card is used in the Box PC 620. This connection is used to:

- Download the OS data to the OS within the SIMATIC PCS 7 BOX station
- Download the S7 program to the CPU 416-2 PCI within the SIMATIC PCS 7 BOX station

In this configuration variant, you can use the function "Download changes to OS online".

Restrictions

The following functions are not possible with the SIMATIC PCS 7 BOX with External Engineering Station:

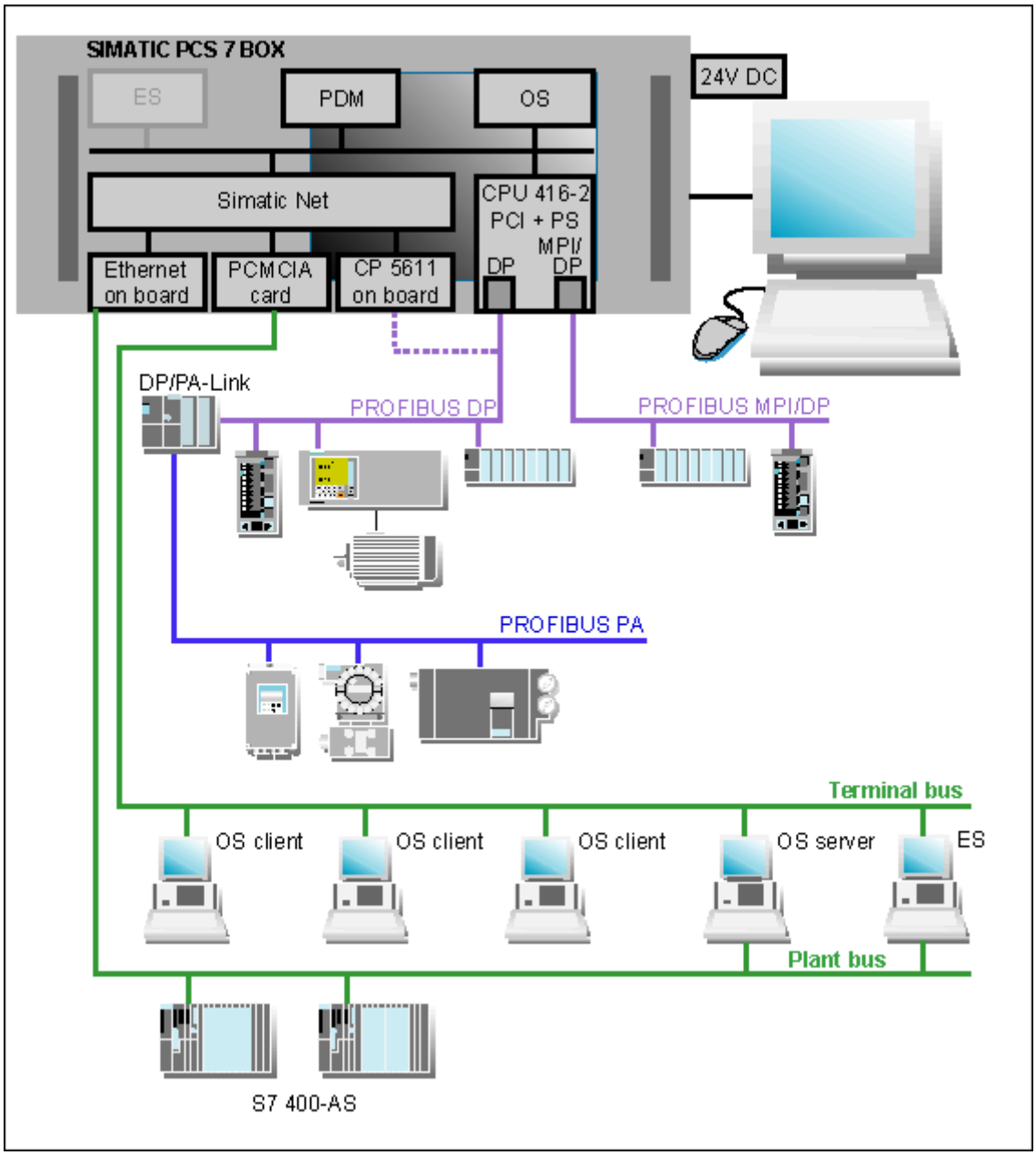
- The time synchronization between the OS/WinCC and CPU 416-2 PCI can only be implemented in this configuration variant using the WinAC time synchronization from the PC clock since no external clock can be connected.
- The PROFIBUS DP/MPI interface of the CPU 416-2 PCI is fully functional but the capacity of the PROFIBUS DP/MPI interface is limited. It is recommended to only connected I/O stations that do not require PDM operation to this interface.
- Plant changes during ongoing operation using CiR (Configuration in Run) cannot be performed.

Special Features of the CPU 416-2 PCI Interfaces

The special features of the CPU 416-2 PCI interface are the same as those in the "SIMATIC PCS 7 BOX as single station system" variant.

3.4.4 SIMATIC PCS 7 BOX in a PCS 7 network

In this configuration variant, the SIMATIC PCS 7 BOX station is integrated in a PCS 7 network and functions as an AS/OS client station. In contrast to the "SIMATIC PCS 7 BOX with external engineering" variant, two network connections are needed from the SIMATIC PCS 7 BOX station to the terminal and plant bus. In this variant, you can perform the time synchronization of the CPU 416-2 PCI using a time master integrated in the plant bus.



The authorization for the preinstalled PCS 7 software corresponds to the authorization you have obtained for the configuration variant "SIMATIC PCS 7 BOX with external engineering station". You can activate the complete preinstalled PCS 7 software (Runtime) and the PDM (Process Device Manager) with this authorization.

Note

The authorization for the PDM must be ordered separately.

The connection of the PDM (through the ES in a PCS 7 network of the PDM or on the SIMATIC PCS 7 BOX station) determines whether or not the PDM can be activated on the SIMATIC PCS 7 BOX station or the ES in a PCS 7 network of the PDM with the authorization.

Mode of Operation

The on-board Ethernet interface of the Box PC 620 is connected to the plant bus of the PCS 7 network. This connection (ISO protocol) is used to download the S7 program from a central ES in a PCS 7 network to the CPU 416-2 PCI of the SIMATIC PCS 7 BOX station.

The optional CP 1512 interface in the form of a PC card (PCMCIA) within the SIMATIC PCS 7 BOX station is connected to the terminal bus. This connection (TCP/IP protocol) is used to download the OS from a central ES in a PCS 7 network.

These two connections can be used to create and edit programs for the external ES in a PCS 7 network.

Restrictions

The following restrictions apply to the configuration variant " SIMATIC PCS 7 BOX in a PCS 7 network":

- The communication between the OS in the SIMATIC PCS 7 BOX station to an OS server in a PCS 7 network is currently not planned.
- The operation with @PCS7 is currently not planned.
- Plant changes during ongoing operation using CiR (Configuration in Run) cannot be performed.

Special Features

- The SIMATIC PCS 7 BOX also represents a stand-alone, self-contained unit in this configuration variant.
- Time synchronization can be implemented via a central time master connected to the plant bus or via the local PC clock.
- The communication between an AS in a PCS 7 network and the CPU 416-2 PCI within the SIMATIC PCS 7 BOX station can be performed with the software WinAC 3.4 for SIMATIC S7 CPU 416-2 PCI.

Note

Since the AS-AS communication with the integrated CPU 416-2 PCI takes places over the on-board Ethernet interface of the Box PC 620, this communication should be kept to a minimum to avoid overloading the processor in the Box PC 620 and potential connection failure scenarios.

If the Box PC is switched off or unstable, the CPU 416-2 PCI cannot be access via this connection.

3.5 Connection Options for SIMATIC PCS 7 BOX

3.5.1 Connecting to PROFIBUS

The DP and MPI/DP interfaces of the CPU 416-2 PCI integrated in the Box PC 620 can be used to connect distributed I/O. The PROFIBUS DP interface is preferable.

Note

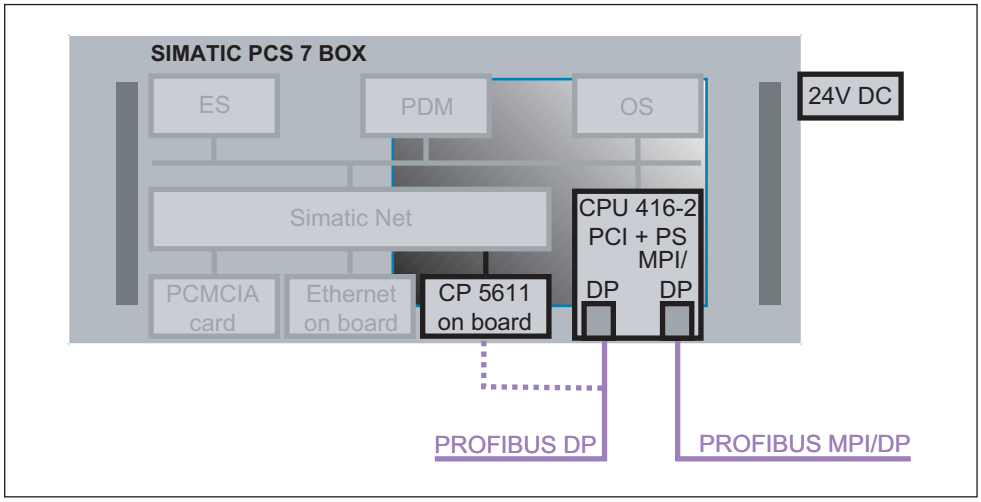
The on-board CP 5611 interface cannot be used to connect distributed I/O because it can only be used for PDM access and cannot be operated as DP master.

PROFIBUS PA

Intelligent field devices are connected to the PROFIBUS PA. DP/PA Link with a DP/PA coupler is used for the connection of the PROFIBUS PA to a PROFIBUS DP.

Configuration of Intelligent Field Devices via SIMATIC PDM

You can configure intelligent field devices from the SIMATIC PCS 7 BOX station using the Process Device Manager (PDM). The integrated PROFIBUS DP connection of the CPU 416-2 PCI must be connected to the "on-board CP 5611" to be able to configure intelligent field devices.



Note

Special cables are available for the Box PC 620. Please refer to the catalog for more information.

3.5.2 Network Connection to Ethernet

The network connection to the plant and terminal bus differs depending on the configuration variant employed.

Configuration variants	Network connection
SIMATIC PCS 7 BOX as single station system	None
SIMATIC PCS 7 BOX with external engineering station	Combined plant/terminal bus via Ethernet port on board
SIMATIC PCS 7 BOX in a PCS 7 network	• Plant bus via Ethernet port on board • Terminal bus via CP 1512 PCMCIA plug-in card

Communication specifications

Interfaces	Ethernet on board	CP 1512 PCMCIA card
Protocol	ISO	TCP/IP
Time synchronization possible	Yes	Yes
Number of connections via WinAC CPU 416-2 PCI	64	64
Configured communication (AS-AS) via WinAC CPU 416-2 with PG/OS	Yes	Yes

3.5.3 PS Extension Board

The PS extension board (PS=Power Supply) is used to supply power to the CPU 416-2 PCI independent from the PC power unit. This enables the CPU 416-2 PCI to be operated even when the Box PC 620 is switched off. The PS extension board is a standard component in SIMATIC PCS 7 BOX. Connecting a backup battery to the PS extension board enables several startup variants for the CPU 416-2 PCI (restart, warm restart and complete restart). The ventilator of the Box PC 620 is operated with voltage from the PS extension board.

The PS extension board provides the following voltage:

- DC 5 V for power supply for CPU 416-2 PCI
- DC 12 V for power supply for PC fan

Additional Information

Manual *WinAC Controlling CPU 416-2 PCI*

Manual *WinAC Slot 412/WinAC Slot 416 Version 3.4*

3.6 The Operator Panel of the CPU 416-2 PCI

3.6.1 The Operator Panel of the CPU 416-2 PCI

The operator and display elements of the CPU 412-2 PCI are symbolically represented as an operator panel on the PC display.

Additional Information

Opening the Operator Panel of the CPU 416-2 PCI

Manual *WinAC Controlling CPU 416-2 PCI*

Manual *WinAC Slot 412/WinAC Slot 416 Version 3.4*

4 Commissioning and Configuration

4.1 Overview of Commissioning and Configuration

The commissioning for SIMATIC PCS 7 BOX based on the Box PC 620 includes the following tasks:

	Commissioning/Configuration Steps
1	Configuring the PC station using the Commissioning Wizard
2	Configuring the PC using the Component Configurator
3	Creating a new PCS 7 project
4	Configuring a PCS 7 project and renaming the SIMATIC PC station
5	Setting the hardware configuration of PC stations
6	Configuring NetPro for using PDM
7	Setting time synchronization
8	Checking if the PG/PC interface is set to "PC internal"
9	Opening the operator panel of the CPU 416-2 PCI
10	Compiling and downloading the AS and OS data
11	Setting the CPU 416-2 PCI to RUN-P

The configuration tasks should be carried out in the order they appear.

Note

The commissioning and configuration tasks for the SIMATIC PCS 7 BOX described here relate to the "single station system" configuration variant. The special tasks for the "external engineering" and "PCS 7 network" configuration variants are described as required. The description always relates to the "single station system" configuration variant unless the other variants are explicitly mentioned.

4.2 Configuring SIMATIC PCS 7 BOX for a Single Station System

4.2.1 Step 1: Configuring the PC Stations Using the Commissioning Wizard

The SIMATIC NET Commissioning Wizard is automatically started when the SIMATIC PCS 7 BOX station is first booted.

Requirements

- Installation of SIMATIC PCS 7 V6.0 SP3
- Software WinAC 3.4 for SIMATIC S7 CPU 416-2 PCI

Note

The Windows 2000 Professional Hardware Wizard may appear during the commissioning of all the hardware adapters (CP 5611, CP 1512, CPU 41x2 PCI).

Close this Wizard when any new hardware is detected.

Follow These Steps:

Note

The required settings in the SIMATIC NET Commissioning Wizard is described in detail in the manual *PC Configurations and Authorizations*. The following procedures relate specifically to the special features of the SIMATIC PCS 7 BOX.

---

1. Start the SIMATIC PCS 7 BOX station.
2. The SIMATIC NET Commissioning Wizard starts. Go to the next dialog of the Wizard by pressing the "Next" button.
3. Use the on-board CP 5611 module for your PCS 7 project by activating the option "Use module in configured PC station for production".

   Specify the slot in the "Index" field. Slots (index) 1 and 3 cannot be used because they will be used later by the WinCC application and the CPU 41x-2 PCI when the PCS 7 project is created . Otherwise, accept all other default settings.
4. If the CP 1512 module is installed, it will be recognized by the SIMATIC NET Commissioning Wizard. It is not needed in the "single station system" configuration variant. Therefore, activate the option "Use module for programming only" for this module.

5. Click on the "Next" button until you get to the settings for the OPC server. Deactivate the option "SIMATIC NET OPC server in configure PC station" and click on "Next".
6. Close the SIMATIC NET Commissioning Wizard by clicking once again on the "Next" button.
7. Confirm the "SIMATIC NET Commissioning Wizard" warning dialog that appears by clicking "OK".
8. In the next two dialogs of the SIMATIC NET Commissioning Wizard, click on "Next" and then on the "Finish" button.
9. When the settings made in the Commissioning Wizard are saved, the "Set PC Station" configuration console appears. Close the "Set PC Station" configuration console.

Note

You can call up the "Set PC Station" configuration console with the Windows command **Start > Simatic > SIMATIC NET > Settings > Set PC Station** and change the operating mode of the employed module at a later time if needed.

Additional Information

Manual *PC Configurations and Authorizations*

4.2.2 Step 2: Configuring the PC Using the Component Configurator

The settings in the Component Configurator are similar to those in the subsequently created PCS 7 project.

Requirement

- Installation of the software WinAC 3.4 for SIMATIC S7 CPU 416-2 PCI

Follow These Steps:

Note

The CPU 416-2 PCI is automatically inserted into Slot 3 of the Component Configurator during the installation of WinAC 3.4.

The CP 5611 production module selected in the Commissioning Wizard is automatically displayed in the Component Configurator in the slot (index) that you have specified in the Commissioning Wizard.

1. Start the Component Configurator using the Windows command **Start** > **Simatic** > **Component Configurator**.
2. Select a "WinCC application" from the "Type" menu and insert it into Slot (index) 1 using the "Insert" button. Then click on "OK" and confirm the warning dialog with "OK".
3. Enter a name using the "Station name" button. The station name you enter here must be identical to the name of the SIMATIC PC station in the PCS 7 project. Close the Component Configurator with the "OK" button.

Additional Information

STEP 7 online help for the Component Configurator

4.2.3 Step 3: Creating a New PCS 7 Project

You can create a new PCS 7 project using the PCS 7 Wizard "New Project" that is automatically displayed with the start of the SIMATIC Manager.

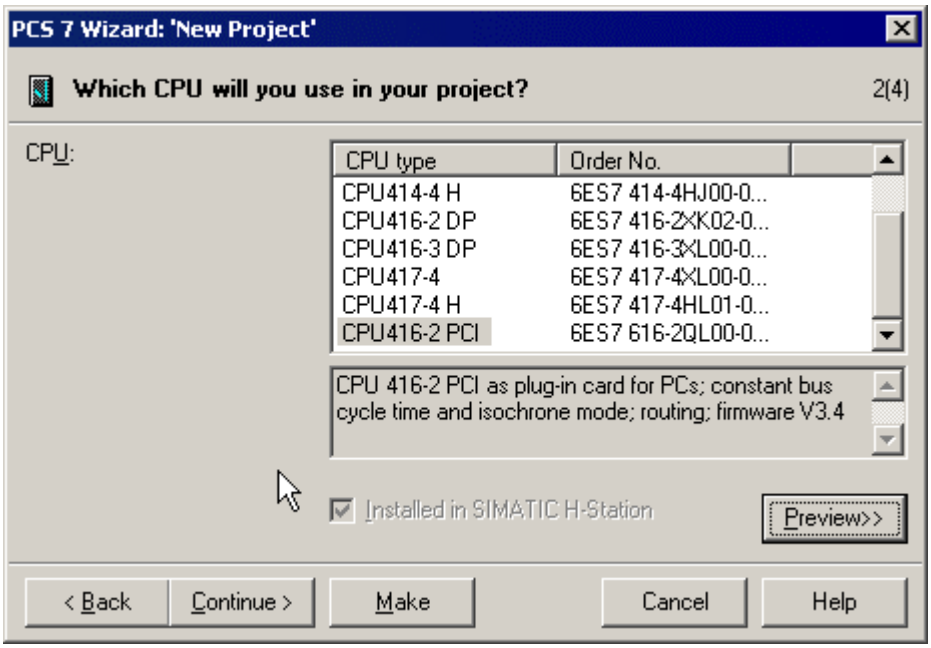
As an alternative, you can add a SIMATIC PCS 7 BOX station to an existing PCS 7 project. This type of configuration is described under "Additional commissioning and configurations" > "Configuration of SIMATIC PCS 7 BOX in a PCS 7 network" in the chapter "Adding a SIMATIC PCS 7 BOX Station to Your PCS 7 project".

Requirement

- Installation of SIMATIC PCS 7 V6.0 SP3

Follow These Steps:

1. Start the SIMATIC Manager using the Windows command **Start > Simatic > SIMATIC Manager**. The PCS 7 Wizard "New Project" is only displayed the first time SIMATIC PCS 7 BOX Station is started, and when the option "Display Wizard on starting the SIMATIC Manager" is not deactivated.
2. Activate the option "Multiproject with project and master data library" and then click on the "Next" button.
3. Select CPU416-2 PCI by marking this CPU in the selection list. Then click on the "Next" button.



4. In the next dialog, leave the default settings and activate the "PCS 7 OS" option box. This activates the "single station system" option as a default setting. Leave this setting and click on the "Next" button.
5. In the next dialog, assign a folder name and path for your PCS 7 project.
6. Click on the button "Finish", to create the PCS7 project using the information and settings you have made.
7. Leave the default setting for "Assign unique message numbers CPU-wide" in the displayed "Selection of Message Number Assignment" dialog and click "OK".

Additional Information

Adding a SIMATIC PCS 7 BOX station to your PCS 7 project

STEP 7 online help for the PCS 7 Wizard

4.2.4 Step 4: Configuring a PCS 7 Project and Renaming the SIMATIC PC Station

The PCS 7 Wizard has created a new PCS 7 project. This is displayed in the SIMATIC Manager. You now have to perform the usual configuration tasks in the following PCS 7 software components:

- HW Config
- NetPro
- CFC
- SFC
- WinCC

You also have to adapt the name of the SIMATIC PC station.

Refer to the following documentation for additional information about configuration in SIMATIC PCS 7:

- Process Control System PCS 7; Getting Started - Part 1
- Process Control System PCS 7; Getting Started PCS 7 - Introduction

Adapting the Name of the SIMATIC PC Station

The name of the SIMATIC PC station, which was assigned by the PCS 7 Wizard, must be changed to match the name specified in the Component Configurator.

Requirement

- The PCS 7 project has been created by the PCS 7 Wizard.

Follow These Steps:

1. Mark the SIMATIC PC station in the right project window, open the context menu and select the command "Rename".
2. Enter the name that you specified for the station name in the Component Configurator. Note that the program distinguished between capital and small letters.

Additional Information

STEP 7 online help

4.2.5 Step 5: Setting the Hardware Configuration of PC Stations

Once you completed the configuration of your PCS 7 project, you need to insert a CP 5611 in HW Config of the PC station.

Requirements

- A "New Project" has been created in the PCS 7 Wizard.
- The PCS 7 project is open in the component view of the SIMATIC Manager.

Follow These Steps:

1. Mark the SIMATIC PC station in the left project window, open the context menu with a right mouse click and select the command "Open Object".
2. In HW Config, navigate to the CP 5611 in the hardware catalog under SIMATIC PC Station\CP-PROFIBUS and double-click on the CP 5611 folder. Press the right mouse button and drag the marked CP (SW V6.0 SP5...) to the slot in the station window that you selected in the Component Configurator and click "OK".
3. Right click on the CPU 416-2 PCI in the station window to open the context menu and select the command "Object Properties".
   - Go to the "Diagnostics / Clock" tab.
   - Under "Synchronization in AS:" in the clock section, select "As slave" as the synchronization mode.
   - Close the dialog window with the "OK" button.
4. Save and compile your changes and close HW Config.

Note

Make sure the settings in the Component Configurator match those in the HW Config or your PCS 7 project.

Additional Information

STEP 7 online help

4.2.6 Step 6: Configuring NetPro

No connection is explicitly configured in NetPro for accessing intelligent field devices connected through the PROFIBUS via the PDM. The CP 5611 of the PC station only needs to be connected to the DP line of the CPU 416-2 PCI. A connection between the WinCC application and the CPU 416-2 PCI is also configured.

Note

For access to DP slaves via the PDM, the access point "S7ONLINE (STEP 7)" must be set to the CP5611 interface (PROFIBUS).
Refer to the section "Checking if the PG/PC interface is set to PC internal" for more information about configuring the PG/PC interface.

Requirement

- The configuration in HW Config has to be completed, saved and compiled.

Follow These Steps:

1. In the SIMATIC Manager, open the NetPro by selecting the menu command **Options** > **Configure network**. You can close the displayed "Multiproject" dialog.
2. Select the square of the CP 5611 within the PC station and drag it onto the PROFIBUS. Release the mouse button there.
3. Right click on the CPU 5611 within the PC station again to open the context menu and select the command "Object Properties".
4. Click on the "Properties" button in the "Properties - CP 5611" dialog of the "General" tab.
5. Assign an available address, for example, address 3, and close the dialog with the "OK" button. Then click "OK" again.
6. Right click on the WinCC application within the SIMATIC PC station to open the context menu and select the command "Insert New Connection".
7. Accept the default settings in the "Insert New Connection" dialog and click "OK".
8. In the field "Identification Connection" of the displayed "Properties - S7 Connection" dialog, enter a name such as "Locale_S7_Connection_1" under "Local ID:". Otherwise, accept the default settings and click on the "OK" button.
9. Save and compile your configuration.

10. Select SIMATIC Station and then the menu command **PLC > Download to current project > Selected Stations**. Acknowledge the warning dialog displayed with the "Yes" button.
11. Exit NetPro.

Notes on Download Connection in Run.

Configured S7 connections within a PCS 7 project can be downloaded in Run.

1. To do this, select the corresponding CPU within a module and select the desired connection in the connection table.
2. Select the menu command PLC > Download to current project > Selected Stations.

The selected connection will then be downloaded to both the local and remote communication partner. The communication partner can either be a CPU or a WinCC application.

Additional Information

STEP 7 online help

4.2.7 Step 7: Setting Time Synchronization

WinCC and the CPU 416-2 PCI are synchronized with the local PC clock.

Requirement

- In HW Config, the synchronization mode "As Slave" is set for the time synchronization in the AS.

Follow These Steps:

1. Open the "TimeSyncCfg" dialog with the command Start > Simatic > PC Based Control > WinAC Time Synchronization.
2. Activate the option "PC clock" under "Source" in the "Configuration" section of the dialog.
3. Once you have made these settings, click the "Start" button to begin time synchronization and then click "Close" to exit the dialog.

Additional Information

Manual *Windows Automation Center WinAC Slot V3.4*

4.2.8 Step 8: Checking If the PG/PC Interface Is Set to "PC Internal"

Before downloading the configuration and program of your PCS 7 project to the CPU 416-2 PCI, you first need to check if the access point of the application and the interface settings are correctly configured.

Requirement

- Installation of SIMATIC PCS 7 V6.0 SP3

Follow These Steps:

1. Open the "Set PG/PC Interface" dialog in the SIMATIC Manager with the command **Options > Set PG/PC Interface...**.
2. Select "S7ONLINE (STEP 7)" under "Access point of the application:".
3. Select "PC internal (local)" from the list under "Interface parameter set used:".
4. Close the dialog window with the "OK" button.
5. Click on "OK" again in the subsequent dialog.

Note

The following applies to downloading the configuration and program to the CPU: The "S7ONLINE (STEP 7)" access point must be set to "PC internal (local)".

Additional Information

STEP 7 online help

4.2.9 Step 9: Opening the Operator Panel of the CPU 416-2 PCI

1. The CPU 416-2 PCI does not have display and operator control elements like a CPU in an AS. For this reason, an operator panel showing all displays and operator control elements similar to a CPU in an AS is displayed on the computer screen after the start of the CPU 416-2 PCI . The operator control elements on the computer screen can be activated with the mouse.
2. Before downloading project data to the CPU 416-2 PCI, you should check the status of the CPU 416-2 PCI. The project data should be downloaded to the CPU 416-2 PCI when it is in "STOP".

Requirement

- The WinAC 3.4 software for SIMATIC S7 CPU 416-2 PCI has been installed from the PCS 7 Toolset CD.

Follow These Steps:

1. Start the operator control panel of the CPU 416-2 PCI with the command **Start > Simatic > Simatic PC based Control > CPU 416-2 PCI**.
2. Click on the "STOP" button in the "CPU 416-2 PCI" dialog displaying the operator control panel.
3. Check if the virtual signal LED shows the "STOP" status.
4. You can move and open the operator control panel on the Desktop in the usual way.

Additional Information

Manual *Windows Automation Center WinAC Slot V3.4*

4.2.10 Step 10: Compiling and Downloading the AS and OS Data

The AS and OS data is compiled and downloaded in the SIMATIC Manager with the dialog "Compile and Download Objects". This dialog enables you to make all of the necessary settings conveniently from a central location.

Requirements

- The SIMATIC Manager is open and your PCS 7 project is displayed in the component view.
- CPU 416-2 PCI is in "STOP".
- In NetPro the menu command **PLC > Download to current project > Selected Stations** was executed with SIMATIC Station selected.

Follow These Steps:

1. Right click on the project folder in the left window of the SIMATIC Manager to open the context menu and select the command **PLC > Compile and Download Objects**.
2. Open all folders in the dialog with the plus sign.
3. Click on the "Charts" folder and then on the "Edit" button in the "Settings for compiling/downloading" section.
   - In the dialog "Compile Program / Download PLC", set "Entire Program" under "Compile".
   - Activate the control box "Generate module drivers".
   - Go to the "Download S7" tab and check if the "Entire program" is selected for compiling.
   - Close the dialog window with the "OK" button.
   - Acknowledge the displayed warning dialog by clicking "OK".
4. Activate the options in the "Compile" and "Download" columns for the "Charts" folder.
5. Activate the option box in the "Compile" column for the "OS(1)" folder in the "Compile and Download Objects" dialog.
   Note: The OS must not be downloaded because the configuration data are used locally.
   - Click on the "OS" folder and then on the "Edit" button in the "Settings for compiling/downloading" section.
   - In the "Settings: Compile OS" dialog, click the "Next" button.
   - Select the S7 program in the right window and click on the "Connection" button to check if the connection "WinCC Unit" ="Named Connection" is correctly configured.
   - Click the "Next" button again.

- In the next dialog, activate the options "Variables and Messages" and "Picture Tree" under "Data". Under "Compile", activate the options "Entire OS" and "With memory reset".
- Click the "Apply" button.
- Close the next "Settings: Download OS" dialog without changing the settings by clicking the "OK" button.

6. In the "Compile and download objects" dialog, click the "Start" button.
7. Confirm the "Compile and download objects" dialog by clicking "OK".
8. Confirm the next dialogs displayed by clicking "OK".
9. Check and close the log file.
10. Close the "Compile and download objects" dialog by clicking the "Close" button.

Additional Information

STEP 7 online help

4.2.11 Step 11: Setting the CPU 416-2 PCI to RUN-P

Once you have downloaded the AS and OS data to the CPU 416-2 PCI, set the CPU 416-2 PCI to the "RUN-P" mode using the mouse.

Requirements

- The object are compiled and downloaded.
- The operator panel is already open.

Follow These Steps:

1. Bring the window with the operator control panel of the CPU 416-2 PCI to the foreground.
2. Click on the "RUN-P" button in the operator control panel.

Additional Information

Manual *Windows Automation Center WinAC Slot V3.4*

5 Additional Commissioning and Configuration

5.1 Configuring SIMATIC PCS 7 BOX with External Engineering

5.1.1 Overview of Hardware and Software Installation

With the configuration variant "SIMATIC PCS 7 BOX with external engineering", the external ES and the SIMATIC PCS 7 BOX station must be viewed separately during commissioning and configuration.

Note

Only the special features are described here for the "external engineering" configuration variant. The description for the "single station system" configuration variant applies for all tasks that are not explicitly mentioned.

Required Hardware on the External Engineering Station

- The hardware requirements for the PC of the ES are described in the PCS 7 readme file.
- A 10/100 Mbps Ethernet network card is required for downloading the OS and S7 program to the CPU 416-2 PCI via the combination plant/terminal bus.
- A CP 5611 is needed for accessing intelligent field devices connected to the PROFIBUS DP.

Required Software Installation on the External Engineering Station

- SIMATIC PCS 7 V6.0 SP3, see PCS 7 readme file
- PDM

Required Hardware on the SIMATIC PCS 7 BOX Station

- WinAC 3.4 for SIMATIC S7 CPU 416-2 PCI

Required Software Installation on the SIMATIC PCS 7 BOX Station

- SIMATIC PCS 7 V6.0 SP3, see PCS 7 readme file

Additional Information

PCS 7 readme file

5.1.2 Overview of Configuration Steps for Commissioning

Only the steps that deviate from the configuration variant "SIMATIC PCS 7 BOX as single station system" and are marked in bold are available as links. The other steps correspond to the "SIMATIC PCS 7 BOX as single station system" configuration variant.

	Commissioning/Configuration Steps
1	**Configuring the PC stations using the Commissioning Wizard**
2	**Configuring the PC Using the Component Configurator**
3	Creating a new PCS 7 project
4	Configuring a PCS 7 project and renaming the SIMATIC PC station
5	**Adding an external ES to your PCS 7 project**
6	**Setting the hardware configuration of PC stations on the ES**
7	**Configuring NetPro for an external ES**
8	Setting Time Synchronization
9	Checking if the PG/PC interface is set to "PC internal"
10	Opening the operator panel of the CPU 416-2 PCI
11	**Compiling and downloading the AS and OS data**
12	Setting the CPU 416-2 PCI to RUN

The configuration tasks should be carried out in the order they appear.

5.1.3 Step 1: Configuring the PC stations using the Commissioning Wizard

The Commissioning Wizard (CW) automatically appears on the SIMATIC PCS 7 BOX station following the installation of SIMATIC PCS 7 V6.0 SP3 and booting of the SIMATIC PCS 7 BOX station. This is where you select the modules to use for your PCS 7 project.

With the configuration variant "SIMATIC PCS 7 BOX with external engineering", the external ES and the SIMATIC PCS 7 BOX station must be viewed separately during commissioning and configuration.

Note

Use the CP 5611 module for production operation either on the external ES or on the SIMATIC PCS 7 BOX station depending on the connection of the PDM.
The authorization for the PDM software must be ordered separately to activate the PDM on the respective station.

CW on the SIMATIC PCS 7 BOX Station

Requirements

- Installation of PCS 7 V6.0 SP3
- Software WinAC 3.4 for SIMATIC S7 CPU 416-2 PCI

Follow These Steps:

1. If the PDM is connected to the SIMATIC PCS 7 BOX station, use the on-board CP 5611 module for your PCS 7 project by activating the option "Use module in configured PC station for production".
2. Specify the slot in the "Index" field.
3. Use the on-board Ethernet network card for your PCS 7 project by activating the option "Use module in configured PC station for production" and specifying the slot in the "Index" field.

Note

All other settings in the CW are the same as the "single station system" configuration variant.

CW on the External ES

Requirement

- Installation of PCS 7 V6.0 SP3

Note

The Windows 2000 Professional Hardware Wizard may appear during the commissioning of all the communication CPs.

Close this Wizard when any new hardware is detected.

Follow These Steps:

1. Use the CP 5611 module for your PCS 7 project by activating the option "Use module in configured PC station for production".
2. Specify the slot in the "Index" field.
3. Use the Ethernet network card for your PCS 7 project by activating the option "Use module in configured PC station for production" and specifying the slot in the "Index" field.

Additional Information

Manual *PC Configurations and Authorizations*

5.1.4 Step 2: Configuring the PC Using the Component Configurator

The settings in the Component Configurator must be made on the SIMATIC PCS 7 BOX station. You do not have to make any settings in the Component Configurator on the external ES since all hardware components used in the Commissioning Wizard for production operation have already been entered.

Note

If you want to test the OS on the external ES, you have to add a WinCC application in the Component Configurator on the ES.

Requirement

- CW has been run on the SIMATIC PCS 7 BOX station.

Follow These Steps:

Note

The CPU 416-2 PCI is automatically inserted into Slot 3 of the Component Configurator during the installation of WinAC 3.4 on the SIMATIC PCS 7 BOX station.

1. Start the Component Configurator using the Windows command **Start** > **Simatic** > **Component Configurator**.
2. Select a "WinCC application" from the "Type" menu and insert it into Slot (index) 1 using the "Insert" button. Then click "OK".
3. Enter a name using the "Station name" button. The station name you enter here must be identical to the name of the SIMATIC PC station in the PCS 7 project. Close the Component Configurator with the "OK" button.

Additional Information

STEP 7 online help for the Component Configurator

5.1.5 Step 5: Adding an External ES to Your PCS 7 Project

All other configuration tasks are performed on the external ES. Once you have created a PCS 7 project using the PCS 7 Wizard, you must add to the external ES to your project.

Requirements

- A "New Project" has been created in the PCS 7 Wizard.
- The PCS 7 project has been configured and the name of the SIMATIC PC station has been changed to match the name specified in the Component Configurator on the SIMATIC PCS 7 BOX station.
- The PCS 7 project is displayed in the component view of the SIMATIC Manager.

Follow These Steps:

1. Right click on the project folder in the left window of the component view to open the context menu and select the command **Insert New Object > SIMATIC PC Station**.
2. Right-click on the inserted SIMATIC PC station and select "Rename" in the context menu.
3. Enter the name that you specified as the "Station name" in the Component Configurator on the external ES.

Additional Information

STEP 7 online help

5.1.6 Step 6: Setting the Hardware Configuration of PC Stations on the ES

Once you have configured your PCS 7 project in the SIMATIC Manager on the external ES, you have to add communication CPs in HW Config on both PC stations and a WinCC application on the PC station of the ES.

Note

Use the CP 5611 module for production operation either on the external ES or on the SIMATIC PCS 7 BOX station depending on the connection of the PDM.
The following section describes the integration of the CP 5611 in the external ES.

Requirements

- The ES has been added to your PCS 7 project.
- The PCS 7 project is displayed in the component view of the SIMATIC Manager.

Follow These Steps:

1. Double-click on the SIMATIC PC station containing the CPU 416-2 PCI in the left window of the SIMATIC Manager. The objects of the SIMATIC PC station are then displayed in the right window.
2. Double-click on the "Configuration" object.
3. In HW Config, navigate to the CP IE General in the hardware catalog under **SIMATIC PC Station > CP Industrial Ethernet**.
   Press the left mouse button and drag the marked CP IE General to the slot in the station window that you selected in the Component Configurator on the SIMATIC PCS 7 BOX station. Click on the "OK" button in the displayed dialog.
4. Double-click on the SIMATIC PC station representing the ES in the left window of the SIMATIC Manager. The objects of the SIMATIC PC station are then displayed in the right window.
5. Double-click on the "Configuration" object.
6. In HW Config, navigate to the CP IE General in the hardware catalog under **SIMATIC PC Station > CP Industrial Ethernet**.
   Press the right mouse button and drag the marked CP IE General to the slot in the station window that you selected in the Component Configurator on the ES. Click on the "OK" button in the displayed dialog.

7. In HW Config, navigate to the CP 5611 in the hardware catalog under **SIMATIC PC Station > CP PROFIBUS**.
   Press the left mouse button and drag the marked components under CP 5611 to the slot in the station window that you selected in the Component Configurator on the ES. Click on the "OK" button in the displayed dialog.
8. In HW Config, navigate to the WinCC application in the hardware catalog under **SIMATIC PC Station > HMI**.
   Press the left mouse button and drag the marked WinCC application to the slot in the station window that you selected in the Component Configurator on the ES. Click on the "OK" button in the displayed dialog.
9. Save and compile your changes and close HW Config.

Additional Information

STEP 7 online help

5.1.7 Step 7: Configuring NetPro for an External ES

The employed modules are assigned to networks and connections are made in NetPro on the ES.

Using PDM

For the configuration variant "SIMATIC PCS 7 BOX with external engineering station", the access from the PDM to intelligent field devices connected to the PROFIBUS DP can be made via the external ES or the SIMATIC BOX station. The following is a description of access via the external ES.

Access to the OS and CPU 416-2 within the SIMATIC PCS 7 BOX Station

The OS and S7 program are downloaded from the ES via the combination plant/terminal bus.

Requirement

- The hardware of the two PC stations has been configured in HW Config on the ES.

Follow These Steps:

1. In the SIMATIC Manager, open the NetPro by selecting the menu command **Options** > **Configure network**.
2. You can close the displayed "Multiproject" dialog.
3. Select the square of the CP 5611 within the SIMATIC PC station of the ES and drag it onto the PROFIBUS. Release the mouse button there.

   In the "Properties" dialog, check if a free PROFIBUS address is specified. If it is not, you can enter an address by clicking on the "Properties" button in the "Interface" section of the "Properties" dialog.
4. Open the folder "Subnet" in the catalog "Select Network Object" and mark the subnet "Industrial Ethernet".

   Press the left mouse button and drag the object into the network view. Then release the mouse button.
5. Select the IE General in the SIMATIC PC station of the ES and drag it onto the Industrial Ethernet. Release the mouse button there.
6. Select the IE General in the SIMATIC PC station of the SIMATIC PCS 7 BOX station and drag it onto the Industrial Ethernet. Release the mouse button there.

7. Right click on the WinCC application within the SIMATIC PC station of the SIMATIC PCS 7 BOX station to open the context menu.

   Select "Insert new connection" in the context menu. Select the CPU 416-2 PCI under the PC station that represents the SIMATIC PCS 7 BOX station and accept the other default settings in this dialog. Click on the "OK" button to close the dialog.

   In the dialog "Properties S7 Connection", assign a name in the section "Connection Identification" under "Local ID" and click on "OK".
8. To be able to test the OS on the external ES test, create another connection with the same name from the WinCC application in the ES to the CPU 416-2 PCI. The configuration of this connection is similar to that described under Step 7.
9. Save and compile your changes.
10. Select SIMATIC Station and then the menu command **PLC > Download to current project > Selected Stations**. Acknowledge the warning dialog displayed with the "Yes" button.
11. Exit NetPro.

Notes on Download Connection in Run.

Configured S7 connections within a PCS 7 project can be downloaded in Run.

1. To do this, select the corresponding CPU within a module and select the desired connection in the connection table.
2. Select the menu command PLC > Download to current project > Selected Stations.

The selected connection will then be downloaded to both the local and remote communication partner. The communication partner can either be a CPU or a WinCC application.

Additional Information

STEP 7 online help

5.1.8 Step 11: Compiling and Downloading the AS and OS Data for an External ES

The differences in the "Compile and Download Objects" dialog between a single station system and the "SIMATIC PCS 7 BOX for an external ES" configuration variant are as follows:

1. Both configurations, that of the ES and that of the SIMATIC PCS 7 BOX station, need to be compiled and downloaded.
2. The OS must be compiled and downloaded. The network path from the external ES to the OS must be specified and an appropriate destination folder for the OS should be created on the SIMATIC PCS 7 BOX station.

Requirements

- The SIMATIC Manager is open and your PCS 7 project is displayed in the component view.
- CPU 416-2 PCI is in "STOP".
- In NetPro the menu command **PLC > Download to current project > Selected Stations** was executed with SIMATIC Station selected.

Follow These Step:

Note

Only the difference to the "single station system" configuration variant in the "Compile and Download Objects" dialog is described in the following.

---

3. Activate the option boxes in the "Compile" and "Download" columns for the "OS(1)" folder in the "Compile and Download Objects" dialog.
   - Click on the "OS" folder and then on the "Edit" button in the "Settings for compiling/downloading" section.
   - In the "Settings: Compile OS" dialog, click the "Next" button.
   - Select the S7 program in the right window and click on the "Connection" button to check if the connection "WinCC Unit" ="Named Connection" is correctly configured.
   - Click the "Next" button again.
   - In the next dialog, activate the options "Variables and Messages" and "Picture Tree" under "Data". Under "Compile", activate the options "Entire OS" and "With memory reset".

- Click the "Apply" button.
- Click on the "Browse" button and select the network path to the OS in the "Settings: Download OS" dialog. Select the option "Entire WinCC project" and then click on "OK".

Additional Information

Compiling and downloading the AS and OS data for a single station system

STEP 7 online help

5.2 Configuring SIMATIC PCS 7 BOX in the PCS 7 Network

5.2.1 Overview of Commissioning and Configuration

A connection to the plant and terminal bus is made to integrate the SIMATIC PCS 7 BOX station in an existing PCS 7 system.

The special features of this configuration variant are that the time synchronization of the AS and OS in the SIMATIC PCS 7 BOX station can be performed by a time master, such as SICLOCK TM, on the plant bus and that the communication is possible between an AS in a PCS 7 network and the CPU 416-2 PCI in the SIMATIC PCS 7 BOX station.

In the following overview, only the steps that deviate from the configuration variant "SIMATIC PCS 7 BOX as single station system" and are marked in bold are available as links. The other steps correspond to the "SIMATIC PCS 7 BOX as single station system" configuration variant.

	Commissioning/Configuration Steps
1	**Configuring the PC Station Using the Commissioning Wizard**
2	**Configuring the PC Using the Component Configurator**
3	**Adding a SIMATIC PCS 7 BOX Station to Your PCS 7 Project**
4	**Configuring NetPro**
5	**Synchronizing the Time on the AS via the Plant Bus**
6	**Synchronizing the Time on the AS via the Plant Bus**
7	**Configuring AS-AS Communication**
8	Checking if the PG/PC interface is set to "PC internal"
9	Opening the operator panel of the CPU 416-2 PCI
10	**Compiling and Downloading the AS and OS Data**
11	Setting the CPU 416-2 PCI to RUN

The configuration tasks should be carried out in the order they appear.

5.2.2 Step 1: Configuring the PC Stations Using the Commissioning Wizard

The Commissioning Wizard (CW) automatically appears on the SIMATIC PCS 7 BOX station following the installation of SIMATIC PCS 7 V6.0 SP3 and booting of the SIMATIC PCS 7 BOX station. This is where you select the modules to use for your PCS 7 project.

Note

The CP 5611 module is set for production operation in the CW based on the connection of the PDM (via an ES in the PCS 7 network or SIMATIC PCS 7 BOX station).
The authorization for the PDM software must be ordered separately to activate the PDM on the respective station.

Requirements

- Installation of PCS 7 V6.0 SP3
- Software WinAC 3.4 for SIMATIC S7 CPU 416-2 PCI

Follow These Steps:

Note

If the communication module CP 1512 is inserted in a PCMCIA slot, the Windows 2000 Professional Hardware Wizard for commissioning will be displayed.

Carry out the steps in the Wizards and register the module in the operating system.

---

1. Use the on-board CP 5611 module for your PCS 7 project by activating the option "Use module in configured PC station for production".
2. Specify the slot in the "Index" field.
3. Use the on-board Ethernet network card for your PCS 7 project by activating the option "Use module in configured PC station for production" and specifying the slot in the "Index" field.
4. Select "PG operation" for the CP1512 module so that it is not used in your PCS 7 project although is physically present.

Additional Information

Manual *PC Configurations and Authorizations*

5.2.3 Step 2: Configuring the PC Using the Component Configurator

The Component Configurator needs to be run on the SIMATIC PCS 7 BOX station. The settings in the Component Configurator are similar to those in the subsequently created PCS 7 project.

Note

Depending on how you wish to visualize your processes, on an OS in the SIMATIC PCS 7 BOX station or on an existing OS in the PCS 7 network, you need to insert a WinCC application at Index 1 in the Component Configurator in both cases.

Requirements

- CW has been run on the SIMATIC PCS 7 BOX station.
- The WinAC 3.4 software for SIMATIC S7 CPU 416-2 PCI has been installed from the PCS 7 Toolset CD.

Follow These Steps:

1. Start the Component Configurator using the Windows command **Start** > **Simatic** > **Component Configurator**.
2. Select a "WinCC application" from the "Type" menu and insert it into Slot (index) 1 using the "Insert" button. Then click "OK".
3. Enter a name using the "Station name" button. The station name you enter here must be identical to the name of the SIMATIC PC station in the PCS 7 project. Close the Component Configurator with the "OK" button.

Additional Information

STEP 7 online help for the Component Configurator

5.2.4 Step 3: Adding a SIMATIC PCS 7 BOX Station to Your Project

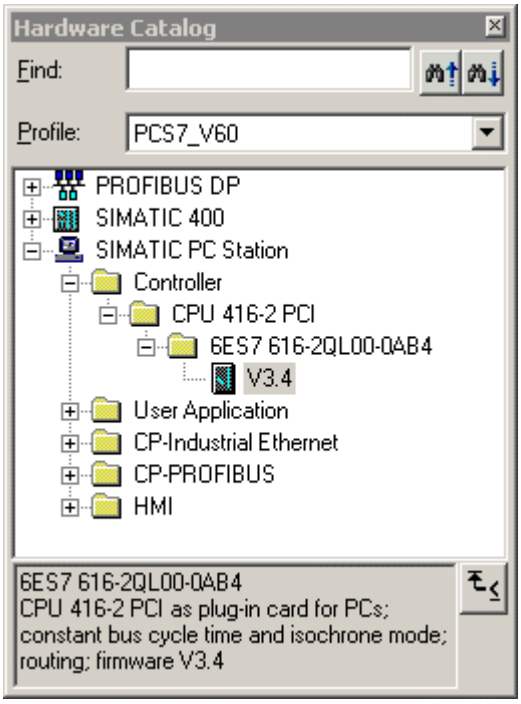
Once your PCS 7 project is configured, you can add the SIMATIC PCS 7 BOX station. To do this, open the project on the ES in a PCS 7 network.

Requirements

- Installation SIMATIC PCS 7 V6.0 SP3
- The PCS 7 project is open and displayed in the component view of the SIMATIC Manager.

Follow These Steps:

1. Right click on the project folder in the left window of the SIMATIC Manager to open the context menu and select the command **Insert New Object > SIMATIC PC Station**.
2. Right-click on the inserted SIMATIC PC station and select "Rename" in the context menu. Enter the name that you specified as the "Station name" in the Component Configurator on the SIMATIC PCS 7 BOX station.
3. Double-click on the "Configuration" object in the right window of the SIMATIC Manager.
4. If you require an OS in the SIMATIC PCS 7 BOX Station, insert a "WinCC Application" into Index 1 from the catalog via **SIMATIC PC Station > HMI**. The slot must match the one set in the Component Configurator.
5. Open the folder **SIMATIC PC Station > Controller** in the catalog and double-click on the folder "CPU 416-2 PCI" and then double-click on the folder with specified order number. Select software version V3.4, drag the object to Index 3 in the station window and release the mouse button.
   Confirm the displayed dialog with the "OK" button.



6. Go to the **CP-Industrial Ethernet** folder in the catalog and mark the object **IE General**. Drag the object to Index 5 in the station window and release the mouse button. The slot must match the one set in the Component Configurator. Confirm the displayed dialog with the "OK" button.
7. If you use PDM on the SIMATIC PCS 7 BOX Station, insert **CP 5611 > SW V6.0SP5...** into Index 6 in the station window from the catalog via **SIMATIC PC Station > CP PROFIBUS** accordingly. The slot must match the one set in the Component Configurator.
   Confirm the displayed dialog with the "OK" button.
8. Save and compile your changes in HW Config.

Additional Information

STEP 7 online help

5.2.5 Step 4: Configuring NetPro

The employed modules are assigned to networks and connections are made in NetPro on the ES. A PROFIBUS DP must also be inserted. This is connected with DP interface of the CPU 416-2 PCI in the SIMATIC PCS 7 BOX station.

Using PDM

For the configuration variant "SIMATIC PCS 7 BOX in the PCS 7 network", the access from the PDM to intelligent field devices connected to the PROFIBUS DP can be made via the PCS 7 network or the SIMATIC BOX station.

connection pathfrom an ES in a PCS 7 Network

The OS in the SIMATIC PCS 7 BOX station is accessed via the terminal bus using the TCP/IP protocol. This connection path is not configured in NetPro but it must be physically present.

Access to the CPU 416-2 within the SIMATIC PCS 7 BOX Station

The AS in the SIMATIC PCS 7 BOX station is accessed via the plant bus using the ISO protocol. This connection route is configured in NetPro an it must be physically present.

Requirements

- The hardware has been configured in HW Config on the ES.
- The PCS 7 project is displayed in the component view of the SIMATIC Manager on the ES.

Follow These Steps:

1. In the SIMATIC Manager, open the NetPro by selecting the menu command **Options** > **Configure network**.
2. Insert the **PROFIBUS DP** in your network view from the catalog under **Subnets** by double-clicking on this object.
3. Select the CP 5611 in the SIMATIC PCS 7 BOX station and drag it onto the PROFIBUS you have just inserted. Release the mouse button there.

   In the "Properties" dialog, check if a free PROFIBUS address is specified. If it is not, you can enter an address by clicking on the "Properties" button in the "Interface" section of the "Properties" dialog.
4. Select the DP interface in the SIMATIC PCS 7 BOX station and drag it onto the PROFIBUS you have just inserted. Release the mouse button there.
5. Select the IE General in the SIMATIC PCS 7 BOX station and drag it onto the Industrial Ethernet. Release the mouse button there.

6. Right click on the WinCC application in the SIMATIC PCS 7 BOX to open the context menu.

   Select "Insert new connection" in the context menu. Select the CPU 416-2 PCI in the SIMATIC PC station and click on "OK".

   In the dialog "Properties S7 Connection", assign a name in the section "Connection Identification" under "Local ID" and click on "OK".
7. Save and compile your changes.
8. Select SIMATIC Station and then the menu command **PLC > Download to current project > Selected Stations**. Acknowledge the warning dialog displayed with the "Yes" button.
9. Exit NetPro.

Notes on Download Connection in Run.

Configured S7 connections within a PCS 7 project can be downloaded in Run.

1. To do this, select the corresponding CPU within a module and select the desired connection in the connection table.
3. Select the menu command PLC > Download to current project > Selected Stations.

The selected connection will then be downloaded to both the local and remote communication partner. The communication partner can either be a CPU or a WinCC application.

Additional Information

STEP 7 online help

5.2.6 Step 5: Synchronizing the Time on the AS via the Plant Bus

CPU 416-2 PCI in the SIMATIC PCS 7 BOX station can be synchronized with other network stations in a PCS 7 network by a central time master, such as SICLOCK TM, via the plant bus. The time master provides the time of day in cyclic intervals on the Industrial Ethernet/PROFIBUS. Industrial Ethernet only supports the ISO protocol.

Requirements

- A time master, e.g., SICLOCK TM, connected to the plant bus.
- The "on-board Ethernet" network interface of the SIMATIC PCS 7 BOX station is connected to the plant bus of the PCS 7 system. This interface card must be capable of processing the time signal of the time master.
- The WinAC 3.4 for SIMATIC S7 CPU 416-2 PCI has been installed.
- In HW Config, the synchronization mode "As Slave" is set for the time synchronization in the AS.

Follow These Steps:

1. Open the corresponding dialog on the SIMATIC PCS 7 BOX station with the command **Start > Simatic > PC Based Control > WinAC Time Synchronization**.
2. Activate the option "CP" under "Source" in the "Configuration" section of the dialog.
3. Click the "Select" button.
4. Select the interface connected to the plant bus under "Interface parameter set used" in the "Set PG/PC Interface" dialog. Then click on the "OK" button to close the dialog. Confirm the displayed warning dialog with the "OK" button.
5. Once you have made these settings, click the "Start" button to begin time synchronization and then click "Close" to exit the dialog.

Additional Information

Setting the hardware configuration of PC stations

Online help of the dialog "WinAC Time Synchronization"

Manual *Windows Automation Center WinAC Slot V3.4*

5.2.7 Step 6: Synchronizing the Time on the OS via the Plant Bus

The OS in the SIMATIC PCS 7 BOX station can be synchronized with other network stations in a PCS 7 network by a central time master, such as SICLOCK TM, via the plant bus.

Requirements

- A time master, e.g., SICLOCK TM, connected to the plant bus.
- The WinCC project is open on the ES in the PCS 7 network.

Follow These Steps:

1. Open the WinCC "Time Synchronization" Editor.
2. Activate the option "Synchronization via plant bus (master, slave)".
3. Activate the option "Display symbolic name of access point".
4. Under "Access point 1" "<Softnet(1)>", select where the time synchronization of the plant bus should be performed. Since the SICLOCK TM is the time master, activate the option "Slave"..
5. Close the dialog window with the "OK" button.

Additional Information

Context-sensitive and online help for time synchronization

5.2.8 Step 7: Configuring AS-AS Communication

The communication between an AS in a PCS 7 network and an AS in the SIMATIC PCS 7 BOX station is configured in NetPro.

Requirements

- The connection route between the partners via the plant bus must be physically present.
- The connection partner is configured in your PCS 7 project, in HW Config and in NetPro.
- NetPro is open on the ES in the PCS 7 network.

Follow These Steps:

1. Right click on the CPU 416-2 PCI in the SIMATIC PC station to open the context menu and select the command "Insert New Connection".
2. In the "Insert General Column Groups" dialog, specify the communication partner you wish to reach and then click "OK".
3. In the dialog "Properties - S7 Connection", check the connection route and then click on "OK".

Additional Information

Online help for STEP 7

Manual *Windows Automation Center WinAC Slot V3.4*

5.2.9 Step 10: Compiling and Downloading the AS and OS Data for a PCS7 network

The differences in the "Compile and Download Objects" dialog between a single station system and the "SIMATIC PCS 7 BOX for an external ES" configuration variant are as follows:

1. Both configurations, that of the ES and that of the SIMATIC PCS 7 BOX station, need to be compiled and downloaded.
2. The OS must be compiled and downloaded. The network path from the external ES to the OS must be specified and an appropriate destination folder for the OS should be created on the SIMATIC PCS 7 BOX station.

Requirements

- The SIMATIC Manager is open and your PCS 7 project is displayed in the component view.
- CPU 416-2 PCI is in "STOP".
- In NetPro the menu command **PLC > Download to current project > Selected Stations** was executed with SIMATIC Station selected.

Follow These Step:

Note

Only the difference to the "single station system" configuration variant in the "Compile and Download Objects" dialog is described in the following.

1. Activate the option boxes in the "Compile" and "Download" columns for the "OS(1)" folder in the "Compile and Download Objects" dialog.
   - Click on the "OS" folder and then on the "Edit" button in the "Settings for compiling/downloading" section.
   - In the "Settings: Compile OS" dialog, click the "Next" button.
   - Select the S7 program in the right window and click on the "Connection" button to check if the connection "WinCC Unit" ="Named Connection" is correctly configured.
   - Click the "Next" button again.
   - In the next dialog, activate the options "Variables and Messages" and "Picture Tree" under "Data". Under "Compile", activate the options "Entire OS" and "With memory reset".
   - Click the "Apply" button.
   - Click on the "Browse" button and select the network path to the OS in the "Settings: Download OS" dialog. Select the option "Entire WinCC project" and then click on "OK".

Additional Information

Compiling and downloading the AS and OS data for a single station system

STEP 7 online help

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