

# SIEMENS

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## SIMATIC

### Process Control System PCS 7 Use with 0 to 70° C ambient temperature

System Manual

02/2015

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## Legal information

### Warning notice system

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

#### **DANGER**

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

#### **WARNING**

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

#### **CAUTION**

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

#### **NOTICE**

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

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

### Qualified Personnel

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

### Proper use of Siemens products

Note the following:

#### **WARNING**

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

### Trademarks

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

### Disclaimer of Liability

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

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# Preface

## 1.1 Preface

### Purpose of the manual

This manual provides additional information on the use of various hardware components in ambient temperatures from 0 to 70° C.

### Basic knowledge required

Comprehension of this manual requires general knowledge in the field of automation technology. This is provided in the preface of the *CPU 410-5H Process Automation* manual.

Particularly when using an S7-400 in safety-relevant areas, you should read the information regarding the safety of electronic controllers in the appendix of the *S7-400 Automation system; Hardware and Installation* manual.

### Scope of the manual

The manual applies to components listed below:

- Rack UR2 XTR; 6ES7 400-1JA11-0AA1 FS01
- Rack UR2-H XTR; 6ES7 400-2JA10-0AA1 FS01
- Rack CR3 XTR; 6ES7 401-1DA01-0AA1 FS01
- Power Supply Module PS 405 4A XTR; 6ES7 405-0DA02-0AA1 FS01
- Power Supply Module PS 405 10A R XTR; 6ES7 405-0KR02-0AA1 FS01
- Power Supply Module PS 407 4A XTR; 6ES7 407-0DA02-0AA1 FS01
- Power Supply Module PS 407 10A R XTR; 6ES7 407-0KR02-0AA1 FS01
- Backup Battery 3.6V/2.2 Ah for PS407/405 XTR; 6ES7971-0BA02,  
Read the labeling on the packaging
- CPU 410-5H Process Automation; 6ES7 410-5HX08-0AB0 as of V8.1 FS02

Both 1 and the 2 are checked in the "Product versions" field on the front panel of the

CPU:  $\frac{X|X}{3|4}$

- System Expansion Card 0 POs; 6ES7653-2CH00-0XB0 FS03
- System Expansion Card 100 POs; 6ES7653-2CA00-0XB0 FS03
- System Expansion Card 500 POs; 6ES7653-2CC00-0XB0 FS03
- System Expansion Card 1000 POs; 6ES7653-2CE00-0XB0 FS03
- System Expansion Card 1600 POs; 6ES7653-2CF00-0XB0 FS03

- System Expansion Card 2k+ POs; 6ES7653-2CG00-0XB0 FS03
- Synchronization Module IF 960-H 10m XTR; 6ES7 960-1AA08-0XA0 FS01

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**Note**

All fiber optic cables supplied by SIEMENS can be operated in ambient temperatures from 0 to 70° C. For fiber optic cables not supplied by SIEMENS, make sure that they can also be operated in ambient temperatures from 0 to 70° C.

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## Scope of information

This manual supplements the following manuals:

- *S7-400 Automation System; Hardware and Installation*
- *S7-400 Automation Systems; Module Data*
- *CPU 410-5H Process Automation*

## Recycling and disposal

The hardware components of PCS 7 are suitable for recycling due to their environmentally friendly characteristics. For ecologically compatible recycling and disposal of your old device, contact a certified disposal service for electronic scrap.

## Additional support

Contact your Siemens partner at your local office or agencies if you have any questions relating to the product and do not find the right answers in this manual.

You will find your contact partner at:

Contact partners (<http://www.siemens.com/automation/partner>)

A guide to the technical documentation for the various SIMATIC products and systems is available at:

Documentation ([http://www.automation.siemens.com/simatic/portal/html\\_76/techdoku.htm](http://www.automation.siemens.com/simatic/portal/html_76/techdoku.htm))

The online catalog and online ordering system are available at:

Catalog (<http://mall.industry.siemens.com/>)

## Training Centers

We offer various courses for newcomers to the PCS 7 process automation system. Contact your regional Training Center, or the central Training Center in D-90327 Nuremberg, Germany:

Training ([http://www.sitrain.com/index\\_en.html](http://www.sitrain.com/index_en.html))

## Technical Support

You can contact Technical Support for all Industry Automation products using the Web form for Support Request

Support Request (<http://www.siemens.de/automation/support-request>)

Additional information about our technical support is available on the Internet at Technical Support (<http://support.automation.siemens.com>)

## Service & Support on the Internet

In addition to the documentation, Siemens offers a comprehensive online knowledge base on the Internet at:

Service & Support (<http://www.siemens.com/automation/service&support>)

There you will find:

- The newsletter that provides the latest information about your products.
- The current documentation using the Search function on the Service & Support pages.
- An international forum where users and specialists can exchange their experience.
- Your local contact partner for automation and drive technology in our contacts database.
- Information about on-site services, repairs and spare parts. Lots more is available on the "Services" pages.
- Applications and tools for the optimal use of PCS 7. Performance measurements for DP and PN are published here, for example.

## 1.2 Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. You can find more information about industrial security on the Internet (<http://www.siemens.com/industrialsecurity>).

To stay informed about product updates as they occur, sign up for a product-specific newsletter. You can find more information on the Internet (<http://support.automation.siemens.com>).





## Product combination

### 2.1 The basic system for operation at 70° C

#### Hardware of the basic system

The basic system consists of the hardware components required for a controller. The following figure shows the components in the redundant configuration.

The basic system can be only operated in ambient temperatures from 0 to 70° C if all components used are also approved for this.

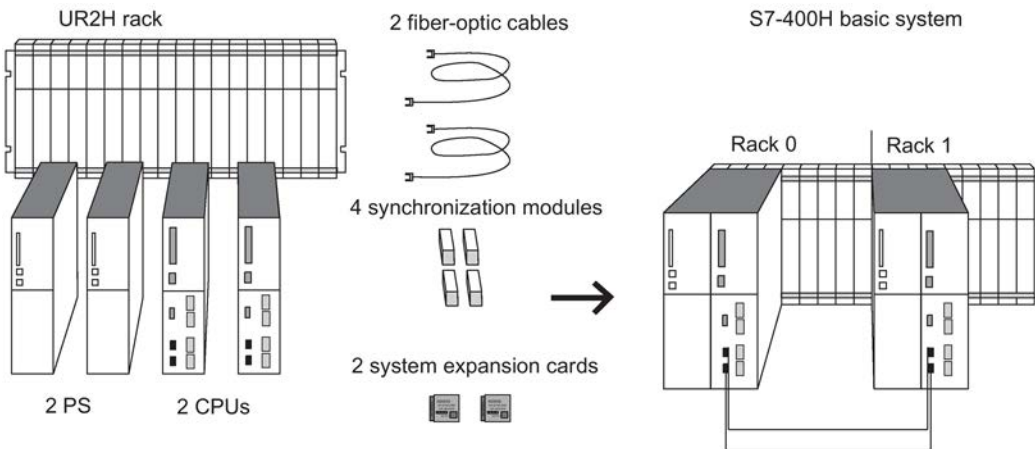


Figure 2-1 Hardware of the basic system in redundant mode

The following figure shows the components in the single mode configuration. In this case as well, the basic system can be only operated in ambient temperatures from 0 to 70° C if all components used are also approved for this.

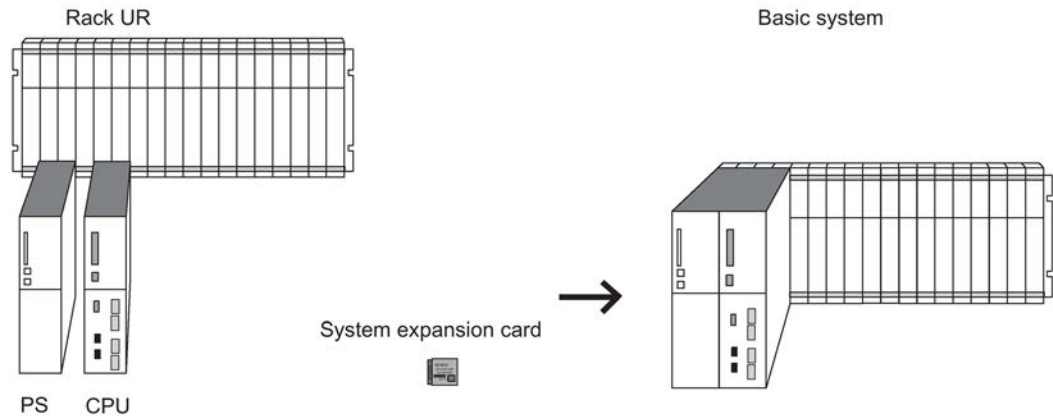


Figure 2-2 Hardware of the basic system in single mode

*2.1 The basic system for operation at 70 °C*

You can find the article numbers of the components that can operate in ambient temperatures from 0 to 70 °C in the section Preface (Page 5). You can find additional information these components in the following sections.

## Product family

### 3.1 Specifications

#### General technical specifications

You can find the following information in the *Automation System S7-400; Module Data* manual:

- The approvals and standards that the S7-400 fulfills.
- Information on electromagnetic compatibility
- The shipping and storage conditions for modules and backup batteries
- The mechanical and climatic ambient conditions for operation

The "Temperature 0 to +60° C" specification is obsolete, 0 to 70° C is the permissible ambient temperature range.

- Specifications for isolation tests, safety class, and degree of protection

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#### Note

You will find the current approvals on the type plate of the respective product.

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#### Specifications for power supply modules and racks

The power supply modules and racks have the same specifications as the corresponding components without the suffix "XTR" in their names. You can find this information in the *Automation System S7-400; Module Data* manual.

#### Specifications of the CPU, SECs and the synchronization module

You can find the specifications of the CPU, SECs and the synchronization module in the *Process Control System PCS 7; CPU 410-5H Process Automation* manual.

### 3.2 Rack

The racks listed below can be operated in ambient temperatures from 0 to 70° C.

#### Rack UR2 XTR; 6ES7 400-1JA11-0AA1 FS01

The UR2 XTR rack is used for configuring central devices. The UR2 XTR rack has both an I/O bus and a communication bus. The UR2 XTR has 9 single-width slots.

**Rack UR2-H XTR; 6ES7 400-2JA10-0AA1 FS01**

The UR2-H XTR rack essentially represents two electrically isolated UR2 XTR racks on the same mounting rail. The main area of application of the UR2-H XTR is in the compact configuration of redundant systems (two devices or systems on one rail profile). The UR2-H XTR has 2x9 single-width slots.

**Rack CR3 XTR; 6ES7 401-1DA01-0AA1 FS01**

The CR3 XTR rack is used for configuring central devices. The CR3 XTR has both an I/O bus and a communication bus. The CR3 XTR has 4 single-width slots.

### 3.3 Power supply modules

The power supply modules and backup batteries listed below can be operated in ambient temperatures from 0 to 70° C.

**PS 405 4A XTR; 6ES7 405-0DA02-0AA1 FS01**

The power supply module PS 405 4A XTR is designed for connection to a DC power supply of 19.2 to 72 V and supplies 5 V DC / 4 A and 24 V DC / 0.5 A on the secondary side.

**PS 405 10A R XTR; 6ES7 405-0KR02-0AA1 FS01**

The power supply module PS 405 10A XTR is designed for connection to a DC power supply of 19.2 to 72 V and supplies 5 V DC / 10 A and 24 V DC / 1 A on the secondary side.

**PS 407 4A XTR; 6ES7 407-0DA02-0AA1 FS01**

The power supply module PS 407 4A XTR is designed for connecting to either an AC power supply of 85 to 264 V or a DC power supply of 88 to 300 V and supplies 5 V DC / 4 A and 24 V DC / 0.5 A on the secondary side.

**PS 407 10A R XTR; 6ES7 407-0KR02-0AA1 FS01**

The power supply module PS 407 10A XTR is designed for connecting to either an AC power supply of 85 to 264 V or a DC power supply of 88 to 300 V and supplies 5 V DC / 10 A and 24 V DC / 1 A on the secondary side.

**Backup battery; 6ES7 971-0BA02**

The 3.6 V / 2.2 Ah backup battery for PS 407/405 XTR enables the configured parameters and the memory contents (RAM) in the CPU to be buffered via the backplane bus when the power supply module is switched off or if the supply voltage fails.

**NOTICE****Note shelf life**

Note that this battery has a maximum shelf life of 3 years. Faultless operation at 70° C cannot be guaranteed for backup batteries that have been stored for more than 3 years. Before installing it, check the printed production date of the backup battery and replace the battery in time if needed.

**3.4 CPU, SECs and synchronization module****CPU 410-5H Process Automation; 6ES7 410-5HX08-0AB0 as of V8.1 FS02**

Both 1 and the 2 are checked in the "Product versions" field on the front panel of the CPU:

$\frac{X|X}{3|4}$

The CPU 410-5H Process Automation is specifically designed for the SIMATIC PCS 7 control system.

**System Expansion Card; 6ES7 653-X**

The number of POs of a CPU 410-5H is stored on a system expansion card (SEC). The following SECs can be operated in ambient temperatures from 0 to 70° C:

- System Expansion Card without process objects; 6ES7 653-2CH00-0XB0 FS03
- System Expansion Card for 100 process objects; 6ES7 653-2CA00-0XB0 FS03
- System Expansion Card for 500 process objects; 6ES7 653-2CC00-0XB0 FS03
- System Expansion Card for 1000 process objects; 6ES7 653-2CE00-0XB0 FS03
- System Expansion Card for 1600 process objects; 6ES7 653-2CF00-0XB0 FS03
- System Expansion Card for 2k+ process objects; 6ES7 653-2CG00-0XB0 FS03

**Synchronization Module 10 m; 6ES7 960-1AA08-0XA0 FS01**

The synchronization modules are used to couple two CPUs in redundant mode. They are installed in the CPUs and interconnected by means of fiber optic cables.

