SIEMENS

SIMATIC

Process Control System PCS 7 V7.0 Service Support and Diagnostics

Manual

11/2006
A5E00783462-01

Safety Guidelines

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 to property damage only have no safety alert symbol. The 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 notice 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 device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel.** Within the context of the safety notices in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:

Warning
This device and its components may only be used for the applications described in the catalog or the technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens.
Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Trademarks

All names identified by ® are registered trademarks of the 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.

Siemens AG
Automation and Drives
Postfach 4848
90437 NÜRNBERG
GERMANY

A5E00783462-01
11/2006

Preface

Purpose of this Documentation

This documentation contains information to support you in the following:

- Performing steps to ensure the availability of a PCS 7 system
- Verifying requirements for effective diagnostics for your PCS 7 system
- Understanding the alarm concept of a PCS 7 system
- Responding appropriately to faults and preparing Detailed information about the state of the PCS 7 system for service experts
- Selecting the correct diagnostic tool, enabling you to perform diagnostics on your PCS 7 system with the help provided

Disclaimer of Liability

Warning

Siemens assumes no liability for inappropriate use of the instructions provided in this documentation or any consequences that might result for the customer.

Warning

- Only trained service employees should be authorized to work on the process control system.
- Always observe the plant-specific rules and government regulations when making changes to your system.
- Observe the plant-specific boundary conditions and adjust the work accordingly.
- Always bear in mind that changes in a system can impact other sections of the system.

Target Audience of this Documentation

This documentation is intended for use by the following trained service personnel (Service Level 1):

- PCS 7 users
- SIMATIC S7 specialists

Required Knowledge

This documentation contains information about working with PCS 7 intended for **trained service personnel.** The following knowledge is required to understand the documentation:

- Basic knowledge of Microsoft Windows operating systems
- Knowledge of the functions and configurations of SIMATIC PCS 7 (Engineering System, PCS 7 Operator Station).
- Knowledge of the functions and configurations of SIMATIC S7 (S7-400, STEP 7)
- Knowledge of the functions and configurations of SIMATIC NET (network components and transmission media)

Important Information about this Documentation

This documentation is a guide for service support. It therefore does not claim to be complete. Due to our lack of knowledge of the particular circumstances in your plant, we **cannot guarantee** the following with this documentation:

- That you will be able to use this documentation to remedy problems yourself.
- That, if service is required (similar to what is presented), the procedure described will not necessarily enable you to find the cause of the fault or to correct the fault.
- That Detailed information about individual hardware or software components is complete.
- That Detailed information about individual hardware or software errors is complete.
- This documentation cannot provide the same expert knowledge as that provided by a service technician or a member of the hotline staff.
- That procedures carried out will not disturb the system.
- That the procedures described can be performed via remote access.

Scope of this Documentation

The documentation applies to the software package *Process Control System; PCS 7 Toolset* as of V7.0.

Note

The PCS 7 Manual Collection DVD contains all PCS 7 software and hardware manuals. You can quickly find important information in this collection by using the navigation interface and the full-text search feature.

Differences Between This and the Previous Version

Below you will find an overview of the most important differences between this documentation and that of the previous version:

- Maintenance station for universal diagnostics/maintenance in PCS 7
  You can find information about this in the section "Full Diagnostics with the Maintenance Station"
- Diagnostics for PROFIBUS PA
  You can find information on this in the section "Diagnostics for PROFIBUS PA".
- Diagnostic tools for the following operating systems:
  - Microsoft Windows XP Professional
  - Windows Server 2003
- Other diagnostic tools:
  - PC DiagMonitor
  - Simatic Shell
  - Microsoft Baseline Security Analyzer (MBSA)
  - BANY PROFIBUS

Conventions

The names of the elements in the software interface in this documentation are presented in the language of the documentation. If you have installed a multi-language package for the operating system and subsequently switch languages, however, some terms may appear in the basic language of the operating system and therefore deviate from the terms used in the documentation.

PCS 7 Glossary

You can find a PCS 7 glossary defining the most important technical terms used in the documentation on the DVD *SIMATIC PCS 7; Manual Collection* or within the PCS 7 software through the help menu of the SIMATIC Manager (menu command **Help > Topics >** "Glossary" button).

Further Support

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

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 at:

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

The online catalog and order system is found under:

http://mall.automation.siemens.com/

Training Centers

Siemens offers a number of training courses to familiarize you with the Process Control System SIMATIC PSC 7. 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

Technical Support

You can reach the Technical Support for all A&D products

- Via the Web formula for the Support Request
  http://www.siemens.com/automation/support-request
- Phone: + 49 180 5050 222
- Fax: + 49 180 5050 223

Additional information about our Technical Support can be found on the Internet pages http://www.siemens.com/automation/service

Service & Support on the Internet

In addition to our documentation, we offer our Know-how online on the internet at:

http://www.siemens.com/automation/service&support

where you will find the following:

- The newsletter, which constantly provides you with up-to-date information on your products.
- The right documents via our Search function in Service & Support.
- A forum, where users and experts from all over the world exchange their experiences.
- Your local representative for Automation & Drives.
- Information on field service, repairs, spare parts and more under "Services".

Contents

1 Safeguarding Availability

1.1 Introduction

Overview

This section presents measures for ensuring availability of a PCS 7 system.

You can information about fault-tolerant systems in the manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*.

The information in this section enables you to perform the following tasks:

- Maintain the specified condition of a system.
  Examples: adhere to maintenance intervals, replace batteries
- Optimize the system and prevent faults
  Examples: update firmware, eliminate possible known sources of errors
- Minimize downtime caused by faults
  Examples: provide backups

Note to Reader

Topics in this section are divided into topic areas. The following information is provided for each topic area:

What?	What is described?
When?	When can you perform this action?
How?	You can find Information on the topic in the section entitled "...".

Contents

Topic Area	Information
Data backup	• **What?:** Information on backing up and restoring data in a PCS 7 system. Backups are necessary if you want to restore the state of a component or configuration (because a hard disk is damaged, for example). • **When?:** You should perform a data backup if changes have been made in a PCS 7 system. • **How?:** You can find information on creating data backups in the section "Options for Data Backup".
Hardware update	A SIMATIC station may switch to STOP mode if you change the hardware. • **What?** Information on how to perform a firmware update and the subsequent configuration steps required. • **When?:** If you want to convert components to a current firmware version (because new functions are to be used or errors must be corrected, for example). • **How?:** You can find information about firmware updates in the section "Hardware Updates".
Software update	A SIMATIC station may switch to STOP mode if you change the software. • **What?** Information on converting projects from older versions to a current version. There are two types of software updates: - Updates that **utilize** the new functions of a new version of PCS 7 - Updates that **do not utilize** the new functions of a new version of PCS 7 • **When?:** - If you want to utilize new functions of a new version of PCS 7. - If you want your PCS 7 projects to always run with the latest software version. - If software corrections necessitate conversion. • **How?:** You can find information about software updates in the section "Software Updates".

1.2 Data backup

1.2.1 Options for Data Backup

Introduction

You can back up project data in a variety of ways and for a variety of purposes, for example, project archiving, image file.

After system failure, you can use a backup to quickly restore the system to its original state.

Recommendations for Increasing Data Security

- Always back up the data in the following cases:
  - After configuration changes
  - Before and after system component upgrades
  - Before and after configuration software upgrades
- Keep at least the three most recent versions of your PCS 7 project.
- Use different storage media for backing up the data.
  Examples:
  - A second hard disk
  - ZIP disk
  - MOD
  - CD/DVD

  This way, data can also be read from another storage medium in the event a device becomes defective.
- You can also back up data on hard disks of PCs in a network. Simultaneous hard disk failures on more than one PC are very unlikely.

Options for Data Backup

The sections below describe the options for backing up data:

Backing up ES project data

- Backing Up Parameter Settings of the SIMATIC Station
- Archiving a PCS 7 Project
- Retrieving a PCS 7 Project
- Archiving and Retrieving a Multiproject
- Archiving Custom Libraries
- Exporting Operator and Display Texts
- Backing Up Custom Functions and Actions

Backing up OS project data

- Backing up OS Configuration Data

Backing up Batch data

- Backing Up Configuration Data
- Generating a Backup
- Restoring Data From a Backup
- Archiving Batches

Backing up the Route Control Data

- Backing Up Configuration Data
- Backing up the Project Data of SIMATIC Route Control
- Restoring Data From a Backup

Creating an image

- Backing Up Data by Generating an Image File

Note

Make sure that backups are stored in a protected location (in separate rooms, fireproof cabinets, etc.).

Make sure the backups are readable (particularly when reusable storage media such as floppy disks are used).

1.2.2 Backing Up ES Project Data

1.2.2.1 How to Back Up Parameter Settings of the SIMATIC Station

Introduction

You can change parameters (such as controller settings) online in the SIMATIC station using the PCS 7 OS and the engineering station.

Some situations make it necessary to back up the current data blocks, FBs or parameter settings from the SIMATIC station. This is the case, for example, when the configuration data have been restored from a data backup.

You can make use of the following backup options:

- Read the data blocks and FBs from the SIMATIC station
- Read charts containing the current parameters from the SIMATIC station

Notice

These actions overwrite all settings in the configuration with the current values of the system. Make sure that the settings for start values, for example, are correctly maintained.

Danger

If you read in the data from the SIMATIC Station, you must ensure that hazardous conditions cannot occur following a hot restart of the system or after configuration data are downloaded.

Reading Out Data Blocks and FBs from the SIMATIC Station

1. Open the project in SIMATIC Manager.
2. Select the menu command **View > Online**.
3. In the tree view, select the data blocks and FBs you want to read from the SIMATIC Station.
4. Select the menu command **Edit > Copy**.
5. Select the menu command **View > Offline**.
6. Select the menu command **Edit > Paste**.

Reading Out Charts with Current Parameters from the SIMATIC Station

1. Double-click any CFC chart in SIMATIC Manager to start the CFC Editor.
2. Select the menu command **Chart > Read Back**.
3. In the "Read Back Chart" dialog box, make the following settings:
   - Sources: Program of the CPU
   - Scope: Operator control and monitoring parameters

Recommendation: back up the project at this point. You can find information on this in the section "How to Archive a Project".

This data backup includes all current parameter settings of the SIMATIC station.

1.2.2.2 How to Archive a Project

Introduction

You can use various tools to archive project data.

The *PKZIP for Windows* program is used in the following for archiving:
You will find the setup for *PKZIP for Windows* on the PCS 7 Toolset DVD.
PKZIP for Windows is automatically installed during the system setup of PCS 7.

You can open *PKZIP for Windows* from the SIMATIC Manager.

Requirement

- A utility for archiving the project data is installed (usually *PKZIP for Windows*).

Making Settings in SIMATIC Manager

1. In SIMATIC Manager, select the menu command **Options > Settings**.
   The "Settings" dialog box opens.
2. Select the "Archiving" tab.
3. Select your "preferred archiving program" from the drop-down list box (*PKZIP for Windows* is the default).
4. Select the following "options":
   - Check options
   - Check target directory on retrieval
5. Click "OK" to accept your entries.

Making Settings in the *PKZIP Software*

If you use *PKZIP for Windows*, which is supplied on the PCS 7 Toolset DVD, the following settings need to be made:

1. In the Start menu, select the menu command **Start > Programs > PKZIP > PKZIP for Windows**.
   PKZIP for Windows opens.
2. Select the menu command **Tools > Options.**
   The "Options" dialog box opens.
3. Select the "Compress" tab.

4. Make the following settings:
   - In the "File Options" group:
     Select the "Include subfolders (recurse)" check box.
     In the "Save folder name" list, select "Relative path".
     In the "Update mode" list, select "Add & Update files".
   - In the "File Attributes" group:
     Select all check boxes.
   - In the "Folders" tab:
     You can specify a default folder for your data backup here.
5. Click "OK" to accept your entries.

Archiving a Project

1. In SIMATIC Manager, select the menu command **File > Archive**.
   The "Archiving" dialog box opens.
2. Select the "User Projects" tab.
3. Click "Browse" and select the project you want to archive from the list.
4. Click "OK" to save your entries.
   The "Archiving - Select Archive" dialog box opens.
5. Make the following settings for the archiving:
   - In the "Save in" list:
     Select the drive and folder.
   - In the "File name" field:
     Enter the name of the file in which the data are to be saved.
6. Click "Save" to accept your entries.
   The "Archive – Options" dialog box opens.
7. If you want to archive the project to diskettes, select the disk size.
   You can find more information about this dialog box by pressing "Help".
8. Click "OK".
   The archive operation starts.

When the "Archiving" dialog box closes, archiving is finished.

Recommendation

After compressing your project in the archive directory (S7 project), you should rename the project in such a way that you can determine the archiving date from the name.
Example: "yearmonthdayprojectname"; 021230name

Note

If you copy the project directly to the CD, all files and directories will be write-protected. Before using the project again, you need to remove the "Write-protected" file attribute for all files and folders in the project.

Backing up Configuration Data

Also back up the following configuration data:

- GSD files (Siemens/STEP 7/S7Data/GSD) to another partition or to another drive
- C scripts of the standard functions

1.2.2.3 How to Retrieve a Project

Requirements

- The utility used for archiving the project is installed (usually *PKZIP for Windows*).
- The settings required for the tool used for archiving the project are made (you can find additional information on this in the section "How to Archive a Project".

Note

You will find the setup for *PKZIP for Windows* on the PCS 7 Toolset DVD. *PKZIP for Windows* is automatically installed during the system setup of PCS 7.

Procedure

1. In SIMATIC Manager, select the menu command **File > Retrieve**.
   The "Retrieving - Select Archive" dialog box opens.
2. Make the following settings for the archive file:
   - In the "Search in" list:
     Enter the drive and folder where the project was archived.
   - In the "File name" field:
     Enter the name of the file under which the project was archived.
3. Click "Open" to save your entries.
   The "Select Destination Directory" dialog box opens.
4. Select the destination directory/project directory in the selection list.
5. Click "OK" to accept your entries.

The retrieval is finished when the "Retrieving" dialog box closes.

1.2.2.4 How to Archive and Retrieve a Multiproject

Introduction

You can store a multiproject in compressed form in an archive file in the same way as individual projects or libraries. This can be done on a hard disk or on transportable storage media (such as a ZIP disk).

If individual projects of a multiproject are stored on more than one PC in a network, you must use the following program to archive the multiproject:

- PKZIP for Windows (available on the PCS 7 Toolset DVD)

Recommendation:
Archive the multiproject on an engineering server.

Requirements for Archiving a Multiproject

- A utility for archiving the project data is installed (usually *PKZIP for Windows*). *PKZIP for Windows* is automatically installed during the system setup of PCS 7.
- Archiving a multiproject is a cross project function. Therefore, no other process can access any of the projects in the multiproject during archiving.

Archiving a Multiproject

1. Select the multiproject in SIMATIC Manager.
2. Select the menu command **File > Archive**.
   The "Archiving" dialog box opens.
3. Select the "User Projects" tab.
4. Confirm the selected multiproject by clicking "OK" to save your entries.
5. Make the following settings for the archiving:
   - In the "Save in" list:
     Select the drive and folder.
   - In the "File name" field:
     Enter the name of the file in which the data are to be saved.
6. Click "Save" to accept your entries.
   The "Archive – Options" dialog box opens.
7. If you want to archive the project to diskettes, select the disk size.
   You can find more information about this dialog box by pressing "Help".
8. Click "OK".
   The archive operation starts.

When the "Archiving" dialog box closes, archiving is finished.

Retrieving a Multiproject

1. In SIMATIC Manager, select the menu command **File > Retrieve**.
2. In the next dialog box, select the archived multiproject.
3. Click "Open" to save your entries.
   The "Select Destination Directory" dialog box opens.
4. Select the directory where the archive should be extracted. Click "OK".
   The multiproject is retrieved.
   After retrieval, the "Retrieve" dialog box opens.
5. Click "OK".
   The following is shown in the "Retrieve" dialog box:
   - Name of the retrieved project
   - Prompt for opening the project
6. Click "Yes" to open project or "No" to stop working.

Result

A subdirectory is automatically created in the destination directory you selected. The subdirectory contains the following:

- By default: The name of the multiproject
- Custom: A unique directory name derived from the name of the multiproject

The following are placed in the subdirectory:

- Multiproject
- Projects contained in the multiproject
- Libraries, including the master data library

Once a multiproject is retrieved, all project directories of the multiproject are located on the same level below this directory.

1.2.2.5 How to Archive Custom Libraries

Introduction

If you have created a custom project library in PCS 7, we recommend that you archive it. Perform the steps below for each library to be backed up.

Procedure

1. In SIMATIC Manager, select the menu command **File > Archive**.
   The "Archiving" dialog box opens.
2. Select the "Libraries" tab.
3. Click "Browse" and select the library you want to archive from the list.
4. Click "OK" to save your entries.
   The " Archiving - Select Archive" dialog box opens.
5. Make the following settings for the archiving:
   - In the "Save in" drop-down list box:
     Drive and folder
   - In the "File name" field:
     Enter the name of the file in which the data are to be saved.
6. Click "Save" to accept your entries.
   The archive operation starts.

1.2.2.6 How to Export Operator and Display Texts

Introduction

To visualize the process on the operator station you use faceplates, which show the plant operator the measured values, operating limits, units, and operator texts of the blocks, for example.

If you have changed operator or display texts in your blocks, we recommend that you back up the operator and display texts.

Exporting Operator and Display Texts

The SIMATIC Manager allows you to export information from parameters, signals and messages to a file *.csv format).

You can edit this file in standard Office applications (such as MS Excel, MS Access).

The same mechanisms that are used for converting to project-specific languages are used for the export.

Requirement

PCS 7 allows you to store all operator and display texts in every desired language. The only requirement is that the language is installed in your project:

- The languages available in SIMATIC Manager can be displayed via the menu command **Options > Language for Display Devices**.
- The number of languages offered is specified when Windows is installed (system characteristics).

Procedure

1. Open the project in SIMATIC Manager.
2. In the Component view, select the master data library (or, if not available, the project folder).
3. Select the menu command **Options > Manage Multilingual Texts > Export**. The "Export User Text" dialog box opens.
4. Make the following settings:
   - Under the "Text Tables" section, specify the storage location and the format of the export file (possible formats: *.xls and *.csv).
   - In the "Language" group, set the source and target languages in accordance with your display language.
5. Click "OK".
6. If you have to manage several project-specific languages, repeat steps 3 to 5 for each language. Please note that you then have to set different export file names or target directories.

1.2.2.7 How to Back Up Custom Functions and Actions

Introduction

PCS 7 enables you to create dynamic sequences in your OS project by creating custom functions and actions. These functions and actions are written in ANSI-C language.

You must back up any project functions, standard functions, local actions, and global actions that you have created or modified.

Project and Standard Functions

Project functions and standard functions have file names with the extension *.fct. By default, PCS 7 places these functions in the following folders:

- Project functions are placed in the "\library" folder of the OS project.
- Standard functions are placed in the "\aplib" folder in the installation directory of PCS 7.

Local and Global Actions

Local and global actions have file names with the extension *.pas. By default, PCS 7 places these actions in the following folders:

- Local actions are placed in the "\<Name of PC>\Pas" folder of the project directory.
- Global actions are placed in the "\Pas" folder of the OS project.

Additional information

- Online help for *WinCC Information System*

1.2.3 Backing Up OS Project Data

1.2.3.1 Backing Up Configuration Data

Introduction

When you archive a multiproject, the configuration data of the PCS 7 operator station is saved automatically. A separate backup is unnecessary.

Backing Up OS Configuration Data

The configuration data for PCS 7 Operator Station are saved by default in the following folder: **...\Siemens\WinCC\WinCCProjects**.

To back up data, compress the project paths in this folder and save them on a suitable medium (such as a CD).

Backing Up OS PC Data

The OS configuration data are located on the PCS 7 engineering station. You therefore back up OS server PCs or OS client PCs with an image. You can find information on this in the section "Backing Up Data by Generating an Image File".

1.2.4 Backing Up Batch Data

1.2.4.1 Backing Up Configuration Data

Options for Data Backup

SIMATIC BATCH offers several options for backing up and restoring project data.

Data	Menu command for backup operation	Menu command for restore operation
• Materials • Libraries • Basic recipes • Formula categories • Formulas • Orders • Permissions and roles • User settings (1) • Project settings	**Options > Backup** You can find information on this in the section "How to Generate a Backup". (2)	**Options > Restore** You can find information on this in the section "How to Restore Data From a Backup". (3)
• Completed batches	Select batch(es), select **Archive** on the context menu You can find information on this in the section "How to Archive Batches".	-

(1) "User settings" can only be backed up in a database copy.

(2) You save the data to a database copy or an SBB file (compressed XML file).

(3) You restore the data from a database copy or an SBB file (compressed XML file).

Additional information

- Manual *Process Control System PCS 7; SIMATIC BATCH*

1.2.4.2 How to Generate a Backup

Elements of the Backup

You can back up all configured data with the **Backup** command. The backup includes the following elements:

- Materials
- Libraries
- Basic recipes
- Formula
- Permissions and roles
- Project settings

Rule

Notice

The follow applies when a backup is running:

Operator input cannot be executed on the BATCH client where a backup is being generated.

Procedure

1. Select the multiproject/project in SIMATIC Manager.
2. Select the menu command **Options > SIMATIC BATCH**.
   The "Batch Process Cell" dialog box opens.
3. In BatchCC, select the menu command **Options > Backup**.
4. If there are unarchived batches in the project, you need to confirm the message dialog for unarchived batches. In this case, click "OK".
   The "Backup" dialog box opens.
5. Enter the name of the backup file in the "File name" input box.
6. Click "Save".
   The backup file is created.

1.2.4.3 How to Restore Data from a Backup

Introduction

You reconstruct the data from a backup file and update the Batch process cell in the SIMATIC BATCH Control Center (BatchCC).

Requirement

There is no Batch process cell in the BatchCC.

Read Backup

1. Select the multiproject/project in SIMATIC Manager.
2. Select the menu command **Options > SIMATIC BATCH**.
   The "Batch Process Cell" dialog box opens.
3. In BatchCC, select the menu command **Options > Restore**.
   The "Restore" dialog box opens.
4. Select the backup file.
5. Click "Open".
   The backup file is read.

Updating the Batch Process Cell

1. Select the batch process cell in the tree view of BatchCC.
2. Select the menu command **Edit > Update Process Cell**.
   The "Select a process cell" dialog box opens.
3. Click "OK".
   The "Update process cell" dialog box is displayed.
4. Compare the columns "Current process cell" and "New process cell" row by row. Rearrange them if necessary.
   You can find additional information about this in the manual *Process Control System PCS 7; SIMATIC BATCH*.
5. Click "OK".
   The "Updating process cell" dialog box opens and automatically closes with the update is completed.

Result

The data from a backup file are entered in a Batch database in the BatchCC and the process cell is made available again.

1.2.4.4 How to Archive Batches

Long-term Archive

You archive batches in long-term archives in BatchCC. Long-term archives are used for long-term storage of batch data in accordance with the FDA.

Rules

- You can only archive completed batches.
- The archiving method and archiving path are set.
- Data from long-term archives cannot be used to restore defective batch data or batch structures.

Archiving Individual Batches

You archive a **single** completed batch as follows:

1. Select the batch to be archived in the tree view.
2. Open the context menu (by right-clicking) and select the menu command **Archive**.

Archiving Multiple Batches

You archive **multiple** completed batches as follows:

1. Right-click to open the "Details" shortcut menu and select batch overview list.
2. Select the batches to be archived.
3. Open the context menu (by right-clicking) and select the menu command **Archive**.

1.2.5 Backing Up SIMATIC Route Control Data

1.2.5.1 Backing Up Configuration Data

Options for Data Backup

SIMATIC Route Control offers the following options for backing up and restoring project data.

- You can backup the project data from SIMATIC Route Control together with a PCS 7 project.
  You can find additional information about this in the section "How to Archive a Project".
- You can generate an image of the partition on which the project database is located.
- You can export/import the partial routes from SIMATIC Route Control.
  You can find additional information about this in the section
  "How to Back Up SIMATIC Route Control Project Data"

Additional information

- Manual *Process Control System PCS 7; SIMATIC Route Control*

1.2.5.2 How to Back Up SIMATIC Route Control Project Data

Introduction

This section describes a separate backup of partial routes from SIMATIC Route Control to a file.

Note

You can backup the partial routes with offline project data from SIMATIC Route Control. The interface blocks are part of the PCS 7 project and are archived along with the PCS 7 project.

Preparing the Database Backups

Before performing a backup, you must always carry out the following steps in Route Control engineering:

- Check the database consistency via the menu command **Options > Check Consistency**.
- Compress the database via the menu command **Options > Compress Database**.

Creating a Backup

1. Select the multiproject/project in SIMATIC Manager.
2. Select the menu command **Options > SIMATIC Route Control > Engineering**.
   The "Route Control-Engineering - ..." dialog box opens.
3. Select the menu command **Options > CSV Export/Import > CSV Export/Import Assistant ...**.
   The dialog box "Wizard: CSV file data exchange (Export/Import)" opens.
4. Check the path in the "Directory" input box.
5. Activate the "RC project engineering >> CSV file(s) (Export)" check box in the "Direction" group.
6. Click "Next".
7. Select all check boxes.
8. Click "Next".
9. Click "Finish".
   The files are exported.

Additional information

- Manual *Process Control System PCS 7; SIMATIC Route Control*

1.2.5.3 How to Restore Data from a Backup

Introduction

You reconstruct the partial routes from SIMATIC Route Control from a backup file.

Importing a Backup

1. Select the multiproject/project in SIMATIC Manager.
2. Select the menu command **Options > SIMATIC Route Control > Engineering**.
   The "Route Control-Engineering - ..." dialog box opens.
3. Select the menu command **Options > CSV Export/Import > CSV Export/Import Assistant ...**.
   The dialog box "Wizard: CSV file data exchange (Export/Import)" opens.
4. The dialog box "Wizard: CSV file data exchange (Export/Import)" opens.
5. Check the path set in the "Directory" input box.
6. Activate the "CSV file(s) (Import) >> RC project engineering" check box in the "Direction" group.
7. Click "Next".
8. Select all check boxes.
9. Click "Next".
10. Click "Finish".
    The configuration data is read.

Additional information

- Manual *Process Control System PCS 7; SIMATIC Route Control*

1.2.6 Creating an Image

1.2.6.1 Backing Up Data by Generating an Image File

Introduction

We recommend that you generate an image of the installation in order to back up partitions and hard disk data (following a reinstallation, for example).

Image File

An image file maps all of the data on the backed-up medium (hard disk, logical drives). It is used to back up data on partitions or hard disks. Many of the software packages that can be used to generate image files also offer data compression.

Boot partitions are included in the backup. This enables you to save all the PC settings including the Windows system settings.

All the data of a PC can be restored using an image file, usually in a short amount of time (e.g., 2 GB in approx. 15 minutes). In the event of a fault, you can restore the complete PC installation.

Rules

- You must use the **same hardware** to restore data.
- Note the following hard disk settings for the image file (you can find additional information on this in the section "Managing the Operating System"):
  - Partition size
  - Formatting of partition or hard disk (e.g., NTFS, FAT32)
- Authorizations and license keys cannot be included in the backup.
- The image software must be suitable for the operating system in question.

Basic Procedure

1. Move the authorizations and license keys to another medium (diskette, partition, etc.) before generating the image.
2. Follow the image software manufacturer's instructions to create an image.

Additional information

- Documentation relating to the image software used

1.2.7 Comparing Project Versions

1.2.7.1 Comparing Project Versions with VXM

Version Cross Manager (VXM)

The Version Cross Manager is a standalone application which can purchase as an add-on. The Version Cross Manager enables you to find the differences between two user programs quickly and surely. This allows you to detect whether changes have been made to the user program, and what those changes are.

Overview

Comparison of	Detailed information	Called with	Additional information
Changes to different project versions in the user program	CFC charts SFC charts	**Start > SIMATIC > STEP 7 > VXM - Compare Versions**	Configuration manual *Process Control System PCS 7; Engineering System* Online help *Version Cross Manager*
User programs based on XML files (for synchronizing process-control project data with planning data, for example)	CFC charts SFC charts	Version Cross Manager • Generate XML file using **File > Export**. • Compare XML files using **File > Compare With XML File...**.	Online help *Version Cross Manager*

1.3 Hardware Update

1.3.1 Hardware Updates

Introduction

In this section, a hardware update refers to loading new firmware in SIMATIC modules. Loading new firmware in a SIMATIC module is referred to as a "firmware update" in the following.

A firmware update includes the following:

- Function upgrades
- Operating system enhancements

Released Modules

You can learn about the firmware versions of modules released for a PCS 7 version in the documentation "PCS 7 Released Modules" for the respective version.

Reasons for a Firmware Update

A firmware update for a SIMATIC module may be needed if you wish to use new functions or correct errors.

Checking the Current Revision or Firmware Version for a Module

You may need to check the revision or firmware version of a module in the following situations:

- When you replace a module (because it is defective, for example)
- When you wish to use new functions after changing the configuration

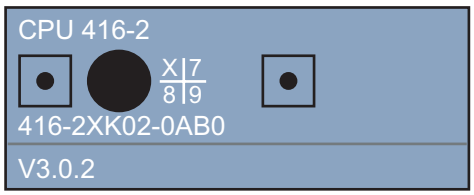
Compare the document *PCS 7 - Released Modules* for older PCS 7 versions to find out which PCS 7 version first included the feature.

Recognizing the Revision or Firmware Version

Update-capable modules:

- You will see the following codes for update-capable modules:
  - The revision is indicated by a cross (in the following example: revision 6).
  - The original version of a firmware is show in text (in the following example: V3.0.2).

Example:

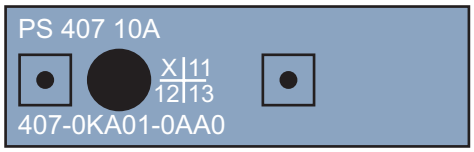


- In the firmware update package you receive a label, which you can paste over the currently shown firmware version. When the firmware update is completed, you should change the specified firmware version of the module to reflect the information for the new firmware version. This will ensure uniform plant documentation.

Non-update-capable modules:

- When only the manufacturer can make changes to a module, only the revision is indicated on the housing of the module (indicated by a cross; in the following example: revision 10).

Example:



Recommendation for Performing Firmware Updates

Perform these firmware updates at regular intervals when an opportunity presents itself (such as during a scheduled plant shutdown).

Reference Sources for the Latest Firmware Version

The update file with the latest firmware versions can be obtained from your Siemens representative or the Internet:

Internet address: www.ad.siemens.com/support

If you cannot access the Internet address, contact Technical Support.

Note

The update file may be in an executable, self-extracting file (EXE file). When performing consecutive updates for various module types or module versions, you must extract the files in separate folders that differ in the following ways:

- Type of module
- Revision
- Firmware version

Overview

The sections below describe topics related to hardware updates:

- Adjustments After a Hardware Change
- Updating a SIMATIC S7 CPU
- Updating an Interface Module IM xxx
- Updating a CP xxx
- Working with GSD Files

1.3.2 How to Make Adjustments after a Hardware Change

Basic Procedure

A change to the hardware always requires a change to the software. You configure the modified hardware in HW Config, after which you then compile and download the changes to the CPU. You can then physically replace, remove or add the modified hardware.

Procedure

1. In HW Config, open the project (AS).
2. Drag the object (for example, CPU: Type, Firmware Version x.x) from the hardware catalog to the corresponding slot in the configuration table of the AS. The following message appears: "Do you want to replace component ...with component ...?"
3. After verification, click "Yes" to confirm.
4. Select the menu command **Station > Save/Compile**.
   The compile operation can also be performed during the concluding steps.

1.3.3 Updating the CPU

1.3.3.1 Updating a SIMATIC S7 CPU

Preparation

Compare the type and revision of the deployed CPU modules to the documentation *Process Control System PCS 7; Released PCS 7 Modules.*

If replacement of the CPU is required, contact your Siemens representative.

Firmware Update for H-CPUs

Note

A uniform hardware version and the same revision must always be ensured for the H-CPUs of a fault-tolerant PCS 7 system.

It is necessary to place both H-CPUs in STOP mode for a firmware update.

Update-capability of CPUs

You perform the firmware update using an S7 memory card. This is referred to simply as a memory card in the following.

Component	Updating CPU S7-400	Updating CPU S7-400H
PC with external EPROM burner or programming device for programming the memory card	X	X
2 MB S7 Memory card - Order No. 6ES7 952-1KL00-0AA0	X	-
4 MB S7 Memory card - Order No. 6ES7 952-1KM00- 0AA0	X	X
STEP 7	X	X
Files for the firmware update (available on the Internet).	X	X

1.3.3.2 How to Perform a Firmware Update of the CPU

Notes about the Firmware Update

The procedures for firmware updates is described below using the CPU 416-2 (6ES7 416-2XK02-0AB0) as an example.

Preparation

Compare the type and revision of the deployed CPU modules to the documentation *Process Control System PCS 7; Released PCS 7 Modules.*

If replacement of the CPU is required, contact your Siemens representative.

Requirements

The following requirements must be met for the update:

- STEP 7 V5.3 or later is installed on the programming device or PC.
- The update file for the firmware update is available on the programming device/PC.

Loading the Memory Card for Updating the CPU Firmware

1. Clear the memory card by selecting the menu command **File > S7 Memory card > Delete**.
2. In SIMATIC Manager, select the menu command **PLC > Update Operating System > Set Destination Directory**.
3. Set the destination directory.
4. Select the file CPU_HD.UPD.
5. Click "Open".
   This starts programming the memory card (downloading the firmware).
   Upon completion, the "Operating System Update" message dialog box indicates that the download of the firmware on the memory card has been executed.
6. Click "OK".

Performing the CPU Firmware Update

Notice

With the next steps, all data on your CPU are deleted and cannot be recovered!

Do not cancel a download operation once it is started. If the download operation aborts, you can repeat it. If defects occur as a result of the abort, send the CPU in for repair.

1. Switch off the power supply (PS) of the rack where the CPU is inserted.
2. Insert the prepared memory card into the CPU.
3. Switch on the power supply of the rack.
   The firmware is transferred from the memory card to the internal CPU FLASH EPROM.
   During the transfer, all display LEDs on the CPU are illuminated (INTF, EXTF, FRCE, CRST, RUN, STOP).
   After approximately 2 minutes, a slowly flashing STOP LED (=> request for general reset on the system side) signals completion of the CPU firmware update.

Notice

Following the CPU update, an H-CPU starts a self test, which can last several minutes depending on the memory configuration.

4. Switch off the power supply of the rack.
5. Remove the memory card that was used for the CPU update and insert the memory card intended for CPU operation into the CPU, if one is provided.
6. Switch on the power supply of the rack.
   The CPU automatically performs a memory reset and is then ready for operation.

1.3.4 Updating an Interface Module

1.3.4.1 Updating an Interface Module (IM)

Introduction

The interface modules (IM) are the interfaces to the PROFIBUS DP in PCS 7.

Preparation

- Compare the type and version of the deployed interface modules to the documentation *PCS 7 - Released Modules*.
- If replacement of the interface module is required, contact your Siemens representative.
- A firmware update is possible for some interface modules. You will find the procedure to be followed below, in the section "How to Perform a Firmware Update of an IM".

Update-capability of Interface Modules or Interface Modules after Couplers

You can update the firmware of the following components (interface modules or interface modules after couplers) update:

Components	Order Number	As of firmware version
IM 153-2	6ES7 153–2Bx00–0XB0 and higher	
IM 152-1	6ES7 152-1AA00-0AB0	V2.02
Y Coupler	6ES7 197–1LB00–0XA0	
Y Link	6ES7 197–1LA01–0XA0	
DP/PA Link	6ES7 157–0AA82–0XA0	V4.x

Firmware Update for SIMATIC Stations with Redundant Interface Modules

Note

For SIMATIC 400H stations with redundant interface module, you can update the firmware of the interface modules in runtime.

1.3.4.2 How to Perform a Firmware Update for an Interface Module (IM)

Introduction

This section describes the firmware update for interface modules (IM) via Industrial Ethernet.

Requirements

The following is required to perform the update via Industrial Ethernet:

- STEP 7 V5.3 or later is installed on the programming device or PC.
- The update file for the firmware update is available on the programming device/PC.
- The CP 443-1 is routing-capable (in HW Config check: Properties of the CP > description entry "Routing" is present).
- The files containing the current (new) version of the firmware is available in the file system of your programming device or PC.
- The IM is integrated in the PCS 7 project.

Procedure

1. Open SIMATIC Manager.
2. In the Component view, select the SIMATIC station in which the IM is located.
3. Double-click the "Hardware" object in the detail window.
   HW Config opens.
4. Select the IM whose firmware you want to update.
5. Select the menu command **PLC > Update Firmware**.
   The "Update Firmware" dialog box opens.
6. Make the following settings:

Setting	Action
Location of firmware file	1. In the "Firmware File" group, specify the folder where you placed the file for the firmware update. If you want to search, you can use "Browse" to open Explorer.
Activation of "new" firmware	2. Use the "Activate firmware after download" check box to specify when the "new" firmware is to be activated as follows: - Select the "Activate firmware after download" check box if you want the IM to automatically reset after successfully downloading the new firmware. The new firmware is active following the restart. - Clear the "Activate firmware after download" check box if you do not want the IM to reset after downloading the new firmware. The "new" firmware becomes active only after the power supply has been switched off.

7. Click "Execute". The firmware is updated.

Firmware Update in the Redundant System

After the firmware update of the active IM, the "RESET" automatically triggers the switchover of the two IMs.

You can now update the second IM in the redundant system. Each IM must be updated separately.

Updating the Identifier

Note

After the firmware update of the IM has been successfully completed, update the identifier of the firmware version. You can find information about this in the section "Updating the Hardware ".

1.3.5 Updating a CP xxx

1.3.5.1 Updating a Communication Processor (CP)

Introduction

In PCS 7, communication modules (CPs) are used to connect a SIMATIC station to bus systems. By updating the firmware, you can enhance the CP properties without replacing the hardware.

Update Capability of CPs

The specific properties of a module are retained when there is a firmware update. The CP type is not changed by a firmware update.

CP type	Update capability	Order number
CP 341	Can be updated in all versions	
CP 443-1	Can be updated in all versions	
CP 443-5 Extended	Can be updated in all versions	

Overview

The sections below describe procedures for updating firmware:

- CP 341 Firmware Update
- CP 443-1 Firmware Update
- CP 443-5 Extended Firmware Update

1.3.5.2 How to Perform a Firmware Update of the CP 341

Introduction

This section describes how to update the firmware for CP341.

Preparations

- Compare the type and version of the modules you are using with the information in the document *PCS 7 - Released Modules.*
- If you need to replace the CP, contact your Siemens representative.

Requirements for the Firmware Update

- STEP 7 V5.3 or later is installed on the programming device or PC.
- The update file for the firmware update is available on the programming device/PC.
- The software package "Configuration package for point to point communication" V5.0 or later is installed (supplied with the CP).
- The valid parameter assignment is stored in HW Config and has been downloaded to the CPU.

Procedure

1. Open SIMATIC Manager.
2. In the Component view, select the SIMATIC station in which the CP 341 is located.
3. Double-click the "Hardware" object in the detail window.
   HW Config opens.
4. Double-click on the CP whose firmware you wish to update.
   The "Properties" dialog box for the CP opens.
5. Open the "General" tab.
6. Click "Parameters ...".
   The dialog box for the parameter assignment interface opens.
7. Select the menu command Options > Firmware Update ...
   - If the CP is available, the firmware version of the current module firmware is indicated (Vx.y.z).
   - If there is no firmware on the CP, a message to that effect is displayed. This can occur, for example, if the firmware update was aborted. The old firmware is deleted in this case. You must download a firmware.

8. In the "Firmware File" group, specify the folder where you placed the file for the firmware update. If you want to search, you can use "Browse" to open Explorer.
   The version of the selected firmware is displayed under "Selected FW Version".
9. Switch the CPU to STOP.
10. Click "Download Firmware" to start the download procedure for the CP.
11. Click "Download Firmware" to confirm the download procedure.
    If you click "Cancel", the download is aborted. The module will not be operational if this happens.
    Restart the firmware download to make the module operational again.

Note

Before deleting the older firmware, the CP checks if the order number of the firmware to be downloaded is permitted.

Result

The new firmware is saved in the operating system memory of the CP. The progress of the installation is indicated by a progress bar and a percentage under "Done". Once the firmware update is complete, the module is ready for immediate operation.

1.3.5.3 How to Perform a Firmware Update of the CP 443-1

Preparation

- Compare the type and version of the modules you are using with the information in the document *PCS 7 - Released Modules.*
- If you need to replace the CP, contact your Siemens representative.

Requirements for the Firmware Update

- STEP 7 V5.3 or later is installed on the programming device or PC.
- The update file for the firmware update is available on the programming device/PC.
- Ethernet card (CP 1613, 3COM network adapter, for example)

Determining the MAC Address of the CP 443-1

When updating firmware, you must know the current MAC address of the CP 443-1.

1. Open SIMATIC Manager.
2. In the Component view, select the CP 443-1 for which the firmware is to be updated from below the SIMATIC station.
3. Select the menu command **CPU > Diagnostics/Settings > Module Information**.
4. Click "Special Diagnostics".
   The NCM S7 diagnostics tool opens.

Note

If the NCM S7 diagnostics do not start, the connection between the programming device/PC and the CP 443-1 is faulty. Correct the fault.

---

5. Note the MAC address setting of the CP 443-1 under "Industrial Ethernet".

Performing the Firmware Update

Notice

- A warning message appears before the download operation begins if an incorrect CP type has been inadvertently addressed. The firmware can nevertheless be downloaded to an incorrect CP type if the message is acknowledged.
- With the next steps, all data on your CP are deleted and cannot be recovered!
- Do not cancel a download operation once it is started. The CP may no longer be usable if you do this and you will have to send it in for repair.

1. Select the menu command **Start > SIMATIC > STEP 7 > NCM S7 Industrial Ethernet > Firmware Loader**.
   The Firmware Loader dialog box opens.
2. Click "Next".
3. In the dialog box "Step 1set the path for the update file:
   - Click "Browse".
   - Use "Select file" to select the desired file ("<drive>:\TEMP\Cp4435ba.fwl", for example).
   - Click "Open".
4. Click "Next".
5. In the dialog box "Step 2", set the **MAC address**.
6. Click "Next".
7. Check the following settings:
   - "Application access point"
   - "Interface parameter assignment used"
8. Make sure that the correct settings have been activated in the configuration console.

Note

The access point must be set to "S7ONLINE CP xxxx(ISO)".

9. Activate the firmware update by clicking "Download".
   The update operation takes approximately 1 minute.

Procedure when a download error occurs

If the download operation was terminated by an error, no LED is lit on the CP.

1. Switch the power supply of the rack off and on again.
2. Repeat the load operation.

If the CP responds to the download start, but the download operation does not finish properly, it could be that:

- The same address has been assigned more than once on the plant bus.
- The load on the plant bus is too high.

Note

If a CP does not respond to a load procedure via the configured MAC address, load the CP again via the imprinted address.

1.3.5.4 How to Perform a Firmware Update of the CP 443-5 Extended

Preparation

- Compare the type and version of the modules you are using with the information in the document *PCS 7 - Released Modules.*
- If you need to replace the CP, contact your Siemens representative.

Requirements for the Firmware Update

- STEP 7 V5.3 or later is installed on the programming device or PC.
- The update file for the firmware update is available on the programming device/PC.
- MPI cable

Note

Ensure the following for the firmware update of the CP 443-5 Extended:

- If you wish to connect devices that work with the PROFIBUS DPV1 standard to your PCS 7 plant following the update, you must replace the hardware (new type of CP type: 6GK7 443-5DX03-0XE0 with firmware version V5.1)
- This hardware requires special device drivers.
  You can find information about the device drivers in the manual *Process Control System SIMATIC PCS 7; Programming Instructions - Creating Blocks for PCS 7*.

Preparing for the Firmware Update

1. Make sure that the update files required for the firmware update are available on the programming device or PC.
   Files for the firmware update are available on the Internet. You can find information on this in the section "Hardware Updates".
2. Switch off the power supply (PS) of the rack where the CP is inserted.
3. Use an MPI cable to establish a direct connection between the MPI interface of your programming device or PC and the PROFIBUS interface of the CP.
4. Switch on the power supply of the rack and the programming device or PC.

5. Select the menu command **Start > Settings > Control Panel > Set PG/PC Interface**.
   You use this to establish the access path to the CP 443-5 Extended.
   Example: Make the following settings for the CP 5611 (FOC):·
   - Select "FWL_LOAD" as the "Application access point" to the CP 443-5 Extended.
   - Select the MPI interface with the supplement "(FWL)" as the interface.
6. Click "OK".
7. Make sure there are no active applications on your programming device.
8. Restart the interface.

Performing the Firmware Update

Notice

- With the next steps, all data on your CP are deleted and cannot be recovered!
- Do not cancel a download operation once it is started. The CP may no longer be usable if you do this and you will have to send it in for repair.

1. Select the menu command **Start > SIMATIC > STEP 7 > NCM S7 > Firmware Loader**.
   The Firmware Loader dialog box opens.
2. Click "Next".
3. In the dialog box "Step 1 set the path for the update file:
   - Click "Browse".
   - Use "Select file" to select the desired file ("<drive>:\TEMP\Cp4435ex.fwl", for example).
   - Click "Open".
4. Confirm the next three dialog boxes that appear with "Next" unit you reach "Step 4: Perform Download".

5. Follow the instructions given in the dialog box "Step 4: Perform Download". In the table below you will find the download operation states that are displayed.

Where	Display	State
On the PG/PC in the Firmware Loader dialog box	The bar in the dialog box changes.	Download procedure is running.
On the PG/PC in the Firmware Loader dialog box	The message "Download completed successfully" is displayed.	Download procedure is complete.
CP 443-5 Extended	The CP RUN LED flashes.	Download procedure is running.
CP 443-5 Extended	The CP STOP LED is lit.	Download procedure is complete.

6. Switch off the power supply of the rack.
7. Click "Cancel" to close the dialog box.
8. Reestablish the original PROFIBUS connection.
9. Switch on the power supply of the rack.
   The CP conducts a self-test and is then ready for operation.

Procedure when a download error occurs

If the download operation was terminated by an error, no LED is lit on the CP.

1. Switch the power supply of the rack off and on again.
2. Repeat the load operation.

1.3.6 Working with GSD Files

Introduction

STEP 7 Version 5 carefully checks GSD files. Syntax errors or non-interpretable errors can occur with GSD files from an older project, however.

Improved help texts are provided for syntax errors and GSD problems starting with STEP 7 Version 5.1 SP2.

If the following measures are not successful, contact the device manufacturer and request a new GSD file. You can find solutions for some errors in this table:

Troubleshooting

When Error Occurs	Error message	Source of Error	Remedy
During insert operation	In the 'SIMATIC 400(1)' station, the transmission rate of '187 5 Kbps' is not supported by the 'MBK-P' station.	The entry '187.5_supp = 1' is not present.	1. Contact the device manufacturer.
Install a new GSD	The path\file name of the GSD file contains a syntax error. File cannot be interpreted.	Vendor_Name: The number of characters between the quotation marks must not exceed 32; special characters are not allowed.	1. Create a backup copy of the file and open it with a text editor (such as WordPad) 2. Check Vendor_Name. 3. Make corrections to the name, save the file and link it again.
Determine the names of the GSD files and the path: via the object properties of the DP slave	In the 'SIMATIC 400(1)' station, the transmission rate of '187.5 Kbits/s' is not supported by the "MBK-P' station.	The decimal separator in the transmission rate must be a period and not a comma.	1. Create a copy of the file. 2. Open the original file with a text editor (such as WordPad). In transmission rate, change '187,5_supp = 1' to '187.5_supp = 1'). 3. Start HW Config by selecting the menu command **Options Update Catalog**. **Note:** If the entry '187,5_supp = 1' is not present, the transmission rate is not supported. Contact the device manufacturer.

1.4 Software Update

1.4.1 Software Updates

Information

- You can find information on updates for the PCS 7 software in the manuals *Process Control System PCS 7; Software Update*.
- You can find information about updating redundant operator stations in runtime in the manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*, under the section " Guidelines for Updating a Redundant OS in Runtime".
  You can find a brief overview of this topic in this documentation in the section "Updating the PCS 7 OS in Runtime".
- Information on installing hot fixes are included in the respective software package with the hot fix.

Note about Software Updates

Note

Note that you must use the appropriate hardware in order to take advantage of features in new software versions.

You can find information on the minimum requirements for PC stations in PCS 7 in the manual *Process Control System PCS 7; PC Configuration and Authorization.*

1.5 Updating the PCS 7 OS During Running Operation

1.5.1 Updating the PCS 7 OS in Runtime

Introduction

If you configure a PCS 7 OS with redundance, you can update the PCS 7 OS in runtime, which allows you to adapt your existing Process Control System PCS 7 from an "older" version to a "newer" PCS 7 version).

Updating the PCS 7 OS involves the following tasks:

- Preparatory measures
- Installation of the "new" software
- Commissioning measures required to adapt you existing PCS 7 process control system

Updating the PCS 7 OS in runtime offers the following benefits:

- Operation of the PCS 7 system is not disrupted.
- The AS does not enter STOP mode.
- The automation process can still be operator controlled and monitored.

Guide to Updating the PCS 7 OS in Runtime

You can find a guide to updating a redundant OS in runtime in the documentation below.

Scenario	Information can be found in ...	Section ...
Updating the PCS 7 OS in runtime (updating the software, for example) **Requirement:** redundant OS	Configuration manual *Process Control System PCS 7; Fault-tolerant Systems*	Guide to Updating the PCS 7 OS in Runtime: • Phase 1: Updating the standby server • Phase 2: Updating OS clients connected to the standby server • Phase 3: Downloading connections, gateways and changes to the AS • Phase 4: Updating OS clients connected to the master server • Phase 5: Updating the master server

2 Checking Diagnostics Requirements

2.1 Requirements for Diagnostics

Requirements

Several requirements must be fulfilled to ensure that the status of a PCS 7 system can be diagnosed effectively. The most important requirements are:

- Diagnostics are enabled for the components.
- Diagnostic options were activated during configuration

Information on Configuring the Diagnostic Options

The primary configurations can be found in the following documentation:

- Configuration manual *Process Control System PCS 7; Engineering System*
- Configuration manual *Process Control System PCS 7; Operator Station*

You can search for information in the index of these manuals by entering "Diagnostics ..." as a key word.

Checking PC Components

- You can check PC components using software resources of PCS 7 (for example, maintenance station or PC DiagMonitor) and the operating system.
- The following configuration actions assist you in diagnosing PC components:

Configured Element	Reference
Lifebeat monitoring	Configuration manual *Process Control System PCS 7; Operator Station*
Diagnostic screens for PC diagnostics	Configuration manual *Process Control System PCS 7; Operator Station*
WinCC "System Info" channel	Online help for *WinCC Information System*, "Communication > System Info"
Diagnostics for systems with redundant OS PCs	Configuration manual *Process Control System PCS 7; Operator Station*

Checking Module Properties

1. Open the project in SIMATIC Manager.
2. In the Component view, select the SIMATIC station.
3. Double-click the "Hardware" object in the detail window.
   HW Config opens.
4. Double-click the module you wish to check.
   The properties dialog box for the selected module opens.
5. Browse the individual tabs for appropriate options.
   Select the diagnostic properties depending on the module type.
   Available diagnostic options can be found in the following tabs:
   - "Diagnostics"
   - "Inputs"
   - "Outputs"
   - "Options"

SIMATIC Modules with Diagnostic Properties

Diagnostic-capable modules are available for the following components in PCS 7:

- S7-400
- S7 300 modules
- ET 200M
- ET 200S
- ET 200iSP
- DP slaves
- DP/AS-i link
- Diagnostic repeaters
- Network components (SCALANCE; OSM, ESM)

Additional information

- Configuration manual *Process Control System PCS 7; Operator Station*
- Online help *PC DiagMon*

3 Message Concept of PCS 7

3.1 Servicing a System - Message Concept

Introduction

The message system and diagnostic options of PCS 7 help you to assess the system status. You can find information about the PCS 7 message concept in the following sections:

- PCS 7 Message System
- Origin of a Message
- Determining the Source of a Message
- Evaluating and Understanding Messages

Basic Terms

Some basic terms used in the PCS 7 message concept are defined in the following:

Term	Definition
Events	Events cause a change in the data status to occur in the automation system. For example, an event can be the following: A bit is modified in an automation system by a change to a process value or by attaining a specified limit value. The configuration determines which events trigger a message.
Messages	Messages are triggered by events or by a message frame. PCS 7 has the following message types: • Operating messages • Process messages • Event messages • Process control messages and system messages
Error and Fault	In PCS 7, the PCS 7 Operator Station operator control and monitoring system is also used to display errors and faults in the process. • **Error:** State of components (objects) that does not cause a fault to occur in the process (for example, defective display lights) • **Fault:** A state of components (objects) that inhibits the process (for example, a defective motor).

Additional Information

You can find Detailed information about the message system as follows:

- In the *WinCC Information System*:
  Select the menu command **Start > SIMATIC > WinCC > WinCC Information System**, and look under "System Overview > How WinCC Works >
  - Message system of a PCS 7 OS
  - Archive system of a PCS 7 OS
  - Reports system of a PCS 7 OS
- in the configuration manual *Process Control System PCS 7; Operator Station*, in the section "Settings for the Alarm System"
- In the Online help for *SIMATIC BATCH*, you will find the following information under "Batch Data Management":
  - Batch reports
  - Archiving batches
- In the *SIMATIC Route Control* online help, you will find the following information under "Operator Control and Monitoring":
  - Route log

3.2 PCS 7 Message System

Message Systems of PCS 7

PCS 7 acquires data on the status of your process and process control system using blocks assigned with appropriate parameters. You can influence the response to an event with a suitable program.

The most important message systems of PCS 7 are:

- WinCC operator control and monitoring system
- SIMATIC BATCH batch data management

Both message system are available on the PCS 7 OS in process mode (runtime).

Configuration of Messages in the Message Lists of PCS 7 OS

Every process message displayed on a PCS 7 OS always includes the following information:

- Date
- Time of day
- Origin
- Event
- Message class

You can achieve the following when configuring messages:

- Specify the status used to report an event
- Use the "Alarm Logging" editor on the PCS 7 OS to modify the selection of message information to be displayed in WinCC

Message Accuracy for Signal Transitions

Note

Be aware of the accuracy of the message system.

If events are recorded within one scan cycle, they can appear in the wrong order in the message list.

Remedy: You can find information about this in the function manual *Process Control System PCS 7; High-precision Time Stamping*.

Additional information

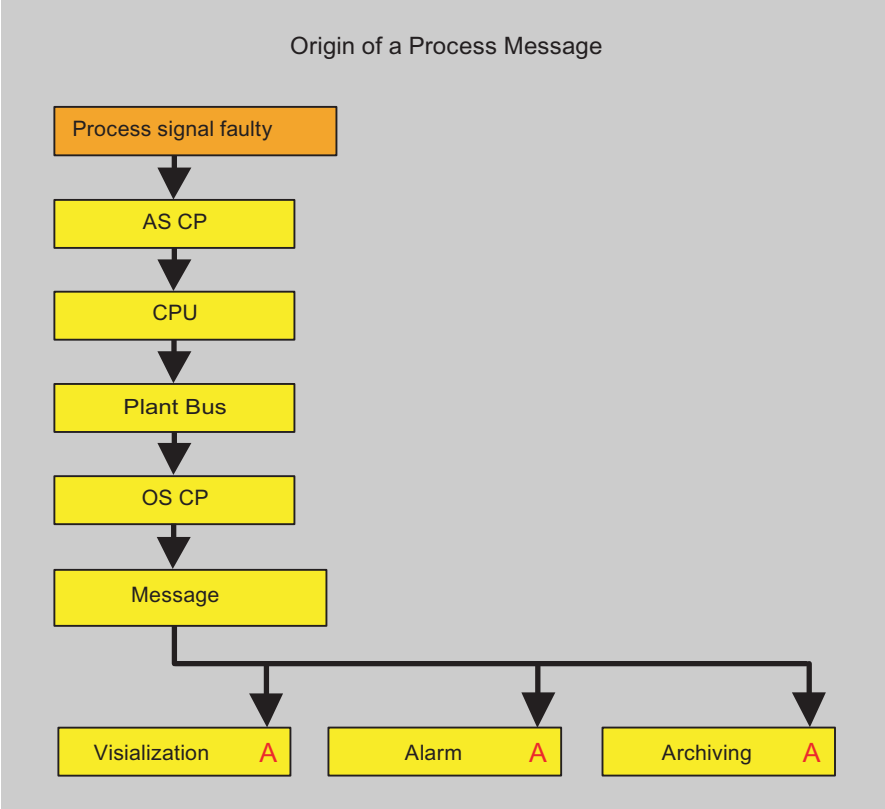
You can find Detailed information on configuring messages in the following manuals:

- Configuration manual *Process Control System PCS 7; Engineering System*
- Configuration manual *Process Control System PCS 7; Operator Station*

3.3 Origin of a Message

Message Path

Messages can originate in different locations in PCS 7 depending on the configuration. Each message is given a time stamp. The event which causes a time stamp to be assigned to a message depends on the place where the message has originated. Irrespective of where they originate, all messages are handled in the same way regarding how they are displayed and archived on the PCS 7 OS.



Additional information

You can find information on configuring messages in the following documentation:

- Configuration manual *Process Control System PCS 7; Engineering System*
- Configuration manual *Process Control System PCS 7; Operator Station*

You can find information about configuring messages with time stamping with increased precision the function manual *Process Control System PCS 7; High-precision Time Stamping.*

3.4 How to Determine the Source of a Message

Procedure

1. Enable the message list by clicking "Activate/Deactivate Autoscroll"  .
2. In the message list, select the message for which you need additional information.
3. Click "Open Infotext"  .
4. Note the message number and use "Alarm Logging" to determine the source of the message.

3.5 Understanding Messages

3.5.1 Introduction

Overview

You can find important information for understanding the PCS 7 message concept in the following sections:

- Message Types in Message Lists and Archives
- Target Groups of Messages
- Message Lists in Process Mode
- Overflow of Message Buffer
- Message Priorities
- Influencing Messages

3.5.2 Message Types in Message Lists and Archives

Message Types in Message Lists and Archives

There are three classes of message:

Term	Definition
Operating messages	Operating messages are generated when an operator controls process variables, for example, changes the operating mode of a controller. • SIMATIC PCS 7 generates operating messages automatically if you use faceplates prepared from the libraries. • If you have configured faceplates according to the programming instructions *Process Control System PCS 7; Creating Blocks for PCS*, operating messages that comply with PCS 7 can also be used for custom blocks.
Process messages	Process messages signal process events that take place in the automated process, such as limit value violations and event messages. • Process messages are predefined for the blocks and therefore do not need to be configured. Message texts and message priority can be modified as needed in the object properties for the CFC blocks. These modifications can also be made centrally in the process object view or by means of import/export operations. • Event messages are a subgroup of process messages. They signal process values that can be used to evaluate a process-related component, such as an operating hours counter.

Term	Definition
Process control messages	Process control messages are generated when SIMATIC PCS 7 detects and signals errors in components within its own system. Such errors range from failure of a component to a wire break message for a connected I/O signal. Process control messages are generated by the driver blocks in PCS 7 and do not need to be configured.

System messages

System messages are messages that are triggered by self-diagnostics of a device. System messages are usually included in the process control messages or process messages (operating messages).

3.5.3 Target Groups of Messages

Target Groups

Message Type	Target group: Process management	Target group: Operation management and recording	Target group: System and maintenance specialists
Operating messages	X	X	X
Process messages	X	X	X
Event messages	X	X	X
Process control messages		X	X
System messages			X

3.5.4 Message Lists in Process Mode

Message Lists

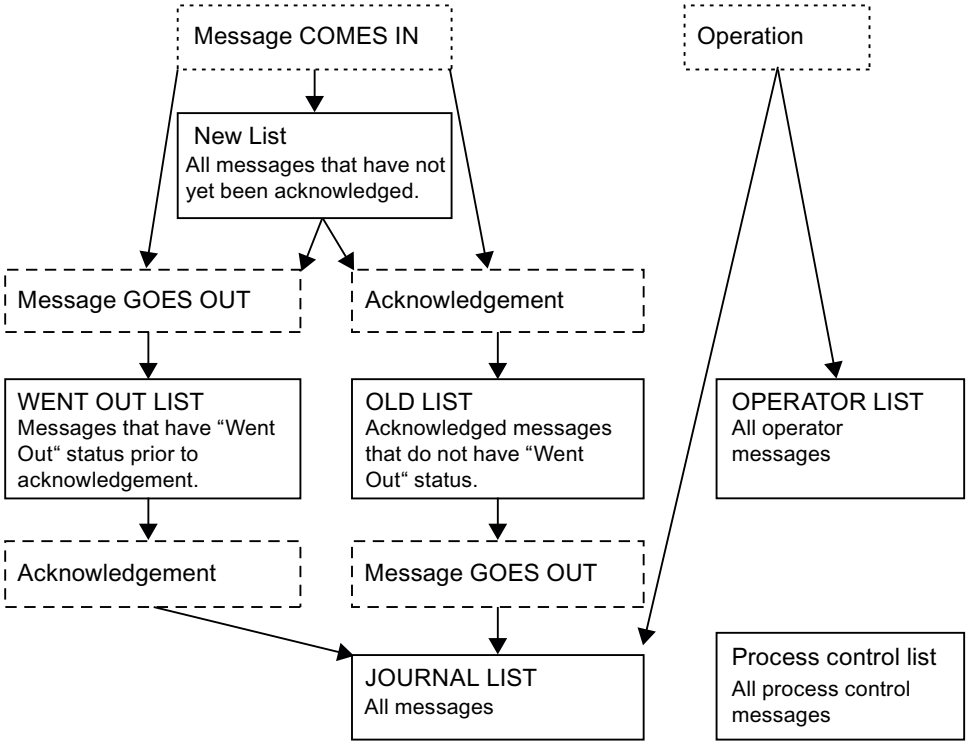
PCS 7 places incoming messages in message lists. You can locate a message in the various message lists according to the source of the event and the message status.

The following messages lists are available by default. You can modify these standard message lists or create additional message lists.

Default Message Lists

List	Contents
Entered state list	The entered state list contains unacknowledged messages.
Acknowledged list	The old list contains the acknowledged messages and the messages pending in the process.
Exited state list	The exited state list contains messages with "exited" status (special message property).
Operating list	The operating input list contains all operating messages. Example: The setpoint of a controller is set to 5 bars, the motor has been enabled.
Process control list	The process control list contains the process control messages. Example: Rack failure
Journal list	The journal list contains all messages (entered, acknowledged, and exited messages)

The following figure illustrates the path a message takes through the message lists.



3.5.5 Overflow of Message Buffer

Overflow of Message Buffer

Each component of the overall PCS 7 system can process only a limited number of messages. If more messages are generated in a component (for example, an AS) within a particular time frame than the component can process, some of these messages will be lost. If this occurs, the AS sets an overflow indicator, and the following event will be signaled in the PCS 7 OS:"NRMS7 message lost".

Note

If events that trigger messages change status in very quick succession, this can trigger a message surge. The overview of the plant status can no longer be sufficiently ensured.

Additional information

You can prevent a message surge by activating the "Messaging Triggered by Acknowledgment" function. You can find information about the configuration in the configuration manual *Process Control System PCS 7; Engineering System.*

3.5.6 Message Priorities

Changing Message Priorities

In PCS 7, a priority can be assigned to each message. 0 is the lowest priority and 16 the highest priority. When a signaling block is newly generated, its messages initially have the lowest priority (0).

You can change the message priority in a variety of ways:

- In the object properties for the block
- In the process object view
- Via an import operation

Rules

- Message priorities can only be specified if you defined the message number range as "Unique for Entire CPU".
- In PCS 7 OS, the unacknowledged message with the highest priority is always displayed in the message row above the overview. If multiple messages have the same priority, the most recent message is displayed here.
- You can filter the list according to priority.

Additional information

You can find information about configuring message priorities in the configuration manual *Process Control System PCS 7; Operator Station.*

3.5.7 Influencing Messages

Options

You have the following options for influencing messages in PCS 7:

- Message suppression
  - You can suppress individual block messages with the CFC configuration.
  - In process mode, you can suppress individual messages directly in the faceplate using the "Suppress message" check box.
- Locking and releasing messages for blocks and OS areas
  Locking (and releasing) messages for blocks and OS areas is used when the plant operator wants to lock all messages of an interrupt-capable block or OS area.
- Hiding and displaying messages
  You hide messages to reduce the number of messages displayed in process mode. The messages are entered in the message archive list. The following variations are used to hide and display messages in PCS 7:
  - Manual hiding and displaying of messages in process mode
  - Automatic hiding and displaying of messages in process mode

Additional information

- Configuration manual *Process Control System PCS 7; Operator Station*
- Configuration manual *Process Control System PCS 7; Engineering System*
- Manual *Process Control System PCS 7; PCS 7 OS Process Management*

4 Failure - What Next?

4.1 Activities in the Event of a Fault

Basic Procedure in the Event of a Fault

1. Evaluate the messages with regard to the following aspects:
   - Time
   - Sequence
   - Source
2. Determine the location and area of the fault.

Note

If the components you are using do not have diagnostics capability, only secondary faults are signaled.

- Use diagnostic tools to analyze the fault. You can achieve the following with the diagnostic tools:

  You can find the cause of a fault.

  or

  You can verify the presumed cause of a fault.
- You can find the following information in the section "Diagnostics for PCS 7" for support:
  The diagnostic tools available for PCS 7
  Applications for the various diagnostic tools according to subsystem

---

Note

Make use of skilled experts if you cannot find a solution to your problem based on available information. You can find information on this in the "Preface" of this documentation.

---

3. Determine the actions to be taken.
   In a running plant, check if a stop is necessary.

Notice

- The following actions should be carried out only under observance of applicable governmental and plant-specific regulations and only by qualified personnel:
  - Changes to the configuration
  - Replacement of and changes to components
- Bear in mind that uncharacteristic situations can occur in the plant after activation. Make sure the activation of components and secondary systems is carefully directed.

Examples of Causes

Fault	Possible Causes	Initial Diagnostics
CPU fault	• Fault due to internal error • Fault due to external error	CPU diagnostics
CP fault	• Fault due to internal error • Fault due to external error	**Module diagnostics > Special diagnostics > NCM S7 diagnostics CP... >** Information from: • "Module" folder • "Operating mode" folder • "Diagnostic buffer" folder
I/O module fault	• Fault due to SIMATIC station component • Fault due to external influences (such as a short circuit on the module terminals)	**Module diagnostics > Status information** and, if available, diagnostic information
PC component fault	If the PC is running: • Fault due to events • Faulty connections	If the PC is defective: • Repair/replace • Restore data

4.2 Preparing for Expert Support

4.2.1 Information on Cause of Fault

Introduction

Topic Area	Information
Supporting service experts	• **What?** Actions for making essential information available to experts for fault analysis. • **When?:** If expert support is needed in the event of a fault, you facilitate the work of the experts by providing them essential information on the plant or the faulty components. • **How?:** You can find information on this in this section.

Overview

You support the work of service experts by providing them with information:

- Service experts need information about your plant and the faulty system in order to provide quick support.
  You can find information on this below, in the section "Plant Documentation".
- Service experts need information from the diagnostic buffer of the CPU in order to analyze the cause of a CPU fault.
  You can find information on this below, in the section "How to Read the CPU Diagnostic Buffer".
- A memory dump facilitates the analysis of the cause of the CPU fault.
  You can find information on this below, in the section "CPU Fault - Preparing Diagnostics".
- Backing up the diagnostics files facilitates the analysis of the cause of an OS fault.
  You can find information on this below, in the section "How to Back Up the Diagnostic Data of the PCS 7 OS".
- You can create the conditions required for remote diagnostics via "remote access".
  You can find information on this below, in the section "Remote Diagnostics of a PCS 7 System".

4.2.2 Plant Documentation

Maintaining System Information

Information on the components of your system is among the most important information needed for successful repair.

You need this information in the following situations:

- When you are planning maintenance
- When you contact the hotline for assistance

Continual maintenance of this information shortens downtimes in case of a fault. Therefore, always keep up-to-date lists (in a database or in a table, for example) containing the following data:

- Plant
- Unit
- Location in plant
- Component
- Versions
  - Hardware
  - Firmware
  - Software

4.2.3 How to Read the CPU Diagnostic Buffer

Formats for Saving Diagnostic Data

You can make it easier for service engineers to perform initial diagnostics on a faulty CPU by saving and having ready the content of the diagnostic buffer in the following formats:

- HEX format
- TXT format

Procedure

1. Select the faulty CPU in the SIMATIC Manager.
2. Select the menu command **CPU > Diagnostics/Settings > Module Information**.
   The "Module Information - Online" dialog opens.
3. Select the "Stacks" tab and read the following system memory:
   - Block stack (B stack)
   - If the CPU is in "STOP": Interrupt stack (I stack)
4. Provide these data to the service engineers.

4.2.4 CPU Fault - Preparing Diagnostics

Introduction

The following information is important for analyzing a CPU fault:

- Information on the relevant CPU
- Information or actions in the event of a fault

Rules

Warning

- Only trained service employees should be authorized to work on the process control system.
- Always observe the plant-specific rules and government regulations when making changes to a system.
- Observe the plant-specific boundary conditions and adjust the work accordingly.
- Always bear in mind that changes in a system can impact other sections of the system.

Information on the Relevant CPU

The following information is needed when a CPU fault occurs:

- Order number
- Firmware version
- Hardware version

If you can access the CPU from the engineering station, you can query this information via the module information. You can find information on this in the section "Module Information".

Note

A constantly updated list of all module information facilitates troubleshooting in the event of a fault and reduces the time needed for correcting the fault.

Information in the Event of a Fault

The following information is needed if a fault occurs:

- Operations and actions/event history leading to the fault
- Status indicated by LED displays on the front of the CPU (such as RUN)

Only the RUN LED is Lit

The SIMATIC station is functioning without errors.

RUN LED and Additional Red LED is Lit

Faults have occurred in the SIMATIC station. Use the diagnostic tools for analysis. You can find additional information in the section "Diagnostics for the CPU".

STOP LED is Lit

- If the STOP LED is lit, read the diagnostic buffer. You can find information about this procedure in the section "How to Read the CPU Diagnostic Buffer". Save the diagnostic buffer both as a HEX file and as a TXT file!
- These data can be analyzed by trained service engineers. They contain information about the cause, for example:
  - I/O error
  - Synchronization error with an H-CPU
- If the possibility exists that a hardware error in the I/O caused the CPU to switch to STOP mode, save the diagnostic buffer of the relevant module and the associated bus interface module (for example, CP 443-5).
- Generate a memory dump.

All LEDs Are Off or Are Flashing

You recognize the "CPU defective" status by the following LED displays on the front of the CPU:

- All LEDs are flashing.
- All LEDs are off, even though the power supply is switched on.

For additional support, contact your Siemens representative or Technical Support. Have the "information in the event of a fault" indicated above ready.

4.2.5 How to Back Up the Diagnostic Data of the PCS 7 OS

Basic Procedure

We recommend that you back up the diagnostic files for analysis of the cause of the OS fault by experts.

1. Back up all diagnostic folders of WinCC
   (default: drive:\Siemens\WinCC\Diagnose).
2. Provide this data to the service engineers.

You can back up the data using the *PKZIP* software supplied on the PCS 7 Toolset DVD.

Setting Up the PKZIP Software

If you use the *PKZIP* software supplied on the PCS 7 Toolset DVD, the following settings need to be made.

1. In Windows Explorer, select the path "Program Files > Pkware > Pkzipw4".
2. Double-click the PKZIP compression program.
   PKZIP for Windows opens.
3. Select the menu command **Tools > Options**.
   The "Options" dialog box opens.
4. Select the "Compress" tab.
5. Make the following settings:
   - In the "File Options" group:
     Select the "Include subfolders (recurse)" check box.
     In the "Save folder name" list, select "Relative path".
     In the "Update mode" list, select "Add & Update files".
   - In the "File Attributes" group:
     Select all check boxes.
   - In the "Folders" tab:
     Specify a default folder for your data backup.
6. Click "OK" to confirm your settings.

Backing Up Diagnostic Data

1. Close WinCC.
2. In Windows Explorer, select the path "Program Files > Pkware > Pkzipw4".
3. Double-click the PKZIP compression program.
   PKZIP for Windows opens.
4. Select the menu command **File > New**.
   The "Save File As" dialog box opens.
5. Set the parameters as follows:
   - In the "Save in" group:
     Enter the folder for the backup file.
   - In the "File name" group:
     Enter the name for the backup file (use unique names for backups such as "Plant_Date_BackupNo.".
6. Click "Save" to confirm your settings.
   The dialog box "Add Files - (drive: folder for the backup file)" opens.
7. Set the parameters as follows:
   - In the "Drives:" group:
     Enter the drive containing the diagnostic files.
   - In the "Directory:" group:
     Specify the folder where the diagnostic files are located (default: ...**\Siemens\WinCC\Diagnose**).
   - Click "Add Directory".
     Information regarding the drive and folder of the diagnostic files is entered in the "Files & Directories To Zip." group.
8. Click "OK" to confirm your settings.
   You can watch the progress of the backup in the "Add Status" dialog box. The backup is finished when "Done" appears in the message box.
9. Click "Done".
   All archived files are shown in the *PKZIP* dialog box.
10. Close *PKZIP* with the menu command **File > Exit**.

Note

Once the diagnostic files are backed up (not in diagnostic folder), you can delete the content of the diagnostic folder. In this way, you avoid keeping old information in the new diagnostic files.

If the same error occurs the next time you start WinCC, make an additional backup to help the experts. Only a few messages will need to be analyzed in this backup.

4.2.6 Remote Diagnostics of a PCS 7 System

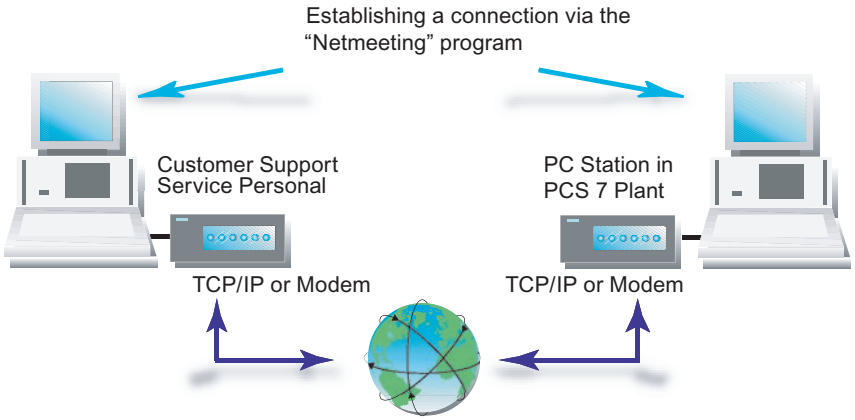
Remote Diagnostics Options

We recommend the following options for the remote diagnostics of PCS 7 systems:

- Remote desktop connection
- Net meeting

Remote Diagnostics and Remote Administration Option for a PCS 7 Plant

To perform remote diagnostics for PCS 7 plants and enable administrative access to PC stations with Windows XP Professional and Windows Server 2003, we recommend you use "Netmeeting".
You can find additional information on this in the operating system's online help.



Transmission Methods

Data can be transmitted with the following:

- Telephone line (modem)
- TCP/IP connection (network connection within the system)

Security Requirements

If you wish to perform remote diagnostics for a PCS 7 plant, you must protect this plant against unauthorized access.

Several measures are needed to realize a security concept. A plant is optimally protected only by the total sum of all security measures.

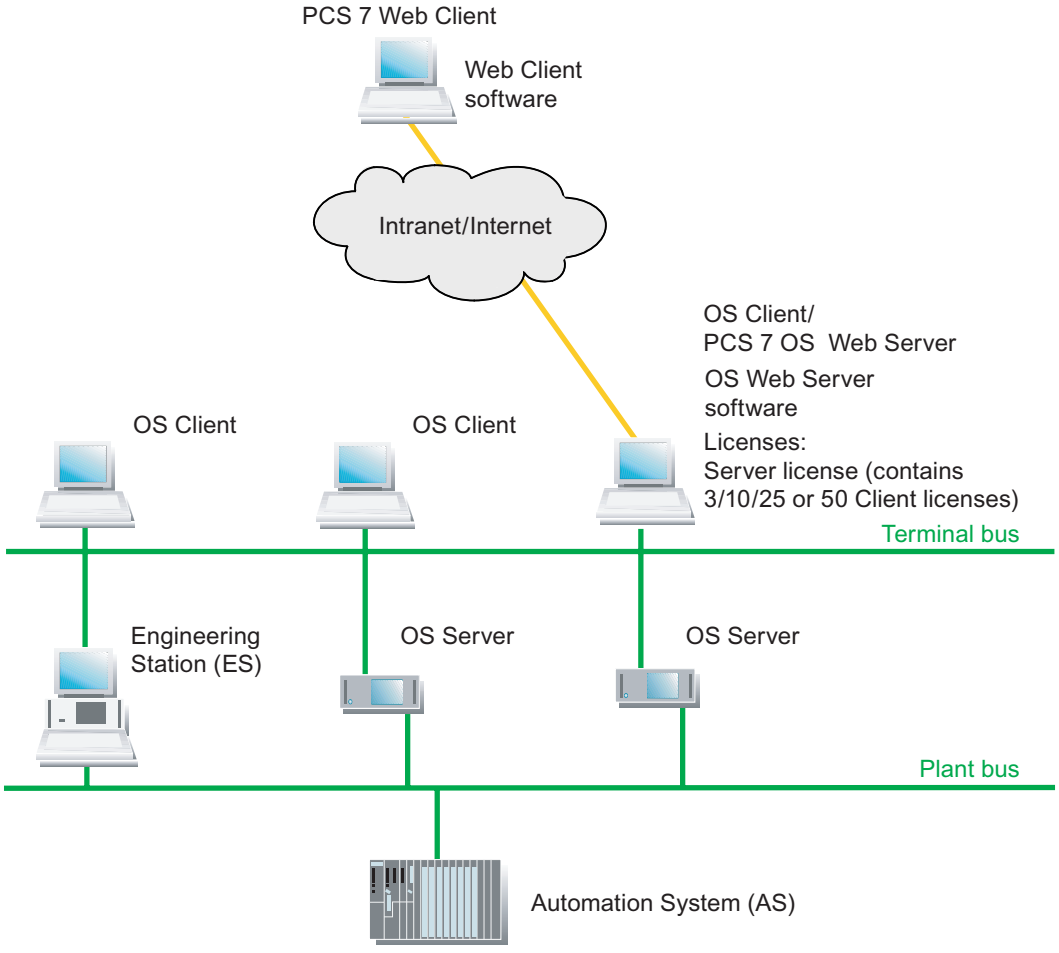
You can find additional information about this in the documentation *Process Control System PCS 7; Security Concept PCS 7.*

4.2.7 Interactive Operator Control and Monitoring with the PCS 7 OS Web Option

Interactive Operator Control and Monitoring of a PCS 7 System Using PCS 7 OS Web Option

Use the PCS 7 OS web option for the interactive operator control and monitoring of a PCS 7 system.
You can find additional information about this in the manual *Process Control System PCS 7; PCS 7 OS Web Option.*

The figure below shows how the PCS 7 OS web option (OS web server, web client) can be used in a PCS 7 system.



Transmission Methods

Data can be transmitted with the following:

- Telephone line (modem)
- TCP/IP connection (network connection within the system)
- Internet

Security Requirements

If you use the PCS 7 OS Web Option in a PCS 7 plant, you must protect this plant against unauthorized access.

Several measures are needed to realize a security concept. A plant is optimally protected only by the total sum of all security measures.

You can find additional information about this in the documentation *Process Control System PCS 7; Security Concept PCS 7.*

5 Diagnostics in PCS 7

5.1 Diagnostic Capabilities in PCS 7 Subsystems

Disclaimer of Liability

Warning

Siemens assumes no responsibility for inappropriate use of the instructions provided in this documentation or any consequences that might result for the customer.

Warning

- All work on the process control system must be performed by trained service personnel.
- Always observe the plant-specific rules and government regulations when making changes to your system.
- Observe the plant-specific boundary conditions and adjust the work accordingly.
- Always bear in mind that changes in a system can impact other sections of the system.

Introduction

The message system and diagnostic tools of PCS 7 help you to assess the status of your system. You can find information about the diagnostic tools In the following sections.

This description illustrates the capabilities of the diagnostic tools so that you can apply them to your individual requirements.

- You will also find information on the fields of application for diagnostic tools.
- You will learn you how to call up a diagnostic tool.
- Since malfunctions can have a variety of causes and because procedures for using the diagnostic tools are already available in the online help, a detailed description is not provided here.

Assessing the Status of your Process Control System

Topic	Questions Answered
Diagnostics in PCS 7	What diagnostics can be performed and where?
Diagnostic tools	• Which diagnostic procedures can be performed with a diagnostic tool? • How is the diagnostic tool activated? • Where can I find a description of the diagnostic tool or diagnostic capability?

Diagnostics

Diagnostics refers to all activities intended to:

- Ascertain the status of a system
- Find errors and faults as early as possible and identify their cause

Diagnostic Message

Diagnostic capabilities are used to analyze the system status and to determine the causes of faults.

Overview of Diagnostic Tools

You can find information on using diagnostic tools, grouped according to areas of application, in the following sections:

- Full Diagnostics Using the Maintenance Station
- Diagnostics for PC user settings
- Diagnostics for PC Components
- Diagnostics for Network Connections
- Diagnostics during Configuration
- Diagnostics for the CPU
- Diagnostics for Modules
- Diagnostics for PROFIBUS DP
- Diagnostics for PROFIBUS PA
- Diagnostics for the OS
- Diagnostics for the BATCH Station
- Diagnostics for the Route Control Station
- Diagnostics for Time of Day

For many components, you will find displays on the front panel indicating the status of the component and any errors. Analyzing these displays enables you to obtain information without intervening in the system. The additional product manuals you will need for this analysis can be found in the section "Diagnostics for Hardware Displays".

5.2 Full Diagnostics with the Maintenance Station (Asset Management)

Introduction

With PCS 7 V6.1 and higher, a PCS 7 system can be fully diagnosed with the help of the maintenance station. The maintenance station is an operator station that is specially configured and assigned parameters for use in diagnostic and maintenance functions.

We particularly recommend the use of a maintenance station in medium and large PCS 7 systems.

Maintenance Station

With the maintenance station, PCS 7 enables you to call up information on the states of all PCS 7 components on diagnostics screens which are hierarchically structured. As part of this process, the data of a component are analyzed using the available online functions of the associated tools. You can access ES data from the diagnostics screens (can be controlled via access protection mechanisms).

Screens for process-control diagnostics can be generated automatically for the entire PCS 7 system and made available on the maintenance station. The topmost level forms an overview screen for the entire system.

Diagnostic Options

You will find information on the states of individual PCS 7 components with diagnostic capability on the maintenance station's special diagnostics screens.

Area	Diagnostics for ...
Automation systems	• CPU • SIMATIC PCS 7 BOX • Distributed I/O, such as ET 200M, ET 200S, ET 200iSP, I/O modules • Field devices (HART, PROFIBUS PA, etc.) • Redundancy - Master/standby configuration - Status of redundant partners
PC stations	• Operator stations • BATCH stations • Route Control stations • Archive servers • SIMATIC PCS 7 BOX • Industrial PCs • Standard PCs (also web client via IP address) • Redundancy of PCS 7 PC stations - Master/standby configuration - Status of redundant partners
Ethernet components	• Switches, e.g.: - SCALANCE X - OSM - ESM • Network objects (via profile file) - Bridges - Routers • Network components, which enable diagnostics using the "NIB II" profile (for example, printers and other SNMP-capable devices)
PROFIBUS components	• PROFIBUS DP - Interface modules (IM) - Coupler - Link modules - Diagnostic repeater • PROFIBUS PA - Interfaces - Coupler

Additional information

- You can find a description of how to configure a maintenance station in the configuration manual *Process Control System PCS 7; Operator Station*.
- You can find a description of how to use the maintenance station to process mode in the configuration manual *Process Control System PCS 7; PCS 7 OS Process Management*.
- You can find information about configuring a plant with PCS 7 OS Web diagnostic server and PCS 7 Web diagnostic client in the manual *Process Control System PCS 7; PCS 7 OS Web Option*

5.3 Diagnostics for PC User Settings

Overview

Diagnostics for	Diagnostics tool	Called with
Defining users and setting access authorization to files and folders (Windows users and user groups)	Windows User Management	**Start > Settings > Control Panel > Administrative Tools > Computer Management > System Tools > Local Users and Groups**
WinCC Users	User Administrator	Open WinCC Explorer by selecting the menu command **Editors > User Administrator > Open**
PCS 7 users (user roles and rights in PCS 7 applications)		**Start > SIMATIC > SIMATIC Logon > Configure SIMATIC Logon**
Shares	Shares for Drives, Folders and Files	**Start > Settings > Control Panel > Administrative Tools > Computer Management > System Tools > Shared Folders > Shares**

5.4 Diagnostics for PC Components

Overview

Diagnostics for	Diagnostics tool	Called with
Status of PC stations, redundancy	Maintenance Station	The maintenance station is an operator station that is specially configured for use in diagnostics. The maintenance station has to be configured. Additional information in the manual *Process Control System PCS 7; PCS 7 OS Process Management*
PC configuration	System Information From Windows	Menu command **Start > Run... >** Enter **"msinfo32"** in the input window.
Functions of drivers, logs, and services	Managing the Operating System Event Display	**Start > Settings > Control Panel > Administrative Tools > Computer Management > System > Event Viewer** Note: Blue symbols only = "everything OK"
Function of standard network modules	Set PC Station	**Start > SIMATIC > SIMATIC NET > Settings > Set PC Station** In the tree view, select **PC Station > "Network Module" modules > Softnet IE**. Click "Test".
Online verification of operating capability of redundant OS components	Redundancy State Control	Picture must be configured and downloaded to the OS. Additional information in the configuration manual *Process Control System PCS 7; Operator Station*
Networks and network connections		You can find information on this in the section "Diagnostics for Network Connections".
Installed versions of the PCS 7 software	SIMATIC Manager	**Start > SIMATIC > SIMATIC Manager** **Help > About >** Click "Display".
Security settings and patches	MBSA	Menu command **Start > Run... >** Enter **"Mbscali.exe"** in the input window.
Printers and print jobs	Printers and Print Jobs	**Start > Settings > Printers and Faxes** Click on the printer that should perform the printing for information about the print job.
PCS 7 Bundle PCs	PC DiagMonitor	PC DiagnMonitor is started automatically on bundle PCs when the PC boots.

5.5 Diagnostics for Network Connections

Overview

Diagnostics for	Diagnostics tool	Called with
Connections with diagnostic capability	Maintenance Station	The maintenance station is an operator station that is specially configured for use in diagnostics. The maintenance station has to be configured. Additional information in the manual *Process Control System PCS 7; PCS 7 OS Process Management*
Network configuration	NetPro	**Network > Check Consistency**
Established connections to SIMATIC stations	NetPro	Select the CPU: **PLC > Activate Connection Status**
Status of network adapters on Industrial Ethernet	"Network Connections" Windows Dialog Box"	**Start > Settings > Network Connections**
Connection to other stations; IP address, MAC address	Command Line Commands	**Start > Programs > Command Prompt** Open DOS window - enter 'ping IP address'
Determining MAC addresses and TCP/IP addresses	Command Line Commands	**Start > Programs > Command Prompt** Open DOS window: enter **ipconfig –all**
Connection established to domain servers: DHCP, WINS, DNS	Command Line Commands	**Start > Programs > Command Prompt** Open DOS window: enter **ipconfig –all**
PC station	Set PC Station	**Start > SIMATIC > SIMATIC NET > Set PC Station**
Status of network components, status of a WinCC application	Station Configuration Editor	Configuration with HW Config and loading of PC station required Call: in start bar via 
PC Ethernet modules	NCM S7 Industrial Ethernet	**Start > SIMATIC > STEP 7 > NCM S7 Industrial Ethernet > Diagnostics**
Status of configured channels and their connections to the SIMATIC station	WinCC - Channel Diagnostics	**Start > Simatic > WinCC > Tools > Channel Diagnostics** > "Channels/Connections" tab
Connections to the OS: faulty or established	Lifebeat Monitoring	Call picture (@CONFIG.PDL) in process mode. Picture must be configured and downloaded to the OS.
Status of process interface	Status of Connections	In the WinCC Explorer: **Options > Status of Connections**

Diagnostics for	**Diagnostics tool**	**Called with**
Client-server connections	Status of Multi-user Operation	In the WinCC Explorer: **Options > Status of Multi-user Operation**
Determine stations Find IP address and MAC address Message frames Collisions	BANY (Add-on Product)	If you have installed BANYnet, call the program with the menu command **Start menu > Programs > BANYnet**.
PROFIBUS DP connections		You can find additional information in the section "Diagnostics for PROFIBUS DP".
PROFIBUS PA connections		You can find additional information in the section "Diagnostics for PROFIBUS PA".
Status of devices with SNMP capability (e.g., network switches)	PC DiagMonitor	**Start > SIMATIC > PC DiagMonitor > Management Station**

5.6 Diagnostics during Configuration

Overview

Diagnostics for	Diagnostics tool	Note
Consistency of hardware configuration	HW Config	Menu command **Station > Check Consistency**
Consistency of PC station configuration	Station Configuration Editor	Click the following icon in the task bar:  Analyze "Status" column table entry
Block consistency in a SIMATIC station	SIMATIC Manager	Select SIMATIC Station > S7 Program > Blocks Menu command **Edit > Check Block Consistency**
Chart consistency in a SIMATIC station	SIMATIC Manager	Select SIMATIC Station > S7 Program > Charts Menu command **Edit > Check Consistency**
Connection error	Module Information	Select the SIMATIC station in SIMATIC Manager or the CPU in HW Config.
Open signal interconnections in PCS 7 Operator Station	PCS 7 operator station (WinCC)	Convert pictures
Connection functions for a PC station	Set PC Station	**Start > SIMATIC > SIMATIC NET > Settings > Set PC Station**

5.7 Diagnostics for the CPU

Overview

Diagnostics for	Diagnostics tool	Called with
CPU module information, redundancy, connections	Maintenance Station	The maintenance station is an operator station that is specially configured for use in diagnostics. The maintenance station has to be configured. Additional information in the manual *Process Control System PCS 7; PCS 7 OS Process Management*
CPU	HW Config	Select the CPU: Menu command **Station > Online**
CPU	Module Information	Select the SIMATIC station in SIMATIC Manager or the CPU in HW Config.
Module displays	Evaluating the Module Display	Notes on manuals: Diagnostics for Hardware Displays
CPU fault - preparing diagnostics	Only to support experts	CPU Fault - Preparing Diagnostics

5.8 Diagnostics for Modules

Overview

Diagnostics for	Diagnostics tool	Called with
Diagnostics for all diagnostics-capable modules	Maintenance Station	The maintenance station is an operator station that is specially configured for use in diagnostics. The maintenance station has to be configured. Additional information in the manual *Process Control System PCS 7; PCS 7 OS Process Management*
Modules and CPs with diagnostics capability	HW Config	**Station > Open Online**
I/O modules and CPs with diagnostics capability	Module Information	Select the SIMATIC station in SIMATIC Manager or the CPU in HW Config.
Module displays	Evaluating the Module Display	Notes on manuals: Diagnostics for Hardware Displays

5.9 Diagnostics for PROFIBUS DP

Overview

Diagnostics for	Diagnostics tool	Called with
Devices and connections with diagnostic capability	Maintenance Station	The maintenance station is an operator station that is specially configured for use in diagnostics. The maintenance station has to be configured. Additional information in the manual *Process Control System PCS 7; PCS 7 OS Process Management*
Status of stations	NCM S7 PROFIBUS	**Start > SIMATIC > STEP 7 > NCM S7 PROFIBUS > Diagnostics**
Internal PROFIBUS DP interface of the CPU	Module Information	Diagnostics via **HW Config > Module Information**
PROFIBUS DP error	PROFIBUS DP Diagnostics With Diagnostic Repeater	Diagnostics via **HW Config > Module Information**
Status of PROFIBUS nodes	NetPro	**Start > SIMATIC > STEP 7 > NetPro** Select the menu command **View > With DP Slaves** to display the DP slaves in the network view
Station failure Fault indication with Detailed information about cause of error Name and comments from HW Config Order number, addresses, slot types	SYSTEM Diagnostics for Process Control (Add-on Product)	Picture must be configured and downloaded to the OS. Additional information in the configuration manual *Process Control System PCS 7; Operator Station*
PROFIBUS error	Amprolyzer (Add-on Product)	If you have installed Amprolyzer, call the program with the menu command **Start menu > Programs > Amprolyzer**.

5.10 Diagnostics for PROFIBUS PA

Overview

Diagnostics for	Diagnostics tool	Called with
Devices and connections with diagnostic capability	Maintenance Station	The maintenance station is an operator station that is specially configured for use in diagnostics. The maintenance station has to be configured. Additional information in the manual *Process Control System PCS 7; PCS 7 OS Process Management*
Devices and connections on the PROFIBUS PA with diagnostic capability	SIMATIC PDM	SIMATIC Manager: **View > Process Device Network View**
Status of devices on the PROFIBUS PA with diagnostic capability	NCM S7 PROFIBUS	**Start > SIMATIC > STEP 7 > NCM S7 PROFIBUS > Diagnostics**
Station failure Fault indication with Detailed information about cause of error Name and comments from HW Config Order number, addresses, slot types	SYSTEM Diagnostics for Process Control (Add-on Product)	Picture must be configured and downloaded to the OS. Additional information in the configuration manual *Process Control System PCS 7; Operator Station*
PROFIBUS error	Amprolyzer (Add-on Product)	If you have installed Amprolyzer, call the program with the menu command **Start menu > Programs > Amprolyzer**.

5.11 Diagnostics for the OS

Overview

Diagnostics for	Diagnostics tool	Called with
Operating capability of all OS components and communication connections	Maintenance Station	The maintenance station is an operator station that is specially configured for use in diagnostics. The maintenance station has to be configured. Additional information in the manual *Process Control System PCS 7; PCS 7 OS Process Management*
WinCC projects and the assigned SIMATIC stations	Lifebeat Monitoring	Call picture (@CONFIG.PDL) in process mode. Picture must be configured and downloaded to the OS.
Connections between OS components	Simatic Shell	Windows Explorer (workstation): Select PC station > "Simatic Shell" folder > in the context menu **Properties**
Connection between WinCC and AS	Status of Connections	In WinCC: **Options > Status of Connections**
Connection between OS server and OS client	Status of Multi-user Operation	In WinCC: **Options > Status of Multi-user Operation**
Status of channels and connections to the AS	WinCC Channel Diagnostics	**Start > SIMATIC > WinCC > Tools > Channel Diagnostics**
Operating capability of redundant OS components	Redundancy State Control	Picture must be configured and downloaded to the OS. For more information, refer to the configuration manual *Process Control System PCS 7 Operator Station*
General system information of an OS server	WinCC "System Info" Channel	Picture must be configured and downloaded to the OS. For more information, refer to the configuration manual *Process Control System PCS 7 Operator Station*
OS fault - preparing diagnostics	Only to support experts	You can find information on this in the section "OS Fault - Preparing Diagnostics".
Status OS Web Server		Internet Explorer: http://<server address>.status.html

5.12 Diagnostics for the BATCH Stations

Overview

Diagnostics for	Diagnostics tool	Called with
Operating capability of all BATCH components and communication connections	Maintenance Station	The maintenance station is an operator station that is specially configured for use in diagnostics. The maintenance station has to be configured. Additional information in the manual *Process Control System PCS 7; PCS 7 OS Process Management*
Status of the BATCH server	Status Symbols in the BATCH Server Task Bar	Task Bar
Status master	Status Symbols in the BATCH Server Task Bar	Task Bar
Status of the standby server (partner server)	Status Symbols in the BATCH Server Task Bar	Task Bar

5.13 Diagnostics for the Route Control Stations

Overview

Diagnostics for	Diagnostics tool	Called with
Operating capability of all SIMATIC Route Control components and communication connections	Maintenance Station	The maintenance station is an operator station that is specially configured for use in diagnostics. The maintenance station has to be configured. Additional information in the manual *Process Control System PCS 7; PCS 7 OS Process Management*
Status of redundant servers	Status Symbols in the Route Control Server Task Bar	Task Bar
Established connections to SIMATIC stations	NetPro	NetPro: Online view > Select the CPU: **PLC > Activate Connection Status**

5.14 Diagnostics for Time of Day

Overview

Diagnostics for	Diagnostics tool	Called with
AS-CPU time	SIMATIC Manager	Select the CPU: **PLC > Set Time of Day**
AS-CPU time	Module Information	**Station > Open Online** Select the CPU: **PLC > Set Time of Day**
PC time	Managing the Operating System	**Start > Settings > Control Panel > Date/Time**. Do not change these settings.
Activated time services	Windows System Utilities	**Start > Settings > Control Panel > Administrative Tools > Services** Select the "Windows time transmitter": **Action > Properties** "General" tab > Startup type: ...
Synchronization status on the terminal bus	Set PG/PC Interface	**Start > SIMATIC > SIMATIC Net > Set PG/PC Interface** Select interface > Click "Diagnostics" > In the "Time" group
Configuration of time displayed in operator control and monitoring systems	WinCC Editor "Time Synchronization"	Open WinCC Explorer with the menu command **Editors > Time Synchronization > Open**

5.15 Diagnostics for Hardware Displays

Overview

Many components have displays indicating the component status and errors. Analyzing these displays enables you to obtain information without intervening in the system.

Component	You can find information about diagnostic options in the following manuals and sections:
Power supply module	Reference manual *SIMATIC; Automation System S7-400; Module Data* • Backup battery (optional) • Error messages by means of LED displays • Operator control and display elements
Central module for S7-400 CPU	Reference manual *SIMATIC; Automation System S7-400; CPU Data* • Monitoring functions of the CPU • Status and error displays • Operating mode switch
CP 441	Manual *SIMATIC; CP 441 Point-to-Point Communication - Installation and Parameter Assignment* • Diagnostics for CP 441
CP 443-1	Device manual *S7 CPs/Part B4;* Description CP *443-1* • Displays and operating mode switch
CP 443-5 Extended	Device manual *S7 CPs/Part B4;* Description CP *443-5* Extended • Displays and operating mode switch
S7-300 I/O modules	Reference manual *SIMATIC;* Automation System S7-300; Module Data • Diagnostic data for the signal modules
S7-300 fail-safe signal modules	Manual *SIMATIC;* Automation System S7-300; Fail-safe Signal Modules • Diagnostics of F-SM errors • Properties, front view, connection and block diagram
S7-300 ex I/O modules	Manual *SIMATIC; Programmable Controllers S7-300, ET 200M; Ex I/O Modules* • Digital input module: Properties • Diagnostics for analog modules • Module view and block diagram
ET 200M	Manual *SIMATIC; Distributed I/O Device ET 200M;* Commissioning and Diagnostics • Diagnostics by means of LED display IM 153-1, IM 153-2 • Diagnostics with STEP 7

Component	You can find information about diagnostic options in the following manuals and sections:
ET 200iSP	Manual *SIMATIC;* Distributed I/O Device ET 200iSP; Commissioning and Diagnostics • Status and error LEDs on IM 151-2 • Insertion and removal of modules • Line break of the NAMUR encoder on the digital input module • Diagnostics with STEP 7
ET 200S	Manual *SIMATIC;* Distributed I/O Device ET 200S; Commissioning and Diagnostics • Diagnostics by means of LED displays • Diagnostic messages for electronic modules
DP/PA couplers	Manual *SIMATIC;* *Bus Interfaces DP/PA Link and Y Link* Diagnostics by means of LED displays • LED displays of the IM 157 • LED displays of the DP/PA coupler • LED displays of the Y coupler
AFD (used with PROFIBUS PA)	Manual *SIMATIC;* SIMATIC NET; *PROFIBUS PA* • Diagnostics by means of LED displays • Diagnostic messages for electronic modules
AFS (used with PROFIBUS PA)	Manual *SIMATIC;* SIMATIC NET; *PROFIBUS PA* • Diagnostics by means of LED displays • Diagnostic messages for electronic modules
Y Link	Information under DP/PA Coupler
Diagnostic repeater	Manual *SIMATIC;* *Diagnostic Repeater for PROFIBUS DP* • LED diagnostics
Switch for Ethernet	Operating instructions *SIMATIC NET;* *Industrial Ethernet switches SCALANCE X-400* • LED Commissioning manual *SIMATIC NET; Industrial Ethernet SCALANCE X-100 and SCALANCE X-200 Product Line* • SCALANCE X<…> displays (SCALANCE X208 displays, for example) Manual *SIMATIC NET; Industrial Ethernet OSM/ESM* • Display and control elements

5.16 Diagnostic Tools

5.16.1 Diagnostics Tools of PCS 7

Disclaimer of Liability

Warning

Siemens assumes no responsibility for inappropriate use of the instructions provided in this documentation or any consequences that might result for the customer.

Warning

- All work must be performed by trained service personnel.
- Always observe the plant-specific rules and government regulations when making changes to your system.
- Observe the plant-specific boundary conditions and adjust the work accordingly.
- Always bear in mind that changes in a system can impact other sections of the system.

5.16.2 Diagnostics for the PCs

5.16.2.1 System Information From Windows

Calling

Menu command **Start > Run**... > Enter "**msinfo32**" in the input window.

Overview

Topic	Detailed information	Called with	Additional information
PC configuration	Operating system Operating system version PC NAME Processor BIOS data Users currently logged on Time zone Size of the work memory Information on the swap file	**System Overview**	Online help of the operating system
Graphics settings	Type of graphics card Set resolution and frequency	**System Overview > Components > Display**	Online help of the operating system
Printers	Display of existing printers	**System Overview > Components > Printer**	Online help of the operating system
Drives	Recognized internal and external drives or storage media Partitioning of hard disks	**System Overview > Components > Storage > Drives**	Online help of the operating system

5.16.2.2 Managing the Operating System

Calling

Call this tool by selecting the menu command **Start > Settings > Control Panel > Administrative Tools > Computer Management**

Overview

Topic	Detailed information	Called with	Additional information
Event display	Icons indicate status (specialist knowledge required for analysis)	**System Tools > Event Viewer**	Select folder, press "F1" key - blue icon only = "everything OK"
Removable memory	Recognized external drives or storage media	**Data Memory > Removable Media**	
Hard disks	Drive names, formats, size, segmentation, partitions, status	**Data Memory > Storage Media Management**	
Network adapters and PC cards	Network adapter type access levels, users, servers, network addresses (IP/MAC address)	**System Tools > System Information > Components > Network > Adapter**	
Network-wide analysis of connected PCs	Active users in network, active PCs	**System Tools > Shared Folders > Shares**	
Management of users and user groups	• Creation and modification of local user accounts • Creation and modification of user profiles • Creation, addition and deletion of local groups	**System Tools > Local Users and Groups**	Online help of the operating system

5.16.2.3 Shares for Drives, Folders and Files

Calling

Call this tool by selecting the menu command **Start > Settings > Control Panel > Administrative Tools > Computer Management > System**

Overview

Topic	Detailed information	Called with	Additional information
Drives and folders	Granting or changing of shares for drives and folders	In the tree view Select **Shared Folders > Share**	Select folder, press "F1" key
Drives and folders	Granting or changing of shares for drives and folders	• Open Windows Explorer • In the tree view, select the drive/folder • Menu command: **File > Properties >** "Release" tab	Online help of the operating system
Files	Granting or changing of shares for files	• Select the file in Windows Explorer • Menu command: **File > Properties** • Select the "Security" tab and make the required settings in the "Permissions" group.	Online help of the operating system

5.16.2.4 Local Users and Groups in the System

Overview

Topic	Detailed information	Called with	Additional information
Managing users and groups in the operating system	• Creation and modification of local user accounts • Creation and modification of user profiles • Creation, addition and deletion of local groups	**Start > Settings > Control Panel > Administrative Tools > Computer Management > System Tools > Local Users and Groups**	Online help of the operating system
Application permissions	• Standard users, language and password changes • Selection of the computer from which the user data are to be obtained • Selection of the device via which component logon is to be checked • Setting a delay time for logging off from SIMATIC Logon	**Start > SIMATIC > SIMATIC Logon > Configure SIMATIC Logon**	Online help for *SIMATIC Logon*

5.16.2.5 Command Line Commands

Calling

Menu command **Start > Run... >** Enter "cmd" in the input window.

You can find additional information about the Windows commands used here using the search function in the Microsoft "Help and Support Center": **Start > Help and Support**

Overview

Topic	Detailed information	Called with	Additional information
Connections Network adapter function	Verification of own network adapter	Enter "ping localhost" or "ping 127.0.0.0".	Help and Support Center
Connections/ Network adapter function	Verification of a connection to another Ethernet node	Enter "ping - {PC name}" or "ping - {IP address}"	Help and Support Center
Connections/ Network adapter function	Identification of own network adapter	Enter "ipconfig"	Help and Support Center
Connections/ Network adapter function	Identification of network adapter of servers and network services	Enter "ipconfig -all"	Help and Support Center
Connections/ Network adapter function	Active connections, computer I/Os, Ethernet statistics	Enter "netstat".	Help and Support Center

5.16.2.6 Set PC Station

Calling

Call this tool by selecting the menu command **Start > SIMATIC > SIMATIC NET > Settings > Set PC Station**

Overview

Topic	Detailed information	Called with	Additional information
Configuration	Detected modules	**SIMATIC NET Configuration > Modules** folder	Online help *Microsoft Management Console*; "Set PC Station" topic
Diagnostic options	Available options vary for each module	**SIMATIC NET Configuration > Modules >** folder, select module. You can find additional information in the online help	Online help *Microsoft Management Console*; "Set PC Station" topic

5.16.2.7 Set PG/PC Interface

Calling

Call this tool by selecting the menu command **Start > SIMATIC > SIMATIC NET > Set PG/PC Interface** or the menu command **Options > Set PG/PC Interface** in SIMATIC Manager.

Overview

Topic	Detailed information	Called with	Additional information
Time synchronization	Status of synchronization of PC on terminal bus (requirement: CP 1613)	Select interface > Click "Diagnostics" > In the "Time" group	Online help *Microsoft Management Console;* "Set PC Station" topic

5.16.2.8 Station Configuration Editor

Calling

Call on the Windows task bar with the button:  .

Requirement

The components in the configuration list must be entered in the same order as in the component image you created with HW Config. If the configuration deviates, it cannot be downloaded to the PC station. You can find additional information about this in the manual *Process Control System PCS 7; PC Configuration and Authorization, in the* section "Preparing the PC Stations".

Notice

Making changes to the configuration list when the PC station is running causes the entire PC communication to be closed and restarted.

In this case, you will receive a corresponding warning message.

Overview

Topic	Detailed information	Called with	Additional information
Hardware configuration and configuration of the PC station	The status display in the configuration list indicates the following: • Whether or not the created component matches the current hardware configuration • Whether or not the configuration matches a downloaded configuration	"Components" tab	Online help Topic: "Status Symbols for Components"
Check module	Verification of accessibility of modules following configuration.	After completing the configuration, you can click "Ring" to check whether modules can be accessed.	Provided the module supports this function, a display on the module will indicate whether the module can be accessed.
PC station	Diagnostics for a PC station	"Diagnostics" tab > Export Save file	Requires expert knowledge. Consult an expert if you encounter problems with the content of a log file

5.16.2.9 Printers and Print Jobs

Overview

Topic	Detailed information	Called with	Additional information
Printers and devices	Device failure Display of available printers	**Start > Settings > Printers and Faxes** • Problem devices • Printers	Online help via F1
Pending print jobs	Display of print jobs Deletion of print jobs	**Start > Settings > Printers and Faxes** Double-click the name of the printer.	Online help via F1

5.16.2.10 PC DiagMonitor

Overview

Topic	Detailed information	Called with	Additional information
Status of the PC station	CPU temperature, Fan speed, Hard disks, Operating hours, BIOS data	**Start > SIMATIC >** PC DiagMonitor > **PC DiagMonitor**	Online help

5.16.3 Diagnostics in the Network

5.16.3.1 NetPro

Calling

Call in the SIMATIC Manager or HW Config with the menu command **Options > Configure Network**.

Overview

Topic	Detailed information	Called with	Additional information
Consistency of configuration	Nodes that are not networked (exception: MPI nodes that are not networked) inconsistent connections in subnets with only one node	**Network > Check Consistency**	Online help *STEP 7*: "Checking the Consistency of the Network" topic
Connection status	Established connections to SIMATIC stations	Select the CPU: **PLC > Activate Connection Status**	
Connection status	Established connections to PC stations	Select PC stations: **PLC > Activate Connection Status**	
Faults on PROFIBUS	Only when diagnostic repeaters are used	**CPU > PROFIBUS > Display Network Topology**	
Status of DP slaves	Display DP slaves in the network view	**View > With DP Slaves**	

5.16.3.2 NCM S7 Industrial Ethernet

Calling

Menu command **Start > SIMATIC > STEP 7 > NCM S7 Industrial Ethernet > Diagnostics**

Overview

Topic	Detailed information	Called with	Additional information
CP status	Dynamic information about the operating mode of the communication functions of CPs connected online	**Diagnostics > Online > Open Connection**	Online help *STEP 7;* Topic: "Diagnostics for the Hardware" Manual *SIMATIC NET; NCM S7 for Industrial Ethernet*
General CP diagnostics and statistics functions	Operating mode Scan event messages recorded in the Ethernet CP	**Diagnostics > Online > Open Connection**	
Diagnostics functions depending on CP type and operating mode	ISO transport connections ISO-on-TCP connections TCP connections UDP connections E-mail connections	**Diagnostics > Online > Open Connection**	

5.16.3.3 "Network Connections" Windows Dialog Box

Overview

Topic	Detailed information	Called with	Additional information
Status of network adapters on Industrial Ethernet	Dynamic display of the status of physical and virtual network adapters	**Start > Settings > Network Connections**	Online help of the operating system

5.16.3.4 NCM S7 PROFIBUS

Calling

Menu command **Start > SIMATIC > STEP 7 > NCM S7 PROFIBUS > Diagnostics**

Overview

Topic	Detailed information	Called with	Additional information
General CP diagnostics and statistics functions	Operating mode Connected stations Station-related statistics functions Station overview	"General" tab	• Online help for NCM Diagnostics, "General Diagnostic Functions" • Manual SIMATIC NET; NCM S7 for PROFIBUS
Mode-specific diagnostics	Dynamic information about the operating mode of the communication functions of CPs connected online		
FMS connections	DP master diagnostics Communication status of slaves and call of data for DP slave diagnostics DP slave diagnostics (non-passive slaves)		
PROFIBUS connections	DP master DP slave FDL connection FMS connection		
PROFIBUS connections	Faults and inconsistencies in FMS connections of the CP		

5.16.3.5 MBSA

Introduction

The Microsoft Baseline Security Analyzer (MBSA) is a tool for administrators that enables them to check a Windows network for security vulnerability.

Overview

Topic	Detailed information	Called with	Additional information
Security vulnerability	Configuration, passwords, utilities, creation of security reports, required updates	Mbscali.exe	MBSA description from Microsoft®

5.16.4 Diagnostics for the Operator Station

5.16.4.1 Lifebeat Monitoring

Overview

Topic	Detailed information	Called with	Additional information
Monitoring of components of WinCC projects and their associated SIMATIC stations	Configured components are displayed graphically in a plant picture. Faulty components have a red line running through them in the graphic.	Configure lifebeat monitoring and call the picture in process mode	Online help for *WinCC Information System,* "Lifebeat Monitoring" Information on the configuration in the configuration manual *Process Control System PCS 7; Operator Station*

5.16.4.2 Simatic Shell

Calling

1. Select the PC station (workstation) in the tree view of Windows Explorer.
2. Select the "Simatic Shell" folder.
3. Select the menu command **Settings** from the context menu.

Overview

Topic	Detailed information	Called with	Additional information
Network adapters	• Network adapters of the local computer • "IP" column, current TCP/IP addresses and MAC addresses of the local network adapters	"Network adapters" list	Online help of SIMATIC Shell
Multicast service life (TTL)	Maximum number of route jumps between subnets ("TTL" IP parameter)	"Multicast service life (TTL)" input line	Online help of SIMATIC Shell
Multicast proxy	IP address of a computer in another subnet, which is to be used as a substitute for distributing Multicast packets	"Multicast proxy" input line	Online help of SIMATIC Shell
Compatibility	Compatibility mode for communication between different versions of WinCC	"Compatibility" check box	Online help of SIMATIC Shell
Computer status change	When the status of a computer changes, a message is sent to all stations, for example: • When a computer has archived a project • When a computer shuts down • When a computer boots up, thus becoming part of a network/station group		Online help for *WinCC Information System*

5.16.4.3 WinCC "System Info" Channel

Introduction

The WinCC "System Info" channel is used to evaluate system information from server PCs.

This channel does not require hardware because it directly accesses the system information on the server PC on which it is installed.

Note

Only system information from a single server can be represented or evaluated on a client.

Overview

Topic	Detailed information	Called with	Additional information
Time information	Display of time of day, date and day of the week in process pictures	Display in configured picture	Online help *WinCC Information System,* Topic: "Communication > System Information"
CPU load	CPU load in a trend display	Display in configured picture	
Drive capacities - storage space	• Display and monitoring of available drive capacities of different servers on a multi-client system • Monitoring of available drive capacity and message triggering	Display in configured picture	
Timers and counters	Use of timers and counters (for example, to count operating hours)	Display in configured picture	
Event triggering	Triggering of events through evaluation of system information in scripts	Display in configured picture	

Configuration

Online help for *WinCC Information System*, "Communication > System Info > Channel Configuration > How to Configure the Channel System Info".

5.16.4.4 User Administrator

Calling

Call this tool by selecting the menu command **Start > SIMATIC > WinCC**

Overview

Topic	Detailed information	Called with	Additional information
For the OS Creating users Setting access permissions	Assignment and verification of access permissions for users of the PCS 7 Operator Station: • For process mode • For configuration system editors	In the tree view of WinCC Explorer, select: **Editors > User Administrator > Open**	Online help for WinCC Information System, "User Administrator Functionality" topic and "Preventing Unauthorized Operation" topic

5.16.4.5 WinCC - Channel Diagnostics

Calling

Select the menu command **Start > SIMATIC > WinCC > Tools > Channel Diagnostics**

Overview

Topic	Detailed information	Called with	Additional information
Connections	Overview of the status of the configured channels and their connections to the SIMATIC station, directly or by network connection through Internet Explorer	"Channels/Connections" tab	Online help for *WinCC Information System*, "How to Test the Channel and the Connection"
Trace mode	Trace mode can be activated in process mode (this affects runtimes)	Only to support experts	Online help for *WinCC Information System*, "How to Configure the Trace Function of a Channel"

Additional information

Online help for *WinCC Information System,* "Channel Diagnostics Using Channel Diagnosis"

5.16.4.6 Status of Multi-user Operation

Calling

Diagnostics on the connection between OS server and an OS client

Only when WinCC is in process mode: in the menu of the WinCC Explorer.

Overview

Topic	Detailed information	Called with	Additional information
Connection status	Status - logical connections and current status of server-client interface	**Options > Status of Multi-user Operation**	Online help *WinCC Information System,* Topic: "Options Status of Multi-user Operation"
Connection status on the server	Current status of connections in Multi-user operation	"Process Data Server" tab	
Connection status on the client	Current status of the client on which the scan is started	"Process Data Clients" tab	

5.16.4.7 Status of Connections

Calling

Diagnostics of the connection between WinCC and an automation system

Only when WinCC is in process mode: in the menu of the WinCC Explorer.

Overview

Topic	Detailed information	Called with	Additional information
Connection status	Status - logical connections and current status of process interface	**Options > Status of Connections**	Online help *WinCC Information System,* Topic: "Checking the Status of the Connection"

5.16.4.8 Redundancy State Control

Overview

For diagnostics in systems with redundant PCs, it is important to always have an overview of the redundancy status. The redundancy status represents the status of the individual master and standby computers. You use the redundancy status display for this.

Topic	Detailed information	Called with	Additional information
Redundant OS components Status	Master; STANDBY Standalone Connection • Not initialized • Initialized • No connection • Fault	Create a picture in the WinCC project of the OS server. Insert a control. Graphics Designer: Object palette > "Default" tab > in the "Smart Objects" tree > drag the control into the picture > in the "Insert Control" dialog box > Select "PCS 7 Redundancy State Control".	You can find information about the configuration in the configuration manual *Process Control System PCS 7; Operator Station*

5.16.5 Diagnostics for the BATCH Station

5.16.5.1 Status Symbols in the BATCH Server Task Bar

Overview

With SIMATIC BATCH, status symbols in the BATCH server task bar indicate the redundancy status.

Topic	Detailed information	Called with	Additional information
Status server	Status displays in the task bar of the BATCH server	Double-click a status symbol to display a field containing information about the server status.	You can find information on the status symbols in the online help.
Status of redundant servers	Status display of the server in process mode: • In the master server task bar you will see the following symbols, highlighted in red:  • In the standby server task bar you will see the following symbols: 	Double-click a status symbol to display a field containing information about the server status.	You can find information on redundant BATCH servers in the manual *Process Control System PCS 7; SIMATIC BATCH*
Status of data replication on the standby server (partner server)	In the standby server task bar you will see the following symbols: • Data replication running:  • Data replication completed: 	Double-click a status symbol to display a field containing information about the server status.	You can find information on redundant BATCH servers in the manual *Process Control System PCS 7; SIMATIC BATCH*

5.16.6 Diagnostics for the Route Control Station

5.16.6.1 Status Symbols in the Route Control Server Task Bar

Overview

With SIMATIC Route Control, status symbols in the Route Control server task bar indicate the redundancy status.

Topic	Detailed information	Called with	Additional information
Status of redundant servers	Status display of the server in process mode: • In the master server task bar you will see the following symbol:  • In the standby server task bar you will see the following symbol: 	Double-click a status symbol to display a field containing information about the server status.	You can find information on redundant Route Control servers in the manual *Process Control System PCS 7; Route Control*

5.16.7 Diagnostics for the SIMATIC Station

5.16.7.1 SIMATIC Manager

Calling

Call SIMATIC Manager by selecting the menu command **Start > Simatic > SIMATIC Manager**

Overview

Topic	Detailed information	Called with	Additional information
Diagnosing hardware	Quick view: Symbols indicate operating status and module information.	**PLC > Diagnostics/Setting > Hardware Diagnostics** Continue to Modules Status > Update: F5 key	Online help *STEP 7*, Topic: "Hardware Diagnostics and Troubleshooting" You can find information about this in the section "Module Status" Additional information: Double-click on the icon
Module information	Use this menu command to read information on the selected module.	Select CPU or CP: **PLC > Module Status**	Online help *STEP 7*, Topic: "Hardware Diagnostics and Troubleshooting" You can find information about this in the section "Module Status"
Operating mode	Displays the operating mode of the current module (RUN, STOP). This requires an online connection to the CPU.	Select CPU or CP: **PLC > Operating Mode**	
Time of day	Checks/sets time of day	Select the CPU: **PLC > Diagnostics/Settings** > Set Time of Day	Online help for STEP *7*, "CPU Clocks with Time Zone Setting and Summer/Winter Time" and "Using the Clock Functions"
Faults on PROFIBUS	• Faulty bus segment • Distance of an error location from the diagnostics repeater	Select the master system: PLC > Diagnose, Monitor/Modify PROFIBUS Node	Online help for STEP *7*, "Topology display using diagnostics repeaters"
All installed authorizations (Versions of installed components)	• Products (name, version, release) • Components (name, version, release) • Firmware updates • DLLs (STEP 7 DLLs, Windows DLLs)	Help **>** About > "Display" button	Online help for STEP *7*, "Installed SIMATIC Software"

Topic	Detailed information	Called with	Additional information
PA devices and HART devices	Requirement: SIMATIC PDM is installed. • Symbols provide information about the status of these devices	**View > Process Device Plant view** Select device. Select context menu command **Open Object**.	Online help for SIMATIC PDM > Configuring networks and process devices Icons: ...> device icons in the process device - Plant view

5.16.7.2 HW Config

Calling

Select the menu command **Start > SIMATIC > SIMATIC Manager**.

In the tree view, click on "SIMATIC Station" and double-click "Hardware" in the selection list.

Overview

Topic	Detailed information	Called with	Additional information
Components accessible online	Icon indicates the operating mode of modules (= system diagnostics).	**Station > Open Online**	The <F5> key refreshes the display. Double-click the icon to obtain additional information.
Time of day	Check/Set	**Station > Open Online** Select the CPU: **PLC > Set Time of Day**	Online help for *STEP 7*, "CPU-xxx Clocks Time Zone Setting and Summer/Winter Time" and "Using the Clock Function"
Module Information	Use this menu command to read information about the selected module.	**Select module: PLC > Module Status**	You can find information about this in the section "Module Status"

Additional information is available in the Online help for *STEP 7*.

- Diagnostic icons in the online view
- Information functions in the quick view
- Basic procedure for determining the cause of a STOP (CPU)
- Hardware diagnostics and troubleshooting
- Operating mode and operating mode transitions

5.16.7.3 Module Information

Calling up quick information

1. Call up the quick information in SIMATIC Manager by selecting the menu command **Component View > View > Online**.
2. Select the SIMATIC station with the menu command **CPU > Diagnostics/Settings > Hardware Diagnostics**.

Additional diagnostics: select a module and click "Module Information"

Calling up module diagnostics

1. Open HW Config.
2. Select the menu command **Station > Open Online.**
3. Select the module.
4. Select the menu command **PLC > Module Information.**

Diagnostics for the CPU

Extensive diagnostic checks are performed on a CPU.

Additional information:
Online help for *STEP 7*, "Diagnostics, Hardware Diagnostics and Troubleshooting"

Topic	Detailed information	Called with	Additional information
Module data	Data for identifying the selected module Examples: • Type • Order number • Firmware • Version • Status • Slot in the rack	"General" tab	Comparison of configured and inserted modules
Events in the diagnostic buffer and Detailed information about the selected event	Analysis of the cause of STOP of a CPU, overview of previous events on the selected module. Diagnostic data for the selected module	"Diagnostic Buffer" tab	Check of events in the diagnostic buffer and Detailed information about the selected event
DP slave diagnostics	Diagnostic data for the selected DP slave (in accordance with EN 50170)	"DP Slave Diagnostics" tab	To determine the cause of a DP slave error
Target system	Current time, operating hours and information about clock synchronization (synchronization intervals)	"Time System" tab	

Topic	Detailed information	Called with	Additional information
Performance data	Operand areas and the available blocks of the selected (CPU/FM) module	"Performance Data" tab For checking the user program to determine whether the CPU meets the appropriate requirements to execute a user program, for example, with regard to process image size	
Performance data	Display of all module types available in the functional scope of the selected module. List of OB, SFB and SFC that can be used in the module.	Used to check the standard blocks contained and called in the user program.	

Diagnostics for DP Slaves

Topic	Detailed information	Called with	Additional information
Module data	Data for identifying the selected module Examples: • Type • Order number • Firmware • Version • Status • Slot in the rack	"General" tab	Comparison of configured and inserted modules
DP slave diagnostics	Diagnostic data for the selected DP slave (in accordance with EN 50170)	"DP Slave Diagnostics" tab	To determine the cause of a DP slave error

5.16.7.4 PROFIBUS Diagnostics with Diagnostic Repeater

Requirements

- The diagnostic repeater must be installed.
- The cable diagnostics must be prepared.

Calling

Select Diagnostic Repeater in HW Config.
Select the menu command **PLC > Diagnostics/Setting > Module Information**

Additional information:
Online help for *STEP 7*, "Hardware Diagnostics and Troubleshooting"

Overview

Topic	Detailed information	Called with	Additional information
Quick overview Error on bus segment	Icons indicate the status of the PROFIBUS master systems	"Module Information" dialog box - Status - Icons in front of the tab names (DP1, DP2, DP3, PG)	Online help *STEP 7,* Topic: "Hardware Diagnostics and Troubleshooting" Comparison of configured and inserted modules
DP slave diagnostics	Diagnostic data for the selected DP slave (in accordance with EN 50170)	"DP Slave Diagnostics" tab	To determine the cause of DP slave errors
Location of error	Graphical representation of the error location		

5.16.7.5 SIMATIC PDM

Introduction

SIMATIC PDM is a software package used for configuring, assigning parameters to, commissioning, and maintaining devices (transducers, for example) and for setting network configurations and configuring PCs.

With SIMATIC PDM, you monitor devices with diagnostic capability which are located in a subnet on the PROFIBUS DP, downstream of a DP/PA link, for example.

Overview

Topic	Detailed information	Called with	Additional information
Connections to SIMATIC PDM	Connection configuration	In the SIMATIC Manager: **Options > Set PG/PC Interface**	Online help *SIMATIC PDM;* "Configuring Networks and Process Devices" topic
PDM device identification	Life List - determine accessible devices (HART and PROFIBUS PA profile V2/V3)	**Start > SIMATIC > STEP 7 > SIMATIC PDM - Life List**	Manual *SIMATIC; The Process Device Manager* Online help for *SIMATIC PDM*, Life List • Take note of the "Scan subnets" option.
Quick information; display configuration	Symbols provide an overview of the configuration and device status (more: see Device Status)	In the SIMATIC Manager: **View > Process Device Plant view**	Online help for *SIMATIC PDM,* *"*Configuring Networks and Process Devices" Icons: ...> Device icons in the process device - Plant view
Device information	• Type • DLL (type file) • Manufacturer • Versions	Open project in the Process Devices - Plant view> **Select device > Edit > Object Properties** "Device" tab	Online help for *SIMATIC PDM*
Device status	• Communication • Maintenance status • Process errors • Configuration errors • Overall status • Device-specific messages	Open project in the Process Devices - Plant view> **Select device > Edit > Object Properties** "Device Status" tab	Online help for *SIMATIC PDM*, if manufacturer files are available in it

5.16.8 Additional Diagnostics Options

5.16.8.1 Additional Diagnostic Options for PCS 7

Disclaimer of Liability

Warning

Siemens does not accept responsibility for inappropriate use of the procedures presented in this documentation or any consequences that might result thereof for the customer.

Warning

- All work on the process control system must be performed by trained service personnel.
- Always observe the plant-specific rules and government regulations when making changes to your system.
- Observe the plant-specific boundary conditions and adjust the work accordingly.
- Always bear in mind that changes in a system can impact other sections of the system.

Overview

The listed components and tools in the following are not part of PCS 7. You can use them to perform advanced inspections and diagnostics. Below you will find some of the diagnostics applications suitable for PCS 7:

- Amprolyzer (Add-on Product)
- BANY (Add-on Product)
- BT 200 Bus Test Device
- SYSTEM Diagnostics for Process Control (Add-on Product)

5.16.8.2 Amprolyzer (Add-on Product)

Introduction

Amprolyzer is a program that allows you to perform simple, thorough diagnostics for PROFIBUS.

Calling

If you have installed Amprolyzer, call the program with the menu command **Start menu > Programs > Amprolyzer**.

Overview

Topic	Detailed information	Called with	Additional information
System configuration	Comparison of specified and actual configuration, lifebeat monitoring	Addition of a new bus using the "Add Bus" button. Display of all bus information using the "Show Bus State" button.	Manual in PDF format
Message frame traffic	Interpretation, statistics, detection/triggering of frame errors and repeats	1. Without filters/triggers: As above 2. With filters/triggers: "Record Complex" button Message frame traffic is recorded here, in addition to a display of all bus information.	Manual in PDF format
Bus recording	Parallel recording of multiple busses at the same time, special triggers, filters	As above	Manual in PDF format
Interface to data evaluation	Open interface using MS Excel	Recorded data are automatically exported and displayed in MS Excel. A recording can be sent as an Excel file, so that the recipient does not have to have this tool.	Manual in PDF format

5.16.8.3 BANY (Add-on Product)

Overview

BANY is utility based on Microsoft Windows used for documentation, diagnostics, recording and analysis of your PCS 7 Ethernet and PROFIBUS networks.

The program packages below can be supplied separately or as a bundle:

- BANYnet
  Diagnostic tool for Ethernet networks
- BANY PROFIBUS
  Diagnostic tool for PROFIBUS networks

Requirements

- The PC to be used for analyzing the PROFIBUS using BANY PROFIBUS must be equipped with a PROFIBUS network adapter (CP 5512).
- If you wish to analyze the terminal bus and plant bus at the same time, the PC must be equipped with two Ethernet network adapters.

Calling

You call the analysis programs via the following menu commands:

- If you have installed BANYnet: **Start menu > Program Files > BANYnet**.
- If you have installed BANY PROFIBUS: **Start menu > Program Files > BANY PROFIBUS**.

BANYnet

The options for diagnosing Ethernet networks using BANYnet are shown in the table below:

Topic	Detailed information	Called with	Additional information
System configuration	Comparison of specified and actual configuration, graphical overview, lifebeat monitoring	In the Start window, select "Plant Manager"	Online help
Status of OSM/ESM	Display, parameter assignment, bus load measurement, SNMP server	In the Start window, select "System Diagnostics"	Online help
Message frame traffic	Interpretation (including PCS 7), statistics, batch analysis	In the Start window, select "Bus Analysis"	Online help
Bus recording	Parallel recording, special trigger, filter	Called from the menu in the "Bus Analysis" dialog box	Online help

BANY PROFIBUS

The options for diagnosing PROFIBUS networks using BANY PROFIBUS are shown in the table below:

Topic	Detailed information	Called with	Additional information
System configuration	Comparison of specified and actual configuration, graphical overview, master/slave monitoring, lifebeat monitoring Display, parameter assignment	In the Start window, select "Plant Manager"	Online help
Bus analysis, transmission rates of 9.6 Kbps to 12 Mbps	Bus load measurement, interpretation (incl. PCS 7), statistics, batch analysis, bus bottlenecks, available reserves, redundancy analysis	In the Start window, select "Bus Analysis"	Online help
Bus recording	Parallel recording, special trigger, filter The recording can be started and finished automatically with the help of triggers.	Refer to menu in the "Bus Analysis" dialog	Online help

5.16.8.4 BT 200 Bus Test Device

Overview

Note

The bus test device is not a software program - for this reason, the Call column is omitted.

Topic	Details	Information and Help
Bus line diagnostics	Tests for : • Line breaks • Monitor breaks • Line exchange A ←→ B • Short circuits • Number of terminating resistors inserted • Reflection points (for example, for line breaks)	Device description
Test of PROFIBUS interfaces	• RS 485 drivers • Internal voltage supply at 5V • RTS signal	Device description
Test of accessibility	... of stations	Device description
Protocol functions		Device description

5.16.8.5 SYSTEM Diagnostics for Process Control (Add-on Product)

Introduction

Display of PROFIBUS diagnostic information on the operator station

Online help: *SYSTEM DIAGNOSTICS - Help*

Overview

Topic	Detailed information	Called with	Additional information
PROFIBUS DP – General	Station failure Display from HW Config	Picture in the OS	See "Configuration" below
PROFIBUS DP Fault	Fault indication with Detailed information about cause of error	Picture in the OS	See "Configuration" below
From HW Config Information	"Name and comments"	Picture in the OS	See "Configuration" below
Configuration information	Order no; Addresses; Slot types	Picture in the OS	See "Configuration" below

Configuration

The configuration is described in the online help *SYSTEM DIAGNOSTICS - Help >*, section "PROFIBUS DP/PA DIAGNOSTICS".

6 Failure, Exchange and Return

6.1 Failure, Exchange and Return - Guide to Documentation

Guide to Documentation

You can find information on component response and the procedure to be followed in the event of failure, exchange and return in the following documentation:

Scenario	Information can be found in ...	Section ...
I/O		
Failure and function fault of modules	Manual *Automation System S7-400 CPU Data*	• Monitoring functions of the CPU
Failure and function fault of SIMATIC ET 200M	Manual *SIMATIC Distributed I/O Device ET 200M*	• Commissioning and Diagnostics
Failure and function fault of SIMATIC ET 200iSP	Manual *SIMATIC Distributed I/O Device ET 200iSP*	• Commissioning and Diagnostics
Failure and function fault of SIMATIC ET 200S	Manual *SIMATIC Distributed I/O Device ET 200iSP*	• Commissioning and diagnostics
Failure and function fault of *Ex I/O modules*	Reference manual *Automation Systems S7-300, ET 200M Ex I/O Modules*	• SIMATIC S7 Ex digital modules • Diagnostics for analog modules
Failure and function fault of redundant input/output modules	Configuration manual *Process Control System PCS 7; Fault-tolerant Systems*	• Failure of Redundant I/O Modules • How to Set the CPU in Respect of the Response of the I/O Modules in the Event of Channel Errors
Failure and function fault of distributed I/O components	Manual *Automation Systems S7-400H; Fault-tolerant Systems* :	• Failure and Replacement of a PROFIBUS DP Master • Failure and Replacement of a Redundant PROFIBUS DP Interface Module • Failure and Replacement of a Redundant PROFIBUS DP Slave • Failure and Replacement of Redundant PROFIBUS DP Lines
Failure of devices configured using PDM	Manual *SIMATIC;* The Process Device Manager	• Device Replacement

Scenario	Information can be found in ...	Section ...
Automation systems		
Failure of a CPU in a redundant AS	Configuration manual *Process Control System PCS 7; Fault-tolerant Systems*	• Failure of the Master CPU
Failure of synchronization between the CPUs of a redundant AS	Configuration manual *Process Control System PCS 7; Fault-tolerant Systems*	• Failure of a Fiber-Optic Cable
Communication		
Failure and function fault of *SCALANCE X-400*	Operating Instructions SIMATIC NET; *Industrial Ethernet switches SCALANCE X-400*	• Installation and Commissioning - Installation and Removal - Displaying LEDs - Replacing the C-PLUG
Failure and function fault of *SCALANCE X-200*	Commissioning manual *SIMATIC NET; Industrial Ethernet SCALANCE X-100 and SCALANCE X-200 Product Line*	• Installation and Maintenance • Configuration/Diagnostics via Remote Mechanisms • SCALANCE X2<...> Displays
Failure and function fault on the OSM	User manual *SIMATIC NET; Industrial Ethernet OSM/ESM Network Management*	• Notes on Troubleshooting
Disrupted network connections	Configuration manual *Process Control System PCS 7; Fault-tolerant Systems*	• Failure, Failover and Restarting of Redundant OS Servers - Disrupted network connection to the OS partner server - Disrupted Network Connection Between the OS Client and the OS Server - Disrupted Network Connection Between the OS and AS
Fault on PROFIBUS DP	Manual *SIMATIC; Diagnostic Repeater for PROFIBUS DP*	• Mounting • Commissioning • Diagnostics
Operator control and monitoring stations		
Failure of a redundant OS server	Configuration manual *Process Control System PCS 7; Fault-tolerant Systems*	• Failure of a redundant OS server
Switchover response of OS clients in the event of an OS server failure	Configuration manual *Process Control System PCS 7; Fault-tolerant Systems*	• Switchover response of OS clients in the event of an OS server failure
Failure of BATCH servers	Manual *Process Control System PCS 7; SIMATIC BATCH*	• Failure of BATCH servers

Scenario	Information can be found in ...	Section ...
Switchover response of BATCH clients in the event of a BATCH server failure	Manual *Process Control System PCS 7; SIMATIC BATCH*	• Switchover response of BATCH clients in the event of a BATCH server failure
Failure response of Route Control servers	Manual *Process Control System PCS 7; SIMATIC Route Control*	• Failure response of Route Control servers
Switchover response of Route Control clients in the event of a Route Control server failure	Manual *Process Control System PCS 7; SIMATIC Route Control*	• Switchover response of Route Control clients in the event of a Route Control server failure

Index

A

B

C

D

E

F

G

H

I

L

M

N

O

P

R

S

T

U

W