

SIMATIC

Process Control System PCS 7 Getting Started (V8.0 or higher with APL)

Getting Started

Preface	1
Creating the PCS 7 project	2
Configuring the hardware and networks	3
Configuring the process tags and the sequential control	4
Preparing the process picture for automatic generation	5
Creating a unit by means of copying	6
Programming and interconnecting the process tags	7
Compile and download	8
Adapting process pictures	9
Operating and monitoring the process	10

Legal information

Warning notice system

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

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

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

Qualified Personnel

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

Proper use of Siemens products

Note the following:

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

Trademarks

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

Disclaimer of Liability

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

Table of contents

1	Preface.....	5
2	Creating the PCS 7 project.....	7
2.1	How to Create the PCS 7 Project.....	7
3	Configuring the hardware and networks.....	11
3.1	How to Configure the Hardware.....	11
3.2	Editing the symbols in HW Config.....	13
3.2.1	How to edit the symbols of the analog input module.....	13
3.2.2	How to Edit the Symbols of the Analog Output Module.....	15
3.2.3	How to Edit the Symbols for the Digital Input Module.....	15
3.2.4	How to Edit the Symbols for the Digital Output Module.....	16
3.3	Setting up the PC Interface.....	17
3.3.1	How to set up the Ethernet interface for the SIMATIC PC station.....	17
3.4	Saving and compiling data in Netpro.....	19
3.4.1	How to Save and Compile the Configurations in NetPro.....	19
3.5	Starting S7 PLCSIM.....	21
3.5.1	How to Start S7-PLCSIM.....	21
3.6	Download to the PLC.....	22
3.6.1	How to download the Ethernet interface from NetPro to the PLC.....	22
4	Configuring the process tags and the sequential control.....	25
4.1	How to Copy the CFC Charts from the Zip File to the Master Data Library.....	25
4.2	How to create a project-specific CFC chart.....	26
4.3	How to Copy the CFC Charts into the Project.....	28
4.4	How to Configure the SFC Chart.....	30
4.5	How to Organize the Project Folder.....	33
5	Preparing the process picture for automatic generation.....	35
5.1	How to Prepare the Plant Display for Automatic Generation.....	35
6	Creating a unit by means of copying.....	37
6.1	How to create a unit by copying the "UNIT_A" unit.....	37
7	Programming and interconnecting the process tags.....	39
7.1	How to program and interconnect the process tags.....	39
8	Compile and download.....	43
8.1	How to Compile and Download Objects.....	43
8.2	How to Set the CPU to RUN/P in S7-PLCSIM.....	46

9 **Adapting process pictures.....49**

 9.1 How to adapt process pictures.....49

10 **Operating and monitoring the process.....51**

 10.1 How to Operate and Monitor the Process.....51

Index.....57

Preface

Information About the Getting Started PCS 7 - First Steps Documentation

The *Getting Started - First Steps* documentation uses a straightforward sample project to illustrate the basic principles of the SIMATIC PCS 7 software components and how they interact during engineering and in a process mode context.

This Getting Started serves as an introduction and does not contain detailed or background information. If this Getting Started information has increased your interest in SIMATIC PCS 7, we recommend you read the *Process Control System PCS 7, Getting Started Part 1*.

Conventions

Note

In this documentation, the names of elements in the software interface are specified in the language of this documentation. If you have installed a multi-language package for the operating system, some of the designations will be displayed in the base language of the operating system after a language switch and will, therefore, differ from the designations used in the documentation.

In PCS 7, you can use standard Windows functions in many situations:

- Multiple selection using the "CTRL" and "Shift" keys
- Column sorting in tables by clicking on the column header
- Use of "drag & drop" instead of "copy and paste"

The individual tutorials in Getting Started build on each other so that you will create your own complete PCS 7 project step-by-step. For this reason, you should work through all the tutorials in the specified sequence.

Purpose of this Getting Started Documentation

This document aims to guide you quickly and successfully through the basics of SIMATIC PCS 7. You get to know many elementary configuration steps and develop an understanding for how SIMATIC PCS 7 functions in the process.

Requirements for the Getting Started PCS 7 - First Steps Documentation

The "fast_MP" sample project can be carried out on any PC or programming device on which the following software is installed:

- Operating system, Internet Explorer, Message Queuing service and SQL server (additional information is available in the manual *Process Control System PCS 7; PC configuration and authorization* and *Process Control System PCS 7; Released Modules*)
- Software package SIMATIC PCS 7 (with PCS 7 Advanced Process Library)

- License keys
- S7-PLCSIM for simulating a SIMATIC S7-400 automation system

Options for accessing PCS 7 documentation

Note

PCS 7 Readme

The information given in the *PCS 7 Readme* on the Internet takes precedence over all the PCS 7 manuals. Please read this *PCS 7 Readme* carefully; it contains important information and amendments on PCS 7.

- The *PCS 7 Readme* on the *Process Control System; SIMATIC PCS 7* DVD contains important information regarding PCS 7 and takes precedence over the PCS 7 documentation supplied.
 - After installation of PCS 7, you can find documents such as *Process Control System PCS 7; PCS 7 Readme* and *What's New in PCS 7?* via the submenu **SIMATIC > Product Information > <Language>**.
-

As of PCS 7 V8.0, you receive basic PCS 7 system documentation with the *Process Control System; SIMATIC PCS 7* DVD.

The PCS 7 Internet site www.siemens.de/pcs7-dokumentation (www.siemens.com/pcs7-documentation) provides convenient access to the complete PCS 7 documentation. You can find the following for the latest PCS 7 versions:

- In the section **"Hardware manuals for SIMATIC PCS 7 ..."**
 - The manuals for components approved for a PCS 7 version
- In the section **"Software manuals for SIMATIC PCS 7 ..."**
 - The complete system documentation
 - The separate setup program for PCS 7 documentation and the PCS 7 help system for download. After the installation of the setup program, you will find the documentation at the following locations on the Engineering Station:
 - As online help (CHM file) for the SIMATIC Manager application
 - As a PDF file in the Windows Start menu with the SIMATIC documentation
 - The complete documentation for PCS 7 as a *Manual Collection*.

Elements of the Getting Started PCS 7 - First Steps Documentation

The document is available in online help format or can be printed out as a hardcopy PDF. We recommend using the printed PDF for configuration on the PC.

You will find the online help and the printable manual in the Start menu under the SIEMENS SIMATIC documentation following installation of SIMATIC PCS 7.

We wish you every success!

Your SIEMENS AG

Creating the PCS 7 project

2.1 How to Create the PCS 7 Project

Introduction

The PCS 7 "New Project" Wizard lets you create a new PCS 7 multiproject with a few mouse clicks.

Requirements

- PCS 7 V8.0 or higher and the associated license keys are installed.
- S7-PLCSIM V5.4 or higher is installed.

Procedure

Step	Action
1	Select the menu command SIMATIC Manager under SIEMENS SIMATIC products in the start menu or double-click the following icon on the desktop:  SIMATIC Manager starts.
2	If projects are still open in SIMATIC Manager, select the menu command File > Close until all projects are closed.
3	Select File > "New Project..." Wizard. The program starts the "New Project" wizard of PCS 7.
4	In step 1(4): Click "Next".
5	In step 2(4): • Select CPU "AS 414-3IE". • Select the bundle 6ES7654**D10-3BC* E-STAND:5. • Select "0" from the "Number of communication modules" drop-down list. • Click "Next".
6	In step 3(4): • Select "3" in the "Number of levels" field in the "Plant hierarchy" group. • Select the "CFC chart" and "SFC chart" check boxes in the "AS objects" group. • In the "OS objects" group, select the "PCS 7 OS" check box and the "Single station system" radio button. • Click "Next".

Step	Action
7	In step 4(4): • Enter "fast" in the "Directory name" input box. • Select a different storage location for the project if necessary. • Click "Make".
8	With an unmodified standard installation of PCS 7, the "Selection of the message number assignment" dialog box appears. Note: In SIMATIC Manager, you can adjust the default setting for assigning message numbers for new projects (standard setting: "Always query settings"). 1. Select Options > Settings 2. In the "Message numbers" tab, change the default for future projects/libraries as follows: – Select the "Assign CPU-oriented unique message numbers" radio button. – If you specify a default that differs from the standard default, the prompt for the message number assignment selection in the PCS 7 Wizard is discarded. 3. Click "OK".
9	On completion, the wizard is closed automatically and the Plant View and Component View are displayed in SIMATIC Manager. Close the Plant view and select View > Process Object view .
10	Select Window > Arrange > Tile vertically . The "Process Object view" and "Component view" windows are arranged vertically.

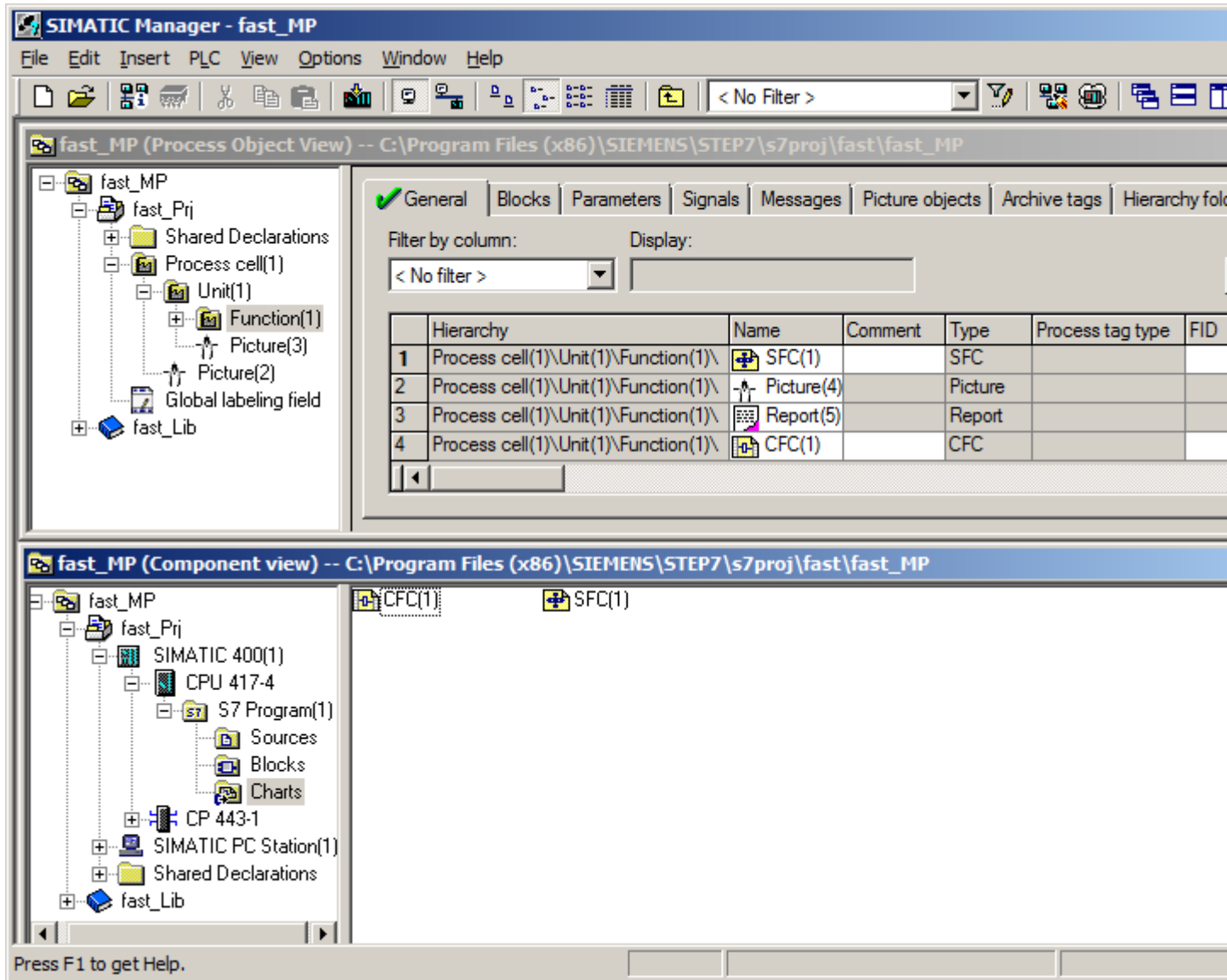
Note

By selecting the **Options > Settings ...** menu command in SIMATIC Manager, you can select the view to be displayed when you open a project from the "Default project view" entry in the "View" tab of the "Settings" dialog box.

Result

You have successfully created the "fast_MP" multiproject that includes a SIMATIC 400 station, a SIMATIC PC station and the "fast_Lib" master data library in SIMATIC Manager. The new

multiproject is displayed in the Process Object view and in the Component view of SIMATIC Manager.



Configuring the hardware and networks

3.1 How to Configure the Hardware

Introduction

The PCS 7 Wizard has created a SIMATIC 400 station, a SIMATIC PC station, and a master data library.

Carry out the following configuration steps in HW Config:

- Create a communication interface.
- Add hardware modules from the hardware catalog for the automation system.

Requirement

- You have created the PCS 7 multiproject "fast_MP".

Procedure

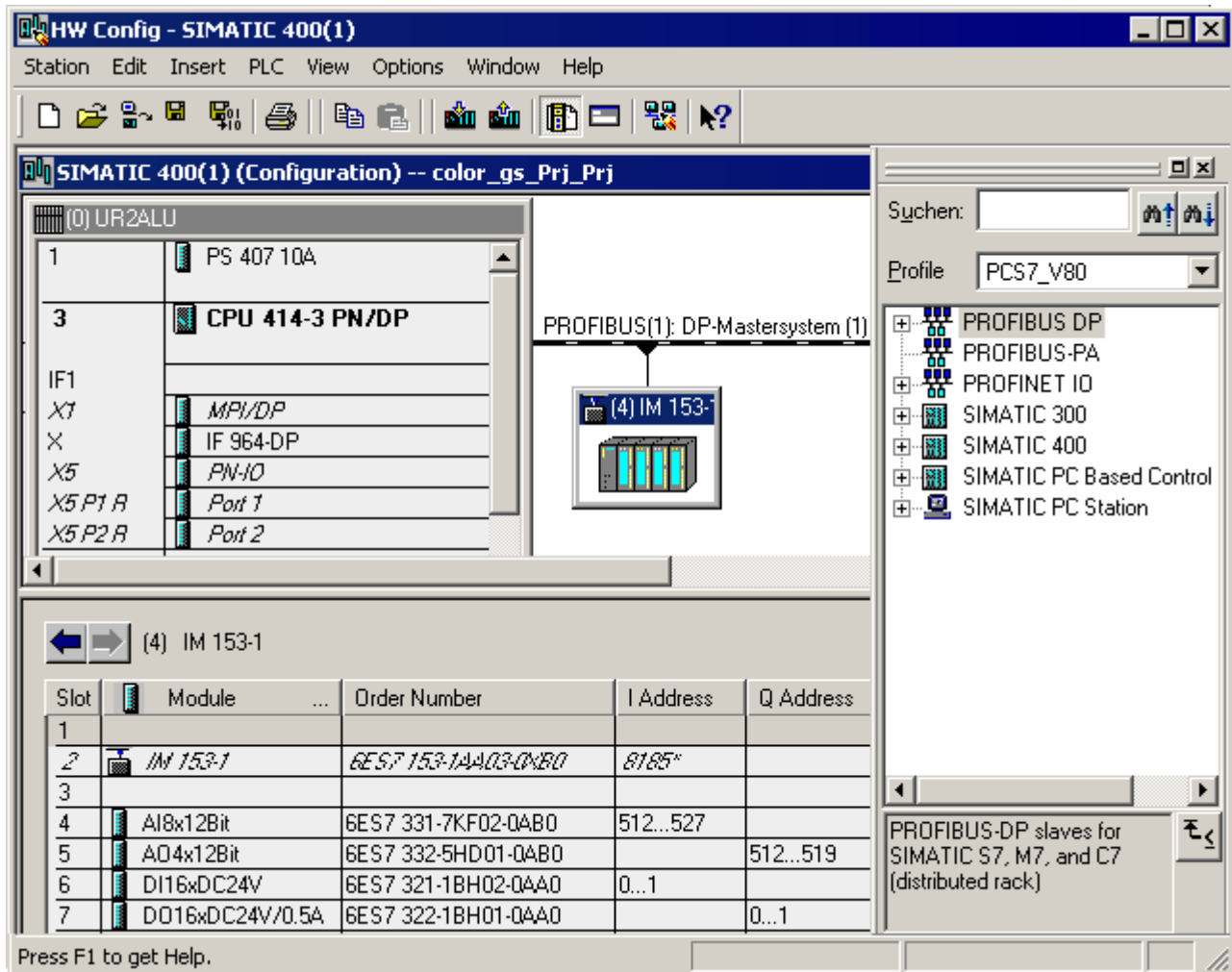
Step	Action
1	Select the SIMATIC 400 station in the Component view, followed by the menu command Edit > Open Object . HW Config opens.
2	Open the shortcut menu of module CPU 414-3 in the X5 (PN-IO) I/O and select the Object properties menu command. The "Properties - PN-IO (R0/S3.5)" dialog box opens.
3	• Open the "General" tab. • Click "Properties" in the "Interface" area. The "Properties - Ethernet interface PN-IO (R0/S3.5)" dialog box opens. • Change the entry in the "IP address" input field to a free address within the address range of your computer. Note: You can obtain information on the address range of your computer via the command line program "ipconfig". • Click "New" in the "Subnet" area. The "Properties - New Subnet Industrial Ethernet" dialog box opens. • Enter a name, e.g. "Plant bus", for the communication channel in the "Name" input field. • Click "OK" in the "Properties – New Subnet Industrial Ethernet" dialog box. The dialog box closes. • In the "Properties - Ethernet Interface PN-IO (R0/S3.5)" dialog box, the list in the "Subnet" area now shows the "Plant bus" entry. • Click "OK". The dialog box closes. • Click "OK" in the "Properties – PN-IO (R0/S3.5)" dialog box. The dialog box closes.

3.1 How to Configure the Hardware

Step	Action
4	• If the hardware catalog is not visible, select the menu command View > Catalog. • Select the current PCS 7 version from the "Profile" drop-down list. • In the hardware catalog, open the "PROFIBUS DP" folder. • Open the "ET 200M" folder and select the "IM 153-2" module. Drag & drop the module to the "DP master system" line. The "Properties - PROFIBUS Interface IM 153-2" dialog box opens. • Click "OK". The defaults are applied.
5	• In the hardware catalog, click the plus symbol to the left of the "IM 153-2" " folder. • Open the "AO-300" folder and drag the module "SM 332 AO4x12Bit" (6ES7 332-5HD01-0AB0) to the slot 4 at the bottom of the IM 153-2 configuration table. Close the "AO-300" folder. Tip: When the module is selected in the hardware catalog, the order number is displayed in the information box at the bottom of the screen. • Open the "AI-300" folder and drag the module "SM 331 AI8x12Bit" (6ES7 331-7KF02-0AB0) to the slot 5 at the bottom of the IM 153-2 configuration table. Close the "AI-300" folder. • Open the "DO-300" folder and drag the module "SM 322 DO16xDC24V/0,5A" (6ES7 322-1BH01-0AA0) to the slot 6 at the bottom of the IM 153-2 configuration table. Close the "DO-300" folder. • Open the "DI-300" folder and drag the module "SM 321 DI16xDC24V" (6ES7 321-1BH02-0AA0) to the slot 7 at the bottom of the IM 153-2 configuration table. Close the "DI-300" folder.
6	Save the changes up to this point with the menu command Station > Save .

Result

In HW Config, the IM 153-2 redundantly applicable interface module for the ET 200M distributed I/O station is extended with the addition of the analog/digital input/output modules.



3.2 Editing the symbols in HW Config

3.2.1 How to edit the symbols of the analog input module

Introduction

To allocate names to the addresses of the "AI8x12Bit" analog input module, assign symbolic names and comments for each address in the "Edit symbols" dialog.

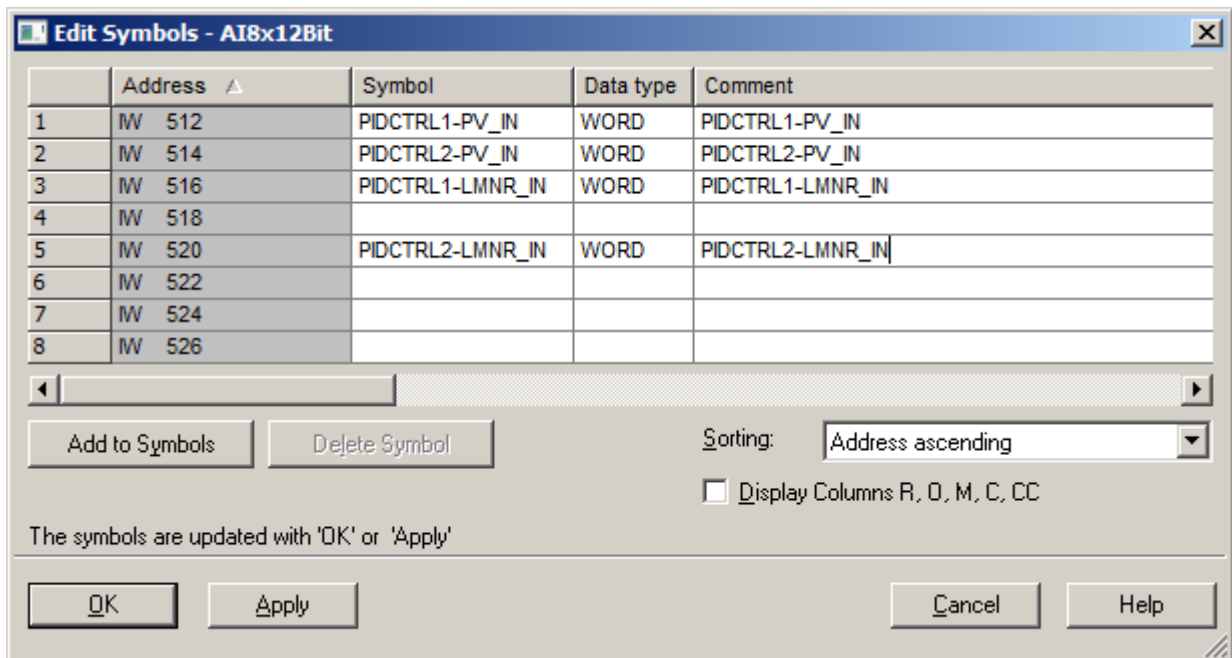
Requirements

- The analog input module is configured in HW Config.
- HW Config is open.

Procedure

Step	Action
1	In the configuration table, open the shortcut menu of the analog input module in slot 4 and select the menu command Edit symbols...
2	In the "Symbol" column, enter "PIDCTRL1-PV_IN" for the first address (EW 512) and use the tab key to move the mouse pointer to the "Data type" column and further to the "Comment" column. In the "Comment" column, re-enter the symbolic name from the "Symbol" column. Tip: Copy the name entered in the "Symbol" column and paste it into the "Comment" column.
3	Enter the symbolic names and comments for the remaining addresses in the same manner. • Second address (EW 514): "PIDCTRL2-PV_IN" • Third address (EW 516): "PIDCTRL1-LMNR_IN" • Fourth address (EW 520): "PIDCTRL2-LMNR_IN"
4	Click "OK". Your settings are applied and the dialog box closes.

Result



3.2.2 How to Edit the Symbols of the Analog Output Module

Introduction

To allocate names to the addresses of the "AO4x12Bit" analog output module, assign symbolic names and comments for each address in the "Edit symbols" dialog.

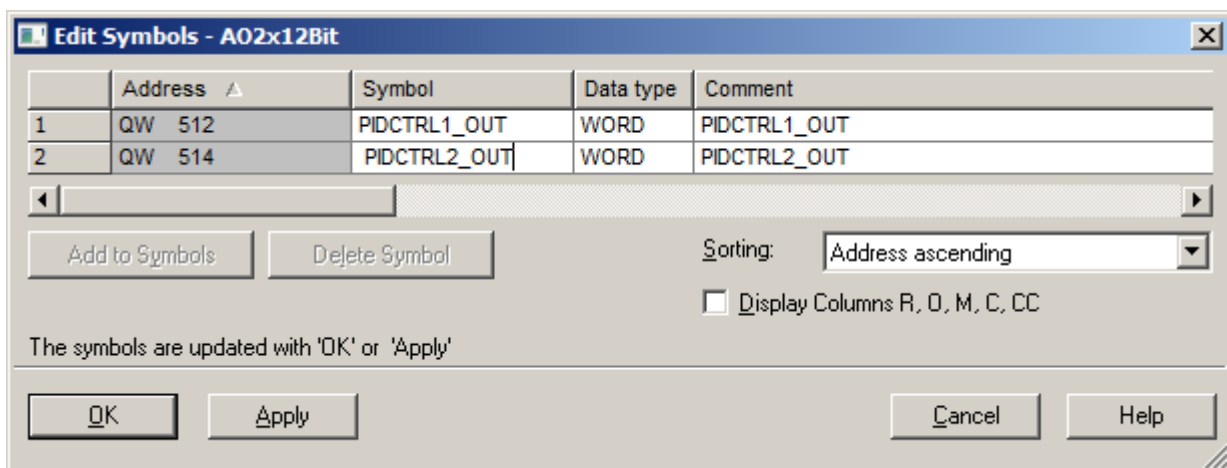
The procedure is the same as for the analog input module.

Enter the symbolic names and comments as illustrated in the figure below.

Requirements

- The analog output module is configured in HW Config.
- HW Config is open.

Result



3.2.3 How to Edit the Symbols for the Digital Input Module

Introduction

To allocate names to the addresses of the "DI16x24V" digital input module, assign symbolic names and comments for each address in the "Edit symbols" dialog.

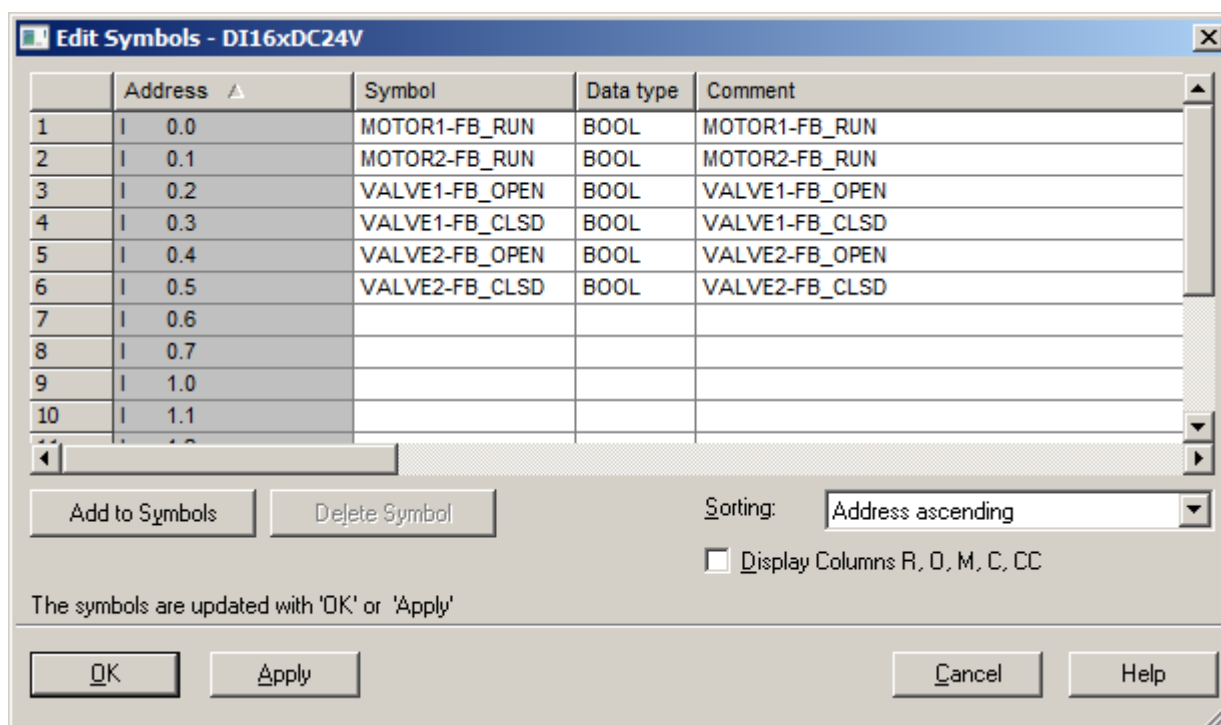
The procedure is the same as for the analog input module.

Enter the symbolic names and comments as illustrated in the figure below.

Requirements

- The digital input module is configured in HW Config.
- HW Config is open.

Result



3.2.4 How to Edit the Symbols for the Digital Output Module

Introduction

To allocate names to the addresses of the "DO8xDC24V/2A" digital output module, assign symbolic names and comments for each address in the "Edit symbols" dialog.

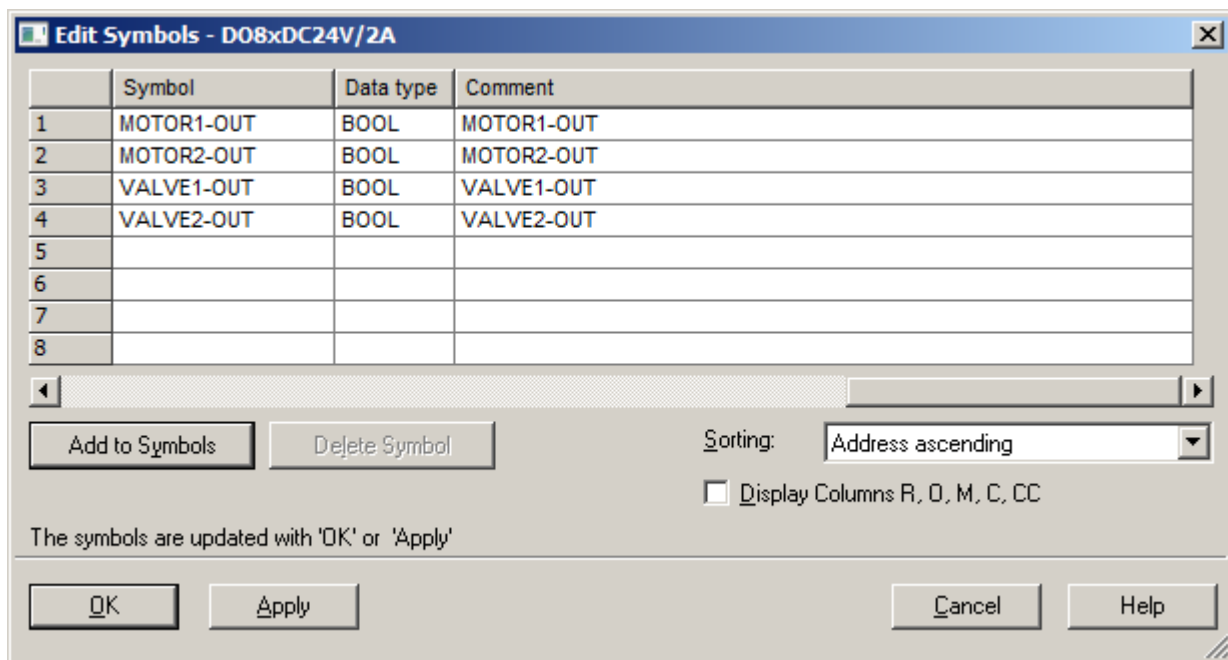
The procedure is the same as for the analog input module.

Enter the symbolic names and comments as illustrated in the figure below.

Requirements

- The digital output module is configured in HW Config.
- HW Config is open.

Result



3.3 Setting up the PC Interface

3.3.1 How to set up the Ethernet interface for the SIMATIC PC station

Introduction

In order to use S7-PLCSIM, you will need to set up an Ethernet interface for the SIMATIC PC station so that the OS variables can be compiled and a connection can be established between the AS and OS for PLCSIM.

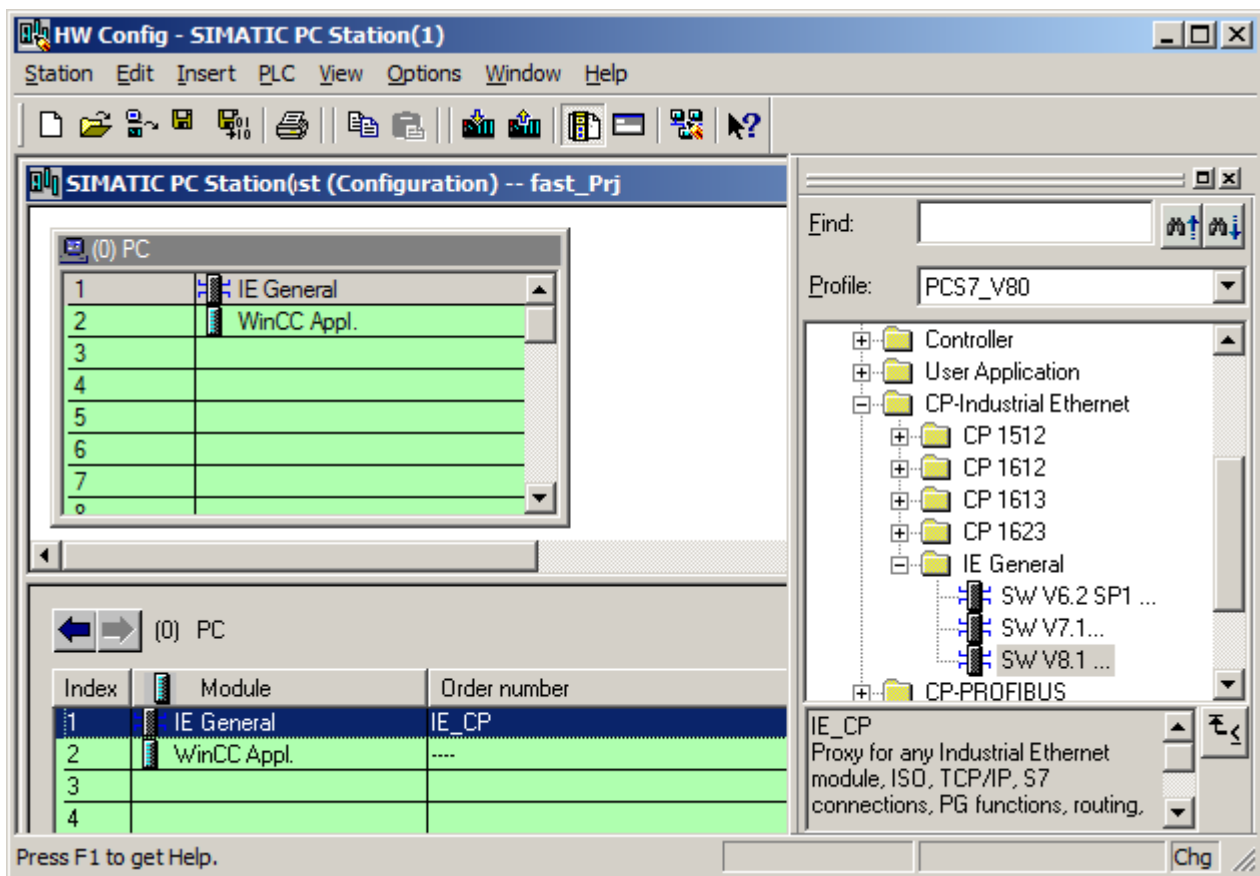
Requirement

- The PCS 7 "fast_MP" project has been created using the PCS 7 Wizard.
- SIMATIC Manager is open in the Component View.

Procedure

Step	Action
1	In the Component View, select the SIMATIC PC station in the "fast_Prj" folder , followed by the menu command Edit > Open Object . HW Config opens.
2	• If the hardware catalog is not visible, select the View > Catalog menu command. • Select the current PCS 7 version from the "Profile" drop-down list. • Open the following folder in the hardware catalog: SIMATIC PC Station > CP Industrial Ethernet > IE General. • Drag & drop the "SW V..." module with the latest version to the slot with index "1". The "Properties – Ethernet Interface IE General (R0/S1)" dialog window opens. • Select the "IP protocol is being used" check box. • Change the entry in the "IP address" input field to the IP address of your computer. • Clear the "Set MAC address/use ISO protocol" check box. • Select the "Plant bus" entry in the list in the "Subnet" area. • Click "OK". The dialog box closes.
3	Select the Station > Save and Compile command.
4	Select the Station > Exit command.

Result



3.4 Saving and compiling data in Netpro

3.4.1 How to Save and Compile the Configurations in NetPro

Introduction

The settings you configured in HW Config for the OS Ethernet interface are accepted by NetPro. Now save, compile, and check the network configuration.

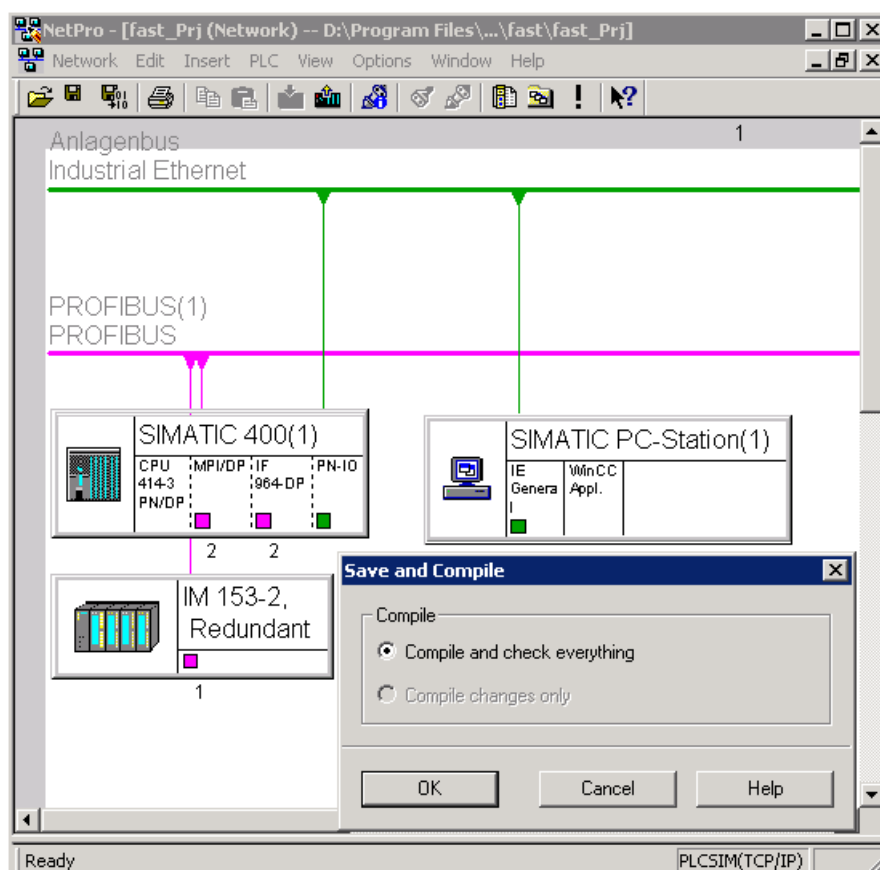
Requirement

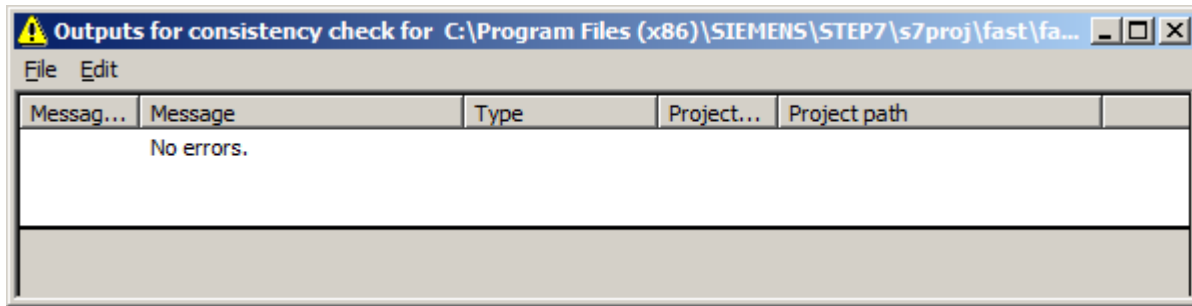
- Configuration has been completed in HW Config.

Procedure

Step	Action
1	In the Component view, select the "fast_Prj" project in the left window of SIMATIC Manager.
2	In the right window of SIMATIC Manager, double-click the "Plant bus" object. The "NetPro" dialog box opens.
3	Select the Network > Save and Compile menu command in NetPro. The "Save and Compile" dialog box opens.
4	Activate the "Compile and check everything" radio button and click "OK".
5	Close the "Outputs for consistency check" dialog box.

Result





3.5 Starting S7 PLCSIM

3.5.1 How to Start S7-PLCSIM

Introduction

Once S7-PLCSIM has been started, you can download the Ethernet interface configured in HW Config from NetPro to the PLC.

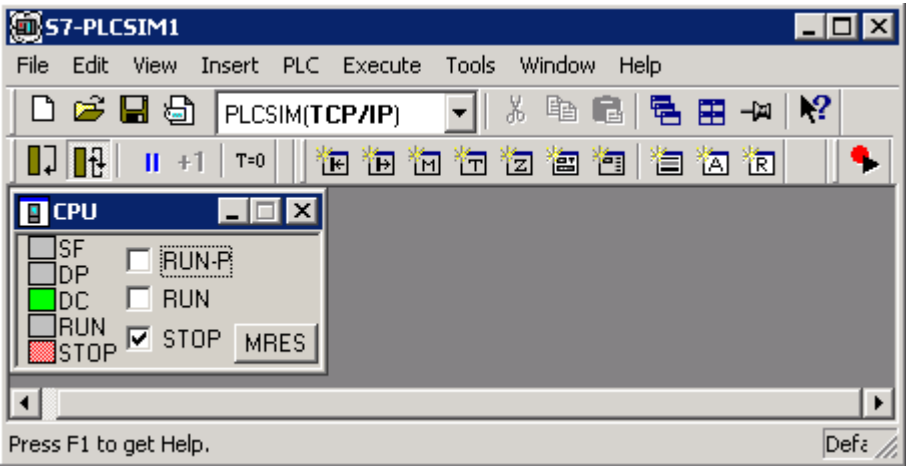
Requirements

- Configuration has been completed in HW Config.
- The network configuration from NetPro has been saved, compiled and checked.

Procedure

Step	Action
1	Switch to the SIMATIC Manager window.
2	Select the menu command Options > Simulate Modules . The "S7 PLCSIM1" dialog box opens.

3.6 Download to the PLC

Step	Action
3	Select the "PLCSIM(TCP/IP)" entry from the drop-down list in the toolbar. 
4	Make sure the CPU is in the "STOP" state.
5	Using the task bar, go back to NetPro.

3.6 Download to the PLC

3.6.1 How to download the Ethernet interface from NetPro to the PLC

Introduction

The following section describes how to download the Ethernet interface configured in HW Config from NetPro to the PLC.

Requirements

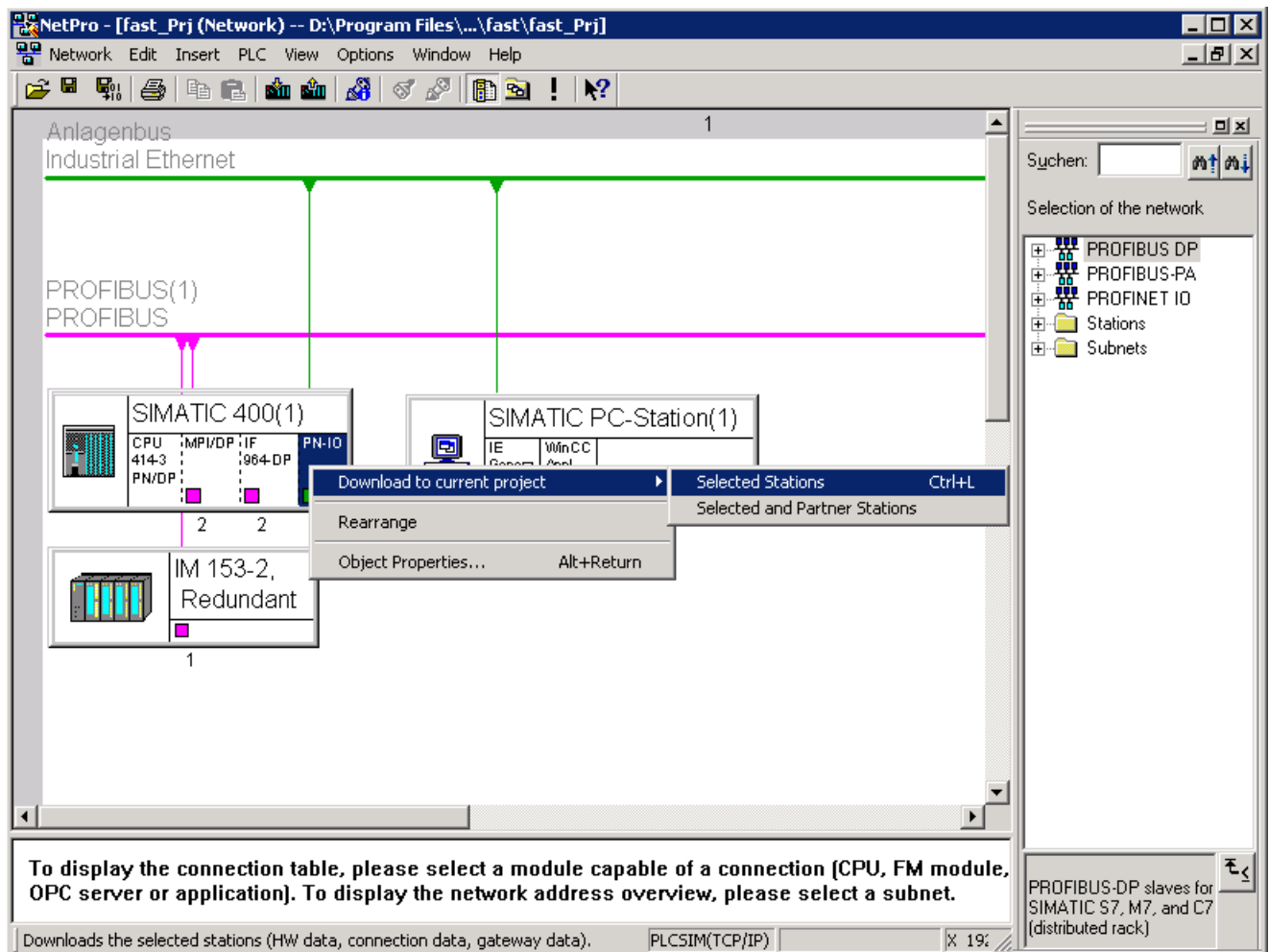
- Configuration has been completed in HW Config.
- NetPro is open.
- S7-PLCSIM has been started and the CPU is in the "STOP" state

Procedure

Step	Action
1	In the network view in NetPro, click on the AS "SIMATIC 400(1)" symbol on the "CPU 414-3 PN/DP" interface.
2	Open the context menu and select menu command Download in current project > Selected stations.

Step	Action
3	Click the "Yes" button in the warning dialog box that appears.
4	Select the menu command Network > Exit . NetPro closes.

Result



Configuring the process tags and the sequential control

4

4.1 How to Copy the CFC Charts from the Zip File to the Master Data Library

Introduction

Use the following standard templates from the *PCS 7 AP Library Vxx* for configuration purposes:

- MotorLean
- PIDConL_ConPerMon
- ValveLean

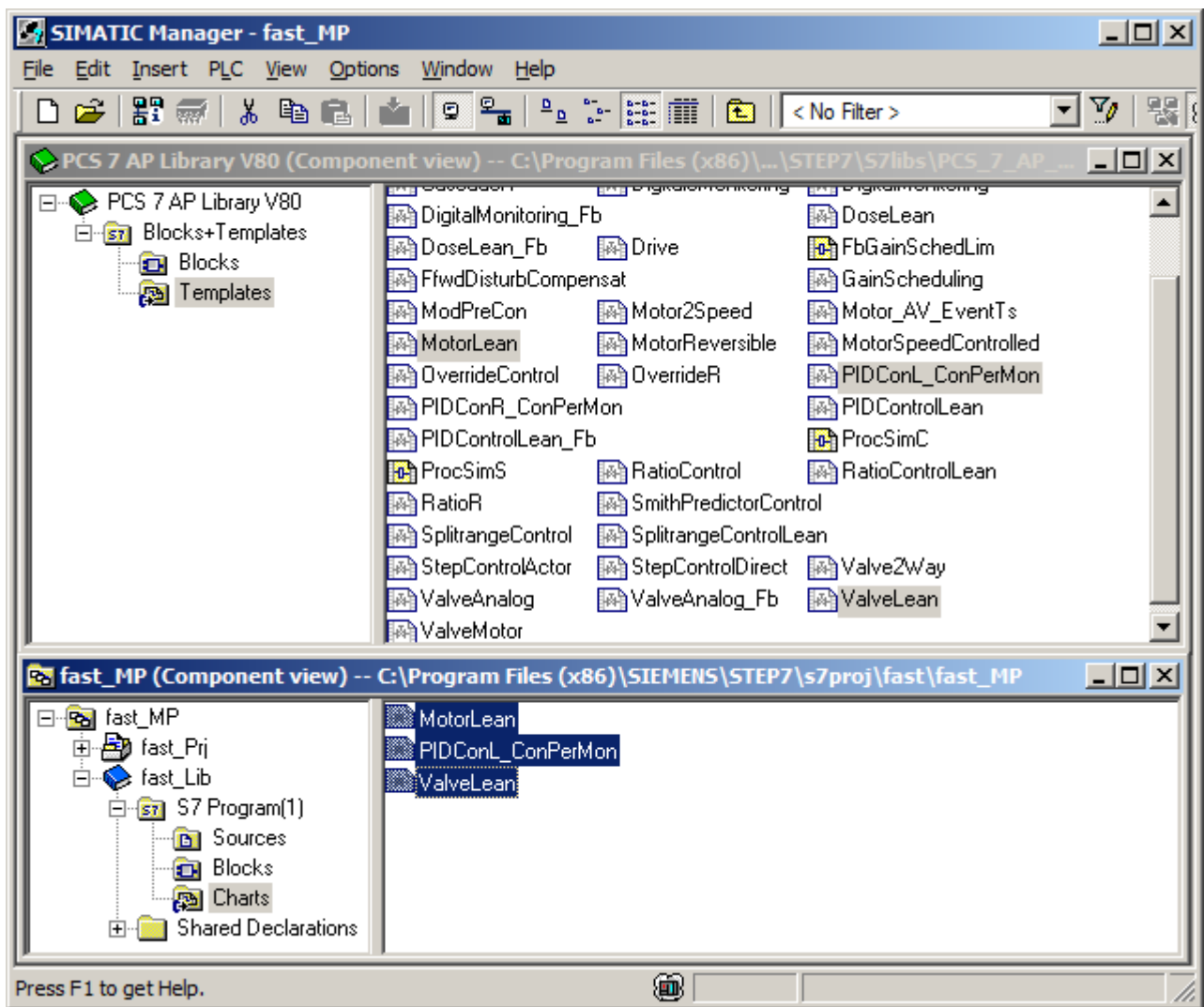
Requirements

- SIMATIC Manager is open in the Component view.
- You have created the "fast_MP" PCS 7 project as a multiproject using the PCS 7 Wizard and opened it.
- The "S7 Program(1)/Charts" folder under "fast_Lib" is open.
- The latest *PCS 7 AP Library Vxx* has been installed.

Procedure

Step	Action
1	• Select the menu command File > Open. • Select the "Libraries" tab. • In the list, select the entry "PCS 7 AP Library <Vxx>". • Click "OK".
2	In SIMATIC Manager, select the menu command Window > Arrange > Tile vertically .
3	• Navigate to the "fast_Lib" master data library in the folder "S7 Program(1)/Charts" in the "fast_MP" multiproject. • In the "PCS 7 AP Library V... (Component view)..." window, open the "PCS 7 AP Library <Vxx> > Blocks + Templates > Templates" folder. • Keeping <Ctrl> pressed, select the MotorLean, PIDConL_ConPerMon and ValveLean process tag types (CFC charts) in the right window. • Drag-and-drop the selected process tag types (CFC charts) to the "S7 Program(1)/Charts" folder in the "fast_Lib" master data library of the "fast_MP" multiproject. You have successfully saved the process tag types (CFC charts) to the master data library within your multiproject.
4	Close the "PCS 7 AP Library V... (Component view)..." window.

Result



4.2 How to create a project-specific CFC chart

You have copied a chart or template to the master data library from a library or project. You can use this object as it is or modify it and then use it in the project.

In the example you have copied templates from the PCS 7 AP Library Vxx to the master data library of the "fast_MP" project. These charts are adapted for the specific project in question.

Note

The CFC Editor contains a zoom function. Use this function to adjust the display size of the blocks.

Procedure

Step	Action
1	- In the Component view in SIMATIC Manager , open the "S7 Program(1)/Charts" folder in the "fast_Lib" master data library. - Select the "MotorLean" CFC chart. In the shortcut menu, select the menu command "Rename". Enter the object name "MOTOR1" . - Select the "ValveLean" CFC chart. In the shortcut menu, select the menu command "Rename". Enter the object name "VALVE1" . - Select the "PIDConL_ConPerMon" CFC chart. In the shortcut menu, select the menu command "Rename". Enter the object name "PIDCTRL1" . After being renamed, the process tag types become process tags.
2	- Double-click on the "MOTOR1" CFC chart. The CFC Editor opens. - Connect the "Start" parameter of the "Motor" block to the "SimPV_In" parameter of the "FbkRun" block. Proceed as follows: - Left-click on the "Start" parameter and keep the mouse button pressed. - Move the cursor to the "SimPV_In" parameter until an arrow symbol appears. - Release the mouse button. - Double-click on the "Sim_On" parameter on the "FbkRun" block. The "Select Structure Element" dialog box opens. - Double-click the "Value ..." line. The "Properties - Input/Output" dialog box opens. - Change the entry in the "Value" input box to 1. - Click "OK". The "Properties - Input/Output" dialog box closes. - Click "Close". The "Select Structure Element" dialog box closes. - In the CFC Editor, select the menu command Chart > Close.
3	- In the Component view in SIMATIC Manager , open the "S7 Program(1)/Charts" folder in the "fast_Lib" master data library. - Double-click on the "VALVE1" CFC chart. The CFC Editor opens. - Connect the "Ctrl" parameter of the "Valve" block to the "SimPV_In" parameter of the "FbkOpen" block. - Double-click on the "Sim_On" parameter on the "FbkOpen" block. The "Select Structure Element" dialog box opens. - Double-click the "Value ..." line. The "Properties - Input/Output" dialog box opens. - Change the entry in the "Value" input box to 1. - Click "OK". The "Properties - Input/Output" dialog box closes. - Click "Close". The "Select Structure Element" dialog box closes. - Connect the "Ctrl" parameter of the "Valve" block to the "SimPV_In" parameter of the "FbkClose" block. - Select the "SimPV_In" parameter of the "FbkClose" block. Select the Invert command in the shortcut menu. Note: An inversion of an input signal is represented by a solid circle at the block input. - Double-click on the "Sim_On" parameter on the "FbkClose" block. The "Select Structure Element" dialog box opens. - Double-click the "Value ..." line. The "Properties - Input/Output" dialog box opens. - Change the entry in the "Value" input box to "1". - Click "OK". The "Properties - Input/Output" dialog box closes.

Result

The "MOTOR1" and "VALVE1" CFC charts are adapted for the specific project in question. The "PIDCTRL1" CFC chart is a copy of the "PIDConL_ConPerMon" template of the PCS 7 AP Library Vxx.

Note

MOTOR1 and VALVE1 example

The changes made to the APL templates are marked in red on the screenshots below.

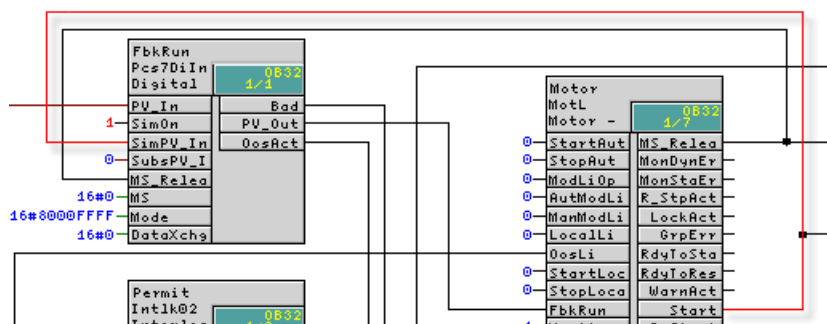


Figure 4-1 MOTOR1

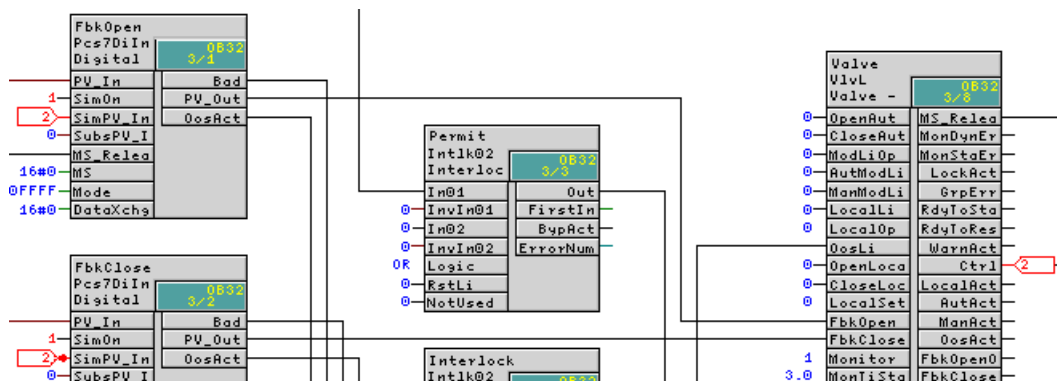


Figure 4-2 VALVE1

4.3 How to Copy the CFC Charts into the Project

Introduction

Now copy the adapted and renamed CFC charts from the "fast_Lib" master data library in the "fast_Pri" project to the plant's "Function (1)" folder. When you have completed copying you can continue with configuration in SIMATIC Manager in the Process Object view.

Requirement

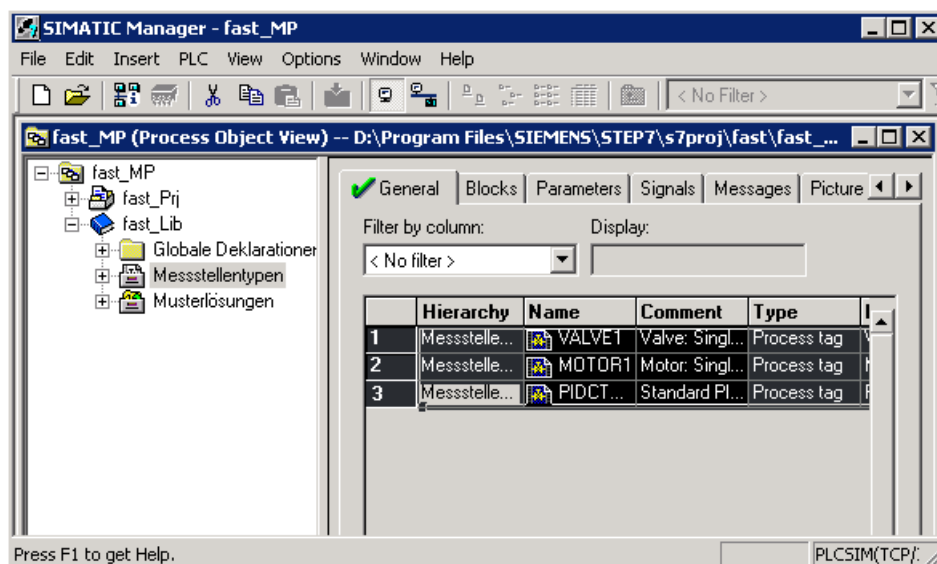
- The project-specific CFC charts "MOTOR1", "VALVE1" and "PIDCTRL1" are located in the "Charts" folder of the master data library in the Process Object View.
- SIMATIC Manager is open in the Component View.

Procedure

Step	Action
1	Select the menu command "View > Plant View" in SIMATIC Manager.
2	Open the tree in the left window in the Plant View.
3	Select the "Process tag types" folder in the "fast_Lib" folder.
4	In SIMATIC Manager, select the menu command "Window > Arrange > Tile vertically" .
5	In the Component View, select the folder "fast_Lib" > S7 Program(1) > Charts
6	Keeping <CTRL> pressed, select the 3 charts "MOTOR1", "VALVE1" and "PIDCTRL1".
7	Open the shortcut menu and select the menu command "Cut" .
8	Select the "Process tag types" folder in the Plant View.
9	Open the shortcut menu and select the menu command "Paste" . The 3 charts are now located in the "Process tag types" folder in the Plant View.
10	In the SIMATIC Manager, select the menu command "View > Process Object View" .
11	Open the tree in the left window in the Process Object View.
12	Click the "Process tag types" folder in the "fast_Lib" folder.
13	In the right window, open the "General" tab. The following CFCs are displayed in the table: • "MOTOR1" • "VALVE1" • "PIDCTRL1"
14	Select all 3 charts. To do this, click on the row numbers in the first column. Drag & drop the selected CFC charts to the "fast_Prj\Plant(1)\Unit(1)\Function(1)" folder. Note: You can select multiple charts by simultaneously pressing the <Ctrl> key.
15	Click on the folder "fast_Prj\Plant(1)\Unit(1)\Function(1)". The copied CFCs are shown in the table in the right window.

Result

The figure below shows the charts that were copied in the "Process tag types" folder.



4.4 How to Configure the SFC Chart

Introduction

The PCS 7 Wizard has created an SFC chart "SFC(1)" in the "Function(1)" folder of the "fast_Prj" project. The following section describes how to rename the SFC chart and adapt it for simulation.

It also shows how you interconnect tags from structures.

Requirements

- You have completed the session in the "New Project" PCS 7 Wizard.
- SIMATIC Manager is open and the "fast_MP" project and all open hierarchy folders are displayed in the Process Object view.

Procedure

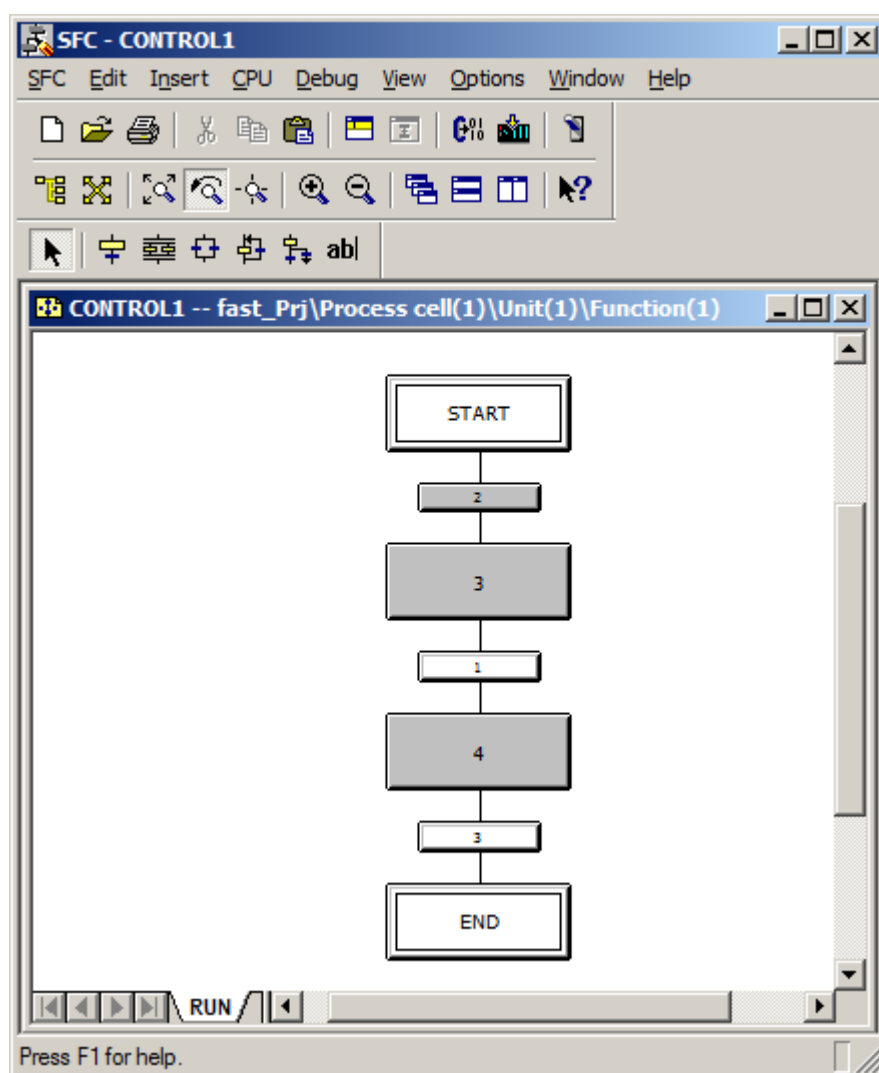
Step	Action
1	In the "fast_Prj \ Plant(1) \ Unit(1) \ Function(1)" folder, open the shortcut menu of the "SFC(1)" object. Select the menu command Rename .
2	Enter the new name "CONTROL1" and press Enter.
3	Double-click the "CONTROL1" object. The SFC Editor opens.

Step	Action
4	• In the SFC Editor, select the Insert > Step+Transition menu command. • Move the cursor in the SFC chart below the "START" step until a green line is displayed and then press the left mouse button. • Select Insert > Select.
5	• Select the first transition (2) below the "START" step and then select the Object Properties command from the shortcut menu. • Select the "Condition" tab. • Click "Browse". • Click the plus symbol in front of the "PIDCTRL1" CFC chart. • Select the "PID" block. • Select the "PV_Out" connection in the "Name" column. Change the width of the dialog box and the individual columns if the columns are not shown with sufficient width. • Open the shortcut menu and select Open Structure. • In the "Name" column, select the "Value" connection. Click "Apply". • In line 1 of the "Properties - 2 --..." dialog box, enter the number "50" next to the "=" and change the character from "=" to ">". • Click "Apply" and then "Close".
6	• In the SFC chart, open the shortcut menu of step (3) below the transition (2) and then select Object Properties. • At the "Minimum:" entry in the "Runtimes" group, enter "10s" (without space). • Select the "Processing" tab. • Click "Browse". • Click the plus symbol in front of the "MOTOR1" CFC chart. • Select the "Motor" block. • In the "Name" column, select the "StartAut" connection. • Open the shortcut menu and select Open Structure. • In the "Name" column, select the "Value" connection. Click "Apply". • In the "Properties - 3 --..." dialog box, enter the number "1" next to ":@" in line 1. Click "Apply". • Select the second line. • Click "Browse". • Select the "Motor" block. • In the "Name" column, select the "StopAut" connection. • Open the shortcut menu and select Open Structure. • In the "Name" column, select the "Value" connection. Click "Apply". • In the "Properties - 3 --..." dialog box, enter "0" next to ":@" in line 2. Click "Apply" and "Close". The motor is now switched on when the process value of the control system reaches or exceeds the value 50.
7	• Open the shortcut menu for step 3 of the SFC and select Copy. • Open the shortcut menu in the blank area of the SFC chart and select Paste. • Move the cursor in the SFC chart above the "End" step until the green line appears and then press the left mouse button.

4.4 How to Configure the SFC Chart

Step	Action
8	- In the SFC chart, open the shortcut menu for step (4) and select the Object Properties menu command. - Select the "Processing" tab. - In the first line ("StartAut" parameter), change the value from "TRUE" to "FALSE". - In the second line ("StopAut" parameter), change the value from "FALSE" to "TRUE". - Click "Apply" and then "Close". - The motor switches off. Processing continues after 10 seconds.
End	Select SFC > Exit.

Result



4.5 How to Organize the Project Folder

Introduction

The PCS 7 Wizard has created and named Unit(1) of the "fast_Prj" project. In the following, you will rename these hierarchy folders:

- Folder "Plant(1)" will become "PLANT"
- "Unit(1)" will become "UNIT_A"

This will make the plant structure clearer.

Objects created by the PCS 7 Wizard that are not required can be deleted

Requirements

- You have completed the session in the PCS 7 Wizard "New Project".
- SIMATIC Manager is open and the "fast_MP" project and all open hierarchy folders are displayed in the Plant view.

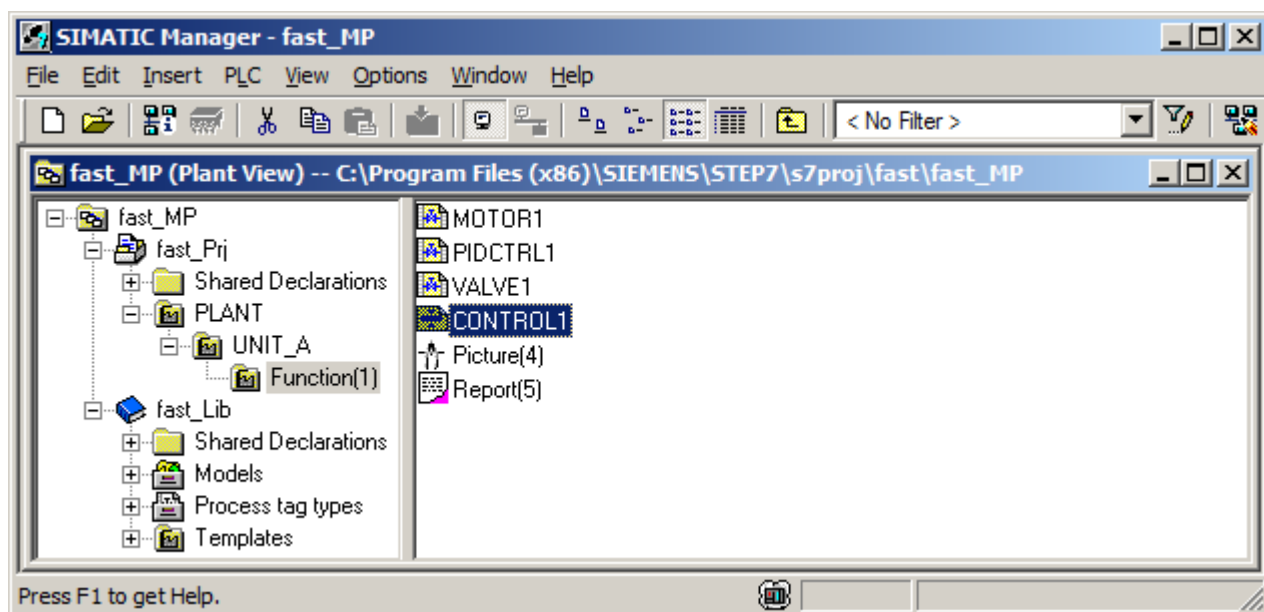
Note

You can configure the different views in SIMATIC Manager by selecting **View >** and then, for example, **Plant View**.

Procedure

Step	Action
1	Open the shortcut menu of the "Process cell(1)" folder in the left pane of the Plant view and select Rename .
2	Enter the name "PLANT" and press Enter.
3	Open the shortcut menu of the "Unit(1)" folder in the left pane of the Plant view and select Rename .
4	Enter the name "UNIT_A" and press Enter.
5	Click the "Function(1)" folder below the "UNIT_A" folder.
6	Open the shortcut menu of the "CFC(1)" object in the right-hand window and select Delete . The "Delete" dialog box opens.
7	Click "Yes".

Result



Preparing the process picture for automatic generation

5.1 How to Prepare the Plant Display for Automatic Generation.

Introduction

To prepare for automatic process picture generation, take the steps described below.

Requirements

- You have completed the session in the PCS 7 Wizard "New Project".
- SIMATIC Manager is open and the "fast_MP" project and all open hierarchy folders are displayed in the Plant view.

Procedure

Step	Action
1	Select the "UNIT_A" folder in the left-hand window of the Plant view.
2	Open the shortcut menu of the "Picture(3)" object in the right window and then select the Object Properties ... menu command.
3	Select the "Block icons" tab.
4	Select the "Derive block icons from the plant hierarchy" check box and click "OK".
5	Open the shortcut menu of the "UNIT_A" folder and select Plant Hierarchy > Customize . The "Plant Hierarchy - Settings" dialog box opens.
6	Select the radio button in the "OS area" column for the second level in the "Level Settings" group.
7	Select the "Derive picture hierarchy from the plant hierarchy" check box.
8	Click "OK".

"Customize Plant Hierarchy" dialog box

Customize Plant Hierarchy

Number of hierarchy levels: 8

Level	Max. number of characters	Included in HID	With separator	OS area
1:	24	☐	☒	☐
2:	24	☐	☒	☒
3:	24	☐	☒	☐
4:	24	☐	☒	☐
5:	24	☐	☒	☐
6:	24	☐	☒	☐
7:	24	☐	☒	☐
8:	24	☐	☒	☐

Preview:

☒ Derive picture hierarchy from the plant hierarchy
☐ Derive diagnostic screens from the plant hierarchy

☒ Maintenance Station Standard (license required)
☐ Maintenance Station Basic (overview screens only)
☐ Maintenance Station PDM (no AS diagnostics)

☒ Derive PH names from the names of the hardware components
☐ Derive PH names from the comments of the hardware components

Migrate diagnostic settings ...

OK Cancel Help

Creating a unit by means of copying

6.1 How to create a unit by copying the "UNIT_A" unit

Introduction

The following section describes how to copy "UNIT_A" to the "PLANT" folder in the Plant view. During copying, a duplicate of UNIT_A is generated, including all of its configured objects. You need to rename the copied objects.

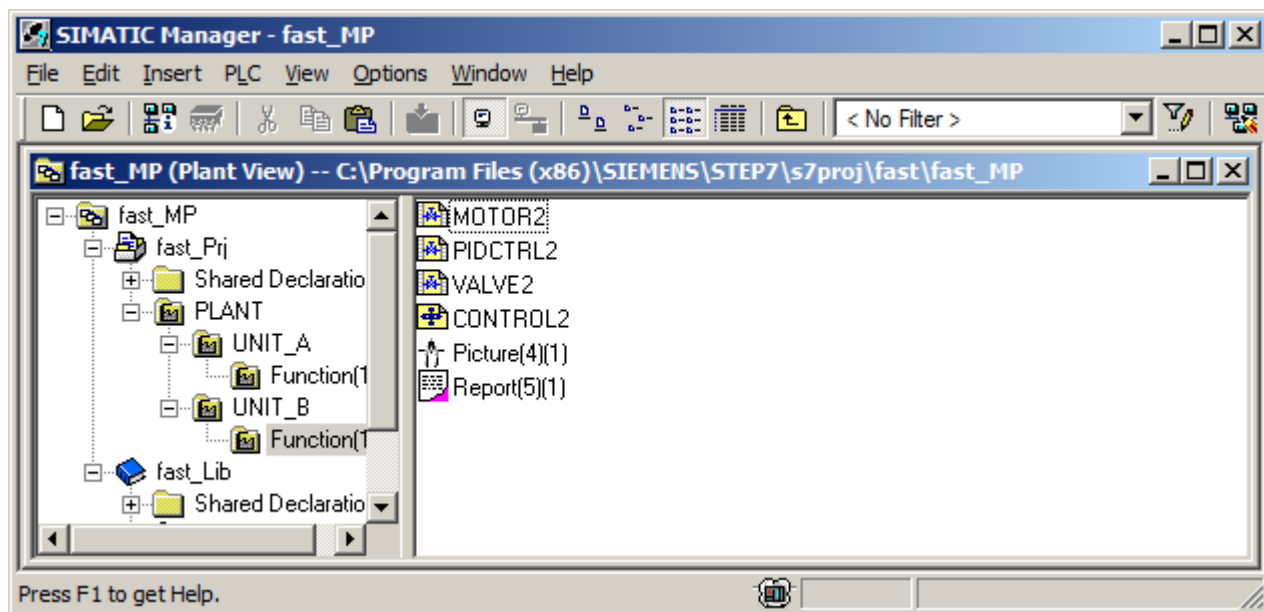
Requirement

- SIMATIC Manager is open and the "fast_MP" project and all open hierarchy folders are displayed in the Plant view.

Procedure

Step	Action
1	Open the shortcut menu of the "UNIT_A" folder in the left-hand window of the Plant view and select Copy .
2	Open the shortcut menu of the "PLANT" folder and select Paste .
3	• Open the shortcut menu of the copied folder "UNIT_A(1)" and select Rename. • Enter the name "UNIT_B" and press Enter.
4	In the left window, select the "Funktion(1)" folder below the "UNIT_B" folder.
5	• In the right-hand window, open the shortcut menu of the "MOTOR1(1)" folder and select Rename. • Enter the name "MOTOR2" and press Enter. • In the right-hand window, open the shortcut menu of the "PIDCTRL1(1)" folder and select Rename. • Enter the name "PIDCTRL2" and press Enter. • In the right-hand window, open the shortcut menu of the "VALVE1(1)" folder and select Rename. • Enter the name "VALVE2" and press Enter. • In the right-hand window, open the shortcut menu of the "CONTROL1(1)" folder and select Rename. • Enter the name "CONTROL2" and press Enter.

Result



Programming and interconnecting the process tags

7.1 How to program and interconnect the process tags

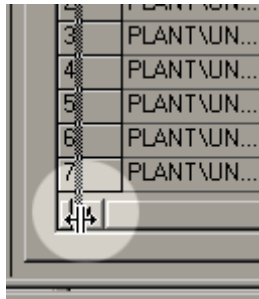
Introduction

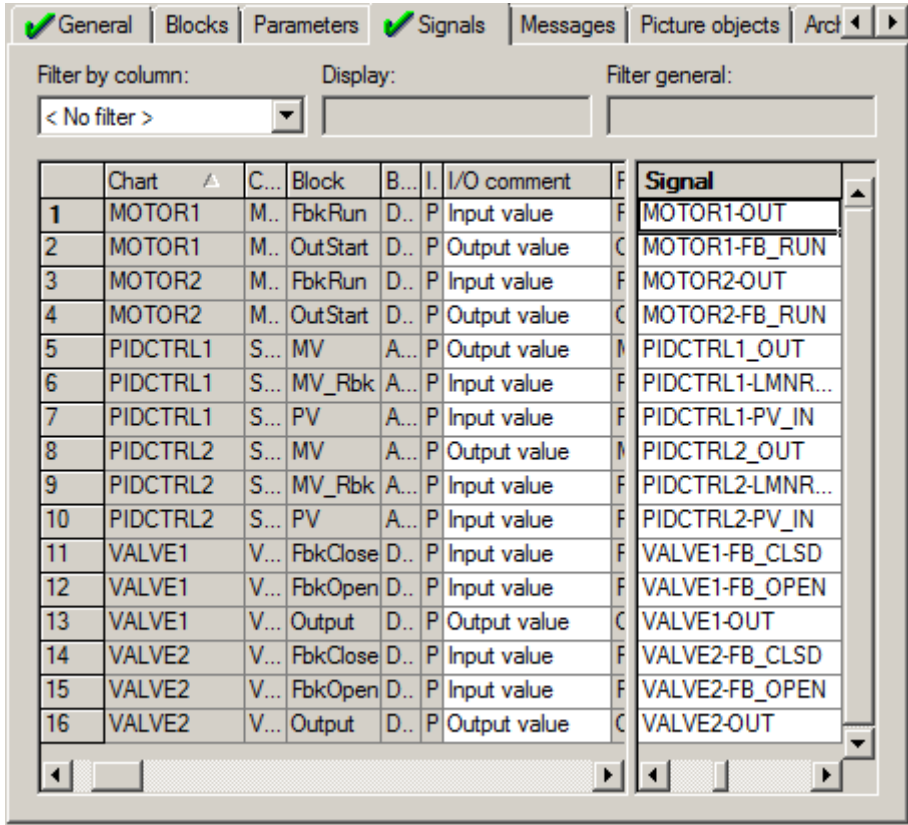
To assign parameters to and interconnect process tags, you must first insert the signals in the Process Object view and then modify the parameter values.

Requirement

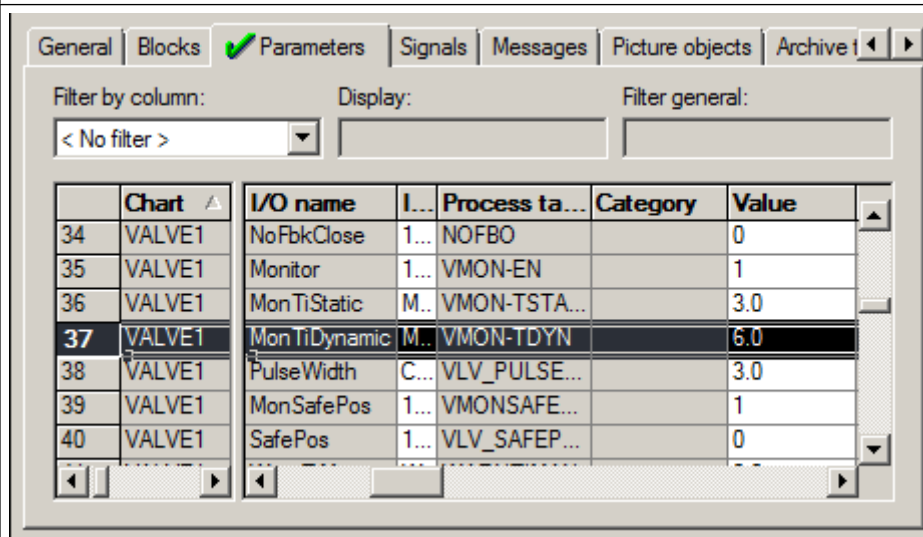
- SIMATIC Manager is open and the "fast_MP" project and all open hierarchy folders are displayed in the Process Object view.

Procedure

Step	Action
1	In the left window of the Process Object view, click the "PLANT" folder.
2	In the right window, click the "Signals" tab.
3	In the right window, split the display window into two sections by positioning the cursor over the bar to the left of the horizontal scroll bar at the bottom (as shown in the screenshot). When the cursor turns into the split symbol, move the bar to the middle of the display window. 
4	• Click the "Chart" column title to sort the column in ascending order. • Use the scroll bar on the bottom left to view the "Chart", "Block", and "I/O comment" columns in the left window. Position the split cursor at the edges of the column titles to hide or reduce the size of the columns. • Next, use the scroll bar on the bottom right to view the "Signal" column.
5	• Find the row in the table with the following entries: Chart column; "MOTOR1" entry and Block column; "FbkRun" entry • Open in the corresponding "Signal" column from the shortcut menu. Select the Insert Signal menu command. • In the "Insert Signal" dialog box, open the shortcut menu of the "Inputs" folder in the right window and select Open. The "Insert Signal" dialog box opens. • Open the "SIMATIC 400 ...\Outputs" folder. • Select the "MOTOR1-OUT" signal in the right window and click "Apply". The signal is inserted.

Step	Action
6	The following table shows the signals that you have to assign to the block I/Os. Proceed as described in the previous step. Note that you must switch between the "Inputs" and "Outputs" folders in the left window of the "Insert Signal" dialog box for each signal. 
7	Close the "Insert Signal" dialog box.

Step	Action
8	• In the right window of the Process Object view, click the "Parameters" tab. • Split the right window into two sections, as described in step 3 above. The left window displays the "Chart" column and the right window displays the "I/O", "Category", and "Value" columns. • Click the "Chart" column title to sort the column in descending order. • Enter the value 6 in the "Value" column in the right window for the chart name "VALVE1" and I/O "MonTiDynamic" . • Enter the value 6 in the "Value" column in the right window for the chart name "VALVE2" and I/O "MonTiDynamic" .



Compile and download

8.1 How to Compile and Download Objects

Introduction

You have now completed all preparations for compiling and downloading the objects. Configure all settings required for compilation and download of the charts and OS in the "Compile and Download Objects" dialog box.

Requirements

- SIMATIC Manager is open and the "fast_MP" project is displayed in the Component view.
- S7-PLCSIM has been started.

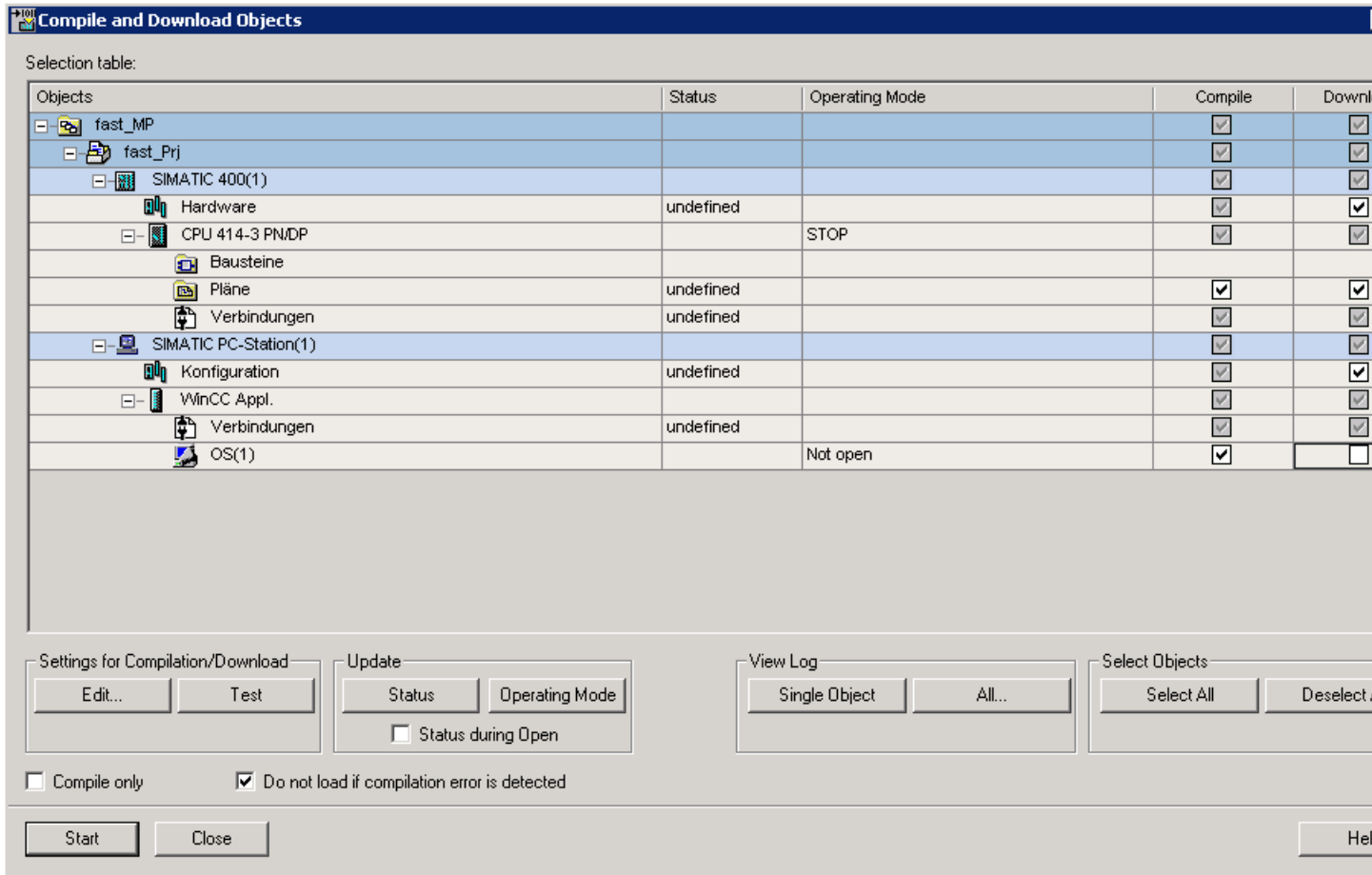
Procedure

Step	Action
1	• In the left window, open the shortcut menu of the "fast_MP" root folder and select PLC > Compile and Download Objects. • Expand the folder structure in the "Compile and Download Objects" dialog box by clicking the plus symbol. • Select the check boxes in the "Compile" and "Download" columns in the "Charts" folder. • Click the "Charts" folder, and then click "Edit" in the "Settings for Compilation/Download" group. The "Compile program / download to target system" dialog box opens.
2	• Select the "Entire program" check box in the "Scope" group. • Click "OK". The "Download to PLC" dialog box opens. • Click "OK". The program closes both dialog boxes.

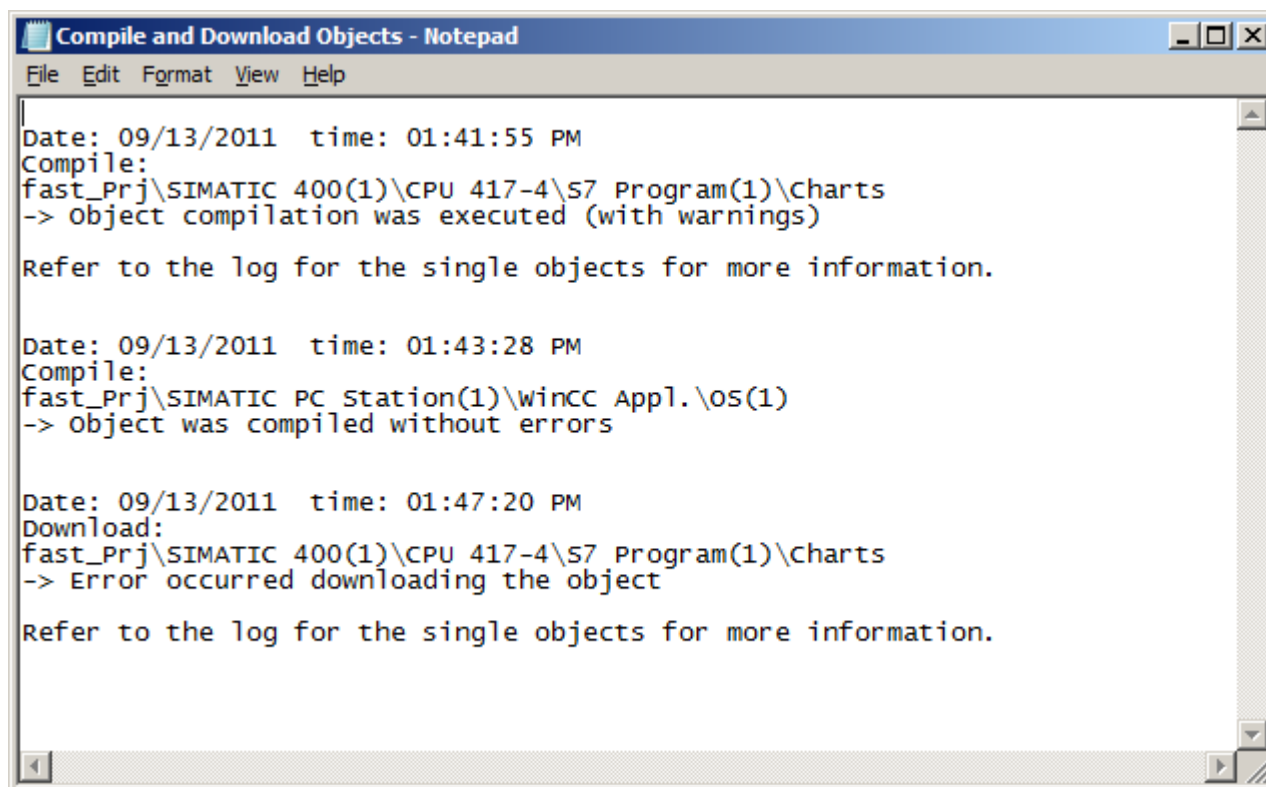
Step	Action
3	• Select the check box for the "OS(1)" folder in the "Compile" column in the "Compile and Download Objects" dialog box. • Click the "OS(1)" folder and then on "Edit" in the "Settings for Compilation/Download" group. • Click "Next" in the "Wizard: Compile OS" dialog box. • Click "Next" again. • Activate the following check boxes in the dialog box that appears. In the "Data" group: - "Tags and messages" check box - "SFC Visualization" check box - "Picture Tree" check box In the "Scope" group: - "Entire OS" option box • Click "Finish". The dialog box is closed.
4	• Click "Start" in the "Compile and Download Objects" dialog box. The "Compile and download objects" dialog box opens. • Click "OK". • A further "Compile and Download Objects" dialog box opens. • Click "Yes". The operation is started. The log file is displayed at the end of this operation. • Close the log file. • Click "Cancel" in the "Compile and Download Objects" dialog box.

Result

The edited "Compile and Download Objects" dialog box is shown in the figure below.



The following log file is displayed on completion of the compilation and download. The warnings can be ignored here.



```
Compile and Download Objects - Notepad
File Edit Format View Help

Date: 09/13/2011  time: 01:41:55 PM
Compile:
fast_Prj\SIMATIC 400(1)\CPU 417-4\S7 Program(1)\Charts
-> Object compilation was executed (with warnings)

Refer to the log for the single objects for more information.

Date: 09/13/2011  time: 01:43:28 PM
Compile:
fast_Prj\SIMATIC PC Station(1)\winCC Appl.\05(1)
-> Object was compiled without errors

Date: 09/13/2011  time: 01:47:20 PM
Download:
fast_Prj\SIMATIC 400(1)\CPU 417-4\S7 Program(1)\Charts
-> Error occurred downloading the object

Refer to the log for the single objects for more information.
```

8.2 How to Set the CPU to RUN/P in S7-PLCSIM

Introduction

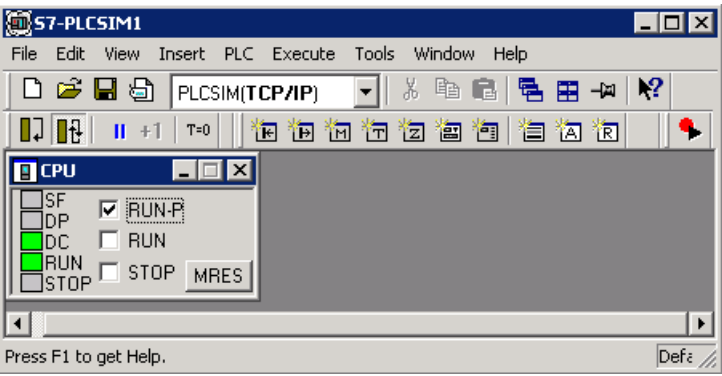
After the objects have been compiled and downloaded, the simulation of the CPU has to be switched over from the "STOP" state to the "RUN-P" state.

Requirements

- The objects have been compiled and downloaded.
- The program S7-PLCSIM has already been started.

Procedure

Step	Action
1	Click the "S7/PLCSIM ..." window in the task bar to open the window.
2	Activate the "RUN-P" check box in the "CPU" window.

Step	Action
Result:	
3	In the "S7 PLCSIM1" window, click the "Minimize" button.

Adapting process pictures

9.1 How to adapt process pictures

Introduction

To operate and monitor the process, open the OS in SIMATIC Manager and activate the OS project.

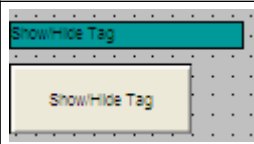
You can make any changes or expansions you like to process pictures in the Graphics Designer of the WinCC Explorer .

The following automatically generated process pictures contain process objects:

- Picture(3) from unit "UNIT_A"
- Picture(3)(1) from unit "UNIT_B"

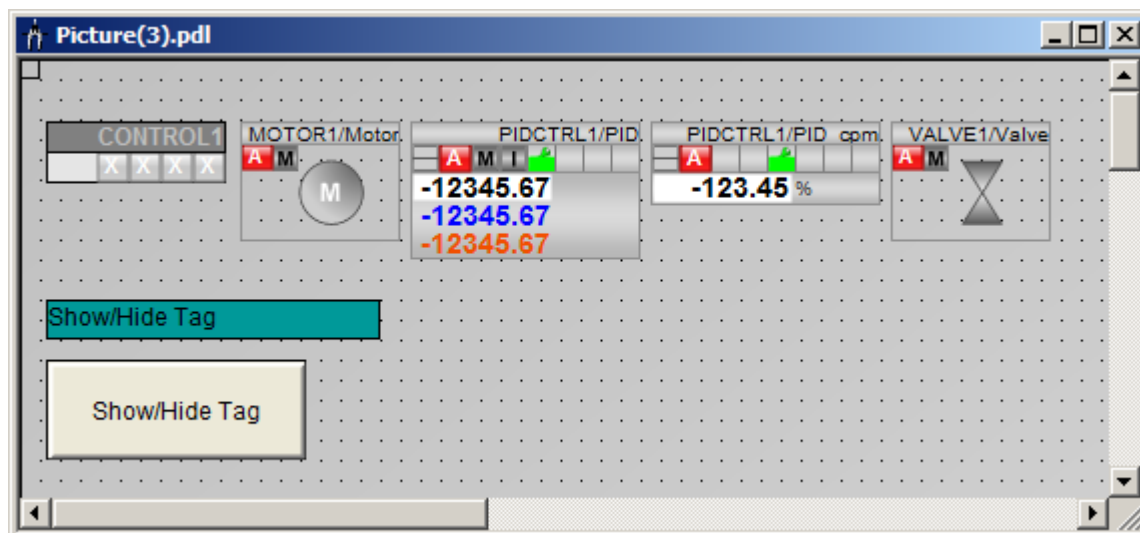
Object names are not shown in automatically generated process pictures. In view of this, insert the "Show/Hide Tag" button from the "@TemplateAPLV8.PDL" template picture into the "Picture(3)" process picture. Use this button to show/hide the object name.

Procedure

Step	Action
1	Open the tree structure of the SIMATIC PC station in the left window of the Component View.
2	Right-click the "OS(1)" folder and select Open object from the shortcut menu. WinCC Explorer opens.
3	Select the ""Grafics Designer"" folder in the tree structure.
4	Double-click the "Picture(3).Pdl" object in the list in the "Name" column. The process picture opens in the Grafics Designer .
5	Select the "File > Open" menu command. The "Open" dialog window opens.
6	Double-click the "@TemplateAPLV8.PDL" object in the list in the "Name" column. The "@TemplateAPLV8.PDL" template picture opens.
7	Select the "Show/Hide Tag" objects. 
8	Select the Copy menu command in the shortcut menu.
9	Click the "Picture(3).Pdl" open picture.
10	Select the Edit > Paste menu command.
11	Select the File > Save menu command.
12	Select the File > Exit menu command. The Grafics Designer closes.

Result

The "Show/Hide Tag" object is inserted into the "Picture(3).Pdl" process picture.



Operating and monitoring the process

10.1 How to Operate and Monitor the Process

Introduction

To operate and monitor the process, open the OS in SIMATIC Manager and activate the OS project.

Note

You can modify and expand the automatically generated pictures - Picture(3) from the "UNIT_A" unit and Picture(3)(1) from the "UNIT_B" unit - in the Graphics Designer of the WinCC Explorer to make them fit your requirements.

Requirements

- In S7-PLCSIM, the CPU simulation is set to the "RUN-P" state.
- SIMATIC Manager is open and the "fast_MP" project is displayed in the Component view.

Procedure

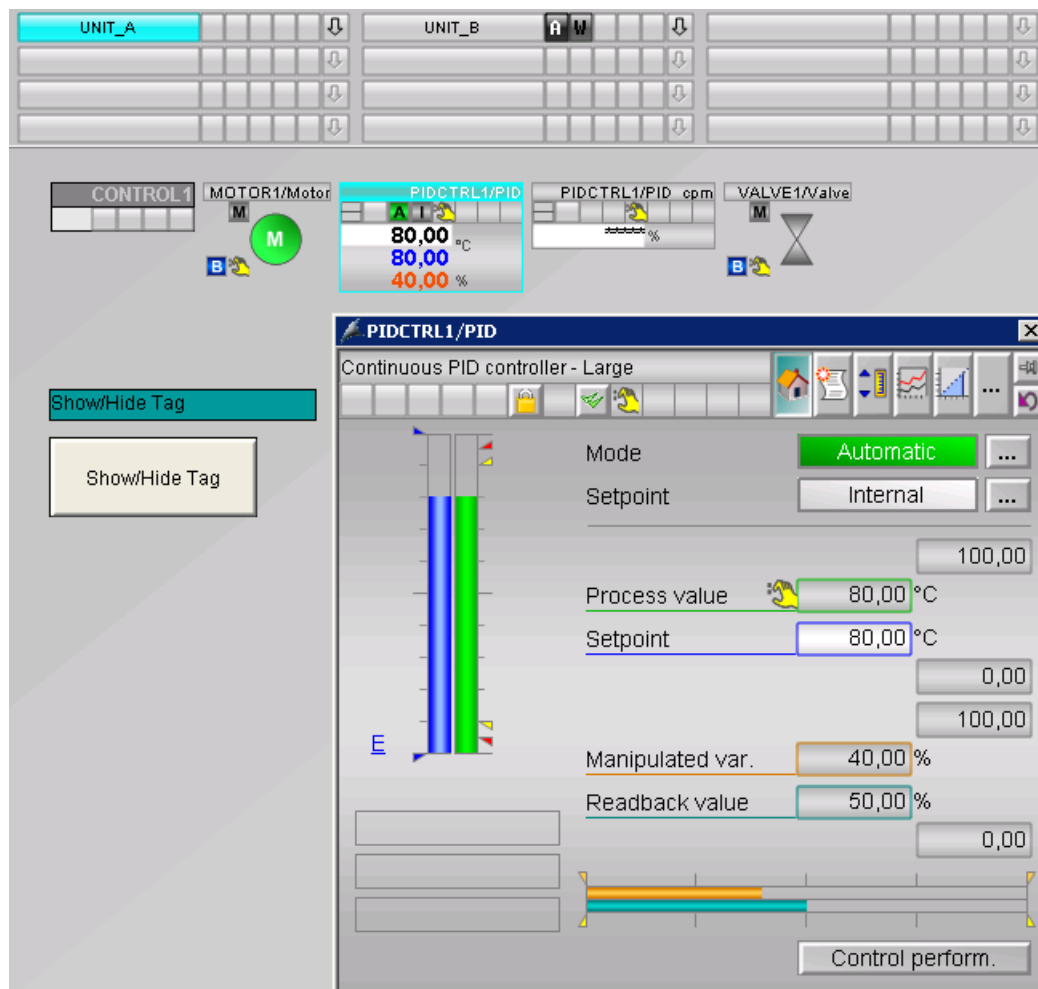
Step	Action
1	Open the Tree view of the SIMATIC PC station in the left window of SIMATIC Manager.
2	Right-click the "OS(1)" folder and select Open object from the shortcut menu. WinCC Explorer opens.
3	Check the following setting: • Navigate to "Tag management > SIMATIC S7 PROTOCOL SUITE > TCP/IP". • Open the shortcut menu and select "System parameters". The "System parameters - TCP/IP" dialog box opens. • Select the "Unit" tab. • In the "Select logical device name" area, the entry for "Logical device name" should be "PLCSIM(TCP/IP)". If this is not the case, select this entry from the drop-down list. • Click "OK". The "System parameters - TCP/IP" dialog box closes. If you have made changes, you now need to restart WinCC Explorer.
4	Select the menu command File > Activate in the WinCC Explorer. WinCC Runtime starts.

Step	Action										
5	- Click the "UNIT_A" area selection key in the overview area at the top left of the "SIMATIC PCS 7 Control System" user interface (see picture below titled "Work area with all operator controls"). - Click "Show/Hide Tag". The designations for the picture objects appear. The automatically generated picture contains the block icons of the following objects: <table> <tr> <td>CONTROL1</td><td>Sequential control system</td></tr> <tr> <td>MOTOR1</td><td>Motor</td></tr> <tr> <td>VALVE1</td><td>Valve</td></tr> <tr> <td>PIDCTRL1</td><td>Controller</td></tr> <tr> <td>Show/Hide Tag</td><td>Click to show/hide the designations for the picture objects.</td></tr> </table> Note: The faceplates of the motor and the controller are open in the following picture, "Work area with all operator controls".	CONTROL1	Sequential control system	MOTOR1	Motor	VALVE1	Valve	PIDCTRL1	Controller	Show/Hide Tag	Click to show/hide the designations for the picture objects.
CONTROL1	Sequential control system										
MOTOR1	Motor										
VALVE1	Valve										
PIDCTRL1	Controller										
Show/Hide Tag	Click to show/hide the designations for the picture objects.										
6	- Click the "MOTOR1/Motor" block icon in the work area of the user interface. The faceplate of the motor is displayed in the work area of the user interface. - Click the "..." button next to where the "Command" is displayed. The "MOTOR1/ Motor" faceplate is expanded. - Click "Start". Click "OK". The motor starts. The "Status" in the faceplate shows "Start".										
7	Repeat the basic procedure of step 5 on the block icon of the valve and test the "Open" command. Test "Stop" command for the motor and the "Close" command for the valve.										
8	Repeat the basic procedure of step 5 for "Automatic" mode for the motor and valve. Leave the faceplate of the motor in "Automatic" mode.										
9	- Click the "PIDCTRL1/PID" block icon in the work area of the user interface. - Click the "..." button next to where the operating mode is displayed. The "PIDCTRL1/PID" faceplate is expanded. - Click the "Automatic" button. Click "OK". The controller is switched to "Automatic". - Click the "Setpoint" display field. The "PIDCTRL1/PID" faceplate is expanded. - Use the slider to set the setpoint to 25. Click "OK". - Wait until the process value is > 10. - In the toolbar of the faceplate, click the "Acknowledge error" button. The controller is now free of errors and in the "Automatic" operating mode.										
10	Change to button set 2 by clicking "Change button set" on the bottom left of the user interface. 										
11	Click "SFC Visualization" in button set 2. The "Open SFC" dialog box opens. 										

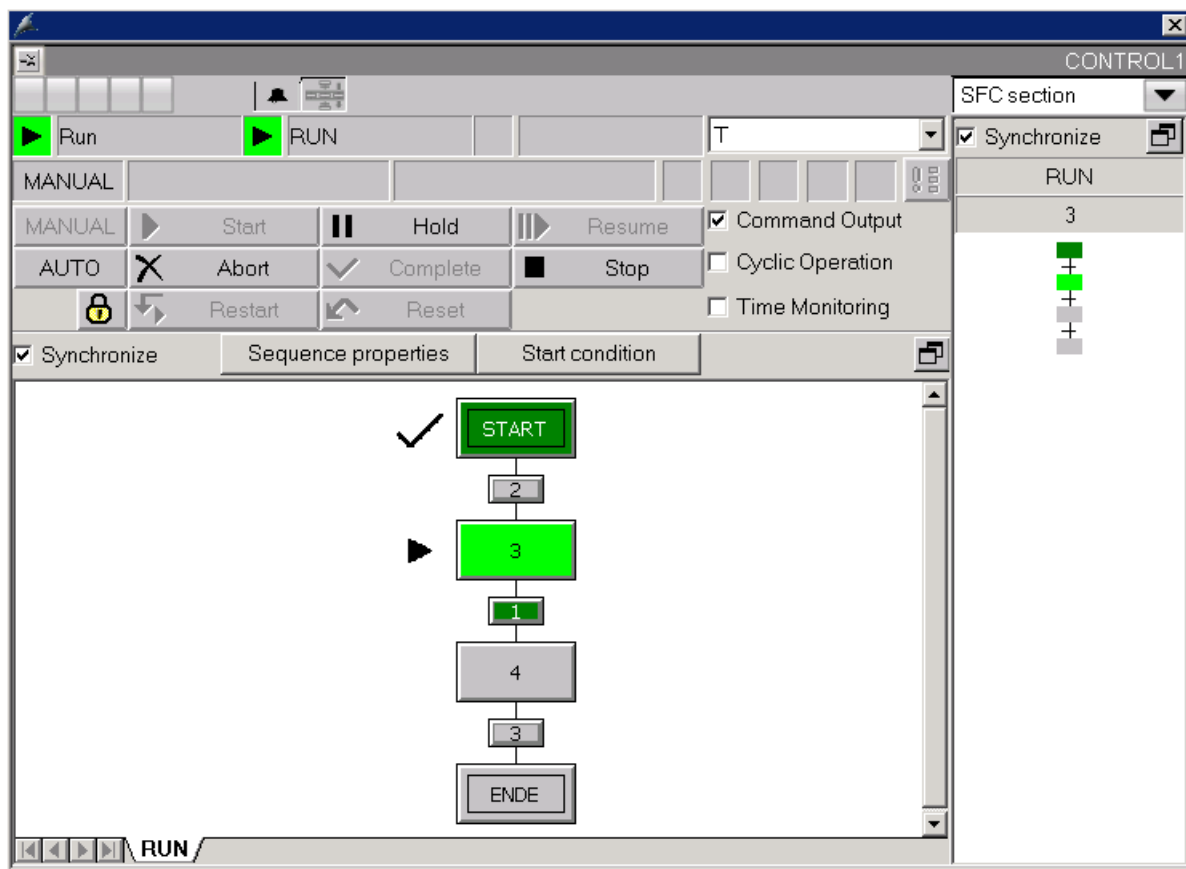
Step	Action	
12	- In the right window select the "CONTROL1" entry in the "SFC name" column and click "OK". The SFC overview is displayed in the work area. - Click the "Start" button and confirm the dialog box that appears by clicking "OK". If the process value of the controller is not greater than 50, the sequential control system stops at the first transition and is not executed further. - Click on the faceplate of the "PIDCTRL1/PID" controller (see picture below "Executing the sequential control system"). - Click on the input box next to "Setpoint" in the faceplate of the controller. The faceplate is expanded. Enter "80" as the setpoint. Click "OK".	
13	- Observe the execution of the sequential control system. - When the configuration is correct, the sequential control system is executed completely. - MOTOR1 is started in the flow chart in step 3 and stopped again in step 4.	
14	Click "Change button set" to change to button set 1.	
15	Click "Message system". The new received messages are displayed in the work area.	
16	Click "Operating message list". The operating messages are displayed in the work area. The list displays all actions you have performed in the faceplates.	

Result

Work area with opened faceplate of PIDCTRL1:



Execution of the sequential control system (Step 9 to 11):



Operating message list (step 10):

operation list					
	Date	Time	Priorit	Source	Operation
1	15/07/10	12:39:07.000	0	PIDCTRL1/PID	: Setpoint (SP_Int) new = 25 °C old = 40 °C
2	15/07/10	12:39:21.000	0	PIDCTRL1/PID	: Automatic (AutModOp) new = 1 old = 0
3	15/07/10	12:39:32.000	0	MOTOR1/Motor	: Automatic (AutModOp) new = 1 old = 0
4	15/07/10	12:40:03.875	0	PIDCTRL1/PID	: Acknowledgment Alarm, Alarm Low on VM-SRV-01
5	15/07/10	12:40:03.922	0	PIDCTRL1/PID	: Acknowledgment Warning, Warning Low on VM-SRV-01
6	15/07/10	12:43:14.781	0	CONTROL1	Executing 'Start' command
7	15/07/10	12:44:09.000	0	PIDCTRL1/PID	: Setpoint (SP_Int) new = 80 °C old = 25 °C
8	15/07/10	12:47:08.813	0	PIDCTRL2/PID	<gentestp>: Acknowledgment Alarm, Alarm Low on VM-SRV-01
9	15/07/10	12:47:08.813	0	PIDCTRL2/PID	<gentestp>: Acknowledgment Warning, Warning Low on VM-SRV-01

Exit WinCC Runtime

To exit WinCC Runtime, click the following symbol.



Index

A

- Analog input module, 13
 - Editing symbols, 13
- Analog output module, 15
 - Editing symbols, 15
- Assigning parameters, 39
 - Process tag, 39
- Automatic generation, 35
 - Process picture, 35

C

- CFC chart, 25, 28
 - copy to project, 28
 - Copying from a zip file to the master data library, 25
- Compile, 19, 43
 - NetPro, 19
 - Objects, 43
- Configuring, 11, 30
 - Hardware, 11
 - SFC chart, 30
- Copy, 28
 - CFC chart, 28
 - Unit, 37
- Copying, 25, 37
 - CFC chart from a Zip file to the master data library, 25
- CPU, 46
 - Setting PLCSIM to RUN-P, 46
- Creating, 7, 37
 - PCS 7 project, 7
 - Unit by copying a unit, 37

D

- Delete, 33
- Deleting
 - Object in project folder, 33
 - Project object, 33
- Digital input module, 15
 - Editing symbols, 15
- Digital output module, 16
 - Editing symbols, 16

Download, 22, 43

- Ethernet interface download from NetPro to the PLC, 22
- Objects, 43

E

- Editing, 13, 15, 16
 - Symbols for analog input module, 13
 - Symbols for analog output module, 15
 - Symbols for digital input module, 15
 - Symbols for digital output module, 16
- Ethernet interface, 22
 - Download from NetPro to the PLC, 22

H

- Hardware, 11
 - Configuring, 11

I

- Information about this Getting Started, 5
- Interconnecting, 39
 - Process tag, 39
- ISO interface, 17
 - setup for SIMATIC PC station, 17

M

- Master data library, 25
 - Copying CFC charts from the Zip file to ~, 25
- Monitor, 51
 - Process, 49, 51
- Monitoring, 49

N

- NetPro, 19
 - Compile, 19
 - Save, 19

O

- Object, 33
 - delete from project folder, 33

- Objects, 43
 - Compile, 43
 - Download, 43
- Operate, 51
 - Process, 49, 51
- Operating, 49
- Organize
 - Project folder, 33
- Organizing, 33

P

- PCS 7 project, 7
 - Creating, 7
- PLC, 22
 - Download Ethernet interface from NetPro to ~, 22
- PLCSIM, 46
 - Setting the CPU to RUN-P, 46
- Prepare
 - Process picture for automatic generation, 35
- Preparing, 35
- Process, 49, 51
 - Monitor, 51
 - Monitoring, 49
 - Operate, 51
 - Operating, 49
- Process picture, 35
 - preparing for automatic generation, 35
- Process tag, 39
 - Assigning parameters, 39
 - Interconnecting, 39
- Project, 28
 - Copy CFC chart to ~, 28
- Project folder, 33
 - Organize, 33
 - Rename, 33
- Project object, 33
 - Delete, 33

R

- Rename
 - Project folder, 33
- Renaming, 33
- Requirements, 5

S

- S7-PLCSIM, 21
 - Starting, 21

- Save, 19
 - NetPro, 19
- Setup, 17, 46
 - CPU to RUN-P in S7 PLCSIM, 46
 - Interface for SIMATIC PC station, 17
- SFC chart, 30
 - Configuring, 30
- Starting, 21
 - S7-PLCSIM, 21
- Structures
 - Interconnecting tags, 30

T

- Tags
 - Structures, 30

U

- Unit, 37
 - creating by copying a unit, 37