

SIEMENS

SIMATIC
Standard PID Control

Getting Started

Edition 03/2003

First Steps in Commissioning

programmieren



Safety Guidelines

This manual contains notices intended to ensure personal safety, as well as to protect the products and connected equipment against damage. These notices are highlighted by the symbols shown below and graded according to severity by the following texts:



Danger

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



Warning

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



Caution

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

Caution

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

Notice

draws your attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

Qualified Personnel

Only **qualified personnel** should be allowed to install and work on this equipment. Qualified persons are defined as persons who are authorized to commission, to ground and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Correct 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.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

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Disclaimer of Liability

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

Introduction

This instruction manual gradually introduces you to an efficient application of Standard PID Control using a concrete example. You will get to know the basic functions of the controller block and the configuration interface.

You will need approximately 30 minutes.



Warning

Operating the PLC as part of a plant or system requires that certain rules and standards be followed, depending on the application.

Failure to observe these standards may cause serious bodily injury, and may damage machines and facilities.

Observe the applicable safety and accident prevention standards, such as IEC 204 (Emergency OFF devices)



Warning

You may come into contact with live electrical wires if the power supply module of your PLC is switched on or the supply lead of the power supply module is connected to the network.

Wire the PLC only when it is disconnected!

Requirements

The following requirements must be met to perform this task:

- You have one of this PLC: S7-300, S7-400, C7-CPU or Win AC.
- STEP 7 >= V5.2 is correctly installed on your programming device.
- You have set up a project for your PLC.
- Your programming device is connected to the CPU of your PLC.
- You are in possession of Standard PID Control FB V5.1 and Standard PID Control Tool V5.1 software products.

Step 1: Installing the sample project and configuration software

Step	Job	Result
1	Open the SETUP directory on your CD Standard PID Control FB. Double-click on SETUP.EXE to start program installation.	This starts the installation program.
2	Follow the instructions of the installation program.	
3	Open the SETUP directory on your CD Standard PID Control Tool. Double-click on SETUP.EXE to start program installation.	This starts the installation program.
4	Follow the instructions of the installation program.	

Step 2: Implementation in the user program

Step	Job	Result
1	In SIMATIC-Manager, select File > Open... > Sample projects to open the project "zEn28_03_StdCon" from the catalog Siemens\STEP7\Examples.	A split window appears, showing the project title.
2	Copy the program "Example2" (Continuous controller with system stimulation) to your user project.	
3	Click on the program "Example2 > Blocks" and download it to your CPU under PLC > Download to CPU (CPU in STOP mode).	Your program is downloaded from the PG to the CPU.
4	Switch the CPU to RUN-P mode.	

Step 3: Process Identification

Step	Job	Result
1	Switch to the online view via View > Online .	The window to the online view is opened.
2	Double-click in the program "Example2 > Blocks" on the DB101.	The configuration software Standard PID Control opened online the DB101.
3	Start the process identification via Debug > Process Identification .	The loop monitor and the process identification are opened.
4	Select PG under "Manipulated variable P9" in the loop monitor and then click the Send button.	The window "Process Identification: Prepare for Data Acquisition" is opened.
5	Click the OK button.	The window "Process Identification" is opened.

Step	Job	Result
6	Configure the manipulated variable to 20.0 in the loop monitor via "Manipulated variable MP9" and then click on the Send button.	The Curve Recorder is opened.
7	Monitor the manipulated variable and wait until it becomes transient. Then click on the OK button.	The Loop Monitor is placed in the foreground.
8	Configure the manipulated variable to 40.0 in the loop monitor via "Manipulated variable MP9" and then click on the Send button.	The Curve Recorder is in placed in the foreground.
9	Wait until the process value becomes transient. This may take some minutes. However, you can cancel the measuring value acquisition at a constant process value curve of about 60.0.	The process value increases. The loop monitor is placed in the foreground on the completion of the measuring value acquisition.
10	Click the Close button.	The window "Close Loop Monitor" is opened.
11	Click the OK button.	The window "Process Identification: Start the Calculation" is opened.
12	Click the OK button.	The window "Process Identification: Result and Downloading the Optimized Parameters" is opened.
13	Click the Apply PID button .	The windows of Process Identification are closed.
14	Transfer the controller parameters with PLC > Download to the CPU.	In the status bar the feedback appears: Active parameter were loaded

Step 4: Testing the controller by means of Loop Monitor and Curve Recorder

Step	Job	Result
1	Open the loop monitor via Debug > Loop Monitor .	The loop monitor is opened.
2	Open the Curve recorder via Debug > Curve Recorder .	The Curve recorder is opened.
3	Click the Start button on the curve recorder.	The Curve recorder runs.
4	Move the loop monitor next to the curve recorder.	
5	Activate PG in the setpoint field in the loop monitor and enter 40.	
6	Click the Send button.	You can monitor the control process on the curve recorder and in the loop monitor.

Examples

The zEn28_03_StdCon project contains more examples that you can use for orientation and that you can adapt to your application (refer to the manual Standard PID Control, chapter 7.2 and the subsequent chapter).

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