

SIEMENS

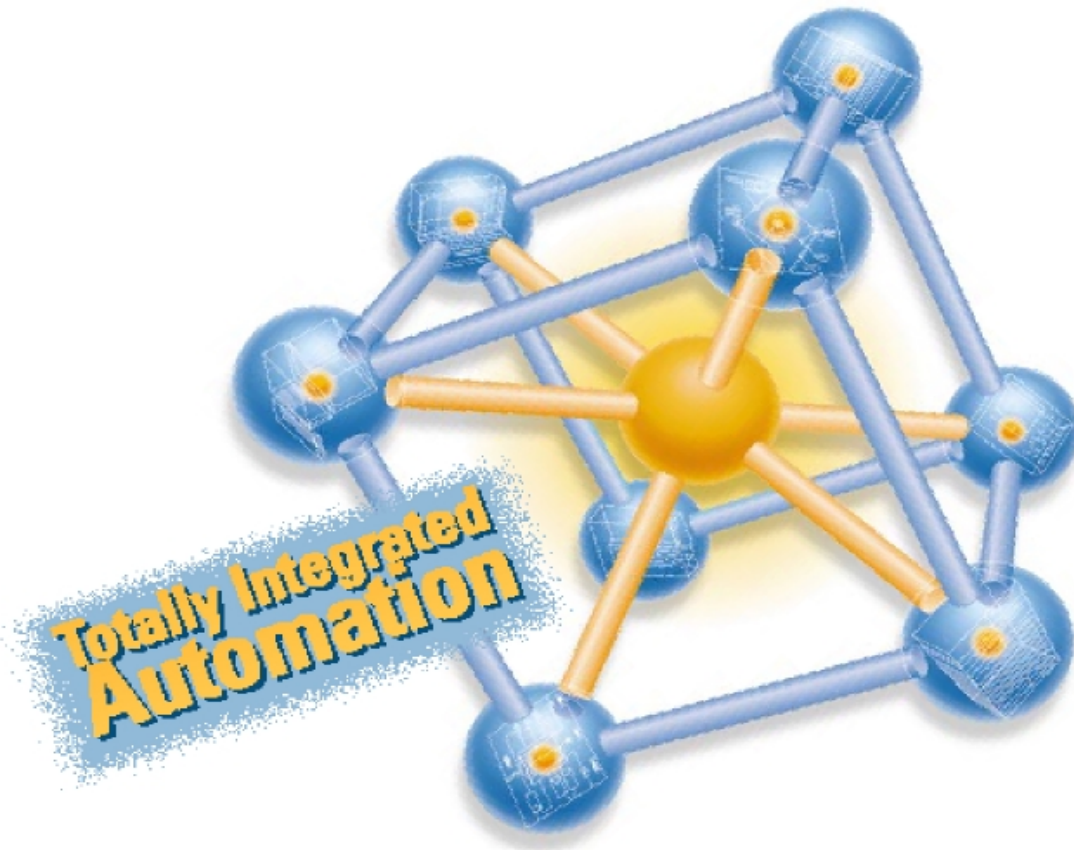
SIMATIC

Automation System S7-300

Getting Started

Edition 10/2001

Commissioning, First Steps CPU 31xC: PtP Connection



Introduction

The sample in this manual takes you through four steps, showing you how to commission a fully functional application. You are going to get acquainted with the basic hardware and software functions and learn how to transfer data via serial interface. The references to the manual should give you a first overview of the information it contains.

It should take no more than one or two hours to work through this sample, depending on experience.

Prerequisites

Conditions are that:

- You have an S7-300 station, consisting of a power supply module and a CPU 31C-2 PtP. The serial connection is established via the 15-pole sub-D socket at the right side.
- STEP 7 (\geq V5.1 + Servicepack 2) is correctly installed on your PG.
- The sample projects are available, either on your CD or you have downloaded them from the Internet.
- You have created a project for the S7-300 station.
- The PG is connected to the CPU.
- You have prepared your connection partner for data transfer and connected the required patch cord.
- The CPU is correctly connected to a power supply.



Warning

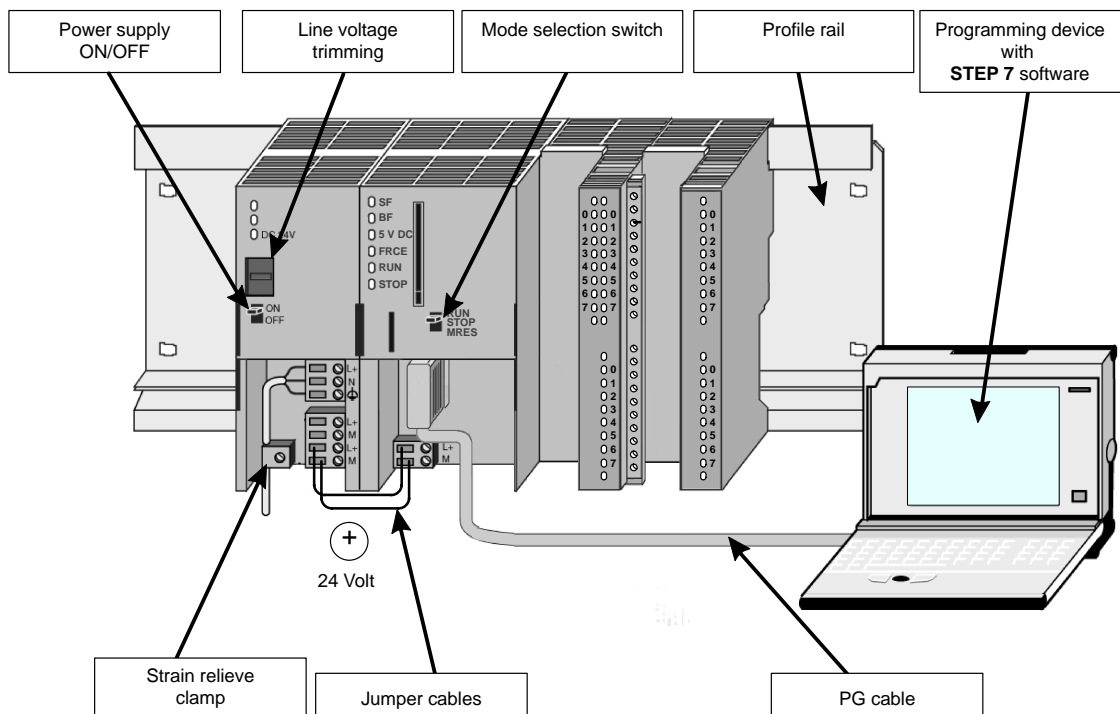
Depending on the field of application, your S7-300 as component in plants and systems requires special attention relating to specific rules and regulations. Please pay attention to current regulations on safety and for the prevention of accidents, e.g. IEC 204 (EMERGENCY-OFF devices). Serious injury as well as damage to machines and appliances is to be expected if you neglect these regulations.



Warning

You risk contacting live wires if the PS 307 power supply module is switched on or if the power line of the PS is connected to mains.
Wire the S7-300 only after you have switched off power!

Structure of the Sample



1st step: Installing a sample project

You have two options of installing a sample project:

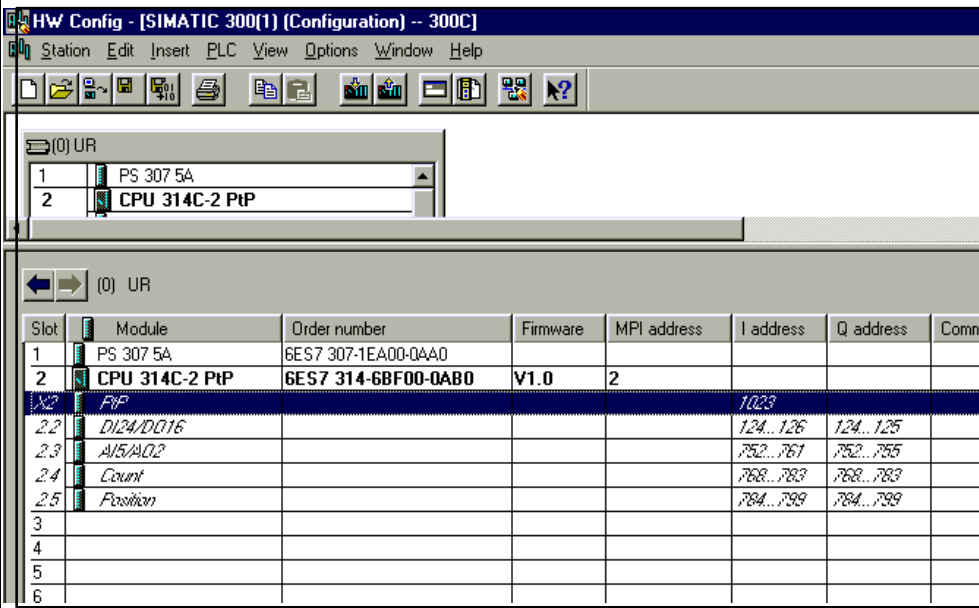
From CD:

Step	Action	Result
1	Double-click on SETUP.EXE in the SETUP folder of your CD.	The installation program starts.
2	Follow the on-screen instructions.	

Download from the Internet:

Step	Action	Result
1	Open the sample project directory and double-click on SETUP.EXE.	The installation program starts.
2	Follow the on-screen instructions.	

2nd step: Assigning parameters

Step	Action	Result																																																																																																								
1	Open your project in SIMATIC Manager.	A split window opens, showing your project name in the header.																																																																																																								
2	In your project, call the configuration table HW Config.  <table border="1" data-bbox="422 745 1395 1039"> <thead> <tr> <th>Slot</th> <th>Module</th> <th>Order number</th> <th>Firmware</th> <th>MPI address</th> <th>I address</th> <th>Q address</th> <th>Comm</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>PS 307 5A</td> <td>6ES7 307-1EA00-0AA0</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>CPU 314C-2 PtP</td> <td>6ES7 314-6BF00-0AB0</td> <td>V1.0</td> <td>2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.2</td> <td>DI24/DO16</td> <td></td> <td></td> <td></td> <td>124...126</td> <td>124...125</td> <td></td> </tr> <tr> <td>2.3</td> <td>AI5/AO2</td> <td></td> <td></td> <td></td> <td>752...761</td> <td>752...755</td> <td></td> </tr> <tr> <td>2.4</td> <td>Count</td> <td></td> <td></td> <td></td> <td>768...783</td> <td>768...783</td> <td></td> </tr> <tr> <td>2.5</td> <td>Position</td> <td></td> <td></td> <td></td> <td>784...799</td> <td>784...799</td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Slot	Module	Order number	Firmware	MPI address	I address	Q address	Comm	1	PS 307 5A	6ES7 307-1EA00-0AA0						2	CPU 314C-2 PtP	6ES7 314-6BF00-0AB0	V1.0	2				2.2	DI24/DO16				124...126	124...125		2.3	AI5/AO2				752...761	752...755		2.4	Count				768...783	768...783		2.5	Position				784...799	784...799		3								4								5								6								7								8								
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3	Double-click on the "PtP" submodule.	The "PtP properties" dialog opens.																																																																																																								
4	Select the "ASCII" protocol and enter the default settings in the parameter masks with a click on OK: <ul style="list-style-type: none"> 9600 bits/s, 8 data bits, 1 stop bit, even parity. 																																																																																																									
5	Confirm your entries with OK.	The "PtP properties" dialog is closed.																																																																																																								
6	Save your project configuration with Station > Save and compile.	Your changes are now stored in your project.																																																																																																								
7	While the CPU is in STOP state, download this configuration via PLC > Load to module....	Data are downloaded from the PG to your CPU.																																																																																																								
8	Close HW Config with Station > Close.	You are returned to SIMATIC Manager.																																																																																																								

3rd step: Implementation in the user program

Step	Action	Result																																										
1	In SIMATIC Manager, open the project "ZEn26_01_TF_____31xC_PtP" in the catalog \Siemens\STEP7\Examples via File > Open... > Sample projects .	A split window opens, showing your project name in the header.																																										
2	Double-click on the station "CPU 31xC ASCII".	Your station is opened.																																										
3	Open the S7 program for the station CPU and double-click on the "Function blocks" container.	You are shown all function blocks of the S7 program.																																										
4	<p>With the exception of system data, select all function blocks and copy them to your project under SIMATIC 300 Station > CPU3xx > S7 Program > Function blocks.</p> <table border="1"> <thead> <tr> <th>Function block</th> <th>Name (in the symbol bar)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>OB1:</td> <td>CYCLE</td> <td>Cyclic program processing</td> </tr> <tr> <td>OB100:</td> <td>RESTART</td> <td>Startup processing Restart</td> </tr> <tr> <td>DB21:</td> <td>SEND IDB</td> <td>Instance DB to SFB SEND_PTP</td> </tr> <tr> <td>DB22:</td> <td>RCV IDB</td> <td>Instance DB to SFB RCV_PTP</td> </tr> <tr> <td>DB40:</td> <td>SEND WORK DB</td> <td>Work DB for SFB SEND_PTP</td> </tr> <tr> <td>DB41:</td> <td>RCV WORK DB</td> <td>Work DB for SFB RCV_PTP</td> </tr> <tr> <td>DB42:</td> <td>SEND SRC DB</td> <td>Send DB</td> </tr> <tr> <td>DB43:</td> <td>RCV DST DB</td> <td>Receive DB</td> </tr> <tr> <td>SFB60:</td> <td>SEND_PTP</td> <td>Send SFB for data</td> </tr> <tr> <td>SFB61:</td> <td>RCV_PTP</td> <td>Receive SFB for data</td> </tr> <tr> <td>FB21:</td> <td>SEND</td> <td>Send data</td> </tr> <tr> <td>FB22:</td> <td>RECEIVE</td> <td>Receive data</td> </tr> <tr> <td>VAT1:</td> <td>-</td> <td>VAT1</td> </tr> </tbody> </table>	Function block	Name (in the symbol bar)	Description	OB1:	CYCLE	Cyclic program processing	OB100:	RESTART	Startup processing Restart	DB21:	SEND IDB	Instance DB to SFB SEND_PTP	DB22:	RCV IDB	Instance DB to SFB RCV_PTP	DB40:	SEND WORK DB	Work DB for SFB SEND_PTP	DB41:	RCV WORK DB	Work DB for SFB RCV_PTP	DB42:	SEND SRC DB	Send DB	DB43:	RCV DST DB	Receive DB	SFB60:	SEND_PTP	Send SFB for data	SFB61:	RCV_PTP	Receive SFB for data	FB21:	SEND	Send data	FB22:	RECEIVE	Receive data	VAT1:	-	VAT1	
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5	In SIMATIC Manager, select SIMATIC 300 Station > CPU3xx > S7 Program > Function blocks .	You are shown all function blocks of the S7 program.																																										
6	Download all S7 function blocks contained to your CPU with PLC > Download to CPU (CPU in STOP state).	The program and configuration are downloaded from the PG to the CPU.																																										

4th step: Test run

Step	Action	Result
1	In your project directory "Function blocks", double-click on the table of variables "VAT1".	You are shown the table of variables for monitoring and controlling.
2	Go Online via PLC > Connect to > Configured CPU .	The "STOP" status of the CPU pops up at the lower right.

Step	Action	Result
3	Switch to monitoring mode via Variable > Monitoring .	The "Status value" column displays the actual values of the operands.
4	Switch the CPU to RUN.	The "RUN" status of the CPU pops up at the lower right. Data transfer is started. You can view the number of transmissions at the operand "DB42.DBW0" (Send counter). "DB41.DBW18" (Receive counter) indicates receiving of data.

Diagnosics/Fault elimination

Errors can occur as a result of operator fault, incorrect wiring of the serial interface or configuration conflicts.

How to diagnose such errors and messages is described in the manual, Chapter "Error handling and interrupts".

Sample :

The "ZEn26_01_TF____31xC_PtP" project contains more samples you can use for orientation. You can customize all samples according to your personal applications.