

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Selected official pages for procurement and maintenance review

PRODUCT BRAND

Siemens

PRODUCT MODEL

6ES7313-6CE00-0AB0

Compact PROFIBUS Central Processor. Relevant section pages: 11, 94, 95, 96, 109, 144. Adjacent model text on shared pages is outside this product reference.

OFFICIAL SOURCE

S7-300 Programmable Controller Hardware and Installation; 09/2002; A5E00105492-02

Siemens original documentation and product reference

This historical Siemens original is preserved from a third-party document archive. The selected pages cover the CE0x family and CE00 commissioning. Their general power drawing is not a CE00 I/O pinout. Original wording and pagination remain unchanged.

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Amikon Limited prepared this independent reference package. Selected manufacturer pages follow with their original content and pagination visible.

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.

Note

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.

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A5E00105492-02



Preface

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Purpose of this manual

To get you started, this manual contains the information you will need to plan, assemble, wire up, address and commission a S7-300.

You will then get to know the tools you can use to diagnose and eliminate errors in hardware and software.

Basic knowledge required

To understand this manual you will require a general knowledge of automation technology, backed up by a knowledge of the STEP 7 basic software. You may find it useful to read the Programming with STEP 7 V5.1 manual first.

Scope of the Manual

This manual applies to S7-300 PLCs, assembled with one of the CPUs described in the *CPU Data* Reference Manual.

Approvals

The SIMATIC S7-300 product series has the following approvals:

- Underwriters Laboratories, Inc.: UL 508 (Industrial Control Equipment)
- Canadian Standards Association: CSA C22.2 No. 142, (Process Control Equipment)
- Factory Mutual Research: Approval Standard Class Number 3611

CE mark

The SIMATIC S7-300 product series conforms to the requirements and safety specifications of following EU directives:

- EU directive 73/23/EWE "Low-voltage directive"
- EU directive 89/336/EEC "EMC directive"

C tick mark

The SIMATIC S7-300 product series is compliant with AS/NZS 2064 (Australia).

7.4 Wiring the power supply module and the CPU

Requirement

The modules are mounted on the rail.

Connection comb (not CPU 312 IFM and CPUs with MMC)

You can connect some of the CPUs to the PS 307 power supply module using the connection comb included with the module.

PS and CPU wiring

Note

The PS 307 power supply module is equipped with two additional DC 24 V connections (L+ and M) for the supply of I/O modules.

Note

On the 31xC, 312, 314 (6ES7314-1AF10-0AB0) and 315-2 DP (6ES7315-2AG10-0AB0) CPUs, the power supply connector is a plug and can be removed.



Warning

You can come into contact with live wires if the power supply module and any additional load power supply units are connected to the mains. You should therefore disconnect the S7-300 from the power supply before starting the wiring. Only use ferrules with insulating collars to press-fit onto the ends of the cables. Once you have wired the modules, close all the front panels. You can then switch on the S7-300 again.

1. Open the front panel to the PS 307 power supply module and CPU.
2. Open the strain relief clamp on the PS 307.
3. Strip the power cable to a length of 11 mm and connect it to L1, N and to the ground conductor terminal of the PS 307.
4. Screw-tighten the strain relief clamp again.
5. **You have two options for wiring the CPU, depending on which one you are using:**
 - For the **CPUs 31xC, 312, 312 IFM** (on which the power connection is on the front connector of the integral peripheral), **314** (6ES7314-1AF10-0AB0), and **CPU 315-2 DP** (6ES7315-2AG10-0AB0), the power supply connector is a plug and may be removed. Strip the connecting cables for the CPU power supply to a length of 11 mm.

Connect the lower terminals M and L+ on the PS 307 to terminals M and L+ on the CPU.
 - **CPU 313/314/314 IFM/315/315-2 DP/316-2 DP/318-2 DP:** Insert the connection comb and screw-tighten it.
6. Close the front panel.

The figure below illustrates the procedures described above.

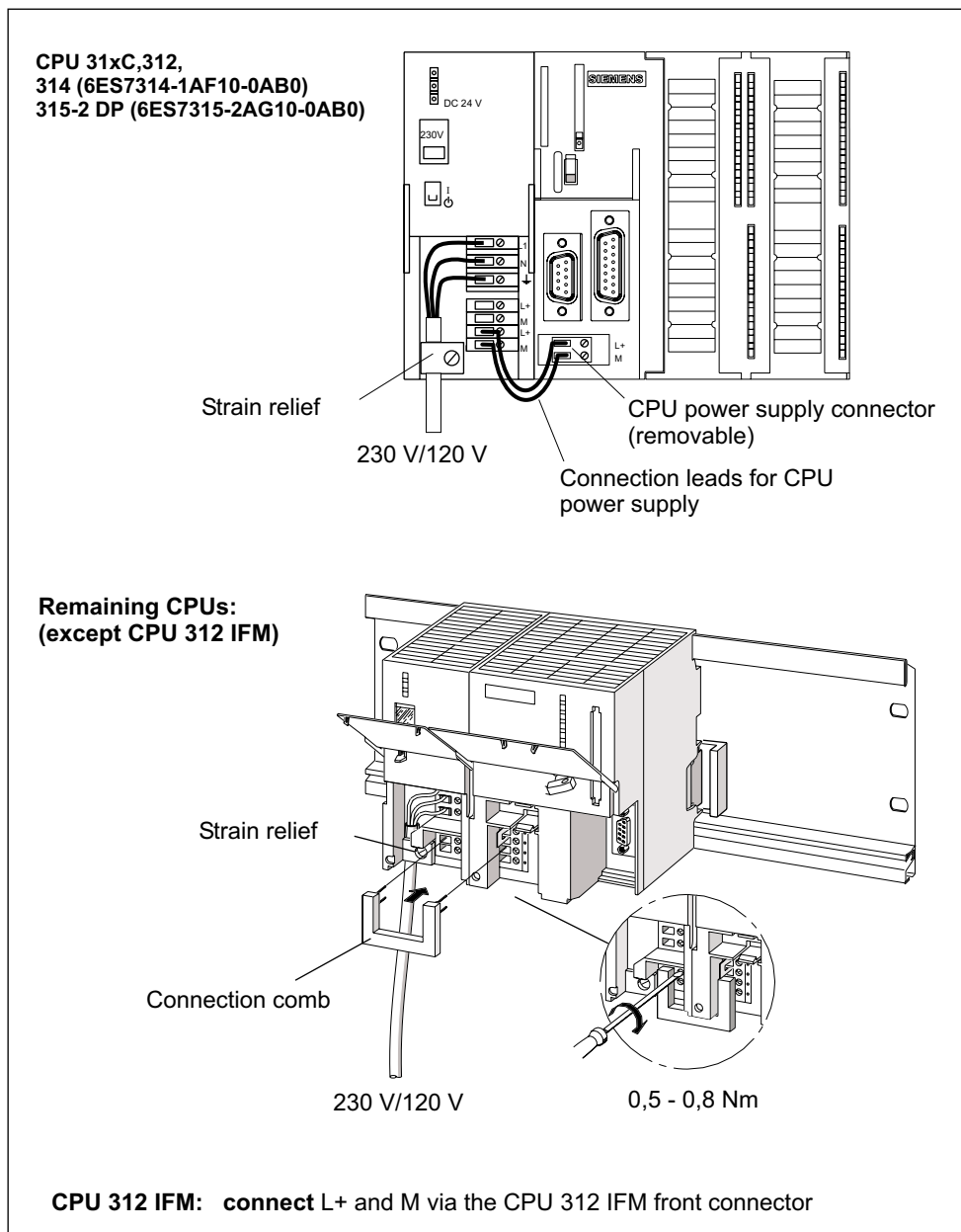


Figure 7-3 Wiring the power supply module and the CPU

Note

The PS 307 power supply module is equipped with two additional DC 24 V connections (L+ and M) for the supply of I/O modules.

7.5 Wiring front connectors

Introduction

The front connector is used to connect the sensors and actuators of your system to the S7-300 PLC. Wire the sensors and actuators to this front connector and then plug it into the module.

Front connector versions

Front connectors come in 20-pin and 40-pin versions, each with screw contacts or spring terminals. 40-pin front connectors are required for CPUs 31xC and 32-channel signal modules.

You must use the following front connectors, depending on the module:

Table 7-4 Assignment of front connectors to modules

Module	Front connectors with screw terminals; Order No.:	Front connectors with spring terminals; Order No.:
Signal modules (not 32-channel), Function modules, Communication module CP 342-2 CPU 312 IFM	6ES7 392-1AJ00-0AA0	6ES7 392-1BJ00-0AA0
Signal modules (32-channel) CPUs 314 IFM and 31xC	6ES7 392-1AM00-0AA0	6ES7 392-1BM01-0AA0

Termination with spring terminals

To terminate a conductor in a front connector with spring terminals, simply insert the screwdriver vertically into the opening with the red opening mechanism, insert the wire into the terminal and remove the screwdriver.



Warning

You can damage the spring-based opening mechanism of the front connector if the screwdriver slips sideways or if you insert the wrong size of screwdriver. Always slide a suitable screwdriver vertically into the desired opening until it reaches the stop. This will ensure that the spring terminal is fully open.

Tip:

There is a separate opening for test probes up to 2 mm in diameter to the left of the opening for the screwdriver.

8.4 User-defined addressing of modules

The following CPUs support free addressing

CPU	Order No.	As of version	
		Firmware	Hardware
CPU 312	6ES7312-1AD10-0AB0	V2.0.0	01
CPU 312C	6ES7312-5BD0x-0AB0		01
CPU 313C	6ES7313-5BE0x-0AB0		01
CPU 313C-2 PtP	6ES7313-6BE0x-0AB0		01
CPU 313C-2 DP	6ES7313-6CE0x-0AB0		01
CPU 314	6ES7314-1AF10-0AB0	V2.0.0	01
CPU 314C-2 PtP	6ES7314-6BF0x-0AB0		01
CPU 314C-2 DP	6ES7314-6CF0x-0AB0		01
CPU 315	6ES7 315-1AF03-0AB0		01
CPU 315-2 DP	6ES7 315-2AF03-0AB0 6ES7 315-2AF83-0AB0		01
CPU 315-2 DP	6ES7315-2AG10-0AB0	V2.0.0	01
CPU 316-2 DP	6ES7 316-2AG00-0AB0		01
CPU 318-2 DP	6ES7 318-2AJ00-0AB0	V3.0.0	03

User-defined addressing

User-defined addressing means that you can assign an address of your choice to any module (SM/FM/CP). The addresses are assigned in *STEP 7*. Here, you specify the module start address that forms the basis for all other addresses of the module.

Advantages of user-defined addressing:

- Optimization of the address areas available, since “address gaps” will not occur between the modules.
- When creating standard software, you can program addresses which are independent of the relevant S7-300 configuration.

9.7 Commissioning PROFIBUS DP

Requirements

Requirement for commissioning a PROFIBUS DP network is:

- A PROFIBUS DP network has been created.
- In *STEP 7*, you have configured the PROFIBUS DP network and you have assigned all network nodes a PROFIBUS DP address and memory area (see the Manual *SIMATIC, STEP 7 V5.x; Configuring hardware and connections with STEP 7 V5.x*).
- Note that you must also set address switches in some of the DP slaves (see the description of the relevant DP slave).
- Software requirements are shown in the table below, depending on the CPU:

Table 9-6 Software requirements

CPU	Order No.	Software required
313C-2DP	6ES/313-6CE00-0AB0	<i>STEP 7 V 5.1</i> or later + SP 4
314C-2DP	6ES7314-6CF00-0AB0	<i>COM PROFIBUS V 5.0</i> or later
315-2 DP	6ES7315-2AF03-0AB0 6ES7315-2AF83-0AB0	<i>STEP 7 V 3.1</i> or later <i>COM PROFIBUS V 3.0</i> or later
315-2 DP	6ES7315-2AG10-0AB0	<i>STEP 7 V 5.1</i> + SP 4 or later
316-2 DP	6ES7316-2AG00-0AB0	<i>STEP 7 V 5.x</i> or later
318-2 DP	6ES7318-2AJ00-0AB0	<i>COM PROFIBUS V 5.0</i> or later

DP address areas of the CPUs

Table 9-7 DP address areas of the CPUs

Address area	315-2 DP (6ES7 315-2AF03-0AB0) 313C-2 DP 314C-2 DP	316-2 DP 315-2 DP (6ES7315-2AG10-0AB0)	318-2 DP
DP address area for I/Os	1024 bytes	2048 bytes	8192 bytes
Number of those in the I/O process image	Bytes 0 to 127	Bytes 0 to 127	Byte 0 to 255 (default), configurable up to byte 2047

DP diagnostic addresses occupy 1 byte per DP master and DP slave in the input address area. For example, at these addresses DP standard diagnostics can be called for the relevant node (LADDR parameter of SFC13). The DP diagnostic addresses are specified in your configuration. If you do not specify any DP diagnostic addresses, *STEP 7* assigns these DP diagnostic addresses, starting at the highest byte address downwards .