SIEMENS

SIMATIC

S7-300
CPU 31xC and CPU 31x, Technical data

Manual

This manual is part of the documentation package with the order number: 6ES7398-8FA10-8BA0

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Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety as well as to avoid property damage. 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.

Danger

indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Warning

indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Caution

used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Caution

used without safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Notice

used without the safety alert symbol indicates a potential situation which, if not avoided, may result in an undesirable result or state.

When several danger levels apply, the notices of the highest level (lower number) are always displayed. If a notice refers to personal damages with the safety alert symbol, then another notice may be added warning of property damage.

Qualified Personnel

The device/system may only be set up and operated in conjunction with this documentation. Only qualified personnel should be allowed to install and work on the equipment. Qualified persons are defined as persons who are authorized to commission, to earth, and to tag circuits, equipment and systems in accordance with established safety practices and standards.

Intended Use

Please note the following:

Warning

This device and its components may only be used for the applications described in the catalog or technical description, and only in connection with devices or components from other manufacturers 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.

Trademarks

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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 the manual are reviewed regularly, and any necessary corrections will be included in subsequent editions. Suggestions for improvement are welcomed.

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Preface

Purpose of the Manual

This manual contains all the information you will need concerning the configuration, communication, memory concept, cycle, response times and technical data for the CPUs. You will then learn the points to consider when upgrading to one of the CPUs discussed in this manual.

Required basic knowledge

- To understand this manual, you require a general knowledge of automation engineering.
- You should also be accustomed to working with STEP 7 basic software.

Area of application

Table 1-1 Application area covered by this manual

CPU	Convention: CPU designations:	Order number	as of version	
			Firmware	Hardware
CPU 312C	CPU 31xC	6ES7312-5BD01-0AB0	V2.0.0	01
CPU 313C		6ES7313-5BE01-0AB0	V2.0.0	01
CPU 313C-2 PtP		6ES7313-6BE01-0AB0	V2.0.0	01
CPU 313C-2 DP		6ES7313-6CE01-0AB0	V2.0.0	01
CPU 314C-2 PtP		6ES7314-6BF01-0AB0	V2.0.0	01
CPU 314C-2 DP		6ES7314-6CF01-0AB0	V2.0.0	01
CPU 312	CPU 31x	6ES7312-1AD10-0AB0	V2.0.0	01
CPU 314		6ES7314-1AF10-0AB0	V2.0.0	01
CPU 315-2 DP		6ES7315-2AG10-0AB0	V2.0.0	01
CPU 315-2 PN/DP		6ES7315-2EG10-0AB0	V2.3.0	01
CPU 317-2 DP		6ES7317-2AJ10-0AB0	V2.1.0	01
CPU 317-2 PN/DP		6ES7317-2EJ10-0AB0	V2.3.0	01

Note

The special features of the CPU 315F-2 DP (6ES7 315-6FF00-0AB0) and CPU 317F-2 DP (6ES7 317-6FF00-0AB0) are described in their Product Information, available on the Internet at
http://www.siemens.com/automation/service&support, article ID 17015818.

7.5 CPU 315-2 PN/DP

Technical data

Table 7-6 Technical data for the CPU 315-2 PN/DP

Technical data	
CPU and version	
Order number	6ES7315-2EG10-0AB0
• Hardware version	01
• Firmware version	V 2.3.0
• Associated programming package	STEP 7 as of V 5.3 + SP 1
Memory	
RAM	
• RAM	128 KB
• Expandable	No
Capacity of the retentive memory for retentive data blocks	128 KB
Load memory	Plugged in with MMC (max. 8 MB)
Buffering	Guaranteed by MMC (maintenance-free)
Data storage life on the MMC (following final programming)	At least 10 years
Execution times	
Processing times of	
• Bit operations	0.1 µs
• Word instructions	0.2 µs
• Fixed-point arithmetic	2 µs
• Floating-point arithmetic	6 µs
Timers/counters and their retentivity	
S7 counters	256
• Retentive memory	Configurable
• Default	from C0 to C7
• Counting range	0 to 999
IEC Counters	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM size)
S7 timers	256
• Retentive memory	Configurable
• Default	Not retentive
• Timer range	10 ms to 9990 s

... then please note if you upgrade to one of the following CPUs

CPU	Order number	From version		Hereafter called
		Firmware	Hardware	
312	6ES7312-1AD10-0AB0	V2.0.0	01	CPU 31xC/31x
312C	6ES7312-5BD01-0AB0	V2.0.0	01	
313C	6ES7313-5BE01-0AB0	V2.0.0	01	
313C-2 PtP	6ES7313-6BE01-0AB0	V2.0.0	01	
313C-2 DP	6ES7313-6CE01-0AB0	V2.0.0	01	
314	6ES7314-1AF10-0AB0	V2.0.0	01	
314C-2 PtP	6ES7314-6BF01-0AB0	V2.0.0	01	
314C-2 DP	6ES7314-6CF01-0AB0	V2.0.0	01	
315-2 DP	6ES7315-2AG10-0AB0	V2.0.0	01	
315-2 PN/DP	6ES7315-2EG10-0AB0	V2.3.0	01	
317-2 DP	6ES7317-2AJ10-0AB0	V2.1.0	01	
317-2 PN/DP	6ES7317-2EJ10-0AB0	V2.3.0	01	

Reference

If you intend to migrate from PROFIBUS DP to PROFINET, we also recommend the following manual: *Guide: From PROFIBUS DP to PROFINET IO*

See also

DPV1 (Page 3-32)

A.1.2 Changed behavior of certain SFCs

SFC 56, SFC 57 and SFC 13 which work asynchronously

Some of the SFCs that work asynchronously, when used on CPUs 312IFM – 318-2 DP, were always, or under certain conditions, processed after the first call ("quasi-synchronous").

On the 31xC/31x CPUs these SFCs actually run asynchronously. Asynchronous processing may cover multiple OB1 cycles. As a result, a wait loop may turn into an endless loop within an OB.

The following SFCs are affected:

- SFC 56 "WR_DPARM"; SFC 57 "PARM_MOD"

  On CPUs 312 IFM to 318-2 DP, these SFCs always work "quasi-synchronously" during communication with centralized I/O modules and always work synchronously during communication with distributed I/O modules.