

SIEMENS

SIMATIC NET

S7-300 - PROFIBUS CP 342-5

Equipment Manual

Manual Part B

01/2023

C79000-G8976-C146-11

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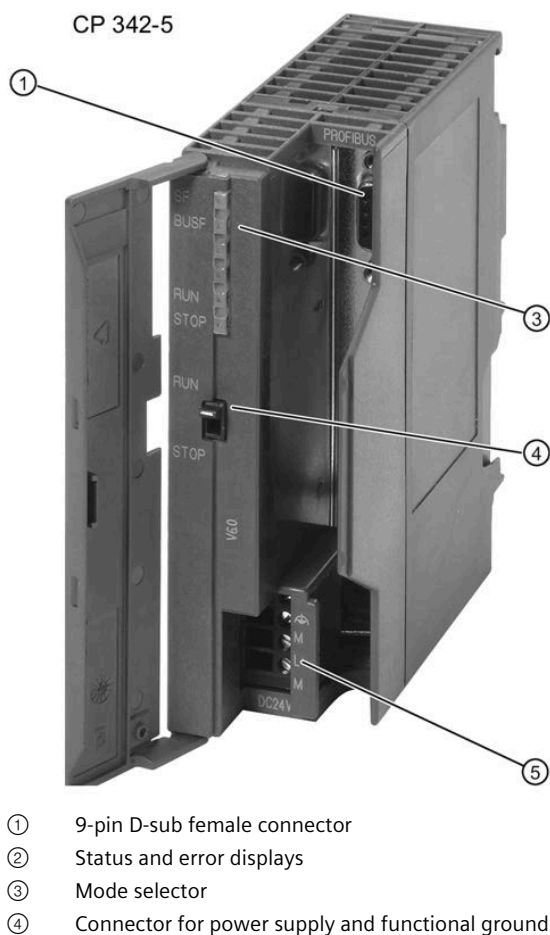
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Preface



Validity of this manual

This manual contains information on the following products:

- **CP 342-5**
Article number: 6GK7 342-5DA03-0XE0
Hardware version: 2
Firmware version: V6.0.66
Communications processor for connection of SIMATIC S7-300 / to PROFIBUS DP

CP 342-5

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Application and functions

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1.1 Application

Automation system

The CP communications processor is intended for operation in a SIMATIC S7-300 / C7-300 automation system. It allows connection of the S7-300 / C7-300 to a PROFIBUS fieldbus system.

1.2 Interfaces and connectors

The connectors are located behind the cover of the housing of the CP.

Connection to PROFIBUS

- CP 342-5

The interface is a 9-pin D-sub female connector operating according to the RS485 standard.

For information on the connection see section Installing, connecting and commissioning (Page 36).

Connection to power supply

A 4-pin terminal is available for the 24 VDC power supply,

For information on the connection see section Installing, connecting and commissioning (Page 36).

Application and functions

1.3 Communications services

1.3 Communications services

Supported communications services

In its current configuration, the CP supports the following communications services:

- **PROFIBUS DP**

- as DP master class 1 (PROFIBUS DP according to EN 50170 DPV0, DP master)
- as DP slave (PROFIBUS DP according to EN 50170 DPV0, DP slave)

Note**DP master or DP slave**

Please note, however: The CP only supports operation either as DP master or DP slave. You can also deselect DP mode altogether.

- **S7 communication and PG/OP communication**

- PG functions with uploading / downloading of FM modules, configuration / diagnostics and routing
- Operator control and monitoring functions (HMI)
Multiplexing TD/OP connections

When multiplexing OP connections, the following acyclic services are supported:

- read once
- write once
- read system status list
- Client and server for data exchange via communication blocks on S7 connections configured at both ends

The following blocks/functions are available:

BSEND FB 12, BRCV FB 13,

PUT FB 14, GET FB 15

USEND FB 8, URCV FB 9

C_CNTRL FC 62

You will find a more detailed description in /5/ (Page 54).

Note

The partner station can be an S7-300, S7-400 or PG/PC application with SIMATIC NET OPC server; raw data tags using BSEND/BRCV to WinCC are not supported.

- Server for data exchange on connections configured at both ends without communications blocks on the S7-300 / C7-300 station

Application and functions

1.5 Requirements for use

1.5.2 Project engineering

Configuration and downloading the configuration data

It is possible to download the configuration data to the CP via MPI or PROFIBUS. The following version of STEP 7 is required:

STEP 7 version	Functions of the CP
STEP 7 as of V5.1	The functional range of the following CP type can be configured: 6GK7342-5DA02-0XE0
- STEP 7 as of V5.4.5 with Hotfix 4 and HSP 1049 - STEP 7 as of V5.5.2 - STEP 7 Professional V11 or higher	The functional range of the following CP type can be configured: 6GK7342-5DA03-0XE0

Depending on what is available on your PG / PC and the S7-300 station, use one of the following connectors to load the configuration data: MPI, Industrial Ethernet or PROFIBUS.

Note

Changing bus parameters

If you change the bus parameters in the configuration data, you must not load this configuration data on the CP via PROFIBUS!

Note

Extensive configuration

Before loading an extensive configuration over a previous configuration, you should run a memory reset on the CP.

By doing this, you avoid the configuration storage space on the CP being exceeded. If the configuration storage space on the CP is not adequate, the diagnostics buffer of the CP reports a lack of resources when you download the configuration data.

Replacing a module without a programming device

The CP supports the option of storing the configuration data of the CP on the CPU. If you use this option, this means that module replacement is possible without having to load the configuration data from the PG again.

The configuration data is then stored in load memory of the CPU. Storage of the configuration data is protected from power failure by the battery backup or the EPROM module card in the CPU.

Application and functions

1.6 Compatibility with the previous product

1.6 Compatibility with the previous product

1.6.1 Enhanced functions and modifications

Replacing a module

The CP 342-5 (6GK7 342-5DA03-0XE0) is suitable as a replacement for the following predecessor products:

- CP 342-5 (6GK7 342-5DA00-0XE0)
- CP 342-5 (6GK7 342-5DA01-0XE0)
- CP 342-5 (6GK7 342-5DA02-0XE0)

Functional differences

In the following table, you can see the performance and functional characteristics that differ from the previously available device types.

	CP type 6GK7 342-5-****-0XE0			
Performance/functional characteristics	-5DA00-	-5DA01-	-5DA02-	-5DA03-
Number of connectable DP slaves	64	124	124	124
I/O configuration limits DP master	240 bytes	2160 bytes	2160 bytes	2160 bytes
I/O configuration limits DP slave	86 bytes	240 bytes	240 bytes	240 bytes
Also supports transmission speeds > 1.5 Mbps			●	●
Supports SYNC / FREEZE in DP slave mode				●
Interface in the user program in DP mode	Refer to the information in section Compatibility in the user program in DP mode (Page 24).			

Application and functions

1.6 Compatibility with the previous product

1.6.2 Replacing older modules / module replacement

Module replacement

If you replace one of the modules listed below with the new module CP 342-5 (6GK7 342-5DA03-0XE0), remember the following procedure:

Module used up to now	What to do / module replacement
6GK7 342-5DA00-0XE0	Supply the new module with an adapted configuration as follows: - In STEP 7 / HW Config, replace the already configured CP 342-5 with the new module; You will find this in the hardware catalog. - Save, compile and load the configuration data to the CPU or CP again.
6GK7 342-5DA01-0XE0 6GK7 342-5DA02-0XE0	Case a: Configuration unchanged If you have no requirements beyond what you had with the previous CP (for example configuration limits), you do not need to make changes in the configuration. You only need to remember the following distinction during commissioning: - With the module you are replacing, you chose to have the configuration data stored on the CPU. When you start up the CP, the configuration data will be loaded automatically from the CPU. - You had not chosen this option for the CP you are replacing. In this case, load the configuration data again from your PG/PC to the CP. Case b: adapted configuration If you want to use the extended options of the new CP, follow the steps below: - Use the new FCs (version 3.0 or higher; see also section Compatibility in the user program in DP mode (Page 24)) in your user program. Note: If applicable, remember changes to the data format of the ANY pointer on the FC interface; you will find more detailed information in the online help for the blocks. - In STEP 7 / HW Config, replace the already configured CP 342-5 with the new module; You will find this in the hardware catalog. - Expand your configuration to suit your needs, for example the connection configuration. - Save, compile and load the configuration data to the CPU or CP again.

CP 342-5

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LEDs and mode selector

2.1 LED displays

LEDs on the front panel

On the front panel, you will see the following LEDs for displaying the operational and communications status:



Figure 2-1 LEDs on the front panel

The LEDs have the following meaning:

- SF: Group error
- BUSF: Bus faults on the PROFIBUS interface
- RUN: RUN mode
- STOP: STOP mode

Unlabeled LED placeholders have no meaning.

LEDs for displaying the operating mode

The different combinations of the LEDs on the front panel indicate the status according to the following scheme.

Table 2- 1 Legend - meaning of the symbols

Symbol				-
Status	ON (steady light)	OFF	Flashing	Any

LEDs and mode selector

2.1 LED displays

Table 2- 2 LED display schemes

SF (red)	BUSF (red)	RUN (green)	STOP (yellow)	CP operating mode
Startup and operating statuses				
				Starting up (STOP → RUN)
				Running (RUN)
				Stopping (RUN → STOP) The time required for the signaled mode change depends on the size of the STEP 7 project; this can take up to 1 minute in large projects. On completion of the mode change, the data exchange with the DP slaves continues.
				Stopped (STOP) In STOP mode, configuring and performing diagnostics on the CP remain possible.
				Stopped (STOP) with error(s). In this state, the CPU or intelligent modules in the rack remain accessible using PG functions.
				Running (RUN) with problems on PROFIBUS.
				Running (RUN) with problems on the DP slaves.
Updating firmware				
				- Ready to begin loading firmware. (Operating mode active for a period of 10 s) or - CP is in DP slave mode and is not involved in cyclic data exchange with the DP master.
				Loading firmware.
				Invalid firmware was loaded.
				Cp waits for firmware update. (CP has incomplete firmware)
Errors				
				Module fault / system error (The two unlabeled LEDs also flash in this status.)

2.2 Mode selector

Controlling the mode

There are different ways in which you can control the operating status of the CP, as follows:

- Mode selector
- STEP 7 configuration software:
 - SIMATIC Manager / menu command: PLC > Display Accessible Nodes
 - NetPro / menu command: PLC > Operating Mode...
 - HW Config / menu command: PLC > Operating Mode...
 - NCM Diagnostics / menu command: Operating Mode

To control the CP mode from STEP 7, the mode selector must be set to RUN.

Mode selector

With the mode selector, you can set the following modes:

- Change from STOP to RUN

The CP enters the configured and/or loaded data in the work memory. The CP then changes to STOP.

Diagnostics of the CP is possible.

- Change from RUN to STOP

The CP changes to STOP with the following response:

- Established connections (FDL and S7 connections) are terminated.
- Configuration and diagnostics of the CP are possible.
- The following applies to DP mode:
 - DP slave mode: The CP is no longer in data transfer.
 - DP master mode: the mode is "OFFLINE".

Note**Longer transition times in complex systems**

Depending on the extent of the configuration, it can take up to 1 minute before the CP reaches the "OFFLINE" mode.

Further information

Read the explanations relating to the topic of "Downloading the configuration to the target system" in the /1/ (Page 53) manual.

Installation, wiring, commissioning, removal

3.3 Installing, connecting and commissioning

WARNING

Lack of equipotential bonding

If there is no equipotential bonding in hazardous areas, there is a risk of explosion due to equalizing current or ignition sparks.

- Ensure that equipotential bonding is available for the device.

WARNING

Unprotected cable ends

There is a risk of explosion due to unprotected cable ends in hazardous areas.

- Protect unused cable ends according to IEC/EN 60079-14.

WARNING

Insufficient isolation of intrinsically safe and non-intrinsically safe circuits

Risk of explosion in hazardous areas

- When connecting intrinsically safe and non-intrinsically safe circuits, ensure that the galvanic isolation is performed properly in compliance with local regulations (e.g. IEC 60079-14).
- Observe the device approvals applicable for your country.

WARNING

Unauthorized repair of devices in explosion-proof design

Risk of explosion in hazardous areas

- Repair work may only be performed by personnel authorized by Siemens.

3.3 Installing, connecting and commissioning

NOTICE

Improper mounting

Improper mounting may damage the device or impair its operation.

- Before mounting the device, always ensure that there is no visible damage to the device.
- Mount the device using suitable tools. Observe the information in the respective section about mounting.

4

Configuration and operation

4.1 Configuring in third-party systems

Configuring in third-party systems via GSD file

To allow configuration as DP slave in third-party systems, a GSD file is available. You will find this on the following page of Siemens Industry Online Support:

Link: (<https://support.industry.siemens.com/cs/ww/en/view/113652>)

The protocol variant DP-V1 or DP-V0 is decided during operation by the setting of the connected DP master.

4.2 Loading with modified transmission speed

Startup response with modified transmission speed

If you change the transmission speed when downloading the configuration data, expect a significantly longer startup delay on the CP. The startup delay can run into several minutes.

Note

Clear/reset CP

Reset the CP memory before you download configuration data with a different transmission speed.

To reset memory, use the corresponding function in the configuration tool or in special diagnostics, see manual/1/ (Page 53)

4.3 DP mode

DP data exchange

If the central CPU is in STOP mode, substitute values are transferred in the DP data exchange.

The following applies: Default value = 0

Diagnostics and upkeep

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! CAUTION

Hot surfaces

Risk of burns during maintenance work on parts with a surface temperature above 70 °C (158 °F).

- Take appropriate protective measures, for example, wear protective gloves.
- Once maintenance work is complete, restore the touch protection measures.

! WARNING

Cleaning the housing

- **In hazardous areas**
Only clean the outer parts of the housing with a damp, but not wet, cloth.
- **In non-hazardous areas**
Only clean the outer parts of the housing with a dry cloth.

Do not use any liquids or solvents.

5.1 Loading firmware

Firmware update

If new firmware versions are available for the CP, you will find these on the Internet pages of Siemens Industry Online Support:

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/15673/dl>)

Save the firmware file to the file system of your PG/PC.

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Technical specifications

Table 6- 1 CP 342-5

Technical specifications	Value
Transmission speeds supported	9.6 kbps, 19.2 kbps, 45.45 kbps, 93.75 kbps, 187.5 kbps, 500 kbps, 1.5 Mbps, 3 Mbps, 6 Mbps, 12 Mbps
Interfaces	
Connection to PROFIBUS	9-pin D-sub female connector
Maximum current consumption on the PROFIBUS interface when connecting network components	100 mA at 5V
Rated voltage	24 V DC
Current consumption	
• from 24 V	120 mA typical / 230 mA max.
• from S7-300 / C7-300 backplane bus	40 mA typical
Cable cross section for 24 V	0.25...2.5 mm ²
Power dissipation	5 W
Permissible ambient temperature	
• With horizontal installation of the rack	0...60 °C
• With vertical installation of the rack	0...40 °C
• Transport/storage temperature	-40 °C through +70 °C
• Max. relative humidity.	95% at +25 °C
• Operating altitude	Up to 2000 m above sea level
Dimensions W x H x D (mm)	40 x 125 x 120
Weight	Approx. 300 g

Over and above this, all the information relating to the following topics in I/2/ (Page 54) and in the section "General technical specifications" applies to the CP:

- Electromagnetic compatibility
- Transportation/storage conditions
- Mechanical and climatic environmental conditions
- Information on insulation checks, protection class and degree of protection



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