

# SIEMENS

## SIMATIC NET

### S7-1200 - PROFIBUS CM 1243-5

#### Operating Instructions

#### Preface

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## Legal information

### Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

#### **DANGER**

indicates that death or severe personal injury **will** result if proper precautions are not taken.

#### **WARNING**

indicates that death or severe personal injury **may** result if proper precautions are not taken.

#### **CAUTION**

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

#### **NOTICE**

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

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

### Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

### Proper use of Siemens products

Note the following:

#### **WARNING**

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

### Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

### Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

# Preface

## Validity of this manual

This document contains information on the following product:

CM 1243-5  
Article number 6GK7 243-5DX30-0XE0  
Hardware product version 3  
Firmware version V1.3.4

The device is the communications module for the PROFIBUS DP master function for the SIMATIC S7-1200.



Figure 1 CM 1243-5

At the top right behind the hinged cover of the module housing, you will see the hardware product version printed as a placeholder "X". If the printed text is "X 2 3 4", "X" would be the placeholder for hardware product version 1.

## Product name

- CM

In this document, the term "CM" is used instead of the full product name "CM 1243-5".

## New in this release

- New firmware version with the following functions:
  - Operation of the CM with a CPU V4
  - Configuration also with STEP 7 V13 SP1
  - Improved loading of firmware files

You will find the supported STEP 7 version for the particular firmware version in the section Requirements for operation (Page 12).

You will find the configuration limits depending on the firmware version in the section Performance data (Page 11).

- Editorial revision

## Replaced documentation

This manual replaces the manual release 05/2012.

## Current manual release on the Internet

You will also find the current version of this manual on the Internet pages of Siemens Industry Online Support:

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/15669/man>)

## Purpose of the manual

This manual describes the properties of this module and supports you when installing and commissioning the device.

The necessary configuration steps are described in the form of an overview.

You will also find instructions for operation and maintenance and information on the diagnostics options of the device.

## Required experience

To install, commission and operate the CM, you require experience in the following areas:

- Automation engineering
- Setting up the SIMATIC S7-1200
- SIMATIC STEP 7
- Data transfer with PROFIBUS

## Cross references

In this manual there are often cross references to other sections.

To be able to return to the initial page after jumping to a cross reference, some PDF readers support the command <Alt>+<Left arrow>.

## Further information

You will find an overview of further reading and references in the Appendix of this manual.

You will also find information about training, Service & Support and who to contact in the Appendix of this manual.

## License conditions

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### Note

#### Open source software

Read the license conditions for open source software carefully before using the product. The acceptance of the disclaimers of liability and warranty it contains is a clear precondition of the use of open source software.

You will find license conditions in the document "OSS\_CM12435\_86.pdf" on the data medium supplied with the product documentation.

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## Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit

Link: (<http://www.siemens.com/industrialsecurity>)

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

Link: (<http://www.siemens.com/industrialsecurity>).

## Firmware

The firmware is signed and encrypted. This ensures that only firmware created by Siemens can be downloaded to the device.

## SIMATIC NET glossary

Explanations of many of the specialist terms used in this documentation can be found in the SIMATIC NET glossary.

You will find the SIMATIC NET glossary here:

- SIMATIC NET Manual Collection or product DVD  
The DVD ships with certain SIMATIC NET products.
- On the Internet under the following address:

Link: (<https://support.industry.siemens.com/cs/ww/en/view/50305045>)

## Training, Service & Support

You will find information on Training, Service & Support in the multi--language document "DC\_support\_99.pdf" on the data medium supplied with the documentation.

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# Application and properties

## 1.1 Connecting the S7-1200 to PROFIBUS

### Connecting the S7-1200 to PROFIBUS DP

The S7-1200 can be connected to a PROFIBUS fieldbus system with the following communications modules:

- CM 1242-5  
Operates as DP slave
- CM 1243-5  
Operates as DP master class 1

If a CM 1242-5 and a CM 1243-5 are installed together, an S7-1200 can perform the following tasks simultaneously:

- Slave of a higher-level DP master system  
and
- Master of a lower-level DP master system

## 1.2 Communications services of the CM

### Bus protocol

PROFIBUS communication with the S7-1200 CMs is based on the PROFIBUS DP-V1 protocol. The supported functions and restrictions are described below.

### Possible DP slaves for the DP master CM 1243-5

With the DP master module CM 1243-5, the S7-1200 can communicate with the following DP-V0/V1 slaves:

- Distributed I/O SIMATIC ET200
- S7-1200 CPUs with CM 1242-5
- S7-200 CPUs with PROFIBUS DP module EM 277
- SINAMICS converter
- Drives and actuators from various vendors
- Sensors of various vendors
- S7-300/400 CPU with PROFIBUS interface

- S7-300/400 with PROFIBUS CP (for example CP 342-5)
- SIMATIC PC stations with PROFIBUS CP

### Types of communication with the CM 1243-5 in DP-V1

The following types of communication are available with DP-V1:

- Cyclic communication

The CM supports cyclic communication for the transfer of process data between DP slave and DP master.

Cyclic communication is handled by the operating system of the CPU. No instructions or software blocks are required for this. The I/O data is read or written directly from/to the process image of the CPU.

- Acyclic communication

The CM also supports acyclic communication:

- The "RALRM" instruction is available for receiving interrupts of the DP slaves.
- The "RDREC" and "WRREC" instructions are available for transferring configuration, diagnostics or I/O data.

Functions not supported by the CM 1243-5:

- SYNC / FREEZE
- Get\_Master\_Diag

### Other communications services of the CM 1243-5

The CM 1243-5 supports the following additional communications services:

- S7 communication

- PUT/GET services

The DP master functions as a client and server for queries from other S7 controllers or PCs via PROFIBUS.

- PG/OP communication

The PG functions allow the downloading of configuration data and user programs from a PG and the transfer of diagnostics data to a PG.

Possible communications partners for OP communication are HMI panels, SIMATIC panel PCs with WinCC flexible or SCADA systems that support S7 communication.

## 1.3 Performance data

### Number of CPs/CMs that can be plugged in per S7-1200 station

You can configure a maximum of three CMs/CPs per station. The maximum number of DP master modules depends on the firmware version of the CPU in the master station:

- CM 1243-5 + CPU with firmware version V2.x: Maximum of 1 DP master (CM 1243-5)
- CM 1243-5 + CPU with firmware version V3.x: Maximum of 3 DP masters (CM 1243-5)

### Transmission speeds of the CM 1243-5

As the transmission speed on PROFIBUS, values of 9.6 kbps to 12 Mbps are permitted for the CM.

### Characteristic data of the DP interface of the CM 1243-5

- **Number of operable DP slaves**

The number of DP slaves that can be operated with the DP master depends on the STEP 7 version, the firmware version of the CPU in the master station and the firmware version of the CM 1243-5:

- CM with a CPU with firmware V3: Maximum of 32 DP slaves
- CM with a CPU with firmware V2: Maximum of 16 DP slaves

You will find the required STEP 7 version and firmware version of the CPU in the section Requirements for operation (Page 12).

In conjunction with a CPU with firmware version 2.x, the maximum number of operable DP slaves is reduced by the following modules or nodes:

- CM 1242-5 slave modules plugged into the station of the DP Master
- PROFINET IO devices connected to the station of the DP Master

**Example**

The DP master module CM 1243-5 is plugged into the station.

There are also two CM 1242-5 DP slave modules plugged into the station.

5 PROFINET IO devices are also connected to the CPU.

In this case, the maximum number of DP slaves that can be operated with the CM 1243-5 is 9. ( $16 - 2 - 5 = 9$ )

- **Number of operable slots**

Total number of operable slots: Maximum 256

Any distribution of the slots as I slots and Q slots is permitted.

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**Note**

Bi-directional slots are counted double.

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- **Data areas of the DP master**

Size of the DP data areas of the DP master: Max. 1024 bytes

- Input area of the DP master in total: Max. 512 bytes
- Output area of the DP master in total: Max. 512 bytes

- **Data areas of the DP slaves**

Maximum size of the DP data areas of the DP slaves

- Input area per DP slave: Max. 244 bytes
- Output area per DP slave: Max. 244 bytes
- Diagnostics data area per DP slave: Max. 244 bytes

### Characteristic data of S7 communication

- Number of possible connections for S7 communication in total: 8

Of which maximum:

- Configured connections for PUT/GET services: 6
- PG/OP connections: 3

- User data per frame

- PUT: Max. 209 bytes
- GET: Max. 222 bytes

## 1.4 Requirements for operation

### Configuration tool

To configure the module, the following configuration tool is required:

- STEP 7 Basic

For the precise version, refer to the following table.

### CPUs of the S7-1200

Use of PROFIBUS functionalities with the S7-1200 requires CPUs with firmware versions 2.0 or higher in the master station. For the precise version, refer to the following table.

## Supported functions depending on the firmware and STEP 7 versions

Required components	Functions and configuration limits *
<ul style="list-style-type: none"> <li>CM: Firmware version V1.x</li> <li>CPU: Firmware version V2.0</li> <li>STEP 7 V11.0</li> </ul>	All functions and the reduced configuration limits are supported.
<ul style="list-style-type: none"> <li>CM: Firmware version V1.2</li> <li>CPU: Firmware version V3.0</li> <li>STEP 7 V11.0 + Service Pack 2 + Update 2</li> </ul>	All functions and the full configuration limits are supported.
<ul style="list-style-type: none"> <li>CM: Firmware version V1.3.3</li> <li>CPU: Firmware version V3.0 or V4.x</li> <li>STEP 7 V13</li> </ul>	All functions and the full configuration limits are supported.
<ul style="list-style-type: none"> <li>CM: Firmware version V1.3.4</li> <li>CPU: Firmware version V3.0 or V4.x</li> <li>STEP 7 V13 + SP1</li> </ul> <p>The CM remains configurable with STEP 7 V13. For the restriction refer to the column "Functions and configuration limits".</p>	<p>All functions and the full configuration limits are supported.</p> <p>When configuring with STEP 7 V13 + SP1 operation of the CM in projects with ET 200S HF is supported.</p>

\* You will find the relevant configuration limits in the section Performance data (Page 11).

Regardless of the configuration limits, the CM should be operated with the newest possible firmware version. For information on loading newer firmware versions and the firmware files to be used, refer to the section Downloading firmware (Page 33).

## 1.5 Configuration examples for PROFIBUS

Below, you will find examples of configurations in which the CM 1242-5 is used as a DP slave and the CM 1243-5 is used as a DP master.

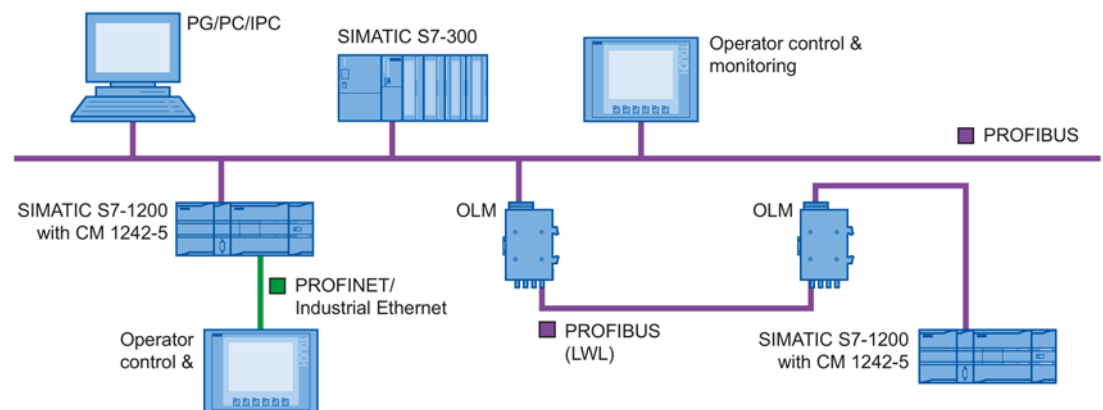


Figure 1-1 Configuration example with a CM 1242-5 as PROFIBUS slave

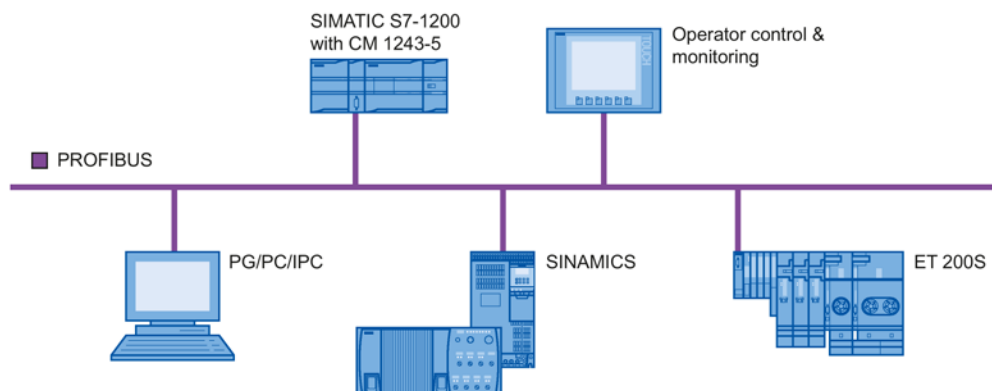


Figure 1-2 Configuration example with a CM 1243-5 as PROFIBUS master

## LEDs and connectors

### 2.1 Opening the covers of the housing

#### Location of the display elements and the electrical connectors

The LEDs for the detailed display of the module statuses are located behind the upper cover of the module housing.

The terminals for the power supply are located on the top of the module.

The PROFIBUS connector is located behind the lower cover of the module.

#### Opening the covers of the housing

Open the upper or lower cover of the housing by pulling it down or up as shown in the illustration. The covers extend beyond the housing to give you a grip.

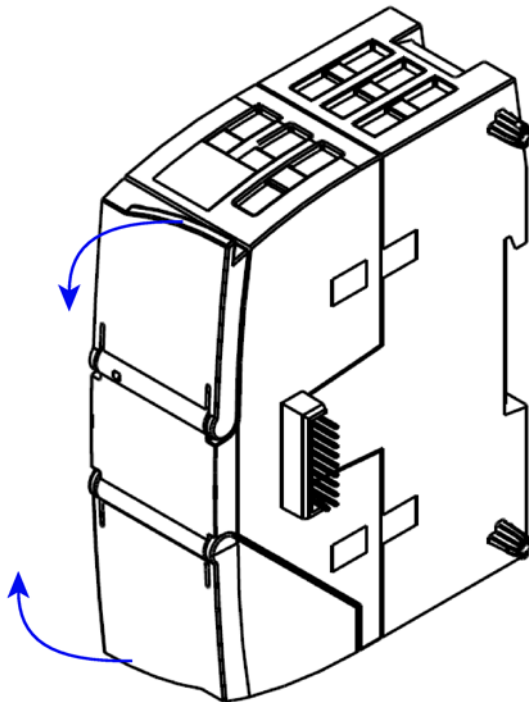


Figure 2-1 Opening the covers of the housing

## 2.2 LEDs


### LEDs of the module

The module has various LEDs for displaying the status:

- LED on the front panel

The "DIAG" LED that is always visible shows the basic statuses of the module.



Table 2- 1 LED on the front panel

LED / colors	Name	Meaning
 red / green	DIAG	Display of the basic status of the module

- LEDs below the upper cover of the housing

Open the upper housing cover. The LEDs here provide more detailed information on the module status.

Table 2- 2 LEDs below the upper cover of the housing

LED / colors	Name	Meaning
 yellow / green	RUN/STOP	Details on the operational and communications status of the module
 red	ERROR	Group error
	- not used -	-
	- not used -	-

#### Note





#### LED colors when the module starts up

When the module starts up, all its LEDs are lit for a short time. Multicolored LEDs display a color mixture. At this point in time, the color of the LEDs is not clear.

### Display of the operating and communication status

The LED symbols in the following tables have the following significance:

Table 2- 3 Meaning of the LED symbols

Symbol					-
LED status	OFF	ON (steady light)	Flashing, one color	Flashing yellow-green	Not relevant



The LEDs indicate the operating and communications status of the module according to the following scheme:

Table 2- 4 Display of the basic states of the module by the "DIAG" LED























DIAG (red / green)	Meaning	Comment
	Power OFF	
 green	RUN without errors	
 flashing green	<ul style="list-style-type: none"> <li>• Startup</li> <li>• STOP without errors</li> <li>• No project data</li> <li>• Firmware update</li> </ul>	The individual states are signaled by the RUN/STOP and ERROR LEDs (see below).
 flashing red	Problem / error	The individual states are signaled by the RUN/STOP and ERROR LEDs (see below).

Table 2- 5 Display schemes for detailed module statuses

DIAG (red / green)	-	RUN/STOP (yellow / green)	ERROR (red)	Meaning
<b>Detailed status schemes</b>				
 green				RUN without errors, Exchange of user data with DP master
 flashing green				<ul style="list-style-type: none"> <li>Stopped (STOP) without errors</li> <li>No project data available</li> </ul>
 flashing green				Starting up (STOP → RUN)
 flashing green				Loading firmware (The RUN/STOP and ERROR LEDs flash alternately.)
 flashing red				RUN with PROFIBUS problem: <ul style="list-style-type: none"> <li>DP slave errors</li> <li>No master-slave connection</li> <li>PROFIBUS cable not connected or not detected</li> </ul>
 flashing red				System fault: <ul style="list-style-type: none"> <li>CM has not received an address from the CPU</li> <li>Power supply of the CM was interrupted</li> <li>CPU reset to factory defaults</li> </ul> Solution when the error is permanent: Station power → OFF → ON Other possible problems: <ul style="list-style-type: none"> <li>Module fault</li> <li>Incomplete firmware version</li> </ul> Contact the hotline.

In STOP mode, configuring and performing diagnostics on the CM remain possible.

## 2.3 Electrical connections

### Power supply

The 3-pin socket for the external 24 V DC power supply is located on the top of the module. The matching plug ships with the product.

You will find the pin assignment of the socket in section Pin assignment of the socket for the external power supply (Page 36).

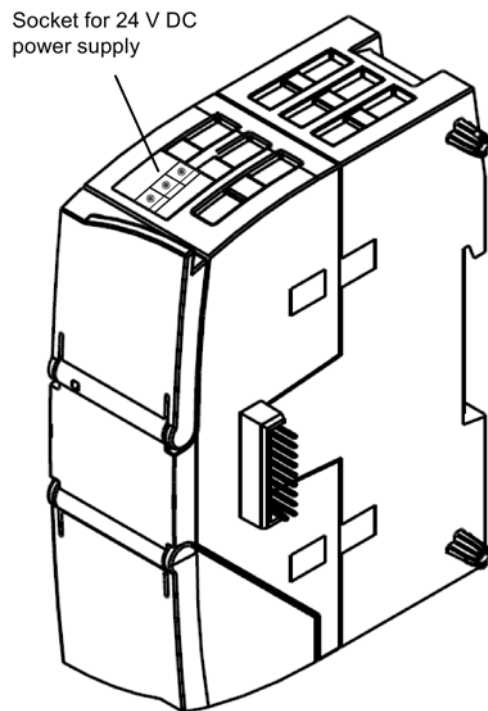


Figure 2-2 Socket for the 24 V DC power supply

### **9-pin D-sub female connector (PROFIBUS)**

The PROFIBUS connector is located behind the lower cover of the module. The interface is a 9-pin D-sub female connector operating according to the RS-485 standard.

You also have the option of connecting to optical PROFIBUS networks via an Optical Bus Terminal OBT or an Optical Link Module OLM.

You will find the pin assignment of the D-sub socket in section Pinout of the D-sub socket (Page 37).

### **More detailed information on the electrical connections**

For technical information on the electrical connections, refer to the section Technical specifications (Page 35).



# Installation, connecting up, commissioning

## Safety notices on the use of the device


Note the following safety notices when setting up and operating the device and during all associated work such as installation, connecting up or replacing the device.

## 3.1 Important notes on using the device


### Overvoltage protection


<b>NOTICE</b>
<p><b>Protection of the external power supply</b></p> <p>If power is supplied to the module or station over longer power cables or networks, the coupling in of strong electromagnetic pulses onto the power supply cables is possible. This can be caused, for example by lightning strikes or switching of higher loads.</p> <p>The connector of the external power supply is not protected from strong electromagnetic pulses. To protect it, an external overvoltage protection module is necessary. The requirements of EN61000-4-5, surge immunity tests on power supply lines, are met only when a suitable protective element is used. A suitable device is, for example, the Dehn Blitzductor BVT AVD 24, article number 918 422 or a comparable protective element.</p> <p>Manufacturer: DEHN+SOEHNE GmbH+Co.KG Hans Dehn Str.1 Postfach 1640 D-92306 Neumarkt, Germany</p>


### 3.1.1 Notes on use in hazardous areas


 <b>WARNING</b>
<p>The device may only be operated in an environment with pollution degree 1 or 2 (see IEC 60664-1).</p>

3.1 Important notes on using the device


 <b>WARNING</b>
<p>The equipment is designed for operation with Safety Extra-Low Voltage (SELV) by a Limited Power Source (LPS).</p> <p>This means that only SELV / LPS complying with IEC 60950-1 / EN 60950-1 / VDE 0805-1 must be connected to the power supply terminals, or the power supply unit for the equipment power supply must comply with NEC Class 2, as described by the National Electrical Code (r) (ANSI / NFPA 70).</p> <p>If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.</p>

 <b>WARNING</b>
<p><b>EXPLOSION HAZARD</b></p> <p>Do not connect or disconnect cables to or from the device when a flammable or combustible atmosphere is present.</p>

 <b>WARNING</b>
<p><b>EXPLOSION HAZARD</b></p> <p>Replacing components may impair suitability for Class 1, Division 2 or Zone 2.</p>

 <b>WARNING</b>
<p>When used in hazardous environments corresponding to Class I, Division 2 or Class I, Zone 2, the device must be installed in a cabinet or a suitable enclosure.</p>

3.1.2 Notes on use in hazardous areas according to ATEX / IECEx

 <b>WARNING</b>
<p><b>Requirements for the cabinet/enclosure</b></p> <p>To comply with EU Directive 94/9 (ATEX95), the enclosure or cabinet must meet the requirements of at least IP54 in compliance with EN 60529.</p>

 **WARNING**

**Cable**

If the cable or conduit entry point exceeds 70 °C or the branching point of conductors exceeds 80 °C, special precautions must be taken. If the equipment is operated in an air ambient in excess of 50 °C, only use cables with admitted maximum operating temperature of at least 80 °C.

 **WARNING**

Take measures to prevent transient voltage surges of more than 40% of the rated voltage. This is the case if you only operate devices with SELV (safety extra-low voltage).

### 3.1.3 Notes on use in hazardous areas according to UL HazLoc

 **WARNING**

**EXPLOSION HAZARD**

You may only connect or disconnect cables carrying electricity when the power supply is switched off or when the device is in an area without inflammable gas concentrations.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only.

This equipment is suitable for use in Class I, Zone 2, Group IIC or non-hazardous locations only.

### 3.1.4 Notes on use in hazardous areas according to FM

 **WARNING**

**EXPLOSION HAZARD**

You may only connect or disconnect cables carrying electricity when the power supply is switched off or when the device is in an area without inflammable gas concentrations.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only.

This equipment is suitable for use in Class I, Zone 2, Group IIC or non-hazardous locations only.

 **WARNING**

**EXPLOSION HAZARD**

The equipment is intended to be installed within an ultimate enclosure. The inner service temperature of the enclosure corresponds to the ambient temperature of the module. Use installation wiring connections with admitted maximum operating temperature of at least 30 °C higher than maximum ambient temperature.

## 3.2 Installing and commissioning the CM 1243-5

### Prior to installation and commissioning

 **WARNING**

**Read the system manual "S7-1200 Programmable Controller"**

Prior to installation, connecting up and commissioning, read the relevant sections in the system manual "S7-1200 Programmable Controller" (refer to the documentation in the Appendix).

When installing and connecting up, keep to the procedures described in the system manual "S7-1200 Programmable Controller".

Make sure that the power supply is turned off when installing/uninstalling the devices.

### Configuration

One requirement for the commissioning of the CP is the completeness of the STEP 7 project data. You should also read the section "Configuration and programming (Page 29)".



### Dimensions for installation

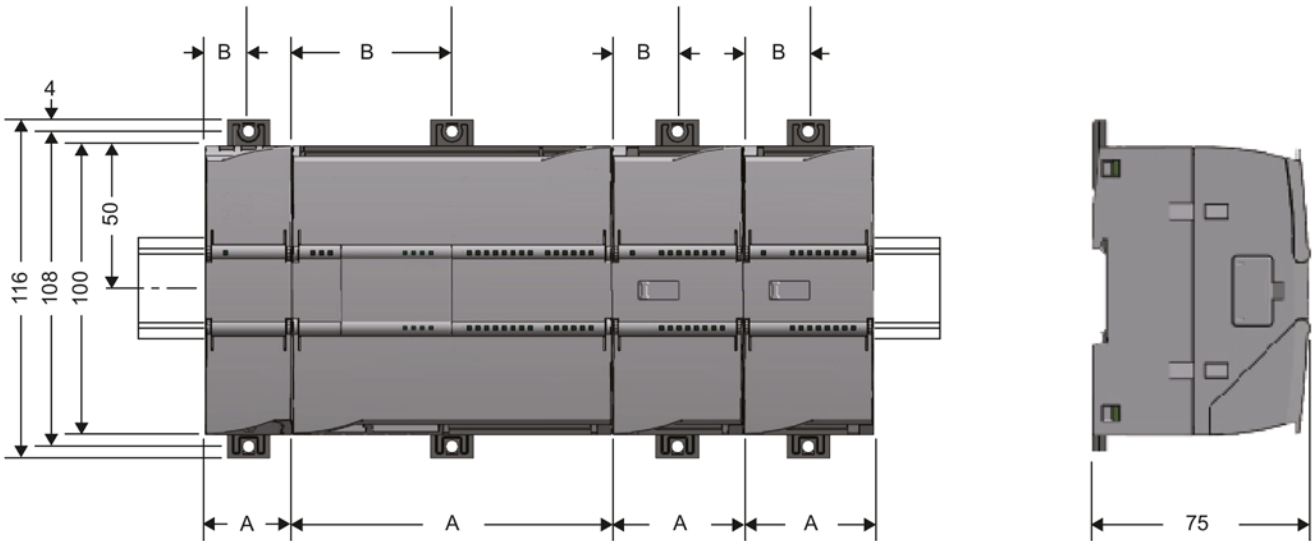


Figure 3-1 Dimensions for installation of the S7-1200

Table 3- 1 Dimensions for installation

S7-1200 devices		Width A	Width B *
CPU	CPU 1211C, CPU 1212C	90 mm	45 mm
	CPU 1214C	110 mm	55 mm
Signal modules	8 or 16 digital I/Os 2, 4 or 8 analog I/Os Thermocouple, 4 or 8 I/Os RTD, 4 I/Os	45 mm	22.5 mm
	16 analog I/Os RTD, 8 I/Os	70 mm	35 mm
Communications inter- faces	CM 1241 RS-232 and CM 1241 RS-485	30 mm	15 mm
	CM 1243-5 (PROFIBUS master) CM 1242-5 (PROFIBUS slave)	30 mm	15 mm
	CP 1242-7 (GPRS CP)	30 mm	15 mm

\* Width B: The distance between the edge of the housing and the center of the hole in the DIN rail mounting clip

### DIN rail mounting clips

All CPUs, SMs, CMs and CPs can be installed on the DIN rail in the cabinet. Use the pull-out DIN rail mounting clips to secure the device to the rail. These mounting clips also lock into place when they are extended to allow the device to be installed in a switching panel. The inner dimension of the hole for the DIN rail mounting clips is 4.3 mm.

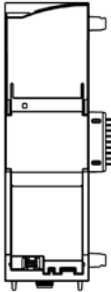
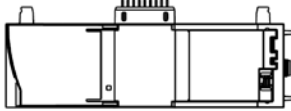
**Procedure for installation and commissioning**

**Note**

**Installation location**

During installation, make sure that the upper and lower ventilation slits of the module are not obstructed and good ventilation is possible. Above and below the device, there must be a clearance of 25 mm to allow air to circulate and prevent overheating.

Remember that the permitted temperature ranges depend on the position of the installed device.

Device position / permitted temperature range	Installation location
Horizontal installation of the rack: 0 °C to 55 °C	
Vertical installation of the rack: 0 °C to 45 °C	

**Note**

**Connection with power off**

Only wire up the S7-1200 with the power turned off.

**Power supply from the power outputs of the CPU**

The power of the CM must be supplied via the power outputs of the CPU.

Keep within the maximum load of the power outputs of the CPU.

You will find data relating to the current consumption and power loss of the CM in the section Technical specifications of the CM 1243-5 (Page 35).

**Grounding the PROFIBUS cable**

If a CM 1243-5 is plugged into the S7-1200, a PROFIBUS cable must always be connected to the CM 1243-5. The PROFIBUS cable must be grounded.

Table 3- 2 Procedure for installation and connecting up

Step	Execution	Notes and explanations
1	Mount the CM on the DIN rail and connect it to the module to its right.	Use a 35 mm DIN rail. The slots to the left of the CPU are permitted.
2	Secure the DIN rail.	
3	Secure the power supply wires to the power output of the CPU.	
4	Secure the wires of the power supply to the plug supplied with the CM and insert the plug in the socket on the top of the CM.	The pinning is shown beside the socket on the top of the housing. You will also find this in the section Pin assignment of the socket for the external power supply (Page 36).
5	Connect the PROFIBUS cable to the D-sub female connector of the CM.	Lower surface of the CM
6	Turn on the power supply.	
7	Close the front covers of the module and keep them closed during operation.	
8	The remaining steps in commissioning involve downloading the STEP 7 project data.	The STEP 7 project data of the CM is transferred when you download to the station. To load the station, connect the engineering station on which the project data is located to the Ethernet interface of the CPU. You will find more detailed information on loading in the following sections of the STEP 7 online help: <ul style="list-style-type: none"> <li>"Loading project data"</li> <li>"Using online and diagnostics functions"</li> </ul>

### 3.3 Note on operation

#### NOTICE

##### Closing the front panels

To ensure interference-free operation, keep the front panels of the module closed during operation.



# Configuration and programming

## 4.1 Configuration

### Configuration in STEP 7

You configure the DP modules and DP master systems in SIMATIC STEP 7. You will find the required version in the section Requirements for operation (Page 12).

You will find the number of CMs/CPs that can be configured per station in the section Performance data (Page 11).

### Overview of the STEP 7 configuration

Follow the steps below when configuring:

1. Create a STEP 7 project.
2. Insert the required SIMATIC stations.
3. Insert the communications modules and other required modules in the stations.
4. Select the PROFIBUS interface of the master module and create a DP master system using the shortcut menu (right mouse button).
5. Configure the DP master system in the following parameter groups:
  - General
  - Network settings
  - Cable configuration
  - Additional network nodes
  - Bus parameters
6. Network the PROFIBUS slaves with the master system:
  - Either using the shortcut menu command with the PROFIBUS interface selected
  - Or in the "Operating mode" parameter group of the slave module
7. Configure the slave modules.

Configuring the DP slaves is described in the manual of the slave module.
8. Configure the PROFIBUS master module.

This affects the properties in the following parameter groups:

  - General
  - PROFIBUS interface with the lower-level parameter groups "General" and "PROFIBUS address". The "Mode" of the DP master is preset.
9. Configure the remaining modules and submodules according to your requirements.
10. Save the project.

---

**Note**

You will find more detailed information on configuring the individual parameters in the help system of STEP 7.

---

### Downloading project data

When you load the station, the project data of the CM is stored on the CPU.

## 4.2 Programming

### DP data exchange with the CPU

No instructions are necessary for GP data exchange with the CPU. The cyclically transferred slave data is written to the input and output areas of the CPU.

### Reading and writing consistent data of a standard slave

With the DPRD\_DAT and DPWR\_DAT instructions, you can read consistent data with a length of > 4 bytes from a slave or transfer consistent data to a slave.

### Receiving interrupts with RALRM

The RALRM instruction is used to receive interrupts from DP slaves and the corresponding information is indicated by the output parameters of the instruction.

### Reading and writing a data record with the RDREC and WRREC instructions

The "RDREC" and "WRREC" instructions are available for transferring configuration, diagnostics or I/O data.

### S7 communication: Data exchange with remote communications partners

The CM can communicate with remote partners via PROFIBUS. The following instructions are used:

- PUT: Instruction for writing data to a remote CPU or a remote PC
- GET: Instruction for reading data from a remote CPU or a remote PC

Remote communications partners can be S7-CPU's, PCs, PGs, TDs/OPs or SCADA systems, such as WinCC.

---

**Note**

**Information on the instructions**

You will find information on the instructions mentioned above in the STEP 7 help.

---

# Diagnostics and upkeep

## 5.1 Diagnostics

### Diagnostics options

You have the following diagnostics options available for the module:

- The LEDs of the module  
For information on the LED displays, refer to the section LEDs (Page 16).
- STEP 7: The "Diagnostics" tab in the Inspector window  
Here, you can obtain the following information on the selected module:
  - Entries in the diagnostics buffer of the CPU
  - Information on the online status of the module
- STEP 7: Diagnostics functions in the "Online > Online and diagnostics" menu  
Here, you can obtain static information on the selected module:
  - General information on the module
  - Diagnostics status
  - Information about the PROFIBUS interface:
    - Settings
    - Statistics
    - Node list with PROFIBUS address and response on PROFIBUS

You can obtain further information on the diagnostics functions of STEP 7 in the STEP 7 online help.

- DP diagnostics

You will find the description of the functions of DP diagnostics in the documentation of the relevant slave (for example, in the manual of the CM 1242-5, see /3/ (Page 50)).

The evaluation of diagnostics data records requested by the DP master and the diagnostics interrupts or diagnostics alarms of the DP slaves is handled in the user program of the DP master station.

## 5.2 Downloading firmware

### New firmware versions

If a new firmware version is available for the module, you will find this on the Internet pages of Siemens Industry Online Support:

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/15669/dl>)  
("Entry list" tab > entry type "Download")

For firmware version V1.3.4 two different firmware files are available:

- File for operation of the CM with a CPU ≤ V3:  
6GK7 243-5DX30-0XE0 V01.03.04.upd
- File for operation of the CM with a CPU V4:  
6GK7 243-5DX30-0XE0 V01.03.04\_V4CPU.upd

The CM with firmware version V1.3.4 is compatible with STEP 7 projects with lower firmware versions of the CM.

### Loading the firmware file

To load a firmware file you require a SIMATIC memory card.


You will find a description of the procedure for loading firmware on the following page:

Link: (<https://support.industry.siemens.com/cs/ww/en/view/109476832>)

You can recognize that firmware is being loaded by the flashing LEDs of the CM, see section LEDs (Page 16).

## 5.3 Module replacement

### Module replacement

 <b>WARNING</b>
<b>Read the system manual "S7-1200 Programmable Controller"</b>
Prior to installation, connecting up and commissioning, read the relevant sections in the system manual "S7-1200 Programmable Controller" (refer to the documentation in the Appendix).
When installing and connecting up, keep to the procedures described in the system manual "S7-1200 Programmable Controller".
Make sure that the power supply is turned off when installing/uninstalling the devices

The configuration data of the CM is stored on the local CPU. This allows simple replacement of this communications module when necessary.

When the station starts up again, the new CM reads the project data from the CPU.

For information on the compatibility of the firmware versions, see section Downloading firmware (Page 33).



# Technical specifications

## 6.1 Technical specifications of the CM 1243-5

Table 6- 1 Technical specifications of the CM 1243-5

<b>Technical specifications</b>	
Article number	6GK7 243-5DX30-0XE0
<b>Interfaces</b>	
Connection to PROFIBUS	9-pin D-sub female connector
Maximum current consumption on the PROFIBUS interface when connecting network components (for example optical network components)	15 mA at 5 V (only for bus termination) *)
<b>Permitted ambient conditions</b>	
Ambient temperature	
<ul style="list-style-type: none"> <li>• During storage</li> <li>• During transportation</li> <li>• During operation with the rack installed horizontally</li> <li>• During operation with the rack installed vertically</li> </ul>	<ul style="list-style-type: none"> <li>• -40 °C to 70 °C</li> <li>• -40 °C to 70 °C</li> <li>• 0 °C to +55 °C</li> <li>• 0 °C to 45 °C</li> </ul>
Relative humidity at 25 °C during operation, without condensation, maximum	95%
Degree of protection	IP20
<b>Power supply, current consumption and power loss</b>	
Type of power supply	DC
Power supply / external	24 V
<ul style="list-style-type: none"> <li>• minimum</li> <li>• maximum</li> </ul>	<ul style="list-style-type: none"> <li>• 19.2 V</li> <li>• 28.8 V</li> </ul>
Current consumption (typical)	
<ul style="list-style-type: none"> <li>• from 24 V DC</li> <li>• from the S7-1200 backplane bus</li> </ul>	<ul style="list-style-type: none"> <li>• 100 mA</li> <li>• 0 mA</li> </ul>
Effective power loss (typical)	
<ul style="list-style-type: none"> <li>• from 24 V DC</li> <li>• from the S7-1200 backplane bus</li> </ul>	<ul style="list-style-type: none"> <li>• 2.4 W</li> <li>• 0 W</li> </ul>
Power supply 24 VDC / external	
<ul style="list-style-type: none"> <li>• Min. cable cross section</li> <li>• Max. cable cross section</li> <li>• Tightening torque of the screw terminals</li> </ul>	<ul style="list-style-type: none"> <li>• min.: 0.14 mm<sup>2</sup> (AWG 25)</li> <li>• max.: 1.5 mm<sup>2</sup> (AWG 15)</li> <li>• 0.45 Nm (4 lb-in)</li> </ul>

6.2 Pin assignment of the socket for the external power supply

Technical specifications	
Electrical isolation	710 VDC for 1 minute
<ul style="list-style-type: none"> <li>• PROFIBUS interface to ground</li> <li>• PROFIBUS interface to internal circuit</li> </ul>	
Dimensions and weights	
<ul style="list-style-type: none"> <li>• Width</li> <li>• Height</li> <li>• Depth</li> </ul>	<ul style="list-style-type: none"> <li>• 30 mm</li> <li>• 100 mm</li> <li>• 75 mm</li> </ul>
Weight	
<ul style="list-style-type: none"> <li>• Net weight</li> <li>• Weight including packaging</li> </ul>	<ul style="list-style-type: none"> <li>• 134 g</li> <li>• 171 g</li> </ul>

) The current load of an external consumer connected between VP (pin 6) and DGND (pin 5) must not exceed a maximum of 15 mA (short-circuit proof) for bus termination.

## 6.2 Pin assignment of the socket for the external power supply

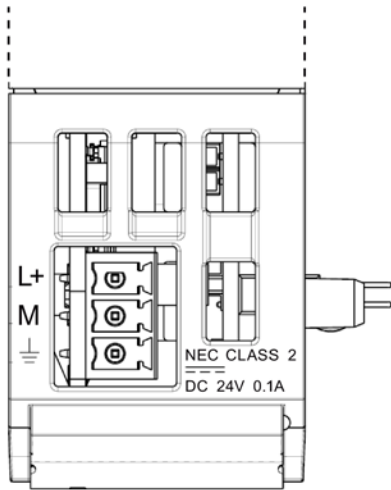


Figure 6-1 Socket for the external 24 VDC power supply (view from above)

Table 6-2 Pin assignment of the socket for the external power supply

Pin	Labeling	Function
1	L+	+ 24 VDC
2	M	Ground reference for + 24 VDC
3		Ground connector

## 6.3 Pinout of the D-sub socket

### PROFIBUS interface

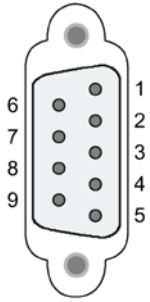


Table 6- 3 Pinout of the D-sub socket

Pin	Description	Pin	Description
1	- not used -	6	VP: Power supply +5 V only for bus terminating resistors; not for supplying external devices
2	- not used -	7	- not used -
3	RxD/TxD-P: Data line B	8	RxD/TxD-N: Data line A
4	CNTR-P: RTS	9	- not used -
5	DGND: Ground for data signals and VP	Housing	Ground connector

### PROFIBUS cable and connector

#### NOTICE

##### Contacting the shield of the PROFIBUS cable

The shield of the PROFIBUS cable must be contacted.

To do this, strip the insulation from the end of the PROFIBUS cable and connect the shield to functional earth.

#### Note

If you use a 180° PROFIBUS or a PG connector, the lower panel cannot be completely closed.

*6.3 Pinout of the D-sub socket*

# Dimension drawings

# A

---

**Note**

All dimensions in the drawings are in millimeters.

---

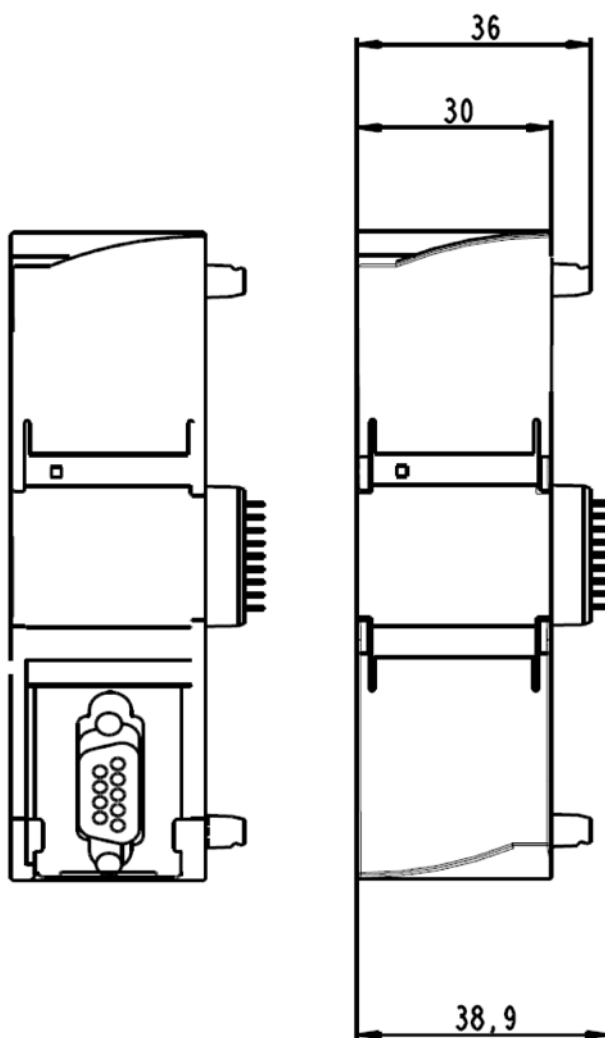


Figure A-1 CM 1243-5 - front view

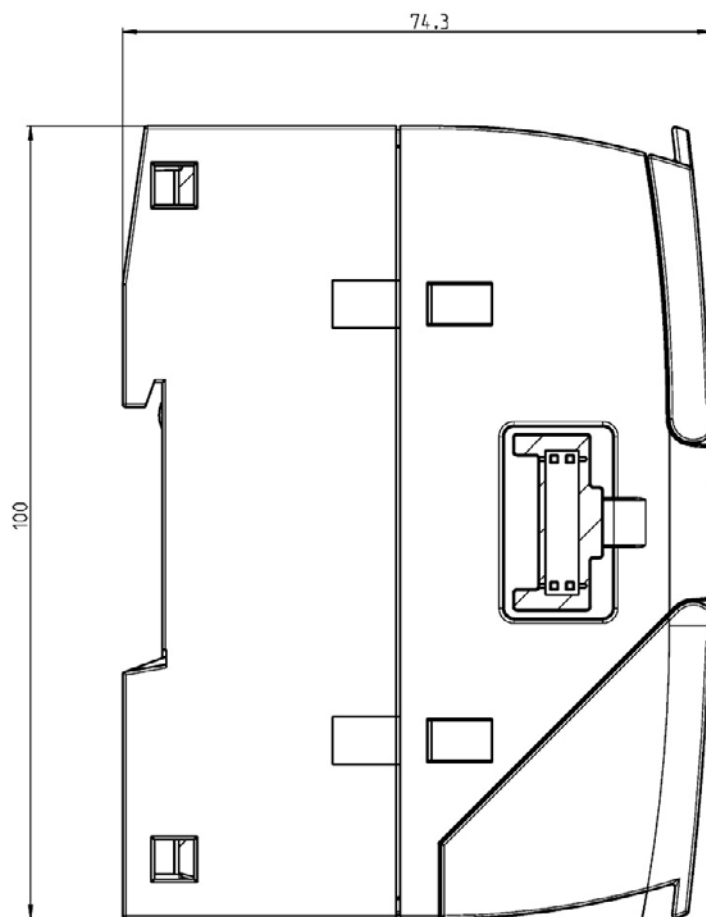


Figure A-2 CM 1243-5 - left side view

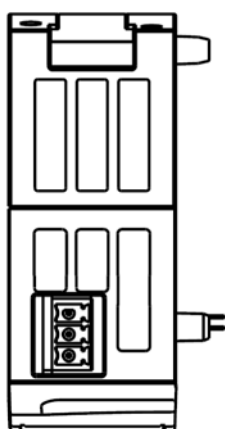


Figure A-3 CM 1243-5 - view from above

# Approvals

## B.1 Approvals

### Approvals issued

---

**Note****Issued approvals on the type plate of the device**

The specified approvals - with the exception of the certificates for shipbuilding - have only been obtained when there is a corresponding mark on the product. You can check which of the following approvals have been granted for your product by the markings on the type plate. The approvals for shipbuilding are an exception to this.

---

### Certificates for shipbuilding and national approvals

The device certificates for shipbuilding and special national approvals can be found in Siemens Industry Online Support on the Internet:

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/15669/cert>)

The product has the following approvals and meets the following standards:

### EC declaration of conformity



The product meets the requirements and safety objectives of the following EC directives and it complies with the harmonized European standards (EN) for programmable logic controllers which are published in the official documentation of the European Union.

- **2014/34/EU (ATEX explosion protection directive)**

Directive of the European Parliament and the Council of 26 February 2014 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres, official journal of the EU L96, 29/03/2014, pages. 309-356

- **2014/35/EU**

Guideline 2014/35/EU of the European Parliament and of the Council of February 26, 2014 on the harmonization of the laws of the member states relating to the making available on the market of electrical equipment designed for use within certain voltage limits (low voltage directive).

– EN 61131-2 Programmable controllers - Equipment requirements and tests

- **2014/30/EU (EMC)**

EMC directive of the European Parliament and of the Council of February 26, 2014 on the approximation of the laws of the member states relating to electromagnetic compatibility; official journal of the EU L96, 29/03/2014, pages 79-106

- Emission  
EN 61000-6-4: Industrial area
- Immunity  
EN 61000-6-2: Industrial area

- **2011/65/EU (RoHS)**

Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

The EC Declaration of Conformity is available for all responsible authorities at:

Siemens Aktiengesellschaft  
Division Process Industries and Drives  
Process Automation  
DE-76181 Karlsruhe  
Germany

You will find the EC Declaration of Conformity for this product on the Internet at the following address:

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/15669/cert>)  
→ "EC declaration of conformity"

## IECEX

The product meet the requirements of explosion protection according to IECEx.

IECEX classification: Ex nA IIC T4 Gc

IECEX certificate: IECEx DEK 14.0088X

The CP meets the requirements of the following standards:

- EN 60079-0  
Hazardous areas - Part 0: Equipment - General requirements
- EN 60079-15  
Explosive atmospheres - Part 15: Equipment protection by type of protection 'n'

You can see the current versions of the standards in the IECEx certificate that you will find on the Internet at the following address:

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/15669/cert>)

The conditions must be met for the safe deployment of the CP according to the section Notes on use in hazardous areas according to ATEX / IECEx (Page 22).

You should also note the information in the document "Use of subassemblies/modules in a Zone 2 Hazardous Area" that you will find on the Internet at the following address:

Link: (<https://support.industry.siemens.com/cs/ww/en/view/78381013>)



## ATEX



The product meets the requirements of the EC directive:2014/34/EC "Equipment and Protective Devices for Use in Potentially Explosive Atmospheres".

ATEX approval: II 3 G Ex nA IIC T4 Gc

Type Examination Certificate: KEMA 10ATEX0166 X


Relevant standards:

- EN 60079-0:2006: Explosive atmospheres - general requirements
- EN 60079-15:2005: Electrical apparatus for explosive gas atmospheres; type of protection 'n'

The device is suitable for use in environments with pollution degree 2.

The device is suitable for use only in environments that meet the following conditions:

- Class I, Division 2, Group A, B, C, D and areas where there is no risk of explosion
- Class I, Zone 2, Group IIC and areas where there is no risk of explosion

 <b>WARNING</b>
<b>Keeping to the installation guidelines</b>
The product meets the requirements if you keep to the following during installation and operation:
<ul style="list-style-type: none"><li>• The notes in the section Notes on use in hazardous areas according to ATEX / IECEx (Page 22)</li><li>• The installation instructions in the document /1/ (Page 49)</li></ul>

You should also note the information in the document "Use of subassemblies/modules in a Zone 2 Hazardous Area" that you will find on the Internet at the following address:

Link: (<https://support.industry.siemens.com/cs/ww/en/view/78381013>)

## RoHS

The product meets the requirements of the EC directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Applied standard:

- EN 50581:2012

## c(UL)us



Applied standards:

- Underwriters Laboratories, Inc.: UL 61010-1 (Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements)
- IEC/UL 61010-2-201 (Safety requirements for electrical equipment for measurement, control and laboratory use. Particular requirements for control equipment)
- Canadian Standards Association: CSA C22.2 No. 142 (Process Control Equipment)

File Number: E85972

### cULus Hazardous (Classified) Locations



Underwriters Laboratories, Inc.: cULus IND. CONT. EQ. FOR HAZ. LOC.

Applied standards:

- ANSI ISA 12.12.01
- CSA C22.2 No. 213-M1987

APPROVED for Use in:

- Cl. 1, Div. 2, GP. A, B, C, D T4A; Ta = -20 °C...60 °C
- Cl. 1, Zone 2, GP. IIC T4; Ta = -20 °C...60 °C

Report / UL file: E223122 (NRAG7.E223122)

Note the conditions for the safe deployment of the product according to the section Notes on use in hazardous areas according to UL HazLoc (Page 23).

### FM



Factory Mutual Approval Standard Class Number 3600, 3611, 3810, ANSI/ISA-61010-1

Equipment rating:

Class I, Division 2, Group A, B, C, D, Temperature Class T4A, Ta = 55 °C  
Class I, Zone 2, Group IIC, Temperature Class T4, Ta = 55 °C

Report Number: 3040919

Note the conditions for the safe deployment of the CP according to the section Notes on use in hazardous areas according to FM (Page 23).

### Manufacturer's declaration for China

- CCC certificate
- China RoHS

### Australia - RCM



The CP meets the requirements of the AS/NZS 2064 standards (Class A).

### Current approvals

SIMATIC NET products are regularly submitted to the relevant authorities and approval centers for approvals relating to specific markets and applications.

If you require a list of the current approvals for individual devices, consult your Siemens contact or check the Internet pages of Siemens Industry Online Support:

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/15669/cert>)

## B.2 Standards and test specifications

### Standards and test specifications

The device meets the following standards and test specifications. The test criteria for the device are based on these standards and test specifications.

### Industrial environments

The product was developed for use in industrial environments.

Application	Requirements for emissions	Requirements for immunity
Industry	EN 61000-6-4:2007	EN 61000-6-2:2005

### Electromagnetic compatibility (EMC)

The electromagnetic compatibility (EMC) of an electrical device is its capability of functioning as intended in an electromagnetic environment without emitting electromagnetic interference that could impair the operation of other electrical devices in the vicinity.

Electromagnetic compatibility - immunity	
EN 61000-4-2 Electrostatic discharge	8 kV air discharge to all surfaces 4 contact discharge to exposed conductive surfaces
EN 61000-4-3 Radiated electromagnetic field	80 to 1 000 MHz, 10 V/m, 80% AM at 1 kHz 1.4 to 2.0 GHz, 3 V/m, 80% AM at 1 kHz 2.0 to 2.7 GHz, 1 V/m, 80% AM at 1 kHz
EN 61000-4-4 Fast transient bursts	2 kV, 5 kHz with coupling network to AC and DC system power 1 kV, 5 kHz with coupling clamp to inputs/outputs
EN 61000-4-5 Surge immunity	DC systems - 2 kV common mode, 1 kV push-pull For DC systems (I/O signals, DC power supplies), external protection is necessary. 2 kV via coupling clamp on PROFIBUS cable
EN 61000-4-6 Conducted disturbances	150 kHz to 80 MHz, 10 V RMS, 80 % AM at 1 kHz
EN 61000-4-611 Voltage dips	DC systems 0 % for 1 cycle, 40 % for 12 cycles and 70 % for 30 cycles at 60 Hz

Electromagnetic compatibility - emission	
Conducted emissions EN 61000-6-4, class A 0.15 MHz to 5 MHz 5 MHz to 30 MHz	< 79 dB (µV) quasi peak; <66 dB (µV) average < 73 dB (µV) quasi peak; <60 dB (µV) average
Conducted emissions EN 61000-6-4, class A 30 MHz to 230 MHz 230 MHz to 1 GHz	< 40 dB (µV/m) quasi peak; measured at 10 m < 47 dB (µV/m) quasi peak; measured at a distance of 10 m

**Environmental conditions**

<b>Environmental conditions - transportation and storage</b>	
EN 60068-2-2, Test Bb, dry heat and EN 60068-2-1 Test Ab, cold	-40 °C to +70 °C
EN 60068-2-30, Test Db, damp heat	25 °C to 55 °C, 95% humidity
EN 60068-2-14, Test Na, temperature shock	-40 °C to +70 °C, dwell time 3 hours, 2 cycles
EN 60068-2-32 Free fall	0.3 m, five times, in product packaging
Atmospheric pressure	1 080 to 660 hPa (corresponding to an altitude of -1 000 to 3 500 m)

<b>Environmental conditions - operation</b>	
Ambient temperatures / air humidity (inlet air 25 mm below device)	0 °C to 55 °C for horizontal installation of the rack 0 °C to 45 °C for vertical installation of the rack 95% relative humidity, non-condensing
Atmospheric pressure	1080 to 795 hPa (corresponding to an altitude of -1000 to 2000 m)
EN 60068-2-14, Test Nb, temperature change	5 °C to 55 °C, 3 °C/minute
EN 60068-2-27 Mechanical shock	15 g, 11 ms pulse, 3 positive and 3 negative shocks in each of the 3 axes (half sine)
EN 60068-2-6 Sinusoidal vibration (DIN rail mount)	2 mm PP from 2 to 13 Hz and 0.7 g from 13 to 100 Hz (according to shipbuilding 1); 10 sweeps per axis, 1 octave/minute

**Protection class**

- Protection class III according to EN 61131-2 (protective conductor not required)

**Degree of protection**

- Mechanical protection to EN 60529: IP20

Protects against finger contact with high voltage as tested by standard probe. External protection required for dust, dirt, water and foreign objects of < 12.5 mm in diameter.

# References

## Where to find Siemens documentation

- Article numbers

You will find the article numbers for the Siemens products of relevance here in the following catalogs:

- SIMATIC NET - Industrial Communication / Industrial Identification, catalog IK PI
- SIMATIC - Products for Totally Integrated Automation and Micro Automation, catalog ST 70

You can request the catalogs and additional information from your Siemens representative. You will also find the product information in the Siemens Industry Mall at the following address:

Link: (<https://mall.industry.siemens.com>)

- Manuals on the Internet

You will find SIMATIC NET manuals on the Internet pages of Siemens Industry Online Support:

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/15669/man>)

Go to the required product in the product tree and make the following settings:

Entry type "Manuals"

- Manuals on the data medium

You will find manuals of SIMATIC NET products on the data medium that ships with many of the SIMATIC NET products.

/1/

SIMATIC  
S7-1200 Automation System  
system manual  
Siemens AG

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/13683/man>)

**/2/**

SIMATIC NET  
PROFIBUS Network Manual  
system manual  
Siemens AG

Link: (<https://support.industry.siemens.com/cs/ww/en/view/35222591>)

**/3/**

SIMATIC NET  
CM 1242-5  
Operating Instructions  
Siemens AG

Link: (<https://support.industry.siemens.com/cs/ww/en/ps/15667/man>)

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