Properties

The communication module has the following properties:

- Technical properties
  - RS422/485 interface
  - short-circuit proof
  - electrically disconnected
  - Protocols: 3964(R), Modbus master (RTU), Modbus slave (RTU), Freeport and USS with instructions
- Supported system functions
  - Firmware update
  - Identification data I&M0
  - Diagnostic interrupts
  - Parameter re-assignment in CPU RUN mode (using instructions)

Additional information

Additional information on the properties of the CM PtP RS422/485 HF can be found in the function manual CM PtP - Configurations for point-to-point connections (http://support.automation.siemens.com/WW/view/en/59057093).

You can find additional information on the design of the S7-1500 and the associated modules in the system manual S7 -1500 Automation System (http://support.automation.siemens.com/WW/view/en/59191792).

2.2 Accessories

Scope of delivery

The scope of delivery of the communication module includes a U connector for connection to the backplane bus.

Connecting cables

Connecting cables are available in the standard lengths: 5 m, 10 m and 50 m (each with a 15-pin sub D connector).

Table 2- 1 Order numbers of connecting cables

Connecting cables for CM PtP RS422/485 BA CM PtP RS422/485 HF	Type	Order number
X27 interface (RS422/485)	X27 (RS 422), 5 m	6ES7902–3AB00–0AA0
	X27 (RS 422), 10 m	6ES7902–3AC00–0AA0
	X27 (RS 422), 50 m	6ES7902–3AG00–0AA0

Online catalog

Additional order numbers for S7-1500 can be found on the Internet (http://www.siemens.com/industrymall) in the online catalog and online ordering system.

2.3 Functions

Introduction

The communication module allows you to exchange data between your own and other programmable controllers or computers by means of a point-to-point connection, and to connect various devices from a variety of manufacturers.

Functionality of the CM PtP RS422/485 HF

The CM PtP RS422/485 HF communication module offers the following functionality:

- RS422/485 interface
- Data transmission rate: 300 to 115.2 kbps
- Maximum frame length: 4 kbyte
- Transmission protocols: Freeport, 3964(R) and Modbus

Note

The USS protocol can be implemented with instructions included in STEP 7 (TIA Portal).

Hardware components of a point-to-point connection

You require certain hardware components for a point-to-point connection with the CM PtP RS422/485 HF.

Components	Function
Central processor unit (CPU) Accessories: Memory card	... executes the user program.
CM PtP RS422/485 HF communication module	... communicates with a communication partner (point-to-point) by means of the interface.
Connecting cable	... connects the CM PtP RS422/485 HF communication module with the communication partner. 
U connector	... provides the mechanical and electrical connection between the modules.
Optional: Power supply module (PS)	... converts the line voltage (120/230 VAC or 24 VDC) into the operating voltage of 15 VDC required for supply of the S7-1500.

System environment

The communication module can be used in the following system environments:

Applications	Components required	Configuration
Central operation in an S7-1500 system	• CPU 151x • CM PtP RS422/485 HF • Power supply (optional)	STEP 7 (TIA Portal)
Distributed operation in an S7-1500 system	• CPU 151x • IM 155-5 • CM PtP RS422/485 HF • Power supply (optional)	STEP 7 (TIA Portal)
Distributed operation in an S7-300/400 system	• CPU 31x / CPU 41x • IM 155-5 • CM PtP RS422/485 HF	STEP 7 (TIA Portal) STEP 7 with integration of a GSD file
Distributed operation in a third-party system	• Third-party programmable controller • IM 155-5 • CM PtP RS422/485 HF	GSD file imported to/installed in the engineering system [1)]

1) Information on using the communication module in a third-party system is available in the programming and operating manual CM PtP operation with PROFINET controller (http://support.automation.siemens.com/WW/view/en/59062563).

Additional information

Information on configuring and programming the CM PtP RS422/485 HF communication module is available in the function manual CM PtP - Configurations for point-to-point connections (http://support.automation.siemens.com/WW/view/en/59057093).

2.4 Properties of the RS422/485 interface

Definition

The RS422/485 (X27) interface is a differential voltage interface for serial data transmission.

Properties

The RS422/485 (X27) interface has the following properties and meets the following requirements:

Type	Differential voltage interface
Front connector:	15-pin sub-D female connector, with screw lock
RS422 signals:	T (A), R (A), T (B), R (B), GND; isolated
RS485 signals:	R/T (A), R/T (B), GND; all signals isolated against backplane bus and load voltage
Max. data transmission rate:	115.2 kbps
Max. cable length:	• 250 m for 115.2 kbps • 500 m for 38.4 kbps • 1200 m for up to19.2 kbps Cable type LIYCY 3 x 2 x 0.14. T(A)/T(B) and R(A)/R(B) twisted in pairs
Standard:	DIN 66259 Parts 1 and 3, EIA-RS422/485, CCITT V.11

Connecting

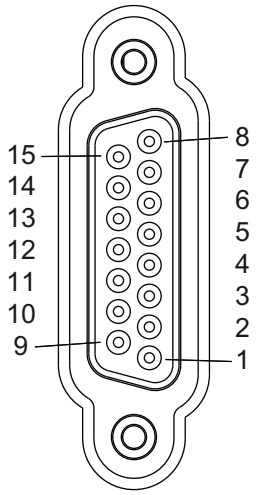
3

3.1 RS422/485 (X27) interface of the communication module

Terminal assignment

The table below shows the terminal assignment for the 15-pin sub D female connector in the front panel of the communication module.

Table 3- 1 Terminal assignment for the 15-pin sub D female connector of the integrated interface of the communication module

RS422/485* female connector	Pin	Designation	Input/output	Meaning
	1	-	-	-
	2	T (A) -	Output	Send data (four-wire mode)
	3	-	-	-
	4	R (A)/T (A) -	Input Input/output	Receive data (four-wire mode) Receive/send data (two-wire mode)
	5	-	-	-
	6	-	-	-
	7	-	-	-
	8	GND	-	Functional ground (isolated)
	9	T (B) +	Output	Send data (four-wire mode)
	10	-	-	-
	11	R (B)/T (B) +	Input Input/output	Receive data (four-wire mode) Receive/send data (two-wire mode)
	12	-	-	-
	13	-	-	-
	14	-	-	-
	15	-	-	-
* View from the front				

Connecting cables

Standard connecting cables of various lengths (see chapter Accessories (Page 11)) are available for connection with a communication partner which also has a 15-pin sub-D female connector.

Please note that you must only use shielded connector casings and cables. A large surface area of the cable shield must be in contact with the connector casing on both sides.

CAUTION

Cable shield - GND

Never connect the cable shield to the GND, as this could destroy the modules. GND (pin 8) must always be connected on both sides, as this could otherwise also destroy the modules.

3.2 Installation guidelines

To take into consideration

The general installation guidelines must be taken into consideration (see function manual EMC/EMI compatible installation of control systems (http://support.automation.siemens.com/WW/view/en/59193566)).

The cable shield must be installed on a grounding rail to maintain the EMC values (electromagnetic compatibility).

Technical specifications

7

7.1 Technical specifications

	6ES7541-1AB00-0AB0
Product type designation	CM PtP RS422/485 HF
General information	
• I&M data	Yes; I&M 0
Engineering with	
STEP 7 TIA Portal can be configured/integrated as of version	V12.0 / V12.0
STEP 7 can be configured/integrated as of version	V5.5 SP2 or higher with a GSD file
PROFIBUS as of GSD version/GSD revision	- / -
PROFINET as of GSD version/GSD revision	V2.3
Installation type/mounting	
• Rail mounting possible	Yes; S7-1500 mounting rail
Supply voltage	
Voltage type of supply voltage	System power supply
Input current	
• Current consumption (rated value)	33 mA; from backplane bus
Power	
• Power from the backplane bus	0.65 W
Power loss	
• Power loss, typ.	0.6 W
Address area	
Occupied address area	
• Inputs	8 bytes
Interfaces	
1. Interface	
Interface hardware	
• RS 422	Yes
• RS 485	Yes

	6ES7541-1AB00-0AB0
Interface hardware	
RS 485	
• Transmission rate, max.	115.2 kbps
• Max. cable length	1200 m
RS 422	
• Transmission rate, max.	115.2 kbps
• Max. cable length	1200 m
• 4-wire full duplex connection	Yes
• 4-wire multipoint connection	No
Protocols	
Integrated protocols	
Freeport	
• Frame length, max.	4 kbyte
• Bits per character	7 or 8
• Number of stop bits	1 or 2 bits
• Parity	None, even, odd, always 1, always 0, any
3964 (R)	
• Frame length, max.	4 kbyte
• Bits per character	7 or 8
• Number of stop bits	1 or 2 bits
• Parity	None, even, odd, always 1, always 0, any
Modbus RTU master	
Address area	1 to 247, extended 1 to 65,535
• Max. number of slaves	32
Modbus RTU slave	
Address area	1 to 247, extended 1 to 65,535
Frame buffer	
• Buffer memory for frames	8 kbyte
• Number of frames which can be buffered	255

	6ES7541-1AB00-0AB0
Interrupts/diagnostics/status information	
Interrupts	
• Diagnostic interrupt	Yes
• Hardware interrupt	No
Diagnostic messages	
Diagnostics	Yes
• Wire break	Yes
Diagnostics display LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Receive RxD	Yes; yellow LED
• Send TxD	Yes; yellow LED
Electrical isolation	
• between backplane bus and interface	Yes
Insulation	
Insulation tested with	707 V DC (Type Test)
Ambient conditions	
Operating temperature	
• Horizontal installation, min.	0 °C
• Horizontal installation, max.	60 °C
• Vertical installation, min.	0 °C
• Vertical installation, max.	40 °C
Distributed operation	
• At SIMATIC S7-300	Yes
• At SIMATIC S7-400	Yes
• At SIMATIC S7-1500	Yes
• At Standard Profinet Controller	Yes
• Supports Fast Startup	Yes
Dimensions	
• Width	35 mm
• Height	147 mm
• Depth	127 mm
Weights	
• Weight, approx.	0.22 kg

Additional general technical specifications for SIMATIC S7-1500 are available in the system manual (http://support.automation.siemens.com/WW/view/en/59191792).

Dimensional drawing

A

This appendix contains the dimensional drawing of the communication module installed on a mounting rail and with a shield bracket. Always observe the specified dimensions for installation in cabinets, control rooms, etc.

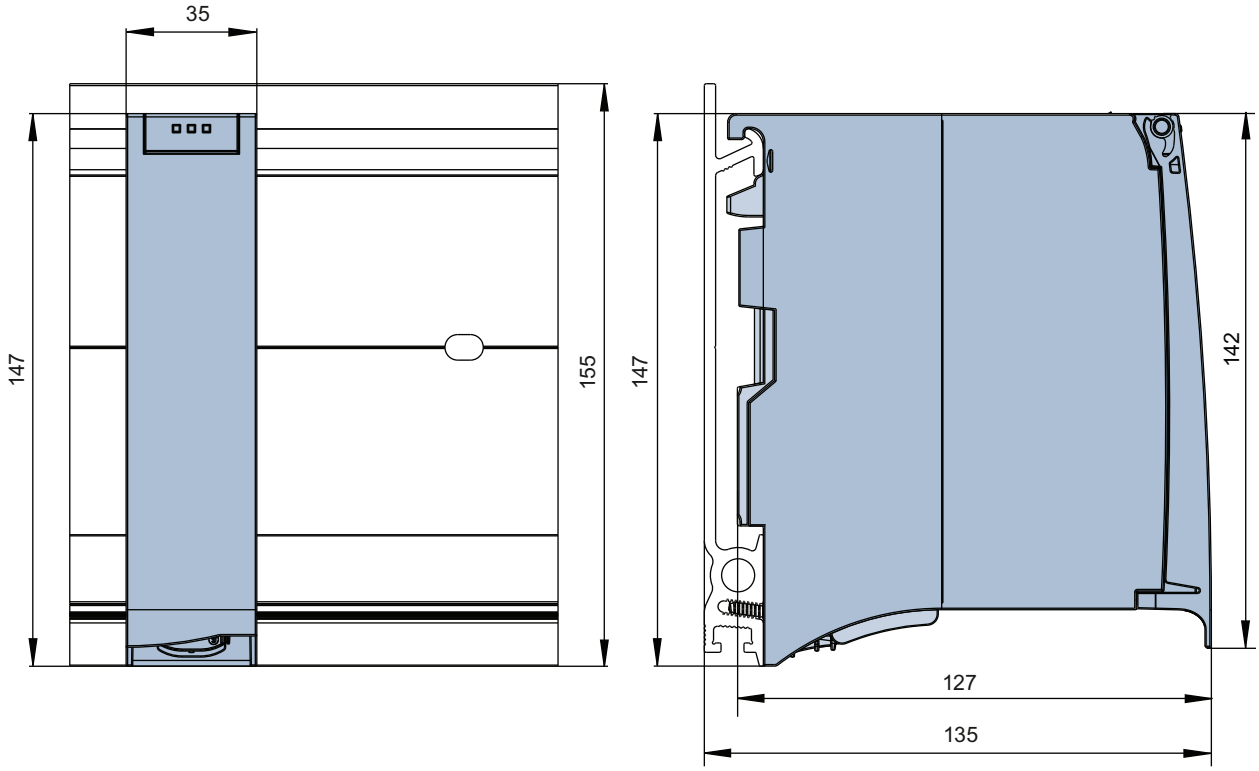


Figure A-1 Dimensional drawing of the CM PtP RS422/485 HF communication module

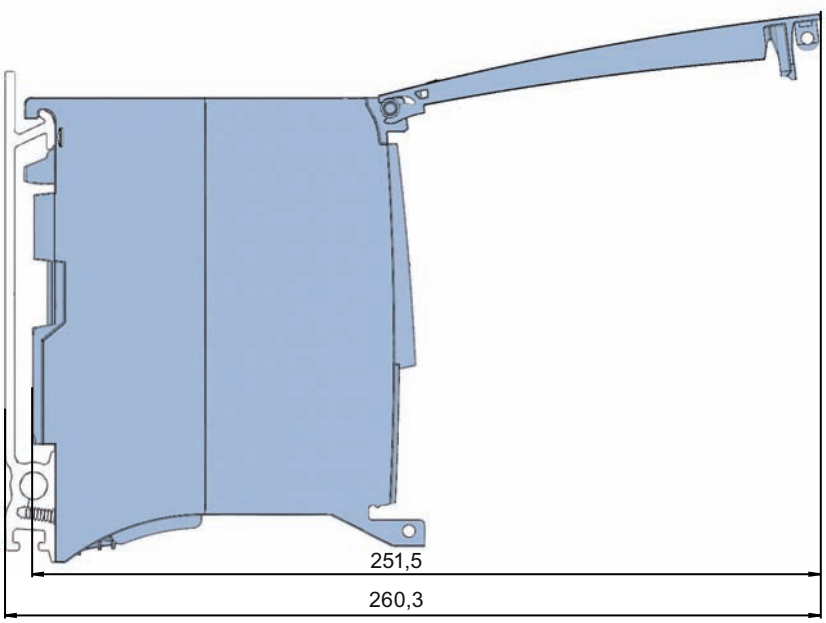


Figure A-2 Dimensional drawing of the CM PtP RS422/485 HF communication module with open front panel