MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Selected official pages for procurement and maintenance review

PRODUCT BRAND

Siemens

PRODUCT MODEL

6ES7155-6BA01-0CN0

PROFIBUS High Feature Bundle. Relevant section pages: 2, 3, 4, 5, 13, 14, 15, 16, 18, 19, 20, 21, 51, 52, 53, 54, 55. Adjacent model text on shared pages is outside this product reference.

OFFICIAL SOURCE

Interface module IM 155-6 DP HF (6ES7155-6BA01-0CN0); 10/2018

Siemens original documentation and product reference

AMIKON PRODUCT SUPPORT

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SIEMENS

SIMATIC

ET 200SP
Interface module IM 155-6 DP HF (6ES7155-6BA01-0CN0)

Manual

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10/2018
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Legal information

Warning notice system

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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.

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Preface

Purpose of the documentation

This manual supplements the ET 200SP distributed I/O system (http://support.automation.siemens.com/WW/view/en/58649293) system manual.

Functions that generally relate to the system are described in this manual.

The information provided in this manual and in the system/function manuals supports you in commissioning the ET 200SP distributed I/O system.

Conventions

Please also observe notes marked as follows:

Note

A note contains important information on the product described in the documentation, on the handling of the product or on the section of the documentation to which particular attention should be paid.

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For environmentally friendly recycling and disposal of your old equipment, contact a certified electronic waste disposal company and dispose of the equipment according to the applicable regulations in your country.

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Product overview

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2.1 Properties

Article number

6ES7155-6BA01-0CN0

Article number 6ES7155-6BA01-0CN0 contains the following components:

- Interface module IM 155-6 DP HF (6ES7155-6BU01-0CN0)
- Server module (6ES7193-6PA00-0AA0)
- PROFIBUS FastConnect bus connector (6ES7972-0BB70-0XA0)

View of the module

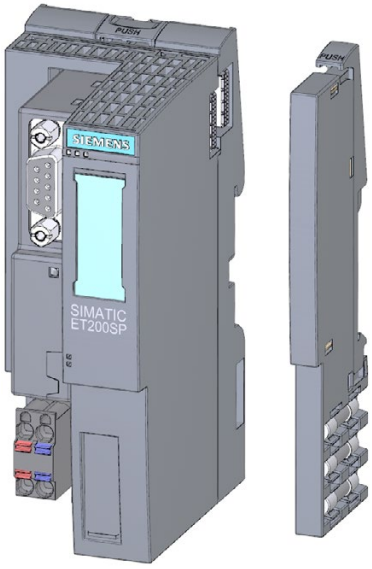


Figure 2-1 View of the 155-6 DP HF interface module with supplied accessories

Properties

The module has the following technical properties:

- Connects the ET 200SP distributed I/O system with PROFIBUS DP
- Power supply 1 L+ 24 V DC (SELV/PELV)
- Bus connection via RS485 interface

The module supports the following functions (Page 14):

Maximum configuration

- 244 bytes I/O data
- 32 I/O modules and 16 ET 200AL modules

Accessories

You order the following accessories separately:

- Labeling strips
- Reference identification label

You can find additional information on the accessories in the ET 200SP distributed I/O system (http://support.automation.siemens.com/WW/view/en/58649293) system manual.

Server module

The server module is included in the product package of the interface module and available separately as an accessory.

The server module has the following properties:

- Terminates the backplane bus of the ET 200SP distributed I/O system
- Features a support for 3 spare fuses (5 × 20 mm)
- Provides station functions, e.g., status bytes
- Identification data I&M 0 to 3

Note

You need to configure the server module in the configuration software.

To do so, place the server module with the required length of status bytes at the last slot of the configuration. When there are 32 I/O modules, the server module is inserted at slot 33.

PROFIBUS FastConnect bus connector

The PROFIBUS FastConnect bus connector is included in the product package of the interface module and also available separately as an accessory.

You can find additional information on the PROFIBUS FastConnect bus connector in the corresponding product information on the Internet (http://support.automation.siemens.com/WW/view/en/58648998).

Configuration with more than 244 bytes of parameter data

With a configuration as of STEP 7 V5.5 SP 3 with HSP 242, you have the option of operating the IM 155-6 DP HF interface module as of 6ES7155-6BA00-0CN0 in DPV1 mode with more than 244 bytes of parameter data. Configuration with the GSD file does not offer this option.

Reference

You can find additional information on identification data in the ET 200SP distributed I/O system (http://support.automation.siemens.com/WW/view/en/58649293) system manual.

2.2 Functions

2.2.1 Functions

Introduction

The interface module supports the following functions:

- Identification data I&M 0 to 3
- PROFIBUS DP
- Firmware update via PROFIBUS DP
- Configuration control by means of the user program
- Operation as DPV1 slave
- Operation after Y-link (not with F-modules)
- Station extension via ET-Connection
- F-direct data exchange

Requirements

The table below shows the software requirements for a configuration with the IM 155-6 DP HF interface module:

Table 2- 1 Version dependencies of other module functions

Function	Product version of the module as of	Firmware version of the module as of	Configuration software		
			Configuration with GSD file (http://support.automation.siemens.com/WW/view/en/19698639/130000) / software from a third-party manufacturer[1]	STEP 7 as of V5.5 SP3 with HSP0242	STEP 7 (TIA Portal) as of V13
Operation after Y-link (not with F-modules)	1	V1.1.0	X	-	-
Hot-swapping	1	V1.0.0	X	X	X
Station extension via ET-Connection	1	V3.0.0	X	X (as of HSP0242 V2)	-
F-direct data exchange	1	V3.1.0	-	X (as of HSP0242 V3)	-
Interface module; article number: 6ES7155-6BA01-0CN0	1	V4.2	-	X [2]	X (as of V15.1)

[1] Systems of third-party manufacturers: Depending on the range of functions of the third-party system

[2] Configure the module as version 6ES7155-6BA00-0CN0 FW V3.1 (as of HSP0242 V3)

Connecting

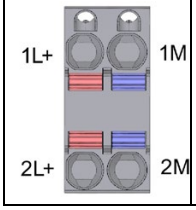
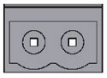
3

3.1 Terminal assignment

24 V DC supply voltage

The table below shows the signal names and descriptions of the pin assignment of the 24 V DC supply voltage.

Table 3- 1 Pin assignment 24 V DC supply voltage

View		Signal name[1)]	Description
Connector	IM connection		
		1L+	24 V DC
		2L+	24 V DC (for looping through)[2]
		1M	Ground
		2M	Ground (for looping through)[2]

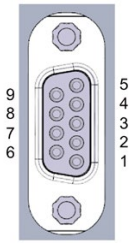
1 1L+ and 2L+ as well as 1M and 2M are internally bridged.

2 Maximum 10 A permitted.

PROFIBUS DP with RS485 interface

The following table shows the signal names and descriptions of the terminal assignment of the PROFIBUS DP interface.

Table 3- 2 Terminal assignment PROFIBUS DP with RS485 interface

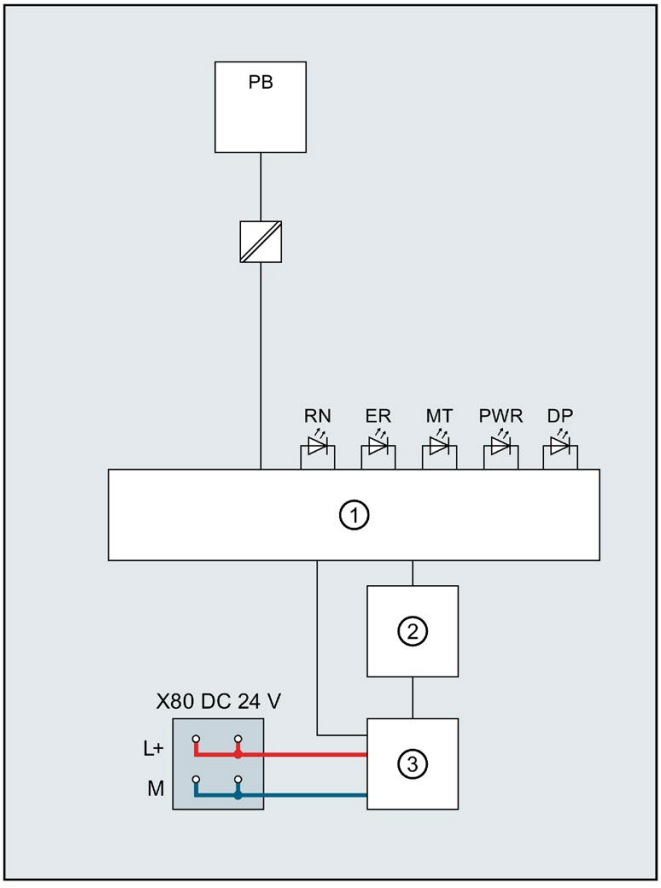
View		Signal name	Description
	1	-	-
	2	-	-
	3	RxD/TxD-P	Data line B
	4	RTS	Request To Send
	5	M5V2	DP data reference potential (from station)
	6	P5V2	Supply plus (from station)
	7	-	-
	8	RxD/TxD-N	Data line A
	9	-	-

Reference

You can find additional information on connecting the interface module and on the accessories in the ET 200SP distributed I/O system (http://support.automation.siemens.com/WW/view/en/58649293) system manual.

3.2 Block diagram

The following figure show the block diagram of the IM 155-6 DP HF interface module.



①	ET 200SP backplane bus interface and electronics	L+	24 V DC supply voltage
②	Backplane bus	M	Ground
③	Internal power supply	RN	RUN/STOP LED (green)
X80 24 V DC	Feed supply voltage	ER	ERROR LED (red)
PB	PROFIBUS interface	MT	MAINT LED (yellow)
		PWR	POWER LED (green)
		DP	PROFIBUS DP LED (green)

Figure 3-1 Block diagram of the IM 155-6 DP HF interface module

3.3 Setting the PROFIBUS DP address

Introduction

On the interface module (PROFIBUS), set the PROFIBUS DP address for PROFIBUS DP using the DIP switch. By setting the PROFIBUS DP address, you specify where the ET 200SP is to be addressed on the PROFIBUS DP.

Requirements

- Each PROFIBUS DP address may be assigned only once on the PROFIBUS DP.
- Valid PROFIBUS DP addresses are 1 to 125.
- The set PROFIBUS DP address must match the PROFIBUS DP address specified for the ET 200SP in the configuration software.

Required tools

Screwdriver 3 - 3.5 mm

Setting the PROFIBUS DP address

1. Slide the window of the interface module upwards.
2. Use a screwdriver to set the required PROFIBUS address via the DIP switch.
3. Close the window.

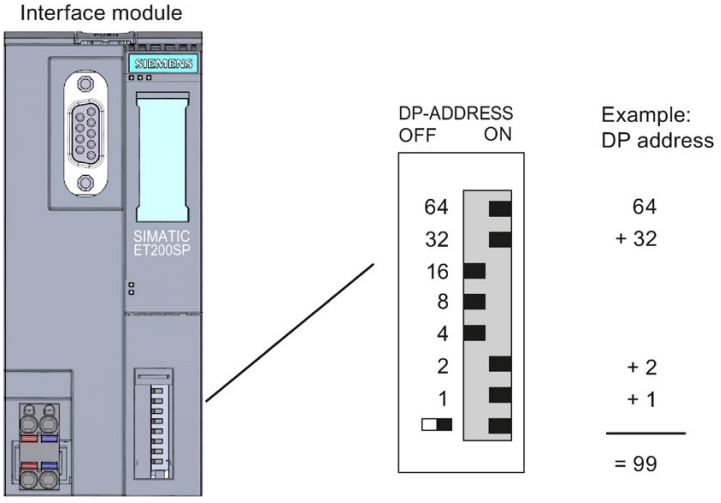


Figure 3-2 Setting the PROFIBUS DP address

Changing the PROFIBUS DP address

You can change the PROFIBUS DP address in exactly the same way as you set it. **A change in the PROFIBUS DP address only becomes valid for the ET 200SP** after a POWER ON of the interface module.

Plugging and pulling (hot-swapping) of ET 200SP I/O modules

NOTICE

Pulling and plugging (hot swapping) of ET 200SP I/O modules during operation on S7-300 via PROFIBUS **DP**

ET 200SP I/O modules can be pulled and plugged:

- As of STEP7 V5.5 SP3 HSP 242 and
- If "Operation if preset configuration <> actual configuration" parameter is enabled.

Note the following when operating the ET 200SP with S7-300 via PROFIBUS DP: Plugging of ET 200SP I/O modules results in a brief station failure of the ET 200SP.

Note

ET 200SP I/O modules can be pulled and plugged without restrictions for all other DP master systems if you enable the "Pull/plug module (OB83)" parameter.

Communication module IO-Link Master CM 4xIO-Link

Note

Communication module IO-Link Master CM 4xIO-Link

Operation of the CM 4xIO-Link IO-Link Master communication module with the IM 155-6 DP HF interface module is supported as of S7-PCT V3.1 and an updated module firmware version/GSD file.

Reaction times for fail-safe modules

The following maximum reaction time of the interface module must be taken into account when calculating the reaction times of fail-safe modules: **Maximum reaction time = 2.3 ms**

First BaseUnit of an ET 200SP in the configuration

The interface modules support plugging a dark-colored BaseUnit in slot 1. This means that modules without a connection to the integrated voltage buses P1 and P2 can now also be configured starting with slot 1. Currently, this applies to the following modules:

- AI EnergyMeter ST (6ES7134-6PA00-0BD0)
- DI 4x120 … 230VAC ST (6ES7131-6FD00-0BB1)
- DQ 4x24 … 230VAC/2A ST (6ES7132-6FD00-0BB1)

Note

First BaseUnit of an ET 200SP in the configuration

Please note the information on limiting the overvoltage and power rating in the AC I/O module manuals.

The 24 V DC supply voltage is fed in via an external fuse.

The 24 V DC supply voltage is provided by a light-colored BaseUnit.

Requirement for configuration of these modules in slot 1:

- Configuration via GSD or GSDML
- Configuration as of STEP7 V5.5 SP4 as of
  - HSP0242 V2.0 for IM155-6 DP HF
- Configuration as of STEP7 V13 SP1

See also: Functions (Page 14)

Technical specifications

7

7.1 Technical specifications

Technical specifications of the IM 155-6 DP HF

The following table shows the technical specifications as of 08/2018. You can find a data sheet including daily updated technical specifications on the Internet (https://support.industry.siemens.com/cs/de/en/pv/6ES7155-6BA01-0CN0/td?dl=de).

Article number	6ES7155-6BA01-0CN0
General information	
Product type designation	IM 155-6DP HF with PROFIBUS connector and server module
Firmware version	V4.2
Product function	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V15 SP1
• STEP 7 configurable/integrated as of version	As of V5.5 SP4, only up to FW V3.1
• PROFIBUS as of GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
Configuration control	
via dataset	Yes
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption, max.	335 mA
Inrush current, max.	1.6 A
I^2t	0.038 $A^2 \cdot s$
Power loss	
Power loss, typ.	1.5 W

Article number	6ES7155-6BA01-0CN0
Address area	
Address space per module	
• Address space per module, max.	32 byte; per input / output
Address space per station	
• Address space per station, max.	244 byte; per input / output
Hardware configuration	
Rack	
• Modules per rack, max.	32; + 16 ET 200AL modules
Interfaces	
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	
• RS 485	Yes
• Output current of the interface, max.	90 mA
Protocols	
• PROFIBUS DP slave	Yes
RS 485	
• Transmission rate, max.	12 Mbit/s
PROFIBUS DP	
Services	
– SYNC capability	Yes
– FREEZE capability	Yes
– DPV0	Yes
– DPV1	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Connection display DP	Yes; Green DP LED
Potential separation	

Article number	6ES7155-6BA01-0CN0
between backplane bus and electronics	No
between PROFIBUS DP and all other circuit components	Yes
between supply and all other circuits	No
Permissible potential difference	
between different circuits	Safety extra low voltage SELV
Isolation	
Isolation tested with	707 V DC (type test)
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m
Connection method	
ET-Connection	
• via BU/BA Send	Yes; + 16 ET 200AL modules
Dimensions	
Width	50 mm
Height	117 mm
Depth	74 mm
Weights	
Weight, approx.	150 g