AMIKON TECHNICAL DOCUMENTATION

Installation Instructions

Siemens 6ES7155-6AA01-0BN0

ET 200SP PROFINET Bundle

SUPPLY	BACKPLANE	HOT SWAP	SHARING
24 V DC	**4.5 W infeed**	**Single module**	**2 controllers**

For qualified personnel only. Isolate the equipment and follow the complete manufacturer and site safety procedures. This reference does not replace the approved project design or the full installation manual.

01 PREPARATION AND WIRING CHECKS

- Read the interface and ET200SP system manuals together; installation requires qualified personnel.
- Select the documented 24 V DC SELV/PELV supply and the correct BusAdapter.
- Supply-terminal pairs 1L+/2L+ and 1M/2M are bridged internally; loop-through must not exceed 10 A.
- Use the pin assignment for the installed RJ45 or FastConnect adapter; disabled autonegotiation changes the port-2 RJ45 assignment.
- Place and parameterize the server module in the final configuration slot; check the first-BaseUnit rules for the actual I/O type.
- If configuration control is enabled, the user program must provide control data record 196.

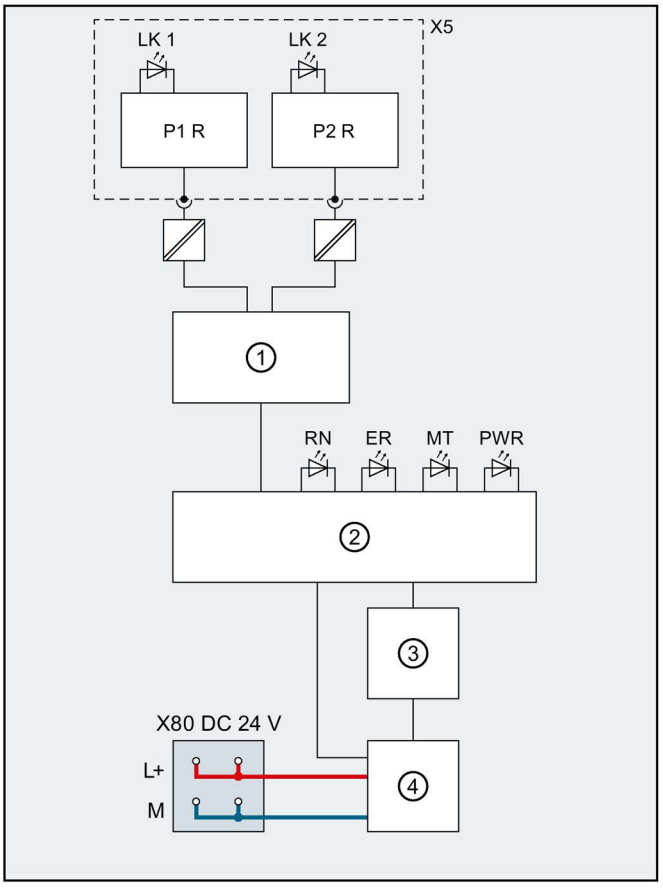
02 ORIGINAL WIRING REFERENCE

Original source PDF pages 24, 3, 4, 10, 11, 12, 21, 22, 23, 25, 43, 44. The following pages retain the original Siemens drawings and printed page numbers.

Siemens original installation documentation

3.2 Schematic circuit diagram

The following figure shows a block diagram of the IM 155-6 PN ST interface module.



①	Switch	L+	24 V DC supply voltage
②	ET 200SP backplane bus interface and electronics	M	Mass
③	Backplane bus	LK 1,2	TX/RX Link LED
④	Internal power supply	RN	RUN LED (green)
X80 24 V DC	Supply voltage infeed	ER	ERROR LED (red)
X5	BusAdapter	MT	MAINT LED (yellow)
P1 R	PROFINET interface X1 Port 1	PWR	POWER LED (green)
P2 R	PROFINET interface X1 Port 2		

Figure 3-1 Block diagram of the IM 155-6 PN ST interface module

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.

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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.

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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.

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.

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To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under (http://www.siemens.com/industrialsecurity).

Product overview

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2.1 Properties

Article number

6ES7155-6AU01-0BN0 (IM 155-6 PN ST interface module and server module)

6ES7155-6AA01-0BN0 (IM 155-6 PN ST interface module with BusAdapter BA 2×RJ45 and server module)

View of the module

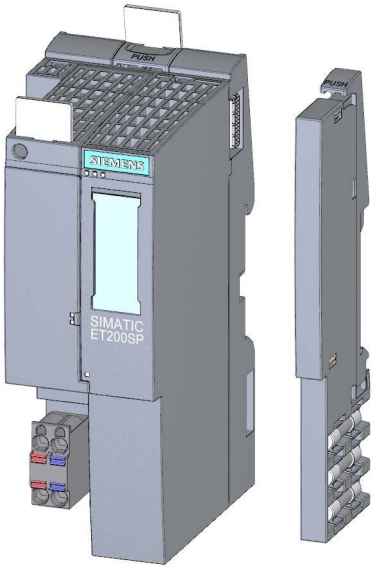


Figure 2-1 View of the IM 155-6 PN ST interface module and the server module

Properties

The module has the following technical properties:

- Connects the ET 200SP distributed I/O system with PROFINET IO
- Supply voltage 1L+ 24 V DC (SELV/PELV). The connection plug is included in the scope of delivery of the interface module.
- PROFINET IO connection via selectable BusAdapter for RJ45 bus connector (BA 2×RJ45) or for direct connection of the bus cable (BA 2×FC)
- Use of fail-safe modules
- As of firmware version V 3.0, you can plug a light-colored or a dark-colored BaseUnit into slot 1.

The module supports the following functions (Page 13)

Maximum configuration

- 32 I/O modules
- 512 bytes I/O data
- 1 m backplane bus (without interface module)

Accessories

The following accessories can be ordered separately:

- BA 2xRJ45 BusAdapter
- BA 2xFC BusAdapter
- 24 V DC connector
- Labeling strips
- Reference identification label

Note

The interface module is also available as a bundle with the BusAdapter BA 2xRJ45 (and the server module). The article number is 6ES7155-6AA01-0BN0.

A detailed list of the available accessories can be found in the system manual ET 200SP distributed I/O system (http://support.automation.siemens.com/WW/view/en/58649293).

Server module

The server module is included in the scope of delivery 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 holder for 3 spare fuses (5 × 20 mm)
- Identification data I&M 0 to 3

Note

You need to configure and assign parameters to the server module in the configuration software.

To do this, place the server module in the last configuration slot and enable the parameter Group diagnostics: Missing supply voltage L+. When there are 32 I/O modules, the server module is inserted in slot 33.

You can find more information in the Server module (http://support.automation.siemens.com/WW/view/en/63257531) manual.

First BaseUnit of an ET 200SP in the configuration (as of V3.0)

Note

First BaseUnit of an ET 200SP in the configuration

The first BaseUnit of an ET 200SP station may be a dark-colored one if an AC I/O module or AI Energy Meter ST is plugged. Please note the information on limiting the overvoltage and power rating in the AC I/O module manuals.

A light-colored BaseUnit must be plugged into the slot of the first 24 V DC I/O module in order to route the 24 V DC supply voltage via a fuse.

Pay attention to the type of the BaseUnits during the configuration.

As of firmware V3.x, the interface modules support plugging dark-colored BaseUnits 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
- DI 4x120..230VAC ST (6ES7131-6FD00-0BB1)
- DQ 4x24..230VAC/2A ST (6ES7132-6FD00-0BB1)

Requirement for configuration of these modules in slot 1:

- Configuration via GSD or GSDML
- Configuration as of STEP 7 V5.5 SP4 with
  - HSP0241 V2.0 for IM155-6 PN ST
  - HSP0242 V2.0 for IM155-6 DP HF
  - HSP0255 V3.0 for IM155-6 PN HF
- Configuration as of STEP 7 V13 SP1

Wiring

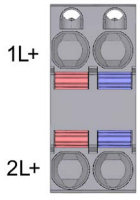
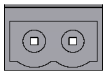
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3.1 Pin assignment

24 V DC supply voltage

The following table shows the signal names and the descriptions of the pin assignment for a 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]

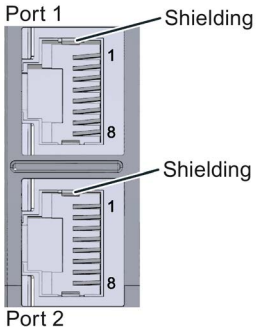
1 1L+ and 2L+ as well as 1M and 2M are bridged internally.

2 Maximum 10 A permitted.

PROFINET IO with BusAdapter BA 2×RJ45

The following table shows the signal name and description of the pin assignment of the BusAdapter BA 2×RJ45.

Table 3- 2 PROFINET IO pin assignment with BusAdapter BA 2×RJ45

View	Signal name		Description
	1	TD	Transmit data +
	2	TD_N	Transmit data -
	3	RD	Receive data +
	4	GND	Ground
	5	GND	Ground
	6	RD_N	Receive data -
	7	GND	Ground
	8	GND	Ground

Note

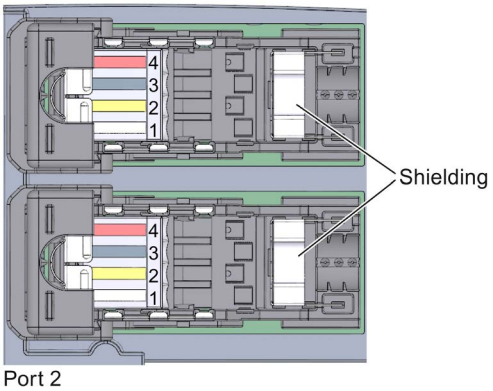
PROFINET interface X1 Port 2

If autonegotiation is disabled, the RJ-45 socket (X1 Port 2) has the switch assignment (MDI-X).

PROFINET IO with BusAdapter BA 2×FC

The following table shows the signal name and description of the pin assignment of the BusAdapter BA 2×FC.

Table 3- 3 PROFINET IO pin assignment with BusAdapter BA 2×FC

View	Signal name		Description
Port 1  Port 2	1	TD	Transmit data +
	2	RD	Receive data +
	3	TD_N	Transmit data -
	4	RD_N	Receive data -

Reference

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

Parameters/address space

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4.1 Parameters

Parameters for IM 155-6 PN ST interface module

The following table shows the parameters for the IM 155-6 PN ST interface module.

Table 4- 1 Parameters for interface module IM 155-6 PN ST (GSD file)

Parameters	Value range	Default	Efficiency range
Configuration control	Disable/enable	Disable	ET 200SP

4.2 Explanation of parameters

4.2.1 Configuration control

You can use this parameter to enable the configuration control function in the ET 200SP distributed I/O system.

Note

If you configure the enable, the ET 200SP distributed I/O system requires a control data record 196 from the user program in order for the ET 200SP distributed I/O system to operate the I/O modules.

Reference

You can find more information in the ET 200SP distributed I/O system (http://support.automation.siemens.com/WW/view/en/58649293) system manual and in the STEP 7 online help.

Compatibility

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Compatibility between the versions of the IM 155-6 PN ST

The table below describes which version you can use in the configuration for which actually plugged version of the IM 155-6 PN ST interface module. The table also describes the functional differences of the versions of the IM 155-6 PN ST interface module.

IM 155-6 PN ST configured	IM 155-6 PN ST plugged					Changes compared to previous version
	V1.0.x	V1.1.x	V3.1.x	V3.3.x	V4.1.x	
V1.0	✓	✓	✓	✓	✓	---
V1.1	---	✓	✓	✓	✓	• The "Group diagnostics: Missing supply voltage L+" parameter can be set on the server module • "Status of supply voltage L+ of the I/O modules" can be configured on the server module
V3.1	---	---	✓	✓	✓	• User data 512 bytes • Station extension via ET-Connection
V3.3	---	---	---	✓	✓	• Support of submodules
V4.1	---	---	---	---	✓	---

Note

IM 155-6 PN ST (6ES7155-6AU00-0BN0) with firmware version V4.1

You can upgrade the previous version of the IM 155-6 PN ST interface module (6ES7155-6AU**00**-0BN0) to the firmware version V4.1. In this case configure the module as IM 155-6 PN ST interface module (6ES7155-6AU**01**-0BN0) with firmware version V4.1.

Status of the supply voltage

Load voltage diagnostics are only valid if the station started up with a valid and complete configuration.

- For modules in the following table without a parameter assignment, the status of the supply voltage is always signaled as "1" regardless of the actual status of the supply voltage.
- If a potential group is exclusively made up of modules without parameter assignment from the table below, no group diagnostics "Missing supply voltage L+" is signaled for this potential group.

Modules	Article number
DI 8x24VDC ST	6ES7132-6BF00-0BA0
DI 16x24VDC ST	6ES7131-6BH00-0BA0
DI 8x24VDC HF	6ES7132-6BF00-0CA0
DQ 4x24VC/2A ST	6ES7132-6BD20-0BA0
DQ 8x24VDC/0,5A ST	6ES7132-6BF00-0BA0
DQ 16x24VDC/0,5A ST	6ES7132-6BH00-0BA0
DQ 8x24VDC/0,5A HF	6ES7131-6BF00-0CA0

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 = configured update time + 400 µs (but at least 1.4 ms)