AMIKON TECHNICAL DOCUMENTATION

Installation Instructions

Siemens 6ES7155-5AA01-0AB0

ET 200MP Standard Interface

SUPPLY	BACKPLANE	STATION I/O	SHARING
24 V DC	**14 W infeed**	**512 B per direction**	**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

- Use the exact 5AA01 Standard manual with the ET200MP system manual and qualified personnel.
- The 24 V supply terminal pairs are internally bridged; the documented loop-through maximum is 10 A.
- If autonegotiation is disabled, port P1 uses MDI and P2 uses MDI-X assignments.
- The manual distinguishes the older 5AA00 interface's 90-degree port orientation; do not use that image as this model's connector location.
- Set Connection to supply voltage L+ consistently with actual front supply and any upstream system power supply.

02 ORIGINAL WIRING REFERENCE

Original source PDF pages: MM pp. 22,3-4,11-12,20-21,23-24; DS pp. 1-4. The following pages retain the original Siemens drawings and printed page numbers.

Siemens original installation documentation

Siemens Data sheet 6ES7155-5AA01-0AB0; 2019-08-19; appended source pp. 1-4

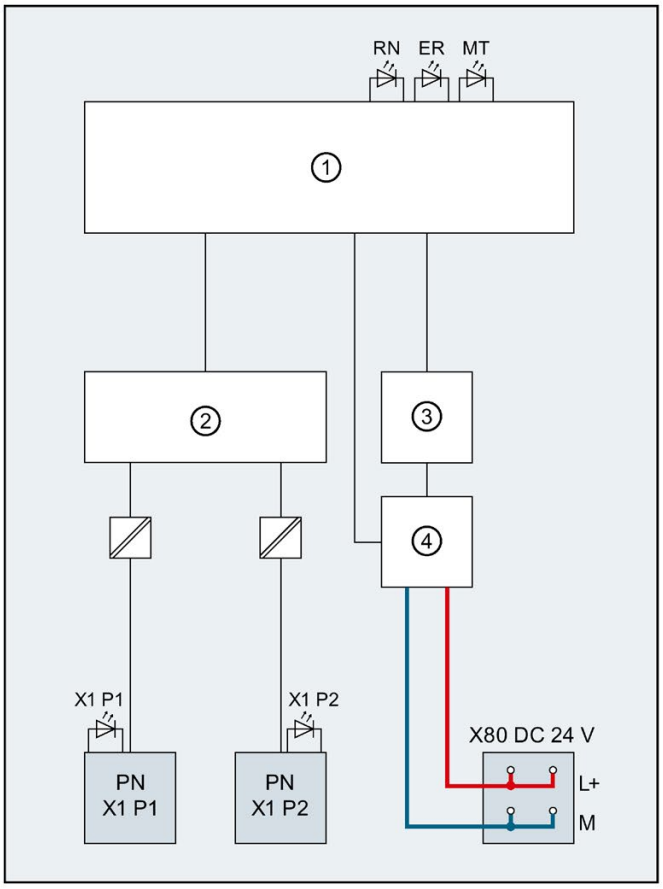
Additional information

You can find additional information on connecting the interface module and on accessories (RJ45 bus connector) in the ET 200MP distributed I/O system (https://support.industry.siemens.com/cs/ww/en/view/59191792) system manual.

3.2 Block diagram

Block diagram

The following figure shows a block diagram of the IM 155-5 PN ST interface module.



①	Electronics	L+	24 V DC supply voltage
②	PROFINET 2-port switch	M	Ground
③	Backplane bus interface	RN	RUN/STOP LED (yellow/green)
④	Internal supply voltage	ER	ERROR LED (red)
X80 24 V DC	Infeed of supply voltage	MT	MAINT LED (yellow)
PN X1 P1	PROFINET interface X1 Port 1	X1 P1, X1 P2	LED Link TX/RX
PN X1 P2	PROFINET interface X1 Port 2		

Figure 3-2 Block diagram of the IM 155-5 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.

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.

Siemens AG
Division Digital Factory
Postfach 48 48
90026 NÜRNBERG
GERMANY

A5E03612323-AC
℗ 09/2017 Subject to change

Copyright © Siemens AG 2013 - 2017.
All rights reserved

Preface

Purpose of the documentation

This manual supplements the system manual S7-1500, ET 200MP automation system (https://support.industry.siemens.com/cs/ww/en/view/59191792). Functions that generally relate to the system are described in this manual.

The information provided in this manual and in the system/function manuals support you in commissioning the system.

Conventions

Please also observe notes marked as follows:

Note

A note contains important information on the product, on the handling of the product and 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 constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit (http://www.siemens.com/industrialsecurity).

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

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

Product overview

2

2.1 Properties

Article number

6ES7155-5AA01-0AB0

View of the module



Figure 2-1 View of the IM 155-5 PN ST interface module

Properties

- Technical properties
  - Connects the ET 200MP distributed I/O system with PROFINET IO
  - 24V DC power supply (SELV/PELV)
  - PROFINET IO connection using RJ45 bus connector
- Supported functions (Page 13)

Maximum configuration

- 512 bytes I/O data per station
- The integrated power supply of the interface module feeds 14 W into the backplane bus. Up to 12 I/O modules can be supplied this way. The exact number of operable modules is determined by the power budget (see relevant section in the ET 200MP distributed I/O system (https://support.industry.siemens.com/cs/ww/en/view/59191792) system manual).
- A maximum of one power supply module (PS) upstream from the interface module and two downstream from the interface module is possible.
- If you use a power supply module (PS) upstream from the interface module, the maximum possible configuration is a total of 32 modules (up to 30 modules downstream from the interface module).

Wiring

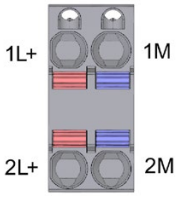
3

3.1 Terminal assignment

24V DC power supply

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]	Designation
	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.

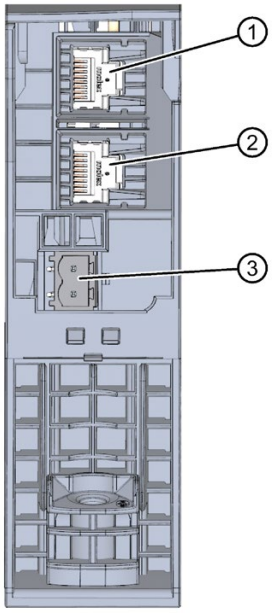
[2] Maximum 10 A permitted.

PROFINET interface X1 with 2-port switch (X1 P1 R and X1 P2 R)

The pin assignment of the ports depends on the setting of the port option "Activate autonegotiation".

- Port P1 X1 R: When autonegotiation is deactivated, the RJ45 socket is allocated as data terminal equipment MDI (normal pin assignment).
- Port P2 X1 R: When autonegotiation is deactivated, the RJ45 socket is allocated as a switch MDI-X (crossed pin assignment).
- The following applies to both ports: When autonegotiation is activated, autocrossing is in effect and the RJ45 socket is allocated either as data terminal equipment MDI or a switch MDI-X.

The figure below shows the location of the PROFINET interface X1 and the connection socket for the 24 V DC supply voltage.



① Port P1 X1 R (front)
② Port P2 X1 R (rear)
③ Connection socket 24 V DC supply voltage

Figure 3-1 Location of the PROFINET ports and the 24 V DC connection socket (view from below)

Note

You need a screwdriver (max. blade width 2.5 mm) to remove the PROFINET plug.

Note

IM 155-5 PN ST interface module (6ES7155-5AA00-0AB0)

For the IM 155-5 PN ST with order number 6ES7155-5AA00-0AB0, note that the ports of the PROFINET interface X1 are offset by 90°.

Parameter

4

4.1 Parameters

Table 4- 1 Parameters for IM 155-5 PN ST interface module

Parameters	Value range	Default setting	Efficiency range
Connection to supply voltage L+	Connection/No connection	Connection	ET 200MP
Configuration control	Disable/enable	Disable	ET 200MP

4.2 Description of parameters

4.2.1 Connection to supply voltage L+

Parameter "Connection to supply voltage L+"

This parameter is used

- for diagnostics of the ET 200MP:

  If the actual configuration is different from the required configuration of the interface module supply voltage set with this parameter, the ET 200MP generates a diagnostic alarm.

- to check the power budget for the configuration with STEP 7 V12:

  Depending on how the parameter is set, either the infeed power for the interface module into the backplane bus or the power consumption from the backplane bus is entered into the calculation of the power budget.

The default setting "Connection to supply voltage L+ " means that the front of the interface module is supplied with 24 V DC and feeds power into the backplane bus.

Note

We recommend that you always supply the front of the interface module with 24V DC because if you then insert a power supply module (PS) **upstream** of the interface module, both the power of the power supply module (PS) and the power of the integrated power supply of the interface module are available for the I/O modules (power addition of PS infeed power + IM infeed power in power segment 1).

In this case, you do not have to change the default of the parameter in STEP 7.

The setting "No connection to supply voltage L+ means that the interface module is not supplied with 24 V DC on the front. This can only be the case when a power supply module (PS) is inserted upstream from the interface module and the power supply modules (PS) supply the interface module and the downstream modules. In the case of an interface module without power supply, its power consumption from the backplane bus must be considered as consumer in the power budget and the power segments must be formed accordingly.

Reference

See the section on the power budget and the forming of power segments in the ET 200MP distributed I/O system (https://support.industry.siemens.com/cs/ww/en/view/59191792) System Manual.

SIEMENS

Data sheet 6ES7155-5AA01-0AB0



SIMATIC ET 200MP. PROFINET IO-DEVICE INTERFACEMODULE IM 155-5 PN ST FOR ET 200MP ELEKTRONIKMODULES; UP TO 12 IO-MODULES WITHOUT ADDITIONAL PS; UP TO 30 IO-MODULES WITH ADDITIONONAL PS SHARED DEVICE; MRP; IRT >=0.25MS; ISOCHRONICITY FW-UPDATE; I&M0...3; FSU WITH 500MS

General information	
Product type designation	IM 155-5 PN ST
HW functional status	FS01
Firmware version	V4.1.0
Vendor identification (VendorID)	0x002A
Device identifier (DeviceID)	0X0312
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V14 or higher with HSP 0223 / integrated with V15 or higher
• STEP 7 configurable/integrated as of version	GSDML V2.32
• PROFINET as of GSD version/GSD revision	V2.3 / -

Configuration control	
via user data	No
via dataset	Yes

Supply voltage	
Rated value (DC)	24 V

Subject to change without notice
© Copyright Siemens

permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption (rated value)	0.2 A
Current consumption, max.	1.2 A
Inrush current, max.	9 A
I^2t	0.09 $A^2 \cdot s$
Power	
Infeed power to the backplane bus	14 W
Power available from the backplane bus	2.3 W
Power loss	
Power loss, typ.	4.5 W
Address area	
Address space per module	
• Address space per module, max.	256 byte; per input / output
Address space per station	
• Address space per station, max.	512 byte; per input / output
Hardware configuration	
Integrated power supply	Yes
System power supply can be plugged in to left of IM	Yes
Number of permissible power segments	3
Rack	
• Modules per rack, max.	30; I/O modules
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes
Protocols	
• PROFINET IO Device	Yes
• Media redundancy	Yes; PROFINET MRP
Interface types	
RJ 45 (Ethernet)	

Subject to change without notice
© Copyright Siemens

• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes
• Autonegotiation	Yes
• Autocrossing	Yes

Protocols	
PROFINET IO Device	
Services	
— Isochronous mode	Yes
— Open IE communication	Yes
— IRT	Yes
— PROFIenergy	No
— Prioritized startup	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	2
Redundancy mode	
• MRP	Yes
• MRPD	No
• PROFINET system redundancy (S2)	No
• Redundant PROFINET configuration (R1)	No
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes

Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Equidistance	Yes
shortest clock pulse	250 µs
max. cycle	4 ms

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
• Connection display LINK TX/RX	Yes; 2x green-yellow LEDs

Potential separation	
between backplane bus and electronics	No

Subject to change without notice
© Copyright Siemens

between PROFINET and all other circuits	Yes
between supply and all other circuits	No

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.	40 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

Connection method	
ET-Connection	
• via BU/BA Send	No

Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm

last modified: 08/15/2019

Subject to change without notice
© Copyright Siemens