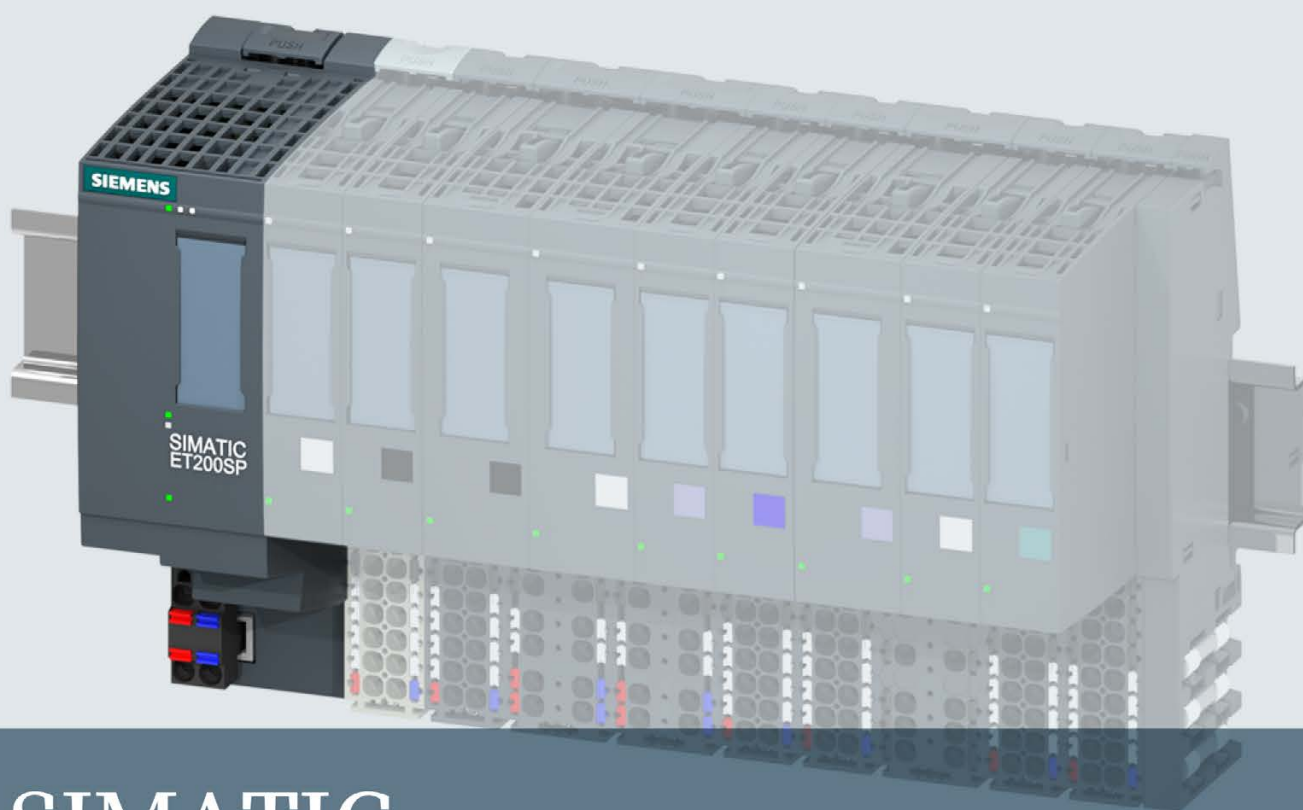


SIEMENS



SIMATIC

ET 200SP

Interface module IM 155-6 PN BA (6ES7155-6AR00-0AN0)

Manual

Edition

03/2015

Answers for industry.

SIMATIC

ET 200SP IM 155-6 PN BA interface module (6ES7155-6AR00-0AN0)

Manual

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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.

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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.

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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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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

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, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

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To stay informed about product updates as they occur, sign up for a product-specific newsletter. You can find more information on the Internet (<http://support.automation.siemens.com>).

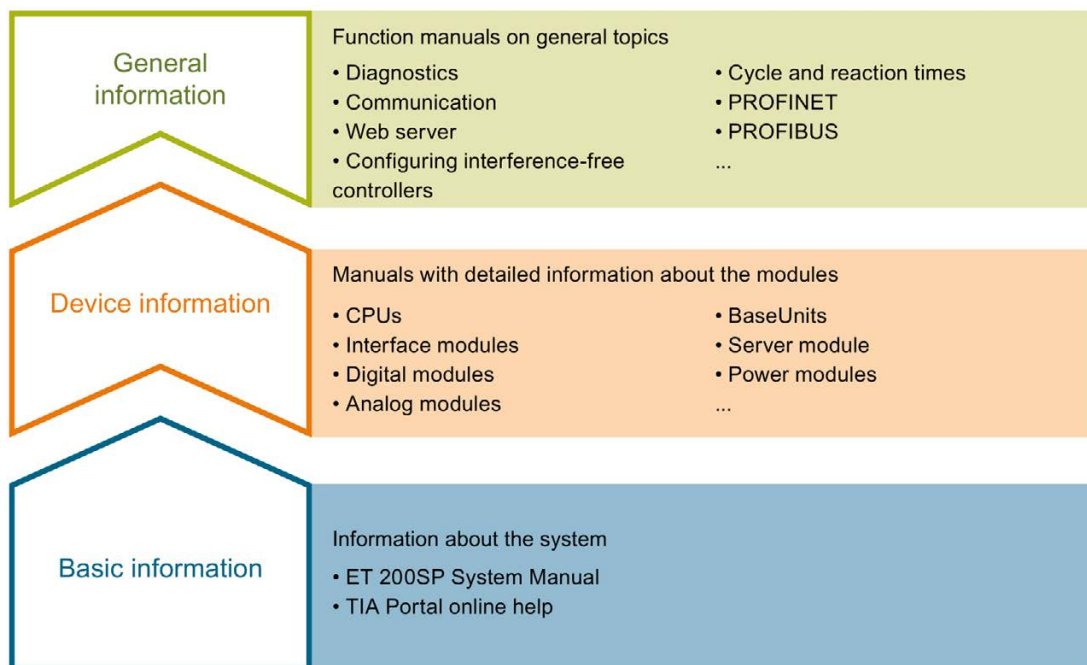
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Documentation guide

The documentation for the SIMATIC ET 200SP distributed I/O system is arranged into three areas.

This arrangement enables you to access the specific content you require.



Basic information

The system manual describes in detail the configuration, installation, wiring and commissioning of the SIMATIC ET 200SP distributed I/O system. The STEP 7 online help supports you in the configuration and programming.

Device information

Product manuals contain a compact description of the module-specific information, such as properties, terminal diagrams, characteristics and technical specifications.

General information

The function manuals contain detailed descriptions on general topics regarding the SIMATIC ET 200SP distributed I/O system, e.g. diagnostics, communication, Web server, designing interference-free controllers.

You can download the documentation free of charge from the Internet (<http://www.automation.siemens.com/mcms/industrial-automation-systems-simatic/en/manual-overview/tech-doc-controllers/Pages/Default.aspx>).

Changes and supplements to the manuals are documented in a Product Information.

Manual Collection ET 200SP

The Manual Collection contains the complete documentation on the SIMATIC ET 200SP distributed I/O system gathered together in one file.

You can find the Manual Collection on the Internet
(<http://support.automation.siemens.com/WW/view/en/84133942>).

My Documentation Manager

The My Documentation Manager is used to combine entire manuals or only parts of these to your own manual.

You can export the manual as PDF file or in a format that can be edited later.

You can find the My Documentation Manager on the Internet
(<http://support.industry.siemens.com/My/ww/en/documentation>).

Application examples

Applications examples support you with various tools and examples for solving your automation tasks. Solutions are shown in interplay with multiple components in the system - separated from the focus in individual products.

You can find application examples on the Internet
(<https://support.industry.siemens.com/sc/ww/en/sc/2054>).

CAX Download Manager

The CAX Download Manager is used to access the current product data for your CAX or CAE systems.

You configure your own download package with a few clicks.

In doing so you can select:

- Product images, 2D dimension drawings, 3D models, internal circuit diagrams, EPLAN macro files
- Manuals, characteristics, operating manuals, certificates
- Product master data

You can find the CAX Download Manager on the Internet
(<http://support.industry.siemens.com/my/ww/en/CAXOnline>).

TIA Selection Tool

With the TIA Selection Tool, you can select, configure and order devices for Totally Integrated Automation (TIA).

This tool is the successor of the SIMATIC Selection Tool and combines the known configurators for automation technology into one tool.

With the TIA Selection Tool, you can generate a complete order list from your product selection or product configuration.

You can find the TIA Selection Tool on the Internet
(<http://w3.siemens.com/mcms/topics/en/simatic/tia-selection-tool>).

Product overview

2.1 Properties

Article number

6ES7155-6AR00-0AN0 (IM 155-6 PN BA interface module and server module)

View of the module

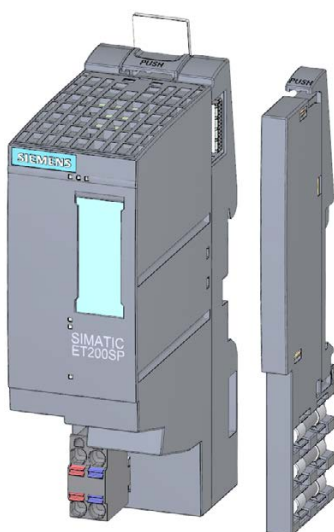


Figure 2-1 View of the IM 155-6 PN BA interface module and the server module

Properties

The module has the following properties:

- 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.
- Supported functions (Page 10)

Maximum configuration

- 12 I/O modules

Maximum amount of I/O data

The maximum amount of I/O data is 32 bytes input/output data.

Accessories

The following accessories must be ordered separately:

- Labeling strips
- Reference identification label

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 (V1.1.1 and higher) is included in the scope of delivery of the interface module and also 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)
- Identification data I&M 0 to 3
- Retentive storage of the device name for device replacement without topological configuration

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: No supply voltage L+. If there are 12 I/O modules, the server module is plugged in slot 13.

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

2.2 Functions

Introduction

The interface module supports the following PROFINET IO functions:

- Integrated switch with 2 ports
- Supported Ethernet services: ping, arp, network diagnostics (SNMP: MIB2, LLDP-MIP and MRP-MIB)
- Port diagnostics
- Deactivating of ports
- Minimum update time 1 ms
- Media redundancy MRP
- Device replacement without programming device
- Reset to factory settings via PROFINET IO
- Firmware update via PROFINET IO

The interface module supports additional functions:

- Identification data I&M 0 to 3
- Device replacement with and without topological configuration
- Configuration control (option handling)

Requirements

Configuration takes place with GSDML or STEP 7 V13/HSPxyz.

Cabling with fixed connection setting

If you set a fixed connection setting of the port in STEP 7, you must also disable "Autonegotiation/Autocrossover".

You can find more information on this topic in the STEP 7 online help and

- As of STEP 7 V12, in the function manual PROFINET with STEP 7 V13 (<http://support.automation.siemens.com/WW/view/de/49948856/0/en>)
- As of STEP 7 V5.5, in the system manual PROFINET System Description (<http://support.automation.siemens.com/WW/view/en/19292127>).

Device replacement without topological configuration

In addition to the interface module, the device name is also saved on the server module (V1.1.1 and higher). A device name saved on the server module is the requirement for device replacement without topological configuration.

Storing the name on the server module and the interface module produces a range of scenarios for using the device name when the interface module is replaced.

Table 2- 1 Scenarios for using the device name

	Interface module empty	Interface module with device name
Server module empty	No device name available.	The device name from the interface module is used and copied to the server module.
Server module with device name	The device name from the server module is used and copied to the interface module.	The device name from the server module is used and copied to the interface module if this has a different device name.

Be aware of the following constraints:

- Resetting to factory settings deletes the device name in both the interface module and the server module. To prevent the device name from being deleted in the server module, you can remove the server module from the interface module before resetting to factory settings.
- When a server module is replaced, a device name stored in the server module is applied to the interface module after a POWER ON.
- Do not pull/plug the server module while under voltage. If you pull/plug the server module while under voltage, the interface module restarts.
- If you use a server module with an invalid firmware version (< V1.1.1), channel-specific diagnostics is generated with the error number 27 (general error). To correct this error, you need to replace the server module or update the server module firmware.

IO devices that have already been used in another configuration should be reset to their factory settings before reuse (see system manual ET 200SP distributed I/O system (<http://support.automation.siemens.com/WW/view/en/58649293>)).

You can find more information on this topic in the STEP 7 online help and

- As of STEP 7 V12, in the function manual PROFINET with STEP 7 V13 (<http://support.automation.siemens.com/WW/view/de/49948856/0/en>)
- As of STEP 7 V5.5, in the system manual PROFINET System Description (<http://support.automation.siemens.com/WW/view/en/19292127>).

Replacement of an IM 155-6 PN BA

If a spare part is required, any IO devices in operation must be reset to their delivery state via "Reset to factory settings" (see the system manual ET 200SP distributed I/O system (<http://support.automation.siemens.com/WW/view/en/58649293>)).

Media redundancy (MRP)

Function for safeguarding communication and plant availability. A ring topology ensures that an alternative communication path is made available if a transmission route fails.

You can find more information on this topic in the STEP 7 online help and

- As of STEP 7 V12, in the function manual PROFINET with STEP 7 V13 (<http://support.automation.siemens.com/WW/view/de/49948856/0/en>)
- As of STEP 7 V5.5, in the system manual PROFINET System Description (<http://support.automation.siemens.com/WW/view/en/19292127>).

2.2.1 Configuration control (option handling)

Properties

Configuration control allows you to prepare your distributed I/O system for future extensions or changes. Configuration control means that you can configure the planned maximum configuration of your distributed I/O system in advance and vary it later in a flexible manner by means of the user program.

Reference

You can find more information on configuration control

- in the ET 200SP distributed I/O system (<http://support.automation.siemens.com/WW/view/en/58649293>) system manual
- on the Internet under the following link Application collection (<http://support.automation.siemens.com/WW/view/en/29430270>)
- in the STEP 7 online help.

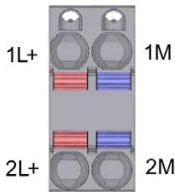
Wiring

3.1 Terminal assignment

24 V DC supply voltage

The following table shows the signal names and the descriptions of the terminal assignment for a 24 V DC supply voltage.

Table 3- 1 Terminal 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

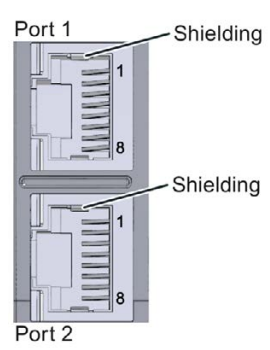
¹ 1L+ and 2L+ as well as 1M and 2M are bridged internally.

² Maximum 10 A permitted.

PROFINET IO

The following table shows the signal name and description of the terminal assignment.

Table 3- 2 PROFINET IO terminal assignment

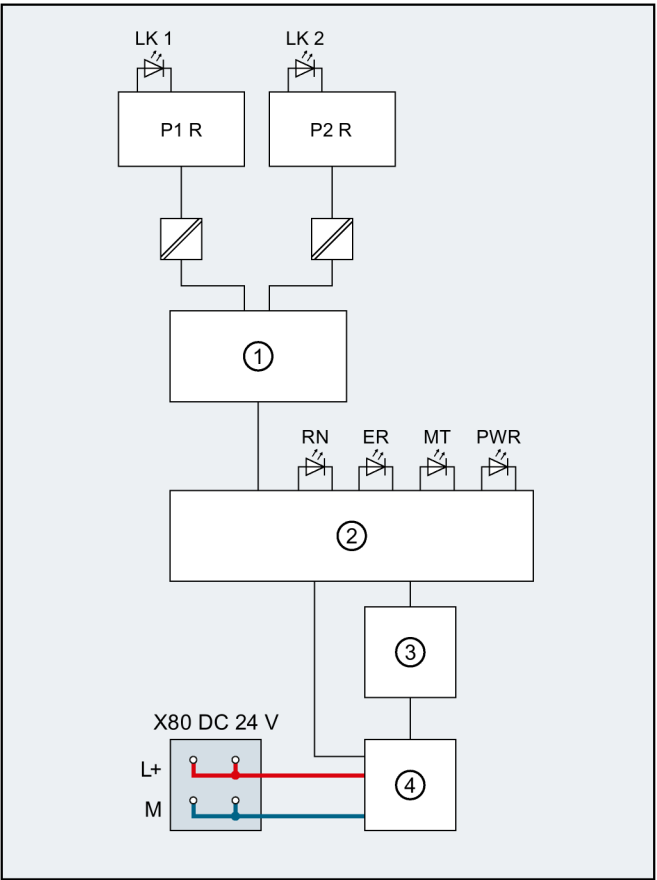
View	Signal name		Description
	1	TD	Transmit data +
	2	TD_N	Transmit data -
	3	RD	Receive data +
	4	GND	Ground
	5	GND	Ground
	6	RD_N	Receive data -
	7	GND	Ground
	8	GND	Ground

Reference

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

3.2 Block diagram

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



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

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

Parameters/address space

4.1 Parameters

Parameters for IM 155-6 PN BA interface module

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

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

Parameters	Range of values	Default	Efficiency range
Configuration control	Disable/enable	Disable	ET 200SP

4.2 Explanation of the parameters

4.2.1 Enabling 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 on the control data record 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.

4.3 Substitute value behavior

The substitute value behavior in the ET 200SP distributed I/O system is executed by the IO controller for each slot.

The respective output behaves according to its configured substitute value behavior:

- Current-free/voltage-free
- Output substitute value
- Keep last value

The substitute value behavior is triggered in the following cases:

- STOP controller
- Controller failure (connection interrupted)
- Station stop, for example, due to:
 - Missing server module
 - Removing more than one I/O module at a time
 - At least one I/O module installed on an incorrect BaseUnit
- Deactivating the IO device

Note

Reducing a configuration

If you reduce the configuration of the ET 200SP distributed I/O system and download the configuration to the CPU, the modules which are no longer configured but still present retain their original substitute value behavior. This applies until the supply voltage is switched off at the interface module.

The "current-free/voltage-free" behavior takes effect in the following cases:

- Firmware update
- Reset to factory settings
- Configuration control: receipt of a new control data record
- Incorrectly configured module
- Module with incorrect parameter assignment

4.4 Status of the supply voltage L+ of the I/O modules

Configurations

The "Status of supply voltage L+ of the I/O modules" is configured in the IM 155-6 PN BA on the server module. The input data can then be read out on the server module. You will find the relevant description in the Server module

(<http://support.automation.siemens.com/WW/view/en/63257531>) manual.

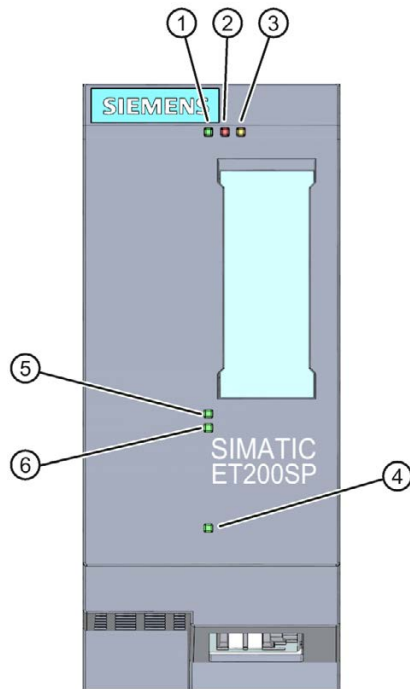
5.1 Status and error displays

Introduction

Diagnostics by means of LEDs is an initial tool for error localization. In order to localize errors still further, you usually evaluate the display of the module status in STEP 7 or the diagnostics buffer of the CPU. The buffer contains plain text information on the error that has occurred. For example, you will find the number of the relevant error OB in the plain text information.

LED display

The following diagram shows the LED display on the interface module and the BusAdapter.



- ① RN (green)
- ② ER (red)
- ③ MT (yellow)
- ④ PWR (green)
- ⑤ LK1 (green)
- ⑥ LK2 (green)

Figure 5-1 LED display on the interface module

Meaning of the LEDs

The following tables describe the meanings of the status and error displays.

RN/ER/MT LED on the interface module

Table 5- 1 RN/ER/MT status and error displays

LEDs			Meaning	Solution
RN (RUN)	ER (ERROR)	MT (MAINT)		
 Off	 Off	 Off	No or insufficient supply voltage on interface module.	Check the supply voltage or turn it on at the interface module. *
 On	 On	 On	Test of LEDs during startup: The three LEDs light up simultaneously for approximately 0.25 s.	-
 Flashes	 Off	 Off	Interface module is deactivated.	Activate the interface module with the configuration software or the user program.
			Interface module is not configured.	Configure the interface module with the configuration software.
			ET 200SP starts up.	-
			ET 200SP is being assigned parameters.	
			ET 200SP is being reset to factory settings.	
 On	Not relevant	Not relevant	ET 200SP is currently exchanging data with the IO controller.	Evaluate the diagnostics and eliminate the error.
Not relevant	 Flashes	Not relevant	Group errors and group error channels.	
			The preset configuration does not correspond to the actual configuration of the ET 200SP .	
			Invalid configuration states.	
			Parameter error in the I/O module.	
 Flashes	 Flashes	 Flashes	The "Node flash test" is running (the LEDs LK1 and LK2 of the PROFINET interface also flash).	-
			Hardware or firmware defective (the LEDs LK1 and LK2 of the PROFINET interface do not flash).	Run a firmware update. If the error persists, contact Siemens Industry Online Support. Replace the interface module.

* PWR LED on (on the interface module): Check the backplane bus for a short circuit.

PWR LED on the interface module

Table 5- 2 PWR status display on the interface module

PWR LED	Meaning	Solution
 Off	No or insufficient supply voltage	Check the supply voltage.
 On	Supply voltage present	-

LK1/LK2 LED on the interface module

Table 5- 3 LK1/LK2 status display on the interface module

LEDs LK1/LK2	Meaning	Solution
 Off	There is no Ethernet connection between the PROFINET IO interface of your PROFINET device and a communication partner (e.g. IO controller).	Check whether the bus cable to the switch/IO controller is interrupted.
 On	There is an Ethernet connection between the PROFINET IO interface of your PROFINET device and a communication partner (e.g. IO controller).	-
 Flashes	The "Node flash test" is running (the RN/ER/MT LEDs also flash).	-

LED display of configuration errors

Configuration errors of the ET 200SP distributed I/O system are output on the interfacemodule by the ERROR (red) and MAINT (yellow) LEDs.

The following configuration errors are indicated by the LEDs:

- More than one I/O module pulled
- Missing server module
- Interruptions or short circuit on the backplane bus

Operating principle

You determine the information for cause of the error with the LED error display. After notification by the flash signal, the error type is displayed followed by the error location/error code.

The LED error display

- is active during POWER ON as well as during operation.
- has priority before all other states displayed by the ERROR and MAINT LED.
- remains turned on until the cause of the error has been corrected.

Table 5- 4 Display of error type and error location

Sequence		Description
1	The ERROR and MAINT LEDs flash 3x at 0.5 Hz	Signaling of error type
2	MAINT LED flashes at 1 Hz	Display of the error type (decimal)
3	The ERROR and MAINT LEDs flash 3x at 2 Hz	Signaling of error location/error code
4	The ERROR LED flashes at 1 Hz	Display of tens digit (decimal) of the error location/error code
5	The MAINT LED flashes at 1 Hz	Display of ones digit (decimal) of the error location/error code
6	Repeat steps 1 to 5 until the cause of the error has been corrected.	

Error display

The following table shows the possible causes of error that can occur.

Table 5- 5 Error display

Error type (MAINT)	Error location (ERROR/MAINT)	Cause of error	Remedy
1	02 to 12*	The number of pulled I/O modules is displayed. The diagnostics data is generated starting with two pulled I/O modules.	Check the configuration of the ET 200SP.
	65*	• Missing server module • Interruptions at the backplane bus • Short circuit of communication on the backplane bus	

* Slot

Note

A short circuit in the backplane bus supply or the bus connection supply is indicated by the following LEDs:

- PWR LED: On
 - RN, ER and MT LED: Off
-

5.2 Interrupts

Introduction

The I/O device generates interrupts as a reaction to specific error events. Interrupts are evaluated based on the I/O controller used.

Evaluating interrupts with I/O controllers

The ET 200SP distributed I/O system supports the following interrupts:

- Diagnostics interrupts
- Hardware interrupts
- Pull/plug module interrupts
- Maintenance events

In the event of an interrupt, interrupt OBs are automatically called in the CPU of the IO controller.

Information on the cause and class of the error is already available, based on the OB number and start information.

Detailed information on the error event can be obtained in the error OB using the instruction "RALRM" (read additional interrupt information).

System diagnostics

STEP 7 (TIA portal) offers innovative system diagnostics for the devices of the S7-1500 (IO controller CPU S7-1500) and the ET 200SP (IO device) automation system. Independent of the cyclic user program, alarms are made available on the display of the CPU S7-1500, the CPU web server and the HMI device.

For more information on system diagnostics, refer to the System Diagnostics function manual. (<http://support.automation.siemens.com/WW/view/en/59192926>).

5.2.1 Triggering a diagnostics interrupt

Triggering a diagnostics interrupt

For an incoming or outgoing event (e.g. wire break on a channel of an I/O module), the module triggers a diagnostics interrupt if this is configured accordingly.

The CPU interrupts the user program and processes the diagnostics block OB 82. The interrupt triggering event is logged in the start information of OB 82.

5.2.2 Triggering a hardware interrupt

Triggering a hardware interrupt

If there is a hardware interrupt, the CPU interrupts user program execution and processes the hardware interrupt block OB 40. The result that triggered the interrupt is added to the start information of the hardware interrupt block.

Note

Diagnostics "Hardware interrupt lost" (from I/O module)

Avoid creating hardware interrupts cyclically.

If the hardware interrupt load is too high, hardware interrupts can get lost depending on the number of I/O modules and the communication load.

5.2.3 Triggering a pull/plug interrupt

Triggering a pull/plug interrupt

If there is a pull/plug interrupt, the CPU interrupts user program execution and processes the hardware interrupt block OB 83. The result that triggered the interrupt is added to the start information of OB 83.

5.3 Alarms

Actions after a diagnostics alarm

There can be more than one diagnostic alarm at a given time. Actions initiated by diagnostics alarms:

- The ERROR LED of the interface module flashes.
- Diagnostic data is reported as diagnostic interrupts to the CPU of the IO controller and can be read via data records.
- Incoming diagnostics alarms are saved to the diagnostics buffer of the I/O controller.
- OB 82 is called.

You can find more information on this topic in the STEP 7 online help.

Reading out the diagnostics data

Table 5- 6 Reading the diagnostics with STEP 7

Automation system with IO controller	Application	See...
SIMATIC S7	Diagnostics as plain text in STEP 7 in online and diagnostics view	STEP 7 online help • As of STEP 7 V13, function manual PROFINET with STEP 7 V13 (http://support.automation.siemens.com/WW/view/de/49948856/0/en) • As of STEP 7 V5.5 system manual PROFINET System Description (http://support.automation.siemens.com/WW/view/en/19292127)
	Instruction "RDREC" (SFB 52) Read data records from the IO device	
	Instruction "RALRM" (SFB 54) Receive interrupts from the IO device	

Additional information on the data records for PROFINET IO

The structure of the diagnostic data records and programming examples are available in the programming manual From PROFIBUS DP to PROFINET IO (<http://support.automation.siemens.com/WW/view/en/19289930>) and in Application example (<http://support.automation.siemens.com/WW/view/en/24000238>).

Causes of error and corrective measures

The causes of error and corrective measures for the diagnostics alarms are described in the manuals for I/O modules (<http://support.automation.siemens.com/WW/view/en/55679691/133300>) in the chapter, "Interrupts/diagnostics alarms".

See also

Channel diagnostics (Page 26)

PROFINET with STEP 7 V11

(<http://support.automation.siemens.com/WW/view/en/49948856>)

5.3.1 Channel diagnostics

Function

Channel-related diagnostics provides information about channel faults in modules.

Channel faults are mapped as channel diagnostics data in IO diagnostics data records.

The data record is read using the instruction "RDREC".

Structure of the diagnostics data records

The data records supported by the ET 200SP distributed I/O system are based on the PROFINET IO standard - Application Layer Service Definition V2.2 or higher.

You can download the standard PROFIBUS user organization (<http://www.profibus.com>) from the homepage of the PROFIBUS User Organization free of charge.

5.3.2 Invalid configuration states of the ET 200SP on PROFINET IO

Invalid configuration states

The following invalid configuration states of the ET 200SP distributed I/O system lead to the failure of the IO device or prevent the exchange of user data with the I/O modules.

- Number of modules exceeds maximum configuration
- Faulty backplane bus (e.g. defective BaseUnit). ET 200SP backplane bus interruptions do not trigger an interrupt.
- Missing server module
- At least one I/O module is installed in a different BaseUnit than the one configured in the parameters.

Note

If you remove more than one I/O module or the server module, this results in a station stop. All I/O modules of the ET 200SP distributed I/O system fail (substitute value behavior) but the interface module is still exchanging data.

Revoking the station stop (by correcting the invalid configuration state) leads to a brief failure of the ET 200SP distributed I/O system and automatic restart.

See also

Status and error displays (Page 18)

Channel diagnostics (Page 26)

5.3.3 Failure of supply voltage L+ at BaseUnit BU...D

Failure of the supply voltage L+

The I/O modules react as follows to failure of the supply voltage L+ on the BaseUnit BU...D:

- If an I/O module is removed during failure of the supply voltage, a pull interrupt is generated.
- If an I/O module is installed during failure of the supply voltage, a plug interrupt is generated.

5.3.4 STOP of the IO controller and recovery of the IO device

STOP of the SIMATIC IO controller

Diagnostics frames received from the IO device while the IO controller is in STOP do not initiate a call of any corresponding OBs when the IO controller goes into RUN. You must read the data record E00C_H with the "RDREC" instruction in OB 100. This record contains all diagnostics for the slots assigned to an IO controller in an IO device.

Recovery of the SIMATIC IO device

If you want to read the diagnostics of a station after its return, you have to read the E00C_H data record with the "RDREC" instruction in OB 86. This record contains all diagnostics for the slots assigned to an IO controller in an IO device.

Compatibility

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 "No supply voltage L+" is signaled for this potential group.

Module	Order 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

Technical specifications

Technical specifications of the IM 155-6 PN BA

Table 7- 1 Technical specifications of the IM 155-6 PN BA

	6ES7155-6AR00-0AN0
Product type designation	IM 155-6 PN BA with 2xRJ45 ports and server module
General information	
Hardware version	FS01
Firmware version	V3.2
Product function	
I&M data	Yes
Engineering with	
STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
STEP 7 can be configured/integrated as of version	V5.5 SP4 or higher
PROFINET as of GSD version/GSD revision	V2.3 / -
Supply voltage	
Rated value (DC)	24 V
Valid range, low limit (DC)	19.2 V
Valid range, high limit (DC)	28.8 V
Polarity reversal protection	Yes
Power and voltage failure backup	
Power/voltage failure backup time	5 ms
Input current	
Current consumption (rated value)	0.1 A
Current consumption, max.	300 mA
I^2t	0.09 A ² s
Power	
Incoming power to the backplane bus	1.7 W
Power loss	
Power loss, typ.	1.7 W
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.	32 byte; per input/output

	6ES7155-6AR00-0AN0
Hardware configuration	
Rack	
Modules per rack, max.	12
Interfaces	
Number of PROFINET interfaces	1
1st interface	
Interface hardware	
• Number of ports	2
• Integrated switch	Yes
• RJ45 (Ethernet)	Yes; 2 integrated RJ45 ports
• BusAdapter (PROFINET)	No
Protocols	
• PROFINET IO device	Yes
• Open IE communication	Yes
Interface hardware	
RJ45 (Ethernet)	
100 Mbps	Yes; PROFINET with 100 Mbps full duplex (100BASE-TX)
Transmission method	PROFINET with 100 Mbps full duplex (100BASE-TX)
Autonegotiation	Yes
Autocrossing	Yes
Protocols	
PROFINET IO	
PROFINET IO	Yes
PROFINET IO device	
Services	
• Isochronous mode	No
• Open IE communication	Yes
• IRT	No
• PROFIenergy	No
• Prioritized startup	No
• Shared Device	No

	6ES7155-6AR00-0AN0
Interrupts/diagnostics/status information	
Status display	Yes
Interrupts	
Interrupts	Yes
Diagnostics indicator 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 LINK TX/RX	Yes; 2x green LED
Electrical isolation	
Between backplane bus and electronics	No
Between PROFINET and all other circuits	Yes
Between supply and all other circuits	No
Ambient conditions	
Ambient temperature during operation	
Horizontal installation, min.	0 °C
Horizontal installation, max.	55 °C
Vertical installation, min.	0 °C
Vertical installation, max.	60 °C
Connection technology	
ET-Connection	
Via BU/BA-Send	No
Dimensions	
Width	35 mm
Height	117 mm
Depth	74 mm
Weights	
Weight, approx.	125 g; IM 155-6 PN BA with 2xRJ45 ports and server module

Dimension drawing

This appendix contains a dimension drawing of the module mounted on a mounting rail. Always observe the specified dimensions for installation in cabinets, control rooms, etc.

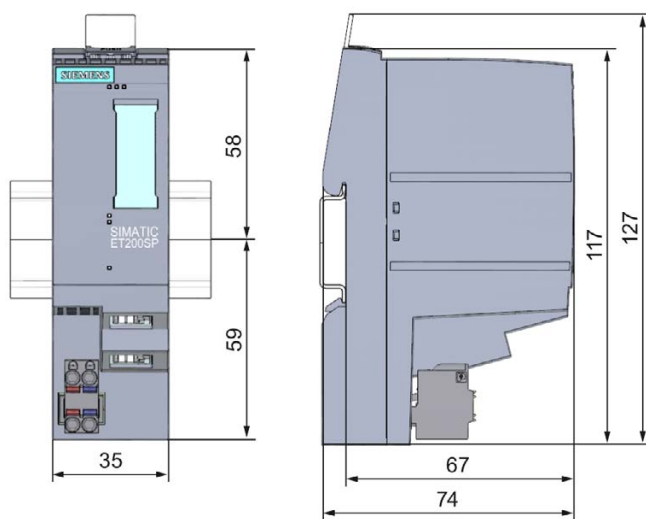


Figure A-1 Dimension drawing of the IM 155-6 PN BA interface module (front and side view)