MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6ES7151-3BA22-0AB0

IM151-3 PN HF INTERFACE

Used with the applicable SIMATIC ET 200S configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Technical documentation applicable to 6ES7151-3BA22-0AB0

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ET 200S distributed I/O IM151-3 PN HIGH FEATURE interface module (6ES7151-3BA22-0AB0)

Manual

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Preface

Preface

Purpose of the manual

This manual supplements the *ET 200S Distributed I/O System* Operating Instructions. General functions for the ET 200S are described in the *ET 200S Distributed I/O System* Operating Instructions.

The information in this document along with the operating instructions enables you to commission the ET 200S.

Basic knowledge requirements

To understand these operating instructions you should have general knowledge of automation engineering.

Scope of the manual

This manual applies to this ET 200S module. It describes the components that are valid at the time of publication.

Recycling and disposal

Thanks to the fact that it is low in contaminants, this ET 200S module is recyclable. For environmentally compliant recycling and disposal of your electronic waste, please contact a company certified for the disposal of electronic waste.

Additional support

If you have any questions relating to the products described in these operating instructions, and do not find the answers in this document, please contact your local Siemens representative.

The portal to our technical documentation for the various SIMATIC products and systems is available at:

Properties

1

1.1 IM151-3 PN HIGH FEATURE interface module

Properties

The IM151-3 PN HIGH FEATURE interface module has the following properties:

- It interconnects the ET 200S with PROFINET IO.
- It prepares the data for the assembled electronic modules and motor starters.
- It supplies the backplane bus.
- Integrated switch with 2 ports
- Transfer and backup of the device name on SIMATIC Micro Memory Card
- Firmware update
  - Via SIMATIC Micro Memory Card
  - Via PROFINET IO
- The reference potential M of the rated supply voltage of the IM151-3 PN HIGH FEATURE to the rail (protective conductor) is connected by means of an RC combination, thus permitting an ungrounded configuration.
- Supported Ethernet services: ping, arp, Net diagnostics (SNMP)/MIB-2
- Interrupts
  - Diagnostic interrupts
  - Process interrupts
  - Insert/remove module interrupts
  - Maintenance interrupts
- Port diagnostics
- Port disabling
- Records for IO modules
- The maximum address space is 256 bytes I/O data.
- A maximum of 63 modules can be operated with the IM151-3 PN HIGH FEATURE.
- The maximum bus length at the backplane bus is 2 m.
- Grouping of modules within one byte (packing).
- Use of fail-safe modules
- IRTflex (RT Class 2)

Isochronous Realtime Ethernet IRTflex (RT Class 2)

IRTflex (RT Class 2) denotes a highly stable form of isochronous communication over PROFINET IO.

This procedure is characterized by particularly simple engineering and high flexibility for network expansions.

In the case of PROFINET IO with IRTflex, a sync master generates a signal with which the sync slaves synchronize themselves. The sync master and sync slaves belong to a sync domain that is configured using STEP 7.

For additional information, refer to the STEP 7 Online Help.

Compatibility with the predecessor module

The IM151-3 PN HIGH FEATURE interface module (6ES7151-3BA22-0AB0) is compatible with the IM151-3 PN HIGH FEATURE interface module (6ES7151-3BA20-0AB0).

The new interface module directly replaces the predecessor module in an existing system without the need for reconfiguration.

Firmware updates on the predecessor module are not supported.

Configuring

Configure the IM151-3 PN HIGH FEATURE nterface module using *STEP 7* V5.4 SP 2.

Constraints when operating the modules with IM151-3 PN HIGH FEATURE

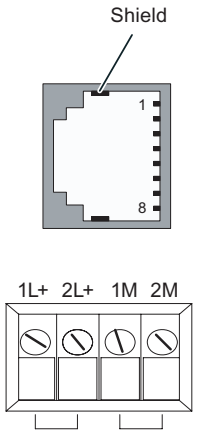
The following modules cannot be used with the IM151-3 PN HIGH FEATURE:

Module	Up to order number	Up to product version
2AO U; HIGH FEATURE	6ES7135-4LB01-0AB0	3
2AO I; HIGH FEATURE	6ES7135-4MB01-0AB0	3
1SI serial interface module	6ES7138-4DF00-0AB0	4
Modbus/USS serial interface module	6ES7138-4DF01-0AB0	4
2PULSE	6ES7138-4DD00-0AB0	6
1Count 24V/100kHz	6ES7138-4DA03-0AB0	-
Motor starter • Direct starter • Reversing starter		 3RK1301-xxxxx-1AA1 3RK1301-xxxxx-1AA1

Pin assignment

The following table shows the pin assignment of the IM151-3 PN HIGH FEATURE interface module for the 24 V DC voltage supply and of the RJ45 interfaces for PROFINET IO:

Table 1-1 Pin assignment of the IM151-3 PN HIGH FEATURE interface module

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
	1L+		24 V DC
	2L+		24 V DC (for loop through)
	1M		Ground
	2M		Ground (for loop through)

Block diagram

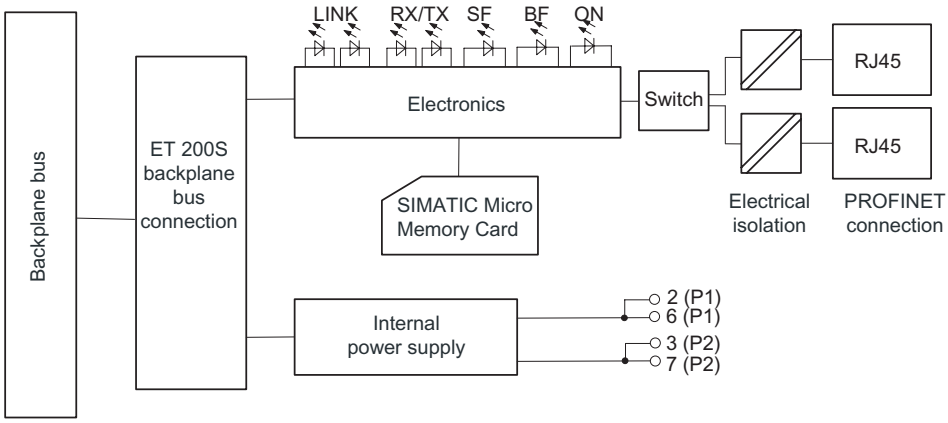


Figure 1-1 Block diagram for the IM151-3 PN HIGH FEATURE interface module

Technical data IM151-3 PN HIGH FEATURE (6ES7151-3BA22-0AB0)

Dimensions and weight	
Dimension B (mm)	60
Weight	Approx. 150 g
Module-specific specifications	
Data transmission rate	• 10 Mbps for Ethernet services • 100 Mbps full duplex for PROFINET IO
Transmission procedure	100BASE-TX
Autonegotiation	Yes
Autocrossing	Yes
Bus protocol	PROFINET IO TCP/IP
Supported Ethernet services	• ping • arp • Net diagnostics (SNMP)/MIB-2
PROFINET interface	2x RJ45
Manufacturer ID (vendor ID)	$002A_H$
Device ID (DeviceID)	0301_H
Voltages, currents, potentials	
Rated supply voltage of the electronic components (1L+)	24 V DC
• Incorrect polarity protection	Yes
• Power failure bypass	Min. 20 ms
Galvanic isolation	
• Between the backplane bus and electronic components	No
• Between Ethernet and electronic components	Yes
• Between the supply voltage and electronic components	No
Permitted potential difference (to the rail)	75 V DC/60 V AC
Insulation test voltage	500 V DC
Current consumption from rated supply voltage (1L+)	Approx. 200 mA
Power dissipation of the module	Approx. 2 W
Status, interrupts, diagnostics	
Interrupts	Yes
Diagnostic function	Yes
• Batch error	Red LED "SF"
• Bus monitoring PROFINET IO	Red "BF" LED
• Monitoring of the supply voltage of the electronics	Green "ON" LED
• Existing connection to network	One green LED "LINK" per interface
• Transmitting/receiving data on the network	One green LED "RX/TX" per interface

Parameters 2

2.1 Parameters for the IM151-3 HIGH FEATURE interface module

Table 2-1 Parameters for the IM151-3 interface module

IM151-3	Value range	Default setting	Applicability
Bus length	≤ 1 m/> 1 m	≤ 1 m	ET 200S
Interference frequency suppression	50 Hz/60 Hz	50 Hz	ET 200S
Reference junction slot	None/2 to 63	None	ET 200S
Reference junction input	RTD on channel 0/ RTD on channel 1	0	ET 200S

2.2 Parameter description

2.2.1 Bus length

≤ 1 m: The default setting for the maximum bus length is 1 m.

> 1 m: The bus length of the ET 200S is > 1 m and can be up to 2 m. However, this setting will increase the response time of the ET 200S.

2.2.2 Interference frequency suppression

The frequency of your AC power system can interfere with the measured value especially when measuring in low voltage ranges and using thermocouple elements. Enter the line frequency for your system here (50 Hz or 60 Hz).

The interference frequency suppression parameter applies to all analog electronic modules. This parameter is also used to specify the integration and conversion time of the various modules. See the technical data for the analog electronic modules.

3.2 Configuring port 1 and port 2

Introduction

The interface module can diagnose 2 ports: X1 P1 and X1 P2.

Requirement

- The ports must be configured in HW Config.
- The port diagnostics must be enabled.

Configuring the ports in HW Config

Configure both ports in HW Config in the "Properties of the IM151-3 PN port..." dialog box:

- Addresses tab: Diagnostic address of the respective port.
- Topology tab:

  You can specify a "Port interconnection".
- Options tab:

  To enable the port diagnostics, select the following for "Connection" under "Transmission Medium/Duplex": "Automatic Settings (monitor)".

Reference

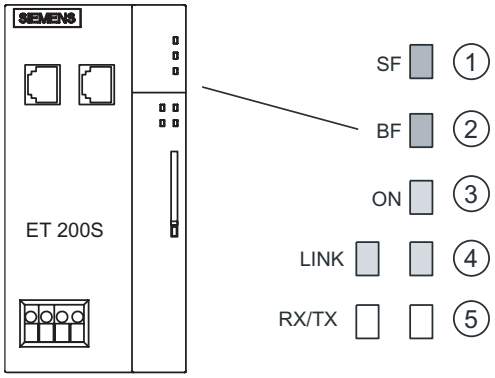
See *STEP 7* Online Help.

4 Interrupt, error, and system messages

4.1 Diagnostics using LED display

LED display

LED display at the IM151-3 interface module (front door opened):



① Batch error (red)
② Bus fault (red)
③ Supply voltage (green)

Under the front door:

④ Connection to a switch or IO controller (green), per interface
⑤ Data exchange (yellow), per interface