

SIMATIC

ET 200M Interface modules IM 153-4 PN and IM 153-2 HF

Product Information

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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

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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.

Preface

Scope of validity

This product information supplements the documentation for ET 200M and takes precedence over the operating instructions.

Security information

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. For more information about industrial security, please visit <http://www.siemens.com/industrialsecurity>.

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Introduction

Overview

This product information applies to:

- IM 153-4 PN interface module
 - 6ES7153-4AA01-0XB0, as of firmware version 4.x, STEP 7 V5.5, SP2
 - 6ES7153-4BA00-0XB0, as of firmware version 4.x, STEP 7 V5.5, SP3
- IM 153-2 HF interface module
 - 6ES7153-2BA02-0XB0
 - 6ES7153-2BA82-0XB0
 - 6ES7153-2BA10-0XB0
 - 6ES7153-2BA70-0XB0

Supplement to the ET 200M operating instructions

This product information is a supplement to the ET 200M (<http://support.automation.siemens.com/WW/view/en/1142798>) operating instructions.

Changes to the IM 153-4AA0x as compared to the ET 200M operating instructions

The following changes have been made:

Property	6ES7153-4AA01-0XB0	6ES7153-4BA00-0XB0
Shared device	x	x
Media redundancy	x	x
Isochronous real-time communication IRT option "high performance"	x	x
Fail-safe modules	—	x
Connection to H-CPU's with system redundancy	—	x
HART modules	—	x

Configuration with STEP 7 or GSD

You can configure the ET 200M:

- 6ES7153-4AA01-0XB0, V4.0 under
 - STEP 7 (TIA Portal) V11 SP2, HSP0028 or
 - STEP 7 Classic V5.5.2.0, HSP0223
- 6ES7153-4BA00-0XB0, V4.0 under
 - STEP 7 (TIA Portal) V11 SP2, HSP0028 or
 - STEP 7 Classic V5.5.2.1, HSP0220
- Or with GSD file

You can find the GSD file at Internet

(<http://support.automation.siemens.com/WW/view/en/25057900>).

The F modules of the 6ES7153-4BA00-0XB0 can only be configured with STEP 7.

You can configure the HART modules

- 6ES7331-7TF01-0AB0
- 6ES7331-7TB00-0AB0
- 6ES7332-8TF01-0AB0
- 6ES7332-5TB00-0AB0

with STEP 7 V5.5 SP3 and SIMATIC PDM V8.0 SP2 (HART on PROFINET).

IM 153-2BAx2

The following changes have been made to the technical specifications of the 6ES7153-2BAx2-0XB0 as of product version 02:

Voltage, Currents, Potentials	
Current consumption from 24 V	max. 600 mA (for 6ES7153-2BAx2, product version 01) max. 620 mA (for 6ES7153-2BAx2, product version 02)

IM 153-2BA10/IM 153-2BA70

There are two new interface modules:

- IM 153-2BA10-0XB0 (replacement part and compatible functional successor for IM 153-2BA02-0XB0)
- IM 153-2BA70-0XB0 (replacement part and compatible functional successor for IM 153-2BA82-0XB0)

Product information

2.1 IM 153-2BA10 and IM 153-2BA70

IM 153-2BAx0

Replacement part

- The interface module IM 153-2BA10-0XB0 is a replacement part and compatible functional successor for IM 153-2BA02
- The interface module IM 153-2BA70-0XB0 is a replacement part and compatible functional successor for IM 153-2BA82

These interface modules can be used in STEP7 (TIA Portal) and in STEP7 Classic.

Supplement to section 3.5.4: Arrangement of the modules for the function "Replace modules during operation" and/or "Redundancy"

The IM 153-2BA10 and IM 153-2BA70 no longer support replacement part operation as IM 153-2AA02 on the redundant bus module ...-7HD00...

Note

Operation of IM 153-2BA02 and IM 153-2BA10/70

The IM 153-2BA10 or the IM 153-2BA70 only support the backplane bus module 6ES7195-7HD10-0XA0. Mixed operation of IM 153-2AA02 and IM 153-2BA10/70 on the same bus module is not approved.

Compatible product versions of the IM 153-2AA02:

If the redundant IM 153-2 is configured as and the interface module on the active bus module 6ES7195-... is plugged,	then the following IM 153-2 is compatible for operation:
IM 153-2AA02	7HD00-0XA0	IM 153-2AA02 IM 153-2BA00 IM 153-2BAx1 IM 153-2BAx2
	7HD10-0XA0	IM 153-2BA00 IM 153-2BAx1 IM 153-2BAx2 IM 153-2BA10 IM 153-2BA70

If the redundant IM 153-2 is configured as and the interface module on the active bus module 6ES7195-... is plugged,	then the following IM 153-2 is compatible for operation:
IM 153-2BA02	7HD10-0XA0	IM 153-2BAx2 IM 153-2BA10 IM 153-2BA70
	7HD80-0XA0	IM 153-2BAx2 IM 153-2BA10 IM 153-2BA70
IM 153-2BA82	7HD80-0XA0	IM 153-2BA82 IM 153-2BA70
IM 153-2BA10	7HD10-0XA0	IM 153-2BA10 IM 153-2BA70
	7HD80-0XA0	IM 153-2BA10 IM 153-2BA70
IM 153-2BA70	7HD80-0XA0	IM 153-2BA70

Additional information

You can also find the FAQ "Which bus modules can you use with the interface modules of the ET 200M?" on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/109479504>).

2.2 Supplement to the sections

Supplement to the ET 200M operating instructions

This section lists all of the supplements to the sections of the ET 200M operating instructions.

Supplement to section 3.5.4: Arrangement of the modules for the function "Replace modules during operation" and/or "Redundancy"

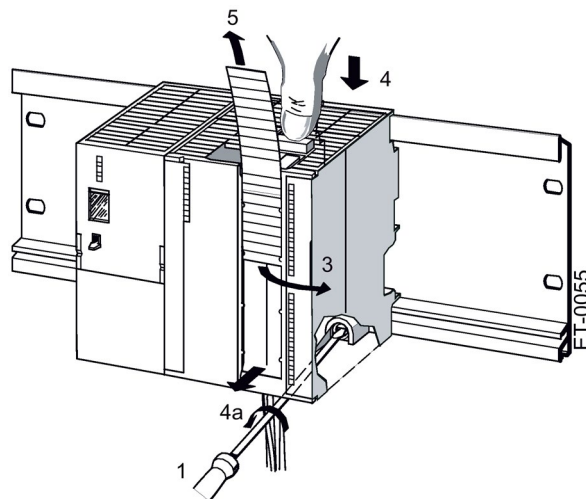
IM 153-2BA02/82, IM 153-4AA00/01 and IM 153-2BA10/70: Maximum 12 signal modules, FMs and CPs can be plugged next to the IM 153-2BA02/82IM 153-4AA00/01 and IM 153-2BA10/70.

Supplement to section 7.7: Replace modules with the function "Replace modules during operation"

New sequence for the individual steps for "Removing a module"

When removing modules with "Replace modules during operation", proceed as follows:

1. Switch off the voltage.
2. Open the front door (3).
3. Unlock the front connector and remove it.
 - With 20-pin front connector: To do this, use one hand to press down the unlocking button (4) and use your other hand to remove the front connector via the gripping surface (4a).
 - With 40-pin front connector: Release the fixing screw in the center of the front connector. Use the gripping surface to pull out the front connector.
4. Loosen the fixing screw(s) on the module (1).
5. Swing the module out.
6. Pull the labeling strips out of the module (5).



Supplement to section 7.10.4: Update of the IM 153-2Bxx1

Configuration as IM 153-2Bxx1

The firmware update is created separately with each IM 153-2.

The IM 153-2 is integrated in the PCS 7 project.

Procedure

1. Open the SIMATIC Manager.
2. In the component view, select the SIMATIC station in which the IM 153-2 is located.
3. Double-click on the "Hardware" object in the detail window.
HW Config opens.
4. Select the IM 153-2 with the firmware you want to update.
5. Select the menu command **Target system > Update Firmware**.
The "Update Firmware" dialog box opens.
6. Make the settings according to the following table.
7. Click "Run". The firmware is updated.

Setting	Action
Location of the firmware file	Specify the folder in the "Firmware file" group, in which you have saved the file for updating the firmware.
Activate the "new" firmware	Use the "Activate firmware after download" check box to specify the time at which the "new" firmware should be activated: <ul style="list-style-type: none">• Select the "Activate firmware after download" option if the IM 153-2 should automatically perform a RESET upon successful download of the new firmware. The new firmware is then active after restart.• Clear the "Activate firmware after download" option if the IM 153-2 no RESET should be performed upon successful download of the new firmware. The new firmware only takes effect after the supply voltage is switched off and on again.

In the redundant system with PROFIBUS DP

Following the firmware update of the active IM 153-2, the subsequent "RESET" automatically switches between the two IM 153-2.

Supplement to section 8.2: Time stamping the input signals with IM 153-2

Rules

You can also use the following digital input module: 6ES7 321-7EH00-0AB0 (1 ms)

Supplement to section 8.4: Redundancy:

Rules for arranging fault-tolerant station components

In a fault-tolerant station, the following conditions must be met for the ET 200M:

Redundantly used modules (DP slave interface modules IM 153-2) must be identical, i.e. they must have the same order number and the same product version or firmware version.

Supplement to section 9.1.3.1: Structure of the slave diagnostics

If you have not performed the configuration with GSD, there are no module status and channel-related diagnostics blocks for the IM 153-1AA03.

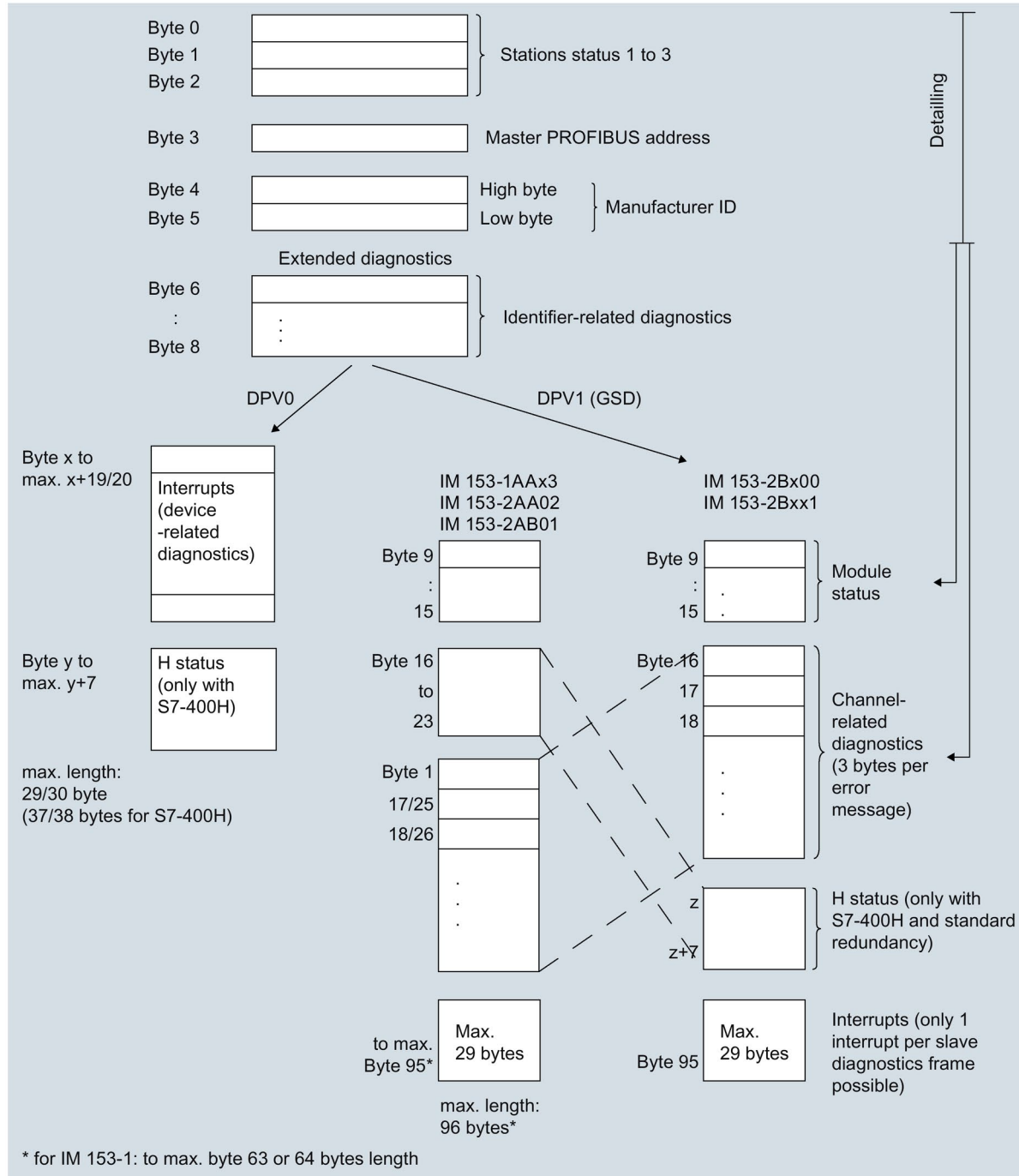


Figure 2-1 Structuring of the slave diagnostics new

Error in section 10.1 Pollutant concentration

This sentence is correct: The ET 200M distributed I/O system satisfies the requirements of the standard ISA-571.04 serverity level G1;G2;G3.

Supplement to section 10.3 Technical specifications of the IM 153-x

Technical specifications	IM 153-1	IM 153-2	IM 153-2 FO
:			
Voltage, Currents, Potentials			
:			
Recommended external fuse for power supply lines	Systems with a grounded reference potential require a miniature circuit breaker with a rated current of 3 A for the redundant interface module.		
:			

Supplement to section 10.5 Response time of the ET 200M

Switchover time in the case of redundancy

The switchover times, dependent on the mode and configuration amounts to:

DP master system	ET 200M with IM 153...	Switchover time	Configuration
S7-400H	-2BAx2	30 ms	any configuration
	-2BA10/-2BA70		... without F-, FM- or HART modules.
S7 software redundancy; S5-115H/155H	-2BAx2	30 ms	any configuration
	-2BA10/-2BA70		... without F-, FM- or HART modules.

2.3 The new functions for the IM 153-4

Media redundancy

Function for ensuring the network and system availability. Redundant transmission links (ring topology) ensure that an alternative communication path is made available if a transmission link fails.

You can find additional information in the STEP 7 online help and the PROFINET system description (<http://support.automation.siemens.com/WW/view/en/19292127>) manual.

Shared device

The "Shared Device" function allows the submodules of an IO device to be divided up among different IO controllers.

The following conditions apply for an ET200M if it is to be operated as a shared device.

You can find additional information in the STEP 7 online help and the PROFINET system description (<http://support.automation.siemens.com/WW/view/en/19292127>) manual.

The following applies to the ET 200M:

- If an IO controller fails, the entire IO device outputs substitute values. This means that not only do the IO modules of the failing IO controller output substitute values, but also the IO modules of the intact IO controller.
- Since the outputs of an IO module cannot separately output substitute values, in the shared device environment the I/O will only output process values if both IO controllers are in RUN.

As soon as an IO controller is in STOP mode, the outputs of that IO module that are subscribed by the other IO controller will therefore output substitute values. This fact must be taken into account, for example, for the STEP 7 functions, "Modify" and "Force". With the STEP 7 "Modify" and "Force" functions, a CPU in STOP mode will be reported as being in RUN mode. This releases the modules that are assigned to the other controller that is still in RUN.

Configuration as Shared Device

"IM153-4 PN ST as of V3.0 Shared Device" or "IM153-4 PN HF as of V3.0 Shared Device" must be used for the configuration of shared device. The remaining configuration is done in the usual way.

When configuring as a shared device, you have to insert OB 83, OB 85 and OB 122 in the block list. The transition from STOP to RUN generates so-called "Return of submodule" alarms. The alarms are intercepted by the OB 83, otherwise the CPU would go into STOP.

Both IO controllers that share the device must be in "RUN" in order for the IM 153-4 PN to be able to send data to the I/O.

See also STEP 7 documentation (<http://support.automation.siemens.com/WW/view/en/10805384/133300>).

Isochronous real-time communication

Synchronized communication protocol for cyclic exchange of IRT data between PROFINET devices. A reserved bandwidth within the send clock is available for the IRT data. The reserved bandwidth ensures that the IRT data can be transmitted at reserved, synchronized intervals while remaining uninfluenced by another greater network load (for example, TCP/IP communication or additional real time communication).

The "high performance" IRT option requires a configuration of the topology.

Note

IO controller as a sync master for IRT communication with the option "high performance"

We recommend also operating the IO controller as a Sync-Master if you configure the IRT communication with the option "high performance".

Otherwise, IRT and RT configured IO devices may fail if the sync master fails.

You can find additional information about configuring synchronized PROFINET devices in Sync domains in the STEP 7 online help and in the PROFINET system description (<http://support.automation.siemens.com/WW/view/en/19292127>) manual.

Fail-safe signal modules (only 6ES7153-4BA00-0XB0)

The following fail-safe signal modules can be used with the 6ES7153-4BA00-0XB0 interface module:

Module	Order no.	As of product version
SM 326; DI 24 x DC 24V	6ES7326-1BK02-0AB0	1
SM 336; F-AI 6 x 0/4 ... 20 mA HART	6ES7336-4GE00-0AB0	1
SM 326; F-DO 10 x DC 24V/2A PP	6ES7326-2BF10-0AB0	1
SM 326; DO 8 x DC 24V/2A PM	6ES7326-2BF41-0AB0	1

A safety protector is *no* longer required for these modules.

SM 322 DO 16 x DC 24V/0,5 A, 6ES7322-8BH10-0AA0

You can also use the SM 322 DO 16 x DC 24V/0,5 A 6ES7322-8BH10-0AA0 module with the 6ES7153-4BA00-0XB0.

Connection to H-CPU (6ES7153-4BA00-0XB0 only)

In the case of system redundancy, you can connect the 6ES7153-4BA00-0XB0 to the following S7-400 CPUs:

CPU	Order no.	As of firmware version
CPU 412-5H PN/DP	6ES7412-5HK06-0AB0	V6
CPU 414-5H PN/DP	6ES7414-5HM06-0AB0	V6
CPU 416-5H PN/DP	6ES7416-5HS06-0AB0	V6
CPU 417-5H PN/DP	6ES7417-5HT06-0AB0	V6

With these CPUs, the 6ES7153-4BA00-0XB0 can participate in system redundancy.

Requirements of 6ES7153-4BA00-0XB0:

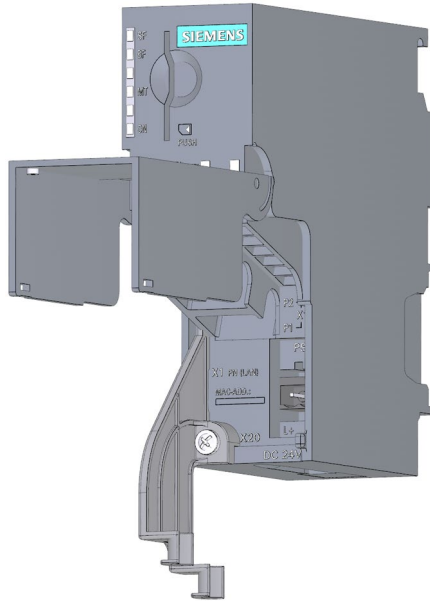
- The 6ES7153-4BA00-0XB0 can be configured as a system redundancy device with a STEP 7 version as of V5.5.2 HF1.
- The connection settings (transmission medium/duplex) must be set to full duplex.

You can find examples for system redundancy in the Fault-tolerant S7-400H systems (<http://support.automation.siemens.com/WW/view/en/53385282>) manual.

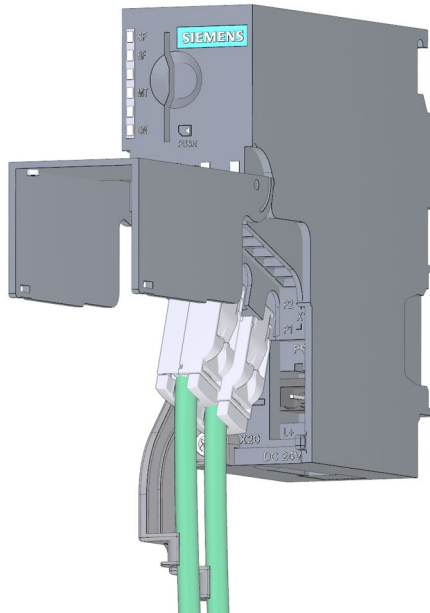
Principle for fastening PROFINET cable with cable ties

The following describes how to fasten PROFINET cables with cable holders. The cable holders are available as accessories.

1. Screw the cable holder onto the interface module.



2. Insert the PROFINET cable.



3. Connect the PROFINET cable to the cable holder using the cable tie.

