SIEMENS

SIMATIC

**ET 200S distributed I/O
Power module PM-E DC24V HF
(6ES7138-4CA60-0AB0)**

Manual

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
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

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 for the specific task, 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 adhered to. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of the 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.

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 (http://support.automation.siemens.com/WW/view/en/1144348).

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 this manual and do not find the answers in this document, please contact your local Siemens representative (http://www.siemens.com/automation/partners).

A guide to the technical documentation for the various SIMATIC products and systems is available on the Internet. (http://www.siemens.com/simatic-docu).

The online catalog and ordering systems are available on the Internet (http://www.siemens.com/automation/mall).

Training center

We offer courses to help you get started with the ET 200S and the SIMATIC S7 automation system. Please contact your regional training center or the central training center in D - 90327, Nuremberg, Germany (http://www.siemens.com/sitrain).

Technical Support

You can contact Technical Support for all Industry Automation products by means of the Internet Web form for the Support Request (http://www.siemens.com/automation/csi_en_WW/support_request).

Additional information about Siemens Technical Support is available on the Internet (http://www.siemens.com/automation/csi_en_WW/service).

Service & Support on the Internet

In addition to our documentation, we offer a comprehensive knowledge base on the Internet (http://www.siemens.com/automation/csi_en_WW/support).

There you will find:

- Our Newsletter, which constantly provides you with the latest information about your products.

- The right documentation for you using our Service & Support search engine.

- The bulletin board, a worldwide knowledge exchange for users and experts.

- Your local contact for Automation & Drives in our contact database.

- Information about on-site services, repairs, spare parts, and lots more.

Table of contents

Properties

1

1.1 Power module PM-E DC24V HF (6ES7138-4CA60-0AB0)

Properties

- The PM-E DC24V HF power module monitors the supply voltage for all electronic modules in the voltage group. The supply voltage is fed in by means of the TM-P terminal module.
- You can use all the electronic modules except the 2DI AC120V ST, 2DI AC230V ST, and 2DO AC24..230V/1A in the voltage group of the PM-E DC24V HF power module.
- The current status of the power module is stored in the status byte in the process input image (PII). This is updated irrespective of whether the "No Load Voltage" diagnosis has been enabled.
- The PM-E DC24V HF power module is suitable for fail-safe modules.
- Extended temperature range from 0 to 55°C with vertical installation.

⚠ CAUTION

If you do not maintain the indicated load voltage of 24V DC, the result may be dangerous plant conditions.

The result may be damages to the ET 200S or minor personal injuries.

Only connect the specified load voltage of 24V DC to the TM-P terminal module of the power module. The connected load voltage must correspond to the supply voltage of the electronic modules in the voltage group.

Requirements for operation

It is possible to operate the PM-E DC24V HF power module using the following interface modules as of the order numbers specified.

Interface module	as of order number	Firmware version (or higher)
IM 151-1 STANDARD	6ES7151-1AA05-0AB0	V2.2.4
IM 151-1 FO STANDARD	6ES7151-1AB05-0AB0	V2.2.4
IM 151-1 HIGH FEATURE	6ES7151-1BA02-0AB0	V2.2.3
IM 151-3 PN	6ES7151-3AA23-0AB0	V7.0.0
IM 151-3 PN FO	6ES7151-3BB23-0AB0	V7.0.0
IM 151-3 PN HIGH FEATURE	6ES7151-3BA23-0AB0	V7.0.0
IM 151-3 PN HIGH SPEED	6ES7151-3BA60-0AB0	V3.0.0
IM 151-8 PN/DP CPU	6ES7151-8AB01-0AB0	V3.2.0
IM 151-8F PN/DP CPU	6ES7151-8FB01-0AB0	V3.2.0

Maximum configuration per voltage group

The number of modules that can be connected depends on the total current of all modules in a voltage group. This total must not exceed the maximum current carrying capacity.

Address space of inputs/outputs

Address space of inputs/outputs by selecting the following as an option:

Options	Address space of the inputs	Address space of the outputs
Status byte (S)	1 byte	--
Option handling (O)	8 bytes	8 bytes
Status byte and option handling (SO)	9-byte inputs	9 bytes (9th byte not relevant)

General terminal assignment

Note

Terminals A4 and A8 are only available at specified terminal modules.

Terminal assignment for PM-E DC24V HF (6ES7138-4CA60-0AB0)				
Terminal	Assignment	Terminal	Assignment	Notes
2	L+	6	L+	• L+: Rated load voltage 24 VDC
3	M	7	M	• M: Chassis ground
A4	AUX1	A8	AUX1	• AUX1: Protective-conductor terminal or potential bus (freely usable up to 230 VAC)

Usable terminal modules

| Usable terminal modules for PM-E DC24V HF (6ES7138-4CA60-0AB0)			
TM-P15C23-A1 (6ES7193-4CC30-0AA0)	TM-P15C23-A0 (6ES7193-4CD30-0AA0)	TM-P15C22-01 (6ES7193-4CE10-0AA0)	← Spring terminal
TM-P15S23-A1 (6ES7193-4CC20-0AA0)	TM-P15S23-A0 (6ES7193-4CD20-0AA0)	TM-P15S22-01 (6ES7193-4CE00-0AA0)	← Screw-type terminal
TM-P15N23-A1 (6ES7193-4CC70-0AA0)	TM-P15N23-A0 (6ES7193-4CD70-0AA0)	TM-P15N22-01 (6ES7193-4CE60-0AA0)	← Fast Connect
			Connection examples

Block diagram
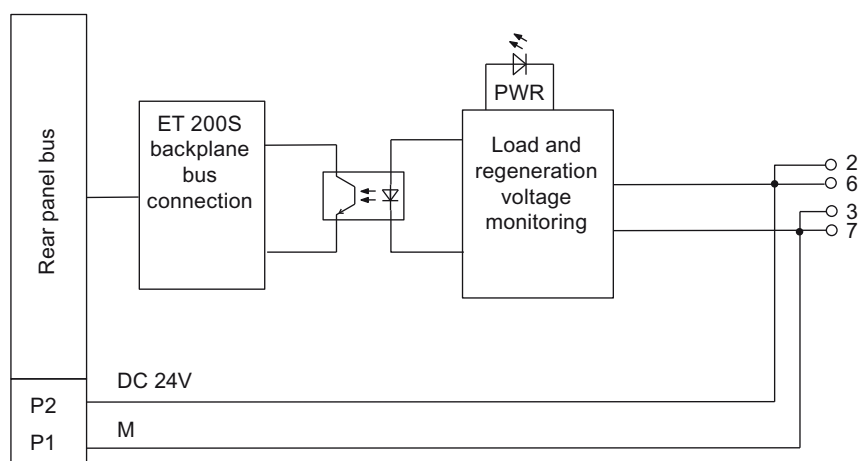
Figure 1-1   Block diagram of the PM-E DC24V HF power module

Technical data PM-E DC24V HF (6ES7138-4CA60-0AB0)

Dimensions and weight	
Dimension B (mm)	15
Weight	Approx. 35 g
Voltages, currents, potentials	
Rated load voltage	24 VDC
• Overvoltage protection	No
Protection with automatic circuit breakers	Yes, tripping characteristic B, C
Max. current-carrying capacity	10 A
• Short-circuit protection	No
Electrical isolation	
• Between rated load voltage and backplane bus	Yes
• Between the power modules	Yes
Insulation test voltage	500 VDC
Current consumption	
• From the load voltage L+ (no load)	max. 15 mA
Power dissipation of the module	typ. 350 mW
Parameter length	3 bytes
Status, interrupts, diagnostics	
Diagnostic function	Yes
• Group error	Red "SF" LED
• Load voltage monitoring	Green "PWR" LED
• Diagnostic information readable	Yes

Parameters

2

2.1   Parameters for PM-E DC24V HF

Parameters

The following table lists the power module parameters.

Table 2- 1   Parameters for power modules

PM-E DC24V HF	Range of values	Default setting	Applicability
Diagnostics: No load voltage	Disable/enable	Disable	Power module

The parameters are explained below.

Diagnostics: No load voltage

Use this parameter to enable a diagnostic message because there is no load voltage.

If there is no load voltage, only the diagnostic message of the affected power module is sent to the DP master. The SF error LEDs of all modules in the relevant voltage group light up.
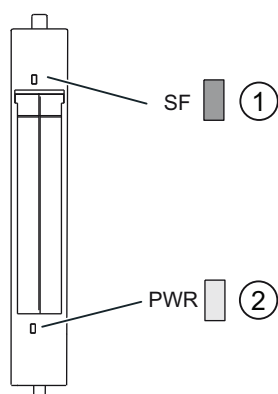
Diagnostics

3

3.1 Diagnostics using LED display

Power module

LED displays on the power module:

| ① | Batch error (red) |
| ② | Load voltage (green) |

Status and error displays by means of LEDs on power modules

The table below shows the status and error displays on the power module.

Event (LEDs)		Cause	Remedy
SF	PWR		
On		No parameter assignment or incorrect module plugged in. A diagnostic message is pending.	Check the parameter assignment. Evaluate the diagnostics.
	Off	There is no load voltage at the power module.	Check the load voltage.

3.2 Error types

Power module error types

The diagnostic message is reported on channel 0 and applies to the entire module.

The table below shows the types of errors affecting power modules

Table 3- 1   Power module error types

Error type		Meaning	Remedy
17_D	10001: Encoder or load voltage missing	Supply voltage not present or too low.	Correct the process wiring. Check the supply voltage.

Configuring

4

4.1 Configuring the address space

Address area for option handling and status byte

You can control and monitor option handling, and evaluate the status byte of the power module using the control (PIO) and feedback interface (PII).

The address range of the control (PIO) and feedback interface (PII) depends on how the corresponding entry in the configuration software is configured, or which entry has been selected.

This table shows the PII feedback interface and the PIO control interface for different entries.

Table 4- 1   PII feedback interface and PIO control interface

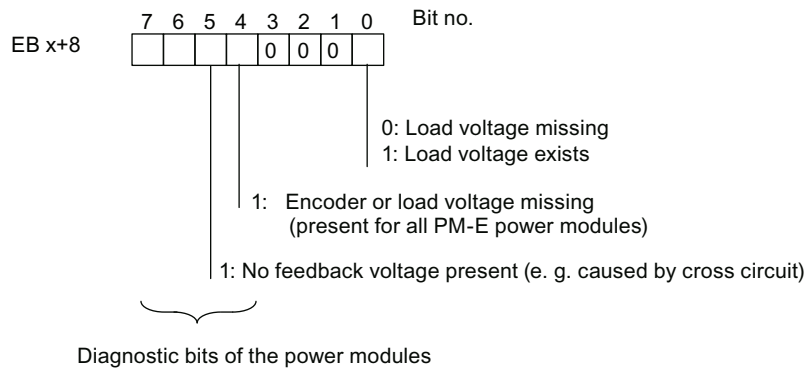| With STEP 7, HW Config or COM PROFIBUS or other configuration software	PII feedback interface		PIO control interface	
Usual entry for the power module	---		---	
Ends in ...S	IBx	Status byte	---	
Ends in ...O	IBx ::: IBx+7	Option handling	QBx ::: QBx+7	Option handling
Ends in ...SO	IBx ::: IBx+7	Option handling	QBx ::: QBx+7	Option handling
	IBx+8	Status byte	QBx+8	Not applicable

Status byte for power modules

Figure 4-1   Assignment of status byte for power modules