SIEMENS

SIMATIC

ET 200S distributed I/O
Power module PM-E DC24V
(6ES7138-4CA01-0AA0)

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**
  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.

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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

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/mail].

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


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.
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Properties

1.1 Power module PM-E DC24V (6ES7138-4CA01-0AA0)

Properties

- The PM-E DC24V power module monitors the supply voltage for all the 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 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 power module is suitable for fail-safe modules.
- Extended temperature range from 0 to 55°C with vertical installation.

**CAUTION**

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

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:

<table>
<thead>
<tr>
<th>Options</th>
<th>Address space of the inputs</th>
<th>Address space of the outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status byte (S)</td>
<td>1 byte</td>
<td>--</td>
</tr>
<tr>
<td>Option handling (O)</td>
<td>8 bytes</td>
<td>8 bytes</td>
</tr>
<tr>
<td>Status byte and option handling (SO)</td>
<td>9-byte inputs</td>
<td>9 bytes (9th byte not relevant)</td>
</tr>
</tbody>
</table>
Properties

1.1 Power module PM-E DC24V (6ES7138-4CA01-0AA0)

General terminal assignment

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

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Assignment</th>
<th>Terminal</th>
<th>Assignment</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>L+</td>
<td>6</td>
<td>L+</td>
<td>• L+: Rated load voltage 24 VDC</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>7</td>
<td>M</td>
<td>• M: Chassis ground</td>
</tr>
<tr>
<td>A4</td>
<td>AUX1</td>
<td>A8</td>
<td>AUX1</td>
<td>• AUX1: Protective-conductor terminal or potential bus (freely usable up to 230 VAC)</td>
</tr>
</tbody>
</table>
### Usable terminal modules

<table>
<thead>
<tr>
<th>Usable terminal modules for PM-E DC24V (6ES7138-4CA01-0AA0)</th>
<th>Connection examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM-P15C23-A1 (6ES7193-4CC30-0AA0)</td>
<td></td>
</tr>
<tr>
<td>TM-P15C23-A0 (6ES7193-4CD30-0AA0)</td>
<td></td>
</tr>
<tr>
<td>TM-P15C22-01 (6ES7193-4CE10-0AA0)</td>
<td>Spring terminal</td>
</tr>
<tr>
<td>TM-P15S23-A1 (6ES7193-4CC20-0AA0)</td>
<td></td>
</tr>
<tr>
<td>TM-P15S23-A0 (6ES7193-4CD20-0AA0)</td>
<td></td>
</tr>
<tr>
<td>TM-P15S22-01 (6ES7193-4CE00-0AA0)</td>
<td>Screw-type terminal</td>
</tr>
<tr>
<td>TM-P15N23-A1 (6ES7193-4CC70-0AA0)</td>
<td></td>
</tr>
<tr>
<td>TM-P15N23-A0 (6ES7193-4CD70-0AA0)</td>
<td></td>
</tr>
<tr>
<td>TM-P15N22-01 (6ES7193-4CE60-0AA0)</td>
<td>Fast Connect</td>
</tr>
</tbody>
</table>

#### Block diagram

Figure 1-1  Block diagram of the PM-E DC24V power module
## Technical data PM-E DC24V (6ES7138-4CA01-0AA0)

<table>
<thead>
<tr>
<th>Dimensions and weight</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension B (mm)</td>
<td>15</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 35 g</td>
</tr>
</tbody>
</table>

### Voltages, currents, potentials

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated load voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>No</td>
</tr>
<tr>
<td>Protection with automatic circuit breakers</td>
<td>Yes, tripping characteristic B, C</td>
</tr>
<tr>
<td>Max. current-carrying capacity (up to 60°C)</td>
<td>10 A</td>
</tr>
<tr>
<td>Short-circuit protection</td>
<td>No</td>
</tr>
</tbody>
</table>

### 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. 4 mA

### Power dissipation of the module

- Typically 100 mW

### Parameter length

- 3 bytes

### Status, interrupts, diagnostics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic function</td>
<td>Yes</td>
</tr>
<tr>
<td>Group error</td>
<td>Red &quot;SF&quot; LED</td>
</tr>
<tr>
<td>Load voltage monitoring</td>
<td>Green &quot;PWR&quot; LED</td>
</tr>
<tr>
<td>Diagnostic information readable</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Parameters

The following table lists the power module parameters.

Table 2-1 Parameters for power modules

<table>
<thead>
<tr>
<th>PM-E DC24V</th>
<th>Range of values</th>
<th>Default setting</th>
<th>Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostics: No load voltage</td>
<td>Disable/enable</td>
<td>Disable</td>
<td>Power module</td>
</tr>
</tbody>
</table>

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.
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.

<table>
<thead>
<tr>
<th>Event (LEDs)</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF On</td>
<td>No parameter assignment or incorrect module plugged in. A diagnostic message is pending.</td>
<td>Check the parameter assignment. Evaluate the diagnostics.</td>
</tr>
<tr>
<td>PWR Off</td>
<td>There is no load voltage at the power module.</td>
<td>Check the load voltage.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Error type</th>
<th>Meaning</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>17001: Encoder or load voltage missing</td>
<td>Supply voltage not present or too low.</td>
<td>Correct the process wiring. Check the supply voltage.</td>
</tr>
</tbody>
</table>


Configuring

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>
<thead>
<tr>
<th>With STEP 7, HW Config or COM PROFIBUS or other configuration software</th>
<th>PII feedback interface</th>
<th>PIO control interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual entry for the power module</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Ends in ...S</td>
<td>IBx</td>
<td>Status byte</td>
</tr>
<tr>
<td>Ends in ...O</td>
<td>IBx</td>
<td>Option handling</td>
</tr>
<tr>
<td></td>
<td>::</td>
<td>Option handling</td>
</tr>
<tr>
<td></td>
<td>IBx+7</td>
<td></td>
</tr>
<tr>
<td>Ends in ...SO</td>
<td>IBx</td>
<td>Option handling</td>
</tr>
<tr>
<td></td>
<td>::</td>
<td>Option handling</td>
</tr>
<tr>
<td></td>
<td>IBx+7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IBx+8</td>
<td>Status byte</td>
</tr>
</tbody>
</table>
Status byte for power modules

Figure 4-1 Assignment of status byte for power modules
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