

# SIEMENS

## SIMATIC

ET 200S distributed I/O  
Digital electronic module  
4DI DC24V ST  
(6ES7131-4BD01-0AA0)  
Manual

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## Safety Guidelines

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.

|  |
|--|
|  <b>DANGER</b>                        |
| indicates that death or severe personal injury <b>will</b> result if proper precautions are not taken.                 |
|  <b>WARNING</b>                       |
| indicates that death or severe personal injury <b>may</b> result if proper precautions are not taken.                  |
|  <b>CAUTION</b>                       |
| with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.       |
| <b>CAUTION</b>   |
| without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.          |
| <b>NOTICE</b>  |
| 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 device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

## Prescribed Usage

Note the following:

|  |
|--|
|  <b>WARNING</b>   |
| This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance. |

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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.

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# 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.

<http://www.siemens.com/automation/partner>

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

<http://www.siemens.com/automation/simatic/portal>

The online catalog and ordering system are available at:

<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.

Phone: +49 (911) 895-3200.

<http://www.siemens.com/sitrain>

## Technical Support

You can reach technical support for all A&D projects

- using the support request web form:  
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- Phone: + 49 180 5050 222
- Fax: + 49 180 5050 223

For more information about our technical support, refer to our Web site at

<http://www.siemens.de/automation/service>

## Service & Support on the Internet

In addition to our documentation services, you can also make use of our comprehensive online knowledge base on the Internet.

<http://www.siemens.com/automation/service&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. Lots more can be found on our "Services" pages.

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## Properties

### 1.1 Digital electronic module 4DI DC24V ST (6ES7131-4BD01-0AA0)

#### Properties

- Digital electronic module with four inputs
- Nominal input voltage 24 VDC
- Suitable for switches and proximity switches (BEROs)
- Extended temperature range from 0 to 55 °C with vertical installation

#### General terminal assignment

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**Note**  
 Terminals 4, 8, A4, A8, A3 and A7 are only available at specified terminal modules.

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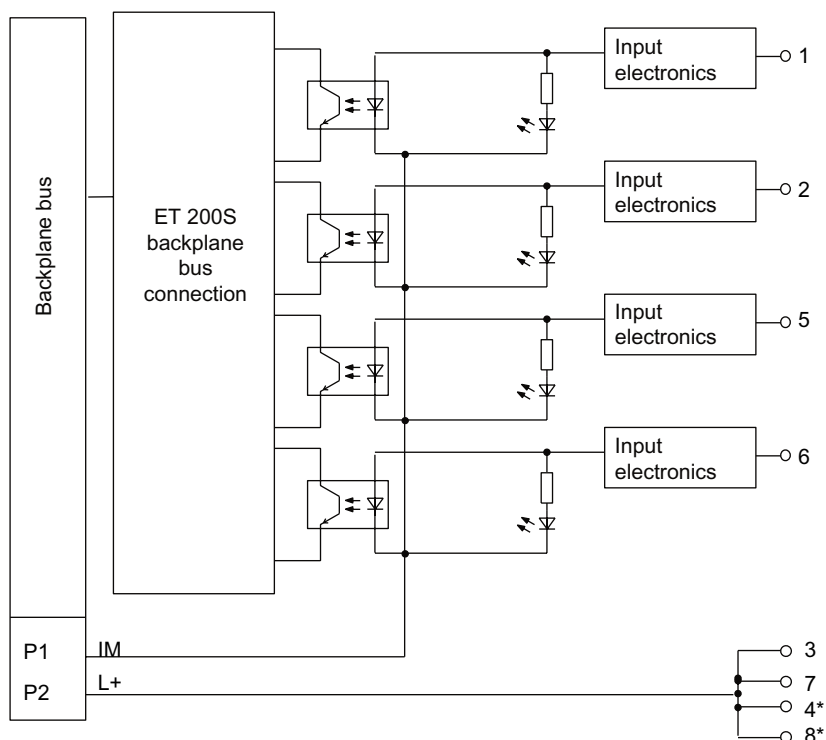
| Terminal assignment for the 4DI DC24V ST (6ES7131-4BD01-0AA0) |                 |          |                 |   |
|---|-----------------|----------|-----------------|---|
| Terminal  | Assignment      | Terminal | Assignment      | Notes   |
| 1   | DI <sub>0</sub> | 5        | DI <sub>1</sub> | <ul style="list-style-type: none"> <li>• DI<sub>n</sub>: Input signal, Channel n</li> <li>• L+: Sensor power supply 24 VDC</li> <li>• AUX1: Protective-conductor terminal or potential bus (freely usable up to 230 VAC)</li> </ul> |
| 2   | DI <sub>2</sub> | 6        | DI <sub>3</sub> |   |
| 3   | L+              | 7        | L+              |   |
| 4   | L+              | 8        | L+              |   |
| A4  | AUX1            | A8       | AUX1            |   |
| A3  | AUX1            | A7       | AUX1            |   |

Usable terminal modules

| Usable terminal modules for the 4DI DC24V ST (6ES7131-4BD01-0AA0) |                                      |                                      |                                      |   |
|---|--------------------------------------|--------------------------------------|--------------------------------------|---|
| TM-E15C26-A1<br>(6ES7193-4CA50-0AA0)                              | TM-E15C24-A1<br>(6ES7193-4CA30-0AA0) | TM-E15C24-01<br>(6ES7193-4CB30-0AA0) | TM-E15C23-01<br>(6ES7193-4CB10-0AA0) | ← Spring terminal   |
| TM-E15S26-A1<br>(6ES7193-4CA40-0AA0)                              | TM-E15S24-A1<br>(6ES7193-4CA20-0AA0) | TM-E15S24-01<br>(6ES7193-4CB20-0AA0) | TM-E15S23-01<br>(6ES7193-4CB00-0AA0) | ← Screw-type terminal   |
| TM-E15N26-A1<br>(6ES7193-4CA80-0AA0)                              | TM-E15N24-A1<br>(6ES7193-4CA70-0AA0) | TM-E15N24-01<br>(6ES7193-4CB70-0AA0) | TM-E15N23-01<br>(6ES7193-4CB60-0AA0) | ← Fast Connect  |
|   |                                      |                                      |                                      | <p><b>Wiring examples</b></p> <p>2-wire</p> <p>3-wire</p> <p>* connect to Terminal 3 or 7 at TM-E15x23-01</p> |



Block diagram



\* M only for terminal modules with terminal 4 and 8

Figure 1-1 Block diagram of the 4DI DC24V ST

Technical data 4DI DC24V ST (6ES7131-4BD01-0AA0)

| Dimensions and weight          |              |
|--------------------------------|--------------|
| Width (mm)                     | 15           |
| Weight                         | Approx. 35 g |
| Module-specific data           |              |
| Supports isochronous operation | No           |
| Number of inputs               | 4            |
| Length of cable                |              |
| • Unshielded                   | Max. 600 m   |
| • Shielded                     | Max. 1,000 m |
| Parameter length               | 1 byte       |
| Address space                  | 1 byte       |
| Address space (packed)         | 4 bits       |

## Properties

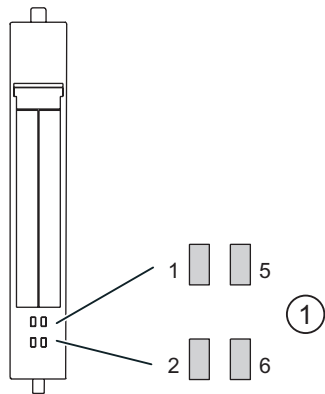
### 1.1 Digital electronic module 4DI DC24V ST (6ES7131-4BD01-0AA0)

| <b>Voltages, currents, potentials</b>        |                                |
|--|--------------------------------|
| Rated supply voltage (from the power module) | 24 VDC                         |
| • Reverse polarity protection                | Yes                            |
| Electrical isolation                         |                                |
| • Between the channels                       | No                             |
| • Between the channels and backplane bus     | Yes                            |
| Permissible potential difference             |                                |
| • Between the different circuits             | 75 VDC / 60 VAC                |
| Insulation test voltage                      | 500 VDC                        |
| Current consumption                          |                                |
| • From supply voltage                        | Dependent on the sensor        |
| Power dissipation of the module              | Typically 0.7 W                |
| <b>Status, interrupts, diagnostics</b>       |                                |
| Status display                               | Green LED per channel          |
| Diagnostics function                         | No                             |
| <b>Sensor power supply output</b>            |                                |
| Output voltage                               |                                |
| • With load                                  | Min. L+ (-0.5 V)               |
| Output current                               |                                |
| • Rated value                                | 500 mA                         |
| • Permitted range                            | 0 to 500 mA                    |
| <b>Data for selecting a sensor</b>           |                                |
| Input voltage                                |                                |
| • Rated value                                | 24 VDC                         |
| • For signal "1"                             | 15 V to 30 V                   |
| • For signal "0"                             | -30 V to 5 V                   |
| Input current                                |                                |
| • At signal "1"                              | Typ. 7 mA (for 24 V)           |
| Input delay                                  |                                |
| • At "0" to "1"                              | Typ. 3 ms (2.0 to 4.5 ms)      |
| • At "1" to "0"                              | Typ. 3 ms (2.0 to 4.5 ms)      |
| Input characteristic curve                   | According to IEC 61131, Type 1 |
| Connection of 2-wire BEROs                   | Supported                      |
| • Permitted bias current                     | Max. 1.5 mA                    |

## Diagnostics

### 2.1 Diagnostics using LED display

#### LED display



① Status display for input status (green)

#### Status displays

| Event (LEDs) |    |    |    | Cause                         | Remedy |
|--------------|----|----|----|-------------------------------|--------|
| 1            | 5  | 2  | 6  |                               |        |
| On           |    |    |    | Input on channel 0 activated. | —      |
|              | On |    |    | Input on channel 1 activated. | —      |
|              |    | On |    | Input on channel 2 activated. | —      |
|              |    |    | On | Input on channel 3 activated. | —      |



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