

# SIEMENS

## SIMATIC

ET 200S distributed I/O  
Digital electronic module  
4DI DC24V HF  
(6ES7131-4BD01-0AB0)  
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.

# 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.

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- 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 HF (6ES7131-4BD01-0AB0)

#### Properties

- Digital electronic module with four inputs
- Nominal input voltage 24 VDC
- Diagnostics: Short circuit
- Short-circuit protection
- Suitable for switches and proximity switches (BEROs)
- Supports isochronous operation
- 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 of the 4DI DC24V HF (6ES7131-4BD01-0AB0)				
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

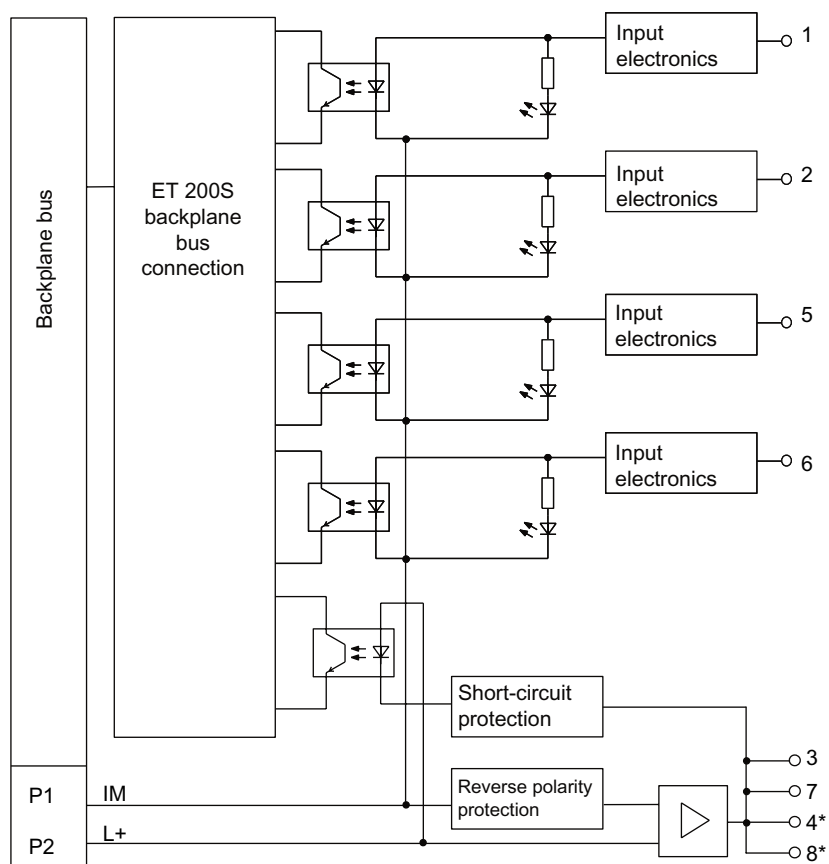
Properties

1.1 Digital electronic module 4DI DC24V HF (6ES7131-4BD01-0AB0)

Usable terminal modules of the 4DI DC24V HF (6ES7131-4BD01-0AB0)				
TM-E15C26-A1 (6ES7193-4CA50-0AA0)	TM-E15C24-A1 (6ES7193-4CA30-0AA0)	TM-E15C24-01 (6ES7193-4CB30-0AA0)	TM-E15C23-01 (6ES7193-4CB10-0AA0)	← Spring terminal
TM-E15S26-A1 (6ES7193-4CA40-0AA0)	TM-E15S24-A1 (6ES7193-4CA20-0AA0)	TM-E15S24-01 (6ES7193-4CB20-0AA0)	TM-E15S23-01 (6ES7193-4CB00-0AA0)	← Screw-type terminal
TM-E15N26-A1 (6ES7193-4CA80-0AA0)	TM-E15N24-A1 (6ES7193-4CA70-0AA0)	TM-E15N24-01 (6ES7193-4CB70-0AA0)	TM-E15N23-01 (6ES7193-4CB60-0AA0)	← Fast Connect



Block diagram



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

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

Technical data 4DI DC24V HF (6ES7131-4BD01-0AB0)

Dimensions and weight	
Width (mm)	15
Weight	Approx. 35 g
Module-specific data	
Supports isochronous operation	Yes
Number of inputs	4
Cable length	
• Unshielded	Max. 600 m
• Shielded	Max. 1000 m
Parameter length	3 bytes
Address space	1 byte
Address space (packed)	4 bits

Properties

1.1 Digital electronic module 4DI DC24V HF (6ES7131-4BD01-0AB0)

<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
Interrupts	
• Process interrupt	Parameters can be configured
Diagnostics function	
• Group error	Red "SF" LED
• Diagnostic information can be displayed	Yes
<b>Sensor supply output</b>	
Output voltage	
• With load	Min. L+ (-0.5 V)
Output current	
• Rated value	500 mA
• Permitted range	0 to 500 mA
Short-circuit protection	Yes, electronic <sup>1</sup>
<b>Data for selecting a sensor</b>	
Input voltage	
• Rated value	24 VDC
• For signal "1"	11 V to 30 V
• For signal "0"	-30 V to 5 V
Input current	
• At signal "1"	Typ. 8 mA
Input delay (parameters can be assigned)	
• At "0" to "1"	0.1 ms (0.05 to 0.15 ms) 0.5 ms (0.4 to 0.6 ms) 3 ms (2.7 to 3.3 ms) 15 ms (14.85 to 15.15 ms)
• At "1" to "0"	0.1 ms (0.05 to 0.15 ms) 0.5 ms (0.4 to 0.6 ms) 3 ms (2.7 to 3.3 ms) 15 ms (14.85 to 15.15 ms)
Input characteristic curve	According to IEC 61131, Type 1
Connection of 2-wire BEROs	
• Permitted bias current	max. 1.5 mA
<sup>1</sup> Per module	

# Parameters

## 2.1 Parameters

This table shows the parameters for digital input modules:

Table 2-1 Parameters for digital input modules

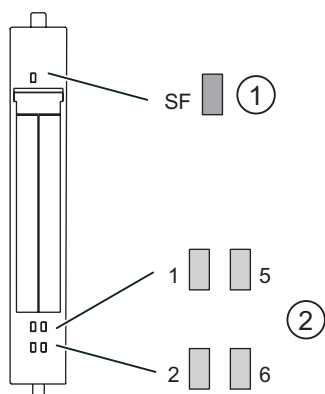
4DI DC24V HF	Range of values	Default setting	Applicability
Hardware interrupt <sup>3</sup>	<ul style="list-style-type: none"> <li>• Disable</li> <li>• Enable</li> </ul>	Disable	Module
Input delay <sup>1</sup>	<ul style="list-style-type: none"> <li>• 0.1 ms</li> <li>• 0.5 ms</li> <li>• 3 ms</li> <li>• 15 ms</li> </ul>	3 ms	Module
Diagnostics: Short circuit to M <sup>2</sup>	<ul style="list-style-type: none"> <li>• Disable</li> <li>• Enable</li> </ul>	Disable	Module
Trigger for process interrupt, rising edge <sup>3</sup>	<ul style="list-style-type: none"> <li>• Disable</li> <li>• Enable</li> </ul>	Disable	Channel 0
			Channel 1
			Channel 2
			Channel 3
<sup>1</sup> The input delay applies to "0" to "1" and to "1" to "0". <sup>2</sup> Short circuit of the sensor supply. <sup>3</sup> Can only be assigned parameters for the IM151-1 HIGH FEATURE interface module and the IM151-7 CPU			



## Diagnostics

### 3.1 Diagnostics using LED display

#### LED display



- ① Batch error (red)
- ② Status display for input status (green)

#### Status and error displays

Event (LEDs)					Cause	Remedy
SF	1	5	2	6		
On					No parameter assignment or incorrect module plugged in. Diagnostic message is pending	Check the parameter assignment. Evaluate the diagnostics.
	On				Input on channel 0 activated.	—
		On			Input on channel 1 activated.	—
			On		Input on channel 2 activated.	—
				On	Input on channel 3 activated.	—

### 3.2 Error types

#### Digital electronic module error types

Table 3-1 Error types

Error type		Meaning	Remedy
1 <sub>D</sub>	00001: Short circuit (in conjunction with IM151-1 BASIC/IM151-1 COMPACT/IM151-1 STANDARD, 6ES7151-1AA02-0AB0 and higher, IM151-1 FO STANDARD, 6ES7151-1AB01-0AB0 and higher) or IM151-1 HIGH FEATURE	Short circuit at the encoder supply. The diagnostic message is output on channel 0 and applies to the entire module.	Correct the process wiring (encoder wiring).
26 <sub>D</sub>	11010: External error (in conjunction with IM151-1 STANDARD up to 6ES7151-1AA01-0AB0, or IM151-1 FO STANDARD up to 6ES7151-1AB00-0AB0)		

### 3.3 Interrupts

#### Process interrupt of digital input modules

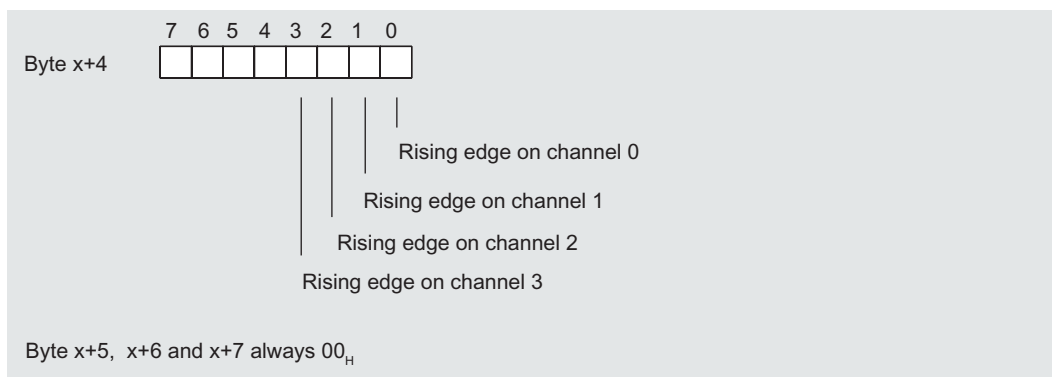


Figure 3-1 Structure as of byte x+4 for process interrupt (digital input)

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