SIEMENS

Preface

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SIMATIC

ET 200S distributed I/O
Digital electronic module 4DI UC24..48V
(6ES7131-4CD02-0AB0)

Manual

03/2010
A5E02773622-01

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.

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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 (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).

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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

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1.1 Digital electronic module 4DI UC24..48V (6ES7131-4CD02-0AB0)

Properties

- Digital electronic module with four inputs
- Rated input voltage 24 VAC/VDC to 48 VAC/VDC
- Diagnostics: Wire break
- Diagnostics: Fuse blown
- Diagnostics: No load voltage
- Suitable for switches and proximity switches (BEROs)
- Supports isochronous mode

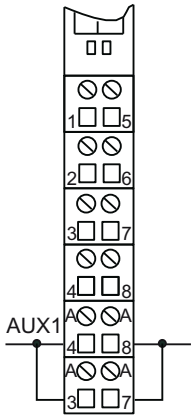
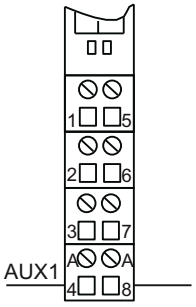
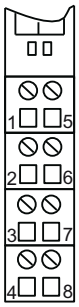
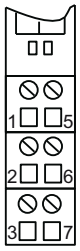
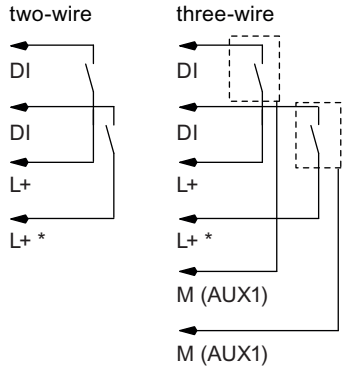
General terminal assignment

Note

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

Terminal assignment of the 4DI UC24..48V (6ES7131-4CD02-0AB0)				
Terminal	**Assignment**	**Terminal**	**Assignment**	**Notes**
1	DI_0	**5**	DI_1	• DI_n: Input signal, Channel n • L+: Sensor power supply 24 VAC/VDC to 48 VAC/VDC • AUX1: Protective-conductor terminal or potential bus (freely usable up to 230 VAC)
2	DI_2	**6**	DI_3	
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 UC24..48V (6ES7131-4CD02-0AB0)				
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
				Connection examples  * connect to Terminal 3 or 7 at TM-E15x23-01

Block diagram

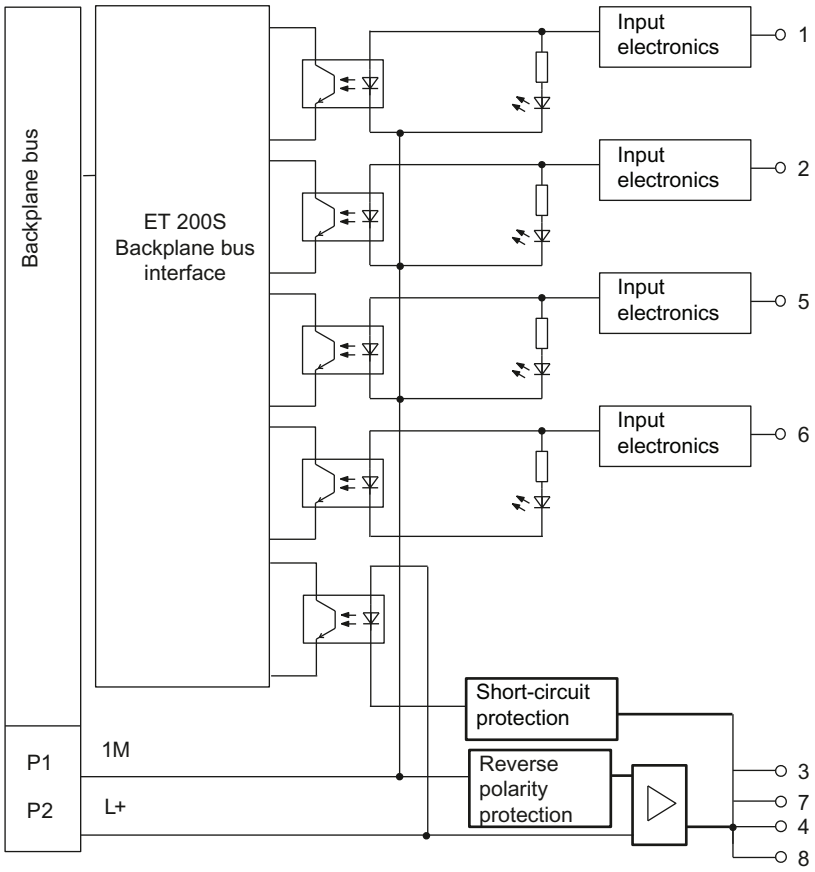


Figure 1-1 Block diagram of the 4DI UC24..48V

Technical Specifications 4DI UC24..48V (6ES7131-4CD02-0AB0)

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. 1,000 m
Parameter length	3 bytes
Address space	1 byte
Address space (packed)	4 bits

Voltages, currents, potentials	
Rated supply voltage (from the power module)	24 VAC/VDC to 48 VAC/VDC
• Horizontal installation up to 60°C	
• Vertical installation up to 40°C	
• Reverse polarity protection	AC or DC automatically
Electrical isolation	
• Between the channels	No
• Between channels and backplane bus	Yes
Permissible potential difference	
• Between the different circuits	75 VDC, 60 VAC
Insulation test voltage	2500 VDC
Current consumption	
• From the power supply L+	Dependent on the sensor
Power dissipation of the module	Typically 0.7 W
Status, interrupts, diagnostics	
Status display	Green LEDs per channel
Diagnostics function	Parameters can be configured
• Batch error display	Red LEDs (SF)
Sensor power supply outputs	
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, per module Fuse 1A, replaceable Order number: 6ES7193-4KA00-0AA0
Data for selecting a sensor	
Input voltage • Rated value	 24 to 48 VUC
• For signal "1"	-15 VDC to -57.6 VDC 15 VDC to 57.6 VDC 15 VAC to 48 VAC
• For signal "0"	-6 VDC to 6 VDC 0 VAC to 5 VAC
• Frequency range	47 Hz to 63 Hz
Input current • At signal "1"	 From 4 mA to 10 mA
Input delay • At "0" to "1" • At "1" to "0"	 Max. 15 ms max. 15 ms
Input characteristic curve[1]	
Connection of 2-wire BEROs	Supported
• Permitted bias current	Max. 0.5 mA to 2 mA[2]

Sensor switching	
Resistance circuit of the sensor for wire break monitoring	
• Nominal voltage 24 V (15 V to 35 V)	18 kΩ
• Nominal voltage 48 V (30 V to 60 V)	39 kΩ

[1] IEC 61131 does not provide technical specifications for UC modules. However, the values have been adjusted to IEC 61131 as closely as possible.

[2] Minimum load current is required in the case of wire-break monitoring.

Parameters

2

2.1 Parameters

This table shows the parameters for digital input modules:

Table 2- 1 Parameters for digital input modules

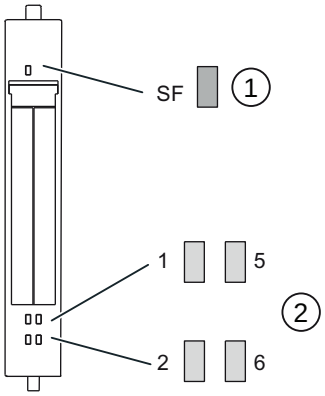
4DI UC24..48V	Range of values	Default setting	Applicability
Process interrupt	• block • enable	block	Module
Diagnostic interrupt	• Disable • Enable	Disable	Module
Diagnostics: Wire break*	• Disable • Enable	Disable	Module
Diagnostics: Fuse is defective	• Disable • Enable	Disable	Module
Diagnostics: No load voltage	• Disable • Enable	Disable	Module
* If the wire-break check is activated, all the unused inputs must be stabilized to prevent them from triggering a module wire break. To do this, connect a resistor between terminal 24/48 V (3, A4, 7, A8) and the free input. The resistor must provide at least 0.5 mA of input current (see "Encoder switching" in the technical data table). This ensures that sufficient current is flowing to prevent wire break detection. The sensor must supply at least 0.5 mA when switched off (otherwise a wire break will be reported when the sensor is switched off). Alternatively, a resistor can be connected parallel to the encoder terminals (the current must be at least 0.5 mA).			

Diagnostics

3

3.1 Diagnostics using LED display

LED display



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

Status and error displays

Event (LEDs)					Cause	Remedy
SF	1	5	2	6		
On					No configuration or incorrect module plugged in. There is a diagnostic message.	Check the parameter settings. Analyze the diagnostic data.
	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
26_D	11010: External error	Line to the final controlling element interrupted.	Correct the process wiring.
		Supply voltage not present or too low.	Correct the process wiring. Check the supply voltage.
		Fuse tripped.	Replace the fuse.

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