

SIEMENS

SIMATIC

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

Manual

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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.

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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/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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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 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

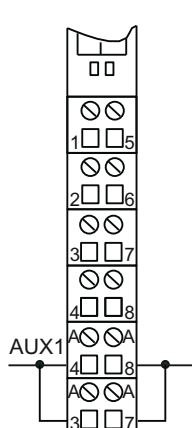
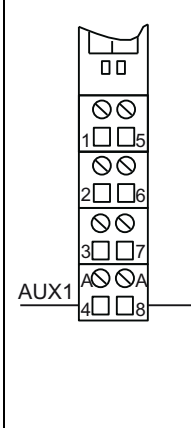
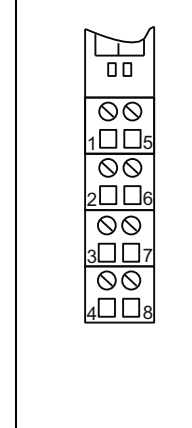
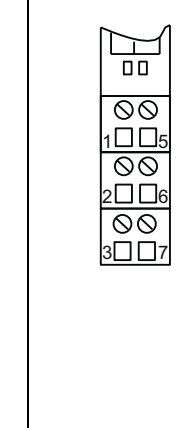
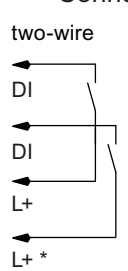
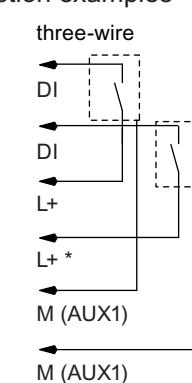
General terminal assignment

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 two-wire  three-wire  * connect to Terminal 3 or 7 at TM-E15x23-01				

Block diagram

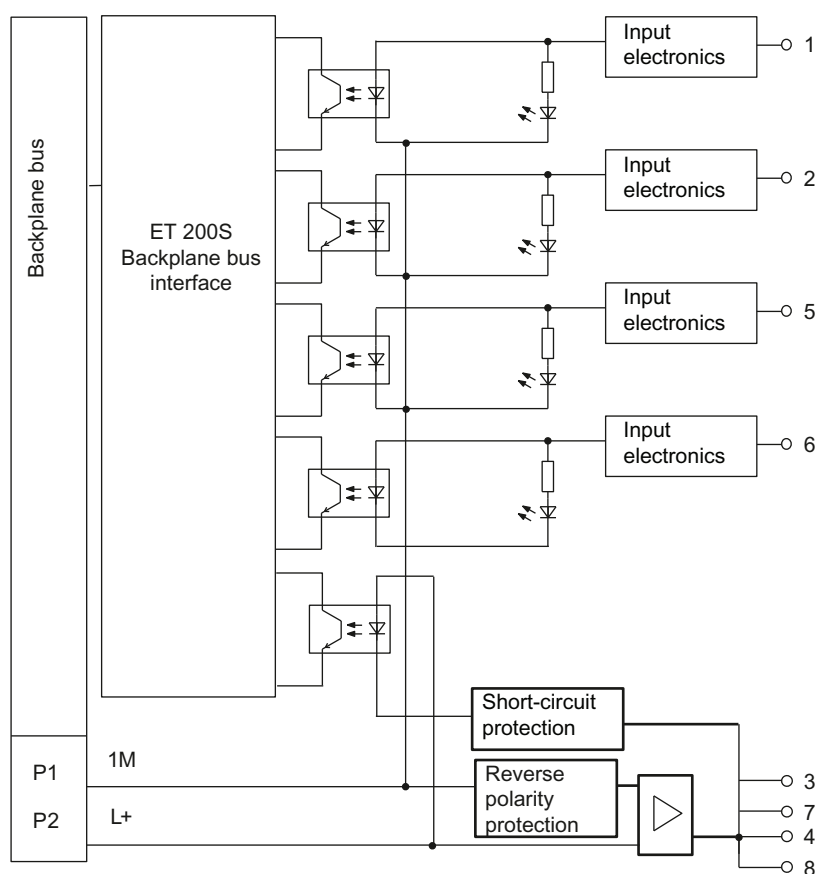


Figure 1-1 Block diagram of the 4DI UC24..48V

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"	Max. 15 ms
At "1" to "0"	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 k Ω
• Nominal voltage 48 V (30 V to 60 V)	39 k Ω
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

2.1 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

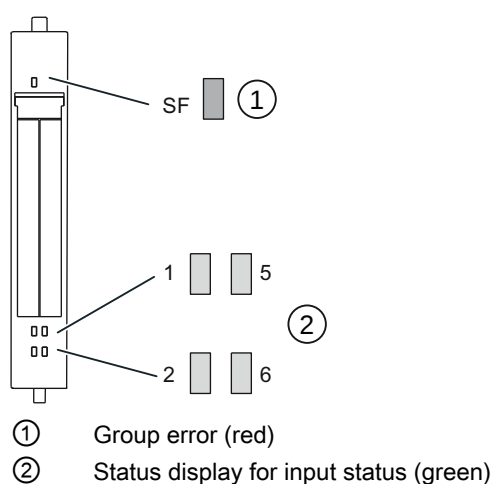
* If the wire-break check is activated, all the unused inputs must be stabilized to prevent them from triggering a module wire break. To do this, connect a resistor between terminal 24/48 V (3, A4, 7, A8) and the free input. The resistor must provide at least 0.5 mA of input current (see "Encoder switching" 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

3.1 Diagnostics using LED display

LED display



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
26D	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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