

EZ 102

S-DIAS Digital Output Module

Instruction Manual

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Translation of the Original Instruction

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S-DIAS Digital Output Module

EZ 102

with 10 short-circuit proof outputs

The S-DIAS EZ 102 digital output module has 10 short-circuit proof, galvanically isolated, digital outputs in 2 groups (+24 V/100 mA). The power supply for each group is monitored for under voltage.

The EZ 102 is used for the implementation of the Euromap interface.



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1 Introduction

1.1 Target Group/Purpose of this Operating Manual

This operating manual contains all information required for the operation of the product.

This operating manual is intended for:

- Project planners
- Technicians
- Commissioning engineers
- Machine operators
- Maintenance/test technicians

General knowledge of automation technology is required.

Further help and training information, as well as the appropriate accessories can be found on our website www.sigmathek-automation.com.

Our support team is happily available to answer your questions.
Please see our website for our hotline number and business hours.

1.2 Important Reference Documentation

This and additional documents can be downloaded from our website or obtained through support.

1.3 Contents of Delivery

1x EZ 102

2 Basic Safety Directives

2.1 Symbols Used

The following symbols are used in the operator documentation for warning and danger messages, as well as informational notes:

DANGER



Danger indicates that death or serious injury **will occur**, if the specified measures are not taken.

⇒ To avoid death or serious injuries, observe all guidelines.

Danger indique une situation dangereuse qui, faute de prendre les mesures adéquates, **entraînera** des blessures graves, voire mortelles.

⇒ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

WARNING



Warning indicates that death or serious injury **can** occur, if the specified measures are not taken.

⇒ To avoid death or serious injuries, observe all guidelines.

Avertissement d'une situation dangereuse qui, faute de prendre les mesures adéquates, **entraînera** des blessures graves, voire mortelles.

⇒ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

CAUTION



Caution indicates that moderate to slight injury **can** occur, if the specified measures are not taken.

⇒ To avoid moderate to slight injuries, observe all guidelines.

Attention indique une situation dangereuse qui, faute de prendre les mesures adéquates, **peut** entraîner des blessures assez graves ou légères.

⇒ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

INFORMATION**Information**

- ⇒ Provides important information on the product, handling or relevant sections of the documentation, which require attention.

2.2 Disclaimer

INFORMATION



The contents of this operating manual were prepared with the greatest care. However, deviations cannot be ruled out. This operating manual is regularly checked and required corrections are included in the subsequent versions. The machine manufacturer is responsible for the proper assembly, as well as device configuration. The machine operator is responsible for safe handling, as well as proper operation.

The current operating manual can be found on our website. If necessary, contact our support.

Subject to technical changes, which improve the performance of the devices. The following operating manual is purely a product description. It does not guarantee properties under the warranty.

Please thoroughly read the corresponding documents and this operating manual before handling a product.

SIGMATEK GmbH & Co KG is not liable for damages caused through, non-compliance with these instructions or applicable regulations.

2.3 General Safety Directives

The Safety Directives in the other sections of this operating manual must be observed. These instructions are visually emphasized by symbols.



INFORMATION

According to EU Directives, the operating manual is a component of a product.

This operating manual must therefore be accessible in the vicinity of the machine since it contains important instructions.

This operating manual should be included in the sale, rental or transfer of the product, or its online availability indicated.

Regarding the requirements for Safety and health connected to the use of machines, the manufacturer must perform a risk assessment in accordance with machine directives 2006/42/EG before introducing a machine to the market.

Operate the unit with devices and accessories approved by SIGMATEK only.

CAUTION

Handle the device with care and do not drop or let fall.

Prevent foreign bodies and fluids from entering the device.

The device must not be opened!

Manipulez l'appareil avec précaution et ne le laissez pas tomber.

Empêchez les corps étrangers et les liquides de pénétrer dans l'appareil.

L'appareil ne doit pas être ouvert!

If the device does not function as intended or has damage that could pose a danger, it must be replaced!

En cas de fonctionnement non conforme ou de dommages pouvant entraîner des risques, l'appareil doit être remplacé!

The module complies with EN 61131-2.

In combination with a facility, the system integrator must comply with EN 60204-1 standards.

For your own safety and that of others, compliance with the environmental conditions is essential.

Le module est conforme à la norme EN 61131-2.

En combinaison avec une équipement, l'intégrateur de système doit respecter la norme EN 60204-1.

Pour votre propre sécurité et celle des autres, le respect des conditions environnementales est essentiel.

2.4 Software/Training

The application is created with the software LASAL CLASS 2 and LASAL SCREEN Editor.

Training for the LASAL development environment, with which the product can be configured, is provided. Information on our training schedule can be found on our website.

3 Standards and Directives

3.1 Directives

The product was constructed in compliance with the following European Union directives and tested for conformity.

3.1.1 EU Conformity Declaration



EU Declaration of Conformity

The product EZ 102 conforms to the following European directives:

- **2014/35/EU** Low-voltage Directive
- **2014/30/EU** Electromagnetic Compatibility (EMC Directive)
- **2011/65/EU** “Restricted use of certain hazardous substances in electrical and electronic equipment” (RoHS Directive)

The EU Conformity Declarations are provided on the SIGMATEK website. See Products/Downloads or use the search function and the keyword “EU Declaration of Conformity”.

4 Type Plate

	HW: X.XX SW: XX.XX.XXX Safety Version: SXX.XX.XX
Serial No.	SIGMATEK GMBH & CO KG Sigmatekstrasse 1 A-5112 LAMPRECHTSHAUSEN
Article Number	Product Name Short Name

Exemplary nameplate (symbol image)

	HW: 1.00 SW: 01.00.000 Safety Version: S01.00.00
12345678	SIGMATEK GMBH & CO KG Sigmatekstrasse 1 A-5112 LAMPRECHTSHAUSEN
12-246-133-3	Handbediengerät Wireless HGW 1033-3

HW: Hardware version

SW: Software version

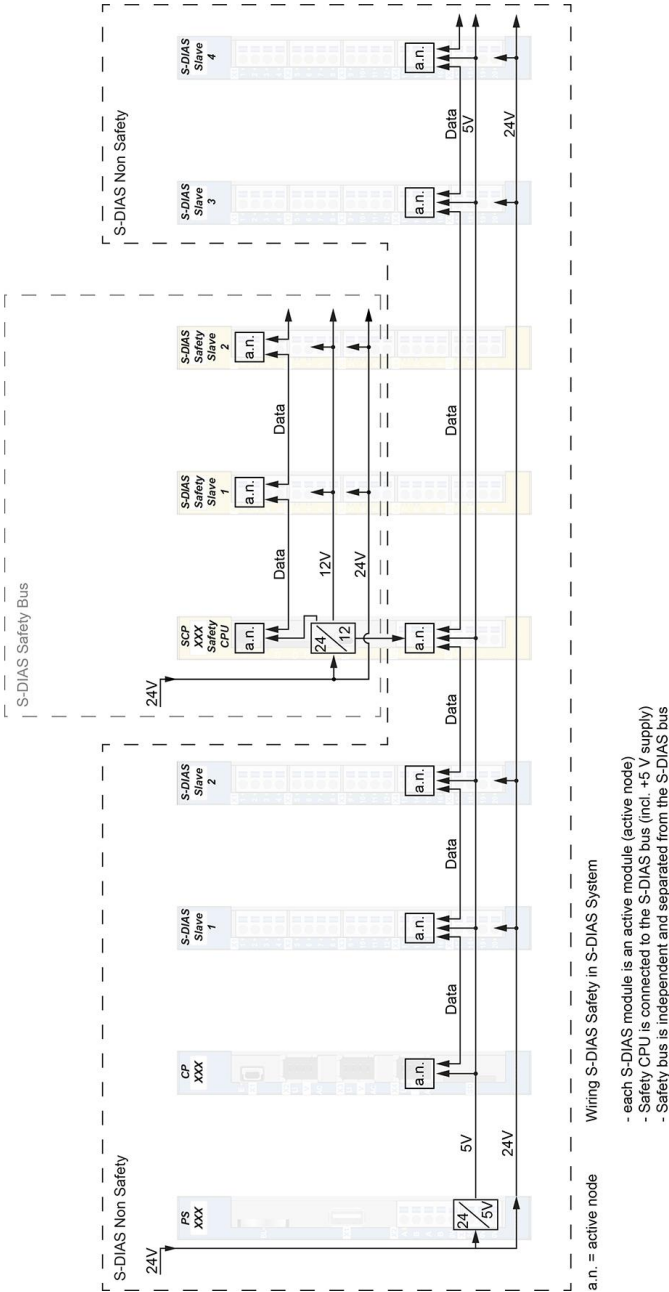
5 Technical Data

5.1 Digital Output Specification

Number	10
Short-circuit proof, current limited	yes
Maximum continuous current load/channel allowed	0.1 A
Maximum total current (entire module)	1.0 A
Maximum braking energy of outputs (inductive load)	maximum 0.1 Joules/channel
Residual current (off)	$\leq 12 \mu\text{A}$
Turn-on delay	$< 200 \mu\text{s}$
Turn-off delay	$< 200 \mu\text{s}$
Galvanic isolation	yes (isolation voltage 300 V)

5.2 Electrical Requirements

Supply voltage +24 V/1-2	+18-36 V DC	
Current consumption supply voltage +24 V/1-2	corresponds to the load on the digital outputs	
Voltage supply from the S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 45 mA	maximum 50 mA



5.3 Voltage Monitor

Supply voltage +24 V/1-2	supply voltage > 18 V (according DC OK-LED lights green)
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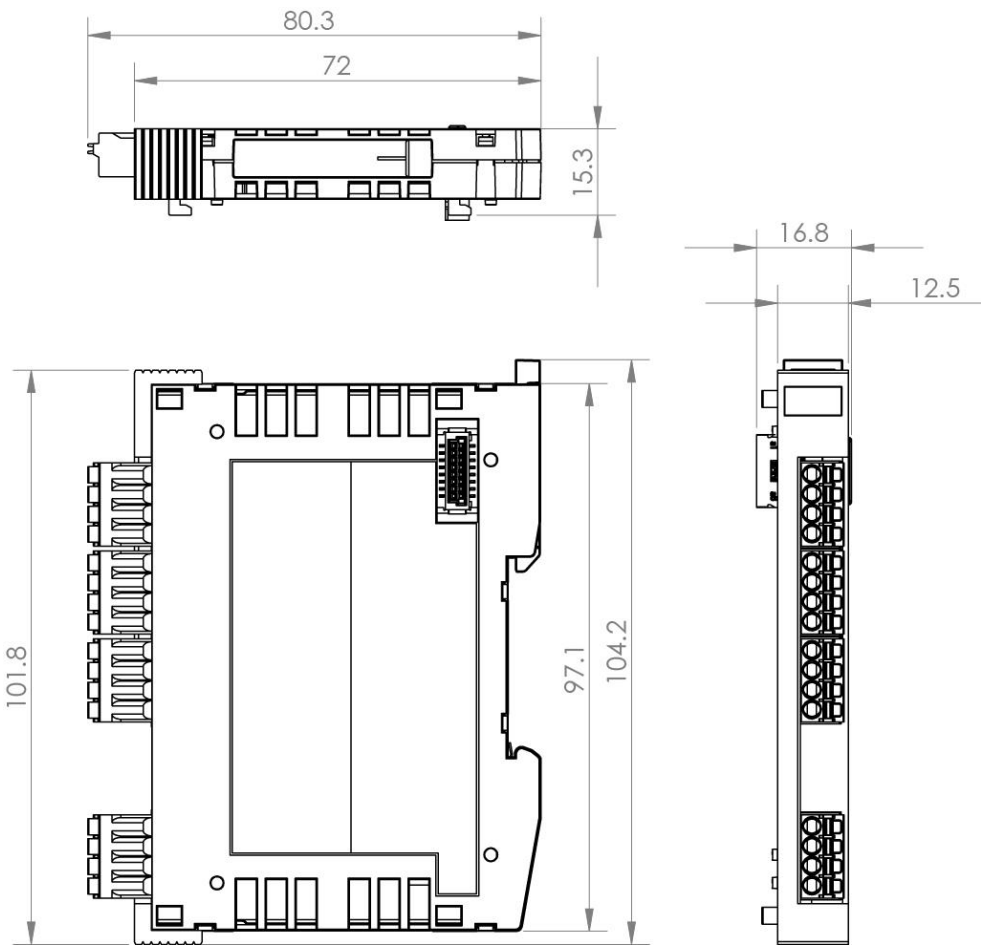
5.4 Miscellaneous

Article number	20-051-102
Standard	UL 508 (E247993)
Approbations	UL, cUL, CE

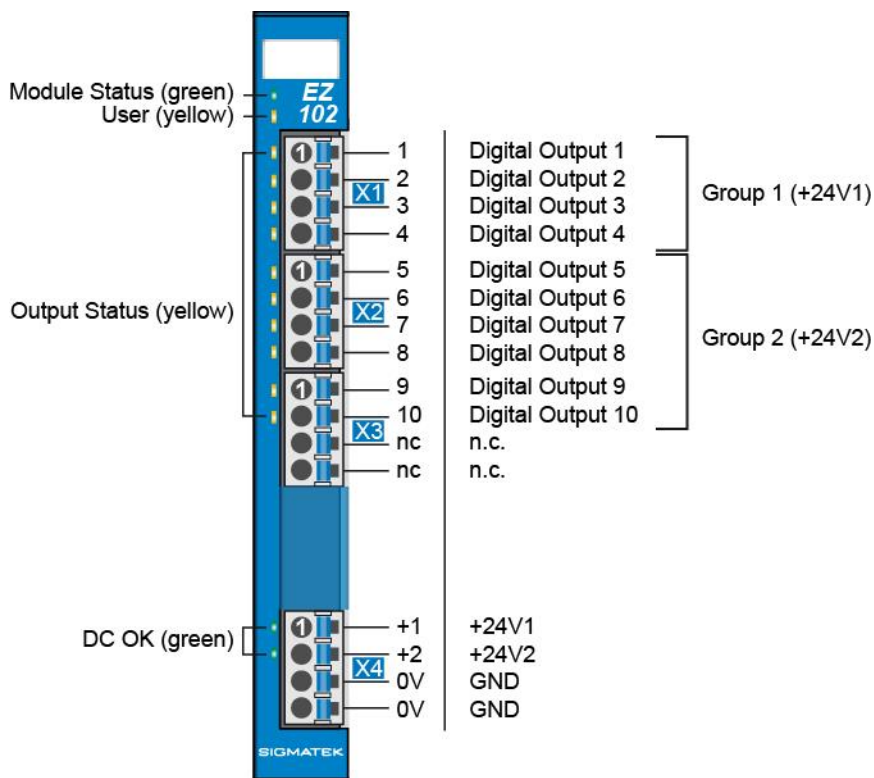
5.5 Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

6 Mechanical Dimensions



7 Connector Layout



INFORMATION



The GND supply (X4: Pin 3 and Pin 4) is internally bridged. Only one GND pin (pin 3 or pin 4) is required to power the module. The bridged connections may be used for further looping of the GND supply. However, it must be taken into account that a total current of 6 A per connection is not exceeded by the forward looping!

7.1 Status LEDs

Module Status	green	ON	module active
		OFF	no supply available
		BLINKING (5 Hz)	no communication
User	yellow	ON	can be set from the application
		OFF	(e.g. the module LED can be set to blinking through the visualization so that the module is easily found in the control cabinet)
		BLINKING (2 Hz)	
		BLINKING (4 Hz)	
Output status	yellow	ON	output on
		OFF	output off
DC OK	green	ON	Supply voltage OK

7.2 Applicable Connectors

Connectors:

X1-X4: Connectors with spring terminals (included in delivery)

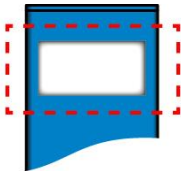
The spring terminals are suitable for connecting ultrasonically compacted (ultrasonically welded) strands.

Connections:

Stripping length/ Sleeve length:	10 mm
Mating direction:	parallel to the conductor axis or circuit board
Conductor cross section rigid:	0.2-1.5 mm ²
Conductor cross section flexible:	0.2-1.5 mm ²
Conductor cross section ultrasonically compacted:	0.2-1.5 mm ²
Conductor cross section AWG/kcmil:	24-16
Conductor cross section flexible with ferrule without with plastic sleeve:	0.25-1.5 mm ²
Conductor cross section flexible with ferrule with plastic sleeve:	0.25-0.75 mm ² (reason for reduction d2 of the ferrule)



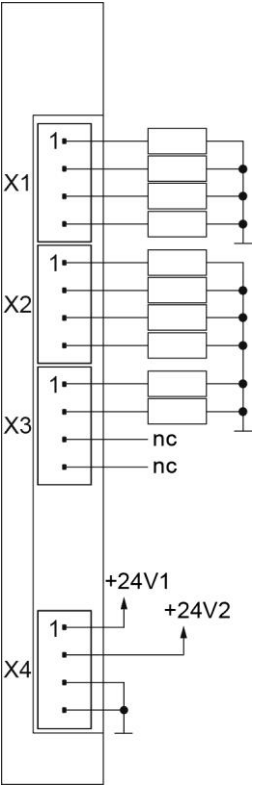
7.3 Label Field



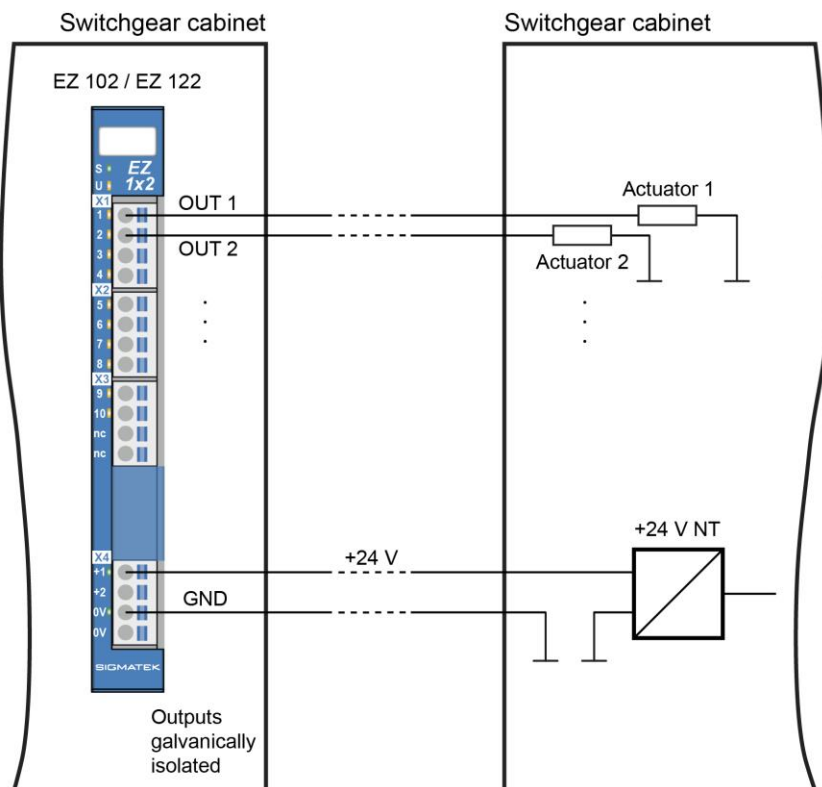
Manufacturer	Weidmüller
Type	MF 10/5 CABUR MC NE WS
Weidmüller article number	1854510000
Compatible printer	Weidmüller
Type	Printjet Advanced 230V
Weidmüller article number	1324380000

8 Wiring

8.1 Wiring Example



8.2 Wiring Diagram EUROMAP Interface



8.3 General Information on the Digital Outputs

The cross section of the +24 V and 0 V supply must be designed for the maximum output current drawn by a group.

INFORMATION

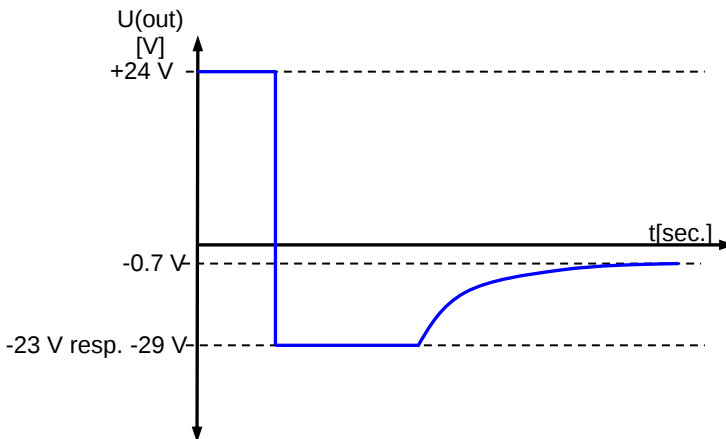


When inductive loads are not equipped with a protective circuit, the high surge current flows over the 0 V line when the load is disconnected since the internal protective circuit is wired against 0 V. An excessively long or too thin 0 V conductor can lead to undesired responses from the outputs of the affected module.

The outputs can be turned off by disconnecting the +24 V supply voltage.

Applying power to an output whose supply voltage exceeds 0.7 V is not allowed.

The outputs have additional protection internally. The disconnection of inductive loads is limited to -23 V for supply group 1 resp. -29 for supply group 2 as shown in the graph below. However, an additional protection circuit directly on inductive loads is recommended (freewheeling diode) to avoid a system failure caused by voltage spikes (cross talk on analog lines). However, this results in the internal voltage limit being effective up to -0.7 V only.

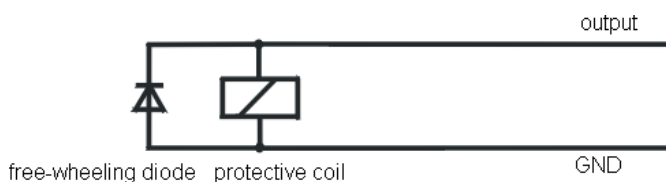


8.4 Note

The following guidelines should be observed:

- Avoid parallel wiring between input lines and load-bearing circuits.
- Protective circuits for all relays (RC networks or free-wheeling diodes).
- Correct wiring to ground.

Connecting Inductive Loads



INFORMATION



The ground bus should be connected to the control cabinet when possible!

The S-DIAS module CANNOT be connected/disconnected while voltage is applied!

9 Assembly/Installation

9.1 Check Contents of Delivery

Ensure that the contents of the delivery are complete and intact. See chapter 1.3 Contents of Delivery.

INFORMATION

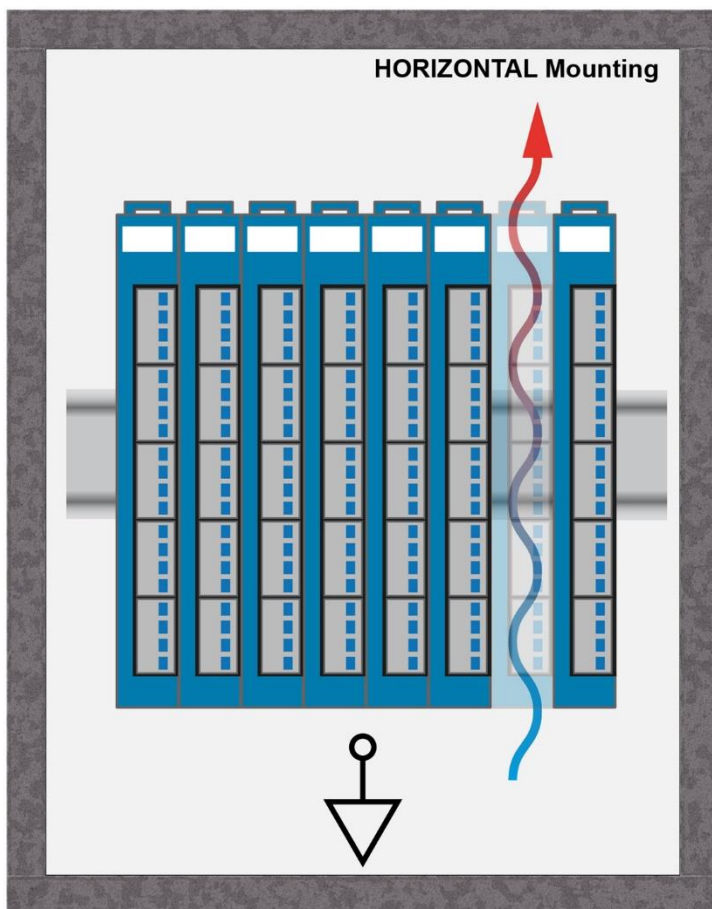


On receipt and before initial use, check the device for damage. If the device is damaged, contact our customer service and do not install the device in your system.

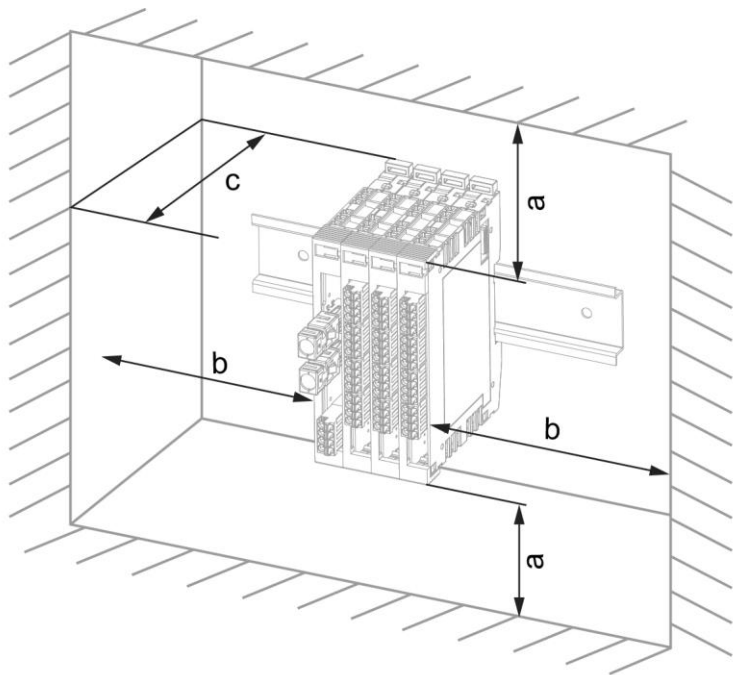
Damaged components can disrupt or damage the system.

9.2 Mounting

The S-DIAS modules are designed for installation into the control cabinet. To mount the modules a DIN-rail is required. The DIN rail must establish a conductive connection with the back wall of the control cabinet. The individual S-DIAS modules are mounted on the DIN rail as a block and secured with latches. The functional ground connection from the module to the DIN rail is made via the grounding clamp on the back of the S-DIAS modules. The modules must be mounted horizontally (module label up) with sufficient clearance between the ventilation slots of the S-DIAS module blocks and nearby components and/or the control cabinet wall. This is necessary for optimal cooling and air circulation, so that proper function up to the maximum operating temperature is ensured.



Recommended minimum distances of the S-DIAS modules to the surrounding components or control cabinet wall:



a	b	c
30 mm (1.18")	30 mm (1.18")	100 mm (3.94")

a, b, c ... distances in mm (inches)

10 Addressing

Address (hex)	Size (bytes)	Access Type	Description	Reset value
Memory				
0000	2	w	Output register Bit 0 Output 1 Bit 1 Output 2 ... Bit 15 Output 16	0000
0002	2	r	24 V status Bit 0 DC 24 V OK 1 Bit 1 DC 24 V OK 2 Bit 2-15 reserved	0000

11 Supported Cycle Times

11.1 Cycle Times below 1 ms (in μs)

50	100	125	200	250	500
x	x	x	x	x	x

x= supported

11.2 Cycle Times equal to or higher than 1 ms (in ms)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

x= supported

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

x= supported

12 Hardware Class EZ102

Hardware Class EZ102 for the S-DIAS EZ102 digital input module

```
SDIAS:51, EZ102 (EZ1021)
S Class State (ClassState) <-[]->
S Device ID (DeviceID) <-[]->
S FPGA Version (FPGAVersion) <-[]->
S Hardware Version (HwVersion) <-[]->
S Serial Number (SerialNo) <-[]->
S Retry Counter (RetryCounter) <-[]->
O LED Control (LEDControl) <-[]->
----- Digital Outputs -----
O Digital Out 1 (Output1) <-[]->
O Digital Out 2 (Output2) <-[]->
O Digital Out 3 (Output3) <-[]->
O Digital Out 4 (Output4) <-[]->
O Digital Out 5 (Output5) <-[]->
O Digital Out 6 (Output6) <-[]->
O Digital Out 7 (Output7) <-[]->
O Digital Out 8 (Output8) <-[]->
O Digital Out 9 (Output9) <-[]->
O Digital Out 10 (Output10) <-[]->
O Output Word (OutputWord) <-[]->
S Voltage OK Output 1-4 (VoltageOkBank1) <-[]->
S Voltage OK Output 5-10 (VoltageOkBank2) <-[]->
ALARM:00, Empty
```

This hardware class is used to control the EZ 102 hardware module with 10 digital outputs. More information on the hardware can be found in the module documentation.

12.1 General Information

Class State	State	Shows the actual status of the hardware class.									
Device ID	State	Shows the Device ID of the hardware module.									
FPGA Version	State	FPGA version of the module in 16#XY (e.g. 16#10 = version 1.0).									
Hardware Version	State	Hardware version of the module in format 16#XXYY (e.g. 16#0120 = Version 1.20).									
Serial Number	State	Shows the serial number of the hardware module.									
Retry Counter	State	This server increments when a transfer fails.									
LED Control	Output	With this output, the application LED of the S-DIAS module can be activated to find the module in the network more quickly. The following statuses are possible: <table><tr><td>0</td><td>LED off</td></tr><tr><td>1</td><td>LED on</td></tr><tr><td>2</td><td>blinks slowly</td></tr><tr><td>3</td><td>blinks rapidly</td></tr></table>		0	LED off	1	LED on	2	blinks slowly	3	blinks rapidly
0	LED off										
1	LED on										
2	blinks slowly										
3	blinks rapidly										
Required	Property	This property is active by default, which means that the S-DIAS hardware module at this position is mandatory for the system and can under no circumstances be disconnected or return an error. Otherwise, the entire hardware deactivated. If the hardware module is missing or removed, an S-DIAS error is triggered. If his client is initialized with 0, the hardware module located in this position is not mandatory. This means that it can be inserted or removed at any time. However, which components identified as "not required" should be selected with regard to the safety of the system.									
Voltage Ok Bank [1,2]	State	<table><tr><td>0</td><td>power supply error</td></tr><tr><td>1</td><td>power supply ok</td></tr></table> Bank1: for outputs 1-4 Bank2: for outputs 5-10	0	power supply error	1	power supply ok					
0	power supply error										
1	power supply ok										

12.2 Digital Outputs 1-10

Output	Output	Output 1-10 set via the write() method.
Output Word	Output	Used to set the digital outputs in a 10-bit field. In this word, bit 0 to bit 9 are allocated to output1 to output10. A write() instruction to this server writes the bit pattern to these outputs.

12.3 Communication Interfaces

ALARM	Downlink	With this downlink the corresponding alarm class can be placed via the hardware editor.
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13 Transport/Storage

INFORMATION



This device contains sensitive electronics. During transport and storage, high mechanical stress must therefore be avoided.

For storage and transport, the same values for humidity and vibration as for operation must be maintained!

Temperature and humidity fluctuations may occur during transport. Ensure that no moisture condenses in or on the device, by allowing the device to acclimate to the room temperature while turned off.

When sent, the device should be transported in the original packaging if possible. Otherwise, packaging should be selected that sufficiently protects the product from external mechanical influences. Such as cardboard filled with air cushioning.

14 Storage

INFORMATION



When not in use, store the operating panel according to the storage conditions. See chapter 13.

During storage, ensure that all protective covers (if available) are placed correctly, so that no contamination, foreign bodies or fluids enter the device.

15 Maintenance

INFORMATION



During maintenance as well as servicing, observe the safety instructions from chapter 2 Basic Safety Directives.

15.1 Service

This product was constructed for low-maintenance operation.

15.2 Repair

INFORMATION



In the event of a defect/repair, send the device with a detailed error description to the address listed at the beginning of this document.

For transport conditions, see chapter 13 Transport/Storage.

16 Disposal

INFORMATION



Should you need to dispose of the device, the national regulations for disposal must be followed.

The device appliance must not be disposed of as household waste.



Documentation Changes

Change date	Affected page(s)	Chapter	Note
28.04.2016	13	4.4 Mounting	Graphics distances
09.12.2016	5	1.4 Miscellaneous	UL added
10.02.2017	3	1.1 Digital Output Specification	Extended "Galvanic isolation" specification
17.08.2017	5	1.5 Environmental Conditions	Pollution Degree
	8	3.2 Applicable Connectors	Sleeve length added Added info regarding ultrasonically welded strands
18.10.2017	9	3.3 Label Field	Added chapter
	13	4.4 Mounting	Changed chapter level from 4.4 to 5
	14	5 Mounting	Graphic replaced
17.01.2018	11	4.2 Wiring Diagram EUROMAP Interface	Added chapter and diagram
20.09.2018		3 Connector Layout	Note added
14.11.2019	18	7 Supported Cycle Times	Chapter added
28.02.2020	18	7 Supported Cycle Times	Text adapted
08.09.2020	19	8 Hardware Class EZ102	Chapter added
04.11.2020	15	5 Mounting	Expansion functional ground connection
20.04.2023	8	3 Connector Layout	Info box corrected
26.07.2023		Document	General chapters added, design

