INSTALLATION MANUAL

ZE-4DI-2AI-2DO / Z-4DI-2AI-2DO / ZE-2AI

I/O modules, ModBUS RTU / ModBUS TCP-IP



ZE-4DI-2AI-2DO



Z-4DI-2AI-2DO



ZE-2AI

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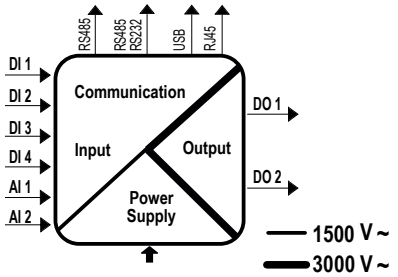
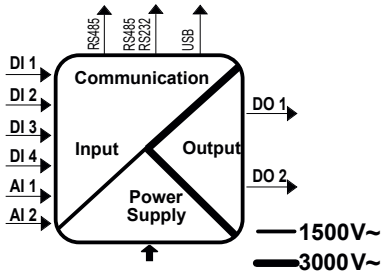
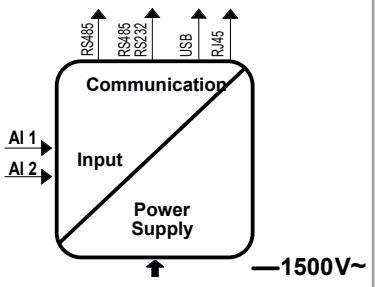
SENECA s.r.l.
Via Austria, 26 – 35127 – PADOVA – ITALY
Tel. +39.049.8705355 - 8705359 - Fax +39.049.8706287

For manuals in other languages and configuration software, visit:
www.seneca.it/products/ze-4di-2ai-2do - www.seneca.it/products/z-4di-2ai-2do - www.seneca.it/products/ze-2ai

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TECHNICAL SPECIFICATIONS

STANDARDS	**EN61000-6-4** Electromagnetic emissions, industrial environment. **EN61000-6-2** Electromagnetic immunity, industrial environment. **EN60950** Security in information processing equipment
INSULATION	ZE-4DI-2AI-2DO  Z-4DI-2AI-2DO  ZE-2AI 
ENVIRONMENTAL CONDITIONS	*Temperature*: -25 ÷ + 70°C *Humidity*: 30% ÷ 90% non condensing. *Altitude:* Up to 2000 m above sea level *Storage temperature:* -30 ÷ + 85° *Protection degree:* IP20.
ASSEMBLY	IEC EN60715, 35mm DIN rail in vertical position.
CONNECTIONS	Removable 3-way screw terminals, 5 mm pitch for cable up to 2.5 mm^2 Rear connector IDC10 for DIN bar 46277 RJ45 micro USB
POWER SUPPLY	Voltage: 11 ÷ 40 Vdc; 19 ÷ 28 Vac 50 – 60 Hz Absorption: Typical: 1.5 W @ 24Vdc, Max: 4 W **(ZE-4DI-2AI-2DO Z-4DI-2AI-2DO)** Absorption: Typical: 1.5 W @ 24Vdc, Max: 2 W **(ZE-2AI)**
DIGITAL INPUTS only ZE-4DI-2AI-2DO Z-4DI-2AI-2DO	Number of channels 4. Configurable PNP or NPN. Voltage input OFF < 4V, ON > 8V (max. 24 Vdc). Current input 20mA. Max frequency 5 KHz. Absorbed current 3mA @ 12Vdc , 10mA @ 24Vdc
COUNTERS: only ZE-4DI-2AI-2DO Z-4DI-2AI-2DO	4 x 32 bit resettable counters on non-volatile memory.
DIGITAL OUTPUTS only ZE-4DI-2AI-2DO Z-4DI-2AI-2DO	Number of channels 2. SPDT free contact relay. Max. voltage 250 Vac. Max. current 2A.
ANALOGUE INPUTS	Number of channels 2. Configurable mAdc or Vdc. Voltage input 0 ÷ 30V. precision 0.1% of Full Scale. Current input 0 ÷ 20mA precision 0.1% of Full Scale. Input protection 40V / 25mA. Resolution 16 bit.
COMMUNICATION PORTS	RS485 COM1 on IDC10 connector. RS485 or RS232 M10-M11-M12. Ethernet 100 baseT RJ45 front. **(ZE-4DI-2AI-2DO, ZE-2AI)** Side micro USB.

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PRELIMINARY WARNINGS

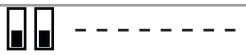
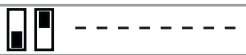
The word **WARNING** preceded by the symbol ⚠ indicates conditions or actions that put the user's safety at risk.

The word **ATTENTION** preceded by the symbol ⚠ indicates conditions or actions that might damage the instrument or the connected equipment. The warranty shall become null and void in the event of improper use or tampering with the module or devices supplied by the manufacturer as necessary for its correct operation, and if the instructions contained in this manual are not followed.

	**WARNING**: The full content of this manual must be read before any operation. The module must only be used by qualified electricians. Specific documentation is available via QR-CODE shown on page 1.
	The module must be repared and damaged parts replaced by the Manufacturer. The product is sensitive to electrostatic discharges. Take appropriate measures during any operation.
	Electrical and electronic waste disposal (applicable in the European Union and other countries with recycling). The symbol on the product or its packaging shows the product must be surrendered to a collection centre authorized to recycle electrical and electronic waste.

SETTING THE DIP-SWITCHES

The position of the DIP-switches defines the Modbus communication parameters of the module: Address and Baud Rate
The following table shows the values of the Baud Rate and the Address according to the setting of the DIP-switches:

DIP-Switch status					
SW1 POSITION	**BAUD RATE**	**SW1 POSITION**	**ADDRESS**	**POSITION**	**TERMINATOR**
1 2 3 4 5 6 7 8		3 4 5 6 7 8		**10**	
	9600		#1		Disabled
	19200		#2		Enabled
	38400		#...		**LEGEND**
	57600		#63		 **ON**
	From EEPROM		From EEPROM		 **OFF**

Note: When DIP switches 1 to 8 are OFF, the communication settings are taken from programming (EEPROM).
Note 2: The RS485 line must be terminated only at the ends of the communication line.

DIP-SWITCHES			
SW1	All DIP switches in OFF position.  For further information, refer to the USER MANUAL.		
SW2	RS232 or RS485 settings on terminals 10-11-12 (COM2 serial port)		
	RS232	**ON**	
	RS485	**OFF**	

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CONFIGURATION OF FACTORY SETTINGS

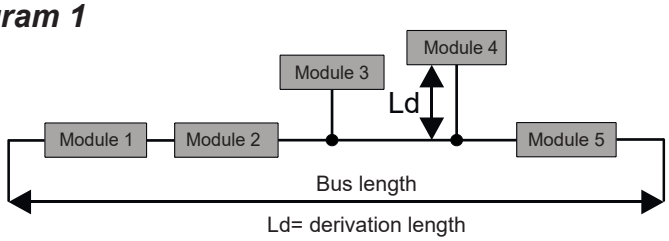
All DIP-switches in	OFF
Communication parameters of ModBUS protocol: RS485 and RS482/232 ports	38400, 8, N, 1 Address 1
Communication parameters of micro USB port	115200, 8, N, 1 Address 1
Analogue Input 1-2	VOLTAGE

ModBUS CONNECTION RULES

1) Install the modules in the DIN rail (120 max)
2) Connect the remote modules using cables of an appropriate length. The following table shows cable length data:
- Bus length: maximum length of the Modbus network according to the Baud Rate. This is the length of the cables that connect the two farthest modules (see Diagram 1).
- Derivation length: maximum length of a derivation 2 m (see Diagram 1).

Diagram 1

Bus length	Derivation length
1200 m	2 m



For maximum performance, it is recommended to use special shielded cables, such as BELDEN 9841.

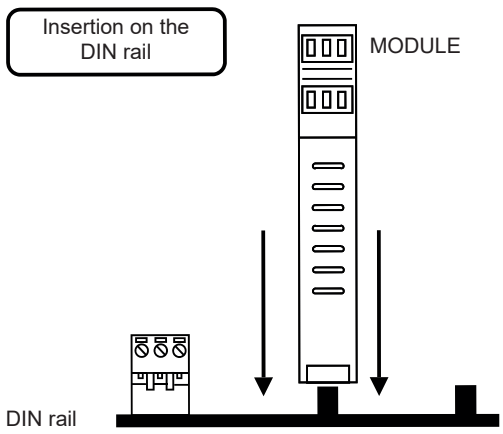
INSTALLATION REGULATIONS

The module has been designed for vertical installation on a DIN 46277 rail. For optimal operation and long life, adequate ventilation must be provided. Avoid positioning ducting or other objects that obstruct the ventilation slots. Avoid mounting modules over heat-generating equipment. Installation in the bottom part of the electrical panel is recommended.

Insertion in the DIN rail

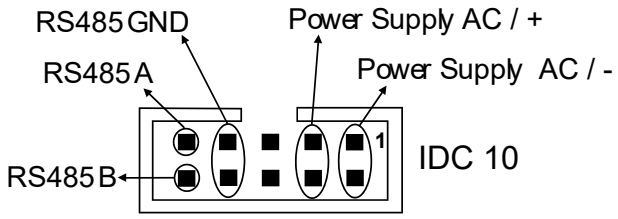
As shown in figure:

1. Insert the IDC10 rear connector of the module on a free slot of the DIN rail (the insertion is univocal since the connectors are polarized).
2. To secure the module to the DIN rail, tighten the two hooks on the sides of the IDC10 rear connector.

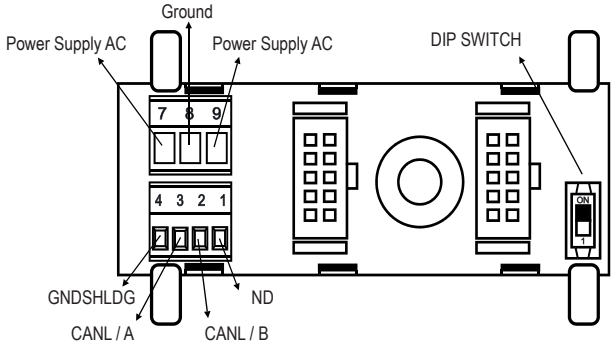


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Power supply and Modbus interface are available using the Seneca DIN rail bus, via the IDC10 rear connector, or the Z-PC-DINAL-17.5 accessory.



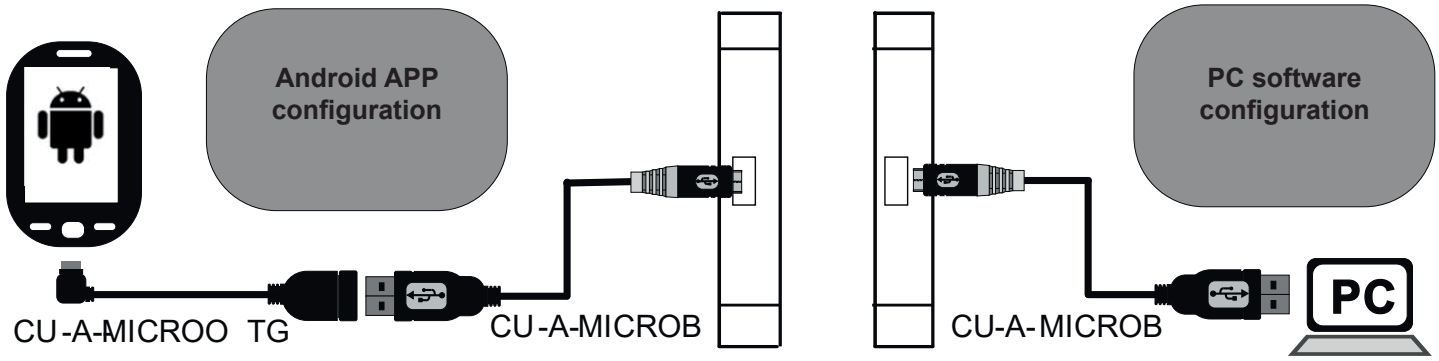
Back connector (IDC 10)
The illustration shows the meanings of the various IDC10 connector pins if signals are to be sent via them directly.



Z-PC-DINAL2-17.5 accessory use
If the Z-PC-DINAL2-17.5 accessory is used, signals can be sent via terminal boards. The illustration shows the meaning of the various terminals and DIP-switch position (found in all supports for the DIN rail listed in Accessories) for the termination of the CAN network (not used for the Modbus network).
GNDSHLD:
Connection cable signal protection shield (recommended).

USB PORT

The module is designed to exchange data according to the modes defined by the MODBUS protocol. It has a micro USB connector and can be configured using applications and/or software programs. The USB serial port uses the following communication parameters: **115200,8,N,1**
The USB communication port responds exactly like the RS485 or RS232 ports with the exception of the communication parameters.
EASY SETUP is the software to use for the configuration.
For further information go to the following website:
www.seneca.it/products/ze-4di-2ai-2do - www.seneca.it/products/z-4di-2ai-2do - www.seneca.it/products/ze-2ai



Check that the device in question is included in the list of products supported by the Easy Setup APP in the store.

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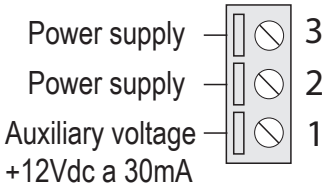
ELECTRICAL CONNECTIONS

Attention: the upper power supply limits must not be exceeded, as this might cause serious damage to the module.

To meet the electromagnetic immunity requirements:

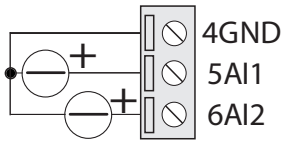
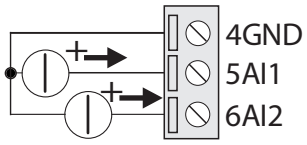
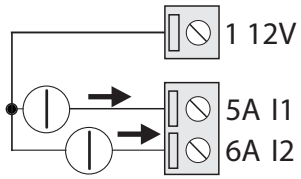
- use shielded signal cables;
- connect the shield to a preferential instrumentation earth system;
- separate shielded cables from other cables used for power installations (transformers, inverters, motors, induction ovens, etc...).

POWER SUPPLY

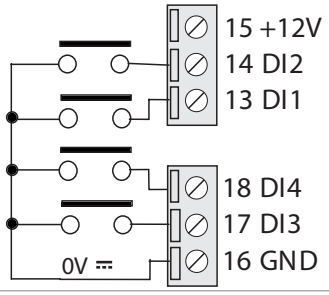


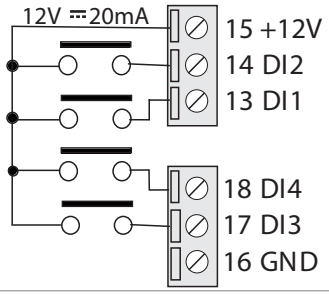
The power supply is connected to terminals 2 and 3.
The supply voltage must be between:
11 and 40Vdc (indifferent polarity), or between 19 and 28 Vac.
The power supply source must be protected from any failures in the module by means of a suitably sized fuse.

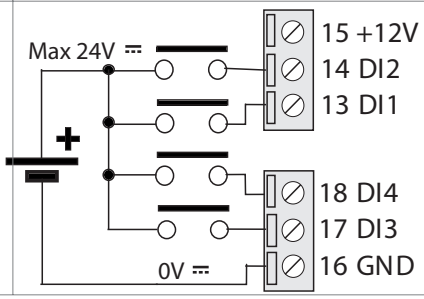
ANALOGUE INPUTS

Voltage	Active sensor current (4 wires)	Passive sensor current (2 wires)	
			The module has two analogue inputs that can be configured via software as voltage or current. For the configuration software, see the user manual

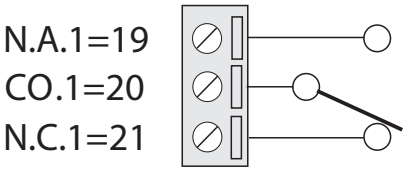
DIGITAL INPUTS (ONLY ZE-4DI-2AI-2DO and Z-4DI-2AI-2DO)

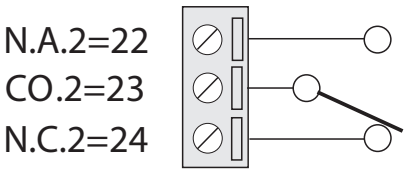






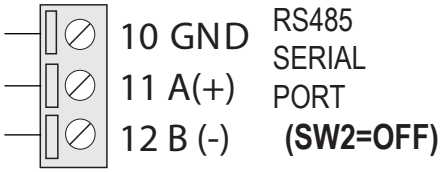
DIGITAL OUTPUTS (ONLY ZE-4DI-2AI-2DO and Z4DI-2AI-2DO)

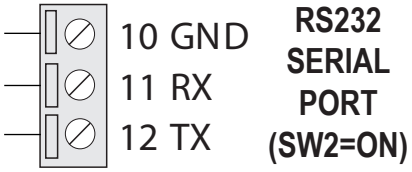




The has two digital outputs with free contacts.
The two figures show the internal relay contacts available.

COM2 SERIAL PORT

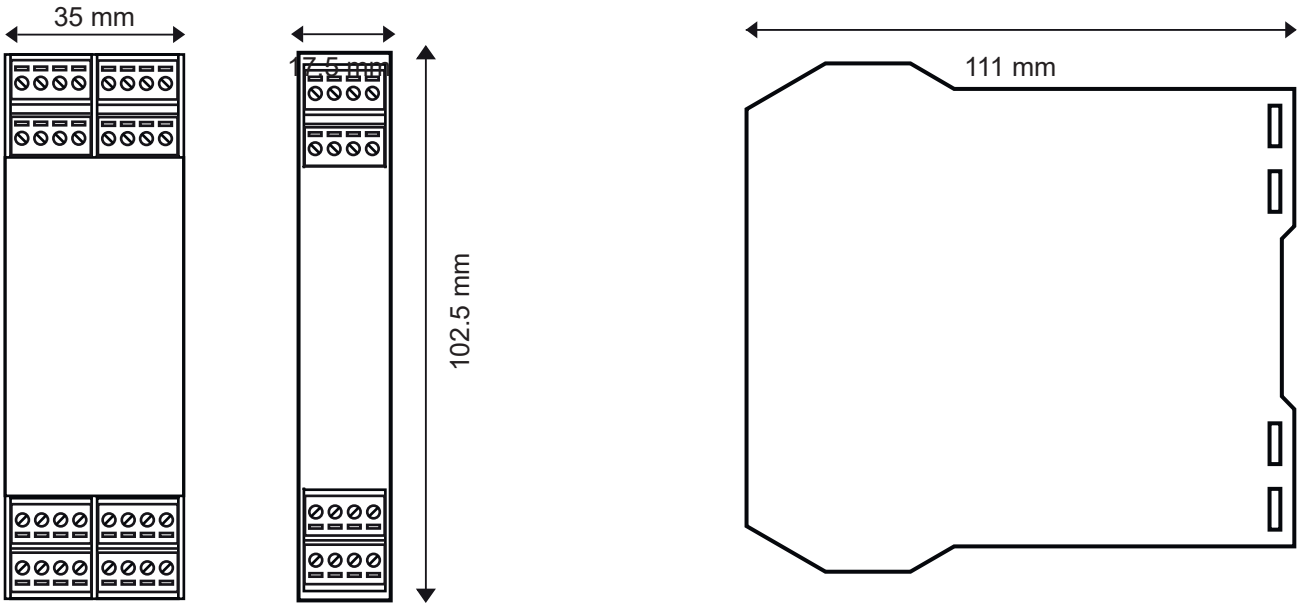




The module has a COM2 port configurable via the SW2 switch on terminals 10 -11-12

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MODULE LAYOUT



Single module dimensions LxHxD: 17.5 x 102.5 x 111 mm; **Weight:** 110 g; **Enclosure:** PA6, black

Double module dimensions LxHxD: 35 x 102.5 x 111 mm; **Weight:** 110 g; **Enclosure:** PA6, black

LED SIGNALS ON THE FRONT PANEL (ZE-4DI-2AI-2DO)

LED	STATUS	MEANING
IP/ PWR (Green)	ON	Module powered and IP address acquired
IP/ PWR (Green)	Flashing	Powered module. Waiting for IP address from DHCP server
Tx/ Rx (Red)	Flashing	Transmission and reception of data on at least one Modbus port: port COM 1, port COM 2
ETH TRF (Green)	Flashing	Packet transmission on Ethernet port
ETH LNK (Yellow)	ON	Ethernet port connected
DI1, DI2, DI3, DI4 (Red)	On / Off	Status of digital input 1, 2, 3, 4
DO1, DO2 (Red)	On / Off	Status of output 1, 2
FAIL (Red)	Flashing	Outputs in fail condition

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LED SIGNALS ON THE FRONT PANEL (Z-4DI-2AI-2DO)

LED	STATUS	MEANING
PWR (Green)	ON	Module powered
Tx/ RX (Red)	Flashing	Transmission and reception of data on at least one Modbus port: port COM 1, port COM 2
DI1, DI2, DI3, DI4 (Red)	On / Off	Status of digital input 1, 2, 3, 4
DO1, DO2 (Red)	On / Off	Status of output 1, 2
FAIL (Red)	Flashing	Outputs in fail condition

LED SIGNALS ON THE FRONT PANEL (ZE-2AI)

LED	STATUS	MEANING
IP/ PWR (Green)	ON	Module powered and IP address acquired
IP/ PWR (Green)	Flashing	Powered module. Waiting for IP address from DHCP server
FAIL (Red)	ON	At least one of the two analogue inputs is out of scale (underscale-overscale)
ETH TRF (Green)	Flashing	Packet transmission on Ethernet port
ETH LNK (Yellow)	ON	Ethernet port connected
Tx1 (Red)	Flashing	Modbus packet transmission from device to port COM 1
Rx1 (Red)	Flashing	Modbus packet transmission to port COM 1
Tx2 (Red)	Flashing	Modbus packet transmission from device to port COM 2
Rx2 (Red)	Flashing	Modbus packet transmission to port COM 2

CONTACT INFORMATION

Technical support	support@seneca.it	Product information	sales@seneca.it

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