



# INSTALLATION GUIDE

Language manual	English
Product	<b>Z-4DI-2AI-2DO</b>
Description	<b>4 digital in - 2 analog in - 2 relay digital out Modbus RTU</b>

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## 1.0 DISCLAIMER



Before executing any operation it's mandatory to read all the content of this user manual. Only electrical-skilled technicians can use the module described in this user Manual; it is responsibility of the manufacturer to verify that the installation complies with safety standards.



Only the Manufacturer is authorized to repair the module or to replace damaged components.



No warranty is guaranteed in connection with faults resulting from improper use, from modifications or repairs carried out by Manufacturer-unauthorised personnel on the module, or if the content of this user Manual is not followed.



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## 2.0 DESCRIPTION AND GENERAL FEATURES

### 2.1 Description

Module with 4 digital inputs, 2 analog inputs, 2 relay outputs, slave for Modbus RTU, on two RS485 serial ports.

### 2.2 General features

- Possibility to set the parameters via USB (Easy setup software)
- Replica of the Modbus registers on RTU protocol (NR.2 independent RS485 slave ports)
- Baud rate for ModbusRTU: 1200 baud up to 115200 baud
- Configuration of two analog inputs: voltage or current
- Configuration of four digital inputs: NPN or PNP. **4 counters and 4 totalizers @ 32 bits, max 5 kHz, backed up (not volatile FERAM)**
- Configuration of two relay outputs:fail management if there is no Modbus communication
- 1500 Vac galvanic isolation between power supply and communication
- Quick installation on DIN 46277 rail
- Removable screw terminals with section of 2.5 mm<sup>2</sup>

## 3.0 TECHNICAL SPECIFICATIONS

### 3.1 General specifications

Power supply	19.. 28 Vac (50..60 Hz), 11.. 40Vdc
maximum power consumption	3,5 W
Isolation	1500 vac

### 3.2 COM RS485

Maximum Baud rate	115 k
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Connection	Screw terminals (M10, M11, M12): port 2, or IDC10 (rear connector): port 1
<b>3.3 Digital input</b>	
Number of channels	4
Input type	PNP, NPN
Voltage supply	12 Vdc
Current supply	20 mA
Max frequency	5 kHz
Current consumption	3 mA
<b>3.4 Digital output</b>	
Number of channels	2
Input type	Relay, free contact (SPDT)
Max voltage	250 Vac
Max current	2 A
<b>3.5 Analog input</b>	
Number of channels	2
Input type; resolution	mA/ Vdc, configurable; 16 bit
Voltage / current input	0..30 Vdc / 0..20 mA, accuracy 0,1% of the end scale
Input protection	Yes, 40 Vdc or 25 mA
Sampling time	Configurable, from 1 to 300 ms
<b>3.6 Environmental conditions</b>	
Temperature	-20 °C.. +70 °C
Humidity	30 ..90% a 40 °C no condensing
Storage temperature	-25 .. +85°C
<b>3.7 Box</b>	
Dimensions	100 x 35 x 111 mm
Box; protection degree	Black, PA6, IP20
<b>3.8 Connectors</b>	
Connectors	IDC 10 for Seneca bus
	Removable terminals, pitch 5,08 mm
	Mini-B USB
<b>3.9 Standars</b>	
EN 61000-6-4/ 2007	Emission, industrial environmental
EN 61000-6-2/ 2005	Immunity, industrial environmental
EN 61010-1/ 2001	Safety

## 4.0 PRELIMINARY INSTRUCTIONS FOR USE

The module is designed to be installed on DIN 46277 rail (fig. 1) in vertical position.



No operation on the module is allowed while it is power on.  
**It is forbidden** to install the module near heat-emitting devices



It is recommended that the use and installation operations are performed by an electrical-skilled technician

## 5.0 INSTALLATION

To install/remove the module on/from DIN 46277 rail, execute the following operations (Fig.1a and Fig.1b)

### 5.1 Installation on/removal from DIN 46277 rail

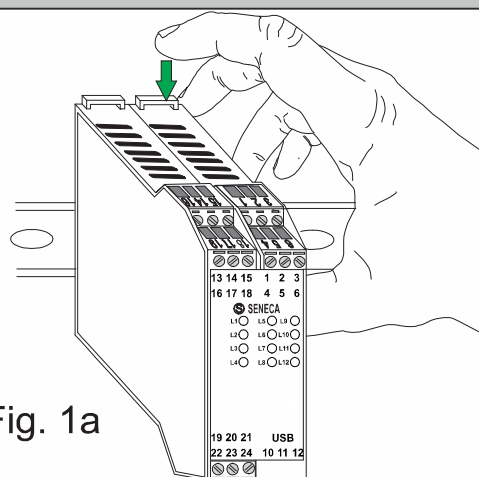


Fig. 1a

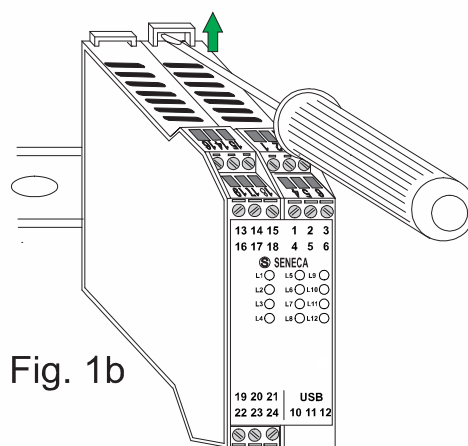


Fig. 1b

#### INSTALLATION

- 1) Pull the four latches (placed in the back-side panel) outwards;
- 2) insert the module in a DIN rail free slot;
- 3) make sure that the IDC10-connector pins are inserted on the slot correctly;
- 4) press the four latches inwards.

#### REMOVAL

- 1) Pull the four latches (placed in the back-side panel) outwards, using a screwdriver;
- 2) pull out the module gently.

It's important to insert the pins on the slot correctly because IDC10-connector is polarized; this connection is facilitated by use of a female/male insertion between IDC10 connector and DIN rail slot (Fig 1c and Fig 1d).

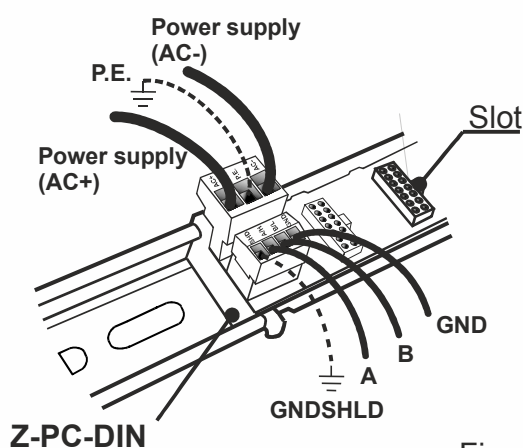
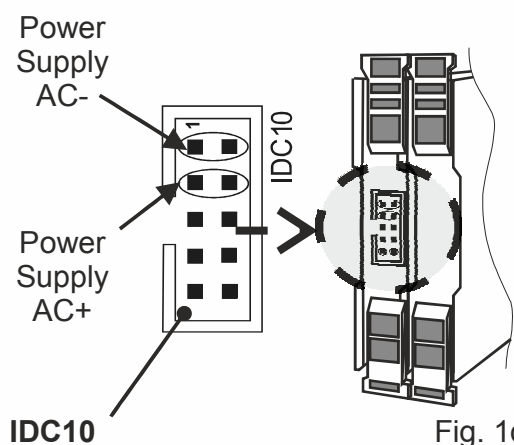


Fig. 1c



# 6.0 ELECTRICAL CONNECTIONS

## 6.1 Terminals

Description	Analog Inputs		Auxiliary Voltage	Power supply	Screw terminals
	V/I [2]	V/I [1]			
<p><b>Analog inputs (V/mA)</b> are configurable with <b>configuration software</b>.</p> <p>* Using the software <b>Easy Setup</b></p>	<p>Configurable*</p>		<p>①</p> <p>12 Vdc @ 40 mA</p>	<p>11..40 Vdc 19..28 Vac</p>	<p>1 [+12 Vdc] 2 3 4 [Gnd] 5 [AI 1] 6 [AI 2]</p>

Screw terminals	Digital inputs <b>NPN</b>				Digital inputs <b>PNP</b>				Auxiliary Voltage.
	1	2	3	4	1	2	3	4	
DI1 13 DI2 14 12Vdc 15 GND 16 DI3 17 DI4 18									<p>②</p> <p>+12 Vdc @ 20 mA</p>

Screw terminals	RS485 Communication port #2
10 11 12	GND, RS485 Port #2 A, RS485 Port #2 B, RS485 Port #2

Digital Outputs		Screw terminals
DO [2]	DO [1]	
	N.Open Common N.Close	19 20 21
N.Open Common N.Close		22 23 24

**FAIL MODE ENABLED** (see software Easy)

If there is no Modbus communication through all ports (port 1 RTU, port 2 RTU) for a time greater than «timeout to start fail», it follows that:

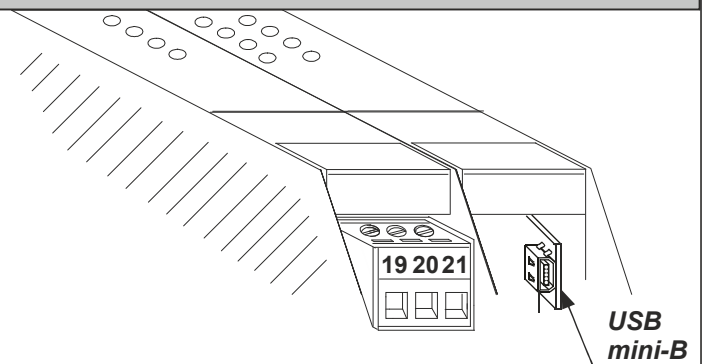
- relay outputs switch, in the state configured on software Easy
- the LED PWR starts to blink, to signal the fail condition.

In this condition, if Modbus communication returns through at least one of the two ports, the outputs remain at the previous state and the LED PWR returns in the status of constant light.

## 6.2 USB

USB port with mini-B plug-in for a easy PC connection.

This port allows to use the Easy setup configuration software to configure the module or update firmware (free download from [www.seneca.it](http://www.seneca.it)).



## 7.0 CONFIGURATION AND SETTINGS

### 7.1 Dip-Switch

In the following tables: box without circle means Dip-Switch=0 (OFF state); box with circle means Dip-Switch=1 (ON state).

1	2	BAUD RATE RS485 #1-#2	3	4	5	6	7	8	ADDRESS RS485 #1 - #2
		9600							Baud Rate and Address are retrieved from EEprom(*)
	●	19200						●	ADD # 1
●		38400					●		ADD # 2
●	●	57600					●	●	ADD # 3
						●			ADD # 4
						●		●	ADD # 5
						●	●		ADD # 6
						●	●	●	ADD # 7
					●				ADD # 8
					●			●	ADD # 9
					●		●		ADD # 10
					...	...	...	...	...
				...	...	...	...	...	...
			●	●	●	●	●	●	ADD # 63

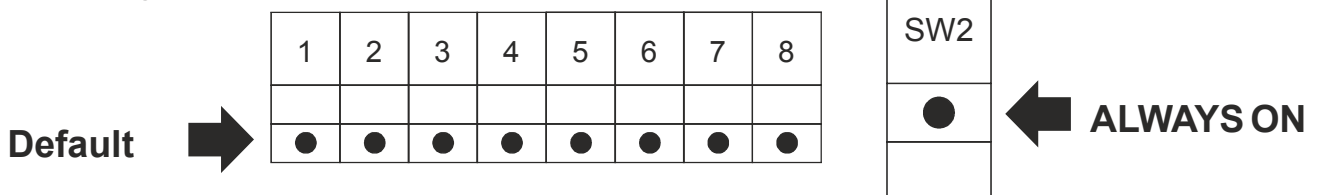
(\*) For two RTU ports, it is possible to assign a baudrate and an address different from each other using Easy setup software. In this case, all switch 1..8 must be in OFF.

Unchangeable parameters from dip-switch: DATA: 8 bit, PARITY NONE, 1 STOP bit

**For both RS485 ports, default parameters are: 38400 baud, 8N1**

(from EEPROM).

**IMPORTANT: the dip-switch SW2 placed at the right of the switch number 8 must be always in position ON!**



### 7.2 Easy Setup

The configuration software (Easy setup) can be free downloaded from the website [www.seneca.it](http://www.seneca.it).

## 8.0 SIGNALLING LEDs

LED	STATE	MEANING
Tx (GREEN)	Blinking	The device sends a correct data packet
Rx (RED)	Blinking	The device receives a correct data packet (at least one of two buses)
DI1, DI2, DI3, DI4 (REDS)	ON / OFF	Status of digital input 1, 2, 3, 4
DO1, DO2 (REDS)	ON / OFF	Status of relay output 1, 2
PWR (GREEN)	Fixed	The module is power on
PWR (GREEN)	Blinking	Outputs in fail (there is no Modbus communication)

## 9.0 ACCESSORIES

CODE	DESCRIPTION	
Z-PC-DIN	AL1-35	DIN rail support with screw terminals P=35 mm
	AL2-17,5	DIN rail support with screw terminals P=17,5 mm
Z-PC-DIN	1-35	DIN 1 slot support for rear connector P=35 mm
	2-17,5	DIN 2 slot support for rear connector P=17,5 mm
	4-35	DIN 4 slot support for rear connector P=35 mm
	8-17,5	DIN 8 slot support for rear connector P=17,5 mm



Disposal of Electrical & Electronic Equipment (Applicable throughout the European Union and other European countries with separate collections programs). This symbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical & electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of the product, please contact your local city office, waste disposal service of the retail store where you purchased this product.

