INSTALLATION MANUAL

Z-4AI

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**: Before operating, read this document thoroughly and retain it for future reference. Non-respect of these instructions may reduce performances and safety of the devices and cause danger for people and property. The products must be installed, operated, serviced and maintained by qualified personnel in compliance with applicable standards and regulations. Don't open the device, it does not contain replaceable components, the tripping of the internal fuse (if included) is caused by an internal failure. Don't repair or modify the device, if malfunction or failure should occur during operation, send unit to the factory for inspection. No responsibility is assumed by SENECA for any consequences deriving from the use of this material.
	The module must be repaired 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.

DOCUMENTATION
Z-4AI

SENECA

QUALITY MANAGEMENT SYSTEM
ISO 9001:2015

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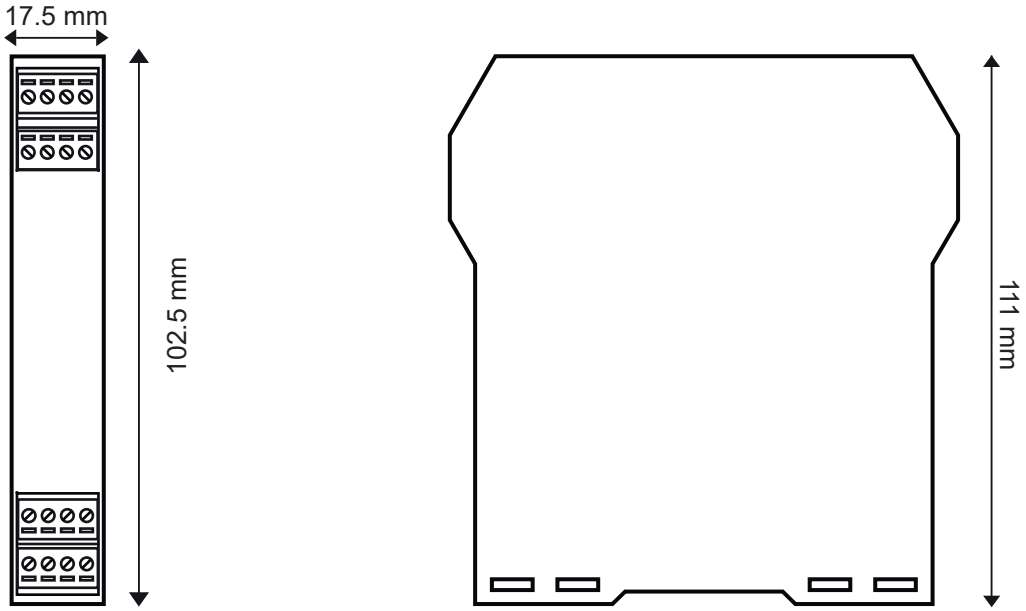
CONTACT INFORMATION

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MODULE LAYOUT

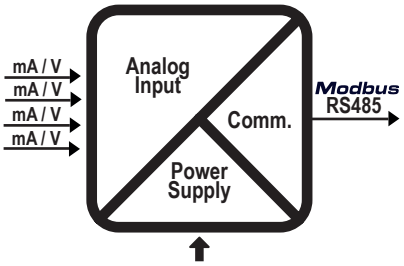


Dimensions LxHxD: 17.5 x 102.5 x 111 mm; **Weight:** 110 g; **Enclosure:** PA6, black

SIGNALS VIA LED ON FRONT PANEL

LED	STATUS	LED meaning
PWR Green	ON	The device is powered correctly
FAIL yellow	Flashing	Anomaly or fault
RX Red	Flashing	Receipt of packet completed
RX Red	ON	Anomaly / Check connection
TX Red	Flashing	Transmission of packet completed

TECHNICAL SPECIFICATIONS

CERTIFICATIONS	CE UKCA c UL us LISTED 3LUT
INSULATION	 **WARNING** the maximum working voltage between any terminal and ground must be less than 50Vac / 75Vdc — **1500 V~**
ENVIRONMENTAL CONDITIONS	*Temperature:* -25 ÷ + 65°C; *Humidity:* 30% ÷ 90% non condensing. *Altitude:* Up to 2000 m above sea level; *Storage temperature:* -30 ÷ + 85° *Protection rating:* IP20 (not UL evaluated) Open Type;.
ASSEMBLY	IEC EN60715, 35mm DIN rail in vertical position.
CONNECTIONS	3-way removable screw terminals, pitch 5 mm Rear connector IDC10 for DIN bar 46277 front micro USB
POWER SUPPLY	Voltage: 11 ÷ 40Vdc; 19 ÷ 28Vac 50 ÷ 60Hz; Absorption: Typical: 0.5W @ 24Vdc, Max: 3.5W Supplied with limited energy according to UL 61010-1 3rd Ed, section 9.4 or LPS in conformance with UL 60950-1 or Class 2 in compliance with UL 1310 or UL 1585 Pollution degree 2 Overvoltage category II

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INPUTS	
Voltage input:	Bipolar with F.S. programmable at +2Vdc and +10Vdc Input impedance >100kOhm
Current input:	Bipolar with F.S. Programmable at +20mA with 50Ohm internal shunt selectable via DIP-switch. Available power supply: 90 + 90mA at 13Vdc.
Number of channels:	4
Input resolution:	15 bit + sign.
Input protection:	± 30Vdc or 25mA
Voltage and current precision:	Starting: 0.1 % of full scale Linearity: 0.03% of scale. Zero: 0.05% of scale. TC: 100 ppm, EMI: <1 %
Sampling time	120ms/channel or 60ms/channel
Measurement update times	- 250ms for 4 channels with ADC speed 1 sample every 60ms - 500ms for 4 channels with ADC speed 1 sample every 120ms
Filter	configurable from 0 to 6

CONFIGURATION OF FACTORY SETTINGS

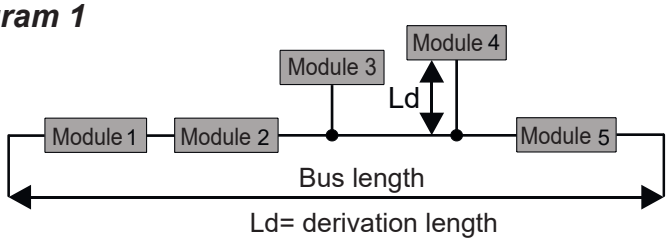
All DIP-switches in	OFF
Communication parameters of ModBUS protocol:	38400 8, N, 1 Address 1
Communication parameters of micro USB front port	2400 8, N, 1 Address 1
Channel input from 1 to 4	VOLTAGE ± 10 Vdc
Numerical representation of the input measurement:	± 10000 mV
Sampling time:	120 ms

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).

Bus length	Derivation length
1200 m	2 m

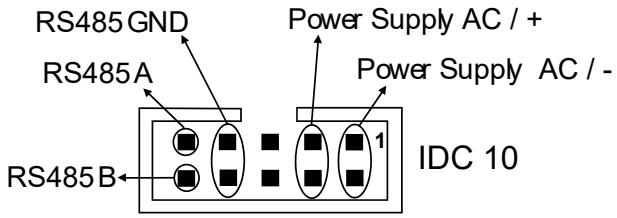
Diagram 1



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

IDC10 CONNECTOR

Power supply and Modbus interface are available using the Seneca DIN rail bus, via the IDC10 rear connector, or the Z-PC-DINAL2-17.5 accessory.



Rear Connector (IDC 10)
The meaning of the various pins on the IDC10 connector is shown in the figure if you wish to supply signals directly via it.

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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	• • • • • • • •	#...		
- - - - - - - -	57600		#63		
- -	From EEPROM		From EEPROM		

Note: When DIP switches 3 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.
The settings of the dip-switches must be compatible with the settings on the registers.
The description of the registers is available in the USER MANUAL.

ANALOGUE INPUT SETTING VIA DIP-SWITCH:

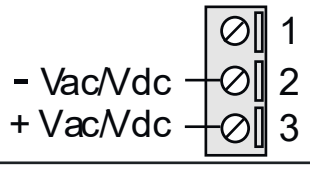
DIP-Switch SW2 defines the type of input for each individual channel.
Channels 1 to 4 can be set in current or voltage.
For the settings, refer to the SW2 table on the side.

SW2 ANALOGUE INPUTS		
	ON	CURRENT INPUT
	OFF	VOLTAGE INPUT

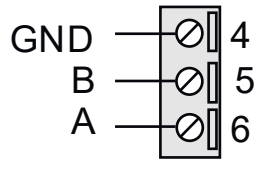
ELECTRICAL CONNECTIONS

⚠ CAUTION
Use AWG size 30-12 or two 24-16, torque 5 lb in. (For UL approval)

⚠ CAUTION
Minimum temperature rating of the cable to be connected to the field wiring terminals, 80°C

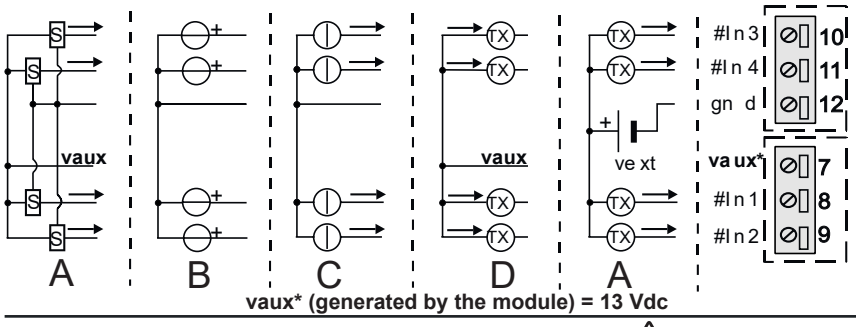


Power supply
The upper limits must not be exceeded as this can seriously damage the module.
If the power supply source is not protected against overload, a safety fuse with a 2.5A max permissible value must be installed in the power supply line.



ModBus RS485
Connection for RS485 communication using the MODBUS master system as an alternative to the Z-PC-DINx bus.
N.B. The indication of the RS485 connection polarity is not standardised and in some devices may be inverted.

INPUTS



vaux* (generated by the module) = 13 Vdc

A) Voltage input with sensor supply from the MODULE (13 Vdc)
B) Voltage input with sensor supply NOT coming from the MODULE
C) Current input with sensor supply NOT coming from the MODULE
D) Current input with sensor supply from the MODULE (13 Vdc)
E) Current input with EXTERNAL sensor supply

⚠ ATTENTION

The upper power supply limits must not be exceeded, as this might cause serious damage to the module. Switch the module off before connecting inputs and outputs.
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 (inverters, motors, induction ovens, etc...).
- make sure that the module is not supplied with a supply voltage higher than that indicated in the technical specifications in order not to damage it.

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