

Z-PC Line

Z-4AI

4 ANALOG INPUT voltage-current with Modbus RS485

Installation Manual

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GENERAL SPECIFICATIONS

- Voltage or current inputs with programmable range: ± 2 Vdc, ± 10 Vdc and ± 20 mA with 16 bits resolution.
- **NEW** module auxiliary power supply can be supplied to all 4 current loop at the same time.
- **NEW** Modbus address and Baud rate can be set through DIP-switches.
- Sampling time for all channel at 240 ms or 480 ms.
- Current input with internal shunt can be imposed through DIP-switch.
- 1500 Vac output isolation compared with other low voltage circuits.
- Easy connections for power supply and serial communication by seneca bus that can be mounted on standard DIN 46277 rail.
- Removable terminals with section of 2.5 mm².
- RS485 serial communication with Modbus-Rtu protocol, maximum 64 nodes.
- Module insertion or extraction from seneca bus without interruption for serial communication and power supply.
- Connection distance up to 1200 m.
- RS232 communication with jack 3,5 mm connector on frontal.

TECHNICAL FEATURES

Inputs	
Voltage inputs	Bipolar with programmable FS at ± 2 Vdc, or ± 10 Vdc; input impedance: >100 k Ω
Current inputs	Bipolar with programmable FS at ± 20 mA. The 50 Ω internal shunts are selected throughh DIP-switches. Available power supply at 90 mA, 13 V
Number of input channel	4
Protection inputs	± 30 Vdc or 25 mA
Inputs resolution	15 bit + 1 bit sign.
Voltage and current accuracy	Initial: 0.1% of full scale, Linearity: 0.03% of range. Zero: 0.02% of range. TC: 100 ppm EMI: 0.02 %
Sampling Time	120 ms / channel o 60 ms / channel

Power supply	
Voltage	10 ..40 Vdc 19 ..28 Vdc @ 50 ..60 Hz
Consumption	Typical: 1.5 W, Maximum: 2.5 W
Environmental condition	
Temperature	-10 ..+65°C
Humidity	30 ..90% a 40°C not condensing
Storage Temperature	-20 ..+85°C
Degree protection	IP20

Connections	
Connections	Removable 3-way screw terminals, 5,08 pitch Rear IDC10 connector for DIN 46277 rail Frontal jack 3.5 mm

Box / Dimensions	
Dimensions	L: 100 mm; H: 112 mm; W: 17,5 mm
Box	PBT, Black

Isolations 1500 V

Standards

The module is conforming to the following regulations:

EN61000-6-4/2002 (electromagnetic emission, industrial environment).

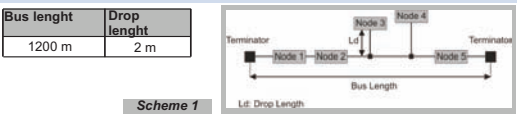
EN61000-6-2/2006 (electromagnetic immunity, industrial environment)

EN61010-1/2001 (safety). All circuits must be isolated from the other circuits under dangerous voltage with double isolation. The power supply transformer must comply with EN60742: "Isolated transformers and safety transformers".

SUPPLEMENTARY NOTE FOR USE:
Use in environment with 2 or less pollution degree.

MODBUS CONNECTIONS

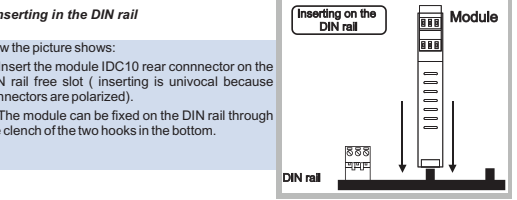
- 1) Connect the module into the DIN rail (max 120)
- 2) Use a cable with a suitable length to connect the remote modules. In the following table there are data relative to:
 - Maximum length of the Modbus bus: It defines the connection length between two modules that have bus terminator dip switch on. (see scheme 1).
 - Drop length: Maximum length of branch (see scheme 1).



For the maximum performances it's recommended to use a specific shielded cable, for example BELDEN 9841.

INSTALLATION

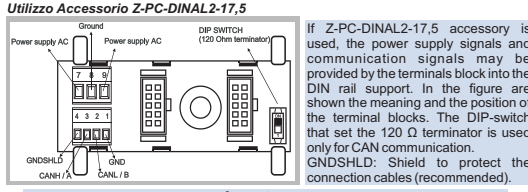
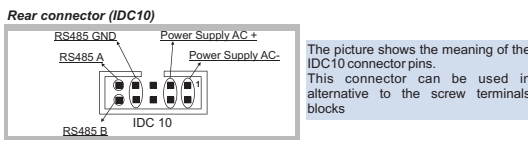
The module is designed to be installed, in vertical position, on DIN 46277 rail. For the best module performance and duration, avoid to place cables raceways and other objects that could obstruct ventilation slits. Never install the modules near heat sources. The module installation is adviced in the bottom of the control panel.



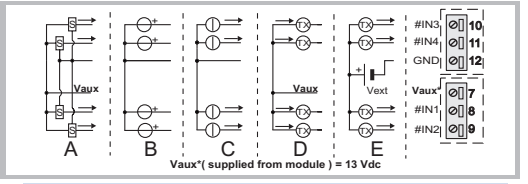
ELECTRICAL CONNECTIONS

Power supply and Modbus interface

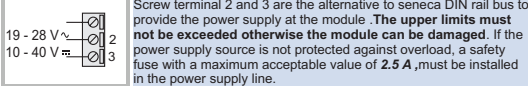
Power Supply and Modbus interface are available by using the bus for the Seneca DIN rail, by the rear IDC10 connector or by Z-PC-DINAL2-17.5 accessory.



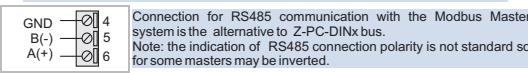
- ### Input
- A) Voltage input with sensor's power supply from MODULE (13 Vdc)
 - B) Voltage input with sensor's power supply NOT from MODULE
 - C) Current input with sensor's power supply NOT from MODULE
 - D) Current input with sensor's power supply from MODULE (13 Vdc)
 - E) Current input with external power supply for sensor.



Power supply



RS485

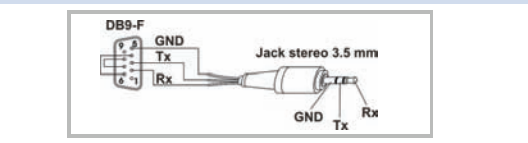


RS232

RS232 port can be used to communicate and also to program the module. Z-NET or EASY Z-PC are the Seneca configuration softwares. RS232 communication use the following communication parameters:

2400,8,N,1

RS232 and RS485 port use the same Modbus protocol. When RS232 communication is established, the serial RS485 bus network will be not enable. The RS485 port will return automatically active some seconds after the last data packed received from RS232 port. The 3,5 mm DB9 jack stereo connector for RS232 communication can either be assembled as indicated in the following figure or purchased as an accessory (cod. PM001601).



DIP-SWITCHES SETTING

The DIP-switches positions defines the Modbus communication parameter: Address and Baud rate. In the following table the Baud rate and address value are listed as a function of the DIP-switches position:

DIP-switches table			
POSITION	BAUD RATE	POSITION	ADDRESS
00xxxxxxx	9600	xx00001xx	# 1
01xxxxxxx	19200	xx000010xx	# 2
10xxxxxxx	38400
11xxxxxxx	57600	xx11111xx	# 63

POSITION	BAUD RATE	POSITION	ADDRESS
xx000000	From EEprom	xx000000	From EEprom

Note: when DIP-switches from 3 to 8 are OFF, communication parameters are retrieved from EEprom
 Note 2: The termination of RS485 communication must be enabled only to the end of the communication line.

DIP-switches for inputs setting

CHANNEL	VOLTAGE	CURRENT
CH1	0000XXXX	1000XXXX
CH2	0000XXXX	0100XXXX
CH3	000XXXXX	0010XXXX
CH4	000XXXXX	0001XXXX

KEY
 ON

The DIP-switches inputs setting must be compatible with the Modbus register setting. The description of Modbus registers are available in the USER MANUAL.

MODBUS REGISTER AND LED SIGNALLINGS

Holding register

Register	Name	Description
40017	NCH 1	Measured value of channel with scale ± 10000 normalized.
40018	NCH 2	See before.
40019	NCH 3	See before.
40020	NCH 4	See before.

LEDs signalling

LED	STATE	Meaning of LEDs
PWR	On	Power supply presence.
FAIL	Blinking	Error settings.
RX	Blinking	Received data.
	On	Error connection.
TX	Blinking	Received data.

FACTORY SETTING AND ADVANCED SETTING

Factory settings

- Tutti i DIP-switch in OFF.**
- Modbus protocol: - Communication parameters: 38400 8,N,1 Addr. 1
 - Input channel 1 : VOLTAGE ± 10 V
 - Input channel 2 : VOLTAGE ± 10 V
 - Input channel 3 : VOLTAGE ± 10 V
 - Input channel 4 : VOLTAGE ± 10 V
 - Measure NCH representation : ± 10000
 - Signal sampling time : 120 ms for channel

Advanced settings

- Input channel can be set in current or voltage.
- Possibility to set the representation of the measure in range with value: IS (start scale) ES (end scale) : ± 10000 mV and 0 ..20000 μ A.
- Possibility to set the representation of the measure with normalized value.
- Signal sampling time can be set at 60 ms or 120 ms.
- Possibility to set a filters for the inputs measured

Variations of standard parameters are possible by using configuration softwares Z-NET and EASY-Z-PC (www.seneca.it). For more information about a list of all register and their function consult the USER manual

