SENECA

Z-PC Series

CANopen Modbus

EN

# ZC-4RTD

CANopen I/O Module

4 RTD/Ohmeter converter

## Installation Manual

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## General Secifications

| | |
|---|---|
| HW | ✓ 4 isolated RTD inputs<br>✓ 2, 3, 4 wires measurement<br>✓ RTD type: PT100, PT500, PT1000, NI100<br>✓ 1500Vac isolations between 6 zones (4 inputs, power, CAN)<br>✓ Inputs protected against 4KV ESD |
| SW | ✓ 3 different acquisition speeds<br>✓ A/D resolution: 13 or 14 bit<br>✓ Rejection programmable at 50 or 60 Hz<br>✓ Programmable value in case of fault or freezing of last reading<br>✓ Measurements available in: floating-point (MSW e LSW), integer (16 bit), tenths of degree, tenths ohms e hundredths ohms. |
| Comm | ✓ CAN Interface with CANopen protocol: up to 1 Mbps speed.<br>✓ CANopen Baud rate and Node ID configurability by DIP-switches or software.<br>✓ Node guarding or heartbeat<br>✓ RS232 Serial Communication with MODBUS-RTU protocol<br>✓ Complete configurability through specific software downloadable in the website www.seneca.it |

## Technical Specifications

| POWER | |
|---|---|
| Voltage | 10 – 40 V DC o 19 – 28 V AC (50 – 60Hz) |
| Consumption | Max 1.0W |

| PT100 - EN60751/A2 (ITS-90) input | | PT1000 - EN60751/A2 (ITS-90) input | |
|---|---|---|---|
| Measuring Range | -200°C +600°C | Measuring Range | -200°C +210°C |
| Resistance Range | 18.5Ω - 330Ω | Resistance Range | 185Ω - 1800Ω |
| Fault signalling | Rx < 18Ω; Rx > 341Ω | Fault signalling | Rx < 180Ω; Rx > 1851Ω |
| Current on sensor | 875 uA nom. | Current on sensor | 333uA nom |
| **PT500 - EN60751/A2 (ITS-90) input** | | **NI100 input** | |
| Measuring Range | -200°C +750°C | Measuring Range | -60°C +250°C |
| Resistance Range | 92.5Ω - 1800Ω | Resistance Range | 69Ω - 295Ω |
| Fault signalling | Rx < 90Ω; Rx > 1851Ω | Fault signalling | Rx < 60Ω; Rx > 301Ω |
| Current on sensor | 333 uA nom | Current on sensor | 875uA nom |
| Cables resistance | 30Ω MAX each | Cables resistance | 30Ω MAX each |
| Cables resistance | 20Ω MAX each | Cables resistance | 30Ω MAX each |



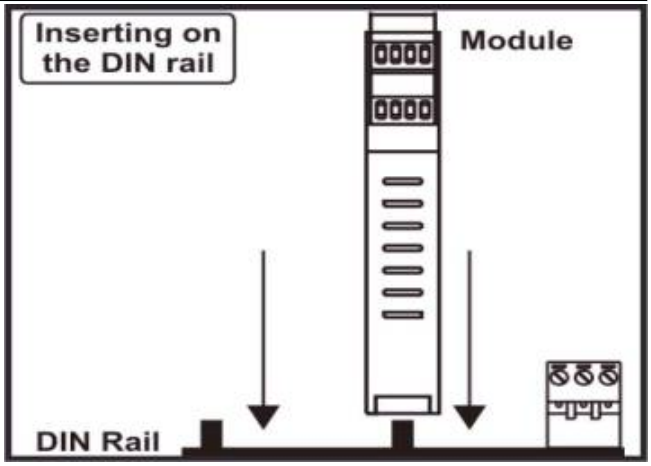
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| CONVERSION / PRECISION SPECIFICATIONS | |
|---|---|
| ADC | 13 o 14 Bit |
| Class / Base Precision | 0.05 |
| Calibration Precision | 0.04% |
| Linearity | 0.025% |
| Thermal drift | < 50 ppm/°C |
| Sampling frequency | Da 11 Hz a 48 Hz |
| Interference rejection | 50 Hz or 60 Hz |
| **ENVIRONMENTAL CONDITIONS** | |
| Operational Temperature | -10 – +65 °C |
| Storage Temperature | -20 – +85 °C |
| Humidity | 30 – 90 % non-condensing |
| Altitude | Up to 2000m a.s.l. |
| **CONNECTIONS** | |
| Removable terminals | Removable 4-way screw terminals, 3.5mm pitch. |
| IDC10 Rear Connector | CAN Interface and Power Supply (for DIN rail). |
| Stereophonic frontal jack | 3,5 mm for RS232 connection (COM) |
| **DIMENSIONS / BOX** | |
| Dimensions and Weight | 100 x 112 x 17,5 mm; 140 g |
| Box | PBT, black |
| **ISOLATIONS / STANDARS** | |
| Standards<br><br>CE | EN61000-6-4/2007 (electromagnetic emission, industrial environment)<br>EN61000-6-2/2005 (electromagnetic immunity, industrial environment)<br>EN61010-1/2001 (safety).<br>*All circuits must be insulated from the other circuits under dangerous voltage with double insulation. The power supply transformer must comply with EN60742: "Insulated transformers and safety transformers".* |



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## Installation Rules




The module is designed to be installed in vertical position on a DIN 46277 rail. In order to ensure optimum performance and the longest working life, the module(s) must be supplied adequate ventilation and no raceways or other objects that obstruct the ventilation slots. Never install modules above sources of heat; we recommend installation in the lower part of the control panel.

***Inserting on the DIN rail as it is illustrated in the figure:***

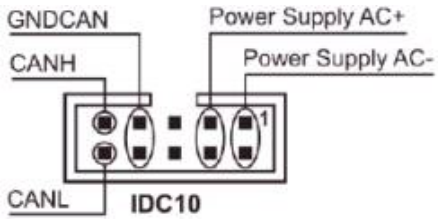
1) Insert the rear IDC10 connector on a DIN rail free slot (the inserting is univocal since the connectors are polarized).
2) Tighten the two locks placed at the sides of the rear connector to fix the module.

## Electrical Connections

### POWER SUPPLY AND CAN INTERFACE

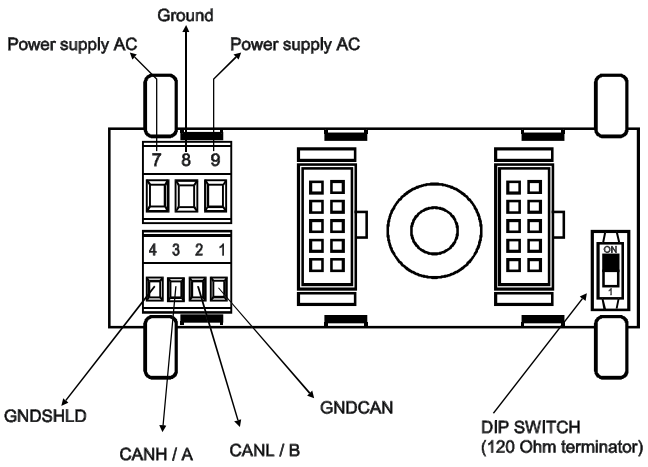
Power Supply and CAN interface are available by using the bus for the Seneca DIN rail, by the rear IDC10 connector or by Z-PC-DINAL1-35 / Z-PC-DINAL2-17.5 accessory (see *Accessories).*

#### *Rear Connector (IDC10)*




In the figure the meaning of the IDC10 connector pins is showed, in the case the user decides to provide the signals directly through it.

#### *Z-PC-DINAL1-35 / Z-PC-DINAL2-17.5 Accessories Use*




In case of Z-PC-DINAL1-35 / Z-PC-DINAL2-17.5 accessory use, the signals may be provided by terminal blocks. The figure shows the meaning of the terminals and the position of the DIP-switch (present on each DIN rail supports listed on *Accessories*) for CAN network termination.
**GNDSHLD**: Shield to protect the connection cables (always recommended).



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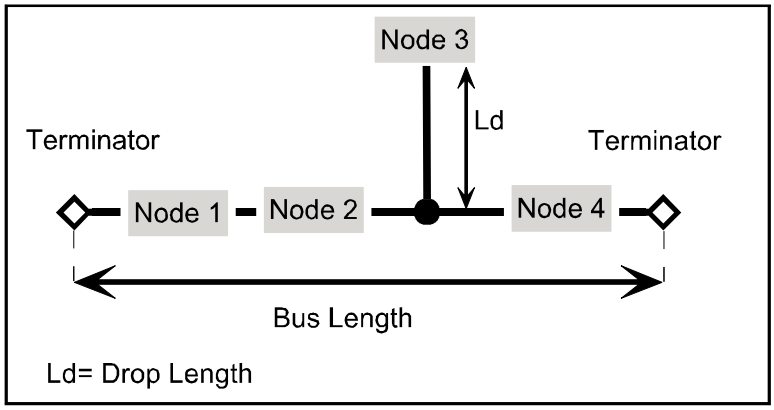
## *CAN bus Connection Rules*

1) Install the modules on the DIN rail (max 120).
2) Connect the remote modules using cables of proper length. On the table the following data about the cables length are provided:

– *Bus Length*: CAN network maximum length as a function of the Baud rate. It is the lenght of the cables which connects the two bus terminators modules (see *Scheme*).
– *Drop Length*: maximum length of a drop line (see *Scheme*) as a function of the Baud Rate.

| Baud rate | Bus Length | Drop length |
|---|---|---|
| 20 kbps | 2500 m | 150 m |
| 50 kbps | 1000 m | 60 m |
| 125 kbps | 500 m | 5 m |
| 250 kbps | 250 m | 5 m |
| 500 kbps | 100 m | 5 m |
| 800 kbps | 50 m | 3 m |
| 1000 kbps | 25 m | 0,3 m |

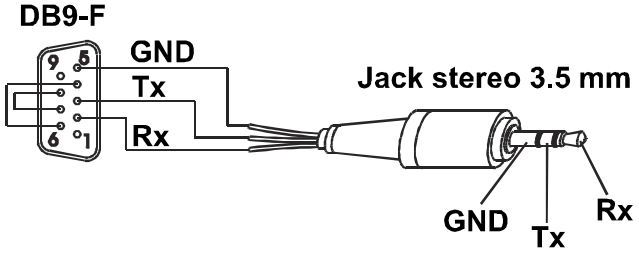
**Scheme**




For the best performances, the use of special shielded cables is recommended (***BELDEN 9841*** cable for example).

3) Terminate the two ends of the CANbus network by setting to ON the DIP-switch present on the DIN rail connection supports (see *Accessories*) where the two ends are inserted.

## RS232 SERIAL PORT

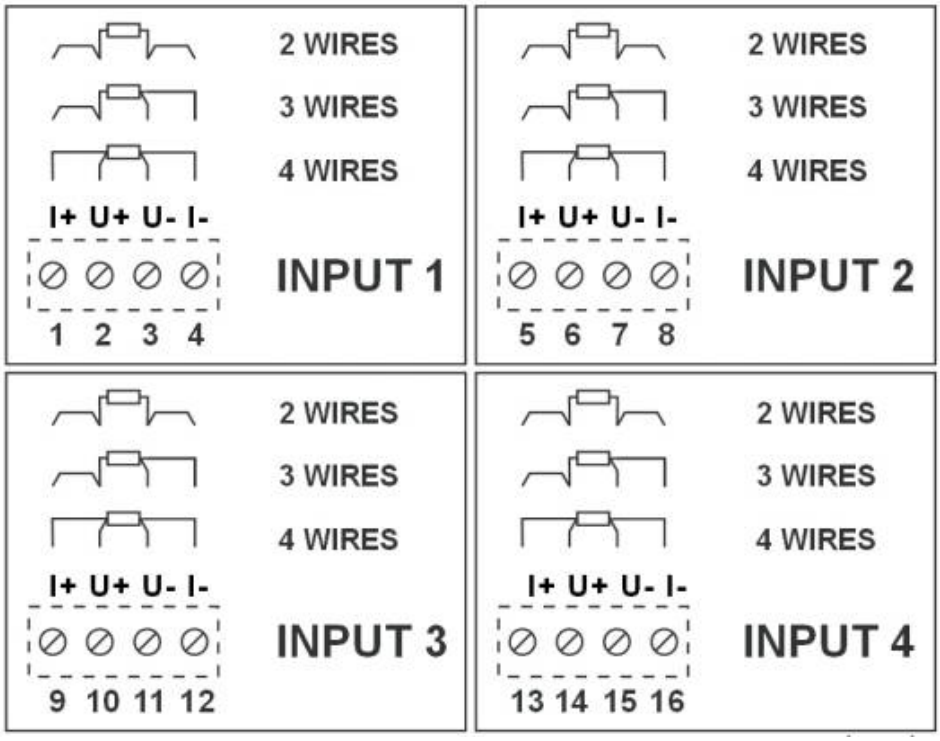



The connection cable DB9 with a 3.5 mm stereophonic jack, can be assembled as indicated in the following figure, or can be bought as an accessory (see *Accessories*).



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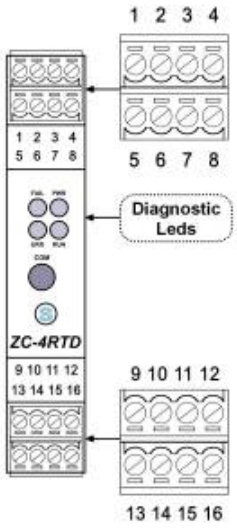
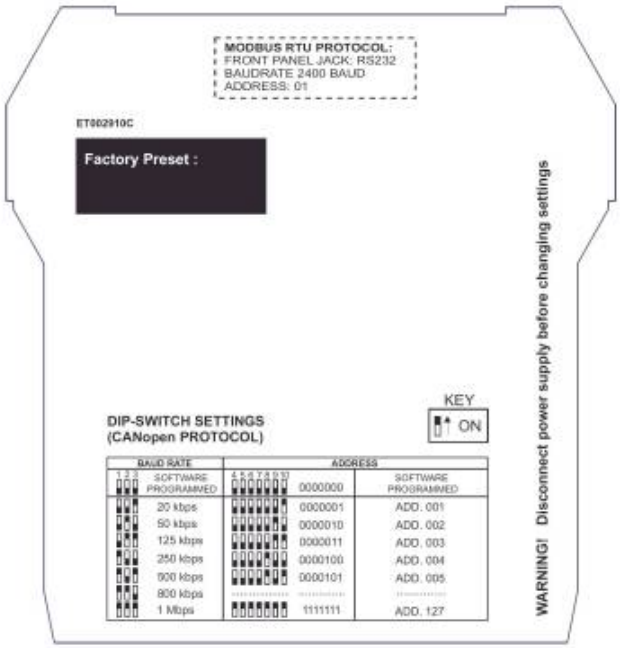
## ANALOG INPUTS




# *Significant Components Position*

## TERMINALS/LEDS/CONNECTOR/DIP-SWITCH

The terminals numbering, the leds position on the frontal panel and the DIP-switch on the rear side are illustrated below.

| *Front panel* | *Rear side* |
|---|---|
|  |  |







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# Leds Signallings

## LEDS *ERR* AND *RUN:* CANOPEN COMMUNICATION STATE

The meaning of leds ***ERR*** and ***RUN*** is described below; refer to the *User Manual* for details about the possible state and the flashing modes of the two leds.

***Led ERR (Red) meaning***

| *N°* | *Led ERR (Red)* | *STATE* | *DESCRIPTION* |
|---|---|---|---|
| 1 | Off | No error | The Device is in working condition. |
| 2 | Single flash | Warning, limit reached | At least one of the error counters of the CAN controller has reached or exceeded the warning level (too many error frames). |
| 3 | Double flash | Error control Event | A guard event (NMT-Slave or NMT-Master) |
| 4 | Triple flash | Sync error | The SYNC message has not been received within the configured communication cycle period time out. |
| 5 | ON | Bus off | The CAN controller is bus off. |

***Led RUN (Green) Meaning***

| *N°* | *Led RUN (Green)* | *STATE* | *DESCRIPTION* |
|---|---|---|---|
| 1 | Single flash | Stop | The Device is in STOPPED state. |
| 2 | Blinking | Pre-Operational | The Device is in the PRE-OPERATIONAL state. |
| 3 | On | Operational | The Device is in the OPERATIONAL state. |

## FAIL AND PWR: GENERAL SYSTEM DIAGNOSTICS

| *Led PWR (Green)* | *Description* |
|---|---|
| On | Power supply Presence |
| ***Led FAIL (Yellow)*** | ***Description*** |
| Off | • No error. |
| On | • Fault: Power supply not sufficient, faulty channel, faulty sensor, internal communication error (can be de-activated via software). |
| Blinking | • Data reception from frontal jack. |



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## Programming

The module can be programmed both through CAN interface or RS232 interface (via ModBUS-RTU). Refer to the *User Manual* for details about the communication.

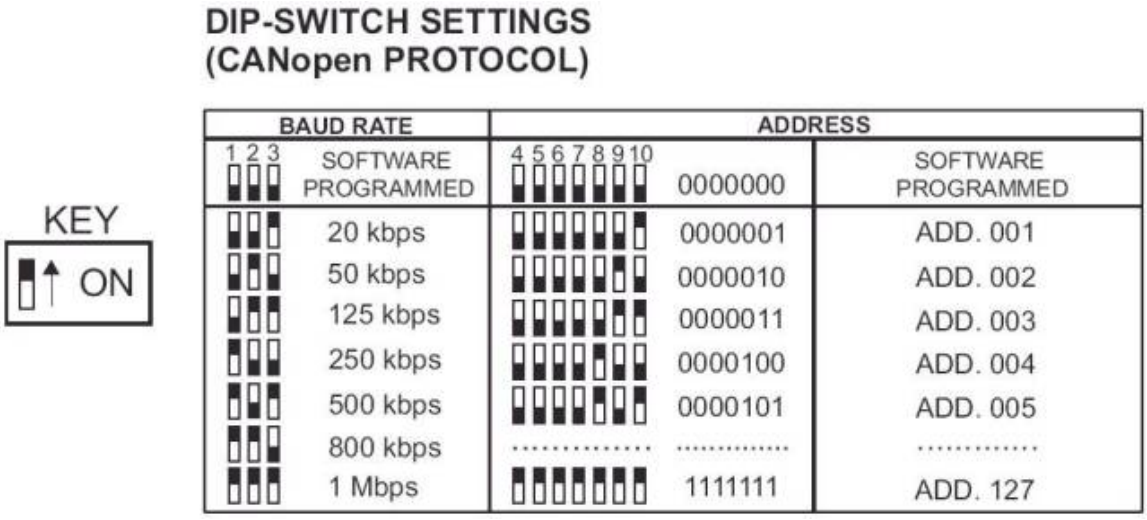
### *Factory preset*

With all the DIP-switches in OFF position, the module is programmed as follows:

- **CAN** communication : **Baud Rate: 20 kbps, Address: 127**
- **RTD input** on CH1,CH2, CH3, CH4: **PT100**
- **ModBUS** communication from **frontal jack** : **2400, 8, N, 1 ADDR = 1**

## DIP-switch settings

The DIP-switches position defines the module CAN communication parameters: Address and Baud Rate. In the following figure the Baud Rate and Address values are listed as a function of the DIP-switches position:




We underline that on all the DIN rail supports listed on *Accessories* a DIP-switch is present and if it is set to ON position the CAN network termination is inserted.

## Accessories

### SUPPORTS FOR MOUNTING ON DIN RAIL GUIDE/ SERIAL CABLE

| Code | Description |
|---|---|
| Z-PC-DINAL1-35 | Bus Support: Terminal blocks + 2 slots to connect Z-PC line modules. |
| Z-PC-DINAL2-17.5 | Bus Support: Terminal blocks + 1 slot to connect Z-PC line modules. |
| Z-PC-DIN2-17.5 | Bus Support: 2 slots to connect Z-PC line modules. |
| Z-PC-DIN1-35 | Bus Support: 1 slot to connect Z-PC line modules. |
| Z-PC-DIN8-17.5 | Bus Support: 8 slots to connect Z-PC line modules. |
| Z-PC-DIN4-35 | Bus Support: 4 slots to connect Z-PC line modules. |
| PM001601 | Serial Cable: from 2,5 mm stereo Jack to DB9F |

Disposal of Electrical & Electronic Equipment (Applicable throughout the European Union and other European countries with separate collection 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 and 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 this product, please contact your local city office, waste disposal service or the retail store where you purchased this product.



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