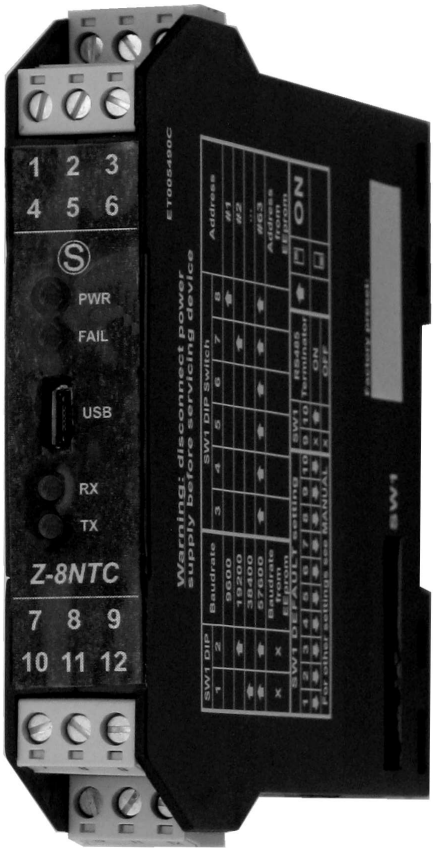
INSTALLATION MANUAL

Z-8NTC

RS485 Modbus RTU Module with 8 NTC Inputs

EN



CE

SENECA

CERTIFICATE N. 9115.SENE - REGISTRATION NUMBER IT-627
CSQ IQNet CERTIFIED MANAGEMENT SYSTEM
azienda con sistema di gestione per la qualità certificato
ISO 9001:2008

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

Manuals and configuration software are available at website:
www.seneca.it/products/z-8ntc

This document is property of SENECA Srl. Duplication and reproduction are forbidden, if not authorized. Contents of the present documentation refers to products and technologies described in it. This informations may be modified or integrated for technical and / or commercial requirements.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

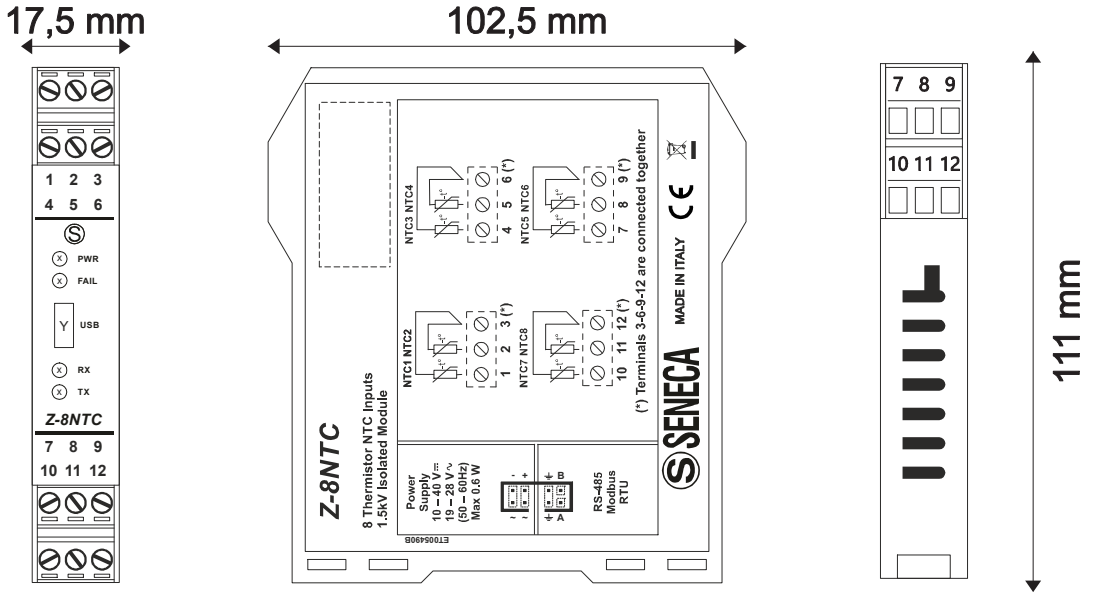
MODULE DESCRIPTION

Z-8NTC is a digital converter for: Resistors, NTC and PTC, with eight measurement channels, insulated up to 1.5 kV from power supply and from serial communication line.
The module is characterized by a three-point overall insulation.

GENERAL CHARACTERISTICS

- 16-bit A/D conversion on three adjustable scales 100 Ω – 10 kΩ, 1 kΩ –100 kΩ, 5 kΩ – 500 kΩ.
- 0.5% accuracy on resistance value.
- Measurement available in the following sizes: Resistance (Ω) or Temperature (°C, °F, °K) on Integer 32-bit and Floating point 32-bit, direct or swapped.
- Conversion From temperature to resistance with Steinhart-Hart equation.
- Each channel can be individually enabled and configured.
- Programmable filter for reading stabilization.
- Conversion time: 500 ms for all the channels; Rejection 50/60 Hz
- Linearization through configuration software for sensors: NTC, BALCO, COSTER, KTY etc.
- Easy power supply and serial bus wiring by means of the Seneca Z-BUS housed in the DIN rail.
- Removable screw terminals for section Max. 2.5 mm^2 cable.
- DIP switches configurable or software configurable communication parameters.
- RS485 Serial communication with MODBUS-RTU protocol.
- Frontal USB Port for MODBUS-RTU configuration and communication.

MODULE LAYOUT



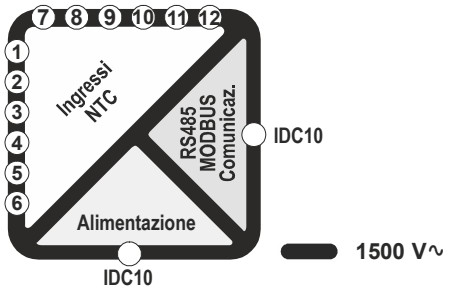
Dimensions (L×H×W)	17,5 x 102,5 x 111 mm
Weight	140 g.
Case	Material PA6, Black color.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

LED SIGNALLING ON FRONT PANEL

LED	State	LEDs Meaning
PWR (Green)	On	Power supply presence
	Off	The device is powered off
FAIL (Yellow)	Blinking On	Error settings Fault or Failure
RX (Red)	Blinking On	Recived data from RS485 Verify the connection
TX (Red)	Blinking On	Transmitted data to RS485 Verify the connection

TECHNICAL SPECIFICATIONS

STANDARDS	**EN61000-6-4** Electromagnetic emission, industrial environment **EN61000-6-2** Electromagnetic immunity, industrial environment **EN61010-1** Safety
INSULATION	
ENVIRONMENTAL COND. *Temperature* *Humidity* *Altitude* *Storage temperature* *Protection degree*	 -20 – +70°C 30% – 90% a 40°C not condensing Up to 2000 m a.s.l. -20 – + 85°C IP20
MOUNTING	IEC EN60715 DIN Rail
CONNECTIONS	Removable 3-way screw terminals, 5,08 mm pitch Rear IDC10 connector for CEI EN60715 rail Micro USB frontal panel connector.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

TECHNICAL SPECIFICATIONS

POWER SUPPLY	
Tension	10 – 40 V⎓ o 19 – 28 V∿ 50 – 60 Hz
Power absorbed	Max. 0.6W
NTC INPUTS	Generic NTC with user-definable curve.
Number of channels	8
Measurement range	Rated values: 1kΩ / 10kΩ / 50kΩ — Range of measurements: from 100Ω to 10kΩ / from 1kΩ to 100kΩ / from 5kΩ to 500kΩ
Resolution	16 bit, min. 0.02 % of the value at the scale limits
Accuracy	0.5 %
Stability	100 ppm

PRELIMINARY WARNINGS



Before performing any operation is mandatory to read the full contents of this manual. The module may only be used by qualified and skilled technicians in the field of electric installation. Specific documentation is available for download at website: www.seneca.it/products/z-8ntc.



Only the Manufacturer is authorized to repair the module or to replace damaged parts. The product is susceptible to electrostatic discharge, take appropriate countermeasures during any operation.



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



It is forbidden to place anything that could obstruct the ventilation slits.
It is forbidden to install the module near heat sources.



Severe operating conditions: -Powersupply > 30 V⎓, Powersupply > 26 V∿ and the module power the input sensor. **Separate the module at least 5 mm** away from the other devices installed side by side if the module operate with:
- The operating temperature > 40°C and one of the severe operating condition exists.
- The operating temperature > 35°C and two of the severe operating conditions exist.



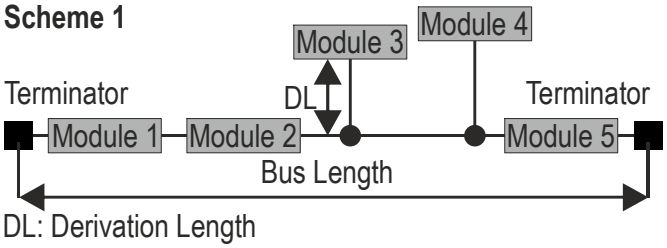
Disposal of electrical & electronic equipment (applicable throughout the EU and other countries with separate collection programs). The symbol found on this product or on its packaging, indicates that this product it must be handed over to an applicable collection point for **the recycling of electrical and electronic equipments.**

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

MODBUS CONNECTION STANDARDS

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: Modbus network maximum length as a function of the Baud rate.
It is the length of the cables which connect the two bus terminators modules (see Scheme 1).
-Drop Length: maximum length of a drop line (see Scheme 1).

Scheme 1



DL: Derivation Length

• MODBUS Scheme 1

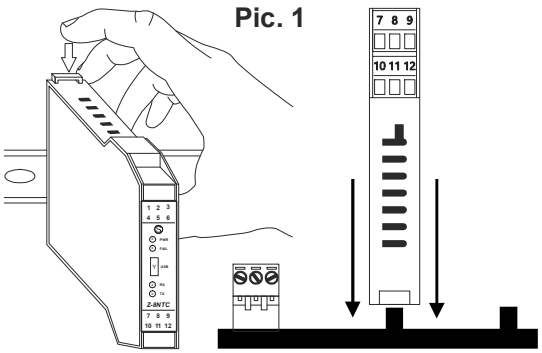
Bus length	Derivation Length	Baudrate
1200 m	2 m	115kbps

In order to obtain maximum performances it's recommended to use a specific shielded cable, as an example BELDEN 9841.

INSTALLATION RULES

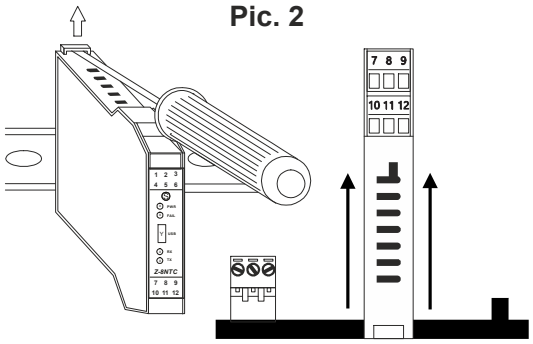
In order to ensure optimum performance and a longest working life, the module(s) must be provided with adequate ventilation and no raceways or other objects that obstruct the ventilation slots.
Never install the modules near heat sources.
We recommend installation in the lower part of the control panel.

INSTALLATION ON AND REMOVAL FROM IEC EN 60715 DIN RAIL



Pic. 1

Insertion on the IEC EN 60715 DIN rail:
1) Move the two hooks on the back of the module outwards as illustrated in **Pic.2**.
2) Insert the module rear IDC10 connector into a free slot of DIN rail accessory as you can see in **Pic.1**.
(the insertion is one way only because the connectors are polarized).
3) To secure the module to the IEC EN 60715 DIN rail, tighten the two hooks on the side of the IDC10 rear connector as shown in **Pic.1**.



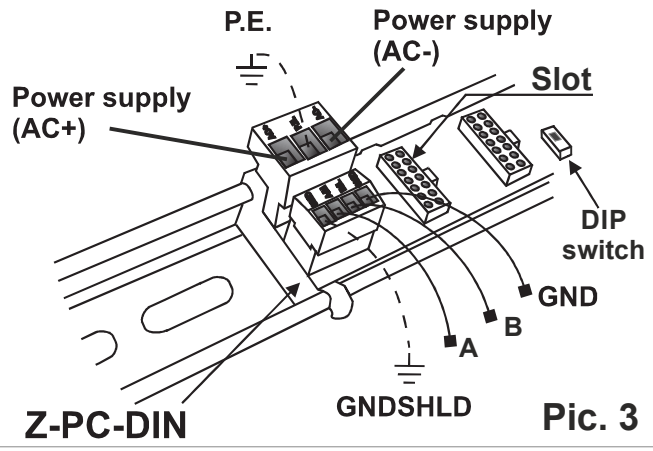
Pic. 2

Removal from IEC EN 60715 DIN rail:
As shown in **Pic.2**:
1) Move outwards the two hooks on the side of the module, with the help of a screwdriver.
2) Extract the module from the IEC EN 60715 DIN rail.

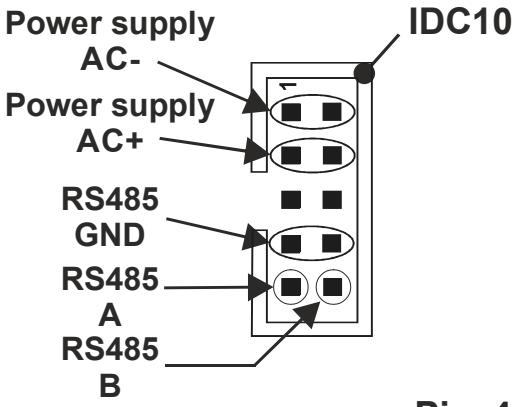
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

USE OF Z-PC-DINAL ACCESSORY

Don't turn upside down the module and **don't force the insertion** of the IDC10 connector into the Z-PC-DIN bus. The IDC10 connector located on the rear of the module will be inserted on a free slot of Z-PC-DIN accessory. In the figure you can see the meaning of the various pins of the rear IDC10 connector if you want to provide the signals directly through this connector. The pictures **Pic.3** and **Pic.4** show how to connect powersupply and RS485 COM1 port to the rear IDC10 connector.



Pic. 3



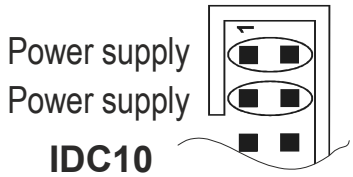
Pic. 4

In case of 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 network termination (not used in case of Modbus network). GNDSHLD: Shield to protect the signal inside the connection cables from electromagnetic disturbances (recommended).

ELECTRICAL CONNECTIONS

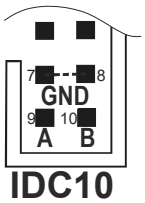
• POWER SUPPLY

19 – 28V∿ 50 – 60 Hz
10 – 40V⎓ 0.6 W Max



Connect the IDC10 rear connector to provide power supply to module.
The supply voltage must be between:
10 and 40V⎓ (any polarity), or between 19 and 28 V∿.
The upper limits mus not be exceeded as this can seriously damage the module. If the power supply source is not protected against overload, a safety fuse of max. 2.5 A must be installed in the power supply line near the device.

• RS485



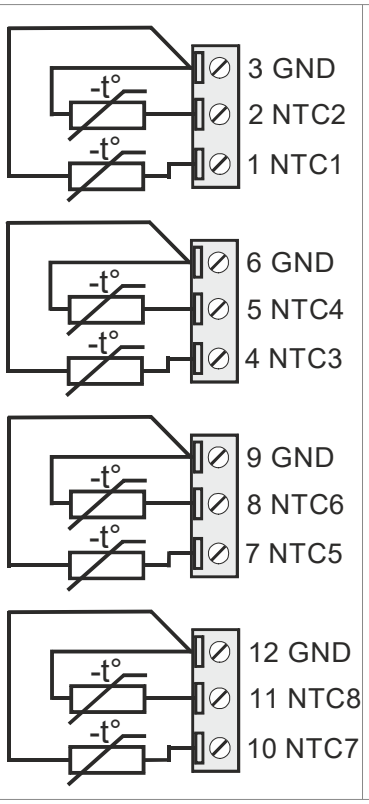
RS485

Connection for RS485 communication with the Modbus master system through Z-PC-DINAL2-17.5 accessory.
Note: the indication of the RS485 connection polarity is not standardised and in some masters may be inverted

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

ELECTRICAL CONNECTIONS

• 8 NTC INPUTS



The module allows:
resistors measurement within a range from 100 Ω to 500 kΩ or thermistors measurement within a range from 1 kΩ to 50 kΩ.
3, 6, 9 and12 terminals are internally connected to the same ground within the device.
If you want to measure resistors or thermistors with resistance < 1 kΩ then the conductors resistance introduces an important measurement error.
If the length of the cable does not exceed 100 m. you can reduce this error by using wires with a section greater than 1 mm^2.
You can also compensate this error using the configuration software.
The resistors and thermistors must be individually connected with two wires better if using shielded cable with a twisted pair for each channel.

REGISTRI MODBUS

Detailed information about the list of MODBUS registers and their functions can be found within the **USER MANUAL**.

IMPOSTAZIONI

The **EASY SETUP** configuration software, allows the parameter setting.
This software is available for free on the Internet site: www.seneca.com.
Some parameters can also be set using **DIP-switches.**

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

CONFIGURATIONS

DIP-SWITCHES

Before setting the DIP switches, in order to avoid damage to the module, you must disconnect the power supply. The DIP-switches position defines the Modbus Address and Baud Rate communication parameters. In the following table the Baud Rate and Address values are listed as a function of the DIP-switches position:

SW1	BAUD RATE	SW1	ADDRESS	SW1	TERMINATOR
1 2		3 4 5 6 7 8		9 10	
⬇⬇	9600	⬇⬇⬇⬇⬆	# 1	x ⬇	DISABLED
⬇⬆	19200	⬇⬇⬇⬆⬇	# 2	x ⬆	ENABLED
⬆⬇	38400	. . . . .	#. .		**ON**
⬆⬆	57600	⬆⬆⬆⬆⬆	# 63		
⬇⬇	FROM EEPROM	⬇⬇⬇⬇⬇	FROM EEPROM		**OFF**
				X	Not Used

Note: If switches from 3 to 8 are in OFF position, communication settings are retrieved from EEPROM.
2nd Note: The termination of the RS485 line must be carried out only at the ends of the communication line.

FACTORY SETTINGS

DEFAULT CONDITION FOR THE CONFIGURATION PARAMETERS OF THE MODULE:

All DIP-switches at OFF position ⬇

RS485 MODBUS protocol comunication parameters:	38400 8,N,1 Addr. 1

ORDER CODES

Code	Description
Z-8NTC	RS485 Modbus RTU protocol module with 8 NTC inputs
Z-PC-DINAL2-17,5	Modbus CEI EN 60715 rail connections system - Z-PC Line

CONTACTS

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

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000