INSTALLATION MANUAL

R-8AI-8DIDO
R-8AI-8DIDO-P

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**: The full content of this manual must be read before any operation. The module must only be used by qualified electricians. Specific documentation is available using the QR-CODE shown on page 1.
	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.

R-8AI-8DIDO
DOCUMENTATION

R-8AI-8DIDO-P
DOCUMENTATION

SENECA

QUALITY MANAGEMENT SYSTEM
ISO 9001:2015

SENECA s.r.l.; Via Austria, 26 – 35127 – PADOVA – ITALY; Tel. +39.049.8705359 - Fax +39.049.8706287

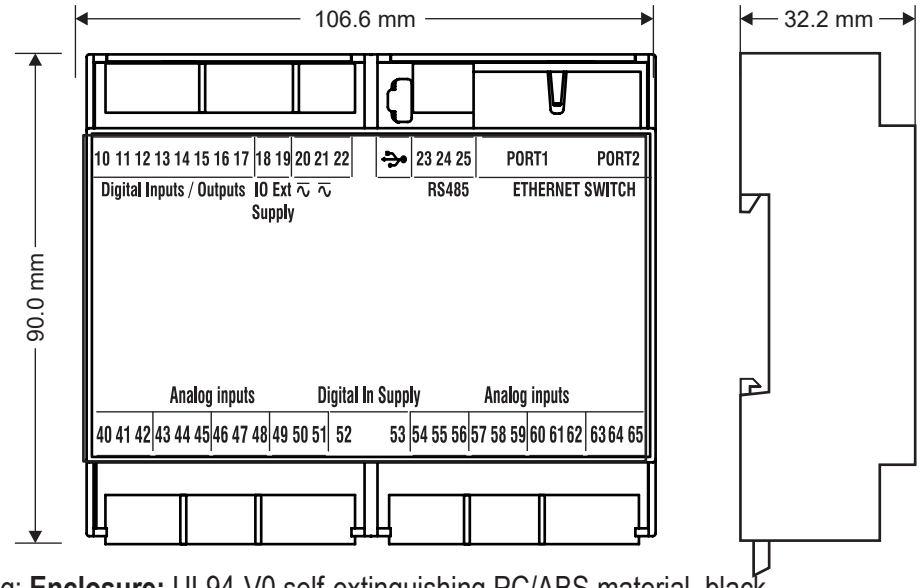
CONTACT INFORMATION

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

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MODULE LAYOUT

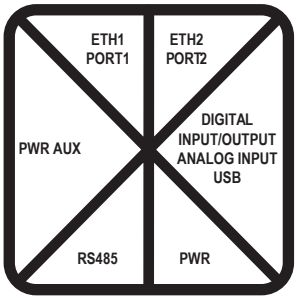


Weight: 170 g; **Enclosure:** UL94-V0 self-extinguishing PC/ABS material, black.

SIGNALS VIA LED ON FRONT PANEL

LED	STATUS	LED meaning
PWR	On	Device powered
	Off	Device not powered
IO1/IO8	On	Digital input/output active
	Off	Digital input/output not active
OUT SUP	On	Digital inputs/outputs powered
	Off	Non-digital inputs/outputs powered
STS (Status)	On	IP address set
	Flashing	Waiting for the IP address from the DHCP
COM (R-8AI-8DIDO-P version only)	On	Verification of RS485 connection
	Flashing	Data packet transmission over RS485
FAIL	On	Digital output in FAIL
	Off	Digital output OK
RX (R-8AI-8DIDO version only)	On	RS485 port wiring error
	Flashing	Reception of data packet completed on RS485
TX (R-8AI-8DIDO version only)	Flashing	Reception of data packet completed on RS485
ETH TRF (Yellow)	Flashing	Packet transit on Ethernet port
ETH LNK (Green)	Flashing	Ethernet port connected

TECHNICAL SPECIFICATIONS

CERTIFICATIONS	https://www.seneca.it/products/r-8ai-8dido/doc/CE_declaration
INSULATION	 **1500 Vac**
POWER SUPPLY	Voltage: 10÷40 Vdc; 19÷28 Vac; 50÷65 Hz; Absorption: 3 W
ENVIRONMENTAL CONDITIONS	Operating temperature: from -25°C to +65 °C Humidity: 10%– 90% non condensing. Storage temperature: from -30°C to +85 °C Protection rating: IP20
ASSEMBLY	35mm DIN rail IEC EN60715
CONFIGURATION	With integrated WEB Server (R-8AI-8DIDO version only)
CONNECTIONS / COMMUNICATION PORTS	3.5 mm pitch terminal block, 1.5 mm^2 max cable section 1 micro USB port for programming (R-8AI-8DIDO version only) 2 Ethernet (with LAN fault-bypass function) 100 base T on RJ45 1 RS485 port on terminals (R-8AI-8DIDO version only)
AUXILIARY VOLTAGE OUTPUT	Max voltage/current: 12 Vdc / 20 mA
DIGITAL INPUTS	Number of channels: 8; Voltage: Threshold ON: > 9 V; Threshold OFF: < 4 V; Vmax: 24 V; Impedance 9 kΩ
DIGITAL OUTPUTS	Number of channels: 8, MOSFET, PNP; Max voltage/current: 0.2 A / 24 V
ANALOGUE INPUT	Number of channels: 8; Type: voltage, current, thermocouple, thermoresistance Measuring range: Voltage: -30 V ÷ -30 V; -120m V ÷ +120 mV Current: -24 mA ÷ +24 mA Thermocouple: J, K, T, E, N, R, S, B, L Thermoresistance: PT100: -200 °C ÷ +200 °C (only for cold junction offset) **NOTE**: See page 6 for dip-switch settings

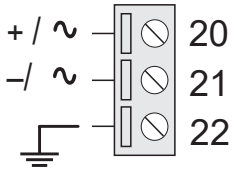
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ELECTRICAL CONNECTIONS

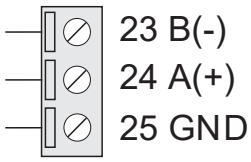
⚠ CAUTION

The upper power supply limits must not be exceeded, as this could 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 (transformers, inverters, motors, etc...).

POWER SUPPLY

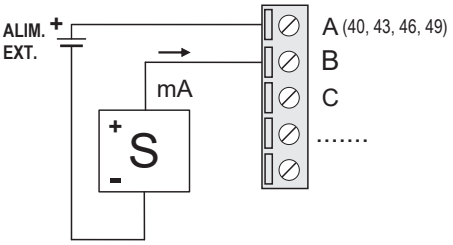


RS485 SERIAL PORT



Connection to the RS485 port.
Polarity is not standardised and in some devices may be inverted.

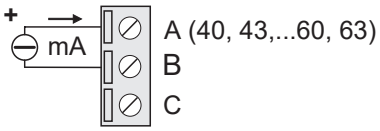
CURRENT (mA)
Passive transmitter, with external power supply



The relative dip-switch goes to the ON position

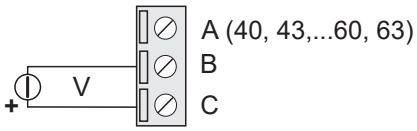
ANALOGUE INPUTS: <u>The device has 8 analogue inputs that can be configured via DIP-SDWITCH:</u>

CURRENT (mA)
Transmitter active



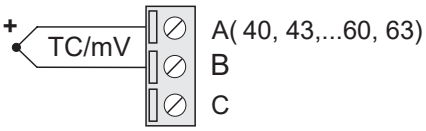
The relative dip-switch goes to the ON position

VOLTAGE (V) ±30V



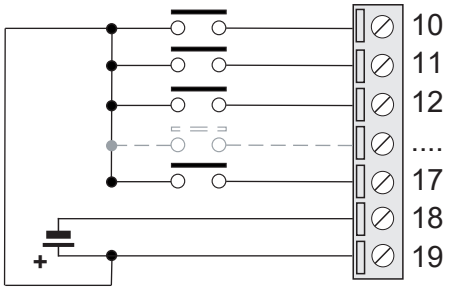
The relative dip-switch goes to the OFF position

THERMOCOUPLE (Tc / mV)

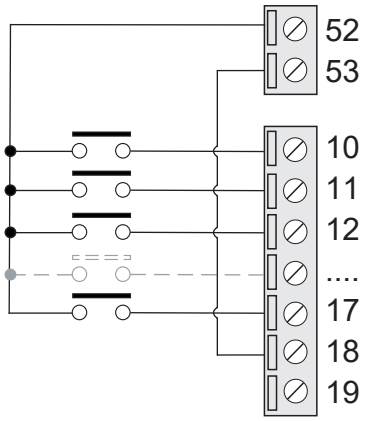


The relative dip-switch goes to the OFF position

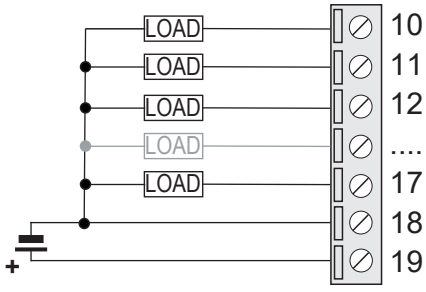
DIGITAL INPUTS (PNP)
With external power



DIGITAL INPUTS (PNP)
With internal power



DIGITAL OUTPUTS (PNP)
With external power



The digital outputs must be powered externally to function properly.

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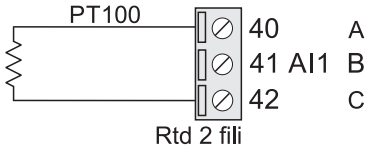
⚠ CAUTION

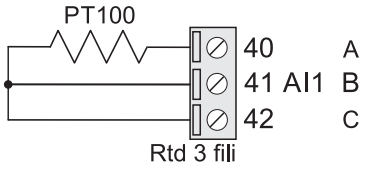
The input for the RTD thermoresistance is available only for the first channel. For channels 2 to 8 it is not available.

⚠ WARNING

The product is not suitable for connection to a dangerous voltage conductor. The maximum allowable voltage is 50 Vac.

THERMORESISTANCE

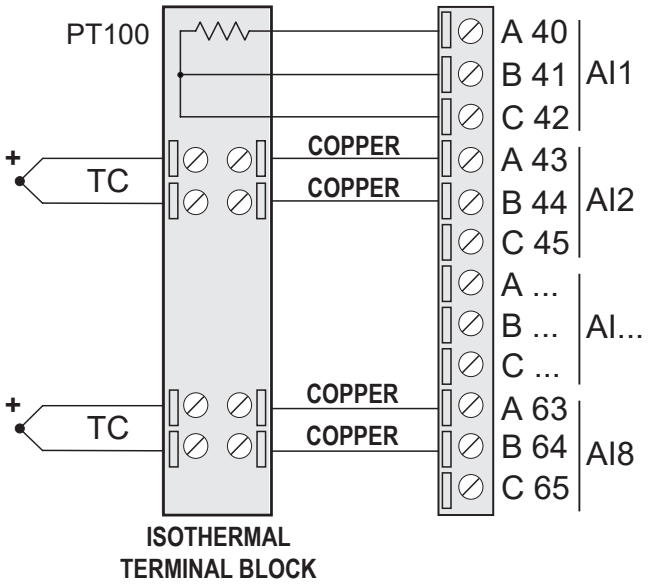




The relative dip-switch goes to the OFF position.
Function valid only for analogue input 1.

INSTRUCTIONS FOR ANALOGUE INPUTS:

The analogue inputs of this device are designed to measure voltages/currents on floating circuits that is not electrically connected to each other. It is also possible to measure currents/voltages on non-floating circuits, with a potential difference between negative terminals not exceeding 200 mV. In the case of measurement with thermocouples it is possible to obtain correct measurements even if they are applied to common metal parts.
The temperature measurement using thermocouples can be affected by measurement errors due to the determination of the cold junction temperature carried out near the terminal.
To eliminate any measurement errors it is necessary to wire the thermocouples on an isothermal terminal board separate from the device as shown in the diagram on the side.
Input No. 1 set as Pt100 (see the table on page 4) will then be used to measure the cold junction temperature of said terminal block.



FEATURE SUMMARY

ANALOGUE INPUTS						
	Range	**Resolution**	**Impedance**	**Precision**	**Temperature drift**	**Ext. current**
Voltage (V)	-30+30 Vdc	1 mV	> 200 kohm	0.1% f.s.	100 ppm	
Voltage (mV)	-120+120 mV	4 uV	> 10 Mohm	0.1% f.s.	100 ppm	
Current (mA)	-24..-+24 mA	0.8 uA	20 Ohm	0.2% f.s.	100 ppm	
Thermocouple	-120+120 mV	4 uV	> 10 Mohm	0.1% f.s.	100 ppm	
PT100	-200..200 °C	0.05 °C		0.5°C	50 ppm	0.5 mA

THERMOCOUPLE TYPE							
	Range [°C]	**Resolution [°C]**	**Impedance [Mohm]**	**Precision [f.s.]**	**Temperature Drift**	**Standard**	**cold junction error [°C]**
J	-210..1200	0.1	> 10	0.1%	100ppm	EN 60584	2
K	-200..1372	0.1	> 10	0.1%	100ppm	EN 60584	2
T	-200..400	0.1	> 10	0.1%	100ppm	EN 60584	2
E	-200..1000	0.1	> 10	0.1%	100ppm	EN 60584	2
N	-200..1300	0.1	> 10	0.1%	100ppm	EN 60584	2
R	-50..1768	0.3	> 10	0.1%	100ppm	EN 60584	2
S	-50..1768	0.5	> 10	0.1%	100ppm	EN 60584	2
B	250..1820	0.5	> 10	0.1%	100ppm	EN 60584	2
L	-200..800	0.1	> 10	0.1%	100ppm	GOST:8.585	2

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SETTING THE DIP-SWITCHES

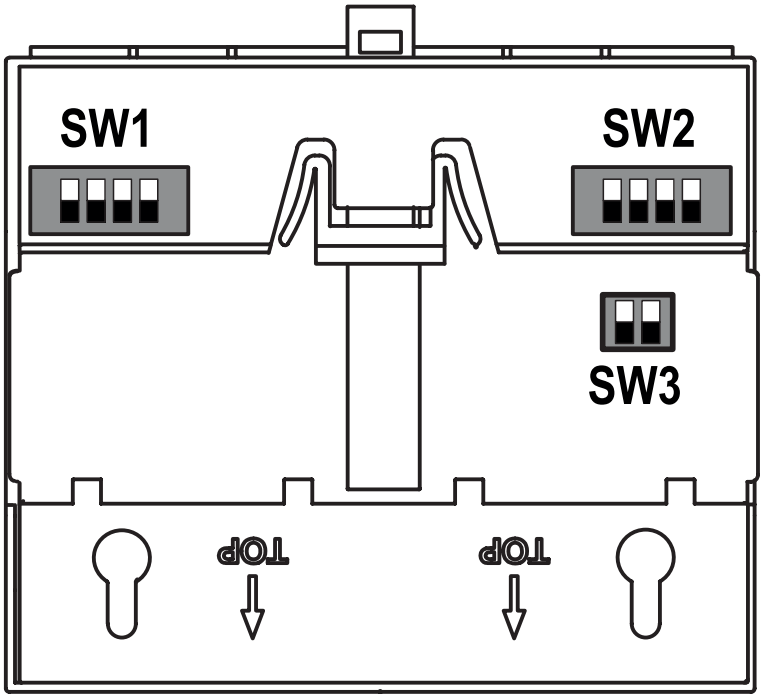
The DIP-SWITCHES on the back of the device have the following functions:

DIP-SWITCH SW1 AND SW2:
ANALOGUE INPUT/OUTPUT CONFIGURATION

SW1				SW2			
1	2	3	4	1	2	3	4
AI1	**AI2**	**AI3**	**AI4**	**AI5**	**AI6**	**AI7**	**AI8**

SW3 DIP-SWITCH:
DEFAULT SETTINGS

SW3		
DI1	**ON**	DEFAULT SETTINGS
DIP1	**ON**	



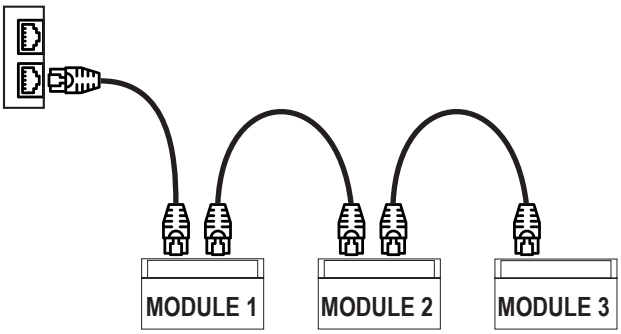
DIP- SWITCH positions

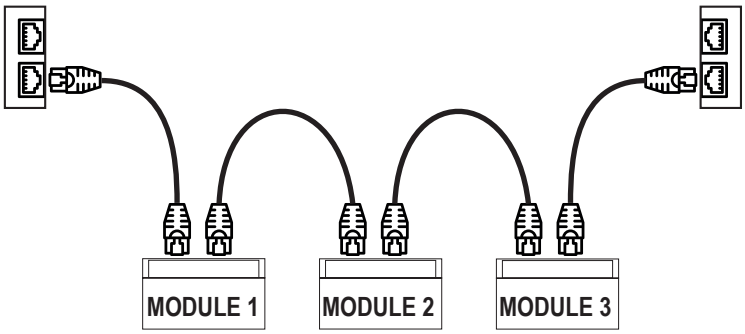
DAISY-CHAIN ETHERNET CONNECTION

⚠ CAUTION

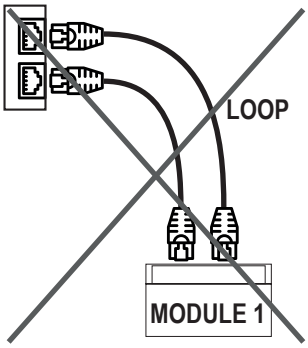
IT IS NOT ALLOWED TO CREATE LOOPS WITH ETHERNET CABLES

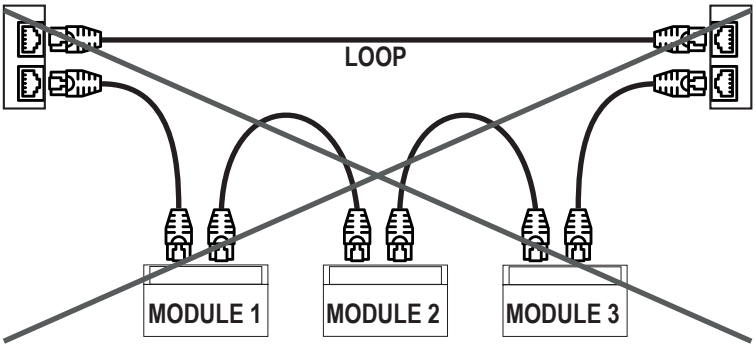
Using the daisy-chain connection it is not necessary to use switches to connect the devices.
The following examples show the correct connections.





There must be no loops in the Ethernet cabling, otherwise the communication will not work. The modules and switches must be connected eliminating any loops. The following examples show the incorrect connections.





The LAN fault-bypass function allows you to keep the connection between the two Ethernet ports of the device ON, in the event of a power failure. If a device turns off, the chain is not interrupted and the devices downstream of the switched-off one will still be accessible. This function has a limited duration: the connection remains active for a few days, typically 4.
The fault-bypass function requires that the sum of the lengths of the two cables connected to the switched off module is less than 100m.

ETHERNET CONNECTION RULES

For the Ethernet cabling between the devices, the use of the unshielded CAT5 or CAT5e cable is required.

FACTORY IP ADDRESS

The default module IP address is static: 192. 168. 90. 101

WEB SERVER

To access the maintenance Web Server with the 192.168.90.101 factory IP address
(Default user: admin; Default password: admin) http://192.168.90.101

⚠ CAUTION

DO NOT USE DEVICES WITH THE SAME IP ADDRESS IN THE SAME ETHERNET NETWORK.