INSTALLATION MANUAL

Z-SG

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 could damage the instrument or 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 electro-static 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.

Z-SG
DOCUMENTATION

SENECA

QUALITY MANAGEMENT SYSTEM
ISO 9001:2015

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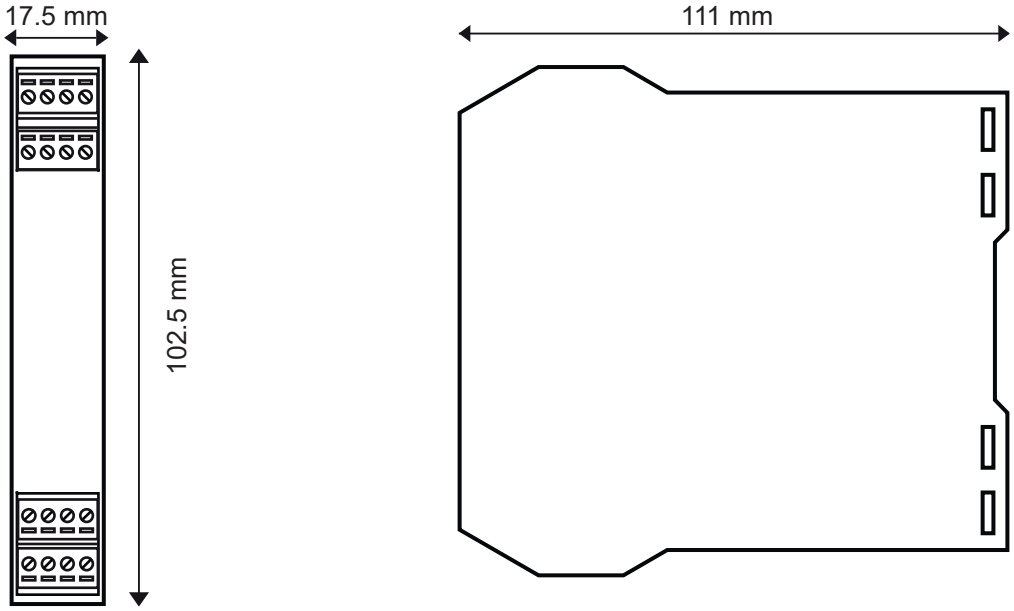
CONTACT INFORMATION

Technical support	supporto@seneca.it	Product information	commerciale@seneca.it

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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

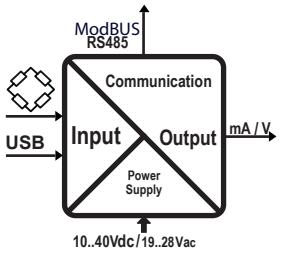
LED	STATUS	LED meaning
PWR Green	ON	The device is powered correctly
FAIL yellow	On	Faulty
RX Red	Flashing	Receipt of packet completed
RX Red	ON	Anomaly / Check connection
TX Red	Flashing	Transmission of packet completed

FUNCTIONS DESCRIPTION

- Power supply and serial connection wiring facilitated by means of a bus housed in the DIN rail.
- Communication can be configured by DIP-switch or software.
- RS485 serial communication or via USB with MODBUS-RTU protocol.
- Protection against ESD discharges up to 4 kV.
- 1500 Vac insulation: between input and all other circuits, between communication and power supply and between retransmitted output and power supply.
- Analog output in voltage or current, with programmable limits.
- Cell calibration with sample weight, not required in case of known cell sensitivity.
- Configurable digital I/O.
- Rejection at 50 Hz and 60 Hz.
- Stable weighing signal via digital output/Modbus register.
- Remote tare writing in volatile and/or non-volatile memory via digital input/Modbus register
- Strain gauge directly powered by the instrument.
- Ratiometric measurement.
- Sensitivity from ± 1 to ± 64 mV/V.
- Complete configurability with dedicated EASY SETUP software.
- Cell calibration and configuration using Easy Setup software.

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TECHNICAL SPECIFICATIONS

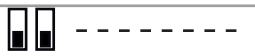
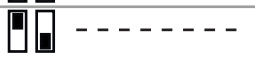
CERTIFICATIONS	CE
INSULATION	 —1500 V~ **⚠ WARNING** the maximum working voltage between any terminal and ground must be less than 50 Vac / 75Vdc
ENVIRONMENTAL CONDITIONS	*Temperature*: -10 ÷ + 65°C *Humidity*: 30% ÷ 90% non condensing. *Altitude:* Up to 2000 m above sea level *Storage temperature:* -20 ÷ + 85° *Protection degree:* IP20.
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*: 10 ÷ 40 Vdc; 19 ÷ 28 Vac 50 ÷ 60 Hz *Absorption*: Typical: 1.5 W @ 24Vdc, Max: 2 W
ANALOG INPUT	*Input type*: 4- or 6-wire differential measurement input *Input impedance*: > 1 MΩ *Full scale:* ± 10 mV / ± 320 mV *Error:* 0.01% of the electrical full scale in “factory calibration” mode * Thermal stability: 0.0025%/C° of full scale. *Insulation:* 1500 Vac three-ways
COMMUNICATION	*Serial communication ports:* RS485, 2400 - 115200 Baud / USB 38400 Baud Address: 01, parity: NO, Data: 8 Stop bits: 1 *Protocol:* Modbus Rtu
LOAD CHARACTERISTICS	*Supply voltage*: 5 Vdc *Minimum impedance*: 87 Ω equivalent (possibly deriving from several load cells) *Sensitivity:* *From* ±1 mV/V to ±64 mV/V *Load cells:* 4 or 6 wires
ANALOG OUTPUT	*Voltage output*: Configurable between 0 ÷ 10 Vdc, minimum load resistance 2 kΩ *Current input*: Configurable between 0 ÷ 20mA, maximum load resistance: 500 Ω *Retransmission error:* *0.1 % of maximum field* *Response time (10%..90%):* *5ms*
DIGITAL IN/OUT	*Opto-insulated digital input*: Min. voltage: 12 V / Max. voltage: 30 V *Opto-insulated digital input*: Min. current: 50 mA / Max. voltage: 30 V
OTHER SPECIFICATIONS	*Input type*: 4- or 6-wire differential measurement input *Input impedance*: > 1 MΩ *Full scale:* ± 10 mV / ± 320 mV

* In the case of “calibration with sample weight” mode, the accuracy is given by the linearity error (0.003% of the electric full scale)

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SETTING THE SW1 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 Baud Rate and Address values according to the DIP-switch setting:

DIP-Switch status			
SW1 POSITION 1 2 3 4 5 6 7 8	BAUD RATE	SW1 POSITION 1 2 3 4 5 6 7 8	ADDRESS
	9600		#1
	19200		#2
	38400		#...
	57600		#63
	From EEPROM		From EEPROM

Note: When DIP switches 3 to 8 are OFF, the communication settings are taken from programming (EEPROM).

SETTING THE SW3 DIP-SWITCHES

Status of the SW3 dip-switches			
SW3 POSITION		SW3 POSITION	
1	Mass RS485	2	RS485 terminator
	Connected		On
	Disconnected		Off

Note 1: Since the GND terminal of the RS485 port and the negative terminal of the analog output are not isolated from each other, in order to use the analog outputs of several instruments simultaneously and connected to each other via the RS485 port, it is necessary to disconnect the GND terminal of the RS485 port via the dedicated dip-switch (SW3).
Note 2: The RS485 line must be terminated only at the ends of the communication line.

SETTING THE SW2 DIP-SWITCHES

SW2 DIP-SWITCH SETTING			
1	DIGITAL I/O TYPE + CALIBRATION BUTTON ENABLING		
	Selects digital input. Enables calibration button		
	Selects digital output		
2	3	OUTPUT	
		0 - 10 V	
		0 - 5 V	
		0 - 20 mA	
		4 - 20 mA	
4	5	METHOD OF USE/CALIBRATION	
		Selects how to use 2 and 4	
		Selects how to use 1 and 3	
		Acquisition of the tare value via button or Digital input (2 and 4)	
		Manual cell calibration mode (1 and 3)	
6	7	8	CELL SENSITIVITY
			± 1 mV/V
			± 2 mV/V
			± 4 mV/V
			± 8 mV/V
			± 16 mV/V
			± 32 mV/V
			Sensitivity from ModBus register SENSE_RATIO (40044). Real non-integer values can also be set.

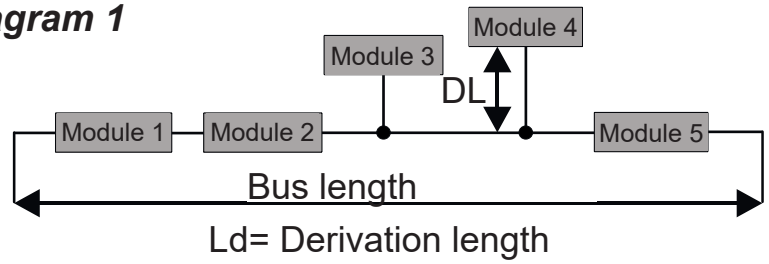
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ModBUS CONNECTION RULES

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

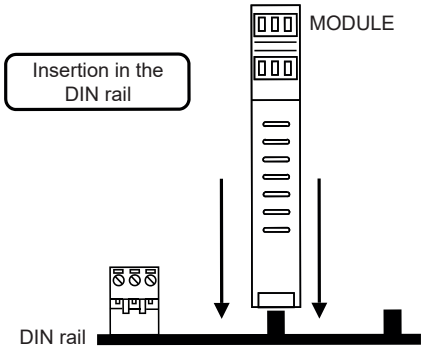


For maximum performance, it is recommended to use special shielded cables, such as BELDEN 9841.

INSTALLATION REGULATIONS

The module has been designed for vertical installation on a DIN 46277 rail. For optimal operation and long life, adequate ventilation must be provided. Avoid positioning ducting or other objects that obstruct the ventilation slots. Avoid mounting modules over heat-generating equipment.
Installation in the bottom part of the electrical panel is recommended.

Insertion in the DIN rail
As shown in figure:
1. Insert the IDC10 rear connector of the module on a free slot of the DIN rail
   (the insertion is univocal since the connectors are polarized).
2. To secure the module to the DIN rail, tighten the two hooks on the sides of the IDC10 rear connector.



USB PORT

The module is designed to exchange data according to the modes defined by the MODBUS protocol. It has a micro USB connector on the front panel and can be configured using applications and/or software programs.
The USB communication has priority over the RS485 communication.
The USB serial port uses the following communication parameters: **2400 BAUD, 8BIT, NO PARITY, 1 STOP BIT, ModBUS ADDRESS 1**. The USB communication port responds exactly like the RS485 port with the exception of the communication parameters. During the use of the USB port, the bus will be inactive; it will reactivate automatically after disconnecting the USB port cable. EASY SETUP (for Windows systems) is the software to be used for the configuration and calibration of the load cell.
For more information, visit www.seneca.it/prodotti/z-sg.

(*) Check that the device in question is included in the list of products supported by the Easy Setup APP in the store.

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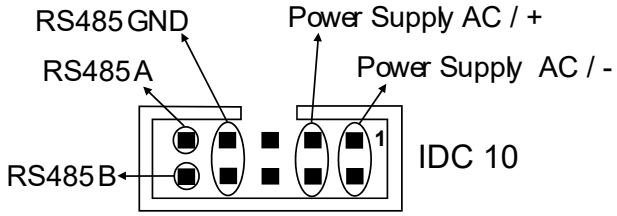
ELECTRICAL CONNECTIONS

⚠ CAUTION

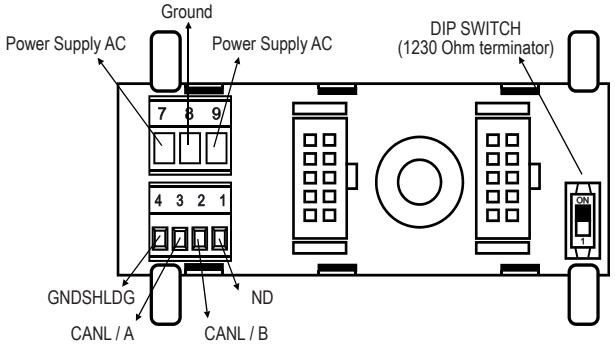
The upper power supply limits must not be exceeded, as this could cause serious damage to the module.
To meet the electromagnetic immunity requirements:

- 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...).

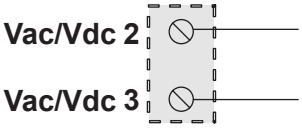
Power supply and Modbus interface are available using the Seneca DIN rail bus, via the IDC10 rear connector, or the Z-PC-DINAL-17.5 accessory.



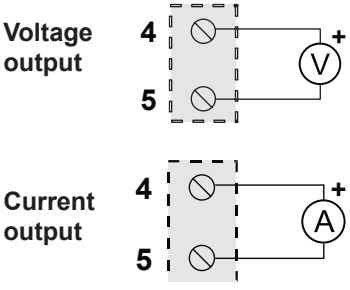
Back connector (IDC 10)
The illustration shows the meanings of the various IDC10 connector pins if signals are to be sent via them directly.



Z-PC-DINAL2-17.5 accessory use
If the Z-PC-DINAL2-17.5 accessory is used, signals can be sent via terminal boards. The illustration shows the meaning of the various terminals and DIP-switch position (found in all supports for the DIN rail listed in Accessories) for the termination of the CAN network (not used for the Modbus network).
GNDSHLD:
Connection cable signal protection shield (recommended).



Power supply
Terminals 2 and 3 can be used to provide the module with power supply as an alternative to the connection using the Z-PC-DINx bus. **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.

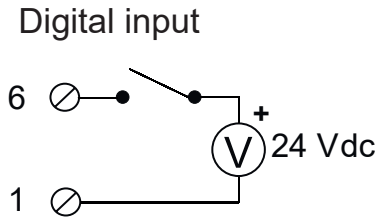


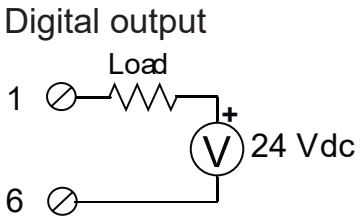
Output
The module provides a retransmitted voltage (configurable in the 0 - 10 Vac range) or current (configurable in the 0 - 20 mA, range) output. For the electrical connections, screened cables are recommended.

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Digital input/output

Depending on the settings, it is possible to decide whether to have a digital output or input.
The connections in the two cases are shown below:

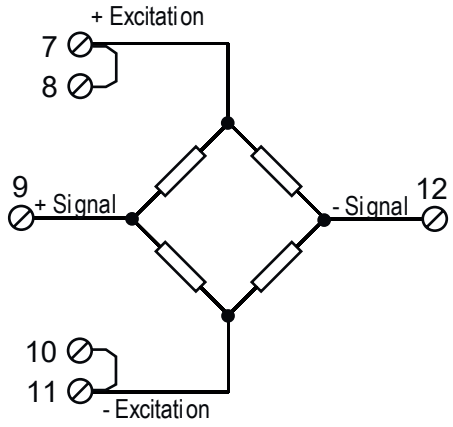




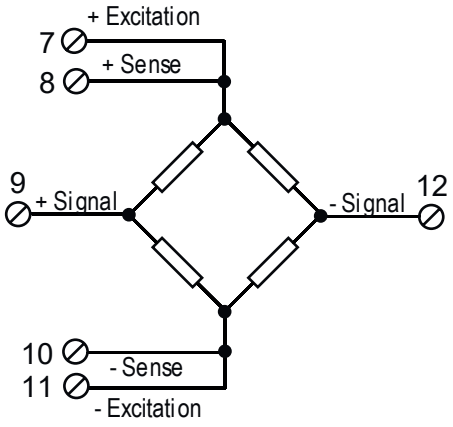
Connection to the load cell via 4 or 6 wires:

The figure shows the connections to be made for a connection to a load cell. The terminals have the following meaning:
7: Load cell positive supply
8: Load cell positive supply reading
9: Cell reading positive
10: Load cell negative supply
11: Load cell negative supply reading
12: Cell reading negative
For the connections, the use of screened cables is required.

4-WIRE MEASUREMENT



6-WIRE MEASUREMENT



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 (not configurable)

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