INSTALLATION MANUAL

Z-D-OUT

Modbus Module with
5 Relay for Digital Outputs

EN



CE

SENECA

ISO 9001:2008

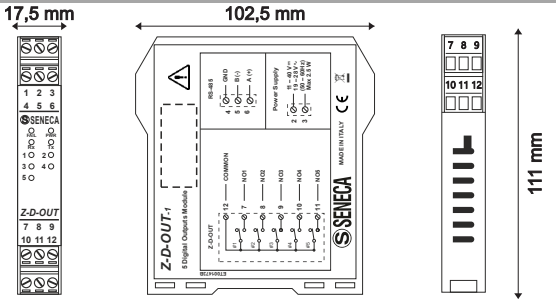
SENECA s.r.l.
Headquarters: Via Austria, 26 – 35127 – PADOVA – ITALY
Phone +39.049.8705355 - 8705359 - Fax +39.049.8706287

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

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MODULE LAYOUT



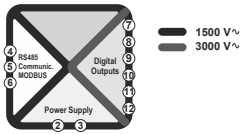
Dimensions (L×H×W)	17,5 x 102,5 x 111 mm (with terminals).
Weight	150 g.
Case	Material PA6, Black color.

LED SIGNALING ON FRONT PANEL

LED	State	LEDs Meaning
PWR (Green)	On	Power supply presence
	Off	The device is powered off
FAIL (Yellow)	Blinking	Error settings
	On	Fault or Failure
RX (Red)	Blinking	Recived data from RS485
	On	Verify the connection
TX (Red)	Blinking	Transmitted data to RS485
	On	Verify the connection
1 (Red)	On	Output 1 Active
	Off	Output 1 Disabled
2 (Red)	On	Output 2 Active
	Off	Output 2 Disabled
....	.....	.....
5 (Red)	On	Output 5 Active
	Off	Output 5 Disabled

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TECHNICAL SPECIFICATIONS

STANDARDS	**EN61000-6-4** Electromagnetic emission, industrial environment **EN61000-6-2** Electromagnetic immunity, industrial environment **EN61010-1** Safety
INSULATION	
ENVIRONMENTAL CONDITIONS *Temperature* *Humidity* *Altitude* *Storage temperature* *Protection degree*	 -20 – +65°C 30% – 90% a 40°C not condensing Up to 2000 m a.s.l -20 – + 85°C IP20
MOUNTING	35mm IEC EN60715 DIN Rail
CONNECTIONS	Removable 3-way screw terminals, 5,08 mm pitch Rear IDC10 connector for CEI EN60715 rail
POWERSUPPLY *Tension* *Power absorbed*	 10 – 40 V⎓ or 19 – 28 V~ 50 – 60 Hz Max. 2.5W
DIGITAL OUTPUTS	Number of channels 5. SPST N.O. relay outputs with common line Max. Voltage 250V~ Max. Current 5A with Max. environmental temperature 55°C Max. Current 3A with Max. environmental temperature 65°C Common Max. Current 12A with Max. environmental temperature 55°C Common Max. Current 8A with Max. environmental temperature 65°C

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-d-out.

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.

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PRELIMINARY WARNINGS

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.

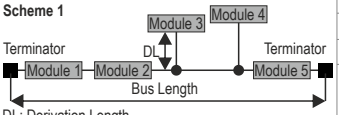
Severe operating conditions: -Powersupply > 30 V⎓, Powersupply > 26 V∿ and the module power the input sensor. **Separate the module at least 5 mm** away from the other devices installed side by side if the module operate with:
- The operating temperature > 40°C and one of the severe operating condition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

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 lenght 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



• MODBUS Scheme 1

Bus length	Derivation Length	Baudrate
1200 m	2 m	115kbps

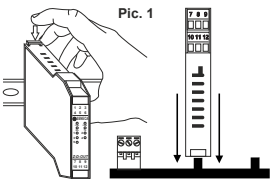
In order to obtain maximum performances it's recommended to use a specific shielded cable, as an example BELDEN 9841.

INSTALLATION RULES

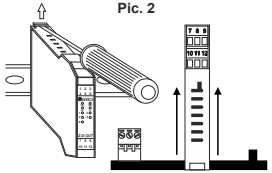
In order to ensure optimum performance and a longest working life, the module(s) must be provided with adequate ventilation and no raceways or other objects that obstruct the ventilation slots.
Never install the modules near heat sources.
We recommend installation in the lower part of the control panel.

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INSTALLATION ON AND REMOVAL FROM IEC EN 60715 DIN RAIL



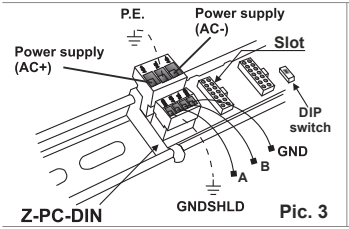
Insertion on the IEC EN 60715 DIN rail:
1) Move the two hooks on the back of the module outwards as illustrated in **Pic.2**.
2) Insert the module rear IDC10 connector into a free slot of DIN rail accessory as you can see in **Pic.1**.
(the insertion is one way only because the connectors are polarized).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



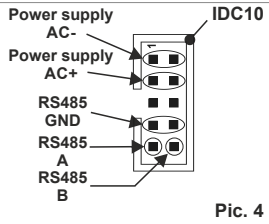
Removal from IEC EN 60715 DIN rail:
As shown in **Pic.2**:
1) Move outwards the two hooks on the side of the module, with the help of a screwdriver.
2) Extract the module from the IEC EN 60715 DIN rail.

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



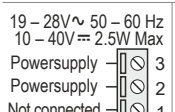
Pic. 4

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).

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ELECTRICAL CONNECTIONS

• POWERSUPPLY



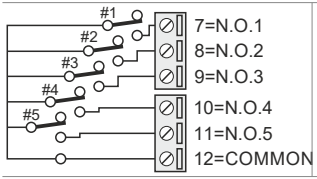
Terminals 2 and 3 can be used to provide power supply to the module as an alternative to the connection with the Z-PC-DINx bus.The supply voltage must be between 10 and 40V⎓ (any polarity), or between 19 and 28 V~. **The upper limits mus not be exceeded as this can seriously damage the module.** If the 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



Connection for RS485 communication with the Modbus master system as an alternative to the Z-PC-DINx bus connection.
Note: the indication of the RS485 connection polarity is not standardised and in some masters may be inverted

• FIVE DIGITAL OUTPUTS



Note: Pay attention to the maximum current that can flow through the relays common terminal. Please read the technical specifications.
In the Modbus register 40002 from bits 0 to 4 is possible to see or change the state of the outputs from 1 to 5. You can also set the outputs in a security state when the bus communication is losted.

MODBUS REGISTER

HOLDING REGISTER

REGISTER	NAME	DESCRIPTION
40002	OUTPUT	Output 1: 40002.0 Output 2: 40002.1 Output 3: 40002.2 Output 4: 40002.3 Output 5: 40002.4 The active status of the output is obtained by setting the bits to 1.

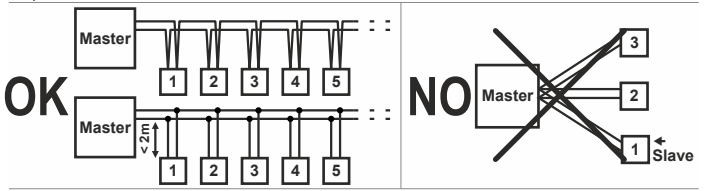
COIL REGISTER

REGISTER	NAME	DESCRIPTION
00001	OUTPUT 1	Output 1 active status. See User Manual register 40005.0
00002	OUTPUT 2	Output 2 active status. See User Manual register 40005.1
00003	OUTPUT 3	Output 3 active status. See User Manual register 40005.2
00004	OUTPUT 4	Output 4 active status. See User Manual register 40005.3
00005	OUTPUT 5	Output 5 active status. See User Manual register 40005.4

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SERIAL INTERFACE

The RS485 serial interface is based on a balanced differential communication line with typical impedance of 120 ohm. The maximum length of the connection is not defined but depends on the communication speed, the signal to noise ratio and the cable quality. Broadly as a rule the maximum length for granted operation is fixed at 1200 m. The connection cable does not have to be shielded if the distance is only a few metres in a “low noise” electrical environment. For distances between 15 and 100 m a shielded twisted cable can be used without particular specifications whereas for connections over 100 m you must use, for example, CEAM CPR 6003 or BELDEN 9841 cable.
The communication line should be a chain type, avoiding star connection and limiting branches to a few metres (see figure below). The ends of the line must be terminated by setting the related dip-sw on the module to ON, or by fitting a resistance of 120 ohm parallel to the line. The cable shield must be connected to the **GND** terminal on both sides, and connected to earth on at least one side. If necessary to reduce interference, the other side should be connected to earth by means of a 10 nF capacitor.



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		1 2 3 4 5 6 7 8		9 10	
↓↓x x x x x x	9600	x x ↓↓↓↓↓↑	# 1	x ↓	DISABLED
↓↑x x x x x x	19200	x x ↓↓↓↓↑↓	# 2	x ↑	ENABLED
↑↓x x x x x x	38400	x x	#. .	↑	ON
↑↑x x x x x x	57600	x x ↑↑↑↑↑↑	# 63	↓	OFF
x x ↓↓↓↓↓↓	FROM EEPROM	x x ↓↓↓↓↓↓	FROM EEPROM		

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.

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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
Digital outputs:	DISABLED
Safety state:	DISABLED
Safety time:	DISABLED
Reverse relay status	DISABLED

Variations of standard parameters are possible by using configuration software EASY-SETUP available from www.seneca.it site.
For more information about a list of all register and their function please see the USER manual.

ORDER CODES

Code	Description
Z-D-OUT-1	Modbus RS485 module with 5 relays digital outputs.
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

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