INSTALLATION MANUAL

ZC-24DO

CANopen/MODBUS I/O Module with 24 Digital Outputs

EN



SENECA

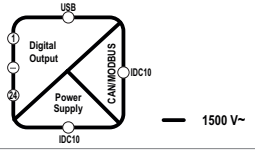
ISO 9001:2008

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Manuals and configuration software are available at website: www.seneca.it/products/zc-24do

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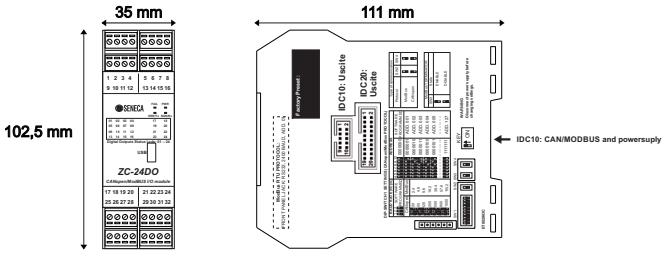
TECHNICAL SPECIFICATIONS

STANDARDS	**EN61000-6-4** Electromagnetic emission, industrial environment. **EN61000-6-2**.Electromagnetic immunity, industrial environment. **EN61010-1** (safety) Install a fuse with a maximum capacity of 2.5 A near the module
ISOLATION	
ENVIRONMENTAL CONDITIONS *Temperature* *Humidity* *Storage temperature* *Protection rating*	 -20 – + 65°C 90% a 40° non condensing, until 2000 m s.l.m. -20 – + 85°C IP20
MOUNTING	35mm IEC EN60715 DIN Rail.
CONNECTIONS	Removable 4-way screw terminals, 3.5 mm pitch for cable up to 2.5 mm^2 , IDC10 Rear, IDC10 Lateral, IDC1o Lateral and Micro USB front.
POWER SUPPLY	Voltage 10 – 40 V⎓ o 19 – 28 V⎓ 50 – 60 Hz Typical absorption 1,5 W, MAX 2,5 W
DIGITAL OUTPUT	Number of channels 24, MOSFET (Open Source), with common negative Supply voltage 5 - 30 VC Max. 0.5A current for each output (with connection from terminals) Current Max. 25 mA for each output (with connection from side connectors) RDS on 0.75Ω, ON / OFF delay MAX 1 ms
COMMUNICATION PORTS	Front USB with MODBUS protocol IDC10 rear CAN with MODBUS RTU protocol on RS485: up to 115kbps Rear IDC10 CAN with CANopen protocol: up to 1 Mbps
CONFIGURABILITÁ	Baud rate e Address MODBUS o Baud rate e Node ID CANopen tramite DIP-switch o via software.
Dimensions (L×H×W)	35 x 102,5 x 111 mm (with terminals).
Weight	250 g.
Case	Material PA6, black color.

For further information, please refer to the: **USER MANUAL**

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MODULE LAYOUT



PRELIMINARY WARNINGS

WARNING: 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/zc-24do

The symbol ⚠ with the word **WARNING** identifies conditions and actions that pose hazard(s) to the user. The symbol ⚠ with the word **CAUTION** identifies conditions andactions that may damage the device or the equipements connected.

No warranty is guaranteed 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.

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.

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

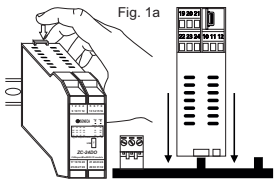
Disposal of electrical & electronic equipment (applicable throughout the EU and other countries with separate collection programs). The symbol found on this product or on its packaging, indicates that this product it must be handed over to an applicable collection point for **the recycling of electrical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

INSTALLATION RULES

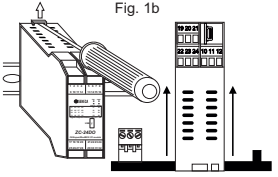
The module is designed to be installed in vertical position on a DIN 46277 rail. In order to ensure optimum performance and the longest working life, the module(s) must be supplied with adequate ventilation and no raceways or other objects that obstruct the ventilation slots. Never install modules above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

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INSTALLATION 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 fig. 1b.
2) Insert the module rear IDC10 connector into a free slot of DIN rail accessory as you can see in fig 1a. (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 fig. 1a.



Removal from IEC EN 60715 DIN rail:
As shown in fig. 1b:
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 **Fig. 1 c** and **Fig.1 d** show how to connect powersupply and RS485 port to the rear IDC10 connector.

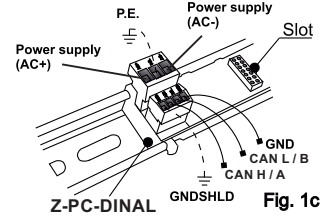


Fig. 1c

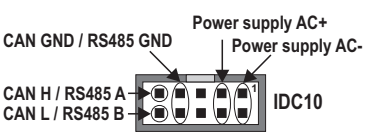


Fig. 1d

POWER SUPPLY AND CAN/MODBUS INTERFACE

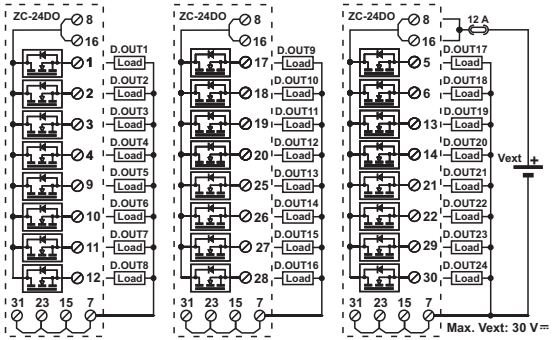
Power Supply and CAN/MODBUS interface are available by using the bus for the Seneca DIN rail, by the rear IDC10 connector or by Z-PC-DINAL1-35 accessory.

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ELECTRICAL CONNECTIONS

DIGITAL OUTPUTS CONNECTIONS FROM TERMINALS

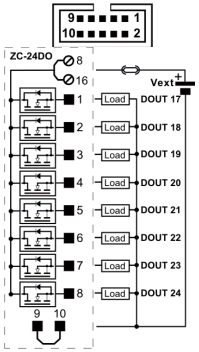
The total current entering on power supply terminal must be limited to 12 A with quick-break fuse or quivalent protection.



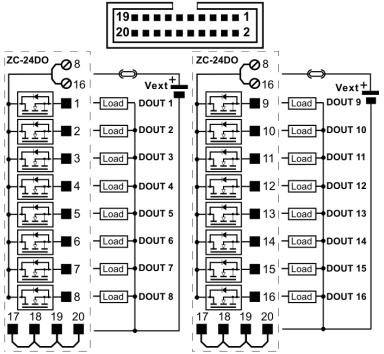
DIGITAL OUTPUTS CONNECTIONS FROM CONNECTORS (module rear side)

Connection suggested to supply 24 V relays. The total current entering on power supply terminal must be limited to 0.6 A with quick-break fuse or equivalent protection. Max. current for each output: 25 mA.

IDC10: DOUT17..DOUT24



IDC20: DOUT1..DOUT16

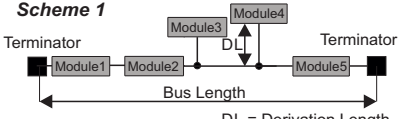


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MODBUS CONNECTION RULES

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 connect the two bus terminators modules (see Scheme 1).
-Drop Length: maximum length of a drop line (see Scheme 1) as a function of the Baud Rate.

Scheme 1



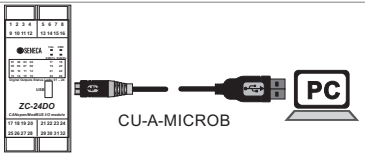
• MODBUS Scheme 1

BUS lenght	Derivation lenght	Baudrate
1200 m	2 m	115kbps

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

PROGRAMMING VIA MICRO USB PORT

The module has a micro USB connector on the front panel for communication with a windows PC and configuration software.



Parameters of the USB port for PC connection: Address: 1, Baud Rate: 2400 Baud, Parity: none, Stop bit: 1. For the product programming tools, consult the website: www.seneca.it/products/zc-24do. For more information, please refer to the USER MANUAL. In order to change the parameters please download EASY-SETUP software from the download area at the bottom the product's page.

PROGRAMMING VIA CAN/MODBUS INTERFACE

The module may be programmed/configured through the CAN/MODBUS interface; please refer to the User Manual for details about the communication.
For the variation of the parameters, the communication software: Z-NET and EASY-SETUP are available in the download area of the website www.seneca.it/software.

With all DIP-switches in the OFF position (the communication parameters are taken from the memory).

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LED SIGNALLING ON FRONT PANEL

LED	Status	LED signalling
PWR (Green)	ON	Power supply available
	OFF	Module OFF
Fail (Yellow)	ON	Receiving data on the USB port or external power failure on the terminals POSITIVE: 8 and NEGATIVE: 7 or Fail: at least one output in fault condition.
RUN (CANOPEN) (Green)	ON	The device is working correctly (CANOPEN)
	Single Blinking	The device is in stopped state
	Blinking	Device turned on (pre-operation)
Tx (MODBUS) (Green)	ON	Device in data trasmission (RS485 MODBUS)
ERR (CANOPEN) (Red)	ON	Bus off and CANOPEN controller off
	OFF	No error device is working fine (CANOPEN)
	Single Blinking	At least one of the CANOPEN controller error counters has reached or exceeded the alarm threshold (too many error messages).
	Double Blinking	A Guard event occurred (NMT slave or NMT master)
	Triple Blinking	The Sync message was not received within the communication cycle timeout (synchronism error).
Rx (MODBUS) (Red)	ON	Device in data reception (RS485 MODBUS)
Number 01.–.24 (Green)	ON	The digital output (01.–.24) is on.
	OFF	The digital output (01.–.24) is off.

DEFAULT PARAMETERS

Default parameters available with all **DIP-switches in the OFF position:**

MODBUS: Address 1 Baud Rate: 38400, Bit: 8, Equality: None, Stop bit: 1
- MODBUS Protocol (con SW2 e SW4 = OFF).
- In case of Fail the outputs all lead to the value 0.
- MODBUS communication monitoring is not active.

Mooving DIP-switches **SW2 e SW4 in ON** the device is configurated for:
CANOPEN: Address: 127, Baud Rate: 20 kbps
- CANopen protocol (with SW2 e SW4 = ON).
- In case of Fail the outputs all lead to the value 0.

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SETTING VIA DIP-SWITCHS

DIP-switches must be set with the module switched off in order to avoid damage.
The DIP-switches position defines the module CAN/MODBUS communication parameters: Address and Baud Rate. Remember that in all DIN rail supports there is a **DIP switch which, when turned ON, inserts the termination of the CAN network**. In the following table the Baud Rate and Address values are listed as a function of the DIP-switches position:

SW1	BAUD RATE (kbps)		SW1	ADDRESS	ADDRESS
1 2 3	CANOPEN	MODBUS	4 5 6 7 8 9 10	BINARY	DECIMAL
↓↓↑	20	2.4	↓↓↓↓↓↓↑	0000001	ADD. 001
↓↑↓	50	4.8	↓↓↓↓↓↑↓	0000010	ADD. 002
↓↑↑	125	9.6	↓↓↓↓↓↑↑	0000011	ADD. 003
↑↓↓	250	19.2	↓↓↓↓↑↓↓	0000100	ADD. 004
↑↓↑	500	38.4	↓↓↓↓↑↓↑	0000101	ADD. 005
↑↑↓	800	57.6	.....	.....	.....
↑↑↑	1000	115.2	↑↑↑↑↑↑↑	1111111	ADD. 127
↓↓↓	FROM EEPROM SOFTWARE PROGRAMMED		↓↓↓↓↓↓↓	FROM EEPROM SOFTWARE PROGRAMMED	

SW2	SW4	PROTOCOL	SW3	MODBUS TERMINATOR	KEY	
↓	↓	MODBUS	↑	ENABLED	↑	ON
↑	↑	CANOPEN	↓	DISABLED	↓	OFF

Note: When DIP switches 1 to 10 are OFF, communication settings are taken from programming (EEPROM).
Note 2: The termination of the line must be carried out only at the ends of the communication line.

ACCESSORIES

Code	Description
Z-PC-DINAL1-35	DIN rail support with power supply terminals P = 35 mm
Z-PC-DIN1-35	DIN holder 1 slot for rear connector P = 35 mm
CU-A-MICROB	USB cable plug, USB A - microUSB-B-SP

CONTACTS

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

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