

Z-PC Line

ZC-24DO

CANopen/MODBUS I/O Module
24 Digital Outputs

Installation Manual

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Humidity	30 - 90 % at 40 °C non condensing
Altitude	Up to 2000 m a.s.l.
Storage Temperature	-20 / +85 °C
Protection	IP20

CONNECTIONS

Removable Terminals	4-way screw terminals (3.5 mm pitch): outputs.
Rear IDC10 Connector	CAN/MODBUS Interface and power supply (for DIN rail)
IDC10 / IDC20 Connectors	Outputs (on the rear, alternatively to terminals).
Stereophonic Frontal Jack	3,5 mm; RS232 (COM)

DIMENSIONS / BOX

Dimensions	L: 100 mm, H: 112 mm, W: 35 mm
Box	PBT, black

ISOLATIONS / STANDARDS

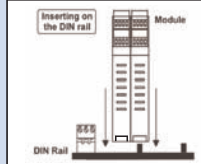
Isolation Diagram 3-Points 1500 V _{AC} isolation 	Standards The module complies with the following standards: EN61000-6-4/2002-10 (electromagnetic emission, industrial environment). EN61000-6-2/2006-10 (electromagnetic immunity, industrial environment). EN61010-1/2001 (safety). All circuits must be isolated from the other circuits under dangerous voltage with double isolation. The power supply transformer must comply with EN60742: "Isolated transformers and safety transformers".
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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 adequate ventilation and no raceways or other objects that obstruct the ventilation slots. Never install modules above sources of heat; we recommend installation in the lower part of the control panel.

Inserting on the DIN rail

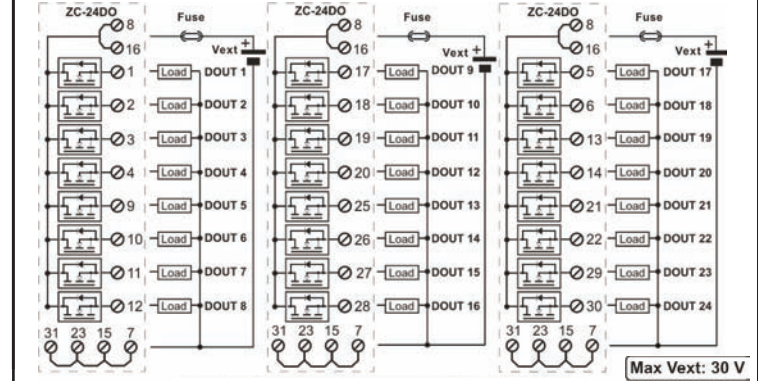
- As it is illustrated in the next figure:
- 1) Insert the rear IDC10 connector on a DIN rail free slot (the inserting is univocal since the connectors are polarized).
 - 2) Tighten the four locks placed at the sides of the rear IDC10 connector to fix the module.



DIGITAL OUTPUTS

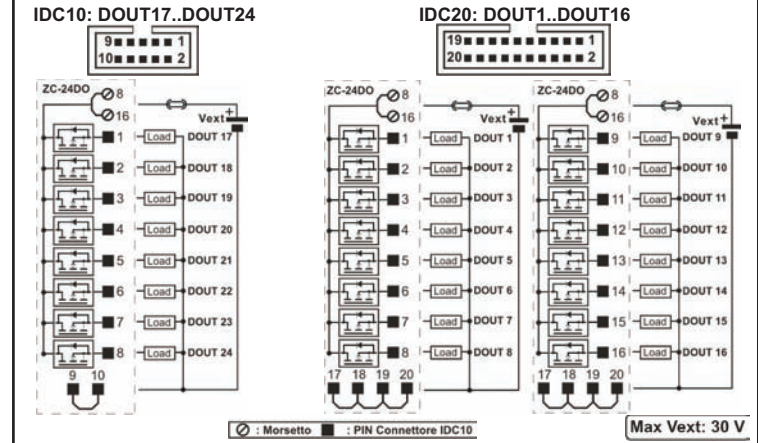
Digital Outputs Connections from terminals

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



Digital Outputs Connections from connectors (module rear side)

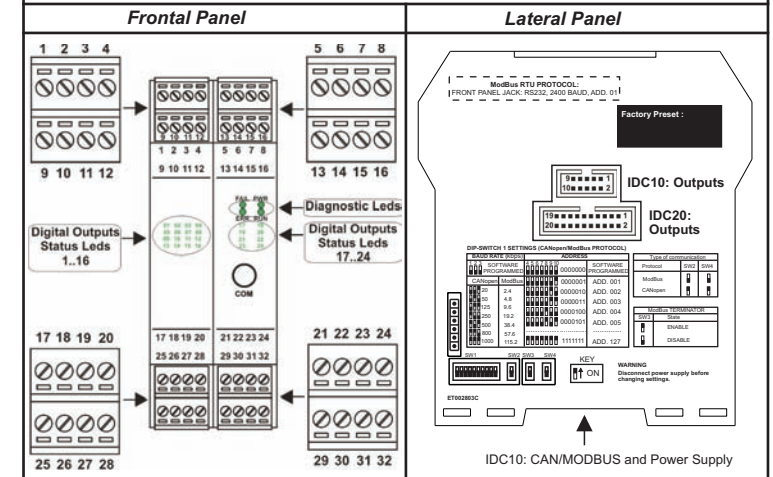
Connection suggested to supply 24 V relays. The total current entering on power supply terminal must be limited to 0.6 A with quick-break fuse or equivalent protection. Max. current for each output: 25 mA.



Significant Components Position

Terminals/Leds/IDC10 Connector/ DIP-switch

The terminals numbering, the leds position on the frontal panel, the rear IDC10 connector (fixing on the DIN rail) and the DIP-switch on the rear side are illustrated below.



LEDs Signallings

LED ERR E RUN: CANOPEN / MODBUS COMMUNICATION STATE

The meaning of leds ERR and RUN is described below; refer to the User Manual for details about the possible state and the flashing modes of the two leds.

LED ERR (Red)	STATE	LED (Red) ERR (CANOPEN) Meaning
OFF	No error	The Device is in working condition.
Single flash	Warning limit reached	At least one of the error counters of the CAN controller has reached or exceeded the warning level (too many error frames).
Double flash	Error Event	A guard event (NMT-Slave or NMT-master).
Triple flash	Sync Error	The SYNC message has not been received within the communication cycle period time out.
ON	Bus off	The CAN controller is bus off.

LED ERR (Red)	LED (Red) Rx (MODBUS) Meaning
ON	The device is receiving.

General Specifications

- 24 Mosfet Digital Outputs with shared negative pole, 5 - 30 V_{DC} collectively supplied.
- Digital outputs available both by terminals and IDC10/ IDC20 connectors to facilitate the connection to external relays.
- Can Interface with CANopen protocol up to 1 Mbps speed or MODBUS RS485 Interface up to 115 Kbit/s speed.
- CANopen/MODBUS Baud rate and Node ID configurability by DIP-switches or software.
- RS232 Serial Communication with MODBUS-RTU protocol.
- Facilitated power supply and CANopen/MODBUS bus wiring by means of the bus housed in the DIN rail.
- 1500 V_{AC} Isolation among output, power supply and CANopen/MODBUS interface circuits.
- Overtemperature and short-circuit to ground of digital outputs continuous monitoring and consequent fault condition signalling.
- Outputs value in case of no communication or fault condition: programmable value or last set value.
- Leds Signallings: Power Supply, Digital Outputs State, CANopen/MODBUS Communication, MODBUS-RTU Communication.

Specifiche Tecniche

OUTPUTS

Numbers of Channels	24
Outputs Type	MOSFET (Open Source)
Power Supply Voltage	5 - 30 V _{DC}
Maximum current (for each output)	0,5 A (connection from terminals) 25 mA (connection from connectors)
RDS on	0,75 Ω
ON/OFF delay	Max 1 ms

POWER SUPPLY

Voltage	10 - 40 V _{DC} 19 - 28 V _{AC}
Consumption	Typical: 1.5 W, Max: 2.5 W

ENVIRONMENTAL CONDITIONS

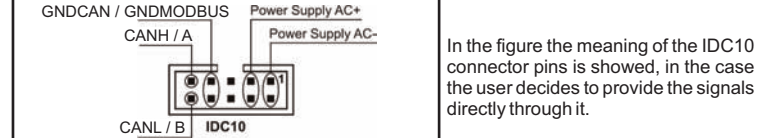
Temperature	-10 / +65 °C
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Electrical Connections

POWER SUPPLY AND CAN/MODBUS INTERFACE

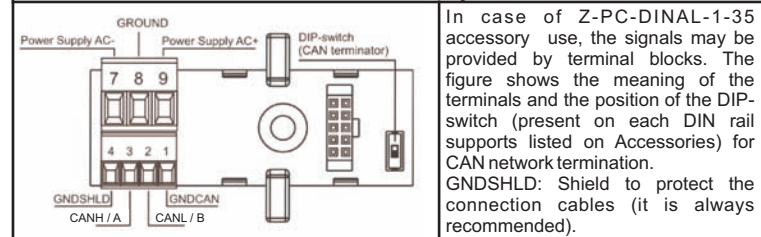
Power Supply and CAN/MODBUS interface are available by using the bus for the Seneca DIN rail, by the rear IDC10 connector or by Z-PC-DINAL1-35 accessory.

Rear Connector (IDC10)



In the figure the meaning of the IDC10 connector pins is showed, in the case the user decides to provide the signals directly through it.

Z-PC-DINAL1-35 Accessory Use



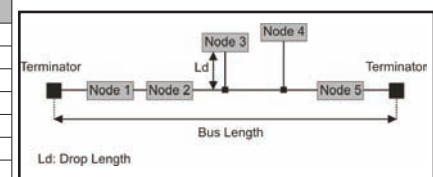
In case of Z-PC-DINAL1-35 accessory use, the signals may be provided by terminal blocks. The figure shows the meaning of the terminals and the position of the DIP-switch (present on each DIN rail supports listed on Accessories) for CAN network termination. GNDSHLD: Shield to protect the connection cables (it is always recommended).

CAN bus 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 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) as a function of the Baud Rate.

Baud rate	Bus Length	Drop Length
20 kbps	2500 m	150 m
50 kbps	1000 m	60 m
125 kbps	500 m	5 m
250 kbps	250 m	5 m
500 kbps	100 m	5 m
800 kbps	50 m	3 m
1000 kbps	25 m	0,3 m

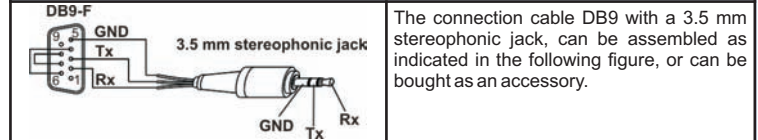
Scheme 1



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

- 3) Terminate the two ends of the CANbus network by setting to ON the DIP-switch present on the DIN rail connection supports (see Accessories) where the two ends are inserted.

RS232 SERIAL PORT



The connection cable DB9 with a 3.5 mm stereophonic jack, can be assembled as indicated in the following figure, or can be bought as an accessory.

DIP-switches Settings

The DIP-switches position defines the module CAN/MODBUS communication parameters: Address and Baud Rate. In the following figure the Baud Rate and Address values are listed as a function of the DIP-switches position:

BAUD RATE (kbps)	ADDRESS	Type of communication
1 2 3 SOFTWARE PROGRAMMED	4 5 6 7 8 9 10 SOFTWARE PROGRAMMED	Protocol SW2 SW4
CANopen ModBus	0000000	ModBus
20	0000001	CANopen
2.4	0000010	
4.8	0000011	
9.6	0000100	
19.2	0000101	
38.4	0000101	
57.6	
115.2	1111111	

We underline that on all the DIN rail supports a DIP-switch is present and if it is set to ON position the CAN network termination is inserted.

Programming

PROGRAMMING THROUGH CAN/MODBUS INTERFACE

The module may be programmed/configured through the CAN/MODBUS interface; refer to the User Manual for details about the communication.

Factory Parameters

With all the DIP-switches in OFF position (values from memory), the module is originally programmed as follows:
MODBUS, Baud Rate: 38400, Bit: 8, Parity: None, Stop bit: 1, Address: 1
To switching ON SW2 and SW4: CANOPEN, Baud Rate: 20 kbps, Address: 127.

PROGRAMMING THROUGH RS232 (FRONTAL JACK)

The module may be programmed/configured through the RS232 interface by using MODBUS-RTU protocol; refer to the User Manual for details about the communication. The connection parameters are the following:
Address: 1, Baud Rate: 2400 Baud, Parity: none, Stop bit: 1.

FACTORY SETTINGS

- All DIP-switch OFF:
- MODBUS Protocol / - Communication parameters: 38400 8,N,1 Addr. 1
 - In case of fail, outputs go low.
 - Modbus communication monitoring, not active.

- All dip switch OFF except SW2 (ON) and SW4 (ON):
- CANopen Protocol / - Communication parameters: 20K Addr. 127
 - In case of fail, outputs go low.

Variations of standard parameters are possible by using configuration softwares Z-NET and EASY-Z-PC (www.seneca.it).

Disposal of Electrical & Electronic Equipment (Applicable throughout the European Union and other European countries with separate collections programs). This symbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical & electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of the product, please contact your local city office, waste disposal service of the retail store where you purchased this product.