INSTALLATION MANUAL

ZC-16DI-8DO

CANopen/MODBUS I/O Module
16 Digital Inputs - 8 Digital Outputs

EN

CE

SENECA

ISO 9001:2008

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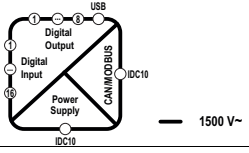
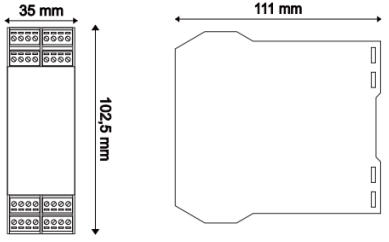
For manuals in French, German, English and configuration software visit www.seneca.it/products/zc-16di-8do

TECHNICAL SPECIFICATIONS

STANDARDS	**EN61000-6-4** Electromagnetic emissions, 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
INSULATION	
ENVIRONMENTAL CONDITIONS *Temperature* *Humidity / Altitude* *Storage temperature* *Degree of protection*	 -20 – 65°C 30 - 90 % non condensing, up to 2000 m above sea level -20 – 85°C IP20
ASSEMBLY	25Mm DIN rail IEC EN60715
CONNECTIONS	Removable 4-way screw terminals, 3.5 mm pitch for cable up to 2.5 mm2, IDC10 Rear, micro USB.
POWER SUPPLY	Voltage 10 - 40 ⎓ In 19 - 28 B ~ 50 - 60 X3. Typical absorption 1.5 W, MAX 2.5 W
DIGITAL OUTPUTS	Number of channels 8, MOSFET (Open Source) Supply voltage 5 - 30 V ⎓ MAX current 0.5 A (with connection from terminals). MAX current 25 mA (with connection from connectors) RDS on 0.75Ω, with MAX ON/OFF delay 1 ms
DIGITAL INPUTS	Number of channels 16, Sink (pnp) U_L (status OFF): 0-7 V⎓ U_H (status ON): 11-30 V⎓ V mAX: 30 V ⎓ Current consumption (for each input) 3mA
COMMUNICATION PORTS	way removable screw terminals, pitch 3.5 mm Micro USB communication (virtual serial) with MODBUS protocol Power supply via CAN / MODBUS IDC10 connector on DIN rail Outputs on the side as an alternative to the terminals with IDC20 connectors
CONFIGURABILITY	Baud rate and Node ID CANopen/MODBUS via DIP-switch or via software.

MODULE LAYOUT



Dimensions: 35 x 102.5 x 111mm, Weight:: 250 g, **Container** PA6, black

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 is no longer valid in case of improper use or tampering with the module or devices supplied by the manufacturer, necessary for its correct operation and if the instructions contained in this manual have not been followed.

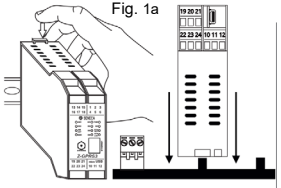
	WARNING: The full content of this manual must be read before operation. The module must only be used by qualified electricians. Specific documentation is available at www.seneca.it/prodotti/z-gprs3.
	The module must be repaired and damaged parts replaced by the manufacturer. The product is sensitive 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 that the product must be disposed of at a collection centre authorised to recycle **electrical and electronic waste.**

ASSEMBLY STANDARDS

The module has been designed for vertical installation on an IEC EN 60715 omega guide.
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 equipment generating heat.
Installation in the bottom part of the switchboard is recommended.

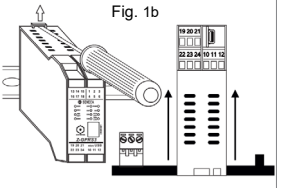
INSTALLATION ON AND REMOVAL FROM DIN IEC EN 60715 RAIL

Fig. 1a



Insertion on the OMEGA IEC EN 60715 rail:
1) Move the two hooks on the back of the module outward as illustrated in Fig. 1b.
2) Insert the rear IDC10 connector of the module into a free slot of the OMEGA rail accessory as shown in Fig. 1a. (insertion is univocal as connectors are polarised).
3) To secure the module to the OMEGA guide, tighten the two hooks on the side of the IDC10 rear connector as illustrated in Fig. 1a.

Fig. 1b



Removal from the OMEGA IEC EN 60715 rail:
As shown in figure 1b:
1) With the help of a screwdriver, pull the two hooks on the side of the module outwards.
2) Slowly extract the module from the rail.

USE OF THE Z-PC-DINAL ACCESSORY

⚠ ATTENTION

Do not turn the module upside down and do not force the insertion of the IDC10 connector on the Z-PC-DIN bus. The module's rear IDC10 connector must be plugged into a free slot on the Z-PC-DIN bus. The illustration shows the meanings of the various IDC10 connector pins if signals are to be sent via them directly.

SUPPLY AND CAN/MODBUS INTERFACE

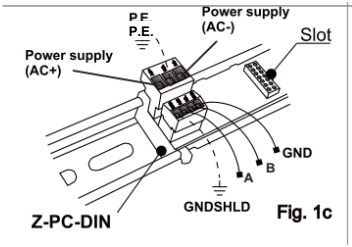


Fig. 1c

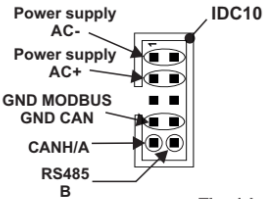


Fig. 1d

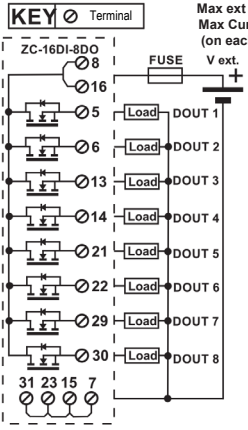
Power supply and CAN/MODBUS interface are available using the Seneca omega rail bus, via the IDC10 connector, or the Z-PC-DINAL-35 accessory.

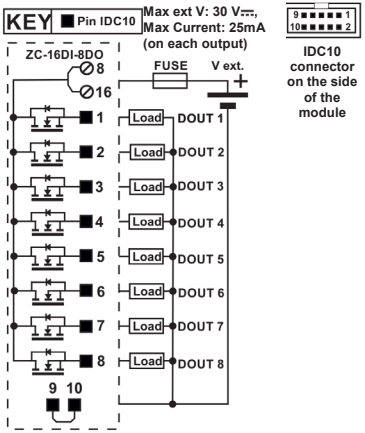
DIGITAL OUTPUT CONNECTIONS FROM TERMINAL.

Limit to 4 A the total current entering the output power terminal by fast-acting fuse or equivalent protection.
Maximum current per output: 0.5 A.

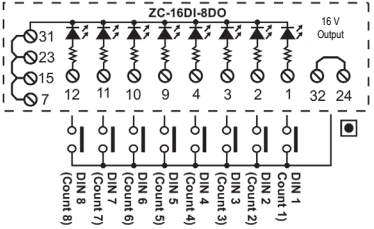
DIGITAL OUTPUT CONNECTIONS FROM CONNECTORS

It is recommended for powering 24 V relays to limit the total current in the power supply terminal to 0.2 A by fast -acting fuse or equivalent protection.
Maximum current per output: 25 mA.

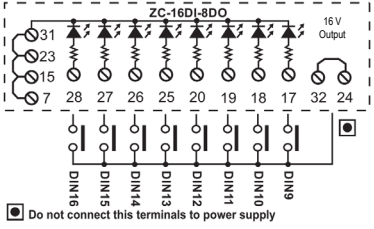




Digital inputs configurable at counter high speed (MAX frequency: 10 kHz)



General digital inputs

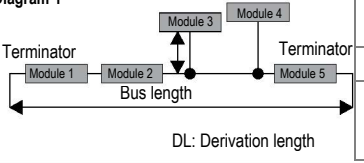


MODBUS CONNECTION RULES

Connect the remote modules using cables of an appropriate length. The following table shows the data regarding the cable length:
- Bus length: maximum length of the Modbus network
- Derivation length: maximum length of a derivation (see Diagram 1).

NOTE: For maximum performance, we recommend the use of special shielded cables, such as BELDEN 9841. Terminate the two ends of the CAN network by setting to ON the DIP switch on the supports for the connection to the DIN rail on which the two ends are inserted.

Diagram 1



● MODBUS Diagram 1		
Bus length	**Derivation length**	**Baud ate**
1200 m	2 m	115kbps

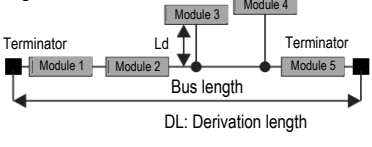
For maximum performance, it is recommended to use special shielded cables, such as BELDEN 9841.

CANopen CONNECTION RULES

NOTE: For maximum performance, we recommend the use of shielded cables, such as BELDEN 9841.
Terminate the two ends of the CAN network by setting to ON the DIP switch on the supports for the connection to the DIN rail on which the two ends are inserted.

Baud rate	Bus length	Derivation length
20 kbps	2500 m	150m
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

Diagram 2



PROGRAMMING

Micro USB Interface
The module has a micro USB connector on the front panel for the software configuration.
For the product programming tools, go to.seneca.it/prodotti/zc-24do. The connection parameters are as follows:
Address: 1, Baud Rate: 2400 Baud, Parity: none, Stop bit: 1.

PROGRAMMING VIA CAN/MODBUS INTERFACE

The module can be programmed/configured via the CAN/MODBUS interface; for details regarding communication, refer to the User Manual.

LED SIGNALS ON THE FRONT PANEL

LED	Status	LED meaning
PWR (Green)	On	Power supply on
	Off	Module Off
Fail (Yellow)	On	Lack of external power supply on the terminals POSITIVE: 8 and NEGATIVE: 7 or at least one output in fault condition.
RUN (CANOPEN) (Green)	On	Device operating normally (CANOPEN: OPERATIONAL)
	Single flash	Device not operating (stopped)
	Flashing	Device switching on (PRE-OPERATIONAL)
Tx (MODBUS) (Green)	On	Device transmitting data (MODBUS)
ERR (CANOPEN) (Red)	On	BUS OFF conditions
	Off	No error and device operating normally (CANOPEN)
	Single flash	At least one of the CANOPEN controller error counters has reached or exceeded the alarm threshold (too many error
	Double flashing	A Guard event occurred (NMT slave or NMT master).
	Triple flashing	The Sync message was not received within the communication cycle timeout (synchronism error).
Rx (MODBUS) (Ref)	On	Device receiving data (MODBUS)
Number 01-16 (Green)	On	The corresponding digital output (01 - 16) is on.
	Off	The corresponding digital output (01 - 16) is off.
Number 1O.–.8O (Green)	On	The corresponding digital output (10 - 80) is on.
	Off	The corresponding digital output (10 - 80) is off.

DIP SWITCH SETTINGS

All DIP - switches in OFF:
- MODBUS protocol/communication parameters: 38400 8,N,1 Addr. 1
- In case of Fail the outputs all move to 0
- MODBUS communication monitoring is not activated

Moving SW2 and SW4 to ON the module is configured for:
- CANopen protocol/communication parameters: 20K Addr. 127
- In case of Fail the outputs all move to 0

To vary any parameter, the EASY SETUP and Z-NET 4 communication software packages are available to be downloaded from www.seneca.it.

DIP SWITCH SETTINGS

●DIP-SWITCH

DIP-switches must be set while the module is not powered on in order to avoid damaging it.
The position of the DIP-switches defines the CANOPEN/ MODBUS communication parameters of the module: 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.** The following table shows the Baud Rate and Address values according to the DIP-switch setting:

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 line must be terminated only at the ends of the communicationn line and only fot CANopen bus.

ACCESSORIES

Code	Description
Z-PC-DINAL1-35	DIN rail support with power supply terminals P = 35 mm
Z-PC-DIN1-35	DIN 1-slot support for rear connector P = 35mm

CONTACT INFORMATION:

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