

# Z-D-OUT

## 5 RELAY OUTPUTS MODULE / RS485

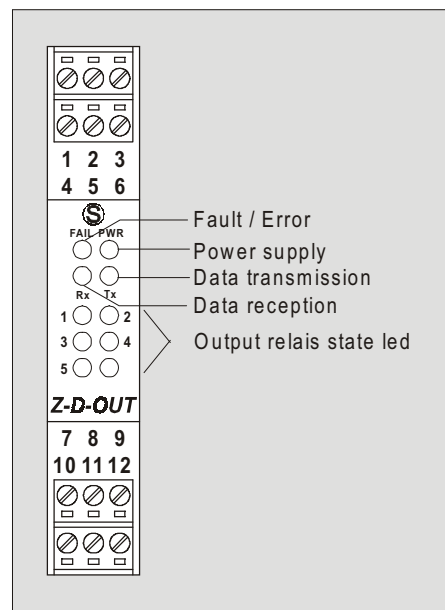
Used to pilot 5 output SPST relays from all of the control systems which are able to communicate with the transmission protocol MODBUS RTU through the RS485 serial interface.

The instrument comprises 5 SPST NO output relays with negative in common and 5 A 250Vac capacity resistive loading, 2 A inductive loading.

For each output it is possible to set whether the state of relays if at rest, if so, it should be NO otherwise NC as well as the state to which the relays need to be taken upon start-up or in the case of lack of communication, including a delay which can vary between 50 and 2500 ms.

The wiring of the power supply and serial bus is facilitated by the use of a support bus that can be lodged within the DIN guide. Such a system also allows for hot swapping, that is, the insertion and extraction of the module from the bus without the interruption of the communication nor the power supply to the remaining part of the system.

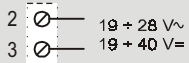
Frontal signalling LEDs for: presence of power supply, anomaly, state of the 5 inputs, reception/transmission of data.



### TECHNICAL DATA

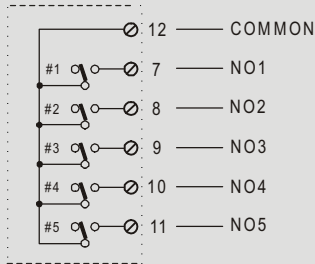
- Power supply : 19 - 40 Vcc / 19 - 28 Vca - 50/60 Hz, power consumption max. 2,5W
- Input galvanised separation / the remaining circuits are at low voltage : 2500 Vac
- Interface : serial RS485 2 wire with settable velocity : 4800, 9600, 19200, 38400, 57600 baud
- Communication protocol : MODBUS RTU
- Communication time : < 10 ms (@ 38400 baud)
- Connection distance : up to 1200 m
- Outputs : 5 relay type SPST NO with common
- Current capacity : resistive load 5A 250Vac , inductive load 2A
- Maximum total current : 12 A on common clamp (see connections)
- For further information make reference to page 2.

**POWER SUPPLY**

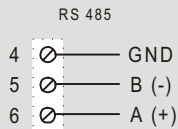


Power voltage must be in a range from 19 to 40 Vdc (indifferent polarity), from 19 to 28 Vac. **Upper limits must be exceeded, if it happen there could be damage for module.** It is necessary to protect power source from possible module's failure by fuse correctly dimensioned.

**OUTPUTS**



**SERIAL INTERFACE**



**BUS SUPPORT DIN TYPE**

The connection, for serial interface and feed of the module, is also situated on the connector on the instrument bottom.

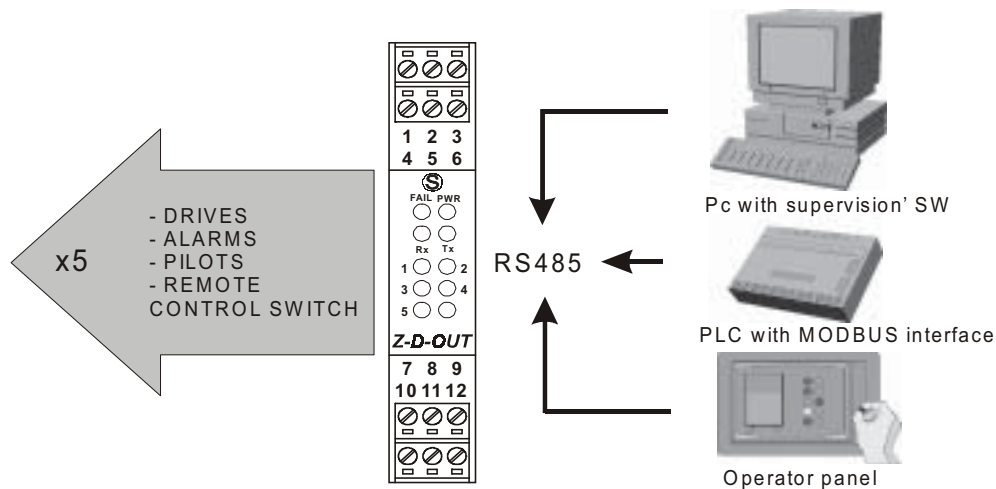
This connector allows the connectin by bus through the support that must be installed in the DIN guide.

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**PROGRAMMING**

All of the settings of the module, such as the type of input, setting of the digital filters, velocity of the serial interface, address of the module, etc. can be configured by means of the appropriate Z-PROG software.

**EXAMPLES**



## Z-PC Line



## Z-D-OUT

Modbus Module with  
5 relay for Digital Outputs

## Installation Manual



### Contents:

- General Specifications
- Technical Specifications
- Installation Rules
- Electrical connections
- Modbus connections rules
- DIP-switches settings
- Digital inputs
- Leds Signallings
- Factory Settings

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## General Specifications

- 5 SPST relay outputs N.O. with common line, capacity 5 A-250 Vac resistive, 2 A inductive.
- Pull-out terminals, section 2.5 mm<sup>2</sup>.
- Possibility of setting relays as N.O. or N.C. (rest status).
- Setting of relay safety status at start-up or in the event of no communication.
- Safety time settable from 0,5 s to 2,5 s.
- Possibility of ON-LINE configuration. RS485 serial communication with Modbus RTU protocol, maximum 32 nodes.
- 2500 Vac output insulation with respect to remaining low voltage circuits.
- Power supply and serial connection wiring facilitated by means of a bus that can be housed in the DIN guide. The terminals can still be used.
- Insertion into and removal from bus without interrupting communication or system power supply.
- Communication times below 10 ms (@ 38400 Baud).
- Connection distance up to 1200 m.

## Technical Specifications

### INPUTS

Type output	5 SPST N.O. relay outputs with common line
Number of Channels	5
Maximum rated current	5 A
Maximum switching voltage	250 V <sub>AC</sub>
Relay working voltage	24 V <sub>DC</sub>
Pick-Up Relay	18 V
Drop-Out Relay	2,4 V
Relay absorbed current	9 mA
Operate / release time relay	5/2 ms



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POWER SUPPLY	
Voltage	10 ..40 V <sub>DC</sub> 19 ..28 V <sub>AC</sub> a 50 ..60 Hz
Consumption	Typical: 1,5 W, Max: 2,5 W
ENVIRONMENTAL CONDITION	
Temperature	-10 ..+65°C
Humidity	30 ..90% a 40°C non condensing
Altitude	Up to 2000 m a.s.l.
Storage Temperature	-20 ..+85°C
Protection	IP20
CONNECTIONS	
Connections	Removable 3-way crew terminals, 3,5 pitch Rear IDC10 connector for DIN 46277 rail

DIMENSIONS / BOX	
Dimensioni	L: 100 mm; H: 112 mm; W: 17,5 mm
Contenitore	PBT, colore nero

ISOLATIONS	STANDARDS
1500 Vac a tre punti:	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".

**ADDITIONAL NOTES :**  
Use in Pollution Degree 2 Environment .  
Power Supply must be Class 2.  
When supplied by an Isolated Limited Voltage/Limited Current power supply a fuse rated max 2,5 A shall be installed in the field.



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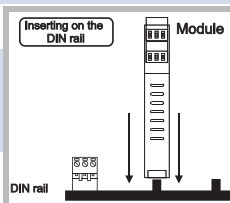
## Installation Rules

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 two locks placed at the sides of the rear IDC10 connector to fix the module.

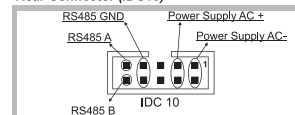


## Electrical Connections

### POWER SUPPLY AND MODBUS INTERFACE

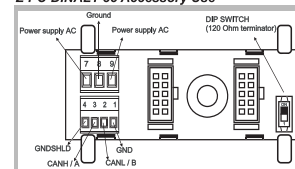
Power Supply and CAN/Modbus interface are available by using the bus for the Seneca DIN rail, by the rear IDC10 connector or by Z-PC-DINAL1-35 accessory.

#### 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-DINAL-1-35 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 network termination (not used in case of Modbus network).  
GND/SHLD: Shield to protect the connection cables (recommended).



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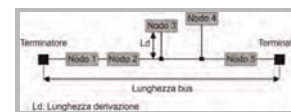
POWER SUPPLY	
	Terminals 2 and 3 can be used to provide the module with power supply as an alternative to connection using the Z-PC-DINx bus. <b>The upper limits must not be exceeded as this can seriously damage the module.</b> If the power supply source is not protected against overload, a safety fuse with a max. permissible value of 2,5 A must be installed in the power supply line.
DIGITAL OUTPUTS	
	<b>Note:</b> The maximum current that can flow through the COMMON terminal is 12A

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

### 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: Modbus 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.

Schema 1



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

## DIP-switch settings

The DIP-switches position defines the module 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:

### DIP SWITCH STATUS

POSITION	BAUD RATE	POSITION	INDIRIZZO	POSITION	TERMINATOR
00xxxxxxx	9600	xx00001xx	# 1	xxxxxxx0	Disable
01xxxxxxx	19200	xx000010xx	# 2	xxxxxxx1	Enable
10xxxxxxx	38400	.....	.....		
11xxxxxxx	57600	xx111111xx	# 63		

POSITION	BAUD RATE	POSITION	INDIRIZZO
xx000000	From EEPROM	xx000000	From EEPROM

**Note:** when switches from 3 to 8 are in OFF, communication settings are retrieved from EEPROM

### Digital Outputs

**General:**  
In the Modbus register 40002 is possible to see the state of outputs or change the state of them. Bits 0 to 4 in 40002 register respectively represent the status of output from 1 to 5.

Besides you can set up the output in a state of security when the bus communication is lost.

## MODBUS REGISTER

### Holding register

Register	Name	Description
40002	OUTPUT	Input 1: 40002.0 Input 2: 40002.1 Input 3: 40002.2 Input 4: 40002.3 Input 5: 40002.4 The active status of the output is obtained by



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Counting can be set to increase or decrease by Bit No. 1 in Register 40005 (EPRFLC).

## Coil register

Register	Name	Description
00001	OUTPUT 1	Active status output 1. See register 40015.0
00002	OUTPUT 2	Active status output 2. See register 40015.0
00003	OUTPUT 3	Active status output 3. See register 40015.0
00004	OUTPUT 4	Active status output 4. See register 40015.0
00005	OUTPUT 5	Active status output 5. See register 40015.0

## LEDS Signallings

LED	STATE	Meaning of LEDES
PWR	On	Power supply presence.
FAIL	Blinking On	Error settings. Fault/Failure.
RX	Blinking On	Recived data from RS485. Verify the connection.
TX	Blinking On	Recived data from RS485. Verify the connection.

## Factory settings

### Tutti i DIP-switch in OFF:

- Modbus protocol / Communication parameters : 38400 8,N,1 Addr. 1
- Digital Outputs : DISABLE
- Statesafe : DISABLE
- Safetime : DISABLE
- Inversion relay status : DISABLE

Variations of standard parameters are possible by using configuration softwares Z-NET and EASY-Z-PC ([www.seneca.it](http://www.seneca.it)).  
For more information about a list of all register and their function consult the USER manual.



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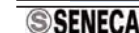
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