



8 channel relay output module E7125-8R

USER MANUAL

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Specifications

Power supply	24 VDC
Power consumption	< 6 VA
Number of outputs	8 x SPDT
Output type	Electromagnetic switch-over relay 3A 250 VAC / 24 VDC
Communication interface	RS-485
Baud Rate	Up to 57600 bit/s
Communication protocol	Modbus RTU
Protection class	IP20
Dimensions	H60 × W70 × L90
Mounting	DIN rail
Terminals	Pluggable 3 way screw terminals
Operating conditions	-10...+55 °C, < 80 %RH without condensation Safe indoor areas
CE marking	EN 61000-6-3:2007, EN 61326-1:2013 (EMC, Emissions) EN 61000-6-1:2007, EN 61000-6-2:2005, EN 61326-2-1:2013 (EMC, Immunity)

Product Description

E7125-8R relay output module controls eight independent electromagnetic switch over relays according to incoming digital data. Each relay channel can be set by Modbus commands to ON, OFF or PWM mode with configured period.

The device can be used in a variety of automation systems to provide interfacing between actuators and various types of sensors and proximity switches.

The Module operates in the RS485 network using Modbus RTU protocol.

The device is a Slave unit, so the Fieldbus network must include a Master unit, e.g. a PC with a running SCADA system, controller or regulator.

The product complies with the 2004/108/EC and 2014/30/EU Directives on electromagnetic compatibility

Safety requirements

Always adhere to the safety provisions applicable in the country of use.

The voltage on terminal contacts of the device is life-threatening. Only trained personnel can operate the module.

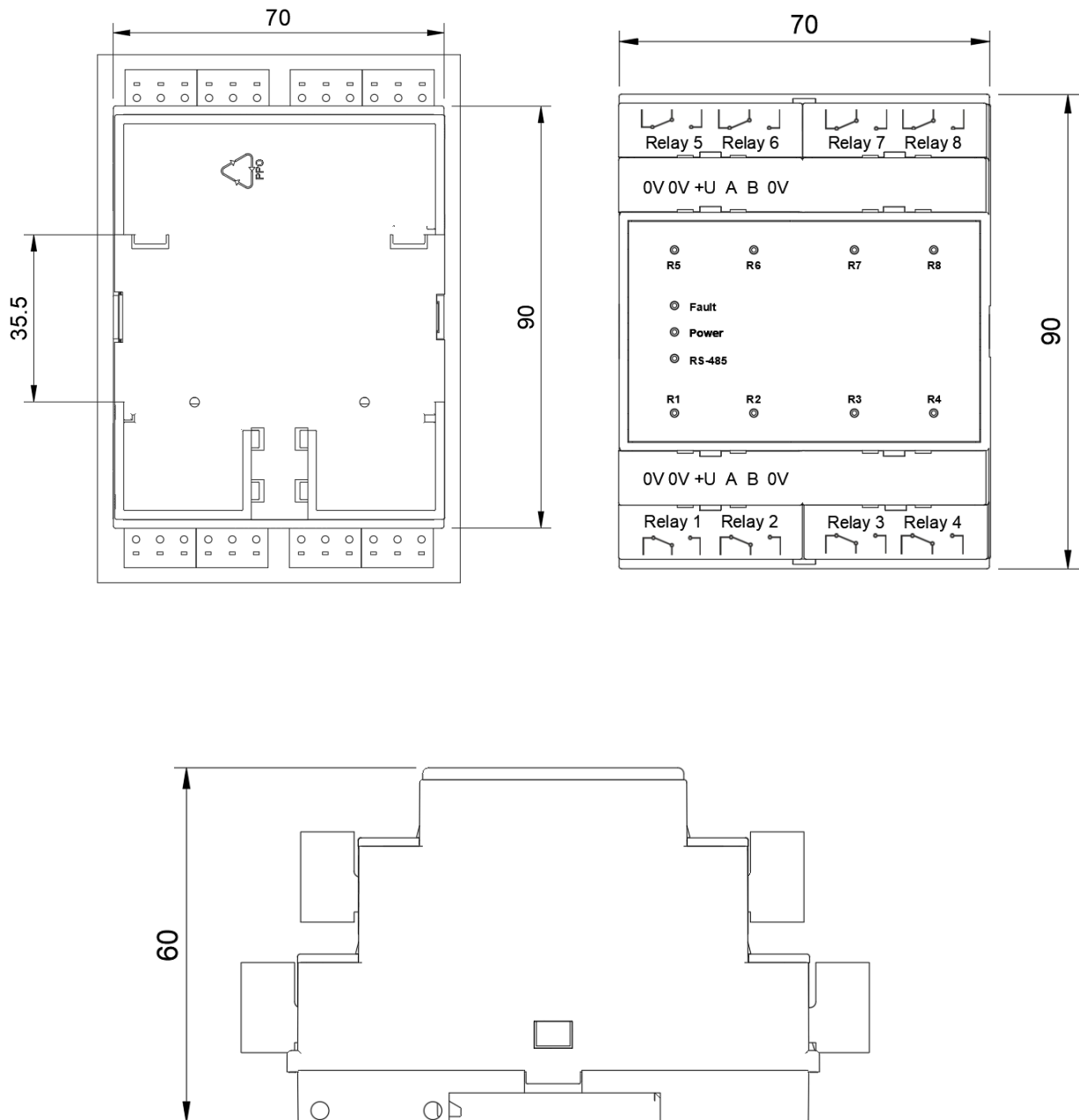
Operating conditions

The device should be used in explosion-safe (non ATEX -rated) indoor areas, without aggressive gases in the atmosphere. Allowed conditions are:

- Temperature in the range of -10...+55 °C
- Relative humidity in the range of 0...80% RH
- Non-condensing;
- Atmospheric pressure in the range of 84...106,7 kPa.

Device dimensions

The device is mounted to the 35 mm DIN-rail and should be installed in the cabinet providing protection from moisture, dust and unauthorised access.



Installation and connections

To connect the device proceed as follows:

Collect the cables for connection of the device to the actuators, power source and RS485 interface cable.

- Connect the device to the power source
- Connect the device to actuators
- Connect discrete sensors to the device inputs
- Connect the device to RS485 interface
- Apply power to the device

Power the device through the supply line, which is not connected to the heavy-duty equipment.

Installation of the power switch in the outer circuit is recommended.

Independent DC supply unit mounted in the same electrical cabinet must be used to power the device.

To connect external devices via the RS-485 interface use a two-wire circuit.

Overall length of all connections via the RS-485 interface should not exceed 1200 m.

Switch off power for both units while connecting.

Use twisted pair cable, respect polarities.

The A cable is connected to A output of the device, cable B – to B output.

As power and the RS-485 terminals are doubled you can connect input from one side and continue the power and RS-485 cabling from another side.

Use cables with copper stranded wires with cross-section not exceeding 0,75 mm² to ensure the reliability of electrical connections.

Strip and dip cable ends beforehand.

Stripped end of the cable should not protrude over the terminal block.

We recommend using screened cables and line interference filters to protect circuits from external inducted interferences.

Discrete outputs

The device is equipped with eight relay outputs (max. 3 A). Each relay may operate independently in PWM mode. Outputs are controlled via the RS485 network. All outputs have switch-over contacts.

Outputs control in Modbus RS485 network

Discrete outputs may be controlled either by command to generate PWM signal or by group on/off command. PWM signals generated by device's outputs are determined by period and duty cycle.

PWM period is set with corresponding Modbus register (registers 32-39).

It is saved to non-volatile memory of the device so there is no need to reconfigure it each time the module is required to be controlled through Modbus.

PWM duty cycle is transmitted via RS485 network in the range between 0 and 1000.

PWM duty cycle is set for each output independently in corresponding Modbus registers (registers 0-7).

The command for writing to register is 16 (0x10), for reading 3 (0x03).

Duty cycle in Modbus register	Relay output status
0	OFF
1000	ON
Between 0 and 1000	PWM signal with duty cycle proportional to transmitted value

When command 16 is used, bit value from 0 to 15 is saved to the register 50.

Bits from 0 to 7 refer to outputs from 1 to 8

If output is on, bit value is 1, if output is off, bit value is 0.

Note!

PWM period, safe state parameters, and other output characteristics may be changed via Modbus protocol. These data are saved to device non-volatile memory which has limited overwriting capacity (ca. 1 million). We don't recommend changing PWM period and safe state parameters as frequently as PWM duty cycle is transmitted.

Fault mode

If no signal is received from the Master device during the time specified by the maximum network timeout parameter (register 48), module outputs switch to safe (fault) mode.

The maximum network timeout parameter is set for all outputs at once, the safe condition is specified for each output independently.

Safe mode is set for each output independently with the safe condition parameters (registers 16-23), which determines PWM duty cycle and may take value 0...100%.

This parameter may be modified via Modbus protocol while operating.

For the list of registers used to set the safe condition, see Annex 1.

Parameter maximum network timeout is set in the range 0...600 s through Modbus register 48. If the value is 0, the parameter is out of service and the output does not turn to safe state.

When the device turns to the safe state, the LED indicator FAULT lights on the front panel.

If a request from the master device comes in fault mode, the LED indicator turns off, but the output state does not change until a correct value is received to the output value register from the Master.

Relay outputs check

To check the relay outputs of your module for correct operation, proceed as follows:

- Connect the module to the PC via RS485 adapter
- Launch Plurasens Configurator software
- Select E7125-8R Sub-Program
- Toggle your desired relay with *Toggle* button
- Contacts will close or open
- Measure the resistance of relay contacts (closed and open).
- The resistance of closed contacts should not exceed 1 Ohm
- The resistance of open contacts should be more than 2 MOhm.

Default Modbus RTU parameters

Parameter	Permitted values	Default
Modbus ID	1...247	16
Supported baud rates	1200, 2400, 4800, 9600, 19200, 38400, 57600	9600
Data bits	8	8
Parity	none / odd / even	none
Stop bits	1, 2	1
Protocol	Modbus RTU	
Implemented functions	03 - Read multiple registers 16 - Write a multiple registers	

Delivery set

- 8 channel relay output module E7125-8R
- 12 x 3 way screw terminals
- All necessary software can be requested from your distributor

Warranty

This product is warranted to be free from defects in material and workmanship for a period of one year from the date of the original sale. During this warranty period, the Manufacturer will, at its option, either repair or replace a product that proves to be defective.

This warranty is void if the product has been operated in conditions outside ranges specified by the Manufacturer or damaged by customer error or negligence or if there has been an unauthorised modification.

Annex 1 Modbus RTU Registers

Parameter	Unit	Value	Type	Address
Output 1 value	0.1%	0...1000	uint16	0
Output 2 value	0.1%	0...1000	uint16	1
...	0.1%	0...1000	uint16	...
Output 8 value	0.1%	0...1000	uint16	7
Output 1 safe mode	0.1%	0...1000	uint16	16
Output 2 safe mode	0.1%	0...1000	uint16	17
...	0.1%	0...1000	uint16	...
Output 8 safe mode	0.1%	0...1000	uint16	23
Output 1 PWM period	s	1...900	uint16	32
Output 2 PWM period	s	1...900	uint16	33
...	s	1...900	uint16	...
Output 8 PWM period	s	1...900	uint16	39
Max network timeout	s	0...600	uint16	48
Output value bit mask	-	0...255	uint16	50
Baudrate	bits/s	2400-57600	uint16	51
Parity	-	0 - none 1 - even	uint16	52

		2 - odd		
Stop bits	-	1, 2	uint16	53
Modbus address	-	1...247	uint16	54
Response delay	ms	10...255		55
Restart	-	42330 for restart	uint16	56

Manufacturer contacts

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