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ANALOG VOLTAGE OUTPUT
EXTANSION MODULE
with output MODBUS RTU

NPEIO-4AO

Do not dispose of this device in the trash along with other waste! According to the Law on Waste, electro coming from households free of charge and can give any amount to up to that end point of collection, as well as to store the occasion of the purchase of new equipment (in accordance with the principle of old-for-new, regardless of brand). Electro thrown in the trash or abandoned in nature, pose a threat to the environment and human health.

PURPOSE

NPEIO-4AO module serves as an external device which expanding analog voltage outputs of PLCs or other devices in which data exchange is via the RS- 485 according to the MODBUS RTU protocol.

FUNCTIONING

The module has 4 analog voltage outputs 0-10V. The values of the outputs volages can be set or read via RS-485, using MODBUS RTU protocol. The module has the function of recording the output voltage non-volatile memory in the local area. Each time you power up the module output value will be restored to the saved state.

Setting communication parameters is realized through the RS-485 port using MODBUS RTU communication protocol.

Switching ON the power is indicated by lighting the green LED U. Laws correct exchange of data between the module and the second device is indicated by a yellow LED lighting Tx.

Parameters of MODBUS RTU protocol

Communication parameters	
Protocol	MODBUS RTU
Work mode	SLAVE
Port settings (factory settings)	Bit numbers on sec: 1200 / 2400 / 4800 / 9600 / 19200 / 3840 / 57600 /115200 Data bits: 8 Parity: NONE/EVEN/ODD Start bits: 1 Stop bits: 1 / 2
Range of network addresses (factory settings)	1÷247 (100)
Range of base addresses	1÷238
Range of residual addresses (switch code)	0÷9
Command codes	3: Read value of outputs registry (0×03 - Read holding Register) 6: The setting of a single output (0×06 - Write Single Register) 16: The setting of multiple outputs (0×10 - Write Multiple Registers) 17: Read ID (0x11 - Report Slave ID)
The maximum frequency of queries	15Hz

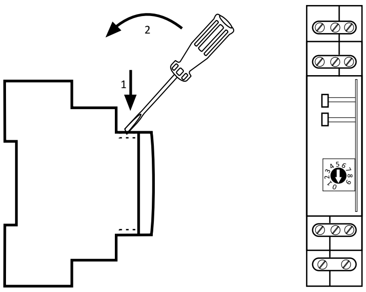
Registers

Communication parameters				
adress	**description**	**code**	**type**	**atr.**
0	read actual base sdress	03	int	read
0	save a new base adress: 1÷238	06, 16	int	write
Module can accept network addresses in the range 1 ÷ 247 The network address of the module is set in a complex way: using the MODBUS protocol to set the base address, the number in the range 1 to 238, and a multi-position switch to set address residual, ie the number from 0 to 9th The sum of these two values determines the network address (eg, 1 +6 = 7, 70 +3 = 73, 238 +9 = 247).				
1	read a speed of transmission	03	int	read
1	save a new speed of transmission	06, 16	int	write
The speed value [bits/sec] is given in the form of an integer divided by 100, for example, 9600 bit/sec write in figures 96; 115200 bit/sec write in figures 1152.				
2	read of actual parity value	03	int	read
2	save a new parity value	06, 16	int	write
Parity adopt appropriate meanings: NONE - 0; EVEN - 1, ODD - 2				
3	read of actual number of stop bits	03	int	read
3	save the number of stop bits	06, 16	int	write
Number of stop bits accepts the importance of 1 or 2				

OUTPUT parameters				
adress	**descriptions**	**code**	**type**	**atr.**
3000÷ 3003	read the current value of output voltage 1÷4	03	int	read
3000÷ 3003	setthe current value of output voltage 1÷4	06, 16	int	write
The voltage value is presented as signed integer number multiply by the 0.1 factor (eg, the registry value 46 corresponds to the voltage 4.6 V).				
3004	write current command voltage values to local memory (number 44012)	06, 16	int	write
Writing of value 44012 to the registry saves the value of the outputs. After the writing in local memory registry value is automatically set to 0.				
In response to the command "odzczyt ID" (code 17), we obtain a packet of information about the module: in the "Slave ID" code 0xEC; in the "Run Status Indicator" code 0xFF; in the "Additional Data" text "AO-1Mv1. 2 "				

Setting the Network Address

Module can accept network addresses in the range 1 ÷ 247 The network address of the module is set in a complex way: using the MODBUS protocol to set the base address, the number in the range 1 to 238, and a multi-position switch to set address residual, ie the number from 0 to 9th The sum of these two values determines the network address (eg, 1 +6 = 7, 70 +3 = 73, 238 +9 = 247). Multi-position code switch is located under the front elevation.Cladding removed using flat-head screwdriver 3mm elevation gently undermining hooks on the sides of the enclosure. 3mm flat screwdriver to switch the rotary switch to the desired number, as a sub-address (range 0 to 9). Set a new module address is the sum of the values and partial base address,after setting the front elevation set up with special attention to the proper fitting of LEDs in the holes

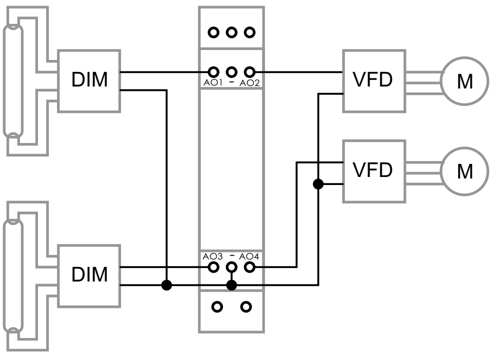


ASSEMBLY

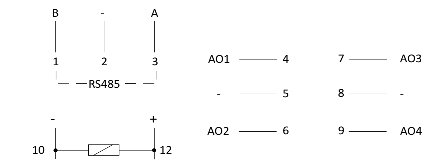
General assumptions:
* Recommend the use of filters and surge suppression (eg, OP-230 F&F).
* Recommended use of shielded twisted pair signal cables for connecting the module to another device.
* Communication lines must be completed by termination module LT-04 (F&F).
* When using shielded cables grounded screens performed only on one side and as close to the device.
* Do not lay signal cables in parallel in close proximity to the line of high and medium voltage.
* Do not install the module in close proximity to high power electrical loads, electromagnetic measurement devices, devices with phase power regulation, and other devices that may introduce noise

Installation
1. Set the address and communication parameters of module.
2. Take off the power.
3. Put the module on the rail.
4. Power supply of module connect to joints 10-12 accordance to mark.
5. Signal output 1-3 (port RS-485) connect to output of device type MASTER.
6. To selected outputs AO connect receiver accordance with technical data.

Inputs AO
Diagram of connection devices



Inputs/outputs description



1-3	port RS485
4/6/7/9	output signal AO.
2/5/8/	galvanic connected to p.10
10-12	supply of relay

RS-485 port is not galvanically isolated from power supply module.

TECHNICAL DATA

supply	9÷30V DC
max. current consumption	40mA
output signal	0÷10V
output signal precision	0,1V
mistake precision	±0,02V
min. output resistance	2kΩ
short-circuit current	40mA
port	RS-485
communication protocol	MODBUS RTU
working temperature	-40°C÷50°C
storage temperature	-40°C÷70°C
relative humidity	85% for 30°C
connection	screw terminals 1,5mm²
torque	0,4Nm
dimensions	1 module (18mm)
protection level	IP20