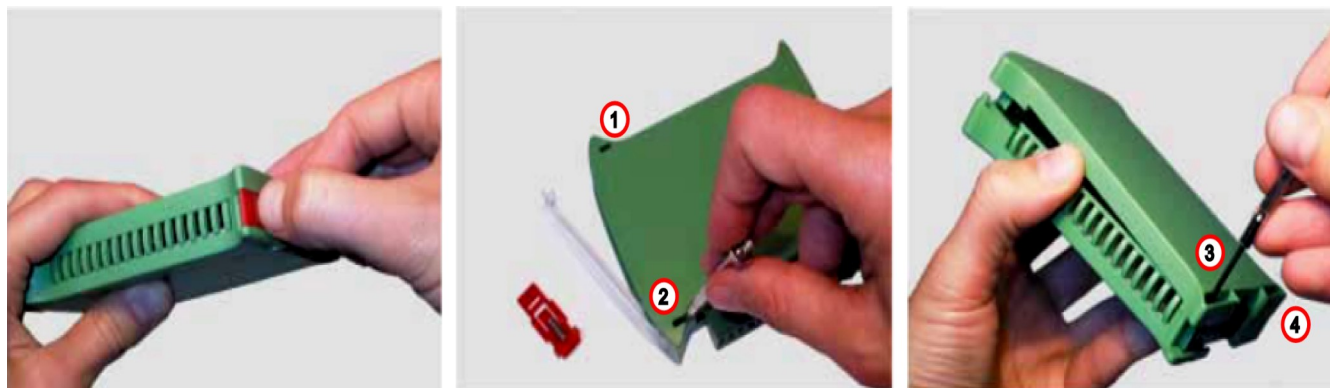


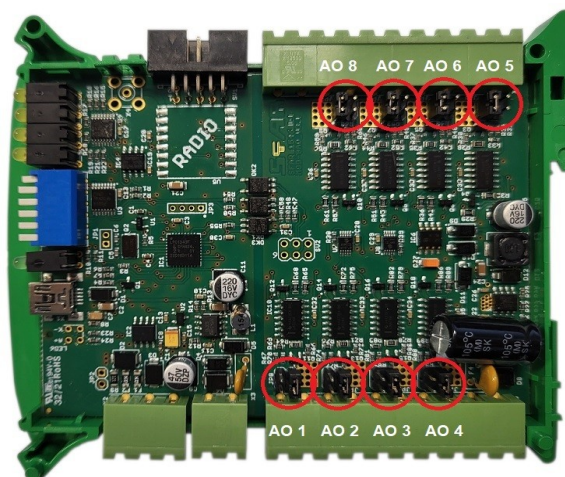
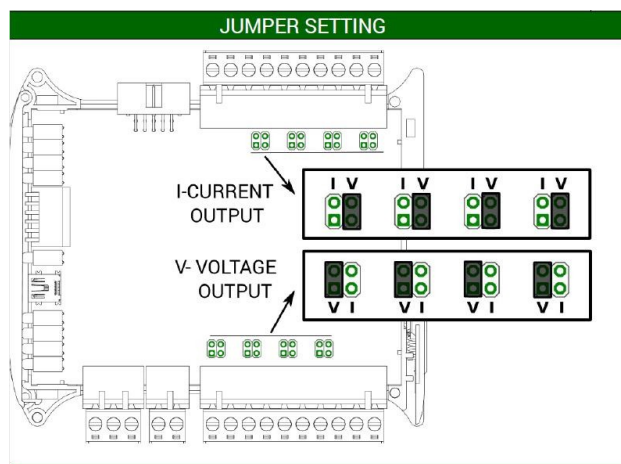
## **VOLTAGE output configuration and connecting with MOD-8AO by RS485 Modbus.**

### 1. Open MOD-8AO:

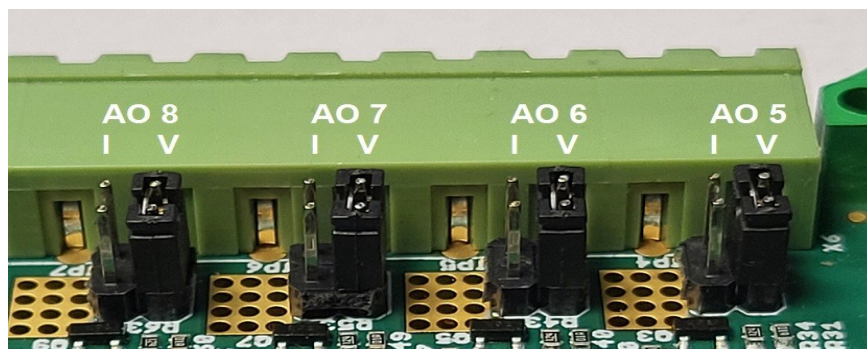


### 2. Set jumpers to **Voltage** outputs. The channel with voltage output must have shorted jumpers marked as voltage "V"

#### Location of the jumpers



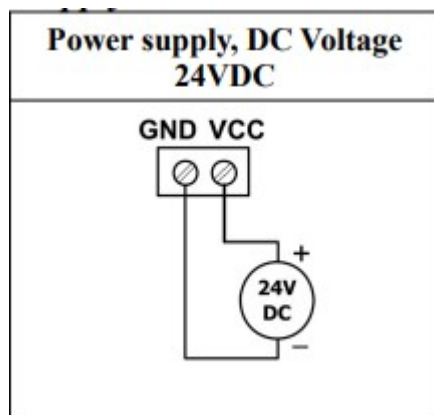
#### View of the shorted jumpers in the "V" position



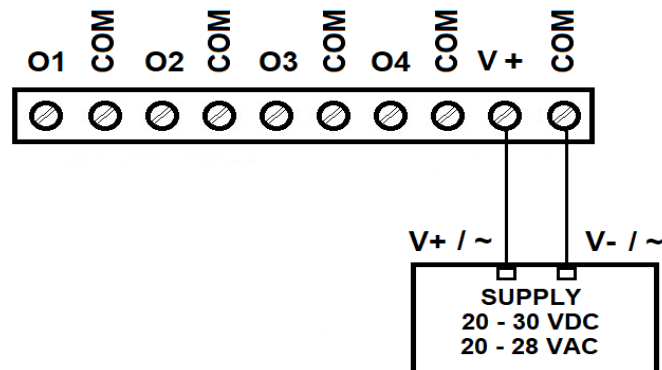
3. Close **MOD-8AO**

4. Connect

A. power supply:



B. power supply of analog outputs



5. Connect MOD-8AO by USB cable to IO Configurator and set type of output.

Link to download:

[https://www.aspar.com.pl/katalogi/IOMODULES/KONFIGURATOR/software/Konfigurator\\_IO.zip](https://www.aspar.com.pl/katalogi/IOMODULES/KONFIGURATOR/software/Konfigurator_IO.zip)

The IO Configurator allows to set one type of voltage outputs:

- 0 VDC to 10 VDC

Register value - range: 0 - 10000

### Examples

mode 0-10VDC

register value: 0

output value: 0 VDC

mode 0-10VDC

register value: 3500

output value: 3,5 VDC

mode 0-10VDC

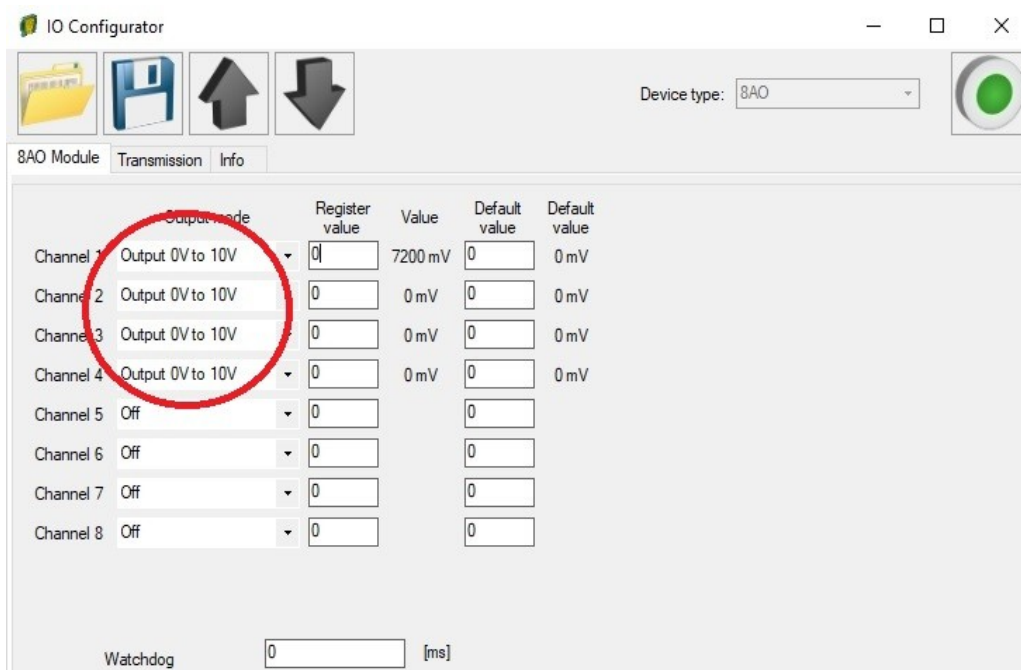
register value: 7200

output value: 7,2 VDC

mode 0-10VDC

register value: 10000

output value: 10 VDC

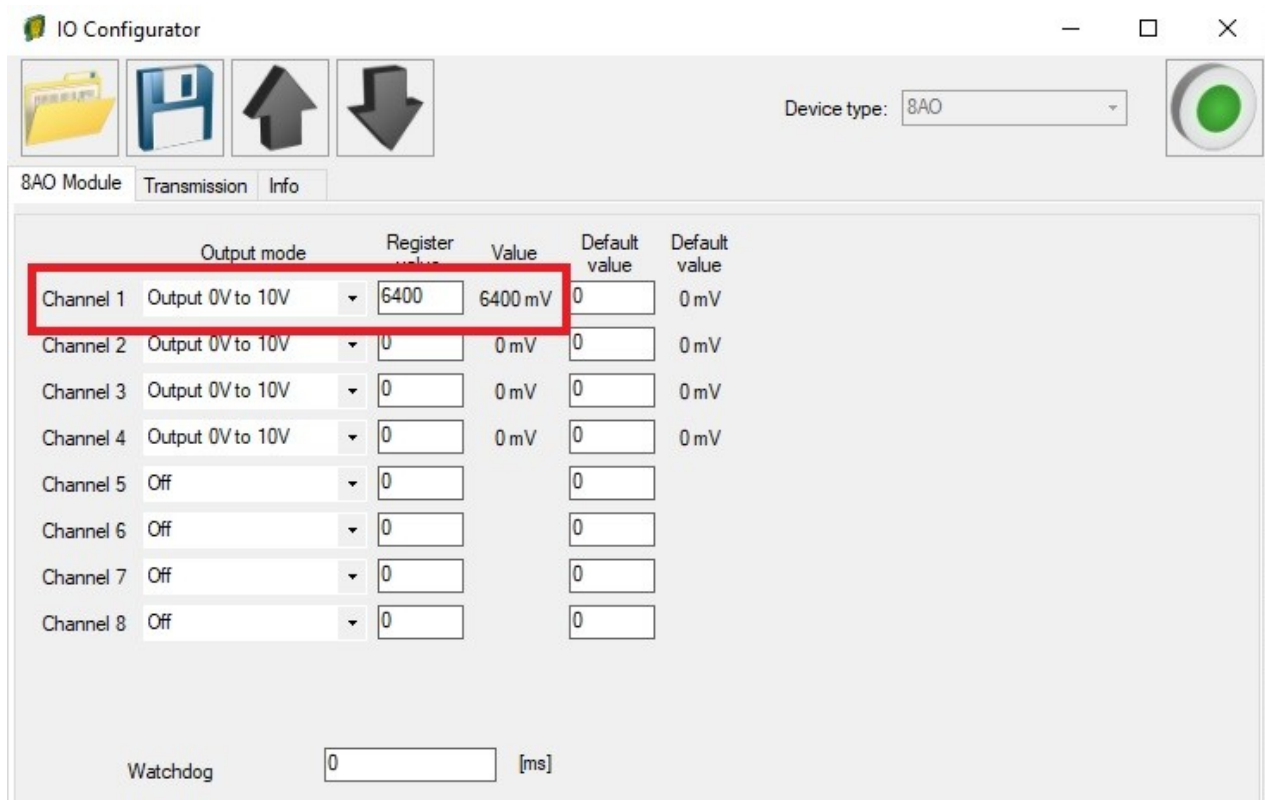


6. Set 6,4VDC on channel 1 using IO Configurator. Channel 1 is configured as 0-10VDC. The range of register is: 0-10000. This means that the register value should be **6400** to get **6,4VDC** at the analog output.

mode 0-10VDC

register value: 6400

output value: 6,4 VDC



IO Configurator

Device type: 8AO

8AO Module Transmission Info

	Output mode	Register value	Value	Default value	Default value
Channel 1	Output 0V to 10V	6400	6400 mV	0	0 mV
Channel 2	Output 0V to 10V	0	0 mV	0	0 mV
Channel 3	Output 0V to 10V	0	0 mV	0	0 mV
Channel 4	Output 0V to 10V	0	0 mV	0	0 mV
Channel 5	Off	0		0	
Channel 6	Off	0		0	
Channel 7	Off	0		0	
Channel 8	Off	0		0	

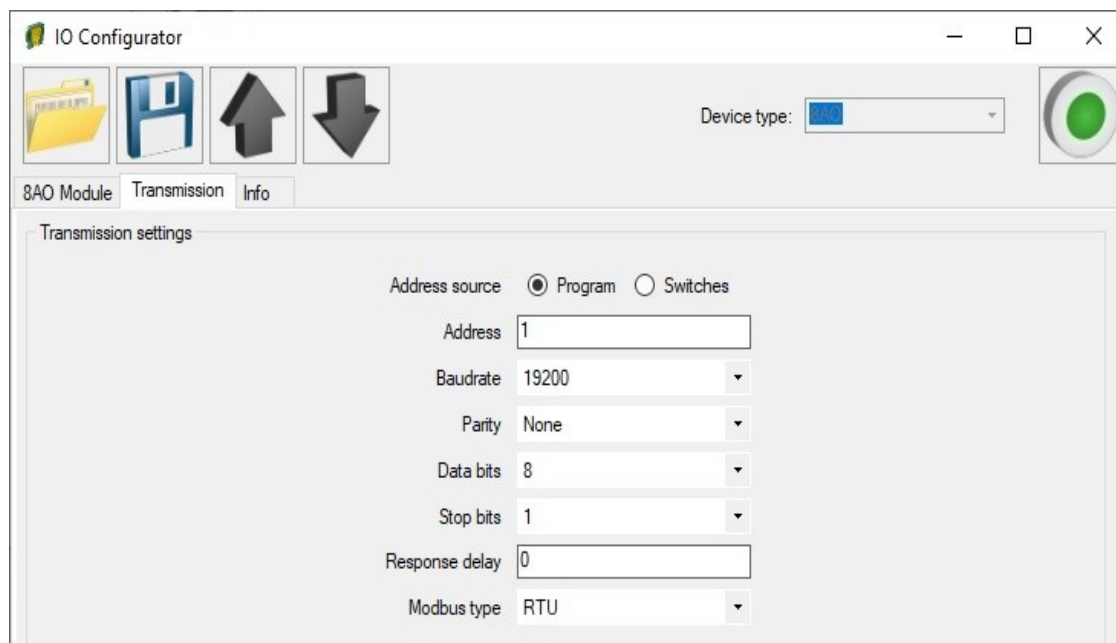
Watchdog 0 [ms]

6.1. Measure the output voltage on channel 1 with a multimeter.



7. Set 4,0 VDC on channel 1 using **Modbus** protocol. Channel 1 is configured as 0-10VDC. The range of register is: 0-10000. This means that the register value should be **4000** to get **4VDC** at the analog output.

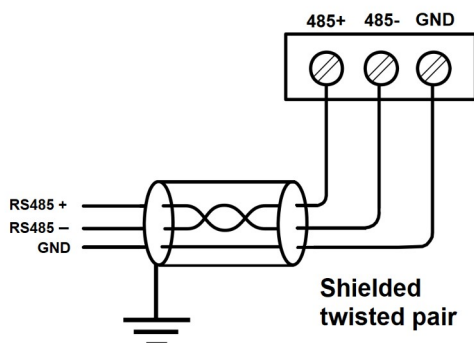
7.1. Set communication parameters in IO Configurator (MOD-8AO is a Modbus slave, client)



7.2. Set communication parameters in your **Master Device** (Baudrate, parity, Data bits, Stop bits, Modbus type – the same, Address – other).

7.3. Disconnect IO Configurator

7.4. Connect MOD-8AO with your Master Device by RS485:

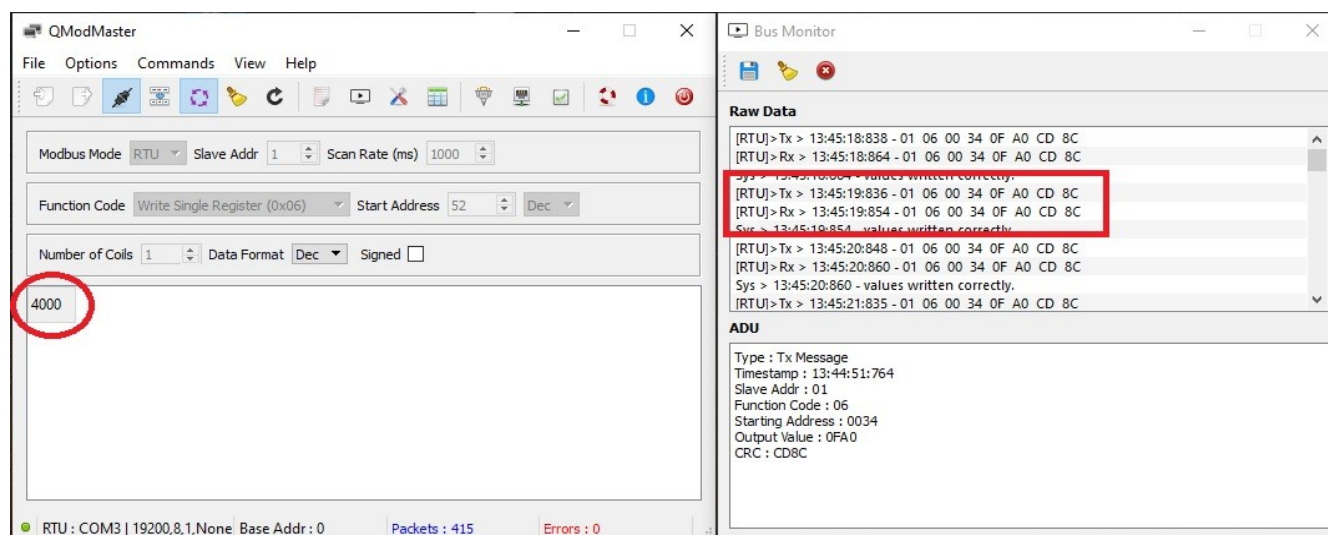




7.5. Master Device: Send a query to MOD-8AO – write value of analog output AO 1 (Channel 1). Use Modbus function - **Write Single Register 06**. Address of the register analog output 1 (AO 1): **52** (dec) or **34** (hex). New register value – 4000.

40053	52	0x34	Analog output 1	Read & Write	Value of analog output:  in mV for voltage output (max 10240)  in $\mu$ A for current output 0 - 20mA (max 20480)  in ‰ for current output 4-20mA (max 1000)
40054	53	0x35	Analog output 2	Read & Write	
40055	54	0x36	Analog output 3	Read & Write	
40056	55	0x37	Analog output 4	Read & Write	
40057	56	0x38	Analog output 5	Read & Write	
40058	57	0x39	Analog output 6	Read & Write	
40059	58	0x3A	Analog output 7	Read & Write	
40060	59	0x3B	Analog output 8	Read & Write	

In this example Modbus Master Device is software – QModMaster:



The screenshot displays the QModMaster software interface. The main window shows the configuration for a Modbus Master Device. The Modbus Mode is set to RTU, Slave Address is 1, and Scan Rate is 1000 ms. The Function Code is set to Write Single Register (0x06). The Start Address is 52 (Dec). The Number of Coils is 1, and the Data Format is Dec. The value 4000 is entered in the data field. The Bus Monitor window on the right shows the raw data for the transaction, with the following messages:

```

[RTU]>Tx > 13:45:18:838 - 01 06 00 34 0F A0 CD 8C
[RTU]>Rx > 13:45:18:864 - 01 06 00 34 0F A0 CD 8C
[RTU]>Tx > 13:45:19:836 - 01 06 00 34 0F A0 CD 8C
[RTU]>Rx > 13:45:19:854 - 01 06 00 34 0F A0 CD 8C
Sys > 13:45:19:854 - values written correctly.
[RTU]>Tx > 13:45:20:848 - 01 06 00 34 0F A0 CD 8C
[RTU]>Rx > 13:45:20:860 - 01 06 00 34 0F A0 CD 8C
Sys > 13:45:20:860 - values written correctly.
[RTU]>Tx > 13:45:21:835 - 01 06 00 34 0F A0 CD 8C
  
```

The ADU (Application Data Unit) section shows the following details:

```

Type : Tx Message
Timestamp : 13:44:51:764
Slave Addr : 01
Function Code : 06
Starting Address : 0034
Output Value : 0FA0
CRC : CD8C
  
```

7.6. View of communication frame:

A. query to MOD-8AO:

01 06 00 **34** 0F AO CD 8C

B. answer from MOD-8AO

01 06 00 34 **0F A0** CD 8C

**0F A0** (hex) = **4000** (dec)

7.7. The new value of register 52 (dec) – AI 1 – analog output 1 is: **4000**.  
**4000 = 4,00VDC**

7.8. Measure the output voltage on channel 1 with a multimeter.



8. Connection of the voltage output.

