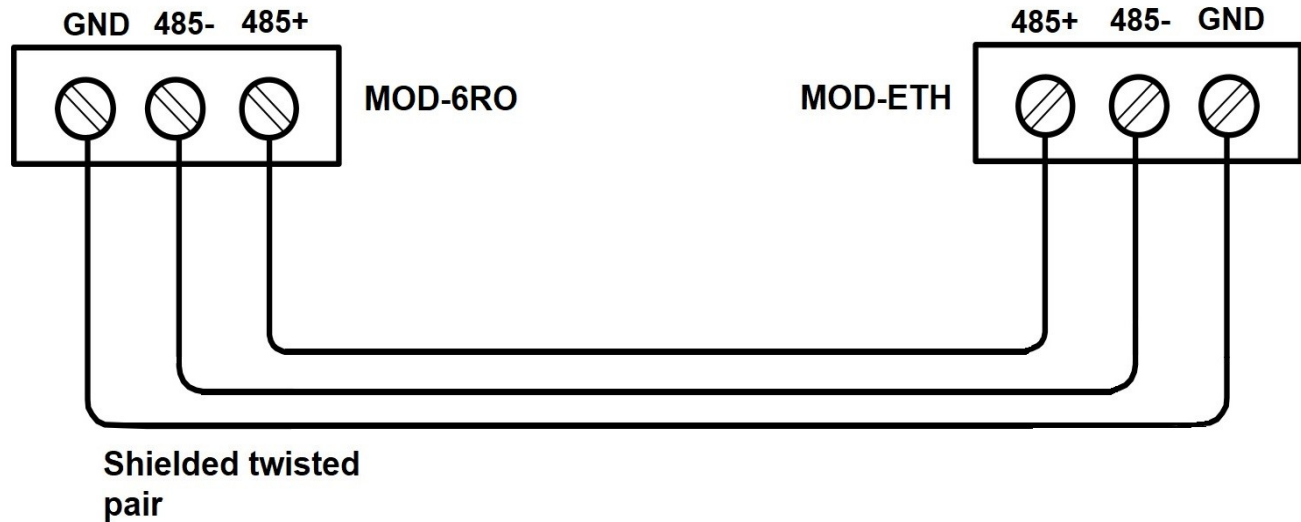
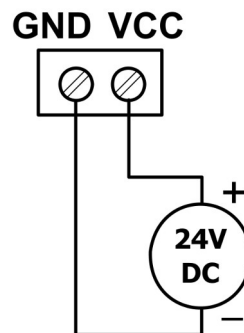


Example how to connect MOD-ETH with MOD-6RO and write registers by Modbus TCP

- 1 Connect MOD-6RO and MOD-ETH using RS485:



- 2 Connect power supply to MOD-6RO and MOD-ETH.



- 3 Open IO Configurator

Link to download:

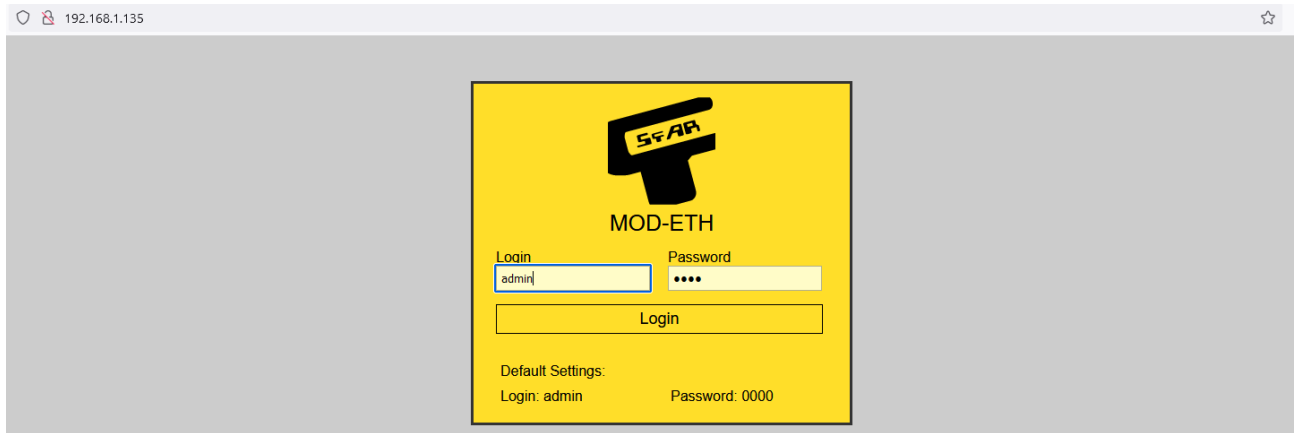
https://www.aspar.com.pl/katalogi/IOMODULES/KONFIGURATOR/software/Konfigurator_IO.zip

4 Set communication parameters in MOD-ETH and MOD-6RO in IO Configurator – (TRANSMISSION):

<u>MOD-ETH</u>	MOD-6RO
Baud rate: 19200 Parity: NONE Data bits: 8 Stop bits: 1 Response delay: 0 Modbus Type: RTU	Address: 2 Baud rate: 19200 Parity: NONE Data bits: 8 Stop bits: 1 Response delay: 0 Modbus Type: RTU

<u>MOD-ETH</u>	MOD-6RO

5 Connect MOD-ETH to your PC using Ethernet cable and open using web browser
MOD-ETH: 192.168.1.135 (login: admin, password: 0000).



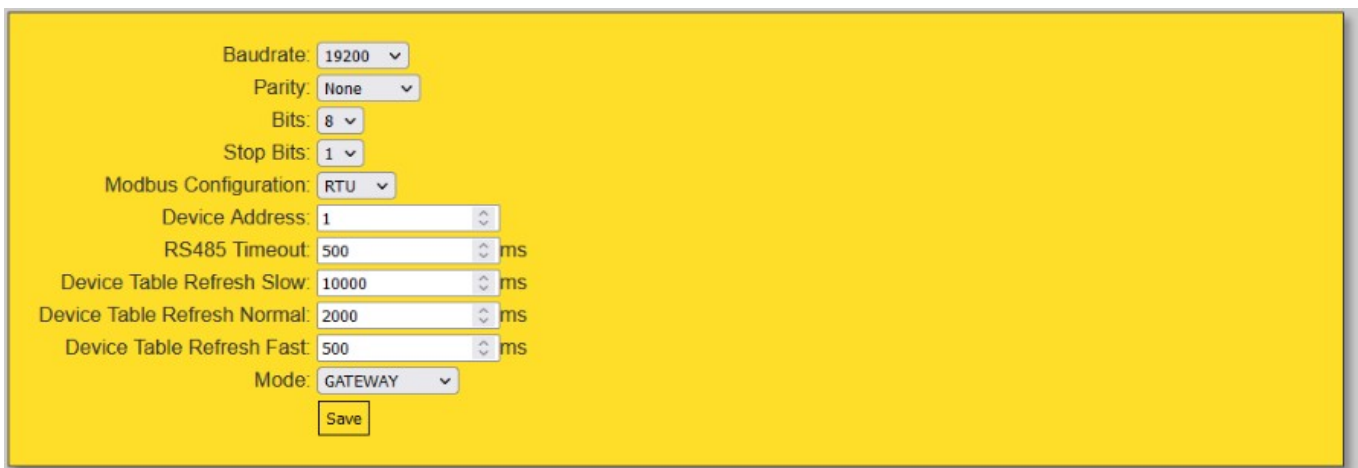
6 Set:

6.1 NETWORK



IP: 192.168.1.135
 Mask: 255.255.255.0
 Gateway: 192.168.1.1
 Modbus port: 502
 HTTP port: 80
 Connection Timeout: 60 s
 Save Reset Device

6.2 MODBUS CONFIG (GATEWAY MODE)



Baudrate: 19200
 Parity: None
 Bits: 8
 Stop Bits: 1
 Modbus Configuration: RTU
 Device Address: 1
 RS485 Timeout: 500 ms
 Device Table Refresh Slow: 10000 ms
 Device Table Refresh Normal: 2000 ms
 Device Table Refresh Fast: 500 ms
 Mode: GATEWAY
 Save

The MOD-ETH module has two different working modes. The first is the Modbus TCP **GATEWAY**, in which the device converts the frames of Modbus TCP into Modbus RTU/ASCII and sends them to the RS485 network's devices.

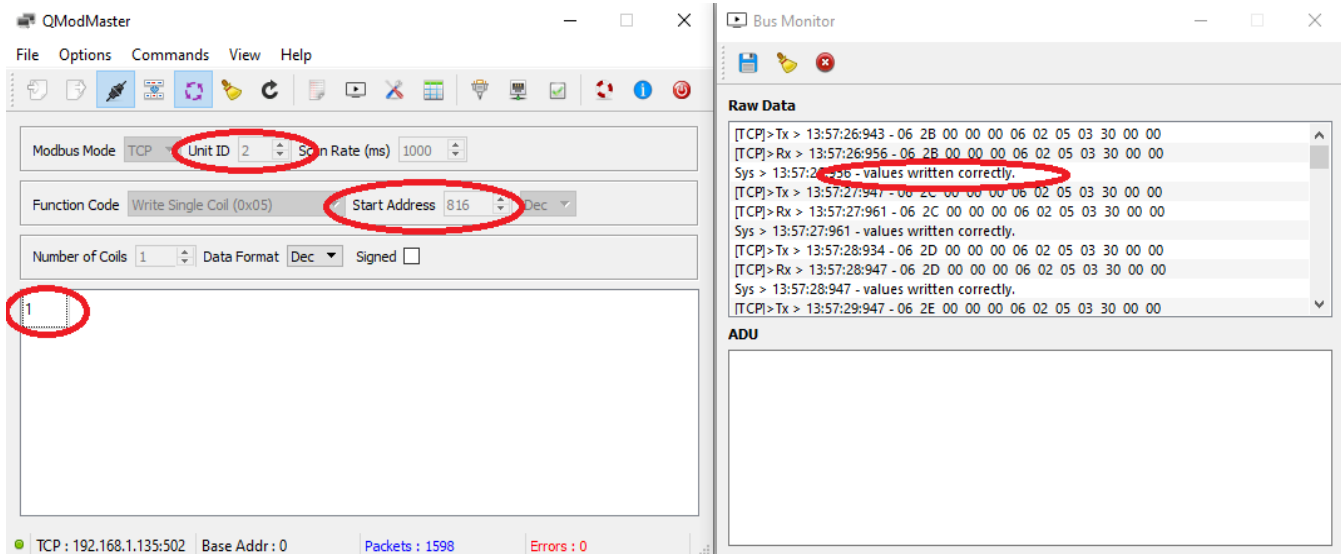
The second mode is the **Device Table** function, in which the module reads the RS485 network's devices only using the earlier-defined requests and ignores the requests addressed to other devices in the Modbus TCP network. The communication with external modules is only possible through the internal registers of the module in the range of addresses from 1000 to 1099.

7 Set relay output 1 of the MOD-6RO to value "1" (**GATEWAY MODE**) using a Modbus Master Device via Modbus TCP using function 5 – WRITE SINGLE COIL.

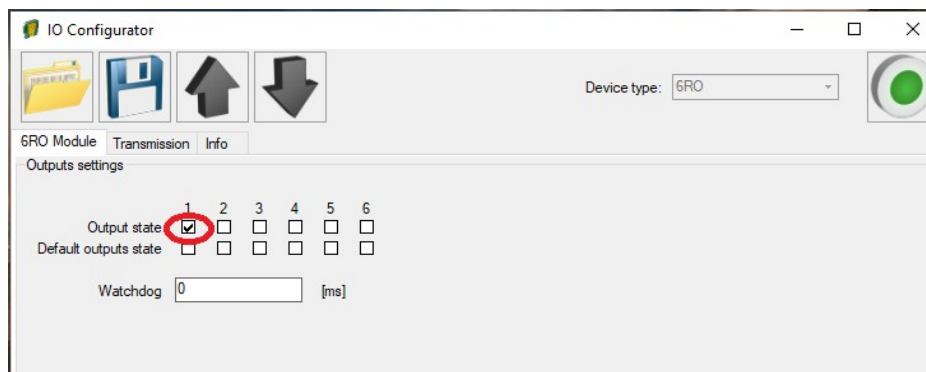
In this case a Modbus Master Device is software – **QModMaster**.

Below the window with Modbus TCP settings – Master Device. You have to use: **address of MOD-6RO: 2**, WRITE SINGLE COIL - function 5, start address: **816 (dec)** (relay output 1 in MOD-6RO)

Modbus Address	Dec Address	Hex Address	Register name	Access	Description
193	192	0x0C0	Default output 1 state	Read & Write	Default output 1 state
194	193	0x0C1	Default output 2 state	Read & Write	Default output 2 state
195	194	0x0C2	Default output 3 state	Read & Write	Default output 3 state
196	195	0x0C3	Default output 4 state	Read & Write	Default output 4 state
197	196	0x0C4	Default output 5 state	Read & Write	Default output 5 state
198	197	0x0C5	Default output 6 state	Read & Write	Default output 6 state
817	816	0x330	Output 1	Read & Write	Output 1 state
818	817	0x331	Output 2	Read & Write	Output 2 state
819	818	0x332	Output 3	Read & Write	Output 3 state
820	819	0x333	Output 4	Read & Write	Output 4 state
821	820	0x334	Output 5	Read & Write	Output 5 state
822	821	0x335	Output 6	Read & Write	Output 6 state



Relay output no. 1 - 1 (ON)



8 Set relay output no 1 and output no 3 of the MOD-6RO to value "1" (**GATEWAY MODE**) using a Modbus Master Device via Modbus TCP using function 6 – WRITE SINGLE REGISTER.

Below the window with Modbus TCP settings – Master Device. You have to use: **address of MOD-6RO: 2**, WRITE SINGLE REGISTER - function 6, start address: **51 (dec)** (output register in MOD-6RO)

Modbus	Dec	Hex	Register Name	Access	Description
30001	0	0x00	Version/Type	Read	Version and Type of the device
30002	1	0x01	Switches	Read	Switches state
40003	2	0x02	Baud rate	Read & Write	RS485 baud rate
40004	3	0x03	Stop Bits & Data Bits	Read & Write	No of Stop bits & Data Bits (see 3.5.3)
40005	4	0x04	Parity	Read & Write	Parity bit
40006	5	0x05	Response Delay	Read & Write	Response delay in ms
40007	6	0x06	Modbus Mode	Read & Write	Modbus Mode (ASCII or RTU)
40009	8	0x08	Watchdog	Read & Write	Watchdog
40013	12	0x0C	Default outputs state	Read & Write	Default outputs state
40033	32	0x20	Received packets LSB	Read & Write	No of received packets
40034	33	0x21	Received packets MSB	Read & Write	
40035	34	0x22	Incorrect packets LSB	Read & Write	No of received packets with error
40036	35	0x23	Incorrect packets MSB	Read & Write	
40037	36	0x24	Sent packets LSB	Read & Write	No of sent packets
40038	37	0x25	Sent packets MSB	Read & Write	
40052	51	0x33	Outputs	Read & Write	Outputs state

To turn on two outputs:1 and 3, the value of the output register must be 5 (1+4=5, see table below)

Number of output	1	2	3	4	5	6
Output register bit	0	1	2	3	4	5
Bit value	1	2	4	8	16	32

The screenshot shows two windows from the QModMaster software. The **QModMaster** window is on the left, displaying configuration settings for a Modbus TCP connection. The **Bus Monitor** window is on the right, showing a log of raw data and system messages.

QModMaster Configuration:

- Modbus Mode: TCP
- Slave Addr: 2
- Scan Rate (ms): 1000
- Function code: Write Single Register (0x06)
- Address: 51
- Data Format: Dec
- Signed:
- Number of Coils: 1
- Value: 5

Bus Monitor Raw Data:

```
[TCP]>Tx > 12:59:31:262 - 09 44 00 00 00 06 02 06 00 33 00 05
[TCP]>Rx > 12:59:31:276 - 09 44 00 00 00 06 02 06 00 33 00 05
Sys > 12:59:31:276 - values written correctly.
[TCP]>Tx > 12:59:32:272 - 09 45 00 00 00 06 02 06 00 33 00 05
[TCP]>Rx > 12:59:32:286 - 09 45 00 00 00 06 02 06 00 33 00 05
Sys > 12:59:32:286 - values written correctly.
[TCP]>Tx > 12:59:33:266 - 09 46 00 00 00 06 02 06 00 33 00 05
[TCP]>Rx > 12:59:33:280 - 09 46 00 00 00 06 02 06 00 33 00 05
Sys > 12:59:33:280 - values written correctly.
[TCP]>Tx > 12:59:34:265 - 09 47 00 00 00 06 02 06 00 33 00 05
```

The screenshot shows the **IO Configurator** window, which is used to configure the hardware settings of the MOD-6RO module. The **6RO Module** tab is selected, and the **Outputs settings** section is visible.

IO Configurator Settings:

- Device type: 6RO
- Outputs settings:
 - Output state: 1, 2, 3, 4, 5, 6
 - Default outputs state: 1, 2, 3, 4, 5, 6
 - Watchdog: 0 [ms]

9 MODBUS CONFIG (DEVICE TABLE MODE)

Baudrate: 19200
 Parity: None
 Bits: 8
 Stop Bits: 1
 Modbus Configuration: RTU
 Device Address: 1
 RS485 Timeout: 500 ms
 Device Table Refresh Slow: 10000 ms
 Device Table Refresh Normal: 2000 ms
 Device Table Refresh Fast: 500 ms
 Mode: DEVICE TABLE

9.1 Add new devices (DEVICE TABLE MODE)

1

2

Device Address	Function	Size	Register Address	Internal Address	Speed	ON/OFF	Delete Device	Status
<input type="button" value="Add Device"/>							<input type="button" value="Save Config"/>	<input type="button" value="Load Config"/>

3

Device Address	Function	Size	Register Address	Internal Address	Speed	ON/OFF	Delete Device	Status
2	(0x06) Write Single Register	1	51	1000	Normal	ON	<input type="button" value="Delete"/>	OK
<input type="button" value="Add Device"/>							<input type="button" value="Save Config"/>	<input type="button" value="Load Config"/>

51 – output register address in MOD-6RO

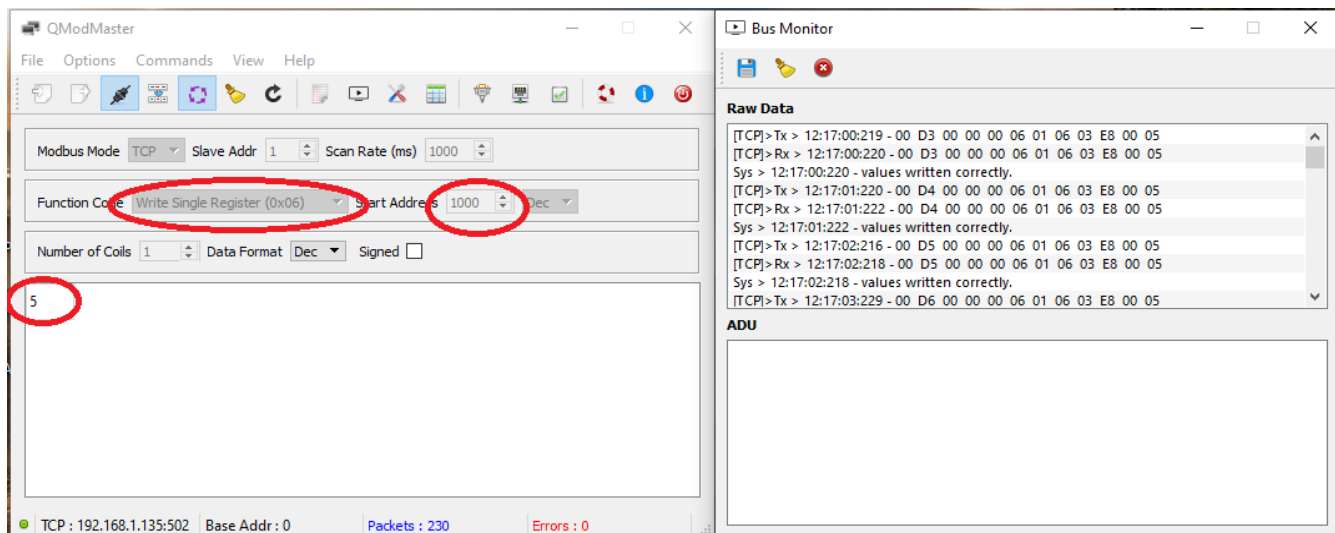
The maximum number of devices that can be added is **25**

The communication with connected modules via RS485 is only possible through the internal registers of the MOD-ETH module whose address range is from 1000 to 1099.

10 Set relay output no 1 and output no 3 of the MOD-6RO to value "1" (**DEVICE TABLE MODE**) using a Modbus Master Device via Modbus TCP.

10.1 Write the value "5" to register 1000 in the module's internal memory

Below the window with Modbus TCP settings. You have to use: **address of MOD-ETH: 1**, WRITE SINGLE REGISTER - function 6, start address: 1000 (internal register of MOD-ETH)



5 (dec) – register value 1000 (dec)

10.2 Open the table containing the internal registers of the MOD-ETH module.

Address	00	01	02	03	04	05	06	07	08	09
1000	5	0	0	0	0	0	0	0	0	0
1010	0	0	0	0	0	0	0	0	0	0
1020	0	0	0	0	0	0	0	0	0	0
1030	0	0	0	0	0	0	0	0	0	0
1040	0	0	0	0	0	0	0	0	0	0
1050	0	0	0	0	0	0	0	0	0	0
1060	0	0	0	0	0	0	0	0	0	0
1070	0	0	0	0	0	0	0	0	0	0
1080	0	0	0	0	0	0	0	0	0	0
1090	0	0	0	0	0	0	0	0	0	0

5 (dec) – register value 1000 (dec)

The register value of 1000 is automatically sent to output register 51 in the MOD-6RO. A value 5 in register 51 means that outputs 1 and 3 are ON:

