

# Advanced IO

r1

version: Analog+Rel

User manual - draft



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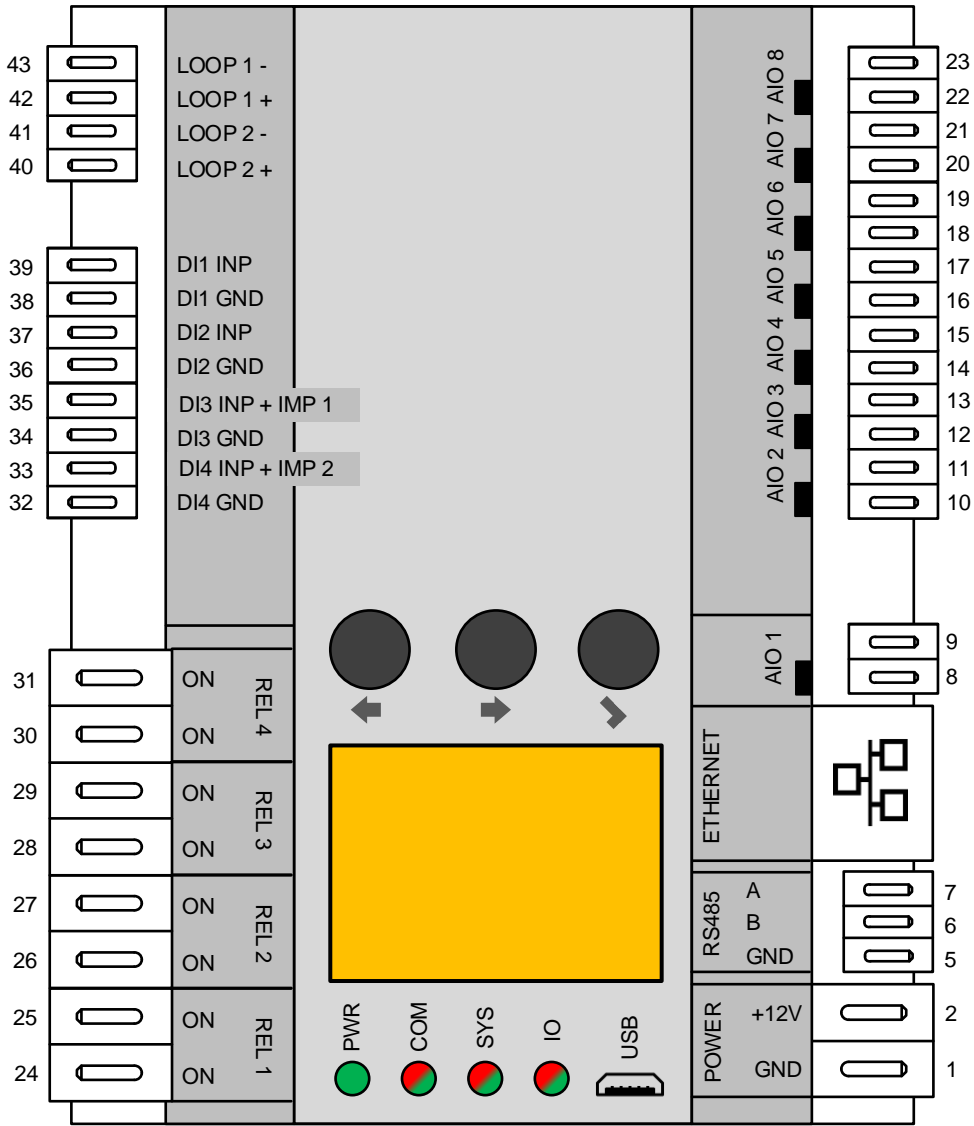
# 1. Device parameters

Power supply	typ. 24 VDC (on request other)
Power consumption	max. 2W (without Radio modules)
USB interface (VCP)	115200/8/N/1
<b>Relay output parameters</b>	
Max. switching capability	5A @250VAC
<b>Digital input parameters</b>	
Input sensing voltage	9 – 48 VDC
Input current	2,5 mA @ 12VDC input
<b>Analog input/output mode</b>	
	<i>Voltage input</i> <i>Current input</i> <i>PT100, NTC10k</i> <i>Voltage output</i> <i>Separate current outputs</i>
<b>Voltage input mode</b>	
Input range of voltages	0-10 VDC
Input impedance	cca 25 kOhm
<b>Current input mode</b>	
Current range	0-30 mA
Sensing impedance	75 Ohm
<b>Current output mode</b>	
Current range	0-20 mA
Excitement voltage	power supply of the module
<b>PT100 input mode</b>	
Excitation current	nom. 4 mA
<b>NTC 10k input mode</b>	
Excitation current	nom. 50 $\mu$ A
Coefficient B	3435
Range	-10 °C >
<b>Voltage output mode</b>	
Nominal voltage output range	0-10 VDC
Minimum voltage on output at 0 setpoint	8 mV when sinking zero current 70 mV when sinking 1 mA
Maximum output current	5 mA
<b>Impulse measurement</b>	
Minimum impulse duration	1 ms
Impulse output type	S0 (or similar)

## 2. Factory settings

IP address	192.168.0.100
Subnet mask	255.255.255.0
Gateway	192.168.0.1
Default TCP port	5000
Default Modbus port	502
Default RTU address	1
Default RTU settings	115200/8/N/1
Default setting of the analog I/O	all inputs as voltage input

## 3. Front view



To recall the factory settings, enter the **System Menu > Factory**. Device will reset during few seconds

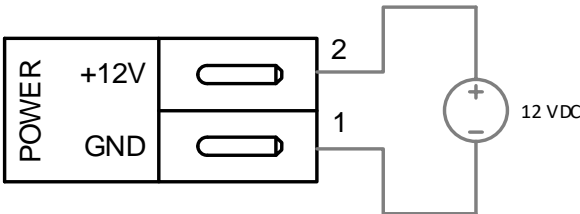
## 4. Description

The Advanced IO module in the ANALOG+REL version is an electronic device providing remote digital outputs and inputs together with the flexible analog input and output control. The device could be controlled over a raw TCP port or a Modbus TCP interface.

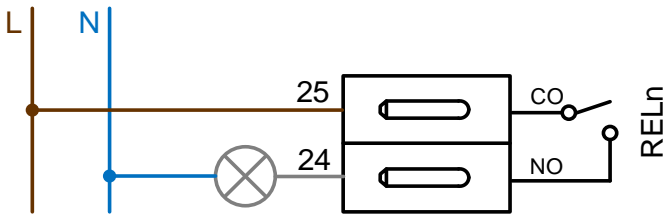
## 5. Electrical connection

### 5.1. Power supply

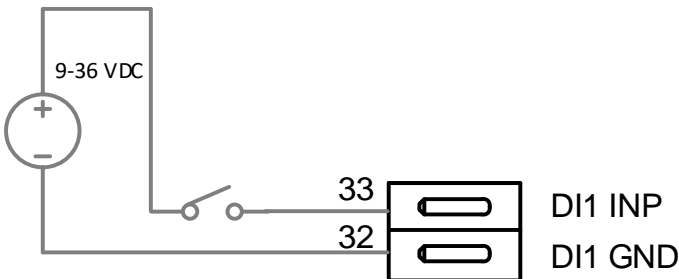
The device is supplied by an external power supply (not included) with output voltage of 12 V DC. The connection circuit is stated on the picture below.



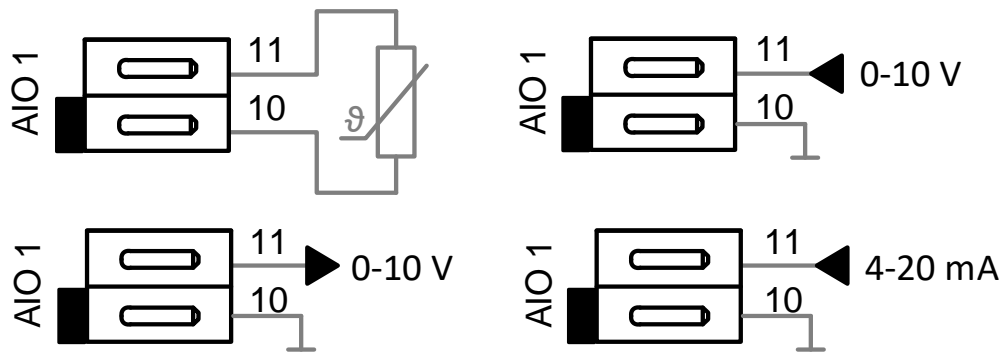
### 5.2. Relay outputs



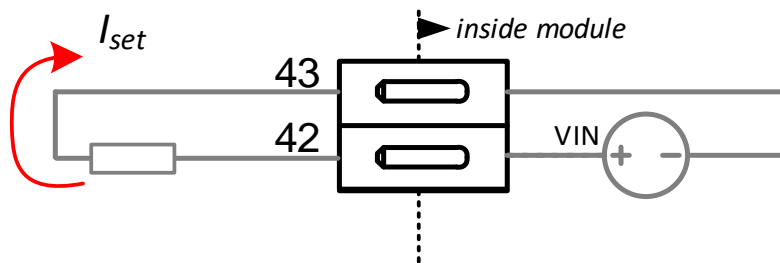
### 5.3. Digital inputs



### 5.4. Analog inputs/outputs



## 5.5. Loop output



## 6. Communication interfaces

### 6.1. Raw TCP socket

Will be added in the future.

### 6.2. Modbus TCP

The device is also equipped with a Modbus TCP communication interface. A specification of the interface could be found at <http://www.modbus.org/>. The memory map of the device outputs and inputs is stated in the table below.

Please note, the socket provides a 15 seconds timeout between two commands. If the timeout is reached, the socket connection is closed automatically.

Input registers	
0	FW version year
1	FW version month
2	FW version day
3	Module temperature inside electronics
4	Uptime hours
5	Uptime minutes
6	Uptime seconds

50-51	Analog input 1 value (FLOAT) [V/mA/°C/V]
52-53	Analog input 2 value (FLOAT) [V/mA/°C/V]
54-55	Analog input 3 value (FLOAT) [V/mA/°C/V]
56-57	Analog input 4 value (FLOAT) [V/mA/°C/V]
58-59	Analog input 5 value (FLOAT) [V/mA/°C/V]
60-61	Analog input 6 value (FLOAT) [V/mA/°C/V]
62-63	Analog input 7 value (FLOAT) [V/mA/°C/V]
64-65	Analog input 8 value (FLOAT) [V/mA/°C/V]
66-69	Impulse count on input DI3 (impulse counter 1)
70-73	Impulse count on input DI4 (impulse counter 2)

Holding registers	
0,1,2,3	IP address of the device (default is: 192,168,0,100)
4,5,6,7	IP subnet mask (default is: 255,255,255,0)
8,9,10,11	IP gateway (default is: 192,168,0,1)
12	TCP port of ModBUS communication (default is: 502)
13,14,15,16,17,18	MAC address (default is unique from factory)
19	TCP port of Text protocol communication (default is: 5000)
20	Modbus RTU RS485 address (applicable after set)
21	Modbus RTU RS485 baud rate (applicable after device reset) 0- 9600 1- 19200 2- 38400 3- 57600 4- 115200
22	Modbus RTU RS485 parity (applicable after device reset) 0- None 1- Odd 2- Even
50-57	Configuration of analog I/O modes (port number from 1 to 8) 0 – voltage input 1 – current input 2 – PT100 3 – voltage output 4 – NTC 10 kOhm (range from -10 °C -> )
58-59	Analog output voltage setpoint 1 value (FLOAT) [V]
60-61	Analog output voltage setpoint 2 value (FLOAT) [V]
62-63	Analog output voltage setpoint 3 value (FLOAT) [V]
64-65	Analog output voltage setpoint 4 value (FLOAT) [V]
66-67	Analog output voltage setpoint 5 value (FLOAT) [V]
68-69	Analog output voltage setpoint 6 value (FLOAT) [V]
70-71	Analog output voltage setpoint 7 value (FLOAT) [V]
72-73	Analog output voltage setpoint 8 value (FLOAT) [V]
74-75	Loop output 1 setpoint (FLOAT) [mA]
76-77	Loop output 2 setpoint (FLOAT) [mA]
78-81	Impulse count setpoint on input DI3 (impulse counter 1)
82-85	Impulse count setpoint on input DI4 (impulse counter 2)

Coils	
50-53	Relay outputs
54	Apply setpoint impulse count on impulse counter 1
55	Apply setpoint impulse count on impulse counter 2



### 6.3. USB interface

The USB interface is used only for service reasons. In a normal operation, it is not necessary to use it.

If you connect the reader via USB cable to the PC, the reader acts as a virtual COM port with parameters 115200/8/N/1. The reader implements the same set of commands as in the case of TCP configuration server, so the user could also use the USB interface to configure the reader.

The USB interface can be used to a device firmware upgrade. In this case, a special PC utility is necessary to load the firmware.

## **7. List of commands (via TCP text port or USB connection – added in future)**



***On behalf of  
Embedded Electronics & Solutions, s.r.o.  
we would like to thank you.***

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