

# User guide

# Advanced I/O

## PD LOOP

### Converter 0-20 mA current loops to ModBUS

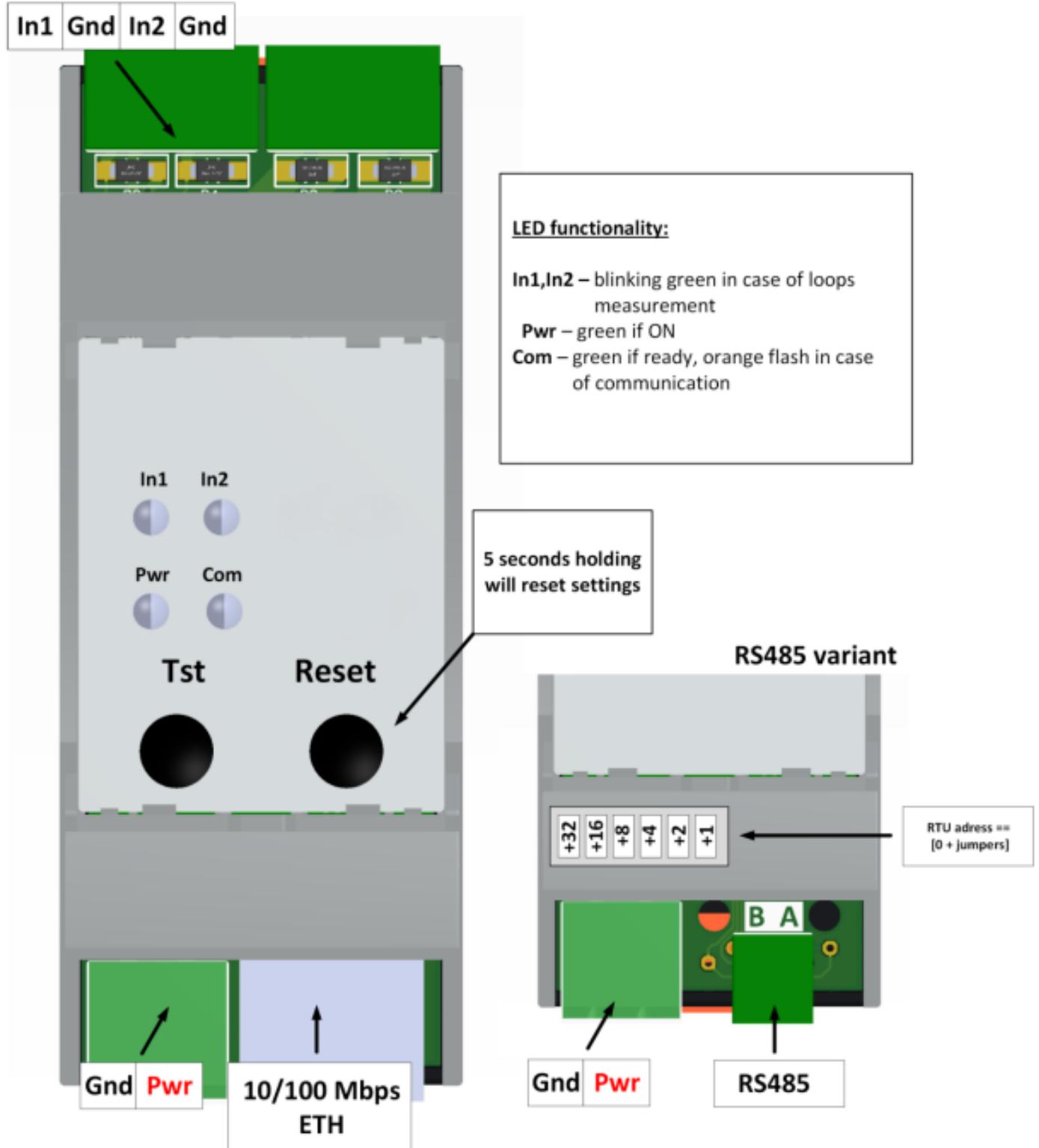
v.1.1



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## 1. System schematic



## 2. Basic parameters

### 2.1. System description

This device converts 0-20 mA current loops to ModBUS. Each PDLoop can be connected to 2 current meters; the connected meters are configured separately. As physical layer is used RS485. The module is powered from external power.

### 2.2. System parameters

PD Loop RS485 variant	
<b>Communication interface</b>	1x RS485
<b>ModBUS address range</b>	64 - 127
<b>IO interface</b>	2x current input 2x relay output (optional)
<b>Temperature range</b>	-20 to +50°C
<b>Power supply voltage</b>	24 VDC
<b>Power consumption</b>	max. 0,5 W
<b>Dimensions</b>	113 x 35 x 60 mm
<b>Mount</b>	DIN rail

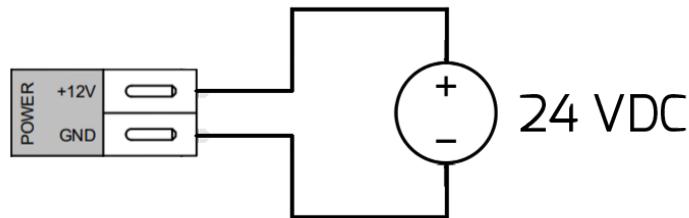
PD Loop Ethernet variant	
<b>Communication interface</b>	1x Ethernet
<b>ModBUS address range</b>	64 - 127
<b>IO interface</b>	2x current input 2x relay output (optional)
<b>Temperature range</b>	-20 to +50°C
<b>Power supply voltage</b>	24 VDC
<b>Power consumption</b>	max. 0,5 W
<b>Dimensions</b>	113 x 35 x 60 mm
<b>Mount</b>	DIN rail

<b>Current input</b>	
<b>Number of inputs</b>	2
<b>Current range</b>	0 - 20 mA
<b>Accuracy</b>	+- 20 µA

### 3. Detailed connection schematics

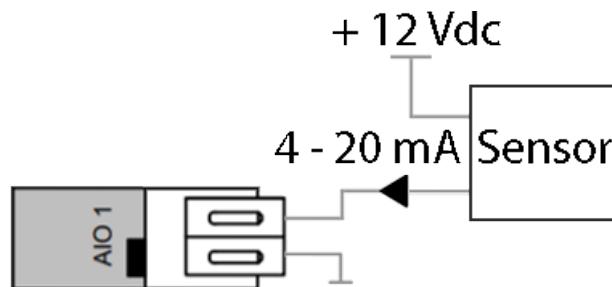
#### 3.1. Power supply

The device requires an external DC power supply, able to provide at least 5 W of power at 24 V.



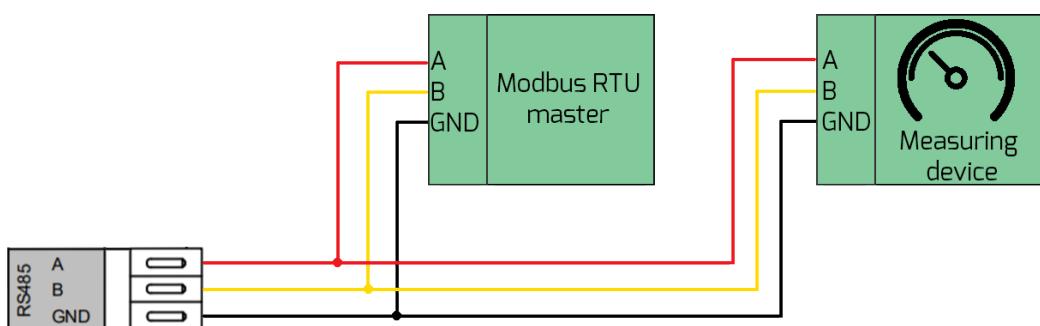
#### 3.2. Current input

It is primarily used to read the values of sensors with active current output.



#### 3.3. RS485

RS485 serves communication purposes through the Modbus RTU protocol with the master control unit (chapter 4).



## 4. Modbus communication

### 4.1. Factory settings

The whole system can be administered using Modbus TCP protocol.

To use Modbus/TCP communication, the device must be connected to the network via ethernet cable.

The device appears as TCP slave in the modbus communication.

To use several devices in one network, they need to be assigned different IP addresses.

Setting a different IP address is possible by rewriting the holding registry 8 to 11. Then you must set the log. 1 coil 4.

Modbus TCP factory settings	
IP address	192.168.0.100
Subnet mask	255.255.255.0
Gateway	192.168.0.1
Modbus port	502

PD Loop RS485 variant can be administered via Modbus RTU which requires the connection of differential pairs of RS485 and GND. To use several devices, they need to be assigned different RTU addresses. This is possible by choosing using combinations of jumpers on the board.

Modbus RTU factory settings	
RTU address	1
Factory communication settings	
Communication speed	19200 Bits/s
Format	8 Bits
Parity	none
Stop bit	1

## 4.2. Modbus registers

### 4.2.1. Input registers

		Data type	RAW range from	RAW range to	OpenDAF address	OpenDAF object type	OpenDAF data type
0	Current sensed at In1 [ $\mu$ A]	int16	0	20000	\$a/3:1	measurement	integer
1	Current sensed at In2 [ $\mu$ A]	int16	0	20000	\$a/3:1	measurement	integer

(\$a - unit address)

### 4.2.2. Holding registers

		Data type	RAW range from	RAW range to	OpenDAF address	OpenDAF object type	OpenDAF data type
16	IP address of device, first octet (standard: 192) (ETH)	uint16	0	255	\$a/4:17	measurement / command	integer
17	IP address of device, second octet (standard: 168) (ETH)	uint16	0	255	\$a/4:18	measurement / command	integer
18	IP address of device, third octet (standard: 0) (ETH)	uint16	0	255	\$a/4:19	measurement / command	integer
19	IP address of device, fourth octet (standard: 100) (ETH)	uint16	0	255	\$a/4:20	measurement / command	integer
20	IP subnet mask, first octet (standard: 255) (ETH)	uint16	0	255	\$a/4:21	measurement / command	integer
21	IP subnet mask, second octet (standard: 255) (ETH)	uint16	0	255	\$a/4:22	measurement / command	integer
22	IP subnet mask, third octet (standard: 255) (ETH)	uint16	0	255	\$a/4:23	measurement / command	integer
23	IP subnet mask, fourth octet (standard: 0) (ETH)	uint16	0	255	\$a/4:24	measurement / command	integer
24	IP gateway, first octet (standard 192) (ETH)	uint16	0	255	\$a/4:25	measurement / command	integer
25	IP gateway, second octet (standard 168) (ETH)	uint16	0	255	\$a/4:26	measurement / command	integer
26	IP gateway, third octet (standard 0) (ETH)	uint16	0	255	\$a/4:27	measurement / command	integer
27	IP gateway, fourth octet (standard 1) (ETH)	uint16	0	255	\$a/4:28	measurement / command	integer
28	TCP port of modbus communication (standard: 502) (ETH)	uint16	1	65535	\$a/4:29	measurement / command	integer
29	MAC address, first octet (ETH)	uint16	0	255	\$a/4:30	measurement / command	integer
30	MAC address, second octet (ETH)	uint16	0	255	\$a/4:31	measurement / command	integer
31	MAC address, third octet (ETH)	uint16	0	255	\$a/4:32	measurement / command	integer
32	MAC address, fourth octet (ETH)	uint16	0	255	\$a/4:33	measurement / command	integer
33	MAC address, fifth octet (ETH)	uint16	0	255	\$a/4:34	measurement / command	integer
34	MAC address, sixth octet (ETH)	uint16	0	255	\$a/4:35	measurement / command	integer

(\$a - unit address)

### 4.2.3. Coils registers

		Data type	RAW range from	RAW range to	OpenDAF address	OpenDAF object type	OpenDAF data type
0	Save counter 0 preset	bool	1	1	\$a/0:1	measurement / command	binary
1	Save counter 1 preset	bool	1	1	\$a/0:2	measurement / command	binary
4	Module will load new IP settings and automatically make reset (ETH)	bool	1	1	\$a/0:5	measurement / command	binary
5	Relay output 1 (depends on product variant)	bool	0	1	\$a/0:6	measurement / command	binary
6	Relay output 2 (depends on product variant)	bool	0	1	\$a/0:7	measurement / command	binary

(\$a - unit address)



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