IOMB-02 INSTALLATION INSTRUCTIONS

EN

ENGLISH

I/O-Module with Modbus RTU communication, 4 digital and 4 analogue inputs and 2 digital and 2 analogue outputs/PWM.

DANGER: IMPORTANT INFORMATION ON ELECTRICAL SAFETY AND THE ENVIRONMENT

The product's relay switch can be powered with 230V. The power must be switched off during maintenance.

TECHNICAL DATA

Supply voltage:	24V AC/DC ±10%
Power consumption	<100 mA, excl. PWM output
Analogue inputs:	4 x 0-10V DC, (input impedance 5.3 kΩ) or 4 x Pt1000/Ni1000LG
Analogue outputs:	2 x 0-10V DC / PWM
- Max load/output 0-10V:	>5 kΩ imp.
- Max load PWM:	1A (24V)
Digital inputs:	4, via potential-free closing contact
Digital outputs, relay:	2 x 5A, 250V
Indicators LED:	6 amber: Digital I/O, 1 green: Operation/ communication
Communication:	Modbus RTU (RS485)
- RS485 unit load:	96kOhm (1/8 UL)
- Parity selectable:	None, even, odd
- Stop bits:	1 or 2, selectable for no parity
- Speed (baud rate, kbps):	9.6 / 19.2 / 38.4 / 57.6
- Address:	1-64
- Terminating resistor:	120Ω via jumper J7
Ambient temperature:	-20 till +50°C
Cable inlets:	6 x M16 and 2 x M20
Weight grams:	778 g
Dimensions (WxHxD):	250x175x75 mm
Protection class:	IP67

APPLICATION

IOMB-02 is used to collect and distribute analogue and digital signals to and from regulators (DUC) using Modbus RTU communication.

FUNCTION

IOMB-02 is an IP67 enclosed I/O module that transmits measurement and control signals via Modbus to and from DUC regulators. IOMB-02 has 4 digital and 4 analogue inputs and 2 digital and 2 analogue outputs.

The analogue outputs can be configured via Modbus for either 0-10V or PWM output for controlling, for example, a thermal actuator. **NB** 0-10V or PWM for respective analogue output.

The analogue inputs can be configured (via jumpers) to receive either 0-10V or temperature sensor (Pt1000/Ni1000LG). Choice of Pt1000 or Ni1000LG is set on the Modbus register 4x0026-29.

The digital in and outputs both have an amber LED. The green operation LED blinks during Modbus communication.

Addressing, choice of parity and baud rate is set with DIP switches. IOMB-02 should be de-energised at these settings.

The housing has 6 M16 and 2 M20 cable fittings.

Selectable default function: IOMB-02 has a selectable function for dealing with interruptions in the Modbus communication. This means that the two digital and analogue outputs can be set individually should the Modbus communication be interrupted for a certain amount of time. The time for communication interruption before the default function kicks in can be set between 1 and 600 seconds. If set to 0 seconds then the function is deactivated (factory setting).

As an accessory, a Modbus-IP gateway is available for retrofit.

MOUNTING

IOMB-02 is wall-mounted indoors.

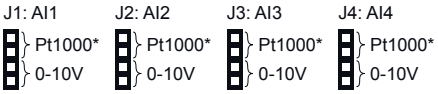
MAINTENANCE

IOMB-02 is maintenance-free.

LED INDICATION

LED Diod	Function	Status
L1	DIN1	Closed
L2	DIN2	Closed
L3	DIN3	Closed
L4	DIN4	Closed
L5	DUT1	Active
L6	DUT2	Active
L7	Operation	
L7 Blinks	Modbus communication	Active

ANALOG INPUTS, CONFIGURATION OF JUMPERS



* Choice of Pt1000 or Ni1000LG is set on the Modbus register 4x0026-28.

MODBUS SETTINGS

(DIP switch: 0 = OFF / 1 = ON)

Modbus ID	DIP switch 1,2,3,4,5 and 6
1	000000
2	100000
3	010000
4	110000
5	001000
6	101000
7	011000
8	111000
9	000100
10	100100
11	010100
12	110100
13	001100
14	101100
15	011100
16	111100
17	000010
18	100010
...	...
64	111111

Modbus Parity	DIP switch 7 and 8
None (2 stop bits)	00
None (1 stop bit)	11
Even (1 stop bit)	10
Odd (1 stop bit)	01

Modbus Baud rate	DIP switch 9 and 10
9600	00
19200	10
38400	01
57600	11

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MODBUS REGISTER

I/O Module MODBUS register.

Coils (0x)	Function	Range
0x0001	Digital output #1	Off or On
0x0002	Digital output #2	Off or On
Discrete inputs (1x)	**Function**	**Range**
1x0003	Digital input #1	Off or On
1x0004	Digital input #2	Off or On
1x0005	Digital input #3	Off or On
1x0006	Digital input #4	Off or On
Input reg. (3x)	**Function**	**Range**
3x0009	Analog input #1 x100 (Volt)	0 to 1000
3x0010	Analog input #2 x100 (Volt)	0 to 1000
3x0011	Analog input #3 x100 (Volt)	0 to 1000
3x0012	Analog input #4 x100 (Volt)	0 to 1000
3x0013	Analog input #1 (Ohms)	0 to 1300
3x0014	Analog input #2 (Ohms)	0 to 1300
3x0015	Analog input #3 (Ohms)	0 to 1300
3x0016	Analog input #4 (Ohms)	0 to 1300
3x0017	Analog input #1 x10 (°C)	-500 to +500
3x0018	Analog input #2 x10 (°C)	-500 to +500
3x0019	Analog input #3 x10 (°C)	-500 to +500
3x0020	Analog input #4 x10 (°C)	-500 to +500
Holding reg. (4x)	**Function**	
4x0001	Digital output #1	Range
4x0002	Digital output #2	0 or 1
4x0003	Digital input #1	0 or 1
4x0004	Digital input #2	0 or 1
4x0005	Digital input #3	0 or 1
4x0006	Digital input #4	0 or 1
4x0007	Analog output #1 x100 (Volt) / PWM x10 (%)	0 to 1000
4x0008	Analog output #2 x100 (Volt) / PWM x10 (%)	0 to 1000
4x0009	Analog input #1 x100 (Volt)	0 to 1000
4x0010	Analog input #2 x100 (Volt)	0 to 1000
4x0011	Analog input #3 x100 (Volt)	0 to 1000
4x0012	Analog input #4 x100 (Volt)	0 to 1000
4x0013	Analog input #1 (Ohms)	0 to 1300
4x0014	Analog input #2 (Ohms)	0 to 1300
4x0015	Analog input #3 (Ohms)	0 to 1300
4x0016	Analog input #4 (Ohms)	0 to 1300
4x0017	Analog input #1 x10 (°C)	-500 to 500
4x0018	Analog input #2 x10 (°C)	-500 to 500
4x0019	Analog input #3 x10 (°C)	-500 to 500
4x0020	Analog input #4 x10 (°C)	-500 to 500
4x0021	Digital output #1 default value *1	0 or 1
4x0022	Digital output #2 default value *1	0 or 1
4x0023	Analog output #1 default value x100 (Volt) / PWM x10 (%) *1	0 to 1000
4x0024	Analog output #2 default value x100 (Volt) / PWM x10 (%) *1	0 to 1000
4x0025	Timeout for activating default values (4x0021-4x0024) *2	0-600 sec
4x0026	Setting of temperature sensor type, analog input 1: 0=Pt1000, 1=Ni1000LG	0 or 1
4x0027	Setting of temperature sensor type, analog input 2: 0=Pt1000, 1=Ni1000LG	0 or 1
4x0028	Setting of temperature sensor type, analog input 3: 0=Pt1000, 1=Ni1000LG	0 or 1
4x0029	Setting of temperature sensor type, analog input 4: 0=Pt1000, 1=Ni1000LG	0 or 1
4x0030	Analog output type, analog output 1: 0 = 0-10V, 1=PWM	0 or 1
4x0031	Analog output type, analog output 2: 0 = 0-10V, 1=PWM	0 or 1
4x0032	AC power supply detected 0=DC, 1=AC	0 or 1

*1 Selectable default value that can be activated upon loss of communication on the Modbus loop.

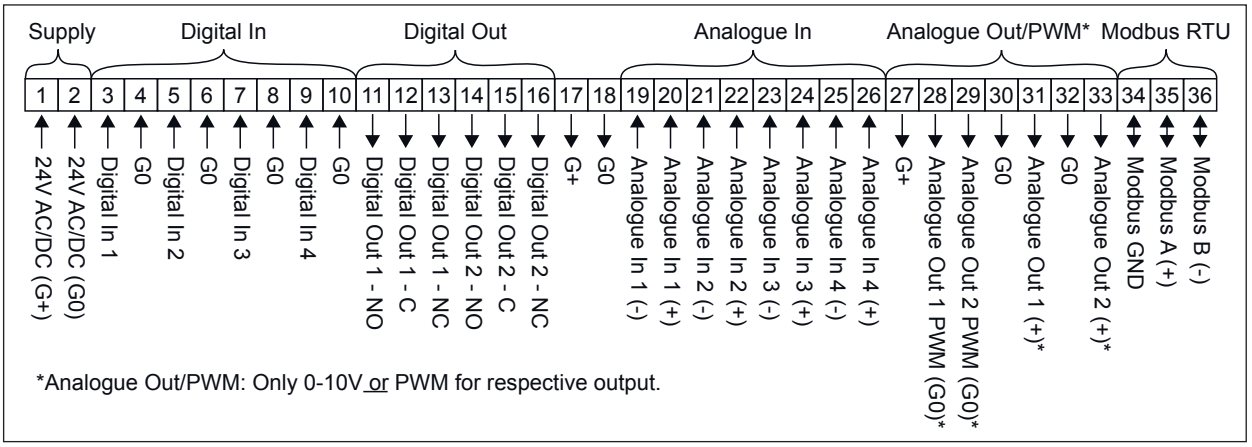
*2 Upon loss of communication (Modbus) lasting longer than the allotted number of seconds (1-600 seconds), the adjustable default values for the registers 4x0021 to 4x0024 are activated. To close the function, select 0 seconds (factory setting).

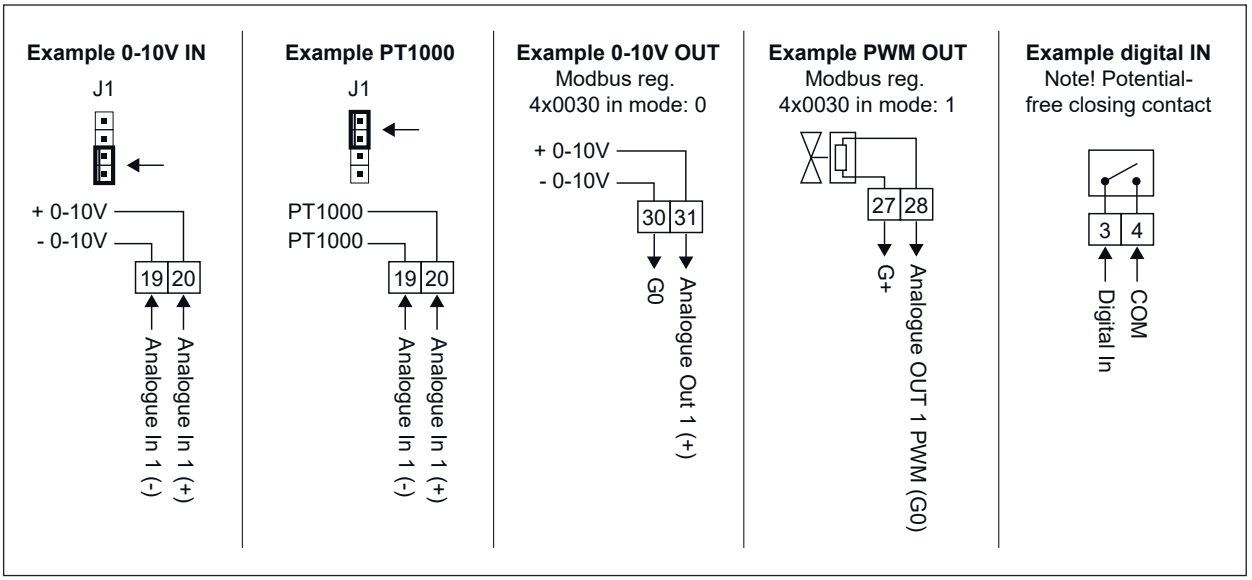
MODBUS COMMUNICATION

Reference	Description
0x	Read/Write Discrete Outputs or Coils
1x	Read Discrete Inputs
3x	Read Input Registers
4x	Read/Write Output or Holding registers

Subject to change without prior notice. Omissions and printing errors excepted.

WIRING DIAGRAM



*Analogue Out/PWM: Only 0-10V or PWM for respective output.

EXAMPLE CONNECTIONS