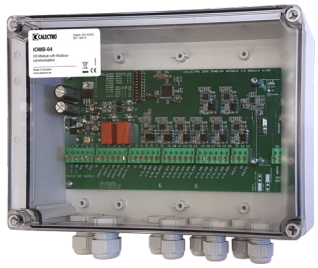
IOMB-04 INSTALLATION INSTRUCTIONS

EN



ENGLISH

I/O Module with Modbus RTU communication, 2 digital and 8 configurable inputs and 2 digital and 2 analogue outputs.

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
Analogue inputs:	8 x 0-10V DC,(input impedance 5.3 kΩ) or 8 x Pt1000/ Ni1000LG or potential-free closing contact
Analogue outputs:	2 x 0-10V DC
- Max load/output:	>5 kΩ imp.
Digital inputs:	2, via potential-free closing contact
Digital output, relay:	2 x 5A, 250V
Indicators LED:	4 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 J9
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-04 is used to collect and distribute analogue and digital signals to and from regulators (DUC) using Modbus RTU communication.

FUNCTION

IOMB-04 is an IP-67 enclosed I/O module that transmits measurement and control signals via Modbus to and from DUC regulators. IOMB-04 has 2 digital and 8 configurable inputs and 2 digital and 2 analogue outputs.

The analogue inputs can be configured (via jumpers) to receive either 0-10V, temperature sensor (Pt1000/ Ni1000LG) or potential-free closing contact. Choice of Pt1000 or Ni1000LG is set in the Modbus register 4x0044-4x0051. The analogue outputs have 0-10V output.

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-04 should be de-energised at these settings

The housing has 6 M16 and 2 M20 cable fittings.

Selectable default function: IOMB-04 has a selectable function for dealing with interruptions in the Modbus communication. This means that the digital and analogue outputs can be set individually if the Modbus communication is 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-04 is wall-mounted indoors.

MAINTENANCE

IOMB-04 is maintenance-free.

LED INDICATION

LED Diod	Function	Status
L1	DOUT1	Active
L2	DOUT2	Active
L3	DIN1	Closed
L4	DIN2	Closed
L5	Operation	
L5 Blinks	Modbus Communication	Active

MULTI-FUNCTION INPUTS, CONFIGURATION OF JUMPERS

J1: A/D_IN1 (Ditto for jumpers J2-J8)

* Choice of Pt1000 or Ni1000LG is set in Modbusregister 4x0044-51.

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
19	010010
20	110010

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

© 2021.09.10 R2.0 Calectro AB HFE6091 EN

MODBUSREGISTER

I/O Modul MODBUS register.

Coils (0x)	Function	Range	Read/ Write
0x0001	Digital output #1	0 or 1	R/W
0x0002	Digital output #2	0 or 1	R/W
Discrete inputs (1x)	**Function**	**Range**	**Read/ Write**
1x0003	Digital input #1	0 or 1	R
1x0004	Digital input #2	0 or 1	R
1x0005	Digital input #3 (Only valid in PT1000/DIN Mode)	0 or 1	R
1x0006	Digital input #4 (Only valid in PT1000/DIN Mode)	0 or 1	R
1x0007	Digital input #5 (Only valid in PT1000/DIN Mode)	0 or 1	R
1x0008	Digital input #6 (Only valid in PT1000/DIN Mode)	0 or 1	R
1x0009	Digital input #7 (Only valid in PT1000/DIN Mode)	0 or 1	R
1x0010	Digital input #8 (Only valid in PT1000/DIN Mode)	0 or 1	R
1x0011	Digital input #9 (Only valid in PT1000/DIN Mode)	0 or 1	R
1x0012	Digital input #10 (Only valid in PT1000/DIN Mode)	0 or 1	R
Input (3x)	**Function**	**Range**	**Read/ Write**
3x0013	Analog output #1 x100 (Volt)	0 to 1000	R/W
3x0014	Analog output #2 x100 (Volt)	0 to 1000	R/W
3x0015	Analog input #1 x100 (Volt)	0 to 1000	R
3x0016	Analog input #2 x100 (Volt)	0 to 1000	R
3x0017	Analog input #3 x100 (Volt)	0 to 1000	R
3x0018	Analog input #4 x100 (Volt)	0 to 1000	R
3x0019	Analog input #5 x100 (Volt)	0 to 1000	R
3x0020	Analog input #6 x100 (Volt)	0 to 1000	R
3x0021	Analog input #7 x100 (Volt)	0 to 1000	R
3x0022	Analog input #8 x100 (Volt)	0 to 1000	R
3x0023	Analog input #1 (Ohms)	0 to 1300	R
3x0024	Analog input #2 (Ohms)	0 to 1300	R
3x0025	Analog input #3 (Ohms)	0 to 1300	R
3x0026	Analog input #4 (Ohms)	0 to 1300	R
3x0027	Analog input #5 (Ohms)	0 to 1300	R
3x0028	Analog input #6 (Ohms)	0 to 1300	R
3x0029	Analog input #7 (Ohms)	0 to 1300	R
3x0030	Analog input #8 (Ohms)	0 to 1300	R
3x0031	Analog input #1 x10 (°C)	-500 to 500	R
3x0032	Analog input #2 x10 (°C)	-500 to 500	R
3x0033	Analog input #3 x10 (°C)	-500 to 500	R
3x0034	Analog input #4 x10 (°C)	-500 to 500	R
3x0035	Analog input #5 x10 (°C)	-500 to 500	R
3x0036	Analog input #6 x10 (°C)	-500 to 500	R
3x0037	Analog input #7 x10 (°C)	-500 to 500	R
3x0038	Analog input #8 x10 (°C)	-500 to 500	R

Holding (4x)	Function	Range	Read/ Write
4x0001	Digital output #1	0 or 1	R/W
4x0002	Digital output #2	0 or 1	R/W
4x0003	Digital input #1	0 or 1	R
4x0004	Digital input #2	0 or 1	R
4x0005	Digital input #3 (Only valid in PT1000/DIN Mode)	0 or 1	R
4x0006	Digital input #4 (Only valid in PT1000/DIN Mode)	0 or 1	R
4x0007	Digital input #5 (Only valid in PT1000/DIN Mode)	0 or 1	R
4x0008	Digital input #6 (Only valid in PT1000/DIN Mode)	0 or 1	R
4x0009	Digital input #7 (Only valid in PT1000/DIN Mode)	0 or 1	R
4x0010	Digital input #8 (Only valid in PT1000/DIN Mode)	0 or 1	R
4x0011	Digital input #9 (Only valid in PT1000/DIN Mode)	0 or 1	R
4x0012	Digital input #10 (Only valid in PT1000/DIN Mode)	0 or 1	R
4x0013	Analog output #1 x100 (Volt)	0 to 1000	R/W
4x0014	Analog output #2 x100 (Volt)	0 to 1000	R/W
4x0015	Analog input #1 x100 (Volt)	0 to 1000	R
4x0016	Analog input #2 x100 (Volt)	0 to 1000	R
4x0017	Analog input #3 x100 (Volt)	0 to 1000	R
4x0018	Analog input #4 x100 (Volt)	0 to 1000	R
4x0019	Analog input #5 x100 (Volt)	0 to 1000	R
4x0020	Analog input #6 x100 (Volt)	0 to 1000	R
4x0021	Analog input #7 x100 (Volt)	0 to 1000	R
4x0022	Analog input #8 x100 (Volt)	0 to 1000	R
4x0023	Analog input #1 (Ohms)	0 to 1300	R
4x0024	Analog input #2 (Ohms)	0 to 1300	R
4x0025	Analog input #3 (Ohms)	0 to 1300	R
4x0026	Analog input #4 (Ohms)	0 to 1300	R
4x0027	Analog input #5 (Ohms)	0 to 1300	R
4x0028	Analog input #6 (Ohms)	0 to 1300	R
4x0029	Analog input #7 (Ohms)	0 to 1300	R
4x0030	Analog input #8 (Ohms)	0 to 1300	R
4x0031	Analog input #1 x10 (°C)	-500 to 500	R
4x0032	Analog input #2 x10 (°C)	-500 to 500	R
4x0033	Analog input #3 x10 (°C)	-500 to 500	R
4x0034	Analog input #4 x10 (°C)	-500 to 500	R
4x0035	Analog input #5 x10 (°C)	-500 to 500	R
4x0036	Analog input #6 x10 (°C)	-500 to 500	R
4x0037	Analog input #7 x10 (°C)	-500 to 500	R
4x0038	Analog input #8 x10 (°C)	-500 to 500	R
4x0039	Digital output #1 default value	0 or 1 (*1)	R/W
4x0040	Digital output #2 default value	0 or 1 (*1)	R/W
4x0041	Analog output #1 default value x100 (Volt)	0 to 1000 (*1)	R/W

4x0042	Analog output #2 default value x100 (Volt)	0 to 1000 (*1)	R/W
4x0043	"Timeout for activating default values (4x0039-4x0042) (seconds)"	0-600 (*2)	R/W
4x0044	"Setting of temperature sensor type, analog input 1: 0=Pt1000, 1=Ni1000LG"	0 or 1	R/W
4x0045	"Setting of temperature sensor type, analog input 2: 0=Pt1000, 1=Ni1000LG"	0 or 1	R/W
4x0046	"Setting of temperature sensor type, analog input 3: 0=Pt1000, 1=Ni1000LG"	0 or 1	R/W
4x0047	"Setting of temperature sensor type, analog input 4: 0=Pt1000, 1=Ni1000LG"	0 or 1	R/W
4x0048	"Setting of temperature sensor type, analog input 5: 0=Pt1000, 1=Ni1000LG"	0 or 1	R/W
4x0049	"Setting of temperature sensor type, analog input 6: 0=Pt1000, 1=Ni1000LG"	0 or 1	R/W
4x0050	"Setting of temperature sensor type, analog input 7: 0=Pt1000, 1=Ni1000LG"	0 or 1	R/W
4x0051	"Setting of temperature sensor type, analog input 8: 0=Pt1000, 1=Ni1000LG"	0 or 1	R/W

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

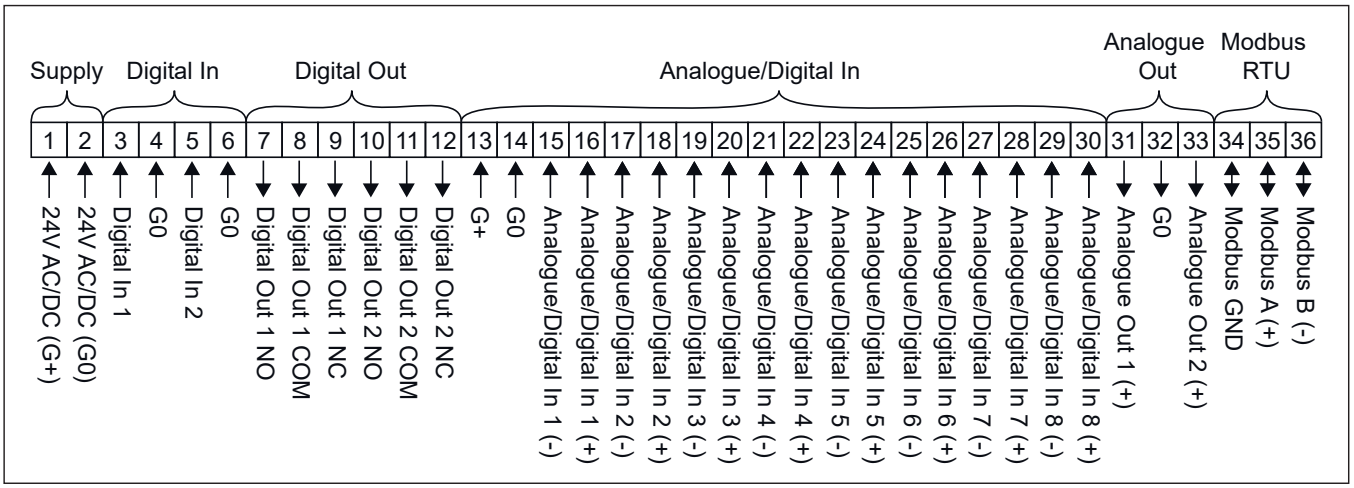
*2 Upon loss of communication (Modbus) lasting longer than the allotted number of seconds (1-600 seconds), the adjustable default values for the registers 4x0039 to 4x0042 are activated. To close the function, select 0 seconds (factory setting).

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

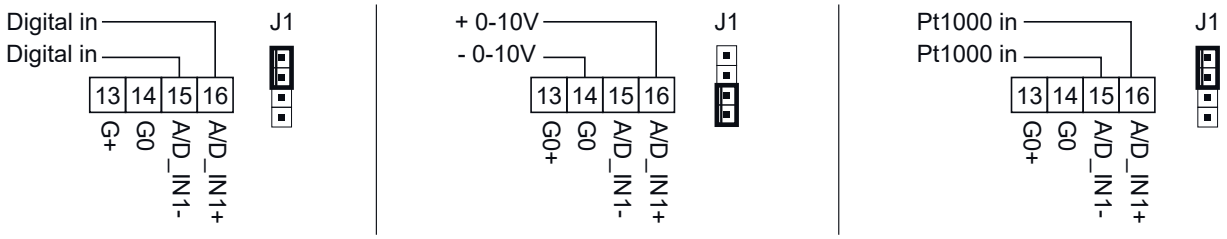
Subject to change without prior notice. Omissions and printing errors excepted.

WIRING DIAGRAM

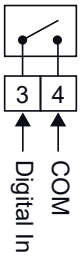
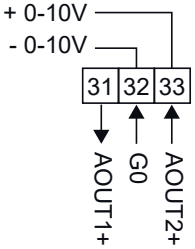


EXAMPLE CONNECTIONS

Example multi-function inputs 1-8. The example shows input 1.



Exempel digital IN
NOTE! Potential-free closing contact



Example analogue output 2