

# IOMB-03 INSTALLATION INSTRUCTIONS

EN



## ENGLISH

I/O Module with Modbus RTU communication, 3 digital and 3 analogue inputs and 3 digital and 3 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

|                                   |   |
|-----------------------------------|---|
| <b>Supply voltage:</b>            | 24V AC/DC ±10%  |
| <b>Power consumption</b>          | <100 mA   |
| <b>Analogue inputs:</b>           | 3 x 0-10V DC, (input impedance 5.3 kΩ) or 3 x Pt1000/Ni1000LG |
| <b>Analogue outputs:</b>          | 3 x 0-10V DC  |
| <b>- Max load/output:</b>         | >5 kΩ imp.  |
| <b>Digital inputs:</b>            | 3, via potential-free closing contact                         |
| <b>Digital output, relay:</b>     | 3 x 5A, 250V  |
| <b>Indicators LED:</b>            | 6 amber: Digital I/O, 1 green: Operation/communication        |
| <b>Communication:</b>             | Modbus RTU (RS485)  |
| <b>- RS485 unit load:</b>         | 96kΩhm (1/8 UL)   |
| <b>- Parity selectable:</b>       | None, even, odd   |
| <b>- Stop bits:</b>               | 1 or 2, selectable for no parity                              |
| <b>- Speed (baud rate, kbps):</b> | 9.6 / 19.2 / 38.4 / 57.6                                      |
| <b>- Address:</b>                 | 1-64  |
| <b>- Terminating resistor:</b>    | 120Ω via jumper J7  |
| <b>Ambient temperature:</b>       | -20 till +50°C  |
| <b>Cable inlets:</b>              | 6 x M16 and 2 x M20   |
| <b>Weight grams:</b>              | 778 g   |
| <b>Dimensions (WxHxD):</b>        | 250x175x75 mm   |
| <b>Protection class:</b>          | IP67  |

### APPLICATION

IOMB-03 is used to collect and distribute analogue and digital signals to and from regulators (DUC) using Modbus RTU communication.

### FUNCTION

IOMB-03 is an IP67 enclosed I/O module that transmits measurement and control signals via Modbus to and from DUC regulators. IOMB-03 has 3 digital and 3 analogue inputs and 3 digital and 3 analogue outputs.

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 4x0026-28. 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-03 should be de-energised at these settings.

The housing has 6 M16 and 2 M20 cable fittings.

**Selectable default function:** IOMB-03 has a selectable function for dealing with interruptions in the Modbus communication. This means that the three digital and three 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-03 is wall-mounted indoors.

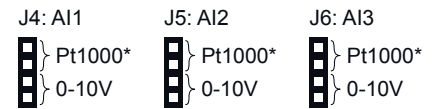
### MAINTENANCE

IOMB-03 is maintenance-free.

### LED INDICATION

| LED Diode | Function             | Status |
|-----------|----------------------|--------|
| L1        | DIN1                 | Closed |
| L2        | DIN2                 | Closed |
| L3        | DIN3                 | Closed |
| L4        | DUT1                 | Active |
| L5        | DUT2                 | Active |
| L6        | DUT3                 | Active |
| L7        | Operation            |        |
| L7 Blinks | Modbus communication | Active |

### ANALOGUE 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                     |
| 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                  |

## 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    |
| 0x0003               | Digital output #3            | Off or On    |
| Discrete inputs (1x) | Function                     | Range        |
| 1x0004               | Digital input #1             | Off or On    |
| 1x0005               | Digital input #2             | Off or On    |
| 1x0006               | Digital input #3             | Off or On    |
| Input reg. (3x)      | Function                     | Range        |
| 3x0010               | Analog input #1 x100 (Volt)  | 0 to 1000    |
| 3x0011               | Analog input #2 x100 (Volt)  | 0 to 1000    |
| 3x0012               | Analog input #3 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 #1 x10 (°C)     | -50 to +50   |
| 3x0017               | Analog input #2 x10 (°C)     | -50 to +50   |
| 3x0018               | Analog input #3 x10 (°C)     | -50 to +50   |
| Holding reg. (4x)    | Function                     | Range        |
| 4x0001               | Digital output #1            | 0 or 1       |
| 4x0002               | Digital output #2            | 0 or 1       |
| 4x0003               | Digital output #3            | 0 or 1       |
| 4x0004               | Digital input #1             | 0 or 1       |
| 4x0005               | Digital input #2             | 0 or 1       |
| 4x0006               | Digital input #3             | 0 or 1       |
| 4x0007               | Analog output #1 x100 (Volt) | 0 to 1000    |
| 4x0008               | Analog output #2 x100 (Volt) | 0 to 1000    |
| 4x0009               | Analog output #3 x100 (Volt) | 0 to 1000    |
| 4x0010               | Analog input #1 x100 (Volt)  | 0 to 1000    |
| 4x0011               | Analog input #2 x100 (Volt)  | 0 to 1000    |
| 4x0012               | Analog input #3 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 #1 x10 (°C)     | -500 to +500 |
| 4x0017               | Analog input #2 x10 (°C)     | -500 to +500 |
| 4x0018               | Analog input #3 x10 (°C)     | -500 to +500 |

|        |  |    |           |
|--------|--|----|-----------|
| 4x0019 | Digital output #1 default value  | *1 | 0 or 1    |
| 4x0020 | Digital output #2 default value  | *1 | 0 or 1    |
| 4x0021 | Digital output #3 default value  | *1 | 0 or 1    |
| 4x0022 | Analog output #1 default value x100 (Volt)                               | *1 | 0 to 1000 |
| 4x0023 | Analog output #2 default value x100 (Volt)                               | *1 | 0 to 1000 |
| 4x0024 | Analog output #3 default value X100 (Volt)                               | *1 | 0 to 1000 |
| 4x0025 | Timeout for activating default values (4x0019-4x0024)                    | *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    |

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

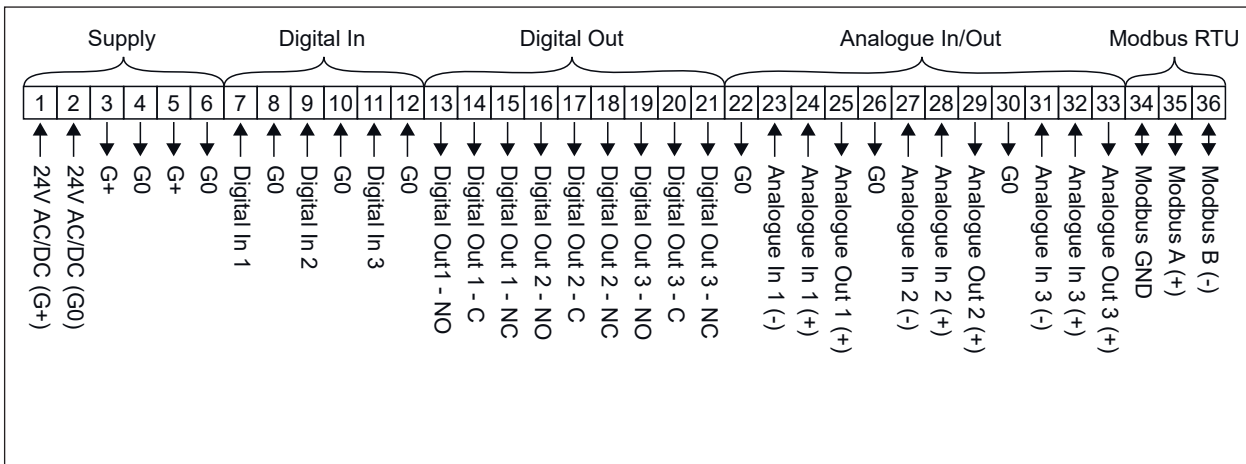
\*2 Upon loss of communication (Modbus) lasting longer than the allotted number of seconds (1-600 seconds), the adjustable default values for the registers 4x0019 to 4x0024 are activated. To close the function, select 0 seconds (factory setting).

## 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



## EXAMPLE CONNECTIONS

