

DDACM-X3

DIN rail mounted Modbus to analogue converter



The DDACM series are intended for converting Modbus RTU (RS485) data into analogue / modulating output signal (0–10 VDC / 0–20 mA / PWM). They feature 3 outputs and are Power over Modbus supplied and all parameters are accessible via Modbus RTU. The series needs a master unit, such as the Sentera RDPU or any BMS or master module that is able to write a value in Modbus Holding registers. The converters can control devices with voltage, current or PWM inputs, e.g. an EC fan.

Key features

- Two product versions - one featuring galvanically isolated outputs and inputs intended for EC fans without galvanic isolation of the analogue input
- 3 RGB LEDs for status indication of the outputs
- Modbus RTU communication and 24 VDC power supply via RJ45 connector (PoM connection)
- DIN rail mountable
- 3 independent analogue / modulating outputs with 3 modes

Technical specifications

| | | |
|---|------------------------------|---|
| Power supply | 24 VDC, Power over Modbus | |
| 3 independent selectable analogue / modulating output modes | 0–10 VDC | min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$) |
| | 0–20 mA | max. load 500 Ω ($R_L \leq 500 \Omega$) |
| | PWM | PWM frequency: 1 kHz, min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$) PWM voltage level – open collector (external pull-up resistor and 3,3–30 VDC external voltage source) or internal pull-up resistor 2,2 kΩ to 12 VDC |
| Resolution of the outputs | 0,1% | |
| Operating isolation voltage | 630 VDC peak | |
| Maximum isolation voltage | 1.000 VDC for 1 min | |
| Accuracy of the outputs | 0–10 VDC mode | ±0,1V |
| | 0–20 mA mode | ±0,2 mA |
| | PWM mode | PWM frequency: ±1% Pulse width: <0,1% |
| Protection standard | IP20 (according to EN 60529) | |
| Ambient conditions | Temperature | -10–60 °C |
| | Rel. humidity | 5–85 % rH (non-condensing) |

Standards

- Low Voltage Directive 2014/35/EU
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
- EMC directive 2014/30/EU:
 - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
 - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments Amendments A1:2011 and AC:2012 to EN 61000-6-3
 - EN 61000-6-4:2007 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments Amendment A1:2011 to EN 61000-6-4
- WEEE Directive 2012/19/EC
- RoHS Directive 2011/65/EC

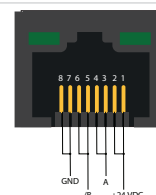
Area of use

- BMS and controlled ventilation systems
- Modbus signal conversion

Wiring and connections

RJ45 socket - 24 VDC, PoM

| | |
|-------|-------------------------------------|
| Pin 1 | Supply voltage, 24 VDC |
| Pin 2 | Supply voltage, 24 VDC |
| Pin 3 | Modbus RTU communication, signal A |
| Pin 4 | Modbus RTU communication, signal A |
| Pin 5 | Modbus RTU communication, signal /B |
| Pin 6 | Modbus RTU communication, signal /B |
| Pin 7 | Ground, supply voltage |
| Pin 8 | Ground, supply voltage |



Terminal blocks - Analogue / modulating outputs

| | |
|-----|---|
| O1 | Analogue / modulating output 1 (0–10 VDC / 0–20 mA / PWM) |
| GND | Ground, AO1 |
| O2 | Analogue / modulating output 2 (0–10 VDC / 0–20 mA / PWM) |
| GND | Ground, AO2 |
| O3 | Analogue / modulating output 3 (0–10 VDC / 0–20 mA / PWM) |
| GND | Ground, AO3 |

Article codes

| Article code | Supply | Galvanically isolated outputs and input | Maximum power consumption | Nominal power consumption | Imax |
|--------------|--------------|---|---------------------------|---------------------------|-------|
| DDACM-03 | 24 VDC (PoM) | No | 1,2 W | 0,36 W | 50 mA |
| DDACM-I3 | | Yes | 2,04 W | 1,2 W | 85 mA |

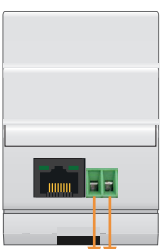
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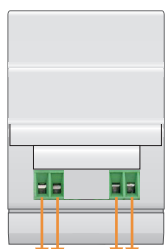
Fixing and dimensions

Bottom view



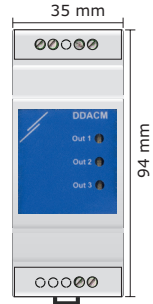
O1 GND

Top view

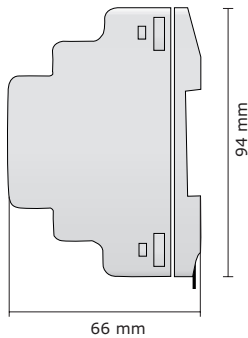


O2 GND O3 GND

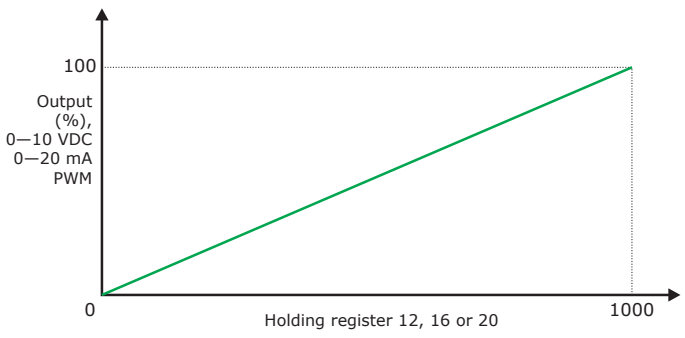
Front view



Side view



Operational diagram



Modbus registers



The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters. The parameters of the unit can be monitored / configured through the 3SMODBUS software platform. You can download it from the following link: <https://www.sentera.eu/en/3SMCenter>

For more information about the Modbus registers, please refer to the product Modbus Register Map.

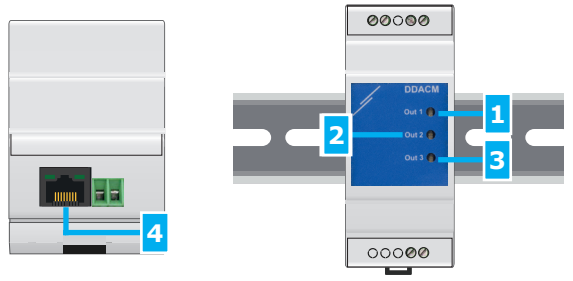
Settings and indications

Functional indications

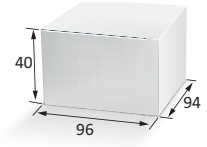
| | | |
|-----------|----------------|---|
| | solid on | Corresponding output = 0 |
| 1 - Out 1 | 1 LED blinking | Corresponding output is changing to 0 |
| 2 - Out 2 | solid on | Corresponding output > 0 |
| 3 - Out 3 | Blinking | Corresponding output is changing to > 0 |

Warnings

| | | |
|------------------------|-----------------|--|
| 1 - Out 1 | solid on | Hardware problem in the corresponding channel |
| 2 - Out 2 | 3 LEDs blinking | Communication timeout |
| 3 - Out 3 | | Bootloader mode activated |
| Out 1 and Out 2 | Blinking | Firmware uploading |
| Out 1, Out 2 and Out 3 | | Change of Modbus device address |
| Out 1 | | Active Modbus RTU communication |
| Out 2 | Blinking | Change of Parity check mode |
| Out 3 | | Modbus RTU communication and 24 VDC power supply: Blinking green LED on the left indicates that data is transmitted; Blinking green LED on the right indicates that data is received |
| 4 - RJ45 socket | | |



Packaging



| Article | Packaging | Length [mm] | Width [mm] | Height [mm] | Net weight | Gross weight |
|----------|---------------|-------------|------------|-------------|------------|--------------|
| DDACM-03 | Unit (1 pc.) | 96 | 94 | 40 | 0,076 kg | 0,09 kg |
| | Box (20 pcs.) | 325 | 210 | 155 | 1,52 kg | 2 kg |
| DDACM-I3 | Unit (1 pc.) | 96 | 94 | 40 | 0,082 kg | 0,096 kg |
| | Box (20 pcs.) | 325 | 210 | 155 | 1,64 kg | 2,2 kg |