

DDACM

Digital to analog converter with 3 outputs



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 k Ω ($R_L \geq 50$ k Ω)
	0—20 mA	max. load 500 Ω ($R_L \leq 500$ Ω)
	PWM	PWM frequency: 1 kHz, min. load 50 k Ω ($R_L \geq 50$ k Ω) PWM voltage level – open collector (external pull-up resistor and 3,3—30 VDC external voltage source) or internal pull-up resistor 2,2 k Ω 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	$\pm 0,1$ V
	0—20 mA mode	$\pm 0,2$ mA
	PWM mode	PWM frequency: ± 1 % Pulse width: $< 0,1$ %
Protection standard	IP20 (according to EN 60529)	
Ambient conditions	Temperature	-10—60 $^{\circ}$ 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
- RoHS Directive 2011/65/EC

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.



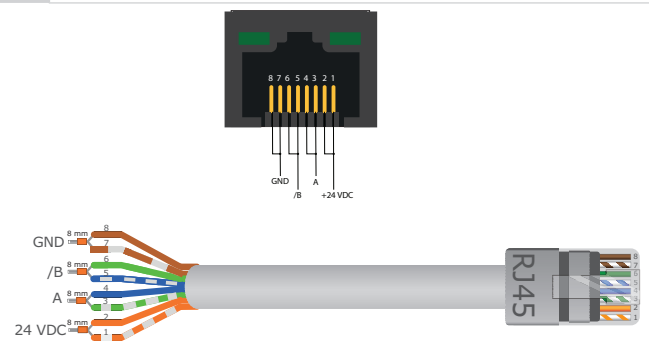
Area of use

- 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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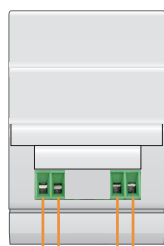
Fixing and dimensions

Bottom view



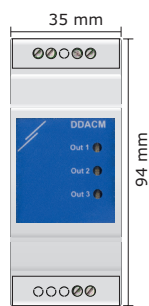
O1 GND

Top view

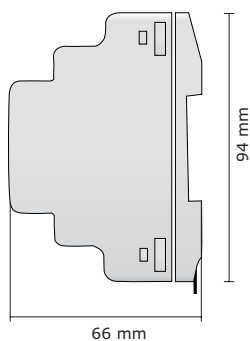


O2 GND O3 GND

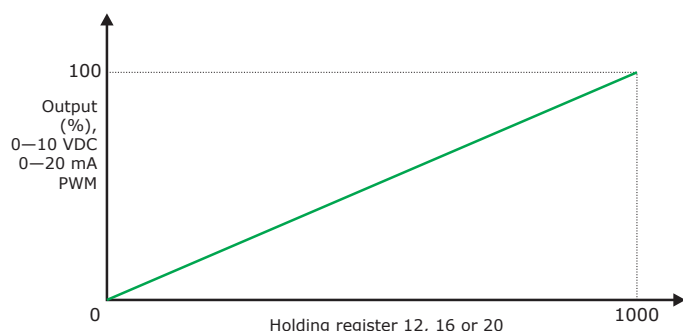
Front view



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.

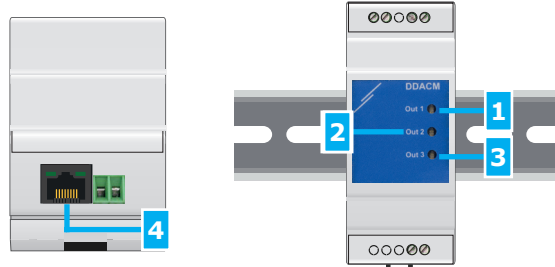
Settings and indications

Functional indications

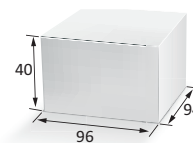
	solid on	Corresponding output = 0
1 - Out 1	1 LED blinking	Corresponding output is changing to 0
2 - Out 2	solid on	Corresponding output > 0
3 - Out 3	Blinking	Corresponding output is changing to > 0

Warnings

1 - Out 1	solid on	Hardware problem in the corresponding channel
2 - Out 2	3 LEDs blinking	Communication timeout
3 - Out 3		
Out 1 and Out 2		Bootloader mode activated
Out 1, Out 2 and Out 3		Firmware uploading
Out 1	Blinking	Change of Modbus device address
Out 2		Active Modbus RTU communication
Out 3		Change of Parity check mode
4 - RJ45 socket		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



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

Global trade item numbers (GTIN)

Packaging	DDACM-03	DDACM-I3
Unit	05401003000700	05401003000717
Box	05401003500217	05401003500224