SENTERA CONTROLS

ECMF8-DM
HVAC controller for EC fans

ECMF8-DM is a fan speed controller with Modbus RTU communication, two analogue/ modulating/ digital inputs, two tacho inputs and two analogue/modulating outputs for connecting EC fan(s) or a VFD. The device can be used for single or dual ventilation control according to one or more sensor measurements or according to downloadable application specific firmware (solutions) like destratification in warehouses, air curtain control, etc.

Key features

- 2 analogue / modulating / digital inputs
- 2 tacho inputs
- Modbus RTU for connecting up to 247 Slave devices or a Master device
- Integrated power supply for connected sensors
- 2 analogue /modulating outputs with adjustable minimum and maximum settings
- Single or dual output based on single or differential input control
- Ascending or descending output modes
- Free solution firmware available for download

Area of use

- Control of 1 or 2 (groups of) EC fans
- For indoor use only
- Demand based ventilation control
- Application specific solutions

Technical specifications

Supply voltage (Us)		85 - 264 VAC, 50 / 60 Hz
Analogue / modulating outputs x 2 (max. load 200 Ω)		0 – 10 VDC / 0 – 20 mA / 0 – 100 % PWM
Analogue/modulating/digital inputs x 2		0 – 10 VDC / 0 – 20 mA / 0 – 100% PWM / Digital Input ON – OFF (1 - 0)
Digital inputs logic levels		0 (0 – 0,8 VDC)
		1 (2 – 12 VDC)
Analogue / Modulating /Digital input, Modbus or Overwrite control mode	Analogue / Modulating / Digital input mode	based on readings from analogue / modulating inputs.
	Modbus mode	based on input from sensors or other slave devices connected on the RJ45 Master connector.
	Overwrite mode	based on user input from dedicated Holding Registers
Integrated power supply for external sensors		24 VDC (Imax 750 mA)
Protection standard		IP54 (according to EN 60529)
Ambient conditions	Storage temperature	-10 – 60 °C
	Operating temperature	-10—40 °C
	Relative humidity	5—95% rH (non-condensing)

Article codes
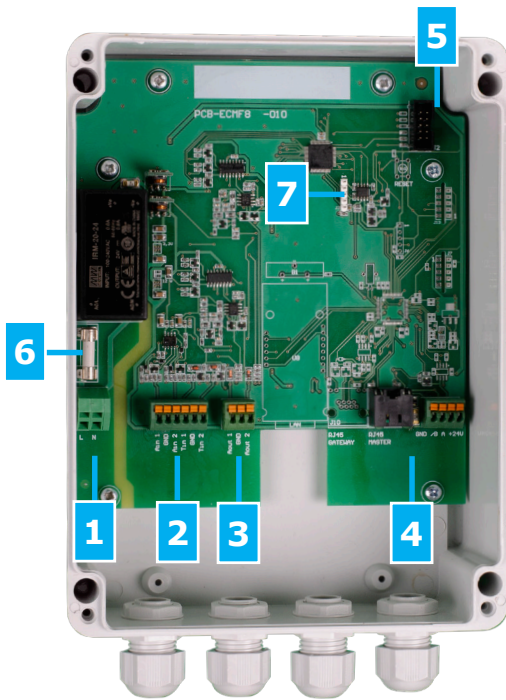
Article code	Built-in internet gateway
ECMF8-AO-DM	No

Wiring and connections

L	Supply voltage, Line
N	Supply voltage, Neutral
Ain1, Ain2	Analogue / modulating / digital inputs
GND	Analogue inputs, Ground
Tin 1, Tin 2	Tacho inputs
GND	Tacho inputs, Ground
Aout 1, Aout 2	Analogue / modulating outputs
GND	Analogue / modulating outputs, Ground
RJ45 socket	To connect the slave devices, PoM (Data + Power supply)
GND	Ground signal for the Modbus slave devices
/B	Modbus RTU, signal /B
A	Modbus RTU, signal A
+24 VDC	+24 VDC power supply for the Modbus slave devices
Connections	Cable cross section L, N terminals max. 2,5 mm²
	Cable cross section other terminals max. 1,5 mm²
	Cable gland clamping range 3—6 mm

Legend

1 - Terminal block power supply	
2 - Terminal block analogue/ modulating inputs and Tacho inputs	
3- Terminal block analogue/ modulating outputs	
4 - RJ45 socket and terminal block PoM	To connect HVAC sensors, potentiometers or other slave devices. Do not connect an external 24 VDC power supply to ECMF8 - this will cause permanent damage. Modbus RTU communication can be connected via the RJ45 socket, via the terminal block or via both.
5 - LED's connector	To connect LED's on cover of casing with circuit board.
6 - Fuse	(5*20 mm) T 1.25 A H 250 VAC
7 - Header	Put a jumper between pin 1 and pin 2 for minimum 15 seconds to reset the Modbus communication parameters to its default values. 1 2 3 4 5
	Put a jumper between pin 3 and pin 4 and restart the supply voltage to enter bootloader mode manually. 1 2 3 4 5

LED Indications

Green	Normal operation.
Blinking Yellow	Off level activated for input 1/2 or both.
Blinking Red	System Error – Communication with external Modbus sensors is lost.

Standards

CE

- Low Voltage Directive 2014/35/EU
  - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - EN 62311:2008 Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)
  - EN 60950-1:2006 Information technology equipment - Safety - Part 1: General requirements Amendments AC:2011, A11:2009, A12:2011, A1:2010 and A2:2013 to EN 60950-1

- EMC Directive 2014/30/EU
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - EN 61000-6-2:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments Amendment AC:2005 to EN 61000-6-2
  - 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 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
  - EN 55011:2009 Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement Amendment A1:2010 to EN 55011
  - EN 55024:2010 Information technology equipment - Immunity characteristics - Limits and methods of measurement

- RoHs Directive 2011/65/EU
  - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

- ETSI EN 301 489-1 V2.1.1 (2017-02) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1:
  - Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU

- ETSI EN 301 489-17 V3.1.1 (2017-02) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17:
  - Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

Download and Install Sentera Solution Firmware

This product requires application dedicated firmware, which can be downloaded from the Sentera website: Select your application via www.sentera.eu/en/solutions.

First, connect all required products including the Sentera internet gateway. Then connect your installation to www.senteraweb.eu. Click "Link to solution" and enter the solution code to download the selected firmware into the connected devices. After the download there is the possibility to use the installation stand alone or to keep the internet gateway connected.
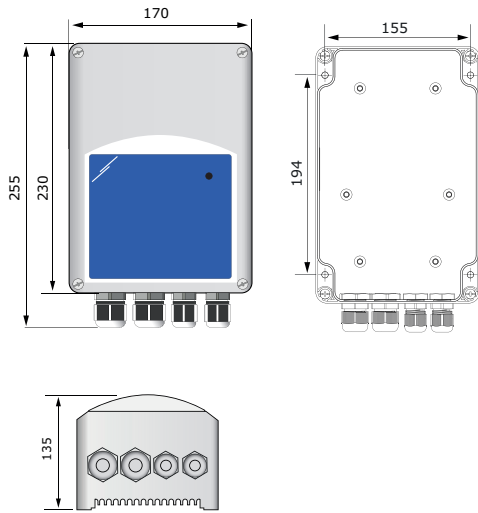
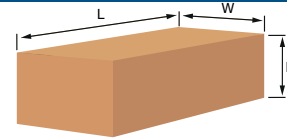For more information about the Modbus registers, please refer to the product Modbus Register Map.

ECMF8
STATUS

Fixing and dimensions

170

155

255
230

194

135

Packaging

L
W
H
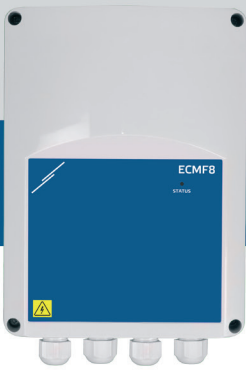
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
ECMF8-AO-DM	Unit (1 pc.)	260	170	140	0.96 kg	1.16 kg

Global trade item numbers (GTIN)

Packaging	Unit (1 pc.)	Pallet (pcs.)
ECMF8-AO-DM	05401003018460	05401003701164

Application example: destratification

SIG-M-2

Sentera Modbus RTU Internet gateway

ECMF8-DM

DTS-M

EC fan

EC fan

ECMF8
STATUS

DTS-M