SENTERA CONTROLS

ECMF8-EW/WF
HVAC controller for EC fans / VFD with internet gateway

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. The integrated internet gateway sends and receives data from Senteraweb.

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
- Integrated Wifi and Ethernet (-EW only) gateway for connection to SenteraWeb Cloud services.
- Free subscription to SenteraWeb for parameter customization and live monitoring of the connected slave devices(*)
- Optional paid subscriptions to SenteraWeb for notifications and scheduling services

* Consult the actual SenteraWeb subscription program for details

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)

Modbus registers

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.

Article codes

Article code	Built-in internet gateway
ECMF8-AO-EW	Ethernet and Wi-Fi
ECMF8-AO-WF	Wi-Fi

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 master 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
Ethernet socket (ECMF8-AO-EW)		Ethernet LAN connection
RJ45 gateway socket		for Modbus RTU communication with Modbus master

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Legend

ECMF8-WF

ECMF8-EW

1 - Terminal block power supply			To connect the power supply terminals
2 - Terminal block analogue/ modulating inputs and Tacho inputs			To connect the analogue/modulating/digital inputs and the tacho inputs
3- Terminal block analogue/ modulating outputs			To connect the 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 - PROG header, P1			Put a jumper between pin 1 and pin 2 for minimum 15 seconds to reset the Modbus communication parameters to its default values
			Put a jumper between pin 3 and pin 4 and restart the supply voltage to enter bootloader mode manually.
8 - Reset switch		ECMF8-AO-EW	Push and hold for 4 seconds until the Blue LED blinks to perform a reset to the factory default except for the Wi-fi module. To reset the Wi-fi module, see "9. Wi-fi reset tact switch"
		ECMF8-AO-WF	Push and hold for 4 seconds until the Blue LED blinks to perform a complete factory reset of the device. After the reset, the unit is traceable as Wi-fi network (XIG) and the configuration page for internet access is accesible via URL: 192.168.1.123 with password 123456798
9 - Wi-fi reset tact switch (EW only)			Push and hold for 4 seconds to perform a reset of the Wi-fi module. After the reset, the unit is traceable as Wi-fi network (XIG) and the configuration page for internet access is accesible via URL: 192.168.1.123 with password 123456798
10 - RJ45 Gateway socket (EW only)			To connect a Modbus master device. ATTENTION! Do not connect external power supply to this RJ45 socket.
11 - Ethernet (-EW only)			To connect the installation to SenteraWeb via a LAN cable

Communication LED Indications

Green	Active internet connection OK (Senteraweb gateway successfully communicates with the SenteraWeb Broker) – sending/receiving data and parameter values of connected slave devices to SenteraWeb
Red	Indicates system error
Red and Pink (fast-blink)	Uploading firmware update for Senteraweb gateway part is in progress.
Blue (long-blink)	Bootloader mode activated, but firmware update process is still not in progress.

Status 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

- Radio equipment Directive 2014/53/EU:
  - EN 300 328 V2.1.1 Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 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.

Fixing and dimensions
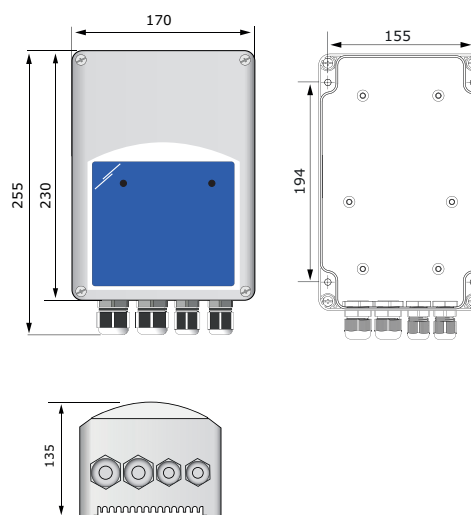
Packaging
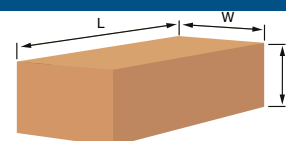
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
ECMF8-AO-EW	Unit (1 pc.)	260	170	140	0.98 kg	1.18 kg
ECMF8-AO-WF	Unit (1 pc.)	260	170	140	0.97 kg	1.17 kg

Global trade item numbers (GTIN)

Packaging	Unit (1 pc.)	Pallet (pcs.)
ECMF8-AO-EW	05401003018477	05401003701171
ECMF8-AO-WF	05401003018484	05401003701188

Application example: destratification