EE800

HVAC Room Transmitter for CO₂, Temperature and Relative Humidity

EE800 combines CO_2, temperature (T) and relative humidity (RH) measurement in one device with modern design. Additionally, it calculates the dewpoint temperature (Td).

The EE800 incorporates the E+E dual wavelength NDIR CO_2 sensor, which compensates for ageing effects, is highly insensitive to pollution and offers outstanding long term stability. A multiple point CO_2 and T factory adjustment procedure leads to excellent CO_2 measurement accuracy over the entire T working range.

EE800 with analogue outputs features an optional passive T sensor, while at EE800 with RS485 additional physical quantities are available on the Modbus RTU and BACnet MS/TP interface: absolute humidity, mixing ratio, enthalpy, frost point temperature and water vapor partial pressure.

EE800

The snap-on enclosure saves installation costs and it is available in two sizes according to regional standards.
An optional USB configuration adapter facilitates easy setup and adjustment of EE800.

Typical Applications

Demand controlled ventilation
Heating, ventilation and air conditioning
Building management

Key Features

CO₂ autocalibration
Modbus, BACnet or analogue outputs
Outstanding long-term stability
Temperature compensation
Optional passive T output
Easy installation

Technical Data

Measured values

CO₂

Measurement principle	Dual Wavelength Non-Dispersive Infrared Technology (NDIR)
Working range	0...2000 / 5000 ppm
Accuracy at 25°C (77 °F) and 1013 mbar	0...2000 ppm: < ± (50 ppm +2 % of measuring value) 0...5000 ppm: < ± (50 ppm +3 % of measuring value)
Response time τ₆₃	typ. 110 s
Temperature dependence	typ. 1 ppm CO_2/°C (-20...45 °C) (-4...113° F)
Calibration interval[1]	>5 years

Temperature

Accuracy[2] at 20°C (68 °F)	±0.3 °C (±0.54 °F) RS485 digital interface; ±0.3 °C (±0.54 °F) voltage output / ±0.7 °C (±1.26 °F) current output

Relative Humidity

Working range	10...90 % RH
Accuracy at 20°C (68 °F)	±3 % RH (30...70 % RH) ±5 % (10...90 % RH)

Calculated values

Dewpoint temperature[3]

Working range	-30...55 °C (-22...131 °F)
Accuracy	< ±2 °C (3.6 °F) for |T| - |Td| < 25 °C (45 °F) < ±3 °C (5.4 °F) for |T| - |Td| < 30 °C (54 °F)

Outputs

Analogue

0...2000 / 5000 ppm	0-5 V / 0-10 V -1 mA < IL < 1 mA 4-20 mA R_L < 500 Ohm

Digital Interface	RS485 with max. 32 devices on one bus
Protocol	Modbus RTU or BACnet MS/TP
Temperature passive	please see ordering guide (only in combination with analogue outputs)

1) Under normal operating conditions.
2) U_V = 24 V DC and R_L = 250 Ω for version with current output
3) Additional calculated physical quantities available only on the Modbus and BACnet interface: absolute humidity, mixing ratio, enthalpy, frost point temperature and water vapor partial pressure.
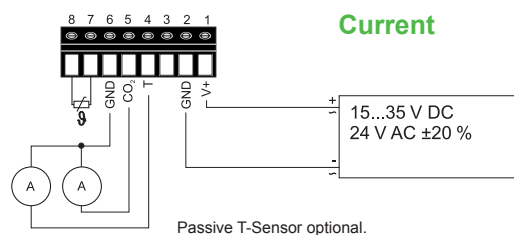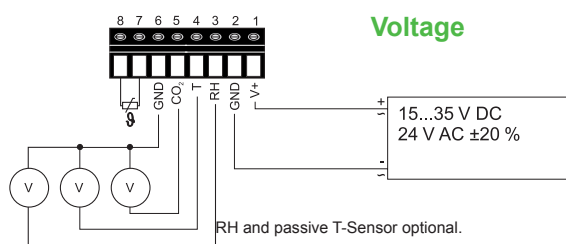
General

Supply voltage	24 V AC ±20 %	15-35 V DC
Current consumption		
Analogue	typ. 14 mA + output current; peak 0.3 A for 0.3 s	
Digital	bias: typ. 11 mA at 15…35 V DC	
	typ. 30 mA at 24 V AC ±20 %	
	peak: 150mA at 15…35 V DC, 24 V AC ±20 %	
Housing (polycarbonate)	US Version: UL94V-0 approved / EU Version: UL94HB approved	
Protection class	IP30	
Display[1]	LC display: alternating CO_2 / T / RH or Td	
Electrical connection	screw terminals max. 1.5 mm² (AWG16)	
Electromagnetic compatibility	EN61326-1 EN61326-2-3	
	FCC Part 15 ICES-003 ClassB	CE
Working / Storage T-range	0...90 % RH (non condensing) / -20...60 °C (-4...140 °F)	

1) Analogue outputs: The display shows the physical quantities selected for the outputs.
Digital interface: The display shows CO_2 and T for Model M11 and CO_2, T, and RH for Model M12
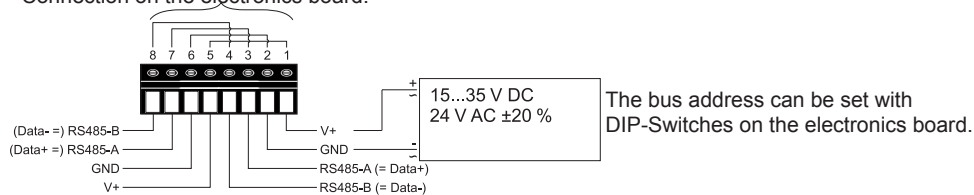
Connection Diagram

Analogue Output

Voltage

RH and passive T-Sensor optional.

Current

Passive T-Sensor optional.

15...35 V DC
24 V AC ±20 %

Digital Interface

Connection on the electronics board.

(Data- =) RS485-B
(Data+ =) RS485-A
GND
V+

V+
GND
RS485-A (= Data+)
RS485-B (= Data-)

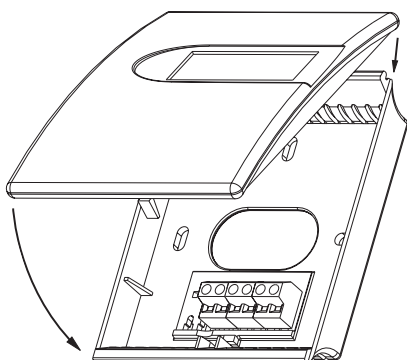15...35 V DC
24 V AC ±20 %

The bus address can be set with
DIP-Switches on the electronics board.

Screw terminals appropriate for daisy-chain wiring

Housing

Colour:
Cover: RAL 9003 (signal white)
Back: RAL 7035 (light grey)

EU:
W x H x D = 85 x 100 x 26 mm (3.3 x 3.9 x 1")

US:
W x H x D = 85 x 136 x 26 mm (3.3 x 5.4 x 1")

Ordering Guide

			EE800
Hardware Configuration	**Model**	CO_2 + T	**M11**
		CO_2 + T + RH	**M12**
	CO_2 Range	0 - 2000 ppm	**no code**
		0 - 5000 ppm	**HR5000**
	Output	0-5 V	**A2**
		0-10 V	**A3**
		4-20 mA[1]	**A6**
		RS485	**J3**
	T-Sensor passive[2]	none	**no code**
		Pt100A	**TP1**
		Pt1000A	**TP3**
		NTC 10k	**TP5**
		Ni1000 Tk6180	**TP9**
	Regional design	EU	**no code**
		US	**RG2**
	Display	none	**no code**
		yes	**D1**
Setup - Analogue outputs	**Output 1 CO_2**	Scaling according to selected "CO_2 Range" as above	
	Output 2 Temperature	T (°C)	**no code**
		T (°F)	**MB2**
	Scale 2 low	0	**no code**
		value[3]	**SBL value**
	Scale 2 high	50	**no code**
		value[3]	**SBH value**
	Output 3 Measurands	Relative Humidity (% RH)	**MC10**
		Dew Point (°C)	**MC52**
		Dew Point (°F)	**MC53**
		none	**no code**
	Scale 3 low	0	**no code**
		value[3]	**SCL value**
	Scale 3 high	100	**no code**
		value[3]	**SCH value**
Setup - Digital output	**Protocol**	Modbus RTU[4]	**no code**
		BACnet MS/TP[5]	**P3**
	Baud rate	9600	**no code**
		19200	**BD6**
		38400	**BD7**
		57600[6]	**BD8**
		76800[6]	**BD9**
	Parity (Modbus)	no parity	**PY0**
		odd	**no code**
		even	**PY2**
	Stopbit (Modbus)	1 stopbit	**no code**
		2 stopbits	**BT2**
	Unit	metric-SI	**no code**
		non-metric	**U2**

1) not with M12
2) not with J3
3) Within working range. For scaling beyond working range limits please contact the E+E sales representative.
4) Modbus Map and setup instructions: See User Guide and Modbus Application Note at www.epluse.com/EE800
5) Product Implementation Conformance Statement (PICS) availbale at www.epluse.com/EE800
6) Only for BACnet

Order Example

EE800-M11A3
Model:	CO_2 + T
CO_2 Range:	0 - 2000 ppm
Output:	0-10V
Regional design:	EU
Output 2 Temperature:	T (°C)
Temperature Scale:	0...50

EE800-M12A3MC52SCL-10SCH10
Model:	CO_2 + T + RH
CO_2 Range:	0 - 2000 ppm
Output:	0-10V
Regional design:	EU
Output 2 Temperature:	T (°C)
Temperature Scale:	0...50
Output 3:	Dew Point (°C)
Dew Point Scale:	-10...10

EE800-M12HR5000J3RG2D1P3BD8PY2BT2U2
Model:	CO_2 + T + RH
CO_2 Range:	0 - 5000 ppm
Digital output:	RS485
Regional design:	US
Display:	yes
Protocol:	BACnet
Baud rate:	57600
Parity:	even
Stopbit:	2
Unit:	non-metric

Accessories (see data sheet „Accessories")

USB configuration adapter	HA011066
Product configuration software	EE-PCS (free download: www.epluse.com/configurator)