

EE871

Modbus CO₂ Probe for Demanding OEM Applications

The E+E CO₂ probe EE871 is designed for use in harsh, demanding OEM applications. A multiple point CO₂ and temperature adjustment procedure leads to excellent CO₂ measurement accuracy over the entire temperature working range, ideal for use in agriculture or outdoors. EE871 incorporates the dual wavelength NDIR CO₂ sensor, which automatically compensates for ageing effects and is highly insensitive to pollution.

The IP65 enclosure and replaceable PTFE filter offer excellent protection in harsh, polluted environments. The compact size, the M12 connector and the optional mounting flange allow for fast probe installation or replacement. With the optional radiation shield EE871 can be also used outdoors.

The measured data range of up to 10000 ppm is available on the Modbus or the E2 digital interface.

An optional kit facilitates easy configuration and adjustment of EE871. The measurement interval can be set according to the application requirements, by this the average current consumption can be reduced to 120 µA for battery-operated devices.



EE871

Typical Applications

Greenhouses and livestock barns
 Fruit and vegetable storage
 Hatchers and incubators
 Outdoor CO₂ monitoring
 Data loggers and handhelds

Key Features

Autocalibration
 Outstanding long-term stability
 Temperature compensation
 Very low current consumption
 IP65 enclosure
 Easy installation

Technical Data

Measured values

CO₂	
Measuring principle	E+E dual wavelength non-dispersive infrared technology (NDIR)
Measurement range	0...2000 / 5000 / 10000 ppm
Accuracy at 25°C and 1013mbar ¹⁾ (77°F...14,69psi)	0...2000 ppm: < ± (50 ppm +2 % from the measured value) 0...5000 ppm: < ± (50 ppm +3 % from the measured value)
0...10000 ppm:	< ± (100 ppm +5 % from the measured value)
Response time t ₉₀	105 s with measured data averaging (smooth output) 60 s without measured data averaging
Temperature dependency	typ. 1 ppm CO ₂ /°C (-20...45 °C) (-4...113 °F)
Measurement interval	adjustable from 15 s to 1 h (Factory setting 15 s)

General

Digital interface	Modbus or E2 (details: www.epluse.com)
Supply voltage	4.75 - 7.5 VDC
Average current consumption ²⁾	120 µA (at 1 h measurement interval)...4.3 mA (at 15 sec. measurement interval)
Current peak	max. 350 mA for 0.05 s
Housing / Protection class	Plastic PC / Housing IP65
Electrical connection	Connector M12 x 1
Cable length E2 interface	max. 10 m (32.8 ft)
Electromagnetic compatibility (Industrial environment)	EN61326-1 EN61326-2-3
Operating conditions	-40...60 °C (-40...140 °F) 0...100 % RH (non-condensing) 85...110 kPa (12,33...15,95 psi)
Storage conditions	-40...60 °C (-40...140 °F) 0...100 % RH (non-condensing) 70...110 kPa (10,15...15,95 psi)

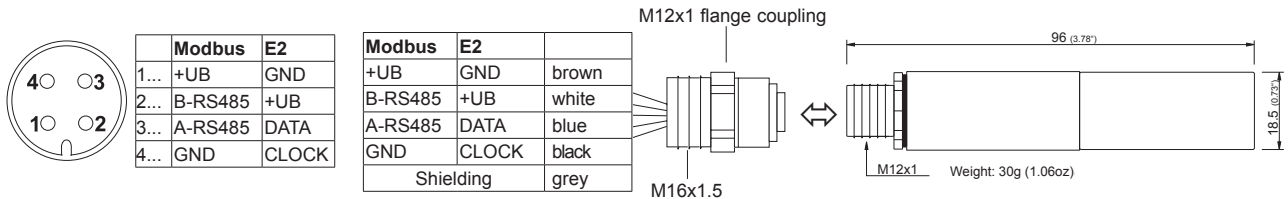
1) For averaging output

2) The average current consumption depends on the measurement interval



Connection

Dimensions (mm/inch)



Modbus Map

The measured values are saved as a 32Bit *float* value from 0x2D to 0x30. The factory setting for the Slave-ID is 246 as an *integer* 16Bit value. This ID can be customised in the register 0x00 (permitted values 1 - 247).

FLOAT (read register):

Register address	Communication address	Parameter name
30046	0x2D	CO ₂ Response time = 60s
30048	0x2F	CO ₂ Response time = 105s

INTEGER (write register):

Register address	Communication address	Parameter name
60001	0x00	Slave-ID
60002	0x01	RS485 Setting
60003	0x02	Measuring time interval

For Modbus protocol setting please see Application Note (www.epluse.com/EE871).

Ordering Guide

MEASUREMENT RANGE	TYPE	OUTPUT	FILTER
0...2000ppm (02)	CO ₂ (C)	E2 interface (2)	PTFE-Filter (E)
0...5000ppm (05)		RS485* (3)	
0...10000ppm (10)			
EE871-			

*Interface parameters - RS485

PROTOCOL	BAUDRATE	PARITY	STOPBITS
Modbus (1)	9600 (A)	odd (O)	1 stopbit (1)
	19200 (B)	even (E)	2 stopbits (2)
	38400 (C)	no parity (N)	

Ordering Example

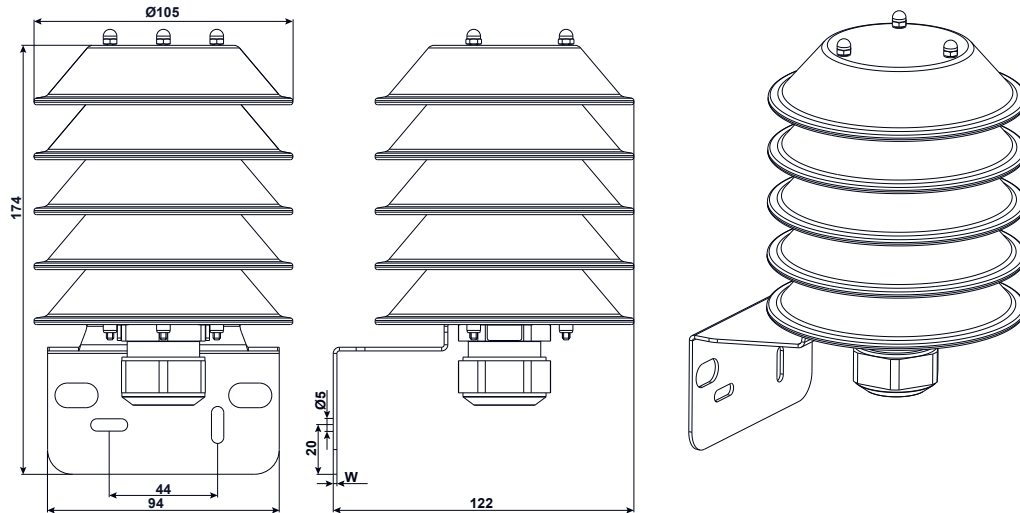
EE871-02C3E-1AE2

Measurement range: 0...2000 ppm
 Type: CO₂
 Output: RS485
 Filter: PTFE-Filter

Protocol: Modbus
 Baudrate: 9600
 Parity: even
 Stopbits: 2

Operation outdoors

For outdoor applications EE871 must be used with the radiation shield order no. HA010507, which protects the device against rain, snow, ice, and solar radiation.



Accessories (For further information, see data sheet "Accessories")

Mounting flange	HA010212
M12x1 flanged coupling with 50mm (1,97") stranded wire	HA010705
Modbus configuration adapter	HA011012
E2 Test and configuration adapter	HA011010
E+E Product configuration software	EE-PCS (Download: www.epluse.com/Configurator)
Connecting cable M12 - flying leads	HA010819/20/21
T-Coupler M12 - M12	HA030204
M12 Connector for self assembly	HA010707
PTFE Filter Cap	HA010116
Radiation shield	HA010507
Protection cap for M12 female cable connector	HA010781
Protection cap for M12 male probe connector	HA010782

Scope of Supply

Model	EE871
EE871 probe according ordering guide	✓
Test report according to DIN EN10204 - 2.2	✓

Support Literature

www.epluse.com/EE871