

EE240 Series

Wireless Sensor for Humidity / Temperature / CO₂

State of the art sensor technology, highest reliability of data transmission and the ease of system installation are the outstanding features of the wireless sensor series EE240.

With a modular structure and easy extendable assortment of sensing probes this allows for usage in many applications.

Currently there is a choice from several sensing probes for the environmental values of relative humidity, temperature, and CO₂.

Indifferent whether a point-to-point connection or a complex network is required, the series EE240 offers the ideal solution.

Interchangeable Sensing probes

For many years, the proven sensor technology of E+E for the measurement values of humidity, temperature, and CO₂ guarantees precise measurements and the highest longtime stability.

The standard interface and the stored calibration data of the sensing probe allow for any choice or combination of the available sensing probes offered.

An adaptation or expansion of the number of sensing probes afterwards or an exchange for service purposes can be achieved in seconds – a must-have for uninterrupted data acquisition.

For high temperature applications or installations in small spaces, the sensing probe can be connected with a sensor cable of up to 10 m (33 ft) in length.

Wireless Transmitter EE244

Every transmitter can be equipped with up to three sensing probes. An optional display is available to provide local indication. As a standard, batteries provide for the power supply. For more power demanding applications the device can be powered through an external adapter.

Base Station EE241 and EE242

Do you have to traverse a street? The inexpensive point-to-point connection can be accomplished very easily with the **EE241**.

The configuration at the factory of the up to four transmitted measurement values is done in accordance with your specifications, meaning that the values are available as analogue outputs (0 – 5 / 10 V or 4 - 20 mA) immediately after installation.

For more complex networks (up to 500 transmitters or up to 2000 measurement values) is the user-configurable **EE242** available. Independent of the topology of the network the integrated Webserver and the Ethernet interface warrants highest flexibility in the configuration of the network with a computer.

A simple integration of the measurement system in the customer's network and the easy remote access and diagnostic of the measurement data are additional helpful features.

The output values can be transferred as an analogue signal, as well as in digital form via Ethernet. For a bus integration, Modbus will be supported. With additional extension modules of the series **EE243**, plainly installed on DIN-rail and digitally interfaced with the basic device, the system can be expanded with extra analogue and digital outputs.

The actual measurement values and some operational information can be indicated on an optional display.

Router Series EE244-R

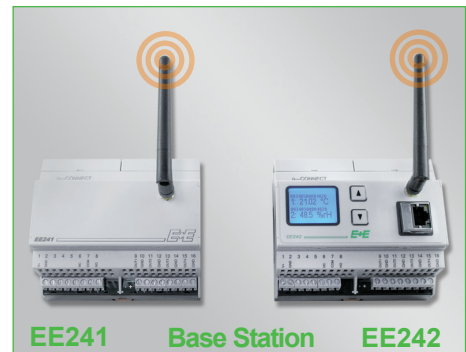
The radio range is greatly depending on local circumstances. With the router series EE244-R obstacles can be bypassed or the transmission distance expanded.



EE244 Transmitter



EE244 Router



EE241 Base Station EE242



Sensing Probes

Typical Applications

Pharmaceutical Industry
Warehouses
Control Rooms
Cooling Chambers
Museums
HVAC Systems
Food Industry

Features

Interchangeable Sensing Probes
Remote Probes up to 10 m (33 ft)
Battery Operating Life up to 1 Years
Webserver
Ethernet
Long Rangeability

Highest Transmission Reliability

The data transmission is based on the IEEE 802.15.4 protocol with a transmission frequency of 2.4 GHz, which can be used all over the world without any additional cost. A special identification address, checksums, handshakes, and bidirectional communication provide the highest transmission reliability.

Typical radio ranges are 100 m (330 ft) for indoor applications and 1000 m (3300 ft) in the open field.

Greater radio ranges are easy obtainable with routers.

The self-configuring, scalable, and self-healing mesh network, even when a connection fails, is another component contributing to the improvement of the transmission reliability and security.

The highest possible data security level is accomplished with a preset encryption key according to AES-128.

Digitale bus connection¹⁾

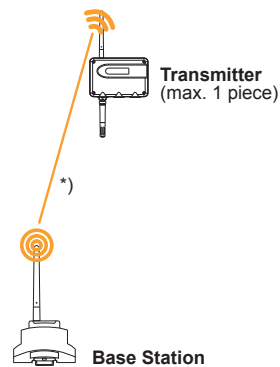
For bus integration, Modbus will be supported. Communication is implemented via the Ethernet or RS485 interface. Bus connection is only supported by the base station EE242.

Installation / Remote Access / Maintenance via Webserver

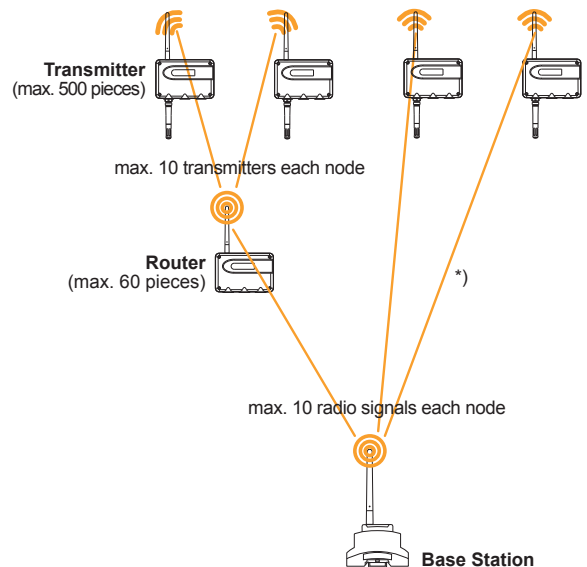
The integrated Webserver allows for platform-independent installation, remote access and easy maintenance with any commercially available browser (Internet Explorer, Firefox, OPERA...) on a computer without additional software.

Wireless Networks

EE241 (point-to-point connection)



EE242 (wireless network)



*) Radio Ranges:
- up to 100m (330 ft) indoors
- up to 1000m (3300 ft) in open field

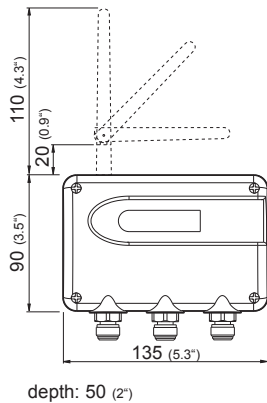
Comparison

	EE241	EE242
Transmitter: max. number of transmitters EE244	1	500
Router: maximum number of routers EE244-R	60	60
Base Station: configuration of analogue outputs	acc. to order code	✓ via Webserver
user-configurable after delivery	--	✓ via Webserver
digital interface	--	✓ Ethernet, Modbus

1) from Q3/2011

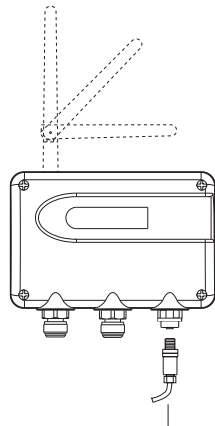
Dimensions in mm

EE244-Ax3:



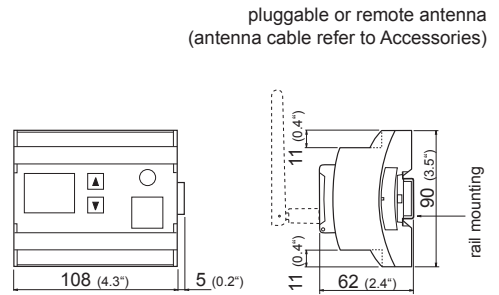
depth: 50 (2")

EE244-Bx2:



socket / ELKA 4012 PG7

EE241/EE242:



pluggable or remote antenna
 (antenna cable refer to Accessories)

rail mounting

Technical Data

Measuring values of sensing probes

Refer to data sheet of respective sensing probes

General

Transmission frequency	2.4 GHz
Transmission system	IEEE 802.15.4
Transmission power	10mW
Radio range	up to 100m (330 ft) indoors, up to 1000m (3300 ft) in open field
Antenna	pluggable
Approval	ETSI / FCC Part 15.247 / IC
Electromagnetic compatibility	EN61326-1 Industry FCC Part 15 Class B EN61326-2-3 Industry ICES-003 Class B



EE244 (Transmitter, Router)

Supply transmitter (EE244-A)	battery 4x1.5V AA
Battery lifetime	> 1 year with a measuring data transmission every 5 min. (for T / %RH)
External supply transmitter (EE244-B)	8...28V DC SELV, typ. $I_L = 20\text{mA}$ at 24V; max. $I_L = 35\text{mA}$ at 24V DC
External supply router (EE244-R)	8...28V DC SELV, typ. $I_L = 20\text{mA}$ at 24V; max. $I_L = 35\text{mA}$ at 24V DC
Housing material	polycarbonate (PC)
Protection class housing	IP65
Temperature ranges	working temperature range of probe: refer to respective data sheet of sensing probe working temperature range: -40...+50°C (-40...122°F) (with display: -20...+50°C / -4...122°F) storage temperature range: -40...+50°C (-40...122°F) (with display: -20...+50°C / -4...122°F)

Max. number of sensing probes 3 (2)^{*)}

Max. number of measuring signals (T, RH..) 6 (4)^{*)}

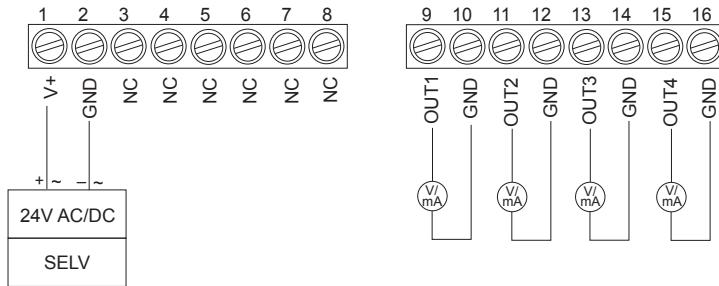
EE241/EE242 (Base Station)

Supply voltage SELV	24V AC/DC ±20%
digital interface	• Ethernet • Modbus (RTU / ASCII / TCP) ¹⁾
Current consumption	EE241 typ. $I_L = 70\text{mA}$ at 24V DC; max. $I_L = 100\text{mA}$ at 24V DC EE242 typ. $I_L = 150\text{mA}$ at 24V DC; max. $I_L = 180\text{mA}$ at 24V DC
Analogue outputs	0-5V -0.5mA < I_L < 0.5mA 0-10V -1mA < I_L < 1mA 0-20mA / 4-20mA $R_L < 500 \text{ Ohm}$
Number of analogue outputs	4
Accuracy of analogue outputs	±5mV resp. ±10µA
Temperature dependence of analogue outputs	max. 0.1 $\frac{\text{mV}}{^\circ\text{C}}$ resp. 1 $\frac{\mu\text{A}}{^\circ\text{C}}$
Resolution of analogue outputs	0.7mV resp. 1.50µA
Electrical connection	screw terminals max. 2.5mm ²
Housing material	polycarbonate (PC)
Protection class housing	IP20
Temperature ranges	working temperature range: -30...+50°C (-22...122°F) (with display: -20...+50°C / -4...122°F) storage temperature range: -30...+50°C (-22...122°F) (with display: -20...+50°C / -4...122°F)







^{*)} with external supply

¹⁾ from Q3/2011

Connection Diagram EE241 / EE242



Overview of Sensing Probes

Application	Picture	Measuring Range	Accuracy	Order Code
Humidity/Temperature Probes				
RH/T probe for standard applications		0...100% RH -40...80°C (-40...176°F)	±2% RH (0...90% RH) ±3% RH (90...100% RH) ±0.1°C (±0.18°F) at 20°C (68°F)	EE07-PFT1
RH/T probe for clean room applications, food and pharmaceutical industry		0...100% RH -40...80°C (-40...176°F)	±2% RH (0...90% RH) ±3% RH (90...100% RH) ±0.1°C (±0.18°F) at 20°C (68°F)	EE07-MFT9
RH/T module for installation in small spaces or unobtrusive mounting		0...95% RH -40...85°C (-40...185°F)	±3% RH (10...100% RH) at 21°C (69.8°F) ±0.3°C (±0.54°F) at 20°C (68°F)	EE03-FT9
Temperature Probes				
T probe for standard applications		-40...80°C (-40...176°F)	±0.1°C (±0.18°F) at 20°C (68°F)	EE07-PT1
T probe for clean room applications, food and pharmaceutical industry		-40...80°C (-40...176°F)	±0.1°C (±0.18°F) at 20°C (68°F)	EE07-MT
CO₂ Probes				
CO ₂ probe for standard applications		0...2000ppm 0...5000ppm 0...10000ppm	±(50ppm+2% of m.v.) ±(50ppm+3% of m.v.) ±(100ppm+5% of m.v.)	EE871

Ordering Guide

POSITION 1: TRANSMITTER / ROUTER

		EE244-	EE244-
Type	transmitter transmitter with external supply router	A B	R
Frequency	2.4GHz (10mW)	A	A
Number of sensing probes	1 2 3 (not possible with type B - transmitter with external supply)	1 2 3	
Display	with without	D	

POSITION 2: BASE STATION - "point-to-point connection" (EE241) and "wireless network" (EE242)

		EE241-	EE242-
Hardware Configuration			
Frequency	2.4GHz (10mW)	A	A
Output signal	0-5V 0-10V 0-20mA 4-20mA	2 3 5 6	2 3 5 6
Display	with without	D	D
Software Configuration			
Physical parameters of outputs	relative humidity RH [%] (A) temperature T [°C] (B) dew point temperature Td [°C] (C) CO ₂ CO ₂ [ppm] (R)	Output 1: A Output 2: B Output 3: C Output 4: R	A / B / C / R A / B / C / R A / B / C / R A / B / C / R
Measured value units	metric / SI non metric / US	E01	E01
T-Scaling (in °C or °F)	-40...60 (T02) 0...50 (T04)	Select Txx code	Select Txx code
Td-Scaling (in °C or °F)	-20...50 (T48) further scalings on request	Select Tdxx code	Select Tdxx code
CO ₂ -Scaling (in ppm)	0...2.000 (C20) 0...10.000 (C22) 0...5.000 (C21)	Select Cxx code	Select Cxx code

POSITION 3: SENSING PROBES

Humidity / Temperature	probe RH/T (polycarbonate) probe RH/T (metal) module RH/T	EE07-PFT1 EE07-MFT9 EE03-FT9
Temperature	probe T (polycarbonate) probe T (metal)	EE07-PT1 EE07-MT
CO ₂	probe CO ₂	EE871

Accessories / Replacement Parts

Transmitter:

- Probe cable for EE07 - 2m (7ft) / 5m (16ft) / 10m (33ft) (HA0108xx)
- Connection cable for EE03, 2m (7ft) (HA010328)
- Connection cable for EE03, 5m (16ft) (HA010329)
- Antenna cable 2m (7ft) (HA010330)
- Bracket for rail installation (HA010203)
- Reference probes (HA010403)
- Duct mounting kit for EE07 (HA010209)
- External power supply unit (V02)

Base Station:

- Antenna cable 2m (7ft) (HA010330)
- Crossover cable (PC to base station) ((HA010333)
- External power supply unit (V02)
- Extension module (available 2011)

Order Example

Position 1 - Transmitter / Router:
EE244-BA1D

Type: transmitter with ext. supply
 Frequency: 2.4GHz
 Probe: 1
 Display: yes

Position 2 - Base Station:
EE242-A3D/ABCR-T04-Td48-C20

Frequency: 2.4GHz
 Output signal: 0-10V
 Display: yes
 Outputs: RH, T, Td, CO₂
 Measured value units: SI
 Scaling: T: 0...50; Td: -20...50

Position 3 - Sensing Probes:
EE07-PFT1, EE07-MT