Digitron Systems

HLX240

Wireless Sensor for Humidity / Temperature / CO$_2$

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 240.

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 CO$_2$.

Indifferent whether a point-to-point connection or a complex network is required, the series 240 offers the ideal solution.

244 Transmitter

Interchangeable Sensing probes

For many years, the proven sensor technology for the measurement values of humidity, temperature, and CO$_2$ 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.

244 Router

Wireless Transmitter 244

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 241 and 242

Do you have to traverse a street? The inexpensive point-to-point connection can be accomplished very easily with the **241**.

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 **242** available.

241   Base Station   242

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 **243**, plainly installed on DIN-rail and digitally interfaced with the basic device, the system can be expanded with extra analogue and digital outputs.

Sensing Probes

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

Router Series 244-R

The radio range is greatly depending on local circumstances. With the router series 244-R obstacles can be bypassed or the transmission distance expanded.

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.
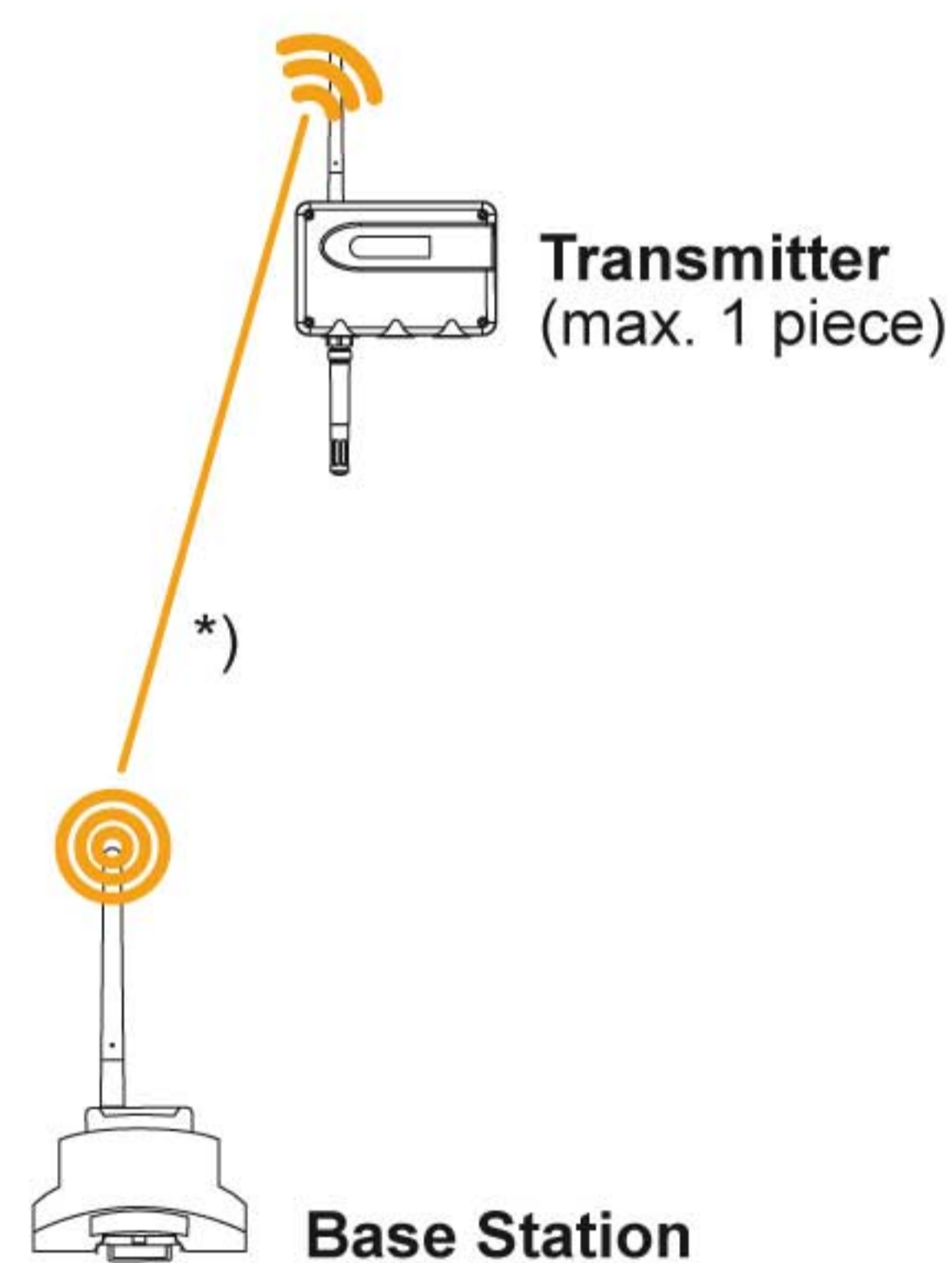
Digitale bus connection[1]

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 242.

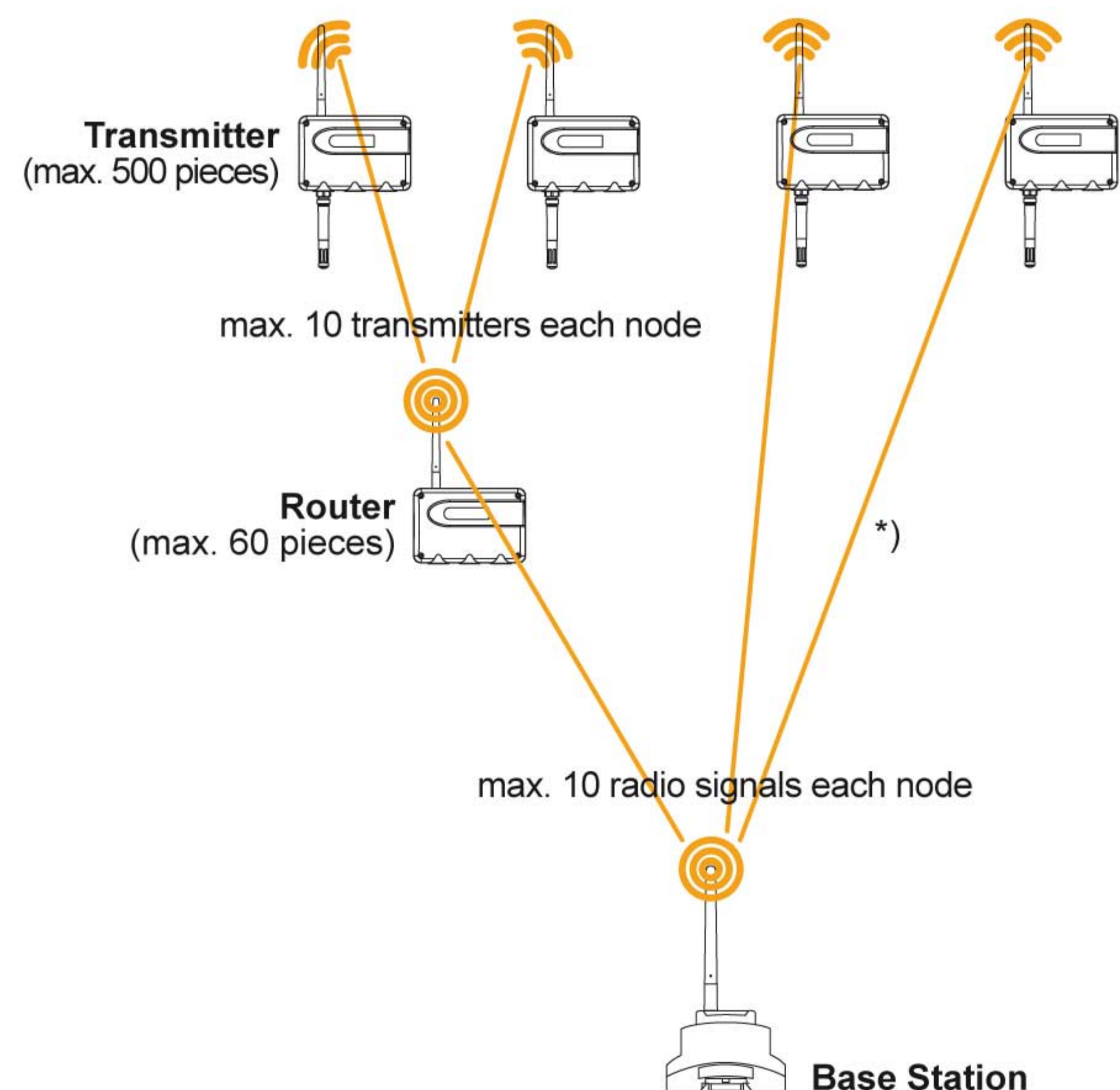## Installation / Remote Access / Maintenance via Webserver

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

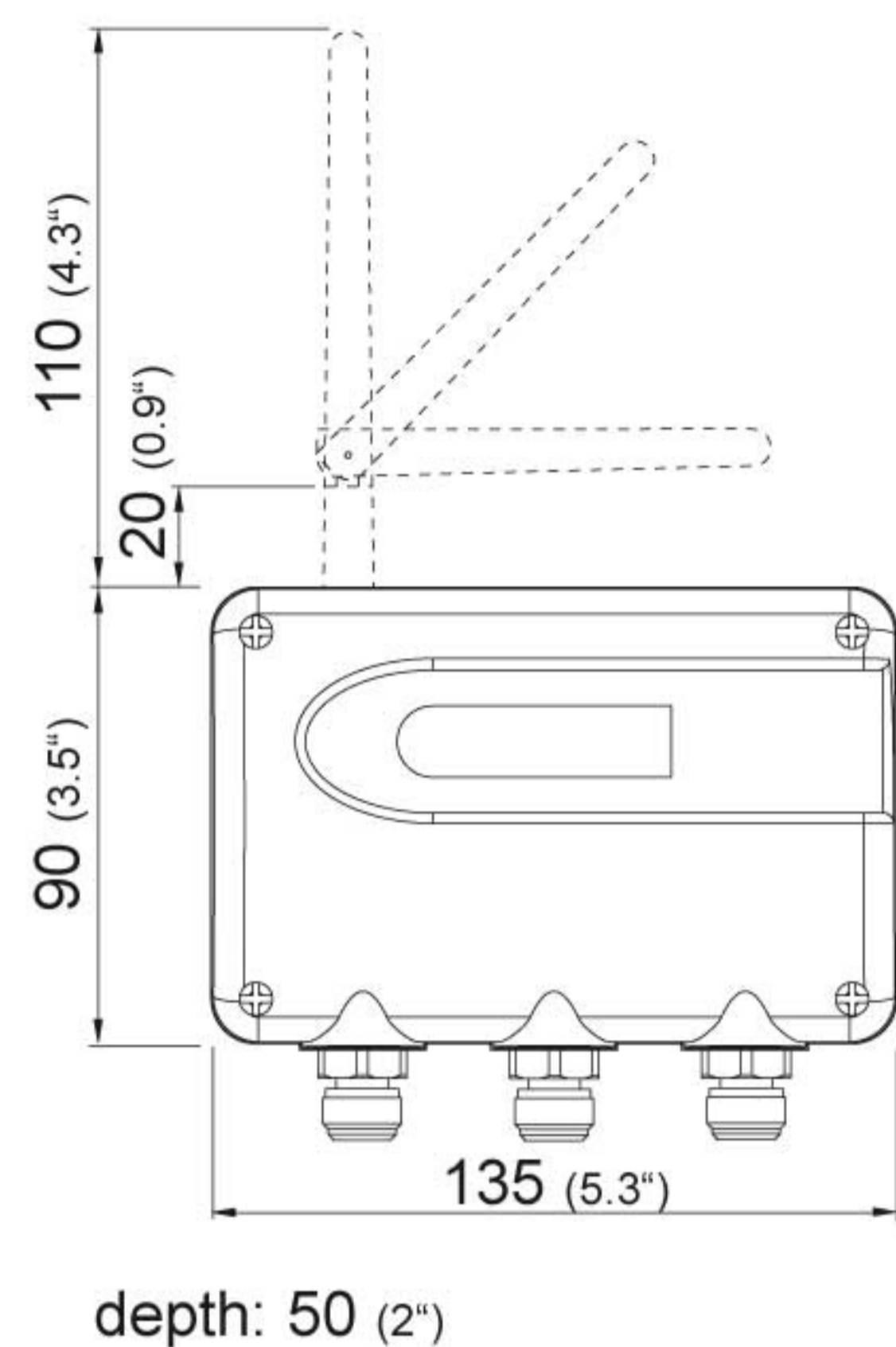### 241 (point-to-point connection)   242 (wireless network)

Transmitter (max. 1 piece)

*)

Base Station

Transmitter (max. 500 pieces)

max. 10 transmitters each node

Router (max. 60 pieces)

*)

max. 10 radio signals each node

Base Station

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

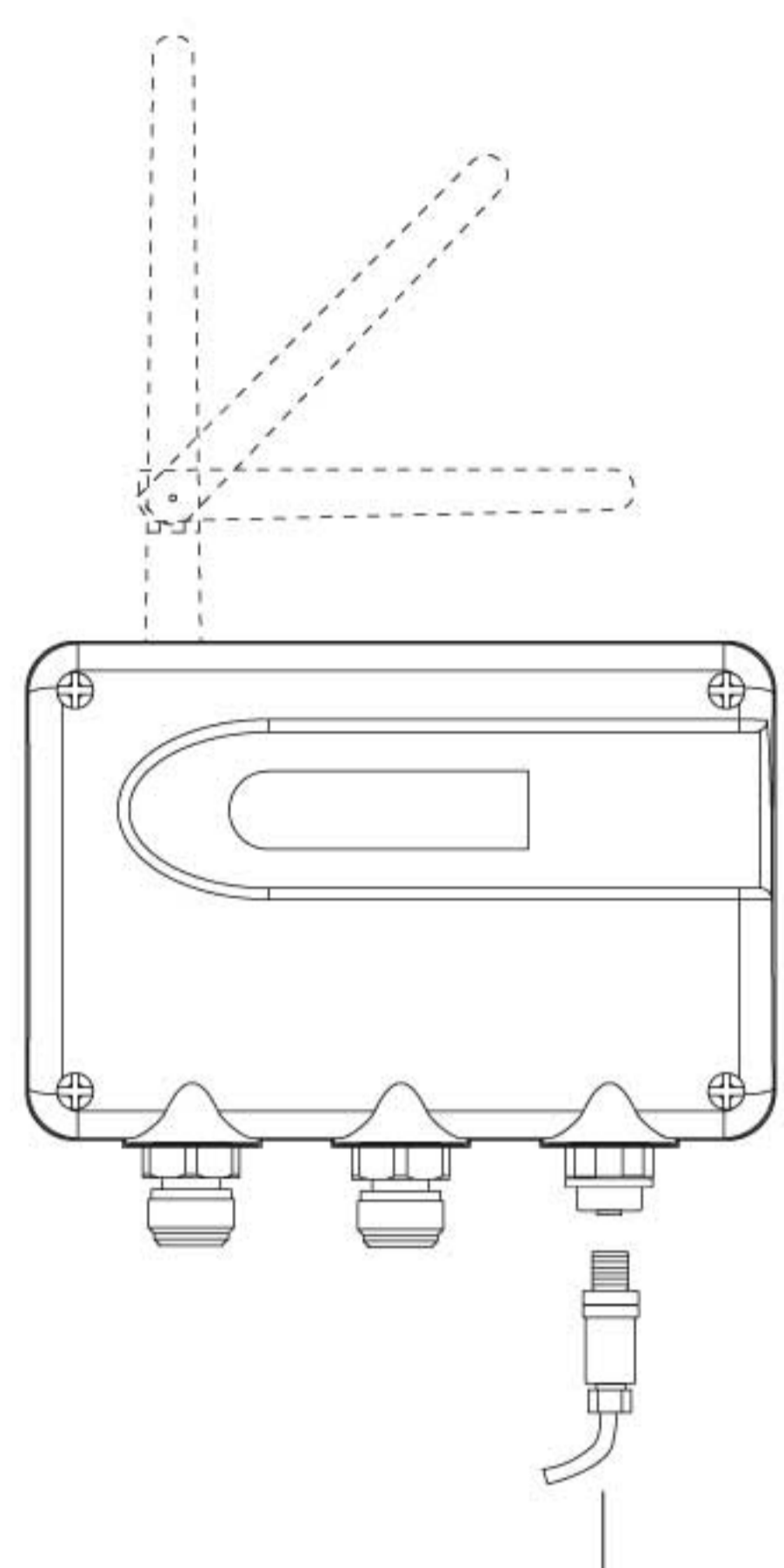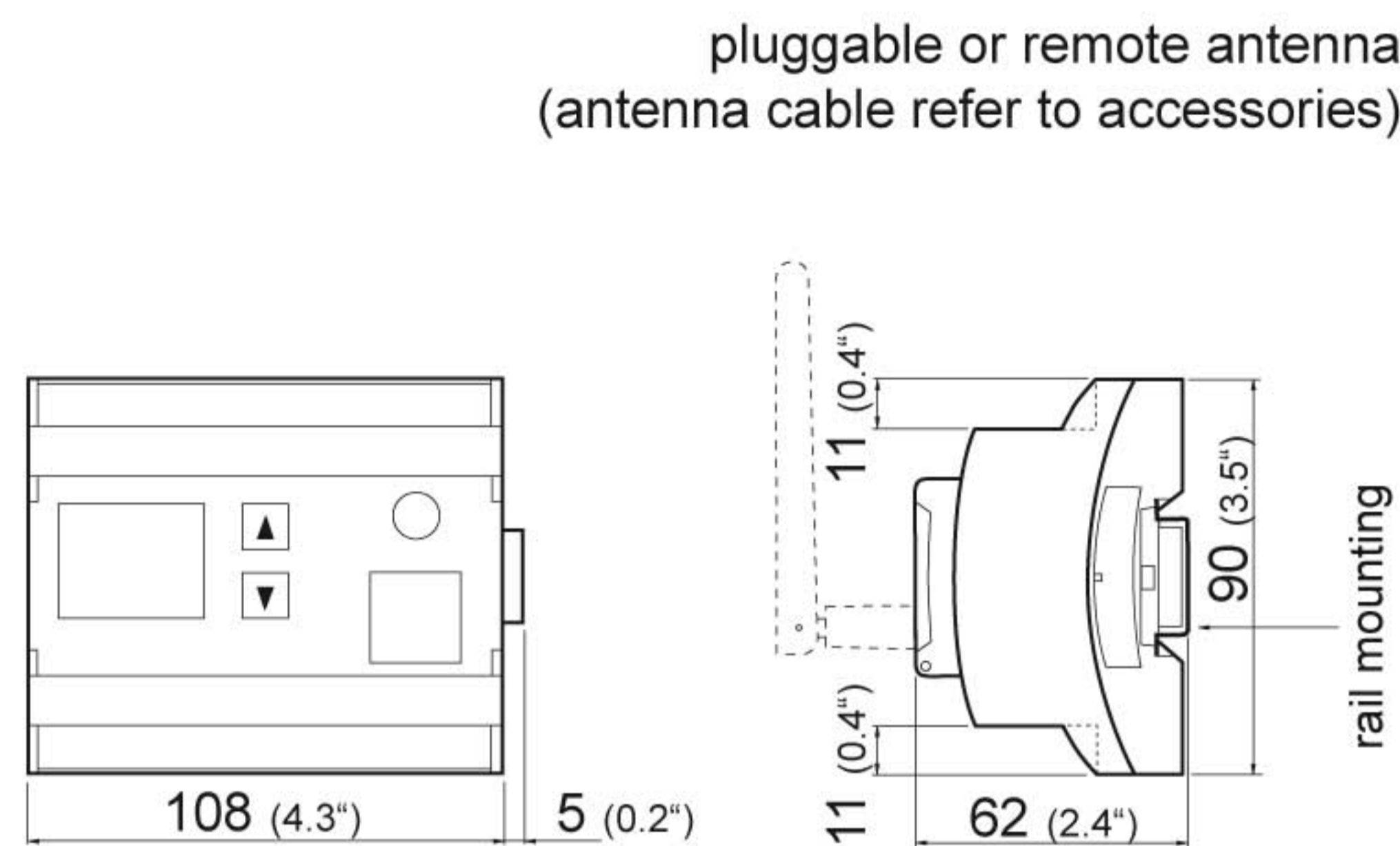| Comparison	241	242
Transmitter:		
max. number of transmitters EE244	1	500
Router:		
maximum number of routers EE244-R	60	60
Base Station:		
configuration of analogue outputs	acc. to order code	✓ via Webserver
user-configurable after delivery	--	✓ via Webserver
digital interface	--	✓ Ethernet, Modbus

1) from Q3/2011

Digitron Italia

Strada ASI Consortile, 7 - Loc. Torrefessa F. 03013 FERENTINO (FR)
P.IVA 02270700608
Tel: +39 0775 392052   Fax: +39 0775 223835   E-mail: info@digitron-italia.it

HLX240

Dimensions in mm

244-Ax3:   **244-Bx2:**   **241/242:**

pluggable or remote antenna
(antenna cable refer to accessories)

110 (4.3") 20 (0.9") 90 (3.5") 135 (5.3")

depth: 50 (2")

socket / ELKA 4012 PG7

11 (0.4") 108 (4.3") 5 (0.2") 11 (0.4") 62 (2.4") 90 (3.5") 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

C€

244 (Transmitter, Router)

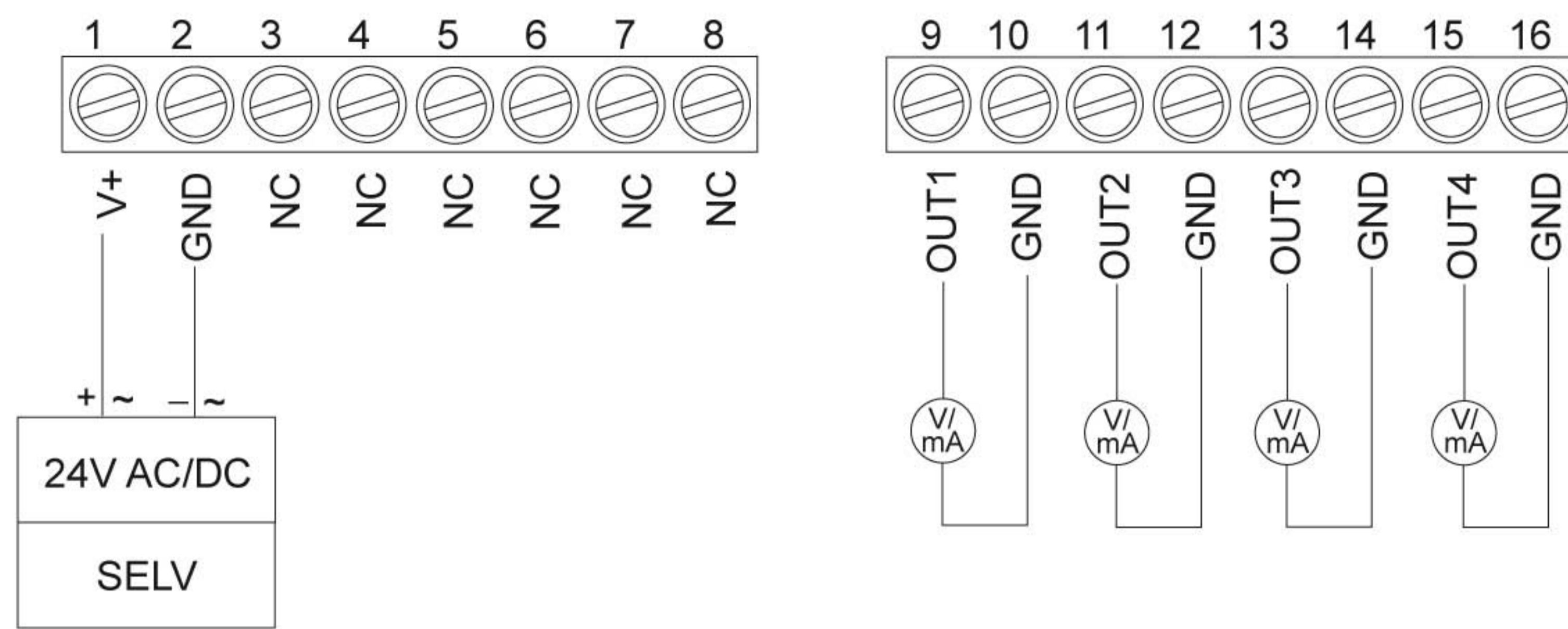|	
Supply transmitter (244-A)	battery 4x1.5V AA
Battery lifetime	> 1 year with a measuring data transmission every 5 min. (for T / %RH)
External supply transmitter (244-B)	8...28V DC SELV, typ. I_L = 20mA at 24V; max. I_L = 35mA at 24V DC
External supply router (244-R)	8...28V DC SELV, typ. I_L = 20mA at 24V; max. I_L = 35mA 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)[*]

241/242 (Base Station)

Supply voltage SELV	24V AC/DC ±20%
digital interface	• Ethernet
	• Modbus (RTU / ASCII / TCP)[1]
Current consumption 241	typ. I_L = 70mA at 24V DC; max. I_L = 100mA at 24V DC
242	typ. I_L = 150mA at 24V DC; max. I_L = 180mA 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 Ohm
Number of analogue outputs	4
Accuracy of analogue outputs	±5mV resp. ±10µA
Temperature dependence of analogue outputs	max. 0.1 $\frac{mV}{°C}$ resp. 1 $\frac{µA}{°C}$
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

HLX240

Digitron Italia   Strada ASI Consortile, 7 - Loc. Torrefessa F. 03013 FERENTINO (FR)
P.IVA 02270700608
Tel: +39 0775 392052   Fax: +39 0775 223835   E-mail:
info@digitron-italia.it

Connection Diagram 241 / 242

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
CO_2 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

Digitron Italia

Strada ASI Consortile, 7 - Loc. Torrefessa F. 03013 FERENTINO (FR)
P.IVA 02270700608
Tel: +39 0775 392052   Fax: +39 0775 223835   E-mail:
info@digitron-italia.it

HLX240

Digitron Systems

Ordering Guide

POSITION 1: TRANSMITTER / ROUTER

		244-	244-
Type	transmitter	A	
	transmitter with external supply	B	
	router		R
Frequency	2.4GHz (10mW)	A	A
Number of sensing probes	1	1	
	2	2	
	3 (not possible with type B - transmitter with external supply)	3	
Display	with	D	
	without		

POSITION 2: BASE STATION - "point-to-point connection" (241) and "wireless network" (242)

				241-	242-
Hardware Configuration					
Frequency	2.4GHz (10mW)			A	A
Output signal	0-5V			2	2
	0-10V			3	3
	0-20mA			5	5
	4-20mA			6	6
Display	with			D	D
	without				
Software Configuration					
Physical parameters of outputs	relative humidity RH [%] **(A)**		Output 1	A	A / B / C / R
	temperature T [°C] **(B)**		Output 2	B	A / B / C / R
	dew point temperature Td [°C] **(C)**		Output 3	C	A / B / C / R
	CO_2 CO_2 [ppm] **(R)**		Output 4	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)**	Output T	Select Txx code	Select Txx code
Td-Scaling (in °C or °F)	-20...50 **(T48)**	further scalings on request	Output Td	Select Tdxx code	Select Tdxx code
CO_2-Scaling (in ppm)	0...2.000 **(C20)**	0...10.000 **(C22)**		Select Cxx code	Select Cxx code
	0...5.000 **(C21)**				

POSITION 3: SENSING PROBES

Humidity / Temperature	probe RH/T (polycarbonate)	EE07-PFT1
	probe RH/T (metal)	EE07-MFT9
	module RH/T	EE03-FT9
Temperature	probe T (polycarbonate)	EE07-PT1
	probe T (metal)	EE07-MT
CO_2	probe CO_2	EE871

Accessories / Replacement Parts

Transmitter:
- Probe cable for EE07 - (HA0108xx)
  2m (7ft) / 5m (16ft) / 10m (33ft)
- 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:	Position 2 - Base Station:	Position 3 - Sensing Probes:
244-BA1D	**242-A3D/ABCR-T04-Td48-C20**	**EE07-PFT1, EE07-MT**

Position 1		Position 2	
Type:	transmitter with ext. supply	Frequency:	2.4GHz
Frequency:	2.4GHz	Output signal:	0-10V
Probe:	1	Display:	yes
Display:	yes	Outputs:	RH, T, Td, CO_2
		Measured value units:	SI
		Scaling:	T: 0...50; Td: -20...50