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# + Datasheet EE451

Wall-mounted Temperature Sensor  
for Indoor and Outdoor



# EE451

## Wall-mounted Temperature Sensor for Indoor and Outdoor

The EE451 wall-mounted sensor reliably measures the temperature (T) indoors and outdoors in building automation, HVAC and process control.

### Analogue, Digital and Passive Outputs

The measured data is available at the voltage or current output, as well as on the RS485 interface with Modbus RTU or BACnet MS/TP protocol. Additionally, EE451 features a wide choice of sensing elements for passive temperature measurement. An optional display is available for the EE451 with analog output.

### Easy Installation

The compact and robust design allows easy and quick installation as well as unbiased measurement of the ambient temperature.

### Configurable and Adjustable

An optional adapter and the free Product Configuration Software facilitate the setup and adjustment of the EE451.



EE451 with active output



EE451 with passive output



EE451 with active output and display

# Features

## LC display

- 38 x 20 mm (1.5 x 0.8")

## External mounting holes

- Mounting with closed cover
- Protection against construction site pollution
- Easy and fast mounting

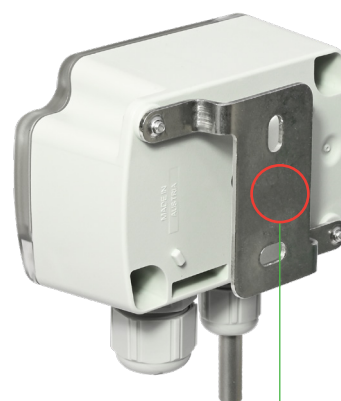


## Bayonet screws

- Open/close with a ¼ rotation

## Enclosure

- Protection rating: IP65/Nema 4X
- Polycarbonate (PC)



## Mounting bracket

- Distance to wall for correct measurement of ambient temperature

## Test report

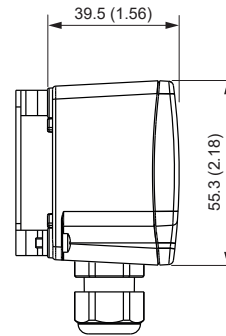
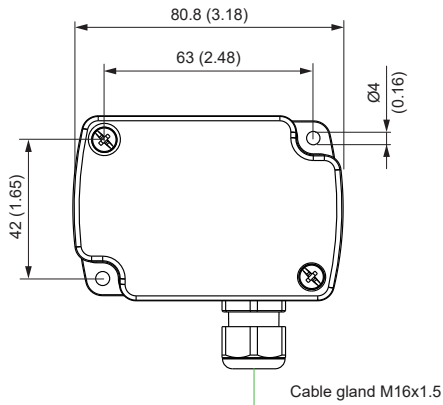
According to DIN EN 10204-2.2

# Dimensions

Values in mm (inch)

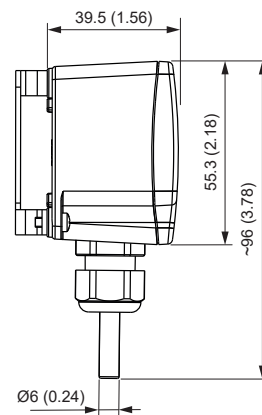
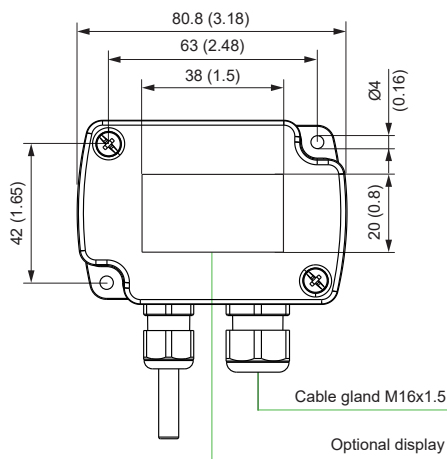
## Passive Output

Mounting bracket included in the scope of supply

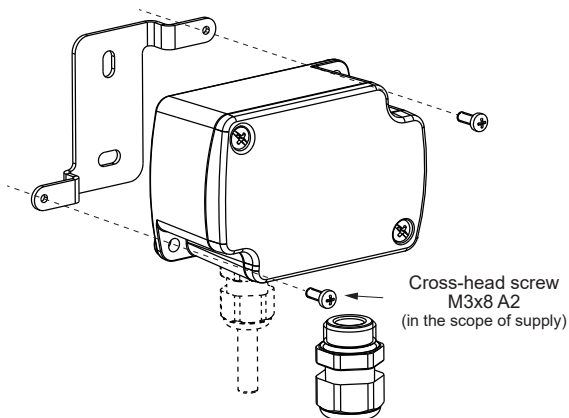


## Active Output

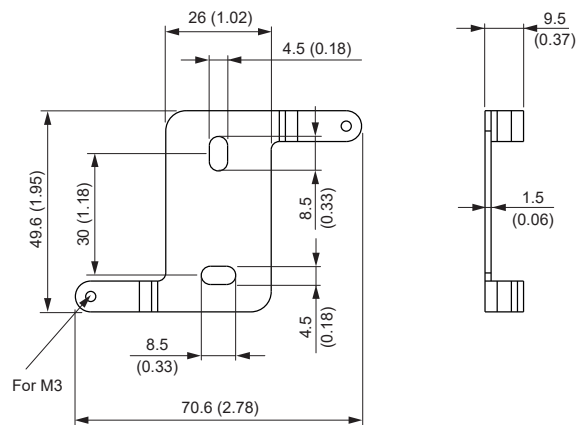
Mounting bracket included in the scope of supply



## Mounting



## Mounting Bracket



# Technical Data

## Measurands

### Temperature (T) - Active

Measuring range	-40 °C...+70 °C (-40...+158 °F)
Accuracy @ 20 °C (68 °F)	±0.3 °C (±0.54 °F)

### Temperature (T) - Passive

Measuring range	-40 °C...+70 °C (-40...+158 °F)		
Sensor type	Nominal resistance	Sensitivity	Standard
Pt100 DIN B	R <sub>0</sub> : 100 Ω	TC: 3.850 x 10 <sup>-3</sup> /°C	DIN EN 60751
Pt1000 DIN B	R <sub>0</sub> : 1000 Ω	TC: 3.850 x 10 <sup>-3</sup> /°C	DIN EN 60751
NTC10k B3950	R <sub>25</sub> : 10 kΩ ±0.5 %	B <sub>25/85</sub> : 3989 K (B <sub>25/50</sub> : 3950 K ± 1.0 %)	-
NTC20k B4286	R <sub>25</sub> : 20 kΩ ± 0.2 °C	B <sub>25/85</sub> : 4286 K (B <sub>25/85</sub> : 4286 K ± 1.0 %)	-
Ni1000 TK6180 DIN B	R <sub>0</sub> : 1000 Ω	TC: 6 180 ppm/K	DIN 43760
Ni1000 TK5000 DIN B	R <sub>0</sub> : 1000 Ω	TC: 5 000 ppm/K	DIN 43760

## Outputs

### Analogue

Analogue output	0 - 10 V 4 - 20 mA (2-wire)	-1mA < I <sub>L</sub> < 1 mA R <sub>L</sub> ≤ 500 Ω	I <sub>L</sub> = load current R <sub>L</sub> = load resistance
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### Digital




Digital interface	RS485 (EE451 = 1 unit load)
Protocol Factory settings Supported Baud rates Measured data types	Modbus RTU Baud rate see order information, 8 data bits, parity even, 1 stop bit, Modbus address 66 9600, 19200 and 38400 FLOAT32 and INT16
Protocol Factory settings Supported Baud rates	BACnet MS/TP Baud rate see order information, 8 data bits, parity none, 1 stop bit, BACnet address 66 9600, 19200, 38400, 57600, 76800 and 115200

### T Sensor Passive

Sensor connection	2-wire connection
Measuring current, typ.	<1 mA (according to technical data of the specific T sensing element)

# Technical Data

## General

<b>Power supply</b> class III  USA & Canada: Class 2 supply necessary, max. voltage 30 V DC <b>0 - 10 V, RS485</b> <b>4 - 20 mA</b>		15 - 35 V DC or 24 V AC ±20 % 10 V DC + R <sub>L</sub> x 20 mA < V+ < 35 V DC R <sub>L</sub> = load resistance	
<b>Current consumption</b> @ 24 V	<b>Voltage output</b>	DC supply max. 0.8 mA AC supply max. 4.6 mA <sub>rms</sub>	With display max. 1.7 mA With display max. 7 mA <sub>rms</sub>
	<b>Current output</b>	According to output current	According to output current
	<b>Digital interface</b>	DC supply typ. 3.5 mA AC supply typ. 12 mA <sub>rms</sub>	
<b>Electrical connection</b>		Screw terminals, max. 2.5 mm <sup>2</sup> (AWG14)	
<b>Cable glands</b>		M16x1.5/UL94 V-2	
<b>LC-display</b>		Available for output A3 and A6 1 line, unit according selected measurand Without backlight Visible area 38 mm x 20 mm (1.5" x 0.8")	
<b>Humidity working range</b>		5...95 %RH, non-condensing	
<b>Temperature working range</b>		<b>Without display</b> <b>With display</b>	-40...+70 °C (-40...+158 °F) -20...+50 °C (-4...+122 °F)
<b>Storage conditions</b>		<b>Without display</b> <b>With display</b>	-30...+70 °C (-22...+158 °F) 5...95 %RH, non-condensing -20...+50 °C (-4...+122 °F) 5...95 %RH, non-condensing
<b>Mounting bracket material</b>		Stainless steel (1.4301 / 304)	
<b>Enclosure</b>	<b>Material</b> <b>Protection rating</b>	Polycarbonate (PC), UL94 V-0 approved IP65/NEMA 4X	
<b>Electromagnetic compatibility</b>		EN 61326-1 FCC Part15 Class B	EN 61326-2-3 ICES-003 Class B Industrial environment
<b>Conformity</b>		 	
<b>Configuration and adjustment</b>		<b>Analogue</b> <b>Digital</b>	PCS10 Product Configuration Software (free download: <a href="http://www.epluse.com/pcs10">www.epluse.com/pcs10</a> ) and configuration adapter. EE-PCS Product Configuration Software (free download: <a href="http://www.epluse.com/configurator">www.epluse.com/configurator</a> ) and configuration adapter.

# Ordering Guide

Feature	Description	Code			
Hardware Configuration		EE451-			
	Model	Active	M3		
		Passive		M7	
	Output	0 - 10 V	A3		
		4 - 20 mA	A6		
		RS485		J3	
	T sensor passive <sup>1)</sup> (R-T-characteristics see <a href="http://www.epluse.com/ee451">www.epluse.com/ee451</a> )	Pt100 DIN B			TP2
		Pt1000 DIN B			TP4
		NTC 20k, B4286			TP6
		Ni1000, TK6180 DIN B			TP9
NTC 10k, B3950				TP11	
	Ni1000, TK5000 DIN B			TP19	
Display	Without display	No code			
	Display	D1			
Software Setup - Outputs	Output (T) measurand	Temperature [°C]	No code		
		Temperature [°F]	MA2		
	Output (T) scaling low	0	No code		
		Value (within the working range)	SALValue		
	Output (T) scaling high	50	No code		
		Value (within the working range)	SAHValue		
	Protocol	Modbus RTU <sup>2)</sup>		P1	
		BACnet MS/TP <sup>3)</sup>		P3	
	Baud rate	9 600		BD5	
		19 200		BD6	
38 400			BD7		
57 600 (for BACnet only)			BD8		
76 800 (for BACnet only)			BD9		
	115 200 (for BACnet only)		BD10		

- 1) Other passive sensor types are available on request for a minimum order quantity of 500 pcs.
- 2) Factory settings: Parity even, stop bit 1. Modbus Map and communication setting: see User Guide and Modbus Application Note at [www.epluse.com/ee451](http://www.epluse.com/ee451).
- 3) Product Implementation Conformance Statement (PICS) available at [www.epluse.com/ee451](http://www.epluse.com/ee451).

# Order Examples

## EE451-M3J3P3BD7

Feature	Code	Description
Model	M3	Active
Output	J3	RS485
Protocol	P3	BACnet MS/TP
Baud rate	BD7	38400

## EE451-M3A3D1

Feature	Code	Description
Model	M3	Active
Output	A3	0 - 10 V
Display	D1	Display
Output (T) measurand	No code	Temperature [°C]
Output (T) scaling low	No code	0
Output (T) scaling high	No code	50

## EE451-M7TP11

Feature	Code	Description
Model	M7	Passive
T sensor passive	TP11	NTC 10k, B3950

# Accessories

For further information see datasheet [Accessories](#).

Description	Code
USB configuration adapter for EE451 with analogue output	HA011023
USB configuration adapter for digital interface	HA011066
E+E Product Configuration Software for digital output (Free download: <a href="http://www.epluse.com/configurator">www.epluse.com/configurator</a> )	EE-PCS
E+E Product Configuration Software for analogue output (Free download: <a href="http://www.epluse.com/pcs10">www.epluse.com/pcs10</a> )	PCS10
Power supply adapter	V03
Conduit Adapter, M16x1.5 auf 1/2"	HA011110





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