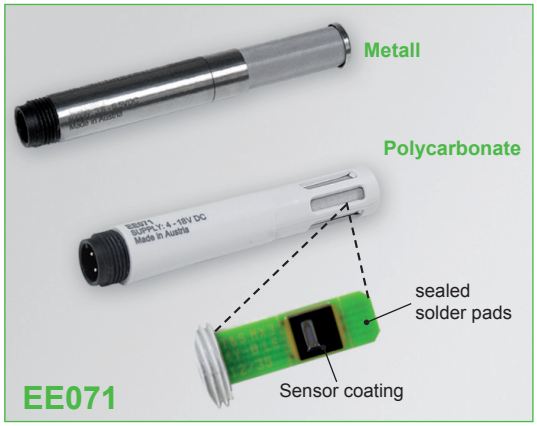
EE071

Humidity and Temperature Probe with Modbus Interface

EE071 is optimized for use in demanding OEM applications.
In addition to the precise measurement of humidity (RH) and temperature (T), the EE071 calculates physical quantities such as dew point temperature, mixing ratio and absolute humidity. All measured and calculated values are available on the RS-485 interface with Modbus RTU protocol.
The RH and T sensor HCT01 is perfectly protected against dust and dirt by the E+E proprietary coating. Furthermore, all solder pads are sealed against corrosion. With the appropriate filter cap the EE071 offers outstanding long term stability even in harsh environment. The compact design with M12 connector allows for easy installation and fast replacement of the probe.
With the optional Modbus configuration adapter the user can perform RH and T adjustment and set the Modbus parameters.



Typical Applications

process and climate technology
agriculture, stables
incubators, hatchers
outdoor measurement
storage rooms, cooling chambers

Key Features

highest accuracy
excellent protection against pollution
outstanding long term stability
temperature compensation
low power consumption
calculated physical quantities

Technical Data

Measured values

Relative Humidity

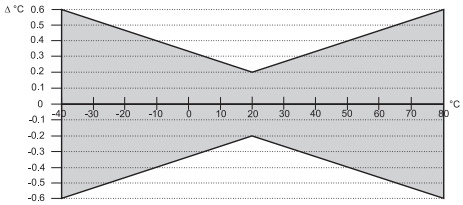
Sensor element	HCT01-00D	
Modbus output range	0.00...100.00 % RH	
Accuracy incl. hysteresis and nonlinearity	±2 % RH (0...90 % RH)	±3 % RH (90...100 % RH)
Temperature dependence	< (0.025 + 0.0003 x RH) [% RH/°C]	

Temperature

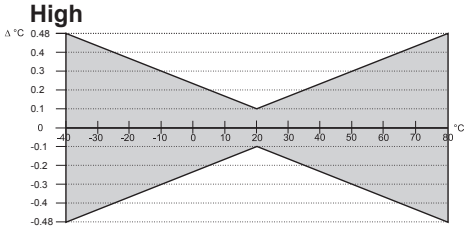
Sensor	Pt1000
Modbus output range	-40.00...+80.00 °C (-40...176 °F)

Accuracy:

Standard



High



General

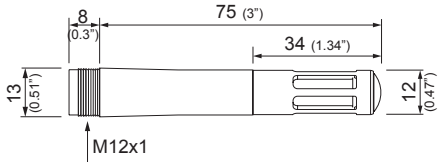
Supply voltage [1) 2)]	4 - 28 V DC	
Current consumption	typ. 0.4 mA at a measuring rate of 1 sec.	
Current pulse during power-up (with serial resistance 100 Ohm)	at UB 7 V: I_{max} 60 mA; current draw drops below 10 mA within 350 µs at UB 12 V: I_{max} 110 mA; current draw drops below 10 mA within 400 µs	
Warmup Time after Power-Up	max. 800ms	
Interface / Bus	RS485 / Modbus in slavemode	
Housing /	polycarbonate or stainless steel / IP65	
Electromagnetic compatibility [3)]	EN613226-1	EN61326-2-3
	FCC Part 15 Class B	ICES-003 Issue 5 ClassB
Working and storage temperature	-40...80°C (-40...176°F)	
Max. cable length	100m (328.1ft)	

CE

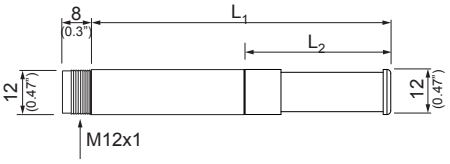
1) For bus operation with terminal resistor (120Ω) min. UB: 4,5V DC
2) No terminal, pull-up or pull-down resistor integrated in the probe
3) EE071 is not protected against voltage spikes (surge)

Dimensions in mm (inch)

polycarbonate housing - EE071-HTPx



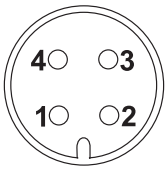
metal housing - EE071-HTMx



Filter	L_1	L_2
Stainless steel grid	79.5 mm (3.13")	38.5 mm (1.52")
H_2O_2	73.5 mm (2.89")	33 mm (1.3")

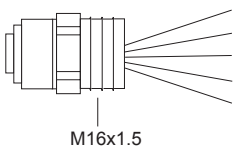
Connection Diagram

EE071:



1...+UB
2...B-RS485 (= Data-)
3...A-RS485 (= Data+)
4...GND

M12x1 flange (HA010705, Accessories)



brown...+UB
white.....B-RS485 (= Data-)
blue.....A-RS485 (= Data+)
black....GND
grey.....shielding

Modbus Map

The measured values are saved as a 32Bit *float* value from 0x19 to 0x25 and as 16Bit *signed integer* between 0x27 and 0x2D.
The factory setting for the Slave-ID is 247 as an *integer* 16Bit value. This ID can be customised in the register 0x00 (value margin 1 - 247 permitted).
The serial number as ASCII-code is located at register address 30001-30008.

FLOAT (read register):

Register address	*Protocol address*	*Parameter name*	
30026	0x19	Temperature	[°C]
30028	0x1B	Temperature	[°F]
30030	0x1D	Rel Humidity	[%]
30032	0x1F	Abs Humidity	[g/m³]
30034	0x21	Dew Point	[°C]
30036	0x23	Dew Point	[°F]
30038	0x25	Mixing ratio	[g/kg]

INTEGER (read register):[1)]

Register address	*Protocol address*	*Parameter name*	
30040	0x27	Temperature	[°C]
30041	0x28	Temperature	[°F]
30042	0x29	Rel Humidity	[%]
30043	0x2A	Abs Humidity	[g/m³]
30044	0x2B	Dew Point	[°C]
30045	0x2C	Dew Point	[°F]
30046	0x2D	Mixing ratio	[g/kg]

INTEGER (write register):

Register address	*Protocol address*	*Parameter name*
60001	0x00	Slave-ID

FLOAT (read & write register):

Register address	*Protocol address*	*Parameter name*
5001[2)]	0x1388	Air pressure[3)]

1) Values are stored with a scaling of 1:100 (e.g.: 2550 is equivalent to 25.5°C)
2) Read function code: 0x03 Write function code: 0x10
3) Ambient pressure in mbar, with 2 decimal digits (e.g. 1008.25)

For Modbus protocol setting please see Application Note (www.epluse.com/EE071).

Radiation shield

For outdoor applications EE071 must be used with the optional radiation shield HA010502, which protects the device against rain, snow, ice and solar radiation.


EE071 with radiation shield HA010502

E+E Sensor Coating

The E+E proprietary sensor coating is a protective layer applied to the active surface of the HCT01 sensing element. The coating extends substantially the lifetime and the measurement performance of the E+E sensor in **corrosive environment**. Additionally, it improves the sensor's long term stability in **dusty, dirty or oily applications** by preventing stray impedances caused by deposits on the active sensor surface.

Ordering Guide

MODEL	HOUSING	FILTER	T-ACCURACY [2]	BAUD RATE[3]	PARITY[3]	STOPBITS[3]
Humidity and Temperature (HT)	polycarbonate (P)	membrane (B)	Standard (x)	9600 (A)	odd (O)	1 stopbit (1)
	metal[1] (M)	metal grid (C)	High (C)	19200 (B)	even (E)	2 stopbits (2)
		PTFE (E)		38400 (C)	no parity (N)	
		H_2O_2[1] (L)				
		stainless steel grid[1] (I)				
EE071-						

1) The metal housing (M) is only available with stainless steel grid filter and with H_2O_2 filter (L). The stainless steel grid filter is only available with metal housing (M).
2) According to graphs in „Technical Data"
3) Factory setup: Baud rate: 9600 (A) / Parity: even (E) / Stopbit: 1 (1)

Order Example

EE071-HTPBCAE1

Model:	humidity & temperature
Housing:	polycarbonate
Filter:	membrane filter
T-Accuracy:	High
Configuration:	baud rate 9600, even parity, 1 stopbit

Scope of Supply

- EE071 probe according to ordering guide
- Inspection certificate according to DIN EN10204 - 3.1

Accessories (See data sheet "Accessories")

- M12x1 flange coupling with 50mm (2") flying leads	HA010705
- Cable connector for customer assembly M12x1	HA010707
- Filter caps	HA0101xx
- Connecting cable M12 - flying leads (1,5 m (59.1") / 5 m (196.9") / 10 m (393.7"))	HA0108**19/20/21**
- Connecting cable M12 - M12 (2 m (78.7") / 5 m (196.9") / 10 m (393.7"))	HA0108**16/17/18**
- T-coupler M12 - M12	HA030204
- Modbus configuration adapter	HA011012
- Radiation shield with cable gland (M20x1.5)	HA010502
- Protection cap for 12 mm (0.47") probe	HA010783
- Protection cap for M12 connecting cable female	HA010781
- Protection cap for M12 probe connector male	HA010782
- Plastic mounting flange 12 mm (0.47")	HA010202
- Stainless steel mounting flange 12 mm (0.47")	HA010201
- Duct mounting kit	HA010209
- Wall mounting clip Ø 12 mm (0.47")	HA010211
- E+E Product Configuration Software (free download at www.epluse.com/configurator)	EE-PCS