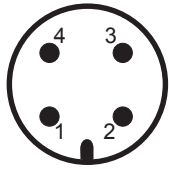


QUICK GUIDE

EE072 - RH and T Probe with Modbus RTU

(Full User Guide at www.epluse.com/EE072)

Connection Diagram



front view
device plug

Pin number	Function	Wire colors for accessories: - Couplig flange HA010705 - Connection cable HA010819/820/821
1	supply voltage	brown
2	B RS485 (D-)	white
3	GND	blue
4	A RS485 (D+)	black

Caution

For accurate measurement it is essential that the temperature of the probe and the sensing head is the same as the temperature of the air to measure. Avoid mounting the EE072 transmitter in a way which creates temperature gradients along the probe.

- The device and mainly the sensing head shall not be exposed to extreme mechanical stress.
- The device must be operated with the filter cap on at all times. Do not touch the sensors inside the sensing head.
- While replacing the filter cap (because of pollution for instance) against an original E+E spare one please take very good care to not touch the sensors.

Modbus Setup

Factory default setup:

Baudrate	Data	Parity	Stopbits	Slave ID
9600	8	Even	One	234

ID address, baud rate, parity and stop bits can be set via:

1. EE-PCS, Product Configuration Software and the appropriate configuration cable.
2. Modbus protocol in the register 60001 (0x00) and 60002 (0x01).
See Application Note Modbus AN0103 (available on www.epluse.com/EE072)

The EE072 factory setting for the slave-ID (Modbus address) is 234 as an integer 16 bit value.

The measured values are saved as a 32 bit float value and 16 bit signed integer.

The serial number as ASCII-code is located at read register address 30001-30008 (16 bit per address).

The firmware version is located at register address 30009 (bit 15...8 = major release; bit 7...0 = minor release).

FLOAT (read register):			INTEGER (read register):		
Function code / Register number ⁽¹⁾ [Dec]	Register address ⁽²⁾ [HEX]	Parameter name	Function code / Register number ⁽¹⁾ [Dec]	Register address ⁽²⁾ [HEX]	Parameter name / Scaling
31003	0x3EA	Temperature T [°C]	34002	0xFA1	Temperature T [°C] * 100
31005	0x3EC	Temperature T [°F]	34003	0xFA2	Temperature T [°F] * 50
31009	0x3F0	Temperature T [°K]	34005	0xFA4	Temperature T [°K] * 50
31021	0x3FC	Relative humidity RH, Uw [% RH]	34011	0xFAA	Relative humidity RH, Uw [% RH] * 100
31101	0x44C	Water vapor partial pressure e [mbar]	34051	0xFD2	Water vapor partial pressure e [mbar] * 10
31103	0x44E	Water vapor partial pressure e [psi]	34052	0xFD3	Water vapor partial pressure e [psi] * 1000
31105	0x450	Dew point temperature Td [°C]	34053	0xFD4	Dew point temperature Td [°C] * 100
31107	0x452	Dew point temperature Td [°F]	34054	0xFD5	Dew point temperature Td [°F] * 100
31147	0x47A	Dew point temperature Td [°K]	34074	0xFE9	Dew point temperature Td [°K] * 100
31109	0x454	Wet bulb temperature Tw [°C]	34055	0xFD6	Wet bulb temperature Tw [°C] * 100
31111	0x456	Wet bulb temperature Tw [°F]	34056	0xFD7	Wet bulb temperature Tw [°F] * 100
31145	0x478	Wet bulb temperature Tw [°K]	34073	0xFE8	Wet bulb temperature Tw [°K] * 100
31113	0x458	Absolute humidity dv [g/m³]	34057	0xFD8	Absolute humidity dv [g/m³] * 10
31115	0x45A	Absolute humidity dv [gr/ft³]	34058	0xFD9	Absolute humidity dv [gr/ft³] * 10
31121	0x460	Mixing ratio r [g/kg]	34061	0xFDC	Mixing ratio r [g/kg] * 10
31123	0x462	Mixing ratio r [g/lb]	34062	0xFDD	Mixing ratio r [g/lb] * 10
31125	0x464	Specific enthalpy h [kJ/kg]	34063	0xFDE	Specific enthalpy h [kJ/kg] * 1
31127	0x466	Specific enthalpy h [ft lbf/lb/kg]	34064	0xFDF	Specific enthalpy h [ft lbf/lb/kg] * 1
31129	0x468	Specific enthalpy h [BTU/lb]	34065	0xFE0	Specific enthalpy h [BTU/lb] * 1
31131	0x46A	Frost point temperature Tf [°C]	34066	0xFE1	Frost point temperature Tf [°C] * 100
31133	0x46C	Frost point temperature Tf [°F]	34067	0xFE2	Frost point temperature Tf [°F] * 100
31149	0x47C	Frost point temperature Tf [°K]	34075	0xFEA	Frost point temperature Tf [°K] * 100
31237	0x4D4	Ice bulb temperature Ti [°C]	34119	0x1016	Ice bulb temperature Ti [°C] * 100
31239	0x4D6	Ice bulb temperature Ti [°F]	34120	0x1017	Ice bulb temperature Ti [°F] * 100
31241	0x4D8	Ice bulb temperature Ti [°K]	34121	0x1018	Ice bulb temperature Ti [°K] * 50

1) Register number starts from 1
2) Register address starts from 0

* 100 is scale 1:100 (2550 is equivalent to 25.5 °C)
* 50 is scale 1:50 (2550 is equivalent to 51 °F)

INFO (read register):

Function code / Register number ⁽¹⁾ [Dec]	Register address ⁽²⁾ [HEX]	Parameter name
30001	0x00	Serial number (as ASCII)
30009	0x08	Firmware
30010	0x09	Name
30602	0x259	Status / Error

INTEGER (write register):

Function code / Register number ⁽¹⁾ [Dec]	Register address ⁽²⁾ [HEX]	Parameter name
60001	0x00	Slave-ID (modbus address)
60002	0x01	Modbus protocol settings ⁽³⁾

FLOAT (read & write register):

Function code / Register number ⁽¹⁾ [Dec]	Register address ⁽²⁾ [HEX]	Parameter name
5001 ⁽⁴⁾	0x1388	Air pressure ⁽⁵⁾

- 1) Register number starts from 1
- 2) Register address starts from 0
- 3) For Modbus protocol setting please see Application Note Modbus AN0103 at www.epluse.com
- 4) Read function code: 0x03 Write function code: 0x10
- 5) Ambient pressure in mbar, with 2 decimal digits (e.g. 1008.25)

Modbus RTU Example

Example of MODBUS RTU command for reading the temperature (float value) T = 26,953624 °C from the register 0x3EA

Device EE072; slave ID 234 [EA in HEX]

Reference document, chapter 6.3: http://www.modbus.org/docs/Modbus_Application_Protocol_V1_1b.pdf

	Modbus ID address	Function code	Starting address Hi	Starting address Lo	No. of register Hi	No. of register Lo	CRC	
Request [Hex]:	EA	03	03	EA	00	02	F2	A0

	Modbus ID address	Function code	Byte count	Register 1 value Hi	Register 1 value Lo	Register 2 value Hi	Register 2 value Lo	CRC	
Response [Hex]:	EA	03	04	A1	06	41	D7	12	CE

For decoding of float values (stored according standard IEEE754), please refer to AN0103, chapter 7

7.2 Modbus floating point format

E+E devices use the Modbus floating point format. The byte pairs 1, 2 and 3, 4 are inverted as follows:

MMMMMMMM	MMMMMMMM	SEEEEEEE	EMMMMMMM
Byte 3	Byte 4	Byte 1	Byte 2

Example:

Response [Hex]				Value in decimal
Byte 1 (Register 2 - Hi)	Byte 2 (Register 2 - Lo)	Byte 3 (Register 1 - Hi)	Byte 4 (Register 1 - Lo)	
41	D7	A1	06	26.953624

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