

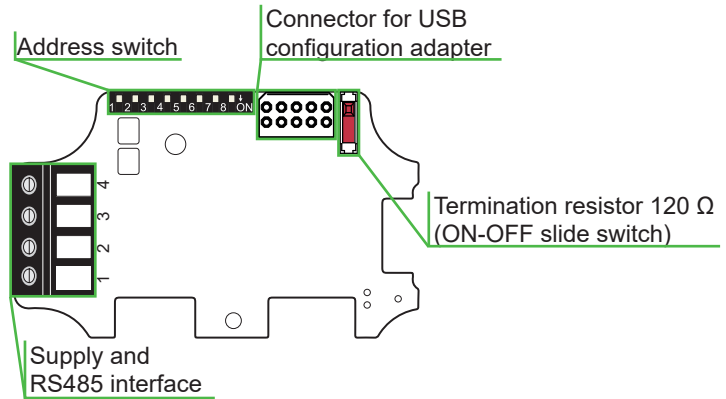
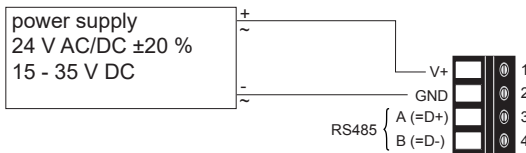
EE431 / EE441 / EE451 / EE471 - Temperature sensors with RS485 Interface

Hardware

The bus termination shall be realized with 120 Ohm resistor (slide switch on the board).

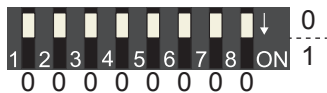
Wiring

Digital interface



Address Settings

Address Switch



Address setting via EE-PCS Product Configuration Software:

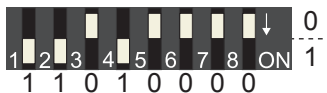
All Dip-Switches at position 0 → address has to be set via Product Configuration Software

Modbus (Slave device): factory setting EE431, EE441, EE451, EE471: 66 (permitted values: 1...247).

BACnet (Master device): factory setting EE431, EE441, EE451, EE471: 66 (permitted values: 0...127).

Example: Slave address is set via configuration software.

Address Switch



Address setting via Dip-Switch:

Modbus (Slave device): Setting the Dip-Switch to any other address than 0, overrules the slave address set via configuration software (permitted values: 1...247).

BACnet (Master device): Setting the Dip-Switch to any other address than 0, overrules the slave address set via configuration software.

BACnet Note:

permitted values are 0...127. The 8th bit of the Dip-Switch is ignored (ID 127 = 0111 111).

To set address 0 via Dip-Switch, the 8th bit shall be set to 1 (ID 0 = 1000 0000).

Example: Slave address set to 11 (= 0000 1011 binary).

BACnet Setup

Please see PICS (Product Implementation Conformance Statement) - available on www.epluse.com

Modbus Setup

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

The EE431, EE441, EE451, EE471 factory setting for the slave-ID (Modbus address) is 66 as an integer 16 bit value.

This ID can be changed by the user in the register 60001 (0x00), permitted values are 1...247.

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):			
Function code / Register number ⁽¹⁾ [Dec]	Register address ⁽²⁾ [HEX]	Parameter name	
31003	0x3EA	Temperature	[°C]
31004	0x3EC	Temperature	[°F]
31004	0x3F0	Temperature	[°K]

INTEGER (read register):			
Function code / Register number ⁽¹⁾ [Dec]	Register address ⁽²⁾ [HEX]	Parameter name	
34002	0xFA1	Temperature	[°C] * 100
34003	0xFA2	Temperature	[°F] * 50
34003	0xFA4	Temperature	[°K] * 50

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

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

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**

INFO (read register):		
Function code / Register number ⁽¹⁾ [Dec]	Register address ⁽²⁾ [HEX]	Parameter name
30001	0x00	Serial number (as ASCII)
30009	0x08	Firmware version

* If the ID is set via DIP-Switch the response will be NAK.

** For Modbus protocol setting please see Application Note Modbus AN0103 at www.epluse.com

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

Modbus RTU Example

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

Device EE431, EE441, EE451, EE471; slave ID 66 [42 in HEX]

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

Request [Hex]: 42 03 03 EA 00 02 EB 48

	Modbus ID address	Function code	Starting address Hi	Starting address Lo	No. of register Hi	No. of register Lo	CRC	
Request [Hex]:	42	03	03	EA	00	02	EB	48

Response [Hex]: 42 03 04 A1 06 41 D7 3B 04

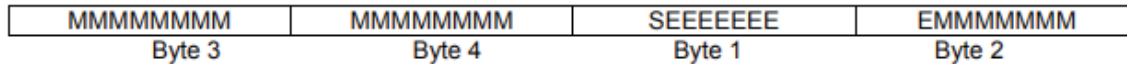
	Modbus ID address	Function code	Byte count	Register 1 value Hi	Register 1 value Lo	Register 2 value Hi	Register 2 value Lo	CRC	
Response [Hex]:	42	03	04	A1	06	41	D7	3B	04

Modbus floating point format

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.



Example:

Response [Hex]	Value in decimal
41 D7 A1 06	26.953624

Protocol setting:

Address, baudrate, parity and stop bits can be set via:

1. Product Configurator Software (available on www.epluse.com)
2. Modbus protocol (please see Application Note Modbus (available on www.epluse.com))

INFORMATION

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