



Modbus Interface Description

Temperature Sensor 22DT-15.. / V1.0

Edition 2026-06

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General notes

General information

Sensor Types	22DT-15..
Protocol	Modbus RTU / RS-485

Modbus RTU

Transmission Formats	1-8-N-2, 1-8-E-1, 1-8-O-1 (Default: 1-8-N-2) E = Even, O = Odd, N = None Bitstructure: Start – Data – Parity – Stop
Baud Rates	9'600, 19'200, 38'400, 57'600 Bd (Default: 9'600)
Address	1...247 0 = Broadcast
Number of Nodes	Max. 32 (without repeater)
Terminating Resistor	External 120 Ω resistor

Configuration

Tool	Via Dip switches
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Register implementation

All data is arranged in a table and addressed by 1..n (Register No.) or 0..n-1 (Address). No distinction is made between data types (Discrete Inputs, Coils, Input Registers and Holding Registers). As a consequence, all data can be accessed with the two commands below.

Supported commands

Standard commands:
Read Holding Registers [3]
Write Single Register [6]
Write Multiple Registers [16]

Interpret values in the registers

All values in the register are shown as unsigned (marked T = **u**), signed (marked T = **s**), or float integers (marked T = **f**). Signed integers are represented as two's complement.

Example unsigned integer:	Example signed integer:
Read (Function 03, 1 Register)	Read (Function 03, 1 Register)
Value Register No. x	Value Register No. x
= 0000 0001 0010 1110 ₂	= 1111 1111 0010 0001 ₂
= 302 ₁₀	= -223 ₁₀
Actual value	Actual value
= value * scaling factor * unit	= value * scaling factor * unit
= 302 * 0.01 * unit	= -223 * 0.01 * unit
= 30.2 unit	= -22.3 unit

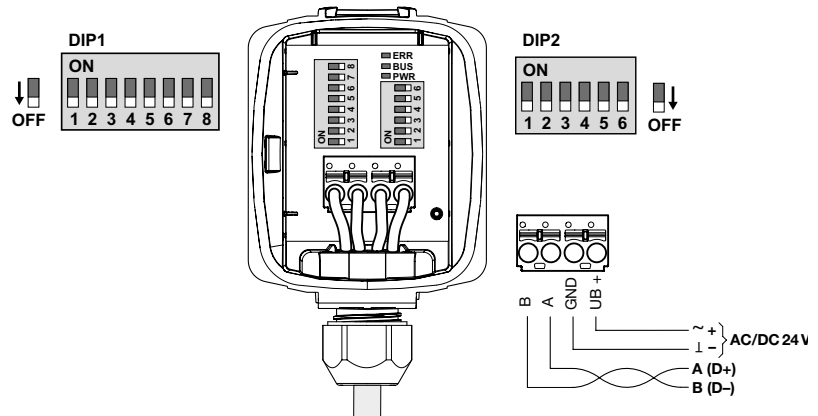


All writeable registers >100 are persistent and are **not** supposed to be written on a regular basis. Designated registers are highlighted in colour in the document.

Operating elements for addressing and configuration

RS 485 connection

The RS485 Modbus connection is place on the basic PCB. Furthermore, on the two DIP switches, the Modbus address of the sensor can be selected and the communication parameters can be set.



Functions of DIP switch 1 and DIP switch 2

DIP switch **DIP1** (8-way) is used to set the Modbus address binary coded in a range of 1...247 (address 0 is reserved for broadcast and can't be set).

DIP switch **DIP2** (6-way) is used to set the Modbus mode, baud rate and parity.

DIP1								1...8 Address
↓	ON							
OFF	1	2	3	4	5	6	7	8
2^0 (1)	2^1 (2)	2^2 (4)	2^3 (8)	2^4 (16)	2^5 (32)	2^6 (64)	2^7 (128)	
1	2	3	4	5	6	7	8	Address
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0
ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1
OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	2
ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	3
OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	4
ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	5
OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	6
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
ON	ON	ON	ON	ON	ON	ON	ON	247

DIP2						
ON						1 = Mode
1	2	3	4	5	6	2,3 = Baud rate
OFF	OFF	OFF	OFF	OFF	OFF	4,5,6 = Parity
1	2	3	4	5	6	Function
OFF						RTU Mode
ON						ASCII Mode
	OFF	OFF				Baud rate 9'600
	ON	OFF				Baud rate 19'200
	OFF	ON				Baud rate 38'400
	ON	ON				Baud rate 57'600
			OFF	OFF	ON	Parity none – 2 Stopbits
			ON	OFF	ON	Parity even – 1 Stopbit
			OFF	ON	ON	Parity odd – 1 Stopbit
			ON	ON	ON	Parity none – 1 Stopbit

LED functions

The three LEDs on the PCB show the actual operating status of the sensor.

PWR During normal operation the LED is flashing.
LED is turned permanently ON during sensor initialization, after power connection of the device, for a few seconds.

BUS LED is turned ON, if bus telegrams are received and sent by the RS485 module.

ERR LED is turned ON in case of a faulty bus configuration or in case of internal errors.

Register descriptions

Register measured variable

Registers No. 1 define the measured value.

No.	Address	Description Comment	Unit		T	Access
1	0	Temperature [scaling factor: 0.1] Selection of SI or Imperial units via Register No. 401 (1 = SI, 2 = Imperial)	SI	°C	s	R
			Imperial	°F		

Register offset and correction values

Registers No. 101 define the offset and correction value of the sensor.

No.	Address	Description Comment	Unit		T	Access
101	100	Offset temperature [scaling factor: 0.1] Selection of SI or Imperial units via Register No. 401 (1 = SI, 2 = Imperial)	SI	°C	s	R / W
			Imperial	°F		

Register sensor units of measurement and constants

Registers No. 401 required unitary system (SI or Imperial) can be selected and further sensor parameters can be chosen.

No.	Address	Description Comment	Unit			T	Access
401	400	Selection of the unitary system [scaling factor: 1.0] (SI or Imperial)	SI	°C	value = 1	s	R / W
			Imperial	°F	value = 2		

Register general device information

Registers No. 504 define general device information.

No.	Address	Description Comment	Unit		T	Access
504	503	Firmware version main circuit board Version# is shown as a hexadecimal number Example: V 4.6 → 0406 ₁₆ → 0000 0100 0000 0110 ₂	–		u	R

Description Access: R = Read, W = Write

All inclusive

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