

Envmeter-485 Pro

Envmeter-485 Pro is a temperature and relative humidity sensor for meteorological use with RS485 Modbus output. It is based on a top of the range hygrometer and a microcontroller that manages the information and transmits it in RS485.

Measurement characteristics

Envmeter-485 Pro uses a sensor with an accuracy of 1.5% in the measurement of relative humidity and 0.1°C in the measurement of temperature, as shown in graphs below (Figs. 1 and 2).

Envmeter-485 Pro is available in two versions:

- basic version, equipped with 2 boards, one dedicated to electronics and the other to the sensor only, which is welded to the printed circuit with special dedicated thermal techniques and profiles, that cannot be used in welding the rest of the electronics.
- professional meteorological use version (Fig 3), equipped with redundant sensors. The microcontroller acquires and calculates the signal coming from the four sensors in order to increase precision and reliability.

Peculiar characteristic in common for both the versions is the reporting of inconsistencies in measurement. For the basic version the report is created when there are repeated errors detected from the thermohygrometric sensor, in the meteorological use version the report is created when there are significant and repeated deviations while double checking the measurements of the four sensors.

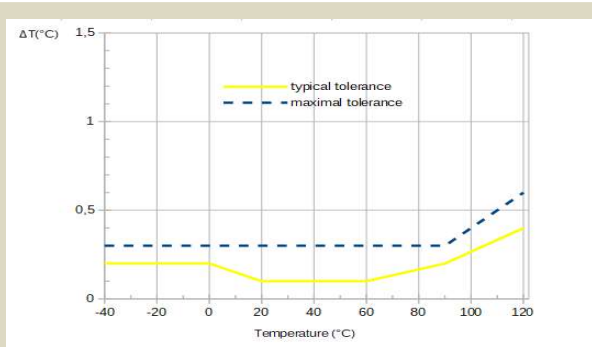


Fig 1 Accuracy of the sensor while measuring the temperature

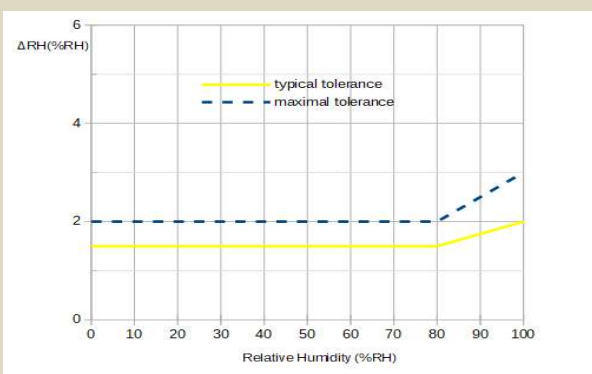


Fig 2 Accuracy of the sensor while measuring the relative humidity

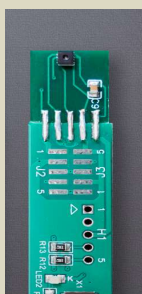


Fig 3.1 basic version

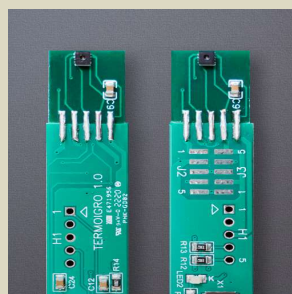


Fig 3.2 professional meteorological use version

ENVMETER-485 PRO		
Product	Humidity and temperature sensor	
Reference standards	WMO CIMO guide ISO 187: 1990 IEC 60751	
Output	Digital: RS485 half duplex with Modbus RTU protocol	
Temperature input	Range	-40 to 125 °C
	Accuracy ⁽¹⁾	±0.1°C
Humidity input	Range	0 to 100 %RH
	Accuracy ⁽²⁾	1.5 %RH
Supply	Range	7.5 – 28V dc
Consumption	< 5mA at 12V	
Connector	M8 male 4 pins with plastic high thermal resistance sheath, UV resistant cladding	
Dimensions	Height 110 mm	
	Ø 75 mm	
Materials	Sensor: digital electronic high precision temperature and humidity sensor	
	Radiation shield: 6 white resin plates resistant to weathering and UV	
	Body: white nylon screws, stainless steel fittings	
(2) value in the range 20°C to 60°C – for the tolerance outside this interval please see fig 1		
(3) value in the range 0% to 80%RH – for the tolerance outside this interval please see fig 2		




Envmeter-485 Pro register map

Register #	Description	Access	NV save																
0x0101	Current air temperature [°C], range -40 to +100, decimal x 10	R																	
0x0102	Current HR [%], range 0 to +100, decimal x10	R																	
0x0103	<p>Status bit coded</p> <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Factory calibration/configuration 1 = OK; 0 = need recalibration</td> </tr> <tr> <td>1</td> <td>Not volatile parameters 1 = OK; 0 = default loaded, need to be changed/saved</td> </tr> <tr> <td>2</td> <td>Sensor type 1 = redundant sensor; 0 = base sensor</td> </tr> <tr> <td>3</td> <td>Temperature reading status 1 = sensor error; 0 = OK</td> </tr> <tr> <td>4</td> <td>HR reading status 1 = sensor error; 0 = OK</td> </tr> <tr> <td>5</td> <td>Watchdog 1 = reset by watchdog timeout occurred; 0 = normal operation</td> </tr> <tr> <td colspan="2">Bits 6 to 15 are reserved for internal diagnostic</td> </tr> </tbody> </table>	Bit	Description	0	Factory calibration/configuration 1 = OK; 0 = need recalibration	1	Not volatile parameters 1 = OK; 0 = default loaded, need to be changed/saved	2	Sensor type 1 = redundant sensor; 0 = base sensor	3	Temperature reading status 1 = sensor error; 0 = OK	4	HR reading status 1 = sensor error; 0 = OK	5	Watchdog 1 = reset by watchdog timeout occurred; 0 = normal operation	Bits 6 to 15 are reserved for internal diagnostic		R	
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0x8001	Serial number, least significant word	R																	
0x8002	Serial number, most significant word	R																	
0x8003	Firmware main version, hexadecimal	R																	
0x8004	Firmware minor version, hexadecimal	R																	
0x8005	Node address, range 1 to 247, decimal, default 1	R/W	Y																
0x8006	<p>Bitrate, coded, range 0 to 4, decimal, default 1</p> <ul style="list-style-type: none"> 0 – 9600 bps 1 – 19200 bps 2 – 38400 bps 3 – 57600 bps 4 – 115200 bps 	R/W	Y																
0x8007	<p>Serial configuration, coded, range 0 to 3, decimal, default 0</p> <ul style="list-style-type: none"> 0 – 8N1 (8 bit / no parity / 1 stop bit) 1 – 8E1 (8 bit / even parity / 1 stop bit) 2 – 8O1 (8 bit / odd parity / 1 stop bit) 3 – 8N2 (8 bit / no parity / 1 stop bit) 	R/W	Y																
0x8008	Serial reply delay [ms] range 0 to 100, decimal, default 1	R/W	Y																
0x8101	Not volatile params save command , write 1 to execute (then wait 1 s before sending next message)	W																	
0x8102	Software reset command , write 1 to execute (then wait 6 s before sending next message)	W																	

Calibration

Each thermohygroscopic sensor installed inside **Envmeter-485 Pro** is tested and calibrated individually by the producer. The calibration is done by comparison with a sample sensor periodically calibrated by an ISO 17025 accredited laboratory.

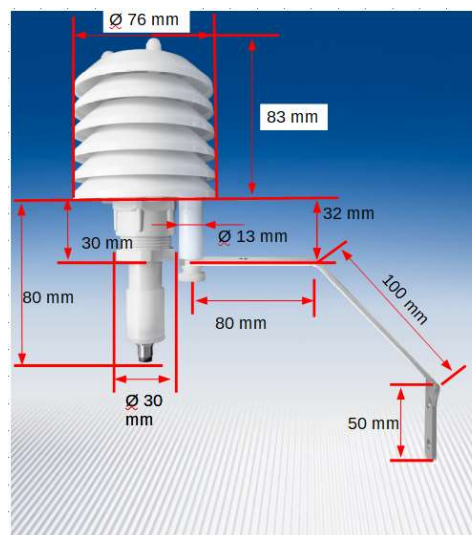
Connection

	PIN# (1m)	Wire colour (4m)	Description
	1	Green	RS485+/B
	2	Red	V+
	3	Green/White	RS485-/A
	4	Black	V-

Frontal view of the output connector

Dimensions and fastening

Fastening complete with an optional inox or white bracket, equipped with two pipe clamps for the pole



*Wights: Envmetre-485 Pro: 134 gr
Bracket: 85 gr*