Meteorological Temperature & Humidity Transmitter (digital)

THM-G1-S

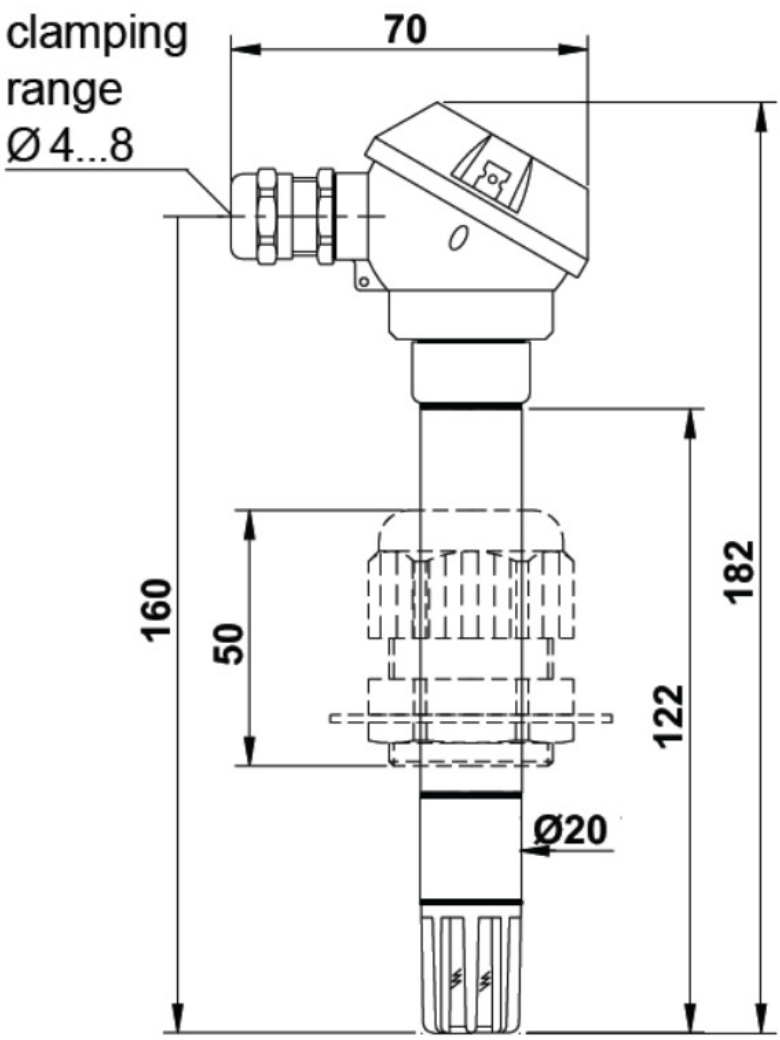
Technical Data

Temperature Measuring Range	-40...+80° C
Temperature Accuracy	±0.3 K
Humidity Measuring Range	0...100% RH
Humidity Accuracy	(5...95%rh at 10...40°C) ..... ±2% rh
Power Supply	5...30 V DC
Output	RS485 with Modbus RTU protocol
Operating Temperature	-40...+80°C
Degree of protection sensor/electronic	IP 30/IP 65

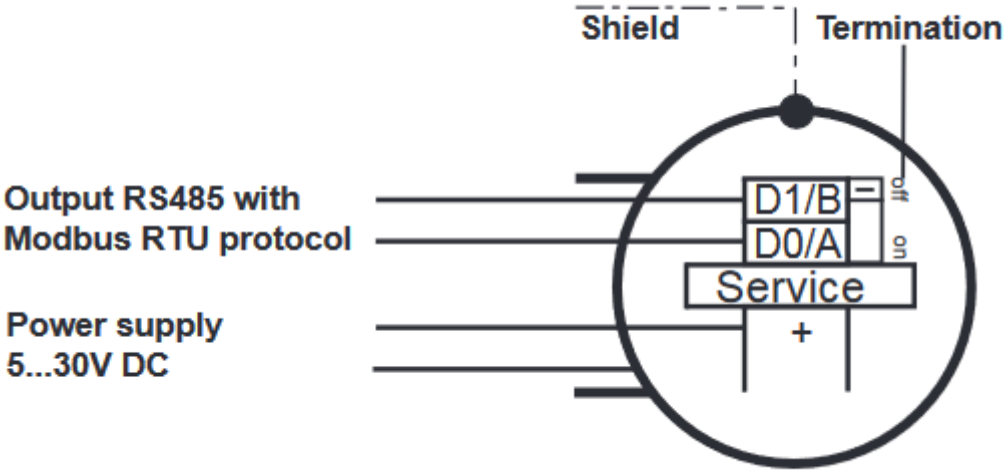
The sensors in this series have got either a RS485-interface and are suitable for data transfer via MODBUS-RTU protocol.

The transmitters with RS485-interface for data transfer of a MODBUS-RTU protocol are equipped with an hx processor that uses the values of the relative humidity and the temperature to calculate the dew point temperature, the enthalpy, the mixing ratio, the absolute humidity or the wet-bulb temperature, in accordance with the laws of physics.

Dimensions



Connection diagrams RS485 ModBus



RS485 with MODBUS-RTU Protocol
Serial interface
The following parameters are possible for data transfer via the EIA-485 interface on the ModBus sensors
• Baud rate: 19200 / 9600 / 4800 / 2400 / 1200 / 600
• Data bits: 8
• Parity: N / E / O
• Stop bits: 1 / 2
Modus 19200@8N2 is pre-defined.

Access to Modbus registers

To ensure compatibility with all Modbus masters, all available registers can be read both with function code 03 hex (read holding register), as well as with function code 04
. Registers with additional write permission can be modified with function code 06 hex (write holding register). All registers available with Modbus sensors by Mela are listed in table 1.

Register-no.	Data type	Value	Permission
0	FLOAT32	Temperature (°C)	readable
1			
2	UINT16	Alarm code temperature	
3	FLOAT32	Relative humidity (%rH)	
4			
5	UINT16	Alarm code humidity	
6	UINT32	Serial number sensor	
7			
8	UINT32	Serial number sensor	
9			
10	FLOAT32	Dew point temperature (°C)	
11			
12	FLOAT32	Enthalpy (kJ/kg)	
13			
14	FLOAT32	Mixing ratio (g/kg)	
15			

16	FLOAT32	Absolute humidity (g/m³)	
17			
18	FLOAT32	Wet-bulb temperature (°C)	
19			
20	UINT16	Alarm code hx processor	
205	UINT16	Modbus address	read and writeable

Functioning

The measured values for relative humidity, temperature and the corresponding alarm codes are saved in registers 0…5 in a cycle time of 2s. Registers 6(8) and 7(9) contain the sensor‘s serial number. If an hx value is scanned from registers 10…19, this is recalculated at the time of the scan, based on the current temperature and the relative humidity. The hx processor emits an alarm code if the values for temperature or relative humidity are outside the permissible input range. No calculation is made in this case, and the register displays the last valid value for each variable.

The memory organisation for the temperature and air humidity readings, as well as for the serial number, is Little Endian. This means that the low byte word is in the lower register and the high byte word is in the higher register.

Alarm codes

Table 2 lists all the possible alarm register values when measuring temperature (reg. no. 2).

Alarm code	Meaning
0	no alarm, the temperature value is within the limits
1	temperature range of the measuring head exceeded
2	below temperature range of the measuring head
3	Wire break or no sensor element detected
4	short circuit at PT1000 (resistance < 500 Ohm)

Table 3 lists all the possible alarm register values when measuring humidity (reg. no. 5).

Alarm code	Meaning
0	no alarm, the humidity value is within the limits
1	humidity range of the measuring head exceeded
2	below humidity range of the measuring head
3	Wire break or no sensor element detected
4	humidity element defective

Table 4 lists all the possible alarm register values of the hx processor (reg. no. 20).

Alarm code	Meaning
0	no alarm, input values are within the limits
1	max. input value of humidity 95%rh and/or temperature +70°C is exceeded
2	min. input value of humidity 5%rh and/or temperature -30°C is below limit

The Modbus address can be modified at any time via write access to the address register (reg. no. 205). Permissible slave ad- dresses are within the 1...247 range. Using address 0 as a slave address is not permissible. Addresses within the 248…255 range are reserved for special Modbus services and their use as a slave address is not permissible either. Address 1 is pre-defined.