AMBIENT & PROCESS Humidity & Temperature Sensor with Modbus output MBRTU-ATH

- USER GUIDE FOR AMBIENT & PROCESS HUMIDITY & TEMPERATURE SENSOR WITH MODBUS OUTPUT MBRTU-ATH

USER GUIDE FOR AMBIENT & PROCESS HUMIDITY & TEMPERATURE SENSOR WITH MODBUS OUTPUT MBRTU-ATH

MBRTU-ATH-MN-EN-01	JUN-2021

This document is applied for the following products

SKU	MBRTU-ATH	**HW Ver.**	2.5	**FW Ver.**	5.1
Item Code	MBRTU-ATH-15-300	PROCESS HUMIDITY AND TEMPERATURE SENSOR, -40 .. +120 C, 300MM PROBE, ALL 304SS MATERIAL, SLIDING-FLANGE, RS485/MODBUSRTU, 7..48VDC SUPPLY, M12-M CONNECTOR			

1. Functions Change Log

HW Ver.	FW Ver.	Release Date	Function Change
2.5	5.1	-2020	Innitial FW

2. Introduction

MBRTU-ATH Humidity and Temperature Sensor utilizes digital temperature sensor delivers high accuracy measurement in range -40℃ to + 85℃ for ambient version or -40℃ to + 120℃ for Process version. Output is Modbus RTU for easily integrating with any PLC, controller, SCADA, BMS or IoT gateway.

- Digital sensor technology;
- High accuracy;
- Standard ModbusRTU output;
- Plug & Play.

PROCESS HUMIDITY & TEMPERATURE SENSOR
WITH MODBUS OUTPUT



MBRTU-ATH-H4.PNG

3. Specification

SENSOR SPECIFICATION for AMBIENT VERSION	
Sensor	Digital type, factory calibrated, output both Humidity & Temperature values
Humidity measuring range	0 .. 100 %RH
Humidity accuracy	+/- 3.0%
Humidity resolution	0.1%
Temperature measuring range	-40 .. + 85 ℃
Temperature accuracy	+/- 1.0 ℃
Temperature resolution	0.1 ℃
Sensor Filter	PA (for integrated version) OR 20um Alloy sintered filter (for sensor with cable)
SENSOR SPECIFICATION for PROCESS VERSION	
Sensor	Digital type, factory calibrated, output both Humidity & Temperature values
Humidity measuring range	0 .. 100 %RH
Humidity accuracy	+/- 1.8% RH typical in 30-70%RH range and 0-80 oC
Humidity resolution	0.1%
Temperature measuring range	-40 .. + 120 ℃

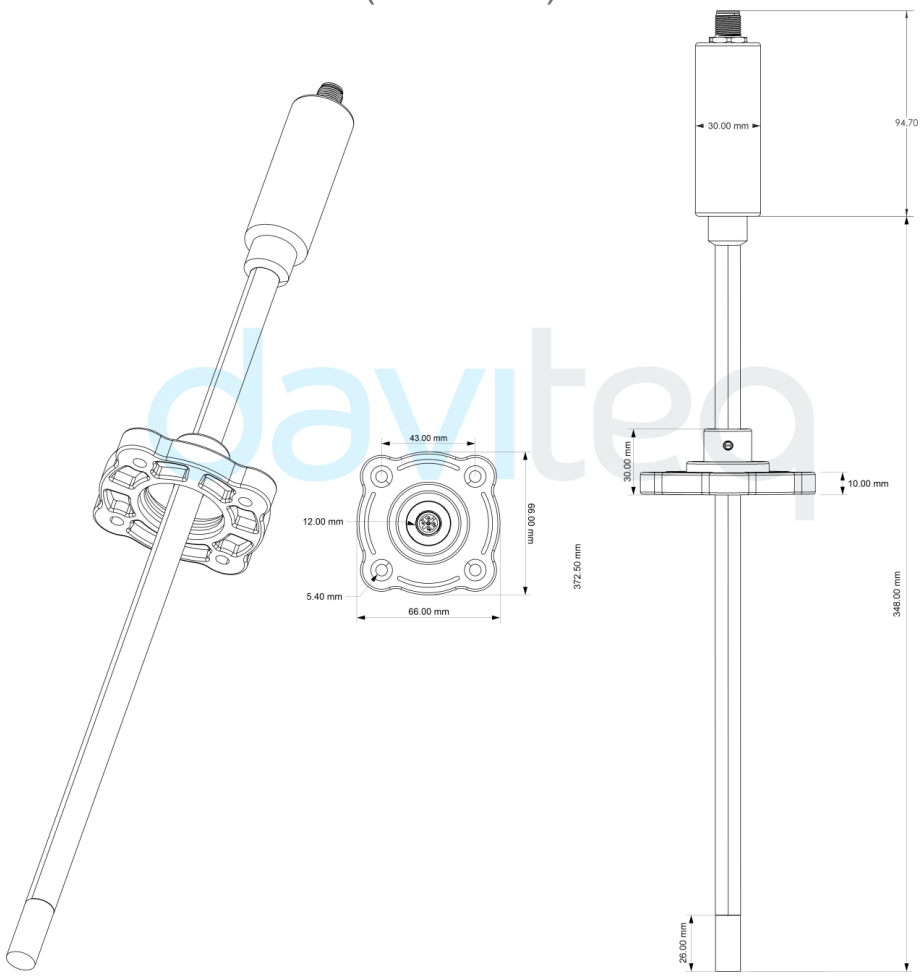
Temperature accuracy	+/- 0.5 ℃ in 0-100 ℃ range
Temperature resolution	0.1 ℃
Sensor Filter	20um Alloy sintered filter (for sensor with cable)
Sensor Probe	12mm diameter, 304SS with sliding flange Probe length: 300mm, 600mm, 900mm
Working pressure	atmosphere
SENSOR SPECIFICATION for OUTDOOR AMBIENT VERSION -ATHP	
Sensor	Digital type, factory calibrated, output both Humidity & Temperature values
Humidity measuring range	0 .. 100 %RH
Humidity accuracy	+/- 1.8% RH typical in 30-70%RH range and 0-80 oC
Humidity resolution	0.1%
Temperature measuring range	-40 .. + 120 ℃
Temperature accuracy	+/- 0.5 ℃ in 0-100 ℃ range
Temperature resolution	0.1 ℃
Barometric Pressure range	300 .. 1200 mbar abs. (in -20 .. + 85 ℃)
Pressure accuracy	+/- 4 mbar (in full measurement range as above)
Pressure resolution	0.1 mbar
Outdoor protection	IP67 electronics housing with Radiation shield with filter for sensor parts
TRANSMITTER SPECIFICATION	
Communication Port	RS485, ModbusRTU protocol, max 19200 baud
Power supply	7..48VDC, avg. < 200mA
Connector	M12-male 4-pin Code A
Working temperature	-40 .. 85 ℃
Working humidity	0 .. 100% RH
Housing	304SS
Rating	IP67
Dimension	H100xD30 (without sensor cable)
Mounting	AMBIENT: SS304 L type bracket for wall mounting PROCESS: integral on probe
Net weight	<200 grams

4. Product components



5. Dimensions

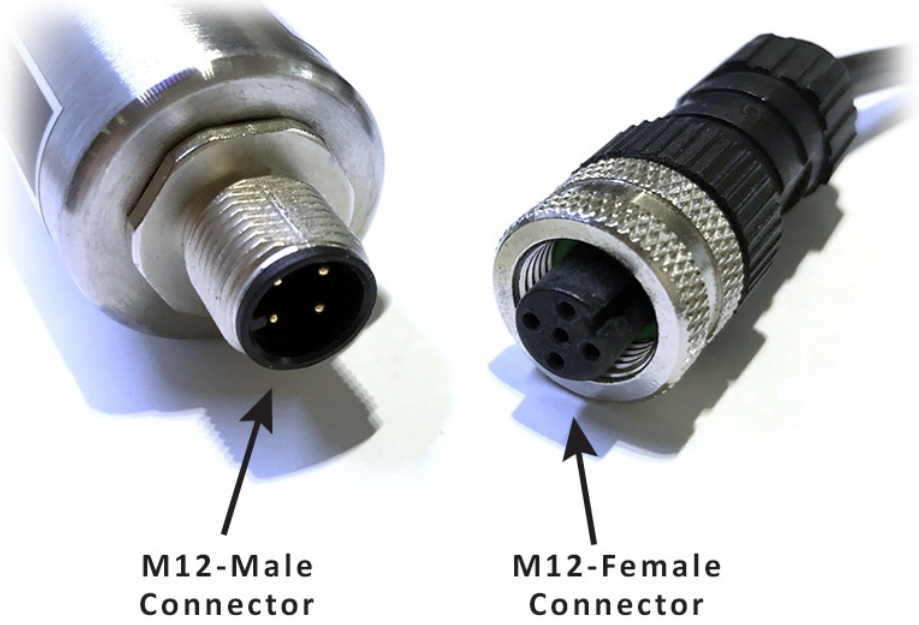
DIMENSION DRAWINGS OF
PROCESS HUMIDITY & TEMPERATURE SENSOR
MBRTU-ATH-15-...
(Unit: mm)



MBRTU-ATH-H5.PNG

6. Wiring

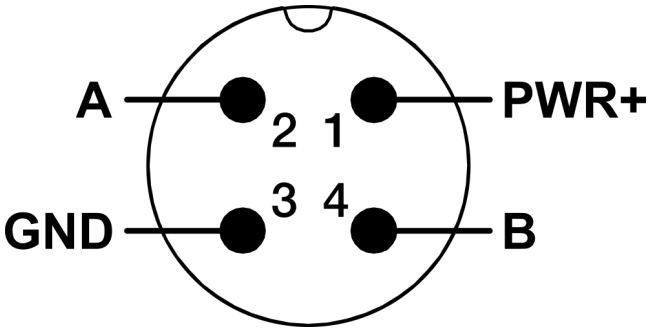
6.1 Electrical connector





6.2 Pinout

Because the sensor uses an M12 electrical connector, please look closely at the pinouts of the M12 electrical connector as shown below.



A - B: RS485/ModbusRTU Output

PWR+: Power supply 7..48VDC

GND: Ground, 0VDC

7. Configuration

7.1 Offline Configuration

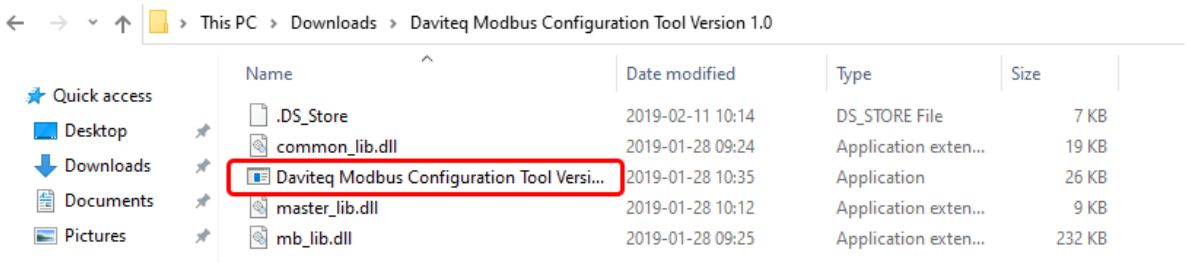
You can download Daviteq Modbus Configuration Tool with the following link:

https://filerun.daviteq.com/wl/?id=yDOjE5d6kqFlGNVVlMdFg19Aad6aw0Hs

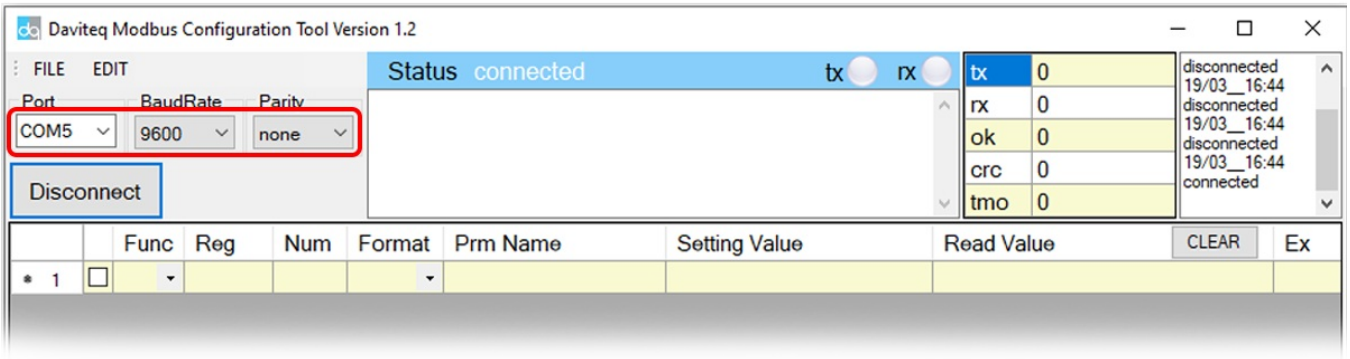
Template File: https://filerun.daviteq.com/wl/?id=pTlOMMJNK1wF9JBszKybiupqoeWapD58

How to use the Modbus configuration software

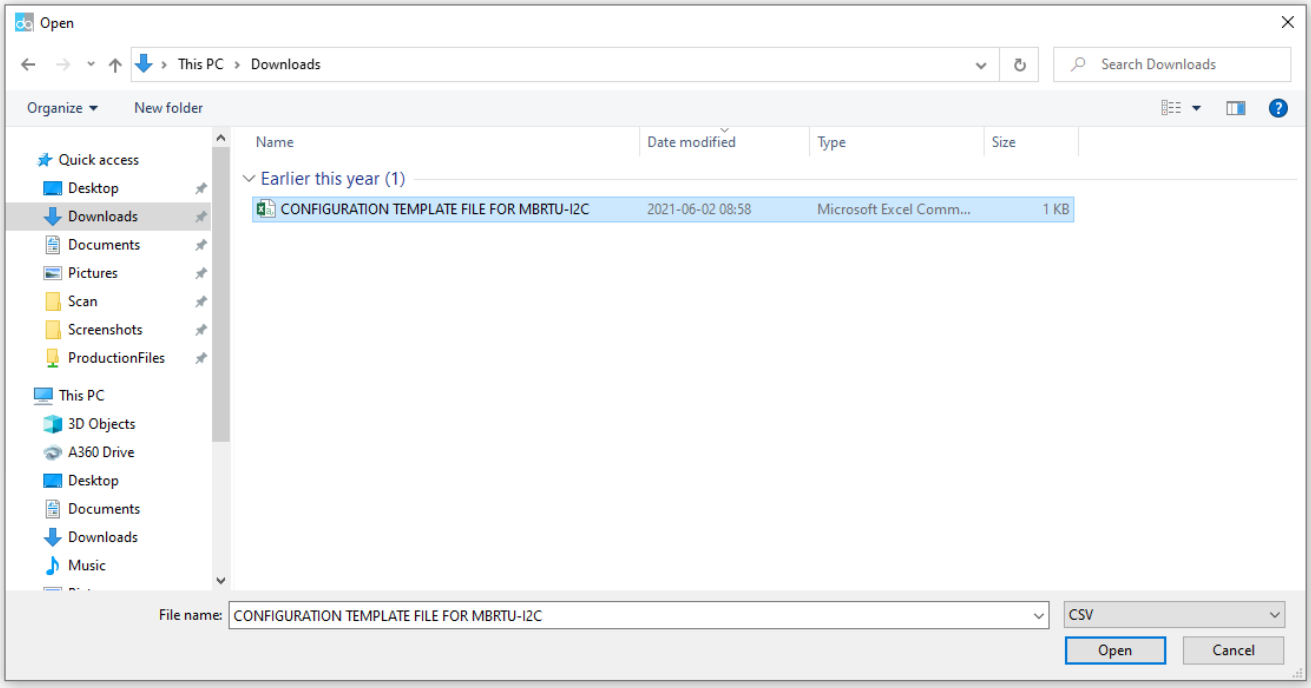
- Unzip file and run file application "Daviteq Modbus Configuration Tool Version"



- Choose **COM Port** (the Port which is USB cable plugged in)
- Set the **BaudRate: 9600**, **Parity: none**



- Click " **Connect** " untill the Status displays "**disconnected**" to "**connected**". It means the modbus sensor is being connected with computer;
- Next, we need to import the configuration file. Go to MENU:**FILE / Import New / =>** select the **template file**.



Step 3: Configure parameters of the sensor.

7.2 Memmap registers

Modbus Register (DEC)	Modbus Register (HEX)	Func Code (Read)	Func Code (Write)	# of Registers	Description	Range	Default	Format	Property	Comment
2	2	3		4	Firmware version			string	Read	
6	6	3		2	Hardware version			string	Read	
9	9	3		2	Humidity (prm1)	0..100%		float	Read	Value from sensor. This value is parameter 1 of a wireless sensor node

11	B	3		1				uint16	Read	Hi-Byte is error code, Lo-Byte is sensor type
12	C	3		2	Temperature (prm 2)			float	Read	Value from sensor. This value is parameter 2 of a wireless sensor node
14	E	3		1	Logic status of parameters			uint8	Read	Hi-Byte is Logic status of parameter 1, Lo-Byte is Logic status of parameter 2
15	F	3		2	Up-Timer 1			uint32	Read	Total time when Hi-Byte of Logic status = 1
17	11	3		2	Down-Timer 1			uint32	Read	Total time when Hi-Byte of Logic status = 0
19	13	3		2	Rising-Edge Counter 1			uint32	Read	Counter value when Hi-Byte of Logic status changes from 0 to 1
21	15	3		2	Falling-Edge Counter 1			uint32	Read	Counter value when Hi-Byte of Logic status changes from 1 to 0
23	17	3		2	Up-Timer 2			uint32	Read	Total time when Lo-Byte of Logic status = 1
25	19	3		2	Down-Timer 2			uint32	Read	Total time when Lo-Byte of Logic status = 0

27	1B	3		2	Rising-Edge Counter 2			uint32	Read	Counter value when Lo-Byte of Logic status changes from 0 to 1
29	1D	3		2	Falling-Edge Counter 2			uint32	Read	Counter value when Lo-Byte of Logic status changes from 1 to 0
256	100	3	16	1	Modbus address	1-247	1	uint16	Read/Writ	Modbus address of device
257	101	3	16	1	Modbus baudrate	0-1	0	uint16	Read/Writ	Baudrate: 0: 9600, 1: 19200
258	102	3	16	1	Modbus parity	0-2	0	uint16	Read/Writ	Parity: 0: none, 1: odd, 2: even
280	118	3	16	2	a1		1	float	Read/Writ	Scale value of parameter_ = (a1 * Raw sensor value of parameter_ + b1. For sensor value scale
282	11A	3	16	2	b1		0	float	Read/Writ	Scale value of parameter_ = (a1 * Raw sensor value of parameter_ + b1. For sensor value scale
284	11C	3	16	2	a2		1	float	Read/Writ	Scale value of parameter_ = (a2 * Raw sensor value of parameter_ + b2. For sensor value scale

286	11E	3	16	2	b2		0	float	Read/Writ	Scale value of parameter_ = (a2 * Raw sensor value of parameter_ + b2. For sensor value scale
290	122	3	16	2	High_thresho			float	Read/Writ	High threshold value for parameter 1
292	124	3	16	2	Low_threshol			float	Read/Writ	Low threshold value for parameter 1
294	126	3	16	2	High_thresho			float	Read/Writ	High threshold value for parameter 2
296	128	3	16	2	Low_threshol			float	Read/Writ	Low threshold value for parameter 2

8. Installation

8.1 Height adjustment

The flange can be moved throughout the sensor body and can be fixed with the M2 countersunk hex nut.



8.2 Accessory installation

The accessories are installed as shown



8.3 Filter

> ⚠ **Please avoid contaminating the sensor filter when installing to get the most accurate measurement**



9. Applications



10. Support contacts

Manufacturer
Daviteq Technologies Inc

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