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Innovative Electronics For You

## PV Module Temperature Transducer Operation and Installation Manual (RS-485 Modbus) (R7) Model – MBMet-803 (For HW Ver - 200)

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## 1. Temperature Transducer - Parts

Module Temperature Sensor RS-485 is shipped with the following parts

- A. PT1000 Sensor Unit (with three meters Lapp insulated cable) – 1 No (Dimension: 4x4x15 mm)
- B. PT1000 to RS-485 Transducer – 1 No
- C. Transducer extension cable – According to customer requirement
- D. Sensor cable holding cable cradles – 3 Nos.

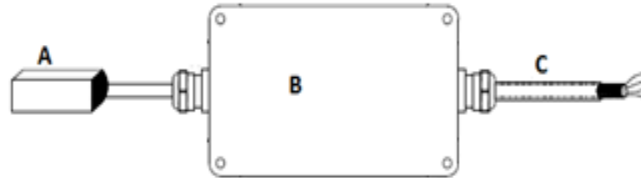


Fig 1 – PV Module Surface Temperature transducer (RS-485)

## 2. Installation of PV Module Sensor

Selection of the place of mounting the sensor is important factor for the correct temperature measurement of the photo-voltaic module. Refer figure 2 for RTD sensor installation of MBMet-803. Use the three cable cradles with cable ties to hold the sensor cable in proper position.

### Installation of PV module Sensor for MBMet-803

The sensor is to be pasted to the **back side** of the PV Module in the **center** most position of the panel. Care is to be taken so that the sensor does not fall in between two cells. As shown in the fig 2.1

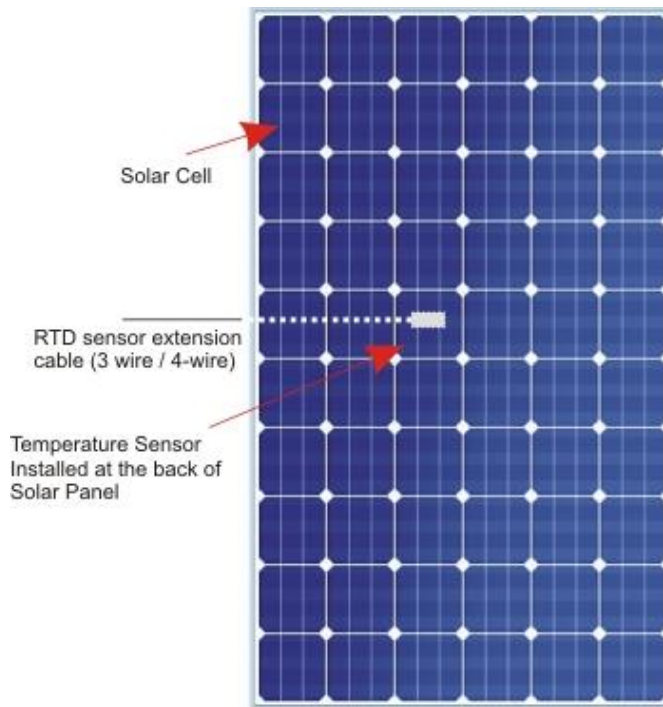


Fig 2 – Position of RTD sensor installation for MBMet-803 Model

## 3. Installation of Temperature Transmitter

The temperature transmitter is to be fixed on the solar table structure (piling).

- i) Open 4nos screws from the top cover of the temperature transmitter.
- ii) Now fix the temperature transmitter on the solar panel table (piling) with 2nos 3/16'' x 2'' round head screw provided with the shipment. As in fig 3.1

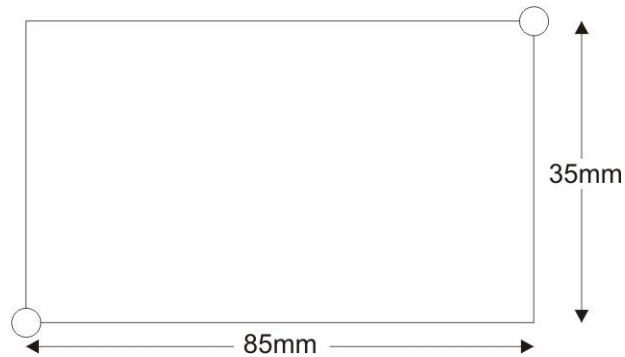


Fig 3.1 – Mounting holes dimensions details of Temperature Transmitter

- iii) Install the transmitter as per details in the picture provided below.

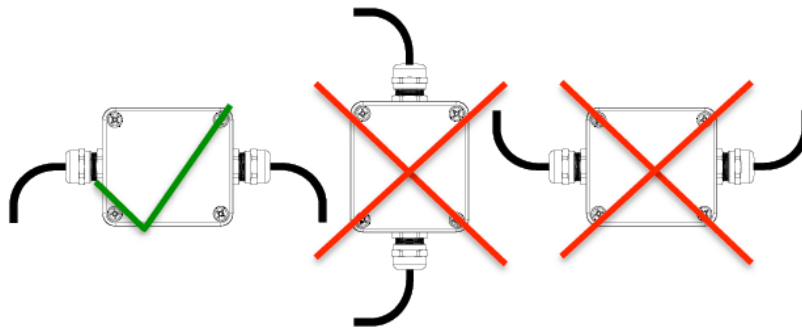


Fig 3.3 – Enclosure mounting in correct way

- iv) Fix the enclosure to the structure.

#### 4. Connection of PV Temperature Transducer

- i) Open the top cover of the transmitter.
- ii) Connect the sensor extension cable as shown in the fig4.1.

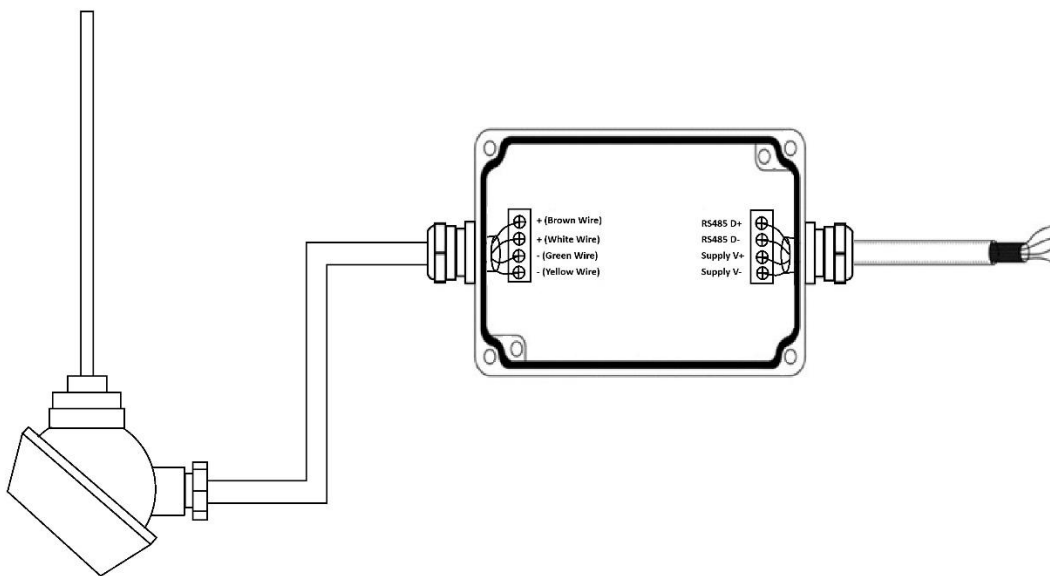


Fig- 4.1: Wiring inside the enclosure (with Silicon insulated cable)

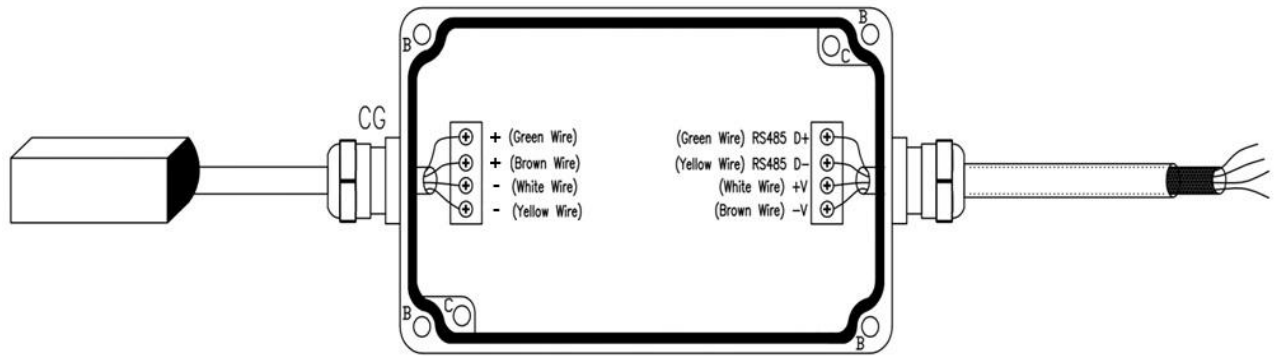


Fig- 4.2: Wiring inside the enclosure (with Lapp insulated cable)

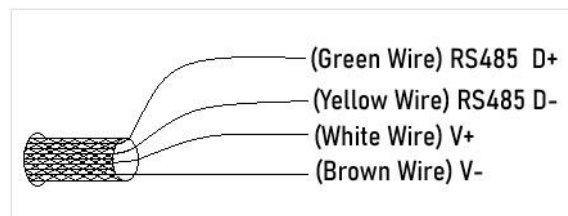


Fig 4.3 – Field wiring

## 5. PV Temperature Transducer Specifications

Model	MBMet-803
Measurement Range	-40° to +150°C
Temperature Accuracy	±0.2°C
Temperature Stability	<0.1°C per year
Sensor Element Type	RTD Class A
Sensor Cable-Length	Silicon insulated cable – 3 meters (MBMet-803) Lapp insulated cable – 3 meters (MBMet-803)
Sensor Housing	Self-Adhesive Aluminum
Self-Adhesive Tape	High Temperature Acrylic Adhesive Tape. Operating temperature tolerance up to 149°C.
Sensor Transmitter Housing	Powder Coated-Cast Aluminum, IP67
Sensor Transmitter Cable	Length : 5 meters (default), PVC insulated, 4-wire cable
Sensor Transmitter Output	Rs-485 Modbus
Power supply	10 to 30 VDC
Operating Atmospheric Temperature	-40°C to +150°C
Operating Ambient Humidity	0.1 to 99.9% RH
Sensor Standard	Meets IEC-61724-1 (2017-03) Class A

Table No: 5.1 – PV Module Temperature Transducer Specification

## 6. Modbus Addresses

	Register Address	Length (bits)	Parameter	Register Type	Parameter Type
<b>Value</b>	0	16	PV Module Temperature*	Read only	Signed Integer
	20	32	PV Module Temperature	Read only	Float
<b>Communication Parameter</b>	100	16	MODBUS ID (Default: 1) 1<ID<247	Read/Write	Unsigned Integer
	101	16	Baud rate (Default: 1) 0=4800; 1=9600; 2=19200	Read/Write	Unsigned Integer
	102	16	Parity (Default: 0) 0=None; 1=Odd; 2=Even	Read/Write	Unsigned Integer
	103	16	Stop bits (Default: 1) 1; 2	Read/Write	Unsigned Integer
	104	16	Temperature Units (Default: 0) 0 = °C; 1 = °K; 2 = °F	Read/Write	Unsigned Integer
	105	16	Save Configured parameters 1= Save **	Write only	Unsigned Integer
<b>Device Information</b>	110	16	Device Model No	Read only	Unsigned 16 Bits
	111	16	Hardware Version	Read only	Unsigned 16 Bits
	112	16	Software Version	Read only	Unsigned 16 Bits
	113	16	Manufacture Year	Read only	Unsigned 16 Bits
	114	16	Device serial number	Read only	Unsigned 16 Bits

Table No: 6.1 – Modbus Address for Temperature value in integer

\* Resolution for PV Module Temperature is 0.1°C

\*\* You must send 1 in register 105 to save the settings otherwise the settings will not be saved

Note: If any value given other than as mentioned in Table 7.1, then it will show illegal data

## 7. Re-setting Default Communication Parameter

Procedure for re-setting default communication parameters is as follows.

- Step-1: Switch On the power supply of the Transducer.
- Step-2: Open the transducer cover for gaining access to the PCB.
- Step-3: Locate the Reset Button in the PCB.

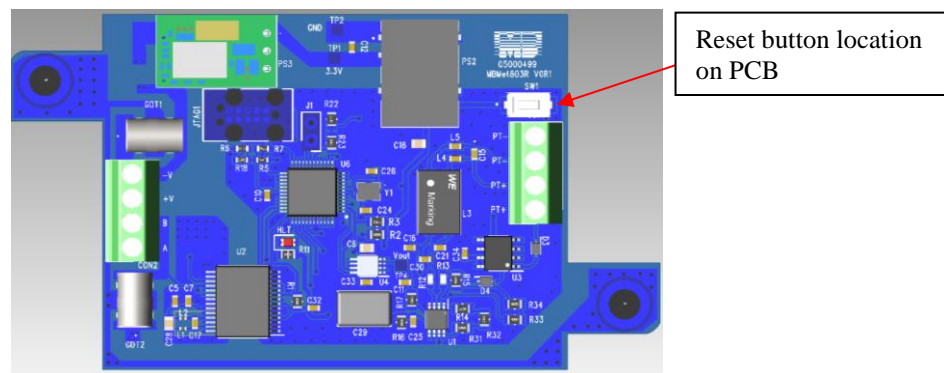


Fig- 7.4: Position of Jumper-J4 in board

- Step-5: Press the button for 15 sec and then release the button.
- Step-6: Close the transducer cover securely.

The transducer is reset to its factory settings. Now it can be communicated with default communication parameter.

## 8. Interfacing with MBSSC application

### 8.1 Installation of MBSSC application

Step-1: Click on this link to download the application file of the software.

<https://www.mbcontrol.com/mbconfig-software/>

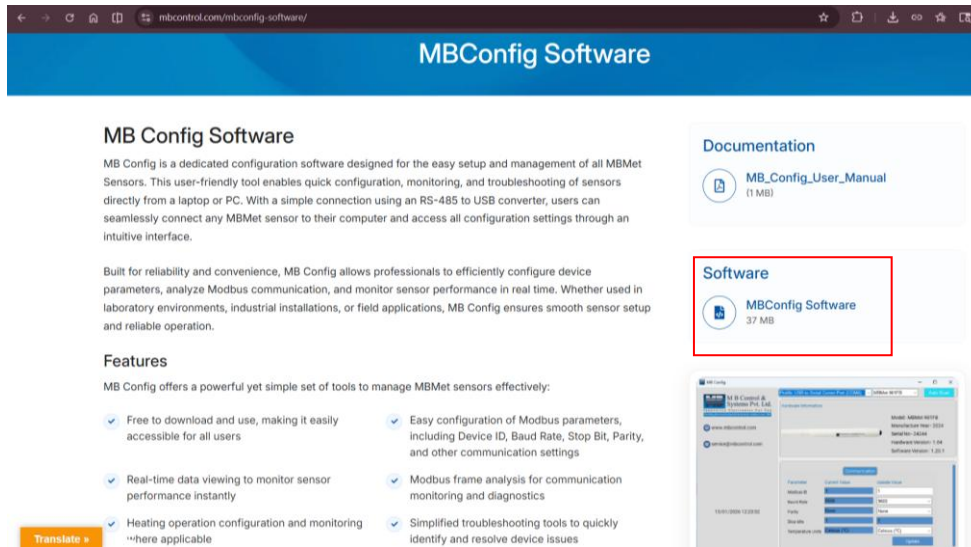


Fig – 8.1.1: Download the MBSSC application

Step-2: Double click on installation file (mbssc-1.0-win64.msi) open below windows click to next button.

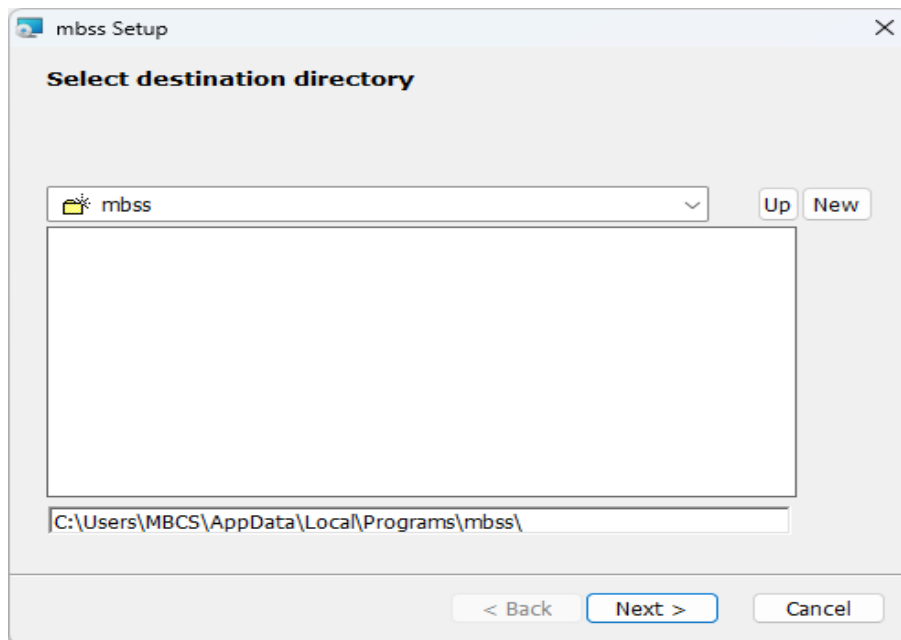


Fig – 8.1.2: Installation of MBSSC application

Step-3: After click next button installation process progress and after some time open below windows click finish button



Fig – 8.1.3: Finish Installation of MBSSC application

Step-4: After Finish MBSSC desktop icon generated and show at desktop below the icon picture.



Fig – 8.1.4: Desktop icon MBSSC application

## 8.2 Interfacing with MBSSC application

Step-1: Now double click on MBSSC icon and open below window.

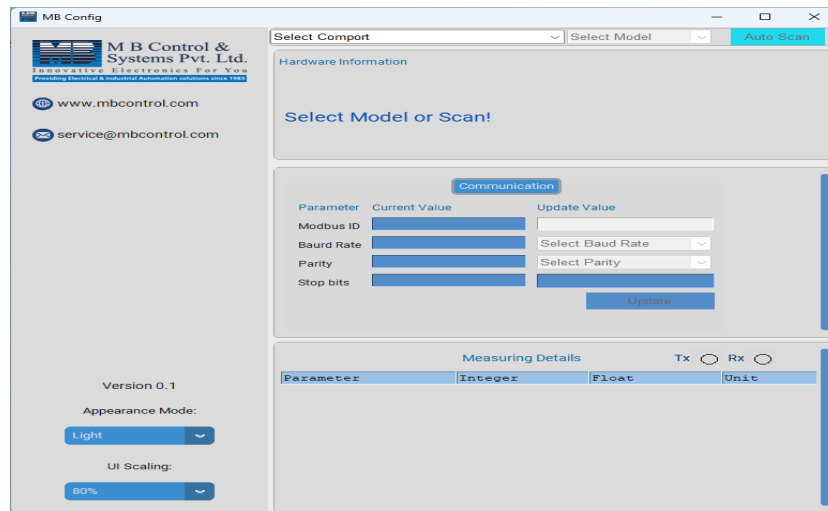


Fig – 8.2.1: User interface of MBSSC application

Step-2: There are two options for communicating with the sensor.

it mandatory to select comport first then active these two options.

1. Auto Scan
2. Select Model

If use Select Model then show the below screen and select model which connected your PC or Auto Scan.

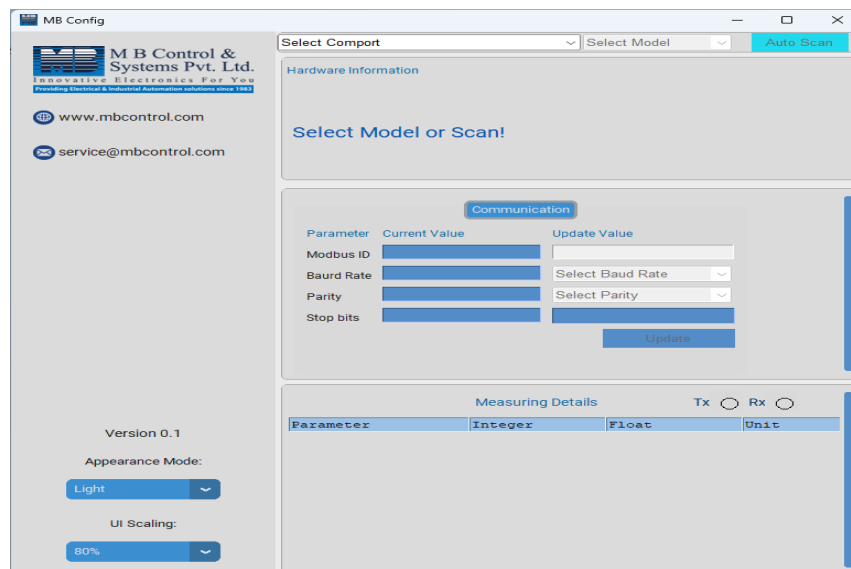


Fig-8.2.2: Sensor model selection

Step-3: After Auto Scan or Select Model this below screen will appear. (Refer figure 8.2.3)

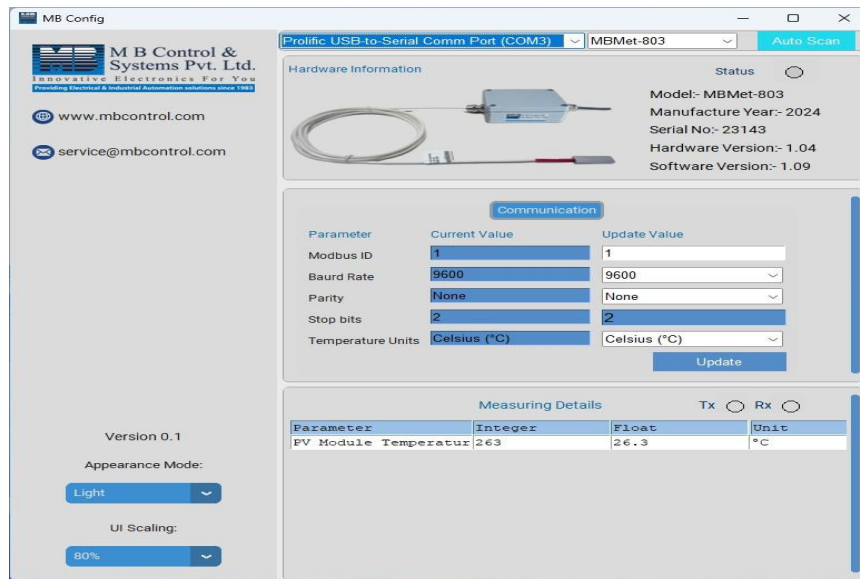


Fig-8.2.3: Sensor connected with the application