

**TM3-485 and TM4-485®**  
**USER MANUAL**  
hw rev. 98.00.00.07



**GENERAL DESCRIPTION**

Temmeter-485 (TM3-485 ® and TM4-485 ) are 2 converters from temperature sensor to RS485 Modbus output. TM3-485 convert values read from any PT100/PT1000 to RS485 Modbus through a dedicated 16 bit converter. TM4-485 convert values read from a Silicon Sensor encapsulated and distributed by us, to RS485 Modbus. Both converters can be used where thermopile pyranometers without a socket for the module's temperature sensors are used, so they are a suitable complement for those using a thermopile pyranometer. Both models have 2 input channel for temperature measurements.

<b>TM 4-485</b>		<b>TM 3-485</b>	
Convertor from our Silicon Temp.Sensor to RS485		Convertor from any PTC to RS485	
		Reference standard IEC 60751	
The converter is compatible with Smartlogger 3000, Sungrow Ermes, Higecco			
<b>Measured Value</b>	Sensor 1 <b>-30 ÷ +85 °C toll. ± 3 °C</b>	<b>Measured Value</b>	Sensor 1 <b>-40 ÷ +110 °C toll. ± 0.2 °C</b>
	Sensor 2 <b>-30 ÷ +85 °C toll. ± 3 °C</b>		Sensor 2 <b>-30 ÷ +110 °C toll. ± 0.2 °C</b>
<b>Temperature Sensor</b>	Silicon Sensor TM4 resolution	<b>Temperature Sensor</b>	Any PT100 or PT1000 at 2-3-4 wires resolution
<b>Precision of the T. sensor</b>	± 2.2°C	<b>Precision of the T. sensor</b>	Depending by the PTC. With TM3 prec.± 0.15°C
<b>Precision of converter</b>	<b>0.1° C</b>		
<b>Precision Overall</b>	± 2.2°C	<b>Precision Overall</b>	± 0.2°C
<b>Calibration</b>	Each TM4 is made by a T.I, Instrument sensor factory calibrated	<b>Calibration</b>	with 2 reference points using precision reference resistances.
<b>Output</b>	Serial: RS485, standard Modbus RTU protocol distance-covered (signal) : atleast 600 m		
<b>Non-linearity</b>	<b>≤0.3%</b>		
<b>Supply voltage</b>	8 – 30 V dc consumption <0,06A Protected against reverse polarity and overvoltage		
<b>Consumption (@ 12V)</b>	<b>0.1 W</b>		
<b>Encapsulation</b>	Resin conformal coating		
<b>Casing</b>	IP67 – Coated grey Aluminium		
<b>Connector</b>	INPUT: M 12 – 8 Pin FEMALE OUTPUT: M8 4 Pin MALE		
<b>Dimensions</b>	97x64x34 mm		
<b>Operating temperature</b>	-40 ÷ 125 °C toll. ± 0.2° C		
<b>Box Working temperature</b>	(-30 ÷ +85 °C)		
<b>Operating humidity</b>	0 ÷ 95% RH		
<b>Weight</b>	200 gr		

<b>PRODUCTION BATCH DETAILS:</b>	
- Date:.....	Operator: .....
- S/N:.....	Modbus Node: .....

## ELECTRICAL INSTALLATION

### WIRINGS

From Converter to Datalogger

Connector Output	M8 Male
# pin	Description
1	RS485+/B, non inverting bus line RS485
2	Power supply +7,5 ÷ 28Vdc
3	RS485-/A, inverting bus line RS485
4	Common (0V)

Tab. 1

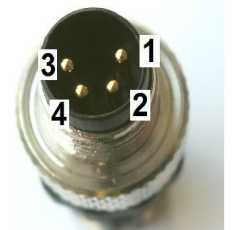


Fig. 3 Front male connector

figure 3 shows the male connector already mounted on our converter

From Temperature probe to Converter there is a M12 8 pins First 4 pin as are reserved for 1st temperature probe, the others for the 2nd temperature probe. A 3 way connector grant waterproof in case 2 temperature probes are connected.

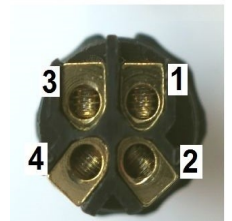
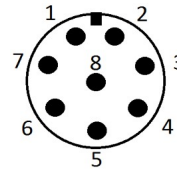


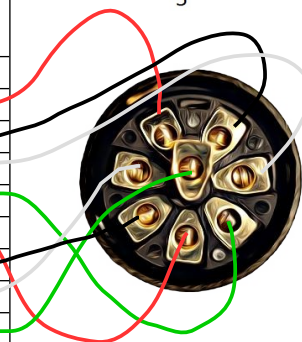
Fig. 4 Back female connector

From Temperature Probe to Converter



Connector Input	M12 male 8 pins	
# pin	TM4-485	TM3-485
1	Sensor 1 – + V	Sensor 1 – Pin 1 (RED)
2	Sensor 1 –	Sensor 1 – Pin 1 (BLACK)
3	Sensor 1 – GND	Sensor 1 – Pin 2 (WHITE)
4	Sensor 1 – Signal	Sensor 1 – Pin 2 (GREEN)
5	Sensor 2 – + V	Sensor 2 – Pin 1 (RED)
6	Sensor 2 –	Sensor 2 – Pin 1 (BLACK)
7	Sensor 2 – GND	Sensor 2 – Pin 2 (WHITE)
8	Sensor 2 – Signal	Sensor 2 – Pin 2 (GREEN)

Tab.

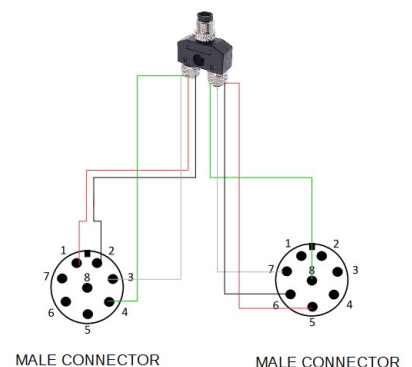


M12 8pin male connector

**A 3 way connector grant waterproof in case 2 temperature probes are connected.**

**Connection:** for enduring wiring **we recommend the use of lacque after done the wiring connections.**

Data is accessible through registers read via Modbus. Below is the map of accessible logs in this release



Function Code	Description
0x03	READ HOLDING REGISTERS
0x04	READ INPUT REGISTERS
0x06	WRITE SINGLE REGISTER
0x10	WRITE MULTIPLE REGISTERS

Modbus is a Master-Slave protocol, widely used as an industry standard. Simple, efficient and reliable.

Please note that in the current implementation of TM3-485 or TM4-485 Pro function codes 0x03 and 0x04 are equivalent and address the same data area.

Data is accessible through Modbus's functions by 16 bits units called "registers". In the current implementation of TM4-485 are available in these registers:

### TM3-485 and TM4-485: register map

Register #(HEXA)	Description	Access	NV save																		
0x0101	Probe 1 temperature x 10 [°C]	R																			
0x0103	Probe1 Status  <table border="1"> <thead> <tr> <th>Val. (DEC)</th> <th>TM 3-485</th> <th>TM 4-485</th> </tr> </thead> <tbody> <tr> <td>016</td> <td>When PT100/PT1000 =&gt; Probe 1 is Open</td> <td>0x5858 LM61 connected</td> </tr> <tr> <td>017</td> <td>When PT100/PT1000 =&gt; Probe 1 is Normal</td> <td></td> </tr> <tr> <td>031</td> <td>When PT100/PT1000 =&gt; Probe 1 is Short</td> <td></td> </tr> </tbody> </table>	Val. (DEC)	TM 3-485	TM 4-485	016	When PT100/PT1000 => Probe 1 is Open	0x5858 LM61 connected	017	When PT100/PT1000 => Probe 1 is Normal		031	When PT100/PT1000 => Probe 1 is Short									
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10104	4 Pin – PT100																				
11002	2 Pin – PT1000																				
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11004	4 Pin – PT1000																				
0x0102	Probe 2 temperature x 10 [°C]	R																			
0x0104	Probe2 Status  <table border="1"> <thead> <tr> <th>Val. (DEC)</th> <th>TM 3-485</th> <th>TM 4-485</th> </tr> </thead> <tbody> <tr> <td>032</td> <td>When PT100/PT1000 =&gt; Probe 2 is Open</td> <td>0x5858 LM61 connected</td> </tr> <tr> <td>033</td> <td>When PT100/PT1000 =&gt; Probe 2 is Normal</td> <td></td> </tr> <tr> <td>047</td> <td>When PT100/PT1000 =&gt; Probe 2 is Short</td> <td></td> </tr> </tbody> </table>	Val. (DEC)	TM 3-485	TM 4-485	032	When PT100/PT1000 => Probe 2 is Open	0x5858 LM61 connected	033	When PT100/PT1000 => Probe 2 is Normal		047	When PT100/PT1000 => Probe 2 is Short									
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	20104	4 Pin – PT100		
	21002	2 Pin – PT1000		
	21003	3 Pin – PT1000		
	21004	4 Pin – PT1000		
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 ÷ 247, decimal, default 1		R/W	
0x8006	Bitrate, coded, range 0 ÷ 4, decimal, default 1 0 – 9600 bps 1 – 19200 bps 2 – 38400 bps 3 – 57600 bps 4 – 115200 bps		R/W	
0x8007	Serial configuration, coded, range 0 ÷ 3, decimal, default 0 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 / 2 stop bit)		R/W	
0x8008	Serial reply delay [ms], range 0 ÷ 100, decimal, default 1		R/W	

## CALIBRATION

We recommend sending it to the manufacturer for calibration verification in the presence of anomalous readings.

## CONTACT US

Further information on the device can be found at the site:

<https://soluzionesolare.com/products/>

For technical assistance contact:

[support@soluzionesolare.it](mailto:support@soluzionesolare.it)

## Soluzione Solare Srl

Tel. +39.0444.530234- Fax +39.0444.1830563 – VI – Italy

### PART LIST

- TM Sensor
- M12 4 pin female connector
- user manual

For more product information and best practice services scan the qr code below.



For the disposal of the products contact us





DICHIARAZIONE CE DI CONFORMITA'  
CE DECLARATION OF CONFORMITY

Il costruttore/ *The manufacturer:*

**Soluzione Solare Srl**  
Via R. Berica, 621 – 36100 – Vicenza (VI) - Italia

Dichiara sotto la propria responsabilità che i prodotti:  
*declares under our sole responsibility that the product:*

**TEMMETER 3-485 , TEMMETER 4-485**

al quale si riferisce questa dichiarazione, sono conformi alle norme europee armonizzate come pubblicato nella Gazzetta Ufficiale della CE, basato sul seguente standard:  
*to which this declaration relates, is in conformity with European Harmonised Standards as published in the Official Journal of the EC, based on the following standard:*

[EMC – Emissions] EN 61000-6-3:2021;  
[EMC – Immunity] EN 61000-6-2:2019;  
EN 50581

seguendo la disposizione:

*following the provision:*

EMC-directive 2014/30/EC


EMC-directive 2014/30/EC

EMC-directive 2011/65/EC

Vicenza, 30 November 2021

Il legale rappresentante

*Legal representative*

  
A. Calatroni