

**GENERAL DESCRIPTION**

TPC-485 (labelled with PT100<sup>®</sup> and LM61) are 2 converters from temperature sensor to RS485 Modbus output. One converts values read from any PT100/PT1000 to RS485 Modbus through a dedicated 16 bit converter. The other converts 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 channels for temperature measurements.

TPC LED-485 labelled with LM 61		TPC LED-485 labelled with PT100	
Convertor from our Silicon Temp.Sensor to RS485		Converter from any PTC to RS485	
		Reference standard IEC 60751	
The converter is compatible with Smartlogger 3000, Sungrow Ermes, Higeo			
<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 TPC 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 TPC 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 TPC labelled with LM61 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 – UV resistant ASA		
<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

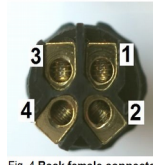


Fig. 4 Back female connector

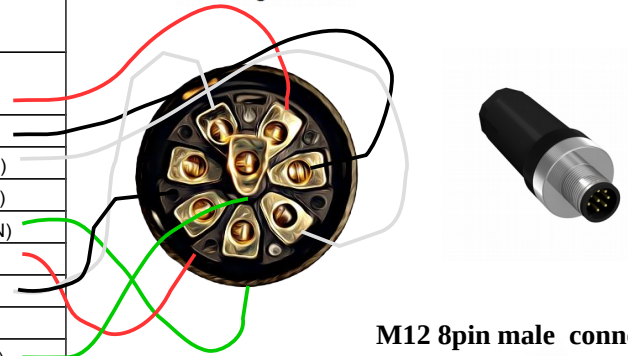
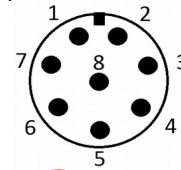
figure 3 shows the male connector already mounted on our converter

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.

From Temperature Probe to Converter

Connector Input	M12 male 8 pins	
# pin	TPC-485 labelled with LM61	TPC-485 labelled with PT100
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)

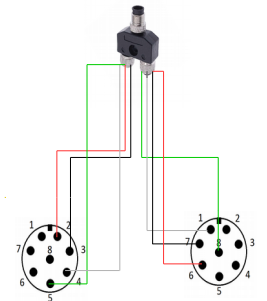
Tab.



M12 8pin male connector

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

**Connection:** for durable wiring we recommend the use of lacquer after wires connections.



MALE CONNECTOR MALE CONNECTOR

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 TPC-485 labelled with PT100 or TPC-485 labelled with LM61 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 TPC-485 labelled with LM61 are available in these registers:

### TPC-485: register map




Register #(HEXA)	Description	Access	NV save
0x0101	Probe 1 temperature x 10 [°C]	R	

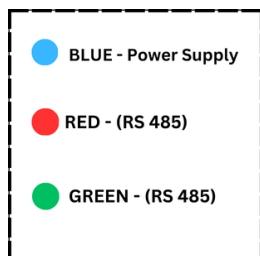
0x0103	<p>Probe1 Status</p> <table border="1"> <thead> <tr> <th>Val. (DEC)</th> <th>TPC-485 labelled with PT100</th> <th>TPC-485 labelled with LM61</th> </tr> </thead> <tbody> <tr> <td>016</td> <td>When PT100/PT1000 =&gt; Probe 1 is Open</td> <td>0x5858 LM61 connected</td> </tr> <tr> <td>017</td> <td>When 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)	TPC-485 labelled with PT100	TPC-485 labelled with LM61	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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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	<p>Bitrate, coded, range 0 ÷ 4, decimal, default 1</p> <p>0 – 9600 bps 1 – 19200 bps 2 – 38400 bps 3 – 57600 bps 4 – 115200 bps</p>	R/W																			
0x8007	<p>Serial configuration, coded, range 0 ÷ 3, decimal, default 0</p> <p>0 – 8N1 (8 bit / no parity / 1 stop bit)</p>	R/W																			

	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)		
0x8008	Serial reply delay [ms], range 0 ÷ 100, decimal, default 1	R/W	

			
GoodWe EZLogger-Smx-485	Huawei SmartLogger 1000/2000/3000	SMA Data Manager M	Sungrow COM100

## DIAGNOSTICS

Color Code	Pulsating time interval	Description
 BLUE	3s Pulsating interval	Supply voltage is in range 10 – 30Vcc and sensor core is active
	No light	Sunmeter 2 is not operating
 RED	Pulsating at certain interval period	This pulsating occurs when data is received from the datalogger  Note : The request from datalogger can be at different speed and parity
	No Light	No request received
 GREEN	Pulsating at certain interval period	This pulsating occurs when data is requested from the datalogger at a matching speed, parity and node address; Sunmeter 2 respond and transmits data to datalogger
Data display on the datalogger/PC		The nodes by TX are matching Sunmeter



### Timing on options:

1. 10 min
2. 40 min[default]
3. 8h
4. Always on

## 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

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## PART LIST

- TM Sensor
- M8 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

