

# LITEMETER LM2-485 PRO®

## USER MANUAL

hw rev. LM3485



### GENERAL DESCRIPTION

The LITEMETER LM2-485 is a solar irradiance sensor with strictly selected electronic components to ensure maximum precision also along temperature changes.

This sensor has RS485 bus interface with the well known industry standard protocol Modbus RTU.

### FEATURES

#### Measurements:

irradiance range: 0 ÷ 1250 W/m<sup>2</sup>

#### Outputs

serial: RS485, standard Modbus RTU protocol

#### Output resolution:

1W/m<sup>2</sup>

#### Output precision:

irradiance: ± 5% (2.5% @S.T.C. (25°C))  
cell temperature ± 1°C

#### Non-stability:

<3% year

#### Non-linearity (0 to 1000 W/m<sup>2</sup>):

≤0.5% (@S.T.C. (25°C))

#### Working temperature:

-30 ÷ +85 °C

#### Supply:

12 ÷ 30Vdc (see scheme on page 2)

#### Power consumption maximum:

85 mW

#### Encapsulation:

small microprismatic glass for photovoltaic modules and E.V.A

#### Case:

or

anodized aluminium with stainless steel screw-clamp to fix it on modules montage profile

#### Wiring:

60 cm or 3m cable cable Ø 4.9 mm, conductors 4x 0,25mm<sup>2</sup>, UV and high temperature resistant

#### Connectors:

4 + 1 GND loose pins ( or M8 4 pin)

#### Dimensions:

98x55x25 mm, with mounting bracket 112x55x66 mm

### PIECE'S LIST

- Instrument with cable
- Aluminium fastening clamp
- Mounting screw for the fastening clamp
- Fixing screw fastening clamp-profile/modules

### CALIBRATION:

- Date:..... Operator: .....

- S/N:..... Modbus Node: .....



**Important : the case presents a hole with a diameter of a few mm, this hole is terminated by a transpiring membrane whose purpose is the barometric compensation to avoid condensation.  
**DON'T PERFORATE. WARRANTY VOID IF REMOVED OR PERFORATED.****

**MECHANICAL FASTENING**

insert the solar sensor with its fastening clamp to the chosen frame of a PV module representative of the PV installation as shown in figure 1. Screw the below bolt of clamp with a wrench until it appear stable.

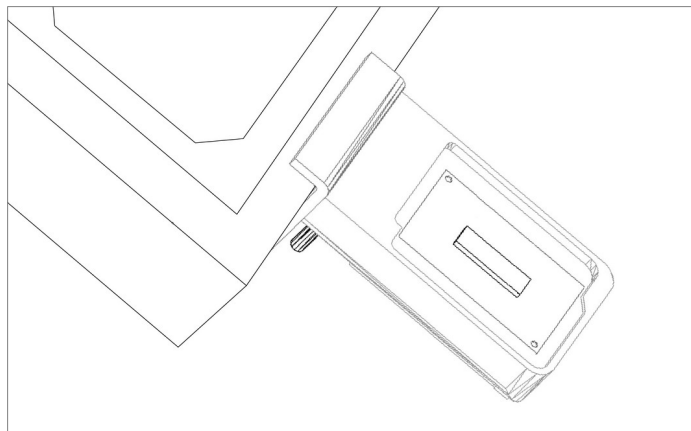


Fig. 1

**CONNECTIONS**

See table1 below. Once connected the irradiance values comes out instantly

#	Cable & TIP colour	Description
1	Red-White TIP	Power supply +12 ÷ 30Vdc
2	<b>Black-White TIP</b>	Power supply / Signal 0 Vdc
3	Green-White TIP	RS485+/B, communication bus non inverting signal
4	Green/White-White TIP	RS485-/A, communication bus inverting bus signal
5	<b>Black-Blue TIP</b>	GND Ground

Tab. 1

**Cabling:** to get optimum *sliding* of the cable in wiring, we highly recommend use of *sliding products*.

Data is accessible through Modbus’s functions by 16 bits units called “registers”. In the current implementation of LM2-485 these registers are available:

Register hex	Register dec	Description	Access	NV save																
<b>0x0101</b>	<b>257</b>	<b>Current irradiance level</b> [W/m <sup>2</sup> ],	R																	
<b>0x8802</b>	<b>34818</b>	<b>Current cell temperature</b> [°C], 2-complent value, fixed point 14.2 format (14 bits integer, 2 bits fractional)	R																	
<b>0x0103</b>	<b>259</b>	<b>Status</b> , bit coded <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Bit</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Factory calibration/configuration 1 = OK; 0 = need recalibration</td> </tr> <tr> <td>1</td> <td>Not volatile parameters 1 = OK; 0 = default loaded, need to be changed/saved</td> </tr> <tr> <td>2</td> <td>Not used</td> </tr> <tr> <td>3</td> <td>Not used</td> </tr> <tr> <td>4</td> <td>Not used</td> </tr> <tr> <td>5</td> <td>Watchdog 1 = reset by watchdog timeout occurred; 0 = normal operation</td> </tr> <tr> <td colspan="2">all undefined bits read as 0</td> </tr> </tbody> </table>	Bit	Description	0	Factory calibration/configuration 1 = OK; 0 = need recalibration	1	Not volatile parameters 1 = OK; 0 = default loaded, need to be changed/saved	2	Not used	3	Not used	4	Not used	5	Watchdog 1 = reset by watchdog timeout occurred; 0 = normal operation	all undefined bits read as 0		R	
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<b>0x8001</b>	<b>32769</b>	<b>Serial number</b> , least significant word	R																	
<b>0x8002</b>	<b>32770</b>	<b>Serial number</b> , most significant word	R																	
<b>0x8003</b>	<b>32771</b>	<b>Firmware main version</b> , hexadecimal	R																	
<b>0x8004</b>	<b>32772</b>	<b>Firmware minor version</b> , hexadecimal	R																	



<b>0x8005</b>	<b>37773</b>	<b>Node address</b> , range 1 ÷ 247, decimal, <b>default 60</b>	R/ W	Y
<b>0x8006</b>	<b>32774</b>	<b>Bitrate</b> , coded, range 0 ÷ 4, decimal, <b>default 1</b> 0 – 9600 bps 1 – 19200 bps 2 – 38400 bps 3 – 57600 bps 4 – 115200 bps	R/ W	Y
<b>0x8007</b>	<b>32775</b>	<b>Serial configuration</b> , coded, range 0 ÷ 3, decimal, <b>default 0</b> 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	Y
<b>0x8008</b>	<b>32776</b>	<b>Serial reply delay [ms]</b> , range 0 ÷ 100, decimal, <b>default 1</b>	R/ W	Y
<b>0x8101</b>	<b>33025</b>	<b>Not volatile params save command</b> , write 1 to execute (then wait 1 s before to send next message)	W	
<b>0x8102</b>	<b>33026</b>	<b>Software reset command</b> , write 1 to execute (then wait 6 s before to send next message)	W	

### CALIBRATION

It is recommended to send to factory for verify calibration after 2 years of outdoor work.

Some “inclusions” may be present and clearly visible into the protective encapsulation resin. This is due to the resin coating process and do not affect overall performance and/or accuracy.

### CONTACTS

Other Information about our solar devices are available at:

<https://soluzionesolare.it/prodotti/>

For technical support, contact:

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