

# LITEMETER LM5-485 PRO®

## USER MANUAL

FW ver. 96.01-00.20 / HW rev. LM5-485



### GENERAL DESCRIPTION

The LITEMETER LM5-485 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 ÷ 1600 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:

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

#### Wiring:

60 cm or 2,5 m 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

### PIECES 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: .....



## 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.

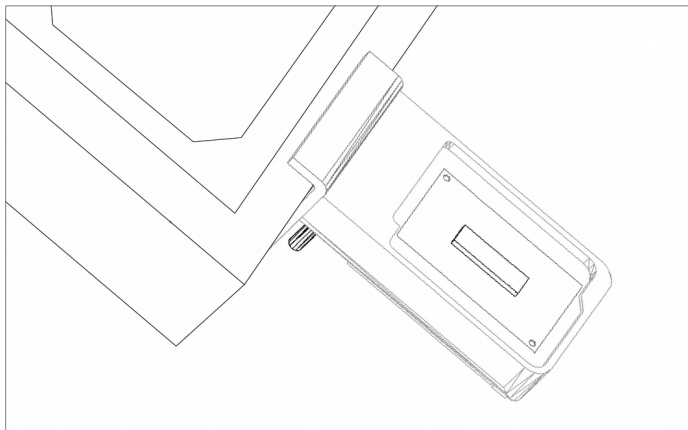


Fig. 1

## CONNECTIONS

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

Cable & TIP colour	Description
Red-White TIP	Power supply +12 ÷ 30Vdc
<b>Black-White TIP</b>	Power supply / Signal 0 Vdc
Green-White TIP	RS485+/B, communication bus non inverting signal
Green/White-White TIP	RS485-/A, communication bus inverting bus signal
<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 LM5-485 these registers are available:

Register hex	Register dec	Description	Access	NV save
<b>0x0101</b>	<b>256</b>	<b>Current irradiance level</b> [W/m <sup>2</sup> ],	R	
<b>0x0102</b>	<b>257</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>258</b>	<b>Status</b> , bit coded	R	
		<b>Bit</b>   <b>Description</b>		
		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		
<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>32773</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	R/ W	Y



		2 – 38400 bps 3 – 57600 bps 4 – 115200 bps		
<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

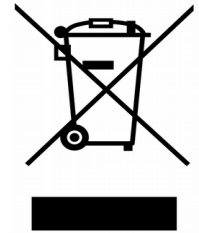
It is recommended to send to factory for verify calibration after 2 years of outdoor work.

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

## CONTACTS

Other Information about our solar devices are available at:  
<https://soluzionesolare.it/prodotti/>

For technical support and waste recycling, contact:  
[support@soluzionesolare.it](mailto:support@soluzionesolare.it)



Do not disperse in the environment

## Soluzione Solare

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Scan the QR code for  
LiteMeter Pro best practice manual





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:*

**LM5-485 PRO**

al quale si riferisce questa dichiarazione, è conforme 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:*

IEC60904-2, IEC60904-4;  
IEC60904-10; EN 50581

Vicenza, 24 January 2020

Il legale rappresentante

*Legal representative*

A handwritten signature in black ink, appearing to read "A. Calatroni", written over a light blue horizontal line.

A. Calatroni

