

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: $0 \div 1600 \text{ W/m}^2$

Outputs

serial: RS485, standard Modbus RTU protocol

Output resolution:

1 W/m^2

Output precision:

irradiance: $\pm 5\%$ (2.5% @S.T.C. (25°C))

cell temperature $\pm 1^\circ\text{C}$

Non-stability:

<3% year

Non-linearity (0 to 1000 W/m2):

$\leq 0.5\%$ (@S.T.C. (25°C))

Working temperature:

$-30 \div +85^\circ\text{C}$

Supply:

$12 \div 30 \text{ Vdc}$ (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 3m cable cable Ø 4.9 mm, conductors 4x 0,25mm², 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.

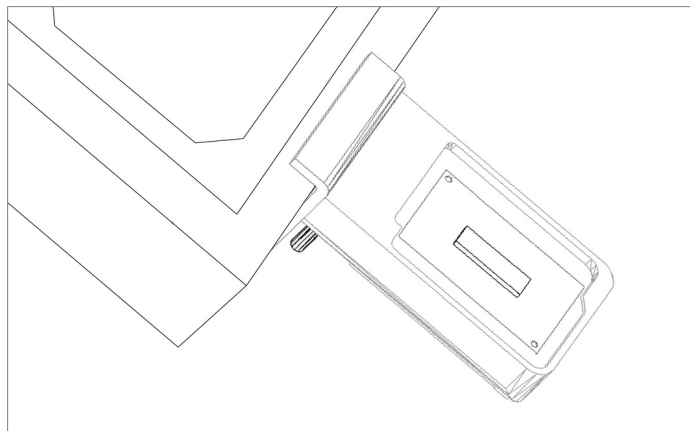


Fig. 1

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	Black-White TIP	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	Black-Blue TIP	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
0x0101	256	Current irradiance level [W/m²],	R	
0x0102	257	Current cell temperature [°C], 2-complent value, fixed point 14.2 format (14 bits integer, 2 bits fractional)	R	
0x0103	258	Status, bit coded	R	
		BitDescription		
		0Factory calibration/configuration 1 = OK; 0 = need recalibration		
		1Not volatile parameters 1 = OK; 0 = default loaded, need to be changed/saved		
		2Not used		
		3Not used		
		4Not used		
		5Watchdog 1 = reset by watchdog timeout occurred; 0 = normal operation		
		all undefined bits read as 0		
0x8001	32769	Serial number, least significant word	R	
0x8002	32770	Serial number, most significant word	R	
0x8003	32771	Firmware main version, hexadecimal	R	
0x8004	32772	Firmware minor version, hexadecimal	R	

0x8005	37773	Node address , range 1 ÷ 247, decimal, default 60	R/ W	Y
0x8006	32774	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	Y
0x8007	32775	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	Y
0x8008	32776	Serial reply delay [ms], range 0 ÷ 100, decimal, default 1	R/ W	Y
0x8101	33025	Not volatile params save command , write 1 to execute (then wait 1 s before to send next message)	W	
0x8102	33026	Software reset command , 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.

CONTACTS

For technical support, contact us:

assistenza@itsensor.it



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:*

IEC 61215, 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 "Andrea Calatroni".
A. Calatroni

