

PYRANOMETER PYRA-485®

USER MANUAL

hw rev. LM4485

GENERAL DESCRIPTION

PYR1-485 and PYR2-485 are ISO 9060:2018 CLASS B (First Class) and CLASS C (Second Class) pyranometers respectively, with RS485 bus interface with the well known industry standard protocol Modbus RTU.

FEATURES

Measurements:

spectral range:

input irradiance range:

Response time:

Temperature response:

Zero offset

Thermal radiation (at 200 W/m²)

Temperature change (5 k/h)

Resolution

Smallest detectable change

PYR1-485

< 20 sec

< ± 2 % (-10 to +40°C)

<14 W/m²

<± 3

PYR2-485

300 ÷ 2900nm

0 ÷ 1600 W/m²

<25 sec

< ± 5 % (-10 to +40°C)

<20 W/m²

<± 6 W/m²

Irradiance: ± 1 W/m²

Inclination: 0.1°

Outputs

serial:

RS485, standard Modbus RTU protocol

Output resolution:

1 W/m²

Output precision:

Tilt response (0 ÷ 90°):

Temp. Response (Δt = 50K)

< ± 2%

< 4%

< ± 4%

< 8%

Working temperature:

-40 ÷ +80 °C

Supply:

9 ÷ 30 Vdc protected against short circuit

Encapsulation:

Quartz [k5]

Special glass transparent to:

Double glass dome

Single glass dome

0,3 ÷ 3,0 μm

0,3 ÷ 3,0 μm

Case:

Anodized aluminum

Connectors:

standard M8 4 pin female

Dimensions:

Φ 162 x h 104 mm

PIECE'S LIST

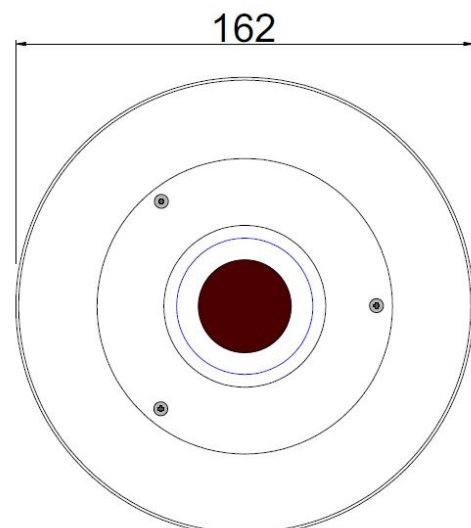
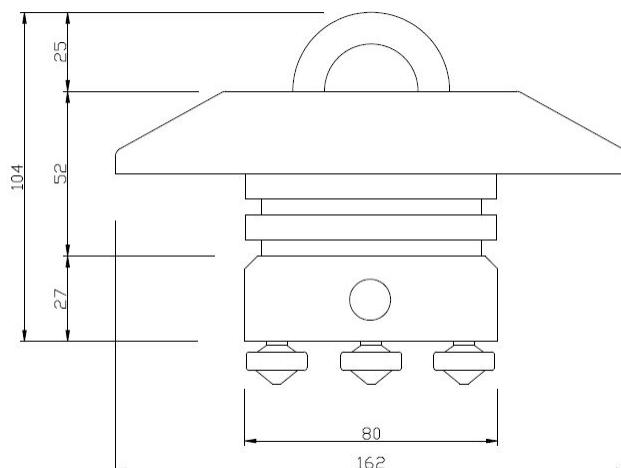
- Pyranometer with sun screen
- M8 4pin male connector
- Instruction sheet
- Calibration Report

CALIBRATION:

Date:..... Operator:

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

DIMENSIONS



CONNECTIONS

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

# pin	SolSol Cable Color	Description
1	Green	RS485+/B, communication bus non inverting bus signal
2	Red	Power supply 12 ÷ 30Vdc
3	Green/White	RS485-/A, communication bus inverting bus signal
4	Black	Power supply / 0 Vdc

Fig.1 has correspondence with the rear side where you have to connect wires

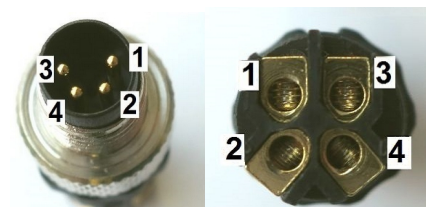


Fig.1 Front and back view of male connector

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

Register hex	Register dec	Description	Access	NV save	
0x0101	257	Current irradiance level [W/m ²]	R		
0x8802	34818	Current body temperature [°C], 2-complent value, fixed point 14.2 format (14 bits integer, 2 bits fractional)	R		
0x0103	259	Status, bit coded	R		
		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
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 1	R/W	Y	
0x8006	32774	Bitrate, coded, range 0 ÷ 4, decimal, default 1	R/W	Y	
		0 – 9600 bps			
		1 – 19200 bps			
		2 – 38400 bps			
		3 – 57600 bps			
	4 – 115200 bps				
0x8007	32775	Serial configuration, coded, range 0 ÷ 3, decimal, default 0	R/W	Y	
		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)			
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 verifying calibration after 2 years of outdoor work.

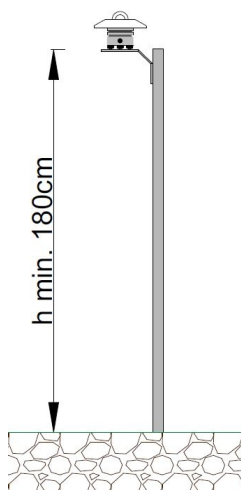
MAINTENANCE

Reading is reduced if the dome is not clean.

1. Keep the dome clean using water or alcohol.
2. Keep instrument levelled.
3. Recalibrate every 2 years.

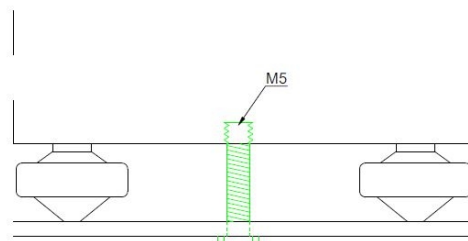
INSTALLATION

It is recommended to install the product at a minimum height of 180cm above the ground.



There are the following **fixing types**:

- With M5 screw on flat bases;
- Bracket on pole;
- Inclinal bracket in degrees



M5 screw on flat bases

*screw's thread must be 0,4cm + distance between the pyranometer and the base. (approx. 1,5 - 1,8 cm long.)

USER INFORMATION

Read this document carefully before installation.

Warranty is 2 years from date of invoice, subject to correct installation and use. Soluzione Solare accepts no liability for any loss or damage arising from incorrect use of the product. This device conforms to the EU 'CE' guideline 89/336/EEC. Unauthorised modifications may void the warranty and CE validity. Visit our website for the latest product support information.

CONTACTS

For technical support, please send an email: assistenza@itsensor.it



DICHIARAZIONE DI CONFORMITÀ ISO 9060
ISO 9060 COMPLIANCE STATEMENT

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

PYRA-420, PYRA-485

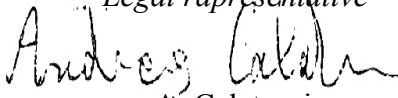
al quale si riferisce questa dichiarazione, è conforme alle norme europee armonizzate
come pubblicato nella Gazzetta Ufficiale della CE, basato sul seguente standard:
*to which this declaration relates, is in conformity with European Harmonised Standards
as published in the Official Journal of the EC,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

ISO 9060

[Solar energy – Specification and classification of instruments for measuring hemispherical solar and direct solar radiation]

Vicenza, 1 January 2019

Il legale rappresentante
Legal representative


A. Calatroni