



Bio Instruments S.R.L.

SENSORS AND SYSTEMS
FOR MONITORING GROWING PLANTS

PIR-1M

Quantum (PAR) Sensor



Introduction

The PIR-1M Quantum Sensor measures Photosynthetic Photon Flux (PPF) in $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$. The sensor is cosine-corrected, and has a domed diffusion disk and head for improved self-cleaning characteristics and long-term stability. The cosine error for typical applications is less than 2%. The output increases approximately 1% per year because of changes in the optical transparency of the diffusion disk. Quantum sensor is calibrated for sunlight. Average spectral errors associated with different light sources is shown below:

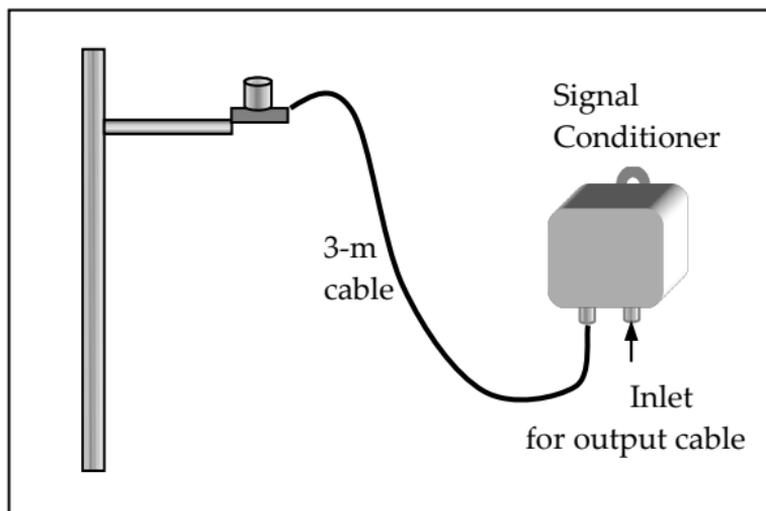
- Cool White Fluorescent: 8% high.
- Metal Halide: 6% high.
- High Pressure Sodium: 0% error.

The probe is connected by a standard 3-meter cable to the waterproof box with the signal conditioner inside.

The output cable length should be specified in the order if required.

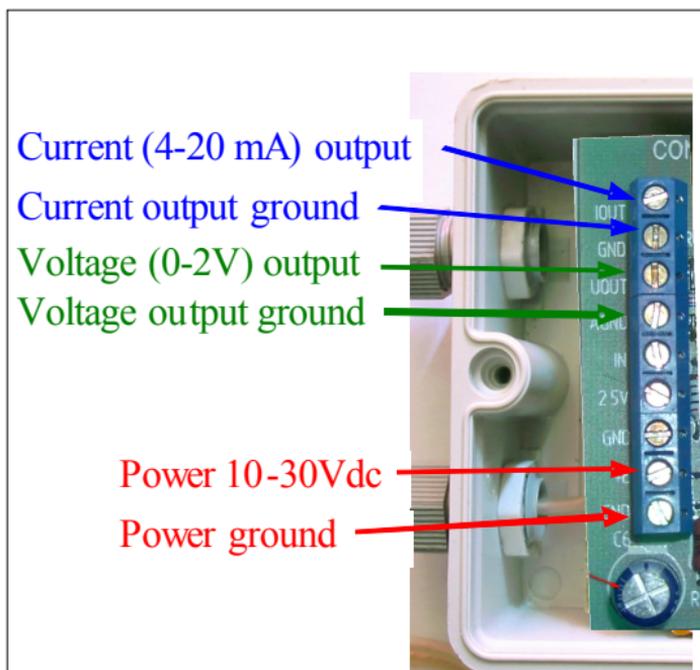
Installation

The PIR-1M Sensor is supplied with the stainless steel bolt for mounting to a solid surface. When supplied with the tripod, there is a special holder for mounting on it. Keep PIR-1M at vertical position.



Connection

For models supplied without output cable, please use a four-core cable with 3 to 6 mm outer diameter. The connection diagram is shown in the picture below:



Connection scheme

Maximal length of the output cable is 10 m for sensors with voltage output and up to 200 m for sensors with 4 to 20 and 0 to 20 mA output.

For models supplied with the optional output cable, please refer to a wiring diagram attached to the sensor.

Calibrations table

V	mA	PPF
0.000	4.000	0
2.000	20.000	2000

Calibrations equations

PIR-1M model: $PPF (\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}) = 1000\times U$

where **U** – output voltage in Volts

PIR-1Mi model: $PPF (\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}) = 125\times I - 500$

where **I** – output current in mA

Specifications

Calibration		Natural sunlight
Measurement range		0 to 2000 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$
Output	PIR-1M PIR-1Mi	0 to 2 VDC 4 to 20 mA
Absolute accuracy		$\pm 5\%$
Repeatability		$\pm 1\%$
Operating temperature		0 to 50 °C
Supply voltage		10 to 30 VDC
Power	PIR-1M PIR-1Mi	0.5 W max 1 W max
Sensor dimensions, mm		24 \varnothing × 27.5 H
Protection index of signal conditioner		IP 64
Cable length between probe and signal conditioner		1 m



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