



# SW-11L Line Quantum Sensor

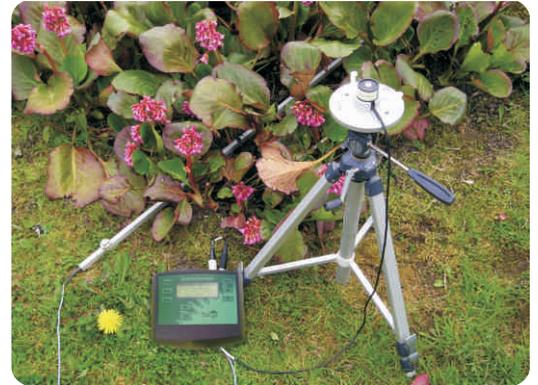
Photosynthetically Active Radiation or PAR light lies in the range 400-700nm and is the part of the sun's spectrum used by plants for photosynthesis. The PAR line quantum sensor consists of 33 individual sensors evenly spaced along an 850mm length. The design and diffusing cover ensures the average of PAR light falling along the whole length is measured.

Measuring light profiles with a single sensor under canopies or in growth rooms can introduce errors, as the light is usually not constant or not uniform over the whole area. The PAR line quantum sensor instantaneously measures an average of the light falling on its entire length, hence minimising these errors. The line sensor is often used together with a standard PAR quantum sensor which measures the incident PAR light falling on the plant surface, whilst the line quantum sensor is usually placed within or beneath the plant canopy.

The percentage of light transmission through the canopy can be instantly read using the SpectroSense2 handheld display meter as pictured above. This sensor can also be used with the SpectroSense2+GPS meter for mapping via plot location or GPS. For long term monitoring both sensors are compatible with Skye DataHog2 loggers or other manufacturers' dataloggers. Please ask for further details.

The SW-11L is designed to give an integrated value of the PAR inside plant canopies. Its cosine response varies whether direct and diffuse light is being measured. In diffuse (overcast conditions) there is no difference between the readings from the SW-11L and a cosine corrected reference sensor. In direct sunlight the SW-11L shows a true cosine response when mounted at a right angle to the radiation source and rotated around its axis (0-50° angle).

When mounted in line with the radiation source and rotated (0-50°) along its long axis indicated PAR output from the SW-11L falls from 100 to 93% of that from the reference sensor. Where high levels of direct radiation an East-West orientation is recommended.



Measures average PAR light over 850mm length

Monitors light levels below or within a canopy

Use with ratio meter and incident light sensor to calculate plant canopy transmissions

Use with SpectroSense2+GPS for mapping

Use with DataHog2 for long term logging

## SW-11L SPECIFICATIONS

**Dimensions** - 1000mm length. Active area in the central 850mm section

**Materials** - 'U' section anodised aluminium. Diffuser - acrylic. IP65 sealed. Level bubble fitted to sensor

**Cables** - 5 metres. Screened twin cable

**Sensor** - 33 photodiodes. PAR response 350-680 nm. Single output integrated along the 850mm active area

**Sensitivity** - 1mV/10  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$ . Individually calibrated

**Linearity** - 1% over 0 - 2000  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$

**Cosine Response** - varies whether direct and diffuse light is being measured (see above)

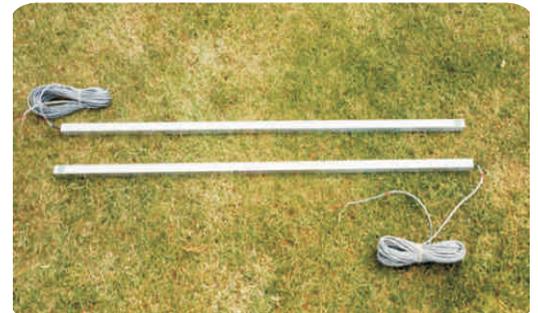
**Temp. Sensitivity** - +/- 0.15%/°C at peak response, from 0-50°C

**Uniformity along sensing surface** - better than 2% over 850mm sensing length

**Response Time** - 2  $\mu\text{seconds}$ , 10-90%

**Operating Temp.** - -20 to +50°C

**Calibration** - Calibration under natural sunlight conditions against a reference SKP 215 PAR Quantum sensor



## ORDERING INFORMATION

### Sensors

SW-11L/V - PAR Line Quantum Sensor with mV output and 5m cable

Add 'SS2' for use with a SpectroSense2 light meter, OR 'I' for use with a DataHog2 datalogger

### Light Meter & Dataloggers

SKA 400 - Apollo hand-held light meter

SKL 904 - 4 channel light meter

SKL 906\* - 4 channel light meter and logger

(\*GPS & 8 channel versions also available)

SDL 5000 - 1 - 16 channel DataHog2 datalogger

### PAR Measuring System

Skye recommend measuring above and below the canopy simultaneously using a PAR Quantum sensor plus a PAR Line Quantum sensor (see photo N1)

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