

GREEN SPEC

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ApogeePAR sensor
SQ-514

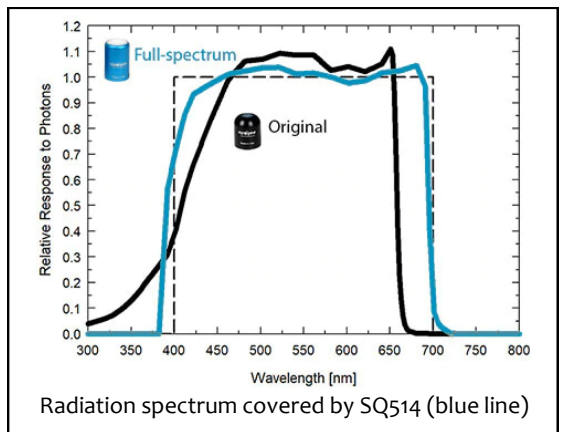
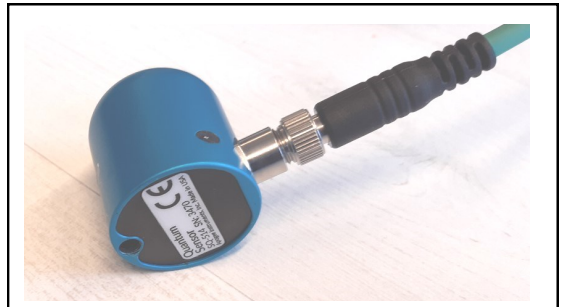
For the measurement of photosynthetically active radiation

Data sheet of Greenspec product with instruction on connection to the Greenspec AFP and AFP light.

This PAR sensor from Apogee measures the light that can be used by the plant for photosynthesis. It is a useful sensor to evaluate the total plant growth capacity. The sensor can measure both sunlight and artificial light but only if the radiation is in the range of 400 to 700 nm. It is possible to have it calibrated for optimal precision with only sunlight or only LED light. The sensor as delivered by Greenspec has not been optimised for one of them. (But this is an option). Normally the sum of the solar radiation over a day is measured. The value is quantified in the unit $\mu\text{mol m}^{-2} \text{s}^{-1}$. For the 4-20 mA version the sensitivity is $250 \mu\text{mol m}^{-2} \text{s}^{-1}$ per mA. This means the range you can measure is 0-4000. This unit cannot directly be compared with a total light sensor, a PYR sensor, which measures energy in Watt or Joule per m^2 . But the values correlate somewhat with each other.

It is important to mount it on a larger plate that is then carefully positioned horizontally. Check this with a level. Inside the greenhouse care must be taken that there is no shade onto the sensor from either the construction or leaves. All electronics are included in the sensor.

Maintenance is rarely needed, but do check for bird droppings. The sensor is waterproof. It can be disconnected from the cable at the sensor head, for easy mounting and maintenance. Clean with water and a soft

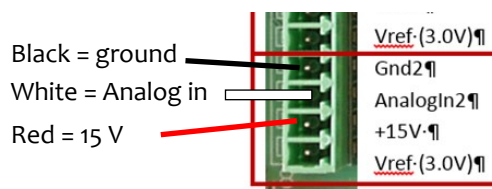


Installation hardware

Mount the unit with the nylon screw onto a larger plate. (do not use a metal screw). Position this plate horizontal with the cable towards the north pole. Take off the plastic cover when the sensor is in use.

Check that no shadows can interfere with the sensor.

Connect the 3 wires as described, connect grey wire nr. 4 to ground.



Set the dipswitch for 4-20 mA



Software configuration in the AFP input menu

Identify the sensor in AFP config:

Select type Analog, select the correct input number, give the name PAR sensor.

Set the values as indicated in the calibration in **option 2**. Fill in: 4-20 mA, range 0-4000, press calculation and apply.

Now cover the sensor so that no light comes into it and check that the value goes to zero.

If the value is not zero, correct in the input settings by setting the opposite value in calculated shift, so if you read -10m set the shift to 10, if you read +5, set the shift to -5. This correction is important for a correct daily sum.

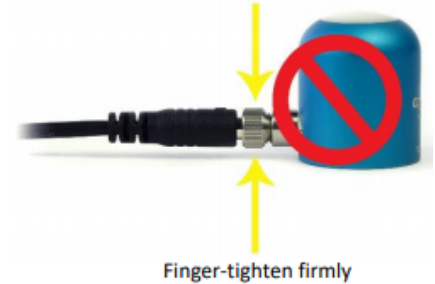
The screenshot shows the 'Analog Input Calibration' window. At the top, 'Input No.' is set to 21 and 'Input Name' is 'In21'. Below, there's a list of sensor types: EC Greenspec, pH Greenspec, Temp Greenspec, Humid Greenspec, Radf Greenspec, and Wind direction Davis-7014 Type 4. A red arrow points to this list. Below the list is a 'Calibration with 2 points' table with columns for Point 1 and Point 2, and sub-columns for Actual, RealTime, PointXY1, and PointXY2. A red arrow points to the 'Actual' column. At the bottom, there's a section for 'Calibration with theoretical calculation' with a table for 'Measure Range' and 'Calc. Shift'. A red arrow points to the 'Calc. Shift' field.

Usage Type
Usage param
Name
Min
Max
CODAGE
In Calib
Calc. Shift
Meas. Metho
Meas. Period

For installation or maintenance the sensor can be disconnected at the sensor head. Do follow these instructions!

Tightening: Connectors are designed to be firmly finger-tightened only. There is an o-ring inside the connector that can be overly compressed if a wrench is used. Pay attention to thread alignment to avoid cross-threading. When fully tightened, 1-2 threads may still be visible.

WARNING: Do not tighten the connector by twisting the black cable or sensor head, only twist the metal connector (yellow arrows).



Technical specifications

General data

Apogee SQ514

Mechanical construction

Dimensions: diameter 30mm, height 37 mm, weight approx. 0,14 kg, with 5 m cable

Materials

Steel housing, anodized blue, polymer optical window, nylon screw.

Input parameters

Measuring range: 0-4000 $\mu\text{mol m}^{-2} \text{s}^{-1}$

Output parameters

Instantaneous, range 400-700 nm.
Measuring error 5 % over temperature range, 10% over spectral range.

Electrical connection data

Power supply 12-24 VDC
Power consumption 20 mA

Process conditions

Operating temperature range -40 - +70 °C
Position horizontal, with cable to true north, check carefully for any possible shadow

Ambient conditions

Storage temperature -10 ... +70 °C Ingress protection IP 68
Install when dry, else trapped water may enter connector.
Electromagnetic compatibility acc. to 2014/30/EU Electromagnetic Compatibility (EMC) Directive 2011/65/EU Restriction of Hazardous Substances (RoHS 2) Directive 2015/863/EU Amending Annex II to Directive 2011/65/EU (RoHS 3)

Warranty

4 years

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