PAR200®

Quantum Spectrometer

The PAR200 makes the "invisible" visible

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Measure PPFD and PPF.

The light visible to the human eye (approx. 380-780 nm) is also used by plants. This part of the electromagnetic radiation, which powers photosynthesis, is named PAR and is usually found in wavelengths from 400 to 700nm.
For plant growers, biologists and scientists the most important data in the light requirements for plants is PPFD (photosynthetic photon flux density). PPFD is a measurement of the amount of light that actually reaches a plant (the number of photosynthetically active photons that fall on a given surface each second).
However for growing lights manufacturers, PPF and PFD measurement will be also important. This evaluates the total amount of energy that is produced by a light source per second.

The ideal tool for measurements of light which stimulates plant growth is our PAR200 Quantum Spectrometer which works in the PAR spectra and expresses PPFD values in µmol/m2/s and PPF in µmol/s. Also for the laboratory applications we specially designed the PAR200 enriched with a high resolution and extended spectral range. To be able to analyze, compare and report all the data it is highly recommended to use our uSpectrum laboratory grade PC software compatible with the PAR200 spectrometer.

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The PAR200 Quantum Spectrometer is specially developed for:

- Agriculture
- Horticulture
- Floriculture
- Oceanography
- Grow light manufacturers
- Universities and research institutions

Instant measuring features with the portable PAR200 spectrometer (stand alone):

- PPFD: photosynthetic photon flux density, which covers PAR from 400nm-700nm
- PPF-UV: 380-400nm
- PPF-B: 400-500nm
- PPF-G: 500-600nm
- PPF-R: 600-700nm
- PPF-FR: 700-780nm
- PFD: total PPF from 380nm-780nm
- SPECTRUM GRAPHICS
- CCT, LUX, FC, Lampda P, Lampda D, CIE1931, CIE 1976

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The PAR200 Quantum Spectrometer is a must-have for:

- Setting up, controlling and making more efficient farmlands
- Evaluating environments of growth for all flora
- Learning more about the photosynthetic processes of plants and bacteria
- Researching the behavior of pigments in plants
- Projecting, manufacturing and controlling growing lights
- Laboratory tests and evaluations
- Monitoring and comparing pilot projects

PC analysis software:

Our professional PC analysis software included with the product is intuitive, user-friendly, delivers results within seconds and features easy export and import functions. This is the ideal tool for a production environment and field work, as well as laboratories and can be used for various applications:

- Comparing the collected data
- Internal case studies
- Analyzes in easy to interpret graphs saved reports (in editable files: Excel, PDF etc.)

Unique technical features PAR200 :

- Super small and lightweight form factor
- Very accurate compared to conventional PAR sensors in the market +/- 1.8% *
- Multipurpose Quantum Spectrometer for stand alone use or system integration
- Data communication by USB, Bluetooth and RS485
- Remote app with Bluetooth communication
- DA logic board for communication with RS485 (PLC system / Modbus protocol)
- Modbus protocol customization and support
- Bluetooth communication and customization (for example: with Raspberry Pi)
- PC analysis laboratory software (see software specifications)
- Full technical support for hardware and software compatibility and integration

* Ask for our product comparison analysis report

The PAR200 Quantum Spectrometer will be delivered with:

- Handcrafted aluminum suitcase
- Product protection bag and belt clip
- uSpectrum laboratory software + license
- Free App for remote measurements and analysis
- USB Cable
- Micro SD Card slot
- RS485 DA board for connection and compatible with PLC
- Power Adaptor
- User manual and a 2 year warranty certificate
- Calibration certificate
- Neck strap screw + neck strap
- Tripod attachment on the bottom of the device

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Hardware Specifications & Stand Alone Features

Sensor	Advanced CMOS Linear Image Sensor
Spectral Bandwidth	Approximately 12 nm（half bandwidth）
Receptor Size	Ø 6.6 ± 0.1 mm
Cosine Correction	Cosine Correction up to 80° angle
Measurement Range	70 ~ 70000 Lux
Wavelength Range	380 ~ 780 nm
Integration Time Range	6 ~ 1000 ms
Operation Mode	Standalone Mode / Bluetooth Mode / USB Mode / System Integrated by RS485 MODBUS
Capture Function	Single time / Continuous 365 days Continious capture by USB or RS485 (MODBUS) connection
Integration Mode	Auto / Manual Manual integration mode by USB or RS485 (MODBUS) connection
Standalone Measurement Results	1. PPFD, PPF-B, PPF-G, PPF-R 2. PPF-UV, PPF-FR, PFD, CCT 3. Spectrum Graphics 4. Illuminance / LUX, Foot Candle, Lampda P, Lampda D 5. CIE 1931 / CIE 1976 U.C.S Chromaticity Value
Digital Resolution	16 bits
Dark Calibration	Yes
Stray Light	-25 dB max.
Wavelength Data	1 nm, 550nm single-frequency with a measurement range of ± 40nm.
Wavelength Reproducibility	± 1 nm (Input source must be a stable light source.)
PAR / PPFD / PPF / PFD Accuracy	± 1.8%
Color Accuracy	Illuminant A @ 2856K at 20000 Lux: ± 0.0025 in CIE 1931 x,y
Color Repeatability	Illuminant A @ 2856K at 20000 Lux: ± 0.0005 in CIE 1931 x,y
CCT Accuracy	± 2%
Illuminance Accuracy	± 2%

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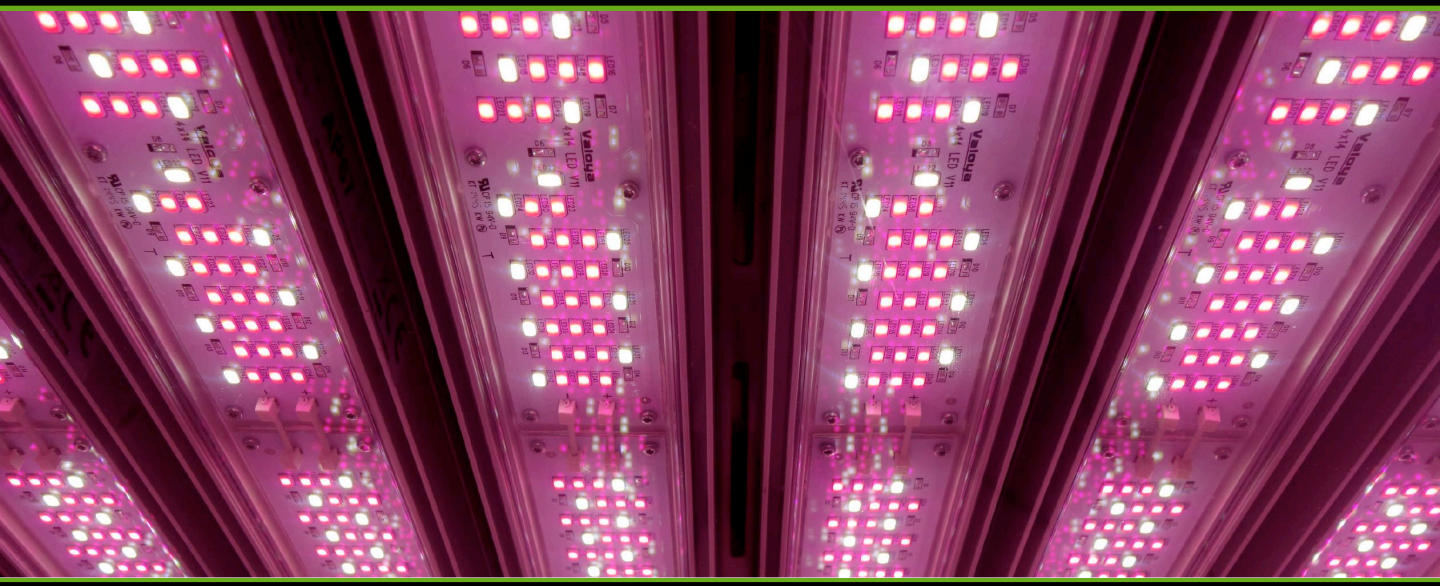

Display	0.96" 128x64 mono OLED Panel
Bluetooth	3.0 / 4.0 compatible with iOS and Android / Rasberry Pi
USB port	compatible software uSpectrum PC laboratory software
RS485 port	compatible with PLC MODBUS Protocol
Max. Files	2000 Files @ 2GB SD Card
Battery Operation Time	≦ 3 hours / Fully Charged
Battery / Power supply	700 mAh / Rechargeable Li-ion Battery | AC/DC power charger
Data Output Interface	Micro SD Card, Mini USB Port
Data Format	MicroSoft Office Excel csv and xls Compatible
Dimensions	33 x 33 x 90 mm (H x W x D)
Weight including Battery	75 g
Operating Temperature Range	0 ~ 35 °C
Storage Temperature Range	-10 ~ 40 °C
Language Selection	English " standalone only " / French / Spanish / Italian / Russian /Traditional Chinese / Simplified Chinese / Japanese

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PC Laboratory Software Specifications

Measuring Capabilities

1. Illuminance (LUX) / Foot Candle (fc)
2. Correlated Color Temperature (CCT)
3. CIE Chromaticity Coordinates
   (1) CIE 1931 x,y Coordinates
   (2) CIE 1976 u',v' Coordinates
   (3) CIE 1931 XYZ Value
4. △x , △y , △u' , △v'
5. Delta uv (Duv)
6. Dominant Wavelength (λd)
7. Purity
8. BIN ANSI C78.377 or Customized
9. Standard Deviation Color Matching (SDCM)
10. Color Rendering Index (CRI , Ra)/ R1 ~ R15
11. Color Quality Scale (CQS)
12. Gamut Area Index (GAI)
13. Television Lighting Consistency Index (TLCI)
14. TM-30-15 (Rf, Rg, Color Vector Graphic)
15. Photosynthetically Active Radiation (PAR)
    (1) PPFD (400nm ~ 700nm)
    (2) PPF-UV (380nm ~ 400nm)
    (3) PPF-B (400nm ~ 500nm)
    (4) PPF-G (500nm ~ 600nm)
    (5) PPF-R (600nm ~ 700nm)
    (6) PPF-NIR (700nm ~ 780nm)
16. Spectral Power Distribution (SPD)
17. Peak Wavelength (λp)
18. Peak Wavelength Value (λpV)
19. Intergration Time (I-Time)
20. Scotopic and Photopic Ratio (S/P)
21. Transmittance for Filters, diffusers and Secondary Optics

Feature

Capture Function	Single time / Continuous
Integration Mode	Auto / Manual
Measuring Modes	1. Basic Mode
	2. Spectrum Mode
	3. CRI Mode
	4. CIE 1931 Chromaticity Mode
	5. CIE 1976 Chromaticity Mode
	6. LUX Image Distribution Mode
	7. Log Mode
	8. BIN Chart Mode
	9. Quality Control Checker Mode
	10. Measurement Comparison Mode
	11. Transmit Mode for Filters and Secondary Optics
	12. TM-30-15 Mode
	13. Data Browser Mode
	14. Option Mode

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A ton of advanced technology in just 75 grams

UPRtek