

PHOTO RESEARCH[®], Inc.

The PR[®]-680 SpectraDuo[®] Colorimeter

Unique Design

The PR-680 SpectraDuo marks the beginning of a new era in light measurement. This unique, patent pending, battery powered portable instrument is the first and only combined fast-scanning 256 detector element spectroradiometer and PMT based photometer on the market. The PR-680 has three available operating modes: 1) As a fast scanning spectroradiometer (like the PR-650) 2) As a highly sensitive photometer (like the PR-880) or 3) Auto Select Mode which automatically selects between detectors based on the available signal.

The PR-680 is supplied with 4 automated measuring apertures (1°, 1/2°, 1/4° and 1/8°) and automated measure shutter. Other



hardware features include AutoSync[®] for automatically synchronizing to the source refresh rate insuring the utmost accuracy, a Secure Digital (SD) port for measurement storage, an external trigger port allowing remote measurement activation from either a push button or peripheral device, and a long lasting rechargeable Lithium-ion (Li) battery.

Easy to Use

The PR-680 is controlled via the on-board, 2.25" x 3" high resolution, full color touch

screen LCD display and 5-way navigation keypad for easy navigation. Following a measurement, the PR-680 displays data and color spectral and CIE graphs on the system display. The PR-680 design provides stand alone operation - no PC required. The PR-680 can be also controlled via the world famous SpectraWin software over the USB or Bluetooth interface.

Flexibility

The unique design of the PR-680 makes tasks such as spectrally based colorimetry and high speed, low level luminance - required for display metrology - possible with a single instrument by supplying a wide dynamic range - 0.003 cd/m² (photometer and 1° aperture) to 2,200,000 cd/m² (spectral and 1/8° aperture) without using external neutral density filters. Since the Pritchard[®] viewing and measuring optics are shared by both detectors, tests can be performed without requiring realignment. An optional analog output provides the capability of using the PMT as a high speed tool for characterizing display ON / OFF response or waveform analysis of flash sources. We've further enhanced the flexibility by adding 2 extended sensitivity modes and 4 measurement speeds.

The PR-680 can be supplied with up to 15 remote heads connected to the instrument in a 'daisy chain' configuration to make simultaneous illuminance or luminance measurements. An ideal tool for tasks such as projector uniformity. For applications other than luminance the PR-680 can be supplied with optical accessories such as a cosine receptor for illuminance, LR-127 LED Analyzer for testing LED's to CIE 127, fiber probe for remote non-line-of-sight testing, and a series of magnification lens for small spot size analysis.

Connectivity

It's easy for the PR-680 to talk to the outside world - it comes equipped with USB and (optional) Bluetooth[®] wireless interfaces. It is supplied with text based, Remote Mode syntax and a driver that emulates an RS232 interface (COM: port) making it a simple task to generate custom programming to perform specific tasks or for inclusion in an ATE environment. If needed, an RS232 interface can be added to complement the standard USB.

Applications

Display luminance and color	Medical / dental color testing
Contrast	Reflectance / transmittance
Screen brightness	Quality control
LED testing	Human factors
Paper, ink and textile testing	Dominant wavelength

Features	Benefits
DUO Detector Design	Spectral and PMT photometer based measurements
Full Color Touch Screen Display	Easy-to-use menu based software.
Wide Dynamic Range	Address almost any display measurement requirement
USB Interface	Connects to virtually any PC
Bluetooth ready (optional)	Wireless, remote data transfer
Analog Output (optional)	Optical Waveform Analysis
Long lasting rechargeable Li battery	Excellent for field use.
SD Memory	Save thousands of measurements

PR-680 Specifications

Measurement Spot Size

		Aperture					
Detectors	256 linear array and PMT	Accessory	Working Distance	1°	1/2°	1/4°	1/8°
Inter-detector alignment error	0%	MS-75 (355 mm to infinity)	355 mm 305 m	5.25 mm 5.32 m	2.63 mm 2.66 m	1.315 mm 1.33 m	0.658 mm 665 mm
Spectroradiometer Wavelength Range	380 to 780 nm	SL-0.5X	94.1 mm to 137 mm	1.5 mm to 2.54 mm	0.75 mm to 1.27 mm	0.375 mm to 0.635 mm	0.188 mm to 0.318 mm
Optics	Pritchard viewing and measuring system.	SL-1X	46 mm to 66 mm	0.890 mm to 1.32 mm	0.445 mm to 0.660 mm	0.226 mm to 0.330 mm	0.111 mm to 0.165 mm
Digital Resolution	16 bits	MS-2.5X	46 mm	0.51 mm	0.225 mm	0.128 mm	0.064 mm
Spectral Resolution	1.56 nm per pixel	MS-5X	28 mm	0.289 mm	0.145 mm	0.072 mm	0.036 mm
Spectral bandwidth	8 nm (5 nm optional)	MS-7.5	100 mm 3.05 m	17.5 mm 53 cm	4.38 mm 13.3 cm	1.09 mm 3.31cm	0.273 mm 0.82.8 mm
Spectral Accuracy	± 1 nm	LA-600	Contact	13.2 mm	13.2 mm	13.2 mm	13.2 mm
Luminance accuracy (Against NIST luminance standard)	Spectral - ± 2% Photometer - ± 2%	FP-600	Contact	3.17 mm	3.17 mm	3.17 mm	3.17 mm

Minimum Measureable Luminance (cd/m²)

		Aperture					
		Access.	Detector	1°	1/2°	1/4°	1/8°
Color Accuracy (for Illuminant A)	±0.0015 in CIE 1931 x,y	MS-75	Array PMT	0.4 0.003	1.60 0.012	6.4 0.048	25.8 0.192
Measurement Capabilities	Luminance, Illuminance, luminous intensity, chromaticity, correlated color temperature.	SL-0.5X	Array PMT	0.4 0.003	1.60 0.012	6.4 0.048	25.8 0.192
Measurement Time	6 ms to 24 secs.	SL-1X	Array PMT	0.4 0.003	1.60 0.012	6.4 0.048	25.8 0.192
Battery	Rechargeable Lithium-ion (≥ 12 hours continuous operation).	MS-2.5X	Array PMT	2.5 0.01	10 0.04	40 0.16	160 0.64
Weight	4 lbs (1.8 kg)	MS-5X	Array PMT	3.5 0.014	14 0.056	56 0.224	224 0.896
Operating Temperature	34° to 95° F (1° to 35° C)	MS-7.5	Array PMT	0.4 0.003	1.60 0.012	6.4 0.048	25.8 0.192
		LA-600	Array PMT	0.4 0.003	1.60 0.012	6.4 0.048	25.8 0.192
		FP-600	Array PMT	2 0.008	8 0.032	32 0.128	128 0.512
		CR-600	Array PMT	5 lux 0.02 lux	20 lux 0.08 lux	80 lux 0.32 lux	320 lux 1.28 lux

Notes:

- Sensitivities are for 100:1 signal to RMS noise against an Illuminant A based NIST traceable luminance standard
- All specifications are subject to change without notice.



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