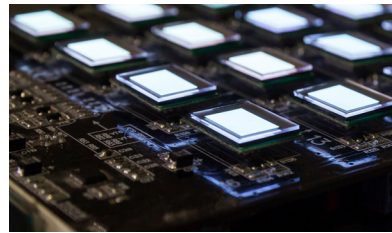
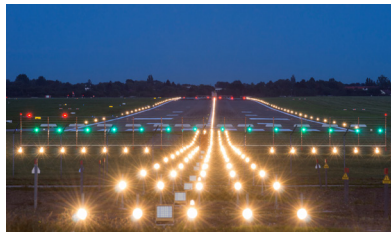




PR-655 / PR-670 Photo Research SpectraScan® Spectroradiometers



Portable instruments for measuring color and light in a wide range of applications.

Photo Research products have been the gold standard for the cinema business since the early 1940's due to their precise and effective quality. Since that time, the products have won numerous Academy Awards and continued to raise the bar in light and color measurement. Today, Photo Research offers a wide variety of SpectraScan® Spectroradiometers including the PR-655 and PR-670—enhanced economical portable solutions for spectral based photometric and colorimetric light measurements, designed for applications requiring precise light measurements from a range of light sources, such as display monitors and projectors, reflective surfaces, and industrial applications including visual display testing, LED testing, film and video post-production, auto/aerospace displays, and dental color testing.

In addition to spectrally based measurements of luminance, chromaticity coordinates and correlated color temperature, the user can also perform white point calibrations of CRT's, LCD's, PDP's and digital projectors by simply entering target values into the setup screens.



Features of the PR-655 / PR-670 Novanta Photo Research SpectraScan® Spectroradiometers:

Pritchard® Optics

Widely accepted as the most accurate, versatile and precise optical system in use today to ensure proper alignment. Simply aim, focus, and press the measure button for accurate measurements you can trust.

Low Polarization

The Pritchard optical system minimizes polarization errors to less than 1%, assuring accurate results when measuring polarized sources, such as LCD's.

Wide Dynamic Range

PR-655: 150 Thousand to 1
PR-670: 4 Million to 1

Connectivity

All instruments are equipped with USB 1.1 and come standard with a simple ASCII based, remote mode command language to setup and control the instrument using a PC or MAC, making it easy to generate custom programming to perform specific tasks or for inclusion in an ATE environment. If needed, a traditional RS-232 interface can be added to complement the standard USB interface. And the external trigger port allows remote measurement activation from either a push button or peripheral device.

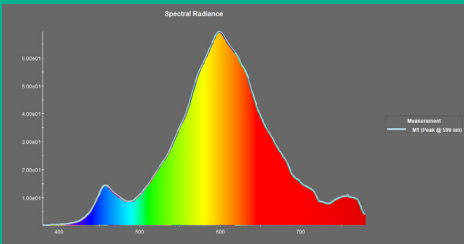


RS-232 Port



USB

Model PR-655 shown



SpectraWin™ Software

SpectraWin® Software is a full featured, menu driven, Windows 32- or 64-bit PC-based control program designed to provide a powerful and easy-to-use interface to control and manipulate data from your SpectraScan device. In addition to the standard features of measurement and display of spectral power distribution, luminance, and CIE colorimetry, SpectraWin has additional features for viewing, analyzing and calculating measured data.

SpectraWin Pro includes a powerful macro scripting tool to help you automate your measurement tasks and the optional RGB DisplayCal package turns your SpectraScan device into a Windows- based display calibration tool enabling you to interactively set the white point of the display from a learned stimulus (golden display) or by entering target values.

Color Touch Screen Display

The PR-6xx design provides stand alone operation - no PC required. Menus are accessed via the on-board, 3.5" high resolution, full color touch screen LCD display and 5-way navigation keypad. Following a measurement, the PR-6xx displays data and color spectral graphs on the system display.

User Profiles & Speed Modes

If multiple users need to access the device, User Profiles allows you to save both setup and preference settings under a unique identifier, for recalling later. To recall your instrument setup at a later time simply select the unique profile from the User Profiles menu and minimize the amount of time required to modify current setup parameters. The total time needed to complete a measurement is certainly an important factor. The PR-6xx devices feature five Speed Modes that can reduce measurement times by changing the way the Adaptive Algorithm determines when a measurement is completed. Available modes are Normal, Fast, 2X Fast and 4X Fast. In 4X Fast Mode, measurements are completed approximately 20 times faster than in Normal Mode.

User Spectral Calibration

Need to correlate the PR-6xx instrument to another spectroradiometer? The User Spectral Calibration feature makes this a simple task. Simply upload a spectral measurement from a second spectroradiometer to the PR-6xx using an SD card, press the Measure button and the PR-6xx will automatically create and use custom spectral correction factors based on the uploaded data.

AutoSync®

The patented Auto Sync® feature takes the worry out of accurately measuring high intensity, fast refreshing sources such as LCD's, PDP's, DLP Projectors, etc. by adjusting the detector exposure time to the source refresh rate. When enabled Auto Sync® insures that entire pulses are captured, improving the accuracy and repeatability of the measurements. The Sync rate of the source is displayed once a measurement is completed.

Portability

All instruments come standard with a Lithium-Ion battery which, on a full charge, can last for over 12 hours of continuous use. Secure Digital (SD) storage allows for over 80,000 measurements on a 512 MB card. Measurements stored on the SD card can be viewed on the instrument or using the optional SpectraWin® software.

- SD Card Storage
- Over 12 Hours of Continuous use
- Less than 3.75 lbs.
- Real Time System Status

Accessories and apertures to customize your device

The PR-655 can utilize a single aperture, with the option of either 1° or 1/2° while the PR-670 is supplied with four automated measurement apertures (1°, 1/2°, 1/4° and 1/8°).

Luminance Accessories

Lenses:

MS-2.5X MicroSpectar Lens series, 5x and 2.5X magnification, fixed focus lens for luminance/radiance measurements.

SL-1X, 0.5X High resolution supplementary lens, reduces the near focus range to 91.4 mm. Refer to the PR-655 / PR-670 Product Specifications chart for spot coverage. Used with the standard MS-75 lens.

Miscellaneous:

Fiber Probe (FP) Flexible fiber probe option for making non line of sight measurements. Available in lengths of 2, 4 and 10 feet, other lengths available.

Luminance Adapter (LA) For application that require contact measurement of luminance and radiance in ambient light condition.

Filters

Neutral Density (ND) Source attenuation filters, for use on MS-75, SL-1X, SL-0.5X lenses. Available ND filters are 0.3, 0.7, 1, 2, 3, 4, attenuation of 2, 5, 10, 100, 1,000 and 10,000 respectively.

Filter Holder (FH) Designed to hold two, 2" x 2" (51 mm x 51 mm) filters. Ideal for filter transmission measurements including Dolby 3D filter measurements. Threads onto the MC-75, SL-0.5X or SL-1X lenses during use.

Illuminance Accessories

Cosine Receptor (CR) Designed to measure cosine corrected illuminance/irradiance falling on a plane from all sources within the hemisphere above the plane.

Reflectance Standard

RS-3 2" diameter (51mm diameter) PTFE reflectance standard used for making ambient light measurements, measurements of point sources (e.g. lamps) or measurements of the illuminating source for reflectance (GAIN) or L*a*b* calculations. The RS-3 is uncalibrated, meaning that all spectral reflectance correction factors are set to 1.00. With SAE 1/4 - 20 thread. Black anodized, aluminum case.

SRS-3 All the capabilities of the RS-3 and calibrated for absolute spectral reflectance. Includes reflectance factors and certificate of calibration.

System Options

5 nm Bandwidth Ideal for applications that require accurate color measurements of narrow band or "spiky" spectra (8NM is standard).

RS-232 Adds a port to connect to RS-232 devices. Includes a 3 meter cable terminated on one end with a 9 pin sub-D female connector. PR-655's equipped with this option can be drop in replacements for PT-650's.

Accessories

PR-655 1 internal aperture / 128 photo diode array

PR-670 4 apertures / 256 photo diode array

SD Card

Rechargeable lithium-ion battery

AC adaptor

Soft-carrying case

MS-75 lens

Photo Research SpectraScan® Spectroradiometers

PR-655 / PR-670 Product Specifications

Measurement Spot Size

Note: PR-670 includes all apertures. PR-655 can only utilize a single aperture: either 1° or 1/2° aperture.

ACCESSORY	WORKING DISTANCE	APERTURES			
		1°	1/2°	1/4°	1/8°
MS-75	355 mm to 305 mm	5.25 mm to 5.32 m	2.63 mm to 2.66 m	1.315 mm to 1.33 m	0.658 mm to 665 mm
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 to 0.318 mm
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	0.113 mm to 0.165 mm
MS-2.5X	46 mm	0.51 mm	0.225 mm	0.128 mm	0.064 mm
LA-680	Contact	13.2 mm	13.2 mm	13.2 mm	13.2 mm
FP-680	Contact	3.17 mm	N/A	N/A	N/A

Sensitivity

Note: Numbers in grey rows apply to PR-655.

ACCESSORY	APERTURES (f)			
	1°	1/2°	1/4°	1/8°
MS-75	0.01 to 39,000	0.04 to 156,250	0.16 to 650,000	0.64 to 2,500,000
	0.2 to 30,000	0.8 to 120,000	N/A	N/A
SL-0.5X	0.01 to 39,000	0.04 to 156, 250	0.16 to 650,000	0.64 to 2,500,000
	0.2 to 30,000	0.8 to 120,000	N/A	N/A
SL-1X	0.01 to 39,000	0.04 to 156,250	0,16 to 650,000	0,64 to 2,500,000
	0.2 to 30,000	0.8 to 120,000	N/A	N/A
MS-2.5X	0.025 to 97,500	0.10 to 390,000	0.40 to 1,560,000	1.60 to 6,240,000
	0.5 to 72,000	2.0 to 288,000	N/A	N/A
LA-600	0.01 to 39,000	0.04 to 156,250	0.16 yo 650,000	0.64 to 2,500,000
	0.2 to 30,000	0.8 to 120,000	N/A	N/A
FP-600	0.025 to 97,500	N/A	N/A	N/A
	0.5 to 72,000	1.6 to 300,000	N/A	N/A
CR-600	0.02 to 78,000 fc	N/A	N/A	N/A
	0.4 to 60,000 fc	1.6 to 240,000 fc	N/A	N/A

Novanta Photo Research SpectraScan® Spectroradiometers

PR-655 / PR-670 Product Specifications

MEASURING CAPABILITIES:

- Luminance
- Spectral Radiance
- Illuminance
- Spectral Irradiance
- Radiant Intensity
- CCT (in Kelvins)
- L*a*b*
- L*u*v*
- RGB Display Calibration
- Dominant Wavelength
- Display Contrast

FEATURE	PR-655	PR-670
Spectral Range	380 - 780 nm	380 - 780 nm
Detector	128 Detector Photo Diode Array	256 Detector Photo Diode Array
Exposure Time	3 - 6,000 ms	6 - 30,000 ms
Spectral Bandwidth	8 (std.)/5 (opt) nm	8 (std.)/5 (opt) nm
Spectral Accuracy	± 1 nm	± 1 nm
Wavelength Resolution	< 3.5 nm	< 2 nm
Luminance Range * (Illuminant A)	0.2 to 30,000 fL	0.01 to 2,500,000 fL
Luminance Accuracy¹ (Illuminant A @ 2856K)	± 2 %	± 2 %
Luminance Repeatability¹ (Illuminant A @ 2856K)	≤ 1%	≤ 1%
Color Accuracy¹	± 0.0015 in CIE x,y	± 0.0015 in CIE x,y
Digital Resolution	16 bits	16 bits
AutoSync® Range	20 - 400 (Custom Sync 20 - 1200) Hz	20 - 400 (Custom Sync 20 - 1200) Hz
Aperture	1° or 1/2° (opt)	1°, 1/2°, 1/4°, 1/8° automated
Field of View	7° with MS-75	7° with MS-75
Minimum Measuring Area	0.01 inch with MS- 5X Lens	0.001 inch with MS-5X Lens and 1/8° aperture
Minimum Working Distance (w/ Std. Lens)	14 inches (356 mm)	14 inches (356 mm)
Battery	Rechargeable Li-Ion	Rechargeable Li-Ion
Interface	USB, RS-232 (opt.), IEEE488 (opt.)	USB, RS-232 (opt.), IEEE488 (opt.)
Data Storage	Secure Digital (SD) Card	Secure Digital (SD) Card
Mode of Operation	Stand alone or PC	Stand alone or PC
System Software	SpectraWin™ for Windows (opt.)	SpectraWin™ for Windows (opt.)
Size (approx.)	14" x 7.94" x 3.21" (355.60 mm x 201.68 mm x 81.53 mm)	14" x 7.94" x 3.21" (355.60 mm x 201.68 mm x 81.53 mm)
Weight (approx.)	3.75 lbs. (1.7 kg)	4.5 lbs. (2.04 kg)

Specifications are subject to change without notice.

Notes: *Stated sensitivities are for a precision of 10:1 against an Illuminant A (2856 K) source using largest available aperture.

¹ Luminance level of 3 fL for the PR-655, 0.15 fL for the PR-670, with a 1° aperture against an Illuminant A NIST traceable standard.