WESTBORO PHOTONICS

Smart Series Imaging Photometers

P230U, P501U, P1230U



Setting the benchmark for measurement performance and value

High Resolution

With several lens choices and resolutions of 2.3, 5.0 or 12.3 megapixels, these photometers have your application covered.

Matched Lenses

Each photometer has a lens series that is matched to the sensor resolution and size, providing optimally crisp and clear images. Standard lenses offer fields of view from 10˚ to as much as 55˚. Microscope lenses are also available.

Superior Sensors

Using Sony's latest Pregius® CMOS sensors, the photometric measurements are faster, and more precise and sensitive than previous CCDs.

High Dynamic Range

As a result of the improved noise performance and large full well capacity, a single exposure measurement can reliably report a wider dynamic range of luminance values (>70dB). Up to 1,000,000:1 dynamic range can be acquired using HDR imaging methods.

Capable Software

Photometrica® software and application packages provide extensive options for measurement and analysis. Fully customized solutions can be created using built-in scripting or external control via the included SDK.

Low Power (<4.5W)

With such a low power draw, the instrument does not heat up much when in use. The lower operating temperature removes the need for a Peltier cooler and fan. Everything just gets better with the efficient design: lower weight, lower cost and better reliability.

Key Features

- High speed measurements
- Up to 12.3 MP resolution
- Small size, low power
- Simple and robust design
- Exceptional sensitivity
- Wide dynamic range

Applications

- AR/VR Near Eye Displays (NEDs)
- Display testing
- Beam pattern of lamps and luminaires
- Automotive and avionics lighting
- Architectural scenes
- Theatrical and commercial lighting
- Human factors engineering
- Roadway lighting

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TECHNICAL SPECIFICATIONS

		P230U	P501U	P1230U
Sensor Model, Diagonal Size, Pixel Pitch		IMX174, 1/1.2″, 5.86 µm	IMX250, 2/3″, 3.45 µm	IMX253, 1.1″, 3.45 µm
Sensor Type		Sony Pregius, 12-bit, global shutter CMOS		
Sensor Megapixels		2.3	5.0	12.3
Pixel Array		1920 x 1200	2448 x 2048	4096 x 3000
High Dynamic Range (multi-exposure)		> 1 000 000:1		
Luminance Minimum (cd/m²)*, Limit of Detection		0.000 1		
Luminance Minimum (cd/m²)*, SNR = 60		0.002		
Luminance Minimum (cd/m²)*, SNR = 100		0.003		
Luminance Maximum without optional ND Filters (cd/m²)**		600 000	2 000 000	
System Accuracy***		Luminance (Y) ± 3 %		
Short-Term Repeatability†		Luminance (Y) ± 0.02 %		
Near Eye Display Lenses (5mm Entrance Pupil)††	**8 mm NED**	67° horizontal FOV (with side and corner clipping)	53° horizontal FOV	67° horizontal FOV (with side and corner clipping)
	10 mm NED	55° horizontal FOV	41° horizontal FOV	68° horizontal FOV
XR2 Near Eye Display Lens (4mm Entrance Pupil)		N/A	54° horizontal FOV	73° horizontal FOV
Standard Lenses Field of View at ∞ (H x V); Field of View at Minimum Focus Distance	**8 mm lens**	N/A	54.0° x 45.2°; 133 mm x 111 mm; 16 cm to ∞	N/A
	12 mm lens	48.8° x 30.5°; 290 mm x 181 mm; 35 cm to ∞	39.1° x 32.7°; 80.7 mm x 67.5 mm; 15 cm to ∞	55.9° x 40.9°; 125.0 mm x 91.6 mm; 18 cm to ∞
	16 mm lens	38.9° x 24.3°; 221 mm x 138 mm; 35 cm to ∞	30.0° x 25.1°; 61.1 mm x 51.1 mm; 15 cm to ∞	44.0° x 32.2°; 93.5 mm x 68.5 mm; 18 cm to ∞
	25 mm lens	25.8° x 16.1°; 141 mm x 88.3 mm; 35 cm to ∞	20.0° x 16.7° ; 36.7 mm x 30.7 mm; 15 cm to ∞	28.9° x 21.2°; 86.0 mm x 63.0 mm; 24 cm to ∞
	35 mm lens	18.4° x 11.5°; 96.8 mm x 60.5 mm; 35 cm to ∞	14.3° x 12.0°; 23.4 mm x 19.6 mm; 18 cm to ∞	20.8° x 15.2°; 70.0 mm x 51.3 mm; 28 cm to ∞
	50 mm lens	12.8° x 8.0°; 107 mm x 66.9 mm; 35 cm to ∞	10.1° x 8.4°; 19.1 mm x 16.0 mm; 18 cm to ∞	14.6° x 10.7°; 70.0 mm x 51.3 mm; 38 cm to ∞
Communication Interface		USB3		
Power		5 V over USB or 12 V over GPIO Connector (recommended), 4.5 W max		
Dimensions Excluding Lens, Barrel, and Tripod Mount (H x W x D)		44 mm x 29 mm x 58 mm		
Weight		110 g for photometer; 200 to 350 g with a typical lens attached		
Operating Temperature		0 to 50°C, to specifications: 18 to 24°C		
Operating Humidity		10% to 90% (no condensation)		
Compliance		CE, FCC, KCC, RoHS. The ECCN for this product is: EAR099.		

Specifications are subject to change.
* Using 7x7 pixel area, f1.4, 12mm lens and 6 second exposure.
** Using shortest exposure time and smallest iris.
*** Based on measurements of illuminant A, 20 x 20 pixel area.
† Using 90 x 90 pixel area.
†† LS-8L has pupil position at 13.4 mm, LS-10L pupil position is at 17.5 mm. Side and corner clipping with P230U and P1230U.

All photometers include Photometrica software, PCI express card with two USB 3.1 ports, ¼-20 tripod adapter and a 3 meter USB 3.0 Type-A to Micro-B cable with locking screws. Lenses are selected separately.

Westboro Photonics continually pursues improvements to the instruments. Specification adjustments, errata or omissions do not constitute grounds for compensation.

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