



WESTBORO
PHOTONICS

SMART SERIES IMAGING
PHOTOMETERS

USB3 CCD

P280U P280SU P910 P1200U

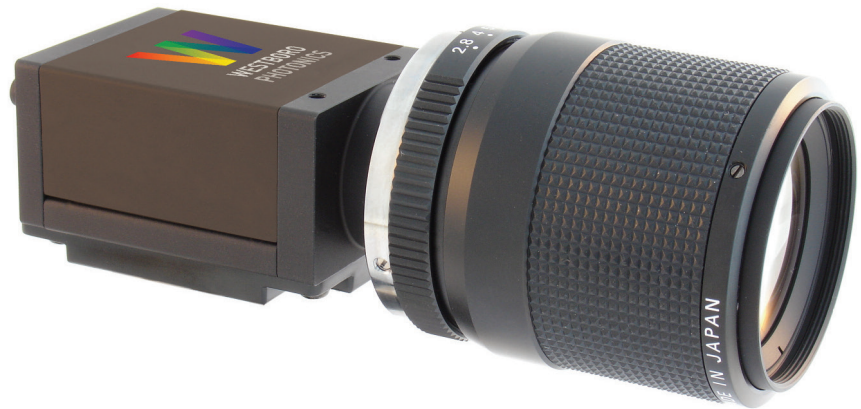
USB3 CCD

KEY FEATURES

Fast Measurements
Up to 12 Megapixels
Compact
Low Power
Sensitive
High Dynamic Range

APPLICATIONS

Display Testing
Beam Pattern of Lamps
and Luminaires
Roadway Lighting
Automotive and Avionic
Lighting
Architectural Scenes
Theatrical and
Commercial Lighting
Human Factors
Engineering



The fastest imaging photometers

HIGH RESOLUTION

With several lens choices and resolutions of 2.8, 9.1 or 12 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 82°. Microscope lenses are also available.

SUPERIOR SENSORS & FILTERS

Using Sony's latest ICX CCD sensors, the photometric measurements are fast and stable. The photopic filters are precisely matched to each sensor and calibrated to ensure the highest accuracy measurements.

HIGH DYNAMIC RANGE

A single exposure measurement can reliably report a wide dynamic range of luminance values over 60dB (1000:1). Up to 120dB (1,000,000:1)

dynamic range can be acquired using HDR imaging methods.

COMPACT

Weighing just 300 g (with a typical lens) the photometer is easier and less costly to mount. Its small footprint allows for installation into tight spaces and the locking USB3 cables ensure reliable connectivity.

CAPABLE SOFTWARE

Photometrica® software and optional software packages provide extensive options for measurement and analysis. The optional Software Development Kit (SDK) allows for the creation of fully customized solutions using built-in scripting or external control.

LOW POWER (<4.5W)

The photometers can be powered over the USB3 cable or via the photometer's GPIO connector. Most importantly, the low power consumption results in cooler operation and less noise.

SMART SERIES USB3 CCD

SPECIFICATIONS		P280SU	P280U	P910U	P1200U
Sensor Model, Diagonal Size, Pixel Pitch		ICX674 2/3", 4.54 µm	ICX687 1/1.8", 3.69 µm	ICX814 1", 3.69 µm	ICX834 1", 3.1 µm
Sensor Type		14-bit, global shutter CCD			
Sensor Megapixels		2.8	2.8	9.1	12
Pixel Array		1920 x 1440	1928 x 1448	3376 x 2704	4240 x 2824
Full Well (e-)		13490	8517	9996	6085
System Dynamic Range (single exposure, per pixel)		62 dB	60 dB	60 dB	54 dB
High Dynamic Range (multi-exposure)		> 1,000,000:1			
Temporal Dark Noise (e-)		9.56	7.43	9.43	11.18
Luminance Minimum (cd/m ²)*, SNR = 100		0.04	0.06	0.06	0.08
Luminance Maximum (cd/m ²)**		15,000,000			
System Accuracy***		Luminance (Y) ± 4 %			
Short-Term Repeatability****		Luminance (Y) ± 0.08 %			
Standard Lenses Field of View at ∞ (H x V) Field of View at Minimum Focus Distance Focus Distance	5 mm lens		71.5° x 55.5°; 140 mm x 100 mm 16 cm to ∞		
	8 mm lens	57.6° x 44.8°; 100 mm x 76 mm 16 cm to ∞	48.5° x 36.4°; 83 mm x 61 mm 16 cm to ∞		
	12 mm lens	40.2° x 30.7°; 64 mm x 48 mm 15 cm to ∞	33.4° x 24.7°; 53 mm x 39 mm 15 cm to ∞	54.9° x 45.2°; 92 mm x 73 mm 18 cm to ∞	57.6° x 40.3°; 97 mm x 65 mm 18 cm to ∞
	16 mm lens	30.7° x 23.3°; 46 mm x 35 mm 15 cm to ∞	25.4° x 18.7°; 38 mm x 28 mm 15 cm to ∞	42.6° x 34.6°; 66 mm x 52 mm 18 cm to ∞	44.8° x 30.8°; 69 mm x 46 mm 18 cm to ∞
	25 mm lens	19.9° x 15.0°; 26 mm x 20 mm 15 cm to ∞	16.4° x 12.0°; 22 mm x 16 mm 15 cm to ∞	28.0° x 22.6°; 62 mm x 50 mm 24 cm to ∞	29.6° x 20.0°; 66 mm x 44 mm 24 cm to ∞
	35 mm lens	14.3° x 10.7°; 16 mm x 12 mm 17 cm to ∞	11.7° x 8.6°; 13 mm x 10 mm 17 cm to ∞	20.2° x 16.2°; 59 mm x 47 mm 28 cm to ∞	21.4° x 14.3°; 62 mm x 42 mm 28 cm to ∞
	50 mm lens	10.0° x 7.5°; 8.8 mm x 6.6 mm 18 cm to ∞	8.2° x 6.0°; 7.2 mm x 5.3 mm 18 cm to ∞	14.2° x 11.4°; 62 mm x 50 mm 38 cm to ∞	15.0° x 10.1°; 66 mm x 44 mm 38 cm to ∞
Calibrated Iris Positions		Two: typically f/1.8, f/16			
Minimum Measurement Time at 100 cd/m ² (sec)		0.3	0.4	0.5	0.6
Spatial Measurement Capabilities		Luminance, Illuminance, Luminous Intensity, Uniformity, Contrast, Gamma, User Defined			
Units		cd/m ² , fL, lux, fc, cd			
Communication Interface		USB 3.0			
Power		5 V over USB or 12 V over GPIO Connector (recommended), 4.5 W max			
Dimensions Excluding Lens (H x W x D)		44 mm x 29 mm x 58 mm			
Weight		110 g for photometer; 200 g 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			

- * Using 7x7 pixel area, calibrated with 35mm lens, f/1.8
- ** Typical, using ND3 and at iris f/16
- *** Based on measurements of illuminant A, 20 x 20 pixel area
- **** Using 90 x 90 pixel area

SYSTEM RECOMMENDATIONS

- 3.0 GHz and 8 cores
- 16 - 32 GB RAM
- Windows 7 or 10, 64 bit
- Dual-monitor video output
- USB 3.1 port. (USB 3.1 PCIe card included with system)

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

