



**WESTBORO
PHOTONICS**

SMART SERIES

CCD IMAGING PHOTOMETERS

P32F P144F P199F P501F

P32F

KEY FEATURES

Fast Measurements

Up to 2448 x 2048
Resolution

Small Size, 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 SMART series of imaging photometers is based upon advanced digital imagers using progressive scan Sony CCD sensors and compact electronics. They are the smallest, most versatile imaging photometers in the world. The series is available in four resolutions:

MODEL	P32F	P144F	P199F	P501F
RESOLUTION	648 x 488	1392 x 1032	1624 x 1224	2448 x 2048

With typical lenses, these photometers can reliably measure scenes below 0.1 cd/m² and above 20,000 cd/m². Very high dynamic range scenes (with both very bright and dim areas) can be properly acquired with software. High dynamic range measurements can exceed 1,000,000:1.

The imagers are designed to maximize usability and include sturdy metal cases, LED status indicator and a 1/4-20" thread mount on the bottom. Screw holes located on either side of the camera's IEEE-1394B connector ensure a secure locking of the 4.5 meter long IEEE-1394B cable to the camera. This guarantees not only a reliable connection, it also

reduces stress on internal electronics caused by cable movement. No additional cables to the photometer are required as both power and data are supplied over the 1394B cable.

The precise matching of the CIE V-lambda filter ensures accurate measurements.

The photometers can be configured with a wide assortment of zoom or fixed focal length lenses. Contact Westboro Photonics for lens options.

Very low power consumption ensures minimal self-heating thereby negating the need for TE cooling. Optional 12V battery operation is available.

SPECIFICATIONS

SMART SERIES CCD IMAGING PHOTOMETERS

MODEL	P32F	P144F	P199F	P501F
Measurement Capabilities	Luminance, Illuminance, Luminous Intensity, Ratio			
Units	cd/m ² , fL, lux, cd, % user defined			
A/D	12-bit	12-bit	12-bit	14-bit
Sony Sensor Size and Type	1/3" ICX 424 HAD	1/2" ICX 267 Super HAD	1/1.8" ICX 274 HAD	2/3" ICX 625 Super HAD
Pixel Size (µm)	7.4 x 7.4	4.65 x 4.65	4.4 x 4.4	3.45 x 3.45
Image Resolution H x V	648 x 488	1392 x 1032	1624 x 1224	2448 x 2048
Dynamic Range	>100,000:1 with electronic bracketing			
Luminance Range (cd/m ²)*1	.007 to 24,000	.015 to 50,000	.02 to 50,000	.08 to 100,000
Optional ND filters	10X, 100X, 1000X	10X, 100X, 1000X	10X, 100X, 1000X	10X, 100X, 1000X
Repeatability *2	0.5%	0.5%	0.5%	0.5%
Accuracy *2	3 %, typical, relative to illuminant A calibration source			
Exposure timing	Electronic Shutter, <10 ms to 10 s			
Lenses Available	C- or F-mount	C- or F-mount	C- or F-mount	C- or F-mount
Dimensions (without lens)	29 x 29 x 30 mm	29 x 29 x 30 mm	29 x 29 x 30 mm	44 x 29x 58 mm
Weight	58 g	58 g	58 g	104 g
Power Requirements	2 W	2 W	2 W	3.8 W
Mounting	Standard 1/4"-20 mount on bottom			
Computer Interface	IEEE-1394B	IEEE-1394B	IEEE-1394B	IEEE-1394B
Electrical Compliance	CE and Part 15 Class A of FCC Rules			
Temperature	To cal specifications, 18 to 25 °C, Operating 5 to 40 °C; storage -30 to 60 °C, non-condensing			
Warranty	2 years	2 years	2 years	2 years

*1. Typical values when used with zoom lens. Reliable measurement threshold level: luminance stimulus to produce a response 97.5% below CCD saturation level (100 counts on the 12-bit scale).

*2. Relative to calibration standard average, of 6 x 6 pixel area, illuminant A, 5 to 1000 cd/m², for all calibrated focus and zoom settings of lenses with less than 30 degrees field of view at F-5.6. Uniformity is verified in center of each of 9 zones of the image. See our sample calibration reports for more information.

*Specifications are subject to change without notice

ORDERING INFORMATION	
P32F	Imaging Photometer, 648 x 488 Resolution
P144F	Imaging Photometer, 1392 x 1032 Resolution
P199F	Imaging Photometer, 1624 x 1224 Resolution
P501F	Imaging Photometer, 2448 x 2048 Resolution
PM-DEV	Software Developers Kit (SDK) for automation using LabView, Matlab, VB, C# and C++ etc.

SYSTEM REQUIREMENTS	
Windows 7, Windows XP Installed IEEE-1394B interface with 12V power 1GB RAM, 20GB HDD 1920 x 1200 resolution monitor recommended	New photometers include: - Photometrica® software - Calibration with one lens - 1394A-B Interface cable

