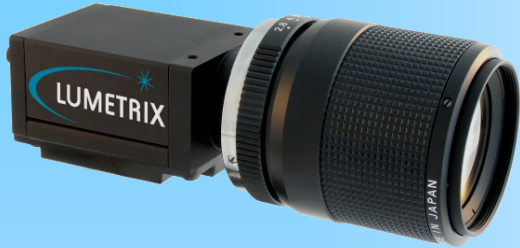


# SMART Series

CCD Imaging Photometers



- ◆ Fast Measurements
- ◆ Cost Effective
- ◆ Resolution up to 2448 x 2048 Pixels
- ◆ Small size
- ◆ 12- or 14-bit A/D

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. Typical applications include:

- Display inspection and characterization
- Beam patterns of lamps and luminaires
- Roadway and Airport Lighting
- Automotive lighting
- Architectural scenes
- Reflection and transmission
- Theatrical and commercial lighting
- Human factors engineering

Model:	P32F	P144F	P199F	P501F
Pixels:	648x488	1392x1032	1624x1224	2448x2048

This series of imaging photometers is available in four resolutions:

With typical lenses, these photometers can reliably measure scenes, below  $0.1 \text{ cd/m}^2$  and above  $20,000 \text{ cd/m}^2$ . Using Lumetrix's RT32 or Photometrica™ software high dynamic range scenes (with both very bright and dim areas) can be properly acquired. 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" threaded 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 for measurements.

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

Very low power consumption means it is easy to run on external batteries. The photometers have very minimal self heating, eliminating the need for additional cooling electronics.



## Detailed Specifications

Model	P32F	P144F	P199F	P501F
Measurement Capabilities	Luminance, Illuminance, Luminous Intensity, ratio			
Units	cd/m <sup>2</sup> , fL, lux, cd, %, user defined			
A/D	12-bit			14-bit
Sony Sensor Size and Type	1/3" ICX424 HAD	1/2" ICX267 Super HAD	1/1.8" ICX274 HAD	2/3" ICX625 Super HAD
Pixel Size (um)	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	648x488	1392x1032	1624x1224	2448x2048
Dynamic Range	>100,000:1 with electronic bracketing			
Luminance Range (cd/m <sup>2</sup> ) *1,2	.007 to 24,000	.015 to 50,000	.02 to 50,000	.08 to 100,000
Optional ND filters	10X, 100X, 1000X			
Meas. time at 1cd/m <sup>2</sup> *1	<.2s	<.6s	<.9s	<1s
Repeatability *2	0.10%			
Accuracy *3	3%			
Exposure timing	Electronic Shutter, 0.65ms to 10s			
Lenses Available	C- or F-Mount			
Dimensions (WxHxD) (without lens)	29x29x30 mm			44x29x58 mm
Weight	58 g			104 g
Power Requirements	2W			3.8W
Mounting	Standard 1/4"-20 mount on bottom			
Computer Interface	IEEE-1394b			
Electrical Compliance	CE and Part 15 Class A of FCC Rules			
Temperature	To cal specifications, 18 to 25C, Operating 5 to 40C; storage -30 to 60C, non-condensing			
Warranty	2 years			

\*1 Typical with zoom lens and 3 calibrated iris selections. With >100:1 resolution (50:1 signal to noise ratio). Illuminant A

\*2 Average 6x6 pixel area with sufficient signal to noise

\*3 Relative to calibration standard, 6x6 pixel area, illuminant A, from 5 to 1000 cd/m<sup>2</sup> at F-5.6

\* Specifications are subject to change without notice

## Sample Lenses

Photometer:	P32F	P144F	P199F	P501F
	Field of View			
<b>IQC-48ZM</b> , 1/2" zoom, 8-48mm, 1m to infinity	<b>MIN:</b> 2.3° x 3° <b>MAX:</b> to 13° x 17°	3.1° x 4.1° to 18° x 23°		
<b>IQC-75ZM</b> , 2/3" zoom, 12.5-75mm, 1.2m to infinity	<b>MIN:</b> 1.8° x 2.4° <b>MAX:</b> to 10° x 14	2.4° x 3° to 14° x 18°	3° x 4° to 18° x 23°	4° x 5.5° to 23° x 31°
<b>IQC-50</b> , 50mm macro lens, 0.25m to infinity			4.5° x 6°	6° x 8°

Other lens types such as macro, fisheye and tele-microscopic are available

## Ordering Information

All imaging photometers include a 1394b PCI express bus card, 4.5m cable and RT32 software

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
1394B-Express	IEEE1394B Express Bus adapter and power supply for Notebook PCs
IQC-COM+	Automation Server, ActiveX and COM Object commands PLUS LABVIEW Drivers for Lumetrix Imaging Photometers.
PM-PH	Photometrica software for Lumetrix Photometers and STiR Instruments.
PM-DEV	Photometrica Automation Server for Lumetrix Photometers. For automation clients such as LabView, Matlab and C++.



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