



CCD Imaging Photometer and Colorimeter PM-1600F™ Series



Applications

- Brightness and color uniformity testing for high dynamic range applications
- Illumination distribution measurement
- Luminance distribution and luminous intensity distribution measurement

Benefits

- Provides quantitative measurements that correspond to human perception of brightness and color
- Fast, accurate luminance and color measurements
- Optimized for high dynamic range, low noise measurement
- Easy to use measurement control and image analysis software allows detailed data evaluation
- Industry leading warranty and technical support ensure successful applications in both R&D and production

High dynamic range imaging colorimeter for demanding measurement applications

The PM-1600F™ Series of imaging photometers and colorimeters delivers high dynamic range, high spatial resolution, large field of view, and measurement speed, making it ideal for luminance and color measurement applications that require low noise and high precision. The CCDs used in the PM-1600F™ series are full-frame CCDs with 100% fill factor, making them ideally suited for obtaining complete luminance and color distribution data for illuminance, luminous intensity, view angle performance, and scatter.

The PM-1600F™ series uses 16-bit (with over 65,000 gray levels), thermoelectrically cooled and temperature stabilized, scientific grade CCDs for accuracy and repeatability. There are two CCD resolutions available—512 × 512 and 1,024 × 1,024—so that the best application fit can be obtained. For added versatility and measurement speed, the CCDs can be operated at lower resolutions with electronically binned pixels. In addition, both photometric and colorimetric configurations are available.

All F-Series™ cameras include motorized filter wheels, for both the CIE matched filters and a set of internal neutral density filters, and Radiant Imaging's patent-pending precision internal shutter. A wide selection of lenses is available, allowing the field of view and working distance to be tailored to the application.

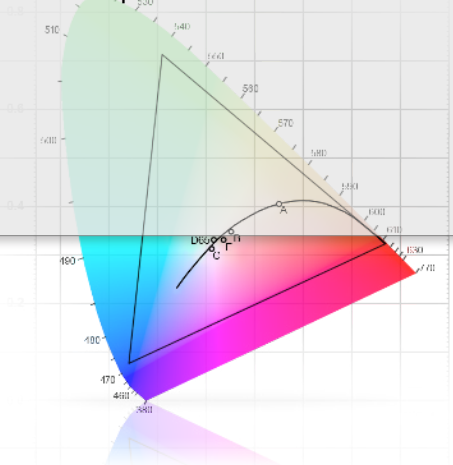
The F-Series™ models include numerous design improvements over earlier Radiant Imaging photometers and colorimeters to provide enhanced performance, improved reliability, and easier maintenance for their users.

Each PM-1600F™ series imaging photometer and colorimeter comes with Radiant Imaging's ProMetric® control and analysis software, which provides complete measurement control and an extensive suite of image analysis functions. ProMetric® software functions can be externally accessed through PMEngine™ .NET (Framework 2.0) controls so users can build custom test and analysis sequences.

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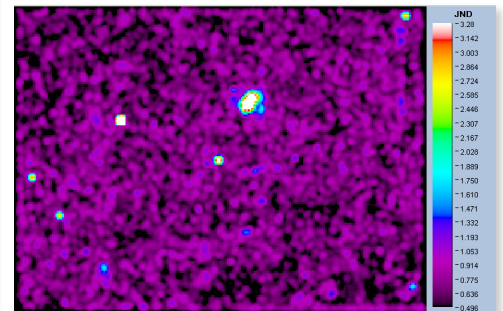
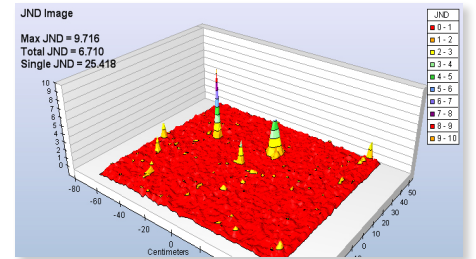
Key Features

- 16-bit, full frame, temperature stabilized CCD sensor
- Integrated CIE matched color filters and neutral density filters
- Precision, patent-pending, high speed internal shutter
- Broad selection of CCD resolutions and standard lenses
- Complete ProMetric® control and analysis software support

Specifications*

Spatial measurement capabilities	Luminance, Radiance, Illuminance, Irradiance, Luminous Intensity, Radiant Intensity, CIE Chromaticity Coordinates, L*a*b* Color Scale, Correlated Color Temperature (CCT), Dominant Wavelength		
Units	Footlambert, Cd/cm ² , Cd/m ² , Nit, Mnit, mnit, W/sr/m ² , W/sr/ft ² , W/sr/cm ² , mW/sr/m ² , Footcandles, Lux, mLux, Mlux, Lux-Sec, W/m ² , W/ft ² , W/cm ² , mW/m ² , MW/m ² , W-Sec/m ² , Candela, W/sr, CIE (x,y) and (u',v'), Kelvin (CCT)		
CCD resolution	512 × 512 or 1,024 × 1,024 pixels		
CCD A/D dynamic range	16 bits = 65,536 gray scale levels		
Luminance range	0.0005 nit minimum [†] 10 ¹⁰ nit maximum with optional ND filters		
System accuracy	Illuminance	± 3% ₁	
	Luminance (Y)	± 3% ₁	
	Color Coordinates (x,y)	± 0.003 ₁	
Short-term repeatability	Illuminance	± 0.5% ₂	
	Luminance (Y)	± 0.5% ₂	
	Color Coordinates (x,y)	± 0.0006 ₂	
Interface	USB2.0		
Minimum measurement time (for 100 cd/m ²), photopic and color	512x512 CCD	2 seconds	6 seconds
	1,024x1,024 CCD	3 seconds	9 seconds
Camera field of view	512 × 512 CCD	2° to 38°	
	1,024 × 1,024 CCD	5° to 80°	
Dimensions	154mm × 242mm × 200mm (H × W × D)		
Weight	4.8kg		
Operating temperature	0–30° C		
Operating humidity	20 - 70% non-condensing		

* Specifications subject to change without notice
[†] Higher sensitivity CCD available on request
 Applicable only for color series



System Requirements

- 2.0 GHz or faster processor
- 1GB or greater RAM
- Windows® XP, Vista or 7 (32-bit)
- USB 2.0 interface

- 1 Based on Illuminant A, D65, or user calibration for specific spectra. Based on a virtual detector size of 100 pixels. Specification is for every point within the field of view of the camera.
- 2 At every point within the field of view of the camera, based on a virtual detector size of 100 pixels.
- 3 Uses minimum luminance measurement set-up.