

# PM-1400E Color Series

CCD Imaging Photometer, Radiometer and Colorimeter

NEW AND  
IMPROVED



- Millions of light and color data points acquired in seconds
- Measure 2-D distribution of Luminance (Radiance), Illuminance (Irradiance), Luminous (Radiant) Intensity
- Measure 2-D distribution of CIE (x,y) and (u',v') chromaticity coordinates and Correlated Color Temperature (CCT)
- Cooled scientific grade CCD camera with 14 bits of dynamic range
- Field of View: 1 degree to 68 degrees plus micro and macro capabilities
- Fully Integrated Windows Software with Active-X controls for easy Production and Automated Test Sequence Interface Development

## NEW TO THE "E" SERIES

- Patent pending mechanical shutter shortens exposure times and provides increased lifetime and repeatability
- Internal ND filters now included
- New shutter design, motors and circuitry. Change from magnetic to optical positioning of new filter wheel
- Increased speed of filter wheel allows for up to 20% shorter measurement time for sequential color measurements

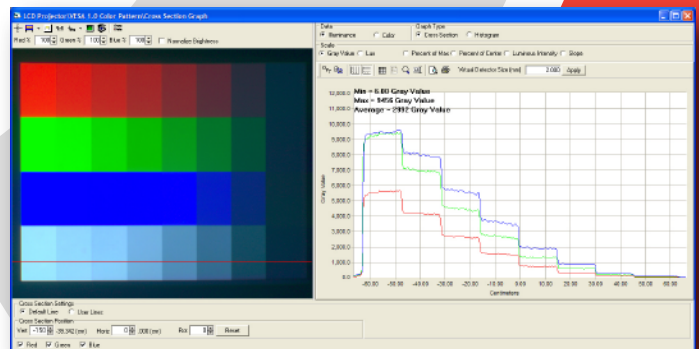
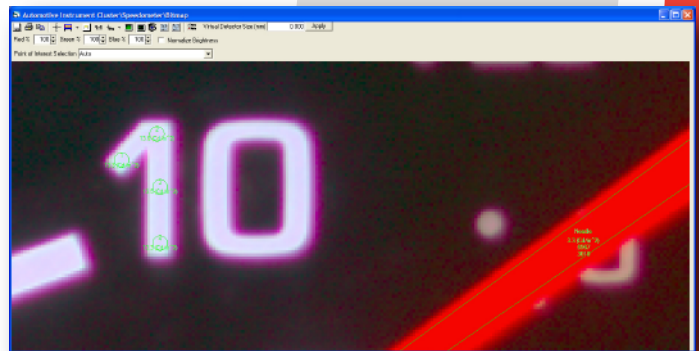
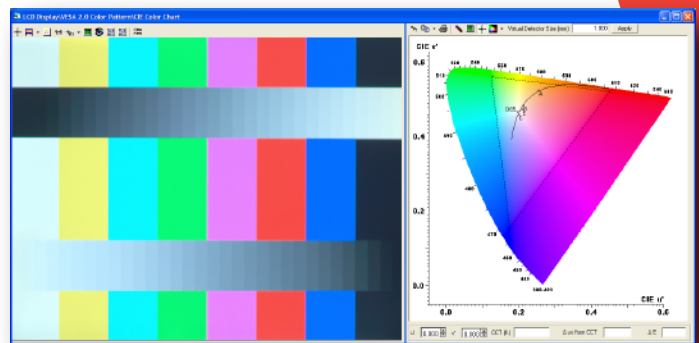
## DESCRIPTION

PM-1400E Color Series is a **USB 2.0** computer controlled CCD-based imaging photometer, radiometer and colorimeter system capable of capturing images and quantitatively analyzing these images for light and color characteristics. The PM-1400E Color system consists of:

- 2-stage Peltier cooled 14-bit CCD camera
- Precisely designed color filters to match the CIE 1931 tristimulus spectral response curves (*custom filters available upon request*)
- Standard lenses from 14mm to 300mm (*Microscope objectives 4x to 50x also available*)
- ProMetric® v. 8.5 software for camera control, data acquisition, data analysis and test report generation.
- Illuminance calibration light source or factory luminance calibration included
- Factory color calibration included

## APPLICATIONS

- CRT, LCD, PDP, LED, OLED, and Backlight Display Testing of Luminance, Luminance Uniformity and Mura Inspection
- Projection System Testing of Luminance, Illuminance, Color Uniformity and Color Mura Inspection
- Roadway and Scene Illumination and Color Evaluations
- Color Filter Uniformity Testing
- Illumination System Beam Pattern Testing of Luminous (Radiant) Intensity and Illuminance (Irradiance)



15321 Main St. NE, Duvall, Washington, 98019, US  
Phone: (425) 844-0152 Fax: (425) 844-0153  
sales@radiantimaging.com  
www.radiantimaging.com

# PM-1400E Color Series

CCD Imaging Photometer, Radiometer, and Colorimeter



## TYPICAL SPECIFICATIONS\*

### 2-Dimensional Measurement Capabilities

Luminance  
Radiance  
Illuminance  
Irradiance  
Luminous Intensity  
Radiant Intensity  
CIE Chromaticity Coordinates  
Correlated Color Temperature (CCT)

### Units

Footlambert, Cd/cm<sup>2</sup>, Cd/m<sup>2</sup>, Nit, Mnit, mnit  
W/sr/m<sup>2</sup>, W/sr/ft<sup>2</sup>, W/sr/cm<sup>2</sup>, mW/sr/m<sup>2</sup>  
Footcandles, Lux, mLux, Mlux, Lux-Sec  
W/m<sup>2</sup>, W/ft<sup>2</sup>, W/m<sup>2</sup>, mW/m<sup>2</sup>, MW/m<sup>2</sup>, W-Sec/m<sup>2</sup>  
Candela  
W/sr  
CIE (x,y) and (u',v')  
Kelvin (for CCT)

### CCD Resolution (px)

512x512, 768x512, 1024x1024, 1536x1024 or 3072x2048  
Custom CCD resolutions are also available

### CCD Camera A/D Dynamic Range

14 bits = 16,384 grayscale levels

### Luminance Range

0.005 nit minimum  
10<sup>10</sup> nit maximum with ND filters

### System Accuracy

Illuminance ± 3%<sub>1</sub>  
Luminance (Y) ± 3%<sub>1</sub>  
Chromaticity Coordinates (x,y) ± 0.003<sub>1</sub>

### Short Term Repeatability

Illuminance ± 0.5%<sub>2</sub>  
Luminance ± 0.5%<sub>2</sub>  
Chromaticity Coordinates (x,y) ± 0.0006<sub>2</sub>

### Interface

USB 2.0

### Minimum Color Measurement Time for 100 cd/m<sup>2</sup>

4.5 seconds (512x512)  
4.9 seconds (768x512)  
8.0 seconds (1024x1024)  
10.0 seconds (1536x1024)  
30.4 seconds (3072x2048)

### Camera Field of View (FOV)

512x512 CCD 1 to 30 degrees  
768x512 CCD: 1 to 20 degrees  
1024x1024 CCD: 3 to 62 degrees  
1536x1024 CCD: 2 to 40 degrees  
3072x2048 CCD: 3 to 68 degrees

### Dimensions:

242mm (H) x 154mm (W) x 100mm (D)

### Weight:

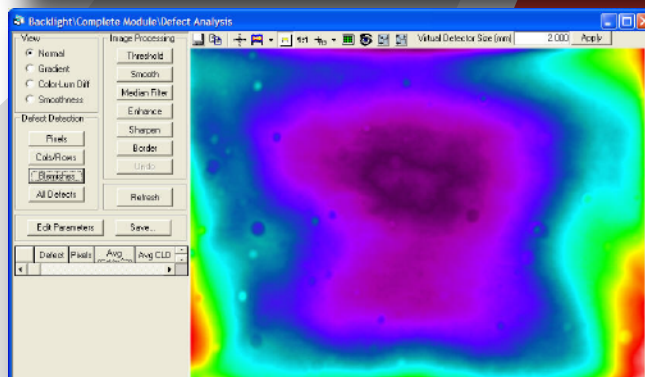
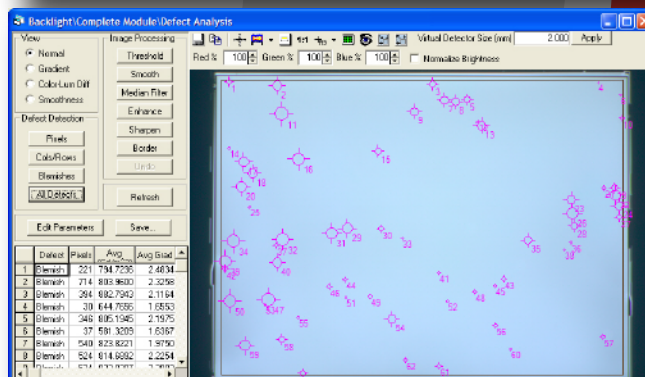
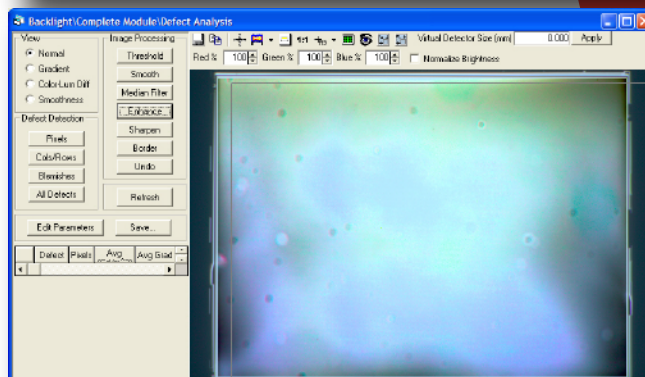
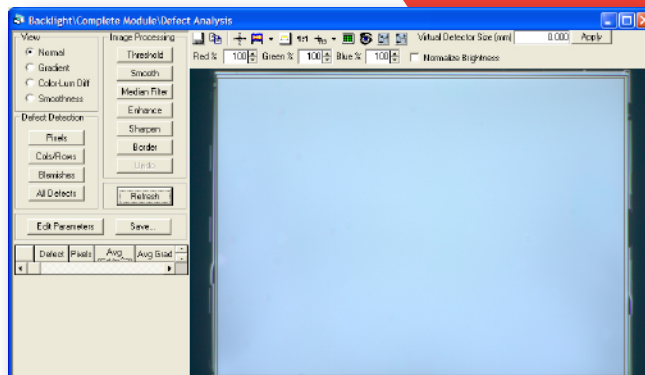
8 lbs. (3.6 kg.)

1. Based on Illuminant A, D 65, or user calibration for specific spectra. Based on a virtual detector size of 40 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 virtual detector size of 40 pixels.

\* Specifications subject to change without notice.

## DEFECT DETECTION (advanced capabilities)



## SYSTEM REQUIREMENTS

Pentium IV, 1.3 GHz Processor or faster, 512 MB RAM  
Windows® 2000 or XP  
USB 2.0 Interface



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IMAGING

SEE THE DIFFERENCE™

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