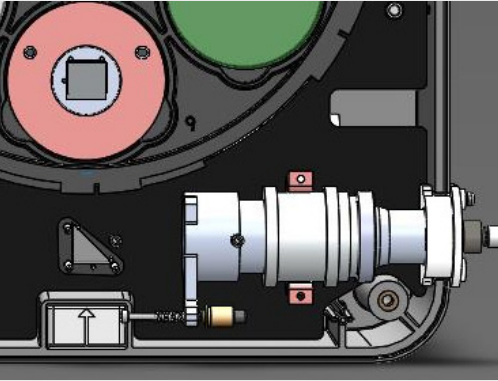


## ProMetric® I-SC Solution

Imaging Colorimeter & Integrated Spectrometer



The ProMetric I-SC employs a mirror mounted inside the imaging colorimeter on the color filter wheel to redirect light through a fiber-optic cable to the spectrometer.

### ProMetric I-SC Highlights

- Optimized for speed, resolution, and measurement accuracy
- Captures spectral and spatial measurement data simultaneously using a single solution
- References spectral data to calibrate the tristimulus imaging colorimeter according to CIE color-matching functions
- Works seamlessly with Radiant Vision Systems TrueTest™ Automated Visual Inspection Software packages
- Offers multiple sensor resolution options and lens choices with Smart Calibration™ for a wide range of distance and aperture settings

## Combination imaging colorimeter & spectrometer for complete color measurement in one solution

ProMetric® I imaging colorimeters are designed to address inspection demands for high-volume manufacturing of displays, illuminated components, light sources, and surfaces. These systems use tristimulus color filters, which provide an innately close response to standard CIE color-matching functions. This enables the most accurate evaluation of color based on the human visual experience (380 nm - 780 nm) to ensure quality as perceived by users of light-emitting devices. With scientific-grade image sensors in a range of high-resolution options, ProMetric imaging colorimeters can perform subpixel-level measurement of luminance and chromaticity as well as inspect numerous precise details across large fields of view.

The ProMetric I-SC Solution uses a polarization-insensitive mirror to combine the functions of an enhanced ProMetric I imaging colorimeter with a high-end CAS 140D spectroradiometer from Instrument Systems GmbH. This innovative design is based on patented technology developed by Radiant Vision Systems (US Patent No. 8482652). Using a measurement image acquired by the connected imaging colorimeter, the ProMetric I-SC simultaneously measures spectral data at the center point while quantifying and comparing spatial luminance ( $\text{cd}/\text{m}^2$ ) and chromaticity (CIE  $x,y$  and  $u'v'$ ) values across the image to evaluate a device. Both systems are controlled using a single software platform, which also provides a centralized interface for data visualization and output. From software, users can initiate spectral data capture on demand or program the solution to capture a spectrum automatically with each measurement. Reference spectral data can be applied directly to the imaging colorimeter for in-line color calibration to new devices and device states, ensuring a consistent match between camera response and CIE measurement functions. As a directly integrated system, ProMetric I-SC operates continuously without intervention, ensuring repeatable accuracy, efficiency, and ease of use.

ProMetric I-SC colorimeters are optimized to work with industry-leading TrueTest™ Automated Visual Inspection Software from Radiant Vision Systems. TrueTest provides a complete turnkey solution for production-level test sequencing using a library of light measurement and inspection software tools. From absolute accuracy in product design to optimal efficiency for in-line quality control, the ProMetric I-SC Solution is engineered specifically to address end-to-end metrology applications.

# ProMetric® I-SC Solution Specifications

## Spectrometer Specifications

Parameter	Spectroradiometer
Luminance Minimum	0.02 cd/m <sup>2</sup>
Luminance Maximum (using ND3 filter)	1,000,000 cd/m <sup>2</sup>
Spectroradiometer Absolute Accuracy	Color Coordinates (x,y) ± 0.0015 for CIE standard illuminant A
Short-term Repeatability	± 0.1% (2 sigma)
Minimum Measurement Time	200 ms
Measurement Spot Size	Corresponding to ~600 I61 imaging colorimeter sensor pixels (in diameter)
Communication Interface	Ethernet 100/1000
Power supply	Wide-range input 100 - 240 VAC 50/60 Hz
Dimensions (H x W x D)	144 mm x 341 mm x 359 mm
Weight	9 kg
Operating Temperature	15 - 35° C
Operating Humidity	Relative humidity 0 - 70 % max., non-condensing

## Imaging System Specifications

Parameter	ProMetric I61-SC
Primary Application	Uniformity Testing, R&D Settings, Production Line Testing, Display Testing, Color Correction
Sensor Pixel Resolution	9568 x 6380
Sensor Megapixels	61.0
Sensor Type	CMOS
System Dynamic Range (single exposure, per pixel)	76 dB (1 x 1 binning)
Luminance (Minimum)*	0.0005 cd/m <sup>2</sup> Limit of Detection 0.0010 cd/m <sup>2</sup> @ SNR = 60 0.0015 cd/m <sup>2</sup> @ SNR = 100
Luminance (Maximum)	10 <sup>10</sup> cd/m <sup>2</sup> with optional ND filters
Imaging Colorimeter Accuracy**	Illuminance ± 3%; Luminance (Y) ± 3%; Color Coordinates (x,y) ± 0.003
Short-term Repeatability*	Illuminance ± 0.02%; Luminance (Y) ± 0.02%; Color Coordinates (x,y) ± 0.00005
Lens Type	Electronically controlled focus and aperture
Focal Distances Available	50, 100 mm
Field of View (Full Angle, H x V degrees)	50 mm 40° x 28° 100 mm macro 20° x 14°
Minimum Measurement Time***	0.6 sec - photopic 1.8 sec - color
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	foot-lambert, cd/m <sup>2</sup> , nit, W/sr/m <sup>2</sup> , foot-candles, lux, lux-s, W/m <sup>2</sup> , W-s/m <sup>2</sup> , candela, W/sr, CIE (x, y) and (u', v'), Kelvin (CCT)
Communication Interface	10 Gigabit Ethernet (10 GigE)
Power	100-240 V, 50-60 Hz, 140 Watts
LCD Touch Panel	Resolution: 800 x 600; Diagonal: 125 mm
Dimensions (H x W x D)	238 mm x 181 mm x 230 mm
Weight	4.6 kg
Operating Temperature	5 - 35° C
Operating Humidity	20 - 70% non-condensing

Specifications subject to change without notice.

## ProMetric® I-SC Colorimeter



ProMetric I-SC imaging colorimeters, and the electronically-controlled lenses supplied with them, are factory-calibrated over all possible distances and two specific aperture settings. Because the lenses are electronically controllable for focus (working distance) and aperture, the colorimeter will automatically apply the appropriate flat-field correction.

Lens	Calibrated Apertures
Canon EF 50 mm R f/2.0 USM	f/4 f/8
Canon EF 100 mm f/2.8L Macro IS USM	f/4 f/8

ProMetric I-SC imaging colorimeters optionally can be fitted with an AR/VR Lens to measure near-eye displays in augmented (AR), virtual (VR), or mixed reality (MR) headsets.

## System Specifications

- Intel® Core™ i7-8086 CPU @ 4.00 GHz and 8 cores
- 32 GB Installed RAM

## System Requirements

- Windows® 10, 64 bit
- Ethernet 100/1000
- Desktop: PCI-E x8 lane slot (I61-SC)
- Laptop: Thunderbolt 3 Port (I61-SC)

\* Based on a virtual detector size of 100 x 100 pixels.  
 \*\* Based on illuminant A or user calibration for specific spectra. Based on a virtual detector size of 100 x 100 pixels and a minimum exposure time of 10 ms.  
 \*\*\* For 100 cd/m<sup>2</sup>, using Ethernet.



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