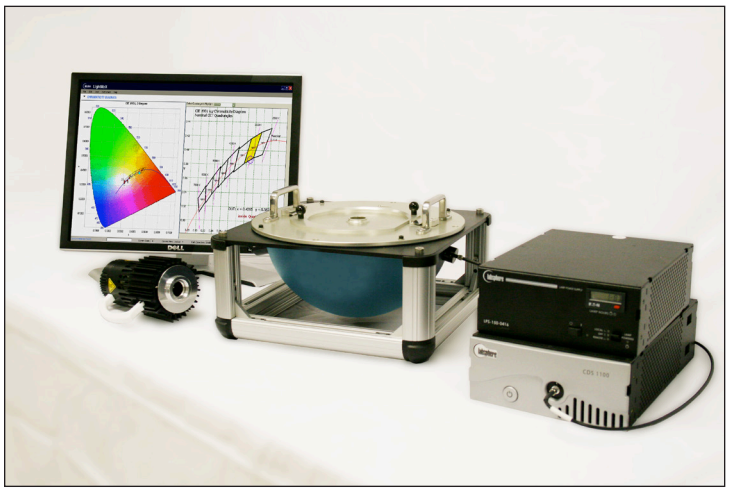
HalfMoon® Light Measurement Systems

Efficient forward flux measurement method in half the footprint



VALUE

Larger forward flux emitting light engines measured with half of the footprint of a regular integrating sphere system

Lamp standard of forward flux minimizes substitution errors between the lamp standard and DUT

Radiometric, photometric and colorimetric characterization capabilities

Easy mounting capabilities for DUTs

Spectraflect® coated hemisphere

Out of the box operation

User friendly control software

Backed by ISO 9001:2000 Registered Quality Management System

APPLICATIONS

LEDs

LED light engines

SSL fixtures

Displays

Practical

This intuitively designed system allows for the same accurate, repeatable results as a traditional integrating sphere system in half the footprint. Designed to measure forward emitting lamps, LEDs, board mounted and heat-sinked LED Light Engines for Solid State Lighting (SSL), the HalfMoon System features a Spectraflect® coated hemisphere capped with an interior mirrored surface. This mirrored surface creates a virtual integrating sphere within the interior. A centrally placed port in the mirrored surface allows for the Device Under Test (DUT) to be internally mounted in the center of the virtual sphere while keeping the electrical and thermal controls of the DUT outside, reducing absorption errors that can occur in a traditional sphere based system.

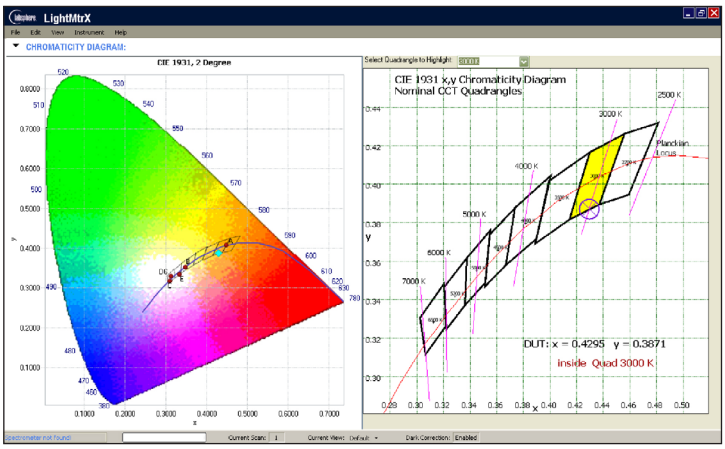
Simple

The central mounting of the HalfMoon sphere allows for users to easily mount the lamp in the center of the sphere with the lamp driving device remaining on the outside of the sphere, reducing absorption errors. The center mounting combined with the internal mirrored surface allows for symmetrical light distribution by the specular image minimizing integrating error within the sphere. The hemispherical design of the HalfMoon system also allows for a smaller footprint being only half the size of a traditional integrating sphere system.

Fast and accurate

With the MtrX-SPEC Spectral Light Measurement Software, and CDS 1100/2100, Labsphere's HalfMoon Systems offer users fast repeatable results. The CDS 1100/2100 spectrometers offer low noise, high dynamic range and a choice of broad spectral ranges through the UV-VIS-NIR with unparalleled ease of use. The NIST traceable calibration and validation for 2p spectral flux, lumens, electrical, and color characterization of the DUT are able to be done with minimal process tooling.

These results help increase the rate of product development, decrease time to market and reduce development costs.



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PB-01300-000 Rev.02

Specifications

Model and Description	HMS-1211	HMS-1221
HalfMoon Light Measurement System	AS-02780-125	AS-02780-126
System Includes	**12 inch**	**12 inch**
HalfMoon, HM-120-SF	AS-02780-120	AS-02780-120
Preset Power Supply, LPS-150-0416	AS-02656-416	AS-02656-416
Calibrated Forward Spectral Flux Standard	AS-02768-100	AS-02768-100
CCD Array Spectrometer, CDS 1100 or 2100	AS-02746-100	AS-02746-200
50 W Absorption Correction Lamp, AUX-50	AS-02737-050	AS-02737-050
Sold Separately		
MtrX-SPEC Spectral Light Measurement Software	MtrX-SPEC	MtrX-SPEC

Product Properties and Performance

HalfMoon Sphere	**12 inch (31 cm)**	**12 inch (31 cm)**
Coating Reflectance:	98%	98%
Radiometric Range:	100 W (max)	100 W (max)
Photometric Range: (Illuminant A)	311 mlm – 6945 lm	311 mlm – 6945 lm
Red LED Range:	53 mlm – 1167 lm	53 mlm – 1167 lm
Green LED Range:	186 mlm – 4139 lm	186 mlm – 4139 lm
Blue LED Range:	78 mlm – 1695 lm	78 mlm – 1695 lm
Spectral Range:	350 - 850 nm	350 - 1000 nm
Max Recommended DUT Dimension: *	2 x 2 in (5 x 5 cm)	2 x 2 in (5 x 5 cm)
Spectrometer	**CDS 1100**	**CDS 2100**
Detector:	TE Cooled 1044 x 64 CCD (back thinned)	TE Cooled 1044 x 64 CCD (back thinned)
Spectral Range:	250 - 850 nm	350 - 1050 nm
Resolution:	1.5 FWHM	1.5 FWHM
Integration Time:	8 ms – 60 s	8 ms - 60 s
Cooling:	10 +/- 0.05 C	10 +/- 0.05 C
TE Temp Drift:	+/- 1 C	+/- 1 C
Linearity:	+/- 0.5%	+/- 0.5%
Wavelength Accuracy:	<+/- 0.4 nm	<+/- 0.4 nm
Stray Light Broadband:	$<10^{-4}$ at 400 nm w/ Ill A source	$<10^{-4}$ at 400 nm w/ Ill A source
Stray Light LED/Laser:	$<10^{-5}$ at 500 nm w/633 nm laser	$<10^{-5}$ at 500 nm w/633 nm laser
Focal Length:	100 mm	100 mm
Optical Input:	600 mm, 3 m long (SMA Connection)	600 mm, 3 m long (SMA Connection)
Speed:	0.1 scans /sec	0.1 scans /sec
Dynamic Range: (Single Scan)	30000:1	30000:1
Spectral Sample Interval:	0.25 nm	0.25 nm
Mechanical Shutter:	Yes	Yes
AD Converter:	16 bit	16 bit
PC Interface:	USB 2.0	USB 2.0
Trigger:	11.3 lbs (5.04 kg)	11.3 lbs (5.04 kg)
Dimensions: (W x D x H)	8.3 x 13.0 x 3.5 in (21.1 x 32.9 x 8.9 cm)	8.3 x 13.0 x 3.5 in (21.1 x 32.9 x 8.9 cm)
Lamp Standard	**FFS-100-400**	**FFS-100-400**
Lamp Current: (Amps)	4.167	4.167
Approximate Luminous Flux:	400 lm	400 lm
Rated Life:	2000 hrs	2000 hrs
Rated Voltage: (Volts)	12	12
Power Supply	**LPS-150-0416, 4.17 A, 50 W**	**LPS-150-0416, 4.17 A, 50 W**
Power Requirements:	110/220 VAC, 50/60 Hz	110/220 VAC, 50/60 Hz
Current Stability:	0.1%	0.1%
Current Rise Time:	20 s	20 s
Regulated Current:	4.17 A +/- 0.1%	4.17 A +/- 0.1%
Weight:	6.5 lbs (2.9 kg)	6.5 lbs (2.9 kg)
Dimension: (W x D x H)	8.3 x 10.5 x 3.5 in (21.1 x 26.7 x 8.9 cm)	8.3 x 10.5 x 3.5 in (21.1 x 26.7 x 8.9 cm)
Compliance:	CE	CE

* With custom adapter

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Specifications

Model and Description	HMS-2011	HMS-2021
HalfMoon Light Measurement System	AS-02780-205	AS-02780-206
System Includes	**20 inch**	**20 inch**
HalfMoon Sphere, HM-200-SF	AS-02780-200	AS-02780-200
Preset Power Supply, LPS-150-0416	AS-02656-416	AS-02656-416
Calibrated Forward Spectral Flux Standard	AS-02768-100	AS-02768-200
CCD Array Spectrometer, CDS 1100 or CDS 2100	AS-02746-100	AS-02746-100
50 W Absorption Correction Lamp, AUX-50	AS-02737-050	AS-02737-050
Sold Separately		
MtrX-SPEC Spectral Light Measurement Software	MtrX-SPEC	MtrX-SPEC

Product Properties and Performance

HalfMoon Sphere	**20 inch (50 cm)**	**20 inch (50 cm)**
Coating Reflectance:	98%	98%
Radiometric Range:	100 W (max)	400 W (max)
Photometric Range: (Illuminant A)	1.25 lm – 27778 lm	1.25 lm – 27778 lm
Red LED Range:	208 mlm – 467 lm	208 mlm – 467 lm
Green LED Range:	0.75 lm – 6667 lm	0.75 lm – 6667 lm
Blue LED Range:	317 mlm – 7056 lm	317 mlm – 7056 lm
Spectral Range:	350 - 850 nm	350 - 1000 nm
Max Recommended DUT Dimension: *	6 x 6 in (15 x 15 cm)	6 x 6 in (15 x 15 cm)
Spectrometer	**CDS 1100**	**CDS 2100**
Detector:	TE Cooled 1044 x 64 CCD (back thinned)	TE Cooled 1044 x 64 CCD (back thinned)
Spectral Range:	250 - 850 nm	350 - 1050 nm
Resolution:	1.5 FWHM	1.5 FWHM
Integration Time:	8 ms – 60 s	8 ms - 60 s
Cooling:	10 +/- 0.05 C	10 +/- 0.05 C
TE Temp Drift:	+/- 1 C	+/- 1 C
Linearity:	+/- 0.5%	+/- 0.5%
Wavelength Accuracy:	<+/- 0.4 nm	<+/- 0.4 nm
Stray Light Broadband:	$<10^{-4}$ at 400 nm w/ Ill A source	$<10^{-4}$ at 400 nm w/ Ill A source
Stray Light LED/Laser:	$<10^{-5}$ at 500 nm w/633 nm laser	$<10^{-5}$ at 500 nm w/633 nm laser
Focal Length:	100 mm	100 mm
Optical Input:	600 mm, 3m long (SMA Connection)	600 mm, 3m long (SMA Connection)
Speed:	0.1 scans /sec	0.1 scans /sec
Dynamic Range: (single scan)	30000:1	30000:1
Spectral Sample Interval:	0.25 nm	0.25 nm
Mechanical Shutter:	Yes	Yes
AD Converter:	16 bit	16 bit
PC Interface:	USB 2.0	USB 2.0
Trigger:	11.3 lbs. (5.04 kg)	11.3 lbs. (5.04 kg)
Dimensions: (W x D x H)	8.3 x 13.0 x 3.5 in (21.1 x 32.9 x 8.9 cm)	8.3 x 13.0 x 3.5 in (21.1 x 32.9 x 8.9 cm)
Lamp Standard	**FFS-100-400**	**FFS-100-400**
Lamp Current: (Amps)	4.167	4.167
Approximate Luminous Flux:	400 lm	400 lm
Rated Life:	2000 hrs	2000 hrs
Rated Voltage: (Volts)	12	12
Power Supply	**LPS-150-0416, 4.17 A, 50 W**	**LPS-150-0416, 4.17 A, 50 W**
Power Requirements:	110/220 VAC, 50/60 Hz	110/220 VAC, 50/60 Hz
Current Stability:	0.1%	0.1%
Current Rise Time:	20 s	20 s
Regulated Current:	4.17 A +/- 0.1%	4.17 A +/- 0.1%
Weight:	6.5 lbs. (2.9 kg)	6.5 lbs. (2.9 kg)
Dimension: (W x D x H)	8.3 x 10.5 x 3.5 in (21.1 x 26.7 x 8.9 cm)	8.3 x 10.5 x 3.5 in (21.1 x 26.7 x 8.9 cm)
Compliance:	CE	CE

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Specifications

Model and Description	HMS-4011	HMS-4021
HalfMoon Light Measurement System	AS-02780-405	AS-02780-406
System Includes	**40 inch**	**40 inch**
HalfMoon Sphere, HM-400-SF	AS-02780-400	AS-02780-400
Preset Power Supply, LPS-100-0833	AS-02600-833	AS-02600-833
Calibrated Forward Spectral Flux Standard	AS-02768-200	AS-02768-200
CCD Array Spectrometer, CDS 1100 or CDS 2100	AS-02746-100	AS-02746-100
100 W Absorption Correction Lamp, AUX-100	AS-02737-100	AS-02737-100
Sold Separately		
MtrX-SPEC Spectral Light Measurement Software	MtrX-SPEC	MtrX-SPEC

Product Properties and Performance

HalfMoon Sphere	**40 inch (1.02 m)**	**40 inch (1.02 m)**
Coating Reflectance:	98%	98%
Radiometric Range:	1,500 W (max)	1,500 W (max)
Photometric Range: (Illuminant A)	5 lm - 111111 lm	5 lm - 111111 lm
Red LED Range:	1 lm - 18611 lm	1 lm - 18611 lm
Green LED Range:	2.98 lm - 66389 lm	2.98 lm - 66389 lm
Blue LED Range:	1.22 lm - 27222 lm	1.22 lm - 27222 lm
Spectral Range:	350 - 850 nm	350 - 1000 nm
Max Recommended DUT Dimension: *	13 x 13 in (33 x 33 cm)	13 x 13 in (33 x 33 cm)
Spectrometer	**CDS 1100**	**CDS 2100**
Detector:	TE Cooled 1044 x 64 CCD (back thinned)	TE Cooled 1044 x 64 CCD (back thinned)
Spectral Range:	250 - 850 nm	350 - 1050 nm
Resolution:	1.5 FWHM	1.5 FWHM
Integration Time:	8 ms – 60 s	8 ms - 60 s
Cooling:	10 +/- 0.05 C	10 +/- 0.05 C
TE Temp Drift:	+/- 1 C	+/- 1 C
Linearity:	+/- 0.5%	+/- 0.5%
Wavelength Accuracy:	<+/- 0.4 nm	<+/- 0.4 nm
Stray Light Broadband:	$<10^{-4}$ at 400 nm w/ Ill A source	$<10^{-4}$ at 400 nm w/ Ill A source
Stray Light LED/Laser:	$<10^{-5}$ at 500 nm w/633 nm laser	$<10^{-5}$ at 500 nm w/633 nm laser
Focal Length:	100 mm	100 mm
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Dynamic Range: (Single Scan)	30000:1	30000:1
Spectral Sample Interval:	0.25 nm	0.25 nm
Mechanical Shutter:	Yes	Yes
AD Converter:	16 bit	16 bit
PC Interface:	USB 2.0	USB 2.0
Trigger:	11.3 lbs (5.04 kg)	11.3 lbs (5.04 kg)
Dimensions: (W x D x H)	8.3 x 13.0 x 3.5 in (21.1 x 32.9 x 8.9 cm)	8.3 x 13.0 x 3.5 in (21.1 x 32.9 x 8.9 cm)
Lamp Standard	**FFS-100-1000**	**FFS-100-1000**
Lamp Current: (Amps)	8.333	8.333
Approximate Luminous Flux:	1000 lm	1000 lm
Rated Life:	2000 hrs	2000 hrs
Rated Voltage: (Volts)	12	12
Power Supply	**LPS-100-0833, 8.33 A, 100 W**	**LPS-100-0833, 8.33 A, 100 W**
Power Requirements:	110/220 VAC, 50/60 Hz	110/220 VAC, 50/60 Hz
Current Stability:	0.1%	0.1%
Current Rise Time:	20 s	20 s
Regulated Current:	8.33 A +/- 0.1%	8.33 A +/- 0.1%
Weight:	6.5 lbs. (2.9 kg)	6.5 lbs. (2.9 kg)
Dimension: (W x D x H)	8.3 x 10.5 x 3.5 in (21.1 x 26.7 x 8.9 cm)	8.3 x 10.5 x 3.5 in (21.1 x 26.7 x 8.9 cm)
Compliance:	CE	CE

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