

illumia[®] Plus2 Integrating Hemisphere Spectroradiometers

Efficient forward flux measurement method in half the footprint

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 hemisphere system features a Spectrafect[®] coated hemisphere capped with an interior mirrored surface which 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 hemisphere 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 allows for a smaller footprint being only half the size of a traditional integrating sphere system. The integrating hemisphere is recommended by IES as an alternative method to the integrating sphere for measuring total luminous flux.



Features:

- Ideal for in-line productivity
- Test forward flux emitting luminaires and fixtures measured with half the footprint of a regular integrating sphere system
- Radiometric, photometric and colorimetric characterization capabilities
- IES accepted method for photometry of light sources
- Easy mounting capabilities

Find the illumiaPlus2 Hemisphere System that best fits your application

Hemisphere System 800

Measure:

- Packaged LEDs
- Clustered LEDs
- Miniature Lamps
- Entertainment Lighting
- Automotive Lighting
- LED Troffers
- LED Luminaires

Key Features:

- Wide spectral range
- Fast CCD array detector
- Compact size
- Ideal for QC and manufacturing applications
- High sensitivity

Hemisphere System 2600

Measure:

- Indoor Lighting
- Outdoor Lighting
- Roadway Lighting
- Lamp and Luminaires
- LEDs
- Entertainment Lighting
- Automotive Lighting
- Troffers
- Luminaires
- CFLs
- Fluorescent Lamps
- OLEDs
- Low Power LEDs
- UV LEDs (CDS 1100 model only)

Key Features:

- Fast, low noise; TE cooled back-thinned CCD array detector
- Shutter for dark measurements in real time
- Hardware triggering capability
- Exceptional stability at long exposure time
- High dynamic range

Every illumiaPlus2 Hemisphere System features these standard products

Programmable DC Power Supplies

Designed to accurately provide DC current to reference lamp, auxiliary lamp, and DCV devices under test. The current output is selected, set and controlled using Integral Software included with the power supply.

- Programmable regulated DC current
- Programmable regulated DC voltage
- Controlled current ramp up
- Lamp operation timer
- Easy on/off operation
- Front panel or remote control
- Current, voltage readback

ICM-500 Control Module

The illumiaPlus2 Control Module is the routing module that ties Labsphere's powerful Integral Software to the illumiaPlus2 total spectral flux measurement hardware. When the ICM-500 is controlled by Integral, this user friendly, turn key system automatically routes power and metering.

- Main hub for power supplies and power meters
- Routes DC voltage to 2π and 4π reference locations
- Routes power to absorption correction lamp
- Routes DC or AC power to devices under test
- USB inputs

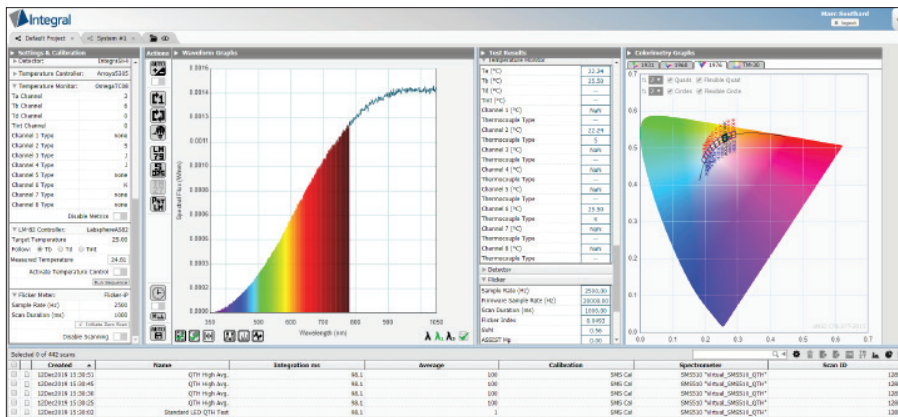
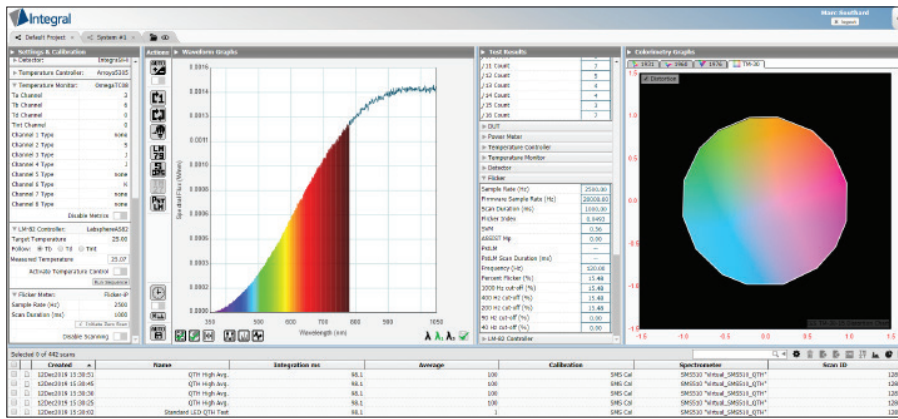
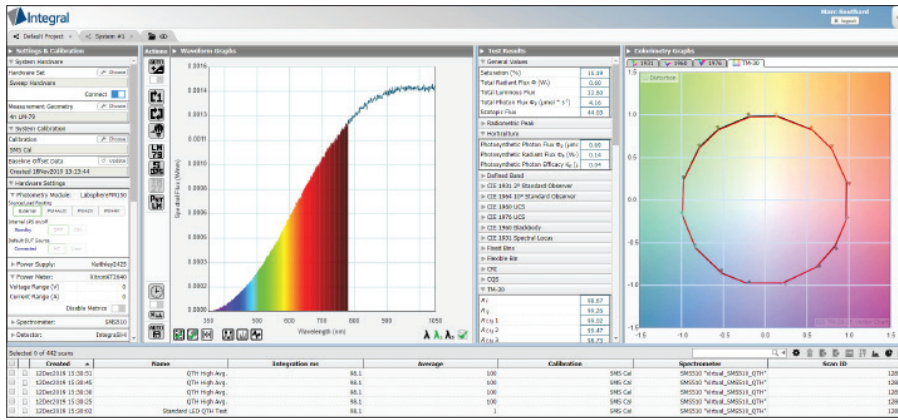


Calibrated Spectral and Luminous Flux Standards

Each standard has been carefully screened, seasoned, and calibrated at our manufacturing facility under the guidelines recommended by the NVLAP accredited ISO 17025 practices for the highest degree of confidence.



Integral® Light Measurement Software



Supported Devices		
Spectrometer	Power Supply	Power Meter
CDS1100	Agilent8811B	Q/NOZH8775C1
CDS1200	Agilent8812B	TETP62201
CDS2400	AgilentE3632A	Xbrn2501
CDS2600	AgilentE3633A	YokogawaWT210
CDS3000	AgilentE3634A	YokogawaWT3080
CDS3810	AgilentN5761A	YokogawaWT310
CDS3820	AmelKX5	
CDS3830	AmelKX_1501X	
CDS880	Chroma61601	
CDS819	Chroma61602	
QEProGeneric	Chroma61603	
SMSS500	Chroma61604	
SMSS500ULS	Chroma61605	
SMSS10	Kentley4400	
	Kentley2410	
	Kentley2420	
	Kentley2425	
	Kentley2430	
	Kentley2440	
Photometry Module		
LabSpherePM100	LabSphereLP5	
LabSpherePM150	LabSphereAS82	
	LabSphereATC82	
LM-82 Controller		
CSZ_CP	MagnuM8211	
LabSphereAS82	FluorAP59000	
LabSphereATC82	Guadach31015	
	TDKLambda_GEN100_7_5	
	TDKLambda_GEN150_10	
	TDKLambda_GEN40_10	
	TDKLambda_2Series	
	Temp Controller	
	Arroyo5300	
	Arroyo5305	
	Arroyo5805	
	LandTEC	
	Temp Monitor	
	OmegaTC08	
	Flicker Meter	
	Flicker-P	
	Gottlich109dFK38InGaAs	
	Detector	
	IntegratingGasExtender	
	IntegratingGasStandard	
	IntegraSHi	
	IntegraSiLo	
	Kentley6485	
	Kentley6514	

List of Integral Supported Devices

- HTML5-enabled web browser based light measurement software
- Operation from any device, any platform, any location and in any language
- Instantly switch between English, Mandarin Chinese, Japanese, Korean, and French
- Large assortment of test hardware configurations are supported (spectrometer, AC and DC power supplies, temperature controls and monitors)
- Powerful, easy-to-use Application Programming Interface (API) supports LabVIEW, .NET, C, and VBA
- One user can control many test stations and multiple users can access the same test station from anywhere
- Meets LM-79-19 and LM-78 integrating sphere spectrometer recommended measurement methods
- Automated calibration routines
- Built-in report generator with the ability to create custom reports
- All Industry standard color calculations including:
 - x, y, u, v, u', v', CCT, CRI (1-15 and general), CQS, luminous flux (lumens), scotopic lumens, Duv, dominant wavelength, peak wavelength, FWHM, Centroid, Purity, ANSI SSL 2015 binning, TM-30-18 fidelity and gamut data, distortion and vector graphics, and horticulture

illumiaPlus2 Hemisphere System Specifications

System	Hemisphere 800	Hemisphere 2600
Spectral Flux Measurements*:	350 nm - 850 nm	350 nm - 1050 nm
Minimum Measurable Lumens: (typical)	0.02 lumens (Cool white LED source with 50 cm sphere)	0.01 lumens (Cool white LED source with 50 cm sphere)
Maximum Measurable Lumens: (typical)	~46K lumens (Cool white LED source with 195 cm sphere)	~159K lumens (Cool white LED source with 195 cm sphere)
Exposure Time Range: (Actual exposure time depends on sphere size and source type)	1 ms - 5 sec	8 ms – 900 sec
Software:	Integral	Integral
Spectrometer	CDS 800	CDS 2600
Detector:	2048 element CMOS Array	1044 x 64 CCD (back thinned)
Spectral Range: (spectrograph)	240 - 1100 nm	325 - 1050 nm
Shutter:	No	Yes

* Calibrated spectral range

Hemisphere 800 Ordering Information

System	with 30 cm hemisphere	with 50 cm hemisphere	with 100 cm hemisphere
800 Order Number:	AA-40460-030	AA-40460-050	AA-40460-100
Above Systems Include:			
Hemisphere:	HM-030-SF	HM-050-SF	HM-100-SF
Spectrally-Calibrated Lamp:	2PI-1-INT-650	2PI-1-INT-650	2PI-1-INT-650
Lamp Socket Assembly			
Control Module:	ICM-500	ICM-500	ICM-500
Aux Lamp:	AUX-650	AUX-650	AUX-650
Software:	Integral	Integral	Integral

Performance Specifications (lumens)

	min	max	min	max	min	max
Tungsten Filament:	0.009	1360	0.03	3750	0.10	8150
Cool White LED:	0.007	1270	0.02	3550	0.08	7250
Warm White LED:	0.006	790	0.02	2250	0.07	6900
Blue LED:	0.009	55	0.03	150	0.10	600
Red LED:	0.006	140	0.02	400	0.06	550
Upper Range:	Ambient temp cannot exceed 100°C		Ambient temp cannot exceed 100°C		Ambient temp cannot exceed 100°C	

Hemisphere 2600 Ordering Information

System	with 30 cm hemisphere	with 50 cm hemisphere	with 100 cm hemisphere
2600 Order Number:	AA-40450-030	AA-40450-050	AA-40450-100
Above Systems Include:			
Hemisphere:	HM-030-SF	HM-050-SF	HM-100-SF
Spectrally-Calibrated Lamp:	2PI-1-INT-650	2PI-1-INT-650	2PI-1-INT-650
Lamp Socket Assembly			
Control Module:	ICM-500	ICM-500	ICM-500
Aux Lamp:	AUX-650	AUX-650	AUX-650
Software:	Integral	Integral	Integral

Performance Specifications (lumens)

	min	max	min	max	min	max
Tungsten Filament:	0.005	2450	0.02	6900	0.06	27200
Cool White LED:	0.002	1360	0.01	3800	0.02	15000
Warm White LED:	0.001	950	0.005	2650	0.02	12500
Blue LED:	0.001	100	0.001	300	0.01	900
Red LED:	0.001	238	0.004	650	0.02	950
Upper Range:	Ambient temp cannot exceed 100°C		Ambient temp cannot exceed 100°C		Ambient temp cannot exceed 100°C	

Model Number

Wavelength Range:	240 - 1100 nm
Signal-to-Noise Ratio:	330:1 (at full signal)
A/D Resolution:	6 MHz
Dark Noise: (correctable)	16 RMS counts
Dynamic Range:	3330
Integration Time:	30 μ s to 40 s *
Stray Light:	0.2 - 1%

Electronics

Power:	USB, 500 mA
Computer Operating Systems:	Windows
Computer Interfaces:	USB 2.0

Physical

Dimensions:	95 mm x 68 mm x 70 mm
Weight:	175 grams

Detector

Detector:	HAM S11639
Detector Range:	200 - 1100 nm
Pixels:	2048 pixels
Pixel Size:	14 μ m x 200 μ m

System Spectrometer Specifications

Spectrometer	CDS 800	Spectrometer	CDS 2600
Detector:	2048 element CMOS Array	Detector:	1044 x 64 CCD (back thinned)
Wavelength Range:	240 - 1100 nm	Spectral Range: (spectrograph)	325 - 1050 nm
Signal-to-Noise Ratio:	330:1 (at full signal)	Resolution: (FWHM)	2.4 nm
A/D Resolution:	6 MHz	Integration Time:	8 ms - 900 sec
Integration Time:	30 μ s to 40 s*	Cooling:	-10 \pm 0.05°C
Cooling:	No	Linearity:	\pm 0.1%
Dark Noise: (correctable)	16 RMS counts	Wavelength Accuracy:	< \pm 0.3 nm
Stray Light:	0.2 - 1%	Average % Noise on 100% Line:	0.07%
Dynamic Range:	3330	Stray Light: (Y-50 filter)	1.87%
Mechanical Shutter:	No	Stray Light LED/Laser:	1.8E-5 from 450-550 nm w/633 nm laser
AD Converter:	16 bit	Optical Input:	600 μ m, permanently mounted connection
Power:	USB, 500 mA	Measurement Dynamic Range:	475K
Computer Operating Systems:	Windows	x, y Chromaticity Accuracy:	<0.001 for x, y
Computer Interfaces:	USB 2.0	Mechanical Shutter:	Yes
Detector:	HAM S11639	AD Converter:	18 bit
Detector Range:	200 - 11 00 nm	PC Interface:	USB 2.0
Pixels:	2048 pixels	Trigger: hardware	Yes
Pixel Size:	14 μ m x 200 μ m	Trigger: software	Yes
Dimensions:	95 mm x 68 mm x 70 mm	OD Filters:	No
Weight:	175 grams	Shutter:	Yes

NOTES:

1. Values above are the noise equivalent power in W/nm or lumens for the different wavelength ranges cited. They were all taken with a 5W lamp, 10" sphere and 10 ms integration time.

Upgrade Modules Ordering Information

Model Number: IL-AC1

Order Number: AA-40000-002

Includes:

- Chroma 61603 Programmable Instrument Grade AC Power Source
- Cabling for ICM-500 connections

Model Number: IL-PM1

Order Number: AA-40000-001

Includes:

- XITRON 2640 Precision Multi-Channel Power Analyzer
- Cabling for ICM-500 and AC power source connections

Optional Accessories Ordering Information

Hemisphere Size:	30 cm	50 cm	100
Ambient Temperature Probe and Monitor			
Model Number:	TPM-100TC-08	TPM-100TC-08	TPM-400TC-08
Order Number:	AS-03003-100	AS-03003-100	AS-03003-400
Forward Flux Standard			
Model Number:	FFS-100-400	FFS-100-400	FFS-100-400
Order Number:	AS-02768-100	AS-02768-100	AS-02768-100

illumiaPlus to illumiaPlus2 Upgrade Kit Ordering Information

Model Number:	ICM-500-175	ICM-500-350	ICM-500-525
Order Number:	AS-40000-175	AS-40000-350	AS-40000-525
	<i>Includes: ICM-500, LPS-175 27 DC Power Supply, jumper cable and documentation for systems using 2PI-INT-050, 2PI-INT-650, SCL-050, SCL-650, AUX-050, AUX-650 and FFS-100-400 lamps</i>	<i>Includes: ICM-500, LPS-350 28 DC Power Supply, jumper cable and documentation for systems using AUX-75, FFS-100-1000, and AUX-100 lamps</i>	<i>Includes: ICM-500, LPS-525 42 DC Power Supply, jumper cable and documentation for systems using 2PI-INT-1400, AUX-1400, ISC-1400, and SCL-1400 lamps</i>
Model Number:	Integral LM-User ASM		
Order Number:	AS-81021-000		
	<i>Integral Major Module Software Upgrade to existing illumia and/or Integral installation. Single user, single Integral License and 1 year support and maintenance</i>		