

Catalogue of SSL Broadband Photometers

Comprehensive Product Family for photometers and tristimulus colorimeters

- ✓ The photocurrent meters contain high-quality transimpedance amplifiers (TIA)
- ✓ Photopic X,Y,Z measuring heads for different dynamic ranges and spectral quality
 - ✓ SSL LH for $V(\lambda)$ match CIE1924, and for PPFD, and irradiance
 - ✓ SSL CH for X,Y,Z match CIE1931



SSL Photocurrent Meters

- Product List

Item	Type	Application range
SSL LC-800_x	1-4 channel Photocurrent meter, RS232, "x" specifies the nr of channels	Goniophotometer, Flicker, LightTester
SSL LC-multibox	Adapter box for combining of up to 4 pcs of LH measuring heads to LC-800	Simultaneous measurement with several LH
SSL L-200	Photocurrent meter, RS232 Discontinued	Goniophotometer
SSL L-40	Photocurrent meter, USB	Goniophotometer
SSL L-40.2	Photocurrent meter, USB	Flicker, LightTester
SSL C-400	3-channel Photocurrent meter, USB	Goniophotometer
SSL C-400.2	3-channel Photocurrent meter, USB	Flicker, LightTester

SSL LC-800

Photocurrent meter



Advantages of new version of for tristimulus colorimeter

- wider dynamic range of 9 decades
 - 4-channels for separation of X channel to X_{red} and X_{blue}
 - larger bandwidth at smaller photocurrents
 - improved sampling rate
- ✓ 1-4 Channel Transimpedance amplifier (TIA)
 - ✓ Measurement quantities:
 - ✓ Illuminance E_v (lx)
 - ✓ Effective Luminous Intensity
 - ✓ Flicker Index FI, Percent Flicker MI (%), Flicker Frequency (Hz)
 - ✓ Stroboscopic Visual Measure SVM
 - ✓ Short-term Perceptibility Light Modulation P_{st}^{LM}
 - ✓ CCT (K), CIE1931 xy , CIE1976 $u'v'$
 - ✓ 5V power supply (USB B input), RS-232 communication (DB15)
 - ✓ Compatible with CH and LH measuring heads
 - ✓ Package includes: LC-800, 5V power supply, 1.8m RS-232 cable.

SSL LC-800

Photocurrent meter

Signal bandwidth	Photocurrent range
15 kHz	20 nA – 30 mA
3 kHz	1.5 nA – 170 nA
700 Hz	30 pA – 10 nA
SVM requirement: > 2 kHz	1.5 nA – 30 mA

- ✓ Photocurrent measurement range: 30 pA – 30 mA
- ✓ Linearity <0.1%
- ✓ Sampling rate
 - ✓ Maximum: 200 kHz (5μs)
 - ✓ SVM: 36 kHz (1s measuring time)
 - ✓ P_{st}^{LM} : 2 kHz (1-5min)

SSL L-40

Photocurrent meter



- ✓ Transimpedance amplifier (TIA)
- ✓ Measurement quantities:
 - ✓ Illuminance E_v (lx)
 - ✓ Effective Luminous Intensity
 - ✓ Flicker Index FI, Percent Flicker MI (%), Flicker Frequency (Hz)
 - ✓ Stroboscopic Visual Measure SVM
 - ✓ Short-term Perceptibility Light Modulation P_{st}^{LM}
- ✓ Photocurrent measurement range:
 - ✓ 0.5 nA – 30 μ A (L40)
 - ✓ 5 nA – 300 μ A (L40.2)
- ✓ Signal bandwidth:
 - ✓ Maximum: 15 kHz @ photocurrent > 10 μ A
 - ✓ SVM requirement: > 2 kHz @ photocurrent > 100 nA
- ✓ Sampling rate
 - ✓ Maximum: 100 kHz
 - ✓ SVM: 36 kHz (1s measuring time)
 - ✓ P_{st}^{LM} : 2 kHz (1-5min)
- ✓ Linearity <0.1%
- ✓ USB powered
- ✓ Compatible with SSL photopic measuring heads (LH)

SSL C-400

Photocurrent meter



- ✓ 3-channel photocurrent meter
- ✓ Measurement quantities: Illuminance E_v (lx), Correlated Color temperature CCT (K), color coordinates CIE1931 xy , CIE1976 $u'v'$, Flicker Index, Percent flicker, Flicker frequency, SVM, PstLM
- ✓ 4 measuring ranges in decades
- ✓ Self-color correction algorithm for xy , CCT and E_v based on initial integrated XYZ values
- ✓ Measurement range: 0.3 lx – 10 klx (C-400) / 3 lx - 100 klx (C-400.2)
- ✓ Photocurrent measurement range:
 - ✓ 0.5 nA – 30 μ A (C400)
 - ✓ 5 nA – 300 μ A (C400.2)
- ✓ Signal bandwidth:
 - ✓ Maximum: 15 kHz @ photocurrent > 10 μ A
 - ✓ SVM requirement: > 2 kHz @ photocurrent > 100 nA
- ✓ Accuracy: $E_v \pm 4\%$, CCT ± 100 K
- ✓ Repeatability: $E_v < 0.3\%$, CCT < 20K
- ✓ USB powered (drivers installed automatically in Win 8)
- ✓ Measuring head CH22-3, Spectral match < 12%
- ✓ Standalone Executable testing software (.exe) and LabVIEW drivers for using C-400 in customer's own testing systems

SSL L-200 (Discontinued) Photocurrent meter



- ✓ 1-channel Transimpedance amplifier (TIA)
- ✓ Measurement quantities:
 - ✓ Illuminance E_v (lx)
 - ✓ Flicker Index FI
 - ✓ Percent flicker MI (%)
 - ✓ Flicker frequency (Hz)
 - ✓ Stroboscopic visual measure SVM
 - ✓ Short-term perceptibility light modulation P_{st}^{LM}
- ✓ Signal bandwidth:
 - ✓ Maximum: 15 kHz @ photocurrent > 10 μ A
 - ✓ SVM requirement: > 2 kHz @ photocurrent > 100 nA
- ✓ Sampling rate (12-bit)
 - ✓ Maximum: 100 kHz
 - ✓ SVM: 36 kHz (1s measuring time)
 - ✓ P_{st}^{LM} : 2 kHz (1-5min)
- ✓ Photocurrent measurement range: 50 pA – 20 mA
- ✓ Linearity <0.1%
- ✓ AC 90-240Vac 50/60Hz power supply, RS-232 communication
- ✓ Compatible with SSL photopic measuring heads (LH)

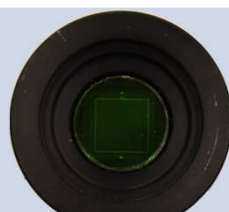
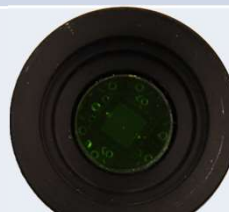
SSL Measuring Heads

- Product List

Item	Channels	E_v (lx)	CCT (K)	CIE1931 xy	PPFD ($\mu\text{mol/s/m}^2$)	E_e (mW/m ²)	WL range (nm)	Photo-diode Active area (mm ²)	Option for PTFE diffuser (" "_D2)
SSL LH1010-f3	1	x					360 – 830	100	
SSL LH66-f3	1	x					360 – 830	34	
SSL LH33-f3	1	x					360 – 830	5.8	
SSL LH22.2-f10	1	x					400 – 750	6.7	X
SSL CH22-3	3	x	x				400 – 750	6.7	
SSL CH-400 Discontinued	3	x	x				360 – 830	6.7	
SSL CH33-3	3	x	x	x			360 – 830	5.8	
SSL CH66-3	3	x	x	x			360 – 830	34	
SSL CH33-4	4	x	x	x			360 – 830	5.8	
SSL CH66-4	4	x	x	x			360 – 830	34	
SSL LH1010-umol10	1				x		400 – 700	100	x
SSL LH66-umol10	1				x		400 – 700	34	x
SSL LH33-umol10	1				x		400 – 700	5.8	x
SSL LH66-Irrad_610	1					x	610 – 1050	34	x
SSL LH66-Irrad_665	1					x	665 – 1050	34	x
SSL LH66-Irrad_715	1					x	715 – 1050	34	x
SSL LH66-Irrad_780	1					x	780 – 1050	34	x
SSL LH66-Irrad_830	1					x	830 – 1050	34	x

SSL LH

Photopic Measuring Heads

LH	S_{Ev} (nA / lx)	f_1'	FOV (1)	Min. D ⁽²⁾ (m)	TIA	Illuminance Measuring Range (lx)	
SSL LH1010 -f3	30	<3%	24°	8	L-40	5 E-2 – 1 E+3	
					L-40.2	5 E-1 – 1 E+4	
					LC-800	1 E-3 – 5 E+5	
SSL LH66-f3	10	<3%	62°	5	L-40	2 E-1 – 3 E+3	
					L-40.2	2 E+0 – 3 E+4	
					LC-800	3 E-3 – 8 E+5	
SSL LH33-f3	1.7	<3%	85°	2	L-40	1 E+0 – 1 E+4	
					L-40.2	1 E+1 – 1 E+5	
					LC-800	2 E-2 – 5 E+6	
SSL LH22.2- f10	3.6	<10 %	106°	2	L-40	2 E-1 – 8 E+3	
					L-40.2	2 E+0 – 8 E+4	
					L-200	2 E-2 – 5 E+6	
					LC-800	8 E-3 – 8 E+6	
SSL LH22.2- f10-D2	0.0 8	<9%	180°	2	L-40	7 E+0 – 4 E+5	
					L-40.2	7 E+1 – 4 E+6	
					L-200	7 E-1 – 2 E+8	
					LC-800	5 E-1 – 4 E+8	

(1) FOV = Detection field-of-view.

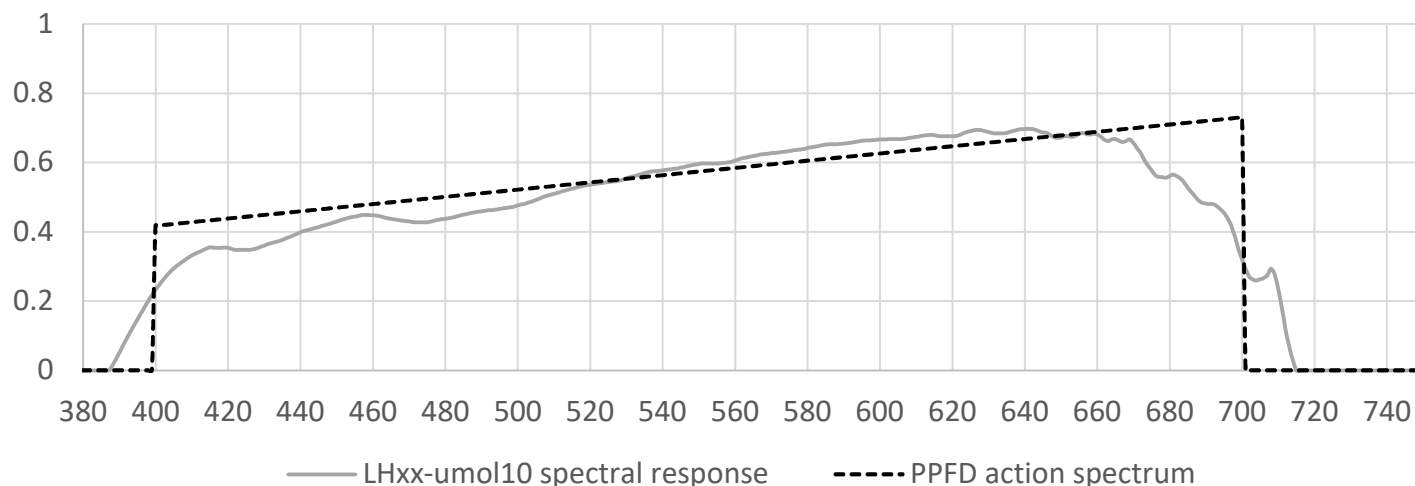
(2) Min. D = Minimum distance to cover all sensors into the angular full field-of-view of 0.1° (corresponding angular accuracy in goniometric measurements).

SSL LH

PPFD Measuring Heads

LH	Sensitivity [$\mu\text{A}/(1000\mu\text{mol/s/m}^2)$]	TIA	Measuring range ($\mu\text{mol/s/m}^2$)	
SSL LH1010- umol10	400	L-40	0.004 – 70	
		L-40.2	0.04 – 700	
		L-200	0.000 1 – 35 000	
SSL LH66- umol10	130	L-40	0.01 – 200	
		L-40.2	0.1 – 2 000	
		L-200	0.000 2 – 60 000	
SSL LH33- umol10	23	L-40	0.1 – 1 000	
		L-40.2	1 – 10 000	
		L-200	0.002 – 350 000	

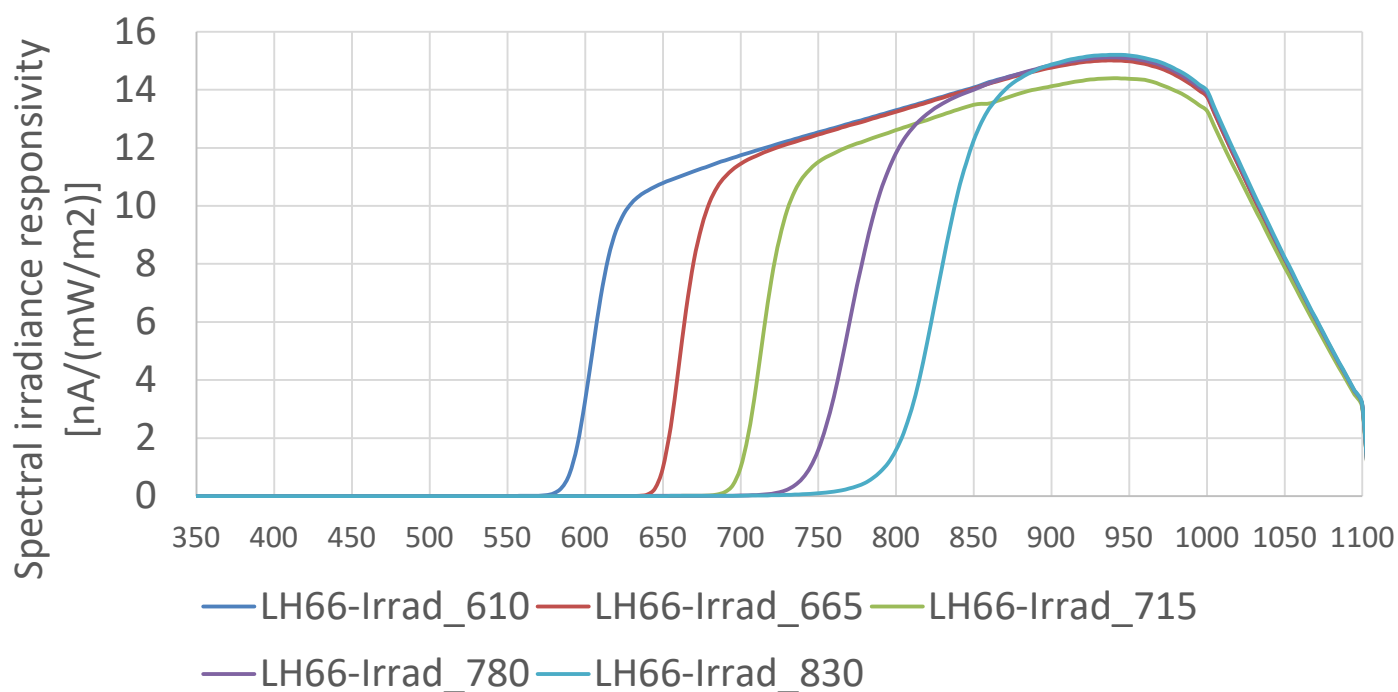
Options: PTFE diffuser for cosine corrector



SSL LH

Irradiance Measuring Heads

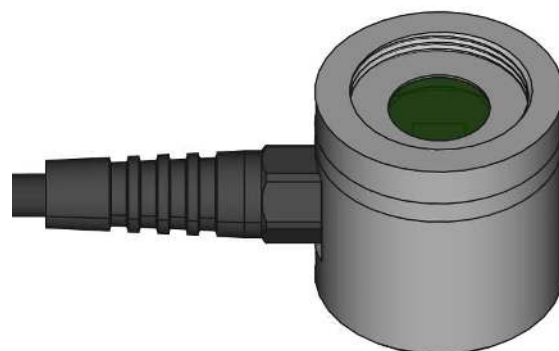
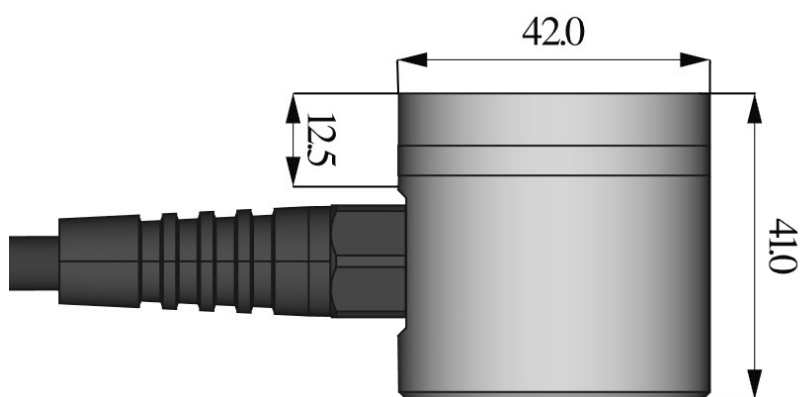
LH	Wavelength range (nm)	Peak Sensitivity [nA/(mW/m ²)]	Measurement range (mW/m ²)	
SSL LH66-Irrad_610	610 – 1050	15	L-40	3E-2 – 2E+3
SSL LH66-Irrad_665	665 – 1050	15		
SSL LH66-Irrad_715	715 – 1050	14	L-40.2	3E-1 – 2E+4
SSL LH66-Irrad_780	780 – 1050	15		
SSL LH66-Irrad_830	830 – 1050	15	L-200	3E-3 – 1E+6



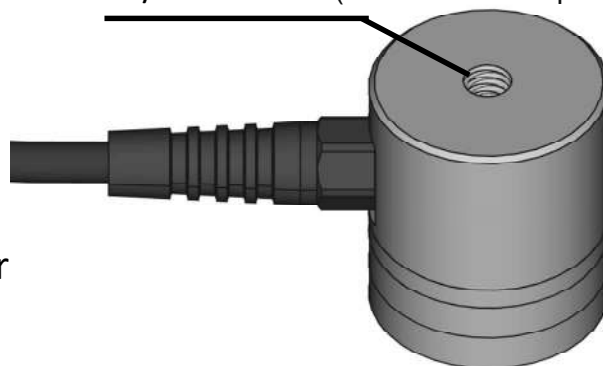
Options: PTFE diffuser for cosine corrector

LH Measuring Heads - Dimensions

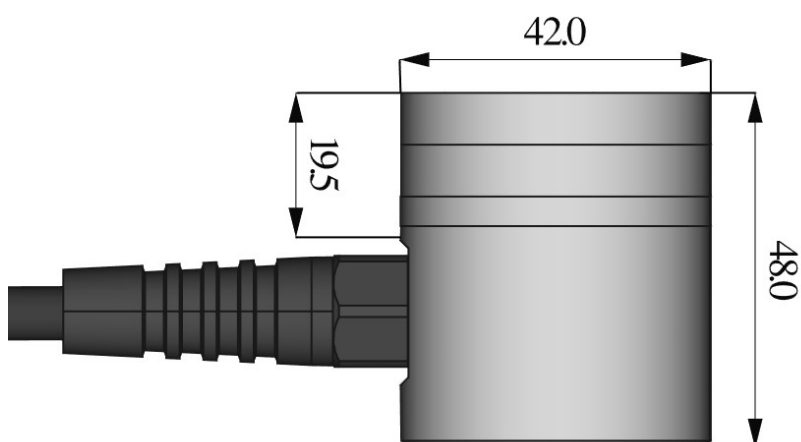
LHxx measuring heads without diffuser



3/8"-16 UNC (1/4"-20 with adapter)

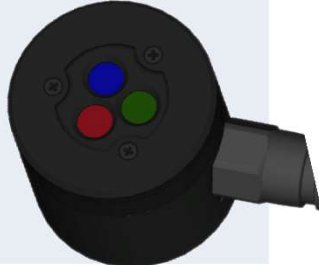
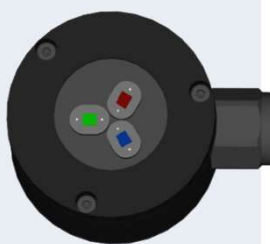


LHxx measuring heads with PTFE cosine diffuser



SSL CH

Color Measuring Heads

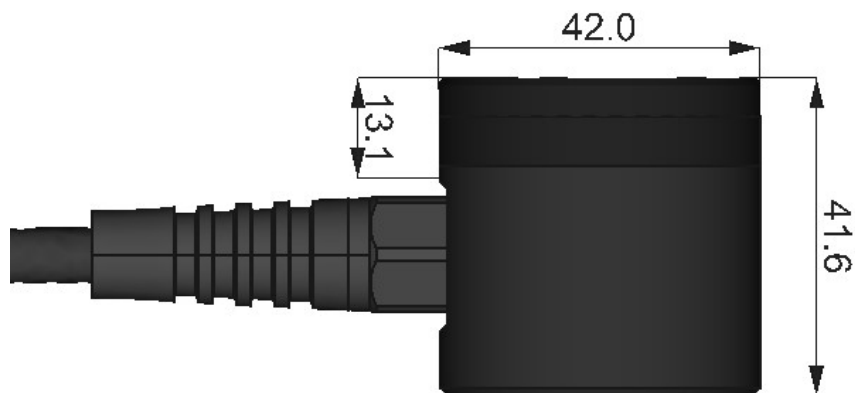
CH	S_{Ev} (nA/ lx)	f_1'	FOV (¹)	Min. D ⁽²⁾ (m)	Illuminance range(lx)	
SSL CH66-4	10	Y, X _r , X _b : 3% Z: 3.5%	15°	15	3 E-3 – 8 E+5	
SSL CH66-3	10	Y, X _r : 3% Z: 3.5%	15°	13	3 E-3 – 8 E+5	
SSL CH33-4	1.7	Y, X _r , X _b : 3% Z: 3.5%	22°	9	2 E-2 – 5 E+6	
SSL CH33-3	1.7	Y, X _r : 3% Z: 3.5%	22°	8	2 E-2 – 5 E+6	
SSL CH22-3	3.6	<12%	60°	4	8 E-3 – 8 E+6	

⁽¹⁾ FOV = Detection field-of-view of each sensors.

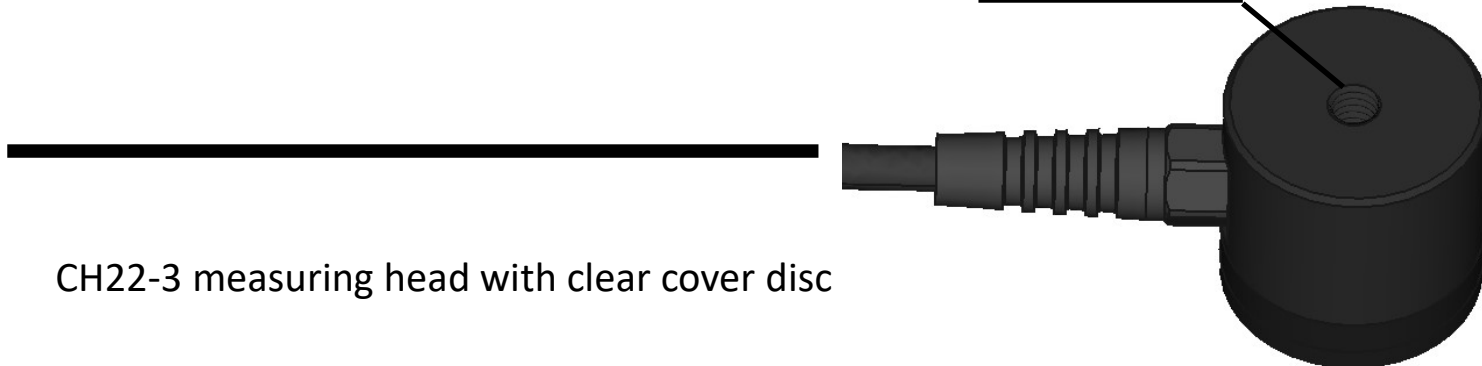
⁽²⁾ Min. D = Minimum distance to cover all sensors into the angular full field-of-view of 0.1° (corresponding angular accuracy in goniometric measurements).

CH Measuring Heads - Dimensions

CH33-x and CH66-x measuring heads



3/8"-16 UNC (1/4"-20 with adapter)



CH22-3 measuring head with clear cover disc

