

## UL-LL

The UL Line Light is the latest design in the Metaphase family of LED lights for line scan. Its narrow, structured beam delivers high intensity and concentrated light for the narrow field of view of a traditional line scan camera. The high intensity and uniformity allows the UL Line Light to be used as front light to inspect for material defects, angled to obtain an off-axis effect to highlight surface defects, or it may be placed beneath the object for a backlight effect to inspect for holes, voids, or contaminants. The UL Line Light is available with a wide variety of LED colors/wavelengths with independent intensity control.



Utilizing a full rod focal lens, the UL-LL provides a tight structured beam of light up to 12 inches (30.48 cm). The optimal working distance is 5 inches (12.7 cm). For working distances beyond 12 inches (30.48 cm), please see our Collimated Line Light offerings. High uniformity ( $\pm 5\%$ ) makes the UL Line Light ideal for front and back lighting line scan applications.

### FEATURES

- 24Z version has a built-in Constant Current Driver with 0-10VDC Intensity Control
- Passive cooling (no fans needed)
- Compliance: ETL listed (UL compliant), CE and RoHS.
- Compatible with DDC-3 and ILD-35

### APPLICATIONS

- Web inspection (foil, plastic film, PCBs, glass, paper, web converting, etc.)
- Geometry measurements of long targets
- Direct position measurement
- Tube or bottle inspection
- Printed circuit board inspection

### GENERAL SPECIFICATIONS

<b>Power Source:</b>	24VDC $\pm 5\%$
<b>Cable (Standard):</b>	10-foot cable with flying leads
<b>Housing:</b>	Black Anodized Aluminum
<b>Ambient Temp:</b>	-20°C to 40°C
<b>Lifetime Expectancy:</b>	75,000 hours (except UV)

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SINGLE COLOR UL LINE LIGHTS														
MODEL	Overall Length Inches / cm	Lens Length Inches / cm	Weight lbs/Kg	Cable(s)			Typical Current (Amps) @24VDC							
				Qty	Lgth	Desc.	WHITE	RED	GREEN	BLUE	IR	UVS	UVL	
UL-LL209	7.0 / 17.8	6.25 / 15.9	3.2 / 1.45	1	10ft	16 AWG 6 Wire	0.5	0.4	0.6	0.5	0.6	0.7	0.8	
UL-LL309	12.0 / 30.5	11.25 / 28.6	5.4 / 2.45				1.0	0.8	1.1	1.1	1.1	1.4	1.6	
UL-LL409	17.0 / 43.2	16.25 / 41.3	7.7 / 3.49				1.6	1.2	1.7	1.7	2.0	2.1	2.4	
UL-LL509	22.0 / 55.9	21.25 / 54.0	10.0 / 4.54				2.1	1.6	2.2	2.2	2.7	3.2	3.2	
UL-LL609	27.0 / 68.6	26.25 / 66.7	12.2 / 5.53				2.7	2.0	2.9	2.8	3.4	4.0	3.4	
UL-LL709	32.0 / 81.3	31.25 / 79.4	14.5 / 6.58				3.2	2.4	3.5	3.4	4.1	4.8	4.1	
UL-LL809	37.0 / 94.0	36.25 / 92.1	16.7 / 7.57				3.8	2.9	4.2	4.0	4.7	5.6	4.8	
UL-LL909	42.0 / 106.7	41.25 / 104.8	18.9 / 8.57				4.4	3.3	4.8	4.6	5.6	6.4	5.5	
UL-LL1009	47.0 / 119.4	46.25 / 117.5	21.2 / 9.62				4.9	3.7	5.4	5.2	6.4	7.2	6.2	
UL-LL1109	52.0 / 132.1	51.25 / 130.2	23.5 / 10.6				5.5	4.2	6.0	5.8	7.1	8.0	6.9	
UL-LL1209	57.0 / 144.8	56.25 / 142.9	25.5 / 11.6				6.1	4.6	6.7	6.4	7.9	8.8	7.6	
UL-LL1309	62.0 / 157.5	61.25 / 155.6	28.3 / 12.8				6.7	5.0	7.4	7.0	8.7	9.6	8.2	
UL-LL1409	67.0 / 170.2	66.25 / 168.3	30.4 / 13.8				7.3	5.5	8.1	7.7	9.6	10.4	8.9	
UL-LL1509	72.0 / 182.9	71.25 / 181.0	35.5 / 16.1				8.0	5.9	8.8	8.3	10.4	11.2	9.6	
UL-LL1609	77.0 / 195.6	76.25 / 193.7	37.7 / 17.1				8.6	6.4	9.5	9.0	11.3	12.0	10.3	
UL-LL1709	82.0 / 208.3	81.25 / 206.4	40.0 / 18.1				9.2	6.9	10.2	9.7	12.1	12.8	11.0	
UL-LL1809	87.0 / 221.0	86.25 / 219.1	42.3 / 19.2				9.9	7.3	10.9	10.4	13.0	13.6	11.7	
UL-LL1909	92.0 / 233.7	91.25 / 231.8	44.5 / 20.2				10.6	7.8	11.7	11.1	14.0	14.4	12.4	
UL-LL2009	97.0 / 246.4	96.25 / 244.5	47.0 / 21.3				11.2	8.3	12.5	11.8	14.9	15.2	13.0	
UL-LL2109	102 / 259.1	101.25 / 257.2	49.0 / 22.2				11.9	8.8	13.3	12.5	15.9	16.0	13.7	
UL-LL2209	107 / 271.8	106.25 / 269.9	51.2 / 23.2				12.6	9.3	14.1	13.3	17.0	16.8	14.4	
UL-LL2309	112 / 284.5	111.25 / 282.6	53.4 / 24.2				13.4	9.8	14.9	14.1	18.0	17.6	15.1	
UL-LL2409	117 / 297.2	116.25 / 295.3	55.6 / 25.2				14.1	10.3	15.7	14.8	19.1	18.2	15.8	
UL-LL2509	122 / 309.9	121.25 / 308.0	58.0 / 26.3				14.9	10.8	16.6	15.7	20.3	18.8	16.5	

Cable #1 (6 conductor, flying leads)	
Wire Color	Function
RED, BROWN	+24VDC
YELLOW	SIGNAL GROUND
BLACK, BLUE	GROUND (24V RTN)
ORANGE	0-10VDC INTENSITY CONTROL
When not using Intensity Control, connect the 0-10V control line to +24VDC and connect Signal Ground to Ground (24V RTN) for maximum intensity	

Cable #2 (If Applicable)	
Wire Color	Function
RED	+24VDC
BROWN	+24VDC
ORANGE	+24VDC
BLACK	GROUND (24V RTN)
BLUE	GROUND (24V RTN)
YELLOW	GROUND (24V RTN)

**Note:** The 0-10VDC Intensity Control input can accept voltages from 0-24VDC where the light will operate at full intensity in the 10-24VDC range. The light is proportionally dimmer for any Intensity Control voltage less than 10VDC and the light is OFF at approximately 0V or not connected (floating).

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RGB LIGHTS							
MODEL	Overall Length Inches / cm	Lens Length Inches / cm	Weight lbs/Kg	Cable QTY	Cable Length	Cable Description	Typical Current (Amps)
UL-LL209	7.0 / 17.8	6.25 / 15.9	3.2 / 1.45	1	10ft	16 AWG, 6 Conductor	0.5
UL-LL309	12.0 / 30.5	11.25 / 28.6	5.4 / 2.45				1.1
UL-LL409	17.0 / 43.2	16.25 / 41.3	7.7 / 3.49				1.6
UL-LL509	22.0 / 55.9	21.25 / 54.0	10.0 / 4.54				2.2
UL-LL609	27.0 / 68.6	26.25 / 66.7	12.2 / 5.53				2.8
UL-LL709	32.0 / 81.3	31.25 / 79.4	14.5 / 6.58				3.4
UL-LL809	37.0 / 94.0	36.25 / 92.1	16.7 / 7.57				4.0
UL-LL909	42.0 / 106.7	41.25 / 104.8	18.9 / 8.57				4.5
UL-LL1009	47.0 / 119.4	46.25 / 117.5	21.2 / 9.62				5.2
UL-LL1109	52.0 / 132.1	51.25 / 130.2	23.5 / 10.6				5.8
UL-LL1209	57.0 / 144.8	56.25 / 142.9	25.5 / 11.6				6.4
UL-LL1309	62.0 / 157.5	61.25 / 155.6	28.3 / 12.8				7.0
UL-LL1409	67.0 / 170.2	66.25 / 168.3	30.4 / 13.8				7.6
UL-LL1509	72.0 / 182.9	71.25 / 181.0	35.5 / 16.1				2
UL-LL1609	77.0 / 195.6	76.25 / 193.7	37.7 / 17.1	9.0			
UL-LL1709	82.0 / 208.3	81.25 / 206.4	40.0 / 18.1	9.7			
UL-LL1809	87.0 / 221.0	86.25 / 219.1	42.3 / 19.2	10.3			
UL-LL1909	92.0 / 233.7	91.25 / 231.8	44.5 / 20.2	11.0			
UL-LL2009	97.0 / 246.4	96.25 / 244.5	47.0 / 21.3	11.6			
UL-LL2109	102 / 259.1	101.25 / 257.2	49.0 / 22.2	12.2			
UL-LL2209	107 / 271.8	106.25 / 269.9	51.2 / 23.2	12.9			
UL-LL2309	112 / 284.5	111.25 / 282.6	53.4 / 24.2	13.5			
UL-LL2409	117 / 297.2	116.25 / 295.3	55.6 / 25.2	14.2			
UL-LL2509	122 / 309.9	121.25 / 308.0	58.0 / 26.3	14.9			

RGB Cable #1 (6 Conductor)	
WIRE COLOR	FUNCTION
BROWN	+24VDC
BLACK	GND (24V RTN)
YELLOW	SIG GND
RED	0-10V RED Intensity Control
ORANGE	0-10V GREEN Intensity Control
BLUE	0-10V BLUE Intensity Control
When not using the Intensity Control, connect the 0-10V control line(s) to +24VDC and connect SIG GND to GND (24V RTN)	

RGB Cable #2 (If Applicable)	
WIRE COLOR	FUNCTION
RED	+24VDC
BROWN	+24VDC
ORANGE	+24VDC
BLACK	GND (24V RTN)
BLUE	GND (24V RTN)
YELLOW	GND (24V RTN)
POWER CABLE	

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PART NUMBER KEY											
MODEL	LENGTH ID (inches)	-	WAVELENGTH	-	DRIVER* (most common)	-	POLARIZER	-	COVER	-	CABLE LENGTH
UL-LL	XXXX	-	XXXXX	-	XXX-XXX	-	XXXX	-	XX	-	XXX
<b>UL-LL</b>	<b>209 to 2509</b> (See above chart)		<b>W</b> (White 6000K, Nominal) <b>R</b> (Red 630nm) <b>G</b> (Green 530nm) <b>B</b> (Blue 470nm) <b>IR850</b> (Infrared 850nm) <b>IR880</b> (Infrared 880nm) <b>IR940</b> (Infrared 940nm) <b>UV365</b> (UV Short 365nm) <b>UV395</b> (UV Long 395nm) <b>RGB</b> (Red-Green-Blue) <b>RGBIR850</b> (Red-Green-Blue-IR850) <b>IR05</b> (Infrared 1050nm) <b>IR20</b> (Infrared 1200nm) <b>IR30</b> (Infrared 1300nm) <b>IR45</b> (Infrared 1450nm) <b>IR55</b> (Infrared 1550nm) <b>IR65</b> (Infrared 1650nm)		<b>24Z</b> <b>24Z-TRG</b> <b>24-ILD</b> <b>U<sup>1</sup></b>  XXX=rate in $\mu$ s Example: 250		<b>POLO</b>  Must use CC with Polarizer  Select or leave blank for no polarizer		<b>CC</b>  Select or leave blank for no cover		<b>5M</b> <b>10M</b>  Length can be customized: ex.7M=7meters  Select or leave blank for 3 meters
Example 1: <b>UL-LL609-W-24Z</b>					<sup>1</sup> Not available in lights exceeding 4A input current						
Example 2: <b>UL-LL1509-WIR45-24Z</b>											

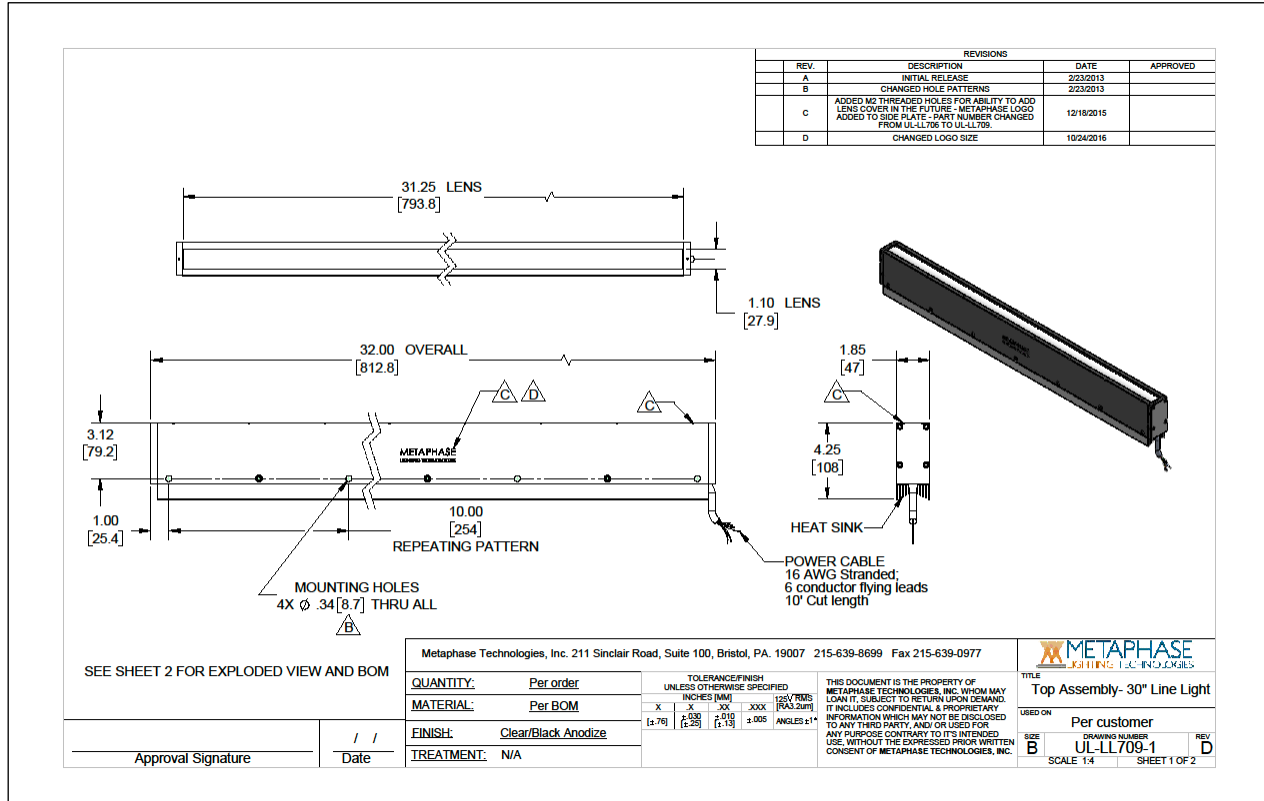
When ordering the Backlight version diffuser, add a B designator before LL. Example: **UL-BLL609-W-24Z**

Contact Metaphase Technologies or your local representative for options such as custom diffusers, lenses, polarizers, IP-rated enclosures for harsh environments, higher intensity, custom wavelengths, higher uniformity, etc. Not all options are available for all lights.

[Link to \\*Driver Options Key / \\*\\*Connector Options Key](#)

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Sample Model Number: **UL-LL709-W-24Z**



COMPLIANCE

CONTACT US



Contact Metaphase Technologies at **215-639-8699** or your local representative for additional details, options and customizations.