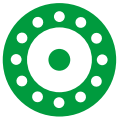




OPTO ENGINEERING

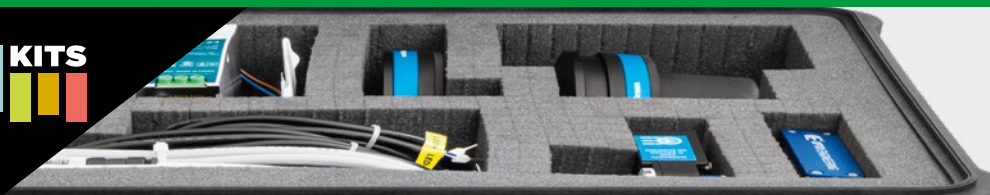
OPTICAL IMAGING TECHNOLOGIES



LIGHTING



ACCESSORIES



KITS

LIGHTING

BACKLIGHTS

- 118 LT2BC series** *NEW MODELS*
High uniformity continuous LED backlights **COLL/DIFF**
- 120 LTBP series** *NEW MODELS*
High power strobed LED backlights **H COLL/DIFF**
- 124 LTBC series**
Continuous LED backlights **DIFF**
- 126 LTBFC series**
Continuous flat side-emitting LED backlights **DIFF**

TELECENTRIC LIGHTS

- 128 LTCLHP series**
High-performance telecentric illuminators **COLL**
- 130 LTCLHP CORE series**
Compact telecentric illuminators **COLL**
- 134 LTCLHP CORE PLUS series** *NEW MODELS*
Compact telecentric illuminators for large FOV systems **COLL**
- 136 LTCL4K series**
Flat telecentric illuminators for line scan cameras **COLL**

RING LIGHTS

- 138 LTRNST series**
LED ring illuminators - straight type α 0° **DIFF**
- 140 LTRNDC series**
Continuous LED direct ring lights α 0°, 15°, 30°, 45° **DIR**
- 142 LTLA series**
High power strobe LED low angle diffused ring lights **H** α 60° **DIFF**
- 144 LTLAIC series**
Continuous LED low angle diffused ring lights α 60° **DIFF**
- 146 LTLADC series**
Continuous LED low angle direct ring lights α 75° **DIR**
- 148 LTRNOB series**
LED ring illuminators - oblique type **DIFF**
- 150 LTRNOBHP series**
High power LED ring illuminators - oblique type **H** **DIFF**

LIGHTING TYPES

- | | |
|------------------------|---------------------|
| COLL Collimated | IND Indirect |
| DIFF Diffused | FOC Focused |
| DIR Direct | |

DOMES LIGHTS

- 152 LTDMC series** *NEW MODELS*
Continuous LED domes **IND**
- 154 LTDM series**
High power strobe LED domes **H** **IND**
- 156 LTDMLA series**
High power strobe dome + low angle illumination systems **H** **IND**

BAR LIGHTS

- 158 LTBRZ3 series** *NEW*
LED bar lights with integrated driving electronics **DIR**
- 160 LTBRDC series**
Continuous LED bar lights **DIR**

COAXIAL LIGHTS

- 162 LTCXC series**
Continuous LED coaxial lights **DIFF**

TUNNEL LIGHTS

- 164 LTTNC series**
Continuous LED tunnel lights **IND**

LINE LIGHTS

- 166 LTLNC series** *NEW MODELS*
Continuous LED line lights **FOC**
- 168 LTLNM series**
Flicker free high power focused modular LED line lights **H** **FOC/COLL**
- 170 LTLNE series**
High power enhanced LED line lights **H** **FOC/COLL**

SPECIALTIES

- 172 View-through system**
Space-saving illumination system for double-side object inspection **DIFF/IND**
- 174 UV series** *NEW*
UV illuminators with different geometry

LIGHTING PARAMETERS

- H** High power: suggested for high speed applications
- α Light angle (°)

175**LED pattern projectors**

- 176 LTPR series**
LED pattern projectors _____
- 182 LTPRSMHP3W series**
3W tilting LED pattern projectors _____

**ACCESSORIES****237****Diffusing & polarizing plates for lighting**

- 237 DFLT series**
Diffusion plates for lighting _____ **NEW**
- 238 PLLT series**
Polarizing plates for lighting _____ **NEW**

241**Projection patterns**

- 241 PTPR series**
Projection patterns for LED projectors _____

249**Mounting mechanics**

- 249 CMLT series**
Mounting brackets for lighting _____ **NEW MODELS**

250**LED controllers**

- 250 LTDV series**
LED lighting strobe controllers _____ **NEW MODELS**
- 254 LTIC series**
LED lighting controllers _____

256**LED sources & replacements**

- 256 LTSCHP series**
High-performance replacement LED modules _____

260**Power supplies**

- 260 PS series**
Power supplies _____ *** RT**

262**Cables**

- 262 CB series**
Cables _____ *** RT**
- 263 ADPT001**
Adapter RS485-USB + cable with 3 elements
for LTDV6CH connection _____

280**KITS**

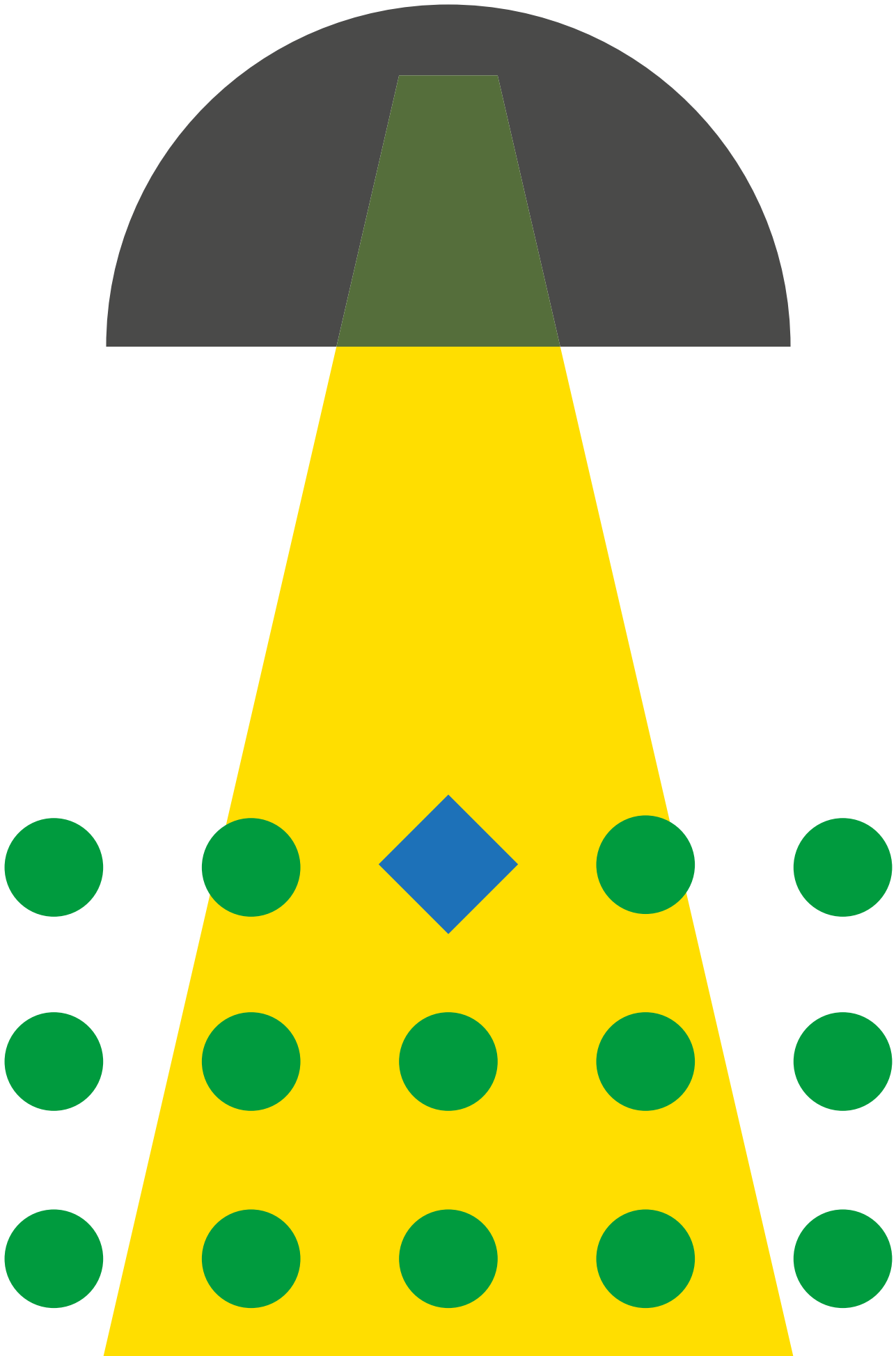
- 285 LTPKIT-A**
Starter high power LED lighting kit, A version _____ **NEW**
- 286 LTPKIT**
High power lighting _____
- 287 LTKITRY-FH-OR-V1**
Continuous lighting kit _____

291**Selection Charts**

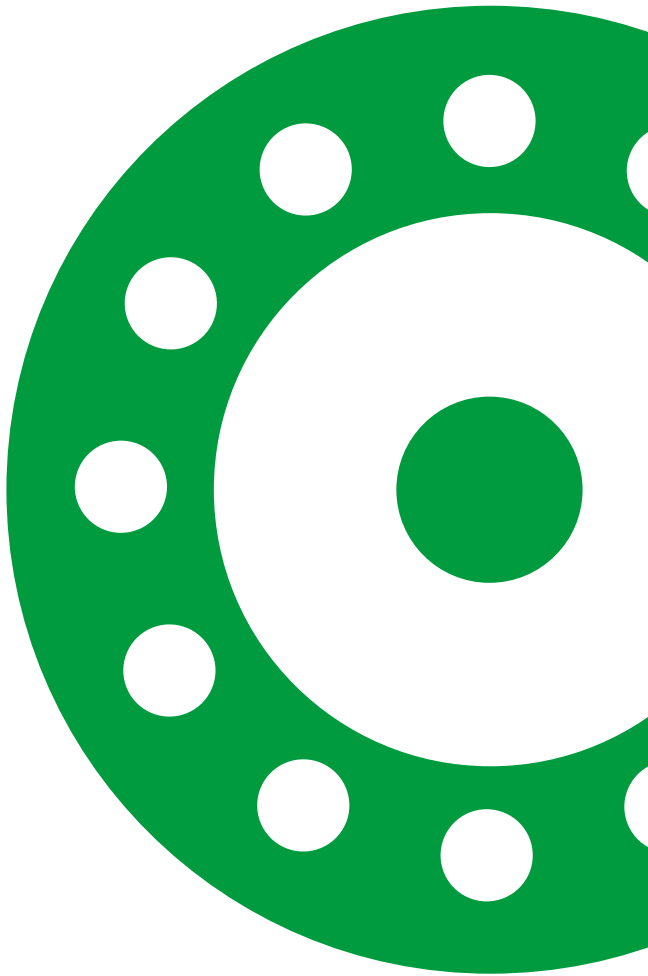
- 300 LED ILLUMINATORS SELECTION CHART** _____
- 302 LED LINE LIGHTS SELECTION CHART** _____

*** RT Products**

In order to meet all of our customers' needs, we have carefully selected a collection of machine vision components from experienced and qualified suppliers to complement our product range. These products will be delivered to you with the same level of competence, quality and technical support that you have come to know and expect from Opto Engineering®. Our goal is to turn our knowledge, experience and passion for machine vision into a broad and comprehensive service for our customers.



LIGHTING



Lighting is one of the most critical elements in a vision system and is in fact key to achieving stable and repeatable results. Incorrect illumination may result in extensive and time consuming image processing or, in the worst case, in the loss of crucial information.

Opto Engineering® lighting solutions, from standard to custom products, are the result of our optical knowledge and are designed with our guiding principle in mind: “simple works better”.

We design and manufacture both lighting and optics. Many of our lighting solutions are conceived to perfectly match our lenses or even to be directly integrated into our optical systems: this approach allows making the most out of our lighting products and greatly simplifies vision system integration, since our products are truly optimised both optically and mechanically.

Opto Engineering® machine vision lighting products include both LED illuminators and pattern projectors, designed to meet the needs of the most demanding industrial environments. Our innovative products enable reliable inspections in many applications thanks to their flexibility, robustness and ease of use.

LED illuminators **116**

LED pattern projectors **175**

LED illuminators

Advanced lighting solutions.

Illumination is a critical part of every machine vision setup:
proper choice of lighting color and geometry can effectively suppress or reveal specific features of an object, leading to simple and accurate image processing.

Opto Engineering® offers a wide range of illumination solutions including ring lights, dome illuminators and a unique space-saving lighting system complemented by specific high power/strobe controllers. The Opto Engineering® illuminators family provides innovative and robust lighting units, **designed to deal with fast-moving objects of various sizes and surface finishes**, such as highly reflective or curved samples.



Refer to specific datasheets available at www.opto-e.com for product compliancy with regulations, certifications and safety labels.

BACKLIGHTS	118 - 127
TELECENTRIC LIGHTS	128 - 137
RING LIGHTS	138 - 151
DOME LIGHTS	152 - 157
BAR LIGHTS	158 - 161
COAXIAL LIGHTS	162 - 163
TUNNEL LIGHTS	164 - 165
LINE LIGHTS	166 - 171
SPECIALTIES	172 - 174

LIGHTING PARAMETERS

H High power: suggested for high speed applications

α Light angle (°)

LIGHTING TYPES

COLLIMATED

DIRECT

FOCUSED

DIFFUSED

INDIRECT



LT2BC series

High uniformity continuous LED backlights

COLLIMATED/DIFFUSED

NEW
MODELS



KEY ADVANTAGES

4 Pin M8 connector.

Excellent uniformity.

Test report with measured uniformity.

Suitable for frequent cleaning

Thanks to the optical grade and scratch resistant protective window.

Wide selection and modular design

Size options with an active area ranging from 48x36 to 288x216 mm.

Available in red, white, green, blue and IR.

Compact design with reduced thickness (26 mm).

Optional integrated collimation film.

The **LT2BC series** offers high intensity LED backlights designed to provide exceptional illumination performances and excellent uniformity. Their special design provides both even lighting that perfectly fits in confined spaces thanks to a special beam shaping diffuser, new high efficiency LEDs and reduced thickness.

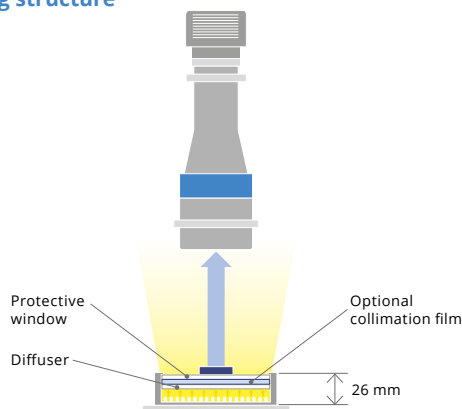
The LT2BC series innovative optical layout has been designed to emit a directional light beam and achieve accurate results even when used in combination with telecentric lenses for measurement applications.

When positioned behind the objects being inspected, the LT2BC series highlights the silhouette of the objects providing excellent image contrast.

These backlights work in continuous mode but they can also be overdriven.

Their robust and modular design featuring M8 connector and scratch resistant protective cover is conceived for demanding industrial automation environments and to provide you with a great choice of sizes, colors and aspect ratios for many diverse applications (from 4:3 to 16:9 and bar lights). Furthermore, LT2BC series can be easily installed into any machine vision system thanks to the lateral M6 threads and their slick design, suitable for environments with space constraints.

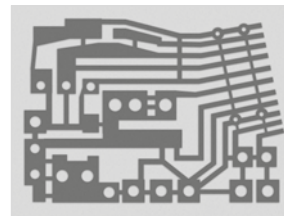
Lighting structure



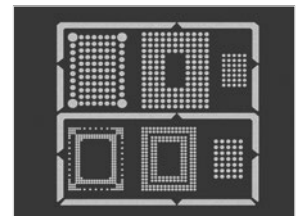
NEW

Optional collimation film available. The collimation film reduces light diffusion and increases parallelism: it is ideal for measurement applications or for the inspection of subtle scratches/dents on transparent surfaces.

Application examples



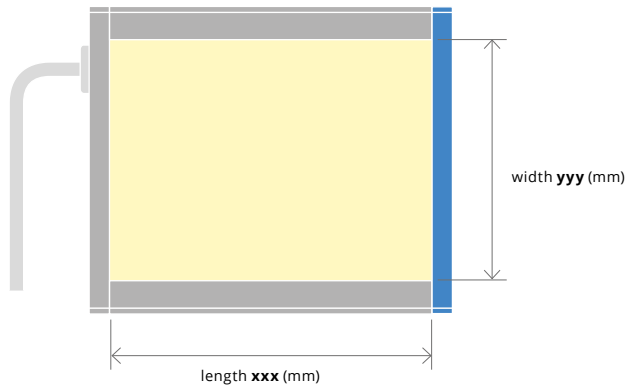
Shape inspection.



Detection of patterns/holes.



Inspection of subtle scratches/dents on transparent surfaces.



COMPATIBLE LIGHT INTENSITY CONTROLLER		
	Light intensity controller	p. 256
FULL RANGE OF COMPATIBLE STROBE CONTROLLERS		
	LTDV series	p. 252
FULL RANGE OF COMPATIBLE TELECENTRIC LENSES		
	Telecentric lenses	p. 18-71
FULL RANGE OF FIXED FOCAL LENGTH LENSES		
	EN2MP series, EN5MP series, EN-2RT series, EN-5RT series	p. 74-77

Light color		-R (red)	-G (green)	-B (blue)	-W (white)	-IR860 (infrared)
Wavelength	(nm)	620	525	470	cool white > 4500 K	860
Spectral FWHM	(nm)	20	33	25	cool white > 4500 K	30

Part number 1	Modules	Number of LEDs	Lighting area dim.		Light color Z	Diffuser	Optional optical sheet a 6	Optical specifications					Electrical specifications			Mechanical specs			
			Width xxx (mm)	Height yyy (mm)				Illuminance					Continuous mode			Pulsed mode	Dimensions		
								-R (red)	-G (green)	-B (blue)	-W (white)	-IR860 (infrared)	Supply voltage (V)	Current (mA) 4	Power cons (W) 5	Max pulse current (mA) 3	Width (mm)	Height (mm)	Thickness (mm)
LT2BC 048 036-z-a	1x1	48	48	36				28	50	12	46	439	24	220	5.3	500	60	56	26
LT2BC 096 036-z-a	2x1	96	96	36				21	39	8	31	304	24	310	7.4	700	108	56	26
LT2BC 144 036-z-a	3x1	144	144	36				17	30	7	25	260	24	380	9.1	850	156	56	26
LT2BC 192 036-z-a	4x1	192	192	36				15	29	6	24	245	24	460	11.0	1000	204	56	26
LT2BC 240 036-z-a	5x1	240	240	36				14	26	6	22	229	24	540	13.0	1200	252	56	26
LT2BC 288 036-z-a	6x1	288	288	36				14	26	6	22	224	24	640	15.4	1400	300	56	26
LT2BC 048 072-z-a	1x2	96	48	72				21	39	8	31	304	24	310	7.4	700	60	92	26
LT2BC 096 072-z-a	2x2	192	96	72				15	29	6	24	245	24	460	11.0	1000	108	92	26
LT2BC 144 072-z-a	3x2	288	144	72				14	26	6	22	224	24	640	15.4	1400	156	92	26
LT2BC 192 072-z-a	4x2	384	192	72				13	24	5	20	193	24	780	18.7	1700	204	92	26
LT2BC 240 072-z-a	5x2	480	240	72				12	22	5	18	184	24	910	21.8	1900	252	92	26
LT2BC 288 072-z-a	6x2	576	288	72				12	21	5	18	177	24	1080	25.9	2250	300	92	26
LT2BC 048 108-z-a	1x3	144	48	108	R = red,	CO = collimation film,		17	30	7	25	260	24	380	9.1	850	60	128	26
LT2BC 096 108-z-a	2x3	288	96	108	G = green,			14	26	6	22	224	24	640	15.4	1400	108	128	26
LT2BC 144 108-z-a	3x3	432	144	108	B = blue,			13	22	5	18	193	24	880	21.1	1800	156	128	26
LT2BC 192 108-z-a	4x3	576	192	108	W = white,			12	21	5	18	177	24	1080	25.9	2250	204	128	26
LT2BC 240 108-z-a	5x3	720	240	108	IR860 = Infrared 860 nm	Leave empty if no optional optical sheet is required		11	19	4	16	155	24	1200	28.8	2500	252	128	26
LT2BC 288 108-z-a	6x3	864	288	108				9	17	4	15	150	24	1280	30.7	2650	300	128	26
LT2BC 048 144-z-a	1x4	192	48	144				15	29	6	24	245	24	460	11.0	1000	60	164	26
LT2BC 096 144-z-a	2x4	384	96	144				13	23	5	20	193	24	780	18.7	1700	108	164	26
LT2BC 144 144-z-a	3x4	576	144	144				12	21	5	18	177	24	1080	25.9	2250	156	164	26
LT2BC 192 144-z-a	4x4	768	192	144				10	19	4	16	155	24	1240	29.8	2550	204	164	26
LT2BC 240 144-z-a	5x4	960	240	144				9	17	4	15	153	24	1440	34.6	2900	252	164	26
LT2BC 288 144-z-a	6x4	1152	288	144				11	19	4	16	170	24	1920	46.1	4000	300	164	26
LT2BC 048 180-z-a	1x5	240	48	180				14	26	6	22	229	24	540	13.0	1200	60	200	26
LT2BC 096 180-z-a	2x5	480	96	180				12	24	5	18	184	24	950	22.8	1900	108	200	26
LT2BC 144 180-z-a	3x5	720	144	180				11	19	4	16	155	24	1200	28.8	2500	156	200	26
LT2BC 192 180-z-a	4x5	960	192	180				9	17	4	15	148	24	1420	34.1	2900	204	200	26
LT2BC 240 180-z-a	5x5	1200	240	180				11	19	4	16	155	24	2000	48.0	4100	252	200	26
LT2BC 288 180-z-a	6x5	1440	288	180				9	16	3	13	146	24	2060	49.4	4100	300	200	26
LT2BC 048 216-z-a	1x6	288	48	216				14	26	6	22	224	24	640	15.4	1400	60	236	26
LT2BC 096 216-z-a	2x6	576	96	216				12	21	5	18	177	24	1080	25.9	2250	108	236	26
LT2BC 144 216-z-a	3x6	864	144	216				9	17	4	15	150	24	1280	30.7	2650	156	236	26
LT2BC 192 216-z-a	4x6	1152	192	216				11	19	4	16	170	24	1920	46.1	4000	204	236	26
LT2BC 240 216-z-a	5x6	1440	240	216				9	16	3	13	146	24	2060	49.4	4100	252	236	26
LT2BC 288 216-z-a	6x6	1728	288	216				8	14	3	12	121	24	2230	53.5	4500	300	236	26

- At emitting surface.
- At 25°C. At max pulse width (1 ms), max pulse frequency = 15 Hz.
- 5 m cable with straight female connector included. Optional cable with right angled connector is also available and must be ordered separately (refer to our website for further info and ordering codes).
- Maximum current +/- 10%.
- Maximum power +/- 10%.
- LT2BCxxx-IR860 are not available as a standard product with integrated optional collimation film. Contact us for customized options.

Ordering information

Our part numbers are coded as **LT2BC xxx yyy - z - a**, where:

- **xxx** defines the illumination area length (in mm),

- **yyy** defines the illumination area width (in mm),

- **z** defines the color. R = red, G = green, B = blue, W = white, IR860 = Infrared 860 nm,

- **a** defines the presence of an optional optical sheet. CO = with collimation films in both horizontal and vertical directions. Leave empty if no optional optical sheet is required.

For additional options such as horizontal/vertical linear or circular polarizers, contact us.

LTBP series

High power strobed LED backlights

H COLLIMATED/DIFFUSED

NEW
MODELS



KEY ADVANTAGES

4 Pin M8 connector.

Excellent uniformity.

Test report with measured uniformity.

Ultra high-power light output and strobe mode operation

For inspection and measurement of fast moving objects and an extended LED lifetime.

Suitable for frequent cleaning

Thanks to the optical grade and scratch resistant protective cover.

Wide selection and modular design

Size options range from 48 x 36 to 288 x 216 mm available in red, white, green, blue and Infrared.

Compact design with reduced thickness (26 mm).

Special continuous alignment mode.

Optional integrated collimation film.

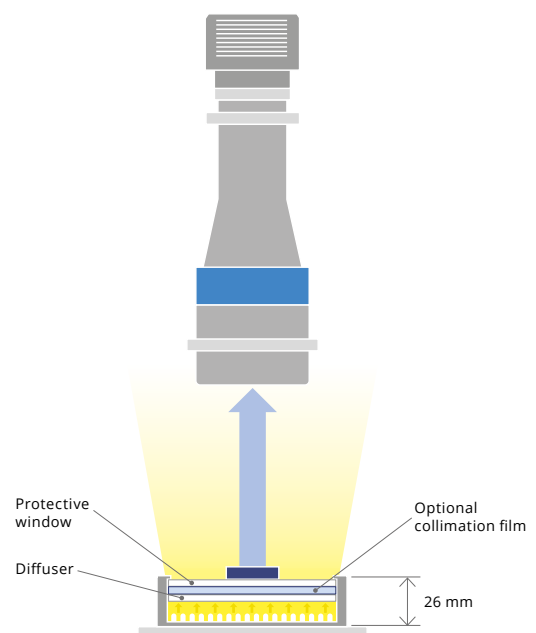
The **LTBP series** offers high power LED backlights designed to provide exceptional illumination performance and excellent uniformity. Their special design provides both powerful and uniform lighting that perfectly fits in confined spaces thanks to a special beam shaping diffuser, new high efficiency LEDs and reduced thickness. The LTBP series innovative optical layout has been designed to emit a directional light beam and achieve accurate results even when used in combination with telecentric lenses for measurement applications.

When positioned behind the objects being inspected, LTBP series highlight the silhouette of the objects providing excellent image contrast and high illuminance for the most demanding high speed applications (down to exposure times of tens of μ s).

These backlights work in strobe mode only but they also feature a special continuous mode to be used for alignment/setting purposes. Their robust and modular design featuring M8/M12 connectors and scratch resistant protective cover is conceived for heavy duty industrial automation environments and to provide you with a great choice of sizes, colors and aspect ratios for many diverse applications (from 4:3 to 16:9 and bar lights).

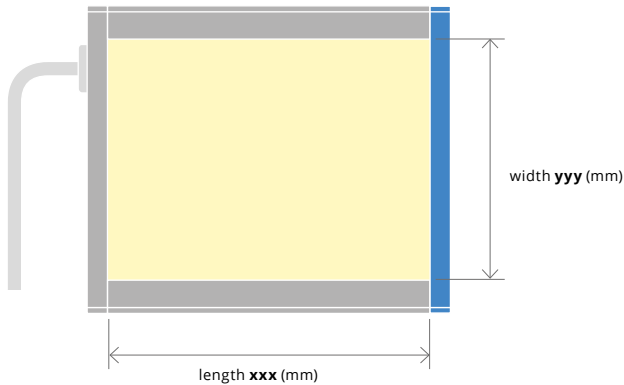
Furthermore, LTBP series can be easily installed into any machine vision system thanks to the lateral M6 threads and their slick design, suitable for environments with space constraints.

Lighting structure



NEW

Optional collimation film available. The collimation film reduces light diffusion and increases parallelism: it is ideal for measurement applications or for the inspection of subtle scratches/dents on transparent surfaces.



Optical specifications

Available light colors	red, green, blue, white, infrared 850 nm
------------------------	--

Electrical specifications

Power supply mode	strobe only, constant current driving	
Pulse width 1	(ms)	≤ 1
Estimated MTBF 2	(h)	> 50000

Mechanical specification

Materials	Black&Blue anodised Aluminium
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- At 25°C. At max pulse width (1 ms), max pulse frequency = 15 Hz.
- At 25°C.

Part number 1	Modules	Optical specifications					Electrical specifications					Mechanical specs				
		Number of LEDs	Lighting area dim.		Light color Z	Diffuser	Optional optical sheet a 3	Driving Current / Peak power consumption					Connection type	Dimensions		
			Width xxx (mm)	Height yyy (mm)				-R (red)	-G (green)	-B (blue)	-W (white)	-IR860 (infrared)		Width (mm)	Height (mm)	Thickness (mm)
LTBP 048 036-z-a	1x1	48	48	36	Yes	CO = collimation film,	1.8 / 43	1.8 / 60	1.8 / 55	1.8 / 48	1.8 / 37	M8	60	56	26	
LTBP 096 036-z-a	2x1	96	96	36			3.6 / 86	3.6 / 121	3.6 / 109	3.6 / 95	3.6 / 75	M8	108	56	26	
LTBP 144 036-z-a	3x1	144	144	36			5.4 / 130	5.4 / 181	5.4 / 164	5.4 / 143	5.4 / 112	M8	156	56	26	
LTBP 192 036-z-a	4x1	192	192	36			7.2 / 173	7.2 / 242	7.2 / 219	7.2 / 190	7.2 / 150	M8	204	56	26	
LTBP 240 036-z-a	5x1	240	240	36			9 / 216	9 / 302	9 / 274	9 / 238	9 / 187	M8	252	56	26	
LTBP 288 036-z-a	6x1	288	288	36			10.8 / 259	10.8 / 363	10.8 / 328	10.8 / 285	10.8 / 225	M8	300	56	26	
LTBP 048 072-z-a	1x2	96	48	72	Yes	Leave empty if no optional optical sheet is required	3.6 / 86	3.6 / 121	3.6 / 109	3.6 / 95	3.6 / 75	M8	60	92	26	
LTBP 096 072-z-a	2x2	192	96	72			7.2 / 173	7.2 / 242	7.2 / 219	7.2 / 190	7.2 / 150	M8	108	92	26	
LTBP 144 072-z-a	3x2	288	144	72			10.8 / 259	10.8 / 363	10.8 / 328	10.8 / 285	10.8 / 225	M8	156	92	26	
LTBP 192 072-z-a	4x2	384	192	72			14.4 / 346	14.4 / 484	14.4 / 438	14.4 / 380	14.4 / 300	M8	204	92	26	
LTBP 240 072-z-a	5x2	480	240	72			8.4 / 168	8.4 / 242	4.9 / 125	4.8 / 123	8.4 / 151	M8	252	92	26	
LTBP 288 072-z-a	6x2	576	288	72			10.1 / 202	10.1 / 291	5.8 / 148	5.8 / 148	10.1 / 182	M8	300	92	26	
LTBP 048 108-z-a	1x3	144	48	108	Yes	CO = collimation film,	5.4 / 130	5.4 / 181	5.4 / 164	5.4 / 143	5.4 / 112	M8	60	128	26	
LTBP 096 108-z-a	2x3	288	96	108			10.8 / 259	10.8 / 363	10.8 / 328	10.8 / 285	10.8 / 225	M8	108	128	26	
LTBP 144 108-z-a	3x3	432	144	108			16.2 / 389	16.2 / 544	16.2 / 492	16.2 / 428	16.2 / 337	M8	156	128	26	
LTBP 192 108-z-a	4x3	576	192	108			10.1 / 202	10.1 / 291	5.8 / 148	5.8 / 148	10.1 / 182	M8	204	128	26	
LTBP 24 0108-z-a	5x3	720	240	108			12.6 / 252	12.6 / 363	7.3 / 187	7.2 / 184	12.6 / 227	M8	252	128	26	
LTBP 288 108-z-a	6x3	864	288	108			15.1 / 302	15.1 / 435	8.7 / 223	8.6 / 220	15.1 / 272	M8	300	128	26	
LTBP 048 144-z-a	1x4	192	48	144	Yes	Leave empty if no optional optical sheet is required	7.2 / 173	7.2 / 242	7.2 / 219	7.2 / 190	7.2 / 150	M8	60	164	26	
LTBP 096 144-z-a	2x4	384	96	144			14.4 / 346	14.4 / 484	14.4 / 438	14.4 / 380	14.4 / 300	M8	108	164	26	
LTBP 144 144-z-a	3x4	576	144	144			10.1 / 202	10.1 / 291	5.8 / 148	5.8 / 148	10.1 / 182	M8	156	164	26	
LTBP 192 144-z-a	4x4	768	192	144			13.4 / 268	13.4 / 386	7.8 / 200	7.7 / 197	13.4 / 241	M8	204	164	26	
LTBP 240 144-z-a	5x4	960	240	144			16.8 / 336	16.8 / 484	9.7 / 248	9.6 / 246	16.8 / 302	M8	252	164	26	
LTBP 288 144-z-a	6x4	1152	288	144			20.2 / 404	20.2 / 582	11.7 / 300	11.5 / 294	20.2 / 364	M8	300	164	26	
LTBP 048 180-z-a	1x5	240	48	180	Yes	Leave empty if no optional optical sheet is required	9 / 216	9 / 302	9 / 274	9 / 238	9 / 187	M8	60	200	26	
LTBP 096 180-z-a	2x5	480	96	180			8.4 / 168	8.4 / 242	4.9 / 125	4.8 / 123	8.4 / 151	M8	108	200	26	
LTBP 144 180-z-a	3x5	720	144	180			12.6 / 252	12.6 / 363	7.3 / 187	7.2 / 184	12.6 / 227	M8	156	200	26	
LTBP 192 180-z-a	4x5	960	192	180			16.8 / 336	16.8 / 484	9.7 / 248	9.6 / 246	16.8 / 302	M8	204	200	26	
LTBP 240 180-z-a 2	5x5	1200	240	180			10.5 + 10.5 / 420	10.5 + 10.5 / 605	12.2 / 312	12 / 307	10.5 + 10.5 / 378	M12	252	200	26	
LTBP 288 180-z-a 2	6x5	1440	288	180			12.6 + 12.6 / 504	12.6 + 12.6 / 504	14.6 / 374	14.4 / 369	12.6 + 12.6 / 454	M12	300	200	26	
LTBP 048 216-z-a	1x6	288	48	216	Yes	Leave empty if no optional optical sheet is required	10.8 / 259	10.8 / 363	10.8 / 328	10.8 / 285	10.8 / 225	M8	60	236	26	
LTBP 096 216-z-a	2x6	576	96	216			10.1 / 202	10.1 / 291	5.8 / 148	5.8 / 148	10.1 / 182	M8	108	236	26	
LTBP 144 216-z-a	3x6	864	144	216			15.1 / 302	15.1 / 435	8.7 / 223	8.6 / 220	15.1 / 272	M8	156	236	26	
LTBP 192 216-z-a	4x6	1152	192	216			20.2 / 404	20.2 / 582	11.7 / 300	11.5 / 294	20.2 / 364	M8	204	236	26	
LTBP 240 216-z-a 2	5x6	1440	240	216			12.6 + 12.6 / 504	12.6 + 12.6 / 726	14.6 / 374	14.4 / 369	12.6 + 12.6 / 454	M12	252	236	26	
LTBP 288 216-z-a 2	6x6	1728	288	216			15.1 + 15.1 / 604	15.1 + 15.1 / 870	17.5 / 448	17.3 / 443	15.1 + 15.1 / 544	M12	300	236	26	

- 5 m cable with straight female connector included. Optional cable with right angled connector is also available and must be ordered separately (refer to our website for further info and ordering codes).
- Red and Green versions of these models feature 2 separate channels.

- LTBPxxxxxy-IR850 are not available as a standard product with integrated optional collimation film. Contact us for customized options.

Ordering information

Our part numbers are coded as **LTBP xxx yyy - z - a**, where:

- **xxx** defines the illumination area length (in mm),
- **yyy** defines the illumination area width (in mm),
- **z** defines the color. R = red, G = green, B = blue, W = white, IR850 = Infrared 850 nm,
- **a** defines the presence of an optional optical sheet. CO = with collimation films in both horizontal and vertical directions. Leave empty if no optional optical sheet is required. For additional options such as horizontal/vertical linear or circular polarizers, contact us.

LTBP series




High power strobed LED backlights



LTBP096072-W



LTBP048036-G

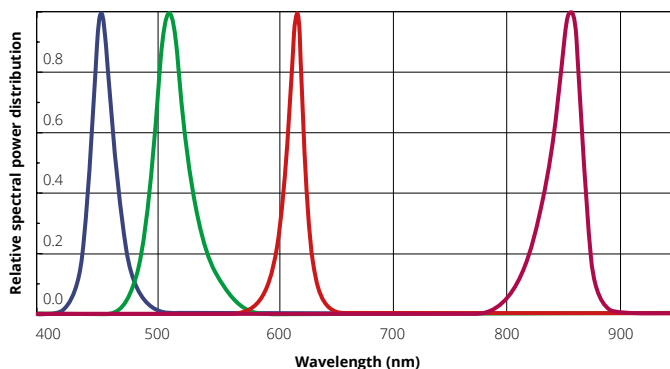
FULL RANGE OF COMPATIBLE STROBE CONTROLLERS		
	LTDV series	p. 252
FULL RANGE OF COMPATIBLE TELECENTRIC LENSES		
	Telecentric lenses	p. 18-71
FULL RANGE OF FIXED FOCAL LENGTH LENSES		
	EN2MP series, EN5MP series, EN-2RT series, EN-5RT series	p. 74-77

Light color			-R (red)	-G (green)	-B (blue)	-W (white)	-IR850 (infrared)
Wavelength	(nm)	LED Type A	620	522	465	cool white > 4500 K	850
		B	625	525	470	cool white > 4500 K	850
Spectral FWHM	(nm)	A	20	30	20	cool white > 4500 K	30
		B	20	30	25	cool white > 4500 K	30
Min estimated illumination	(klux)	A 1	70	150	30	200	-
		B 2	n.a.	n.a.	n.a.	n.a.	-

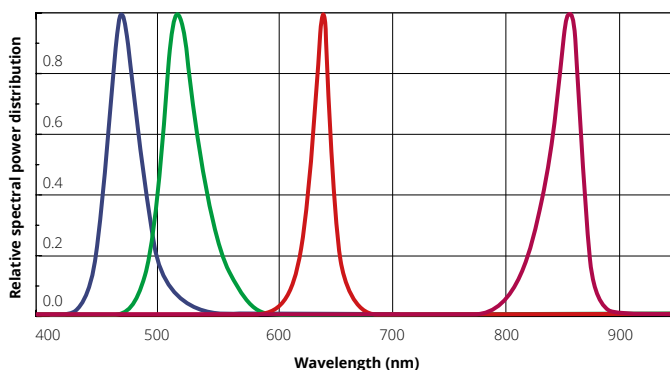
- 1 At max driving current, on emitting surface.
- 2 Available on request.

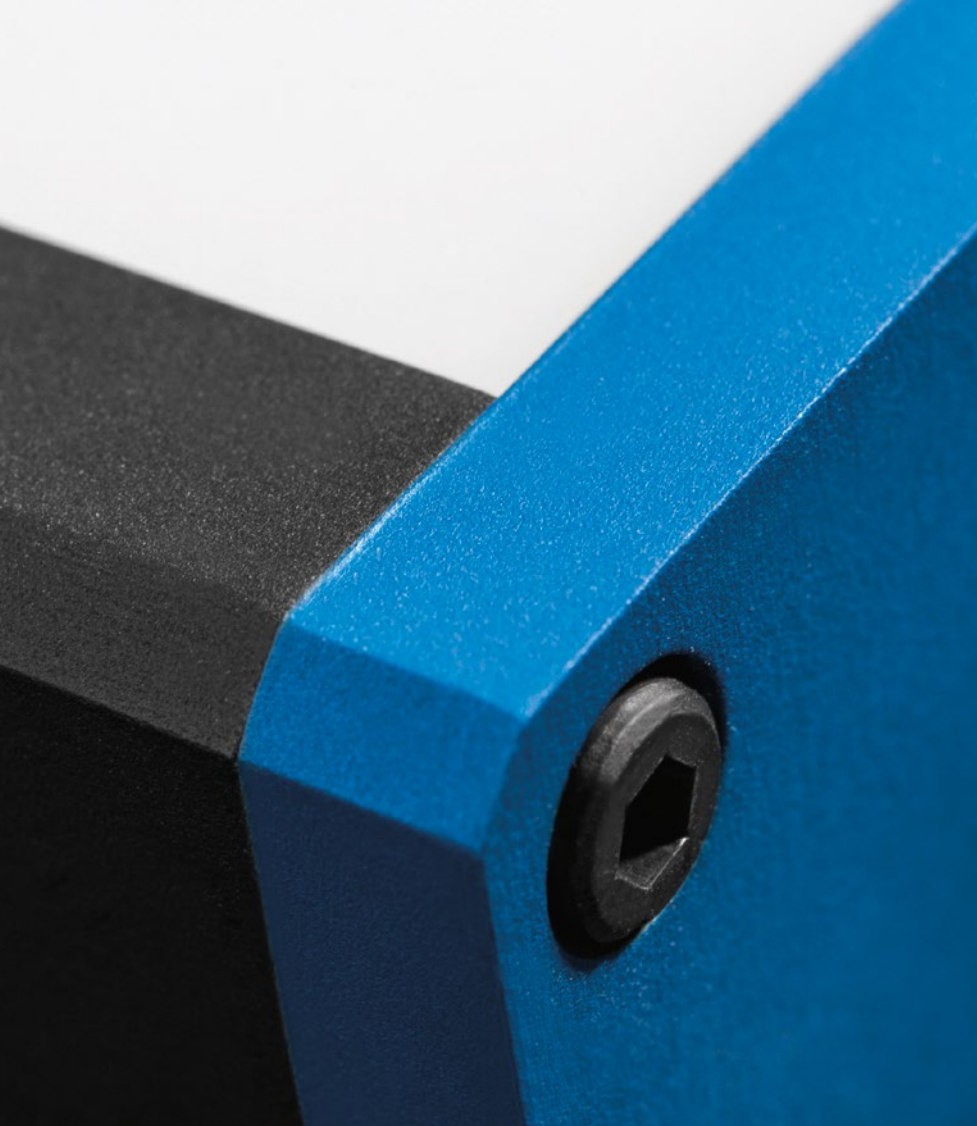
Part number	Module	LED type
LTBP 048 036-z-a	1 x 1	A
LTBP 096 036-z-a	2 x 1	A
LTBP 144 036-z-a	3 x 1	A
LTBP 192 036-z-a	4 x 1	A
LTBP 240 036-z-a	5 x 1	A
LTBP 288 036-z-a	6 x 1	A
LTBP 048 072-z-a	1 x 2	A
LTBP 096 072-z-a	2 x 2	A
LTBP 144 072-z-a	3 x 2	A
LTBP 192 072-z-a	4 x 2	A
LTBP 240 072-z-a	5 x 2	B
LTBP 288 072-z-a	6 x 2	B
LTBP 048 108-z-a	1 x 3	A
LTBP 096 108-z-a	2 x 3	A
LTBP 144 108-z-a	3 x 3	A
LTBP 192 108-z-a	4 x 3	B
LTBP 240 108-z-a	5 x 3	B
LTBP 288 108-z-a	6 x 3	B
LTBP 048 144-z-a	1 x 4	A
LTBP 096 144-z-a	2 x 4	A
LTBP 144 144-z-a	3 x 4	B
LTBP 192 144-z-a	4 x 4	B
LTBP 240 144-z-a	5 x 4	B
LTBP 288 144-z-a	6 x 4	B
LTBP 048 180-z-a	1 x 5	A
LTBP 096 180-z-a	2 x 5	B
LTBP 144 180-z-a	3 x 5	B
LTBP 192 180-z-a	4 x 5	B
LTBP 240 180-z-a	5 x 5	B
LTBP 288 180-z-a	6 x 5	B
LTBP 048 216-z-a	1 x 6	A
LTBP 096 216-z-a	2 x 6	B
LTBP 144 216-z-a	3 x 6	B
LTBP 192 216-z-a	4 x 6	B
LTBP 240 216-z-a	5 x 6	B
LTBP 288 216-z-a	6 x 6	B

Typical emission spectrum of type A LEDs (R, G, B, IR)

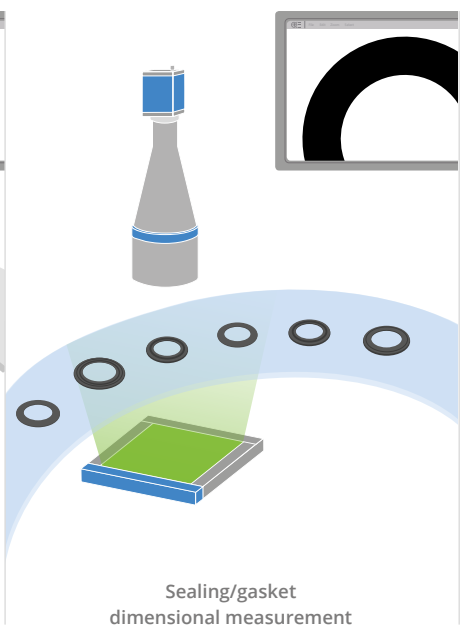
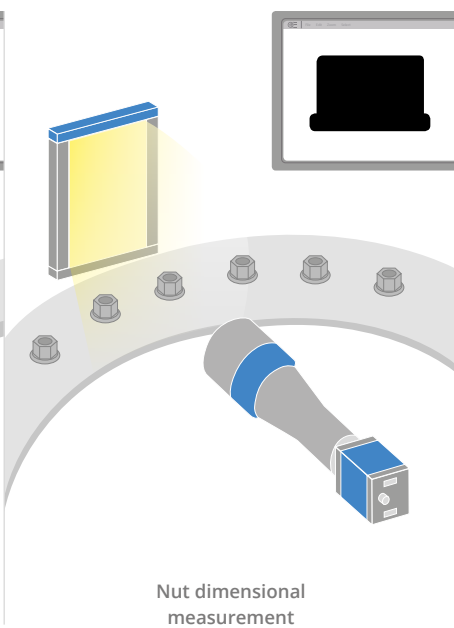
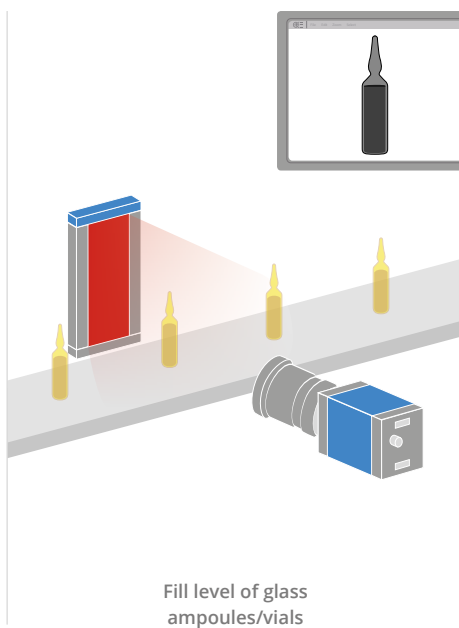


Typical emission spectrum of type B LEDs (R, G, B, IR)





Application examples



LTBC series

Continuous LED backlights

DIFFUSED



KEY ADVANTAGES

Cost-effective homogeneous illumination

Densely packed LED arrays with matte diffuser eliminating hot spots and glare.

Robust industrial Design

M8 connector for easy connection to power supplies.

Easy integration

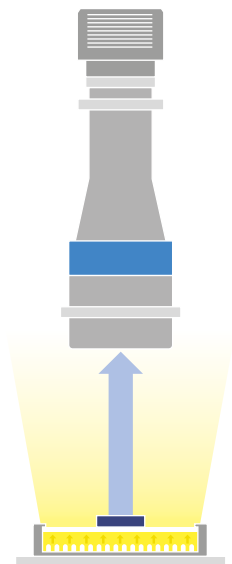
M6 nut channels for easy mounting.



The **LTBC series** offers LED backlights designed to be employed in a wide variety of applications such as shape and size inspection of workpieces.

These backlights are a cost-effective solution without compromising on quality: they feature a robust design and provide diffuse, even illumination without hotspots.

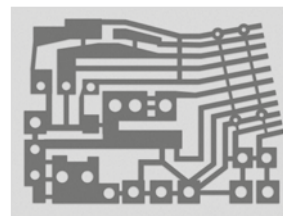
LTBC series backlights effectively emphasize the silhouette of a workpiece, providing excellent optical contrast in combination with many different lenses.

Lighting structure

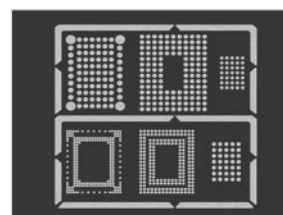


COMPATIBLE STROBE CONTROLLER	
	LTDV1CH-17V strobe controller p. 252
COMPATIBLE LIGHT INTENSITY CONTROLLER	
	LTICGR1000-D1-PS-xx light intensity controller p. 256

Application examples



Shape inspection.



Detection of patterns/holes.



LTBC114114-G



LTBC054054 with M6 threaded hole for easy mounting.

Part number	Optical specifications				Electrical specifications						Dimensions			Compatibility
	Color, peak wavelength	Illuminance (lux) 3	Lighting area		Continuous mode			Pulsed mode		Length (mm)	Width (mm)	Height (mm)	Optics	
			Length (mm)	Width (mm)	Supply Voltage (V)	Current (mA)	Power cons. (W)	Supply Voltage (V) 1	Max pulse Current (mA) 2					
LTBC 054 054-W	white, 6300 K	11100	54.5	54.5	24	54	1.3	36	162	99	99	35.6	TC2300y, TC23012, TCxx016, TCxx024, TCxx036, TCLWD series, TCxMHR016-x, TCxMHR024-x, TCxMHR036-x, TC4M00y-x, TC12M016-F, TC12M024-F, TC12M036-F, TC16M009-x, TC16M012-x, TC16M018-x, TC16M036-x, TCZR036S, TCEL series (except TCEL23036) MC series, MC4K050X-x, MC4K100X-x, MC4K125X-x, MC4K150X-x, MC4K175X-x, MC4K200X-x, MC12K200X-x, MC12K150X-x, MC12K100X-x	
LTBC 054 054-G	green, 525 nm	8500	54.5	54.5	24	54	1.3	36	162	99	99	35.6	TCxx048 - TCxx085, TCCRxx048, TCCRxx056, TCCRxx064, TCCRxx080, TCxMHR048-x, TCxMHR056-x, TCxMHR064-x, TCxMHR080-x, TCCR2Mxx048-x, TCCR2Mxx056-x, TCCR2Mxx064-x, TCCR2Mxx080-x, TCCR4Mxx048-x, TCCR4Mxx056-x, TCCR4Mxx064-x, TCCR4Mxx080-x, TC12M048-F, TC12M056-F, TC12M064-F, TC12M080-F, TC16M048-x, TC16M056-x, TC16M064-x, TC16M080-x, TCZR072S, MC4K025X-x, MC12K067X-x, MC12K050X-x	
LTBC 114 114-W	white, 6300 K	18700	114.5	114.5	24	216	5.2	36	648	159	159	35.6	TCxx096 - TCxx130, TCCRxx096, TCCRxx120, TCxMHR096-x, TCxMHR120-x, TCCR2M096-x, TCCR2M120-x, TCCR4M096-x, TCCR4M120-x, TC12M096-F, TC12M120-F, TC16M096-x, TC16M120-x, TCDPx096, TCDPx120, MCZR033-008, MC12K025X-x	
LTBC 114 114-G	green, 525 nm	15500	114.5	114.5	24	216	5.2	36	648	159	159	35.6	TCxx144, TC23172, TCCPxx144, TCCPxx192, TCxMHR144-x, TC12M144-F, TCCP3MHR144, TCCP3MHR192, TCCP5MHR144, TCCP5MHR192, TC12M192-F, TC16M144-x, TC16M192-x, TCDPx144, MCZR025-006, MCZR018-004	
LTBC 174 174-W	white, 6300 K	18500	174.5	174.5	24	486	11.7	36	1458	219	219	35.6	TCxx096 - TCxx130, TCCRxx096, TCCRxx120, TCxMHR096-x, TCxMHR120-x, TCCR2M096-x, TCCR2M120-x, TCCR4M096-x, TCCR4M120-x, TC12M096-F, TC12M120-F, TC16M096-x, TC16M120-x, TCDPx096, TCDPx120, MCZR033-008, MC12K025X-x	
LTBC 174 174-G	green, 525 nm	16800	174.5	174.5	24	486	11.7	36	1458	219	219	35.6	TCxx096 - TCxx130, TCCRxx096, TCCRxx120, TCxMHR096-x, TCxMHR120-x, TCCR2M096-x, TCCR2M120-x, TCCR4M096-x, TCCR4M120-x, TC12M096-F, TC12M120-F, TC16M096-x, TC16M120-x, TCDPx096, TCDPx120, MCZR033-008, MC12K025X-x	
LTBC 234 234-W	white, 6300 K	19200	234.5	234.5	24	864	20.8	36	2592	279	279	35.6	TCxx144, TC23172, TCCPxx144, TCCPxx192, TCxMHR144-x, TC12M144-F, TCCP3MHR144, TCCP3MHR192, TCCP5MHR144, TCCP5MHR192, TC12M192-F, TC16M144-x, TC16M192-x, TCDPx144, MCZR025-006, MCZR018-004	
LTBC 234 234-G	green, 525 nm	15200	234.5	234.5	24	864	20.8	36	2592	279	279	35.6	TCxx144, TC23172, TCCPxx144, TCCPxx192, TCxMHR144-x, TC12M144-F, TCCP3MHR144, TCCP3MHR192, TCCP5MHR144, TCCP5MHR192, TC12M192-F, TC16M144-x, TC16M192-x, TCDPx144, MCZR025-006, MCZR018-004	

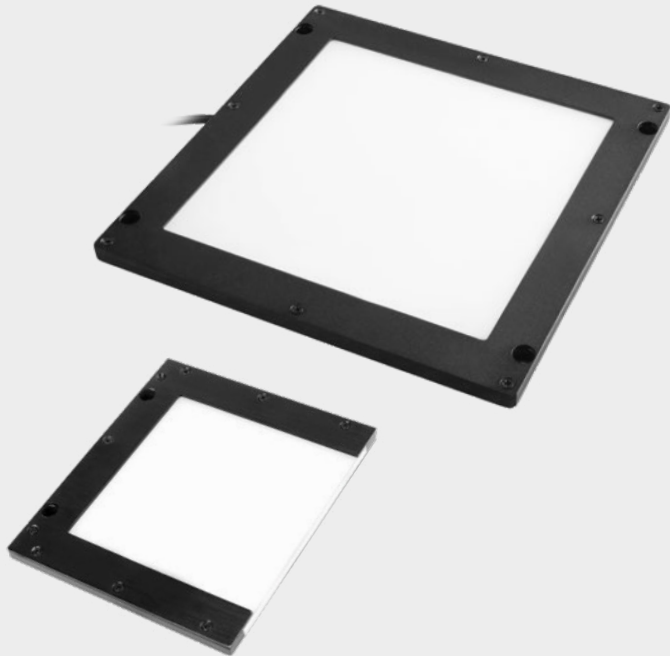
1 With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%. Max pulse width = 10 ms.

2 With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.
3 ± 15% at 20 mm working distance.

LTBFC series

Continuous flat side-emitting LED backlights

DIFFUSED



KEY ADVANTAGES

24V DC supply voltage.

Easy integration & compact size.

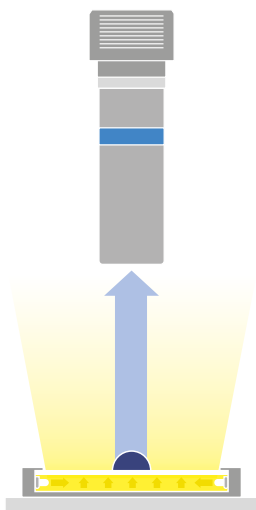
JST connector (optional M8, M12).

Red, Green, Blue and White.

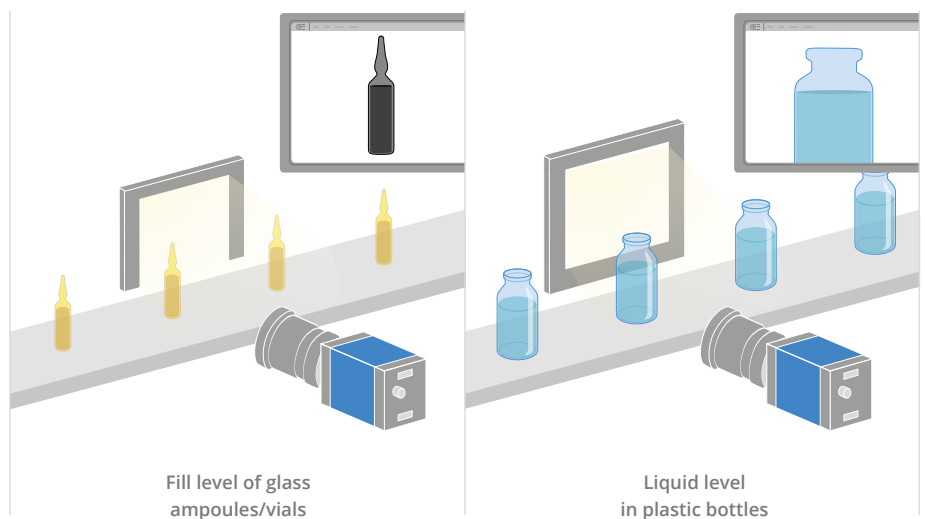
Custom sizes available on request.

The **LTBFC series** consists of flat side-emitting LED backlights: two types are available either with four borders or with three borders and one side flush. Suggested use is continuous mode.



Lighting structure



Application examples





COMPATIBLE STROBE CONTROLLER		
	LTDV1CH-17V strobe controller	p. 252
COMPATIBLE LIGHT INTENSITY CONTROLLER		
	LTICGR1000-D1-PS-xx light intensity controller	p. 256

Part number	Optical specifications				Electrical specifications					Dimensions		
	Light color, wavelength peak	Lighting area		Sides type	Continuous mode			Pulsed mode		Length (mm)	Width (mm)	Height (mm)
		Width (mm)	Length (mm)		Supply voltage (V)	Current (mA)	Power cons. (W)	Supply voltage (V)	Max pulse current (mA)			
LTPVR070-00-1-W-24V	white, 6300 K	70	70	4 borders	24	120	2.9	36	360	98.5	98.5	5.30
LTPVR070-00-1-R-24V	red, 630 nm	70	70	4 borders	24	120	2.9	36	360	98.5	98.5	5.30
LTPVR070-00-1-G-24V	green, 525 nm	70	70	4 borders	24	120	2.9	36	360	98.5	98.5	5.30
LTPVR070-00-1-B-24V	blue, 470 nm	70	70	4 borders	24	120	2.9	36	360	98.5	98.5	5.30
LTPVR100-00-1-W-24V	white, 6300 K	100	100	4 borders	24	160	3.9	36	480	128.5	128.5	5.30
LTPVR100-00-1-R-24V	red, 630 nm	100	100	4 borders	24	180	4.4	36	540	128.5	128.5	5.30
LTPVR100-00-1-G-24V	green, 525 nm	100	100	4 borders	24	160	3.9	36	480	128.5	128.5	5.30
LTPVR100-00-1-B-24V	blue, 470 nm	100	100	4 borders	24	160	3.9	36	480	128.5	128.5	5.30
LTPVRG25X36-00-1-W-24V	white, 6300 K	25	36	3 borders and 1 edge to edge	24	20	0.5	36	60	38.5	43.5	5.30
LTPVRG25X36-00-1-R-24V	red, 630 nm	25	36	3 borders and 1 edge to edge	24	15	0.4	36	45	38.5	43.5	5.30
LTPVRG25X36-00-1-G-24V	green, 525 nm	25	36	3 borders and 1 edge to edge	24	20	0.5	36	60	38.5	43.5	5.30
LTPVRG25X36-00-1-B-24V	blue, 470 nm	25	36	3 borders and 1 edge to edge	24	20	0.5	36	60	38.5	43.5	5.30
LTPVRG31X58-00-1-W-24V	white, 6300 K	31	58	3 borders and 1 edge to edge	24	30	0.8	36	90	60	43.5	5.30
LTPVRG31X58-00-1-R-24V	red, 630 nm	31	58	3 borders and 1 edge to edge	24	30	0.8	36	90	60	43.5	5.30
LTPVRG31X58-00-1-G-24V	green, 525 nm	31	58	3 borders and 1 edge to edge	24	30	0.8	36	90	60	43.5	5.30
LTPVRG31X58-00-1-B-24V	blue, 470 nm	31	58	3 borders and 1 edge to edge	24	30	0.8	36	90	60	43.5	5.30
LTPVRG070-00-1-W-24V	white, 6300 K	70	70	3 borders and 1 edge to edge	24	90	2.2	36	270	98.5	84.5	4.30
LTPVRG070-00-1-R-24V	red, 630 nm	70	70	3 borders and 1 edge to edge	24	90	2.2	36	270	98.5	84.5	4.30
LTPVRG070-00-1-G-24V	green, 525 nm	70	70	3 borders and 1 edge to edge	24	90	2.2	36	270	98.5	84.5	4.30
LTPVRG070-00-1-B-24V	blue, 470 nm	70	70	3 borders and 1 edge to edge	24	90	2.2	36	270	98.5	84.5	4.30

- 1 With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%. Max pulse width = 10 ms.
- 2 With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

Ordering information

Our part numbers are coded as LTPVR(G)xxxx-yy-z-a-bbV where:

- xxxx defines the lighting area length and width. If the lighting length and width are equal, only one size is indicated.
- yy defines the light angle (for this series the angle is 00 = 0°)
- z defines the number of LED rows
- a defines the color: R = red, G = green, B = blue, W = white. Contact us for additional wavelengths.
- bb defines the supply voltage. Optional 12V version is available.

Lighting extension cables (CB series) are not included and must be ordered separately.

Optional connectors: LTBCF series is available with JST connector per standard. For M8 or M12 connectors (available as optional) add -M8 or -M12 at the end of the part number.

Examples: LTPVR100-00-1-W-24V-M8, LTPVR100-00-1-W-24V-M12

LTCLHP series

High-performance telecentric illuminators

COLLIMATED



KEY ADVANTAGES

Complete light coupling

All the light emitted by a LTCLHP source is collected by a telecentric lens and transferred to the camera detector, ensuring very high signal-to-noise ratios.

No border effects

Diffused back-illuminators often make objects seem smaller than their actual size because of light reflections on the sides of the object, while collimated rays are typically much less reflected.

Improved field depth and telecentricity




Collimated illumination geometry increases the telecentric lens' natural field depth and telecentricity far beyond its nominal specs.

Homogeneity test report with measured values.

The **LTCLHP series** offers high-performance telecentric illuminators specifically designed to back-illuminate objects imaged by telecentric lenses. This high performance series provides:

- Excellent **illumination stability** featuring no light flickering thanks to very high current stability over time even at low currents.
- Precise **light intensity tuning** thanks to the leadscrew multi-turn trimmer positioned at the back.
- **Easy LED source replacement** and alignment for all the LED colors offered by Opto Engineering®.

SEE ALSO

	TCBENCH series	p. 62
FULL RANGE OF COMPATIBLE ACCESSORIES		
	CMHO series	p. 248
	LTDV1CH-17V strobe controller	p. 252

DID YOU KNOW?

The LTCLHP series is now also available with new LTSCHP1W-GZ **green** light source, suitable for any kind of sample and specifically tailored for measuring reflective objects and objects with sharp edges.

KEY FEATURES

- **Reduction of edge diffraction effects**
- Enhanced **illumination uniformity**, especially on large FOVs
- Less sensitive to **alignment**



Ordering information

To order the version with the new green LED module use p/n **LTCLHPxxx-GZ** (i.e. LTCLHP064-GZ).

Part number (*)	Beam diameter (mm)	Available colors				Optical specs	Mechanical specs		Compatibility
		R	G	B	W	Working distance range (mm)	Length (mm)	Outer diameter (mm)	
		1				2			
LTCLHP 023-x	16	x	x	x	x	45 – 90	96.8	28	TC2300y, TC23012, TC4M00y-x, LTSCHP1W-x
LTCLHP 016-x	20	x	x	x	x	35 – 70	99.9	38	TCxx016, TC12M016-F, TCxMHR016-x, TCLWD series, TCEL series (except TCEL23036)
LTCLHP 024-x	30	x	x	x	x	45 – 90	124.7	44	TCxx024, TCxMHR024-x, TC12M024-F, TC16M009-x, TC16M012-x, TC16M018-x
LTCLHP 036-x	45	x	x	x	x	70 – 140	152.1	61	TCxx036, TC12M036-F, TCxMHR036-x, TC16M036-x, TCEL23036
LTCLHP 048-x	60	x	x	x	x	90 – 180	187.2	75	TCxx048, TC12M048-F, TCCRxx048, TCxMHR048-x, TC16M048-x
LTCLHP 056-x	70	x	x	x	x	100 – 200	210.5	80	TCxx056, TC12M056-F, TCCRxx056, TCxMHR056-x, TC16M056-x
LTCLHP 064-x	80	x	x	x	x	120 – 240	231.6	100	TCxx064, TCCRxx064, TCxMHR064-x, TC16M064-x, TC12M064-F, TC12K064
LTCLHP 080-x	100	x	x	x	x	150 – 300	277.2	116	TCxx080, TCCRxx080, TCxMHR080-x, TC16M080-x, TC12M080-F, TC12K080
LTCLHP 096-x	120	x	x	x	x	200 – 350	322.2	143	TC23085, TCxx096, TCCRxx096, TCxMHR096-x, TC12M096-F, TC16M096-x
LTCLHP 120-x	150	x	x		x	220 – 440	408.2	180	TC23110, TCxx120, TCxMHR120-x, TC16M120-x, TC12M120-F, TC12K121
LTCLHP 144-x	180	x	x			270 – 540	467.2	200	TC23130, TCxx144, TCCP12144, TCCPxMHR144, TCxMHR144-x, TC16M144-x, TC12M120-F, TC12K144
LTCLHP 192-x	250	x	x		x	350 – 700	608.2	260	TC23172, TCxx192, TCCP12192, TCCPxMHR192, TCxMHR192-x, TC12K192
LTCLHP 240-x	300	x	x			350 – 700	769.2	322	TC23200, TC23240, TCxMHR240-x, TC12M240-F

(*) The last digit of the part number "-x" defines the source color.

1 Opto Engineering® recommends green light for high precision measurement applications.

2 Nominal value, with no spacers in place.

LTCLHP telecentric illuminators offer higher edge contrast in comparison to diffused back light illuminators and therefore higher measurement accuracy.

This type of illumination is especially recommended for the high accuracy measurement of round or cylindrical parts where diffusive back lighting would offer poor performance because of the diffuse reflections coming from the edges of the objects being inspected.

Precise light intensity tuning

Easily and precisely tune the light intensity level thanks to the leadscrew multi-turn trimmer positioned at the back.



Direct LED control

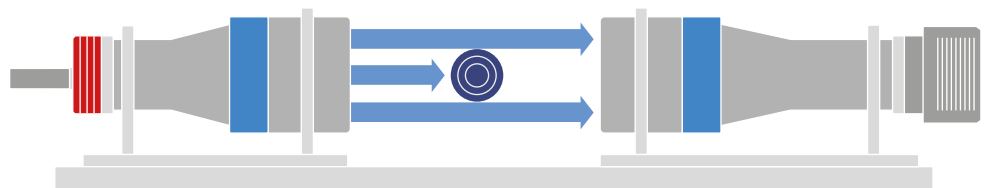
The built-in electronics can be bypassed in order to drive the LED directly for use in continuous or pulsed mode.

When bypassed, the built-in electronics behave as an open circuit allowing for direct control of the LED source.



Easy and precise alignment with bi-telecentric lenses

Create the perfect optical bench for precision measurement applications by interfacing our bi-telecentric lenses and LTCLHP collimated illuminators using Opto Engineering® precision clamping mechanics CMHO series.



Wide selection of different colors

Part number	Light color, wavelength peak	Device power ratings				LED power ratings		
		DC voltage		Power consumption (W)	Max LED fwd current (mA)	Forward voltage		Max pulse current (mA)
		min (V)	max (V)			typical (V)	max (V)	
		1			2	3	4	
LTCLHP xxx-R	red, 630 nm	12	24	< 2.5	350	2.4	3.00	2000
LTCLHP xxx-G	green, 520 nm	12	24	< 2.5	350	3.3	4.00	2000
LTCLHP xxx-B	blue, 460 nm	12	24	< 2.5	350	3.3	4.00	2000
LTCLHP xxx-W	white	12	24	< 2.5	350	2.78	n.a.	2000

1 Tolerance ± 10%.

2 Used in continuous (not pulsed) mode.

3 At max forward current. Tolerance is ±0.06V on forward voltage measurements.

4 At pulse width ≤ 10 ms, duty cycle ≤ 10% condition.

Built-in electronics board must be bypassed (see tech info online).

LTCLHP CORE series

Compact telecentric illuminators

COLLIMATED

KEY ADVANTAGES

Deliver excellent performance

LTCLHP CORE telecentric illuminators deliver exactly the same excellent optical performance as other Opto Engineering® telecentric illuminators.

Downsize your vision system

LTCLHP CORE telecentric illuminators are up to 60% smaller than other telecentric illuminators on the market.

Easy retrofitting into existing systems

LTCLHP CORE illuminators can be mounted in different directions in your machine.

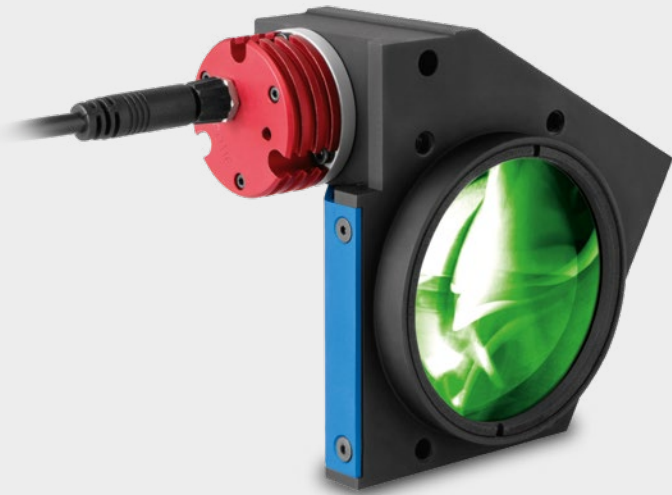
Improve your system performance

LTCLHP CORE illuminators may be used instead of flat backlights to improve your system.

Cut costs and sell more

A smaller system means less expenses and less space and is preferred by the industry.

Homogeneity test report with measured values.



The **LTCLHP CORE Series** offers ultra compact telecentric illuminators. They are up to 60% more compact than other collimated illuminators on the market.

The ultra compact size allows you to greatly reduce the size of your machine and to easily integrate true collimated illumination instead of common flat backlights, thus improving your system's performance.

The smart design also makes them easy to retrofit into existing systems. They can easily be mounted in different directions using any of their 4 sides, with or without clamps.

A smaller system means lower manufacturing, shipping and storage costs, as well as less use of factory space and is the solution preferred by the industry.

LTCLHP CORE illuminators can be used both with classic telecentric lenses and with ultra compact telecentric lenses from the CORE family such as the TC CORE, TC2MHR CORE and TC4MHR CORE series.

DID YOU KNOW?

The LTCLHP CORE series is now also available with new LTSCHP1W-GZ **green** light source, suitable for any kind of sample and specifically tailored for measuring reflective objects and objects with sharp edges.

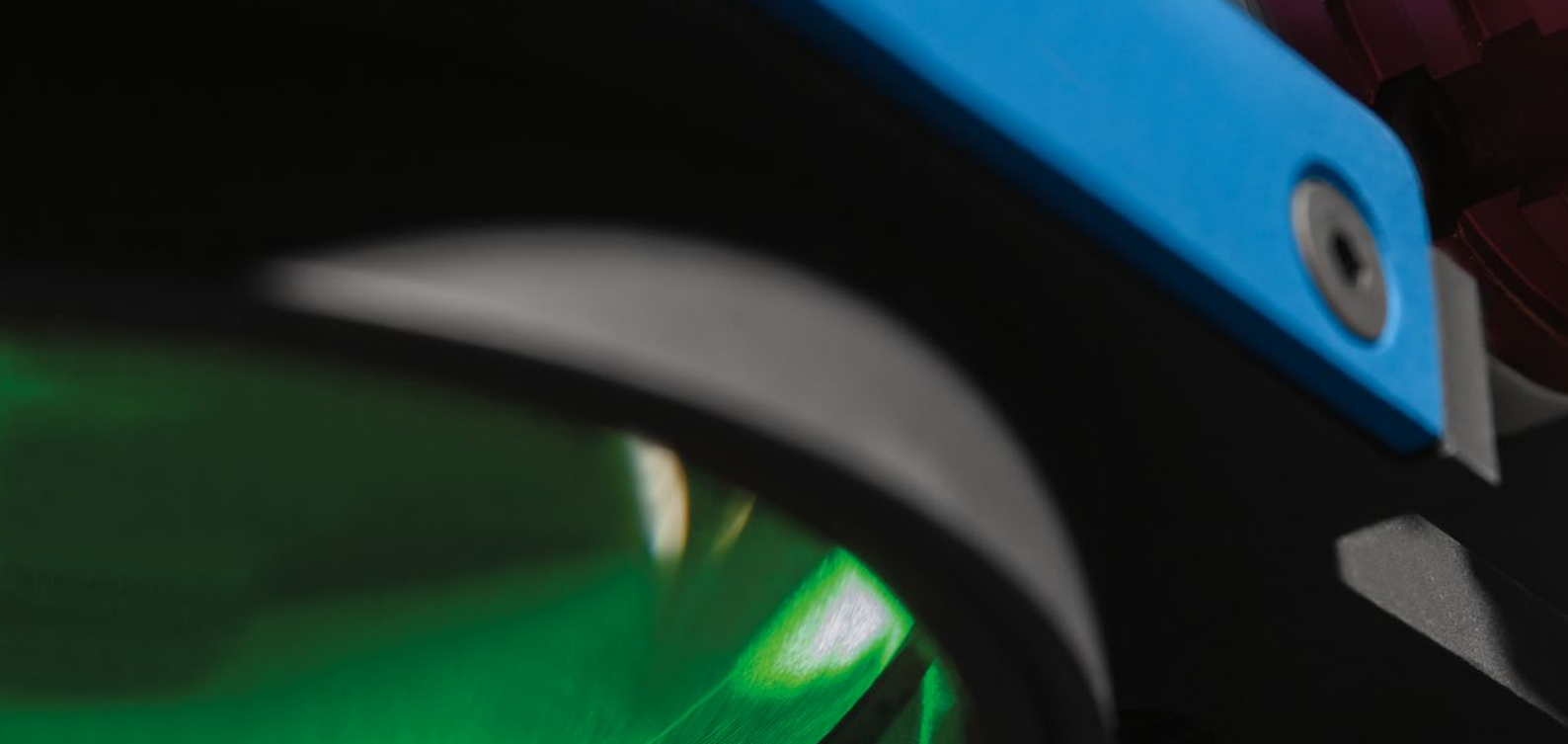
KEY FEATURES

- Reduction of edge diffraction effects
- Enhanced **illumination uniformity**, especially on large FOVs
- Less sensitive to **alignment**







Ordering information

To order the version with the new green LED module use p/n **LTCLCRxxx-GZ** (i.e. LTCLCR064-GZ).



LTCLHP CORE telecentric illuminators are up to 60% shorter than other telecentric illuminators on the market.

SEE ALSO		
	TC series	p. 20
FULL RANGE OF COMPATIBLE ACCESSORIES		
	Mounting mechanics CMHOCR	p. 248
	CMPTCR series	p. 250
	LTDV1CH-17V strobe controller	p. 252

Precise light intensity tuning

Easily and precisely tune the light intensity level thanks to the leadscrew multi-turn trimmer positioned on the back.



Direct LED control

The built-in electronics can be bypassed in order to drive the LED directly for use in continuous or pulsed mode. When bypassed, the built-in electronics behaves as an open circuit allowing for direct control of the LED source.



Part number	Light color, wavelength peak	Device power ratings			LED power ratings		
		DC voltage	Power consumption	Max LED fwd current	Forward voltage	Max pulse current	
		min (V)	max (V)	(W)	typical (V)	max (V)	(mA)
		1			3		4
LTCLCR xxx-R	red, 630 nm	12	24	< 2.5	2.4	3.00	2000
LTCLCR xxx-G	green, 520 nm	12	24	< 2.5	3.3	4.00	2000
LTCLCR xxx-W	white	12	24	< 2.5	2.78	n.a.	2000

1 Tolerance ± 10%.

2 Used in continuous (not pulsed) mode.

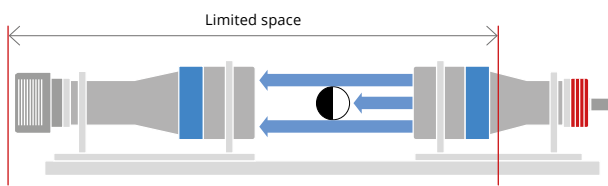
3 At max forward current. Tolerance is ±0.06V on forward voltage measurements.

4 At pulse width ≤ 10 ms, duty cycle ≤ 10% condition. Built-in electronics board must be bypassed (see tech info online).

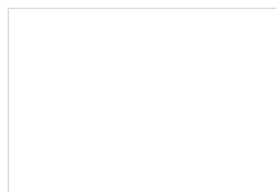
LTCLHP CORE series

Compact telecentric illuminators

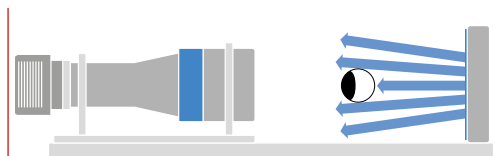
LTCLHP CORE - True collimated illumination in a reduced space



Telecentric lens and collimated illuminator.



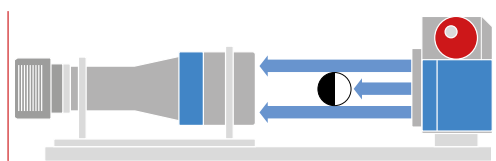
A standard collimated illuminator is impossible to use due to lack of space.



"Classic" telecentric lens and flat backlight.



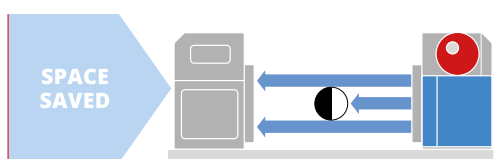
Classic solution with diffuse backlight: less precise measurements due to surface reflections and uncertain edge position.



"Classic" telecentric lens and LTCLHP CORE collimated illuminator.



Smart solution with LTCLHP CORE telecentric illuminator: no edge uncertainty for excellent measurement results.



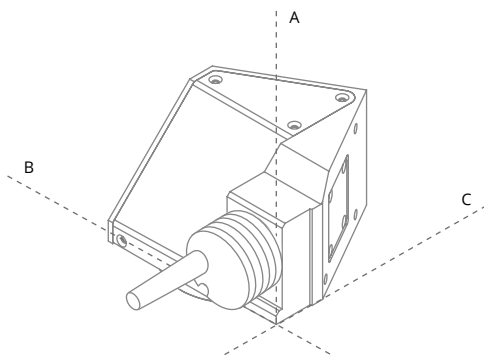
TC CORE telecentric lens and LTCLHP CORE collimated illuminator.



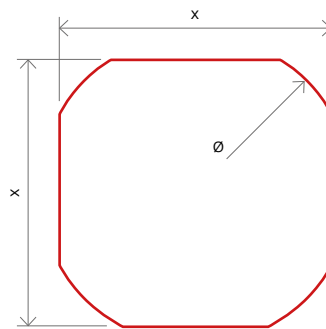
The smartest solution with TC CORE telecentric lens and LTCLHP CORE telecentric illuminator: excellent measurement results in a super compact space.



LTCLHP CORE illuminator dimensions (A, B, C):



Minimum beam shape dimensions:



Part number	Optical specifications			Dimensions			Compatibility
	Light color, wavelength peak	Minimum beam shape dimensions (mm)	Working distance range (mm)	(mm)			
	1			A	B	C 2	
LTCLCR 048-R	red, 630 nm	Ø = 56; x = 50	90 - 180	77	106	162	TCCRxx048, CMHOCR048, CMPTCR048, TCCRxM048-x, TCxx048, TCxMHR048-x, TC12M048-F, TC16M048, TC16M048-Q
LTCLCR 048-G	green, 520 nm	Ø = 56; x = 50	90 - 180	77	106	162	
LTCLCR 048-W	white	Ø = 56; x = 50	90 - 180	77	106	162	
LTCLCR 056-R	red, 630 nm	Ø = 74; x = 66	100 - 200	94	110	172	TCCRxx056, CMHOCR056, CMPTCR056, TCCRxM056-x, TCxx056, TCxMHR056-x, TC12M056-F, TC16M056, TC16M056-Q
LTCLCR 056-G	green, 520 nm	Ø = 74; x = 66	100 - 200	94	110	172	
LTCLCR 056-W	white	Ø = 74; x = 66	100 - 200	94	110	172	
LTCLCR 064-R	red, 630 nm	Ø = 86; x = 67	120 - 240	101	122	179	TCCRxx064, CMHOCR064, CMPTCR064, TCCRxM064-x, TCxx064, TCxMHR0564-x, TC12M064-F, TC16M064, TC16M064-Q, TC12K064
LTCLCR 064-G	green, 520 nm	Ø = 86; x = 67	120 - 240	101	122	179	
LTCLCR 064-W	white	Ø = 86; x = 67	120 - 240	101	122	179	
LTCLCR 080-R	red, 630 nm	Ø = 98; x = 90	150 - 300	119	145	198	TCCRxx080, CMHOCR080, CMPTCR080, TCCRxM080-x, TCxx080, TCxMHR080x, TC12M080-F, TC16M080, TC16M080-Q, TC12K080, TCZR0725
LTCLCR 080-G	green, 520 nm	Ø = 98; x = 90	150 - 300	119	145	198	
LTCLCR 080-W	white	Ø = 98; x = 90	150 - 300	119	145	198	
LTCLCR 096-R	red, 630 nm	Ø = 120; x = 99	200 - 350	139	172	223	TCCRxx096, CMHOCR096, CMPTCR096, TCCRxM096-x, TCxx096, TCxMHR096x, TC12M096-F, TC16M096, TC16M096-Q, TC12K096
LTCLCR 096-G	green, 520 nm	Ø = 120; x = 99	200 - 350	139	172	223	
LTCLCR 096-W	white	Ø = 120; x = 99	200 - 350	139	172	223	
LTCLCR 120-R	red, 630 nm	Ø = 156; x = 130	220 - 440	182	220	231	TCCRxx0120, TCCRxM0120-x, TCxx0120, TCxMHR0120x, TC12M120-F, TC16M0120, TC16M0120-Q, TC12K0120
LTCLCR 120-G	green, 520 nm	Ø = 156; x = 130	220 - 440	182	220	231	
LTCLCR 120-W	white	Ø = 156; x = 130	220 - 440	182	220	231	

1 Opto Engineering® recommends green light for high precision measurement applications.

2 Nominal value, with no spacers in place.

LTCLHP CORE PLUS series

Compact telecentric illuminators for large FOV systems

COLLIMATED

NEW
MODELS



KEY ADVANTAGES

Large illumination area in a super compact form factor

LTCLHP CORE PLUS are up to 40% shorter than other telecentric lights on the market.

Reduce the size of your vision system

The working distance of LTCLHP CORE PLUS telecentric illuminators has been optimised to reduce the system's overall footprint.

Boost your measurement system's performance

LTCLHP CORE PLUS illuminators may be used in place of flat backlights to improve your system's performance.

Smart integration

LTCLHP CORE PLUS illuminators integrate a mounting flange for easy integration without additional clamps.

System compactness is a competitive advantage

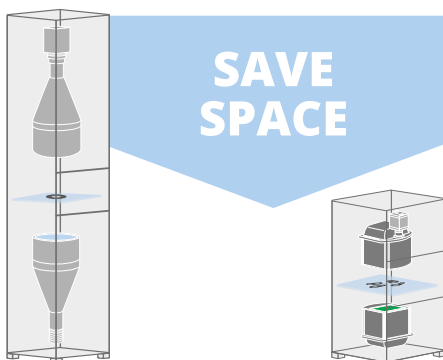
A smaller vision system or measurement machine is preferred by the industry.

LTCLHP CORE PLUS telecentric illuminators are designed to illuminate large areas in a reduced space. They are up to 40% shorter than other telecentric lights on the market.

The length and working distance of a telecentric lens strongly impact the size of a vision system. Their working distance range has been optimised to make a measurement system as compact as possible, allowing to reduce the system's overall dimensions by up to half. The super compact form factor allows you to easily integrate CORE PLUS collimated illumination where classic telecentric lights do not fit instead of common diffuse backlights, thus improving your system's performance.

LTCLHP CORE PLUS lights have been designed for smart integration. They feature a built-in mounting flange so no additional clamps are required.

System compactness is a competitive advantage



Comparison of precision measurement systems with "classic" telecentric lens and light vs. CORE PLUS telecentric lens and light.

SEE ALSO

	TC CORE PLUS series telecentric lenses	p. 28
FULL RANGE OF COMPATIBLE BACKLIGHTS		
	Flat backlights LT2BC, LTBC, LTBP series	p. 118-125
COMPATIBLE ACCESSORIES		
	LTDV1 CH-17V strobe controller	p. 252

ADVANTAGES

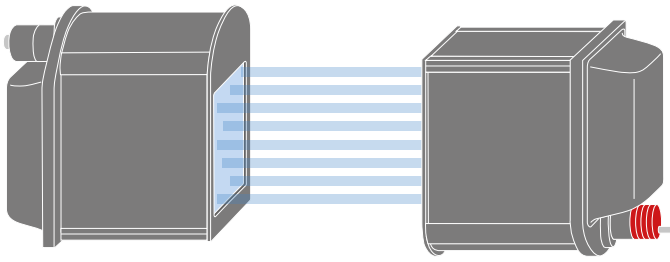


Save more

- Lower manufacturing cost due to less material employed
- Cost of mounting is reduced as no additional clamps are needed
- Less space required for storage and use
- Lower shipment expenses due to smaller size
- Lower transportation risks

Sell more

- Compactness offers a competitive advantage

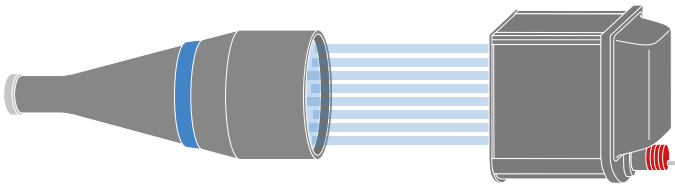


TC CORE PLUS telecentric lens.

LTCLHP CORE PLUS telecentric illuminator.

Setup instructions 1:

To build a telecentric measurement setup it is necessary to position a LTCLHP CORE telecentric illuminator upside down with respect to the TC CORE PLUS telecentric lens.

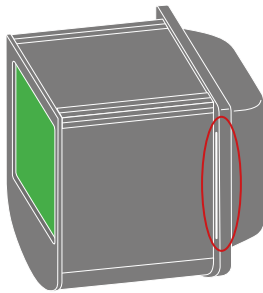


TC telecentric lens.

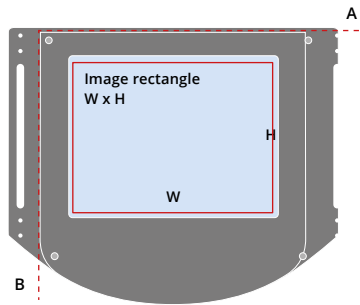
LTCLHP CORE PLUS telecentric illuminator.

Setup instructions 2:

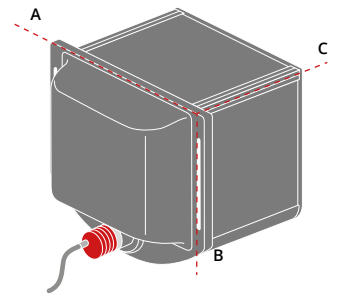
LTCLHP CORE PLUS telecentric illuminator is also a perfect solution when coupled with classic telecentric lenses (e.g. TC series).



Built-in mounting flange: no additional clamps required.



The width of the beam rectangle is aligned along the A axis. The height of the beam rectangle is aligned along the B axis.



A, B and C indicate the mechanical dimensions of the illuminator.

Part number	Optical specifications			Electrical specifications					Mechanical specifications				
	Light color, wavelength peak	Minimum beam shape dimensions (mm x mm)	Working distance range (mm)	Device power rating			LED power ratings		Dimensions				
				DC voltage		Power cons.	Max LED fwd current	Forward voltage	Max pulse current	A	B	C	
				min (V)	max (V)	(W)	(mA)	typical (V)	max (V)	(mA)	(mm)		
1	2	3	4	5	6	7	8	9	10				
LTCLCP 144-G	green, 520 nm	165 x 120	170 - 350	12	24	< 2.5	350	3.3	4	2000	332.0	302.5	310.5
LTCLCP 192-G	green, 520 nm	220 x 160	230 - 450	12	24	< 2.5	350	3.3	4	2000	410.4	344.1	359.3
LTCLCP 260-G	green, 520 nm	265 x 200	270 - 500	12	24	< 2.5	350	3.3	4	2000	425.3	396.7	421.0

- 1 Opto Engineering® recommends green light for high precision measurement applications.
- 2 Beam shape is not circular.
- 3 Working distance: distance between the front end of the mechanics and the object. Set this distance within +/- 5% of the nominal value for maximum resolution and minimum distortion.
- 4 Tolerance ± 10%.
- 5 Used in continuous (not pulsed) mode.

- 6 At max forward current.
- 7 Tolerance is ±0.06V on forward voltage measurements.
- 8 At pulse width ≤ 10 ms, duty cycle ≤ 10% condition. Built-in electronics board must be bypassed (see tech info).
- 9 Maximum dimension of the clamping flange.
- 10 Nominal value, with no spacers in place.

LTCL4K series

Flat telecentric illuminators for line scan cameras

COLLIMATED



KEY ADVANTAGES

Compact design

"Flat" shape for easy integration.

High optical throughput and enhanced field depth

When coupled with compatible TC4K telecentric lenses.

Dedicated CMMR4K mirrors

Right-angle deflection of the light path for usage in tight spaces.

Homogeneity test report with measured values.

LTCL4K telecentric illuminators are specifically designed to be paired with TC4K telecentric lenses, in order to provide the high optical throughput needed for high-speed line scan measurement applications involving, for instance, steering components, gear and cam shafts, grinding and turning parts.

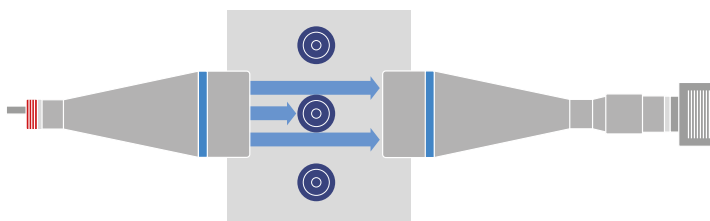
These illuminators are equipped with state-of-the-art LED driving electronics, providing exceptional illumination stability, precise light

intensity tuning and easy replacement of the LED source. The unique "slim" form factor allows these units to be used in tight spaces, often a critical factor in many industrial environments.

Also, CMMR4K right angle mirror attachments can be integrated to quickly assemble different illumination geometries, compatible with most types of inspection configurations.

Application examples

A LTCL4K back-illuminating a mechanical component and interfaced to a TC4K telecentric lens.



DID YOU KNOW?

The LTCL4K series is now also available with the new LTSCHP1W-GZ **green** light source, suitable for any kind of sample and specifically tailored for measuring reflective objects and objects with sharp edges.

KEY FEATURES


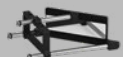

- Reduction of edge diffraction effects
- Enhanced illumination uniformity, especially on large FOVs
- Less sensitive to alignment



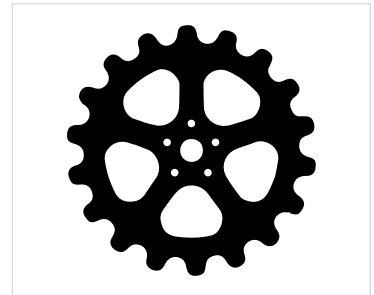
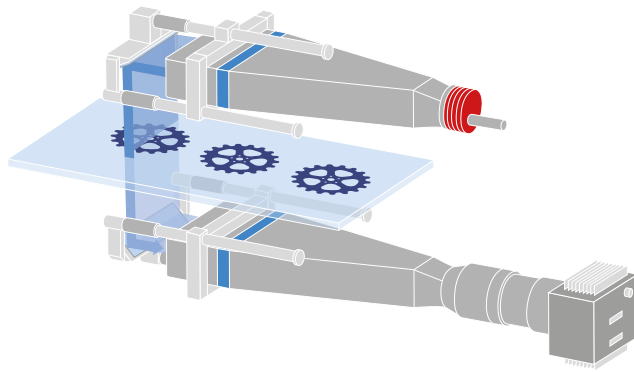
Ordering information

To order the version with the new green LED module use p/n **LTCL4Kxxx-GZ** (i.e. LTCL4K060-GZ).



SEE ALSO		
	TC4K series	p. 52
FULL RANGE OF COMPATIBLE ACCESSORIES		
	CMMR4K series	p. 235
	LTDV1CH-17V strobe controller	p. 252

A LTCL4K illuminator coupled with a TC4K lens using CMMR4K deflecting mirrors to scan samples on a glass surface.



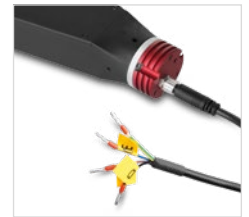
Precise light intensity tuning

Easily and precisely tune the light intensity level thanks to the leadscrew multi-turn trimmer positioned on the back.



Direct LED control

The built-in electronics can be bypassed in order to drive the LED directly for use in continuous or pulsed mode. When bypassed, the built-in electronics behaves as an open circuit allowing for direct control of the LED source.



Electrical specifications

Part number	Light	Device power ratings			LED power ratings			
	Light color, wavelength peak	DC voltage		Power consumption (W)	Max LED fwd current (mA)	Forward voltage		Max pulse current (mA)
		min (V)	max (V)			typical (V)	max (V)	
		1			2	3		4
LTCL4K xxx-G	green, 520 nm	12	24	< 2.5	350	3.3	4.00	2000
LTCL4K xxx-W	white	12	24	< 2.5	350	2.78	n.a.	2000

1 Tolerance ± 10%.

2 Used in continuous (not pulsed) mode.

3 At max forward current. Tolerance is ±0.06V on forward voltage measurements.

4 At pulse width ≤ 10 ms, duty cycle ≤ 10% condition.

Built-in electronics board must be bypassed (see tech info online).

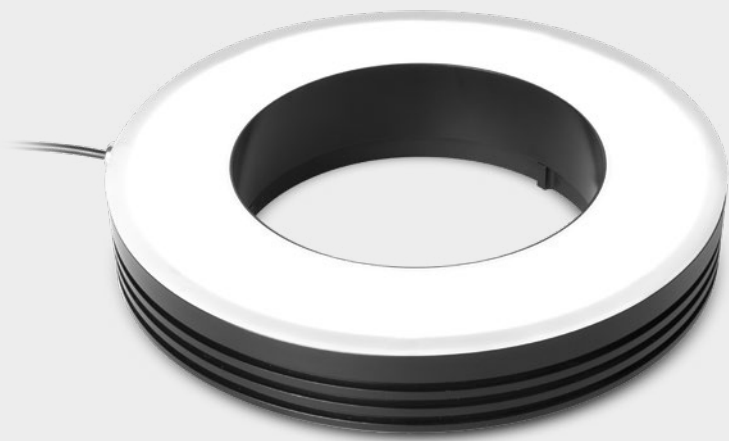
Part number	Optical specifications				Mechanical specifications			Compatibility
	Light color, wavelength peak	Beam width (mm)	Beam height (mm)	Working distance range (mm)	Length (mm)	Width (mm)	Height (mm)	Compatible TC4K
LTCL4K 060-G	green, 520 nm	71	10	90 - 300	218.3	83	38.5	TC4K060-x
LTCL4K 060-W	white	71	10	90 - 300	218.3	83	38.5	TC4K060-x
LTCL4K 090-G	green, 520 nm	102	10	90 - 300	295.2	114	38.5	TC4K090-x
LTCL4K 090-W	white	102	10	90 - 300	295.2	114	38.5	TC4K090-x
LTCL4K 120-G	green, 520 nm	132	10	90 - 300	306.3	144	38.5	TC4K120-x
LTCL4K 120-W	white	132	10	90 - 300	306.3	144	38.5	TC4K120-x
LTCL4K 180-G	green, 520 nm	187	10	120 - 450	483.5	206	38.5	TC4K180-x
LTCL4K 180-W	white	187	10	120 - 450	483.5	206	38.5	TC4K180-x

LTRNST series

LED ring illuminators - straight type

α 0°

DIFFUSED



KEY ADVANTAGES

Mechanically fitting Opto Engineering® optics

Each lens integrates specific mechanical interfaces.

Specific illumination geometry

Illumination path matches Opto Engineering® lenses viewing angle and numerical aperture.

High performance to price ratio

Cost-effective, without compromising quality.

FULL RANGE OF COMPATIBLE TELECENTRIC LENSES



Telecentric lenses

p. 18-71

COMPATIBLE STROBE CONTROLLER



LTDV1CH-17V strobe controller

p. 252

COMPATIBLE LIGHT INTENSITY CONTROLLER



LTICGR1000-D1-PS-xx light intensity controller

p. 256

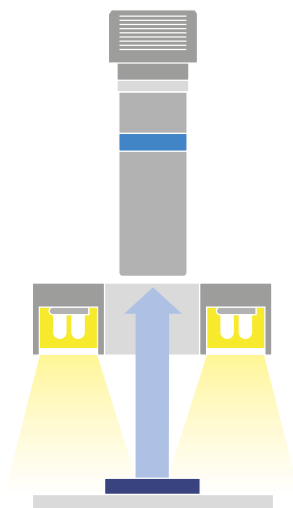
The **LTRNST series** offers LED ring illuminators specifically designed for a wide range of Opto Engineering® products. The straight type models especially fit Opto Engineering® telecentric lenses perfectly.

Every illuminator is equipped with a mechanical interface which makes it very easy to mount it on different lens types. These products enable the optimal illumination geometry for the most common applications of their matching lens.



LTRN illuminator coupled with TC23064

Lighting structure



LTRNST - Ring lights / straight illumination

Product overview



LTRN 016 NW



LTRN 120 NW

Part number	Optical specifications				Electrical specifications					Dimensions			Compatibility
	Light color, peak wavelength	Optimal WD (mm)	Lighting area diam.		Continuous mode ¹			Pulsed mode		Outer diam. (mm)	Inner diam. (mm)	Height (mm)	Compatible OE products
			inner (mm)	outer (mm)	Supply voltage (V)	Current (mA)	Power cons. (W)	Supply voltage (V) ²	Max pulse current (mA) ³				
Straight illumination													
LTRN 023 RD	red, 630 nm	55-85	32	90	24	200	4.8	24 - 48	600	104	28	40	TC2300y, TC23012, TC4M00y-x
LTRN 023 GR	green, 525 nm	55-85	32	90	24	220	5.3	24 - 48	660	104	28	40	TC2300y, TC23012, TC4M00y-x
LTRN 023 BL	blue, 470 nm	55-85	32	90	24	220	5.3	24 - 48	660	104	28	40	TC2300y, TC23012, TC4M00y-x
LTRN 023 NW	white, 6300 K	55-85	32	90	24	480	11.6	24 - 48	1440	104	28	40	TC2300y, TC23012, TC4M00y-x
LTRN 016 RD	red, 630 nm	85-150	48	107	24	300	7.2	24 - 48	900	120.6	37.7	40	TCxx016, TCxMHR016-x, TCxSM016, TCLWD series, TCEL series (except TCEL23036)
LTRN 016 GR	green, 525 nm	85-150	48	107	24	275	6.6	24 - 48	825	120.6	37.7	40	TCxx016, TCxMHR016-x, TCxSM016, TCLWD series, TCEL series (except TCEL23036)
LTRN 016 BL	blue, 470 nm	85-150	48	107	24	315	7.6	24 - 48	945	120.6	37.7	40	TCxx016, TCxMHR016-x, TCxSM016, TCLWD series, TCEL series (except TCEL23036)
LTRN 016 NW	white, 6300 K	85-150	48	107	24	650	15.6	24 - 48	1950	120.6	37.7	40	TCxx016, TCxMHR016-x, TCxSM016, TCLWD series, TCEL series (except TCEL23036)
LTRN 024 RD	red, 630 nm	85-150	48	107	24	300	7.2	24 - 48	900	120.6	44	40	TCxx024, TCxMHR024-x, TCxSM024
LTRN 024 GR	green, 525 nm	85-150	48	107	24	275	6.6	24 - 48	825	120.6	44	40	TCxx024, TCxMHR024-x, TCxSM024
LTRN 024 BL	blue, 470 nm	85-150	48	107	24	315	7.6	24 - 48	945	120.6	44	40	TCxx024, TCxMHR024-x, TCxSM024
LTRN 024 NW	white, 6300 K	85-150	48	107	24	650	15.6	24 - 48	1950	120.6	44	40	TCxx024, TCxMHR024-x, TCxSM024
LTRN 032 RD	red, 630 nm	65-240	84	143	24	400	9.6	24 - 48	1200	157	56	40	TCZR036S
LTRN 032 GR	green, 525 nm	65-240	84	143	24	385	9.3	24 - 48	1155	157	56	40	TCZR036S
LTRN 032 BL	blue, 470 nm	65-240	84	143	24	434	10.5	24 - 48	1302	157	56	40	TCZR036S
LTRN 032 NW	white, 6300 K	65-240	84	143	24	840	20.2	24 - 48	2000	157	56	40	TCZR036S
LTRN 036 RD	red, 630 nm	65-240	84	143	24	400	9.6	24 - 48	1200	157	61	40	TCxx036, TCxMHR036-x, TC12M036-F, TC16M036-x, TCxSM036, MCZRxxx-yyy, TCEL23036
LTRN 036 GR	green, 525 nm	65-240	84	143	24	385	9.2	24 - 48	1155	157	61	40	TCxx036, TCxMHR036-x, TC12M036-F, TC16M036-x, TCxSM036, MCZRxxx-yyy, TCEL23036
LTRN 036 BL	blue, 470 nm	65-240	84	143	24	434	10.4	24 - 48	1302	157	61	40	TCxx036, TCxMHR036-x, TC12M036-F, TC16M036-x, TCxSM036, MCZRxxx-yyy, TCEL23036
LTRN 036 NW	white, 6300 K	65-240	84	143	24	840	20.2	24 - 48	2000	157	61	40	TCxx036, TCxMHR036-x, TC12M036-F, TC16M036-x, TCxSM036, MCZRxxx-yyy, TCEL23036
LTRN 048 RD	red, 630 nm	65-240	84	143	24	400	9.6	24 - 48	1200	157	75	40	TCxx048, TCxMHR048-x, TC12M048-F, TC16M048-x, TCxSM048
LTRN 048 GR	green, 525 nm	65-240	84	143	24	385	9.3	24 - 48	1155	157	75	40	TCxx048, TCxMHR048-x, TC12M048-F, TC16M048-x, TCxSM048
LTRN 048 BL	blue, 470 nm	65-240	84	143	24	434	10.5	24 - 48	1302	157	75	40	TCxx048, TCxMHR048-x, TC12M048-F, TC16M048-x, TCxSM048
LTRN 048 NW	white, 6300 K	65-240	84	143	24	840	20.2	24 - 48	2000	157	75	40	TCxx048, TCxMHR048-x, TC12M048-F, TC16M048-x, TCxSM048
LTRN 056 RD	red, 630 nm	65-240	84	143	24	400	9.6	24 - 48	1200	157	80	40	TCxx056, TCxMHR056-x, TC12M056-F, TC16M056-x, TCxSM056
LTRN 056 GR	green, 525 nm	65-240	84	143	24	385	9.3	24 - 48	1155	157	80	40	TCxx056, TCxMHR056-x, TC12M056-F, TC16M056-x, TCxSM056
LTRN 056 BL	blue, 470 nm	65-240	84	143	24	434	10.5	24 - 48	1302	157	80	40	TCxx056, TCxMHR056-x, TC12M056-F, TC16M056-x, TCxSM056
LTRN 056 NW	white, 6300 K	65-240	84	143	24	840	20.2	24 - 48	2000	157	80	40	TCxx056, TCxMHR056-x, TC12M056-F, TC16M056-x, TCxSM056
LTRN 064 RD	red, 630 nm	280-365	120	178	24	500	12	24 - 48	1500	192	100	40	TCxx064, TCxMHR064-x, TC12M064-F, TC16M064-x, TC12K064, TCxSM064, TCZR072S
LTRN 064 GR	green, 525 nm	280-365	120	178	24	522	12.6	24 - 48	1566	192	100	40	TCxx064, TCxMHR064-x, TC12M064-F, TC16M064-x, TC12K064, TCxSM064, TCZR072S
LTRN 064 BL	blue, 470 nm	280-365	120	178	24	567	13.7	24 - 48	1701	192	100	40	TCxx064, TCxMHR064-x, TC12M064-F, TC16M064-x, TC12K064, TCxSM064, TCZR072S
LTRN 064 NW	white, 6300 K	280-365	120	178	24	960	23.1	24 - 48	2000	192	100	40	TCxx064, TCxMHR064-x, TC12M064-F, TC16M064-x, TC12K064, TCxSM064, TCZR072S
LTRN 080 RD	red, 630 nm	280-365	120	178	24	500	12	24 - 48	1500	192	116	40	TCxx080, TC23072, TCxMHR080-x, TC12M080-F, TC16M080-x, TC12K080, TCxSM080
LTRN 080 GR	green, 525 nm	280-365	120	178	24	522	12.6	24 - 48	1566	192	116	40	TCxx080, TC23072, TCxMHR080-x, TC12M080-F, TC16M080-x, TC12K080, TCxSM080
LTRN 080 BL	blue, 470 nm	280-365	120	178	24	567	13.7	24 - 48	1701	192	116	40	TCxx080, TC23072, TCxMHR080-x, TC12M080-F, TC16M080-x, TC12K080, TCxSM080
LTRN 080 NW	white, 6300 K	280-365	120	178	24	1170	28.1	24 - 48	2000	192	116	40	TCxx080, TC23072, TCxMHR080-x, TC12M080-F, TC16M080-x, TC12K080, TCxSM080
LTRN 096 RD	red, 630 nm	350-450	148	207	24	600	14.4	24 - 48	1800	221	143	40	TCxx096, TC23085, TCxMHR096-x, TC12M096-F, TC16M096-x, TCxSM096
LTRN 096 GR	green, 525 nm	350-450	148	207	24	550	13.2	24 - 48	1650	221	143	40	TCxx096, TC23085, TCxMHR096-x, TC12M096-F, TC16M096-x, TCxSM096
LTRN 096 BL	blue, 470 nm	350-450	148	207	24	650	15.6	24 - 48	1950	221	143	40	TCxx096, TC23085, TCxMHR096-x, TC12M096-F, TC16M096-x, TCxSM096
LTRN 096 NW	white, 6300 K	350-450	148	207	24	1200	28.8	24 - 48	2000	221	143	40	TCxx096, TC23085, TCxMHR096-x, TC12M096-F, TC16M096-x, TCxSM096
LTRN 120 RD	red, 630 nm	450-580	204	276	24	875	21	24 - 48	2000	290	180	40	TCxx120, TC23110, TCxMHR120-x, TC12M120-F, TC16M120-x, TC12K120
LTRN 120 GR	green, 525 nm	450-580	204	276	24	1118	26.9	24 - 48	2000	290	180	40	TCxx120, TC23110, TCxMHR120-x, TC12M120-F, TC16M120-x, TC12K120
LTRN 120 BL	blue, 470 nm	450-580	204	276	24	1118	26.9	24 - 48	2000	290	180	40	TCxx120, TC23110, TCxMHR120-x, TC12M120-F, TC16M120-x, TC12K120
LTRN 120 NW	white, 6300 K	450-580	204	276	24	1690	40.6	24 - 48	2000	290	180	40	TCxx120, TC23110, TCxMHR120-x, TC12M120-F, TC16M120-x, TC12K120
LTRN 144 RD	red, 630 nm	450-580	204	276	24	875	21	24 - 48	2000	290	200	40	TCxx144, TC23130, TCxMHR144-x, TC12M144-F, TC16M144-x, TC12K144
LTRN 144 GR	green, 525 nm	450-580	204	276	24	1118	26.9	24 - 48	2000	290	200	40	TCxx144, TC23130, TCxMHR144-x, TC12M144-F, TC16M144-x, TC12K144
LTRN 144 BL	blue, 470 nm	450-580	204	276	24	1118	26.9	24 - 48	2000	290	200	40	TCxx144, TC23130, TCxMHR144-x, TC12M144-F, TC16M144-x, TC12K144
LTRN 144 NW	white, 6300 K	450-580	204	276	24	1690	40.6	24 - 48	2000	290	200	40	TCxx144, TC23130, TCxMHR144-x, TC12M144-F, TC16M144-x, TC12K144

- ¹ Lifespan: 20,000 hours (drop to 50% intensity) at 25 °C.
- ² With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%. Max pulse width = 10 ms.
- ³ With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

LTRNDC series

Continuous LED direct ring lights

α 0°, 15°, 30°, 45° **DIRECT**



KEY ADVANTAGES

24V DC supply voltage.

Easy integration & compact size.

JST connector (optional M8, M12).

Red, Green, Blue and White.

Custom sizes available on request.

COMPATIBLE STROBE CONTROLLER



LTDV1CH-17V strobe controller

p. 252

COMPATIBLE LIGHT INTENSITY CONTROLLER



LTICGR1000-D1-PS-xx light intensity controller

p. 256

FULL RANGE OF FIXED FOCAL LENGTH LENSES



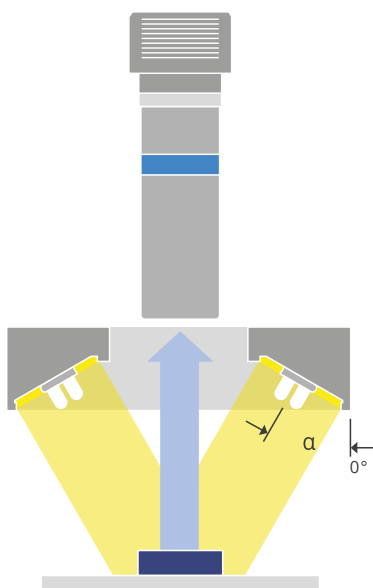
EN2MP series, EN5MP series, EN-2RT series, EN-5RT series

p. 74-77

LTRNDC series consists of LED direct ring lights that provide direct side illumination from different angles.

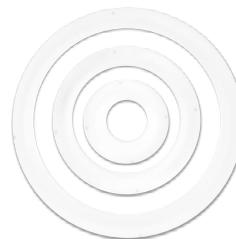
These ring lights reduce shadows and can effectively illuminate non-reflective objects. Suggested use is continuous mode.

Lighting structure



Optional diffusers

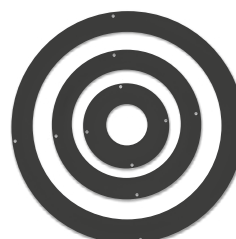
Diffusers can be added to LTRNDC series to increase light uniformity.



Part number	Compatibility
DFLTZGK040-00-2	LTZGK040-00-2-a-24V
DFLTZGK050-00-2	LTZGK050-00-2-a-24V
DFLTZGK070-00-3	LTZGK070-00-3-a-24V
DFLTZGK090-00-4	LTZGK090-00-4-a-24V
DFLTZGK050-15-2	LTZGK050-15-2-a-24V
DFLTZGK070-15-3	LTZGK070-15-3-a-24V
DFLTZGK090-15-4	LTZGK090-15-4-a-24V
DFLTZGK100-15-5	LTZGK100-15-5-a-24V

Optional polarizers

Polarizers can be added to LTRNDC series to reduce unwanted reflections.



Part number	Compatibility
PLLTZGK040-00-2	LTZGK040-00-2-a-24V
PLLTZGK050-00-2	LTZGK050-00-2-a-24V
PLLTZGK070-00-3	LTZGK070-00-3-a-24V
PLLTZGK090-00-4	LTZGK090-00-4-a-24V
PLLTZGK050-15-2	LTZGK050-15-2-a-24V
PLLTZGK070-15-3	LTZGK070-15-3-a-24V
PLLTZGK090-15-4	LTZGK090-15-4-a-24V
PLLTZGK100-15-5	LTZGK100-15-5-a-24V

Part number	Optical specifications			Electrical specifications						Dimensions		
	Light color, peak wavelength	Illumination area diam.		Emission angle α	Continuous mode			Pulsed mode		Outer diam.	Inner diam.	Height
		inner diam. (mm)	outer diam. (mm)		Supply voltage (V)	Current (mA)	Power cons. (W)	Supply voltage (V) ¹	Max pulse current (mA) ²			
LTZGK040-00-2-R-24V	red, 630 nm	16	36	0	24	60	1.44	36	180	43	15	20
LTZGK040-00-2-G-24V	green, 525 nm	16	36	0	24	75	1.8	36	225	43	15	20
LTZGK040-00-2-B-24V	blue, 470 nm	16	36	0	24	75	1.8	36	225	43	15	20
LTZGK040-00-2-W-24V	white, 6300 K	16	36	0	24	75	1.8	36	225	43	15	20
LTZGK050-00-2-R-24V	red, 630 nm	25.2	47.7	0	24	90	2.16	36	270	54	23.5	20
LTZGK050-00-2-G-24V	green, 525 nm	25.2	47.7	0	24	120	2.88	36	360	54	23.5	20
LTZGK050-00-2-B-24V	blue, 470 nm	25.2	47.7	0	24	120	2.88	36	360	54	23.5	20
LTZGK050-00-2-W-24V	white, 6300 K	25.2	47.7	0	24	120	2.88	36	360	54	23.5	20
LTZGK070-00-3-R-24V	red, 630 nm	28.2	62	0	24	180	4.32	36	540	70	26	20
LTZGK070-00-3-G-24V	green, 525 nm	28.2	62	0	24	225	5.4	36	675	70	26	20
LTZGK070-00-3-B-24V	blue, 470 nm	28.2	62	0	24	225	5.4	36	675	70	26	20
LTZGK070-00-3-W-24V	white, 6300 K	28.2	62	0	24	225	5.4	36	675	70	26	20
LTZGK090-00-4-R-24V	red, 630 nm	42.2	84	0	24	270	6.48	36	810	92	40	20
LTZGK090-00-4-G-24V	green, 525 nm	42.2	84	0	24	345	8.28	36	1035	92	40	20
LTZGK090-00-4-B-24V	blue, 470 nm	42.2	84	0	24	345	8.28	36	1035	92	40	20
LTZGK090-00-4-W-24V	white, 6300 K	42.2	84	0	24	345	8.28	36	1035	92	40	20
LTZGK050-15-2-R-24V	red, 630 nm	30	49.6	15	24	90	2.2	36	270	50	28	16
LTZGK050-15-2-G-24V	green, 525 nm	30	49.6	15	24	105	2.6	36	315	50	28	16
LTZGK050-15-2-B-24V	blue, 470 nm	30	49.6	15	24	105	2.6	36	315	50	28	16
LTZGK050-15-2-W-24V	white, 6300 K	30	49.6	15	24	105	2.6	36	315	50	28	16
LTZGK070-15-3-R-24V	red, 630 nm	37	67	15	24	180	4.4	36	540	70	32	20.5
LTZGK070-15-3-G-24V	green, 525 nm	37	67	15	24	240	5.8	36	720	70	32	20.5
LTZGK070-15-3-B-24V	blue, 470 nm	37	67	15	24	240	5.8	36	720	70	32	20.5
LTZGK070-15-3-W-24V	white, 6300 K	37	67	15	24	240	5.8	36	720	70	32	20.5
LTZGK090-15-4-R-24V	red, 630 nm	49.4	85	15	24	330	7.9	36	990	92	47	20.5
LTZGK090-15-4-G-24V	green, 525 nm	49.4	85	15	24	420	10	36	1260	92	47	20.5
LTZGK090-15-4-B-24V	blue, 470 nm	49.4	85	15	24	420	10	36	1260	92	47	20.5
LTZGK090-15-4-W-24V	white, 6300 K	49.4	85	15	24	420	10	36	1260	92	47	20.5
LTZGK100-15-5-R-24V	red, 630 nm	53	99	15	24	450	10.8	36	1350	103	48	24
LTZGK100-15-5-G-24V	green, 525 nm	53	99	15	24	570	13.7	36	1710	103	48	24
LTZGK100-15-5-B-24V	blue, 470 nm	53	99	15	24	570	13.7	36	1710	103	48	24
LTZGK100-15-5-W-24V	white, 6300 K	53	99	15	24	570	13.7	36	1710	103	48	24
LTZGK040-30-2-R-24V	red, 630 nm	22.2	39	30	24	75	1.8	36	225	46	20	16.5
LTZGK040-30-2-G-24V	green, 525 nm	22.2	39	30	24	105	2.52	36	315	46	20	16.5
LTZGK040-30-2-B-24V	blue, 470 nm	22.2	39	30	24	105	2.52	36	315	46	20	16.5
LTZGK040-30-2-W-24V	white, 6300 K	22.2	39	30	24	105	2.52	36	315	46	20	16.5
LTZGK050-30-2-R-24V	red, 630 nm	26.3	46	30	24	90	2.16	36	270	54	23.5	18.3
LTZGK050-30-2-G-24V	green, 525 nm	26.3	46	30	24	120	2.88	36	360	54	23.5	18.3
LTZGK050-30-2-B-24V	blue, 470 nm	26.3	46	30	24	120	2.88	36	360	54	23.5	18.3
LTZGK050-30-2-W-24V	white, 6300 K	26.3	46	30	24	120	2.88	36	360	54	23.5	18.3
LTZGK070-30-3-R-24V	red, 630 nm	34.7	63	30	24	180	4.32	36	540	70	32	20
LTZGK070-30-3-G-24V	green, 525 nm	34.7	63	30	24	225	5.4	36	675	70	32	20
LTZGK070-30-3-B-24V	blue, 470 nm	34.7	63	30	24	225	5.4	36	675	70	32	20
LTZGK070-30-3-W-24V	white, 6300 K	34.7	63	30	24	225	5.4	36	675	70	32	20
LTZGK090-30-4-R-24V	red, 630 nm	51.2	84	30	24	345	8.28	36	1035	92	48	22
LTZGK090-30-4-G-24V	green, 525 nm	51.2	84	30	24	435	10.44	36	1305	92	48	22
LTZGK090-30-4-B-24V	blue, 470 nm	51.2	84	30	24	435	10.44	36	1305	92	48	22
LTZGK090-30-4-W-24V	white, 6300 K	51.2	84	30	24	435	10.44	36	1305	92	48	22
LTZGK070-45-3-R-24V	red, 630 nm	40.5	62.5	45	24	195	4.7	36	585	70	35	21
LTZGK070-45-3-G-24V	green, 525 nm	40.5	62.5	45	24	240	5.8	36	720	70	35	21
LTZGK070-45-3-B-24V	blue, 470 nm	40.5	62.5	45	24	240	5.8	36	720	70	35	21
LTZGK070-45-3-W-24V	white, 6300 K	40.5	62.5	45	24	240	5.8	36	720	70	35	21
LTZGK100-45-5-R-24V	red, 630 nm	58	95	45	24	465	11.2	36	1395	100	48	30
LTZGK100-45-5-G-24V	green, 525 nm	58	95	45	24	600	14.4	36	1800	100	48	30
LTZGK100-45-5-B-24V	blue, 470 nm	58	95	45	24	600	14.4	36	1800	100	48	30
LTZGK100-45-5-W-24V	white, 6300 K	58	95	45	24	600	14.4	36	1800	100	48	30

¹ With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%. Max pulse width = 10 ms.

² With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

Ordering information

Our part numbers are coded as **LTZGKxxx-yy-z-a-bbV** where:

- **xxx** defines the lighting diameter
- **yy** defines the light angle (for this series the angle is 00 = 0°, 15 = 15°, 30 = 30°, 45 = 45°)
- **z** defines the number of LED rows
- **a** defines the color: R = red, G = green, B = blue, W = white. Contact us for additional wavelengths.
- **bb** defines the supply voltage. Optional 12V version is available.

All accessories including lighting extension cables (CB series), diffusers (DFLT series), polarizers (PLLT series) and mounting brackets (CMLT series) must be ordered separately. Optional connectors: LTRNDC series is available with JST connector per standard. For M8 or M12 connectors (available as optional) add -M8 or -M12 at the end of the part number. Examples: LTZGK040-00-2-W-24V-M8, LTZGK040-00-2-W-24V-M12

LTLA series

High power strobe LED low angle diffused ring lights

H α 60°

DIFFUSED



KEY ADVANTAGES

Ultra-high power light output and strobe mode only operation
For the inspection of fast moving objects and extended LED lifetime.

Rugged industrial design with built-in industrial connector
For easy integration into any machine vision system.

Wide selection
Available in two sizes, three colors and two power intensities.

Compatible LTDV strobe controllers available
For easy and appropriate power, control and synchronisation of the illuminator.

Low angle beam shaping diffuser
Highly diffusive material avoids hot spots and ensures uniform light intensity.

The **LTLA series** offers high power diffuse LED strobe low-angle ring light illuminators designed to provide darkfield lighting and to effectively enhance minute surface features or textures.

The LTLA series features ultra-high power light output and can be used to cast shadows that emphasize surface irregularities, scratches or special characteristics (such as bar codes) from a close distance.

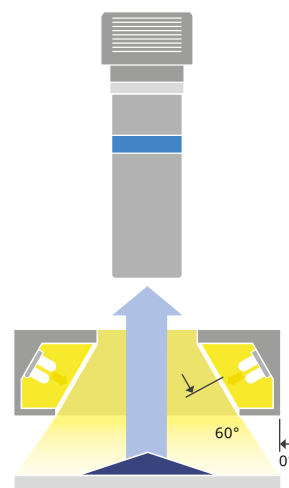
LTLA low angle ring illuminators can be exclusively operated in strobe mode, making them the perfect choice to illuminate very fast moving objects while ensuring extended LED lifetime since no heat is generated.




The LTLA series can be easily powered, controlled and synchronised by compatible LTDV strobe controllers and is available in:

- **two sizes:** medium and large, respectively with illumination area of 60 mm and 100 mm in diameter;
- **two power intensities:** medium power with driving current up to 7.5 A and high power with driving current up to 17 A;
- **three different colors:** white, red and green.

The LTLA series features industry standard connection (M12 four poles connector) and can be easily integrated into any machine vision system with M6 screws.

Lighting structure



FULL RANGE OF COMPATIBLE STROBE CONTROLLERS		
	LTDV series	p. 252
FULL RANGE OF FIXED FOCAL LENGTH LENSES		
	EN2MP series, EN5MP series, EN-2RT series, EN-5RT series	p. 74-77
COMPATIBLE HOLE INSPECTION OPTICS		
	PCHI series	p. 100

DESIGNED FOR OEM APPLICATIONS

Compatible LTDV strobe controllers available to easily power, control and synchronise LED illuminators.



Part number		LTLAB2-W	LTLAB2-G	LTLAB2-R	LTLAC1-W	LTLAC2-W	LTLAC2-G	LTLAC2-R	
Optical specifications									
Number of LEDs		40	40	40	40	80	80	80	
Light color		white, 6000 K	green, 525 nm	red, 625 nm	white, 6500 K	white, 6500 K	green, 528 nm	red, 625 nm	
Spectral FWHM	(nm)	n.a.	35	20	n.a.	n.a.	35	20	
Diffusive ring		yes	yes	yes	yes	yes	yes	yes	
Illumination area diameter	(mm)	60	60	60	100	100	100	100	
Suggested working distance WD	(mm)	5 - 50	5 - 50	5 - 50	5 - 50	5 - 50	5 - 50	5 - 50	
Emission angle α	(deg)	60	60	60	60	60	60	60	
Min estimated illumination ¹	At driving current = 3.5 A	(klux)	55	50	40	35	70	60	45
	At driving current = 7.5 A	(klux)	105	90	70	70	140	120	90
	At driving current = 17.0 A	(klux)	210	180	150	125	250	220	170
Aperture range	(mm)	64 (fixed)	64 (fixed)	64 (fixed)	102 (fixed)	102 (fixed)	102 (fixed)	102 (fixed)	
Electrical specifications									
Power supply mode		strobe only, constant current driving			strobe only, constant current driving				
Driving current	Min	(A)	3.5	3.5	3.5	3.5	3.5	3.5	
	Max	(A)	17.0	17.0	17.0	7.5	17.0	17.0	
Pulse width ²	(ms)	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	
Connection Type ³		M12 industrial male connector			M12 industrial male connector				
Estimated MTBF ⁴	(hours)	> 50000	> 50000	> 50000	> 50000	> 50000	> 50000	> 50000	
Mechanical specifications									
Dimensions	Length	(mm)	166.5	166.5	166.5	206	206	206	
	Width	(mm)	133	133	133	206	206	206	
	Height	(mm)	38	38	38	76	76	76	
Materials		black anodised aluminium body			black anodised aluminium body				
Clamping system		4 holes for M6 screw			8 threaded holes for M6 screw				
Compatibility									
Strobe controllers		LTDV6CH, LTDV1CH-17V, LTDVExCH-20			LTDV6CH, LTDV1CH-17V, LTDVExCH-20	LTDV6CH, LTDV1CH-17V, LTDVExCH-20			
Lenses		TC2300y, TC23012, TC12016, TC23016, TC12024, TC23024, TCxx036, TCEL23036, TC1MHR016-C, TC1MHR024-C, TC1MHR036-C, TC2MHR016-x, TC2MHR024-x, TC2MHR036-x, TC3MHR016-C, TC3MHR024-C, TC3MHR036-C, TC4M004-x, TC4M007-x, TC4M009-x, TC4MHR016-x, TC4MHR024-x, TC4MHR036-x, TC12M016-F, TC12M024-F, TC12M036-F, TC16M009-x, TC16M012-x, TC16M018-x, TC16M036-x, TCLWD series, TCZR036S, MC150X, MC100X, MC075X, MC050X, MC033X, MC4K050X-x, MC4K075X-x, MC4K100X-x, MC4K125X-x, MC4K150X-x			TCxx036, TCEL23036, TCxx048, TC12056, TC23056, TC13064, TCxx064, TC1MHR036-C, TC1MHR048-C, TC1MHR056-C, TC1MHR064-C, TC2MHR036-x, TC2MHR048-x, TC2MHR056-x, TC2MHR064-x, TC3MHR036-C, TC3MHR048-C, TC3MHR056-C, TC3MHR064-C, TC2MHR036-x, TC4MHR036-x, TC4MHR048-x, TC4MHR056-x, TC4MHR064-x, TC12M036-F, TC12M048-F, TC12M056-F, TC12M064-F, TC16M036-x, TC16M048-x, TC16M056-x, TC16M064-x, TC12K064, TCLWD series, TC4K060-x, TCZR072S, MC033X, MC12K200X-x, MC12K150X-x, MC12K100X-x, MC12K067X-x, MC4K050X-x, MC4K075X-x, MC4K100X-x, MC4K125X-x, MC4K150X-x				

- At max Working Distance WD.
- At 25°C. At max pulse width (1 ms), max pulse frequency = 15 Hz.
- 5 m cable with straight female connector included. Optional cable with right angled connector is also available and must be ordered separately (refer to our website for further info and ordering codes).
- At 25°C.

Ordering information

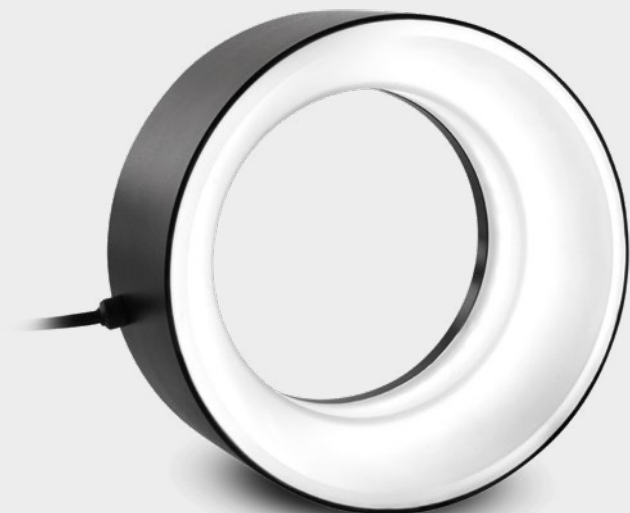
It is easy to select the right illuminator for your application: our part numbers are coded as **LTLA xy-z**, where **x** defines the illuminator size (B = medium, C = large), **y** refers to the power intensity (1 = medium, 2 = high) and **z** refers to color (W = white, R = red, G = green). For instance, LTLA B2-R is a diffuse strobe low angle ring light illuminator - medium size high power red.

LTLAIC series

Continuous LED low angle diffused ring lights

α 60°

DIFFUSED



KEY ADVANTAGES

24V DC supply voltage.

Easy integration & compact size.

JST connector (optional M8, M12).

Red, Green, Blue and White.

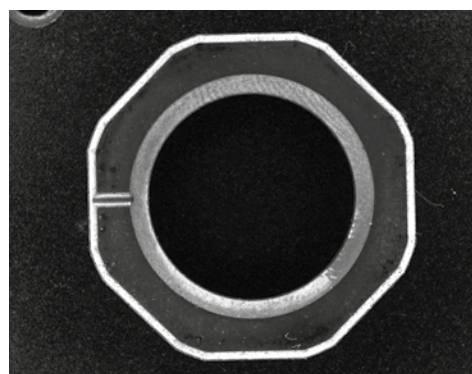
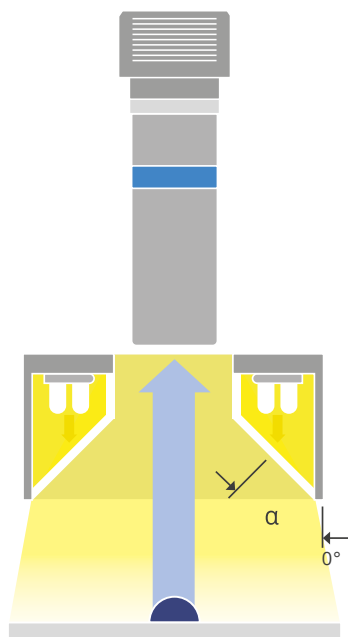
Custom sizes available on request.

COMPATIBLE STROBE CONTROLLER		
	LTDV1CH-17V strobe controller	p. 252
COMPATIBLE LIGHT INTENSITY CONTROLLER		
	LTICGR1000-D1-PS-xx light intensity controller	p. 256
FULL RANGE OF FIXED FOCAL LENGTH LENSES		
	EN2MP series, EN5MP series, EN-2RT series, EN-5RT series	p. 74-77

The **LTLAIC series** consists of LED low angle diffused ring lights that provide diffused even illumination, effectively preventing glare when inspecting shiny surfaces. Suggested use is continuous mode.

Application examples

Lighting structure



Locking ring cosmetic inspection and orientation check: the sloped surfaces are evenly illuminated with the LTLAIC ring light.



Part number	Optical specifications					Electrical specifications					Dimensions		
	Light color, wavelength peak	Optimal WD (mm)	Lighting area		Emission angle α (deg)	Continuous mode			Pulsed mode		Outer diam. (mm)	Inner diam. (mm)	Height (mm)
			inner diam. (mm)	outer diam. (mm)		Supply voltage (V)	Current (mA)	Power cons. (W)	Supply voltage (V)	Max pulse current (mA)			
LT3RZF050-60-1-W-24V	white	5	12	44	60	24	120	2.9	36	360	56.4	10	35
LT3RZF050-60-1-R-24V	red, 620 nm	5	12	44	60	24	120	2.9	36	360	56.4	10	35
LT3RZF050-60-1-G-24V	green, 525 nm	5	12	44	60	24	120	2.9	36	360	56.4	10	35
LT3RZF050-60-1-B-24V	blue, 450 nm	5	12	44	60	24	120	2.9	36	360	56.4	10	35
LT3RZF080-60-1-W-24V	white	5 - 15	38.2	69	60	24	180	4.3	36	540	81	36.2	35
LT3RZF080-60-1-R-24V	red, 620 nm	5 - 15	38.2	69	60	24	180	4.3	36	540	81	36.2	35
LT3RZF080-60-1-G-24V	green, 525 nm	5 - 15	38.2	69	60	24	180	4.3	36	540	81	36.2	35
LT3RZF080-60-1-B-24V	blue, 450 nm	5 - 15	38.2	69	60	24	180	4.3	36	540	81	36.2	35
LT3RZF100-60-1-W-24V	white	5 - 20	59	93.2	60	24	270	6.5	36	810	105.2	57	35
LT3RZF100-60-1-R-24V	red, 620 nm	5 - 20	59	93.2	60	24	270	6.5	36	810	105.2	57	35
LT3RZF100-60-1-G-24V	green, 525 nm	5 - 20	59	93.2	60	24	270	6.5	36	810	105.2	57	35
LT3RZF100-60-1-B-24V	blue, 450 nm	5 - 20	59	93.2	60	24	270	6.5	36	810	105.2	57	35
LT3RZF130-60-1-W-24V	white	7 - 26	86	119.5	60	24	360	8.6	36	1080	131.5	84	35
LT3RZF130-60-1-R-24V	red, 620 nm	7 - 26	86	119.5	60	24	360	8.6	36	1080	131.5	84	35
LT3RZF130-60-1-G-24V	green, 525 nm	7 - 26	86	119.5	60	24	360	8.6	36	1080	131.5	84	35
LT3RZF130-60-1-B-24V	blue, 450 nm	7 - 26	86	119.5	60	24	360	8.6	36	1080	131.5	84	35

1 With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%.
Max pulse width = 10 ms.

2 With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

Ordering information

Our part numbers are coded as **LT3RZFxxx-yy-z-a-bbV** where:

- **xxx** defines the lighting diameter
- **yy** defines the light angle (for this series the angle is 60° = 60°)
- **z** defines the number of LED rows
- **a** defines the color: R = red, G = green, B = blue, W = white. Contact us for additional wavelengths.
- **bb** defines the supply voltage. Optional 12V version is available.

Lighting extension cables (CB series) are not included and must be ordered separately.

Optional connectors: The LTLAIC series is available with JST connector per standard. For M8 or M12 connectors (available as optional) add -M8 or -M12 at the end of the part number.

Examples: LT3RZF050-60-1-W-24V-M8, LT3RZF050-60-1-W-24V-M12

LTLADC series

Continuous LED low angle direct ring lights

α 75°

DIRECT



KEY ADVANTAGES

24V DC supply voltage.

Easy integration & compact size.

JST connector (optional M8, M12).

Red, Green, Blue and White.

Custom sizes available on request.

COMPATIBLE STROBE CONTROLLER



LTDV1CH-17V strobe controller

p. 252

COMPATIBLE LIGHT INTENSITY CONTROLLER



LTICGR1000-D1-PS-xx light intensity controller

p. 256

FULL RANGE OF FIXED FOCAL LENGTH LENSES

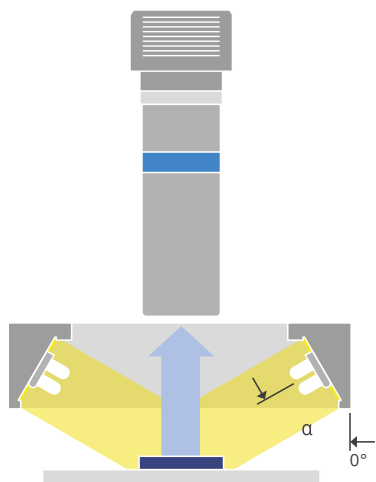


EN2MP series, EN5MP series, EN-2RT series, EN-5RT series

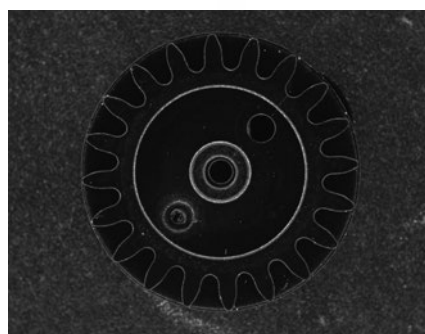
p. 74-77

The **LTLADC series** consists of low angle direct ring lights that provide direct side illumination to emphasize the surface features of the workpiece, such as scratches or texture. Suggested use is continuous mode.

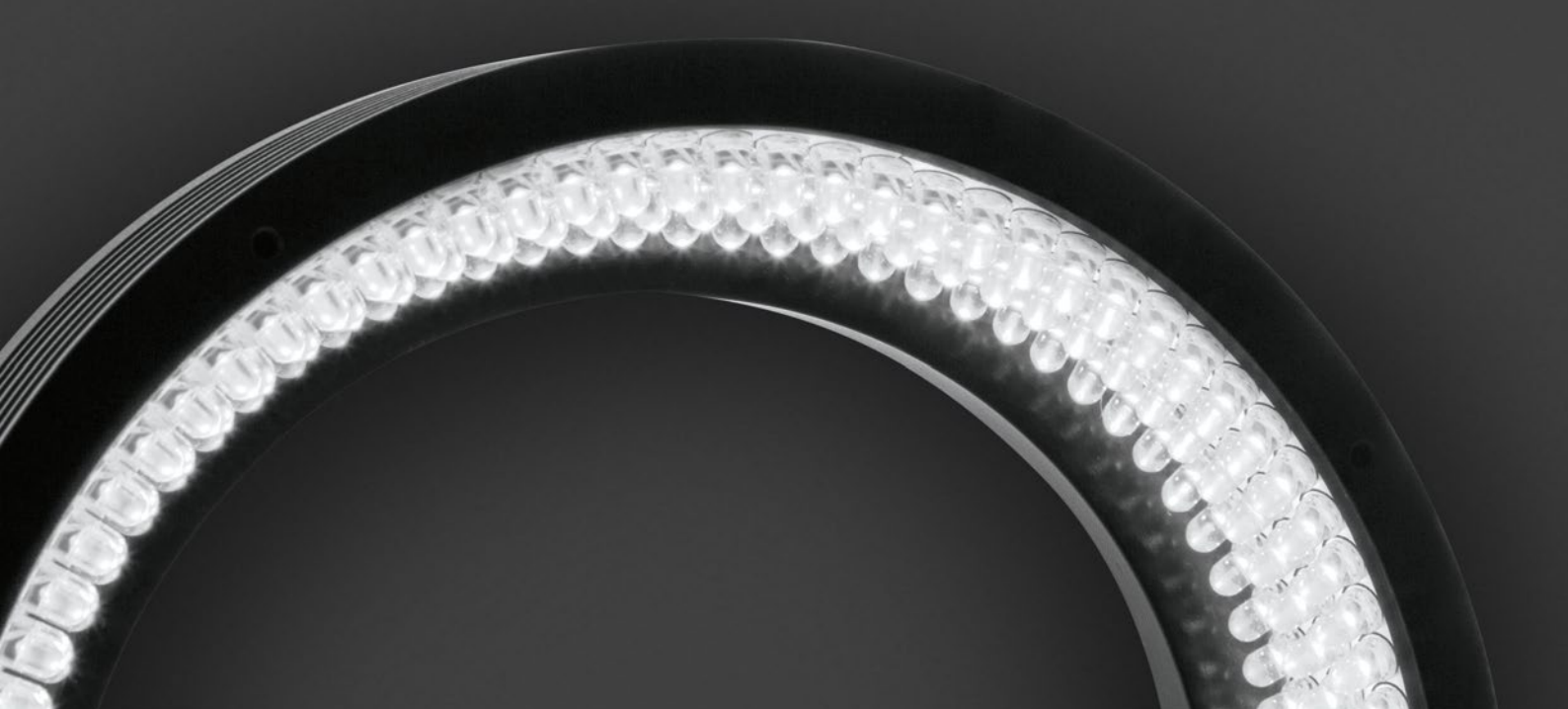
Lighting structure



Application examples



Gear dents counting and inspection with LTLADC low angle ring light (in darkfield configuration) imaged by a macro lens.



Optional diffusers

Diffusers can be added to the LTRNDC series to increase light uniformity.



Part number	Compatibility
DFLTZZO130-75-3	LTZZO130-75-3-a-24V
DFLTZZO170-75-3	LTZZO170-75-3-a-24V

Optional polarizers

Polarizers can be added to the LTRNDC series to reduce unwanted reflections.



Part number	Compatibility
PLLTZZO130-75-3	LTZZO130-75-3-a-24V
PLLTZZO170-75-3	LTZZO170-75-3-a-24V

Part number	Optical specifications					Electrical specifications					Dimensions		
	Light color, wavelength peak	Optimal WD (mm)	Lighting area		Emission angle α (deg)	Continuous mode			Pulsed mode		Outer diam. (mm)	Inner diam. (mm)	Height (mm)
			inner diam. (mm)	outer diam. (mm)		Supply voltage (V)	Current (mA)	Power cons. (W)	Supply voltage (V)	Max pulse current (mA)			
LTZZO130-75-3-W-24V	white, 6300 K	5 - 15	111	126	75	24	540	13	36	225	131	94	24.5
LTZZO130-75-3-R-24V	red, 630 nm	5 - 15	111	126	75	24	420	10.1	36	180	131	94	24.5
LTZZO130-75-3-G-24V	green, 525 nm	5 - 15	111	126	75	24	540	13	36	225	131	94	24.5
LTZZO130-75-3-B-24V	blue, 470 nm	5 - 15	111	126	75	24	540	13	36	225	131	94	24.5
LTZZO170-75-3-W-24V	white, 6300 K	5 - 15	154	170	75	24	735	17.7	36	450	175	136	24.5
LTZZO170-75-3-R-24V	red, 630 nm	5 - 15	154	170	75	24	570	13.7	36	360	175	136	24.5
LTZZO170-75-3-G-24V	green, 525 nm	5 - 15	154	170	75	24	735	17.7	36	450	175	136	24.5
LTZZO170-75-3-B-24V	blue, 470 nm	5 - 15	154	170	75	24	735	17.7	36	450	175	136	24.5

1 With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%. Max pulse width = 10 ms.

2 With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

Ordering information

Our part numbers are coded as **LTZZOxxx-yy-z-a-bbV** where:

- **xxx** defines the lighting diameter
- **yy** defines the light angle (for this series the angle is 75 = 75°)
- **z** defines the number of LED rows
- **a** defines the color: R = red, G = green, B = blue, W = white. Contact us for additional wavelengths.
- **bb** defines the supply voltage. Optional 12V version is available.

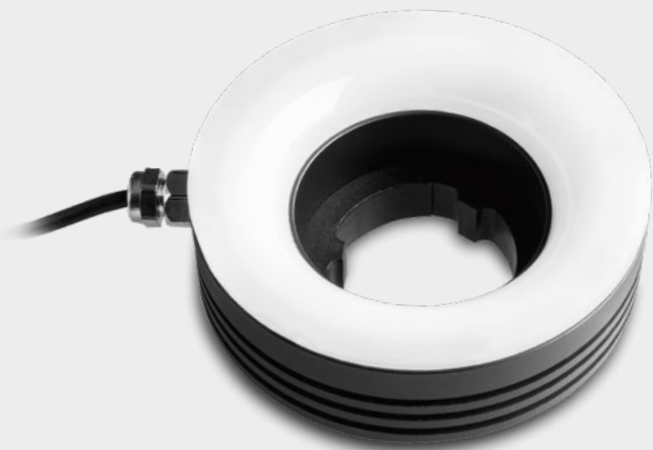
All accessories including lighting extension cables (CB series), diffusers (DFLT series), polarizers (PLLT series) must be ordered separately.

Optional connectors: The LTLADC series is available with JST connector per standard. For M8 or M12 connectors (available as optional) add -M8 or -M12 at the end of the part number. Examples: LTZZO130-75-3-W-24V-M8, LTZZO130-75-3-W-24V-M12

LTRNOB series

LED ring illuminators - oblique type

DIFFUSED



KEY ADVANTAGES

Mechanically fitting Opto Engineering® optics
Each lens integrates specific mechanical interfaces.

Specific illumination geometry
Illumination path matches Opto Engineering® lenses viewing angle and numerical aperture.

High performance to price ratio
Cost-effective, without compromising quality.

The **LTRNOB series** offers LED ring illuminators specifically designed for a wide range of Opto Engineering® products. The oblique type models especially fit Opto Engineering 360° view lenses perfectly.

Every illuminator is equipped with a mechanical interface which makes it very easy to mount it on different lens types.

These products enable the optimal illumination geometry for the most common applications of their matching lens.

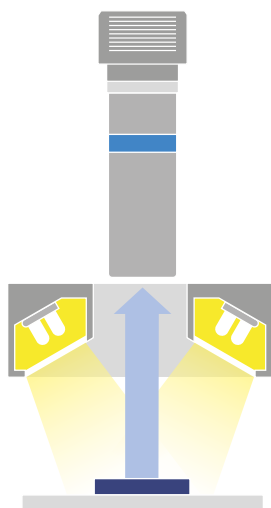


LTRN 245 W45



LTRN 050 W45

Lighting structure



LTRNOB - Ring lights / oblique illumination

Combination examples of LTRNOB and 360° view optics



PC23030XS + compatible LTRN210x20 ring light and CMHO080 clamping mechanics.



PCCD013 + compatible LTRN165x45 ring light.



PCHI023 + compatible LTRN075x45 ring light.



LTRN 050 W 45 mounted on PCPW series.

FULL RANGE OF COMPATIBLE 360° VIEW LENSES		
	360° view lenses	p. 93-109
COMPATIBLE STROBE CONTROLLER		
	LTDV1CH-17V strobe controller	p. 252
COMPATIBLE LIGHT INTENSITY CONTROLLER		
	LTICGR1000-D1-PS-xx light intensity controller	p. 256



Part number	Optical specifications				Electrical specifications					Dimensions			Compatibility
	Light color, peak wavelength	Optimal WD (mm)	Lighting area diam.		Continuous mode ¹			Pulsed mode		Outer diam. (mm)	Inner diam. (mm)	Height (mm)	Compatible OE products
			inner (mm)	outer (mm)	Supply voltage (V)	Current (mA)	Power cons. (W)	Supply voltage (V) ²	Max pulse current (mA) ³				
Oblique illumination													
LTRN 050 R45	red, 630 nm	20-80	19	49	24	60	1.5	24-48	180	53.5	15.2	22	PCPW0xx, MCxxxX, TCCAGExx048, TCCAGE2MHR048, TCCAGE3MHR048
LTRN 050 G45	green, 525 nm	20-80	19	49	24	70	1.7	24-48	210	53.5	15.2	22	PCPW0xx, MCxxxX, TCCAGExx048, TCCAGE2MHR048, TCCAGE3MHR048
LTRN 050 B45	blue, 470 nm	20-80	19	49	24	105	2.6	24-48	315	53.5	15.2	22	PCPW0xx, MCxxxX, TCCAGExx048, TCCAGE2MHR048, TCCAGE3MHR048
LTRN 050 W45	white, 6300 K	20-80	19	49	24	105	2.6	24-48	700	53.5	15.2	22	PCPW0xx, MCxxxX, TCCAGExx048, TCCAGE2MHR048, TCCAGE3MHR048
LTRN 075 R45	red, 630 nm	20-50	43.8	65.4	24	75	1.8	24-48	225	75.4	28	32	TC2300y, TC23012, TC4M00y-x, PCHI0xx, TCCAGExx096, MC3-03X, TCCAGE2MHR096, TCCAGE3MHR096, TCCAGE4MHR096, PCHI023-MF, PCHI023-AF
LTRN 075 G45	green, 525 nm	20-50	43.8	65.4	24	60	1.5	24-48	180	75.4	28	32	TC2300y, TC23012, TC4M00y-x, PCHI0xx, TCCAGExx096, MC3-03X, TCCAGE2MHR096, TCCAGE3MHR096, TCCAGE4MHR096, PCHI023-MF, PCHI023-AF
LTRN 075 B45	blue, 470 nm	20-50	43.8	65.4	24	60	1.5	24-48	180	75.4	28	32	TC2300y, TC23012, TC4M00y-x, PCHI0xx, TCCAGExx096, MC3-03X, TCCAGE2MHR096, TCCAGE3MHR096, TCCAGE4MHR096, PCHI023-MF, PCHI023-AF
LTRN 075 W45	white, 6300 K	20-50	43.8	65.4	24	90	2.2	24-48	270	75.4	28	32	TC2300y, TC23012, TC4M00y-x, PCHI0xx, TCCAGExx096, MC3-03X, TCCAGE2MHR096, TCCAGE3MHR096, TCCAGE4MHR096, PCHI023-MF, PCHI023-AF
LTRN 165 R45	red, 630 nm	30-50	134.5	164.5	24	500	12	24-48	1500	175	132.5	36.5	PCCD0xx
LTRN 165 G45	green, 525 nm	30-50	134.5	164.5	24	400	9.6	24-48	1200	175	132.5	36.5	PCCD0xx
LTRN 165 B45	blue, 470 nm	30-50	134.5	164.5	24	480	11.6	24-48	1440	175	132.5	36.5	PCCD0xx
LTRN 165 W45	white, 6300 K	30-50	134.5	164.5	24	800	19.2	24-48	2400	175	132.5	36.5	PCCD0xx
LTRN 210 R20	red, 630 nm	55-95	116.5	195.6	24	600	14.4	24-48	1800	210	116.5	40	PCxx030XS
LTRN 210 G20	green, 525 nm	55-95	116.5	195.6	24	560	13.5	24-48	1580	210	116.5	40	PCxx030XS
LTRN 210 B20	blue, 470 nm	55-95	116.5	195.6	24	630	15.2	24-48	1890	210	116.5	40	PCxx030XS
LTRN 210 W20	white, 6300 K	55-95	116.5	195.6	24	840	20.2	24-48	2000	210	116.5	40	PCxx030XS
LTRN 245 R25	red, 630 nm	20-80	160	225	24	750	18	24-48	2000	245	157	48	PCxx030HP
LTRN 245 G25	green, 525 nm	20-80	160	225	24	850	20.4	24-48	2000	245	157	48	PCxx030HP
LTRN 245 B25	blue, 470 nm	20-80	160	225	24	650	15.6	24-48	1950	245	157	48	PCxx030HP
LTRN 245 W25	white, 6300 K	20-80	160	225	24	1120	26.9	24-48	2000	245	157	48	PCxx030HP
LTRN 245 R35	red, 630 nm	20-80	160	225	24	750	18	24-48	2000	245	143	48	PCCD0xx
LTRN 245 G35	green, 525 nm	20-80	160	225	24	850	20.4	24-48	2000	245	143	48	PCCD0xx
LTRN 245 B35	blue, 470 nm	20-80	160	225	24	650	15.6	24-48	1950	245	143	48	PCCD0xx
LTRN 245 W35	white, 6300 K	20-80	160	225	24	1120	26.9	24-48	2000	245	143	48	PCCD0xx
LTRN 245 R45	red, 630 nm	20-80	160	225	24	750	18	24-48	2000	245	117	48	PCPW0xx
LTRN 245 G45	green, 525 nm	20-80	160	225	24	850	20.4	24-48	2000	245	117	48	PCPW0xx
LTRN 245 B45	blue, 470 nm	20-80	160	225	24	650	15.6	24-48	1950	245	117	48	PCPW0xx
LTRN 245 W45	white, 6300 K	20-80	160	225	24	1120	26.9	24-48	2000	245	117	48	PCPW0xx

- Lifespan: 20.000 hours (drop to 50% intensity) at 25 °C.
- With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%. Max pulse width = 10 ms.
- With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

LTRNOBHP series

High power LED ring illuminators - oblique type

H DIFFUSED



KEY ADVANTAGES

High power working both in continuous and strobe mode.

Brighter than LTRNOB series also in continuous mode.

Mechanically fitting Opto Engineering® optics

Each lens integrates specific mechanical interfaces.

Specific illumination geometry

Illumination path matches Opto Engineering® lenses viewing angle and numerical aperture.

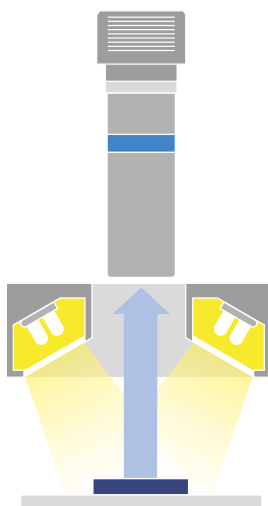
Integrated thermal sensor.

The **LTRNOBHP series** offers the high power version of the LTRNOB series LED ring illuminators and is specifically designed to match Opto Engineering® 360° view lenses.

Every illuminator is equipped with a clamping system which makes it very easy to mount it on Opto Engineering® 360° view lenses.

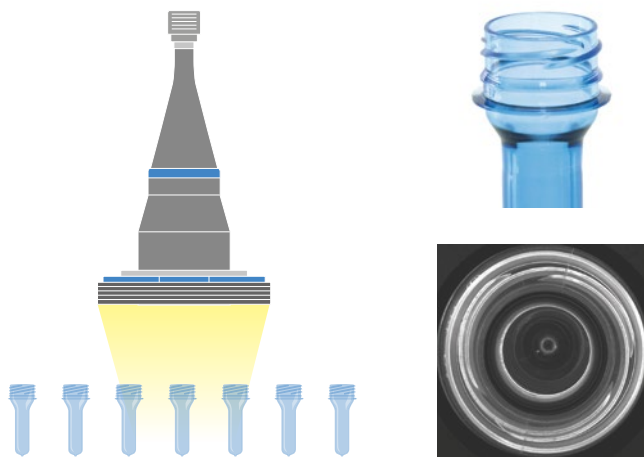
These LED ring lights are designed to work both in continuous and strobe mode for high speed inspection and provide the best illumination geometry for the most common applications of the matching lenses in the beverage, pharma and automotive industries.

Lighting structure



LTRNOBHP - Ring lights / oblique illumination

Application example



Check for defects in bottle preforms (Incomplete or defective thread - Oval Shape - Mouth defects) at high speed using a 360° view lens and a high power ring light from the LTRNOBHP series.

FULL RANGE OF COMPATIBLE 360° VIEW LENSES



360° view lenses

p. 93-109

COMPATIBLE STROBE CONTROLLER



LTDV1CH-17V strobe controller

p. 252

COMPATIBLE LIGHT INTENSITY CONTROLLER



light intensity controller

p. 256

Part number	Optical specifications				Electrical specifications					Dimensions			Compatibility		
	Light color, peak wavelength	Optimal WD (mm)	Lighting area diam. (mm)		Supply voltage (V)	Current (mA)	Max power cons. (W)	Max pulse current (mA)	Peak power (W)	Outer diam. (mm)	Inner diam. (mm)	Height (mm)	Lenses	Controllers	Cables
Oblique illumination															
LTRNHP 075 R45	red, 625 nm	20-50	43.5	65	24 ± 2%	420	10	2800	79	86	28	38	TC2300y, TC23012, TC4M00y-x, PCHI0xx, PCHI023-MF, PCHI023-AF	LTDV1CH-17V, LTDVExCH-20, LTDV6CH	CBLT010
LTRNHP 075 G45	green, 525 nm	20-50	43.5	65	24 ± 2%	420	10	6000	163	86	28	38			
LTRNHP 075 B45	blue, 475 nm	20-50	43.5	65	24 ± 2%	420	10	6000	163	86	28	38			
LTRNHP 075 W45	white, 6200 K	20-50	43.5	65	24 ± 2%	420	10	7200	178	86	28	38			
LTRNHP 165 R45	red, 625 nm	30-50	133.5	162	24 ± 2%	1670	40	7000	169	190	132.5	42	PCCD0xx		
LTRNHP 165 G45	green, 525 nm	30-50	133.5	162	24 ± 2%	1670	40	9000	239	190	132.5	42			
LTRNHP 165 B45	blue, 475 nm	30-50	133.5	162	24 ± 2%	1670	40	9000	221	190	132.5	42			
LTRNHP 165 W45	white, 6200 K	30-50	133.5	162	24 ± 2%	1670	40	13500	293	190	132.5	42			
LTRNHP 210 R20	red, 625 nm	50-100	117.5	182	24 ± 2%	2090	50	9000	217	210	116.5	42	PCxx030XS		
LTRNHP 210 G20	green, 525 nm	50-100	117.5	182	24 ± 2%	2090	50	12000	319	210	116.5	42			
LTRNHP 210 B20	blue, 475 nm	50-100	117.5	182	24 ± 2%	2090	50	12000	294	210	116.5	42			
LTRNHP 210 W20	white, 6200 K	50-100	117.5	182	24 ± 2%	2090	50	18000	391	210	116.5	42			
LTRNHP 245 R25	red, 625 nm	20-80	160	215	24 ± 2%	2710	65	10000	241	245	157	50	PCxx030HP		
LTRNHP 245 G25	green, 525 nm	20-80	160	215	24 ± 2%	2710	65	14000	372	245	157	50			
LTRNHP 245 B25	blue, 475 nm	20-80	160	215	24 ± 2%	2710	65	14000	343	245	157	50			
LTRNHP 245 W25	white, 6200 K	20-80	160	215	24 ± 2%	2710	65	20000	434	245	157	50			

1 With constant driving voltage.

2 With constant driving current. At max pulse width (1 ms), max pulse frequency = 15Hz. Contact us to check other allowable combinations of duty cycle-frequency.

LTDMC series

Continuous LED domes

INDIRECT

NEW MODELS



KEY ADVANTAGES

24V DC supply voltage.


Easy integration & compact size.

JST connector (optional M8, M12).


Red, Green, Blue, White and Infrared.

Custom sizes available on request.

COMPATIBLE STROBE CONTROLLER

	LTDV1CH-17V strobe controller	p. 252
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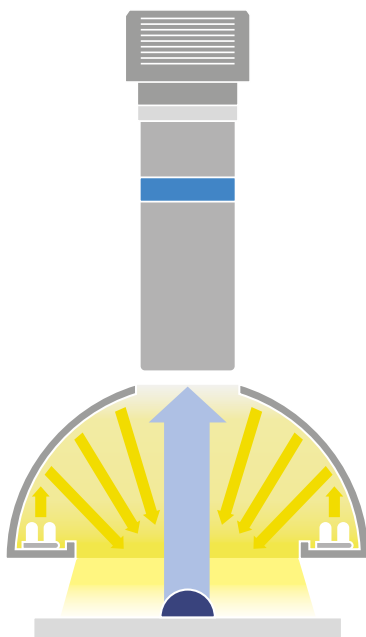
COMPATIBLE LIGHT INTENSITY CONTROLLER

	LTCIGR1000-D1-PS-xx light intensity controller	p. 256
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The **LTDMC series** consists of LED dome illuminators designed to provide uniform illumination of complex surfaces.

The light comes from all angles effectively eliminating glare and shadows. Suggested usage is continuous mode.

Lighting structure



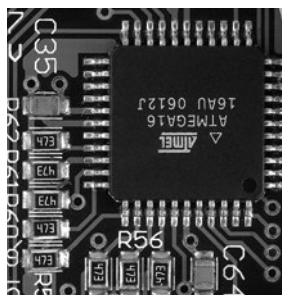
Optional mounting bracket

Specifically designed to easily mount LTDMC.



Part number	Compatibility
CMLT5WRG050-00-X	LT5WRG050-00-1-a-24V
CMLT5WRG070-00-X	LT5WRG070-00-1-a-24V
CMLT5WRG100-00-X	LT5WRG100-00-1-a-24V
CMLT5WRG150-00-X	LT5WRG150-00-1-a-24V
CMLT5WRG200-00-X	LT5WRG200-00-1-a-24V
CMLT5WRG250-00-X	LT5WRG250-00-1-a-24V

Application example



A dome light is the best choice to uniformly illuminate surfaces to perform OCR.



Part number	Optical specifications		Electrical specifications					Mechanical specifications		
	Light color, wavelength peak	Illumination area diam. (mm)	Continuous mode			Pulsed mode		Dimensions		
			Supply voltage (V)	Current (mA)	Power cons. (W)	Supply voltage (V)	Max pulse current (mA)	Outer diam. (mm)	Aperture (mm)	Height (mm)
						1	2			
LT5WRG050-00-1-R-24V	red, 620nm	37.4	24	243	5.8	36	729	68	10	33.8
LT5WRG050-00-1-G-24V	green, 540nm	37.4	24	315	7.6	36	945	68	10	33.8
LT5WRG050-00-1-B-24V	blue, 450nm	37.4	24	315	7.6	36	945	68	10	33.8
LT5WRG050-00-1-W-24V	white	37.4	24	315	7.6	36	945	68	10	33.8
LT5WRG050-00-1-IR850-24V	IR, 850nm	25	24	64	1.5	36	192	68	10	33.8
LT5WRG070-00-1-R-24V	red, 620nm	61	24	378	9	36	1134	95	20	44.5
LT5WRG070-00-1-G-24V	green, 540nm	61	24	490	11.8	36	1470	95	20	44.5
LT5WRG070-00-1-B-24V	blue, 450nm	61	24	490	11.8	36	1470	95	20	44.5
LT5WRG070-00-1-W-24V	white	61	24	490	11.8	36	1470	95	20	44.5
LT5WRG070-00-1-IR850-24V	IR, 850nm	41	24	96	2.3	36	288	95	20	44.5
LT5WRG100-00-1-R-24V	red, 620nm	85.4	24	540	13	36	1620	118	25	56.8
LT5WRG100-00-1-G-24V	green, 540nm	85.4	24	700	16.8	36	2100	118	25	56.8
LT5WRG100-00-1-B-24V	blue, 450nm	85.4	24	700	16.8	36	2100	118	25	56.8
LT5WRG100-00-1-W-24V	white	85.4	24	700	16.8	36	2100	118	25	56.8
LT5WRG100-00-1-IR850-24V	IR, 850nm	68	24	160	3.8	36	480	118	25	56.8
LT5WRG150-00-1-R-24V	red, 620nm	138	24	900	21.6	36	2700	185	40	89.8
LT5WRG150-00-1-G-24V	green, 540nm	138	24	930	22.3	36	2790	185	40	89.8
LT5WRG150-00-1-B-24V	blue, 450nm	138	24	930	22.3	36	2790	185	40	89.8
LT5WRG150-00-1-W-24V	white	138	24	930	22.3	36	2790	185	40	89.8
LT5WRG150-00-1-IR850-24V	IR, 850nm	113	24	1000	24	36	3000	185	40	89.8
LT5WRG200-00-1-R-24V	red, 620nm	193	24	1130	32	36	3990	232	50	112.8
LT5WRG200-00-1-G-24V	green, 540nm	193	24	1380	33.1	36	4140	232	50	112.8
LT5WRG200-00-1-B-24V	blue, 450nm	193	24	1380	33.1	36	4140	232	50	112.8
LT5WRG200-00-1-W-24V	white	193	24	1380	33.1	36	4140	232	50	112.8
LT5WRG200-00-1-IR850-24V	IR, 850nm	160	24	1250	30	36	3750	232	50	112.8
LT5WRG250-00-1-R-24V	red, 620nm	240	24	1500	36	36	4500	284	50	139.4
LT5WRG250-00-1-G-24V	green, 540nm	240	24	1600	38.4	36	4800	284	50	139.4
LT5WRG250-00-1-B-24V	blue, 450nm	240	24	1600	38.4	36	4800	284	50	139.4
LT5WRG250-00-1-W-24V	white	240	24	1600	38.4	36	4800	284	50	139.4
LT5WRG250-00-1-IR850-24V	IR, 850nm	212	24	1500	36	36	4500	284	50	139.4
LT4WRG360-00-1-R-24V	red, 620nm	300	24	1550	37	36	4650	381	36.5	189
LT4WRG360-00-1-G-24V	green, 525nm	300	24	1550	37	36	4650	381	36.5	189
LT4WRG360-00-1-B-24V	blue, 470nm	300	24	1550	37	36	4650	381	36.5	189
LT4WRG360-00-1-W-24V	white	300	24	1550	37	36	4650	381	36.5	189

1 With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%. Max pulse width = 10 ms.

2 With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

Ordering information

Our part numbers are coded as **LT5(4)WRGxxx-yy-z-a-bbV** where:

- **xxx** defines the lighting diameter
- **yy** defines the light angle (for this series the angle is 00 = 0°)
- **z** defines the number of LED rows
- **a** defines the color: R = red, G = green, B = blue, W = white, IR850 = Infrared 850 nm. Contact us for additional wavelengths.
- **bb** defines the supply voltage. The optional 12V version is available.

All accessories including lighting extension cables (CB series) and mounting brackets (CMLT series) must be ordered separately.

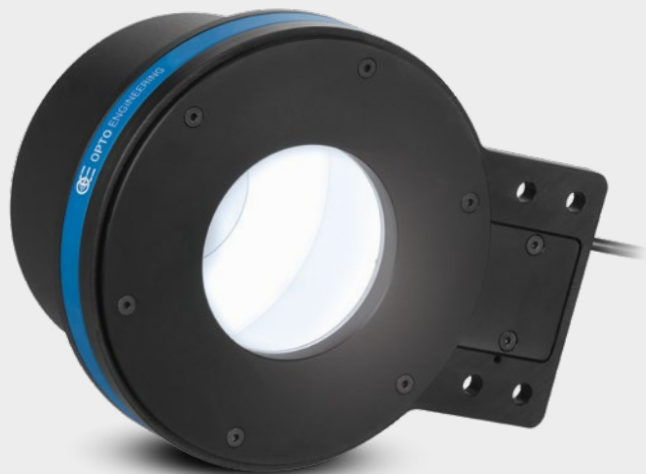
Optional connectors: LTDMC series is available with JST connector per standard. For M8 or M12 connectors (available as optional) add -M8 or -M12 at the end of the part number.

Examples: LT5WRG050-00-1-W-24V-M8, LT5WRG050-00-1-W-24V-M12

LTDM series

High power strobe LED domes

H INDIRECT



KEY ADVANTAGES

Ultra-high power light output and strobe mode only operation
For the inspection of fast moving objects and extended LED lifetime.

Rugged industrial design with built-in industrial connector
For easy integration into any machine vision system.

Wide selection
Available in three sizes, three colors and two power intensities.

Compatible LTDV strobe controllers available
For easy and appropriate power, control and synchronisation of the illuminator.

The **LTDM series** offers high power diffuse LED strobe dome illuminators designed to provide non-directional diffused light and to effectively eliminate glare and shadows.

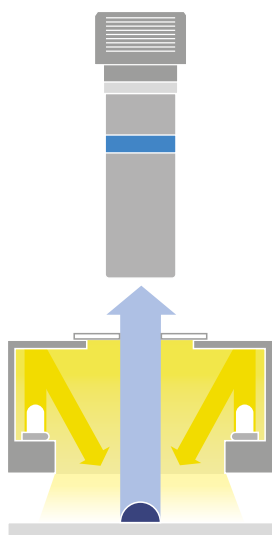
The LTDM series provides ultra-high power light output and can be used to illuminate complex shapes with curved and shiny surfaces. LTDM dome illuminators can be exclusively operated in strobe mode, making them the perfect choice to illuminate very fast moving objects while ensuring extended LED lifetime since no heat is generated.

The LTDM series can be easily powered, controlled and synchronised by compatible LTDV strobe controllers and is available in:

- **three sizes:** small, medium and large, respectively with illumination area of 40 mm, 60 mm and 100 mm in diameter;
- **two power intensities:** medium power with driving current up to 7.5 A and high power with driving current up to 17 A;
- **three different colors:** white, red and green.

The LTDM series features industry standard connection (M8 or M12 four poles connector) and resizable aperture that can be drilled to increase the diameter and accommodate the optics field of view. Additionally they can be easily integrated into any machine vision system by M6 screws.

Lighting structure



Application example



Image with white dome light.



Image with red dome light.

High speed OCR on food cans with LTDM strobe LED dome light and a fixed focal length lens. The red wavelength works well on orange/yellow cans and increases the contrast of the expiration date with respect to the can background so that the image can be easily processed by machine vision algorithms.

DESIGNED FOR OEM APPLICATIONS

Compatible LTDV strobe controllers available to easily power, control and synchronise LED illuminators.


FULL RANGE OF COMPATIBLE STROBE CONTROLLERS

	LTDV series	p. 252
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FULL RANGE OF FIXED FOCAL LENGTH LENSES

	EN2MP series, EN5MP series, EN-2RT series, EN-5RT series	p. 74-77
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FULL RANGE OF INDUSTRIAL CAMERAS

	Area scan cameras	p. 188-203
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Part number		LTDMA1-W	LTDMA1-G	LTDMA1-R	LTDMB2-W	LTDMB2-G	LTDMB2-R	LTDMC1-W	LTDMC2-W	LTDMC2-G	LTDMC2-R	
Optical specifications												
Number of LEDs		15	15	15	40	40	40	40	80	80	80	
Light color		white, 6000 K	green, 525 nm	red, 625 nm	white, 6500 K	green, 528 nm	red, 625 nm	white	white, 6500 K	green, 528 nm	red, 625 nm	
Spectral FWHM	(nm)	n.a.	50	25	n.a.	35	20	n.a.	n.a.	35	20	
Illumination area diameter	(mm)	40	40	40	60	60	60	100	100	100	100	
Suggested working distance WD	(mm)	5 - 50	5 - 50	5 - 50	5 - 50	5 - 50	5 - 50	5 - 50	5 - 50	5 - 50	5 - 50	
Min estimated illumination ¹	At driving current = 3.5 A	(klux)	100	70	40	50	45	35	25	50	45	35
	At driving current = 7.5 A	(klux)	175	125	70	90	80	65	50	100	90	70
	At driving current = 17.0 A	(klux)	n.a.	n.a.	n.a.	160	145	115	n.a.	140	125	100
Aperture range	(mm)	38 (fixed)	38 (fixed)	38 (fixed)	10 - 50	10 - 50	10 - 50	10 - 60	10 - 60	10 - 60	10 - 60	
Electrical specifications												
Power supply mode		strobe only, constant current driving			strobe only, constant current driving			strobe only, constant current driving				
Driving current	Min	(A)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
	Max	(A)	7.5	7.5	7.5	17.0	17.0	17.0	7.5	17.0	17.0	17.0
Pulse width ²	(ms)	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	
Connection Type ³		M8 industrial male connector			M12 industrial male connector			M12 industrial male connector				
Estimated MTBF ⁴	(hours)	> 50000	> 50000	> 50000	> 50000	> 50000	> 50000	> 50000	> 50000	> 50000	> 50000	
Mechanical specifications												
Dimensions	Length	(mm)	107	107	107	166.5	166.5	166.5	206	206	206	206
	Width	(mm)	84	84	84	133	133	133	206	206	206	206
	Height	(mm)	53	53	53	90	90	90	128	128	128	128
Materials		black anodised aluminium body			black anodised aluminium body			black anodised aluminium body / painted steel reflector				
Clamping system		4 threaded holes for M6 screw			4 holes for M6 screw			4 threaded holes for M6 screw				
Compatibility												
Strobe controllers		LTDV6CH, LTDV1CH-17V, LTDVExCH-20			LTDV6CH, LTDV1CH-17V, LTDVExCH-20			LTDV6CH, LTDV1CH-17V, LTDVExCH-20	LTDV6CH, LTDV1CH-17V, LTDVExCH-20			
Lenses		TC23007, TC23009, TCLWD series, MC050X, MC033X, TCEL series (except TCEL23036)			TCLWD series, MC033X, TCEL series (except TCEL23036)			TCLWD series, MC4K050X-x, MC4K075X-x, TCEL series (except TCEL23036)				

- ¹ At max Working Distance WD.
- ² At 25°C. At max pulse width (1 ms), max pulse frequency = 15 Hz.
- ³ 5 m cable with straight female connector included. The optional cable with right angled connector is also available and must be ordered separately (refer to our website for further info and ordering codes).
- ⁴ At 25°C.

Ordering information

It is easy to select the right illuminator for your application: our part numbers are coded as **LTDM xy-z**, where **x** defines the illuminator size (A = small, B = medium, C = large), **y** refers to the power intensity (1 = medium, 2 = high) and **z** refers to color (W = white, R = red, G = green). For instance LTDM B2-R is a diffuse strobe dome illuminator - medium size high power red.

LTDMLA series

High power strobe dome + low angle illumination systems

H **INDIRECT**



KEY ADVANTAGES

Two independent illumination units in one solution

Dome unit for homogeneous illuminations and low angle unit for dark field lightning can be independently operated.

Ultra-high power light output and strobe mode only operation

For the inspection of fast moving objects and extended LED lifetime.

Rugged industrial design with built-in industrial connector

For easy integration into any machine vision system.

Multiple configurations

Available in two sizes and two power intensities.

Compatible LTDV strobe controllers available

For easy and appropriate power, control and synchronisation of the illuminator.

The **LTDMLA series** offers ultra-high power diffuse LED strobe illuminators combining a dome light and a low angle ring light.

This solution provides two different illumination types in a single, compact, easy-to-integrate system: the dome unit provides non-directional diffused light that can be used to homogeneously illuminate complex shapes with curved and shiny surfaces, effectively eliminating glare and shadows. The low angle ring light unit provides darkfield lightning that can be used to cast shadows, greatly emphasizing surface irregularities, scratches and other details.

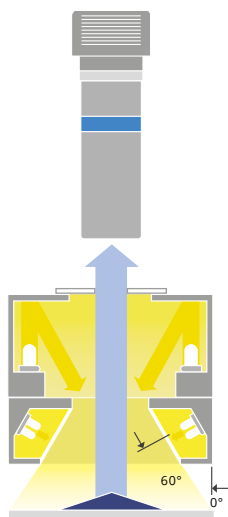
LTDMLA illuminators operate exclusively in strobe mode: the reduced heat generation guarantees extended LED lifetime and makes LTDMLA the perfect choice to illuminate very fast moving objects.

The two illumination units can be operated independently and easily powered, controlled and synchronised by compatible LTDV strobe controllers. The LTDMLA series is available in:

- **two sizes:** medium and large, respectively with illumination area of 60 mm and 100 mm in diameter;
- **two power intensities:** medium power with driving current up to 7.5 A and high power with driving current up to 17 A.

The LTDMLA series features industry standard connection (M12 four poles connector), resizable aperture for the dome unit that can be drilled to increase the diameter and accommodate the optics field of view and effective diffuser for the ring light unit to avoid the formation of hot spots. Additionally the LTDMLA series can be easily mounted and integrated into any machine vision system with M6 screws.

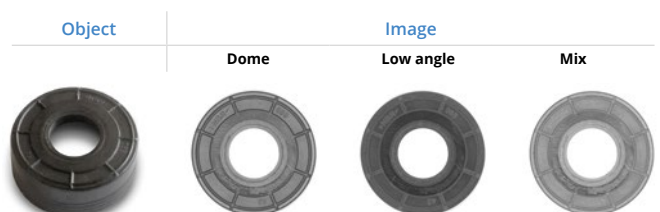
Lighting structure



DESIGNED FOR OEM APPLICATIONS



Compatible LTDV strobe controllers available to easily power, control and synchronise LED illuminators.

Application example



Surface inspection of rubber, plastic and metal sealings with LTDMLA series: the mixing of dome and low angle light achieves the best image contrast.



FULL RANGE OF COMPATIBLE STROBE CONTROLLERS		
	LTDV series	p. 252
FULL RANGE OF FIXED FOCAL LENGTH LENSES		
	EN2MP series, EN5MP series, EN-2RT series, EN-5RT series	p. 74-77

Part number			LTDMLAB2-WW	LTDMLAC1-WW	LTDMLAC2-WW
Optical specifications					
Dome unit					
Number of LEDs			40	40	80
Light color			white, 6500 K	white	white, 6500 K
Spectral FWHM		(nm)	n.a.	n.a.	n.a.
Illumination area diameter		(mm)	60	100	100
Suggested working distance WD		(mm)	5 - 50	5 - 50	5 - 50
Min estimated illumination ¹	At driving current = 3.5 A	(klux)	50	15	35
	At driving current = 7.5 A	(klux)	90	30	65
	At driving current = 17.0 A	(klux)	160	50	100
Aperture range		(mm)	10 - 50	10 - 60	10 - 60
Low angle ring light unit					
Number of LEDs			40	40	80
Light color			white, 6000 K	white, 6500 K	white, 6500 K
Spectral FWHM		(nm)	n.a.	n.a.	n.a.
Diffuse ring			yes	yes	yes
Illumination area diameter		(mm)	60	100	100
Suggested working distance WD		(mm)	5 - 50	5 - 50	5 - 50
Min estimated illumination ¹	At driving current = 3.5 A	(klux)	55	35	70
	At driving current = 7.5 A	(klux)	105	70	140
	At driving current = 17.0 A	(klux)	210	125	250
Electrical specifications					
Power supply mode			strobe only, constant current driving	strobe only, constant current driving	
Driving current	Min	(A)	3.5	3.5	3.5
	Max	(A)	17.0	7.5	17.0
Pulse width ²		(ms)	≤ 1	≤ 1	≤ 1
Connection Type ³			M12 industrial male connector	M12 industrial male connector	
Estimated MTBF ⁴		(hours)	> 50000	> 50000	> 50000
Mechanical specifications					
Dimensions	Length	(mm)	166.5	206	206
	Width	(mm)	133	206	206
	Height	(mm)	104	147	147
Materials			black anodised aluminium body	black anodised aluminium body / Painted steel reflector	
Clamping system			4 holes for M6 screw	8 threaded holes for M6 screw	
Compatibility					
Strobe controllers			LTDV1CH-17V (2 units), LTDVExCH-20, LTDV6CH, TCEL series (except TCEL23036)	LTDV1CH-17V (2 units), LTDVExCH-20, LTDV6CH, TCEL series (except TCEL23036)	LTDV1CH-17V (2 units), LTDVExCH-20, LTDV6CH, TCEL series (except TCEL23036)
Lenses			TCLWD series		MC4K050X

- ¹ At max Working Distance WD.
- ² At 25°C. At max pulse width (1 ms), max pulse frequency = 15 Hz.
- ³ PIN 1 and PIN 2 for the dome unit, PIN 3 and PIN 4 for the ring light unit.
5 m cable with straight female connector included. Optional cable with right angled connector is also available and must be ordered separately (refer to our website for further info and ordering codes).
- ⁴ At 25 °C.

Ordering information

It is easy to select the right illuminator for your application: our part numbers are coded as **LTDMLA xy-WW** where **x** defines the illuminator size (B = medium, C = large), **y** refers to the power intensity (1 = medium, 2 = high). For instance LTDMLA B2-WW is a diffuse strobe dome + low angle illumination system - medium size, high power, dome white, ring light white.

LTBRZ3 series

LED bar lights with integrated driving electronics

DIRECT

NEW



KEY ADVANTAGES

Integrated constant current driving electronics.

Daisy-chain option

Easily connect up to 6 lights together.

Wide selection

- 295 x 25 mm active area
- Available in red, white, green blue and Infrared

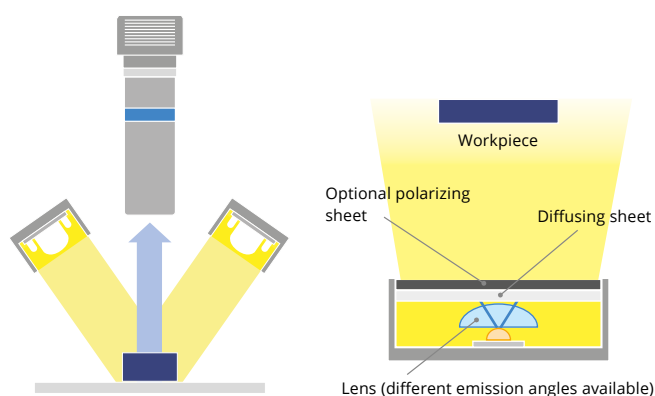
5-pin M12 connector.

Compact lightweight design with reduced thickness (33 mm).

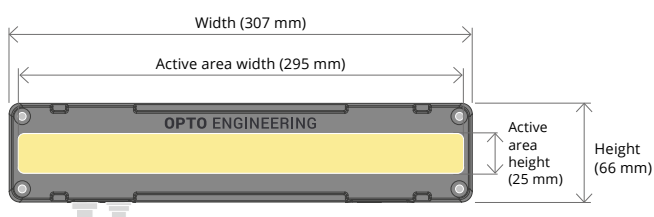
The **LTBRZ3 series** consists of high intensity LED bar lights with integrated constant current driving electronics that can be used in a wide variety of general purpose machine vision applications both as front lights or as back lights including front inspection such as parts identification, checking for presence/absence, visual inspection of large workpieces, robot picking. Each light features 12 high intensity LEDs and provides rectangular illumination on the workpiece. The installation angle can be set freely. Up to six units of these bar lights can be easily connected together via daisy-chain. These lights feature 5-pin M12 connectors, ideal for industrial automation environments.

LTBRZ3 slick and lightweight design is conceived for easy installation into any machine vision system. These bar lights feature 24V supply voltage and can be easily dimmed through a 0-10V analogue signal or a built-in manual potentiometer. They operate in continuous or overdrive/strobe mode: NPN or PNP strobe triggers can be used to control the on/off input of the light. Both continuous and strobe models integrate protection against over-heating. Strobe models integrate an additional protection that limits the maximum duty-cycle in a safe operating range. LTBRZ3 lights are available with different lenses featuring circular/elliptical emission angles or with a special diffusing sheet for backlight applications. Optional polarizing sheets are available (Horizontal or Vertical).

Lighting structure



Dimensions



Lens options (emission angles)

w=10: ~10° circular emission angle lenses that project a narrow beam of light. Ideal for long working distances and in applications that require pseudo collimated light.



Part number:
LTBRZ3-x-y-10-p-e

w=20: ~20° circular emission angle lenses that project a medium beam of light.



Part number:
LTBRZ3-x-y-20-p-e

w=30: ~30° circular emission angle lenses that project a wide beam of light.



Part number:
LTBRZ3-x-y-30-p-e

w=50: ~50° circular emission angle lenses that project an extra-wide beam of light. Ideal to cover large illumination areas in short distance applications.



Part number:
LTBRZ3-x-y-50-p-e

w=EL: ~35°/15° elliptical emission angle lenses that project a beam that is wide along the X axis and narrow along the Y axis. Ideal for applications that require an asymmetrical beam.



Part number:
LTBRZ3-x-y-EL-p-e

w=BL: a uniform and diffused light pattern is emitted at the active area. Ideal for backlight applications.

Part number:
LTBRZ3-x-y-BL-p-e

Illuminated areas at different working distances (WD)

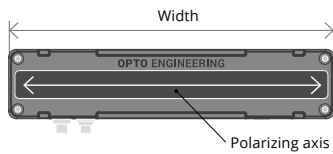
Illuminated area **1**

WD	(mm)	300	500	1000	2000
LENS TYPE = 10°	Width	302	306	334	466
	Height	72	110	204	392
LENS TYPE = 20°	Width	304	316	424	754
	Height	112	178	352	700
LENS TYPE = 30°	Width	310	350	546	1006
	Height	166	262	506	988
LENS TYPE = 50°	Width	342	484	918	1680
	Height	260	428	848	1678
LENS TYPE = EL	Width	310	358	592	1126
	Height	78	120	230	454

1 Approximate data: refer to the product manual to select the appropriate lens. The illuminated areas (Width x Height) represent the rectangles which inscribe the regions with light distribution from 50% to 100%.

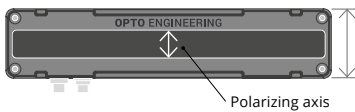
Optional polarizing sheets

PH: with horizontal linear polarizer. Polarizing axis parallel to the active area width.

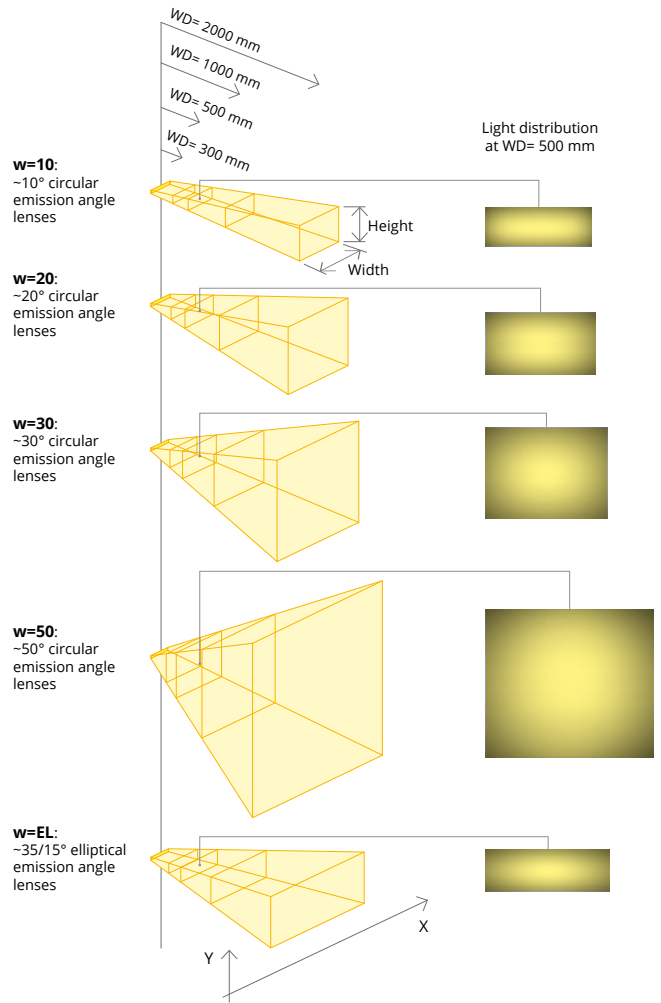


Part Number: LTBRZ3-x-y-w-PH-e

PV: with vertical linear polarizer. Polarizing axis parallel to the active area height.



Part Number: LTBRZ3-x-y-w-PV-e



Optical specifications

Part number	Number of LEDs	Lighting area dim.		Light color	Lens type	Polarizer
		Width H (mm)	Height V (mm)			
LTBRZ3-x-y-w-p-e	12	295	25	R = Red 630 nm, G = Green 530 nm, B = Blue 470 nm, W = White 6500 K, IR = Infrared 850 nm	10 = 10° beam, 20 = 20° beam, 30 = 30° beam, 50 = 50° beam, EL = 35° H x 15° V beam, BL = backlight	PH = linear polarizer with axis parallel to width, PV = linear polarizer with axis parallel to height. Leave empty if the polarizer is not required

Electrical specifications

Part number	Operation mode	Daisy chain	Power consumption				Pulse parameters				Connection 1	Dimension			Clamping		
			Supply voltage	Continuous version	Strobe version	Continuous version	Strobe version	Max duty-cycle	Min Ton	Max Ton		Max duty-cycle	Width	Height		Thickness	
																	(V)
LTBRZ3-x-y-w-p-e	C = continuous, P = pulsed	DC = daisy-chain connection ready. Leave empty if daisy-chain is not required	24 ±5%	20	0.85	120	5	10	100	5	50	10	M12 5 pins	307	66	33	4x M5 holes

1 Versions without daisy-chain are equipped with a single M12 5 pins connector. Versions with daisy-chain are equipped with two M12 5 pins connectors. Cables are not included and must be ordered separately.

Ordering information

Our part numbers are coded as **LTBRZ3-x-y-w-p-e**, where:

x Defines the operation mode of the barlight
 - C means continuous mode only
 - P means pulsed mode only

y Defines the color
 - R is Red, 630 nm
 - G is Green, 530 nm
 - B is Blue, 470 nm
 - W is white, 6500K color temperature
 - IR is Infrared, 850nm

w defines the beam angle:
 - 10 means that each LED emits a circular beam with an aperture of ~10°
 - 20 means that each LED emits a circular beam with an aperture of ~20°
 - 30 means that each LED emits a circular beam with an aperture of ~30°
 - 50 means that each LED emits a circular beam with an aperture of ~50°
 - EL means that each LED emits an elliptical beam with a horizontal aperture of ~35° and a vertical aperture of ~15°
 - BL means that LEDs emit a uniform pattern suitable for backlight applications

p defines the presence of a polarizing film
 - PH means that the polarizing axis of the film is parallel to the width of the illuminator
 - PV means that the polarizing axis of the film is parallel to the height of the illuminator
 Leave this field empty if the polarizer is not required
e defines the presence of a daisy chain connector
 Leave this field empty if the daisy-chain is not required

For additional options, such as wavelengths, optical, electrical or mechanical customization, contact us.

LTBRDC series

Continuous LED bar lights

DIRECT



KEY ADVANTAGES

24V DC supply voltage.

Easy integration & compact size.

JST connector (optional M8, M12).

Red, Green, Blue and White.

Custom sizes available on request.

COMPATIBLE STROBE CONTROLLER



LTDV1CH-17V strobe controller

p. 252

COMPATIBLE LIGHT INTENSITY CONTROLLER



LTICGR1000-D1-PS-xx light intensity controller

p. 256

LTBRDC series consists of LED bar lights that can be used in a wide variety of applications such as text reading on flat surfaces. They provide rectangular illumination on the workpiece and the installation angle can be set freely. Suggested use is continuous mode.

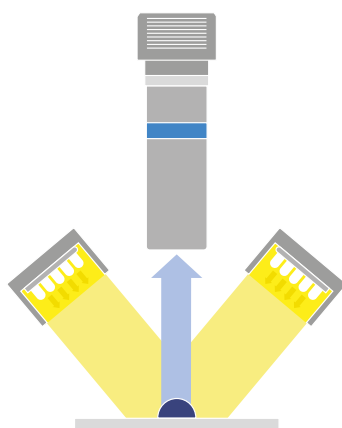
Optional diffusers

Diffusers can be added to LTRNDC series to increase light uniformity.



Part number	Compatibility
DFLTZPFL040-00-6	LTZPFL040-00-6-a-24V
DFLTZPFL080-00-6	LTZPFL080-00-6-a-24V
DFLTZPFL120-00-6	LTZPFL120-00-6-a-24V
DFLTZPFL160-00-6	LTZPFL160-00-6-a-24V
DFLTZPFL200-00-6	LTZPFL200-00-6-a-24V

Lighting structure



Optional polarizers

Polarizers can be added to the LTRNDC series to reduce unwanted reflections.



Part number	Compatibility
PLLTPFL040-00-6-H	LTZPFL040-00-6-a-24V
PLLTPFL040-00-6-V	LTZPFL040-00-6-a-24V
PLLTPFL080-00-6-H	LTZPFL080-00-6-a-24V
PLLTPFL080-00-6-V	LTZPFL080-00-6-a-24V
PLLTPFL120-00-6-H	LTZPFL120-00-6-a-24V
PLLTPFL120-00-6-V	LTZPFL120-00-6-a-24V
PLLTPFL160-00-6-H	LTZPFL160-00-6-a-24V
PLLTPFL160-00-6-V	LTZPFL160-00-6-a-24V
PLLTPFL200-00-6-H	LTZPFL200-00-6-a-24V
PLLTPFL200-00-6-V	LTZPFL200-00-6-a-24V



Optional mounting bracket

Specifically designed to easily mount LTBRDC.



*Includes 2 brackets

Part number	Compatibility
DFLTZPFL040-00-6*	LTZPFL040-00-6-a-24V

Part number	Optical specifications			Electrical specifications					Dimensions		
	Light color, wavelength peak	Lighting area		Continuous mode			Pulsed mode		Length (mm)	Width (mm)	Height (mm)
		Width (mm)	Length (mm)	Supply voltage (V)	Current (mA)	Power cons. (W)	Supply voltage (V) 1	Max pulse current (mA) 2			
LTZPFL040-00-6-W-24V	white, 6300 K	26.3	40	24	72	1.8	36	216	52	31.5	22
LTZPFL040-00-6-R-24V	red, 630 nm	26.3	40	24	78	1.9	36	234	52	31.5	22
LTZPFL040-00-6-G-24V	green, 525 nm	26.3	40	24	72	1.8	36	216	52	31.5	22
LTZPFL040-00-6-B-24V	blue, 470 nm	26.3	40	24	72	1.8	36	216	52	31.5	22
LTZPFL080-00-6-W-24V	white, 6300 K	26.3	80	24	144	3.5	36	432	92	31.5	22
LTZPFL080-00-6-R-24V	red, 630 nm	26.3	80	24	156	3.8	36	468	92	31.5	22
LTZPFL080-00-6-G-24V	green, 525 nm	26.3	80	24	144	3.5	36	432	92	31.5	22
LTZPFL080-00-6-B-24V	blue, 470 nm	26.3	80	24	144	3.5	36	432	92	31.5	22
LTZPFL120-00-6-W-24V	white, 6300 K	26.3	120	24	216	5.2	36	648	132	31.5	22
LTZPFL120-00-6-R-24V	red, 630 nm	26.3	120	24	234	5.7	36	702	132	31.5	22
LTZPFL120-00-6-G-24V	green, 525 nm	26.3	120	24	216	5.2	36	648	132	31.5	22
LTZPFL120-00-6-B-24V	blue, 470 nm	26.3	120	24	216	5.2	36	648	132	31.5	22
LTZPFL160-00-6-W-24V	white, 6300 K	26.3	160	24	288	7	36	864	172	31.5	22
LTZPFL160-00-6-R-24V	red, 630 nm	26.3	160	24	312	7.5	36	936	172	31.5	22
LTZPFL160-00-6-G-24V	green, 525 nm	26.3	160	24	288	7	36	864	172	31.5	22
LTZPFL160-00-6-B-24V	blue, 470 nm	26.3	160	24	288	7	36	864	172	31.5	22
LTZPFL200-00-6-W-24V	white, 6300 K	26.3	200	24	360	8.7	36	1080	212	31.5	22
LTZPFL200-00-6-R-24V	red, 630 nm	26.3	200	24	390	9.4	36	1170	212	31.5	22
LTZPFL200-00-6-G-24V	green, 525 nm	26.3	200	24	360	8.7	36	1080	212	31.5	22
LTZPFL200-00-6-B-24V	blue, 470 nm	26.3	200	24	360	8.7	36	1080	212	31.5	22

- 1 With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%. Max pulse width = 10 ms.
- 2 With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

Ordering information

Our part numbers are coded as **LTZPFLxxx-yy-z-a-bbV** where:

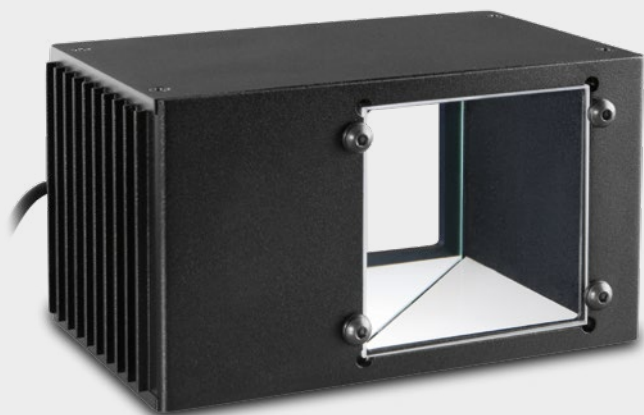
- **xxx** defines the lighting area length
- **yy** defines the light angle (for this series the angle is 00 = 0°)
- **z** defines the number of LED rows
- **a** defines the color: R = red, G = green, B = blue, W = white. Contact us for additional wavelengths.
- **bb** defines the supply voltage. Optional 12V version is available.

All accessories including lighting extension cables (CB series), diffusers (DFLT series), polarizers (PLLT series) and mounting brackets (CMLT series) must be ordered separately. Optional connectors: LTBRDC series is available with JST connector per standard. For M8 or M12 connectors (available as optional) add -M8 or -M12 at the end of the part number. Examples: LTZPFL040-00-6-W-24V-M8, LTZPFL040-00-6-W-24V-M12

LTCXC series

Continuous LED coaxial lights

DIFFUSED



KEY ADVANTAGES

24V DC supply voltage.

Easy integration & compact size.

JST connector (optional M8, M12).

Red, Green, Blue and White.

Custom sizes available on request.

COMPATIBLE STROBE CONTROLLER



LTDV1CH-17V strobe controller

p. 252

COMPATIBLE LIGHT INTENSITY CONTROLLER



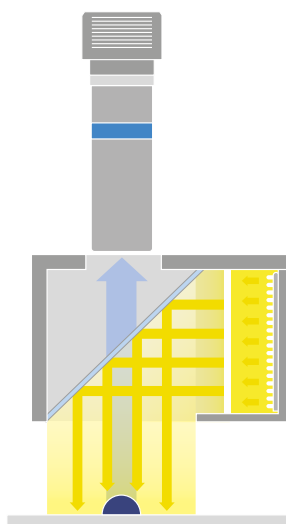
LTCIGR1000-D1-PS-xx light intensity controller

p. 256

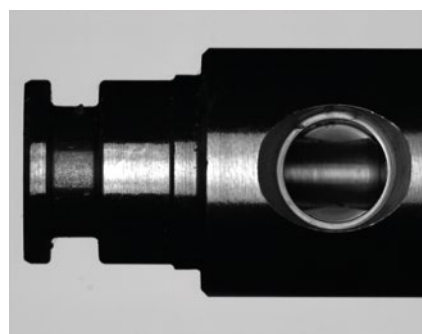
The **LTCXC series** consists of LED coaxial lights that provide coaxial illumination ideal for inspection of scratches/dents on glossy surfaces or pattern inspection on PCB to be used in combination with telecentric lenses.

Light is reflected by a 45° beam splitter so that it is projected onto the same axis as the camera. Suggested use is continuous mode.

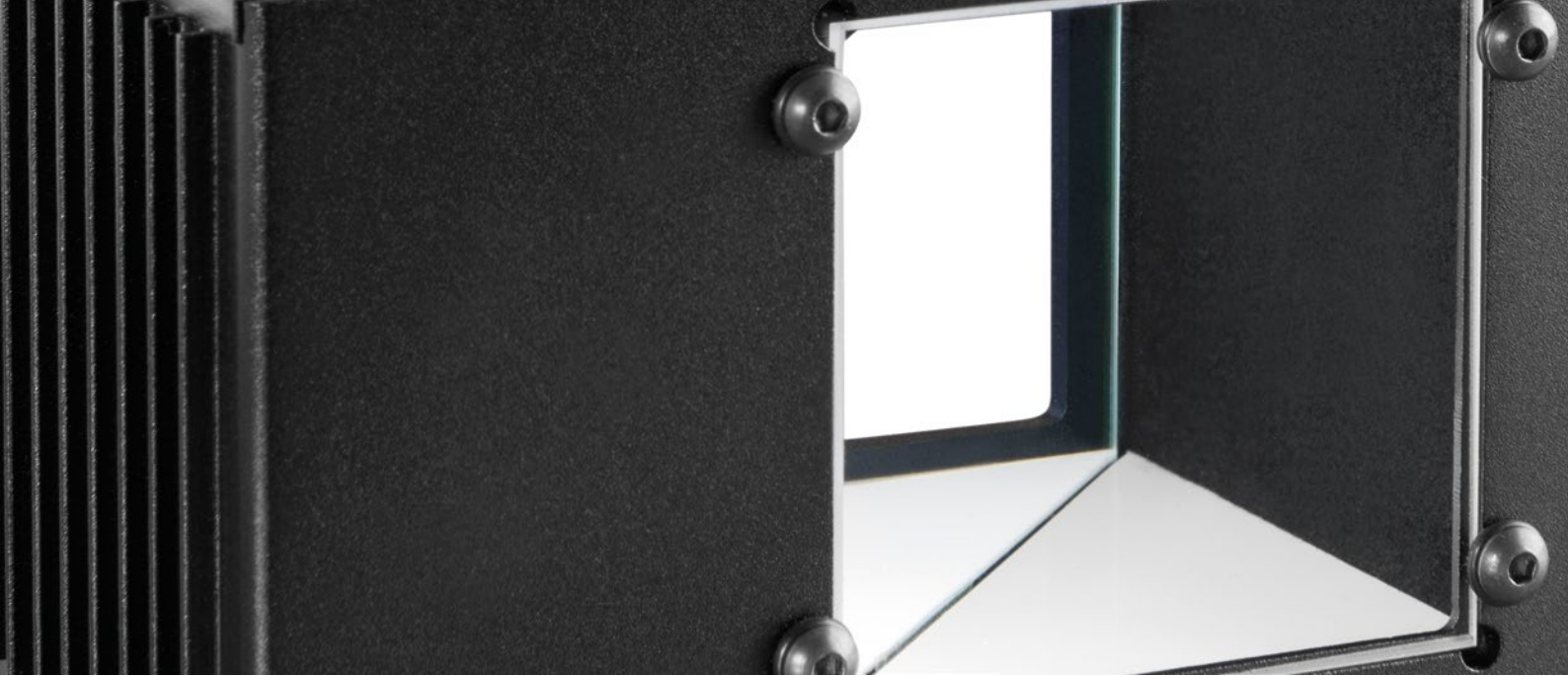
Lighting structure



Application example



Measurement and burr inspection of mechanical valves using the LTCXC series with telecentric lenses.



Optional mounting bracket

Specifically designed to easily mount LTQOG040 model.



Part number	Compatibility
CMLT2QOG040	LT2QOG040-00-X-a-24V

Part number	Optical specifications			Electrical specifications					Dimensions		
	Light color, wavelength peak	Lighting area		Supply voltage (V)	Current (mA)	Power cons. (W)	Pulsed mode		Length (mm)	Width (mm)	Height (mm)
		Width (mm)	Length (mm)				Supply voltage (V)	Max pulse current (mA)			
LT2QOG025-00-X-W-24V	white, 6300 K	27	27	24	160	3.9	36	480	54	33	33
LT2QOG025-00-X-R-24V	red, 630 nm	27	27	24	150	3.6	36	450	54	33	33
LT2QOG025-00-X-G-24V	green, 525 nm	27	27	24	160	3.9	36	480	54	33	33
LT2QOG025-00-X-B-24V	blue, 470 nm	27	27	24	160	3.9	36	480	54	33	33
LT2QOG040-00-X-W-24V	white, 6300 K	48	48	24	350	8.4	36	1050	107.5	60	66
LT2QOG040-00-X-R-24V	red, 630 nm	48	48	24	146	3.5	36	438	107.5	60	66
LT2QOG040-00-X-G-24V	green, 525 nm	48	48	24	350	8.4	36	1050	107.5	60	66
LT2QOG040-00-X-B-24V	blue, 470 nm	48	48	24	350	8.4	36	1050	107.5	60	66
LT2QOG070-00-X-W-24V	white, 6300 K	70	70	24	560	13.5	36	1680	139.6	89	95
LT2QOG070-00-X-R-24V	red, 630 nm	70	70	24	525	12.6	36	1575	139.6	89	95
LT2QOG070-00-X-G-24V	green, 525 nm	70	70	24	560	13.5	36	1680	139.6	89	95
LT2QOG070-00-X-B-24V	blue, 470 nm	70	70	24	560	13.5	36	1680	139.6	89	95
LT2QOG100-00-X-W-24V	white, 6300 K	100	100	24	781	18.8	36	2000	166.5	120	123.8
LT2QOG100-00-X-R-24V	red, 630 nm	100	100	24	450	10.8	36	1350	166.5	120	123.8
LT2QOG100-00-X-G-24V	green, 525 nm	100	100	24	781	18.8	36	2000	166.5	120	123.8
LT2QOG100-00-X-B-24V	blue, 470 nm	100	100	24	781	18.8	36	2000	166.5	120	123.8

- 1 With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%. Max pulse width = 10 ms.
- 2 With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

Ordering information

Our part numbers are coded as **LT2QOGxxx-yy-X-a-bbV** where:

- **xxx** defines the lighting area width and length
- **yy** defines the light angle (for this series the angle is 00 = 0°)
- **a** defines the color: R = red, G = green, B = blue, W = white. Contact us for additional wavelengths.
- **bb** defines the supply voltage. Optional 12V version is available.

All accessories including lighting extension cables (CB series) and mounting brackets (CMLT series) must be ordered separately.
 Optional connectors: LTCXC series is available with JST connector per standard. For M8 or M12 connectors (available as optional) add -M8 or -M12 at the end of the part number.
 Examples: LT2QOG040-00-X-W-24V-M8, LT2QOG040-00-X-W-24V-M12

LTTNC series

Continuous LED tunnel lights

INDIRECT



KEY ADVANTAGES

24V DC supply voltage.

Easy integration & compact size.

JST connector (optional M8, M12).

Red, Green, Blue and White.

Custom sizes available on request.

COMPATIBLE STROBE CONTROLLER



LTDV1CH-17V strobe controller

p. 252

COMPATIBLE LIGHT INTENSITY CONTROLLER



LTICGR1000-D1-PS-xx light intensity controller

p. 256

FULL RANGE OF FIXED FOCAL LENGTH LENSES

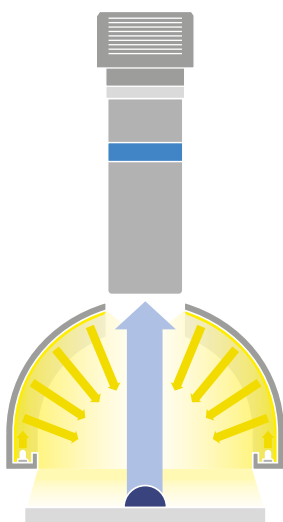


EN2MP series, EN5MP series, EN-2RT series, EN-5RT series

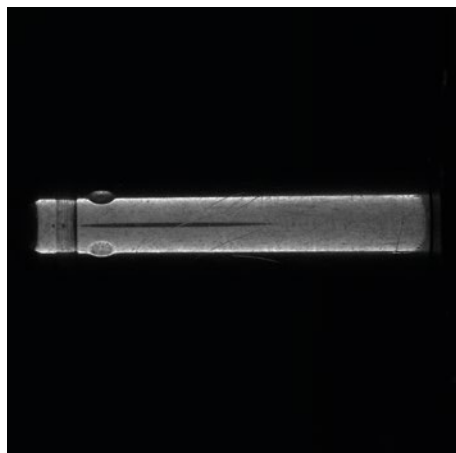
p. 74-77

The **LTTNC series** consists of LED tunnel lights designed to provide even illumination on long cylindrical surfaces or shafts. Suggested use is continuous mode.

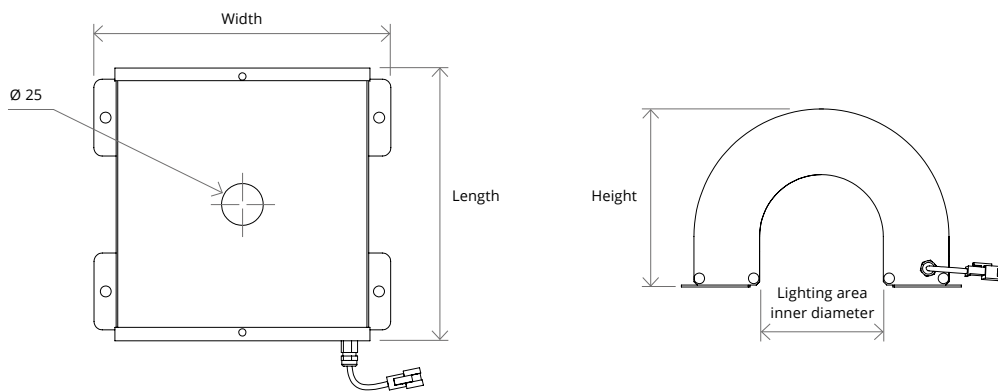
Lighting structure



Application example



Detection of scratches and dark spots on cylindrical metal parts using LTTNC tunnel lights and fixed focal length lenses.



Part number	Optical specifications				Electrical specifications					Dimensions		
	Light color, wavelength peak	Optimal WD (mm)	Lighting area		Continuous mode			Pulsed mode		Width x length (mm)	Aperture (mm)	Height (mm)
			inner diam. (mm)	Width (mm)	Supply voltage (V)	Current (mA)	Power cons. (W)	Supply voltage (V)	Max pulse current (mA)			
LT3WRH150-00-1-W-24V	white, 6300 K	40 - 60	74	147	24	400	9.6	36	1200	177.6 x 163	25	106.5
LT3WRH150-00-1-R-24V	red, 630 nm	40 - 60	74	147	24	450	10.8	36	1350	177.6 x 163	25	106.5
LT3WRH150-00-1-G-24V	green, 525 nm	40 - 60	74	147	24	400	9.6	36	1200	177.6 x 163	25	106.5
LT3WRH150-00-1-B-24V	blue, 470 nm	40 - 60	74	147	24	400	9.6	36	1200	177.6 x 163	25	106.5
LT3WRH200-00-1-W-24V	white, 6300 K	40 - 60	124	147	24	400	9.6	36	1200	227 x 163	25	131.5
LT3WRH200-00-1-R-24V	red, 630 nm	40 - 60	124	147	24	450	10.8	36	1350	227 x 163	25	131.5
LT3WRH200-00-1-G-24V	green, 525 nm	40 - 60	124	147	24	400	9.6	36	1200	227 x 163	25	131.5
LT3WRH200-00-1-B-24V	blue, 470 nm	40 - 60	124	147	24	400	9.6	36	1200	227 x 163	25	131.5

1 With constant driving voltage (36V recommended, 48V max). Duty cycle = 0-10%.
Max pulse width = 10 ms.

2 With constant driving current. Duty cycle = 0-10%. Max pulse width = 10 ms.

Ordering information

Our part numbers are coded as **LT3WRHxxx-yy-z-a-bbV** where:

- **xxx** defines the lighting width
- **yy** defines the light angle (for this series the angle is 00 = 0°)
- **z** defines the number of LED rows
- **a** defines the color: R = red, G = green, B = blue, W = white. Contact us for additional wavelengths.
- **bb** defines the supply voltage. Optional 12V version is available.

Lighting extension cables (CB series) are not included and must be ordered separately.

Optional connectors: LTTNC series is available with JST connector per standard. For M8 or M12 connectors (available as optional) add -M8 or -M12 at the end of the part number.

Examples: LT3WRH150-00-1-W-24V-M8, LT3WRH150-00-1-W-24V-M12

LTLNC series

Continuous LED line lights

FOCUSED

NEW
MODELS



KEY ADVANTAGES

Ultra high power.

Color matched white models.

Condenser lens for a perfectly focused beam of light.

Rugged industrial design with built in industrial connector for easy integration into any machine vision system.





Forced air cooling option.

The **LTLNC series** offers ultra-high power LED line illuminators designed for line scan applications. Their special design provides both a powerful and homogeneous beam of light that is sharply focused onto the object being inspected, by means of a condenser lens.

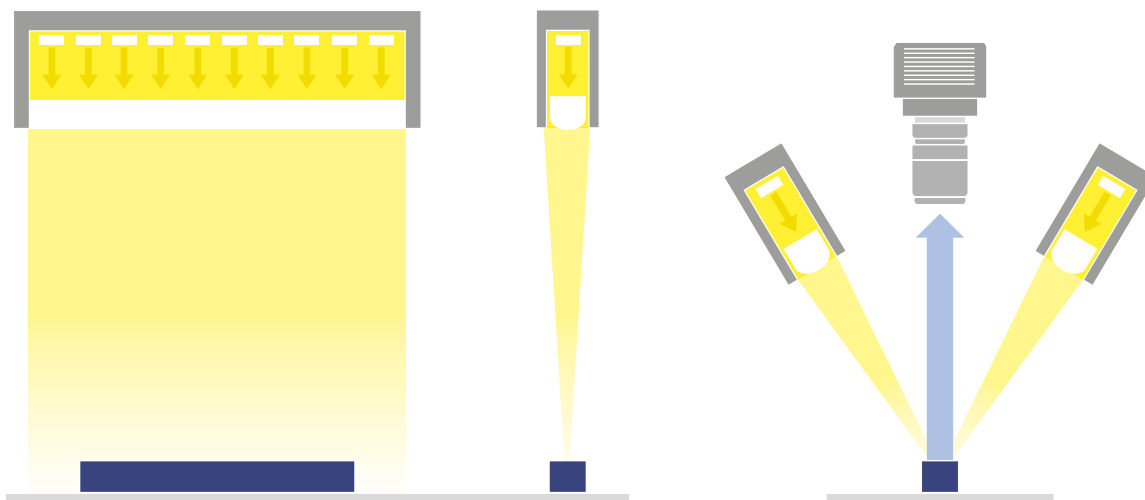
The LTLNC series can efficiently dissipate the generated heat thanks to the fins machined in the aluminium housing and the air cooling ports designed to inject compressed air into the illuminator.

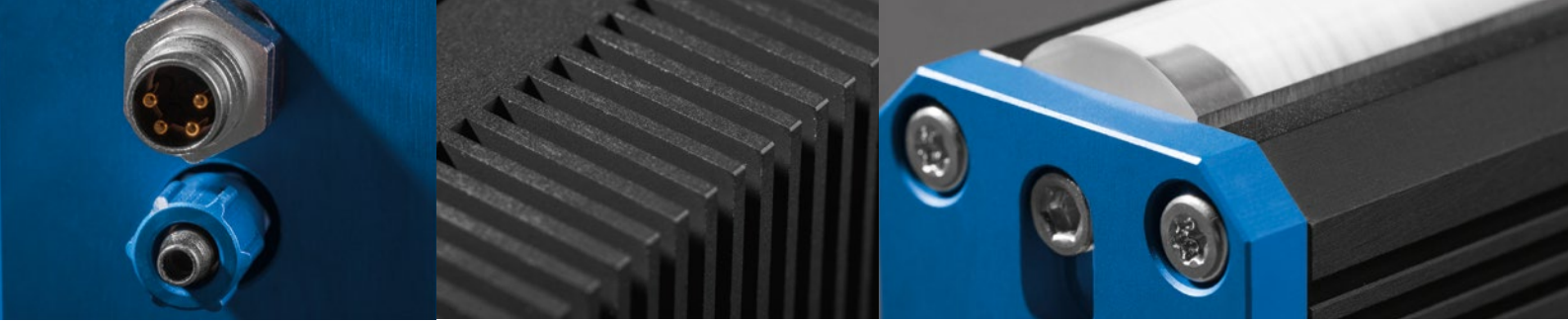
Furthermore the LTLNC series features industrial M8 connectors and can be easily installed into any machine vision system thanks to the four M3 threads in the rear part of the aluminium housing.

SEE ALSO FULL RANGE OF LINE SCAN LENSES

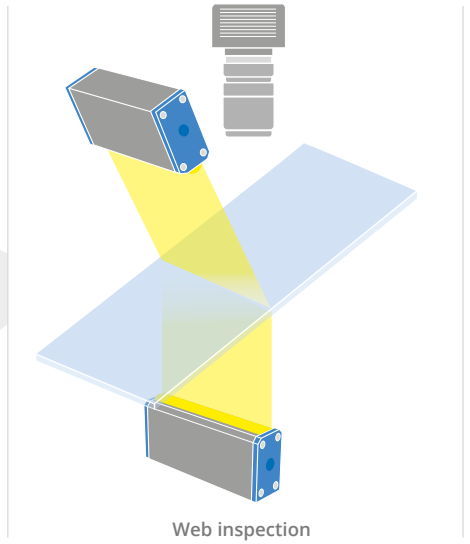
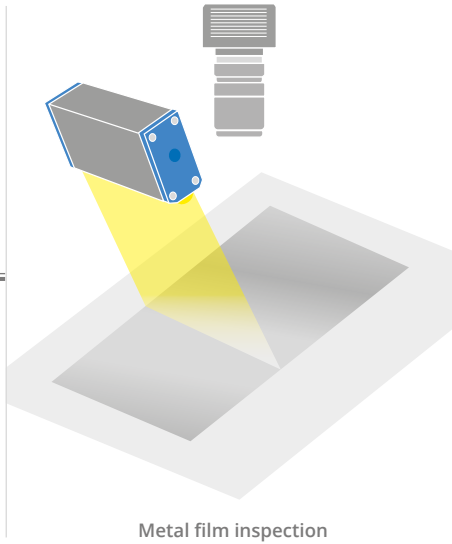
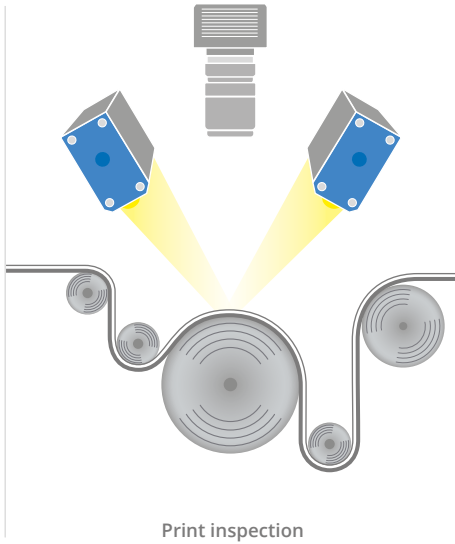
	TC12K series	p. 50
	TC4K series	p. 52
	MC4K series	p. 82
	MC12K series	p. 85

Lighting structure





Application examples



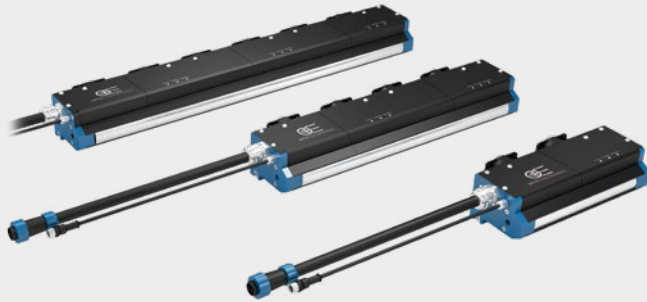
Part number	Optical specifications				Electrical specifications							Mechanical specifications			Compatibility		
	Number of LEDs	Light color	Illumination area (mm x mm)	Suggested working distance WD (mm)	Supply voltage (V)	Continuous mode			Pulsed mode 1			Length (mm)	Width (mm)	Height (mm)	LED controllers	Cables	Lenses
						Continuous driving current max (mA)	Power consumption (W)	Max pulse current (mA)	Voltage (V)	Peak power (W)	Connection type 2						
LTLNC050-W	12	white, 6500 K	50 x 15	20 - 100	24 ± 2%	600	15	2900	55	160	M8 4 PIN industrial male connector	80	32	60	LTC1CH-A1-4, LTC1CH-D1-4, LTDVE2CH-20F, LTDVE4CH-20, LTDVE8CH-20	CBLT003, CBLT004	TC4K060-x TC4K090-x TC4K120-x TC4K180-x TC12K064, TC12K080, TC12K120, TC12K144, TC12K192, TC12K240, MC4K series, MC12K200X-x, MC12K150X-x, MC12K100X-x, MC12K067X-x, MC12K050X-x, MC12K025X-x
LTLNC050-R	9	red, 625 nm				600	15	1000	28	28		80	32	60			
LTLNC050-G	12	green, 525 nm				600	15	2000	39	78		80	32	60			
LTLNC050-B	12	blue, 475 nm				600	15	2000	41	82		80	32	60			
LTLNC050-IR850	11	IR, 850 nm				300	7,2	1500	59	89		80	32	60			
LTLNC100-W	21	white, 6500 K	100 x 15	20 - 100	24 ± 2%	1050	26	4350	42	183	M8 4 PIN industrial male connector	150	32	60	LTC1CH-A1-4, LTC1CH-D1-4, LTDVE2CH-20F, LTDVE4CH-20, LTDVE8CH-20	CBLT003, CBLT004	TC4K060-x TC4K090-x TC4K120-x TC4K180-x TC12K064, TC12K080, TC12K120, TC12K144, TC12K192, TC12K240, MC4K series, MC12K200X-x, MC12K150X-x, MC12K100X-x, MC12K067X-x, MC12K050X-x, MC12K025X-x
LTLNC100-R	18	red, 625 nm				1000	24	2000	31	62		150	32	60			
LTLNC100-G	21	green, 525 nm				1050	26	3000	31	93		150	32	60			
LTLNC100-B	21	blue, 475 nm				1050	26	3000	31	93		150	32	60			
LTLNC100-IR850	22	IR, 850 nm				600	15	3000	60	180		150	32	60			
LTLNC150-W	28	white, 6500 K	150 x 15	20 - 100	24 ± 2%	1400	34	5800	42	244	M8 4 PIN industrial male connector	200	32	60	LTC1CH-A1-4, LTC1CH-D1-4, LTDVE2CH-20F, LTDVE4CH-20, LTDVE8CH-20	CBLT003, CBLT004	TC4K060-x TC4K090-x TC4K120-x TC4K180-x TC12K064, TC12K080, TC12K120, TC12K144, TC12K192, TC12K240, MC4K series, MC12K200X-x, MC12K150X-x, MC12K100X-x, MC12K067X-x, MC12K050X-x, MC12K025X-x
LTLNC150-R	27	red, 625 nm				1500	36	3000	31	93		200	32	60			
LTLNC150-G	28	green, 525 nm				1400	34	4000	31	124		200	32	60			
LTLNC150-B	28	blue, 475 nm				1400	34	4000	31	124		200	32	60			
LTLNC150-IR850	33	IR, 850 nm				900	22	4500	60	270		150	32	60			
LTLNC200-W	28	white, 6500 K	200 x 15	20 - 100	24 ± 2%	1600	39	6000	41	246	M8 4 PIN industrial male connector	250	32	60	LTC1CH-A1-4, LTC1CH-D1-4, LTDVE2CH-20F, LTDVE4CH-20, LTDVE8CH-20	CBLT003, CBLT004	TC4K060-x TC4K090-x TC4K120-x TC4K180-x TC12K064, TC12K080, TC12K120, TC12K144, TC12K192, TC12K240, MC4K series, MC12K200X-x, MC12K150X-x, MC12K100X-x, MC12K067X-x, MC12K050X-x, MC12K025X-x
LTLNC200-R	27	red, 625 nm				1650	40	3000	31	93		250	32	60			
LTLNC200-G	28	green, 525 nm				1600	39	4000	32	128		250	32	60			
LTLNC200-B	28	blue, 475 nm				1600	39	4000	32	128		250	32	60			
LTLNC200-IR850	33	IR, 850 nm				1050	26	4500	55	248		150	32	60			
LTLNC300-W	42	white, 6500 K	300 x 15	20 - 100	24 ± 2%	2100	51	9000	44	396	M8 4 PIN industrial male connector	350	32	60	LTC1CH-A1-4, LTC1CH-D1-4, LTDVE2CH-20F, LTDVE4CH-20, LTDVE8CH-20	CBLT003, CBLT004	TC4K060-x TC4K090-x TC4K120-x TC4K180-x TC12K064, TC12K080, TC12K120, TC12K144, TC12K192, TC12K240, MC4K series, MC12K200X-x, MC12K150X-x, MC12K100X-x, MC12K067X-x, MC12K050X-x, MC12K025X-x
LTLNC300-R	36	red, 625 nm				2000	48	4000	31	124		350	32	60			
LTLNC300-G	42	green, 525 nm				2100	51	6000	33	198		350	32	60			
LTLNC300-B	42	blue, 475 nm				2100	51	6000	33	198		350	32	60			
LTLNC300-IR850	44	IR, 850 nm				1200	29	6000	60	360		150	32	60			

- T_{on} max = 100 ms, Duty cycle ≤ 5%.
- 5 m cable with straight female connector included. Optional cable with right angled connector is also available and must be ordered separately (refer to our website for further info and ordering codes).

LTLNM series

Flicker free high power focused modular LED line lights

H **FOCUSED/COLLIMATED**



KEY ADVANTAGES

Emitting surface up 2 meters in 200 mm increments.

Flicker free for line scan applications.

3 types of projection lenses

Near field focusing (N), far field focusing (F), collimated (C).

Homogeneous beam for uniform illumination.

**Built-in controller / 24VDC power supply.
Dimmable (external 0-10V analogue signal).
Enable signal.**

**Fault output (for overtemperature detection).
Auto shutdown in case of overheating.**

Optional diffusive sheet (D) for superior illumination uniformity.

**White color (other colors on request)
3 Amps / 72 W per module.**

The LTLNM series offers high power LED line illuminators designed for line scan applications. These lights are flicker-free and meet the needs of demanding applications with reduced exposure times (tens of μ s) ensuring very constant illumination and repeatable acquisition. Their modular design provides size flexibility without any compromise in terms of light uniformity.

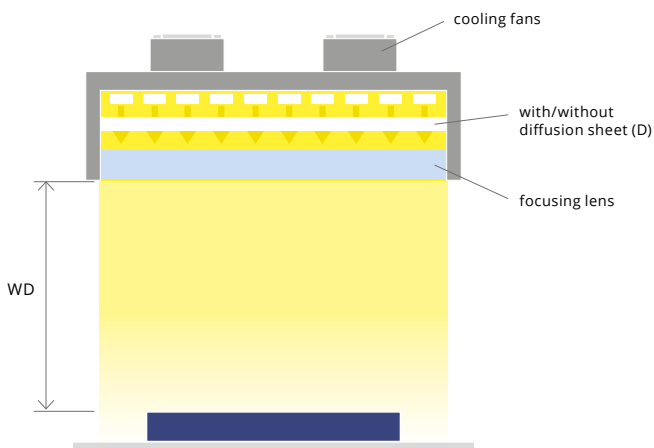
LTLNM are available with an emitting surface of up to 2 meters in 200 mm increments (custom sizes and colors can be requested). The LTLNM series can be supplied with three different light angles/ focusing distances: near field focused (N) with converging rays (10 - 100 mm), far field focused (F) with converging rays (100 - 200 mm) and collimated (C) working at a distance between 10 and 200 mm.

An optional diffusive sheet (D) can be integrated in any model to obtain the best illumination uniformity.

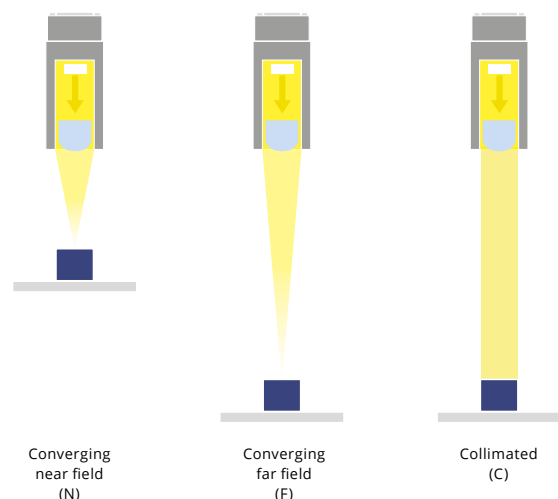
These lights feature 24V supply voltage and can be easily dimmed through an analogue signal.

The LTLNM series can efficiently dissipate the generated heat thanks an efficient forced-air cooling system (fans). The on-board electronics constantly monitor the LED temperature and drives the fans only if needed, in order to minimise noise and increase fan life. These line lights are perfect for applications that require high speed image processing such as fabrics and web inspection.

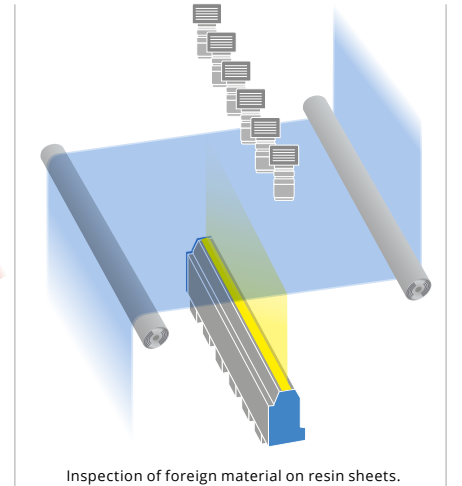
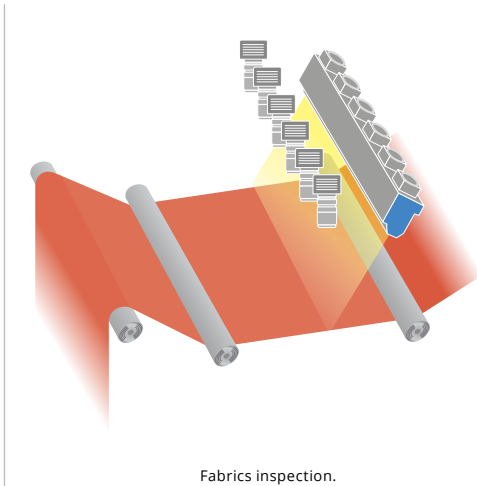
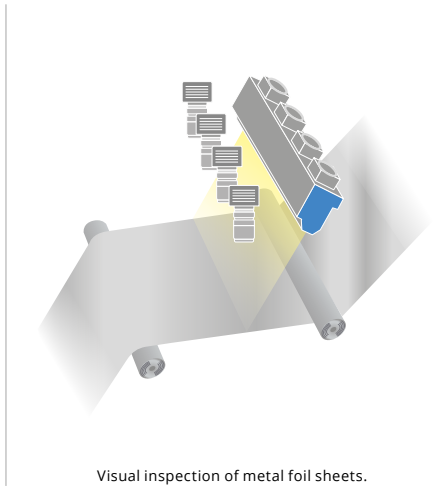
Lighting structure



Projection lenses and focusing distances



Application examples



Part number	Modules	Optical specifications				Electrical specifications				Mechanical specifications				Compatibility		
		Emitting length aaaa (mm)	Projection lens and suggested WD b (mm)	Diffuser c	Light color d	Supply voltage (V)	Current consumption (A)	Power consumption (W)	Connection type 1	Length (mm)	Width (mm)	Height (mm)	Cooling method	Clamping system	Light intensity controllers	Lenses
LTLNM-0200-b-c-FC-W	1	200			White	24V ± 2%	3	72	2 pigtaills terminated with industrial connectors 1	250	80	130	fan (FC)			
LTLNM-0400-b-c-FC-W	2	400			White	24V ± 2%	6	144	2 pigtaills terminated with industrial connectors 1	450	80	130	fan (FC)			
LTLNM-0600-b-c-FC-W	3	600			White	24V ± 2%	9	216	2 pigtaills terminated with industrial connectors 1	650	80	130	fan (FC)			
LTLNM-800-b-c-FC-W	4	800			White	24V ± 2%	12	288	2 pigtaills terminated with industrial connectors 1	850	80	130	fan (FC)			
LTLNM-1000-b-c-FC-W	5	1000	N = near field focusing (10- 100 mm), F = far field focusing (100- 200 mm), C = collimated (10 - 200 mm)	c = D, with diffuser, c = empty, no diffuser	White	24V ± 2%	15	360	2 pigtaills terminated with industrial connectors 1	1050	80	130	fan (FC)	4 threaded holes for M10 screw	embedded	TC4K060-x, TC4K090-x, TC4K120-x, TC4K180-x, TC12K064, TC12K080, TC12K120, TC12K144, TC12K144, TC12K192, TC12K240, MC4K series, MC12K200X-x, MC12K150X-x, MC12K100X-x, MC12K067X-x, MC12K050X-x, MC12K025X-x
LTLNM-1200-b-c-FC-W	6	1200			White	24V ± 2%	18	432	2 pigtaills terminated with industrial connectors 1	1250	80	130	fan (FC)			
LTLNM-1400-b-c-FC-W	7	1400			White	24V ± 2%	21	504	3 pigtaills terminated with industrial connectors 2	1450	80	130	fan (FC)			
LTLNM-1600-b-c-FC-W	8	1600			White	24V ± 2%	24	576	3 pigtaills terminated with industrial connectors 2	1650	80	130	fan (FC)			
LTLNM-1800-b-c-FC-W	9	1800			White	24V ± 2%	27	648	3 pigtaills terminated with industrial connectors 2	1850	80	130	fan (FC)			
LTLNM-2000-b-c-FC-W	10	2000			White	24V ± 2%	30	720	3 pigtaills terminated with industrial connectors 2	2050	80	130	fan (FC)			

1 1 pigtail terminated with industrial circular male connector for power supply,
1 pigtail terminated with industrial circular male connector for i/o signals.

2 2 pigtaills terminated with industrial circular male connector for power supply,
1 pigtail terminated with industrial circular male connector for i/o signals.

Ordering information

Our part numbers are coded as LTLNM-aaaa-b-c-FC-d where:

- aaaa defines the illumination active area length (in mm)

- b defines the focusing distance, N = near field focusing, F = far field focusing, C = collimated

- c defines the presence of a diffusing sheet. Leave empty if no diffuser is required or D = with diffuser mounted in front of the LEDs

- d defines the color -W = White.

LTLNE series

High power enhanced LED line lights

H FOCUSED/COLLIMATED



KEY ADVANTAGES

High density LEDs.

3 types of projection lenses

Near field focusing (N), far field focusing (F), collimated (C).

3 opto-mechanical configurations

Lens only, coaxial illumination (CX) or with 45° mirror (MR).

2 cooling methods and power intensities

Passive or active with fans.

Optional diffusive sheet (D) for illumination uniformity

Hot spots reduction when inspecting highly reflective surfaces.

The **LTLNE series** offers high power LED line illuminators designed for line scan applications. The LTLNE series is available in three opto-mechanical versions: basic configuration with condensing lens, as coaxial line lights (CX) or integrating a 45° mirror (MR).

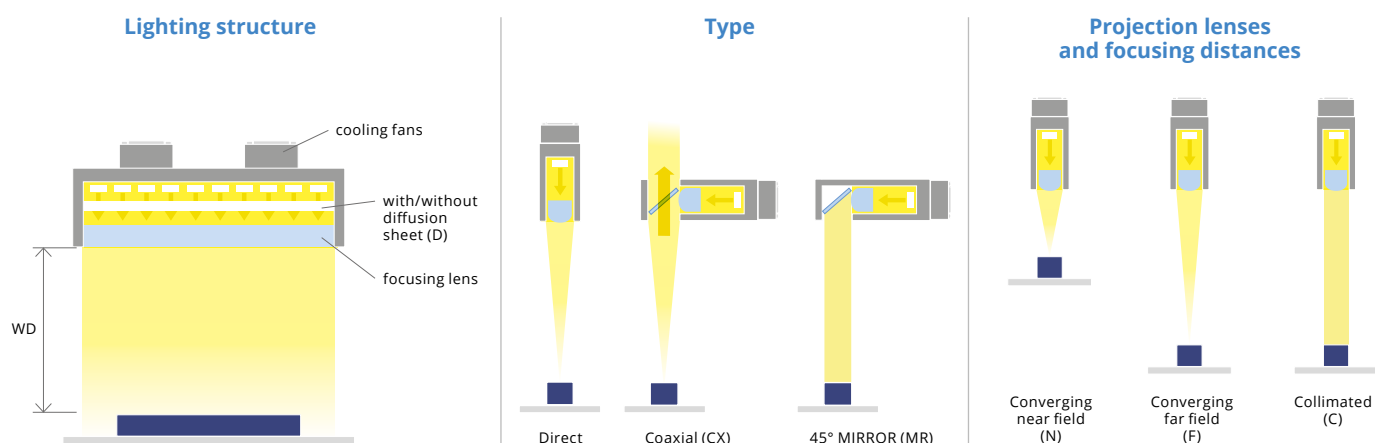
The LTLNE series can be supplied with three different light angles/ focusing distances: near field focused (N) with converging rays (10 – 100 mm), far field focused (F) with converging rays (100 - 200 mm) and collimated (C) focusing at a distance between 10 and 200 mm. An optional diffusive sheet (D) can be integrated in any model to obtain the best illumination uniformity.

These LED line lights are available with an emitting surface of 300 mm (custom sizes and colors can be requested) and feature 24V supply voltage.

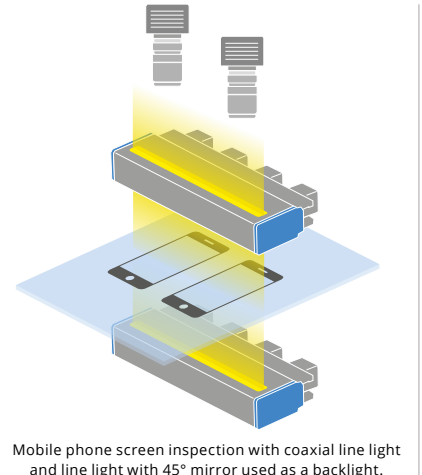
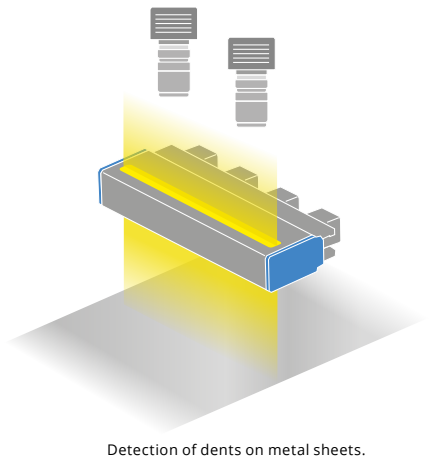
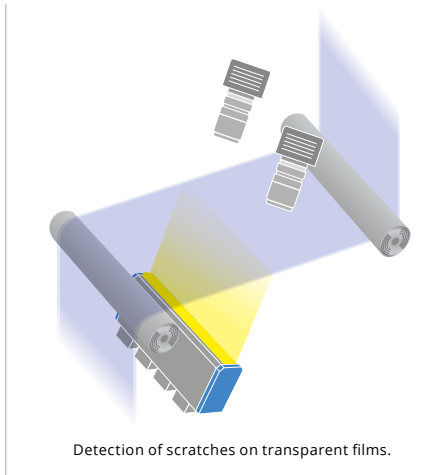
The whole family can efficiently dissipate the generated heat featuring two cooling options: passive cooling (PC) and fan cooling (FC).

Furthermore the LTLNE series features industrial threaded connectors and can be easily installed into any machine vision system thanks to the threaded holes conveniently located on the aluminium housing.

These line lights are perfect for applications that require high speed image processing such as transparent films or glass inspection and detection of dents on metal sheets.



Application examples



	Optical specifications					Electrical specifications				Mechanical specifications					Compatibility	
	Type	Emitting length	Light color	Projection lens and suggested WD	Diffuser	Supply voltage	Nominal driving current	Power consumption at nominal driving current ¹	Connection type	Length	Width	Height	Cooling method	Clamping system	Light intensity controllers	Lenses
	bb	aaa (mm)	f	c (mm)	d	(V)	(mA)	(W)		(mm)	(mm)	(mm)	ee			
LTLNE-300-N-PC-W					no		2000	50			110		passive			
LTLNE-300-N-FC-W					no		4000	100			150	40	fan		LTIC1CH-A1-4	
LTLNE-300-N-D-PC-W	direct	300	White	10 - 100 near field focusing		24V ± 2%	2000	50		340	110		passive			
LTLNE-300-N-D-FC-W					yes		4000	100			150		fan			
LTLNE-300-F-PC-W					no		2000	50			110		passive			
LTLNE-300-F-FC-W					no		4000	100			150	40	fan			
LTLNE-300-F-D-PC-W	direct	300	White	100 - 200 far field focusing		24V ± 2%	2000	50	20 cm pigtail terminated with industrial circular male connector	340	110		passive	8 threaded holes for M4 screw	LTIC1CH-A1-4	
LTLNE-300-F-D-FC-W					yes		4000	100			150		fan			
LTLNE-300-C-PC-W					no		2000	50			110		passive			
LTLNE-300-C-FC-W					no		4000	100			150	40	fan			
LTLNE-300-C-D-PC-W	direct	300	White	10 - 200 collimated		24V ± 2%	2000	50		340	110		passive		LTIC1CH-A1-4	
LTLNE-300-C-D-FC-W					yes		4000	100			150		fan			
LTLNE-300-CX-N-PC-W					no		2000	50			150		passive			
LTLNE-300-CX-N-FC-W					no		4000	100			190	54	fan		LTIC1CH-A1-4	TC4K060-x TC4K090-x TC4K120-x TC4K180-x TC12K054- TC12K080- TC12K120- TC12K144- TC12K144- TC12K192- TC12K240- MC4K series, MC12K200X-x, MC12K150X-x, MC12K100X-x, MC12K067X-x, MC12K050X-x, MC12K025X-x
LTLNE-300-CX-N-D-PC-W	coaxial	300	White	10 - 100 near field focusing		24V ± 2%	2000	50		340	150		passive			
LTLNE-300-CX-N-D-FC-W					yes		4000	100			190		fan			
LTLNE-300-CX-F-PC-W					no		2000	50			150		passive			
LTLNE-300-CX-F-FC-W					no		4000	100			190	54	fan			
LTLNE-300-CX-F-D-PC-W	coaxial	300	White	100 - 200 far field focusing		24V ± 2%	2000	50	20 cm pigtail terminated with industrial circular male connector	340	150		passive	8 threaded holes for M4 screw	LTIC1CH-A1-4	
LTLNE-300-CX-F-D-FC-W					yes		4000	100			190		fan			
LTLNE-300-CX-C-PC-W					no		2000	50			150		passive			
LTLNE-300-CX-C-FC-W					no		4000	100			190	54	fan			
LTLNE-300-CX-C-D-PC-W	coaxial	300	White	10 - 200 collimated		24V ± 2%	2000	50		340	150		passive		LTIC1CH-A1-4	
LTLNE-300-CX-C-D-FC-W					yes		4000	100			190		fan			
LTLNE-300-MR-N-PC-W					no		2000	50			150		passive			
LTLNE-300-MR-N-FC-W					no		4000	100			190	54	fan		LTIC1CH-A1-4	
LTLNE-300-MR-N-D-PC-W	with 45° mirror	300	White	10 - 100 near field focusing		24V ± 2%	2000	50		340	150		passive			
LTLNE-300-MR-N-D-FC-W					yes		4000	100			190		fan			
LTLNE-300-MR-F-PC-W					no		2000	50			150		passive			
LTLNE-300-MR-F-FC-W					no		4000	100			190	54	fan			
LTLNE-300-MR-F-D-PC-W	with 45° mirror	300	White	100 - 200 far field focusing		24V ± 2%	2000	50	20 cm pigtail terminated with industrial circular male connector	340	150		passive	8 threaded holes for M4 screw	LTIC1CH-A1-4	
LTLNE-300-MR-F-D-FC-W					yes		4000	100			190		fan			
LTLNE-300-MR-C-PC-W					no		2000	50			150		passive			
LTLNE-300-MR-C-FC-W					no		4000	100			190	54	fan			
LTLNE-300-MR-C-D-PC-W	with 45° mirror	300	White	10 - 200 collimated		24V ± 2%	2000	50		340	150		passive		LTIC1CH-A1-4	
LTLNE-300-MR-C-D-FC-W					yes		4000	100			190		fan			

1 Models with fan cooling are capable of more power. Ask technical support for details. Other colors are available on request.

Ordering information

Our part numbers are coded as **LTLNE-aaa-bb-c-d-ee-f** where:

- **aaa** defines the illumination active area length (in mm)
- **bb** defines the presence of a beam splitter or a mirror. Leave empty for direct illumination (lens only) - CX = coaxial illumination (50T-50R Beam splitter), -MR = 90° mirror
- **c** defines the focusing distance, N = near field focusing, F = far field focusing, C = collimated
- **d** defines the presence of a diffusing sheet. Leave empty if no diffuser is required or D = with diffuser mounted in front of the LEDs
- **ee** defines the cooling options PC = passive cooling, FC = fan cooling
- **f** defines the color -W = White.

View-through system

Space-saving illumination system for double-side object inspection

DIFFUSED/INDIRECT



KEY ADVANTAGES

Compact space-saving solution for inspection of fast moving object

Illuminates two sides of an object almost simultaneously.

Ultra-high power light output and strobe mode only operation

For the inspection of fast moving object and extended LED lifetime.

Rugged industrial design with built-in industrial connector

For easy integration with any machine vision system.

Modular configuration.



The **View-through system** is a unique space-saving illumination solution designed to illuminate two sides of an object. It consists of two symmetrical modules, each one made of two illumination units:

- A diffuse strobe dome illuminator (white color)
- A special active “view-through” backlight unit (white color)

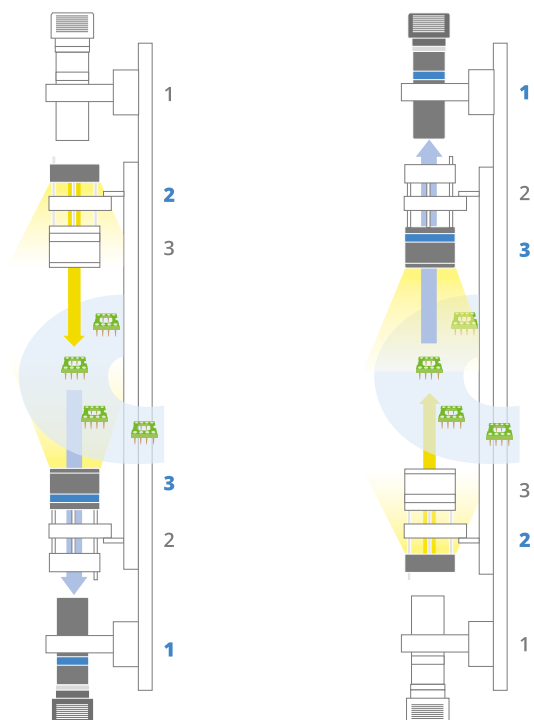
View-through system is designed to create very compact inline inspection solutions that illuminate and image both sides of fast-moving objects. While one camera acquires the image of one side of an object, the corresponding dome and special backlight units emit light simultaneously so that one side of the object can be inspected. Subsequently, the dome and the backlight units are turned off so that the second camera can acquire the image of the other side of the object while its corresponding dome and special backlight units are now switched on.

Such an innovative approach is achieved thanks to the special backlight units which act either as transparent windows (when turned off) or as backlights (when turned on), enabling to quickly and accurately inspect fast-moving objects almost simultaneously, in a very compact solution.

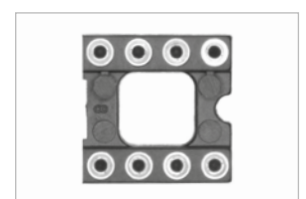
The View-through system can be used for many different inspections, especially for the identification of surface defects/features in applications spanning from automotive to pharmaceutical.

The View-through system is available as LTVT A1-W, which consists of two dome units and two active backlight “view-through” units (white color) or as LTVT BENCH, a complete bench solution which additionally includes a base plate with two right-angle brackets, the LTDV6CH compatible strobe controller (programmable) and the ADPT001 RS485-USB adapter.

Lighting structure



DIL socket, bottom side.



DIL socket, top side.

DESIGNED FOR OEM APPLICATIONS

Compatible LTDV6CH strobe controllers available to easily power, control and synchronise the View-through system.



FULL RANGE OF COMPATIBLE TELECENTRIC LENSES

	TCLWD series	p. 22
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FULL RANGE OF FIXED FOCAL LENGTH LENSES

	EN2MP series, EN5MP series, EN-2RT series, EN-5RT series	p. 74-77
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COMPATIBLE STROBE CONTROLLER AVAILABLE

	LTDV6CH	p. 252
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Part number			LTVTA1-W	LTVTBENCH
Optical specifications				
Dome unit				
Number of LEDs				15
Light color				white, 6000 K
Spectral FWHM		(nm)		n.a.
Illumination area diameter		(mm)		40
Suggested working distance WD		(mm)		5 - 25
Min estimated illumination ¹	At driving current = 3.5 A	(klux)		290
	At driving current = 7.5 A	(klux)		490
Aperture range		(mm)		48 (fixed)
Active backlight view-through unit				
Number of LEDs				18
Light color				white, 6000 K
Spectral FWHM		(nm)		n.a.
Diffusive material				yes
Illumination area diameter		(mm)		40
Suggested working distance WD		(mm)		n.a.
Min estimated illumination ¹	At driving current = 17.0 A	(klux)		5
Electrical specifications				
Power supply mode				strobe only, constant current driving
Pulse width ²		(ms)		≤ 1
Connection Type ³				M8 industrial male connector
Dome unit				
Driving current	Min - Max	(A)		3.5 - 7.5
Active backlight view-through unit				
Driving current	Min - Max	(A)		3.5 - 17.0
Estimated MTBF ⁴		(hours)		> 50000
Mechanical specifications				
Dimensions	Length	(mm)	107	600
	Width	(mm)	84	100
	Height	(mm)	125	155.5
Materials			black anodised aluminium body	
Clamping system			4 threaded holes for M6 screw	
Compatibility				
Lenses			TCLWD series, TCEL series (except TCEL23036)	

Items included	LTVTA1-W		LTVTBENCH	
	Description	Qty	Description	Qty
	Dome unit ⁵	2	Dome unit ⁵	2
	Active backlight view-through unit ⁵	2	Active backlight view-through unit ⁵	2
			Base plate with two right-angle brackets	1
			LTDV6CH strobe controller	1
			ADPT001 adapter RS485-USB	1

¹ At max Working Distance WD.

² At 25°C. At max pulse width (1 ms), max pulse frequency = 15 Hz.

³ PIN 1 and PIN 2 for the dome unit, PIN 3 and PIN 4 for the ring light unit.

⁴ At 25 °C.

⁵ Cables included.

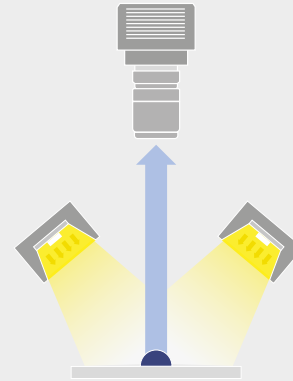
UV series

UV illuminators with different geometry

NEW

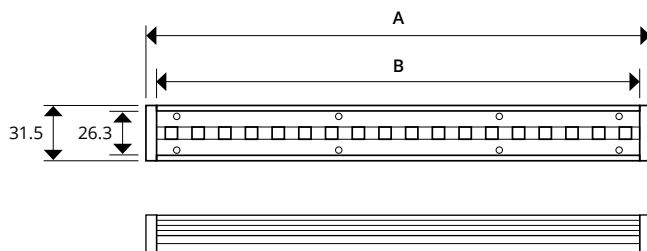


Lighting structure



UV illumination has shorter wavelengths compared to the visible illumination. Ultraviolet illumination with wavelengths shorter than the visible light has electromagnetic radiation in the range between

300 nm and 450 nm, which allows chemicals with UV lighting interaction to be visible under this light.



TECHNICAL SPECIFICATION

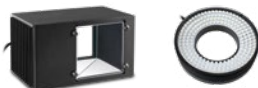
- UV365 - 24V Input Power
- continuous and strobe applications
- compact size
- lighting cable 500mn

CUSTOMIZE LIGHTING

- customize sizes, mounting requirements
- contact our sales for more information

Part number	Description	Dimensions (mm)		Color	Voltage/Watt	Current (mA)	Weight (g)
		A	B				
LTZPFL080-00-1-UV365-24V	LED bar light, 1 LED row, 80X17.3 illumination area, UV 365, 24V	92	80	UV365	24V/ 2.4W	100	95
LTZPFL160-00-1-UV365-24V	LED bar light, 1 LED row, 160X17.3 illumination area, UV 365, 24V	175	160	UV365	24V/ 4.8W	200	155
LTZPFL240-00-1-UV365-24V	LED bar light, 1 LED row, 240X17.3 illumination area, UV 365, 24V	252	240	UV365	24V/ 7.2W	300	230

Other lighting geometries



Part number	Description	Color	Voltage/Watt	Current (mA)	Weight (g)
LTZGK070-15-2-UV375-24V	LED ring light, 2 LED rows, outer diameter 70 mm, 15°, UV 375, 24V	UV375	24V/ 4.32W	180	103
LTZGK090-15-3-UV375-24V	LED ring light, 3 LED rows, outer diameter 92 mm, 15°, UV 375, 24V	UV375	24V/ 7.20W	300	160
LTZGK040-30-1-UV375-24V	LED ring light, 1 LED row, outer diameter 54 mm, 30°, UV 375, 24V	UV375	24V/ 1.08W	45	45
LTZZO090-60-2-UV375-24V	LED low angle ring light, 2 LED rows, outer diameter 90 mm, 60°, UV 375, 24V	UV375	24V/ 7.98W	320	109
LTZZO150-60-2-UV375-24V	LED low angle ring light, 2 LED rows, outer diameter 151 mm, 60°, UV 375, 24V	UV375	24V/ 11.52W	480	272
LTZZO170-75-2-UV375-24V	LED low angle ring light, 2 LED rows, outer diameter 175 mm, 75°, white, 24V	UV375	24V/ 8.40W	350	342
LT2QOG025-00-X-UV365-24V	LED coaxial light, 25x25.6 mm light emitting area, UV 365, 24V	UV365	24V/ 0.72W	30	83
LT2QOG040-00-X-UV365-24V	LED coaxial light, 48x48 mm light emitting area, UV 365, 24V	UV365	24V/ 1.44W	60	324

LED pattern projectors



Advanced structured lighting.

Opto Engineering® LED pattern projectors have been designed for 3D profiling/reconstruction and for the measurement of objects with complex structures or inclined planes.

They are successfully used in a variety of applications like quality control in food and packaging to check for correct volume, reverse engineering, dimensional measurement of electronic components, planarity control of products, robot guidance for pick and place and alignment applications.

When compared to laser emitters, LED technology ensures more homogeneous illumination in addition to sharp edges and no speckle effect.

Many 3D machine vision applications require structured light to be projected onto inclined surfaces, i.e. at a certain angle from the vertical axis. In such cases, the focus is maintained only within a small area close to the center of the field of view and the rest of the image shows relevant defocusing, thus making 3D measurement inaccurate.

For this reason, our family of pattern projectors includes special projectors equipped with a highprecision tilting mechanism that allows the pattern of the light source to meet the Scheimpflug condition so that the projected light is properly and evenly focused across the entire sample surface.

All Opto Engineering® LED projectors feature a wide selection of interchangeable patterns. Furthermore, the size of the projection area can be easily modified by interchanging different 2/3" C-mount lenses. To achieve the best results we suggest to use bi-telecentric lenses or zero distortion macro lenses.



Refer to specific datasheets available at www.opto-e.com for product compliancy with regulations, certifications and safety labels.

LTPR series

LED pattern projectors



KEY ADVANTAGES

LED technology for perfectly sharp edge

The LTPR series ensures thinner lines, sharper edges and more homogeneous illumination than lasers.

With laser emitters the illumination decays both across the line cross section and along the line width.

Laser emitter lines are thicker and show blurred edges; diffraction and speckle effects are also present.

3W, 10W or 90W strobe options.

Wide selection of projection patterns available (custom made on request).

Compatible with any C-mount optics.

The LTPR series consists of different LED pattern projectors available with three power intensities and four wavelengths designed for the most demanding structured light applications including 3D profilometry, stereovision and alignment.

The LTPR series consists of LTPRHP3W models featuring = 3W power intensity, LTPRXP models featuring = 10W power intensity designed for continuous mode operation and LTPRUP models designed for strobe-only operation with peak power intensity of = 90W.

Unlike laser sources, our LED pattern projectors ensure sharp edges and homogeneous light without scattering and diffraction effects.

Several projections patterns can be easily interchanged to project any kind of shape. Additionally LTPR features built in phase-adjustment for easy alignment of the pattern. Any C-mount optics can be interfaced with LTPR series to project areas with different sizes.

Part number	Optical specifications			Electrical specifications							
	Light color	Spectral FWHM (nm)	Illuminance ¹ (klux)	Operation mode	Supply voltage (V)	LED driving current, max (mA)		Power consumption	Pulse width	Estimated MTBF ⁴	Connection Type
LTPRHP3W											
LTPRHP3W-W	White	n.a.	30	continuous and pulsed mode ²	12 - 24 ³	720 ⁴	2000 ⁵ ⁶	<4.5	≤10 ⁷	> 100.000 ⁹	M8 industrial male connector ¹²
LTPRHP3W-R	Red, 630 nm	15	9								
LTPRHP3W-G	Green, 520 nm	40	14								
LTPRHP3W-B	Blue, 460 nm	20	3								
LTPRXP											
LTPRXP-W	White	n.a.	85	continuous mode only	24 ³	700 ⁴	n.a.	<13	n.a.	> 65.000 ¹⁰	M8 industrial male connector ¹³
LTPRXP-R	Red, 630 nm	20	40								
LTPRXP-G	Green, 520 nm	40	68								
LTPRXP-B	Blue, 460 nm	25	9								
LTPRUP											
LTPRUP-W	White	n.a.	170	strobe only, constant current driving	n.a.	n.a.	17000 ⁶	≈90 (strobe peak LED source power)	≤1 ⁸	> 50000 ¹¹	M12 industrial male connector ¹⁴
LTPRUP-R	Red, 618 nm	20	65								
LTPRUP-G	Green, 525 nm	40	220								
LTPRUP-B	Blue, 460 nm	30	20								

- With a 35 mm lens, F/N 1.4 at 100 mm working distance without projection pattern at maximum driving current. Estimated value.
- To pulse LTRHP3W, models built-in electronics must be bypassed in order to drive the LED directly.
- Tolerance ± 10%.
- Max continuous LED driving current is supplied through the built-in electronics. No external controller is required.
- At max LED pulsed current, max LED forward voltage (V) = 3.00 for LTRHP3W-R, 4.00 for LTRHP3W-G/B, 3.4 for LTRHP3W-W.

- To directly drive the LED, current control is necessary. External compatible controller from LTDV series must be used.
- At pulse width ≤ 10 ms, duty cycle ≤ 10% condition. Built-in electronics must be bypassed.
- At 25°C. At max pulse width (1 ms), max pulse frequency = 15 Hz. Contact us to check other admissible combinations of duty cycle-frequency-temperature.



LTPRHP3W-x models featuring built in electronics with multi-turn trimmer for light intensity dimming and ≈ 3W power intensity.

LTPRHP3W and LTPRXP models are designed for continuous mode and integrate built-in electronics that control the current flow through the LED.

LTPRHP3W models integrate a multi-turn trimmer for light intensity dimming while LTPRXP models have fixed current and cannot be dimmed. For LTPRHP3W models, the built-in electronics can be bypassed in order to directly drive the LED through an external controller.



LTPRXP-x models featuring built in electronics, fixed current output and ≈ 10W power intensity

The LTPRUP series offers the most powerful LED pattern projectors available from Opto Engineering®. These models are used in high speed applications where camera exposure time must be set to the minimum, including planarity control of opaque products and 3D profiling. LTPRUP models are designed for strobe-mode only and can be precisely controlled using compatible LTDV strobe controllers series. LTDV controllers are designed to drive the LED of LTPRUP pattern projectors with perfectly constant current, ensuring repeatable results even when low exposure time is required.



LTPRUP-x models for strobe-only operation featuring ≈ 90W peak power intensity. These models are compatible with CMH0016 clamping mechanics, alternatively three M4 and one M6 threads are available as fixing options.

Mechanical specifications				Compatibility				
External	Length 15	Width	Height	Strobe controllers	Lenses	Cable	Clamping mechanics	Projection patterns
Ø (mm)	(mm)	(mm)	(mm)					
37.5	130.4	-	-	LTDV1CH-17V, LTDVE8CH-20, LTDVE4CH-20	EN2MP series, EN5MP series, TC series, TCLWD series, TCHM series, TCEL series	CB244P1500, CB244P1500L	-	PTPR series
105	158.8	-	-		EN2MP series, EN5MP series	CB244P1501, CB244P1501L	-	PTPR series
37.7	108.9	46	93	LTDV1CH-17V, LTDV6CH, LTDVE8CH-20, LTDVE4CH-20	EN2MP series, EN5MP series, ENVF series, TC series, TCLWD series, TCHM series, TCEL series	CBLT001, CBLT002	CMH0016	PTPR series

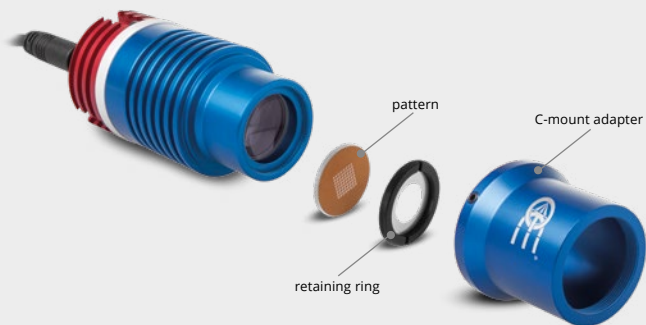
- 9** At 55 °C, 720mA.
- 10** At 110 °C.
- 11** At 25° C.
- 12** 2 m cable with straight female connector included (CB244P1500). Optional cable with right angled connector (CB244P1500L) is also available and must be ordered separately
- 13** 2 m cable with straight female connector included (CB244P1501). Optional cable with right angled connector (CB244P1501L) is also available and must be ordered separately

- 14** 5 m cable with straight female connector included (CBLT001). Optional cable with right angled connector (CBLT002) is also available and must be ordered separately
- 15** Including connector.

LTPR series

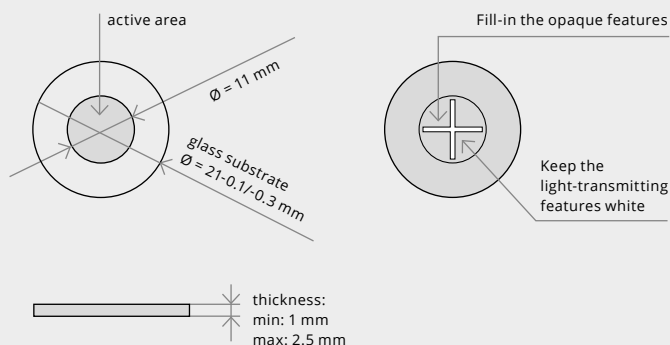
LED pattern projectors

Pattern selection

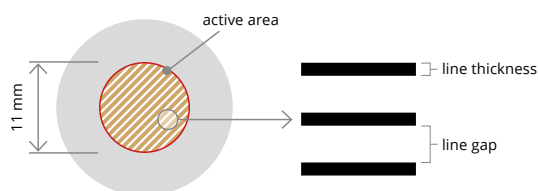


Custom-made pattern

Custom-made patterns can be supplied on request. A drawing with accurate geometrical information must be submitted (please refer to the instructions here below).



The projection pattern can be easily interchanged by unscrewing the retaining ring that holds the pattern. The pattern outer diameter is 21 mm, while the active projection area is a circle of \varnothing 11 mm.



The pattern drawing could either cover the entire 11 mm diameter area or be of any shape inscribed within this area (such as a square with 7.78 mm sides or a 8.8 x 6.6 mm rectangle).

The projection accuracy depends both on the pattern manufacturing accuracy and the distortion of the projection optics mounted on the LTPR models.

The edge sharpness of the projected pattern depends on both the lens resolution and the engraving technique: laser-engraved patterns (part numbers ending in "L") or photolithography-engraved patterns (part numbers ending in "P") can be chosen depending on the type of application.

Every kind of shape can be projected

Standard patterns



Stripe 0.5 mm line thickness.



Edge.

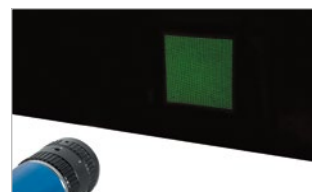


Grid 0.05 mm line thickness.













Line 0.5 mm line thickness.



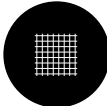



Custom patterns






3D profilometry

3D profilometry	Photolithography patterns	Laser engraved patterns	
Line & stripes	 <p>PT 0000 0100 P format: line line thickness 0.05 mm</p>	 <p>PT 0000 0300 P 8 lines in projection area line gap 0.95 mm line thickness 0.05 mm line length 7.78 mm</p>	 <p>PT 0000 0100 L format: line line thickness 0.5 mm</p>
	 <p>PTST 050 450 P 16 lines in projection area line gap 0.45 mm line thickness 0.05 mm</p>	 <p>PTST 050 200 P 32 lines in projection area line gap 0.20 mm line thickness 0.05 mm</p>	 <p>PT 0000 0300 L format: stripe line gap 0.5 mm line thickness 0.5 mm line length 7.78 mm</p>
	 <p>PTST 050 100 P 53 lines in projection area line gap 0.10 mm line thickness 0.05 mm</p>	 <p>PTST 050 050 P 80 lines in projection area line gap 0.05 mm line thickness 0.05 mm</p>	
	 <p>PTST 010 010 P 550 lines in projection area line gap 0.01 mm line thickness 0.01 mm</p>	 <p>PTST 020 020 P 275 lines in projection area line gap 0.02 mm line thickness 0.02 mm</p>	

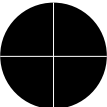
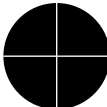
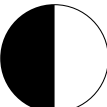
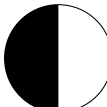
Stereovision

Stereovision	Photolithography patterns	Laser engraved patterns	
Grids	 <p>PT 0000 0400 P 8 x 8 lines in projection area line gap 0.95 mm line thickness 0.05 mm line length 7.78 mm</p>	 <p>PTGR 050 450 P 16 x 16 lines in projection area line gap 0.45 mm line thickness 0.05 mm</p>	 <p>PT 0000 0400 L format: grid line gap 0.8 mm line thickness 0.2 mm line length 7.78 mm</p>
	 <p>PTGR 050 200 P 32 x 32 lines in projection area line gap 0.20 mm line thickness 0.05 mm</p>	 <p>PTGR 050 100 P 53 x 53 lines in projection area line gap 0.10 mm line thickness 0.05 mm</p>	
	 <p>PTGR 050 050 P 80 x 80 lines in projection area line gap 0.05 mm line thickness 0.05 mm</p>		

Cloud of dots

Cloud of dots	Photolithography patterns	Laser engraved patterns	
Cloud of dots	 <p>PTCD 010 P Format: Cloud of dots pattern, density 10.5%</p>	 <p>PTCD 020 P Format: Cloud of dots pattern, density 20%</p>	
	 <p>PTCD 035 P Format: Cloud of dots pattern, density 35%</p>		

Alignment

Alignment	Photolithography patterns	Laser engraved patterns
Cross	 <p>PT 0000 0200 P format: cross line thickness 0.05 mm</p>	 <p>PT 0000 0200 L format: cross line thickness 0.5 mm</p>
Edge	 <p>PT 0000 0500 P format: edge line gap 0.10 mm line thickness 0.05 mm</p>	 <p>PT 0000 0500 L format: edge line gap 0.10 mm line thickness 0.5 mm</p>

Pattern specifications

	Photolithography	Laser engraved
Substrate	Soda lime glass	Borofloat glass
Coating	Chrome	Dichroic mirror
Geometrical accuracy	2 µm	50 µm
Edge sharpness	1.4 µm	50 µm

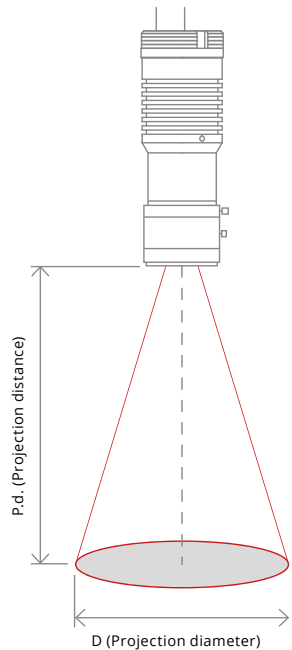
LTPR series

LED pattern projectors

Projection lens selection

Any C-mount optics for 2/3" detectors (11 mm image diagonal) can be interfaced with the LTPR series to project areas with different sizes by means of the mount adaptor included.

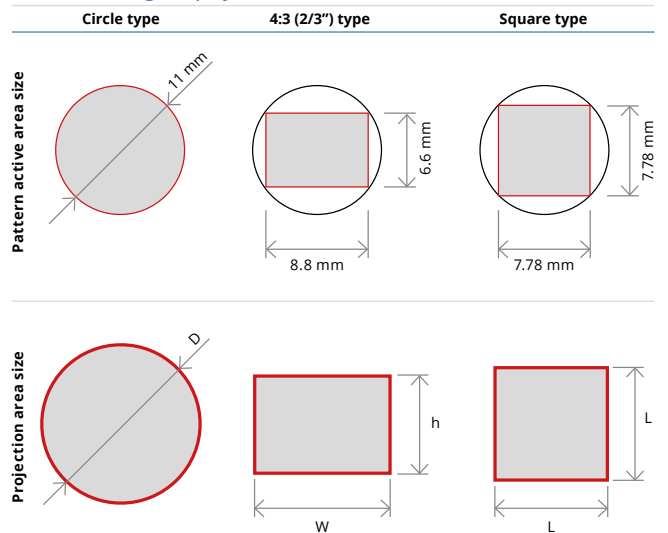
Unless the projection optics introduces significant distortion, the shape of the projected pattern will preserve the features and aspect ratio of the engraved pattern.



The projected area dimensions will be "M" times the original dimensions of the pattern, where M is the optical magnification at which the selected projection lens is operating.

Telecentric lenses for 2/3" detectors can also be interfaced with LTPRHP3W and LTPRUP models, thus providing telecentric projection of the pattern and enabling unparalleled performance in 3D measurement applications.

Pattern drawing and projection area



Below follows a list of the projection diameters (D) and the recommended projection distances (P.d.) achieved with different types of optics.

2 / 3" C-mount lenses

P.d.	@50 mm	@75 mm	@100 mm	@150 mm	@200 mm	@250 mm	@300 mm	@400 mm	@500 mm
Focal length	D (Projection diameter) (mm)								
6 mm	81	127	172	264					
8 mm	58 (*)	92	127	195	264	333			
12 mm	35 (*)	58 (*)	81	127	172	218	264		
16 mm		41 (*)	58 (*)	92 (*)	127	161	195	264	333
25 mm				55 (*)	77 (*)	99 (*)	121 (*)	165	209 (*)
35 mm						68 (*)	83 (*)	115	146

(*) = spacers may be needed to compensate back focal length.

LTPRHP3W



Standard C-mount lenses.

LTPRXP 1



Standard C-mount lenses.

LTPRUP



Standard C-mount lenses.

Telecentric lenses

	TC 23 004	TC 23 007	TC 23 009	TC 23 016	TC 23 024	TC 23 036
P.d. (mm)	56	60.1	62.2	43.1	67.2	102.5
D (mm)	5.5	8.3	11	20.8	31.4	45.2
	TC 23 048	TC 23 056	TC 23 064	TC 23 072	TC 23 080	TC 23 096
P.d. (mm)	132.9	157.8	181.8	226.7	226.7	278.6
D (mm)	59.8	70	80	89.9	99.7	117.8

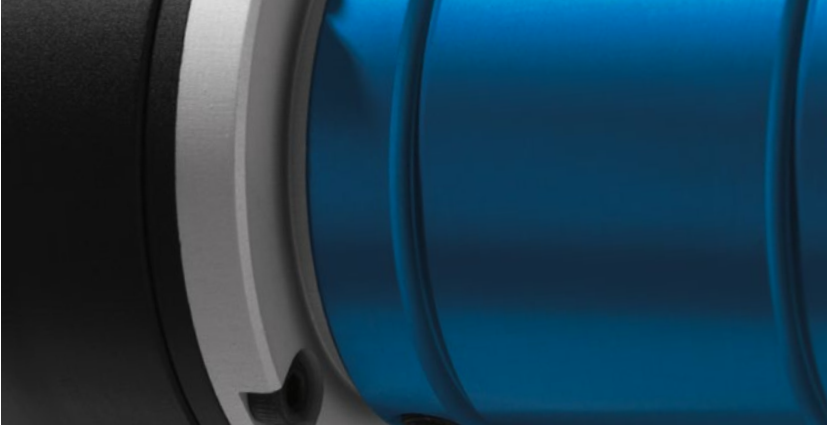






Bi-telecentric lenses.



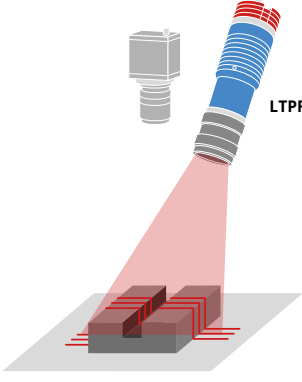
Bi-telecentric lenses.

1 Use of LTPRXP in combination with telecentric lenses is not suggested due to non-homogeneous projection (the light source is a multi-die LED). Contact us to discuss your application and find the most suitable pattern projector.



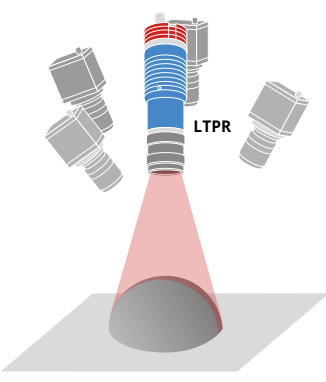
FULL RANGE OF COMPATIBLE PROJECTION OPTICS		
	EN5MP series	p. 76
FULL RANGE OF COMPATIBLE ACCESSORIES		
	Projection patterns PTPR series	p. 243
	Strobe controllers LTDV series	p. 252
	Clamping mechanics CMH0016	p. 248

Application examples



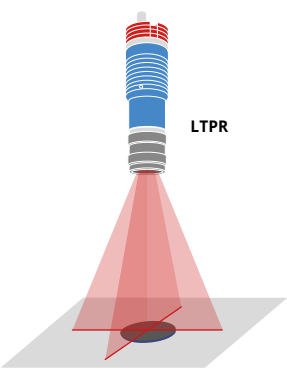
LTPR

3D profilometry



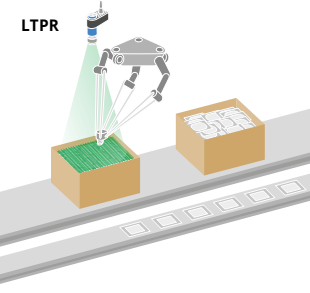
LTPR

Stereovision



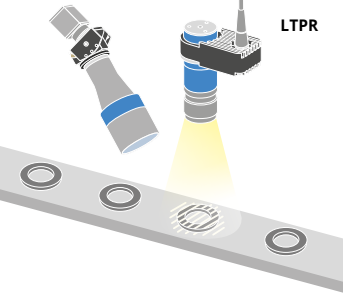
LTPR

Alignment



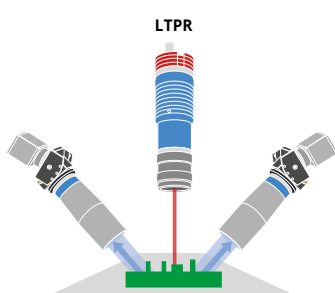
LTPR

Bin picking
(robot guidance for fast pick and place)



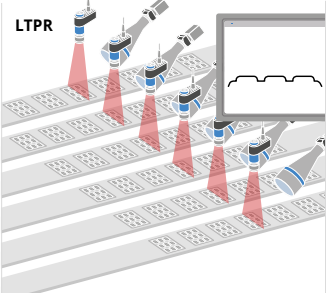
LTPR

Planarity control of black products
(LTPRUP strobe projector suggested)



LTPR

3D inspection of the height
of connector pins



LTPR

Pharmaceutical blister volume
vision control

LTPRSMHP3W series

3W tilting LED pattern projectors



KEY ADVANTAGES

Scheimpflug tilt adjustment compatible with C-mount optics

Focus is maintained even when the pattern is tilted.

Light condenser focusing mechanism

For excellent optical coupling and light throughput.

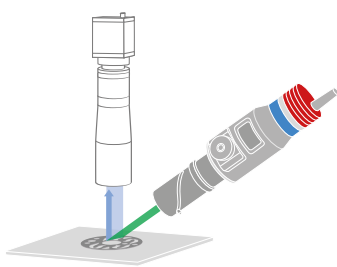
Enhanced optical power

High numerical aperture condenser lens.

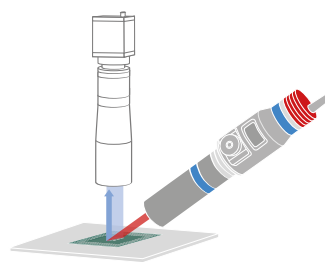
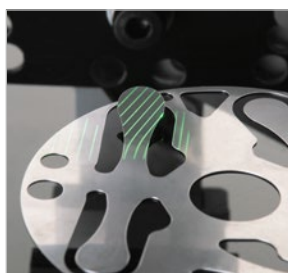
The LTPRSMHP3W series offers LED pattern projectors specifically designed for the most demanding 3D profiling and measurement applications. Triangulation techniques require structured light to be directed onto a sample at a considerable angle from vertical. Tilting the light source pattern becomes essential to ensure that the patterned light is properly focused across the entire sample surface.

LTPRSMHP3W pattern projectors integrate a precision tilting mechanism based on the Scheimpflug condition. This ensures that focus is maintained across the entire part, and reconstruction of the 3D surface is as accurate as possible. Moreover, the internal focus mechanism offers the maximum optical throughput.

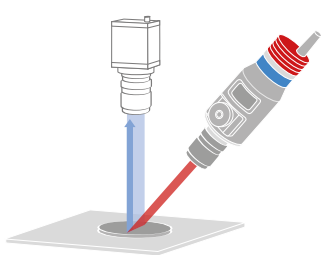
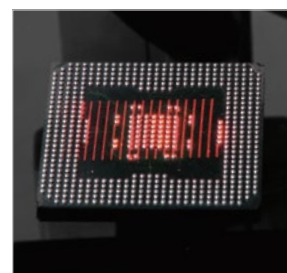
Examples of setup and applications



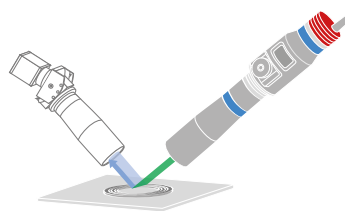
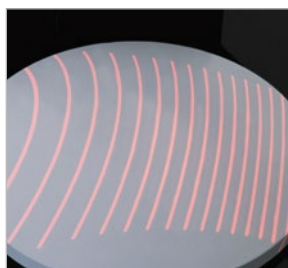
Configuration with zero distortion macro lenses.



Configuration with bi-telecentric lenses.



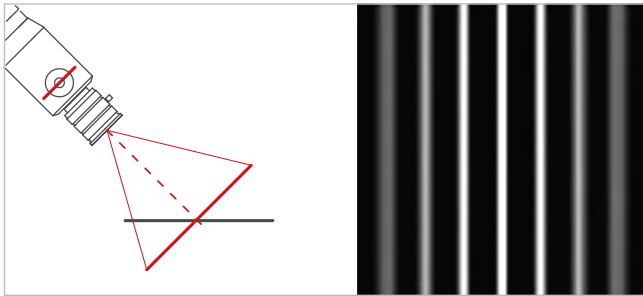
LTPRSM pattern projector with a standard C-mount lens.



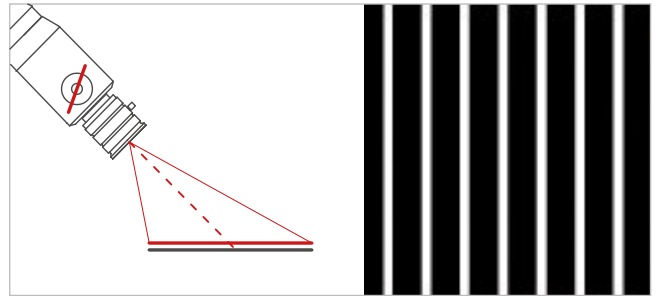
Scheimpflug telecentric optics for both projection and imaging at 90°.

LIGHT SOURCE

- Higher efficiency
- Precise light intensity adjustment
- Easy LED source replacement



Without tilt adjustment the pattern features are only partly focused.



With the Scheimpflug adjustment focus is maintained across the entire plane.

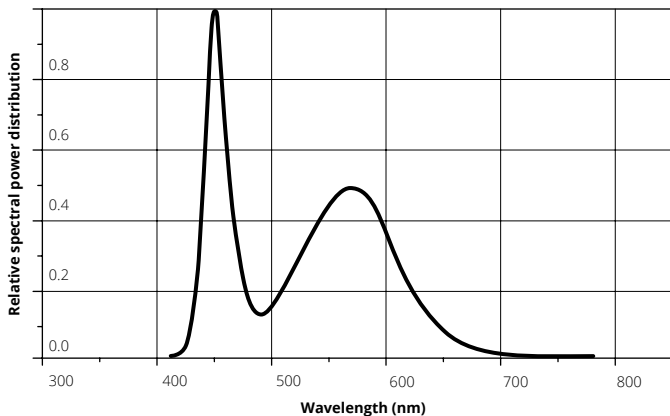


Electrical features

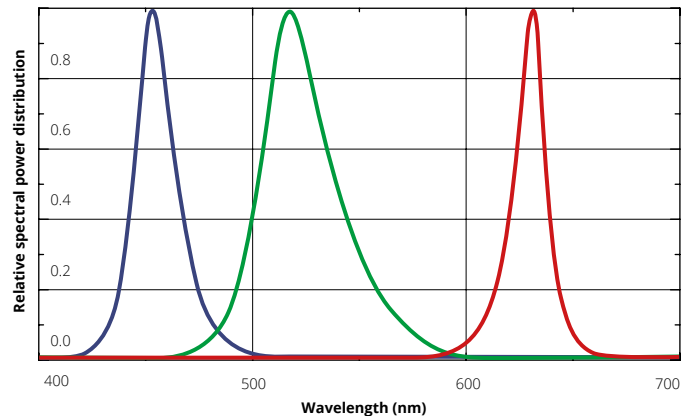
These LED devices integrate built-in switching electronics that control the current flow through the LED and which can be easily tuned by the user. This ensures both light stability and longer lifetime of the product.

The inner circuitry can be bypassed to directly drive the LED. Simply connect the black and blue wires to your power supply instead of the black and brown ones, ensuring that maximum rates are not exceeded.

Typical emission spectrum of white LEDs



Typical emission spectrum of R,G,B LEDs



Part number	Light Light color, wavelength peak	Device power ratings				LED power ratings		
		DC Voltage		Power consumption (W)	Max LED forward current (mA)	Forward voltage		Max pulse current (mA)
		Minimum (V)	Maximum (V)			Typical (V)	Maximum (V)	
LTPRSMHP 3W-R	red, 630 nm	12	24	< 4.5	720	2.4	3.00	2000
LTPRSMHP 3W-G	green, 520 nm	12	24	< 4.5	720	3.3	4.00	2000
LTPRSMHP 3W-B	blue, 460 nm	12	24	< 4.5	720	3.3	4.00	2000
LTPRSMHP 3W-W	white	12	24	< 4.5	720	2.78	n.a.	2000

- 1 Tolerance $\pm 10\%$.
- 2 Used in continuous (not pulsed) mode.
- 3 At max forward current.

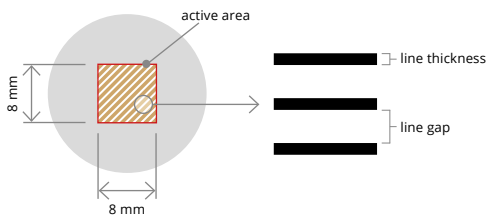
- 4 Tolerance is $\pm 0.06V$ on forward voltage measurements.
- 5 At pulse width ≤ 10 ms, duty cycle $\leq 10\%$ condition.
Built-in electronics board must be bypassed (see tech info online).

LTPRSMHP3W series

3W tilting LED pattern projectors



Pattern selection



The projection pattern placed inside the unit can be changed with ease: just remove the C-mount adaptor by loosening the set-screws and fix the pattern by securing the retaining ring.

Different types of stripe and grid patterns are available; the chart shows the line thickness (0.05 mm) and the gap between neighbouring lines for each pattern type.

When these features are projected, they become 1/M times larger, with "M" being the magnification of the projection lens. The number of lines mentioned after each part number indicates the number of features on the active area of the pattern.

Photolithography stripe patterns

PT 0000 0300 P
8 lines in projection area
line gap 0.95 mm
line thickness 0.05 mm
line length 7.78 mm

PTST 050 450 P
16 lines in projection area
line gap 0.45 mm
line thickness 0.05 mm

PTST 050 200 P
32 lines in projection area
line gap 0.20 mm
line thickness 0.05 mm

PTST 050 100 P
53 lines in projection area
line gap 0.10 mm
line thickness 0.05 mm

PTST 050 050 P
80 lines in projection area
line gap 0.05 mm
line thickness 0.05 mm

Photolithography grid patterns

PT 0000 0400 P
8 x 8 lines in projection area
line gap 0.95 mm
line thickness 0.05 mm
line length 7.78 mm

PTGR 050 450 P
16 x 16 lines in projection area
line gap 0.45 mm
line thickness 0.05 mm

PTGR 050 200 P
32 x 32 lines in projection area
line gap 0.20 mm
line thickness 0.05 mm

PTGR 050 100 P
53 x 53 lines in projection area
line gap 0.10 mm
line thickness 0.05 mm

PTGR 050 050 P
80 x 80 lines in projection area
line gap 0.05 mm
line thickness 0.05 mm

Pattern specifications

Photolithography patterns

Substrate	Soda lime glass
Coating	Chrome
Geometrical accuracy	2 µm
Edge sharpness	1.4 µm

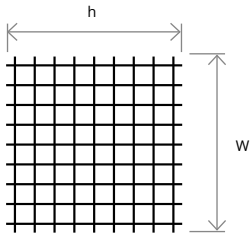
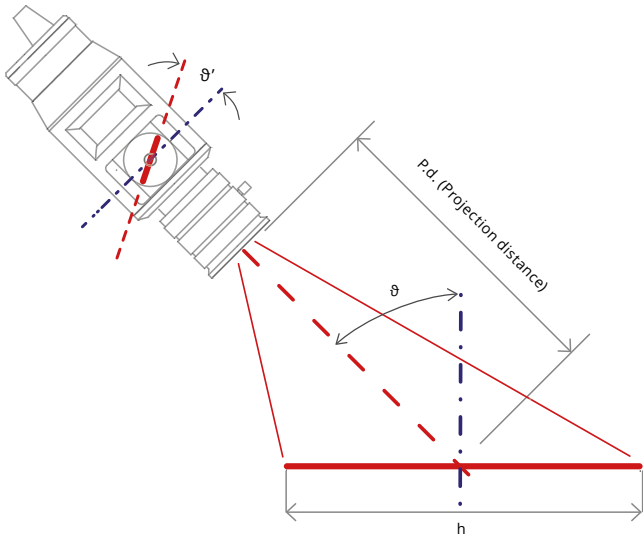
FULL RANGE OF COMPATIBLE PROJECTION OPTICS

	TC series	p. 20
	MC series	p. 78

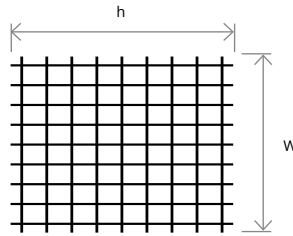
FULL RANGE OF PROJECTION PATTERNS

	PTPR series	p. 243
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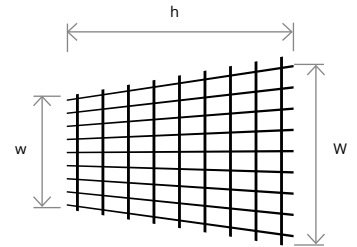
Projection lens selection



Original pattern features



Projection area with a bi-telecentric lens



Projection area with a macro lens

LTPRSMHP3W series units can be interfaced with any type of optics, but the best results are achieved with bi-telecentric lenses. The projection area is undistorted since tilting the pattern causes a linear extension along only one direction.

Excellent results can also be obtained with zero distortion macro lenses; here, the magnification changes along both axes, but image resolution and distortion still easily allows for 3D reconstruction.

With non bi-telecentric lenses, a square pattern becomes a trapezoid in the projection plane, whose parallel sides are indicated as "w" and "W" in the drawings below.

The projection areas shown in the chart are also a good approximation for standard C-mount lenses used as macro lenses.

Projection area with bi-telecentric lenses (TC series)

Part number	Projection distance P.d. (mm)	$\vartheta = 0^\circ$			$\vartheta = 15^\circ$			$\vartheta = 30^\circ$			$\vartheta = 45^\circ$		
		Projection area W x h (mm x mm)	Pattern tilt ϑ' (deg)		Projection area W x h (mm x mm)	Pattern tilt ϑ' (deg)		Projection area W x h (mm x mm)	Pattern tilt ϑ' (deg)		Projection area W x h (mm x mm)	Pattern tilt ϑ' (deg)	
TC 23 009	63.3	8.0 x 8.0	0	8.0 x 8.0	15.0	8.0 x 8.0	30.0	8.0 x 8.0	45.0				
TC 23 016	45.3	15.2 x 15.2	0	15.2 x 15.4	8.1	15.2 x 16.8	17.0	15.2 x 20.0	27.8				
TC 23 024	69.2	22.9 x 22.9	0	22.9 x 23.6	5.4	22.9 x 26.0	11.4	22.9 x 30.5	19.3				
TC 23 036	103.5	32.9 x 32.9	0	32.9 x 34.0	3.7	32.9 x 37.7	8.0	32.9 x 45.3	13.6				
TC 23 048	134.6	43.3 x 43.3	0	43.3 x 44.7	2.8	43.3 x 49.8	6.1	43.3 x 60.3	10.5				
TC 23 056	159.3	51.0 x 51.0	0	51.0 x 52.8	2.4	51.0 x 58.6	5.1	51.0 x 71.3	8.8				
TC 23 064	182.0	58.2 x 58.2	0	58.2 x 60.3	2.1	58.2 x 67.1	4.5	58.2 x 81.7	7.8				
TC 23 080	227.0	72.7 x 72.7	0	72.7 x 73.8	1.7	72.7 x 83.6	3.6	72.7 x 102.0	6.3				
TC 23 096	279.0	85.6 x 85.6	0	85.6 x 88.6	1.4	85.6 x 98.7	3.1	85.6 x 120.9	5.3				



Bi-telecentric lenses.

Projection area with macro (MC3-03x and MC series) and standard lenses

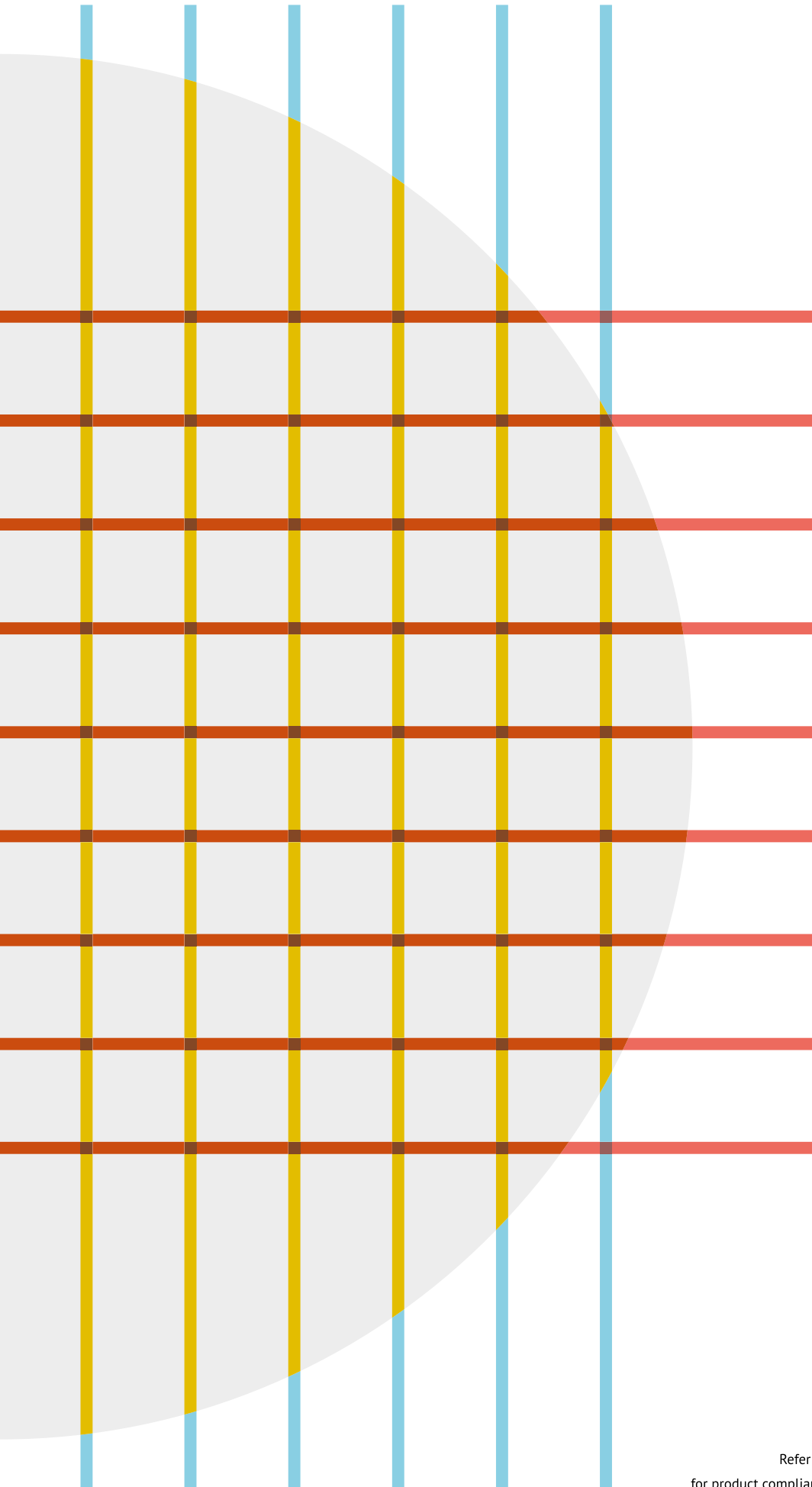
Mag. (x)	Projection distance P.d. (mm)	$\vartheta = 0^\circ$			$\vartheta = 15^\circ$			$\vartheta = 30^\circ$			$\vartheta = 45^\circ$		
		Projection area w (mm)	(W) x h (mm x mm)	Pattern tilt ϑ' (deg)	Projection area w (mm)	(W) x h (mm x mm)	Pattern tilt ϑ' (deg)	Projection area w (mm)	(W) x h (mm x mm)	Pattern tilt ϑ' (deg)	Projection area w (mm)	(W) x h (mm x mm)	Pattern tilt ϑ' (deg)
1	46.0	8.0	(8.0) x 8.0	0	7.7	(8.3) x 8.0	15.0	7.5	(8.6) x 8.1	30.0	7.3	(8.9) x 8.1	45.0
0.75	48.0	10.7	(10.7) x 10.7	0	10.3	(11.1) x 10.9	11.4	10.0	(11.6) x 11.4	23.5	9.6	(12.1) x 12.3	37.0
0.5	60.0	16.1	(16.1) x 16.1	0	15.5	(16.7) x 16.5	7.6	14.9	(17.5) x 17.9	16.2	14.3	(18.4) x 20.7	26.7
0.33	92.0	24.3	(24.3) x 24.3	0	23.4	(25.3) x 25.1	5.1	22.5	(26.5) x 27.8	10.8	21.4	(28.1) x 33.3	18.3
0.2	136.0	40.1	(40.1) x 40.1	0	38.6	(41.6) x 42.1	3.1	37.0	(43.6) x 46.2	6.6	35.1	(46.6) x 56.8	11.4
0.1	275.0	79.5	(79.5) x 79.5	0	76.6	(82.6) x 82.4	1.6	73.5	(86.6) x 92.3	3.4	69.6	(92.6) x 114.2	5.8



Standard C-mount lenses.



Macro lenses.



Refer to specific datasheets available at www.opto-e.com for product compliancy with regulations, certifications and safety labels.

ACCESSORIES

Although accessories are often considered optional, they are in fact essential in many applications to efficiently use a product or even to enhance its performance.

Opto Engineering® extensive range of accessories has been designed and selected to ensure hassle-free and quick integration of our imaging components into your vision system. Our accessories perfectly complement our product range and have been specifically tested in combination with our products to maximize performance.

Our selection includes mounting mechanics, filters, protective windows, first surface mirrors and beam splitters, calibration patterns, projection patterns, in addition to strobe controllers and stepper motor controllers. Please check our website to view the entire range and get the most updated information.

Diffusing & polarizing plates for lighting	239
Projection patterns	243
Mounting mechanics	251
LED controllers	252
LED sources & replacements	258
Power supplies	262
Cables	264

Diffusing & polarizing plates for lighting

Opto Engineering® offers **accessories for illumination including diffusers and polarizers**. Diffusers are designed to improve light uniformity while polarizers can help reduce unwanted reflections when used in combination with a polarizing filter on the camera.

DFLT series

Diffusion plates for lighting

NEW



Opto Engineering® offers a series of diffusion plates available as accessories to be positioned between the LED sources of our illuminators and the workpieces to be inspected.

Diffusers can help avoid the formation of hot spots, especially on glossy workpieces, and provide better light uniformity.

Part number	Description	Thickness (mm)	Compatible products
For ring lights			
DFLTZGK040-00-2	Diffuser for LED ring light, 2 LED rows, outer diameter 43 mm, 0°	2	LTZGK040-00-2-x-24V
DFLTZGK050-00-2	Diffuser for LED ring light, 2 LED rows, outer diameter 44 mm, 0°	2	LTZGK050-00-2-x-24V
DFLTZGK070-00-3	Diffuser for LED ring light, 3 LED rows, outer diameter 70 mm, 0°	3	LTZGK070-00-3-x-24V
DFLTZGK090-00-4	Diffuser for LED ring light, 4 LED rows, outer diameter 92 mm, 0°	4	LTZGK090-00-4-x-24V
DFLTZGK050-15-2	Diffuser for LED ring light, 2 LED rows, outer diameter 50 mm, 15°	2	LTZGK050-15-2-x-24V
DFLTZGK070-15-3	Diffuser for LED ring light, 3 LED rows, outer diameter 70 mm, 15°	2	LTZGK070-15-3-x-24V
DFLTZGK090-15-4	Diffuser for LED ring light, 4 LED rows, outer diameter 92 mm, 15°	2	LTZGK090-15-4-x-24V
DFLTZGK100-15-5	Diffuser for LED ring light, 5 LED rows, outer diameter 103 mm, 15°	2	LTZGK100-15-5-x-24V
DFLTZZO130-75-3	Diffuser for LED low angle ring light, 3 LED rows, outer diameter 131 mm, 75°	2	LTTZO130-75-3-x-24V
DFLTZZO170-75-3	Diffuser for LED low angle ring light, 3 LED rows, outer diameter 175 mm, 75°	2	LTTZO170-75-3-x24V
For bar lights			
DFLTZPFL040-00-6	Diffuser for LED bar light, 6 LED rows, 40x26.3 illumination area	2	LTPFL040-00-6-x-24V
DFLTZPFL080-00-6	Diffuser for LED bar light, 6 LED rows, 80x26.3 illumination area	2	LTPFL080-00-6-x-24V
DFLTZPFL120-00-6	Diffuser for LED bar light, 6 LED rows, 120x26.3 illumination area	2	LTPFL120-00-6-x-24V
DFLTZPFL160-00-6	Diffuser for LED bar light, 6 LED rows, 160x26.3 illumination area	2	LTPFL160-00-6-x-24V
DFLTZPFL200-00-6	Diffuser for LED bar light, 6 LED rows, 200x26.3 illumination area	2	LTPFL200-00-6-x-24V

PLLT series

Polarizing plates for lighting

NEW



Opto Engineering® offers a series of polarizers available as accessories to be positioned between the LED sources of our illuminators and the workpieces to be inspected. Polarizers can help reduce reflections when used in combination with a polarizing filter on the camera, especially on glossy workpieces. Polarizers can be very useful in applications inspecting workpieces packed in transparent plastic bags.

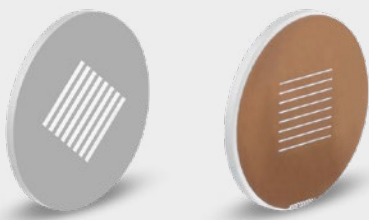
Part number	Description	Thickness (mm)	Compatible products
For ring lights			
PLLTZGK040-00-2	Polarizer for LED ring light, 2 LED rows, outer diameter 43 mm, 0°	0.8	LTZGK040-00-2-x-24V
PLLTZGK050-00-2	Polarizer for LED ring light, 2 LED rows, outer diameter 54 mm, 0°	0.8	LTZGK050-00-2-x-24V
PLLTZGK070-00-3	Polarizer for LED ring light, 3 LED rows, outer diameter 68 mm, 0°	0.8	LTZGK070-00-3-x-24V
PLLTZGK090-00-4	Polarizer for LED ring light, 4 LED rows, outer diameter 92 mm, 0°	0.8	LTZGK090-00-4-x-24V
PLLTZGK050-15-2	Polarizer for LED ring light, 2 LED rows, outer diameter 50 mm, 15°	0.8	LTZGK050-15-2-x-24V
PLLTZGK070-15-3	Polarizer for LED ring light, 3 LED rows, outer diameter 70 mm, 15°	0.8	LTZGK070-15-3-x-24V
PLLTZGK090-15-4	Polarizer for LED ring light, 4 LED rows, outer diameter 92 mm, 15°	0.8	LTZGK090-15-4-x-24V
PLLTZGK100-15-5	Polarizer for LED ring light, 5 LED rows, outer diameter 103 mm, 15°	0.8	LTZGK100-15-5-x-24V
PLLTZZO130-75-3	Polarizer for LED low angle ring light, 3 LED rows, outer diameter 131 mm, 75°	0.8	LTZZO130-75-3-x-24V
PLLTZZO170-75-3	Polarizer for LED low angle ring light, 3 LED rows, outer diameter 175 mm, 75°	0.8	LTZZO170-75-3-x-24V
For bar lights			
PLLTZPFL040-00-6-H	Horizontal polarizer for LED bar light, 6 LED rows, 40x26.3 illumination area	0.8	LTZPFL040-00-6-x-24V
PLLTZPFL040-00-6-V	Vertical polarizer for LED bar light, 6 LED rows, 40x26.3 illumination area	0.8	LTZPFL040-00-6-x-24V
PLLTZPFL080-00-6-H	Horizontal polarizer for LED bar light, 6 LED rows, 80x26.3 illumination area	0.8	LTZPFL080-00-6-x-24V
PLLTZPFL080-00-6-V	Vertical polarizer for LED bar light, 6 LED rows, 80x26.3 illumination area	0.8	LTZPFL080-00-6-x-24V
PLLTZPFL120-00-6-H	Horizontal polarizer for LED bar light, 6 LED rows, 120x26.3 illumination area	0.8	LTZPFL120-00-6-x-24V
PLLTZPFL120-00-6-V	Vertical polarizer for LED bar light, 6 LED rows, 120x26.3 illumination area	0.8	LTZPFL120-00-6-x-24V
PLLTZPFL160-00-6-H	Horizontal polarizer for LED bar light, 6 LED rows, 160x26.3 illumination area	0.8	LTZPFL160-00-6-x-24V
PLLTZPFL160-00-6-V	Vertical polarizer for LED bar light, 6 LED rows, 160x26.3 illumination area	0.8	LTZPFL160-00-6-x-24V
PLLTZPFL200-00-6-H	Horizontal polarizer for LED bar light, 6 LED rows, 200x26.3 illumination area	0.8	LTZPFL200-00-6-x-24V
PLLTZPFL200-00-6-V	Vertical polarizer for LED bar light, 6 LED rows, 200x26.3 illumination area	0.8	LTZPFL200-00-6-x-24V

Projection patterns

Opto Engineering® offers a **wide range of interchangeable chrome on glass patterns** compatible with our LED pattern projectors. Many formats are available as standard off the shelf products, including “**line & stripes**” for 3D profilometry, “**grids**” and “**cloud of dots**” for stereovision applications or “**crosses**” for simple alignment purposes. **Custom patterns can also be supplied upon request** to project any desired shape.

PTPR series

Projection patterns for LED projectors



Opto Engineering® supplies a comprehensive range of projection patterns compatible with our LED pattern projectors. PT projection patterns can be either laser-engraved, with 50 µm geometrical accuracy, or photolithography-engraved for more demanding applications (2 µm accuracy). Custom geometry patterns can also be provided upon request.

Part number	Format	Process	Substrate (mm)	Coating (mm)	Line spacing (mm)	Thickness (mm)	Geometrical accuracy (µm)	Edge sharpness (µm)	With LTPRHP, LTPRXP and LTPRUP projectors (circular aperture)			With LTPRSMHP projectors (square aperture)		
									Active area (mm)	Number of lines	Max line length (mm)	Active area (mm)	Number of lines	Line length (mm)
PT 0000 0100 P	Line	Photolithography	Soda lime glass	Chrome	-	0.05	2	1.4	11	1	11	8 x 8	1	8
PT 0000 0100 L	Line	Laser engraving	Borofloat glass	Dichroic mirror	-	0.5	50	50	11	1	11	8 x 8	1	8
PT 0000 0200 P	Line	Photolithography	Soda lime glass	Chrome	-	0.05	2	1.4	11	-	11	8 x 8	-	8
PT 0000 0200 L	Line	Laser engraving	Borofloat glass	Dichroic mirror	-	0.5	50	50	11	-	11	8 x 8	-	8
PT 0000 0300 P	Stripes	Photolithography	Soda lime glass	Chrome	0.95	0.05	2	1.4	11	8	7.78	8 x 8	8	7.78
PT 0000 0300 L	Stripes	Laser engraving	Borofloat glass	Dichroic mirror	0.5	0.5	50	50	11	8	7.78	8 x 8	8	7.78
PT 0000 0400 P	Grid	Photolithography	Soda lime glass	Chrome	0.95	0.05	2	1.4	11	8 x 8	7.78	8 x 8	8 x 8	7.78
PT 0000 0400 L	Grid	Laser engraving	Borofloat glass	Dichroic mirror	0.8	0.2	50	50	11	8 x 8	7.78	8 x 8	8 x 8	7.78
PT 0000 0500 P	Edge	Photolithography	Soda lime glass	Chrome	-	-	2	1.4	11	-	-	8 x 8	-	-
PT 0000 0500 L	Edge	Laser engraving	Borofloat glass	Dichroic mirror	-	-	50	50	11	-	-	8 x 8	-	-
PTST 050 450 P	Stripes	Photolithography	Soda lime glass	Chrome	0.45	0.05	2	1.4	11	22	11	8 x 8	16	8
PTST 050 200 P	Stripes	Photolithography	Soda lime glass	Chrome	0.2	0.05	2	1.4	11	44	11	8 x 8	32	8
PTST 050 100 P	Stripes	Photolithography	Soda lime glass	Chrome	0.1	0.05	2	1.4	11	73	11	8 x 8	53	8
PTST 050 050 P	Stripes	Photolithography	Soda lime glass	Chrome	0.05	0.05	2	1.4	11	110	11	8 x 8	80	8
PTST 010 010 P	Stripes	Photolithography	Soda lime glass	Chrome	0.01	0.01	2	1.4	11	550	11	8 x 8	400	8
PTST 020 020 P	Stripes	Photolithography	Soda lime glass	Chrome	0.02	0.02	2	1.4	11	275	11	8 x 8	200	8
PTGR 050 450 P	Grid	Photolithography	Soda lime glass	Chrome	0.45	0.05	2	1.4	11	22 x 22	11	8 x 8	16 x 16	8
PTGR 050 200 P	Grid	Photolithography	Soda lime glass	Chrome	0.2	0.05	2	1.4	11	44 x 44	11	8 x 8	32 x 32	8
PTGR 050 100 P	Grid	Photolithography	Soda lime glass	Chrome	0.1	0.05	2	1.4	11	73 x 73	11	8 x 8	53 x 53	8
PTGR 050 050 P	Grid	Photolithography	Soda lime glass	Chrome	0.05	0.05	2	1.4	11	110 x 110	11	8 x 8	80 x 80	8
PTCD 010 P 1	Grid	Cloud of dots pattern density 10.5%	Soda lime glass	Chrome	-	0.05	2	1.4	-	-	-	8 x 8	-	-
PTCD 020 P 2	Grid	Cloud of dots pattern density 20%	Soda lime glass	Chrome	-	0.05	2	1.4	-	-	-	8 x 8	-	-
PTCD 035 P 2	Grid	Cloud of dots pattern density 35%	Soda lime glass	Chrome	-	0.05	2	1.4	-	-	-	8 x 8	-	-

1 Dot size = 0.04 mm x 0.04 mm

2 Dot size = 0.08 mm x 0.08 mm



Grid 0.05 mm line thickness.



Stripe 0.5 mm line thickness.



Edge.



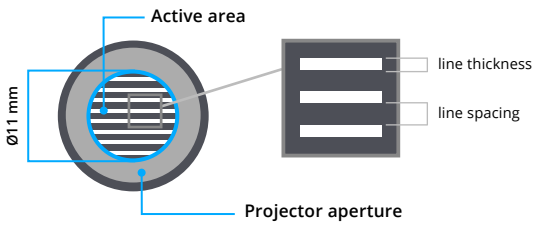
Line 0.5 mm line thickness.

Compatible pattern projectors for machine vision

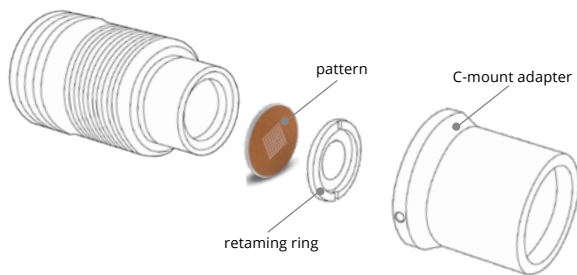
Circular aperture



LTPRHP3W, LTPRXP, LTPRUP pattern projectors.



Pattern mounted on projector with circular aperture and active area.

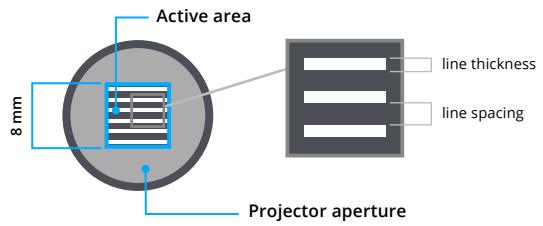


Pattern projector with circular aperture disassembled.

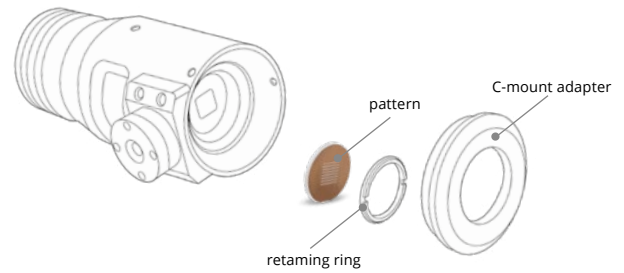
Square aperture



LTPRSMHP3W pattern projectors.



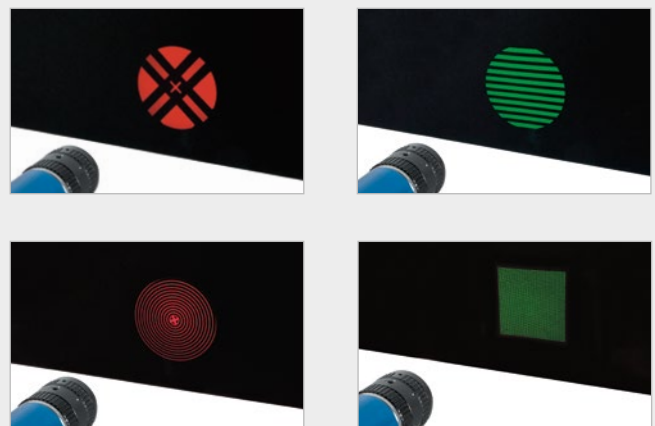
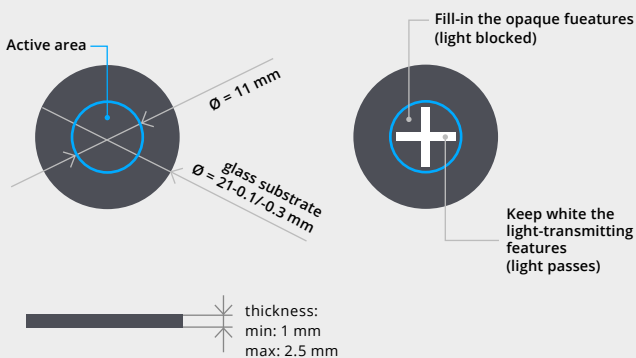
Pattern mounted on projector with square aperture and active area.



Pattern projector with square aperture disassembled.

Custom-made pattern

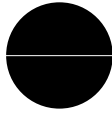
Custom-made patterns can be supplied on request. A drawing with accurate geometrical information must be submitted (please refer to the instructions here below).



Every kind of shape can be projected.

3D profilometry

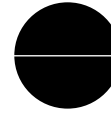
Line & stripes



PT 0000 0100 P
format: line
line thickness 0.05 mm



PT 0000 0300 P
8 lines in projection area
line gap 0.95 mm
line thickness 0.05 mm
line length 7.78 mm



PT 0000 0100 L
format: line
line thickness 0.5 mm



PTST 050 450 P
16 lines in projection area
line gap 0.45 mm
line thickness 0.05 mm



PTST 050 200 P
32 lines in projection area
line gap 0.20 mm
line thickness 0.05 mm



PT 0000 0300 L
format: stripe
line gap 0.5 mm
line thickness 0.5 mm
line length 7.78 mm



PTST 050 100 P
53 lines in projection area
line gap 0.10 mm
line thickness 0.05 mm



PTST 050 050 P
80 lines in projection area
line gap 0.05 mm
line thickness 0.05 mm



PTST 010 010 P
550 lines in projection area
line gap 0.01 mm
line thickness 0.01 mm



PTST 020 020 P
275 lines in projection area
line gap 0.02 mm
line thickness 0.02 mm

Stereovision

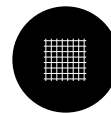
Grids



PT 0000 0400 P
8 x 8 lines in projection area
line gap 0.95 mm
line thickness 0.05 mm
line length 7.78 mm



PTGR 050 450 P
16 x 16 lines in projection area
line gap 0.45 mm
line thickness 0.05 mm



PT 0000 0400 L
format: grid
line gap 0.8 mm
line thickness 0.2 mm
line length 7.78 mm



PTGR 050 200 P
32 x 32 lines in projection area
line gap 0.20 mm
line thickness 0.05 mm



PTGR 050 100 P
53 x 53 lines in projection area
line gap 0.10 mm
line thickness 0.05 mm



PTGR 050 050 P
80 x 80 lines in projection area
line gap 0.05 mm
line thickness 0.05 mm

Cloud of dots



PTCD 010 P
Format:
Cloud of dots pattern,
density 10.5%



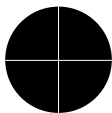
PTCD 020 P
Format:
Cloud of dots pattern,
density 20%



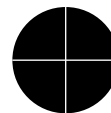
PTCD 035 P
Format:
Cloud of dots pattern,
density 35%

Alignment

Cross

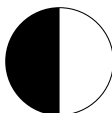


PT 0000 0200 P
format: cross
line thickness 0.05 mm

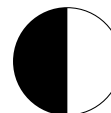


PT 0000 0200 L
format: cross
line thickness 0.5 mm

Edge



PT 0000 0500 P
format: edge
line gap 0.10 mm
line thickness 0.05 mm



PT 0000 0500 L
format: edge
line gap 0.10 mm
line thickness 0.5 mm

Pattern specifications

	Photolithography	Laser engraved
Substrate	Soda lime glass	Borofloat glass
Coating	Chrome	Dichroic mirror
Geometrical accuracy	2 µm	50 µm
Edge sharpness	1.4 µm	50 µm

CMLT series

Mounting brackets for lighting

NEW
MODELS



To simplify the mounting process of LED illuminators within any machine vision system, Opto Engineering® offers a series of brackets designed for positioning lights below, above or around the optics.

Part number	Description	Mechanical specifications					Compatibility
		N of brackets included	Fixing holes diameter (mm)	Length (mm)	Width (mm)	Height (mm)	
CMLT2PFL	L-bracket, 40x30x12 mm	2X	2X Ø 3.20	30	12	40	LTBRDC series
CMLT2QOG040	Bracket 84x53x35 mm	1X	4X Ø 3.20	84	35	53	LT2QOG040-00-x-24V
CMLT5WRG050-00-X	Bracket for LED dome light, 68 mm outer diameter	1X	6X Ø 3.50, 2X M4	79	70	20	LT5WRG050-00-1-x-24V, LT5WRG050-00-1-IR850-24V
CMLT5WRG070-00-X	Bracket for LED dome light, 95 mm outer diameter	1X	6X Ø 3.50, 2X M4	110.5	100	20	LT5WRG070-00-1-x-24V, LT5WRG070-00-1-IR850-24V
CMLT5WRG100-00-X	Bracket for LED dome light, 118 mm outer diameter	1X	6X Ø 3.50, 2X M4	134.5	125	20	LT5WRG100-00-1-x-24V, LT5WRG100-00-1-IR850-24V
CMLT5WRG150-00-X	Bracket for LED dome light, 185 mm outer diameter	1X	7X Ø 3.50, 4X M4	200	190	25	LT5WRG150-00-1-x-24V, LT5WRG150-00-1-IR850-24V
CMLT5WRG200-00-X	Bracket for LED dome light, 232 mm outer diameter	1X	4X Ø 3.50, 3X Ø 5.50, 4X M5	250	240	30	LT5WRG200-00-1-x-24V, LT5WRG200-00-1-IR850-24V
CMLT5WRG250-00-X	Bracket for LED dome light, 284 mm outer diameter	1X	4X Ø 3.50, 3X Ø 6.50, 4X M6	302	290	25	LT5WRG250-00-1-x-24V, LT5WRG250-00-1-IR850-24V
CMLTJA-M6-01	L-bracket for vertical mounting	2X	3X Ø 6.50	51	27	51	LTBC series
CMLTVA-M6-01	L-bracket for horizontal mounting	2X	3X Ø 6.50	51	40	51	LTBC series (4 brackets required for LTBC114114-x, LTBC174174-x, LTBC234234-x)
CMLTOA-M6-00	Join bracket	1X	1X Ø 8.70	-	40	-	LTBC series (2 brackets required for LTBC114114-x, LTBC174174-x, LTBC234234-x)

LED controllers

Opto Engineering® offers a **wide range of industrial LED controllers** designed to accurately set the current intensity, pulse duration and delay of machine vision LED illuminators (in strobe, pulse or continuous mode). High performance LED controllers are key to obtaining consistent light levels and to guaranteeing stable and repeatable performances in any machine vision system.

LTDV series

LED lighting strobe controllers

NEW
MODELS



KEY ADVANTAGES

Compatible with most of the LED lighting solutions available.

Ethernet, RS485 interface.

Up to 8 independently controlled output channels.

Max output current up 20A pulsed.

Easy configuration.

Small, compact units with DIN rail mounting.

NEW LTDVE2CH-20F MODEL

LED Strobe controller 2 channels,
20A/40A pulsed - 2A/4A continuous.

Opto Engineering® range of strobe controllers offer repeatable fast pulsing for quick and accurate strobing of a wide variety of LED lightings available today.

The **LTDV series** comprises models with up to eight channels either with Ethernet and/or RS485 interfaces and a single channel controller with analogue interface.

Opto Engineering® strobe controllers include LTDVE8CH-20 and LTDVE4CH-20 with Ethernet and RS485 interfaces featuring respectively eight and four output channels driving lights with currents up to 20A (pulsed) and 2A (continuous), LTDV6CH featuring six channels and RS485 interface to drive lights up to 17A (pulsed)

and LTDV1CH featuring one single channel, simple DIP switch interface and designed to drive lights with currents from 5mA up to 17A.

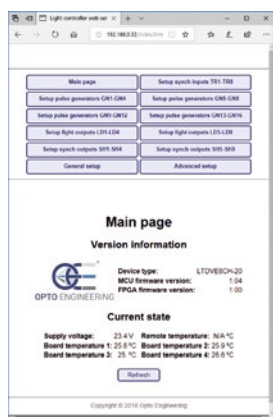
LTDV controllers accurately set current intensity, pulse duration and delay of LED illuminators, they offer filtering options for trigger signals and easily synchronise the strobe pulses with the camera exposure to meet today's machine vision high speed demands.

These controllers are designed to get the very best out of Opto Engineering® LED lighting solutions, in terms of both brightness stability and precise control.

Easy configuration

Easily configure and manage strobe, trigger and camera signals.

LTDVExCH-20



Opto Engineering® LTDVE series of controllers can be configured via Ethernet or RS485.

With the Ethernet interface, you can configure the controller with either the Modbus/TCP, Modbus /UDP slave protocol or the internal web browser. The second option allows for a very easy configuration of the controller using a common web browser to visually change the parameters and/or inspect the device status.

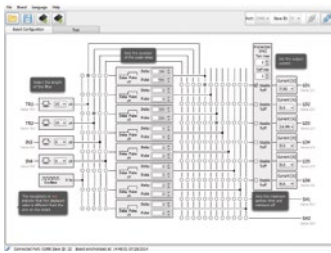
- Easily set the output current intensity of each connected illuminator in small steps (1 mA, 4mA or 20mA depending on current range)
- Set the pulse duration and pulse delay of each illuminator in small steps as low as 1µs
- Control the connected illuminators with up to 8 synchronisation inputs
- Control up to 8 synchronisation outputs (e.g. up to 8 cameras)
- Communication library available (with C source code)

The LTDVE series can also be configured via the RS485 communication port interface that implements the Modbus/RTU slave protocol.

The configuration is stored in a non-volatile memory to maintain your settings even when the Ethernet or RS485 connection is removed.

Opto Engineering® produces custom controller features for specific applications. Contact us to discuss your needs.

LTDV6CH



Main page of LTSW configuration software.

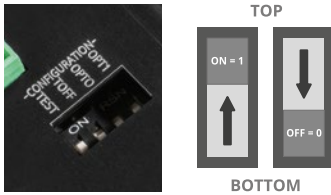
LTDV6CH can be configured via RS485. You can either download and use our free LTSW software to configure the controller from your PC or directly send low-level commands from a PC using the Modbus/RTU slave protocol (all the Modbus function codes supported by the controller are listed in the manual available online).

The LTSW software offers a very intuitive and graphical user interface where you can:

- Set the output current intensity of each connected illuminator in steps of 98 mA
- Set the pulse duration and pulse delay of each illuminator in steps of 1 µs
- Control the connected illuminators with up to 4 synchronisation inputs
- Control up to 2 synchronisation outputs (e.g. up to 2 cameras)
- Write and save different configurations depending on your application

To use LTSW configuration software your PC must have a native RS485 communication interface or a suitable RS485/USB converter must be used (PN: ADPT001).

LTDV1CH



DIP switches interface for simple and fast configuration.

LTDV1CH is simply configured from the front panel via DIP switches. You can easily set the intensity of the LED lights driving current (from 5mA to 17A), filtering option for the trigger signal (select between 10 µs or 100 µs time constant) and delay for synchronisation output (select between 0 or 100 µs).

Part number		LTDV1CH-17V	LTDVE2CH-20F	LTDVE4CH-20	LTDV6CH	LTDVE8CH-20
Electrical specifications						
Status LEDs		Yes (for power on and trigger)	Yes (for all I/Os)	Yes (for all I/Os)		Yes (for all I/Os)
User interface		12-way DIP switch	Ethernet 100 Mbps (using a Web browser or Modbus/TCP slave or Modbus/UDP slave)	Ethernet 100 Mbps RS485 (via Modbus/RTU slave)	RS485 (via Modbus/RTU slave)	Ethernet 100 Mbps (using a Web browser or Modbus/TCP slave or Modbus/UDP slave) Ethernet 100 Mbps RS485 (via Modbus/RTU slave)
Configuration software		-	-	-	LTSW included	-
Output channels n°		1 constant current output	2 independent constant current outputs	4 independent constant current outputs	6 independent constant current outputs	8 independent constant current outputs
Output current range 2	(A)	5 mA-160 mA (in steps of 5 mA) pulsed or continuous 100 mA-3.2 A (in steps of 100 mA) pulsed 1.5 A-17 A (in steps of 500 mA) pulsed	2 independent channels: Pulsed up to 20A per channel, Continuous up to 2A per channel	Up to 20A pulsed or 2A continuous (in steps of 1mA from zero to 200 mA, and 20 mA from 4001mA to 20A)	3.5A - 17.0 pulsed (in steps of 98 mA)	Up to 20A pulsed or 2A continuous (in steps of 1mA from zero to 200 mA, 4 mA from 201 mA to 4000 mA and 20 mA from 4001 mA to 20A)
Max dissipable thermal power per channel	(W)	8	4	4	5	4
Synchronisation inputs n°		1 opto-isolated digital input	2 opto-isolated digital inputs 1	4 opto-isolated digital inputs 1	4 opto-isolated digital inputs 1	8 opto-isolated digital inputs 1
Synchronisation outputs n°		1 opto-isolated digital output	2 opto-isolated digital outputs	4 opto-isolated digital outputs	2 opto-isolated digital outputs	8 opto-isolated digital outputs
Lighting pulse delay	(µs)	-	0 - 1.000.000 2	0 - 1.000.000 2	0 - 65535 3	0 - 1.000.000 2
Lighting pulse width	(µs)	-	2 - 1.000.000 2	10 - 1.000.000 2	10 - 65535 3	10 - 1.000.000 2
Timing repeatability for pulse delay	(µs)	-	0.1 4	0.1 4	0.1 4	0.1 4
Timing repeatability for pulse width	(µs)	-	0.1 4	0.1 4	0.1 4	0.1 4
Supply voltage	(V, DC)	24 5	24	24 - 48	24 5	24 - 48
Output voltage	(V)	0 - 12 (with step-up disabled) or 0 - 36 (with step-up enabled)	5-195	0 - 36	0 - 36	0 - 36
Mechanical specifications						
Dimensions 6	Length (mm)	70	128	195 6	205	255 6
	Height (mm)	82	50	75 6	84	75 6
	Width (mm)	119	120	135 6	123	135 6
Mounting		DIN rail	4 fixing slots	DIN rail	DIN rail	DIN rail
Accessories		-	-	-	ADPT001 7	-
Compatible products		Compatible with most LED lightings available			LTDM series, LTLA series, LTDMLA series, View-through system	Compatible with most LED lightings available

1 Operate from 3.3V to 24V.

2 In variable resolution depending on selected value.

3 In steps of 1 µs.

4 Digital processing.

5 Regulated ± 10%.

6 Including DIN fixing.

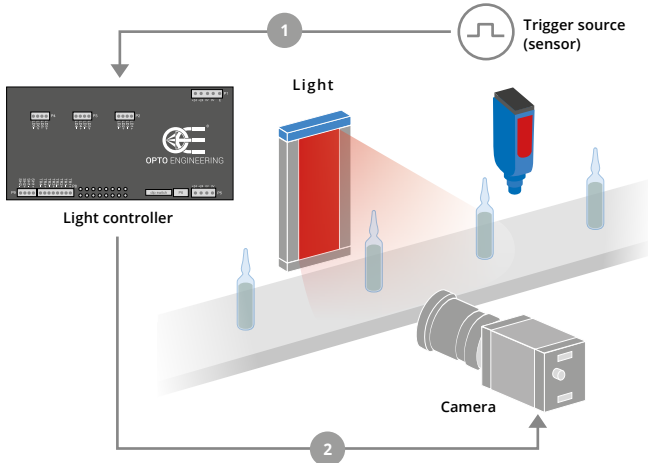
7 To be ordered separately. ADPT001 consists of - one RS485-USB adapter and - one cable for connection with LTDV6CH. In order to configure LTDV6CH via software a RS485 port must be provided.

LTDV series - LED lighting strobe controllers

Triggering options and wiring diagrams

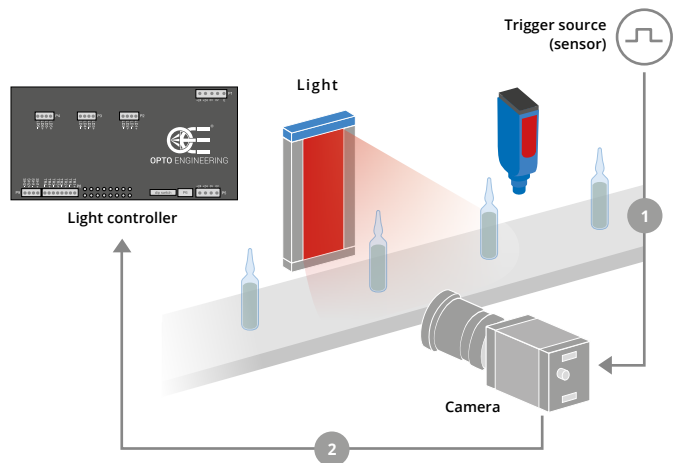
Two typical camera triggering arrangements (Option A and B) are illustrated for each controller model. Triggering Option A is preferred because the controller directly filters the trigger signals, getting rid of unwanted noise. This configuration is possible because Opto Engineering® controllers feature dedicated synchronization outputs which are not commonly available from other manufacturers.

A • Controller triggers camera



Option A - shows a triggering arrangement where the light controller is triggered by trigger source(s) (sensor positioned on the manufacturing line) and the lighting controller then triggers the camera(s). This arrangement has the advantage that the controller can filter the trigger signals before passing the command to the camera and the light.

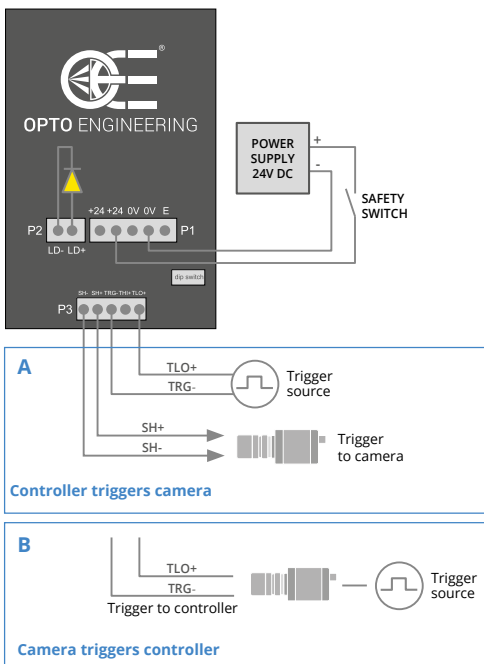
B • Camera triggers controller



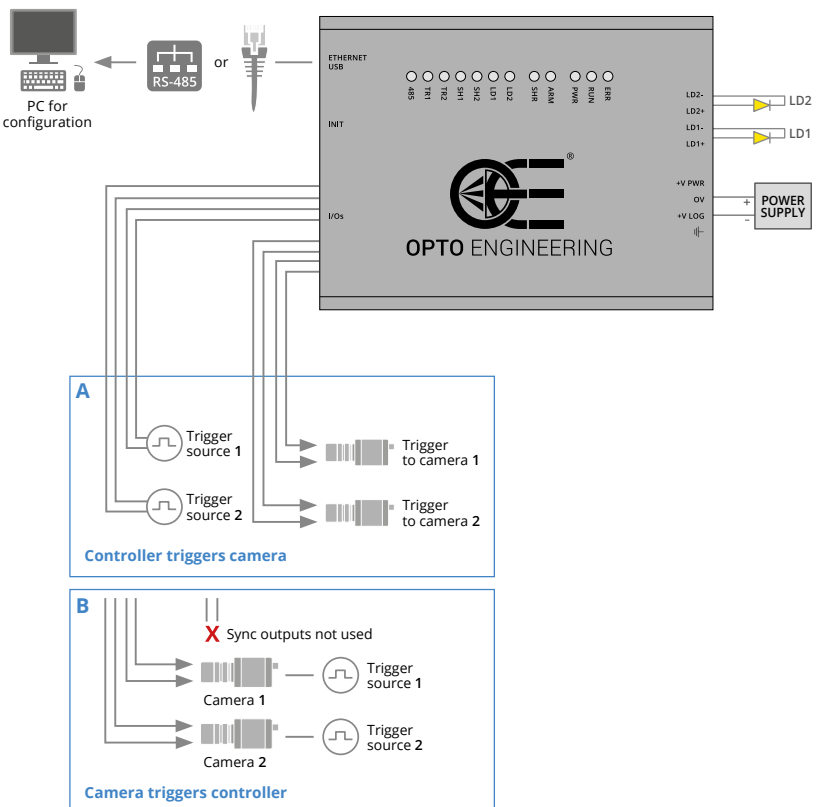
Option B - shows an arrangement where each camera is triggered by a trigger source (sensor), the camera then triggers the light controller and starts its exposure.

The following diagrams explain how to connect Opto Engineering® strobe controllers with the other machine vision components: LED lights, cameras, power supply and PC (for the configuration of all the parameters).

LTDV1CH-17V

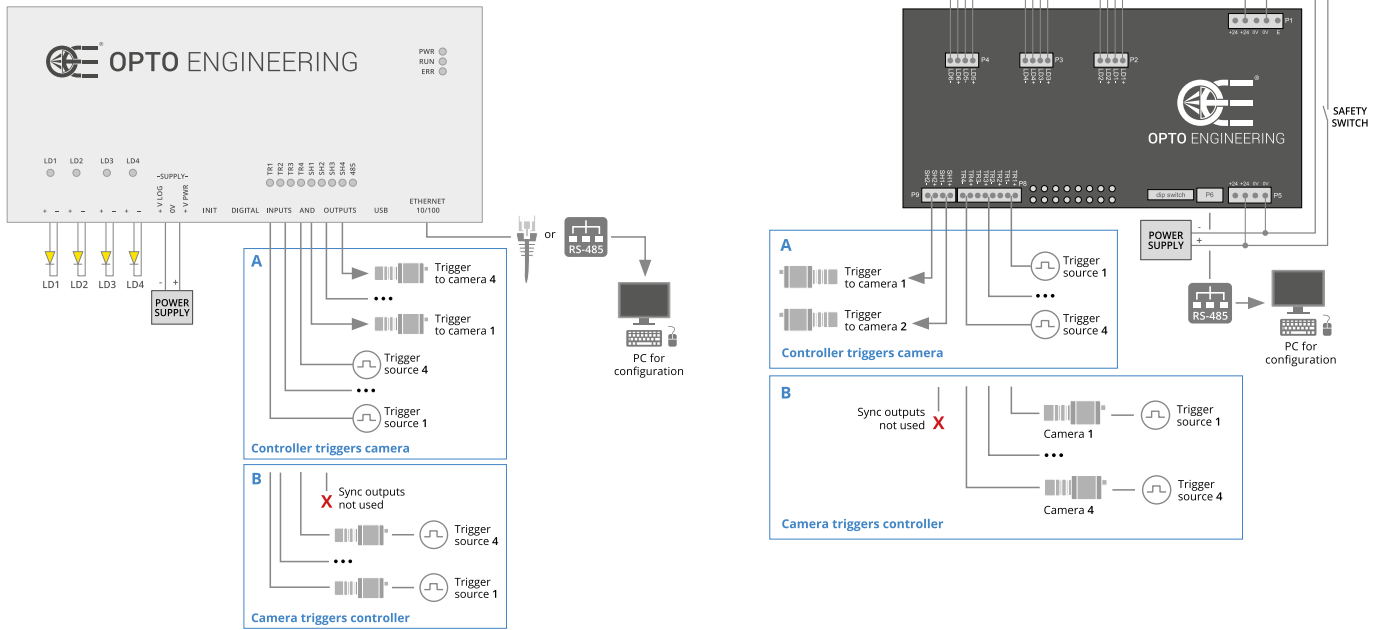


LTDVE2CH-20

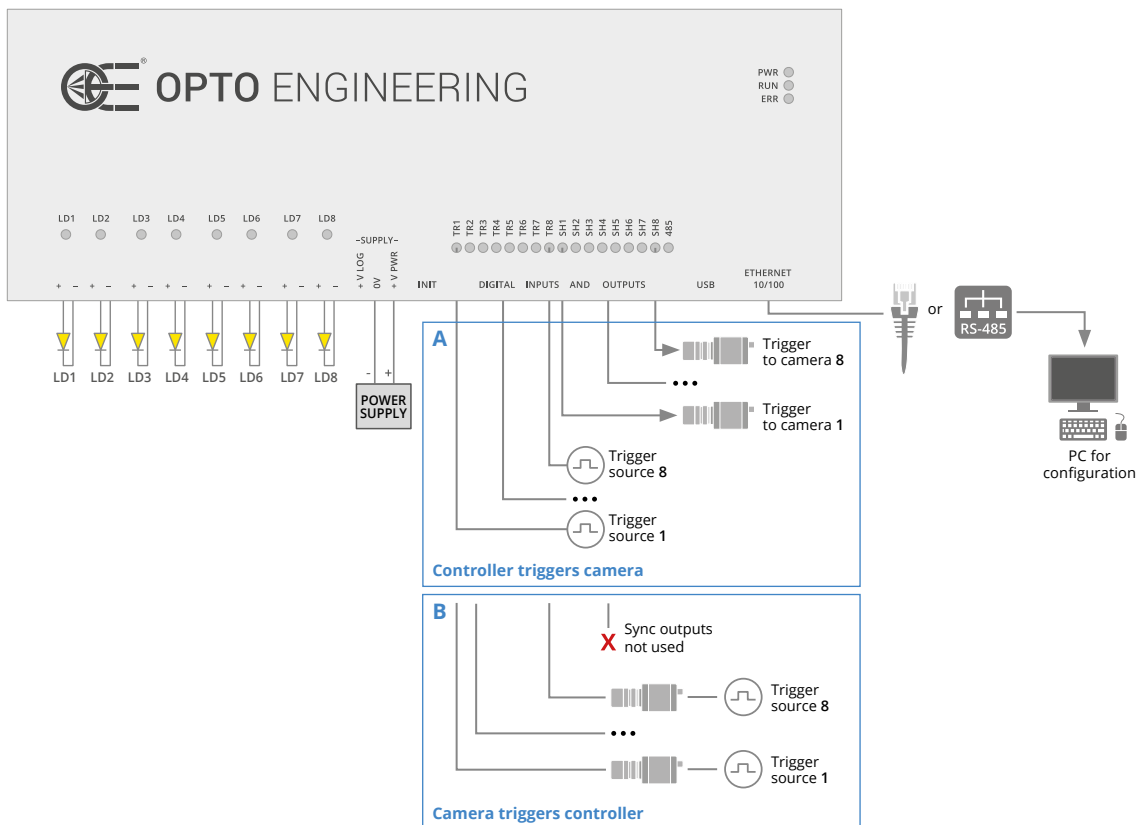


LTDVE4CH-20

LTDV6CH



LTDVE8CH-20











LTIC series

LED lighting controllers



Opto Engineering® offers light intensity controllers available as accessories to precisely adjust the light intensity of our wide range of lights.

Part number	Description	Light control type	Mode	Electrical specifications				
				Status LEDs	Supply voltage (V)	Power cord xx	Other	
DIN RAIL								
 LTIC1CH-A1-4	Analogue lighting controller unit, 4A, 24V	Analogue (via knob or 0-10V analog signal)	Continuous and pulsed ⁴	Yes (for power on, enable and fault)	24-48	not included	Enable input (0-24V), Thermal sensor input ⁵	
 LTIC1CH-D1-4	Digital lighting controller unit, 4A, 24V	Analogue (via knob or 0-10V analog signal) and Digital (Ethernet and RS485) ⁷	Continuous and pulsed ⁴	Yes (for power on, enable and fault)	24-48	not included	Enable input (0-24V), Thermal sensor input ⁵	
 LTICGR1000-D1	Analogue lighting controller unit, 1 channel, 24V, 2A, constant mode, power adaptor 24V plug	Analogue (via knob)	Continuous	No	24	not included	-	
 LTICGR1000-D1-PS-xx ³	Analogue lighting controller unit, 1 channel, 24V, 2A, constant mode, power cord, power adaptor 24V plug	Analogue (via knob)	Continuous	No	24	included (EU, UK or US)	-	
 LTICGR1000-D1-PS-xx-TB ³	Analogue lighting controller unit, 1 channel, 24V, 2A, constant mode, power cord, power adaptor 24V plug, Illumination cable side A SM 3 way male connector, side B terminal blocks connector, 24V - 3m	Analogue (via knob)	Continuous	No	24	included (EU, UK or US)	-	
BENCHTOP								
 LTICOBUL1000CH1-24VxxTB ³	24VDC analog lighting controller 1 channel, power cord, Illumination cable side A SM 3 way male connector, side B terminal blocks connector, 24V - 3m	Analogue (via knob)	Continuous	No	100 - 240	included (EU, UK or US)	-	
 LTICOBUL2000CH2-24V-A1xxTB ³	24VDC analog lighting controller 2 channels, power cord, Illumination cable side A SM 3 way male connector, side B terminal blocks connector, 24V - 3m	Analogue (via knob)	Continuous	No	100 - 240	included (EU, UK or US)	-	
 RT-PSP-12122-LV-xx ³	12VDC analog power supply for LVx-00614 LED spot light	Analogue	Continuous	No	100 - 240	included (EU, UK or US)	-	

¹ Do not exceed lighting maximum ratings specified in the product datasheet. Refer to specific product documentation for detailed instructions.

² Within each product series, only lights that require continuous driving current ≤ max output current of the light controller are considered compatible.

³ xx = UK (240VAC) / EU (220VAC) / US (110VAC).

⁴ Rising time is approx 400 μs. Falling time is approx 100 μs.

⁵ Thermal sensor input works with compatible LED lights (LTRNHP and LTLNE series).



Electrical specifications					Dimensions			Compatibility 1, 2		
Channels	Voltage (V, DC)	Output		Other	Length (mm)	Width (mm)	Height (mm)	LED illuminators 2	LED pattern projectors	LED sources/ modules
		Max current (A)	Power (W)							
1	24-48	4	100	Fault output (0-24V), cooling fans output (0-24V) ⁶	86	54	117	LED illuminators with continuous driving current ≤ 4A, LTRNOBHP, LTRNST, LTRNOB, LT2BC, LTLNC, LTLNE, LTDMC, LTLAIC, LTLADC, LTRNDC, LTBC, LTBFC, LT2BC, LTBRC, LTTNC, LTCXC		
1	24-48	4	100	Fault output (0-24V), cooling fans output (0-24V) ⁶	86	54	117	LED illuminators with continuous driving current ≤ 4A, LTRNOBHP, LTRNST, LTRNOB, LT2BC, LTLNC, LTLNE, LTDMC, LTLAIC, LTLADC, LTRNDC, LTBC, LTBFC, LT2BC, LTBRC, LTTNC, LTCXC		
1	24	2	48	-	55	24	90	LED illuminators with continuous driving current ≤ 2A, LTDMC, LTLAIC, LTLADC, LTRNDC, LTBC, LTBFC, LT2BC, LTBRC, LTTNC, LTCXC, LTLNC, LTLNE		
1	24	2	48	-	55	24	90	LED illuminators with continuous driving current ≤ 2A, LTDMC, LTLAIC, LTLADC, LTRNDC, LTBC, LTBFC, LT2BC, LTBRC, LTTNC, LTCXC, LTLNC, LTLNE	-	-
1	24	2	48	-	55	24	90	LTRNST, LTRNOB	-	-
1	24	5	120	-	330	93	123	LTCLHP, LTCLHP CORE, LTCLHP CORE PLUS, LTCL4K, TCCX, TCCXQ, TCBENCH, TCBENCH CORE, LTDMC, LTRNST, LTRNOB, LTLAIC, LTLADC, LTRNDC, LTBC, LTBFC, LTBDC, LTTNC, LTCXC	LTPRHP3W, LTPRSMHP3W, LTPRXP	LTSCHP
2	24	1	500 mA @ 12V	-	154	91	48	LED illuminators with continuous driving current <1 A	-	-
2	12	1	12	-	118	83	38	-	-	LDSC (RT-LVW-00614 RT-LVG-00614)

⁶ Cooling fans output works with compatible LED lights (LTLNE series).

⁷ Communication protocols: Web browser or Modbus/TCP or Modbus/UDP for Ethernet; Modbus/RTU for RS485.

Opto Engineering® offers replacement LED modules for collimated lights, coaxial telecentric lenses and LED pattern projectors.

LTSCHP series

High-performance replacement LED modules



LTSCHP modules power several Opto Engineering® LED illuminators and feature excellent current stability.

They are available in various colors and can be ordered as spare parts:

1W power sources:

- LTSCHP1W modules are compatible with LTCLHP, LTLCHP CORE (only red, green and white), LTCL4K, TCCXQ, TCCX, TCBENCH series, TCBENCH CORE, MZMT12X series and TCKIT case.
- The new LTSCCP1W-G green light source is compatible with the LTLHP CORE PLUS series.
- The new LTSCHP1W-GZ green light source is now also available: suitable for any kind of sample, it is specifically tailored for measuring reflective objects and objects with sharp edges. In fact, it reduces edge diffraction effects, also ensuring superior illumination uniformity (especially on large FOVs) and making the whole system less sensitive to alignment. It is compatible with LTCLHP, TCBENCH, LTCL4K, LTCLHP CORE, TCBENCH CORE series and TCKIT case.

3W power sources:

- LTSCHP3W modules are compatible with LTPRHP3W and LTPRSMHP3W pattern projectors.

Part number	Light color, Wavelength peak	Device power ratings				LED power ratings			Compatibility
		DC voltage ¹		Power consumption (W)	Max LED forward current (mA) ²	Forward voltage		Max pulse current (mA) ⁵	
		Minimum (V)	Maximum (V)			Typical (V) ³	Maximum (V) ⁴		
1W power sources ⁶									
LTSCHP 1W-R	red, 630 nm	12	24	< 2.5	350	2.4	3.00	2000	LTCLHP, TCBENCH, LTCL4K, TCCX, TCCXQ, LTCLHP CORE, TCBENCH CORE, TCKIT, MZMT12X ⁷
LTSCHP 1W-G	green, 520 nm	12	24	< 2.5	350	3.3	4.00	2000	
LTSCHP 1W-B	blue, 460 nm	12	24	< 2.5	350	3.3	4.00	2000	
LTSCHP 1W-W	white	12	24	< 2.5	350	2.78	-	2000	
LTSCCP 1W-G • NEW	green, 520 nm	12	24	< 2.5	350	3.3	4.00	2000	LTCLHP CORE PLUS
LTSCHP 1W-GZ • NEW	green, 520 nm	12	24	< 2.5	350	3.3	4.00	2000	LTCLHP, TCBENCH, LTCL4K, LTCLHP CORE, TCBENCH CORE, TCKIT
3W power sources									
LTSCHP 3W-R	red, 630 nm	12	24	< 4.5	720	2.4	3.00	2000	LTPRHP3W, LTPRSMHP3W
LTSCHP 3W-G	green, 520 nm	12	24	< 4.5	720	3.3	4.00	2000	
LTSCHP 3W-B	blue, 460 nm	12	24	< 4.5	720	3.3	4.00	2000	
LTSCHP 3W-W	white	12	24	< 4.5	720	2.78	-	2000	

¹ Tolerance ±10%.

² Used in continuous (not pulsed) mode.

³ At max forward current.

⁴ Tolerance is ±0.06V on forward voltage measurements.

⁵ At pulse width ≤ 10 ms, duty cycle ≤ 10% condition.

Built-in electronics board must be bypassed (see tech info).

⁶ Shipped not assembled. See LTCLHP instructions manual.

⁷ Some part numbers are not available in all color options (-R, -G, -B and -W). See page of each product series for available colors.









Did you know that we have all the accessories that can be used to complete your vision system?

Our strobe controllers feature dedicated synchronization outputs that allow to directly filter the trigger signals getting rid of unwanted noise... This function is not commonly available on the market!

Opto Engineering® offers a variety of power supplies available as accessories to power our wide range of machine vision products.

PS series

Power supplies

Part number	Description	Electrical specifications						Dimensions		
		Input Supply voltage (V, AC)	Power cord	Channels	Output Voltage (V, DC)	Max current (A)	Power (W)	Length (mm)	Width (mm)	Height (mm)
 RT-SDR-120-24	24VDC DIN rail power supply	88 - 264	not included	1	24	5	120	113.5	40	125.2
 RT-SDR-240-48	48VDC DIN rail power supply	88 - 264	not included	1	48	5	240	113.5	63	125.2
 RT-DRP-240-24	DIN rail power supply 240V ac - 24V dc 240 W	85 - 264VAC 120 - 370VDC	not included	1	24	10	240	125.5	100	125.2
 RT-DRP-480-24	DIN rail power supply 240V ac - 24V dc 480 W	180 - 264 VAC 250 - 370 VDC	not included	1	24	20	480	227	100	125.2
 RT-DRT-240-24	DIN rail power supply 400V ac three phase - 24V dc 240 W	Three-Phase 340 - 550VAC (Dual phase operation possible) 480 - 780VDC	not included	1	24	10	240	125.5	100	125.2
 RT-DRT-480-24	DIN rail power supply 400V ac three phase - 24V dc 480 W	Three-Phase 340 - 550VAC 480 - 780VDC	not included	1	24	20	240	227	100	125.2
 RT-MV-DC1201-BCSXIO-REV2	Power Supply 12V with digital I/O on separate cable	100, 240	Included (EU)	1	12	2.5		100, 240	Included (EU)	
 COE-PS-UNIVERSAL	Power Supply for COE HR AS series and HR LS series	90 - 264	not included	1	12	5	60	151,90	107	47

1 Do not exceed the maximum ratings specified in the each product datasheet.

Refer to specific product documentation for detailed instructions.

2 Additional wires (not supplied) are required to connect the controllers with the power supply units.

3 Select a power supply with output voltage, maximum output current and maximum output power compatible with the controller and the lights used in the application. Refer to the datasheets of controllers and lights for data about power consumption, voltage and current.



*** RT**

Compatibility 1

Controllers 2		Optics	Lights			Cameras	AI vision units
Light controllers 3	Motion controllers		LED illuminators	LED pattern projectors	LED sources/modules		
LTDVE8CH-20, LTDVE4CH-20, LTDV6CH, LTDV1CH-17V, LTIC1CH-A1-4, LTICGR1000-D1	MTDVxCH-22A2	AOL0223A, AOL0223B	LTCLHP, LTCLHP CORE, LTCLHP CORE PLUS, LTCL4K, TCCX, TCCXQ, TCBENCH, TCBENCH CORE, LTDMC, LTRNST, LTRNOB, LTLAIC, LTLADC, LTRNDC, LTBC, LTBFC, LTBRC, LTTNC, LTCXC, LTLNC, LTLNM, LTLNE, LT2BC	LTPRHP3W, LTPRSMHP3W, LTPRXP	LTSCHP		
LTDVE8CH-20, LTDVE4CH-20, LTDV1CH-7, LTDV1CH-17, LTIC1CH-A1-4			-	-	-		
LTDVE8CH-20, LTDVE4CH-20, LTIC1CH-A1-4, LTICGR1000-D1						PENSO, ALBERT-01	
LTDVE8CH-20, LTDVE4CH-20, LTIC1CH-A1-4, LTICGR1000-D1						ALBERT-01	
						PENSO, ALBERT-01	
						ALBERT-01	
						mvBlueCOUGAR-X, mvBlueCOUGAR-XD	
						COE series	

Opto Engineering® offers a variety of power supplies available as accessories to power our wide range of machine vision products.

CB series

Cables

* RT

Part number	Description	Compatibility
Power cables		
CBLT001	Illumination cable, side 1 M12 connector straight, side 2 cable end - 5 m - for single stage systems	LTDMB2-x, LTMDCX-x, LTLAB2-x, LTLACx-x, LTPRUP-x, LTBP240180-B/W, LTBP288180-B/W, LTBP240216-B/W, LTBP288216-B/W
CBLT002	Illumination cable, side 1 M12 connector right angled, side 2 cable end - 5 m - for single stage systems	LTDMB2-x, LTMDCX-x, LTLAB2-x, LTLACx-x, LTPRUP-x, LTBP240180-B/W, LTBP288180-B/W, LTBP240216-B/W, LTBP288216-B/W
CBLT003	Illumination cable, side 1 M8 connector straight, side 2 cable end - 5 m - for single stage systems	LTDMA1-x, LT2BC series, LTBP series 1, LTLNCxxx-x
CBLT004	Illumination cable, side 1 M8 connector right angled, side 2 cable end - 5 m - for single stage systems	LTDMA1-x, LT2BC series, LTBP series 1, LTLNCxxx-x
CBLT005	Illumination cable, side 1 M12 connector straight, side 2 cable end - 5 m - for double stage systems	LTDMLAB2-WW, LTDMLACx-WW, LTBP240180-R/G, LTBP288180-R/G, LTBP240216-R/G, LTBP288216-R/G
CBLT006	Illumination cable, side 1 M12 connector right angled, side 2 cable end - 5 m - for double stage systems	LTDMLAB2-WW, LTDMLACx-WW, LTBP240180-R/G, LTBP288180-R/G, LTBP240216-R/G, LTBP288216-R/G
CBLT007	Illumination cable PVC grey, side 1 industrial circular connector straight, side 2 cable end - 5 m	LTLNE series
CBLT008	Illumination cable, side 1 industrial circular connector straight, side 2 cable end - 5 m - power supply	LTLNM series
CBLT009	Illumination cable, side 1 industrial circular connector straight, side 2 cable end - 5 m - I/O signals	LTLNM series
CBLT010	Illumination cable, side 1 industrial circular connector straight, side 2 cable end - 5 m	LTRNOBHP series
CBLT014	Illumination cable PVC black, side 1 M12 female connector straight, side 2 cable end, 5-way, 5m length	LTBRZ3 series
CBLT015	Illumination cable PVC black, side 1 M12 female connector right angled, side 2 cable end, 5-way, 5m length	LTBRZ3 series
CBLT016	Illumination jumper cable PVC, side 1 M12 male connector straight, side 2 M12 female connector straight, 5-way, 0.5m length	LTBRZ3-x-y-w-p-DC
CBLT017	Illumination jumper cable PVC, side 1 M12 male connector straight, side 2 M12 female connector straight, 5-way, 1m length	LTBRZ3-x-y-w-p-DC
CBLT018	Illumination jumper cable PVC, side 1 M12 male connector straight, side 2 M12 female connector straight, 5-way, 2m length	LTBRZ3-x-y-w-p-DC
CB244P1500	Power cable, side 1 M8 connector straight, side 2 cable end - 2 m - type 1 labels	LTCLHP series, LTCLHP CORE series, LTCL4K series, TCCX series, LTPR series, LTPRHP3W series, LTPRSMHP3W series, LTSCHP series
CB244P1500L	Power cable, side 1 M8 connector angled, side 2 cable end - 2 m - type 1 labels	LTCLHP series, LTCLHP CORE series, LTCL4K series, TCCX series, LTPR series, LTPRHP3W series, LTPRSMHP3W series, LTSCHP series
CB244P1501	Power cable, side 1 M8 connector straight, side 2 cable end - 2 m - type 2 labels	LTPRXP series, TCCAGExx096
CB244P1501L	Power cable, side 1 M8 connector angled, side 2 cable end - 2 m - type 2 labels	LTPRXP series, TCCAGExx096
CBSLH-24V-F-3M-TB	Illumination cable, side A flying leads, side B terminal blocks connector, 24V - 3m	LTRNST series, LTRNOB series, RT-ANGX1000CH1-24V-xx-TB, RT-ANG2000CH2-24VA1-xx-TB
CBSLH-24V-F-3M	Illumination cable, side A flying leads, side B SM 3 way female connector, 24V - 3m	RT-SD-1000-D1-PS-xx, LTMDC series, LTLAIC series, LTLADC series, LTRNDC series, LTBFC series, LTBRDC series, LTTNC series, LTCXC series
CBPWALB01	ALBERT power cable, 5 m, IP65	ALBERT-01
RT-70261132	Power cord with schuko plug - open end cable, 3 m 10A 250V, single-phase	RT-SDR-120-24, RT-SDR-120-48, RT-DRP-240-24, RT-DRP-480-24, RT-DRT-240-24, RT-DRT-480-24
CBMT002	15 wires cable, DB15HD Male to DB15HD Female connector, 2 m	MTDVxCH-22Ax, TCZRS series
CBMT003	8 wires cable, 2x DB15HD Male to DIN EN 60529 12 Pin Female connector, 2 m	MTDVxCH-22Ax, MZMT12X series, ENMT series
USB cables		
CBUSB20ACT01	Active USB 2.0 cable, industrial level, screw locking, 10 m	STLTCM01
CBUSB3001	Passive USB 3.0 cable, industrial level, horizontal screw locking, 3m	COE HR AS-X series, COE-U series, mvBlueFOX3-2
Ethernet cables		
CBETH001	Ethernet cable for Panel PC, 5 m, IP65	ALBERT-01, RT-KWP5170
CBETH002	Ethernet cable, general purpose, 5 m, IP65	ALBERT-01
CBETH003	Ethernet cable, CAT6, industrial level, high flexible cable with screw, 5 m	COE-G series, COE HR AS-X series, mvBlueCOUGAR-X, mvHR mvBlueCOUGAR-XD, MTDVxCH-22Ax

1 Except LTBP240180-z, LTBP288180-z, LTBP240216-z, LTBP288216-z

Part number	Description	Compatibility
Cables for control and I/O		
CBGPI06PMF-3M	6 Pin Hirose Male - Female moulded connector cable, 3 m	PCH1023-AF, RT-EL-E-4i
CBGPO001	Output cable, 5 m, IP65	ALBERT-01
CBGPI0001	I/O cable, side 1 HIROSE 12 pin, side 2 cable end, 3 m	mvBlueFOX3-2, mvBlueCOUGAR-X, mvBlueCOUGAR-XD, mvHR
CBPH001	Photoelectric sensor cable with M12 connector, 5 m, IP65	RT-WTB9-3P2461, ALBERT-01
CBPH002	Photoelectric sensor cable with flying leads, 5 m, IP65	ALBERT-01
CBTL001	Tower light cable with M12 connector, 5 m, IP68	RT-69942075, ALBERT-01
CBTL002	Tower light cable with flying leads, 5 m, IP68	ALBERT-01
COE I/O cables		
COE-6P-FEMALE	HIROSE 6-pin/Female connector cable for COE HR LS series, 2 meters	COE HR LS series, COE-PS-UNIVERSAL
COE-6P-MALE	HIROSE 6-pin/Male connector cable for COE HR AS series, 2 meters	COE HR AS series, COE-PS-UNIVERSAL
COE-6P-OPEN1-005	HIROSE 6-pin/Open end cable, 0,5 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN1-030	HIROSE 6-pin/Open end cable, 3 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN1-050	HIROSE 6-pin/Open end cable, 5 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN1-100	HIROSE 6-pin/Open end cable, 10 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN1-150	HIROSE 6-pin/Open end cable, 15 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN1-300	HIROSE 6-pin/Open end cable, 30 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN2-030	HIROSE 6-pin/Open end super flexible cable, 3 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN2-050	HIROSE 6-pin/Open end super flexible cable, 5 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN2-100	HIROSE 6-pin/Open end super flexible cable, 10 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN2-150	HIROSE 6-pin/Open end super flexible cable, 15 meters	COE-G series, COE-U series, COE HR AS-X series
COE-6P-OPEN2-300	HIROSE 6-pin/Open end super flexible cable, 30 meters	COE-G series, COE-U series, COE HR AS-X series
COE-12P-OPEN1-030	HIROSE 12-pin/Open end cable, 3 meters	COE HR AS-X series
COE-12P-OPEN1-050	HIROSE 12-pin/Open end cable, 5 meters	COE HR AS-X series
COE-12P-OPEN2-030	HIROSE 12-pin/Open end super flexible cable, 3 meters	COE HR AS-X series

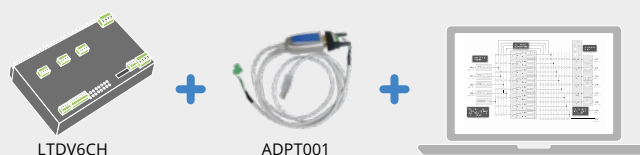
Cables

ADPT001

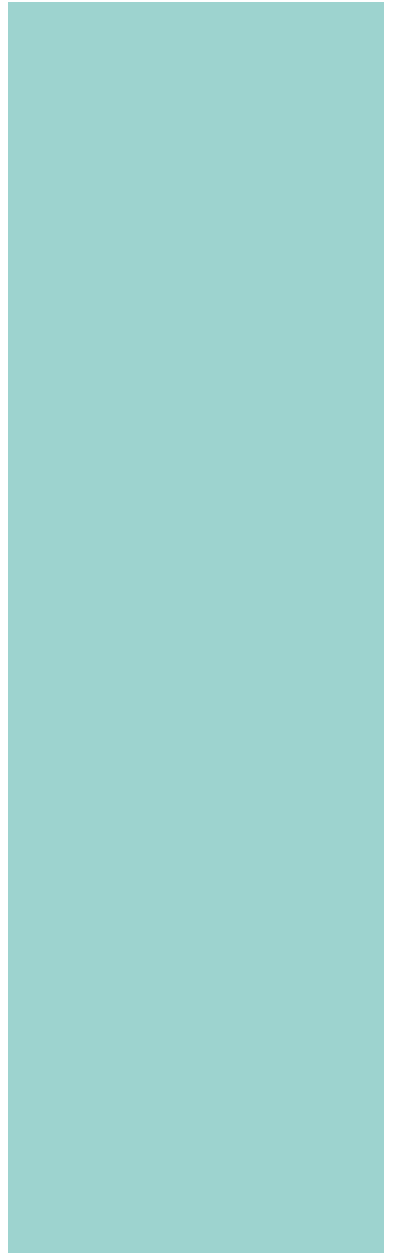
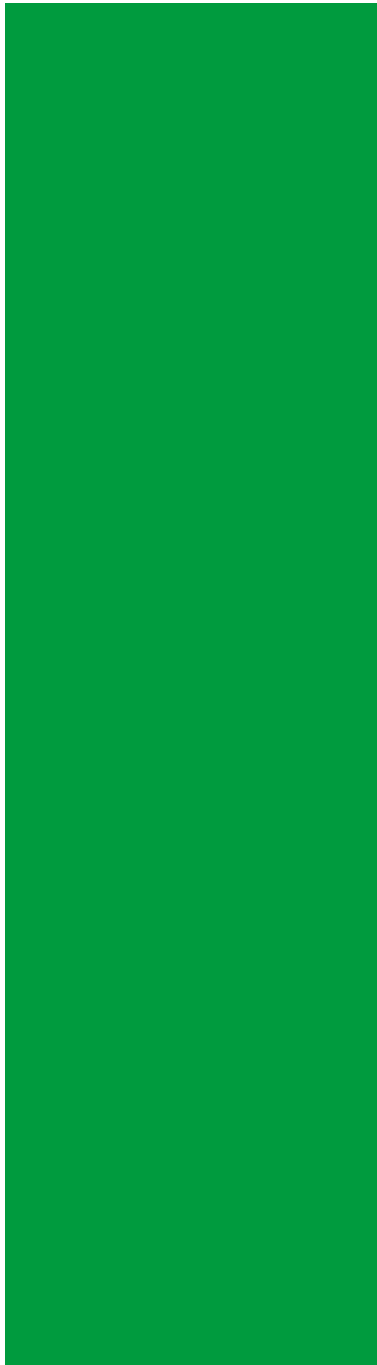
Adapter RS485-USB + cable with 3 elements for LTDV6CH connection



Product combination



Part number	Description	Compatibility
ADPT001	Adapter RS485-USB + cable with 3 elements for LTDV6CH connection	LTDV6CH, MTDV3CH-00A1



Refer to specific datasheets available at www.opto-e.com for product compliancy with regulations, certifications and safety labels.

KITS

Every machine vision lab needs a wide variety of high quality lenses, lights, cameras and accessories to perform feasibility tests.

Our kits include a selection of our best-selling products available at a special price: you should seriously consider to buy these kits for your laboratory to accurately perform feasibility tests with different types of machine vision components.

Opto Engineering® kits are the best solution for everyone frequently dealing with new machine vision applications requiring different type of products.

LTPKIT-A

Starter high power LED lighting kit, A version

NEW



Opto Engineering® **LTPKIT-A** LED lighting KIT includes a selection of some of our best-selling LED illuminators and a high-performance LED controller. Specifically:

- A LED backlight ideal for shape inspection and measurement applications
- A LED illuminator that combines a dome light and a low angle ring light. The dome light homogeneously illuminates complex shapes with curved and shiny surfaces while the diffused ring light provides darkfield lighting that can be used to cast shadows, greatly emphasizing surface irregularities or scratches of the workpiece
- A LED line light that provides both a powerful and uniform beam of light that is sharply focused onto the object being inspected, by means of a condenser lens.
- A high-performance LED strobe controller ideal for high precision machine vision applications. The controller features 2 independent channels, 2 trigger inputs and 2 synchronization outputs, output currents up to 40A in strobe mode and up to 4A in continuous mode*, Ethernet/RS485 interfaces and easy configuration via Web browser.

This LED lighting kit is a very helpful tool for system integrators that are frequently dealing with new machine vision applications requiring different type of lights and high precision control of the timing.

The LTPKIT-A also benefits from a special price: you should seriously consider to buy this kit for your laboratory to accurately perform feasibility tests with different types of lights.

Part number	Products included	Description
LTPKIT-A	LT2BC096072-W	LED backlight, 96 x 72 mm lighting area, white
	LTLNC100-W	LED line light 100 mm, white
	LTDMLAB2-WW	Dome + low angle illumination system - medium size high power white
	LTDVE2CH-20F	LED Strobe controller 2 channels, 20A/40A pulsed - 2A/4A continuous, fast version

*When used in "Special current sharing mode". See LTDVE2CH-20F manual for further details.








LTPKIT

High power lighting kit



The **LTPKIT** is a selection of some of the Opto Engineering® high-power LED lighting solutions, including three different strobe illuminators and an ultra-bright strobe LED pattern projector. The case also includes a 6 channel strobe controller, designed to precisely control the lights and easily manage the trigger signals, in addition to a DIN rail industrial power supply.

This versatile and portable light kit is ideal for system integrators dealing with machine vision applications that require high power strobe illumination. The LTPKIT also benefits from our special educational price: you should seriously consider buying one for your laboratory to discover the advantages of our strobe lights!

Part number	Products included	Quantity	Description
LTPKIT	 LTLAB2-W	1	Diffuse strobe low angle ring light illuminator - medium size high power white
	 LTDMLAB2-W	1	Diffuse strobe dome + low angle illumination system - medium size high power white
	 LTBP096072-W	1	High power strobe LED backlight, 96 x 72 mm lighting area, white
	 LTPRUP-W	1	90W strobe LED pattern projector white
	 LTDV6CH	1	Strobe controller 6 channels
	 RT-SDR-120-24	1	24VDC DIN rail power supply
	 ADPT001	1	Adapter RS485-USB + cable with 3 elements for LTDV6CH connection

LTKITRY-FH-OR-V1

Continuous lighting kit



Opto Engineering® **LTKITRY-FH-OR-V1** case includes a selection of some our commonly used LED illuminators working in continuous mode, including two lighting controllers for dimming, brackets and diffusers.

The continuous lighting kit case is a very helpful tool for system integrators that are frequently dealing with new machine vision applications requiring different type of lights.

The LTKITRY-FH-OR-V1 case also benefits from our special educational price: you should seriously consider to buy this kit for your laboratory in order to be able to perform feasibility tests with many different types of lights!

Part number	Products included	Quantity	Description
LTKITRY-FH-OR-V1	 LTICGR1000-D1-PS-EU	2	Analogue lighting controller unit, 1 channel, 24V, 2A, constant mode, EU power cord, power adaptor 24V plug
	 LT4WRG100-00-1-W-24V	1	LED dome light, 118 mm outer diameter, white, 24V
	 LT2QOG040-00-X-W-24V	1	LED coaxial light, 48 x 48 mm light emitting area, white, 24V
	 LTZPFL160-00-6-W-24V	1	LED bar light, 6 LED rows, 160x26.3 illumination area, white, 24V
	 LTZGK070-15-3-W-24V	1	LED ring light, 3 LED rows, outer diameter 70 mm, 15°, white, 24V
	 LTZGK070-45-3-W-24V	1	LED ring light, 3 LED rows, outer diameter 70 mm, 45°, white, 24V
	 LTZZO130-75-3-W-24V	1	LED low angle ring light, 3 LED rows, outer diameter 131 mm, 75°, white, 24V
	 LTPVRG070-00-1-W-24V	1	Flat side-emitting LED backlight, thin borders, 70 x 70 mm illumination area, white, 24V
	 LTPVR070-00-1-W-24V	1	Flat side-emitting LED backlight, 70 x 70 mm illumination area, white, 24V
	 LT2RZF100-60-2-W-24V	1	LED ring light, 2 LED rows, 100 mm outer diameter, 60°, white, 24V
	Diffusers	-	Diffuser for LTZGK070-15-3, LTZGK070-45-3, LTZZO170-75-3
	Brackets	-	Brackets for LT4WRG100-00-1, LT2QOG040-00-X, LTZPFL160-00-6
	Polarizer	1	Polarizer for LTZPFL160-00-6

SELECTION CHARTS

“Simple works better” is one of our guiding principles and it is the reason why we have organized our optics and lights in easy-to-use selection charts.

Use these charts to quickly identify and select the best Opto Engineering® products that fit your next machine vision application. Our selection charts are also available online at www.opto-e.com to be printed as posters.

LED illuminators selection chart **272**

LED line lights selection chart **274**

LED ILLUMINATORS SELECTION CHART

α	RINGLIGHT							BAR LIGHT
	Normal Angle ($\alpha < 45^\circ$)		30°	45°	Low Angle ($\alpha \geq 45^\circ$)		-	Direct /Diffused
	0°	15°	Direct/Diffused	Direct/Diffused	60°	75°	Diffused	
Light Structure	Direct/Diffused	Direct/Diffused	Direct/Diffused	Direct/Diffused	Diffused	Direct/Diffused	Diffused	Direct /Diffused
LONGEST SIDE OF ILLUMINATED OBJECT								
1 to 8 mm	LTRN023XX(C,SV) LTZGK040-00-2-X-24V(C,SV)	LTZGK050-15-2-X-24V(C,SV)	LTZGK040-30-2-X-24V(C,SV)		LT3RF050-60-2-X-24V(C,SV) LTLAB2-X(SI)			LTPZPFL040-00-6-X-24V(C,SV) LTBP048036-X(SI) LT2BC048036-X(C,SI)
8 to 11 mm	LTRN016XX(C,SV) LTZGK050-00-2-X-24V(C,SV)	LTZGK050-15-2-X-24V(C,SV)	LTZGK040-30-2-X-24V(C,SV)	LTZGK070-45-3-X-24V(C,SV)	LT3RF050-60-2-X-24V(C,SV) LTLAB2-X(SI)			LTPZPFL040-00-6-X-24V(C,SV) LTBP048036-X(SI) LT2BC048036-X(C,SI)
11 to 15 mm	LTRN016XX(C,SV) LTZGK050-00-2-X-24V(C,SV)	LTZGK050-15-2-X-24V(C,SV)	LTZGK050-30-2-X-24V(C,SV)	LTZGK070-45-3-X-24V(C,SV)	LT3RF050-60-2-X-24V(C,SV) LTLAB2-X(SI)			LTPZPFL040-00-6-X-24V(C,SV) LTBP048036-X(SI) LT2BC048036-X(C,SI)
15 to 20 mm	LTRN024XX(C,SV)	LTZGK050-15-2-X-24V(C,SV)	LTZGK050-30-2-X-24V(C,SV)	LTZGK070-45-3-X-24V(C,SV)	LT3RF050-60-2-X-24V(C,SV) LTLAB2-X(SI)		LTRN050X45(C,SV) LTRN075X45(C,SV) LTRNHP075X45(C,SI)	LTPZPFL040-00-6-X-24V(C,SV) LTBP048036-X(SI) LT2BC048036-X(C,SI)
20 to 30 mm	LTRN036XX(C,SV) LTZGK070-00-3-X-24V(C,SV)	LTZGK050-15-2-X-24V(C,SV)	LTZGK070-30-3-X-24V(C,SV)	LTZGK070-45-3-X-24V(C,SV)	LT3RF050-60-2-X-24V(C,SV) LTLAB2-X(SI)		LTRN050X45(C,SV)	LTPZPFL040-00-6-X-24V(C,SV) LTBP048036-X(SI) LT2BC048036-X(C,SI)
30 to 40 mm	LTRN036XX(C,SV) LTRN048XX(C,SV) LTZGK090-00-4-X-24V(C,SV)	LTZGK050-15-2-X-24V(C,SV)	LTZGK090-30-4-X-24V(C,SV)	LTZGK070-45-3-X-24V(C,SV)	LT3RF050-60-2-X-24V(C,SV) LTLAB2-X(SI)		LTRN075X45(C,SV)	LTPZPFL040-00-6-X-24V(C,SV) LTBP048036-X(SI) LT2BC048036-X(C,SI) LTBRZ3 series (C)
40 to 50 mm	LTRN048XX(C,SV) LTRN056XX(C,SV)	LTZGK050-15-2-X-24V(C,SV) LTZGK070-15-3-X-24V(C,SV)		LTZGK070-45-3-X-24V(C,SV)	LT3RF070-60-2-X-24V(C,SV) LTLAB2-X(SI)		LTRN165X45(C,SV) LTRNHP165X45(C,SI) LTRN165X20(C,SV)	LTPZPFL080-00-6-X-24V(C,SV) LTBP096036-X(SI) LT2BC096036-X(C,SI) LTBRZ3 series (C)
50 to 70 mm	LTRN064XX(C,SV) LTRN080XX(C,SV)	LTZGK070-15-3-X-24V(C,SV) LTZGK100-15-5-X-24V(C,SV)		LTZGK070-45-3-X-24V(C,SV) LTZGK100-45-5-X-24V(C,SV)	LT3RF070-60-2-X-24V(C,SV) LT3RZF100-60-2-X-24V(C,SV) LTLACX-X(C,SV)		LTRN165X45(C,SV) LTRN210X20(C,SV) LTRNHP210X20(C,SI) LTRN245X35(C,SV) LTRN245X45(C,SV)	LTPZPFL080-00-6-X-24V(C,SV) LTBP096036-X(SI) LT2BC096036-X(C,SI) LTBRZ3 series (C)
70 to 100 mm	LTRN096XX(C,SV) LTRN120XX(C,SV)	LTZGK100-15-5-X-24V(C,SV)		LTZGK100-45-5-X-24V(C,SV)	LT3RZF100-60-2-X-24V(C,SV) LT3RZF100-60-2-X-24V(C,SV) LTLACX-X(C,SV)	LTTZO130-75-3-X-24V(C,SV)	LTRN210X20(C,SV) LTRNHP210X20(C,SI) LTRN245X25(C,SV)	LTPZPFL080-00-6-X-24V(C,SV) LTPZPFL120-00-6-X-24V(C,SV) LTBP144036-X(SI) LT2BC144036-X(C,SI) LTBRZ3 series (C)
100 to 150 mm	LTRN120XX(C,SV) LTRN144XX(C,SV)				LT3RZF120-60-2-X-24V(C,SV)	LTTZO130-75-3-X-24V(C,SV) LTTZO170-75-3-X-24V(C,SV)		LTPZPFL120-00-6-X-24V(C,SV) LTPZPFL160-00-6-X-24V(C,SV) LTBP192036-X(SI) LT2BC192036-X(C,SI) LTBRZ3 series (C)
150 to 200 mm						LTTZO170-75-3-X-24V(C,SV)		LTPZPFL160-00-6-X-24V(C,SV) LTBP240036-X(SI) LT2BC240036-X(C,SI) LTBRZ3 series (C)
200 to 300 mm								LTBP288036-X(SI) LT2BC288036-X(C,SI) LTBRZ3 series (C)
< 300 mm								LTBRZ3 series (C)

-X refers to the light color

(C) = Continuous mode

(SI) = Strobed mode (constant current I driving)

(SV) = Strobed mode (constant voltage V driving)

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For detailed specifications about the models listed in this chart, digit the specific part number inside the search bar on www.opto-e.com

ACCESSORIES









LED LIGHT CONTROLLERS





LTDV series
Strobe controllers



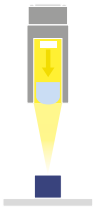


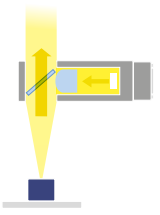
LITC series
Light intensity controller



COLLIMATED LIGHT		FLAT LIGHT		COAXIAL	DOME	TUNNEL	COMBINED
Circular Beam	Linear Beam	Back-Emitting	Side-Emitting				(DOME + LOW ANGLE RINGLIGHT)
							
LTCLHP2300-X(C,SI)		LTBP048036-X(SI) LT2BC048036-X(C,SI)	LTPVRG25X36-00-1-X-24V(C,SV)	LT2QOG025-00-X-X-24V(C,SV)	LTDMA1-X(SI)		
LTCLHP2300-X(C,SI)		LTBP048036-X(SI) LT2BC048036-X(C,SI)	LTPVRG25X36-00-1-X-24V(C,SV)	LT2QOG025-00-X-X-24V(C,SV)	LTDMA1-X(SI)	LT3WRH150-00-1-X-24V(C,SV)	LTDLAB2-WW(SI)
LTCLHP016-X(C,SI)		LTBP048036-X(SI) LT2BC048036-X(C,SI)	LTPVRG25X36-00-1-X-24V(C,SV)	LT2QOG025-00-X-X-24V(C,SV)	LTDMA1-X(SI)	LT3WRH150-00-1-X-24V(C,SV)	LTDLAB2-WW(SI)
LTCLHP024-X(C,SI)		LTBP048036-X(SI) LT2BC048036-X(C,SI)	LTPVRG25X36-00-1-X-24V(C,SV)	LT2QOG025-00-X-X-24V(C,SV)	LTDMA1-X(SI)	LT3WRH150-00-1-X-24V(C,SV)	LTDLAB2-WW(SI)
LTCLHP036-X(C,SI) LTCLCR036-X(C,SI)		LTBC054054-X(C,SV) LTBP048036-X(SI) LT2BC048036-X(C,SI)	LTPVRG25X36-00-1-X-24V(C,SV)	LT2QOG025-00-X-X-24V(C,SV)	LTDMA1-X(SI)	LT3WRH150-00-1-X-24V(C,SV)	LTDLAB2-WW(SI)
LTCLHP036-X(C,SI) LTCLCR036-X(C,SI)		LTBC054054-X(C,SV) LTBP048036-X(SI) LT2BC048036-X(C,SI)	LTPVRG31X58-00-1-X-24V(C,SV)	LT2QOG040-00-X-X-24V(C,SV)	LTDMA1-X(SI)	LT3WRH150-00-1-X-24V(C,SV)	LTDLAB2-WW(SI)
LTCLHP048-X(C,SI) LTCLCR048-X(C,SI)		LTBC054054-X(C,SV) LTBP096072-X(SI) LT2BC096072-X(C,SI)	LTPVRG31X58-00-1-X-24V(C,SV)	LT2QOG040-00-X-X-24V(C,SV)	LTDMB2-X(SI) LT5WRG070-00-1-X-24V(C,SV)	LT3WRH150-00-1-X-24V(C,SV)	LTDLAB2-WW(SI)
LTCLHP056-X(C,SI) LTCLCR056-X(C,SI) LTCLHP064-X(C,SI) LTCLCR064-X(C,SI)	LTCL4K060-X(C,SI)	LTBC114114-X(C,SV) LTBP096072-X(SI) LT2BC096072-X(C,SI)	LTPVR070-00-1-X-24V(C,SV) LTPVRG070-00-1-X-24V(C,SV)	LT2QOG070-00-X-X-24V(C,SV)	LTDMB2-X(SI) LTDMCX-X(SI) LT5WRG070-00-1-X-24V(C,SV) LT5WRG100-00-1-X-24V(C,SV)	LT3WRH150-00-1-X-24V(C,SV)	LTDLAB2-WW(SI) LTDLACX-WW(SI)
LTCLHP080-X(C,SI) LTCLCR080-X(C,SI) LTCLHP096-X(C,SI) LTCLCR096-X(C,SI)	LTCL4K090-X(C,SI)	LTBC114114-X(C,SV) LTBP144108-X(SI) LT2BC144108-X(C,SI)	LTPVR100-00-1-X-24V(C,SV)	LT2QOG100-00-X-X-24V(C,SV)	LTDMCX-X(SI) LT5WRG100-00-1-X-24V(C,SV) LT5WRG150-00-1-X-24V(C,SV)	LT3WRH150-00-1-X-24V(C,SV)	LTDLACX-WW(SI)
LTCLHP120-X(C,SI) LTCLCR120-X(C,SI) LTCLHP144-X(C,SI) LTCLCP144-G	LTCL4K120-X(C,SI) LTCL4K180-X(C,SI)	LTBC114114-X(C,SV) LTBC174174-X(C,SV) LTBP192180-X(SI) LT2BC192180-X(C,SI)			LT5WRG150-00-1-X-24V(C,SV) LT5WRG200-00-1-X-24V(C,SV)	LT3WRH200-00-1-X-24V(C,SV)	
LTCLHP192-X(C,SI) LTCLCP192-G	LTCL4K180-X(C,SI)	LTBC174174-X(C,SV) LTBC234234-X(C,SV) LTBP240216-X(SI) LT2BC240216-X(C,SI)			LT5WRG200-00-1-X-24V(C,SV) LT5WRG250-00-1-X-24V(C,SV)		
LTCLHP240-X(C,SI)		LTBC234234-X(C,SV) LTBP288216-X(SI) LT2BC288216-X(C,SI)			LT5WRG250-00-1-X-24V(C,SV) LT4WRG360-00-1-X-24V(C,SV)		

POWER SUPPLIES PS series 	DIFFUSION PLATES DFLT series 	POLARIZING PLATES PLLT series 	CLAMPING MECHANICS CMLT series 
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LED LINE LIGHTS SELECTION CHART

LIGHT STRUCTURE	STRAIGHT			COAXIAL
	CONVERGENT		COLLIMATED	CONVERGENT
	Near Field Focusing (N)	Far Field Focusing (F)		Near Field Focusing (N)
				
LONGEST SIDE OF ILLUMINATED OBJECT				
1 to 100 mm	LTLNC100-X(C)			
100 to 150 mm	LTLNC150-X(C)			
150 to 200 mm	LTLNM-0200-N-c-FC-W(C) LTLNC200-X(C)	LTLNM-0200-F-c-FC-W(C)	LTLNM-0200-C-c-FC-W(C)	
200 to 300 mm	LTLNE-300-N-PC-W(C) LTLNE-300-N-FC-W(C) LTLNE-300-N-D-PC-W(C) LTLNE-300-N-D-FC-W(C) LTLNC300-X(C)	LTLNE-300-F-PC-W(C) LTLNE-300-F-FC-W(C) LTLNE-300-F-D-PC-W(C) LTLNE-300-F-D-FC-W(C)	LTLNE-300-C-PC-W(C) LTLNE-300-C-FC-W(C) LTLNE-300-C-D-PC-W(C) LTLNE-300-C-D-FC-W(C)	LTLNE-300-CX-N-PC-W(C) LTLNE-300-CX-N-FC-W(C) LTLNE-300-CX-N-D-PC-W(C) LTLNE-300-CX-N-D-FC-W(C)
300 to 400 mm	LTLNM-0400-N-c-FC-W(C)	LTLNM-0400-F-c-FC-W(C)	LTLNM-0400-C-c-FC-W(C)	
400 to 500 mm				
500 to 1000 mm	LTLNM-0600-N-c-FC-W(C) LTLNM-0800-N-c-FC-W(C) LTLNM-1000-N-c-FC-W(C)	LTLNM-0600-F-c-FC-W(C) LTLNM-0800-F-c-FC-W(C) LTLNM-1000-F-c-FC-W(C)	LTLNM-0600-C-c-FC-W(C) LTLNM-0800-C-c-FC-W(C) LTLNM-1000-C-c-FC-W(C)	
1000 to 1500 mm	LTLNM-1200-N-c-FC-W(C) LTLNM-1400-N-c-FC-W(C)	LTLNM-1200-F-c-FC-W(C) LTLNM-1400-F-c-FC-W(C)	LTLNM-1200-C-c-FC-W(C) LTLNM-1400-C-c-FC-W(C)	
1500 to 2000 mm	LTLNM-1600-N-c-FC-W(C) LTLNM-1800-N-c-FC-W(C) LTLNM-2000-N-c-FC-W(C)	LTLNM-1600-F-c-FC-W(C) LTLNM-1800-F-c-FC-W(C) LTLNM-2000-F-c-FC-W(C)	LTLNM-1600-C-c-FC-W(C) LTLNM-1800-C-c-FC-W(C) LTLNM-2000-C-c-FC-W(C)	

-X refers to the light color

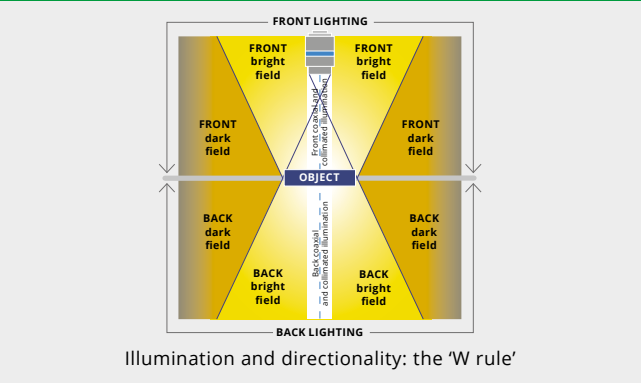
(C) = Continuous mode

(SI) = Strobed mode (constant current I driving)

(SV) = Strobed mode (constant voltage V driving)

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LIGHTING BASICS



COAXIAL		45° MIRROR		
CONVERGENT Far Field Focusing (F)	COLLIMATED	CONVERGENT Near Field Focusing (N)	CONVERGENT Far Field Focusing (F)	COLLIMATED
LTLNE-300-CX-F-PC-W(C) LTLNE-300-CX-F-FC-W(C) LTLNE-300-CX-F-D-PC-W(C) LTLNE-300-CX-F-D-FC-W(C)	LTLNE-300-CX-C-PC-W(C) LTLNE-300-CX-C-FC-W(C) LTLNE-300-CX-C-D-PC-W(C) LTLNE-300-CX-C-D-FC-W(C)	LTLNE-300-MR-N-PC-W(C) LTLNE-300-MR-N-FC-W(C) LTLNE-300-MR-N-D-PC-W(C) LTLNE-300-MR-N-D-FC-W(C)	LTLNE-300-MR-F-PC-W(C) LTLNE-300-MR-F-FC-W(C) LTLNE-300-MR-F-D-PC-W(C) LTLNE-300-MR-F-D-FC-W(C)	LTLNE-300-MR-C-PC-W(C) LTLNE-300-MR-C-FC-W(C) LTLNE-300-MR-C-D-PC-W(C) LTLNE-300-MR-C-D-FC-W(C)

Relationship between object color and light color

One way to maximize contrast is to select the light color that is on the opposite side of the wheel of the feature color. In such case, features will appear dark on the image sensor

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