TPL VISION
Active LED solutions

BLACK & LIGHT (Bn'L)

DIFFUSED AND HOMOGENEOUS BACKLIGHT

HOMOGENEOUS ILLUMINATION | MACHINE VISION SYSTEM | HIGH POWER LED | BLACK BACKGROUND | ULTRA-THIN BORDERS

POWERFUL LARGE BACKLIGHT, WITH SWITCHABLE BLACK BACKGROUND

- ✔ Bn'L = black background,
- ✔ ultra-thin borders,
- ✔ rising time: 25 µs

Many machine vision systems are not made of 1 single light, but of many different illuminations. And, quite often, LED panels can disturb the camera and the other lights efficiency, because they are equipped with a white diffuser, when a dark background would be required.

The Black & Light (Bn'L) by TPL Vision is an innovative solution, that can be integrated in most applications. Equipped with high brightness LEDs, once it is switched on, it perfectly highlights the shape of the products you need to control.

And, as soon as it is off, it becomes a dark background, that helps the other illuminations to work properly. Moreover, the matt materials help to absorb the extra light, and to enhance the inspection process.

WITH THE BN'L, DISCOVER THE DARK SIDE OF BACKLIGHTS !

3 VERSIONS

Besides the **Standard version**, there are 2 other versions:

OVERDRIVE VERSION

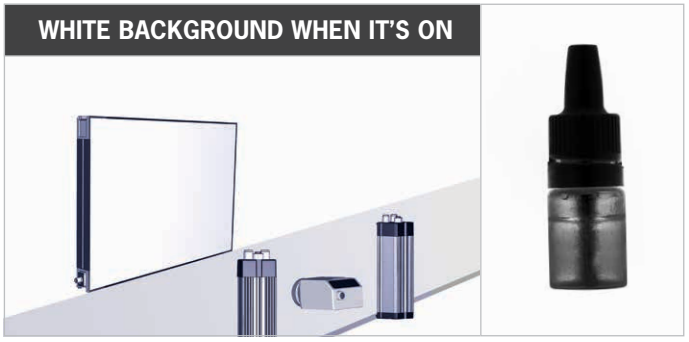
Power customisable by the user, overdrive up to **x 3**

TRINITI VERSION

Light managed by a remote controller overdrive up to **x 6**

BLACK BACKGROUND WHEN IT'S OFF

WHITE BACKGROUND WHEN IT'S ON



3 VERSIONS AVAILABLE

The **STANDARD version** is very easy to use: you don't have to adjust anything, only to plug the light. The STANDARD version works in continuous and strobe mode, with rising and falling times especially short: 25 µs and 15 µs. The STANDARD version generates a high powerful light, that fits most machine vision applications. Moreover, some LED, close to the connector, show if the light is powered, and if the strobe mode is on, for a better use of the product. Besides the **STANDARD Version**, 2 other versions are available : OVERDRIVE and TRINITI.

OVERDRIVE VERSION

OVERDRIVE UP TO x3 WITH CURRENT CONTROL INSIDE

The OVERDRIVE version is just as easy to set and to use as the STANDARD version. Equipped with specific electronics, it gives the opportunity for users to overdrive on their own the lighting power. The OVERDRIVE version is dedicated to specialists who want to customize the luminous flux very precisely, so as to get the most reliable results.

TRINITI VERSION

OVERDRIVE UP TO x6 WITH YOUR OWN CONTROLLER

In the TRINITI version, the products do not have any current controller, which is very useful for users who want to work with their own controllers. In strobe mode, they can use the TRINITI lights in overdrive, so as to get a more intense lighting power. The TRINITI version definitely targets machine vision specialists, able to manage a whole vision system.

AVAILABLE DIMENSIONS

BnL

WIDTH \ LENGTH	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
300		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
500				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
600					✓	✓	✓	✓	✓	✓	✓	✓	✓					
700						✓	✓	✓	✓	✓	✓							
800							✓	✓	✓	✓								
900								✓										

BnL OVERDRIVE

WIDTH \ LENGTH	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
300		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
400			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
500				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
600					✓	✓	✓	✓	✓	✓	✓	✓	✓					
700						✓	✓	✓	✓	✓	✓							
800							✓	✓	✓	✓								
900								✓										

BnL Triniti / BnL EXPERT

WIDTH \ LENGTH	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
300		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
400			✓	✓	✓	✓	✓	✓	✓	✓	✓							
500				✓	✓	✓	✓	✓	✓									
600					✓	✓	✓											
700						✓												

TECHNICAL SPECIFICATIONS

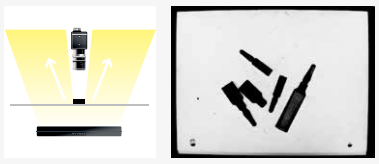
	BnL		BnL OVERDRIVE		BnL TRINITI / BnL EXPERT	
Electronics						
Power supply	24 VDC ±10%				External current controller (not supplied)	
Functioning mode	Continuous or strobe					
Strobe input	PNP : From 5 to 24V for 100% ON. From 0 to 1V for 100% OFF. NPN : less than 1V for 100% ON. Above 2V for 100% OFF. Max 20V.				N/A	
Overdrive	No		yes		According to power supply	
Strobe Conditions (On time, duty cycle)	No restriction		3ms @ 10% at max power		300µs @ 5% at max power	
Dimming	Potentiometer 30-100%				N/A	
Maximum rising time	25 µs				According to power supply	
Maximum falling time	15 µs				According to power supply	
Wiring	Surface ≤ 0,5m² : 1 connector M12 T-Power 12A 4 poles **or** 1 cable 4x1.5²	Surface > 0,5m² : 1 connector M12 T-Power 12A 4 poles **and** 1 cable 4x1.5²	Surface ≤ 0,25m² : 1 connector M12 T-Power 12A 4 poles **or** 1 cable 4x1.5²	0,25m² < Surface < 0,88m² : 1 connector M12 T-Power 12A 4 poles **and** 1 cable 4x1.5²	Surface ≤ 0,25m² : 1 cable 4x1.5²	0,25m² < Surface < 0,5m² : 2 cables 4x1.5²
Power supply cable(s) max length	Wire M12 : 10m (not suppied) ; Cable : 10m				10m	10m
Max consumption	1.32W par 25cm² in peak and on average		3W/25cm² in peak max 0.43W/25cm² max on average (3ms@10%)		7.8W/25cm² in peak max 0.54W/25cm² max on average (300µs@5%)	
Optics						
Colour	White, Red, Green, Blue, Infrared					
Mechanics						
Thickness (mm)	45mm					
Surface	Mini 200x200mm – Max surface 0.88m² Max length 1.9m – Max perimeter 4.5m		Mini 200x200mm – Max surface 0.88m² Max length 1.9m - Max perimeter 4.5m		Mini 200x200mm – Max surface 0.5m² Max length 1.9m - Max perimeter 4.5m	
Weight	23.2 Kg/m² ±15%					
Body materials	Aluminum and loaded ABS					
Diffuser	Black PMMA					
Fixing	4 M4 nuts (supplied) to insert in the groove or 4 M3x20 screws (not supplied)					
Environment						
Operating temperature	-10° to +40°C / 80% of humidity without condensation / No thermal shock (max temperature variation: 10°C in 24h)					
Storage temperature	-20° to +60°C / 80% of humidity without condensation / No thermal shock (max temperature variation: 10°C in 24h)					
IP protection	IP 40					
Labels	RoHS-CE-WEEE					

LIGHTING POWER

Distance	STANDARD	OVERDRIVE
0 m	2 800 Lux	6 500 Lux

Measurements taken with a Black & Light 40x40 WHI (+/-10%).

BACKLIGHT

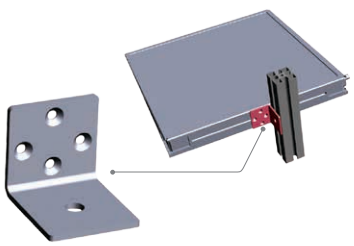


RELATED PRODUCTS

M12 female T-POWER 4 pins cable

2 meters	Ref: C-M12-4P-T-2M
5 meters	Ref: C-M12-4P-T-5M
10 meters	Ref: C-M12-4P-T-10M

MOUNTING DEVICE



Ref: TPL-MOUNT-MBACK-SQUARE1

HOW TO BUILD YOUR REFERENCE

BNL	VERSION	L LENGTH (CM)	W WIDTH (CM)	COLOUR	WIRING 1 – TYPE 1	WIRING 1 – POSITION	WIRING 2 – TYPE 2	WIRING 2 – POSITION
	STANDARD	20	20	WHI	M CONNECTOR M12*	1	A CABLE 2.5 m	1
	O OVERDRIVE	30	30	630	A CABLE 2.5 m	2	B CABLE 5 m	2
	ET TRINITI	40	40	525	B CABLE 5 m	3	C CABLE 10 m	3
	E EXPERT	50	50	470	C CABLE 10 m	4		4
		60	60	850				5
		70	70					6
		80	80					7
		90	90					8
		100						
		110						
		120						
		130						
		140						
		150						
		160						
		170						
		180						
		190						

*T-Power M12 connector for STANDARD and OVERDRIVE versions only

The first figure shall always be the biggest one.

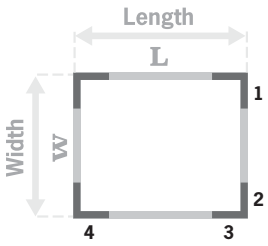
The position of wiring 2 must be different from the position of wiring 1.

WIRING CHOICE

STANDARD	OVERDRIVE	EXPERT
SURFACE ≤ 0.5M² 1 wiring	**SURFACE ≤ 0.25M²** 1 wiring	**SURFACE ≤ 0.25M²** 1 wiring
Connector M12 T-Power OR Cable 2.50m OR 5m OR 10m	Connector M12 T-Power OR Cable 2.50m OR 5m OR 10m	Cable 2.50m OR 5m OR 10m
SURFACE > 0.5M² 2 wirings	**0.25M² < S. < 0.88M²** 2 wirings	**0.25M² < S. < 0.5M²** 2 wirings
Connector M12 T-Power + Cable 2.50m OR 5m OR 10m	Connector M12 T-Power + Cable 2.50m OR 5m OR 10m	Cable 2.50m OR 5m OR 10m + Cable 2.50m OR 5m OR 10m

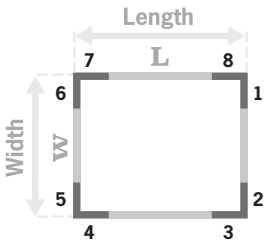
POSITION CHOICE

1 WIRING



Diffuser side overview

2 WIRINGS



Diffuser side overview

REFERENCE EXAMPLES:

BNL STANDARD 30x20 cm White LED Connector M12 T-Power position n°4:
➡ **BNL-3020-WHI-M4**

BNL OVERDRIVE 80x50 cm Red LED Connector M12 T-Power position n°1
Cable 2.50 meters position n°5: ➡ **BNL-O-8050-630-M1A5**

BNL TRINITI 60x60 cm Blue LED Cable 10 meters position n°2
Cable 5 meters position n°8: ➡ **BNL-ET-6060-470-C2B8**

TPL VISION IS EXTREMELY CAREFUL ABOUT BIN SORTING IN THE SELECTION OF LEDS FOR THEIR PRODUCTS.

The human eye is particularly sensitive to color variations. Two products of the same color may appear different in the eyes of the user. However, **the maximum variation of the wavelength DOES NOT EXCEED 10 NM**.

Here are the following bandpass camera filters we recommend:

- White LEDs: no filter required
- Infrared LEDs: LP 830 (http://midopt.com/filters/lp830/)
- Red LEDs: BP 635 (http://midopt.com/filters/bp635/)
- Cyan LEDs: BP 505 (http://midopt.com/filters/bp505/)

We advise using bandpass filters from MidOpt: **www.midopt.com**

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Other available documents :

- PDF, DWG, DXF, IGS, STEP & X_Y DRAWINGS
- USER'S GUIDE

BLACK & LIGHT

RoHS COMPLIANT CE