

## 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



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.

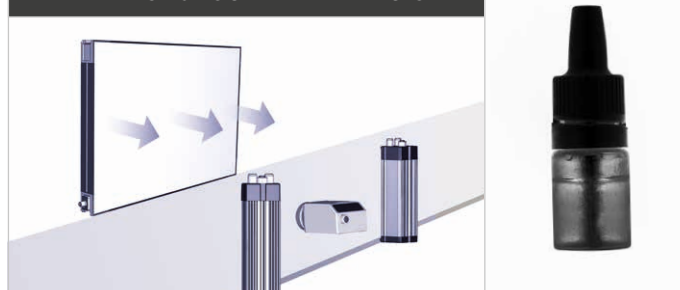
The Black & Light (Bn'L) by TPL Vision is an innovative solution, that can be integrated in most applications. Equipped with high brightness LEDs, once it is switched on, it perfectly highlights the shape of the products you need to control.

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.

### BLACK BACKGROUND WHEN IT'S OFF



### WHITE BACKGROUND WHEN IT'S ON



**OVERDRIVE**  
VERSION

Power customisable by the user, overdrive up to **x3**

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  $\mu$ s and 15  $\mu$ s. 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.

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.

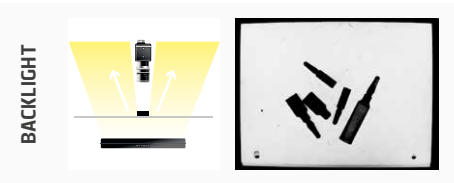
TECHNICAL SPECIFICATIONS

	BnL		BnL OVERDRIVE	
Electronics				
Power supply	24 VDC ±10%			
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.			
Overdrive	No		yes	
Strobe Conditions (On time, duty cycle)	No restriction		3ms @ 10% at max power	
Dimming	Potentiometer 30-100%			
Maximum rising time	25 µs			
Maximum falling time	15 µs			
Wiring	Surface ≤ 0,5m² : 1 connector M12 T-Power 12A 4 poles <b>or</b> 1 cable 4x1.5²	Surface > 0,5m² : 1 connector M12 T-Power 12A 4 poles <b>and</b> 1 cable 4x1.5²	Surface ≤ 0,25m² : 1 connector M12 T-Power 12A 4 poles <b>or</b> 1 cable 4x1.5²	0,25m² < Surface < 0,88m² : 1 connector M12 T-Power 12A 4 poles <b>and</b> 1 cable 4x1.5²
Power supply cable(s) max length	Wire M12 : 10m (not supplied) ; Cable : 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%)	
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	
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 M4x20 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 50			
Information				
Labels	RoHS / CE / UKCA / WEEE			
Country of Origin	Made in France			
Tariff Number	94054990			

LIGHTING POWER

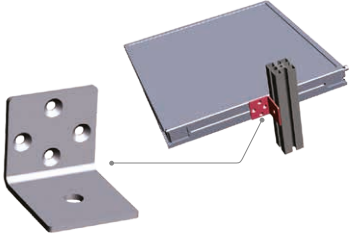
Distance	STANDARD	OVERDRIVE
0 m	2 800 Lux	6 500 Lux

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



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-HPB-SQUARE1









# HOW TO BUILD YOUR REFERENCE

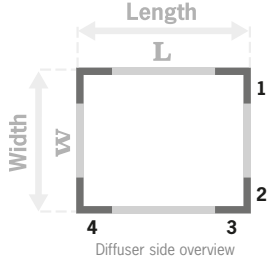
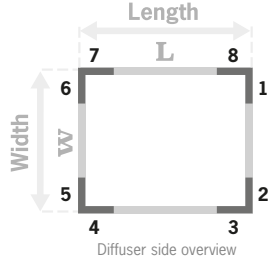
BNL	VERSION	L LENGTH (CM)	W WIDTH (CM)	COLOUR
	STANDARD	20	20	WHI
	O OVERDRIVE	30	30	630
		40	40	525
		50	50	470
		60	60	850
		70	70	
		80	80	
		90	90	
		100		
		110		
		120		
		130		
		140		
		150		
		160		
		170		
		180		
		190		

The first figure shall always be the biggest one.

WIRING 1		WIRING 2	
TYPE 1	POSITION	TYPE 2	POSITION
M CONNECTOR M12	1	A CABLE 2.5 m	1
A CABLE 2.5 m	2	B CABLE 5 m	2
B CABLE 5 m	3	C CABLE 10 m	3
C CABLE 10 m	4		4
			5
			6
			7
			8

The position of wiring 2 must be different from the position of wiring 1. It must be on a different corner and cannot be diagonally across the product, it must be on the same side profile.

WIRING CHOICE	
STANDARD	OVERDRIVE
<b>SURFACE <math>\leq 0.5M^2</math></b> 1 wiring	<b>SURFACE <math>\leq 0.25M^2</math></b> 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
<b>SURFACE <math>&gt; 0.5M^2</math></b> 2 wirings	<b><math>0.25M^2 &lt; \text{SURFACE} &lt; 0.88M^2</math></b> 2 wirings
 Connector M12 T-Power +  Cable 2.50m OR 5m OR 10m	 Connector M12 T-Power +  Cable 2.50m OR 5m OR 10m

POSITION CHOICE	
1 WIRING	2 WIRINGS
 <p>Diffuser side overview</p>	 <p>Diffuser side overview</p>
<b>REFERENCE EXAMPLES:</b> BNL STANDARD 30x20 cm White LED Connector M12 T-Power position n°4: ➔ <b>BNL-3020-WHI-M4</b>  BNL OVERDRIVE 80x50 cm Red LED Connector M12 T-Power position n°1 Cable 2.50 meters position n°3: ➔ <b>BNL-O-8050-630-M1A3</b>	

## 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](http://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**