

# Professional Lighting Systems for Industrial Imaging

## TUNNEL-M-mono

the innovative, versatile LED lighting system designed for a soft, homogeneous illumination of small objects

The tunnel conception offers some specific advantages: light is sent out from a wide stereoscopic area, and at the same time the influence of foreign light is reduced. Mobile objects can for example be transported on belts through the illuminated area.

The high number of LEDs, the wide radiation angle, the highly efficient surface foil - serving as diffusor for a large catchment - together with further arrangements provide for a soft homogeneous illumination with mat or shiny and even - to a limited degree - reflecting surfaces. The many possible adjustments facilitate solutions for most diverse problems.

- optical as well as mechanical advantages deriving from the tunnel design
- homogeneous, soft illumination of objects
- 192 luminous, high-quality SMD LEDs
- monochrome LED population in following standard colors: red, IR or white
- features especially designed for compact lenses series, and short operating distances
- adjustable illumination of defined zones out of different (up to six) directions
- various versions: for 12VDC, 24VDC, flash mode with Strobe Module DUO-X ,or for LFC (zoned flash operation)
- diffusor exchangeable by customer
- supplied standard filter-thread M 40.5 x 0.5 allows easy mounting to lens or camera
- overall high-quality execution

### Remarks to the lens opening:

The higher the facial gloss of the object, the more attention should be paid to the influence of the lens opening, since no light is reflected from this circular area. As an option, the lens can be equipped with a partially transparent mirror to reduce the influence of the lens opening.

With reflecting surfaces effects can be realized - in the centre of this lighting system - similar to those of a darkfield illumination.

### Attention - Security Advice!

LED Lighting Systems may produce highly intense radiation that might damage your eyesight.

Never look into cone of light without eye protection!

## Preliminary Information:

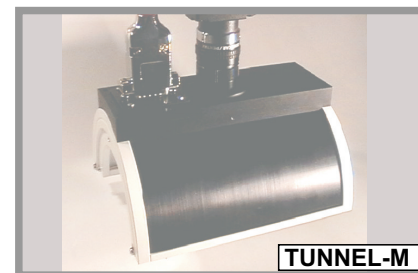
### Models in the TUNNEL-M-mono series

TUNNEL-M-mono-R635/120-12VDC  
-R635/120-24VDC  
-R635/120-Strobe  
-R635/120-LFC(6)

TUNNEL-M-mono-IR880/120-12VDC  
-IR880/120-24VDC  
-IR880/120-Strobe  
-IR880/120-LFC(6)

TUNNEL-M-mono-WS/120-12VDC  
-WS/120-24VDC  
-WS/120-Strobe  
-WS/120-LFC(6)

accessories:  
adapter rings for connecting filter-threads of different sizes



### Modes of operation:

**DC operation:**The lighting systems are available for 12VDC or 24VDC mode. When needed, they can be switched as many times as wanted by using programmable circuit-breakers (e.g. PLC). Usually the six light zones are operated jointly; on demand they can be constructed in a way that enables a separately controlled operation with up to six different lighting zones.

### Flash mode DUO-X (STROBE)

The active light area is divided into two equal parts that can be flashed by using the two outlets of a DUO or DUO-X Strobe Module.

### Zonewise illumination using a LFC

The active light area can be divided into 6 zones, controllable and flashable separately via the six channels of a LFC. This technique permits a highly flexible illumination of objects, using light out of various directions with different intensities; all those settings effective at different moments or in different sequences, if needed.

The programming and/or setting of parameters of the LFC is effected by a serial interface.

### Technical data

case:	alu, black or white anodised
diffusor /filter foil (standard):	0.5mm exchangeable
connecting filter-thread:	40.5 x 0.5mm
inner clearance of filter-thread:	35mm
weight:	approx. 200g
number of LEDs:	192 UHB SMD LEDs
standard colors:	red 625nm, IR 880nm, white, each with a 120°
power supply 12VDC:	red and IR < 220 mA, white <300mA
24VDC:	red and IR < 100 mA, white <150mA
typical apertures used.:	aperture 16 - 22 (e.g. red 625nm)
typical light intensity:	approx. 7 W/m <sup>2</sup> (e.g. red DC mode)
maximum size of focal plane:	depending on size of chip, lens, working distance, approx. 60 x 80mm

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