SENSORS

TLµSERIES

The $TL\mu$ series offers the most reliable and innovative solutions for all detection applications of register marks and other neutral or coloured references.

The microprocessor-based setting can be either 'Teach-in' using two push-buttons or 'Remote' by cable with the possibility of rapidly memorising and recalling 4 different formats. The setting can also be dynamic and completely automatic in the models with the 'Auto-Set' function.

The LED emission can be red/green with automatic selection, or white offering the possibility of operating on all contrasts, also amongst same-coloured objects and backgrounds, presenting different surface treatments or workings. Models with interchangeable 9 mm or 18 mm lenses are available; 22, 28 and 50 mm lenses are supplied as accessories. Moreover many different fibre-optic models are available. The output is NPN or PNP according to the model, but is always selectable by means of an internal switch; an analog output proportional to the received light is also present.



HIGHLIGHTS

- •'Teach-in', 'Remote' setting and models with 'Auto-Set'
- •Red/green or white LED emission
- •Various interchangeable lenses and fibre-optic versions
- •Metal housing with orientable optics and connector

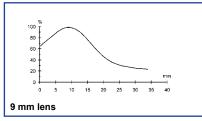
Packaging lines Contrast reading

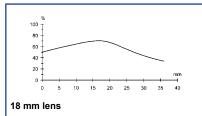
TECHNICAL DATA

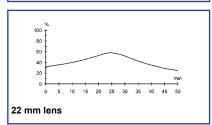
| Bower oupply | 10 30 Vdc, reverse polarity protection | | |
|---------------------------------------|--|--|--|
| Power supply: | , , , , , , , | | |
| Consumption: | 80 mA max. | | |
| Light emission: | red 630 nm / green 526 nm LED | | |
| On at dimension. | white LED (TLµ-4/5xx vers.) | | |
| Spot dimension: | 1.5 x 5 mm (9 mm lens) | | |
| | Ø 3 mm (9 lens - circular) | | |
| O | 2 x 7 mm (18 mm lens) | | |
| Operating distance: | 6 12 mm (9 mm lens) | | |
| | 14 22 mm (18 mm lens) | | |
| | 22 34 mm (28 mm lens) | | |
| O control Patricia Mil | 40 60 mm (50 mm lens) | | |
| Operating distance with fibre-optics: | 0 3 mm proximity | | |
| | 0 10 mm through beam | | |
| Depth of field: | ±3 mm (9 mm lens) | | |
| | ±4 mm (18 mm lens) | | |
| | ±6 mm (28 mm lens) | | |
| | ±10 mm (50 mm lens) | | |
| Setting: | Teach-in with 2 push-buttons | | |
| | Remote with 2 wires | | |
| Indicators: | red OUTPUT LED | | |
| | green READY LED | | |
| Output type: | NPN or PNP, Rpull-down/up 10 kΩ | | |
| Saturation voltage: | 1 V max. (NPN vers.) | | |
| | 2 V max. (PNP vers.) | | |
| Output current: | 200 mA max., short-circuit protection | | |
| Response time: | 50 μs max., 25 ms max. (TLμ-4/5xx vers.) | | |
| Switching frequency: | 10 kHz max., 20 kHz max. (TLµ-4/5xx vers.) | | |
| Operating mode: | automatic dark/light selection | | |
| Analog output range: | 0 5.5 Vdc (2 Vdc on white 90%) | | |
| | 2.2 kΩ output resistance | | |
| Timing function: | 20 ms minimum output ON | | |
| Connection: | M12 4-pole connector | | |
| | 3m Ø 6.1 mm shielded cable | | |
| Electrical protection: | class 1 | | |
| Mechanical protection: | IP67 | | |
| Housing material: | ZAMA | | |
| Lens material: | glass | | |
| Fibre-optic material: | fibre in glass / sheath in metal | | |
| | fibre in PMMA / sheath in PE (OF-30) | | |
| Weight: | 310 g max. (connector vers.) | | |
| | 450 g max. (cable vers.) | | |
| Operating temperature: | -10 +55°C | | |
| Storage temperature: | -25 +70°C | | |
| Fibre operating temperature: | -30 +150°C (glass OF vers.) | | |
| | -30 +60°C (OF-30) | | |
| Reference standard: | EN 60947-5-2 | | |
| Certifications: | C€ | | |

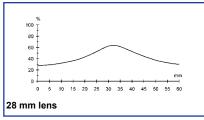
The detection diagrams indicate the typical detection distance.

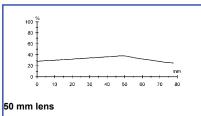
DETECTION DIAGRAMS

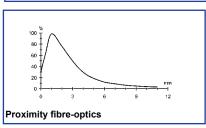


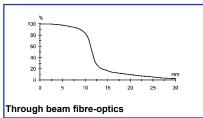




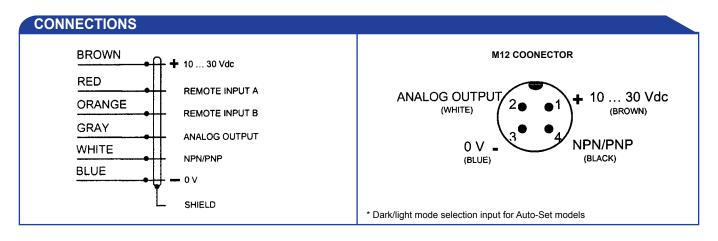


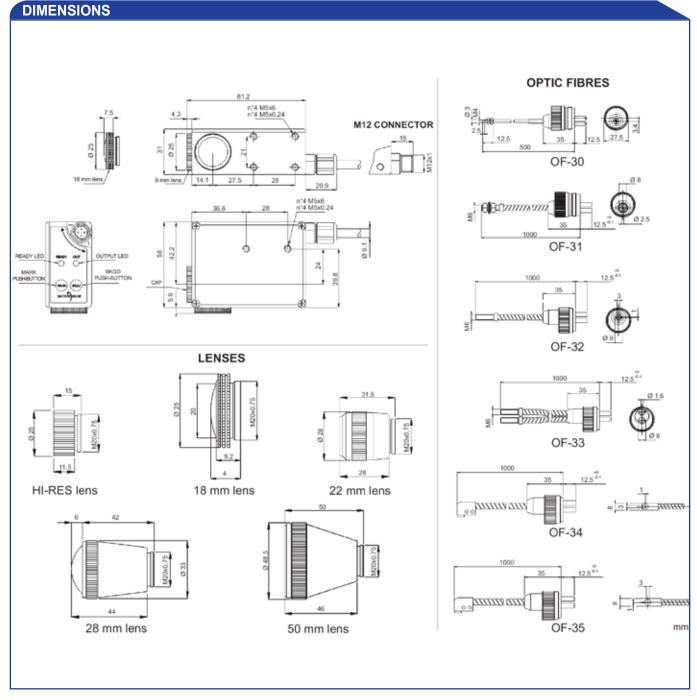






The detection diagrams indicate the typical operating distance.





MODEL SELECTION AND ORDER INFORMATION

| MODEL | EMISSION | SPOT | OPTICS | CONNECTION | OUTPUT | CODE N° |
|----------|-----------|-----------------|-------------|---------------|--------|-----------|
| TLµ-011 | red/green | vertical | 9 mm | cable | NPN | 964401000 |
| TLµ-011L | red/green | horizontal | 9 mm | cable | NPN | 964401010 |
| TLµ-015 | red/green | vertical | 9 mm | M12 connector | NPN | 964401020 |
| TLµ-015L | red/green | horizontal | 9 mm | M12 connector | NPN | 964401030 |
| TLµ-065 | red/green | vertical | 18 mm | M12 connector | NPN | 964401060 |
| TLµ-111 | red/green | vertical | 9 mm | cable | PNP | 964401080 |
| TLµ-111L | red/green | horizontal | 9 mm | cable | PNP | 964401090 |
| TLµ-115 | red/green | vertical | 9 mm | M12 connector | PNP | 964401100 |
| TLµ-115L | red/green | horizontal | 9 mm | M12 connector | PNP | 964401110 |
| TLµ-165 | red/green | vertical | 18 mm | M12 connector | PNP | 964401140 |
| TLµ-415C | white | circular | 9 mm | M12 connector | NPN | 954151330 |
| TLµ-411C | white | circular | 9 mm | cable | NPN | 954151410 |
| TLµ-445 | white | refer to fibres | fibre-optic | M12 connector | NPN | 954151350 |
| TLµ-515C | white | circular | 9 mm | M12 connector | PNP | 954151360 |
| TLµ-511C | white | circular | 9 mm | cable | PNP | 954151420 |
| TLµ-545 | white | refer to fibres | fibre-optic | M12 connector | PNP | 954151380 |

ACCESSORY SELECTION AND ORDER INFORMATION

| MODEL | DESCRIPTION | CODE N° |
|-------------|--|-----------|
| Lens Hi-Res | lens with 9 mm focus (*) | 95ACC1050 |
| Lens No.18 | lens with 18 mm focus | 95ACC2680 |
| Lens No.22 | lens with 22 mm focus | 95ACC1100 |
| Lens No.28 | lens with 28 mm focus | 890000194 |
| Lens No.50 | lens with 50 mm focus | S73030511 |
| OF-30-5 | plastic fibre-optic L 50 cm - point-shaped spot proximity | 96B001070 |
| OF-31-10 | glass fibre-optic L 100 cm - point-shaped spot proximity | 96B201000 |
| OF-32-10 | glass fibre-optic L 100 cm - rectangular spot proximity | 96B211000 |
| OF-33-10 | glass fibre-optic L 100 cm - through beam | 96B221000 |
| OF-34-10 | glass fibre-optic L 100 cm - horizontal spot 90° proximity | 96B231000 |
| OF-35-10 | glass fibre-optic L 100 cm - vertical spot 90° proximity | 96B24100 |

 $^{^{\}star}$ focussing lens to screw between the sensor and the normal 9 mm lens

Please refer also to **Sensor Accessories**

The company endeavours to continuously improve and renew its products; for this reason the technical data and contents of this catalogue may undergo variations without prior notice. For correct installation and use, the company can guarantee only the data indicated in the instruction manual supplied with the products.