⬦DATALOGIC™

TLμ SERIES
INSTRUCTION MANUAL

CONTROLS

OUTPUT LED
The red LED indicates the output status.

READY LED
During functioning, the green LED permanently ON indicates a normal operating condition; fast blinking indicates an output overload condition. See the "SETTING" paragraph for setup procedure indications.
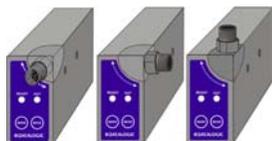
MARK / BKGD PUSHBUTTON
The pushbutton activates the setup procedure.
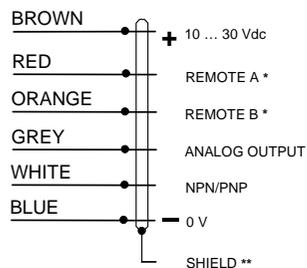
INSTALLATION

Operating distance is rated starting from the lens front face. The M12 connector or cable exit can be rotated in three positions by loosening the locking screw. Tighten the locking screw when finished.
The beam direction may be changed swapping the cap and the lens.
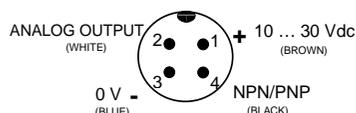Detecting marks on a reflective surface is improved adjusting the beam direction to 5° … 20° from surface axis.

CONNECTIONS

BROWN — **+** 10 … 30 Vdc
RED — REMOTE A *
ORANGE — REMOTE B *
GREY — ANALOG OUTPUT
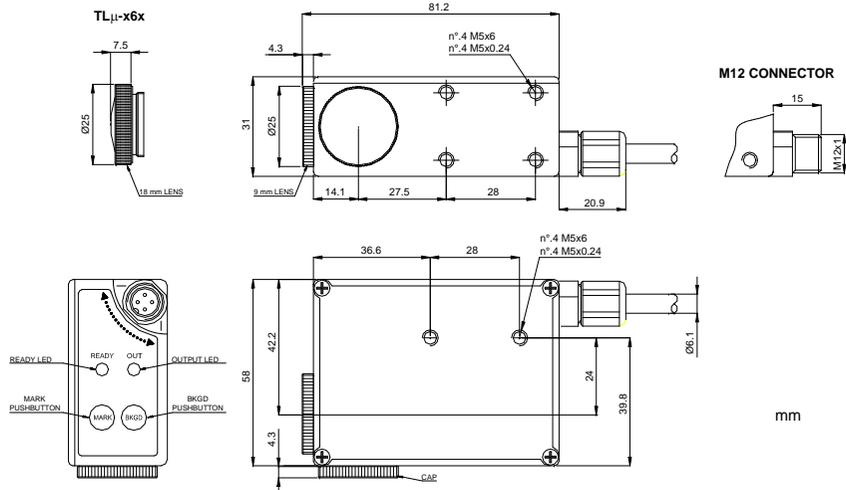WHITE — NPN/PNP
BLUE — **–** 0 V
— SHIELD **

* = Connect the unused REMOTE wires to 0 V.
** = The cable shield is insulated from the sensor housing; it is recommended to connect the shield to 0 V.
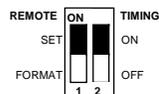
M12 CONNECTOR

ANALOG OUTPUT (WHITE) — 2 1 — **+** 10 … 30 Vdc (BROWN)
0 V (BLUE) — 3 4 — NPN/PNP (BLACK) **-**

DIMENSIONS

TLμ-x6x

7.5
Ø25
18 mm LENS

81.2
4.3
Ø25
31
9 mm LENS
14.1 | 27.5 | 28
n°.4 M5x6
n°.4 M5x0.24
20.9

M12 CONNECTOR
15
M12x1

READY LED — READY — OUT — OUTPUT LED
MARK PUSHBUTTON — MARK — BKGD — BKGD PUSHBUTTON
58
4.3

36.6 | 28
42.2
24
39.8
n°.4 M5x6
n°.4 M5x0.24
Ø6.1
CAP
mm

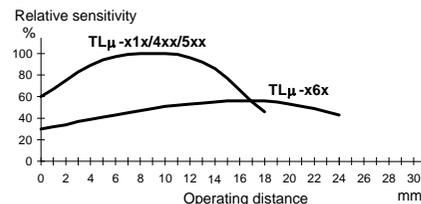## TECHNICAL DATA

Power supply:	10 … 30 Vdc limit values; reverse polarity protection
Ripple:	2 Vpp max.
Current consumption (output current excluded):	80 mA max.
Output:	NPN or PNP, pull down/up resistance 10 kΩ (short-circuit protection)
Output current:	200 mA max.
Analog output:	0 … 2 V ± 10% (white 90%); 5.5 V max.; ripple 40 mVpp max.; output resistance 2.2 kΩ
Output saturation voltage:	1V max. NPN versions / 2V max PNP versions
Response time:	50 μs max. / 25 μs max. (TLμ-4xx/5xx)
Switching frequency:	10 kHz max. / 20 kHz max. (TLμ-4xx/5xx)
Timing function:	20 ms minimum output ON
Indicators:	OUTPUT LED (RED) / READY LED (GREEN)
Setting:	by pushbuttons / by wires; 4 settings storage cable version
Retention data:	non volatile EEPROM memory
Operating temperature:	-10 … 55 °C
Storage temperature:	-20 … 70 °C
Electric shock protection:	Class 1
Operating distance:	9 mm (TLμ-x1x/4xx/5xx) / 18 mm (TLμ-x6x)
Minimum spot dimension:	1.5 x 5 mm (TLμ-x1x) / 2 x 7 mm (TLμ-x6x) / ∅ 3 mm (TLμ-4xx/5xx)
Depth of field:	± 3 mm (TLμ-x1x/4xx/5xx) / ± 4 mm (TLμ-x6x)
Emission type:	green (526 nm) / red (630 nm) with automatic selection or white (400-700 nm)
Ambient light rejection:	according to EN 60947-5-2
Vibration:	0.5 mm amplitude, 10 … 55 Hz frequency, in every axis (EN60068-2-6)
Shock resistance:	11 ms (30 G) 6 shock in every axis (EN60068-2-27)
DARK/LIGHT selection:	teach-in procedure
Housing:	ZAMA
Protection class:	IP67
Connections:	3 m shielded cable ∅ 6.1 mm / M12 4-pole connector
Weight:	450 g. max. cable versions / 310 g. max. connector versions

CONFIGURATION

A double selector and a switch are available removing the sensor side cover. The selector allows to enable the output timing function and choose the pushbuttons and REMOTE inputs operating mode; the switch allows to select the output type (NPN or PNP).

REMOTE	ON		TIMING
SET			ON
FORMAT			OFF
	1	2	

DETECTION DIAGRAM

Relative sensitivity %
100
80
60
40
20
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
Operating distance mm

TLμ -x1x/4xx/5xx
TLμ -x6x

FUNCTION SELECTION

When **FORMAT** is selected (configuration selector section 1), the MARK and BKGD puskbuttons are enabled and connecting the REMOTE inputs (TLμ-xx1) to the power supply as shown in the table allows to select up to 4 different settings (formats). This is the factory setting.

N°. FORMAT	1	2	3	4
input REMOTE A	0V	0V	+V	+V
input REMOTE B	0V	+V	0V	+V

If a non-set format is selected, the sensor is disabled and the green LED flashes at a low rate.
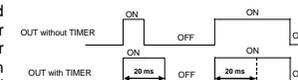A setting can be stored selecting a format and executing the procedure described in the "SETTING" paragraph.

When **SET** is selected (configuration selector section 1), the MARK and BKGD pushbuttons are disabled; the REMOTE inputs (TLμ-x1x) replace the pushbuttons functionality.
Connecting the REMOTE A and B inputs to the positive power supply rail is equivalent to pressing the MARK and BKGD pushbuttons respectively. Connect the unused inputs to 0V.

TIMING FUNCTION

When ON is selected (configuration selector section 2), a delay timer function is enabled which extends the minimum ON output time to 20 ms. The factory setting is OFF (timer disabled).

OUT without TIMER: ON | OFF | ON | OFF
OUT with TIMER: ON 20 ms | OFF | ON 20 ms | OFF

SETTING

A two-step setup procedure adjusts the switching threshold and the LIGHT/DARK mode. Using the procedure given below the sensor output is set to be ON when a mark is detected.

1) Output ON state acquisition (MARK)
Place the target mark into the emission spot and press the MARK pushbutton until the green LED turns OFF.
Don't move the mark during the setting phase (about 1 sec).

2) Output OFF state acquisition (BKGD)
Place the background into the emission spot and press the BKGD pushbutton; the green LED blinks once.
Don't move the background during the setting phase.

If the green LED lights permanently ON, a safe operation has been obtained; if it flashes at a low rate the setup procedure has failed due to insufficient contrast; repeat the procedure from the beginning.

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