

## LD $\mu$ 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

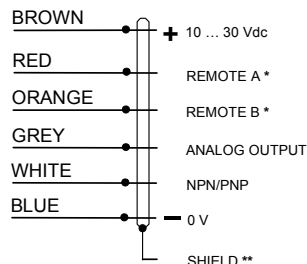
Operating distance is rated starting from the lens front face. The M12 connector or cable exit can be rotated in three positions by loosening the locking screw. Tighten the locking screw when finished.

The beam direction can't be changed; don't swap the cap and the lens.

Detecting on a reflective surface is improved adjusting the beam direction to 5° ... 20° from surface axis.



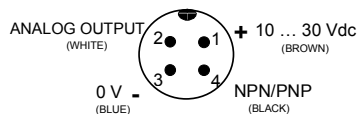
### CONNECTIONS



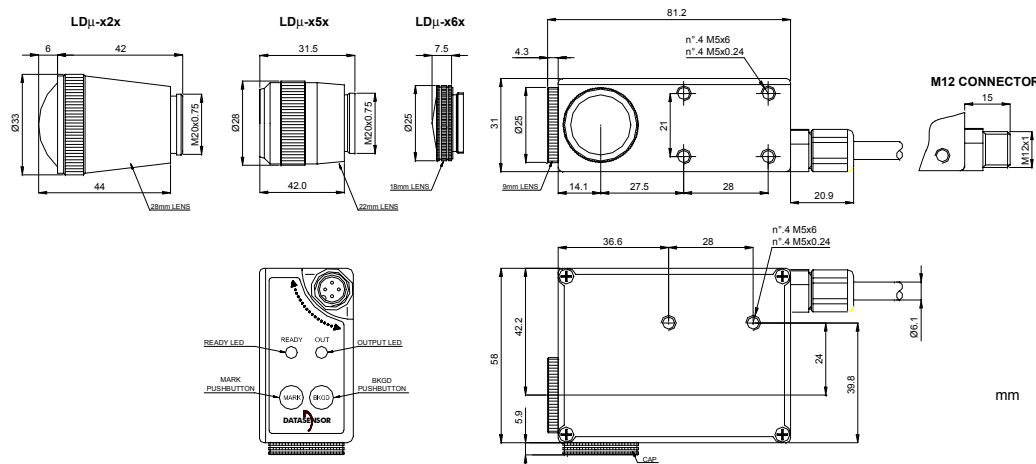
\* = Connect the unused REMOTE wires to 0 V.

\*\* = The cable shield is insulated from the sensor housing; it is recommended to connect the shield to 0 V.

#### M12 CONNECTOR



### DIMENSIONS

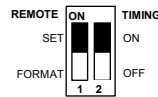


### TECHNICAL DATA

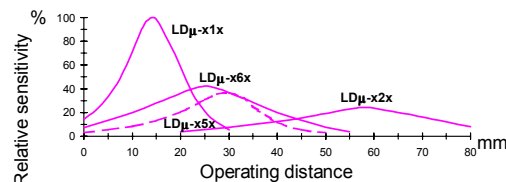
|  |  |
|--|--|
| Power supply:                                  | 10 ... 30 Vdc limit values; reverse polarity protection  |
| Ripple:  | 2 Vpp max.   |
| Current consumption (output current excluded): | 80 mA max.   |
| Output:  | NPN or PNP, pull down/up resistance 10 k $\Omega$ (short-circuit protection)   |
| Output current:                                | 200 mA max.  |
| Analog output:                                 | 0 ... 5.5 V $\pm$ 10%; ripple 40 mVpp max.; output resistance 2.2 k $\Omega$   |
| Output saturation voltage:                     | 1 V max. NPN versions / 2V max PNP versions  |
| Response time:                                 | 500 $\mu$ s max. / 250 $\mu$ s max (LD $\mu$ -4xx)   |
| Switching frequency:                           | 1 kHz max. / 2 kHz max (LD $\mu$ -4xx)   |
| 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 ... 18 mm (LD $\mu$ -x1x) / 15 ... 30 mm (LD $\mu$ -x6x) / 40 ... 75 mm (LD $\mu$ -x2x) / 10 ... 30 mm (LD $\mu$ -x5x) |
| Minimum spot dimension:                        | Ø 5 mm (LD $\mu$ -x1x) / Ø 7 mm (LD $\mu$ -x6x) / Ø 3 mm (LD $\mu$ -x5x) / Ø 4 mm (LD $\mu$ -x2x)                        |
| Emission type:                                 | LED UV (380 nm) / LED UV (370 nm) (LD $\mu$ -4xx)  |
| Ambient light rejection:                       | according to EN 60947-5-2  |
| Vibration:                                     | 10 ... 55 Hz, 1.5 mm amplitude in each X, Y, Z axis for 2 hours  |
| Shock resistance:                              | 500 ms (approx. 50 G) 3 shock in each 3 axis   |
| DARK/LIGHT selection:                          | teach-in procedure   |
| Housing:                                       | zama   |
| Protection class:                              | IP67   |
| Connections:                                   | 6 wires 3 m shielded cable Ø 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).



### DETECTION DIAGRAM



### FUNCTION SELECTION

When **FORMAT** is selected (configuration selector section 1), the MARK and BKGD

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

pushbuttons are enabled and connecting the REMOTE inputs (LD $\mu$ -x1x) to the power supply as shown in the table allows to select up to 4 different settings (formats). This is the factory setting.

If a non-set format is selected, the sensor is disabled and the green LED flashes at a low rate.

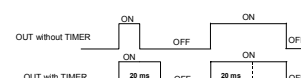
A setting can be stored selecting a format and executing the procedure described in the "SETTING" paragraph.

When **SET** is selected (configuration selector section 1), the MARK and BKGD pushbuttons are disabled; the REMOTE inputs (LD $\mu$ -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).

### 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 luminescent target into the emission spot and press the MARK pushbutton until the green LED turns OFF.

Don't move the target during this phase.

#### 2) Output OFF state acquisition (BKGD)

Remove the luminescent target and press the BKGD pushbutton; the green LED blinks once.

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.

#### DECLARATION OF CONFORMITY

We DATASENSOR S.p.A. declare under our sole responsibility that these products are conform to the 89/336 CEE, 73/23 CEE Directives and successive amendments.

#### WARRANTY

DATASENSOR S.p.A. warrants its products to be free from defects. DATASENSOR S.p.A. will repair or replace, free of charge, any product found to be defective during the warranty period of 36 months from the manufacturing date. This warranty does not cover damage or liability deriving from the improper application of DATASENSOR products.

DATASENSOR S.p.A. Via Lavino 265  
40050 Monte S. Pietro - Bologna - Italy  
Tel: +39 051 6765611 Fax: +39 051 6759324  
http://www.datasensor.com e-mail: info@datasensor.com

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