

## Technical data sheet

### Multiple light beam safety device transmitter

Part no.: 66502100

MLD500-T2L



For illustration purposes only

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## Technical data

### Basic data

|             |             |
|-------------|-------------|
| Series      | MLD 500     |
| Device type | Transmitter |

### Special version

|                 |                                |
|-----------------|--------------------------------|
| Special version | Integrated laser alignment aid |
|-----------------|--------------------------------|

### Functions

|                                |                 |
|--------------------------------|-----------------|
| Functions                      | Range reduction |
| Integrated laser alignment aid | Yes             |

### Characteristic parameters

|                             |                           |
|-----------------------------|---------------------------|
| Type                        | 4, IEC/EN 61496           |
| SIL                         | 3, IEC 61508              |
| SILCL                       | 3, IEC/EN 62061           |
| MTTF <sub>d</sub>           | 204 years, EN ISO 13849-1 |
| Mission time T <sub>M</sub> | 20 years, EN ISO 13849-1  |

### Protective field data

|                 |              |
|-----------------|--------------|
| Operating range | 0.5 ... 50 m |
|-----------------|--------------|

### Optical data

|                                               |                                                |
|-----------------------------------------------|------------------------------------------------|
| Number of beams                               | 2 Piece(s)                                     |
| Beam spacing                                  | 500 mm                                         |
| Light source                                  | LED, Infrared                                  |
| Wavelength                                    | 850 nm                                         |
| Mean power of transmitter diode               | 1.369 µW                                       |
| Transmitted-signal shape                      | Continuous                                     |
| LED risk group                                | Exempt group (in acc. with EN 62471:2008)      |
| Laser alignment aid, light color              | Laser, red                                     |
| Laser alignment aid, light wavelength         | 650 nm                                         |
| Laser alignment aid, class                    | 2, IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 |
| Laser alignment aid, transmitted-signal shape | Continuous                                     |
| Laser alignment aid, transmitting power       | 1,000 µW                                       |

### Electrical data

|                    |                         |
|--------------------|-------------------------|
| Protective circuit | Overvoltage protection  |
|                    | Short circuit protected |

### Performance data

|                               |                              |
|-------------------------------|------------------------------|
| Supply voltage U <sub>B</sub> | 24 V, DC, -20 ... 20 %       |
| Current consumption, max.     | 50 mA, Without external load |
| Fuse                          | External with max. 3 A       |

### Connection

|                       |                   |
|-----------------------|-------------------|
| Number of connections | 1 Piece(s)        |
| Connection 1          |                   |
| Function              | Machine interface |
| Type of connection    | Connector         |
| Thread size           | M12               |
| Material              | Metal             |
| No. of pins           | 5 -pin            |

### Cable properties

|                                            |          |
|--------------------------------------------|----------|
| Permissible conductor cross section, type. | 0.25 mm² |
| Length of connection cable, max.           | 100 m    |
| Permissible cable resistance to load, max. | 200 Ω    |

### Mechanical data

|                       |                          |
|-----------------------|--------------------------|
| Dimension (W x H x L) | 52 mm x 600 mm x 64.7 mm |
| Housing material      | Metal                    |
| Metal housing         | Aluminum                 |
| Lens cover material   | Plastic / PMMA           |
| Material of end caps  | Diecast zinc             |
| Net weight            | 1,400 g                  |
| Housing color         | Yellow, RAL 1021         |
| Type of fastening     | Groove mounting          |
|                       | Swivel mount             |

### Operation and display

|                 |            |
|-----------------|------------|
| Type of display | LED        |
| Number of LEDs  | 2 Piece(s) |

### Environmental data

|                                    |               |
|------------------------------------|---------------|
| Ambient temperature, operation     | -30 ... 55 °C |
| Ambient temperature, storage       | -40 ... 75 °C |
| Relative humidity (non-condensing) | 0 ... 95 %    |

### Certifications

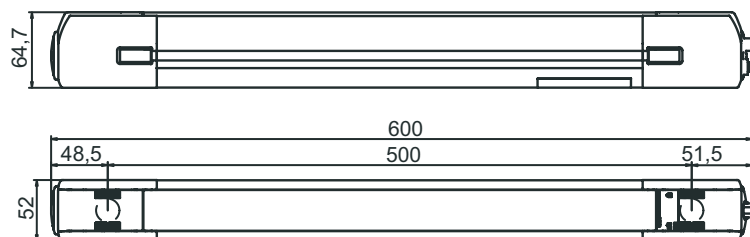
|                      |                |
|----------------------|----------------|
| Degree of protection | IP 67          |
| Protection class     | III            |
| Approvals            | c UL US        |
|                      | TÜV Süd        |
| US patents           | US 6,418,546 B |
|                      | US 7,741,595 B |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27272703 |
| ECLASS 8.0            | 27272703 |
| ECLASS 9.0            | 27272703 |
| ECLASS 10.0           | 27272703 |
| ECLASS 11.0           | 27272703 |
| ECLASS 12.0           | 27272703 |
| ECLASS 13.0           | 27272703 |
| ECLASS 14.0           | 27272703 |
| ECLASS 15.0           | 27272703 |
| ECLASS 16.0           | 27272703 |
| ETIM 5.0              | EC001832 |
| ETIM 6.0              | EC001832 |
| ETIM 7.0              | EC001832 |
| ETIM 8.0              | EC001832 |
| ETIM 9.0              | EC001832 |
| ETIM 10.0             | EC001832 |
| UNSPSC 26.08          | 32151804 |

## Dimensioned drawings

All dimensions in millimeters

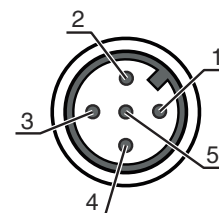


## Electrical connection

### Connection 1

|                    |                   |
|--------------------|-------------------|
| Function           | Machine interface |
| Type of connection | Connector         |
| Thread size        | M12               |
| Type               | Male              |
| Material           | Metal             |
| No. of pins        | 5 -pin            |
| Encoding           | A-coded           |

| Pin | Pin assignment                                                        | Conductor color |
|-----|-----------------------------------------------------------------------|-----------------|
| 1   | +24 V                                                                 | Brown           |
| 2   | With integrated alignment aid, 24 V activation red light beam         | White           |
| 3   | 0 V                                                                   | Blue            |
| 4   | Transmitter range switching: 0 V = entire range, 24 V = reduced range | Black           |
| 5   | n.c.                                                                  | Gray            |



## Operation and display

### LEDs per light axis

### Meaning

|                         |                             |
|-------------------------|-----------------------------|
| Green, continuous light | Transmitted beam active     |
| Off                     | Transmitted beam not active |

## Suitable receivers

|  | Part no. | Designation | Article                                    | Description                                                                                                                                                                             |
|--|----------|-------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 66536100 | MLD510-R2L  | Multiple light beam safety device receiver | Special version: Reflective element for laser alignment aid<br>Number of beams: 2 Piece(s)<br>Beam spacing: 500 mm<br>Response time: 25 ms<br>Connection: Connector, M12, Metal, 5 -pin |
|  | 66556100 | MLD520-R2L  | Multiple light beam safety device receiver | Special version: Reflective element for laser alignment aid<br>Number of beams: 2 Piece(s)<br>Beam spacing: 500 mm<br>Response time: 25 ms<br>Connection: Connector, M12, Metal, 8 -pin |

## Suitable receivers

|                                                                                    | Part no. | Designation | Article                                    | Description                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------|----------|-------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 66555100 | MLD520-R2LM | Multiple light beam safety device receiver | Special version: Integrated status indicator, Reflective element for laser alignment aid<br>Number of beams: 2 Piece(s)<br>Beam spacing: 500 mm<br>Response time: 25 ms<br>Connection: Connector, M12, Metal, 8 -pin                              |
|                                                                                    | 66566100 | MLD530-R2L  | Multiple light beam safety device receiver | Special version: Reflective element for laser alignment aid<br>Number of beams: 2 Piece(s)<br>Beam spacing: 500 mm<br>Response time: 50 ms<br>Connection: Connector, M12, Metal, 8 -pin                                                           |
|                                                                                    | 66565100 | MLD530-R2LM | Multiple light beam safety device receiver | Special version: Integrated muting indicator, Integrated status indicator, Reflective element for laser alignment aid<br>Number of beams: 2 Piece(s)<br>Beam spacing: 500 mm<br>Response time: 50 ms<br>Connection: Connector, M12, Metal, 8 -pin |
|                                                                                    | 66576100 | MLD535-R2L  | Multiple light beam safety device receiver | Special version: Reflective element for laser alignment aid<br>Number of beams: 2 Piece(s)<br>Beam spacing: 500 mm<br>Response time: 50 ms<br>Connection: Connector, M12, Metal, 8 -pin                                                           |

## Part number code

Part designation: **MLDxyy-zab/t****MLD** Multiple light beam safety device

|           |                                                                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>x</b>  | <b>Series</b><br>3: MLD 300<br>5: MLD 500                                                                                                                         |
| <b>yy</b> | <b>Function classes</b><br>00: transmitter<br>10: automatic restart<br>12: external testing<br>20: EDM/RES<br>30: muting<br>35: timing controlled 4-sensor muting |
| <b>z</b>  | <b>Device type</b><br>T: transmitter<br>R: receiver<br>RT: transceiver<br>xT: transmitter with high range<br>xR: receiver for high range                          |
| <b>a</b>  | Number of beams                                                                                                                                                   |

## Part number code

### MLD

### Multiple light beam safety device

|    |                                                                                                                                                                                                                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| b  | <b>Option</b><br>L: integrated laser alignment aid (for transmitter/receiver)<br>M: integrated status indicator (MLD 320, MLD 520) or integrated status and muting indicator (MLD 330, MLD 335, MLD 510/A, MLD 530, MLD 535)<br>E: Connection socket for external muting indicator (AS-i models only) |
| /t | <b>Safety-related switching outputs (OSSDs), connection technology</b><br>-: transistor output, M12 plug<br>A: Integrated AS-i interface, M12 plug, (safety bus system)                                                                                                                               |

#### Note



A list with all available device types can be found on the Leuze website at [www.leuze.com](http://www.leuze.com).

## Notes



### ATTENTION! LASER RADIATION – CLASS 2 LASER PRODUCT



#### Do not stare into beam!

The device satisfies the requirements of IEC/EN 60825-1:2014 safety regulations for a product of **laser class 2** as well as the U.S. 21 CFR 1040.10 and 1040.11 regulations with deviations corresponding to Laser Notice No. 56 from May 08, 2019.

- ⚠ Never look directly into the laser beam or in the direction of reflected laser beams! If you look into the beam path over a longer time period, there is a risk of injury to the retina.
- ⚠ Do not point the laser beam of the device at persons!
- ⚠ Interrupt the laser beam using a non-transparent, non-reflective object if the laser beam is accidentally directed towards a person.
- ⚠ When mounting and aligning the device, avoid reflections of the laser beam off reflective surfaces!
- ⚠ CAUTION! The use of operating and adjusting devices other than those specified here or the carrying out of differing procedures may lead to dangerous exposure to radiation!
- ⚠ Observe the applicable statutory and local laser protection regulations.
- ⚠ The device must not be tampered with and must not be changed in any way.  
There are no user-serviceable parts inside the device.  
Repairs must only be performed by Leuze electronic GmbH + Co. KG.  
The alignment laser emits constant radiation that has a maximum output power of 1 mW and is emitted from the device collimated.

#### NOTE



#### Affix laser information and warning signs!

Laser information and warning signs are affixed to the device. In addition, self-adhesive laser information and warning signs (stick-on labels) are supplied in several languages.

- ⚠ Affix the laser information sheet to the device in the language appropriate for the place of use. When using the device in the US, use the stick-on label with the "Complies with 21 CFR 1040.10/11" note.
- ⚠ Affix the laser information and warning signs near the device if no signs are attached to the device (e.g. because the device is too small) or if the attached laser information and warning signs are concealed due to the installation position.
- ⚠ Affix the laser information and warning signs so that they are legible without exposing the reader to the laser radiation of the device or other optical radiation.

## Accessories

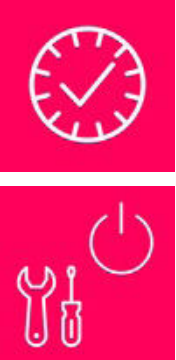
### Connection technology - Connection cables

|                                                                                   | Part no. | Designation        | Article          | Description                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------|----------|--------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50133859 | KD S-M12-5A-P1-020 | Connection cable | Application: Oil and lubricant resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 2,000 mm<br>Sheathing material: PUR  |
|                                                                                   | 50133860 | KD S-M12-5A-P1-050 | Connection cable | Application: Oil and lubricant resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PUR  |
|                                                                                   | 50136146 | KD S-M12-5A-P1-250 | Connection cable | Application: Oil and lubricant resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 25,000 mm<br>Sheathing material: PUR |

### Mounting technology - Swivel mounts

|                                                                                    | Part no. | Designation    | Article              | Description                                                                                                                                                                       |
|------------------------------------------------------------------------------------|----------|----------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 560340   | BT-SET-240BC   | Mounting bracket set | Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 240°<br>Material: Metal<br>Shock absorber: No          |
|                                                                                    | 540350   | BT-SET-240BC-E | Mounting bracket set | Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 240°<br>Material: Metal, Plastic<br>Shock absorber: No |

### Services

|                                                                                    | Part no. | Designation | Article           | Description                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------|----------|-------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | S981050  | CS40-I-140  | Safety inspection | Details: Checking of a safety light barrier application in accordance with current standards and guidelines. Inclusion of the device and machine data in a database, production of a test log per application.<br>Conditions: It must be possible to stop the machine, support provided by customer's employees and access to the machine for Leuze employees must be ensured. |
|                                                                                    | S981046  | CS40-S-140  | Start-up support  | Details: For safety devices including stopping time measurement and initial inspection.<br>Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses.                                                                                                                                         |

Accessories

| Note                                                                             |                                                                                                                                  |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|  | <p>A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.</p> |