



Figure can vary

**Part no.: 66556000**  
**MLD520-R1L**  
**Single beam safety device receiver**



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- Dimensioned drawings
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## Technical data

| Basic data                         |                                                                                     |  |
|------------------------------------|-------------------------------------------------------------------------------------|--|
| Series                             | MLD 500                                                                             |  |
|                                    |                                                                                     |  |
| Special design                     |                                                                                     |  |
| Special design                     | Reflective element for laser alignment aid                                          |  |
|                                    |                                                                                     |  |
| Functions                          |                                                                                     |  |
| Functions                          | Contactor monitoring (EDM), selectable<br>Start/restart interlock (RES), selectable |  |
|                                    |                                                                                     |  |
| Characteristic parameters          |                                                                                     |  |
| Type                               | 4, IEC/EN 61496                                                                     |  |
| SIL                                | 3, IEC 61508                                                                        |  |
| SILCL                              | 3, IEC/EN 62061                                                                     |  |
| Performance Level (PL)             | e, EN ISO 13849-1                                                                   |  |
| MTTF <sub>d</sub>                  | 204 years, EN ISO 13849-1                                                           |  |
| PFH <sub>D</sub>                   | 6.6E-09 per hour                                                                    |  |
| Mission time T <sub>M</sub>        | 20 years, EN ISO 13849-1                                                            |  |
| Category                           | 4, EN ISO 13849                                                                     |  |
|                                    |                                                                                     |  |
| Electrical data                    |                                                                                     |  |
| Protective circuit                 | Overvoltage protection<br>Short circuit protected                                   |  |
|                                    |                                                                                     |  |
| Performance data                   |                                                                                     |  |
| Supply voltage U <sub>B</sub>      | 24 V, DC, -20 ... 20 %                                                              |  |
| Current consumption, max.          | 150 mA, Without external load                                                       |  |
| Fuse                               | External with max. 3 A                                                              |  |
| Inputs                             |                                                                                     |  |
| Number of digital switching inputs | 3 Piece(s)                                                                          |  |
|                                    |                                                                                     |  |
| Switching inputs                   |                                                                                     |  |
| Type                               | Digital switching input                                                             |  |
| Switching voltage high, min.       | 18.2 V                                                                              |  |
| Switching voltage low, max.        | 2.5 V                                                                               |  |
| Switching voltage, typ.            | 23 V                                                                                |  |
| Voltage type                       | DC                                                                                  |  |
| Switching current, max.            | 5 mA                                                                                |  |

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## Outputs

|                                                    |            |
|----------------------------------------------------|------------|
| Number of safety-related switching outputs (OSSDs) | 2 Piece(s) |
| Number of digital switching outputs                | 1 Piece(s) |

### Safety-related switching outputs

|                              |                                      |
|------------------------------|--------------------------------------|
| Type                         | Safety-related switching output OSSD |
| Switching voltage high, min. | 18.2 V                               |
| Switching voltage low, max.  | 2.5 V                                |
| Switching voltage, typ.      | 23 V                                 |
| Voltage type                 | DC                                   |
| Current load, max.           | 380 mA                               |
| Load inductivity             | 2,200,000 µH                         |
| Load capacity                | 0.3 µF                               |
| Residual current, max.       | 0.2 mA                               |
| Residual current, typ.       | 0.002 mA                             |
| Voltage drop                 | 1 V                                  |

### Safety-related switching output 1

|                   |                 |
|-------------------|-----------------|
| Switching element | Transistor, PNP |
|-------------------|-----------------|

### Safety-related switching output 2

|                   |                 |
|-------------------|-----------------|
| Switching element | Transistor, PNP |
|-------------------|-----------------|

### Switching outputs

|                              |        |
|------------------------------|--------|
| Switching voltage high, min. | 18.2 V |
| Switching voltage low, max.  | 2.5 V  |
| Switching voltage, typ.      | 23 V   |
| Voltage type                 | DC     |

### Switching output 1

|                     |                                |
|---------------------|--------------------------------|
| Assignment          | Connection 1, pin 1            |
| Switching element   | Transistor, PNP                |
| Switching principle | +24 V switching                |
| Function            | "State of OSSDs" signal output |

## Timing

|                    |        |
|--------------------|--------|
| Response time      | 25 ms  |
| Restart delay time | 100 ms |

## Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 1 Piece(s) |
|-----------------------|------------|

### Connection 1

|                    |                   |
|--------------------|-------------------|
| Type of connection | Connector         |
| Function           | Machine interface |
| Thread size        | M12               |
| Material           | Metal             |
| No. of pins        | 8 -pin            |

### Cable properties

|                                            |                      |
|--------------------------------------------|----------------------|
| Permissible conductor cross section, typ.  | 0.25 mm <sup>2</sup> |
| Permissible cable resistance to load, max. | 200 Ω                |

## Mechanical data

|                       |                          |
|-----------------------|--------------------------|
| Design                | Cubic                    |
| Dimension (W x H x L) | 52 mm x 193 mm x 64.7 mm |

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|                      |                                 |
|----------------------|---------------------------------|
| Housing material     | Metal, Aluminum                 |
| Lens cover material  | Plastic / PMMA                  |
| Material of end caps | Diecast zinc                    |
| Net weight           | 600 g                           |
| Housing color        | Yellow, RAL 1021                |
| Type of fastening    | Swivel mount<br>Groove mounting |

### Operation and display

|                 |            |
|-----------------|------------|
| Type of display | LED        |
| Number of LEDs  | 1 Piece(s) |

### Environmental data

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

### Certifications

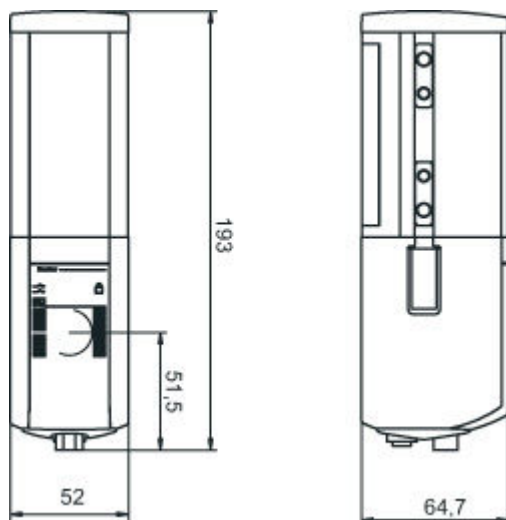
|                      |                                      |
|----------------------|--------------------------------------|
| Degree of protection | IP 67                                |
| Protection class     | III                                  |
| Certifications       | c TÜV NRTL US<br>TÜV Süd<br>c CSA US |
| US patents           | US 6,418,546 B<br>US 7,741,595 B     |

### Classification

|            |          |
|------------|----------|
| eCl@ss 8.0 | 27272701 |
| eCl@ss 9.0 | 27272701 |
| ETIM 5.0   | EC001831 |
| ETIM 6.0   | EC001831 |

## Dimensioned drawings

All dimensions in millimeters

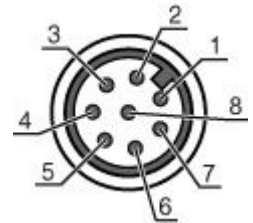


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## Electrical connection

| Connection 1       |                   |
|--------------------|-------------------|
| Type of connection | Connector         |
| Function           | Machine interface |
| Thread size        | M12               |
| Type               | Male              |
| Material           | Metal             |
| No. of pins        | 8 -pin            |
| Encoding           | A-coded           |

| Pin | Pin assignment         | Conductor color |
|-----|------------------------|-----------------|
| 1   | RES/OSSD status signal | White           |
| 2   | +24V                   | Brown           |
| 3   | EDM                    | Green           |
| 4   | MODE                   | Yellow          |
| 5   | OSSD2                  | Gray            |
| 6   | OSSD1                  | Pink            |
| 7   | 0 V                    | Blue            |
| 8   | n.c.                   | Red             |



## Operation and display

### LEDs

| LED | Display                  | Meaning                                              |
|-----|--------------------------|------------------------------------------------------|
| 1   | Red, continuous light    | OSSD off.                                            |
|     | Green, continuous light  | OSSD on                                              |
|     | Red, flashing, 1 Hz      | External error                                       |
|     | Red, flashing, 10 Hz     | Internal error                                       |
|     | Green, flashing, 1 Hz    | Weak signal, device not optimally aligned or soiled. |
| 2   | Yellow, continuous light | Start/restart interlock locked.                      |

## Suitable transmitters

|                                                                                     | Part no. | Designation | Article                               | Description                                                                                                                                                 |
|-------------------------------------------------------------------------------------|----------|-------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 66502000 | MLD500-T1L  | Single beam safety device transmitter | Operating range: 0.5 ... 70 m<br>Light source: LED, Infrared<br>Connection: Connector, M12, Metal, 5 -pin<br>Special design: Integrated laser alignment aid |

## Part number code

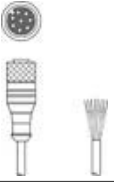
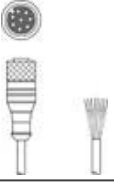
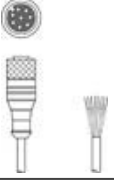
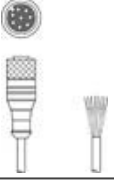
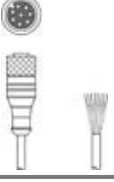
Part designation: **MLDxyy-zab/t**

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| MLD | Multiple light beam safety device                                                                                                                                                                                                                                                                      |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| x   | <b>Series:</b><br>3: MLD 300<br>5: MLD 500                                                                                                                                                                                                                                                             |
| yy  | <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                                                                                                                                     |
| z   | <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                                                                                                                                                              |
| a   | Number of beams                                                                                                                                                                                                                                                                                        |
| 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)                                                                                                                               |

## Accessories

### Connection technology - Connection cables

|                                                                                     | Part no. | Designation        | Article          | Description                                                                                                                                                   |
|-------------------------------------------------------------------------------------|----------|--------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50135128 | KD S-M12-8A-P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PUR  |
|  | 50135129 | KD S-M12-8A-P1-100 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 10,000 mm<br>Sheathing material: PUR |
|  | 50135130 | KD S-M12-8A-P1-150 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 15,000 mm<br>Sheathing material: PUR |
|  | 50135131 | KD S-M12-8A-P1-250 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 25,000 mm<br>Sheathing material: PUR |
|  | 50135132 | KD S-M12-8A-P1-500 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 50,000 mm<br>Sheathing material: PUR |

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## 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                                                 |
|  | 540351   | BT-SET-240CC-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                                        |
|  | 560343   | BT-SET-240CCS   | Mounting bracket set | Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 240°, Shock absorber<br>Material: Metal<br>Shock absorber: Yes          |
|  | 540353   | BT-SET-240CCS-E | Mounting bracket set | Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 240°, Shock absorber<br>Material: Metal, Plastic<br>Shock absorber: Yes |

## Mounting technology - Other

|                                                                                     | Part no. | Designation | Article              | Description                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------|----------|-------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 424417   | BT-2P40     | Mounting bracket set | Contains: BT-P40 clamp bracket, 2x<br>Design of mounting device: Mounting clamp<br>Fastening, at system: Groove mounting<br>Mounting bracket, at device: Groove mounting<br>Type of mounting device: Clampable<br>Material: Metal                                       |
|  | 424422   | BT-2SB10    | Mounting bracket set | Contains: 2x BT-SB10<br>Design of mounting device: Mounting clamp<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable, On the lateral C-groove<br>Type of mounting device: Swiveling<br>Swivel range: -8 ... 8°<br>Material: Metal |
|  | 424423   | BT-2SB10-S  | Mounting bracket set | Contains: 2x BT-SB10-S<br>Design of mounting device: Mounting clamp<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable, On the lateral C-groove<br>Swivel range: -8 ... 8°<br>Material: Metal<br>Shock absorber: Yes              |

## Services

|                                                                                     | Part no. | Designation | Article                                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------|----------|-------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | S981050  | CS40-I-140  | Safety inspection "Safety light barriers" | 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.<br>Restrictions: Travel costs and accommodation expenses charged separately and according to expenditure. |

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|                                                                                   | Part no. | Designation | Article          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------|----------|-------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | S981046  | CS40-S-140  | Start-up support | <p>Details: For safety devices including stopping time measurement and initial inspection.</p> <p>Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses.</p> <p>Restrictions: Max. 2 h., no mechanical (mounting) and electrical (wiring) work performed, no changes (attachments, wiring, programming) to third-party components in the nearby environment.</p> |