



Figure can vary

**Part no.: 66536300**

**MLD510-R4L**

**Multiple light beam safety device receiver**



## Contents

- Technical data
- Suitable transmitters
- Dimensioned drawings
- Electrical connection
- Operation and display
- Part number code
- Accessories

Part no.: 66536300 – MLD510-R4L – Multiple light beam safety device receiver

## Technical data

### Basic data

|             |          |
|-------------|----------|
| Series      | MLD 500  |
| Device type | Receiver |

### Special design

|                |                                            |
|----------------|--------------------------------------------|
| Special design | Reflective element for laser alignment aid |
|----------------|--------------------------------------------|

### Functions

|           |                   |
|-----------|-------------------|
| Functions | Automatic restart |
|-----------|-------------------|

### 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           |

### Optical data

|                 |            |
|-----------------|------------|
| Number of beams | 4 Piece(s) |
| Beam spacing    | 300 mm     |

### Electrical data

|                    |                                                   |
|--------------------|---------------------------------------------------|
| Protective circuit | Overvoltage protection<br>Short circuit protected |
|--------------------|---------------------------------------------------|

### Performance data

|                           |                               |
|---------------------------|-------------------------------|
| Supply voltage            | 24 V, DC, -20 ... 20 %        |
| Current consumption, max. | 150 mA, Without external load |
| Fuse                      | External with max. 3 A        |

# Part no.: 66536300 – MLD510-R4L – Multiple light beam safety device receiver

## Outputs

Number of safety-related switching outputs (OSSDs) 2 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

|                   |                     |
|-------------------|---------------------|
| Assignment        | Connection 1, pin 2 |
| Switching element | Transistor, PNP     |

### Safety-related switching output 2

|                   |                     |
|-------------------|---------------------|
| Assignment        | Connection 1, pin 4 |
| Switching element | Transistor, PNP     |

## 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        | 5 -pin            |

### Cable properties

|                                            |                      |
|--------------------------------------------|----------------------|
| Permissible conductor cross section, typ.  | 0.25 mm <sup>2</sup> |
| 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 1,000 mm x 64.7 mm      |
| Housing material      | Metal, Aluminum                 |
| Lens cover material   | Plastic / PMMA                  |
| Material of end caps  | Diecast zinc                    |
| Net weight            | 2,200 g                         |
| Housing color         | Yellow, RAL 1021                |
| Type of fastening     | Swivel mount<br>Groove mounting |

## Operation and display

|                 |     |
|-----------------|-----|
| Type of display | LED |
|-----------------|-----|

## Part no.: 66536300 – MLD510-R4L – Multiple light beam safety device receiver

|                |            |
|----------------|------------|
| 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

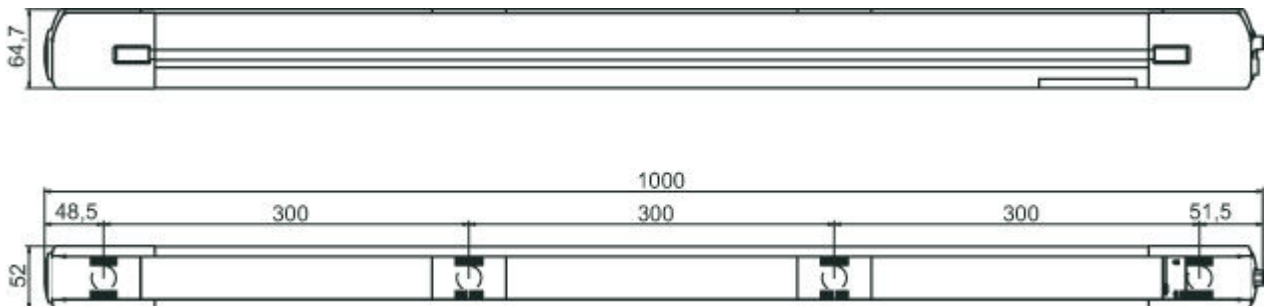
|            |          |
|------------|----------|
| eCl@ss 8.0 | 27272703 |
| eCl@ss 9.0 | 27272703 |
| ETIM 5.0   | EC001832 |

## Suitable transmitters

|                                                                                     | Part no. | Designation | Article                                       | Description                                                                                                                                                                         |
|-------------------------------------------------------------------------------------|----------|-------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 66502300 | MLD500-T4L  | Multiple light beam safety device transmitter | Operating range: 0.5 ... 50 m<br>Number of beams: 4 Piece(s)<br>Beam spacing: 300 mm<br>Connection: Connector, M12, Metal, 5 -pin<br>Special design: Integrated laser alignment aid |

## Dimensioned drawings

All dimensions in millimeters

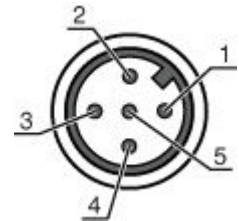


Part no.: 66536300 – MLD510-R4L – Multiple light beam safety device receiver

## Electrical connection

| Connection 1       |                   |
|--------------------|-------------------|
| Type of connection | Connector         |
| Function           | Machine interface |
| Thread size        | M12               |
| Type               | Male              |
| Material           | Metal             |
| No. of pins        | 5 -pin            |
| Encoding           | A-coded           |

| Pin | Pin assignment | Conductor color |
|-----|----------------|-----------------|
| 1   | +24V           | Brown           |
| 2   | OSSD1          | White           |
| 3   | 0 V            | Blue            |
| 4   | OSSD2          | Black           |
| 5   | n.c.           | Gray            |



## 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. |

## Part number code

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

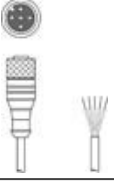
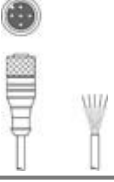
| MLD | Multiple light beam safety device                                                                                                                                  |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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                                                                                                                                                    |

## Part no.: 66536300 – MLD510-R4L – Multiple light beam safety device receiver

| 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)                                                                                                                               |

## Accessories

### Connection technology - Connection cables

|                                                                                     | Part no. | Designation        | Article          | Description                                                                                                                                                   |
|-------------------------------------------------------------------------------------|----------|--------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 678057   | CB-M12-15000E-5GF  | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 15,000 mm<br>Sheathing material: PUR |
|   | 678058   | CB-M12-25000E-5GF  | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 25,000 mm<br>Sheathing material: PUR |
|  | 678059   | CB-M12-50000E-5GF  | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 50,000 mm<br>Sheathing material: PUR |
|  | 50133860 | KD S-M12-5A-P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PUR  |
|  | 50133861 | KD S-M12-5A-P1-100 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 10,000 mm<br>Sheathing material: PUR |

### Mounting technology - Swivel mounts

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

## Part no.: 66536300 – MLD510-R4L – Multiple light beam safety device receiver

|                                                                                   | Part no. | Designation     | Article              | Description                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------|----------|-----------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 540350   | BT-SET-240BC-E  | Mounting bracket set | Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 240°<br>Material: Metal, Plastic                                        |
|  | 560342   | BT-SET-240BCS   | Mounting bracket set | Mounting bracket, 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          |
|  | 540352   | BT-SET-240BCS-E | Mounting bracket set | Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Shock absorber, Turning, 240°<br>Material: Metal, Plastic<br>Shock absorber: Yes |

## Mounting technology - Other

|                                                                                    | Part no. | Designation | Article              | Description                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------|----------|-------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 424417   | BT-2P40     | Mounting bracket set | Contains: 2x BT-P40 clamp bracket<br>Design of mounting device: Mounting clamp<br>Mounting bracket, at system: Groove mounting<br>Mounting bracket, at device: Groove mounting<br>Type of mounting device: Clampable<br>Material: Metal |

## Device columns

|                                                                                     | Part no. | Designation | Article       | Description                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------|----------|-------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 549852   | UDC-1300-S2 | Device column | Dimensions: 160 mm x 1,360 mm x 149 mm<br>Column height without foot: 1,300 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions |
|  | 549853   | UDC-1600-S2 | Device column | Dimensions: 160 mm x 1,660 mm x 149 mm<br>Column height without foot: 1,600 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions |
|  | 549854   | UDC-1900-S2 | Device column | Dimensions: 160 mm x 1,960 mm x 149 mm<br>Column height without foot: 1,900 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions |
|  | 549867   | UDC-2100-S2 | Device column | Dimensions: 160 mm x 2,160 mm x 149 mm<br>Column height without foot: 2,100 mm<br>Functions: Adjustable, 3 directions, Mounting and protection of light curtains and multiple light beam devices |

Part no.: 66536300 – MLD510-R4L – Multiple light beam safety device receiver

|                                                                                   | Part no. | Designation | Article       | Description                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------|----------|-------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 549857   | UDC-2500-S2 | Device column | Dimensions: 160 mm x 2,560 mm x 149 mm<br>Column height without foot: 2,500 mm<br>Functions: Adjustable, 3 directions, Mounting and protection of light curtains and multiple light beam devices |
|  | 549865   | UDC-3100-S2 | Device column | Dimensions: 160 mm x 3,160 mm x 149 mm<br>Column height without foot: 3,100 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions |