

## Technical data sheet

### Single beam safety device receiver

Part no.: 66533001

MLD510-R1/A



Figure can vary

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## Technical data

### Basic data

|        |         |
|--------|---------|
| Series | MLD 500 |
|--------|---------|

### Functions

|                                            |                   |
|--------------------------------------------|-------------------|
| Functions                                  | Automatic restart |
| Reflective element for laser alignment aid | No                |
| Integrated muting indicator                | No                |

### Characteristic parameters

|                             |                           |
|-----------------------------|---------------------------|
| Type                        | 4, IEC/EN 61496           |
| SIL                         | 3, IEC 61508              |
| SILCL                       | 3, IEC/EN 62061           |
| Performance Level (PL)      | e, EN ISO 13849-1:2008    |
| 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

|                                       |                 |
|---------------------------------------|-----------------|
| <b>Performance data</b>               |                 |
| Supply voltage U <sub>B</sub>         | 26.5 ... 31.6 V |
| Current consumption from AS-i circuit | 140 mA          |

### Timing

|                    |        |
|--------------------|--------|
| Response time      | 30 ms  |
| Restart delay time | 100 ms |

### Interface

|                                        |                               |
|----------------------------------------|-------------------------------|
| Type                                   | AS-Interface Safety at Work   |
| <b>AS-i</b>                            |                               |
| Function                               | Process                       |
| AS-i profile                           | S-7.B.1                       |
| Slave address                          | 1..31 programmable, default=0 |
| Cycle time acc. to AS-i specifications | Max. 5 ms                     |

### Connection

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

### Mechanical data

|                       |                                 |
|-----------------------|---------------------------------|
| Dimension (W x H x L) | 52 mm x 193 mm x 64.7 mm        |
| 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     | Groove mounting<br>Swivel mount |

### Operation and display

|                 |                                    |
|-----------------|------------------------------------|
| Type of display | Integrated muting indicator<br>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

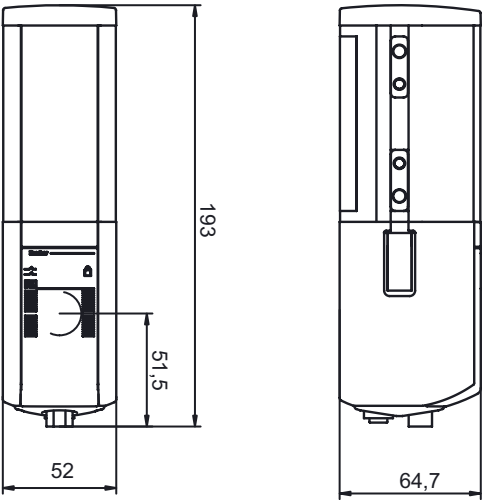
|                      |                                      |
|----------------------|--------------------------------------|
| Degree of protection | IP 67                                |
| Protection class     | III                                  |
| Certifications       | c CSA US<br>c TÜV NRTL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

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| eCl@ss 8.0            | 27272701 |
| eCl@ss 9.0            | 27272701 |
| ETIM 5.0              | EC001831 |
| ETIM 6.0              | EC001831 |

Dimensioned drawings

All dimensions in millimeters

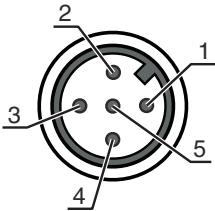


Electrical connection

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   | AS-i+          | Brown           |
| 2   | n.c.           | White           |
| 3   | AS-i-          | Blue            |
| 4   | n.c.           | Black           |
| 5   | n.c.           | Gray            |



Operation and display

| 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.                      |
|     | Off                                                    | No voltage on AS-i cable.                            |
|     | Red, continuous light                                  | AS-i slave not communicating with AS-i master        |
|     | Yellow, flashing                                       | AS-i slave has invalid address 0                     |
|     | Red/green, flashing alternately                        | AS-i slave device error or AS-i connection defective |
|     | Green, continuous light, flashing red at the same time | Periphery error                                      |
|     | Green, continuous light                                | AS-i slave communicating with AS-i master            |

## Suitable transmitters

|                                                                                   | Part no. | Designation | Article                               | Description                                                                                                                                                 |
|-----------------------------------------------------------------------------------|----------|-------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 66501001 | MLD500-T1/A | Single beam safety device transmitter | Operating range: 0.5 ... 70 m<br>Light source: LED, Infrared<br>Type of interface: AS-Interface Safety at Work<br>Connection: Connector, M12, Metal, 5 -pin |

## Part number code

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

|            |                                                                                                                                                                                                                                                                                                       |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MLD</b> | <b>Multiple light beam safety device</b>                                                                                                                                                                                                                                                              |
| <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                                                                                                                                                                                                                                                                                       |
| <b>b</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) |
| <b>/t</b>  | <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).

## Accessories

### Connection technology - Connection cables

|                                                                                     | Part no. | Designation        | Article          | Description                                                                                                                                                  |
|-------------------------------------------------------------------------------------|----------|--------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50133859 | KD S-M12-5A-P1-020 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 2,000 mm<br>Sheathing material: PUR |

## Accessories

|                                                                                   | Part no. | Designation        | Article          | Description                                                                                                                                                   |
|-----------------------------------------------------------------------------------|----------|--------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50137014 | KD S-M12-5A-P1-150 | 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 |
|                                                                                   | 50136146 | KD S-M12-5A-P1-250 | 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: PVC |

## Muting - Mounting systems

|                                                                                    | Part no. | Designation | Article          | Description                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------|----------|-------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 424421   | BT-SB10     | Mounting bracket | Design of mounting device: Mounting clamp<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Swiveling<br>Swivel range: -8 ... 8 °<br>Material: Metal |

## Services

|                                                                                     | Part no. | Designation | Article                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------|----------|-------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | S981050  | CS40-I-140  | Safety inspection<br>"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. |
|   | 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.<br>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.                                                   |

### Note



A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.