

## Technical data sheet

### Safety sensor/receiver set

Part no.: 544046  
MLC510R20-300-IP-25



For illustration purposes only

#### Contents

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



## Technical data

### Basic data

|             |                       |
|-------------|-----------------------|
| Series      | MLC 500               |
| Device type | Receiver              |
| Contains    | 2x BT-IP swivel mount |
| Application | Finger protection     |

### Functions

|                  |                                                            |
|------------------|------------------------------------------------------------|
| Function package | Basic                                                      |
| Functions        | Automatic start/restart<br>Transmission channel changeover |

### Characteristic parameters

|                             |                          |
|-----------------------------|--------------------------|
| Type                        | 4, IEC/EN 61496          |
| SIL                         | 3, IEC 61508             |
| SILCL                       | 3, IEC/EN 62061          |
| Performance Level (PL)      | e, EN ISO 13849-1        |
| PFH <sub>D</sub>            | 7.73E-09 per hour        |
| Mission time T <sub>M</sub> | 20 years, EN ISO 13849-1 |
| Category                    | 4, EN ISO 13849          |

### Protective field data

|                         |        |
|-------------------------|--------|
| Resolution              | 20 mm  |
| Protective field height | 300 mm |

### Optical data

|                 |                                          |
|-----------------|------------------------------------------|
| Synchronization | Optical between transmitter and receiver |
|-----------------|------------------------------------------|

### 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                 |
| Fuse                          | 2 A semi time-lag      |

### 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 V                                 |
| Switching voltage low, max.  | 2.5 V                                |
| Switching voltage, type.     | 22.5 V                               |
| Voltage type                 | DC                                   |
| Current load, max.           | 380 mA                               |
| Load inductivity             | 2,000 µH                             |
| Load capacity                | 0.3 µF                               |
| Residual current, max.       | 0.2 mA                               |
| Residual current, type.      | 0.002 mA                             |
| Voltage drop                 | 1.5 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     |

### Time behavior

|                    |        |
|--------------------|--------|
| Response time      | 7 ms   |
| Restart delay time | 100 ms |

### Connection

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

### Connection 1

|                    |                      |
|--------------------|----------------------|
| Function           | Machine interface    |
| Type of connection | Cable with connector |
| Cable length       | 25,000 mm            |
| Sheathing material | PVC                  |
| Thread size        | M12                  |
| Material           | Metal                |
| No. of pins        | 5 -pin               |

### Cable properties

|                                            |                      |
|--------------------------------------------|----------------------|
| Permissible conductor cross section, type. | 0.25 mm <sup>2</sup> |
| Length of connection cable, max.           | 100 m                |
| Permissible cable resistance to load, max. | 200 Ω                |

### Mechanical data

|                      |                  |
|----------------------|------------------|
| Dimension (Ø x L)    | 52.5 mm x 500 mm |
| Housing material     | Metal            |
| Metal housing        | Aluminum         |
| Lens cover material  | Plastic / PMMA   |
| Material of end caps | Diecast zinc     |
| Net weight           | 450 g            |
| Housing color        | Yellow, RAL 1021 |
| Type of fastening    | Swivel mount     |

### Protective tube

|                                            |                              |
|--------------------------------------------|------------------------------|
| Material                                   | PMMA, clear                  |
| Material of end caps                       | V4A stainless steel (1.4404) |
| Material of clamping cylinder              | PA 6                         |
| Material of pressure-equalization membrane | PA 6                         |
| Cable gland material                       | PA 6                         |

### Operation and display

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

### Environmental data

|                                    |               |
|------------------------------------|---------------|
| Ambient temperature, operation     | 0 ... 55 °C   |
| Ambient temperature, storage       | -30 ... 70 °C |
| Relative humidity (non-condensing) | 0 ... 95 %    |

## Technical data

### Certifications

|                      |                      |
|----------------------|----------------------|
| Degree of protection | IP 65                |
|                      | IP 66                |
|                      | IP 67                |
|                      | IP 69K               |
| Protection class     | III                  |
| Approvals            | c TÜV NRTL US        |
|                      | c UL US              |
|                      | S Mark               |
|                      | TÜV Süd              |
| Vibration resistance | 50 m/s <sup>2</sup>  |
| Shock resistance     | 100 m/s <sup>2</sup> |
| US patents           | US 6,418,546 B       |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27272704 |
| ECLASS 8.0            | 27272704 |
| ECLASS 9.0            | 27272704 |
| ECLASS 10.0           | 27272704 |
| ECLASS 11.0           | 27272704 |
| ECLASS 12.0           | 27272704 |
| ECLASS 13.0           | 27272704 |
| ECLASS 14.0           | 27272704 |
| ECLASS 15.0           | 27272704 |
| ETIM 5.0              | EC002549 |
| ETIM 6.0              | EC002549 |
| ETIM 7.0              | EC002549 |
| ETIM 8.0              | EC002549 |
| ETIM 9.0              | EC002549 |
| ETIM 10.0             | EC002549 |

## Dimensioned drawings

All dimensions in millimeters

MLC safety light curtains pre-mounted in the IP protective tube



- a Connection cable
- b Mounting brackets for mounting
- c End caps, stainless steel V4A
- d MLC receiver
- e IP protective tube

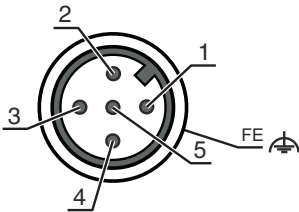
- A Total height incl. mounting brackets = 520 mm
- L Spacing of drilled holes for mounting brackets = 500 mm
- H<sub>PFN</sub> Effective protective field height = 300 mm

Electrical connection

Connection 1

|                    |                      |
|--------------------|----------------------|
| Function           | Machine interface    |
| Type of connection | Cable with connector |
| Cable length       | 25,000 mm            |
| Sheathing material | PVC                  |
| Cable color        | Gray                 |
| Thread size        | M12                  |
| Type               | Male                 |
| Material           | Metal                |
| No. of pins        | 5 -pin               |
| Encoding           | A-coded              |
| Connector housing  | FE/SHIELD            |

| Pin | Pin assignment | Conductor color |
|-----|----------------|-----------------|
| 1   | VIN1           | Brown           |
| 2   | OSSD1          | White           |
| 3   | VIN2           | Blue            |
| 4   | OSSD2          | Black           |
| 5   | FE/SHIELD      | Gray            |



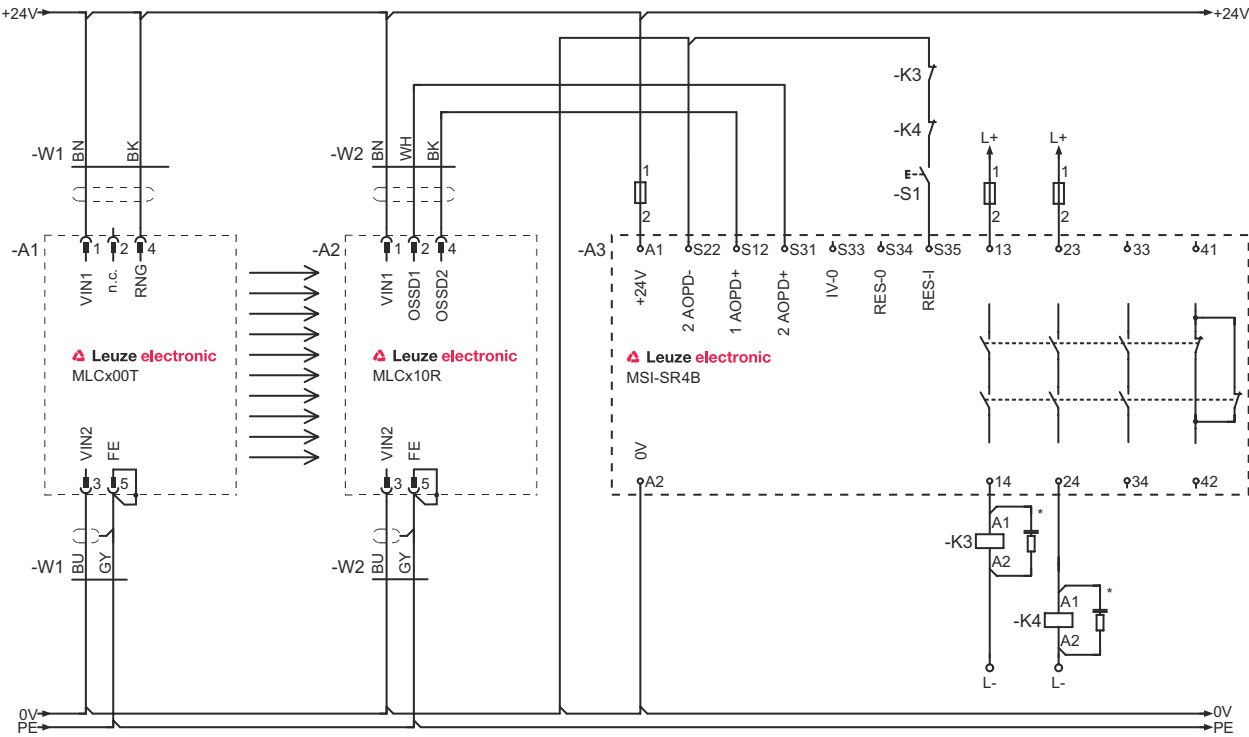
Circuit diagrams

Connection diagram receiver



Circuit diagrams

Circuit diagram example with downstream MSI-SR4B safety relay



Operation and display

| LED | Display                 | Meaning                           |
|-----|-------------------------|-----------------------------------|
| 1   | Off                     | Device switched off               |
|     | Red, continuous light   | OSSD off.                         |
|     | Red, flashing, 1 Hz     | External error                    |
|     | Red, flashing, 10 Hz    | Internal error                    |
|     | Green, flashing, 1 Hz   | OSSD on, weak signal              |
|     | Green, continuous light | OSSD on                           |
| 2   | Off                     | Transmission channel C1           |
|     | Red, continuous light   | OSSD off, transmission channel C2 |

Suitable transmitters

|                                                                                     | Part no. | Designation         | Article                       | Description                                                                                                                                                 |
|-------------------------------------------------------------------------------------|----------|---------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 544038   | MLC500T20-300-IP-25 | Safety sensor/transmitter set | Resolution: 20 mm<br>Protective field height: 300 mm<br>Operating range: 0 ... 12 m<br>Connection: Cable with connector, M12, Metal, 5 -pin, 25,000 mm, PVC |

Part number code

Part designation: MLCxyy-za-hhhhei-ooo

|      |                                                                                                                                                                                                                                                                                                                                |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MLC  | Safety light curtain                                                                                                                                                                                                                                                                                                           |
| x    | Series<br>3: MLC 300<br>5: MLC 500                                                                                                                                                                                                                                                                                             |
| yy   | Function classes<br>00: transmitter<br>01: transmitter (AIDA)<br>02: transmitter with test input<br>10: basic receiver - automatic restart<br>11: basic receiver - automatic restart (AIDA)<br>20: standard receiver - EDM/RES selectable<br>30: Extended receiver blanking/muting or gating<br>35: Extended receiver – Gating |
| z    | Device type<br>T: transmitter<br>R: receiver                                                                                                                                                                                                                                                                                   |
| a    | Resolution<br>14: 14 mm<br>20: 20 mm<br>30: 30 mm<br>40: 40 mm<br>90: 90 mm                                                                                                                                                                                                                                                    |
| hhhh | Protective field height<br>150 ... 3000: from 150 mm to 3000 mm                                                                                                                                                                                                                                                                |
| e    | Host/Guest (optional)<br>H: Host<br>MG: Middle Guest<br>G: Guest                                                                                                                                                                                                                                                               |
| i    | Interface (optional)<br>/A: AS-i                                                                                                                                                                                                                                                                                               |
| ooo  | Option<br>/V: high Vibration-proof<br>EX2: explosion protection (zones 2 + 22)<br>SPG: Smart Process Gating<br>SPG RR: Smart Process Gating – Reduced resolution                                                                                                                                                               |

| Note                                                                               |                                                                                                                                |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
|  | A list with all available device types can be found on the Leuze website at <a href="http://www.leuze.com">www.leuze.com</a> . |

Notes

|  Observe intended use! |                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
|                         | <p>The product may only be put into operation by competent persons.</p> <p>Only use the product in accordance with its intended use.</p> |

Accessories

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.                                                                                                                                         |

Note



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