



Figure can vary

**Part no.: 68001203**  
**MLC510R20-300**  
**Safety light curtain receiver**



## Contents

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

**Technical data**

| <b>Basic data</b> |                        |
|-------------------|------------------------|
| Series            | MLC 500                |
| Device type       | Receiver               |
| Contains          | 2x BT-NC sliding block |
| Application       | Hand protection        |

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

| <b>Characteristic parameters</b> |                          |
|----------------------------------|--------------------------|
| 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          |

| <b>Protective field data</b> |        |
|------------------------------|--------|
| Resolution                   | 20 mm  |
| Protective field height      | 300 mm |

| <b>Optical data</b> |  |
|---------------------|--|
| Synchronization     | Optical between transmitter and receiver |

| <b>Electrical data</b> |   |
|------------------------|---|
| Protective circuit     | Overvoltage protection<br>Short circuit protected |

| <b>Performance data</b>   |                        |
|---------------------------|------------------------|
| Supply voltage            | 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, typ.      | 22.5 V                               |
| Voltage type                 | DC                                   |
| Current load, max.           | 380 mA                               |
| Load inductivity             | 2,000 $\mu$ H                        |
| Load capacity                | 0.3 $\mu$ F                          |
| Residual current, max.       | 0.2 mA                               |
| Residual current, typ.       | 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     |

**Timing**

|                    |        |
|--------------------|--------|
| Response time      | 7 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 $\Omega$         |

**Mechanical data**

|                       |  |
|-----------------------|--|
| Dimension (W x H x L) | 29 mm x 366 mm x 35.4 mm   |
| Housing material      | Metal, Aluminum  |
| Lens cover material   | Plastic / PMMA   |
| Material of end caps  | Diecast zinc   |
| Net weight            | 450 g  |
| Housing color         | Yellow, RAL 1021   |
| Type of fastening     | Groove mounting<br>Mounting on Device Column<br>Swivel mount<br>Mounting bracket |

**Operation and display**

## Part no.: 68001203 – MLC510R20-300 – Safety light curtain receiver

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

### Environmental data

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



### Certifications

|                      |  |
|----------------------|--|
| Degree of protection | IP 65  |
| Protection class     | III  |
| Certifications       | S Mark<br>TÜV Süd<br>c CSA US<br>c TÜV NRTL US |
| Vibration resistance | 50 m/s <sup>2</sup>                            |
| Shock resistance     | 100 m/s <sup>2</sup>                           |
| US patents           | US 6,418,546 B                                 |

### Classification

|            |          |
|------------|----------|
| eCl@ss 8.0 | 27272704 |
| eCl@ss 9.0 | 27272704 |
| ETIM 5.0   | EC002549 |

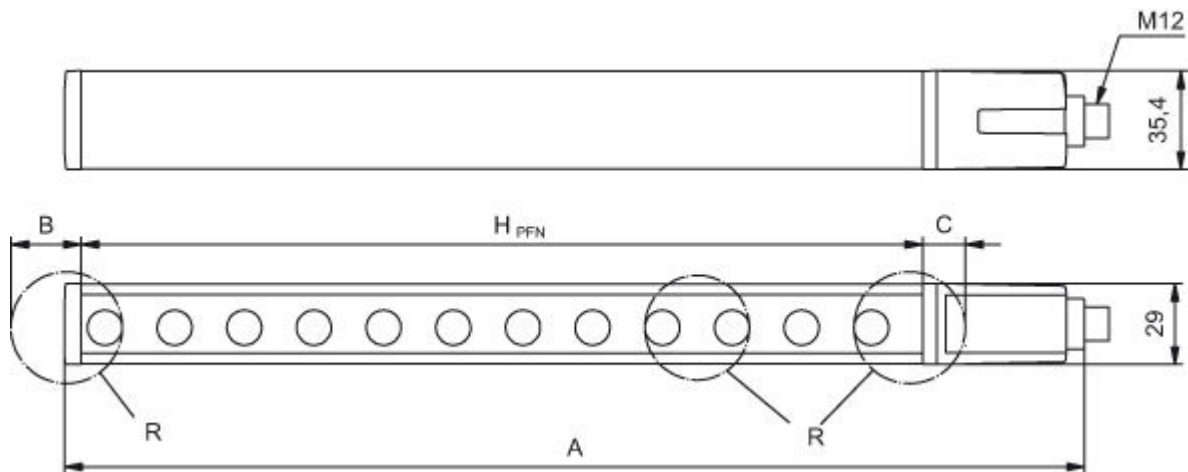
## Suitable transmitters

|   | Part no. | Designation   | Article                          | Description  |
|---|----------|---------------|----------------------------------|--|
|  | 68000203 | MLC500T20-300 | Safety light curtain transmitter | Resolution: 20 mm<br>Protective field height: 300 mm<br>Operating range: 0 ... 15 m<br>Connection: Connector, M12, Metal, 5 -pin |
|  | 68008203 | MLC502T20-300 | Safety light curtain transmitter | Resolution: 20 mm<br>Protective field height: 300 mm<br>Operating range: 0 ... 15 m<br>Connection: Connector, M12, Metal, 5 -pin |

## Dimensioned drawings

All dimensions in millimeters

Calculation of the effective protective field height  $H_{PFE} = H_{PFN} + B + C$

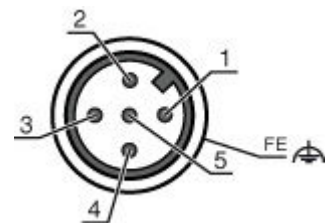


- HPFE Effective protective field height = 317 mm
- HPFN Nominal protective field height = 300 mm
- A Total height = 366 mm
- B 7 mm
- C 10 mm
- R Effective protective field height  $H_{PFE}$  goes beyond the dimensions of the optics area to the outer borders of the circles labeled with R.

## 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           |
| 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



- VIN1 = +24 V, VIN2 = 0 V: transmission channel C1
- VIN1 = 0 V, VIN2 = +24 V: transmission channel C2

Circuit diagram example with downstream MSI-SR4B safety relay



## Operation and display

### LEDs

| 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 |

## Part number code

Part designation: **MLCxyy-za-hhhhei-ooo**

| MLC | Safety light curtain   |
|-----|--|
| x   | <b>Series:</b><br>3: MLC 300<br>5: MLC 500   |
| yy  | <b>Function classes:</b><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 |
| z   | <b>Device type:</b><br>T: transmitter<br>R: receiver   |
| a   | <b>Resolution:</b><br>14: 14 mm<br>20: 20 mm<br>30: 30 mm<br>40: 40 mm<br>90: 90 mm  |
| hhh | <b>Protective field height:</b><br>150 ... 3000: from 150 mm to 3000 mm  |
| e   | <b>Host/Guest (optional):</b><br>H: Host<br>MG: Middle Guest<br>G: Guest   |
| i   | <b>Interface (optional):</b><br>/A: AS-i   |
| ooo | <b>Option:</b><br>/V: high Vibration-proof<br>EX2: explosion protection (zones 2 + 22)<br>SPG: Smart Process Gating  |

### Note

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

**Accessories**
**Connection technology - Connection cables**

|   | Part no. | Designation        | Article          | Description   |
|---|----------|--------------------|------------------|---|
|    | 429088   | CB-M12-15000-5GF   | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 15,000 mm<br>Sheathing material: PUR  |
|    | 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 |
|    | 429089   | CB-M12-25000-5GF   | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 25,000 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 |
|  | 429281   | CB-M12-50000-5GF   | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<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 |
|  | 50137013 | KD S-M12-5A-P1-500 | 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 |
|  | 50133841 | KD U-M12-5A-P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PUR   |





**Part no.: 68001203 – MLC510R20-300 – Safety light curtain receiver**

|   | Part no. | Designation        | Article          | Description  |
|---|----------|--------------------|------------------|--|
|  | 50132534 | KD U-M12-5A-P1-100 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 10,000 mm<br>Sheathing material: PUR |

**Connection technology - Connectors**

|   | Part no. | Designation | Article   | Description  |
|---|----------|-------------|-----------|--|
|  | 429175   | CB-M12-5GF  | Connector | Connection: Connector, M12, Axial, Female, A-coded, 5 -pin |


**Mounting technology - Mounting brackets**

|   | Part no. | Designation | Article              | Description   |
|---|----------|-------------|----------------------|---|
|   | 429056   | BT-2L       | Mounting bracket set | Design of mounting device: Angle, L-shape<br>Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Material: Metal |
|  | 429057   | BT-2Z       | Mounting bracket set | Design of mounting device: Angle, Z-shape<br>Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Material: Metal |






**Mounting technology - Swivel mounts**

|   | Part no. | Designation | Article              | Description  |
|---|----------|-------------|----------------------|--|
|  | 429393   | BT-2HF      | Mounting bracket set | Contains: 2x BT-HF swivel mount, 1 cylinder for mounting on the light curtain<br>Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 360°<br>Material: Metal, Plastic                        |
|  | 429394   | BT-2HF-S    | Mounting bracket set | Contains: 2x BT-HF swivel mount, 1 cylinder for mounting on the light curtain<br>Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 360°<br>Material: Metal, Plastic<br>Shock absorber: Yes |


**Mounting technology - Other**

|   | Part no. | Designation | Article           | Description  |
|---|----------|-------------|-------------------|--|
|  | 425740   | BT-10NC60   | Sliding block set | Contains: 10x BT-NC sliding block<br>Bore hole 1: Ø 4.7 mm<br>Bore hole 2: M6<br>Design of mounting device: Sliding block<br>Mounting bracket, at system: Mounting thread<br>Mounting bracket, at device: Groove mounting<br>Material: Metal |




Part no.: 68001203 – MLC510R20-300 – Safety light curtain receiver

|  | Part no. | Designation | Article              | Description   |
|--|----------|-------------|----------------------|---|
|   | 425741   | BT-10NC64   | Sliding block set    | Contains: 10x BT-NC-M4-M6 sliding block<br>Bore hole 1: M4<br>Bore hole 2: M6<br>Design of mounting device: Sliding block<br>Mounting bracket, at system: Mounting thread<br>Mounting bracket, at device: Groove mounting<br>Material: Metal                                    |
|   | 425742   | BT-10NC65   | Sliding block set    | Contains: 10x BT-NC-M5-M6 sliding block<br>Bore hole 1: M5<br>Bore hole 2: M6<br>Design of mounting device: Sliding block<br>Mounting bracket, at system: Mounting thread<br>Mounting bracket, at device: Groove mounting<br>Material: Metal                                    |
|   | 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   |
|   | 424422   | BT-2SB10    | Mounting bracket set | Contains: 2x BT-SB10<br>Design of mounting device: Mounting clamp<br>Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable, an der seitlichen C-Nut<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>Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable, an der seitlichen C-Nut<br>Swivel range: -8 ... 8 °<br>Material: Metal<br>Shock absorber: Yes              |

## Test rods

|   | Part no. | Designation | Article    | Description   |
|---|----------|-------------|------------|---|
|  | 349939   | AC-TR20/40  | Test piece | Diameter 1: 20 mm<br>Diameter 2: 40 mm<br>Housing material: Plastic, Terluran HH106 black |



## Alignment aids

|   | Part no. | Designation | Article       | Description   |
|---|----------|-------------|---------------|---|
|  | 427300   | AC-ALM      | Alignment aid | Housing material: Plastic                           |
|  | 520101   | AC-ALM-M    | Alignment aid | Housing material: Plastic                           |
|  | 560020   | LA-78U      | Alignment aid | Light source: laser, Red<br>Housing material: Metal |


**Part no.: 68001203 – MLC510R20-300 – Safety light curtain receiver**

|   | Part no. | Designation | Article       | Description   |
|---|----------|-------------|---------------|---|
|  | 520004   | LA-78UDC    | Alignment aid | Light source: laser, Red<br>Housing material: Metal |




**Protective screens**

|   | Part no. | Designation | Article              | Description   |
|---|----------|-------------|----------------------|---|
|  | 429038   | MLC-2PSF    | Mounting bracket set | Type of fastening: Clampable<br>Mounting device material: Metal |
|  | 347072   | MLC-PS300   | Protective screen    | Protective field height: 300 mm<br>Material: PMMA, clear        |






**Deflecting mirror**

|   | Part no. | Designation | Article           | Description   |
|---|----------|-------------|-------------------|---|
|  | 529603   | UM60-300    | Deflecting mirror | Dimensions: 25 mm x 370 mm x 68 mm<br>Protected field height up to: 300 mm<br>Mirror length: 360 mm |

**Device columns**

|   | Part no. | Designation | Article       | Description  |
|---|----------|-------------|---------------|--|
|  | 549856   | UDC-1000-S2 | Device column | Dimensions: 160 mm x 1,060 mm x 149 mm<br>Column height without foot: 1,000 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions |
|  | 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 |

Part no.: 68001203 – MLC510R20-300 – Safety light curtain receiver

|  | Part no. | Designation | Article       | Description  |
|--|----------|-------------|---------------|--|
|   | 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 |
|   | 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 |
|  | 549855   | UDC-900-S2  | Device column | Dimensions: 160 mm x 960 mm x 149 mm<br>Column height without foot: 900 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions     |

## Notes

**Observe intended use!**

- The product may only be put into operation by competent persons.
- Only use the product in accordance with its intended use.