

# Technical data sheet

## Safety light curtain receiver

Part no.: 68096001

MLC530R14300/902250-SPG



For illustration purposes only

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- Electrical connection
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## Technical data

### Basic data

|             |                                                                 |
|-------------|-----------------------------------------------------------------|
| Series      | MLC 500                                                         |
| Device type | Receiver                                                        |
| Contains    | 2x BT-NC sliding block                                          |
| Application | Access guarding<br>Danger zone guarding<br>Smart Process Gating |

### Functions

|                  |                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function package | Smart Process Gating                                                                                                                                                                                                                                                                                                                                                                |
| Functions        | Configuration by means of wiring<br>Fixed blanking with 1-beam tolerance<br>Fixed blanking without tolerance<br>Integration of "contact-based safety circuit"<br>Integration of "electronic safety-related switching outputs"<br>MaxiScan<br>Muting-timeout extension<br>Qualified stop<br>Smart Process Gating<br>Start/restart interlock (RES)<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

|                               |          |
|-------------------------------|----------|
| Total protective field height | 2,850 mm |
| Resolution 1                  | 14 mm    |
| Protective field height 1     | 300 mm   |
| Resolution 2                  | 90 mm    |
| Protective field height 2     | 2,550 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                                 |
| Inputs                             |                                                   |
| Number of digital switching inputs | 3 Piece(s)                                        |

### Switching inputs

|                              |                         |
|------------------------------|-------------------------|
| Type                         | Digital switching input |
| Switching voltage high, min. | 18 V                    |
| Switching voltage low, max.  | 2.5 V                   |
| Switching voltage, type.     | 22.5 V                  |
| Voltage type                 | DC                      |

### 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 5 |
| Switching element | Transistor, PNP     |

### Safety-related switching output 2

|                   |                     |
|-------------------|---------------------|
| Assignment        | Connection 1, pin 6 |
| Switching element | Transistor, PNP     |

### Time behavior

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

### Connection

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

### Connection 1

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

## Technical data

### Mechanical data

|                       |                            |
|-----------------------|----------------------------|
| Dimension (W x H x L) | 29 mm x 2,916 mm x 35.4 mm |
| Housing material      | Metal                      |
| Metal housing         | Aluminum                   |
| Lens cover material   | Plastic / PMMA             |
| Material of end caps  | Diecast zinc               |
| Net weight            | 2,700 g                    |
| Housing color         | Yellow, RAL 1021           |
| Type of fastening     | Groove mounting            |
|                       | Mounting brackets          |
|                       | Mounting on Device Column  |
|                       | Swivel mount               |

### Operation and display

|                 |                   |
|-----------------|-------------------|
| Type of display | 7-segment display |
|                 | LED               |
| Number of LEDs  | 3 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                  |
| 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

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



- $H_{PFE}$  Effective protective field height = 2940 mm

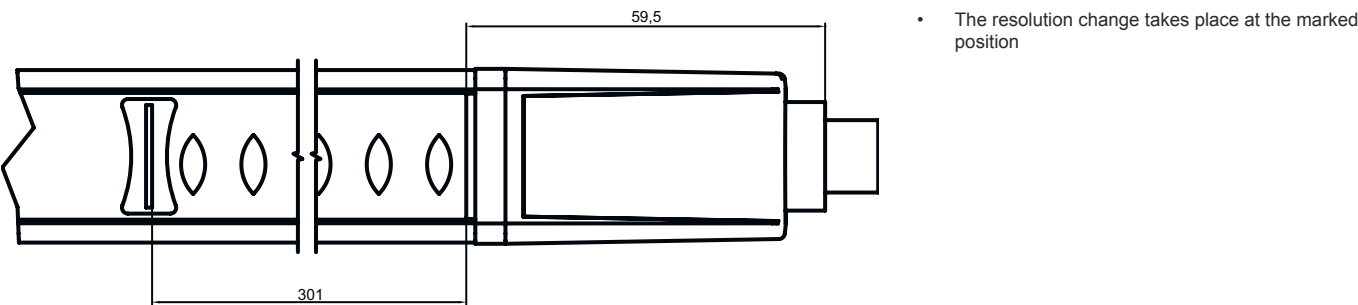
$H_{PFN}$  Nominal protective field height = 2850 mm

A Total height = 2916 mm

B 50 mm
- C 40 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.

Position of resolution limits



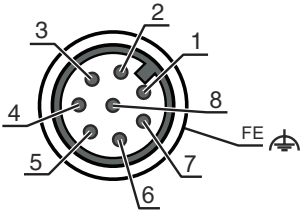
Electrical connection

Connection 1

|                    |                   |
|--------------------|-------------------|
| Function           | Machine interface |
| Type of connection | Connector         |
| Thread size        | M12               |
| Type               | Male              |
| Material           | Metal             |
| No. of pins        | 8 -pin            |
| Encoding           | A-coded           |
| Connector housing  | FE/SHIELD         |

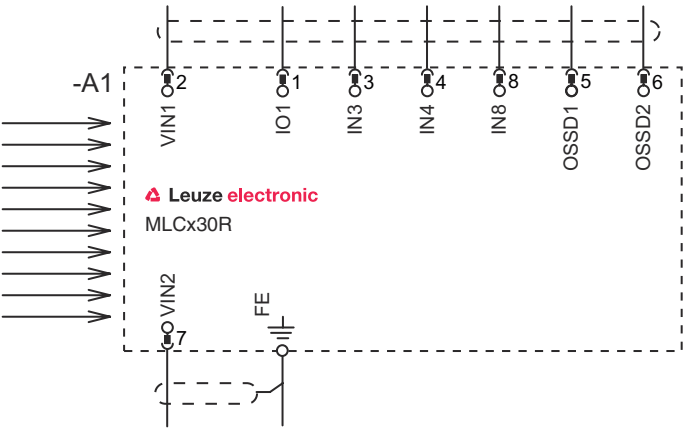
Electrical connection

| Pin | Pin assignment | Conductor color |
|-----|----------------|-----------------|
| 1   | IO1/RES        | White           |
| 2   | VIN1           | Brown           |
| 3   | IN3            | Green           |
| 4   | IN4            | Yellow          |
| 5   | OSSD1          | Gray            |
| 6   | OSSD2          | Pink            |
| 7   | VIN2           | Blue            |
| 8   | IN8            | Red             |



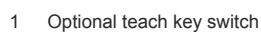
Circuit diagrams

Connection diagram receiver



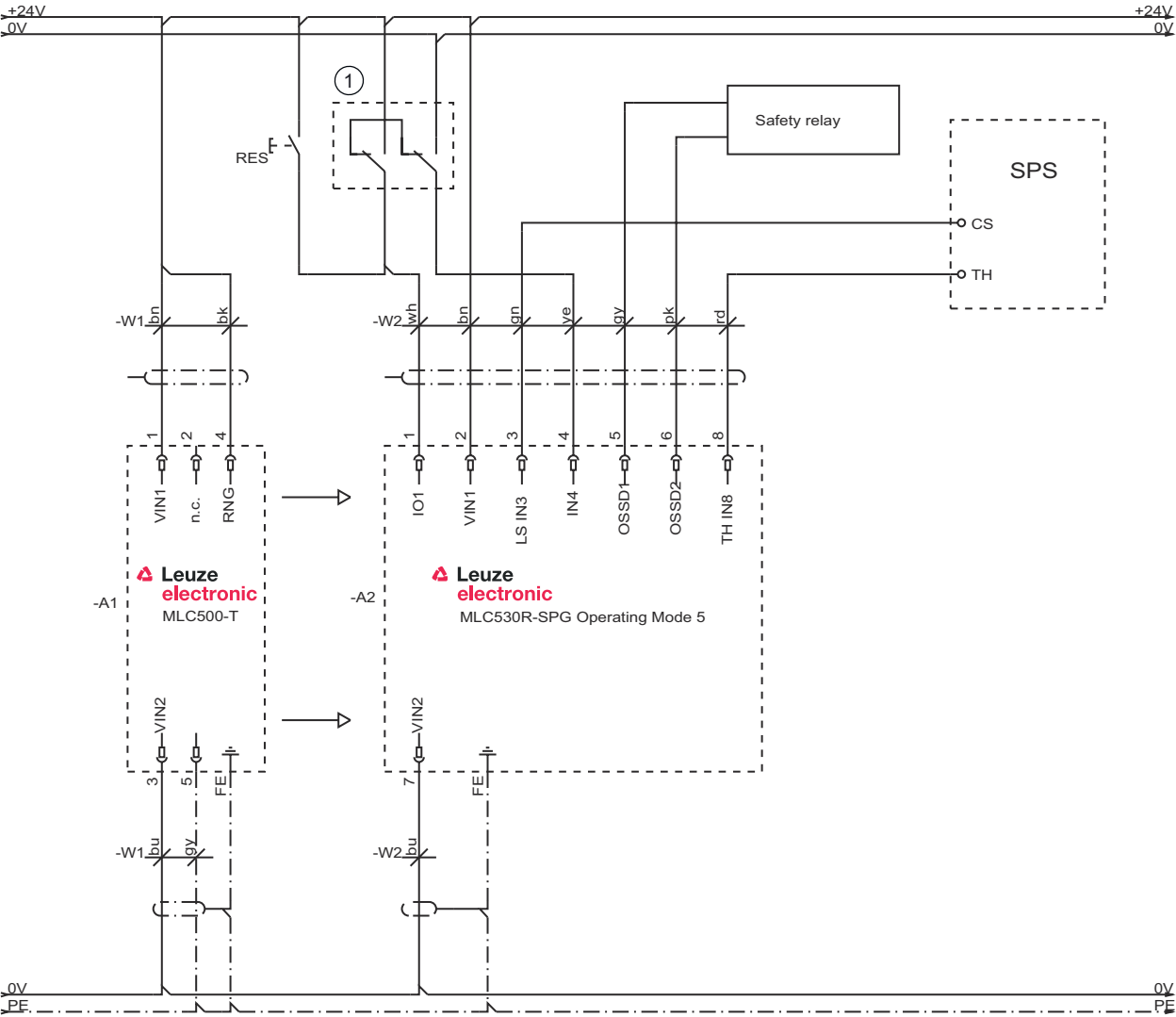
- VIN1 = +24 V, VIN2 = 0 V: transmission channel C1
- VIN1 = 0 V, VIN2 = +24 V: transmission channel C2

## Operating mode 1: connection example with Smart Process Gating (SPG)



Circuit diagrams

Operating mode 5: circuit diagram example with Smart Process Gating (SPG)



1 Optional teach key switch

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                         | RES deactivated or RES activated and enabled or RES blocked and protective field interrupted                          |
|     | Yellow, continuous light    | RES activated and blocked but ready to be unlocked - protective field free and linked sensor is enabled if applicable |
|     | Yellow, flashing            | Upstream safety circuit opened                                                                                        |
|     | Yellow, flashing (1x or 2x) | Changeover of the upstream safety circuit                                                                             |
| 3   | Off                         | No special function (blanking, muting, etc.) active                                                                   |
|     | Blue, continuous light      | Protective field parameter (blanking) correctly taught                                                                |
|     | Blue, flashing, 1 Hz        | Muting active                                                                                                         |

## Operation and display

| LED | Display               | Meaning                                                                                      |
|-----|-----------------------|----------------------------------------------------------------------------------------------|
| 3   | Blue, short flashing  | Teaching of protective field parameters or muting restart required or muting override active |
|     | Blue, flashing, 10 Hz | Error during teaching of protective field parameters                                         |

## Suitable transmitters

|                                                                                   | Part no. | Designation         | Article                          | Description                                                                                                                                         |
|-----------------------------------------------------------------------------------|----------|---------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 68096003 | MLC500T14300/902250 | Safety light curtain transmitter | Resolution: 14 mm / 90 mm<br>Protective field height: 300 mm / 2,550 mm<br>Operating range: 0 ... 10 m<br>Connection: Connector, M12, Metal, 5 -pin |

## Part number code

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

|             |                                                                                                                                                                                                                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MLC</b>  | <b>Safety light curtain</b>                                                                                                                                                                                                                                                                                                           |
| <b>x</b>    | <b>Series</b><br>3: MLC 300<br>5: MLC 500                                                                                                                                                                                                                                                                                             |
| <b>yy</b>   | <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 or gating<br>35: Extended receiver – Gating |
| <b>z</b>    | <b>Device type</b><br>T: transmitter<br>R: receiver                                                                                                                                                                                                                                                                                   |
| <b>a</b>    | <b>Resolution</b><br>14: 14 mm<br>20: 20 mm<br>30: 30 mm<br>40: 40 mm<br>90: 90 mm                                                                                                                                                                                                                                                    |
| <b>hhhh</b> | <b>Protective field height</b><br>150 ... 3000: from 150 mm to 3000 mm                                                                                                                                                                                                                                                                |
| <b>e</b>    | <b>Host/Guest (optional)</b><br>H: Host<br>MG: Middle Guest<br>G: Guest                                                                                                                                                                                                                                                               |
| <b>i</b>    | <b>Interface (optional)</b><br>/A: AS-i                                                                                                                                                                                                                                                                                               |
| <b>ooo</b>  | <b>Option</b><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 [www.leuze.com](http://www.leuze.com).

## 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.

## Accessories

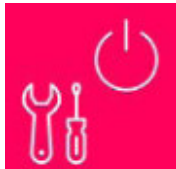
### Connection technology - Connection cables

|                                                                                   | 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>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5.000 mm<br>Sheathing material: PUR |

### Mounting technology - Swivel mounts

|                                                                                    | Part no. | Designation | Article              | Description                                                                                                                                                 |
|------------------------------------------------------------------------------------|----------|-------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 429393   | BT-2HF      | Mounting bracket set | Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 360°<br>Material: Metal, Plastic |

## 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.