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Part no.: 66575300
MLD535-R4LM
Multiple light beam safety device receiver



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

Technical data

| Basic data | |
|----------------------------------|---|
| Series | MLD 500 |
| Device type | Receiver |
| Special design | |
| Special design | Integrated status indicator Integrated muting indicator Reflective element for laser alignment aid |
| Functions | |
| Functions | Timing controlled 2-sensor muting Timing controlled 4-sensor muting Alternative connection for second muting signal Muting enable function Sequence controlled 2-sensor muting Muting-timeout extension Contactor monitoring (EDM), selectable Partial muting Start/restart interlock (RES) |
| 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 _d | 204 years, EN ISO 13849-1 |
| PFH _D | 6.6E-09 per hour |
| Mission time T _M | 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 | |
| Selection of operating mode | Connection 1, pin 2: +24 V for operating mode 1, 2, 4 Connection 1, pin 7: +24 V for operating mode 3, 5, 6 Connection 1, pin 2: 0 V for operating mode 3, 5, 6 Connection 1, pin 7: 0 V for operating mode 1, 2, 4 |
| Protective circuit | Overvoltage protection 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 |

| Inputs | |
|------------------------------------|---|
| Number of digital switching inputs | 4 Piece(s) |
| Switching inputs | |
| Type | Digital switching input |
| Switching voltage high, min. | 18.2 V |
| Switching voltage low, max. | 2.5 V |
| Switching voltage, typ. | 23 V |
| Voltage type | DC |
| Switching current, max. | 5 mA |
| Digital switching input 1 | |
| Assignment | Connection 1, pin 1 |
| Function | Control input for start/restart interlock (RES) |
| Digital switching input 2 | |
| Assignment | Connection 1, pin 3 |
| Function | Control input for contactor monitoring (EDM) |
| Digital switching input 3 | |
| Assignment | Connection 1, pin 4 |
| Function | Control input, second muting signal |
| Digital switching input 4 | |
| Assignment | Connection 1, pin 8 |
| Function | Control input, muting enable/ timeout |

Outputs

| | |
|--|------------|
| Number of safety-related switching outputs (OSSDs) | 2 Piece(s) |
| Number of digital switching outputs | 1 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 μ H |
| Load capacity | 0.3 μ F |
| 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 6 |
| Switching element | Transistor, PNP |

Safety-related switching output 2

| | |
|-------------------|---------------------|
| Assignment | Connection 1, pin 5 |
| Switching element | Transistor, PNP |

Switching outputs

| | |
|------------------------------|--------------------------|
| Type | Digital switching output |
| Switching voltage high, min. | 18.2 V |
| Switching voltage low, max. | 2.5 V |
| Switching voltage, typ. | 23 V |
| Voltage type | DC |

Switching output 1

| | |
|-------------------|--------------------------------|
| Assignment | Connection 1, pin 1 |
| Switching element | Transistor, PNP |
| Function | "State of OSSDs" signal output |

Timing

| | |
|--------------------|--------|
| Response time | 50 ms |
| Restart delay time | 100 ms |

Connection

| | |
|-----------------------|------------|
| Number of connections | 2 Piece(s) |
|-----------------------|------------|

Connection 1

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

Connection 2

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

Part no.: 66575300 – MLD535-R4LM – Multiple light beam safety device receiver
Cable properties

| | |
|--|----------------------|
| Permissible conductor cross section, typ. | 0.25 mm ² |
| 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 | Groove mounting Swivel mount |

Operation and display

| | |
|-----------------|------------------------------------|
| Type of display | Integrated muting indicator 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 | TÜV Süd c CSA US c TÜV NRTL US |
| US patents | US 7,741,595 B US 6,418,546 B |

Classification

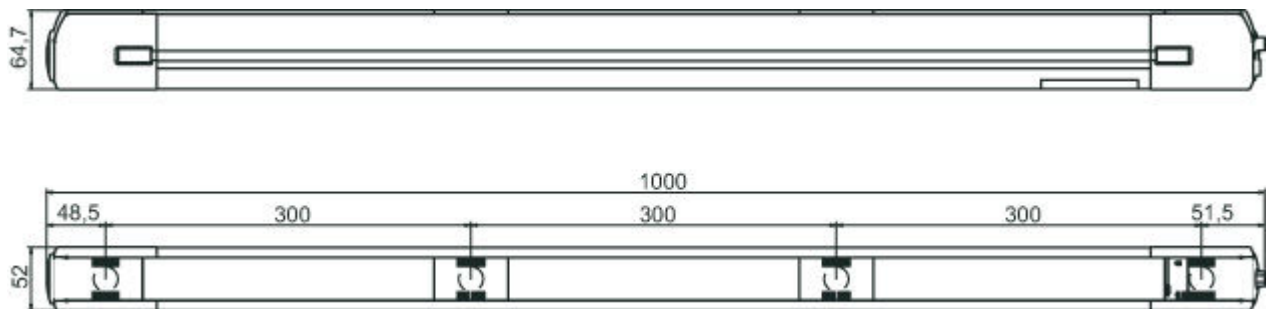
| | |
|------------|----------|
| eCl@ss 8.0 | 27272703 |
| eCl@ss 9.0 | 27272703 |
| ETIM 5.0 | EC001832 |

Suitable transmitters

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

Dimensioned drawings

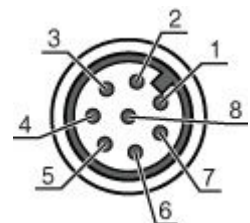
All dimensions in millimeters



Electrical connection

| Connection 1 | |
|--------------------|-------------------|
| Type of connection | Connector |
| Function | Machine interface |
| Thread size | M12 |
| Type | Male |
| Material | Metal |
| No. of pins | 8 -pin |
| Encoding | A-coded |

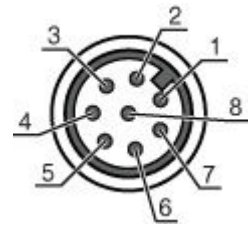
| Pin | Pin assignment | Conductor color |
|-----|------------------------|-----------------|
| 1 | RES/OSSD status signal | White |
| 2 | VIN | Brown |
| 3 | EDM | Green |
| 4 | MS2 | Yellow |
| 5 | OSSD2 | Gray |
| 6 | OSSD1 | Pink |
| 7 | VIN | Blue |
| 8 | M-EN/TO | Red |



| Connection 2 | |
|--------------------|-----------------|
| Type of connection | Connector |
| Function | Local interface |
| Thread size | M12 |
| Type | Female |
| Material | Metal |
| No. of pins | 8 -pin |
| Encoding | A-coded |

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| Pin | Pin assignment | Conductor color |
|-----|----------------|-----------------|
| 1 | MS4 | White |
| 2 | +24V | Brown |
| 3 | MS2 | Green |
| 4 | MS1 | Yellow |
| 5 | RES/LMP | Gray |
| 6 | MS3 | Pink |
| 7 | 0 V | Blue |
| 8 | n.c. | Red |



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. |
| 2 | Yellow, continuous light | Start/restart interlock locked. |

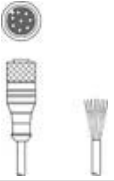
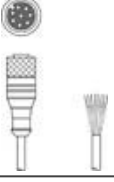



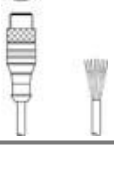





Part number code

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

| MLD | Multiple light beam safety device |
|-----|--|
| x | Series: 3: MLD 300 5: MLD 500 |
| yy | Function classes: 00: Transmitter 10: automatic restart 12: external testing 20: EDM/RES 30: muting 35: timing controlled 4-sensor muting |
| z | Device type: T: transmitter R: receiver RT: transceiver xT: transmitter with high range xR: receiver for high range |
| a | Number of beams |
| b | Option: L: integrated laser alignment aid (for transmitter/receiver) 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) E: connection socket for external muting indicator (AS-i models only) |
| /t | Safety-related switching outputs (OSSDs), connection technology: -: transistor output, M12 plug A: integrated AS-i interface, M12 plug, (safety bus system) |

Accessories

Connection technology - Connection cables


| | Part no. | Designation | Article | Description |
|--|----------|--------------------|------------------|---|
|   | 678064 | CB-M12-50000E-8GF | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 50,000 mm Sheathing material: PUR |
|   | 50135128 | KD S-M12-8A-P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR |
|   | 50135129 | KD S-M12-8A-P1-100 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 10,000 mm Sheathing material: PUR |
|   | 50135130 | KD S-M12-8A-P1-150 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 15,000 mm Sheathing material: PUR |
|   | 50135131 | KD S-M12-8A-P1-250 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 25,000 mm Sheathing material: PUR |
|   | 50135139 | KS S-M12-8A-P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Male, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR |
|   | 50135140 | KS S-M12-8A-P1-100 | Connection cable | Connection 1: Connector, M12, Axial, Male, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 10,000 mm Sheathing material: PUR |
|   | 50135141 | KS S-M12-8A-P1-150 | Connection cable | Connection 1: Connector, M12, Axial, Male, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 15,000 mm Sheathing material: PUR |

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Mounting technology - Swivel mounts

| | Part no. | Designation | Article | Description |
|---|----------|-----------------|----------------------|---|
|  | 560340 | BT-SET-240BC | Mounting bracket set | Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Turning, 240° Material: Metal |
|  | 540350 | BT-SET-240BC-E | Mounting bracket set | Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Turning, 240° Material: Metal, Plastic |
|  | 560342 | BT-SET-240BCS | Mounting bracket set | Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Turning, 240°, Shock absorber Material: Metal Shock absorber: Yes |
|  | 540352 | BT-SET-240BCS-E | Mounting bracket set | Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Shock absorber, Turning, 240° Material: Metal, Plastic Shock absorber: Yes |

Mounting technology - Other

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

Muting - Mounting systems

| | Part no. | Designation | Article | Description |
|---|----------|-----------------|-------------------|--|
|  | 426492 | Set-AC-MT-4S | Muting sensor set | Operating range: 0 ... 4 m Cable length of muting sensors: 300 mm Type of muting sensors: Retro-reflective photoelectric sensors PRK 3B Number of muting sensors: 4 Piece(s) Number of reflectors: 4 Piece(s) |
|  | 426522 | Set-AC-MTX-4S | Muting sensor set | Operating range: 0 ... 8 m Cable length of muting sensors: 300 mm Type of muting sensors: PRK 25B retro-reflective photoelectric sensors Number of muting sensors: 4 Piece(s) Number of reflectors: 4 Piece(s) |
|  | 426528 | Set-AC-MTX.2-4S | Muting sensor set | Operating range: 0 ... 8 m Cable length of muting sensors: 2,000 mm Type of muting sensors: PRK 25B retro-reflective photoelectric sensors Number of muting sensors: 4 Piece(s) Number of reflectors: 4 Piece(s) |

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Muting - Connection technology

| | Part no. | Designation | Article | Description |
|---|----------|---------------|--------------------------|--|
|  | 520140 | AC-SCM6U | Sensor connection module | Suitable for: MLD 335, MLD 535 multiple light beam safety devices Supply voltage: 24 V, DC, -20 ... 20 % Number of connections: 7 Piece(s) Connection: Cable with connector, M12, 500 mm Type of fastening: Through-hole mounting, Groove mounting |
|  | 520141 | AC-SCM6U-BT | Sensor connection module | Suitable for: MLD 335, MLD 535 multiple light beam safety devices Supply voltage: 24 V, DC, -20 ... 20 % Number of connections: 7 Piece(s) Connection: Cable with connector, M12, 500 mm Type of fastening: Mounting plate |
|  | 520142 | AC-SCM6U-BT-L | Sensor connection module | Suitable for: MLD 335, MLD 535 multiple light beam safety devices Supply voltage: 24 V, DC, -20 ... 20 % Number of connections: 7 Piece(s) Connection: Cable with connector, M12, 500 mm Type of fastening: Mounting plate with L-angle |



Display/operating elements

| | Part no. | Designation | Article | Description |
|--|----------|-------------|---------------------|--|
|  | 426296 | AC-ABF70 | Acknowledgment unit | Switching current via button: 1 ... 1,000 mA Housing material: Glass fiber reinforced (PPS), self-extinguishing Clamping plate material: Stainless steel Degree of protection: IP 67, IP 69K Functions: Reset of the start/restart interlock, Overriding with AOPDs with muting function, Illuminated reset buttons Reset buttons: Yes LED indicators: Yes |

Device columns

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

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