



the sensor people



Part no.: 68001403 MLC510R40-300 Safety light curtain receiver



















Figure can vary

# **Contents**

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



### **Technical data**

Basic data	
Series	MLC 500
Device type	Receiver
Contains	2x BT-NC sliding block
Application	Access guarding Hand protection Danger zone guarding
Functions	
Function package	Basic
Functions	Automatic start/restart Transmission channel changeover
Characteristic parameters	
Туре	4, IEC/EN 61496
SIL	3, IEC 61508
SILCL	3, IEC/EN 62061
Performance Level (PL)	e, EN ISO 13849-1
PFHD	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	40 mm
Protective field height	300 mm
Optical data	
Synchronization	Optical between transmitter and receiver
Electrical data	
Protective circuit	Short circuit protected Overvoltage protection
Performance data	
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			
Туре	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 μΗ		
Load capacity	0.3 μF		
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		
ming esponse time	4 ms		
estart delay time	100 ms		
onnection			
umber 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		
Length of connection cable, max.  Permissible cable resistance to load, max.	100 m 200 Ω		
Permissible cable resistance to load, max.			
Permissible cable resistance to load, max.  echanical data	200 Ω		
Permissible cable resistance to load, max.  echanical data  mension (W x H x L)	200 Ω 29 mm x 366 mm x 35.4 mm		
Permissible cable resistance to load, max.  echanical data  mension (W x H x L)  busing material	200 Ω  29 mm x 366 mm x 35.4 mm  Metal, Aluminum		
Permissible cable resistance to load, max.  echanical data mension (W x H x L) busing material ens cover material	200 Ω  29 mm x 366 mm x 35.4 mm  Metal, Aluminum  Plastic / PMMA		
Permissible cable resistance to load, max.  echanical data mension (W x H x L) pusing material ens cover material aterial of end caps	29 mm x 366 mm x 35.4 mm  Metal, Aluminum  Plastic / PMMA  Diecast zinc		
Permissible cable resistance to load, max.  echanical data mension (W x H x L)  busing material ens cover material aterial of end caps et weight	29 mm x 366 mm x 35.4 mm  Metal, Aluminum  Plastic / PMMA  Diecast zinc  450 g		
Permissible cable resistance to load, max.  echanical data mension (W x H x L) pusing material ens cover material aterial of end caps	29 mm x 366 mm x 35.4 mm  Metal, Aluminum  Plastic / PMMA  Diecast zinc		



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	TÜV Süd c TÜV NRTL US c CSA US S Mark	
Vibration resistance	50 m/s²	
Shock resistance	100 m/s²	
US patents	US 6,418,546 B	

Classification	
eCl@ss 8.0	27272704
eCl@ss 9.0	27272704
ETIM 5.0	EC002549

### Suitable transmitters

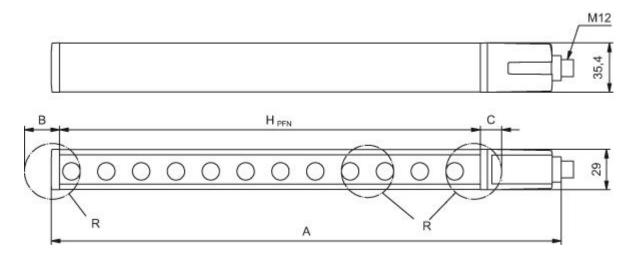
Part no.	Designation	Article	Description
68000403	MLC500T40-300	Safety light curtain transmitter	Resolution: 40 mm Protective field height: 300 mm Operating range: 0 20 m Connection: Connector, M12, Metal, 5 -pin
68008403	MLC502T40-300	Safety light curtain transmitter	Resolution: 40 mm Protective field height: 300 mm Operating range: 0 20 m Connection: Connector, M12, Metal, 5 -pin

### **Dimensioned drawings**

All dimensions in millimeters



### Calculation of the effective protective field height Hpfe = Hpfn + B + C



HPFE Effective protective field height = 340 mm **HPFN** Nominal protective field height = 300 mm

Total height = 366 mm 25 mm

A B C 15 mm

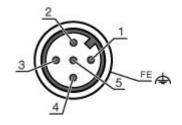
Effective protective field height HPFE goes beyond the dimensions of the optics area to the outer R

borders of the circles labeled with R.

#### **Electrical connection**

Connection 1	
Type of connection	Connector
Function	Machine interface
Thread size	M12
Туре	Male
Material	Metal
No. of pins	5 -pin
Encoding	A-coded
Connector housing	FE/SHIELD

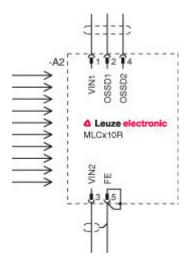
Pin	Pin assignment	Conductor color
1	VIN1	Brown
2	OSSD1	White
3	VIN2	Blue
4	OSSD2	Black
5	FE/SHIELD	Gray





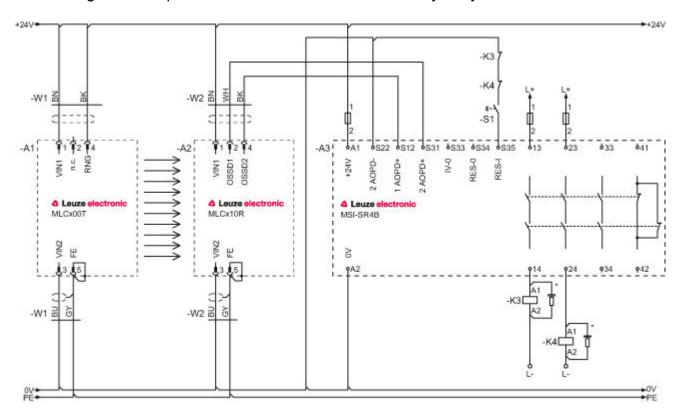
#### **Circuit diagrams**

#### 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	
х	Series: 3: MLC 300 5: MLC 500	
уу	Function classes:  00: Transmitter 01: transmitter (AIDA) 02: Transmitter with test input 10: Basic receiver - automatic restart 11: basic receiver - automatic restart (AIDA) 20: Standard receiver - EDM/RES selectable 30: Extended receiver - blanking/muting	
Z	Device type: T: transmitter R: receiver	
а	Resolution: 14: 14 mm 20: 20 mm 30: 30 mm 40: 40 mm 90: 90 mm	
hhhh	Protective field height: 150 3000: from 150 mm to 3000 mm	
е	Host/Guest (optional): H: Host MG: Middle Guest G: Guest	
i	Interface (optional): /A: AS-i	
000	Option:  /V: high Vibration-proof  EX2: explosion protection (zones 2 + 22)  SPG: Smart Process Gating	





#### **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 Connection 2: Open end Shielded: No Cable length: 15,000 mm Sheathing material: PUR
678057	CB- M12-15000E-5GF	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: Yes Cable length: 15,000 mm Sheathing material: PUR
429089	CB- M12-25000-5GF	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: No Cable length: 25,000 mm Sheathing material: PUR
678058	CB- M12-25000E-5GF	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: Yes Cable length: 25,000 mm Sheathing material: PUR
429281	CB- M12-50000-5GF	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: No Cable length: 50,000 mm Sheathing material: PUR
50133860	KD S-M12-5A- P1-050	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR
50133861	KD S-M12-5A- P1-100	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: Yes Cable length: 10,000 mm Sheathing material: PUR
50137013	KD S-M12-5A- P1-500	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: Yes Cable length: 10,000 mm Sheathing material: PVC
50133841	KD U-M12-5A- P1-050	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PUR



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

## Connection technology - Connectors

	Part no.	Designation	Article	Description
· Marie	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 Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Screw type Material: Metal
429057	BT-2Z	Mounting bracket set	Design of mounting device: Angle, Z-shape Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Screw type Material: Metal

## Mounting technology - Swivel mounts

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

### Mounting technology - Other

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

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	Part no.	Designation	Article	Description
-	425741	BT-10NC64	Sliding block set	Contains: 10x BT-NC-M4-M6 sliding block Bore hole 1: M4 Bore hole 2: M6 Design of mounting device: Sliding block Mounting bracket, at system: Mounting thread Mounting bracket, at device: Groove mounting Material: Metal
****	425742	BT-10NC65	Sliding block set	Contains: 10x BT-NC-M5-M6 sliding block Bore hole 1: M5 Bore hole 2: M6 Design of mounting device: Sliding block Mounting bracket, at system: Mounting thread Mounting bracket, at device: Groove mounting Material: Metal
E E	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
Ti in	424422	BT-2SB10	Mounting bracket set	Contains: 2x BT-SB10 Design of mounting device: Mounting clamp Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable, an der seitlichen C-Nut Type of mounting device: Swiveling Swivel range: -8 8 ° Material: Metal
The state of the s	424423	BT-2SB10-S	Mounting bracket set	Contains: 2x BT-SB10-S Design of mounting device: Mounting clamp Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable, an der seitlichen C-Nut Swivel range: -8 8 ° Material: Metal Shock absorber: Yes

### Test rods

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

# Alignment aids

	Part no.	Designation	Article	Description
	427300	AC-ALM	Alignment aid	Housing material: Plastic
1	520101	AC-ALM-M	Alignment aid	Housing material: Plastic
	560020	LA-78U	Alignment aid	Light source: laser, Red Housing material: Metal



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

### Protective screens

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

# Deflecting mirror

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

### Device columns

	Part no.	Designation	Article	Description
8	549856	UDC-1000-S2	Device column	Dimensions: 160 mm x 1,060 mm x 149 mm Column height without foot: 1,000 mm Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions
8	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



	Part no.	Designation	Article	Description
	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
	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
25	549855	UDC-900-S2	Device column	Dimensions: 160 mm x 960 mm x 149 mm Column height without foot: 900 mm 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.