



the sensor people





Figure can vary

Part no.: 68012910 MLC520R90-1050H Safety light curtain receiver











# **Contents**

- Technical data
- Dimensioned drawings
- Electrical connection
- Circuit diagrams
- Operation and display
- Suitable transmitters
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- Notes
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### **Technical data**

Start/restart interlock (RES)	Posio data	
Device type		MI C 500
Contains		
Contains 2x BT-NC sliding block Application Access guarding Danger zone guarding Procedure Functions Functions Functions Functions  Contactor monitoring (EDM) Startrestart interlock (RES) Transmission channel changeover  Characteristic parameters Type 4, IEC/EN 61496 SIL 3, IEC/EN 61508 SILC 3, IEC/EN 62061 Performance Level (PL) e. EN ISO 13849-1 PFHb 7,73E-09 per hour Mission time Tim 20 years, EN ISO 13849-1 Category 4, EN ISO 13849  Protective field data Resolution 90 mm Protective field height 1,050 mm  Optical data Number of beams 14 Piece(s) Synchronization Optical between transmitter and receiver  Performance data Supply voltage Us 24 V., DC., -20 20 % Current consumption, max. 150 mA Fuse 2 A semi time-lag Inputs Number of digital switching inputs Switching voltage high, min. 18 V Switching voltage (typ.) 22.5 V Switching voltage (typ.) 22.5 V	**	
Application Access guarding Danger zone guarding Functions Function package Standard Functions Contactor monitoring (EDM) Startirestart interlock (RES) Transmission channel changeover  Characteristic parameters Type 4, IEC/EN 61496 SIL 3, IEC 61508 SILC 3, IEC/EN 62061 Performance Level (PL) e. EN ISO 13849-1 PPHD 7.73E-09 per hour Mission time TM 20 years , EN ISO 13849-1 Category 4, EN ISO 13849  Protective field data Resolution 90 mm Protective field height 1,050 mm  Optical data Number of beams 14 Piece(s) Synchronization Optical between transmitter and receiver  Performance data Supply voitage Us 24 V , DC , -20 20 % Current consumption, max. 150 mA Fuse 2 A semi time-leg Inputs Number of digital switching inputs  Switching voitage ktyp, max. 2.5 V Switching voitage ktyp, max. 2.5 V Switching voitage ktyp, 22.5 V		
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Contactor monitoring (EDM)   Start/restart interlock (RES)   Transmission channel chargeover		Standard
Type         4 , IEC/EN 61496           SIL         3 , IEC 61508           SILCL         3 , IEC 61508           Performance Level (PL)         e , EN ISO 13849-1           PFHp         7.73E-09 per hour           Mission time TM         20 years , EN ISO 13849-1           Category         4 , EN ISO 13849           Protective field data           Resolution         90 mm           Protective field height           Optical data           Number of beams         14 Piece(s)           Synchronization         Optical between transmitter and receiver           Electrical data           Protective circuit         Overvoltage protection Short circuit protected           Performance data           Supply voltage UB         24 V , DC , -20 20 %           Current consumption, max.         150 mA           Fuse         2 A semi time-lag           Inputs         Number of digital switching inputs           Type         Digital switching input           Switching voltage low, max.         2.5 V           Switching voltage low, max.         2.5 V           Switching voltage, typ.         22.5 V	Functions	Contactor monitoring (EDM) Start/restart interlock (RES)
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SIL		4 IFC/FN 61496
SILCL   3 , IEC/EN 62061		
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Protective circuit  Overvoltage protection Short circuit protected  Performance data Supply voltage UB  Current consumption, max.  Fuse  2 A semi time-lag  Inputs Number of digital switching inputs  Type  Digital switching input  Switching voltage high, min.  Switching voltage low, max.  Switching voltage, typ.  24 V , DC , -20 20 %  Digital switching input  Sight switching input  150 mA  Piece(s)  Digital switching input  Switching voltage high, min.  18 V  Switching voltage low, max.  2.5 V  Switching voltage, typ.	Electrical data	
Supply voltage UB  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, typ.  22.5 V	Protective circuit	Overvoltage protection Short circuit protected
Current consumption, max.  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, typ.  22.5 V	Performance data	
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Inputs       Number of digital switching inputs     3 Piece(s)       Switching inputs     Digital switching input       Type     Digital switching input       Switching voltage high, min.     18 V       Switching voltage low, max.     2.5 V       Switching voltage, typ.     22.5 V	Current consumption, max.	150 mA
Number of digital switching inputs  Switching inputs  Type  Digital switching input  Switching voltage high, min.  18 V  Switching voltage low, max.  2.5 V  Switching voltage, typ.  22.5 V	Fuse	2 A semi time-lag
Switching inputsTypeDigital switching inputSwitching voltage high, min.18 VSwitching voltage low, max.2.5 VSwitching voltage, typ.22.5 V	Inputs	
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Switching voltage low, max.  2.5 V  Switching voltage, typ.  22.5 V		18 V
Switching voltage, typ. 22.5 V		
voitage type	Voltage type	DC



umber 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 5		
Switching element	Transistor , PNP		
Safety-related switching output 2			
Assignment	Connection 1, pin 6		
Switching element	Transistor , PNP		
art delay time	100 ms		
art delay time			
nection ber of connections	100 ms 2 Piece(s)		
nection ber of connections onnection 1	2 Piece(s)		
nection ber of connections onnection 1 ype of connection	2 Piece(s)  Connector		
nection ber of connections onnection 1 vpe of connection	2 Piece(s)  Connector  Machine interface		
nection ber of connections onnection 1 rpe of connection unction nread size	2 Piece(s)  Connector  Machine interface  M12		
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nection ber of connections onnection 1 rpe of connection unction nread size aterial o. of pins	2 Piece(s)  Connector  Machine interface  M12		
nection ber of connections onnection 1 repe of connection unction nread size aterial o. of pins onnection 2	2 Piece(s)  Connector  Machine interface  M12  Metal  8 -pin		
nection ber of connections onnection 1 rpe of connection unction nread size aterial o. of pins	2 Piece(s)  Connector  Machine interface  M12  Metal		
nection ber of connections onnection 1  ype of connection unction nread size aterial b. of pins onnection 2 ype of connection	2 Piece(s)  Connector  Machine interface  M12  Metal  8 -pin  Cable with connector  Cascade, Guest Out		
nection ber of connections onnection 1 rpe of connection unction nread size aterial o. of pins onnection 2 rpe of connection unction	2 Piece(s)  Connector  Machine interface  M12  Metal  8 -pin  Cable with connector  Cascade, Guest Out Cascade, Middle Guest Out		
nection ber of connections onnection 1 rpe of connection unction nread size aterial o. of pins onnection 2 rpe of connection unction	2 Piece(s)  Connector  Machine interface M12  Metal 8 -pin  Cable with connector  Cascade, Guest Out Cascade, Middle Guest Out 330 mm		
prection ber of connections prection 1 Type of connection pread size paterial po of pins prection 2 Type of connection prection 2 Type of connection prection 2 Type of connection prection 3 Type of connection prection 4 Type of connection prection 5 Type of connection prection 6 Type of connection prection 7 Type of connection prection 8 Type of connection prection 9 Type of connection prection 9 Type of connection 9 Type of	Connector  Machine interface  M12  Metal  8 -pin  Cable with connector  Cascade, Guest Out Cascade, Middle Guest Out 330 mm  PUR		
prection ber of connections connection 1 repe of connection unction pread size aterial co. of pins connection 2 repe of connection unction able length meathing material pread size	2 Piece(s)  Connector  Machine interface  M12  Metal  8 -pin  Cable with connector  Cascade, Guest Out Cascade, Middle Guest Out  330 mm  PUR  M12		
prection ber of connections prection 1 pre of connection pread size paterial po. of pins prection 2 pre of connection prection 2 prection 2 prection 2 prection 2 prection 3 prection 3 prection 4 prection 4 prection 5 prection 6 prection 6 prection 7 prection 7 prection 8 prection 8 prection 9 prection 9 prection 9 prection 1 prection 2 prection 2 prection 2 prection 2 prection 3 p	2 Piece(s)  Connector  Machine interface  M12  Metal  8 -pin  Cable with connector  Cascade, Guest Out Cascade, Middle Guest Out  330 mm  PUR  M12  Plastic		
prection ber of connections connection 1 ripe of connection unction pread size aterial co. of pins connection 2 ripe of connection unction able length meathing material pread size aterial co. of pins	2 Piece(s)  Connector  Machine interface  M12  Metal  8 -pin  Cable with connector  Cascade, Guest Out Cascade, Middle Guest Out  330 mm  PUR  M12  Plastic		
prection ber of connections connection 1 repe of connection unction pread size aterial c. of pins connection 2 repe of connection unction able length pread size aterial pread size aterial c. of pins connection able length pread size aterial c. of pins able properties	Connector Machine interface M12 Metal 8 -pin  Cable with connector Cascade, Guest Out Cascade, Middle Guest Out 330 mm PUR M12 Plastic 8 -pin		

Dimension (W x H x L)

Housing material

29 mm x 1,116 mm x 53 mm

Metal, Aluminum



Lens cover material	Plastic / PMMA		
Material of end caps	Diecast zinc		
Net weight	1,275 g		
Housing color	Yellow, RAL 1021	Yellow, RAL 1021	
Type of fastening	Groove mounting Mounting bracket Swivel mount		
Operation and display			
Type of display	7-segment display LED		

Operation and display		
Type of display	7-segment 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 %

Certifications		
Degree of protection	IP 65	
Protection class	III	
Certifications	c CSA US c TÜV NRTL US TÜV Süd	
Vibration resistance	50 m/s²	
Shock resistance	100 m/s²	
US patents	US 6,418,546 B	

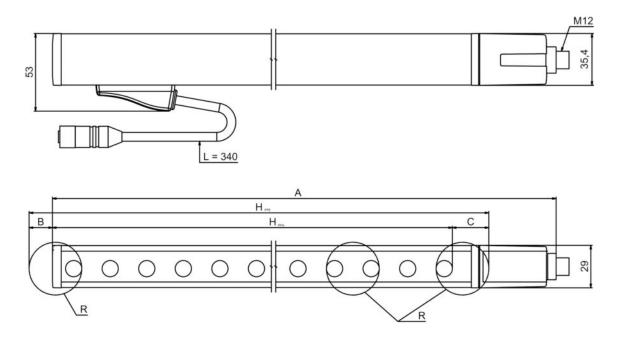
Classification	
Customs tariff number	85365019
eCl@ss 8.0	27272704
eCl@ss 9.0	27272704
ETIM 5.0	EC002549
ETIM 6.0	EC002549

## **Dimensioned drawings**

All dimensions in millimeters



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



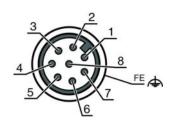
HPFE Effective protective field height = 1140 mm HPFN Nominal protective field height = 1050 mm

- A Total height = 1116 mm
- B 50 mm
- C 40 mm
- R Effective protective field height HPFE 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	
Туре	Male	
Material	Metal	
No. of pins	8 -pin	
Encoding	A-coded A-coded	
Connector housing	FE/SHIELD	

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



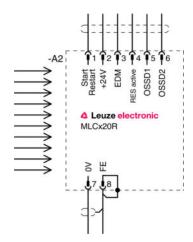
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Connection 2		
Type of connection	Cable with connector	
Function	Cascade, Guest Out Cascade, Middle Guest Out	
Cable length	330 mm	
Sheathing material	PUR	
Cable color	Black	
Wire cross section	0.14 mm²	
Type of stranding	Pair stranding (twisted pair)	
Thread size	M12	
Type Female		
Material	Plastic	
No. of pins	8 -pin	
Encoding	A-coded	

### **Circuit diagrams**

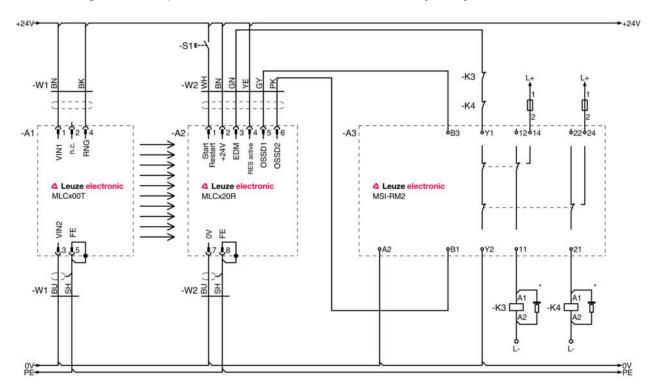
### Connection diagram receiver



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



### Circuit diagram example with downstream MSI-RM2 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	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

#### Suitable transmitters

	Part no.	Designation	Article	Description
68	8010910	MLC500T90-1050H	curtain transmitter	Resolution: 90 mm Protective field height: 1,050 mm Operating range: 0 20 m Connection: Connector, M12, Metal, 5 -pin



#### 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			

#### Note

A list with all available device types can be found on the Leuze electronic website at 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 Connection 2: Open end Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR



## 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 Fastening, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Turning, 360° Material: Metal, Plastic

### Services

Part no.	Designation	Article	Description
S981050	CS40-I-140	Safety inspection "Safety light barriers"	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.  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.  Restrictions: Travel costs and accommodation expenses charged separately and according to expenditure.
S981046	CS40-S-140	Start-up support	Details: For safety devices including stopping time measurement and initial inspection. Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses. Restrictions: Max. 2 h., no mechanical (mounting) and electrical (wiring) work performed, no changes (attachments, wiring, programming) to third-party components in the nearby environment.

#### Note

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