



the sensor people





Figure can vary

Part no.: 50119925 CML720i-R05-1760.R/CN-M12 Light curtain receiver





# **Contents**

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



### **Technical data**

Basic data	
Series	720
Operating principle	Throughbeam principle
	Receiver
Device type  Contains	Accessories for the use of the BT-2R1
Application	Object measurement
- присации	Object measurement
Special design	
Special design	Crossed-beam scanning Diagonal-beam scanning Parallel-beam scanning
Optical data	
Operating range	Guaranteed operating range
Operating range	0.1 3.5 m
Operating range Operating range limit	Typical operating range
Operating range limit Operating range limit	0.1 4.5 m
Measurement field length	1,760 mm
<u> </u>	
Number of beams	352 Piece(s)
Beam spacing	5 mm
Measurement data	
Minimum object diameter	10 mm
Protective circuit	Polarity reversal protection Short circuit protected Transient protection
Performance data	
Supply voltage U <sub>B</sub>	18 30 V , DC
Residual ripple	0 15 % , From U <sub>B</sub>
Open-circuit current	0 350 mA , The specified values refer to the entire package consisting of transmitter and receiver.
Inputs/outputs selectable	
Output current, max.	100 mA
Input resistance	6,000 Ω
Number of inputs/outputs selectable	2 Piece(s)
Туре	Inputs/outputs selectable
Voltage type, outputs	DC
Switching voltage, outputs	Typ. U <sub>B</sub> / 0 V
Voltage type, inputs	DC
Switching voltage, inputs	high: ≥6V low: ≤4V
Input/output 1	
Activation/disable delay	1 ms
Timing	
Timing Readiness delay	450 ms
Cycle time	10.96 ms
Despense time per beem	20 up

30 µs

Response time per beam



Type CANopen  Eunction Process  Service interface Type IO-Link Function Configuration via software Service  Connection Number of connections 2 Piece(s) Plug outlet Rear side  Connection Configuration interface Connection Signal IN Signal OUT Voltage supply  Type of connection Connection  Thread size M12 Type Male Material Metal No. of pins 8 pin Encoding A-coded  Connection BUS IN Encoding A-coded  Connection Connection  Function BUS IN Encoding A-coded  Material Metal No. of pins Bus OUT Type of connection Connector  Function BUS IN Encoding A-coded  Connection Connection  Type Female Material Metal No. of pins Bus OUT Type Female Material Metal No. of pins Bus OUT  Type Female Material Metal No. of pins Female Material No. of pins Semantary XI.783 mm Metal Aluminum Pleastor Description No. of pins Semantary XI.783 mm Metal Aluminum Pleastor Description No. of pins Semantary XI.783 mm Pleastor No. of pins Semantary XI.783 mm Pleastor Description No. of pins	Interface			
CANopen Function Process  Service interface  Type IO-Link Function Configuration via software Service  Connection Number of connections 2 Piece(s) Plug outlet Rear side  Connection  Function Configuration interface Connection to transmitter Signal IN Signal OUT Voltage supply  Type of connection Connector Thread size M12 Type Male Material Metal No. of pins 8-pin Encoding A-coded  Connector 2 Function BUS IN BUS IN BUS OUT Type of connection Connector Thread size M12 Type Male Material Metal No. of pins 5-pin Encoding A-coded  Connector Service  M12 Type Female Material Metal No. of pins A-coded  Connector Service  M12 Type Female Material Metal No. of pins A-coded		CANonon		
Function Process  Service interface Type IO-Link Function Configuration via software Service  Connection Number of connections 2 Piece(s) Plug outlet Rear side  Connection Configuration interface Connection to transmitter Signal IN Signal OUT Voltage supply  Type of connection Connection Thread size M12 Type Male Material Metal Metal No. of pins Bus IN BUS IN BUS OUT Type of connection Connection Connection  Encoding A-coded  Connection BUS IN BUS IN BUS OUT Type of connection Connection  Fine dize M12  Function BUS IN BUS OUT Type of connection Connection  Fine dize M12  Function BUS IN BUS OUT Type of connection Connector  Thread size M12  Function BUS IN BUS OUT Type Female Material Metal No. of pins 5- pin Encoding A-coded  Mechanical data  Design Cubic Dimension (W x H x L) 29 mm x 35.4 mm x 1,783 mm Housing material Metal Aluminum Lens cover material		CANOPEII		
Type		Dragge		
Type	Tunction	FIULESS		
Type				
Connection   Configuration via software		10.11.1		
Function  Connection  Number of connections  Plug outlet  Rear side  Connection  Function  Configuration interface Connection to transmitter Signal IN Signal OUT Voitage supply  Type of connection  Accoded  Mechanical data  Design  Design  Connection  Connection  Connection  Connection  BUS IN BUS OUT Type of connection  BUS IN BUS OUT  Connection  Connection  Connection  Connector  Thread size  M12  Function  BUS IN BUS OUT  Type of connection  Connection  Connection  Connection  BUS IN BUS OUT  Type of connection		IO-Link		
Service				
Number of connections         2 Piece(s)           Plug outlet         Rear side           Connection 1         Configuration interface	Function	Configuration via software Service		
Number of connections         2 Piece(s)           Plug outlet         Rear side           Connection 1         Configuration interface				
Plug outlet  Connection 1  Function  Configuration interface Connection to transmitter Signal IN Signal OUT Voltage supply  Type of connection  Connector  Thread size  M12  Type  Male  Material  No. of pins  Encoding  A-coded  Connection  BUS IN BUS OUT  Type of connection  BUS IN BUS OUT  Type of connection  Connector  Function  BUS IN BUS OUT  Type of connection  Connection  Function  BUS IN BUS OUT  Type of connection  Connection  Thread size  M12  Type  Female  Material  Metal  No. of pins  5 -pin  Encoding  A-coded  Metal  No. of pins  Coded  Metal  No. of pins  Coded  Metal  No. of pins  Cubic  Dimension (W x H x L)  29 mm x 35.4 mm x 1,783 mm  Housing material  Metal , Aluminum  Heas cover material	Connection			
Plug outlet Rear side  Connection 1 Function Configuration interface Connection to transmitter Signal IN Signal OUT Voltage supply  Type of connection Connector Thread size M12 Type Mate Material No. of pins Encoding A-coded  Connection Eurotion BUS IN BUS IN BUS OUT Type of connection Thread size Function BUS IN BUS OUT Type of connection Connector Thread size M12 Type Female Material Metal No. of pins S-pin Encoding A-coded  Connection Type of connection Type of connection Thread size M12 Type Female Material Metal No. of pins S-pin Encoding A-coded  Metal No. of pins S-pin Encoding A-coded  Metal No. of pins S-pin Encoding A-coded	Number of connections	2 Piece(s)		
Function  Configuration interface Connection to transmitter Signal IN Signal OUT Voltage supply  Type of connection  Connector  Thread size  M12  Type Male Material No. of pins Encoding A-coded  Connection  Type of connection  BUS IN BUS OUT  Type of connection  Connector  Thread size  Function BUS IN BUS OUT  Type of connection  Connector  Thread size M12  Type Female Material Metal No. of pins 5 - pin Encoding A-coded  Mechanical data  Design Cubic  Dimension (W x H x L) 29 mm x 35.4 mm x 1,783 mm  Housing material Metal , Aluminum  Lens cover material Plastic	Plug outlet			
Connection to transmitter Signal IN Signal OUT Voltage supply  Type of connection  Connector  Thread size  M12  Type  Male  Material  No. of pins  Encoding  A-coded  Connection 2  Function  BUS IN BUS OUT  Type of connection  Connector  Thread size  M12  Function  BUS IN BUS OUT  Type of connection  Connector  Thread size  M12  Type  Female  Material  Metal  No. of pins  5 - pin  Encoding  A-coded  Mechanical data  Design  Cubic  Dimension (W x H x L)  29 mm x 35.4 mm x 1,783 mm  Housing material  Metal , Aluminum  Lens cover material  Plastic	-			
Connection to transmitter Signal IN Signal OUT Voltage supply  Type of connection  Connector  Thread size  M12  Type Male Material No. of pins 8 -pin Encoding A-coded  Connection 2  Function  BUS IN BUS OUT  Type of connection  Connector  Thread size  M12  Type of connection  Connector  Thread size  M12  Type Female Material Metal No. of pins 5 -pin Encoding A-coded  Mechanical data  Design  Cubic  Dimension (W x H x L) 29 mm x 35.4 mm x 1,783 mm  Housing material Metal , Aluminum  Lens cover material Plastic		Configuration interface		
Signal OUT		Connection to transmitter		
Type of connection         Connector           Thread size         M12           Type         Male           Material         Metal           No. of pins         8 -pin           Encoding         A-coded           Connection 2         Sust IN Bus OUT           Type of connection         Connector           Thread size         M12           Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic		Signal OUT		
Thread size M12  Type Male  Material Metal  No. of pins 8 -pin  Encoding A-coded  Connection 2  Function BUS IN BUS OUT  Type of connection  Trype of connection  Thread size M12  Type Female  Material Metal  No. of pins 5 -pin  Encoding A-coded  Mechanical data  Design Cubic  Dimension (W x H x L) 29 mm x 35.4 mm x 1,783 mm  Housing material Metal , Aluminum  Lens cover material Plastic				
Type         Male           Material         Metal           No. of pins         8 -pin           Encoding         A-coded           Connection 2         BUS IN BUS OUT           Type of connection         Connector           Thread size         M12           Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic	Type of connection			
Material         Metal           No. of pins         8 -pin           Encoding         A-coded           Connection 2         BUS IN BUS OUT           Type of connection         Connector           Thread size         M12           Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic				
No. of pins         8 -pin           Encoding         A-coded           Connection 2         BUS IN BUS OUT           Type of connection         Connector           Thread size         M12           Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic	Туре	Male		
Encoding         A-coded           Connection 2         BUS IN BUS OUT           Type of connection         Connector           Thread size         M12           Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic				
Connection 2           Function         BUS IN BUS OUT           Type of connection         Connector           Thread size         M12           Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic				
Function         BUS IN BUS OUT           Type of connection         Connector           Thread size         M12           Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic	-	A-coded		
BUS OUT				
Type of connection         Connector           Thread size         M12           Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic	Function			
Thread size         M12           Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic	Type of connection			
Type         Female           Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data         Cubic           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic				
Material         Metal           No. of pins         5 -pin           Encoding         A-coded           Mechanical data         Cubic           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic				
No. of pins         5 -pin           Encoding         A-coded           Mechanical data         Cubic           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic				
Mechanical data           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic				
Mechanical data           Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic				
Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic				
Design         Cubic           Dimension (W x H x L)         29 mm x 35.4 mm x 1,783 mm           Housing material         Metal , Aluminum           Lens cover material         Plastic	Mechanical data			
Dimension (W x H x L)  29 mm x 35.4 mm x 1,783 mm  Housing material  Metal , Aluminum  Lens cover material  Plastic		Cubic		
Housing material Metal , Aluminum  Lens cover material Plastic				
Lens cover material Plastic				
Net weight 1,950 g				
	Net weight			
Housing color Silver				
Type of fastening Groove mounting		Groove mounting		
Via optional mounting device	<del>-</del>	Via optional mounting device		
Operation and display		LED		
Type of display  LED  OLED display	type of display			
Number of LEDs 2 Piece(s)	Number of LEDs			
Type of configuration Software	Type of configuration Software			
Teach-in		Teach-in		

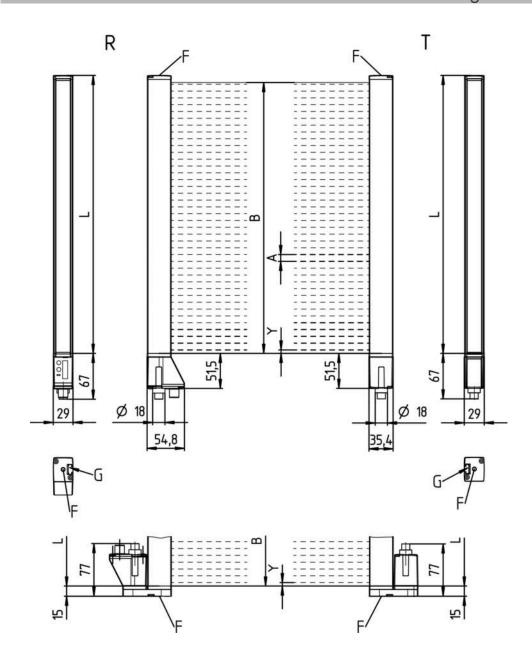


Environmental data			
Ambient temperature, operation	-30 60 °C		
Ambient temperature, storage	-40 70 °C	-40 70 °C	
Certifications			
Degree of protection	IP 65		
Protection class	III		
Certifications	c CSA US		
Standards applied	IEC 60947-5-2	IEC 60947-5-2	
Classification			
Customs tariff number	90314990		
eCl@ss 8.0	27270910	27270910	
eCl@ss 9.0	27270910	27270910	
ETIM 5.0	EC002549		
ETIM 6.0	EC002549	EC002549	

### **Dimensioned drawings**

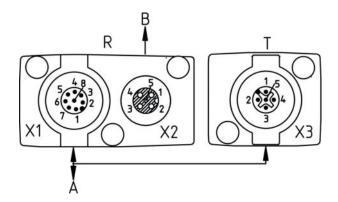
All dimensions in millimeters





- A Beam spacing 5 mm B Measurement field length 1760 mm
- F M6 thread
- G Fastening groove
- L Profile length 1768 mm
- T Transmitter
- R Receiver
- Y 2.5 mm



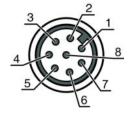


A PWR / SW IN/OUT B BUS IN / OUT

### **Electrical connection**

Connection 1		
Function	Configuration interface Connection to transmitter Signal IN Signal OUT Voltage supply	
Type of connection	Connector	
Thread size	M12	
Туре	Male	
Material	Metal	
No. of pins	8 -pin	
Encoding	A-coded	

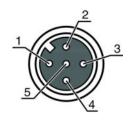
Pin	Pin assignment
1	V+
2	I/O 1
3	GND
4	IO-Link
5	I/O 2
6	RS 485 Tx+
7	RS 485 Tx+
8	FE/SHIELD



Connection 2	
Function	BUS IN BUS OUT
Type of connection	Connector
Thread size	M12
Туре	Female
Material	Metal
No. of pins	5 -pin
Encoding	A-coded



Pin	Pin assignment
1	FE/SHIELD
2	n.c.
3	CAN GND
4	CAN H
5	CAN L



## **Operation and display**

### **LEDs**

LED	Display	Meaning
1	Green, continuous light	Operational readiness
	Green, flashing	Teach / error
		Measurement frequency display
2	Yellow, continuous light	Light path free, with function reserve
	Yellow, flashing	No function reserve
	Off	Object detected

### Suitable transmitters

Part no.	Designation	Article	Description
50119470	CML720i- T05-1760.R-M12	Light curtain transmitter	Operating range: 0.1 3.5 m Connection: Connector, M12, Rear side, 5 -pin

### Part number code

Part designation: CML7XXi-YZZ-AAAA.BCCCDDD-EEEFFF

CML	Operating principle: Measuring light curtain	
7XXi	Series: 720i: 720i series 730i: 730i series	
Y	Device type: T: transmitter R: receiver	
ZZ	Beam spacing: 05: 5 mm 10: 10 mm 20: 20 mm 40: 40 mm	
AAAA	Measurement field length [mm], dependent on beam spacing	
В	Equipment: A: connector outlet, axial R: rear connector outlet	



ccc	Interface: L: IO-Link /CN: CANopen /PB: PROFIBUS /PN: PROFINET /CV: Analog current and voltage output /D3: RS 485 Modbus	
DDD	Special equipment: -PS: Power Setting	
EEE	Electrical connection: M12: M12 connector	
FFF	-EX: Explosion protection:	

#### Note

A list with all available device types can be found on the Leuze electronic website at www.leuze.com.

#### **Notes**

#### Observe intended use!

- · This product is not a safety sensor and is not intended as personnel protection.
- The product may only be put into operation by competent persons.
- · Only use the product in accordance with its intended use.

#### For UL applications:

- For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code).
- These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.5A min, in the field installation, or equivalent (categories: CYJV/CYJV7 or PVVA/PVVA7)

#### **Accessories**

## Connection technology - Connection cables

Part no.	Designation	Article	Description
50132079	KD U-M12-5A- V1-050	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: PVC

Leuze electronic GmbH + Co. KG, In der Braike 1, 73277 Owen Phone: +49 7021 573-0, Fax: +49 7021 573-199



### Connection technology - Interconnection cables

Part no.	Designation	Article	Description
50129781	KDS DN-M12-5A- M12-5A-P3-050	Interconnection cable	Suitable for interface: IO-Link, DeviceNet, CANopen Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Connector, M12, Axial, Male, A-coded, 5 -pin Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR

## Connection technology - Y distribution cables

	Part no.	Designation	Article	Description
	50118183	K-Y1 M12A-5m- M12A-S-PUR	Interconnection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Connector, M12, Axial, Male, A-coded, 5 -pin Connection 3: Connector, M12, Axial, Female, A-coded, 8 -pin Shielded: Yes Cable length fork 1: 5,000 mm Cable length fork 2: 150 mm Sheathing material: PUR
	50118185	K-YCN M12A- M12A-S-PUR	Interconnection cable	Suitable for interface: CANopen Connection 1: Connector, M12, Axial, Male, A-coded, 5 -pin Connection 2: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 3: Connector, M12, Axial, Male, A-coded, 5 -pin Shielded: Yes Cable length fork 1: 250 mm Cable length fork 2: 350 mm Sheathing material: PUR

## Connection technology - Terminating resistors

Part no.	Designation	Article	Description
50040099	TS 01-5-SA	Terminator plug	Suitable for: DeviceNet, CANopen Connection 1: Connector, M12, Axial, Male, A-coded, 5 -pin Function: Bus termination

## Mounting technology - Mounting brackets

Part no.	Designation	Article	Description
50142900	BT 700M.5-2SET	Mounting device set	Contains: 2x mounting brackets, 1 teach template, 4 M6 x 10 screws Design of mounting device: Bracket mounting Fastening, at system: Through-hole mounting, T slotted hole Mounting bracket, at device: Screw type, Sliding block Type of mounting device: Rigid Material: Steel

# Mounting technology - Swivel mounts

	Part no.	Designation	Article	Description
EE.	429046	BT-2R1	Mounting bracket set	Contains: 2x BT-R 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

Leuze electronic GmbH + Co. KG, In der Braike 1, 73277 Owen Phone: +49 7021 573-0, Fax: +49 7021 573-199



### Services

Part no.	Designation	Article	Description
S981001	CS10-S-110	Start-up support	Details: Performed at location of customer's choosing, duration: max. 10 hours. Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses. Restrictions: No mechanical (mounting) and electrical (wiring) work performed, no changes (attachments, wiring, programming) to third-party components in the nearby environment.
S981005	CS10-T-110	Product training	Details: Location and content to be agreed upon, duration: max. 10 hours. Conditions: Price not including travel costs and, if applicable, accommodation expenses. Restrictions: Travel costs and accommodation expenses charged separately and according to expenditure.

#### Note

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