

## Technical data sheet Light curtain receiver

Part no.: 50131881

CML720i-R05-2400.R/PN-M12



For illustration purposes only

### 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                 |
| Device type         | Receiver                              |
| Contains            | Accessories for the use of the BT-2R1 |
| Application         | Object measurement                    |

### Special version

|                 |                        |
|-----------------|------------------------|
| Special version | Crossed-beam scanning  |
|                 | Diagonal-beam scanning |
|                 | Parallel-beam scanning |

### Optical data

|                          |              |
|--------------------------|--------------|
| Measurement field length | 2,400 mm     |
| Number of beams          | 480 Piece(s) |
| Beam spacing             | 5 mm         |

### Measurement data

|                         |       |
|-------------------------|-------|
| Minimum object diameter | 10 mm |
|-------------------------|-------|

### Electrical data

|                    |                              |
|--------------------|------------------------------|
| Protective circuit | Polarity reversal protection |
|                    | Short circuit protected      |
|                    | Transient protection         |

### Performance data

|                      |                                                                                                        |
|----------------------|--------------------------------------------------------------------------------------------------------|
| Supply voltage $U_B$ | 18 ... 30 V, DC                                                                                        |
| Residual ripple      | 0 ... 15 %, From $U_B$                                                                                 |
| Open-circuit current | 0 ... 435 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 $\Omega$            |
| Number of inputs/outputs selectable | 2 Piece(s)                |
| Type                                | Inputs/outputs selectable |
| Voltage type, outputs               | DC                        |
| Switching voltage, outputs          | Typ. $U_B$ / 0 V          |
| Voltage type, inputs                | DC                        |
| Switching voltage, inputs           | high: $\geq 6V$           |
|                                     | low: $\leq 4 V$           |

### Input/output 1

|                          |      |
|--------------------------|------|
| Activation/disable delay | 1 ms |
|--------------------------|------|

### Time behavior

|                        |            |
|------------------------|------------|
| Readiness delay        | 1,500 ms   |
| Cycle time             | 14.8 ms    |
| Response time per beam | 30 $\mu s$ |

### Interface

|      |          |
|------|----------|
| Type | PROFINET |
|------|----------|

### PROFINET

|                      |             |
|----------------------|-------------|
| Function             | Process     |
| Conformance class    | B           |
| Protocol             | PROFINET RT |
| Switch functionality | Integrated  |
| Transmission speed   | 10 Mbit/s   |
|                      | 100 Mbit/s  |

### Service interface

|                     |                            |
|---------------------|----------------------------|
| Type                | IO-Link                    |
| IO-Link<br>Function | Configuration via software |
|                     | Service                    |

### Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 3 Piece(s) |
| 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               | Male                      |
| Material           | Metal                     |
| No. of pins        | 8 -pin                    |
| Encoding           | A-coded                   |

### Connection 2

|                    |           |
|--------------------|-----------|
| Function           | BUS IN    |
| Type of connection | Connector |
| Thread size        | M12       |
| Type               | Female    |
| Material           | Metal     |
| No. of pins        | 4 -pin    |
| Encoding           | D-coded   |

### Connection 3

|                    |           |
|--------------------|-----------|
| Function           | BUS OUT   |
| Type of connection | Connector |
| Thread size        | M12       |
| Type               | Female    |
| Material           | Metal     |
| No. of pins        | 4 -pin    |
| Encoding           | D-coded   |

### Mechanical data

|                       |                              |
|-----------------------|------------------------------|
| Design                | Cubic                        |
| Dimension (W x H x L) | 29 mm x 35.4 mm x 2,423 mm   |
| Housing material      | Metal                        |
| Metal housing         | Aluminum                     |
| Lens cover material   | Plastic                      |
| Net weight            | 2,500 g                      |
| Housing color         | Silver                       |
| Type of fastening     | Groove mounting              |
|                       | Via optional mounting device |

## Technical data

### Operation and display

|                       |              |
|-----------------------|--------------|
| Type of display       | LED          |
|                       | OLED display |
| Number of LEDs        | 4 Piece(s)   |
| Type of configuration | Software     |
|                       | Teach-in     |

### Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -30 ... 60 °C |
| Ambient temperature, storage   | -40 ... 70 °C |

### Certifications

|                      |               |
|----------------------|---------------|
| Degree of protection | IP 65         |
| Protection class     | III           |
| Approvals            | c UL US       |
| Standards applied    | IEC 60947-5-2 |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 90314990 |
| ECLASS 5.1.4          | 27270910 |
| ECLASS 8.0            | 27270910 |
| ECLASS 9.0            | 27270910 |
| ECLASS 10.0           | 27270910 |
| ECLASS 11.0           | 27270910 |
| ECLASS 12.0           | 27270910 |
| ECLASS 13.0           | 27270910 |
| ECLASS 14.0           | 27270910 |
| ECLASS 15.0           | 27270910 |
| 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



- |   |                                  |   |                        |
|---|----------------------------------|---|------------------------|
| A | Beam spacing 5 mm                | L | Profile length 2408 mm |
| B | Measurement field length 2400 mm | T | Transmitter            |
| F | M6 thread                        | R | Receiver               |
| G | Fastening groove                 | Y | 2.5 mm                 |

Dimensioned drawings



Electrical connection

Connection 1

X1

|                    |                                                                                                   |
|--------------------|---------------------------------------------------------------------------------------------------|
| Function           | Configuration interface<br>Connection to transmitter<br>Signal IN<br>Signal OUT<br>Voltage supply |
| Type of connection | Connector                                                                                         |
| Thread size        | M12                                                                                               |
| Type               | 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

X2A

|                    |           |
|--------------------|-----------|
| Function           | BUS IN    |
| Type of connection | Connector |
| Thread size        | M12       |
| Type               | Female    |
| Material           | Metal     |
| No. of pins        | 4 -pin    |
| Encoding           | D-coded   |

Pin Pin assignment

|   |      |
|---|------|
| 1 | TD0+ |
| 2 | RD0+ |
| 3 | TD0- |
| 4 | RD0- |



## Electrical connection

### Connection 3

### X2B

|                    |           |
|--------------------|-----------|
| Function           | BUS OUT   |
| Type of connection | Connector |
| Thread size        | M12       |
| Type               | Female    |
| Material           | Metal     |
| No. of pins        | 4 -pin    |
| Encoding           | D-coded   |

### Pin Pin assignment

|   |      |
|---|------|
| 1 | TD0+ |
| 2 | RD0+ |
| 3 | TD0- |
| 4 | RD0- |



## Operation and display

| LED | Display                                               | Meaning                                |
|-----|-------------------------------------------------------|----------------------------------------|
| 1   | Green, continuous light                               | Operational readiness                  |
|     | Green, flashing                                       | Teach / error                          |
| 2   | Yellow, continuous light                              | Light path free, with function reserve |
|     | Yellow, flashing                                      | No function reserve                    |
|     | Off                                                   | Object detected                        |
| 3   | Green, continuous light (at the X2A / X2B connector)  | Link                                   |
| 4   | Yellow, continuous light (at the X2A / X2B connector) | Activity                               |

## Suitable transmitters

|                                                                                     | Part no. | Designation            | Operating range<br>Operating range<br>limit | Description                                                                     |
|-------------------------------------------------------------------------------------|----------|------------------------|---------------------------------------------|---------------------------------------------------------------------------------|
|  | 50119478 | CML720i-T05-2400.R-M12 | 0.1 ... 3.5 m<br>0.1 ... 4.5 m              | Operating range: 0.1 ... 3.5 m<br>Connection: Connector, M12, Rear side, 5 -pin |

## Part number code

Part designation: CML7XXi-YYZ-AAAA.BCCDDDD-EEEEFF

|      |                                                                        |
|------|------------------------------------------------------------------------|
| CML  | <b>Operating principle</b><br>Measuring light curtain                  |
| 7XXi | <b>Series</b><br>720i: 720i series<br>730i: 730i series                |
| Y    | <b>Device type</b><br>T: transmitter<br>R: receiver                    |
| ZZ   | <b>Beam spacing</b><br>05: 5 mm<br>10: 10 mm<br>20: 20 mm<br>40: 40 mm |
| AAAA | Measurement field length [mm], dependent on beam spacing               |

## Part number code

|            |                                                                                                                                                  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>B</b>   | <b>Equipment</b><br>A: Axial connector outlet<br>R: Rear connector outlet                                                                        |
| <b>CCC</b> | <b>Interface</b><br>L: IO-Link<br>/CN: CANopen<br>/PB: PROFIBUS<br>/PN: PROFINET<br>/CV: Analog current and voltage output<br>/D3: RS 485 Modbus |
| <b>DDD</b> | <b>Special equipment</b><br>-PS: Power Setting                                                                                                   |
| <b>EEE</b> | <b>Electrical connection</b><br>M12: M12 connector                                                                                               |
| <b>FFF</b> | <b>-EX: Explosion protection</b>                                                                                                                 |

### 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!



- ↪ 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 | Application: Chemical resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC |

## Accessories

|                                                                                   | Part no. | Designation         | Article          | Description                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------|----------|---------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50135074 | KS ET-M12-4A-P7-050 | Connection cable | Application: Oil and lubricant resistant<br>Suitable for interface: Ethernet<br>Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PUR |

## Connection technology - Interconnection cables

|                                                                                  | Part no. | Designation                 | Article               | Description                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------|----------|-----------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50135081 | KSS ET-M12-4A-RJ45-A-P7-050 | Interconnection cable | Application: Oil and lubricant resistant<br>Suitable for interface: Ethernet<br>Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin<br>Connection 2: RJ45<br>Shielded: Yes<br>Cable length: 5,000 mm<br>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<br>Connection 2: Connector, M12, Axial, Male, A-coded, 5 -pin<br>Connection 3: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Shielded: Yes<br>Cable length fork 1: 5,000 mm<br>Cable length fork 2: 150 mm<br>Sheathing material: PUR |

## 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<br>Design of mounting device: Bracket mounting<br>Fastening, at system: Through-hole mounting, T slotted hole<br>Mounting bracket, at device: Screw type, Sliding block<br>Type of mounting device: Rigid<br>Material: Steel |

## Mounting technology - Swivel mounts

|                                                                                    | Part no. | Designation | Article              | Description                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------|----------|-------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 429029   | BT-2RG      | Mounting bracket set | Contains: 2x BT-R swivel mount, 2 cylinders for mounting on the light curtain<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 360°<br>Material: Metal, Plastic |

## Accessories

### Configuration devices

|                                                                                  | Part no. | Designation                  | Article         | Description                                                                                    |
|----------------------------------------------------------------------------------|----------|------------------------------|-----------------|------------------------------------------------------------------------------------------------|
|  | 50121098 | SET MD12-US2-IL1.1<br>+ Zub. | Diagnostics set | Supply voltage: DC<br>Interface: USB<br>Connections: 2 Piece(s)<br>Degree of protection: IP 20 |

### 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.<br>Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses. |
|  | S981005  | CS10-T-110  | Product training | Details: Location and content to be agreed upon, duration: max. 10 hours.<br>Conditions: 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.