

## Technical data sheet Stationary bar code reader

Part no.: 50109900

BCL 504i OL 100 H

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For illustration purposes only



CDRH



UK  
CA

## Technical data

### Basic data

|        |          |
|--------|----------|
| Series | BCL 500i |
|--------|----------|

### Special version

|                 |         |
|-----------------|---------|
| Special version | Heating |
|-----------------|---------|

### Functions

|           |                           |
|-----------|---------------------------|
| Functions | Alignment mode            |
|           | AutoConfig                |
|           | AutoControl               |
|           | AutoReflAct               |
|           | Code fragment technology  |
|           | Heating                   |
|           | LED indicator             |
|           | Reference code comparison |

### Characteristic parameters

|      |            |
|------|------------|
| MTTF | 42.4 years |
|------|------------|

### Read data

|                      |                             |
|----------------------|-----------------------------|
| Code types, readable | 2/5 Interleaved             |
|                      | Codabar                     |
|                      | Code 128                    |
|                      | Code 39                     |
|                      | Code 93                     |
|                      | EAN 128                     |
|                      | EAN 8/13                    |
|                      | EAN Addendum                |
|                      | GS1 Databar Expanded        |
|                      | GS1 Databar Limited         |
|                      | GS1 Databar Omnidirectional |
|                      | UPC                         |

|   |               |
|---|---------------|
| Scanning rate, typical                  | 1,000 scans/s |
| Bar codes per reading gate, max. number | 64 Piece(s)   |

### Optical data

|                              |   |
|------------------------------|---|
| Reading distance             | 1,000 ... 2,400 mm                                      |
| Light source                 | Laser, Red  |
| Wavelength                   | 650 nm  |
| Laser class                  | 1, IEC/EN 60825-1:2014                                  |
| Transmitted-signal shape     | Continuous  |
| Bar code contrast (PCS)      | 60 %  |
| Modulus size                 | 0.7 ... 1 mm  |
| Reading method               | Oscillating-mirror scanner                              |
| Scanning rate                | 800 ... 1,200 scans/s                                   |
| Beam deflection              | Via rotating polygon wheel + stepping motor with mirror |
| Light beam exit              | Zero position at side at angle less than 90°            |
| Oscillating mirror frequency | 10 Hz   |
| Max. swivel angle            | 40 °  |

### Electrical data

|                    |                              |
|--------------------|------------------------------|
| Protective circuit | Polarity reversal protection |
|--------------------|------------------------------|

### Performance data

|                         |                         |
|-------------------------|-------------------------|
| Supply voltage $U_B$    | 24 V, DC, -20 ... +20 % |
| Power consumption, max. | 75 W                    |

### Inputs/outputs selectable

|                                     |                  |
|-------------------------------------|------------------|
| Output current, max.                | 100 mA           |
| Number of inputs/outputs selectable | 4 Piece(s)       |
| Voltage type, outputs               | DC               |
| Switching voltage, outputs          | Typ. $U_B / 0$ V |
| Voltage type, inputs                | DC               |
| Switching voltage, inputs           | Typ. $U_B / 0$ V |
| Input current, max.                 | 8 mA             |

### Interface

|      |             |
|------|-------------|
| Type | PROFIBUS DP |
|------|-------------|

### PROFIBUS DP

|                    |                             |
|--------------------|-----------------------------|
| Function           | Process                     |
| Classification     | V1                          |
| Transmission speed | 9,600 ... 12,000,000 Mbit/s |

### Service interface

|      |     |
|------|-----|
| Type | USB |
|------|-----|

### USB

|          |                                       |
|----------|---------------------------------------|
| Function | Configuration via software<br>Service |
|----------|---------------------------------------|

### Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 5 Piece(s) |
|-----------------------|------------|

### Connection 1

|                       |                    |
|-----------------------|--------------------|
| Function              | Service interface  |
| Type of connection    | USB                |
| Designation on device | SERVICE            |
| Connector type        | USB 2.0 Standard-A |

### Connection 2

|                       |                         |
|-----------------------|-------------------------|
| Function              | Signal IN<br>Signal OUT |
| Type of connection    | Connector               |
| Designation on device | SW IN/OUT               |
| Thread size           | M12                     |
| Type                  | Female                  |
| Material              | Metal                   |
| No. of pins           | 5 -pin                  |
| Encoding              | A-coded                 |

### Connection 3

|                       |   |
|-----------------------|---|
| Function              | Signal IN<br>Signal OUT<br>Voltage supply |
| Type of connection    | Connector                                 |
| Designation on device | PWR                                       |
| Thread size           | M12                                       |
| Type                  | Male                                      |
| Material              | Metal                                     |
| No. of pins           | 5 -pin                                    |
| Encoding              | A-coded                                   |

## Technical data

### Connection 4

|                       |               |
|-----------------------|---------------|
| Function              | BUS IN        |
| Type of connection    | Connector     |
| Designation on device | HOST / BUS IN |
| Thread size           | M12           |
| Type                  | Male          |
| Material              | Metal         |
| No. of pins           | 5 -pin        |
| Encoding              | B-coded       |

### Connection 5

|                       |           |
|-----------------------|-----------|
| Function              | BUS OUT   |
| Type of connection    | Connector |
| Designation on device | BUS OUT   |
| Thread size           | M12       |
| Type                  | Female    |
| No. of pins           | 5 -pin    |

### Mechanical data

|                       |   |
|-----------------------|---|
| Design                | Cubic   |
| Dimension (W x H x L) | 173 mm x 84 mm x 147 mm   |
| Housing material      | Metal   |
| Metal housing         | Aluminum  |
| Lens cover material   | Glass   |
| Net weight            | 1,500 g   |
| Housing color         | Red<br>Silver   |
| Type of fastening     | Dovetail grooves<br>Mounting thread<br>Via optional mounting device |

### Operation and display

|                       |   |
|-----------------------|---|
| Type of display       | LED<br>Monochromatic graphical display,<br>128x64 pixel, with background lighting |
| Number of LEDs        | 2 Piece(s)  |
| Type of configuration | Via web browser   |
| Operational controls  | Button(s)   |

### Environmental data

|  |                |
|--|----------------|
| Ambient temperature, operation                   | -35 ... 40 °C  |
| Ambient temperature, storage                     | -20 ... +70 °C |
| Relative humidity (non-condensing)               | 90 %           |
| Extraneous light tolerance on the bar code, max. | 2,000 lx       |

### Certifications

|   |                                      |
|---|--------------------------------------|
| Degree of protection  | IP 65                                |
| Protection class  | III                                  |
| Approvals   | c UL US                              |
| Test procedure for EMC in accordance with standard              | EN 55022<br>EN 61000-4-2, -3, -4, -6 |
| Test procedure for shock in accordance with standard            | IEC 60068-2-27, test Ea              |
| Test procedure for continuous shock in accordance with standard | IEC 60068-2-29, test Eb              |
| Test procedure for vibration in accordance with standard        | IEC 60068-2-6, test Fc               |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 84719000 |
| ECLASS 5.1.4          | 27280102 |
| ECLASS 8.0            | 27280102 |
| ECLASS 9.0            | 27280102 |
| ECLASS 10.0           | 27280102 |
| ECLASS 11.0           | 27280102 |
| ECLASS 12.0           | 27280102 |
| ECLASS 13.0           | 27280102 |
| ECLASS 14.0           | 27280102 |
| ECLASS 15.0           | 27280102 |
| ECLASS 16.0           | 27280102 |
| ETIM 5.0              | EC002550 |
| ETIM 6.0              | EC002550 |
| ETIM 7.0              | EC002550 |
| ETIM 8.0              | EC002550 |
| ETIM 9.0              | EC002550 |
| ETIM 10.0             | EC002550 |
| UNSPSC 26.08          | 43211701 |

# Dimensioned drawings

All dimensions in millimeters



## Electrical connection

### Connection 1

### SERVICE

|                    |                    |
|--------------------|--------------------|
| Function           | Service interface  |
| Type of connection | USB                |
| Connector type     | USB 2.0 Standard-A |

### Pin Pin assignment

|   |           |
|---|-----------|
| 1 | +5 V DC   |
| 2 | D- - Data |
| 3 | D+ - Data |
| 4 | GND       |



## Electrical connection

### Connection 2

### SW IN/OUT

|                    |                         |
|--------------------|-------------------------|
| Function           | Signal IN<br>Signal OUT |
| Type of connection | Connector               |
| Thread size        | M12                     |
| Type               | Female                  |
| Material           | Metal                   |
| No. of pins        | 5 -pin                  |
| Encoding           | A-coded                 |

| Pin | Pin assignment |
|-----|----------------|
| 1   | VOUT           |
| 2   | SWIO 1         |
| 3   | GND            |
| 4   | SWIO 2         |
| 5   | FE             |



### Connection 3

### PWR

|                    |   |
|--------------------|---|
| Function           | Signal IN<br>Signal OUT<br>Voltage supply |
| Type of connection | Connector                                 |
| Thread size        | M12                                       |
| Type               | Male                                      |
| Material           | Metal                                     |
| No. of pins        | 5 -pin                                    |
| Encoding           | A-coded                                   |

| Pin | Pin assignment |
|-----|----------------|
| 1   | VIN            |
| 2   | SWIO 3         |
| 3   | GND            |
| 4   | SWIO 4         |
| 5   | FE             |



### Connection 4

### HOST / BUS IN

|                    |           |
|--------------------|-----------|
| Function           | BUS IN    |
| Type of connection | Connector |
| Thread size        | M12       |
| Type               | Male      |
| Material           | Metal     |
| No. of pins        | 5 -pin    |
| Encoding           | B-coded   |

| Pin | Pin assignment |
|-----|----------------|
| 1   | n.c.           |
| 2   | A (N)          |
| 3   | n.c.           |
| 4   | B (P)          |
| 5   | FE             |



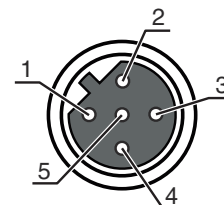
# Electrical connection

## Connection 5

## BUS OUT

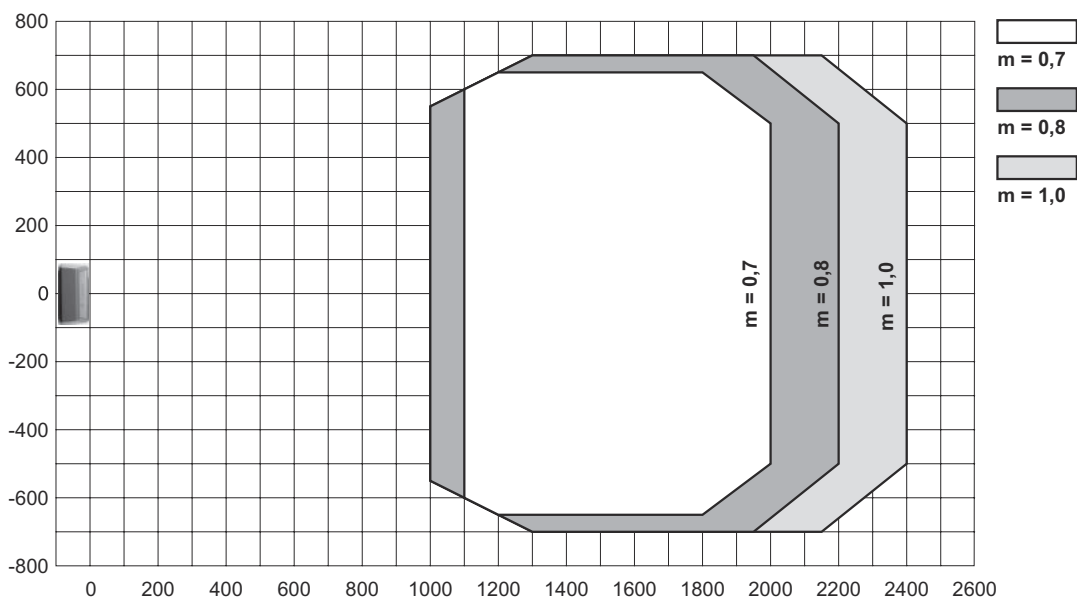
|                    |           |
|--------------------|-----------|
| Function           | BUS OUT   |
| Type of connection | Connector |
| Thread size        | M12       |
| Type               | Female    |
| Material           | Metal     |
| No. of pins        | 5 -pin    |
| Encoding           | B-coded   |

| Pin | Pin assignment |
|-----|----------------|
| 1   | VP             |
| 2   | A (N)          |
| 3   | GND 485        |
| 4   | B (P)          |
| 5   | FE             |



## Diagrams

### Reading field curve



x Reading field distance [mm]  
y Reading field width [mm]

# Diagrams

## Lateral reading field curve



x Reading field distance [mm]  
 y Reading field height [mm]

## Operation and display

| LED   | Display                  | Meaning                         |
|-------|--------------------------|---------------------------------|
| 1 PWR | Off                      | Device switched off             |
|       | Green, flashing          | Device ok, initialization phase |
|       | Green, continuous light  | Device OK                       |
|       | Orange, continuous light | Service operation               |
|       | Red, flashing            | Device OK, warning set          |
|       | Red, continuous light    | Device error                    |
| 2 BUS | Off                      | No supply voltage               |
|       | Green, flashing          | Initialization                  |
|       | Green, continuous light  | Bus operation ok                |
|       | Red, flashing            | Communication error             |
|       | Red, continuous light    | Network error                   |

# Part number code

Part designation: **BCL XXXX YYZ AAA B**

|             |  |
|-------------|--|
| <b>BCL</b>  | <b>Operating principle</b><br>BCL: bar code reader   |
| <b>XXXX</b> | <b>Series/interface (integrated fieldbus technology)</b><br>500i: RS 232 / RS 422 / RS 485 (multiNet master)<br>501i: RS 485 (multiNet slave)<br>504i: PROFIBUS DP<br>508i: EtherNet TCP/IP, UDP<br>548i: PROFINET RT<br>558i: EtherNet/IP |
| <b>YY</b>   | <b>Scanning principle</b><br>S: line scanner (single line)<br>O: oscillating-mirror scanner (oscillating mirror)   |
| <b>Z</b>    | <b>Optics</b><br>N: High Density (close)<br>M: Medium Density (medium distance)<br>F: Low Density (remote)<br>L: Long Range (very large distances)   |
| <b>AAA</b>  | <b>Beam exit</b><br>100: lateral<br>102: front   |
| <b>B</b>    | <b>Special equipment</b><br>H: with heating  |

**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.

**ATTENTION! LASER RADIATION – CLASS 1 LASER PRODUCT**

**Do not stare into beam!**  
The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product of **laser class 2** as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to Laser Notice No. 50 from June 24, 2007.

- ⌘ Never look directly into the laser beam or in the direction of reflected laser beams! If you look into the beam path over a longer time period, there is a risk of injury to the retina.
- ⌘ Do not point the laser beam of the device at persons!

## 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 |

### Connection technology - Interconnection cables

|  | Part no. | Designation                 | Article               | Description   |
|--|----------|-----------------------------|-----------------------|---|
|  | 50107726 | KB USB A - USB A            | Interconnection cable | Suitable for interface: USB<br>Connection 1: USB<br>Connection 2: USB<br>Shielded: Yes<br>Cable length: 1,800 mm<br>Sheathing material: PVC   |
|  | 50135254 | KDS PB-M12-4A-M12-4A-P3-050 | Interconnection cable | Application: Oil and lubricant resistant<br>Suitable for interface: PROFIBUS DP<br>Connection 1: Connector, M12, Axial, Female, B-coded, 5 -pin<br>Connection 2: Connector, M12, Axial, Male, B-coded, 4 -pin<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PUR |

### Connection technology - Terminating resistors

|  | Part no. | Designation | Article         | Description   |
|--|----------|-------------|-----------------|---|
|  | 50038539 | TS 02-4-SA  | Terminator plug | Suitable for: MultiNet Plus, PROFIBUS DP<br>Function: Bus termination<br>Connection 1: Connector, M12, Axial, Male, B-coded, 4 -pin |

### Mounting technology - Other

|  | Part no. | Designation | Article          | Description  |
|--|----------|-------------|------------------|--|
|  | 50111224 | BT 59       | Mounting bracket | Fastening, at system: Groove mounting<br>Mounting bracket, at device: Clampable<br>Material: Metal<br>Shock absorber: No |

## Accessories

## Services

|   | Part no. | Designation | Article          | Description   |
|---|----------|-------------|------------------|---|
|   | S981020  | CS30-E-212  | Hourly rate      | Details: Compilation of the application data, selection and suggestion of suitable sensor system, drawing prepared as assembly sketch.<br>Conditions: Completed questionnaire or project specifications with a description of the application have been provided. |
|   | S981014  | CS30-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.                                    |
|   | S981019  | CS30-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.   |
|  | S981021  | CS30-V-212  | Hourly rate      | Details: REA evaluation with creation of a test report, evaluation of the code quality.<br>Conditions: Original bar codes to be provided by the client.   |

### Note



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