

## Technical data sheet

### Stationary bar code reader

Part no.: 50109899

BCL 504i SL 102 H



For illustration purposes only

#### Contents

- Technical data
- Dimensioned drawings
- Electrical connection
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- Operation and display
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CDRH



UK  
CA

## Technical data

### Basic data

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

### Special version

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

### Functions

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

### Characteristic parameters

|      |          |
|------|----------|
| MTTF | 93 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                 |
| Usable opening angle (reading field opening) | 60 °                       |
| Bar code contrast (PCS)                      | 60 %                       |
| Modulus size                                 | 0.7 ... 1 mm               |
| Reading method                               | Line scanner               |
| Scanning rate                                | 800 ... 1,200 scans/s      |
| Beam deflection                              | Via rotating polygon wheel |
| Light beam exit                              | Front                      |

### Electrical data

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

#### Performance data

|                         |                        |
|-------------------------|------------------------|
| Supply voltage $U_B$    | 24 V, DC, -20 ... 20 % |
| Power consumption, max. | 50 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 |
|          | 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  |
|                       | 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      |
|                       | Signal OUT     |
|                       | 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) | 123.5 mm x 63 mm x 106.5 mm  |
| Housing material      | Metal                        |
| Metal housing         | Aluminum                     |
| Lens cover material   | Glass                        |
| Net weight            | 1,100 g                      |
| Housing color         | Red                          |
|                       | Silver                       |
| Type of fastening     | Dovetail grooves             |
|                       | Mounting thread              |
|                       | Via optional mounting device |

### Operation and display

|                       |                                                                         |
|-----------------------|-------------------------------------------------------------------------|
| Type of display       | LED                                                                     |
|                       | Monochromatic graphical display, 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

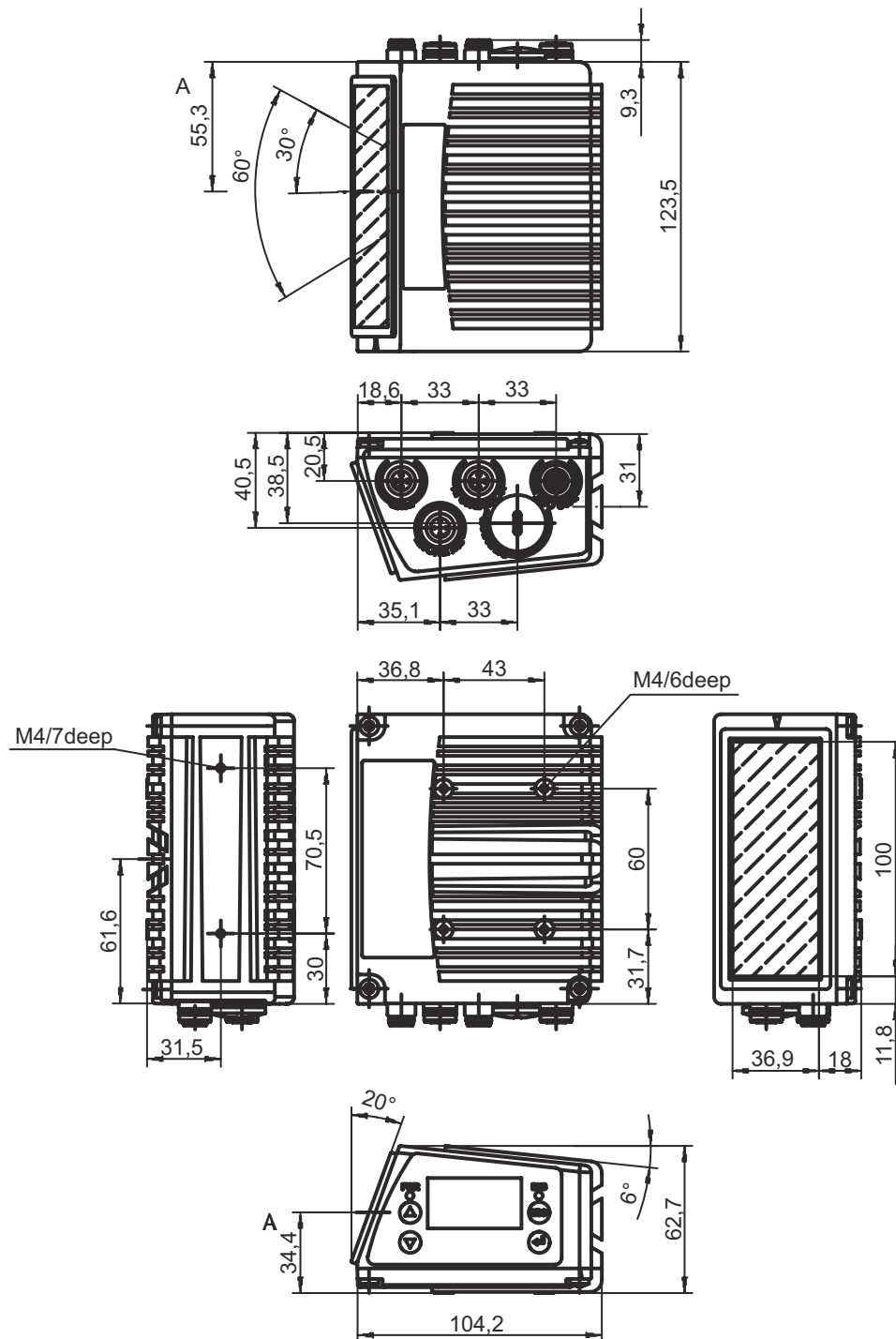
|                                                                 |                          |
|-----------------------------------------------------------------|--------------------------|
| Degree of protection                                            | IP 65                    |
| Protection class                                                | III                      |
| Approvals                                                       | c UL US                  |
| Test procedure for EMC in accordance with standard              | EN 55022                 |
|                                                                 | 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 |
| ETIM 5.0              | EC002550 |
| ETIM 6.0              | EC002550 |
| ETIM 7.0              | EC002550 |
| ETIM 8.0              | EC002550 |
| ETIM 9.0              | EC002550 |
| ETIM 10.0             | EC002550 |

## Dimensioned drawings

All dimensions in millimeters



## Electrical connection

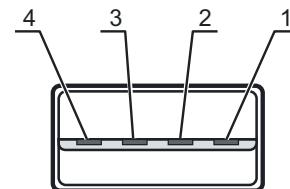
### Connection 1

### 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       |



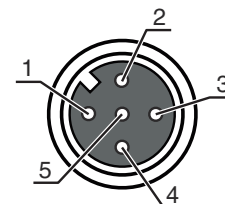
### Connection 2

### 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     |



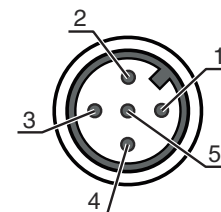
### Connection 3

### 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

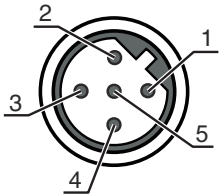
|   |        |
|---|--------|
| 1 | VIN    |
| 2 | SWIO 3 |
| 3 | GND    |
| 4 | SWIO 4 |
| 5 | FE     |



Electrical connection

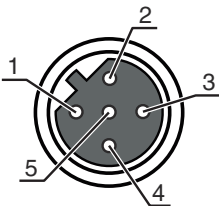
| Connection 4       |           | HOST / BUS IN |
|--------------------|-----------|---------------|
| Function           | BUS IN    |               |
| Type of connection | Connector |               |
| Thread size        | M12       |               |
| Type               | Male      |               |
| 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             |



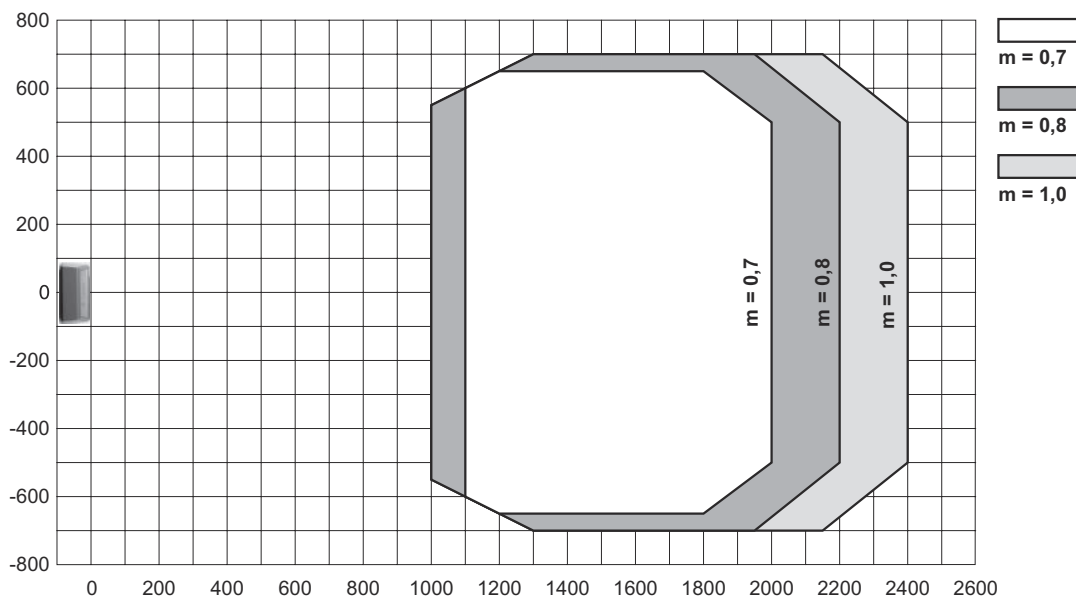
| Connection 5       |           | BUS OUT |
|--------------------|-----------|---------|
| Function           | BUS OUT   |         |
| Type of connection | Connector |         |
| Thread size        | M12       |         |
| Type               | Female    |         |
| Material           | Metal     |         |
| 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

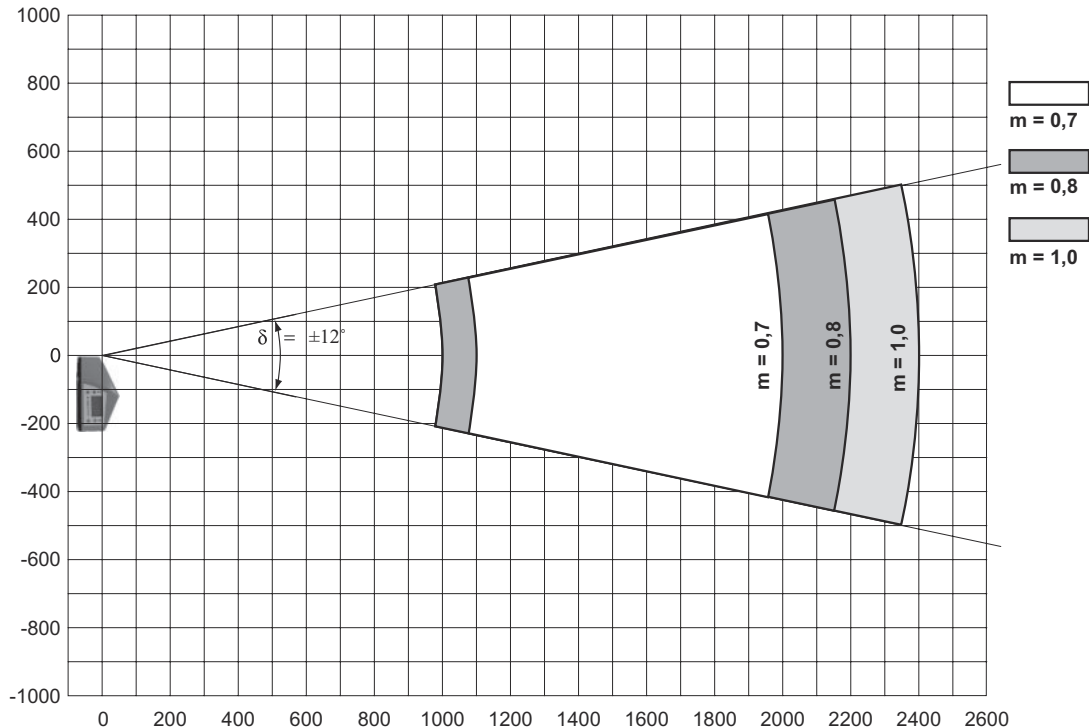
### Reading field curve



x Reading field distance [mm]

y Reading field width [mm]

### 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.

## Notes



### 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.

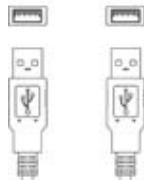
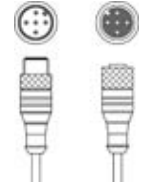
⚠ Do not point the laser beam of the device at persons!

## Accessories

### Connection technology - Connection cables

|                                                                                   | Part no. | Designation        | Article          | Description                                                                                                                                                                       |
|-----------------------------------------------------------------------------------|----------|--------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50132079 | KD U-M12-5A-V1-050 | Connection cable | 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 | 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 |

## Accessories

### 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 |

### 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.