

## Technical data sheet

### Bar code positioning system

Part no.: 50140965  
FBPS 648i 07 SM 110 H



For illustration purposes only

#### Contents

- Technical data
- Dimensioned drawings
- Electrical connection
- Diagrams
- Part number code
- Notes
- Accessories



## Technical data

### Basic data

|             |                                                                                  |
|-------------|----------------------------------------------------------------------------------|
| Series      | FBPS 600i                                                                        |
| Order guide | ATTENTION! Only bar code tapes from the accessories of the FBPS 600i may be used |

### Functions

|           |                         |
|-----------|-------------------------|
| Functions | Heating                 |
|           | Safe position detection |
|           | Safe speed              |

### Characteristic parameters

|                             |                                |
|-----------------------------|--------------------------------|
| SIL                         | 3, EN 61508                    |
| SILCL                       | 3, IEC/EN IEC 62061            |
| Performance Level (PL)      | e, ISO / EN ISO 13849-1        |
| PFH <sub>D</sub>            | < 9.5E-09 per hour             |
| Mission time T <sub>M</sub> | 20 years, ISO / EN ISO 13849-1 |
| Category                    | 4, ISO / EN ISO 13849-1        |
| MTTF                        | 22 years                       |
| Error reaction time         | 10 ms (configurable)           |

### Optical data

|                          |                                                |
|--------------------------|------------------------------------------------|
| Depth of field           | 50 ... 170 mm                                  |
| Light source             | Laser, Red                                     |
| Wavelength               | 655 nm                                         |
| Laser class              | 1, IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 |
| Transmitted-signal shape | Continuous                                     |
| Light beam exit          | Lateral                                        |

### Measurement data

|                           |                     |
|---------------------------|---------------------|
| Measurement range         | 0 ... 10,000,000 mm |
| Resolution                | 0.01 ... 1 mm       |
| Reproducibility (1 sigma) | 0.15 mm             |
| Measurement value output  | 8 ms (PROFIsafe)    |
| Max. traverse rate        | 10 m/s              |

### Electrical data

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

#### Performance data

|                               |                        |
|-------------------------------|------------------------|
| Supply voltage U <sub>B</sub> | 24 V, DC, -25 ... 25 % |
| Current consumption, max.     | 1,100 mA               |
| Power consumption, max.       | 24 W                   |

#### Inputs

|                                    |            |
|------------------------------------|------------|
| Number of digital switching inputs | 1 Piece(s) |
|------------------------------------|------------|

#### Switching inputs

|      |                                                  |
|------|--------------------------------------------------|
| Type | Digital switching input, configurable (not safe) |
|------|--------------------------------------------------|

#### Outputs

|                                     |            |
|-------------------------------------|------------|
| Number of digital switching outputs | 1 Piece(s) |
|-------------------------------------|------------|

#### Switching outputs

|      |                                                   |
|------|---------------------------------------------------|
| Type | Digital switching output, configurable (not safe) |
|------|---------------------------------------------------|

### Interface

|      |               |
|------|---------------|
| Type | PROFINET, SSI |
|------|---------------|

#### PROFINET

|                      |                                         |
|----------------------|-----------------------------------------|
| Function             | Process                                 |
| PROFINET device      | Device nach Spec V2.43                  |
| Profile              | PROFINET/PROFIsafe                      |
| Conformance class    | B                                       |
| Network load class   | III                                     |
| Security level       | 1                                       |
| Switch functionality | Integrated IRT-capable dual-port switch |
| I&M                  | 0 - 4                                   |

#### SSI

|                 |                |
|-----------------|----------------|
| Function        | Process        |
| Clock frequency | 80 ... 800 kHz |
| Data bit        | Adjustable     |

### Service interface

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

#### USB

|          |                                                          |
|----------|----------------------------------------------------------|
| Function | Configuration/parameterization via integrated web server |
|          | Service                                                  |

### Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 5 Piece(s) |
| Plug outlet           | Down       |

#### Connection 1

|                       |                       |
|-----------------------|-----------------------|
| Function              | Functional earth (FE) |
|                       | Signal IN             |
|                       | Signal OUT            |
|                       | Voltage supply        |
| Type of connection    | Connector             |
| Designation on device | XD1 PWR               |
| Thread size           | M12                   |
| Type                  | Male                  |
| Material              | Metal                 |
| No. of pins           | 5 -pin                |
| Encoding              | A-coded               |

#### Connection 2

|                       |                       |
|-----------------------|-----------------------|
| Function              | PROFINET/PROFIsafe IN |
| Type of connection    | Connector             |
| Designation on device | XF1 IN                |
| Thread size           | M12                   |
| Type                  | Female                |
| Material              | Metal                 |
| No. of pins           | 4 -pin                |
| Encoding              | D-coded               |

#### Connection 3

|                       |                   |
|-----------------------|-------------------|
| Function              | Service interface |
| Type of connection    | USB               |
| Designation on device | XF0 SERVICE       |

## Technical data

### Connection 4

|                       |                        |
|-----------------------|------------------------|
| Function              | PROFINET/PROFIsafe OUT |
| Type of connection    | Connector              |
| Designation on device | XF2 OUT                |
| Thread size           | M12                    |
| Type                  | Female                 |
| Material              | Metal                  |
| No. of pins           | 4 -pin                 |
| Encoding              | D-coded                |

### Connection 5

|                       |           |
|-----------------------|-----------|
| Function              | SSI       |
| Type of connection    | Connector |
| Designation on device | X0 SSI0   |
| Thread size           | M12       |
| Type                  | Male      |
| Material              | Metal     |
| No. of pins           | 5 -pin    |
| Encoding              | B-coded   |

### Mechanical data

|                       |                              |
|-----------------------|------------------------------|
| Design                | Cubic                        |
| Dimension (W x H x L) | 105 mm x 112.5 mm x 51.5 mm  |
| Housing material      | Metal                        |
| Metal housing         | Diecast aluminum             |
| Lens cover material   | Glass                        |
| Net weight            | 540 g                        |
| Housing color         | Silver                       |
|                       | Yellow                       |
| Type of fastening     | Dovetail grooves             |
|                       | Fastening on back            |
|                       | Mounting thread              |
|                       | Via optional mounting device |

### Operation and display

|                       |            |
|-----------------------|------------|
| Type of display       | LED        |
| Type of configuration | GSDML file |

### Environmental data

|                                    |               |
|------------------------------------|---------------|
| Ambient temperature, operation     | -35 ... 60 °C |
| Ambient temperature, storage       | -35 ... 70 °C |
| Relative humidity (non-condensing) | 90 %          |

### Certifications

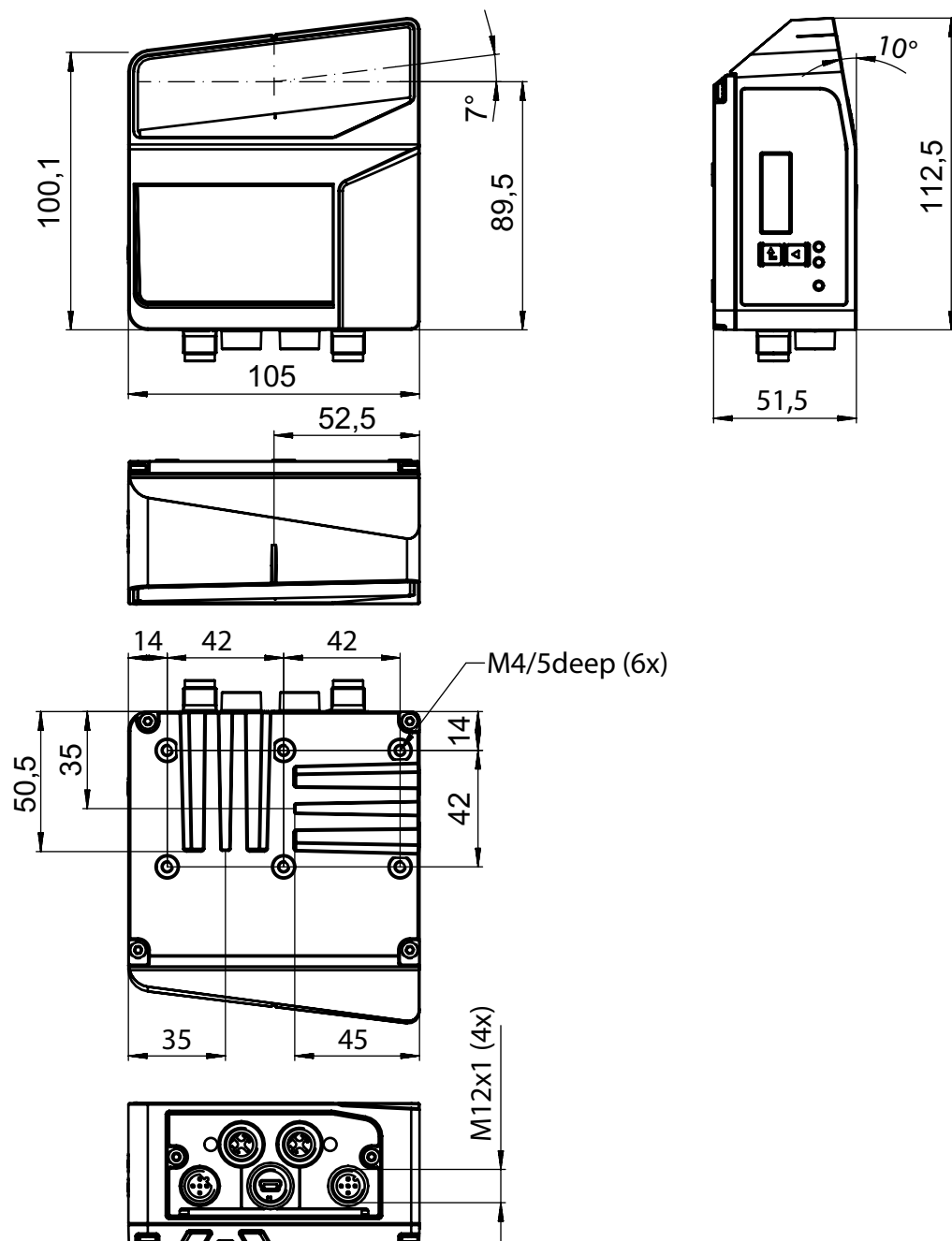
|                      |                                                            |
|----------------------|------------------------------------------------------------|
| Degree of protection | IP 65, EN 60529 with various connectors or screwed-on caps |
| Protection class     | III                                                        |
| Approvals            | c TÜV NRTL US                                              |
|                      | CSA                                                        |
|                      | TÜV Süd                                                    |
|                      | UL                                                         |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 84719000 |
| ECLASS 5.1.4          | 27280190 |
| ECLASS 8.0            | 27280190 |
| ECLASS 9.0            | 27280190 |
| ECLASS 10.0           | 27280190 |
| ECLASS 11.0           | 27280190 |
| ECLASS 12.0           | 27280106 |
| ECLASS 13.0           | 27280106 |
| ECLASS 14.0           | 27280106 |
| ECLASS 15.0           | 27280106 |
| ECLASS 16.0           | 27280106 |
| ETIM 5.0              | EC001825 |
| ETIM 6.0              | EC001825 |
| ETIM 7.0              | EC001825 |
| ETIM 8.0              | EC001825 |
| ETIM 9.0              | EC001825 |
| ETIM 10.0             | EC001825 |

## Dimensioned drawings

All dimensions in millimeters



## Electrical connection

### Connection 1

### XD1 PWR

Function

Functional earth (FE)

Signal IN

Signal OUT

Voltage supply

## Electrical connection

### Connection 1

### XD1 PWR

|                    |           |
|--------------------|-----------|
| 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 | SWO 1  |
| 3 | GNDIN  |
| 4 | SWIN 1 |
| 5 | FE     |



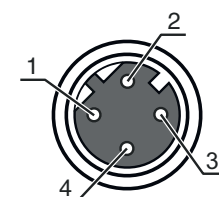
### Connection 2

### XF1 IN

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

#### Pin Pin assignment

|   |     |
|---|-----|
| 1 | TD+ |
| 2 | Rx+ |
| 3 | TD- |
| 4 | Rx- |



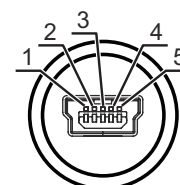
### Connection 3

### XF0 SERVICE

|                    |                   |
|--------------------|-------------------|
| Function           | Service interface |
| Type of connection | USB               |
| Connector type     | USB 2.0 Mini-B    |

#### Pin Pin assignment

|   |     |
|---|-----|
| 1 | VB  |
| 2 | D-  |
| 3 | D+  |
| 4 | ID  |
| 5 | GND |



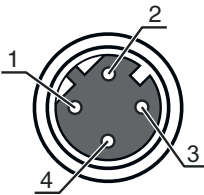
### Connection 4

### XF2 OUT

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

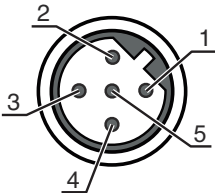
Electrical connection

| Pin | Pin assignment |
|-----|----------------|
| 1   | TD+            |
| 2   | Rx+            |
| 3   | TD-            |
| 4   | Rx-            |



| Connection 5       | X0 SSI0   |
|--------------------|-----------|
| Function           | SSI       |
| Type of connection | Connector |
| Thread size        | M12       |
| Type               | Male      |
| Material           | Metal     |
| No. of pins        | 5 -pin    |
| Encoding           | B-coded   |

| Pin | Pin assignment |
|-----|----------------|
| 1   | DATA+          |
| 2   | DATA-          |
| 3   | CLK+           |
| 4   | CLK-           |
| 5   | FE             |



Diagrams

Reading field curve



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

## Part number code

Part designation: **FBPS 6XXi WW SM XXX Y Z**

|             |                                                                                                                                    |
|-------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>FBPS</b> | <b>Operating principle</b><br>FBPS: Fail-safe bar code positioning system                                                          |
| <b>6XXi</b> | <b>Series/interface (integrated fieldbus technology)</b><br>607i: Standard SSI<br>617i: SSI with CRC<br>648i: PROFINET / PROFIsafe |
| <b>WW</b>   | <b>Series/interface (integrated fieldbus technology)</b><br>07i: Standard SSI<br>17i: SSI with CRC                                 |
| <b>SM</b>   | <b>Scanning principle / optics</b><br>S: line scanner (single line)<br>M: Medium Density (medium distance)                         |
| <b>XXX</b>  | <b>Plug outlet</b><br>100: lateral<br>110: bottom                                                                                  |
| <b>Y Z</b>  | <b>Special equipment</b><br>n/a: no special equipment<br>D: With display<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!



The protection of personnel and the device cannot be guaranteed if the device is operated in a manner not complying with its intended use.

- ☞ Only use the product in accordance with its intended use.
- ☞ Leuze electronic GmbH + Co. KG is not liable for damages caused by improper use.
- ☞ Before commissioning the device, read the operating instructions. Knowledge of the operating instructions is an element of proper use.



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



The device satisfies the requirements of IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 safety regulations for a product of laser class 1 and complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

- ☞ Observe the applicable statutory and local laser protection regulations.
- ☞ The device must not be tampered with and must not be changed in any way.  
There are no user-serviceable parts inside the device.  
Repairs must only be performed by Leuze electronic GmbH + Co. KG.

## Accessories

### Connection technology - Connection cables

|                                                                                   | Part no. | Designation         | Article          | Description                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------|----------|---------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50104172 | KB SSI/IBS-2000-BA  | Connection cable | Application: Oil and lubricant resistant<br>Suitable for interface: SSI, Interbus-S<br>Connection 1: Connector, M12, Axial, Female, B-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 2,000 mm<br>Sheathing material: PUR |
|                                                                                   | 50133859 | KD S-M12-5A-P1-020  | Connection cable | Application: Oil and lubricant resistant<br>Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 2,000 mm<br>Sheathing material: PUR                                            |
|                                                                                   | 50135073 | KS ET-M12-4A-P7-020 | 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: 2,000 mm<br>Sheathing material: PUR          |

### Connection technology - Interconnection cables

|                                                                                    | Part no. | Designation                 | Article               | Description                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------|----------|-----------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50135080 | KSS ET-M12-4A-RJ45-A-P7-020 | 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: 2,000 mm<br>Sheathing material: PUR |

### Connection technology - Connectors

|                                                                                    | Part no. | Designation | Article   | Description                                                |
|------------------------------------------------------------------------------------|----------|-------------|-----------|------------------------------------------------------------|
|  | 50020501 | KD 095-5A   | Connector | Connection: Connector, M12, Axial, Female, A-coded, 5 -pin |

### Mounting technology - Mounting brackets

|                                                                                     | Part no. | Designation | Article         | Description                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------|----------|-------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50121433 | BT 300 W    | Mounting device | Contains: 4x M4 x 10 screw, 2x M6 x 10 screws, 4x M3 x 8 screw<br>Design of mounting device: Angle, L-shape<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Adjustable<br>Material: Metal |

## Accessories

### Mounting technology - Other

|                                                                                   | Part no. | Designation | Article         | Description                                                                                                                                                           |
|-----------------------------------------------------------------------------------|----------|-------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50124941 | BTU 0300M-W | Mounting device | Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable, Groove mounting, Suited for M4 screws<br>Material: Metal<br>Shock absorber: No |
|                                                                                   |          |             |                 |                                                                                                                                                                       |
|                                                                                   |          |             |                 |                                                                                                                                                                       |
|                                                                                   |          |             |                 |                                                                                                                                                                       |

### Bar code tape

|                                                                                   | Part no. | Designation      | Article       | Description                                                                                                                                |
|-----------------------------------------------------------------------------------|----------|------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50144173 | BCB G30 H25 L010 | Bar code tape | Dimensions: 25 mm x 10,000 mm<br>Grid dimension: 30 mm<br>Manufacturing process for bar code tape: Digital printing                        |
|                                                                                   | 50104792 | BCB G30 H47 L010 | Bar code tape | Dimensions: 47 mm x 10,000 mm<br>Grid dimension: 30 mm<br>Manufacturing process for bar code tape: Digital printing                        |
|                                                                                   | 50144190 | BCB G40 H25 L010 | Bar code tape | Dimensions: 25 mm x 10,000 mm<br>Grid dimension: 40 mm<br>Material: Polyester<br>Manufacturing process for bar code tape: Digital printing |
|                                                                                   | 50040041 | BCB G40 H47 L010 | Bar code tape | Dimensions: 47 mm x 10,000 mm<br>Grid dimension: 40 mm<br>Material: Polyester<br>Manufacturing process for bar code tape: Digital printing |

### 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.