

Original operating instructions

BPS 37

Bar code positioning system - SSI interface



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1 General information

1.1 Explanation of symbols


The symbols used in this technical description are explained below.

⚠ ATTENTION!	
	This symbol precedes text messages which must strictly be observed. Failure to observe the provided instructions could lead to personal injury or damage to equipment.
⚠ ATTENTION LASER!	
	This symbol warns of possible danger caused by hazardous laser radiation.
NOTE	
	This symbol indicates text passages containing important information.

1.2 Declaration of Conformity

The bar code positioning system BPS 37, the modular connector hood MS 37 103, and the optional connection units MA 4.7/MA 4D.7 have been developed and manufactured in accordance with the applicable European standards and directives.

The devices of the BPS 37 series **without integrated heating** also fulfill the cUL requirements (Underwriters Laboratory Inc.) for the USA and Canada.

NOTE	
	The corresponding declaration of conformity can be requested from the manufacturer

The manufacturer of the product, Leuze electronic GmbH & Co. KG in D-73277 Owen, possesses a certified quality assurance system in accordance with ISO 9001.



2 Safety


The bar code positioning systems of the BPS 37 series, the MS 37 103 modular connector hoods and the optional MA 4.7/MA 4D.7 connection units have been developed, produced and tested subject to the applicable safety standards. They correspond to the state of the art.

2.1 Intended use

Bar code positioning systems of the BPS 37 series are optical measuring systems which use visible red laser light to determine the position of the BPS relative to a permanently mounted bar code tape.

The modular connector hood MS 37 103 is intended for the easy connection of bar code positioning systems of type BPS 37 with M12 connection technology.


The modular service display MSD 1 101, which is optionally available, displays operational data of the BPS 37 and is used as a simple means of access to the service interface of the MS 37 103.

⚠ CAUTION	
	<p>Use only approved bar code tapes!</p> <p>The bar code tapes approved by Leuze and listed as accessories are an essential part of the measurement system.</p> <p>Bar code tapes not approved by Leuze are not allowed.</p> <p>The use of such bar code tapes is contrary to the intended use.</p>


Areas of application

The BPS 34 bar code positioning systems are designed for the following areas of application:

- High-bay storage devices: Positioning in the travel and lifting axes
- Crane bridges and trolleys
- Side-tracking skates
- Electrical monorail systems
- Elevators

⚠ CAUTION	
	<p>Observe intended use!</p> <p>⚡ Only operate the device in accordance with its 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.</p> <p>Leuze electronic GmbH + Co. KG is not liable for damages caused by improper use.</p> <p>Read the technical description before commissioning the device. Knowledge of this technical description is an element of proper use.</p>

NOTE	
	<p>Comply with conditions and regulations!</p> <p>⚡ Observe the locally applicable legal regulations and the rules of the employer's liability insurance association.</p>


⚠ ATTENTION!	
	<p>For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code).</p>

2.2 Foreseeable misuse

Any use other than that defined under "Intended use" or which goes beyond that use is considered improper use.

In particular, use of the device is not permitted in the following cases:

- in rooms with explosive atmospheres
- as stand-alone safety component in accordance with the machinery directive ¹
- for medical purposes

NOTE	
	Do not modify or otherwise interfere with the device!
	⚡ Do not carry out modifications or otherwise interfere with the device. The device must not be tampered with and must not be changed in any way.
	⚡ The use of a bar code tape not approved by Leuze is equivalent to an intervention in or change to the device/measurement system.
	⚡ The device must not be opened. There are no user-serviceable parts inside.
	⚡ Repairs must only be performed by Leuze electronic GmbH + Co. KG.

2.3 Competent persons

Connection, mounting, commissioning and adjustment of the device must only be carried out by competent persons.

Prerequisites for competent persons:

- They have a suitable technical education.
- They are familiar with the rules and regulations for occupational safety and safety at work.
- They are familiar with the technical description of the device.
- They have been instructed by the responsible person on the mounting and operation of the device.

Certified electricians

Electrical work must be carried out by a certified electrician.

Due to their technical training, knowledge and experience as well as their familiarity with relevant standards and regulations, certified electricians are able to perform work on electrical systems and independently detect possible dangers.

In Germany, certified electricians must fulfill the requirements of accident-prevention regulations BGV A3 (e.g. electrician foreman). In other countries, there are respective regulations that must be observed.


2.4 Exemption of liability

Leuze electronic GmbH + Co. KG is not liable in the following cases:

- The device is not being used properly.
- Reasonably foreseeable misuse is not taken into account.
- Mounting and electrical connection are not properly performed.
- Changes (e.g., constructional) are made to the device.

¹. Use as safety-related component within the safety function is possible, if the component combination is designed correspondingly by the machine manufacturer.

2.5 Laser safety notices

⚠ ATTENTION, LASER RADIATION – CLASS 2 LASER PRODUCT	
	<p>Do not stare into beam!</p> <p>The device satisfies the requirements of IEC 60825-1:2014 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. 56" from May 8, 2019.</p> <ul style="list-style-type: none"> ↪ Never look directly into the laser beam or in the direction of reflected laser beams! <li style="padding-left: 20px;">If you look into the beam path over a longer time period, there is a risk of injury to the retina. ↪ Caution: Opening the device can lead to dangerous exposure to radiation ↪ Do not point the laser beam of the device at persons! ↪ Interrupt the laser beam using a non-transparent, non-reflective object if the laser beam is accidentally directed towards a person. ↪ When mounting and aligning the device, avoid reflections of the laser beam off reflective surfaces! ↪ CAUTION! Use of controls or adjustments or performance of procedures other than specified herein may result in hazardous light exposure. ↪ Observe the applicable statutory and local laser protection regulations. ↪ The device must not be tampered with and must not be changed in any way. <p style="padding-left: 20px;">There are no user-serviceable parts inside the device.</p> <p>Repairs must only be performed by Leuze electronic GmbH + Co. KG.</p>

NOTE	
	<p>Affix laser information and warning signs!</p> <p>Laser information and warning signs are attached to the device (see Figure 2.1):</p>

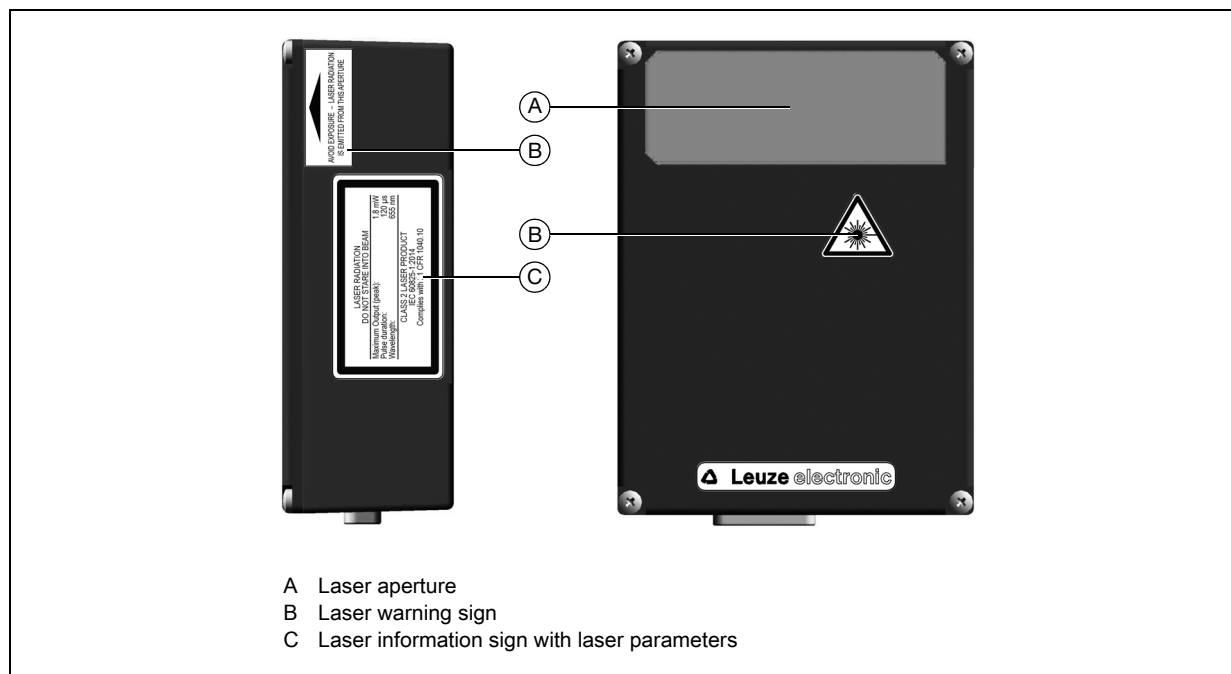


Figure 2.1: Laser apertures, laser warning and information signs

3 Description

For information on technical data and characteristics, refer to Chapter 4.

3.1 Device construction of the BPS 37

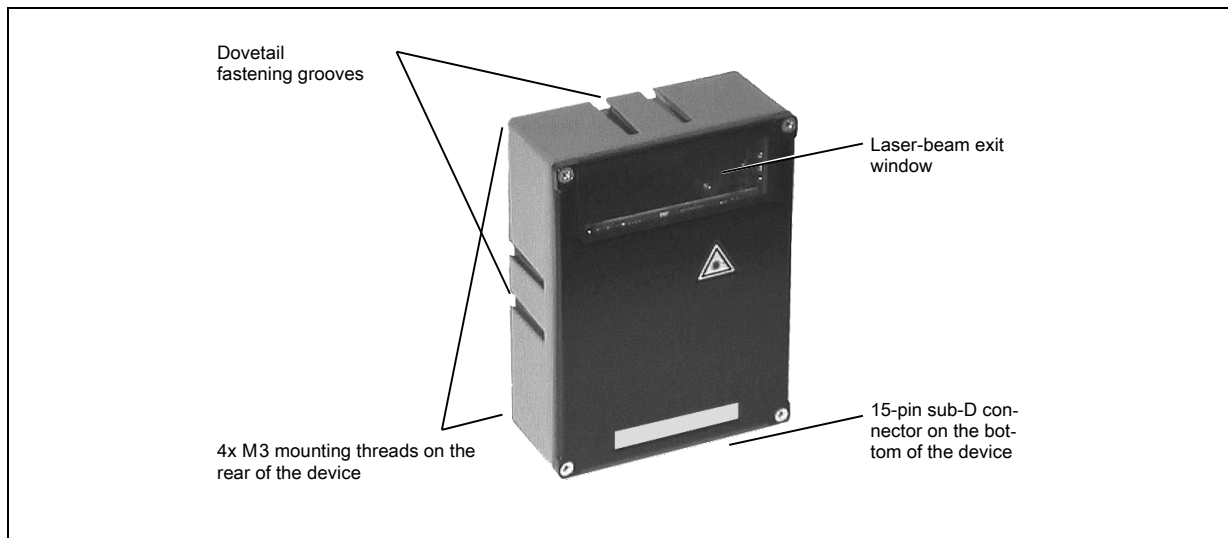


Figure 3.1: Device construction of the BPS 37

3.2 Application

Wherever systems are moved automatically, it is necessary to uniquely determine their respective positions. This is achieved using various measurement procedures. In addition to mechanical measurement sensors, optical methods are particularly well suited for determining positions as they operate without mechanical wear and slippage.

Unlike other optical measurement methods, the bar code positioning system is not restricted to linear movements. It can also be used flexibly in curved systems. Anywhere the long-wearing bar code tape can be attached, it is possible to use the BPS to determine the position to within a millimeter.

Guide tolerances of the system play no roll as the permitted distance range between tape and BPS allows for large deviations in distance.

3.3 Function

The BPS uses visible red laser light to determine its position relative to the bar code tape. This essentially takes place in three steps:

1. Reading a code on the bar code tape
2. Determining the position of the read code in the scanning area of the laser beam
3. Calculating the position to within a millimeter using the code information and code position

The position value is then passed on via the standardized SSI interface (synchronous serial interface) to the drive system of the vehicle for which the position is to be determined.

3.4 Advantages

- Easy mounting and commissioning
- Teach function for the "zero point", i.e. it is not necessary to exactly affix the bar code tape.
- Data output via SSI interface; BPS can be connected instead of a conventional rotary encoder.
- The function of the BPS makes it possible to attach the bar code tape only at those locations where it is necessary that the position be known exactly.
- Positioning of non-linear movements as well
- No referencing necessary following a voltage drop
- Thanks to the large scanning depth, it is possible to compensate for mechanical tolerances.
- It is possible to exactly determine positions from distances of 10000 meters

3.5 Stand-alone operation

The bar code positioning system BPS 37 is operated as individual "stand alone" device. The BPS features a 15-pin sub-D connector for the electrical connection of the supply voltage, the interface and the switching inputs.

With connection units

The connection units simplify the electrical installation of the bar code positioning systems in stand-alone operation.

Moreover, they store the operating parameters so that the configuration data are retained even if the BPS is replaced and can show parameters and operating data on a display (MA 4D.7).

A listing of the available connection units and associated short descriptions can be found in Chapter 5. Separate data sheets are available that contain further details about the connection units.

With MS 37 103 connector hood

The modular connector hood MS 37 103 is intended for the easy connection of the BPS 37 with M12 connection technology.

Without connection unit/connector hood

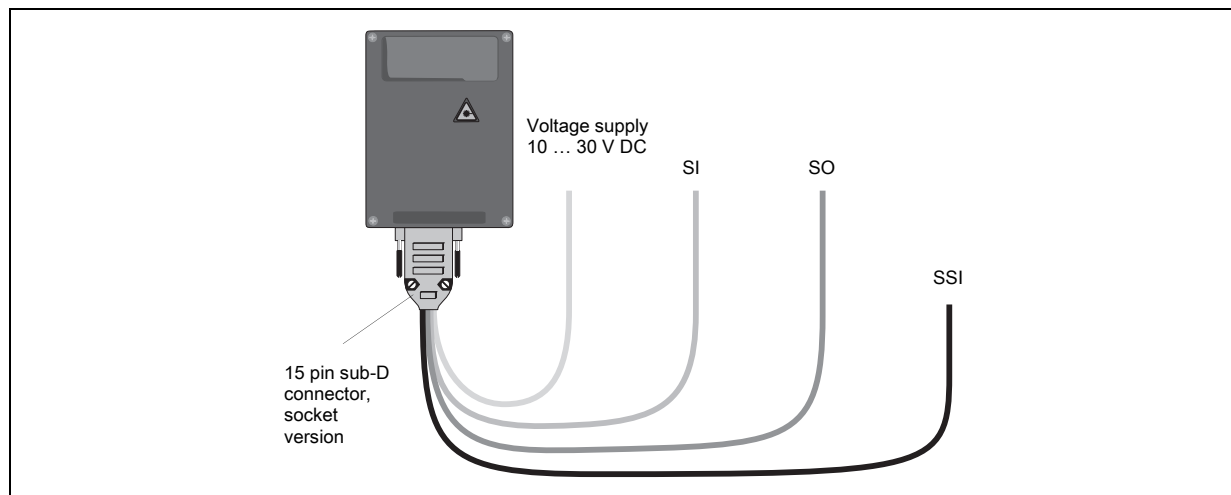


Figure 3.2: Connection BPS "Stand alone"

With MA 4.7/MA4D.7 connection unit

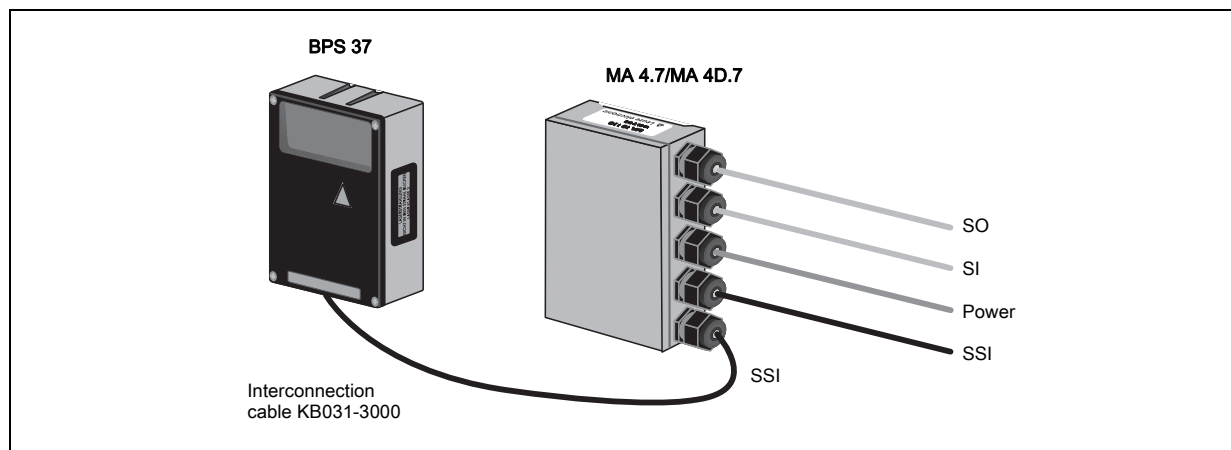


Figure 3.3: BPS connection with MA 4.7 connection unit

With MS 37 103 modular connector hood

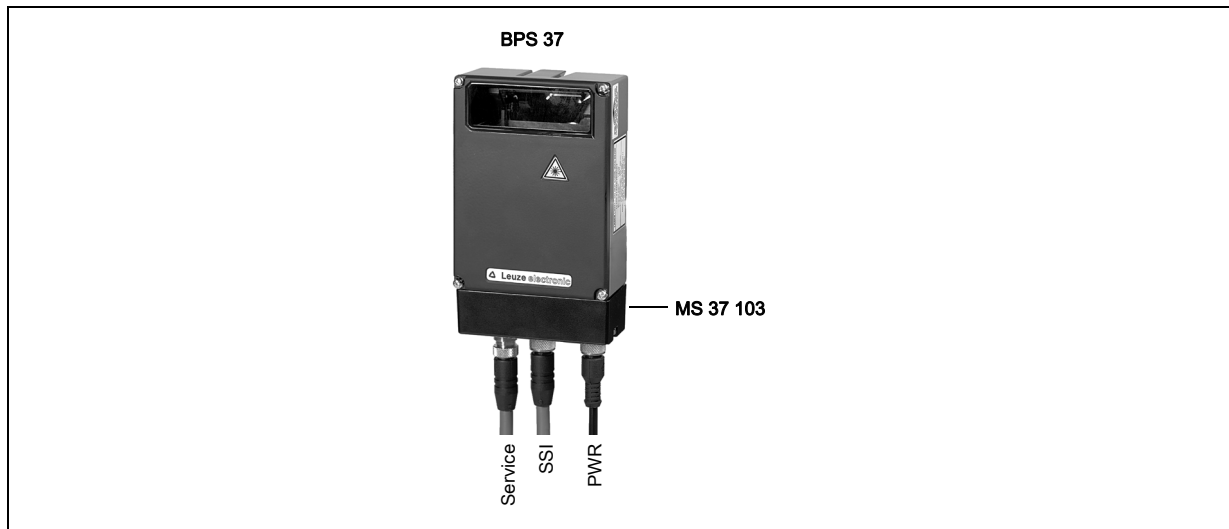


Figure 3.4: BPS connection with MS 37 103 modular connector hood

4 Technical data

4.1 General specifications BPS 37

Optical data

Light source	Laser diode
Laser class	2 acc. to IEC 60825-1:2014
Wavelength	655nm
Max. output power (peak)	1.8mW
Impulse duration	120µs
Scanning rate	1000 scans/s

Measurement data

Reproducibility (3 sigma)	-1 mm
Response time	16ms (configurable)
Output time	2ms
Basis for contouring error calculation	7ms
Working range	90 ... 170 mm

Electrical data

Interface type	SSI (RS422)
(Standard setting)	Electrically isolated
	Bits 0 ... 24: data bits with position value
	Bit 25: error bit
	Resolution: 1 mm
	800 kHz max. clock frequency
	Output of positive and negative position values
	Gray coded
Service interface	RS 232 with fixed data format, 9600Bd, 8 data bits, no parity, 1 stop bit
Ports	1 switching output, 1 switching input
Green LED	Device ready (power on)
Operating voltage	10 ... 30 V
Power consumption	3.2W

Mechanical data

Degree of protection	IP 65
Weight	400 g
Dimensions (H x W x D)	120 x 90 x 43 mm
Housing	Diecast aluminum

Environmental data

Recommended processing temperature	+10 °C ... +25 °C
Processing temperature	0 °C ... +45 °C
Operating temperature range	Without optics heating: 0 °C ... +40 °C With optics heating: -30 °C ... +40 °C
Storage temperature range	-30 °C ... +60 °C
Air humidity	Max. 90% rel. humidity, non-condensing
Vibration	IEC 68.2.6 IEC 68.2.27 (shock) IEC 801
Electromagnetic compatibility	Acc. to IEC 60947-5-2

Bar code tape

Max. length (measurement length)	10000 m
Ambient temperature	-40 °C ... -120 °C
Mech. properties	Scratch and wipe resistant, UV resistant, moisture resistant, partly chemical resistant

Table 4.1: General specifications

NOTE

Two models of the BPS 37 are available:
BPS 37 S M 100 without optics heating, UL approval
BPS 37 S M 100 H with optics heating, no UL approval

4.2 LED indicators

An internal LED indicates in the reading window whether or not the supply voltage is applied.

4.3 Dimensioned drawings

BPS 37 S M 100 / BPS 37 S M 100 H

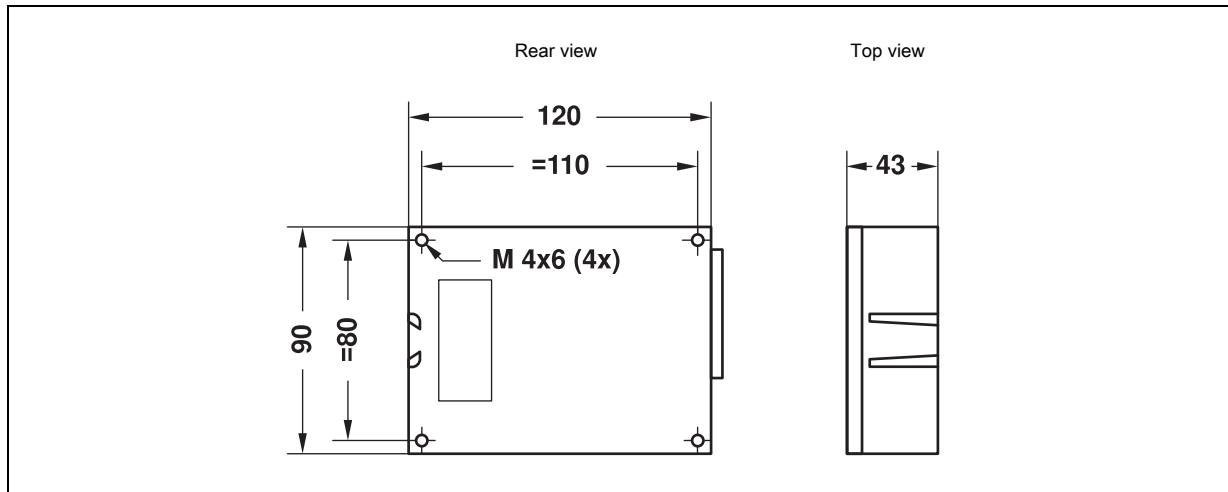


Figure 4.1: BPS 37 dimensioned drawing

MS 37 103

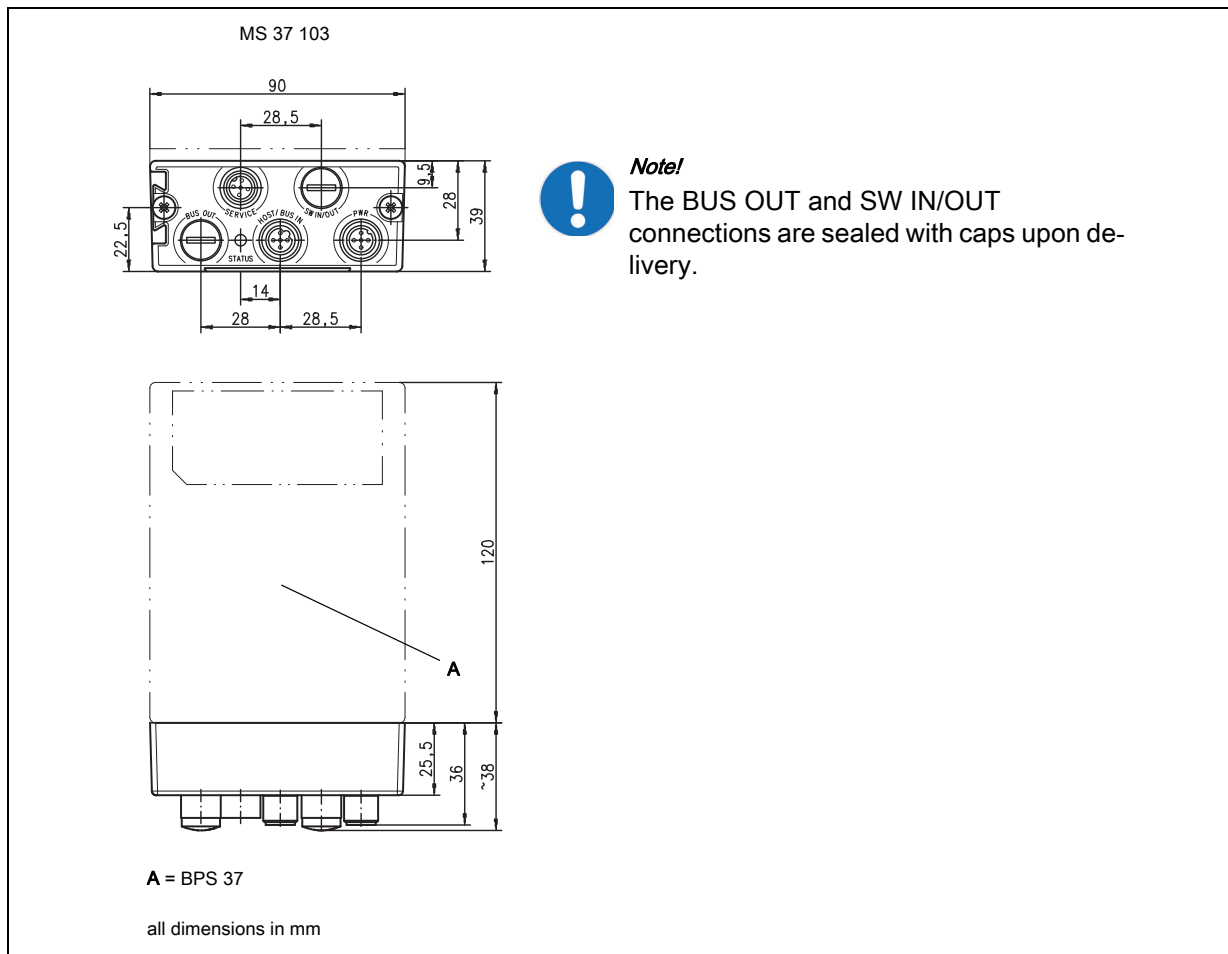


Figure 4.2: MS 37 103 dimensioned drawing

4.4 BPS 37 reading field curve

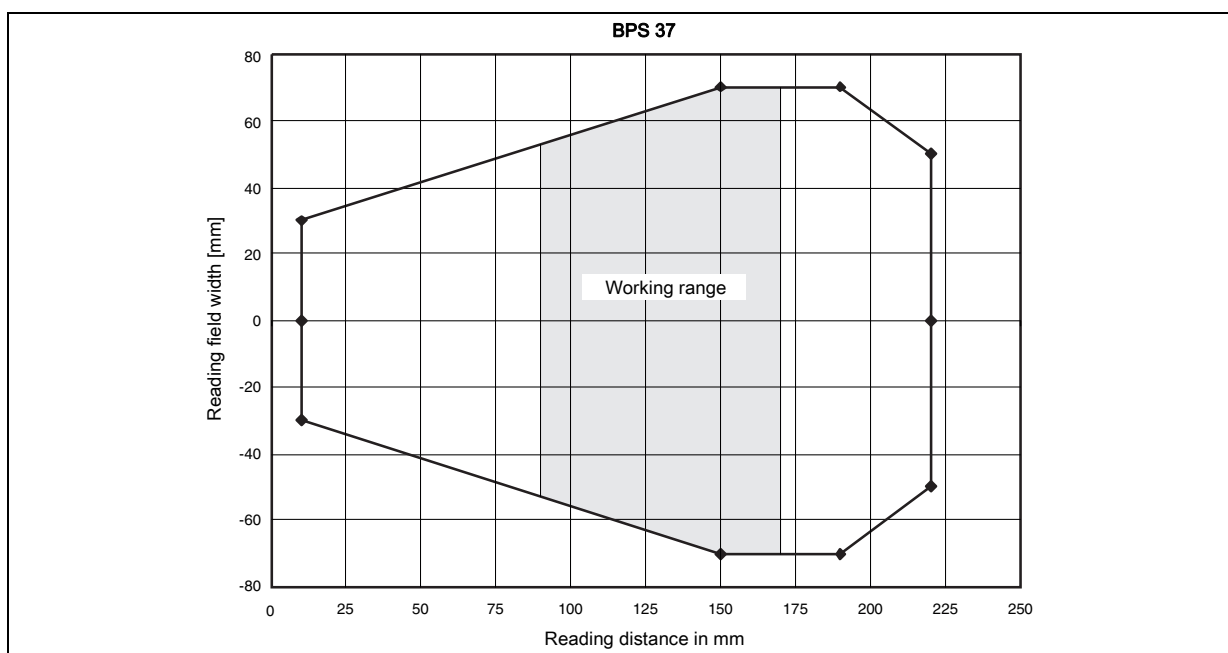



Figure 4.3: BPS 37 reading field curve

5 Accessories/order codes


5.1 Accessories

NOTE	
	Products from Leuze electronic GmbH & Co KG can be ordered from any of the sales and service offices listed on the back page of this operating manual.

Designation	Order no.	Short description
MA 4.7	50037324	Connection unit for BPS 37 with parameter memory
MA 4D.7	50037325	Connection unit for BPS 37 with parameter memory and display
MS 37 103	50107684	Modular connector hood for BPS 37 with M 12 connection technology
BT 56	50027375	Mounting device featuring dovetail for rod
KB 031-3000	50035355	Interconnection cable between BPS and MA, length: 3 m

Table 5.1: Accessories/order codes

5.1.1 Connection units / connector hood

NOTE	
	The connection units are described here in brief only. For further information regarding the connection units please refer to the relevant data sheets

MA 4.7/MA 4D.7 connection unit

The connection units MA 4.7/MA 4D.7 are used to simplify the electrical installation of the BPS 37. They have the following advantages compared to the installation of the BPS 37 as a stand-alone device:

- Terminals for switching inputs and outputs, including voltage supply
- 9-pin sub-D plug for service interface
- Operating mode switch: service operation/normal operation
- Code types - changeover switches binary/gray
- Rotary switch for setting the resolution
- Parameter memory for the BPS - the BPS can be exchanged without the need for reconfiguration.
- Display (MA 4D.7 only)

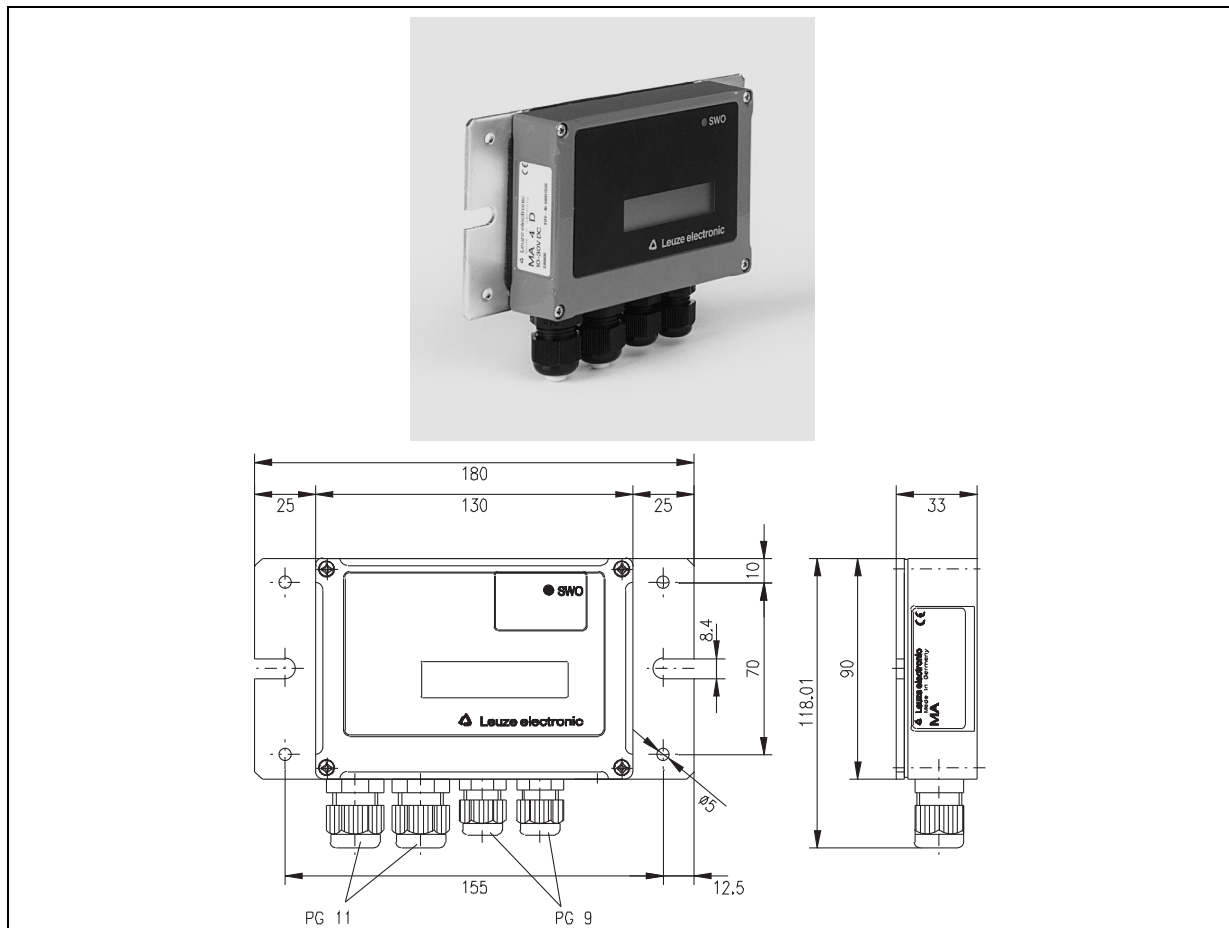


Figure 5.1: MA 4.7/MA 4D.7 connection unit / dimensioned drawing

MS 37 103 connector hood

The modular connector hood MS 37 103 is intended for the easy connection of the BPS 37 with M12 connection technology. It offers the following advantages over the installation of the BPS 37 as a stand-alone device:

- M12 connectors for quick and reliable connection
- Display (MA 4D.7 only)

5.1.2 Mounting accessories

The BT 56 mounting device is available for mounting the BPS 37. It is designed for rod mounting.

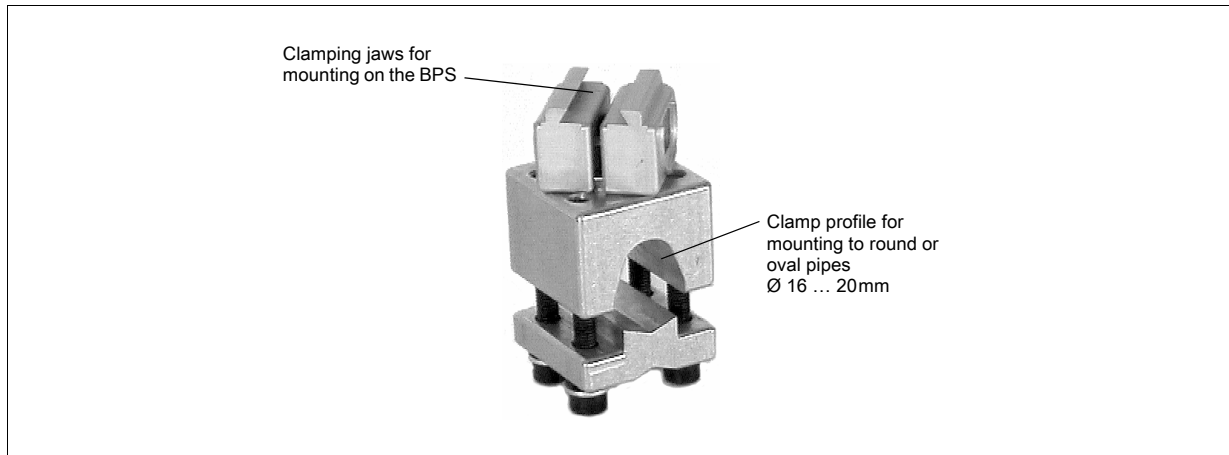
BT 56 mounting device


Figure 5.2: BT 56 mounting device

5.1.3 Interconnection cable

A special interconnection cable is available for the connection between BPS and connection units. This interconnection cable may be used for the connection units MA 4.7 as well as for MA 4D.7.

6 Installation

6.1 Storage, transportation

⚠ ATTENTION!	
	Package the device for transport and storage in such a way that is protected against shock and humidity. Optimum protection is achieved when using the original packaging. Ensure compliance with the approved environmental conditions listed in the specifications.

Unpacking

✎ Check the packaging content for any damage. If damage is found, notify the post office or shipping agent as well as the supplier.

✎ Check the delivery contents using your order and the delivery papers:

- Delivered quantity
- Device type and model as indicated on the nameplate
- Accessories
- Operating instructions


✎ Save the original packaging for later storage or shipping.

If you have any questions concerning your shipment, please contact your supplier or your local Leuze electronic sales office.

✎ Observe the applicable local regulations when disposing of the packaging materials.

Cleaning

✎ Clean the glass window of the BPS 37 with a soft cloth before mounting. Remove all packaging remains, e.g. carton fibers or styrofoam balls.

⚠ ATTENTION!	
	Do not use aggressive cleaning agents such as thinner or acetone for cleaning the device and bar code tape.

6.2 Mounting

Accessories

The mounting system BT 56 is available for installation. It may be ordered separately from Leuze electronic. For order numbers, see Table 5.1 "Accessories/order codes" on page 14.

Mounting the BPS 37

There are two basic types of mounting arrangements for the BPS 37:

- Using the dovetail groove and the corresponding mounting accessories see figure 6.1
- Using the mounting threads on the rear and bottom of the device (Chapter 4.3)

Mounting example BPS 37

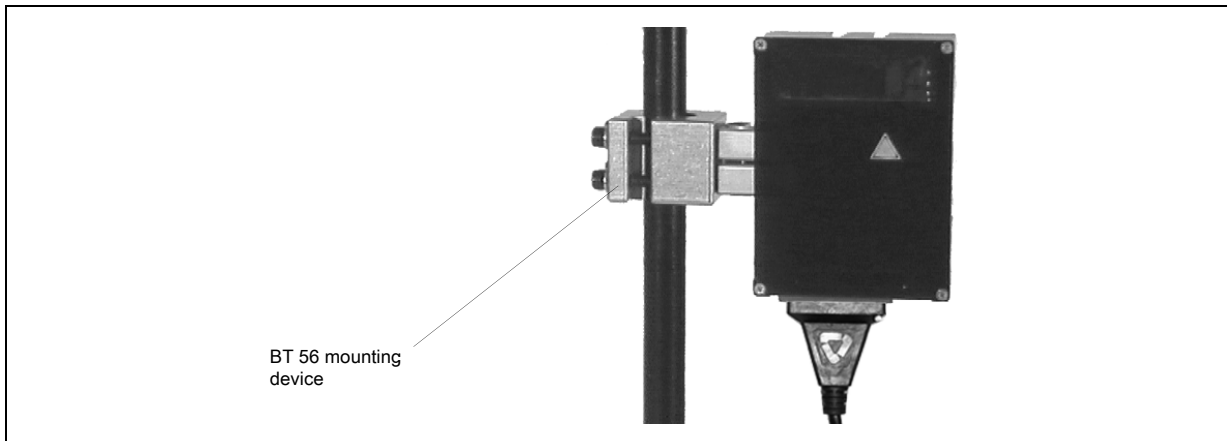


Figure 6.1: Mounting example BPS 37

Mounting of MA

You can mount all connection units individually through the holes located on the mounting plate (see Figure 5.1).

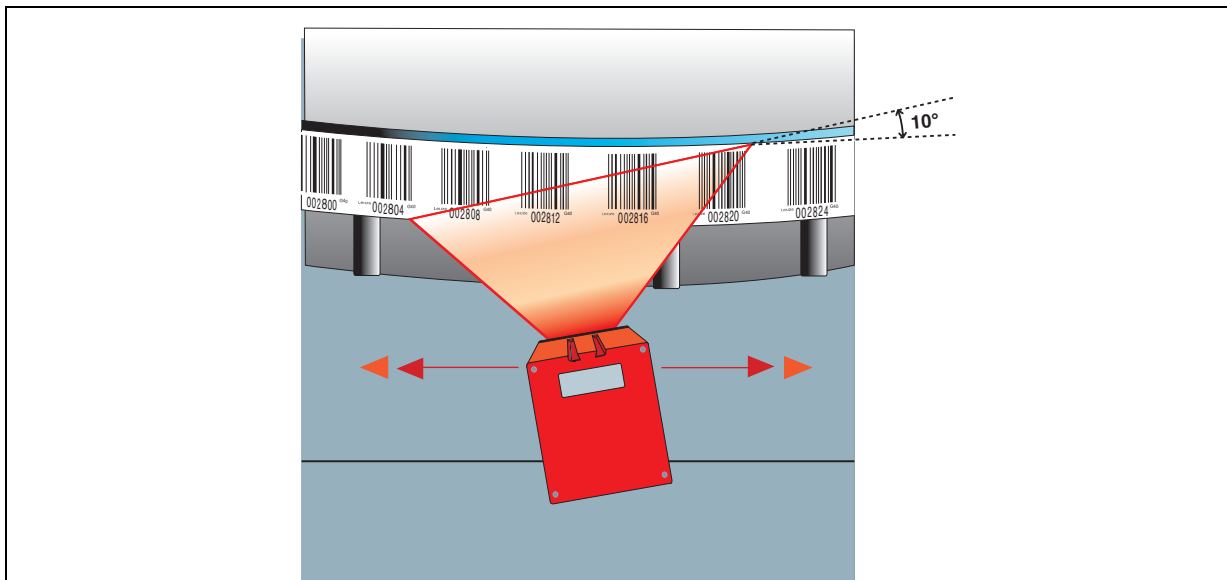
Subsequently, connect the BPS 37 with the connection unit via the respective cable (see Chapter 5.1.3).

6.2.1 Device arrangement

Selecting a mounting location

In order to select the right mounting location, several factors must be considered:

- The scanning range determined from the scanning curve must be adhered to at all areas at which a position determination is to be made
- The BPS should be mounted inclined by 10° in the vertical axis towards the bar code tape to ensure that the read results are reliably obtained even if the bar code tape is soiled.



NOTE



The best functionality is obtained when:

- The BPS is guided parallel to the tape
- The permitted working range is not exited

NOTE



On the BPS 37, the beam is not emitted perpendicular to the housing cover, but with an angle of 10° towards the top. This angle is intended to prevent total reflection on the bar code tape.

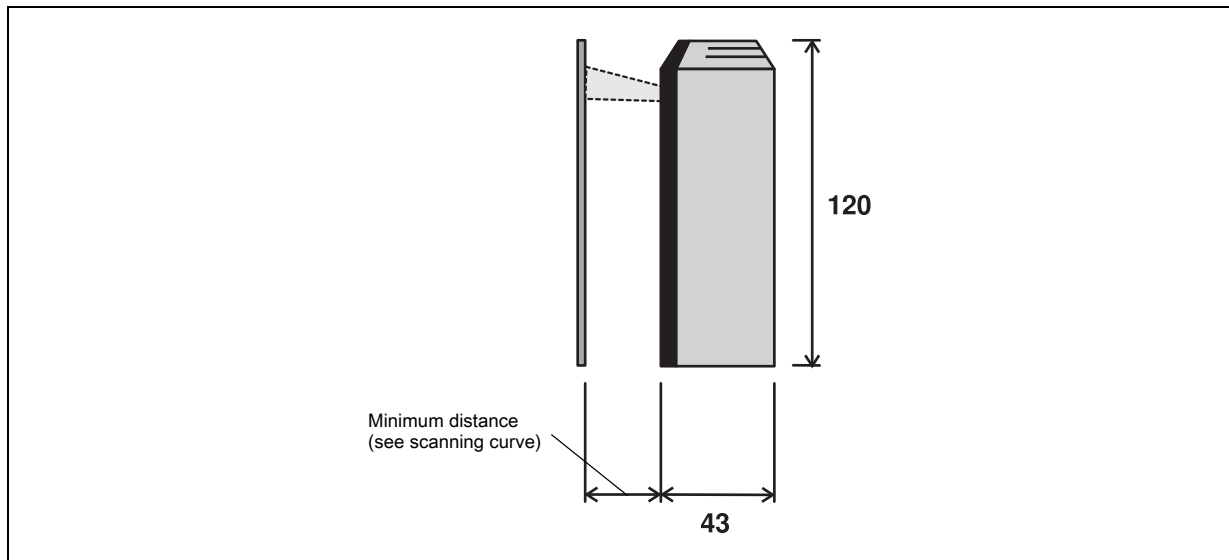


Figure 6.2: Beam exit on the BPS 37

Mounting location

☞ When choosing the mounting location, observe the following:

- maintaining the required environmental conditions (humidity, temperature),
- possible soiling of the reading window due to liquids, abrasion by boxes, or packaging material residues.
- lowest possible chance of damage to the scanner by mechanical collision or jammed parts.

Application example

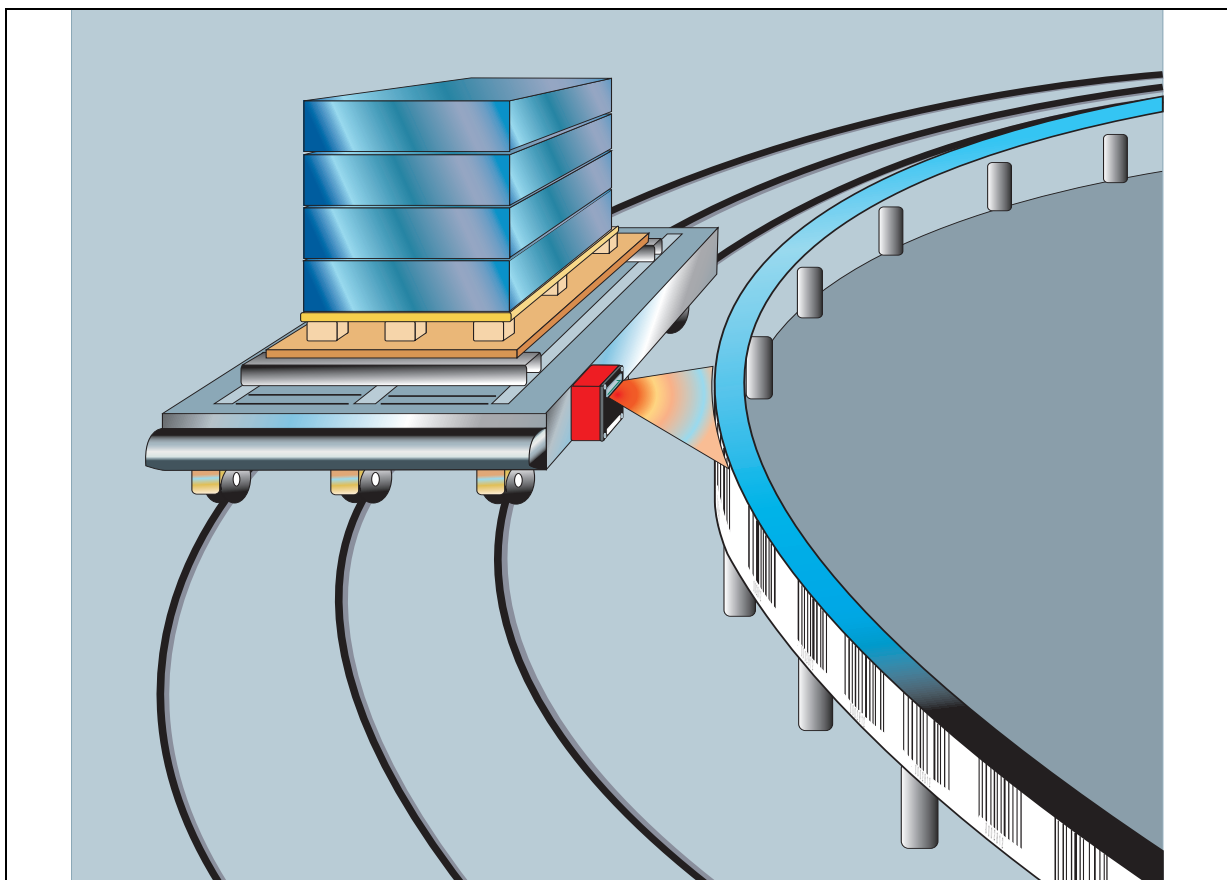



Figure 6.3: Application example

6.3 Connection

⚠ ATTENTION!	
	<p>⚡ Never open the device yourself, as this may compromise degree of protection IP 65.</p> <p>⚡ Before connecting the device, be sure that the supply voltage agrees with the value printed on the name plate.</p> <p>⚡ Connection of the device and maintenance work while under voltage must only be carried out by a qualified electrician.</p> <p>⚡ The power supply unit for the generation of the supply voltage for the BPS 37 and the respective connection units must have a secure electrical insulation through double insulation and safety transformers according to DIN VDE 0551 (IEC 742).</p> <p>⚡ Be sure that the protective conductor is connected correctly. Fault-free operation is only guaranteed when the device is properly earthed.</p> <p>⚡ If faults cannot be cleared, the device should be switched off and protected against accidental use.</p>

6.3.1 Connecting the BPS 37 (SSI)

BPS 37 sub-D pin assignments

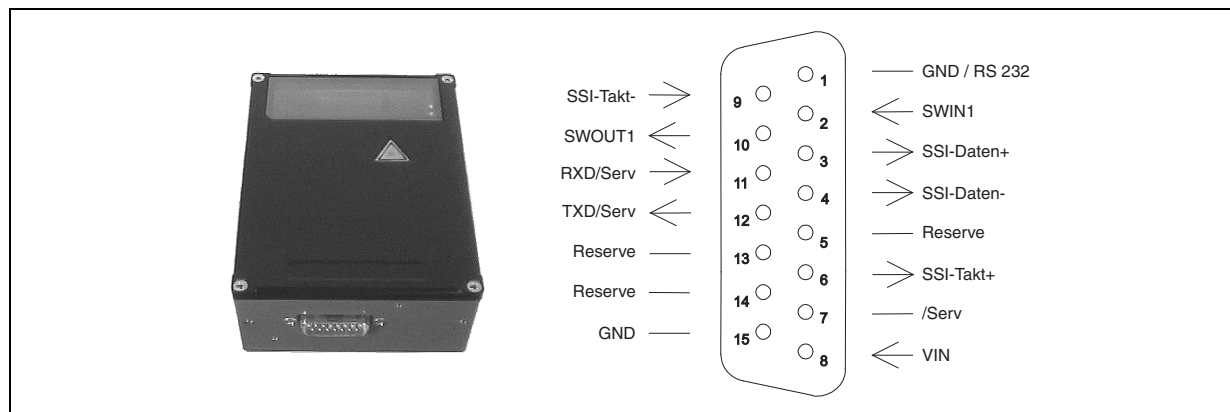


Figure 6.4: BPS 37 sub-D pin assignments

Connection description

Pin 1	GND	Reference ground RS 232
Pin 2	SWIN1	Switching input 1 (+12 ... 30VDC)
Pin 3	SSI data+	SSI data line
Pin 4	SSI data-	SSI data line
Pin 5	Reserve	
Pin 6	SSI clock+	SSI clock line
Pin 7	/Serv	Bridge to pin 15: service operation via RS 232 interface
Pin 8	VIN	Supply voltage +10 ... 30VDC
Pin 9	SSI clock-	SSI clock line
Pin 10	SWOUT1	Switching output 1 (max. 100mA)
Pin 11	RXD/Serv	RXD signal, RS 232 service interface
Pin 12	TXD/Serv	TXD signal, RS 232 service interface

Pin 13	Reserve	
Pin 14	Reserve	
Pin 15	GND	Supply voltage: 0VDC

Table 6.1: Connection description BPS 37

6.3.2 Connecting the SSI interface

Connection with MA

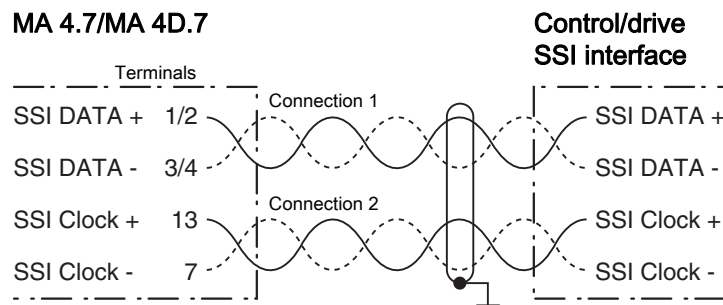


Figure 6.5: Connection with MA

Connection directly with BPS

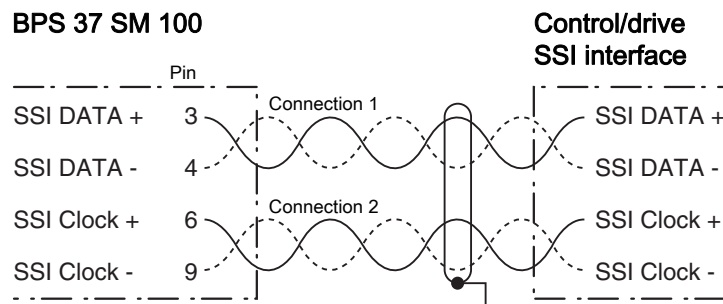




Figure 6.6: Connection directly with BPS

NOTE	
	Ensure adequate shielding. Connections 1 and 2 must be twisted in pairs and the entire interconnection cable must be shielded, and earthed on one side.

⚠ ATTENTION!	
	It is absolutely necessary to connect the protective conductor, since all electrical interference (EMC couplings) is discharged via the protective conductor connection.

Connecting the protective conductor PE

BPS 37 without cable:

connect PE to the housing of the BPS 37 or to the housing of the 15-pin SUB-D connector!

BPS 37 with cable KB 031-3000:

connect PE to the wire with bl/wh color coding or connect it to the shield!

BPS with cable and MA 4.7 (MA 4D.7):

connect PE to PIN 21 or PIN 22!

6.3.3 Connecting the switching input and switching output

The BPS 37 is provided with a switching input and a switching output. The connection of the switching input and output is made in accordance with Figure 6.7:

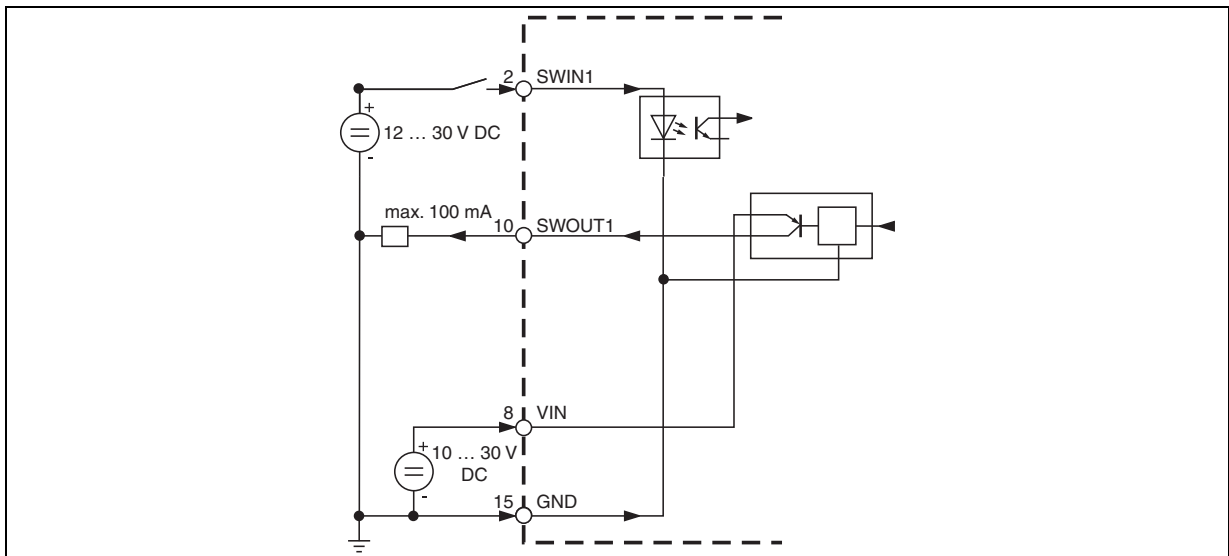


Figure 6.7: Connection diagram for switching input and switching output of the BPS 37

Switching input

In the standard setting you can use the switching input connection SWIN1 to reset the output of the position measurement data to zero by applying a voltage of 12 ... 30VDC between SWIN1 (pin 2) and GND (pin 15).

Switching output

The switching output connection between SWOUT1 (pin 10) and GND (pin 15) is normally open. In the standard setting, SWOUT1 is closed in the event of a positioning error.

You can configure the switching input and output according to your requirements, using the supplied BPSConfig program.

6.3.4 Connection with MS 37 103 modular connector hood

The BPS 37 can be connected via the MS 37 103 using M12 connectors. For the locations of the individual device connections, please refer to Figure 6.8.

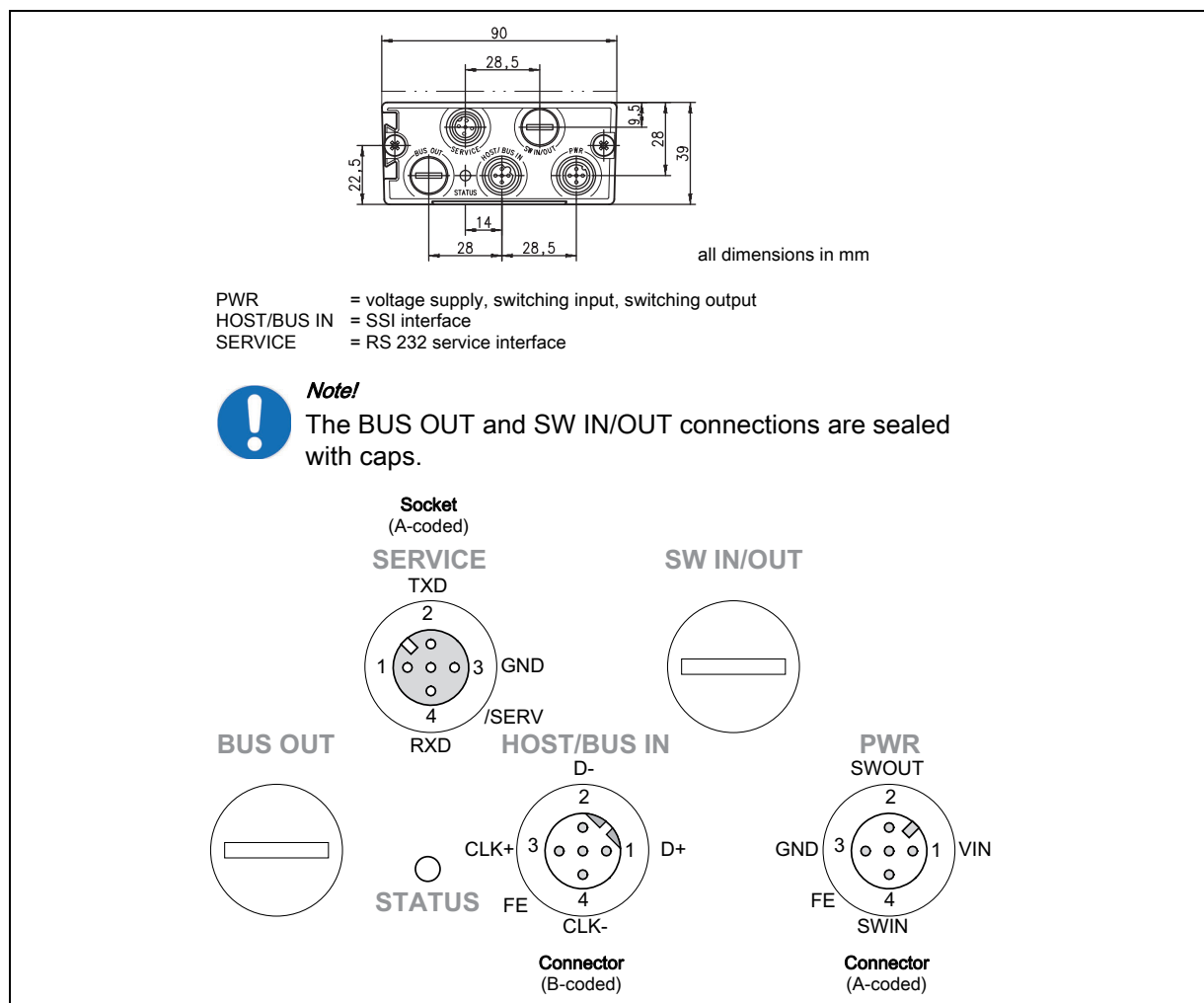


Figure 6.8: Pin assignment of the BPS 37 with MS 37 103

⚠ ATTENTION!

Degree of protection IP 65 is achieved only if the connectors and caps are screwed into place!

PWR IN - voltage supply and switching input/output**⚠ ATTENTION!**For devices with integrated heating, the supply voltage must be wired with a minimum 0.5 mm² (recommended 0.75 mm²) core cross section. It is not possible to loop the supply voltage through to other loads!**NOTE**Cables with a wire cross section of 0.5 mm² or 0.75 mm² are not available as ready-made cables from Leuze electronic.

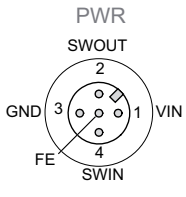
PWR IN (5-pin connector, A-coded)			
 <p>M12 connector (A-coded)</p>	Pin	Name	Comment
	1	VIN	Positive supply voltage Without optics heating: +10 ... +30VDC With optics heating: +22 ... +26VDC
	2	SWOUT	Switching output
	3	GND	Negative supply voltage 0VDC
	4	SWIN	Switching input
	5	FE	Functional earth
	Thread	FE	Functional earth (housing)

Figure 6.9: Pin assignment - PWR IN

Connecting the functional earth FE

BPS 37 with MS 37 103 connector hood:

⚡ Connect FE to PIN 5 of the M12 connector PWR for voltage supply!

⚠ ATTENTION!	
⚠	Degree of protection IP 65 is achieved only if the connectors and caps are screwed into place!

HOST/BUS IN - SSI interface

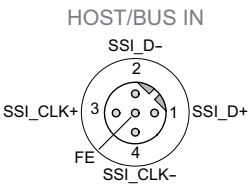
HOST / BUS IN (5-pin plug, B-coded)			
 <p>M12 connector (B-coded)</p>	Pin	Name	Comment
	1	SSI_D+	SSI data line +
	2	SSI_D-	SSI data line -
	3	SSI_CLK+	SSI clock line +
	4	SSI_CLK-	SSI clock line -
	5	FE	Functional earth
	Thread	FE	Functional earth (housing)

Figure 6.10: Pin assignment - HOST/BUS IN

⚠ ATTENTION!	
⚠	Degree of protection IP 65 is achieved only if the connectors and caps are screwed into place!

SERVICE - service interface

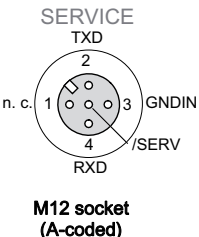

SW IN/OUT (5-pin socket, A-coded)			
 <p>M12 socket (A-coded)</p>	Pin	Name	Comment
	1	n.c.	Not assigned
	2	TXD	TXD signal, RS 232 service interface
	3	GNDIN	Reference ground RS 232
	4	RXD	RXD signal, RS 232 service interface
	5	/SERV	Bridge to GND: service operation via RS232 interface
	Thread	FE	Functional earth (housing)

Figure 6.11: Pin assignment - SERVICE

⚠ ATTENTION!	
	Degree of protection IP 65 is achieved only if the connectors and caps are screwed into place!

6.3.5 Cable lengths and shielding


The following maximum cable lengths and shielding types must be observed:

Connection	Interface	Max. cable length	Shielding
BPS 37 - Service	RS 232	10 m	Absolutely required, sheath of a shielded line
BPS 37/MA 4.7 - Host	SSI	1200 m	Absolutely required, leads as twisted pairs and shielded
Switching input		10 m	Not necessary
Switching output		10 m	Not necessary

Table 6.2: Cable lengths and shielding

6.4 Disassembling, packing, disposing**Repacking**

For later re-use, the device is to be packed so that it is protected against shocks and humidity. Optimum protection is achieved when using the original packaging.

NOTE	
	Electrical scrap is a special waste product! Observe the locally applicable regulations regarding disposal of the product.

7 Commissioning

7.1 Measures to be performed prior to the initial commissioning

- ↳ Before commissioning, familiarize yourself with the operation and configuration of the device(s).
- ↳ Before switch-on, recheck all connections and ensure that they have been properly made.

7.2 Function Test

"Power On" test

After connecting the operating voltage, the BPS 37 performs an automatic "Power On" function test. Subsequently, the green LED lights up in the optical window of the BPS 37.

Interface

Proper function of the interface can be most easily tested in service operation using the service interface with the "BPSSConfig" configuration software and a notebook computer. For order numbers, see Table 5.1 on page 14.

"Online" commands

Using the online commands, important device functions can be checked, e.g. proper functioning of the laser.

Problems

If a problem occurs that cannot be rectified even after checking all electrical connections and settings on the devices and on the host, please contact the closest Leuze service organization (see back page of this operating manual).

7.3 Setting the parameters

You have now commissioned the BPS. Usually, you will have to configure it before you can use it. Using the parameter options made available by the BPS, you can configure the BPS to suit your individual area of application. For instructions regarding the various setting options, refer to Chapter 9 or the online help for the BPSSConfig program.

The setting is usually accomplished by using the program BPSSConfig, see "Installing the "BPSSConfig" software" on page 29.

The various parameter sets are explained briefly in the following Chapter 7.3.1, to understand what is happening during parameter setting.

The setting of the parameters then takes place in the "service" operating mode, which is described in Chapter 7.3.2.

7.3.1 Parameter sets

In the BPS 37 three different parameter sets are administered:

- Parameter set with the factory settings in the ROM
- Current parameter set in EEPROM
- Working copy of the current parameter set in the RAM

Before a parameter set is loaded into the memory of the BPS 37 processor, the validity of the parameter set is verified using check sums.

Factory default parameter set

This parameter set contains the factory-set default settings for all parameters of the BPS 37. It is permanently stored in the ROM of the BPS 37. The parameter set with the default settings is loaded into the memory of the BPS 37,

- the first time the device is commissioned after delivery
- following the command "Factory Default" in the configuration program
- if the check sums of the current parameter set are invalid.

Current parameter set

In this parameter set, the current settings for all device parameters are stored. When the BPS 37 is in operation, the parameter set is stored in the EEPROM of the BPS 37. The current set can be stored:

- by copying a valid parameter set from the host computer
- by means of an off-line setup with the PC setup program BPSConfig

The current parameter set is loaded into the memory of the BPS 37:

- always after connecting the supply voltage
- following a software reset

The current parameter set is overwritten by the parameter set with the factory settings:

- by a parameter reset, see "Online commands" on page 26

7.3.2 Service operating mode

Setting the required parameters is carried out easiest in the 'Service' operating mode. The Service operating mode makes the following defined operating parameters available on a separately wired RS 232 interface, independent from the BPS's configuration for standard operation:

- Transmission rate: 9600 baud
- No parity
- 8 data bits
- 1 stop bit
- Prefix: STX
- Postfix: CR, LF

Activate service interface

The service interface is activated via a bridge between the pins 7 and 15 on the 15-pin sub-D connector. If the BPS 37 is operated with a connection unit, the service interface is activated through a switch in the connection unit.

Connection

You can connect a PC or terminal to the BPS 37 via the serial interface and configure the BPS 37 through this connection. For this, you need a crossed RS 232 interconnection cable (null modem cable) that provides the connections RxD, TxD and GND. A hardware handshake via RTS, CTS is not supported at the service interface.

If the BPS is connected to a connection unit, you can use the 9-pin SubD service connector in the connection unit. For the respective pin assignments, please refer to the data sheet of the connection unit.

Service operating mode

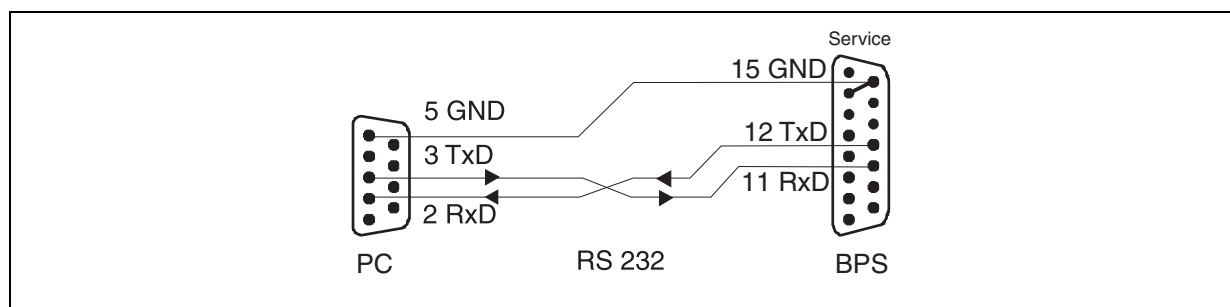


Figure 7.1: Connecting the service interface to a PC or terminal

8 Operation

8.1 BPS 37 display elements

On the BPS 37 there is an LED which signals the BPS's readiness for operation.

8.2 MS 37 103 display elements

On the modular connector hood there is a **status LED** which indicates the state of the device.

State	Meaning
Off	Voltage off
Green, flashing	Initialization of the device
Green, continuous light	Normal operation
Red	Error
Orange, continuous light	Service operation active

9 Communication with the device

Device parameters can be set via commands or using the easy-to-use "BPSCfg 3.0" control software.

9.1 Installing the "BPSCfg" software

✚ Insert the installation CD in your CD drive.

✚ Call up the installation file (e.g. Setup.exe)

The following window appears:

Installation window



Figure 9.1: Installation window

✚ Confirm the following license agreement and select the installation path in the following window:

Installation directory

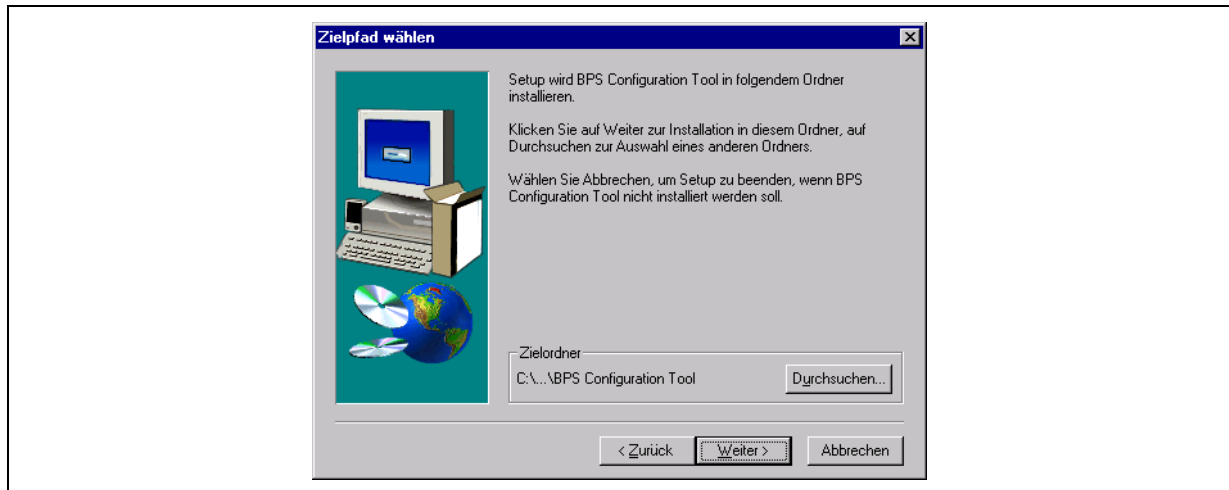


Figure 9.2: Installation directory

✚ Confirm your entry with Next, then follow the installation routine.

For further details please refer to online help of the "BPSCfg" software.

9.2 Overview of commands and parameters

Online commands can be used to send commands directly to the device for control and configuration. For this, the BPS 37 has to be connected to a host or service computer via the serial interface. The commands described can be sent either via the host or the service interface.

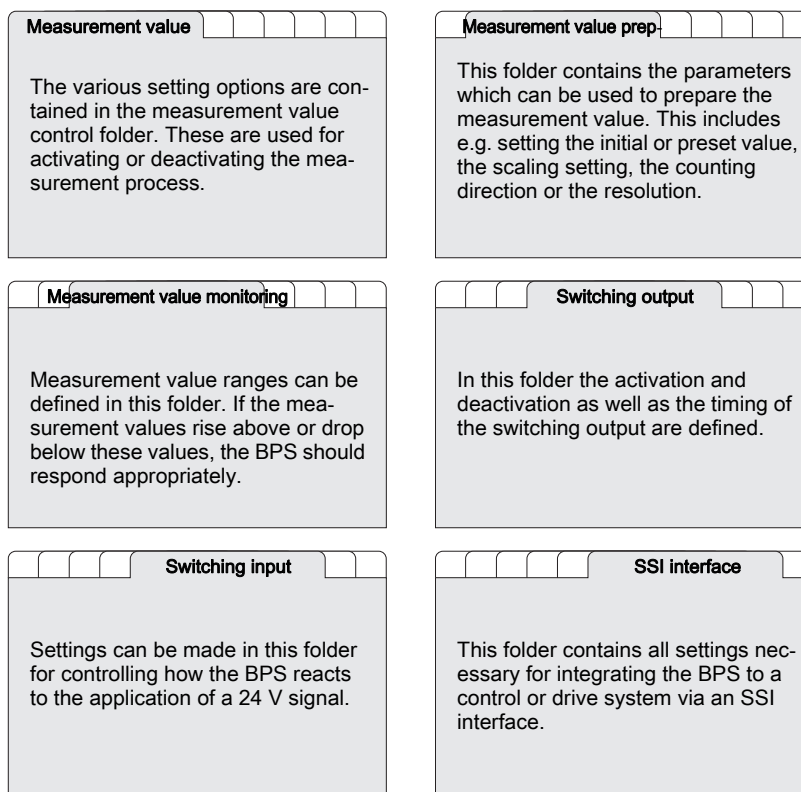
9.2.1 General online commands

Command	Description
M+	Activation of the measurement
M-	Deactivation of the measurement
MI	Reversing the counting direction With the standard setting, the calculation is performed back from the max. measurement length (10000 meter)
MNx=yyyyyyyy	Set preset value x = T = value is stored temporarily (the value is erased after switching on and off) x = D = value is stored permanently in the EPROM y = sign for preset value yyyyyyyy = specification of the preset value in mm Example: MND=+0001000 Current position is permanently set to +1000 mm.
MNR	Deactivates the preset value. The unformatted measurement value is output.
MMxyyyy	Controls the data output via the service interface x = S = a measurement value is output (Single Shot Mode); subsequent specification of the time not necessary x = T = measurement values are output cyclically; time must be subsequently specified y = time specification in ms Example: MMT0500 Measurement values are output via the service interface in a time interval of 500ms
MM-	Deactivation of the MMTyyy function If the cyclical output via the service interface is no longer required, the function must be deactivated using the command MM-.
PC20	Resetting all parameters in the BPS 37 to Leuze default values. Version query

9.2.2 General parameter structure

Using the BPSConfig program, parameters can be changed via the service interface. These parameters are divided into individual folders.

The following folders are available:




10 Maintenance

10.1 General maintenance information

Usually, the bar code positioning system BPS 37 does not require any maintenance by the operator.

Cleaning

Clean the glass window of the BPS 37 with a soft cloth when soiled.

NOTE	
	Do not use aggressive cleaning agents such as thinner or acetone for cleaning the device.

10.2 Repairs, servicing

Repairs to the device must only be carried out by the manufacturer.

- ✎ Contact your Leuze distributor or service organization should repairs be required.
For addresses, please refer to the back page of this operating manual.

11 Appendix

11.1 EC Declaration of Conformity

SMART
SENSOR
BUSINESS

 **Leuze electronic**

the sensor people

EU-/EG-KONFORMITÄTS-ERKLÄRUNG

Hersteller:

Produktbeschreibung:

Barcode Positioniersystem
BPS 34 + MS 34
BPS 37 + MS 37

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union:

Angewandte EU-/EG-Richtlinie(n):

2014/30/EU
2014/35/EU
2011/65/EU

EU/EC DECLARATION OF CONFORMITY

Manufacturer:

Leuze electronic GmbH + Co. KG
In der Braike 1, PO Box 1111
73277 Owen, Germany

Description of product:

Barcode positioning system
BPS 34 + MS 34
BPS 37 + MS 37

This declaration of conformity is issued under the sole responsibility of the manufacturer.

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Applied EU/EC Directive(s):

2014/30/EU
2014/35/EU
2011/65/EU

DECLARATION UE/CE DE CONFORMITE

Constructeur:

Description de produit:

Système de positionnement à codes à barres
BPS 34 + MS 34
BPS 37 + MS 37

La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.

L'objet de la déclaration décrit ci-dessus est conforme à la législation d'harmonisation de l'Union applicable:

Directive(s) UE/CE appliquées:

2014/30/UE
2014/35/UE
2011/65/UE

Angewandte harmonisierte Normen / Applied harmonized standards / Normes harmonisées appliquées:

Angewandte technische Spezifikationen / Applied technical specifications / Spécifications techniques appliquées:

2014/30/EU veröffentlicht: 29.03.2014, EU-Amtsblatt Nr. L 96/79-106; 2014/30/EU published: 29.03.2014, EU-Journal No. L 96/79-106; 2014/30/UE publié: Journal EU n° L 96/79-106
2014/35/EU veröffentlicht: 29.03.2014, EU-Amtsblatt Nr. L 96/357-374; 2014/35/EU published: 29.03.2014, EU-Journal No. L 96/357-374; 2014/35/UE publié: Journal EU n° L 96/357-374

04.12.2019

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