Barcode reader BCL 31/32 with integrated decoder

Technical Description

1 General Information

1.1 Explanation of Symbols

The symbols used in this operating manual are explained below.

Attention!

Pay attention to passages marked with this symbol. Failure to heed this information can lead to injuries to personnel or damage to the equipment.

Attention Laser!

This symbol warns of possible danger through hazardous laser radiation.

Notice!

This symbol indicates text passages containing important information.

1.2 Declaration of Conformity

The bar code reader BCL 31/32 and the optional connector units MA 2/MA 2.2/MA 4/ MA 4D/MA 22 DC have been developed and manufactured under observation of the applicable European standards and directives.

Notice!

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/Teck, possesses a certified quality assurance system in accordance with ISO 9001.

2 Safety Notices

2.1 Safety Standards

The bar code readers BCL 31/32 and the optional connector units MA 2/MA 2.2/MA 4/ MA 4D/MA 22 DC have been developed, produced and tested subject to the applicable safety standards. They correspond to the state of the art.

2.2 Intended Use

Attention!

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

Bar code readers of the type BCL 31/32 are conceived as stationary, high-speed scanners with integrated decoders for all current bar codes used for automatic object recognition.

The optional connector and interface units MA 2/MA 2.2/MA 4/MA 4D/MA 22 DC are intended for the easy connection of bar code readers of type BCL 31/32.

In particular, unauthorised uses include:

- rooms with explosive atmospheres
- operation for medical purposes

Areas of application

The bar code readers BCL 31/32 with optional connector unit MA 2/MA 2.2/MA 4/MA 4D/ MA 22 DC are conceived particularly for the following fields of application:

- labelling and packaging machines
- automatic analysers
- space-critical bar code reading tasks
- storage and conveying engineering, in particular for object identification on fast-moving conveyor belts
- pharmaceutical industry

2.3 Working Safely

Attention!

Access to or changes on the device, except where expressly described in this operating manual, is not authorised.

Safety regulations

Observe the locally applicable legal regulations and the rules of the employer's liability insurance association.

Qualified personnel

Mounting, commissioning and maintenance of the device must only be carried out by qualified personnel. Electrical work must be carried out by a certified electrician.

Attention Laser Radiation!

The BCL 31/32 barcode readers comply with safety standards IEC 60825-1:1993 + A2:2001 for a class 2 product. They also comply with the U.S. 21 CFR 1040.10 and CFR 1040.11 regulations for a class II product except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.

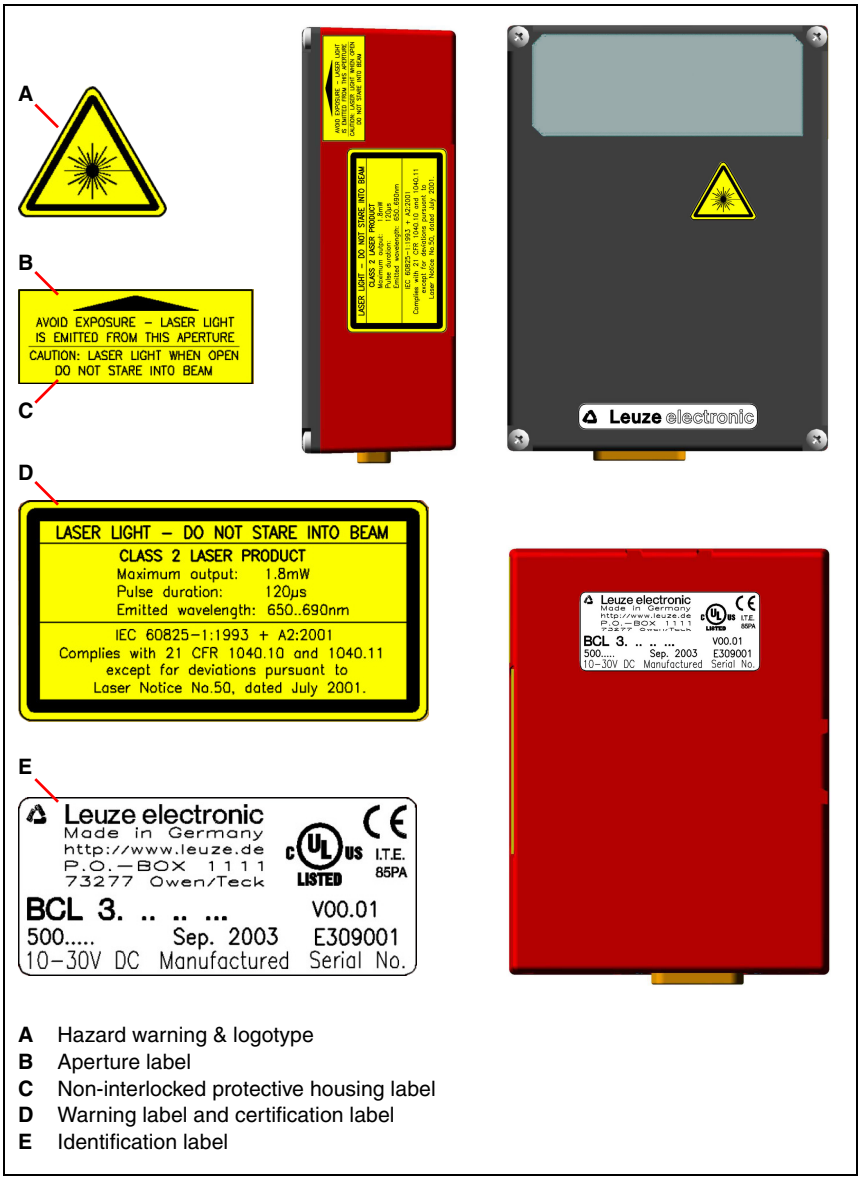
Radiant Energy: The BCL 31/32 uses a low power visible laser diode. The emitted wavelength is 650 … 690 nm. The peak output power of the scanning laser beam is 1.8mW. Laser radiation observed at 120mm above the window through a 7 mm aperture and averaged over 1000 seconds is less than 1mW per CDRH class II specification.

Adjustments: Do not attempt any adjustments to or alterations of this products. Do not remove the scanner's protective housing. There are no user-serviceable parts inside.

The scanner window is the only aperture through which laser radiation may be observed on this product. A failure of the scanner motor, while the laser diode continues to emit a laser beam, may cause emission levels to exceed those for safe operation. The scanner has safeguards to prevent this occurrence. If, however, a stationary beam is emitted, the failing scanner should be disconnected from its power source immediately.

CAUTION: Use of controls or adjustments or performance of procedures other than specified herein may result in hazardous radiation exposure. The use of optical instruments with the product will increase eye hazard.

The housing of the barcode readers BCL 31/32 is labeled on the side, below the scanner window and on the rear with the following logotypes:



A Hazard warning & logotype
B Aperture label
C Non-interlocked protective housing label
D Warning label and certification label
E Identification label

Bild 2.1: Labeling of the BCL 31/32 with logotypes

3 Description

BCL 31/32 device construction

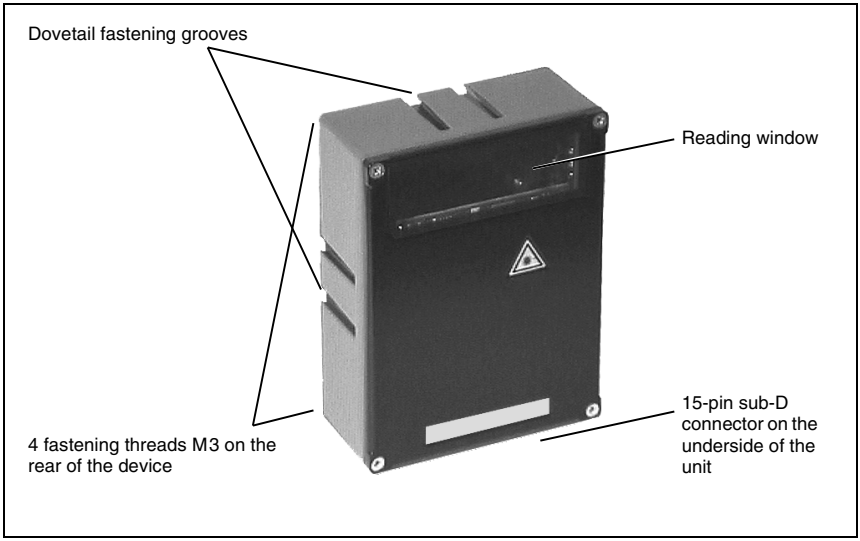


Figure 3.1: BCL 31/32 device construction

3.1 The Bar Code Readers BCL 31/32

The bar code readers BCL 31/32 are high-speed scanners with integrated decoder for all bar codes currently in use, e.g. 2/5 Interleaved, EAN etc.

The many possible configurations of the device allow its adaptation to a multitude of reading tasks. Due to the small dimensions of the unit and the short minimum reading distance, the BCL 31/32 may also be used in highly constrained spaces.

Information on technical data and characteristics can be found in Chapter 4.

auto ReflAct

auto ReflAct stands for automatic Reflector Activation and permits an activation without additional sensors. This is achieved by directing the scanner with reduced scanning beam towards a reflector mounted behind the conveyor path. As long as the scanner is targeted at the reflector, the read gate remains closed. If, however, the reflector is blocked by an object such as a container with a bar code label, the scanner activates the read procedure, and the label on the container is read. When the path from the scanner to the reflector has cleared, the read procedure has completed and the scanning beam is reduced and again directed onto the reflector. The reading gate is closed.

3.2 Standalone operation

The bar code reader BCL 31/32 is operated as a "stand-alone" device. The BCL 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 readers in standalone operation.

In addition, they permit the networking of several bar code readers; they can store operating parameters (MA 4 / MA 4D), and can show parameters and operating data on a display (MA 4D).

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

3.3 Networking

3.3.1 multiNet plus

Up to 30 scanners can be networked together using the connector units MA 2, MA 4 or MA 4D and a bus master MA 30/31. To achieve this, each BCL 31 is assigned a separate hardware address in the respective connection unit. The devices are networked by connecting the individual RS 485 interfaces in parallel.

In the Leuze multiNet plus, the individual network devices sequentially transfer their data to the network master MA 30/31 when requested. In addition, each network device that is declared as slave receives a device address. It is set via a coding switch in the respective connection unit. When exchanging a scanner, the device address remains stored in the MA 2. The connection units MA 4 and MA 4D also store the operating parameters of the scanner.

The master then transmits the data of all network devices via its host interface to a primary PLC control system or a computer, i.e. it "collects" the scanner data in the network and transmits them to an interface on the host computer. This reduces interface costs (CPs) and time spent programming the software.

Two-wire RS 485

The Leuze MultiNet plus is optimised for fast transmission of scanner data to a primary host computer. The multiNet plus consists physically of a two-wire RS 485 interface through which the multiNet plus software protocol is controlled. This makes wiring the network easy and inexpensive as slaves are connected to one another in parallel.

Interface modules

Shielded, twisted pair conductors should be used for the multiNet. This allows a total network length of up to 1200 m. Connection of the network to the primary computer is made via the host interface of the MA 30/31 which can be equipped with 4 different physical interface modules. Modules are available for RS 422, RS 232, TTY and RS 485.

Networking via multiNet plus

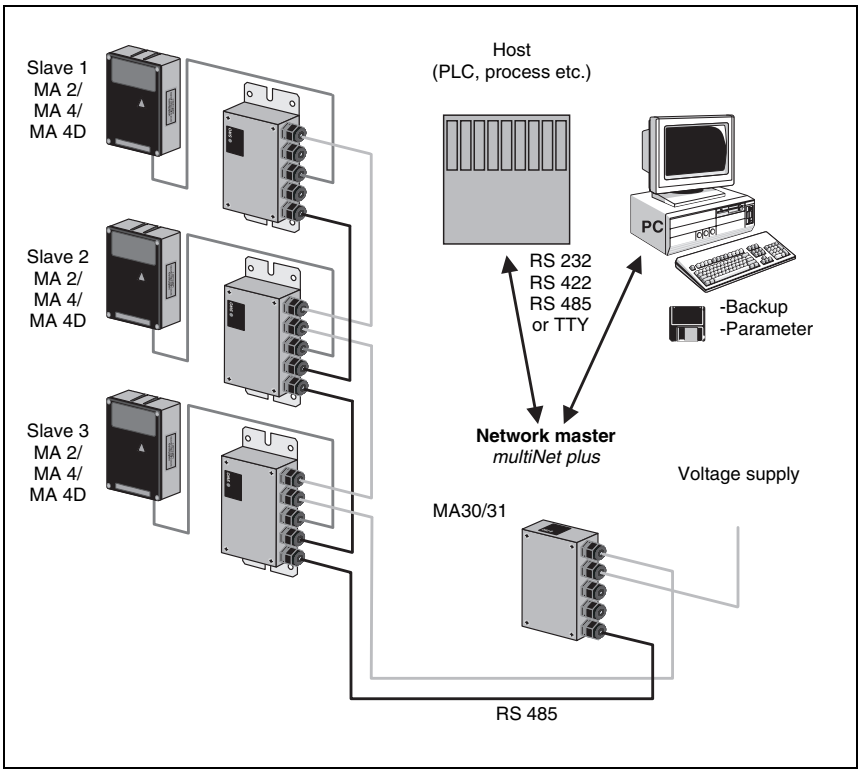


Figure 3.2: Networking possibilities using the multiNet plus (BCL 31)

3.3.2 Daisy Chain

The connection unit MA 22 DC permits the networking of up to 4 bar code readers BCL 32 without an additional network master. The MA 22 DC features two host interfaces, one of which can be used to cascade a further connection unit MA 22 DC. This permits the networking of in total eight BCL 32 without an additional master.

For details regarding the networking with MA 22 DC, please refer to the description of the MA 22 DC.

4 Technical Data

4.1 General Specifications BCL 31/32

Optical Data	
Light source	Laser diode 650 nm
Scanning rate	BCL with M optics: 1000 scans/s BCL with F optics: 800 scans/s BCL with L optics: 800 scans/s
Resolution	BCL 3x xM 100: m = 0.2 mm … 0.5 mm BCL 3x xF 100: m = 0.3 mm … 0.8 mm BCL 3x xL 100: m = 0.35 mm … 0.8 mm
Beam deflection	by means of rotating polygon mirror wheel
Reading distance	see reading curve
Reading field opening	see reading curve
Laser safety class	2 accord. to IEC 60825-1:1993 + A2:2001 II accord. to CDRH
Code types	2/5 Interleaved, Code 39, Code 128, EAN 128, EAN/UPC, EAN Addendum, Codabar, Pharma Code, Code 93
Software features	selectable output format, autoConfig, autoControl, autoReflAct, reference code comparison, multiple read, real time decoding, adjustment mode, diagnosis, reading gate control, control of switching inputs and switching outputs, etc.
Electrical data	
Interface type	BCL 31: RS 485 BCL 32: RS 232
Service interface	RS232 with fixed data format, 9600 Bd, 8 data bits, no parity, 1 stop bit
Baud rate	110 … 115400 Bd
Data formats	data bits: 7, 8, 9 parity: None, Even, Odd stop bits: 1, 2
Protocols	with/without frame protocol ACK/NAK, 3964 (R) RK 512, RTS/CTS X ON / X OFF, multiNet plus
Ports	BCL 31: 1 switching output, 1 switching input BCL 32: 2 switching outputs, 2 switching inputs
LED green	device ready (Power On)
Operating voltage [1)]	10 … 30 V
Power consumption	3.2 W
Additional Functions	
autoReflAct	automatic reading activation via reflector

1) The unit is to be supplied by a Limited Power Supply complying with Cl. 2.5 of UL 60950 (NEC Class 2) and rated from 10 Vdc to 30 Vdc, min. 320 mA.
The unit shall be installed in accordance to the NEC, Article 725-52.

Mechanical data	
Protection class	IP 65
Weight	400 g
Dimensions (W x H x D)	120 x 90 x 43mm
Housing	diecast aluminium
Environmental data	
Ambient temp. (operation/storage)	0°C … +40°C/-20°C … +60°C
Air humidity	max. 90% rel. humidity, non-condensing
Vibration	IEC 60068-2-6, test FC
Shock	IEC 60068-2-27, test Ea
Electromagnetic compatibility	EN 61326-1, IEC 61000-4-2, -3, -4 and -6,

Table 4.1: General specifications

4.2 Dimensioned and Connection Drawings

BCL 31/32

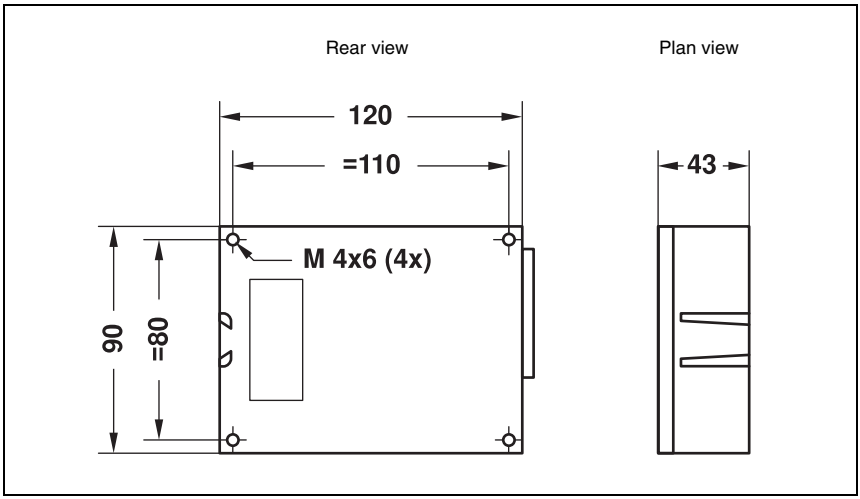


Figure 4.1: Dimensioned drawing BCL 31/32

4.3 Optical Data

Notice!

Please note that the size of the bar code module influences the maximum reading distance and the width of the reading field.Therefore, when selecting a mounting location and/or the bar code label, take into account the different reading characteristics of the scanner with various bar code modules.

For different reading tasks, the BCL 31/32 is available in various versions, both as a raster scanner and as a single line scanner. Please refer to the following table or the respective scanning curves for ratings.

4.3.1 Type overview

Model	Range	Module/ resolution (mm)	Scanning rate (scan/s)	Scanner type	Part No.
BCL 31 S M 100	up to 220mm	0.2 … 0.5	1000	Single line	500 36276
BCL 31 R1 M 100				Raster	500 36275
BCL 32 S M 100				Single line	500 36272
BCL 32 R1 M 100				Raster	500 36271
BCL 31 S F 100	up to 450mm	0.3 … 0.8	800	Single line	500 36278
BCL 31 R1 F 100				Raster	500 36273
BCL 32 S F 100				Single line	500 36274
BCL 32 R1 F 100				Raster	500 36277
BCL 31 S L 100	up to 750mm	0.35 … 0.8	800	Single line	500 41379
BCL 31 R1 L 100				Raster	500 41380
BCL 32 S L 100				Single line	500 41384
BCL 32 R1 L 100				Raster	500 41383

Table 4.2: Type overview

Notice!

BCL 31: interface RS 485
BCL 32: interface RS 232

4.3.2 Raster aperture

Raster aperture depending on various distances:

Scanner distance [mm]	50	100	200	300	400	450
Raster line spacing [mm]	15	21	32	44	55	61

4.3.3 Optics variants and reading fields

The BCL 31/32 is available with two different optics. The optics differ in range and resolution (see Chapter 4.3.1).

- Optic M: for small to medium modules
- Optic F: for medium to large modules
- Optic L: for medium to large modules

The following graphic displays the scanning curves of the various BCL models.

Notice!

Please notice that the real scanning curves are also influenced by factors such as labelling material, printing quality, scanning angle, printing contrast etc., and may thus deviate from the scanning curves specified here.

Scanning curves BCL 31/32 with optic M

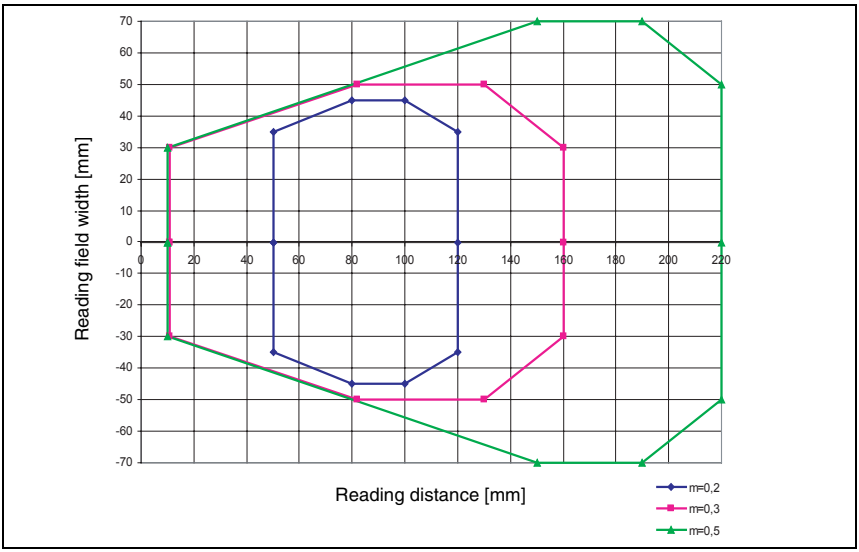


Figure 4.2: Reading field, optics model M (medium density, normal range)

Scanning curves BCL 31/32 with optic F

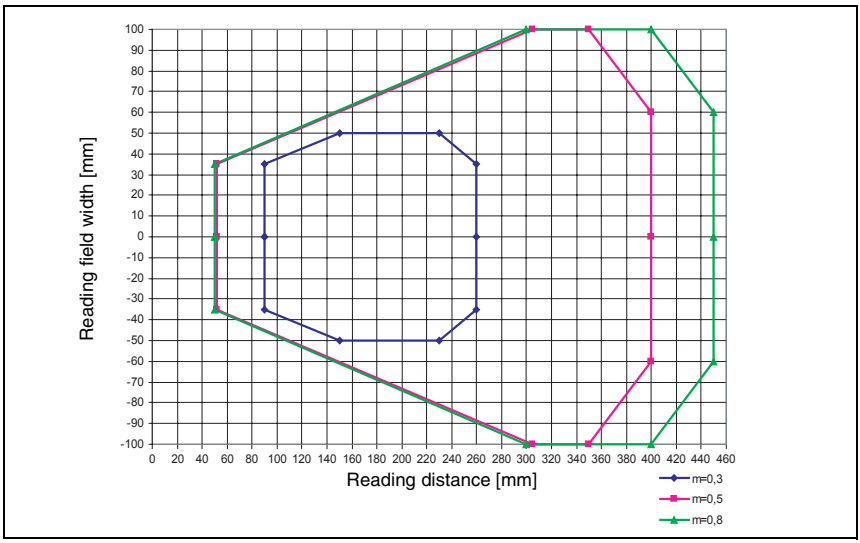


Figure 4.3: Reading field, optics model F (low density, long range)

Scanning curves BCL 31/32 with optic L

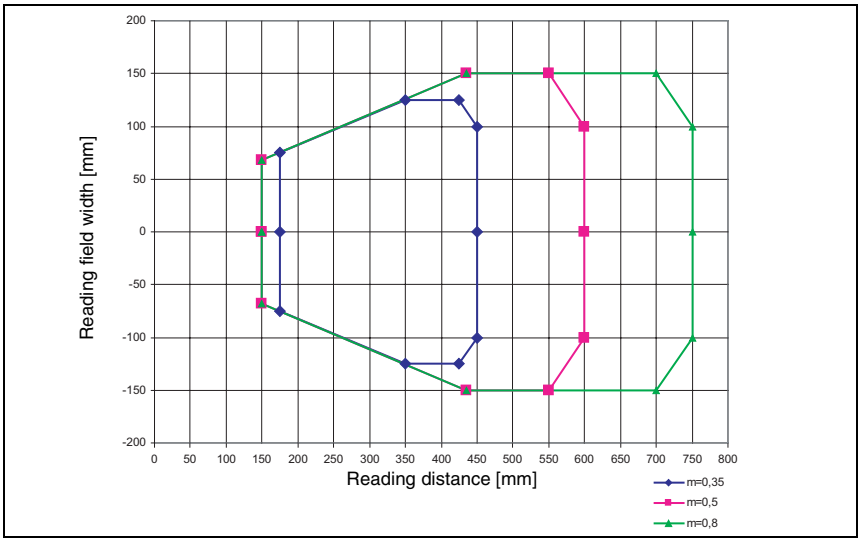


Figure 4.4: Reading field, optics model L (low density, long range)

5 Accessories / Order Designation

5.1 Accessories

Notice!

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.

Symbol	Order No.	Short Description
MA 2	500 31256	Coupling unit MA 2 for BCL 31; standard, multiNet Slave with host interface RS 485
MA 2.2	500 31538	Coupling unit MA 2.2 for BCL 32; standard, multiNet Slave with host interface RS 232
MA 22 DC	500 31496	Daisy chain connection unit for four BCL 32
MA 4	500 31537	Connection unit for BCL 31/32 with parameter memory
MA 4D	500 31536	Connection unit for BCL 31/32 with parameter memory and display
BT 56	500 27375	Mounting bracket with dovetail for rod
KB 031-3000	500 35355	Connection cable between BCL and MA, length: 3m
KB 040-3000	500 26658	Connection cable between BCL and MA in L version, length: 3m
KB 040-6000	500 29381	Connection cable between BCL and MA in L version, length: 6m
KB 040-10000	500 29382	Connection cable between BCL and MA in L version, length: 10m
BCLConfig	500 60298	Programming software

Table 5.1: Accessories / Order Designation

5.1.1 Connection units

Notice!

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

Connector unit MA 2/MA 2.2

The connection units MA 2/MA 2.2 are used to simplify the electrical installation of the BCL 31/32. They have the following advantages compared to the installation of the BCL 31/32 as a standalone device:

- Terminals for switching inputs and outputs, including supply voltage
- Terminals for feed-through of the RS 485 connection (MA 2)
- 9-pin sub D plug for service interface
- Operating mode switch: service operation/standard operation
- Rotary switch for address setting

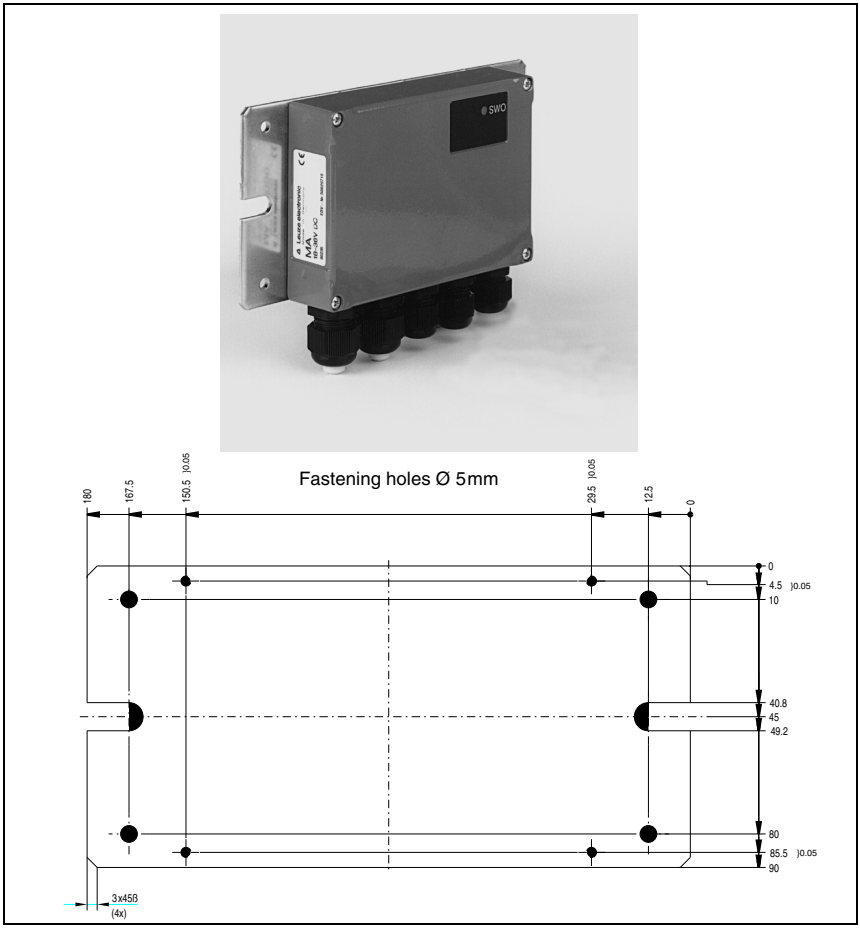


Figure 5.1: Connector unit MA 2/MA 2.2

Connector unit MA 4/MA 4D

Apart from the advantages of the connection units MA 2/MA 2.2, the connection units MA 4/MA 4D have the following additional characteristics:

- Parameter memory for the BCL - the BCL can be exchanged without the need for reconfiguration
- Display (MA 4D only)

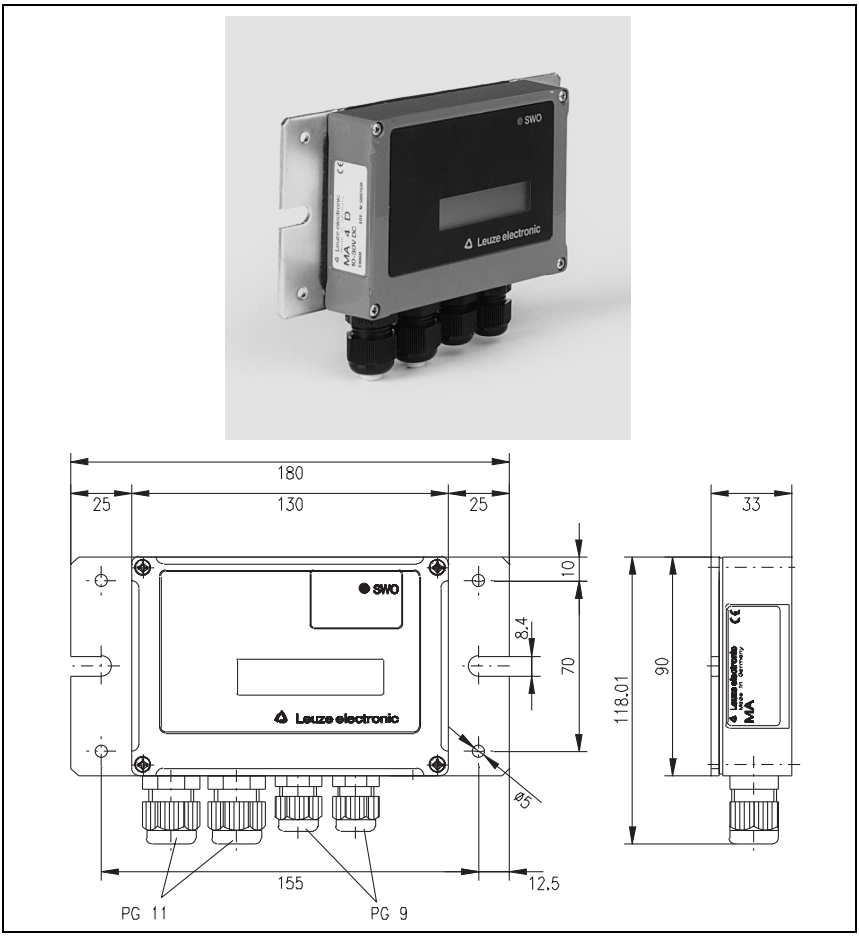


Figure 5.2: Connection unit MA 4/MA 4D / drawing to scale

5.1.2 Fastening Accessories

The mounting unit BT 56 is available for mounting the BCL 31/32. It is designed for rod installation.

Mounting device BT 56

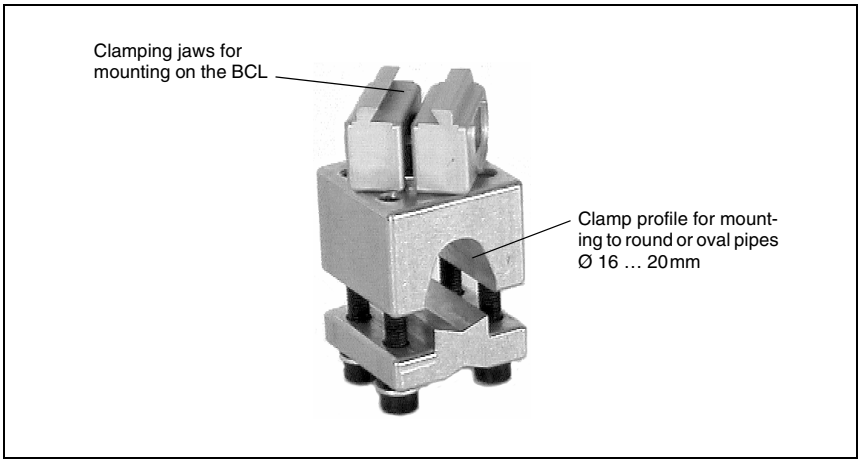


Figure 5.3: Mounting device BT 56

5.1.3 Connection cable

Specific connection cables in various lengths are available for the connection between BCL and connection unit, depending on the model of the connection unit (standard version or L version). These connection cables may be used for the connection units MA 2/MA 2.2 as well as for MA 4/MA 4D.

6 Installation

6.1 Storage, Transportation

Attention!

When transporting, package the device so that it is protected against collision and humidity. Optimal protection is achieved when using the original packaging. Heed the required environmental conditions specified in the technical data.

Unpacking

- *Check the packaging 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 manual

The name plates provide information as to what BCL-type your device is. For specific information, please refer to Chapter 4.3.1.

Name plates, BCL-models

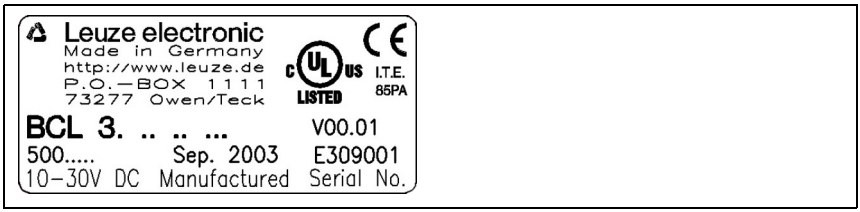


Figure 6.1: Device type plate BCL 31/32

- *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 local regulations regarding disposal and packaging.*

Cleaning

- *Clean the glass window of the BCL 31/32 with a soft cloth before mounting.Remove all packaging remains, e.g. carton fibres or Styrofoam balls.*

Attention!

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

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 Designation" on page 16.

Mounting the BCL 31/32

There are two basic types of mounting arrangements for the BCL 31/32:

- using the dovetail groove and the corresponding mounting accessories (see figure 6.2)
- using the fastening threads on the back- and underside of the devices (Chapter 4.2)

Mounting example BCL 31/32

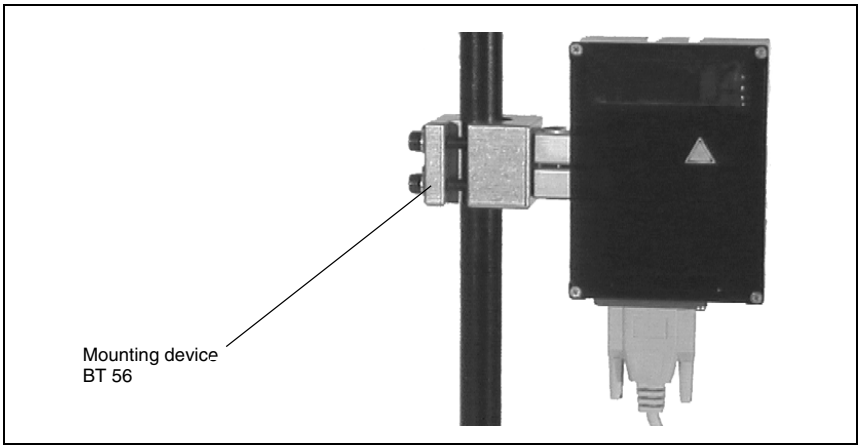


Figure 6.2: Mounting example BCL 31/32

Mounting MA

You can mount all connection units individually through the holes located on the mounting plate (see Figure 5.1 and Figure 5.2).

Subsequently, connect the BCL 31 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:

- size, orientation, and position tolerance of the bar codes on the objects to be scanned
- the reading field of the BCL 31/32 in relation to the bar-code module width
- the resulting minimum and maximum reading distance from the respective reading field

For specific information, please refer to Chapter 4.3.

Notice!

The best reading results are obtained when

- the bar code is moved in a plane that is parallel to the reading window,
- the reading distance lies in the middle area of the reading field.
- you do not use high-gloss labels.

Notice!

On the BCL 31/32, the beam is not emitted perpendicular to the cover of the housing, but with an angle of 10 ° towards the top. This angle is intended in order to avoid a total reflection of the laser in the case of glossy labels. For highly reflective surfaces, this angle may be widened by tilting the BCL.

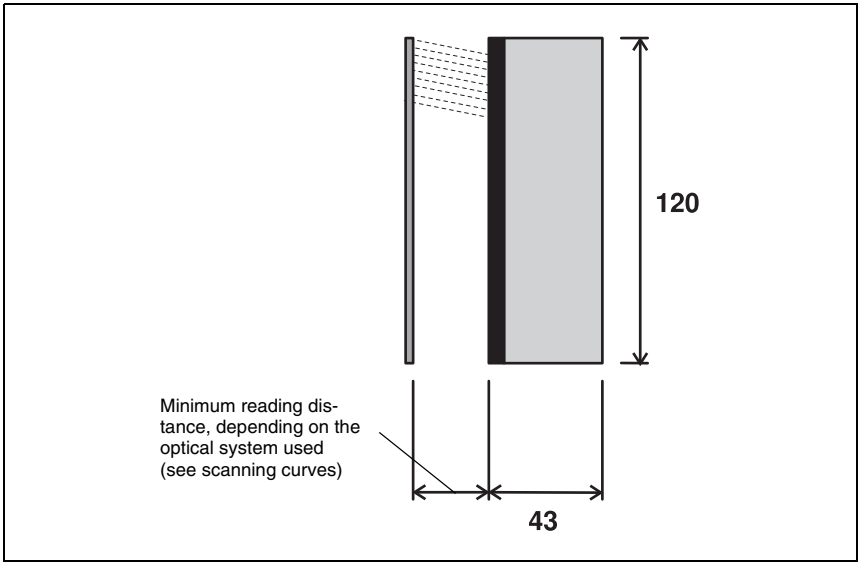


Figure 6.3: Device type plates BCL 31/32

Mounting location

When selecting a mounting location, pay attention to

- 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

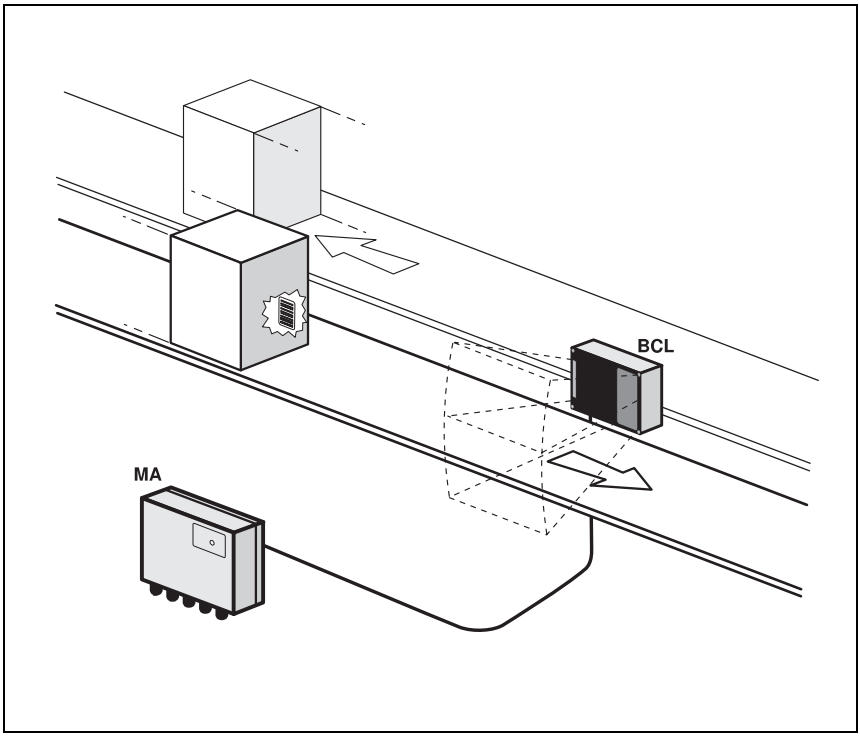


Figure 6.4: Application example "conveyor chain"

6.3 Connection

Attention!

Never open the device yourself, as this may compromise protection class IP 65.

Before connecting the device, be sure that the supply voltage agrees with the value printed on the nameplate.

Connection of the device and maintenance work while under voltage must only be carried out by a qualified electrician.

Power supply: The unit is to be supplied by a Limited Power Supply complying with Cl. 2.5 of UL 60950 (NEC Class 2) and rated from 10 Vdc to 30 Vdc, min. 320 mA. The unit shall be installed in accordance to the NEC, Article 725-52.

Be sure that the earthing conductor is connected correctly. Error-free operation is only guaranteed when the device is properly earthed.

If faults cannot be corrected, the device should be removed from operation and protected against possible use.

6.3.1 Connecting the BCL 31 (RS485)

BCL 31 Sub D pin assignments

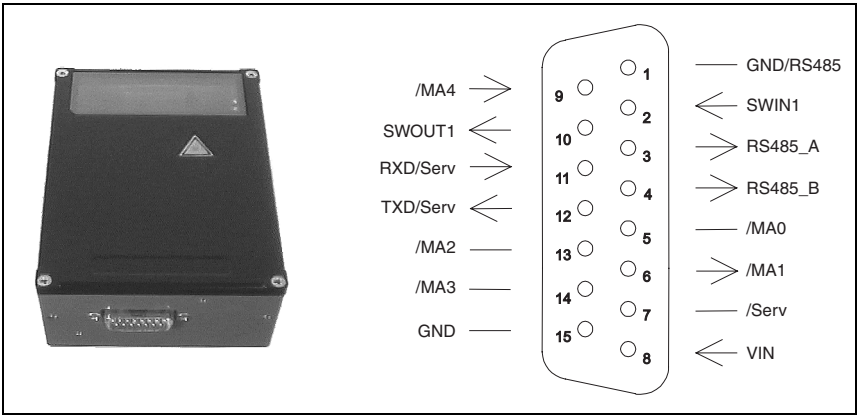


Figure 6.5: BCL 31 Sub D pin assignments

Wiring description

Pin 1	GND/RS485	Reference ground RS 485
Pin 2	SWIN1	Switching input 1 (+12 … 30VDC)
Pin 3	RS485_A	Signal line A RS485
Pin 4	RS485_B	Signal line B RS485
Pin 5	/MA0	Address selection bit0
Pin 6	/MA1	Address selection bit1
Pin 7	/Serv	Bridge to pin 15: service operation via RS232 interface
Pin 8	VIN	supply voltage +10 … 30VDC
Pin 9	/MA4	Address selection bit4
Pin 10	SWOUT1	Switching output 1 (max. 100mA)
Pin 11	RXD/Serv	RXD signal, service interface RS 232
Pin 12	TXD/Serv	TXD signal, service interface RS 232
Pin 13	/MA2	Address selection bit2
Pin 14	/MA3	Address selection bit3
Pin 15	GND	Supply voltage 0VDC

Table 6.1: Connection description BCL 31

Address setting

When integrating the BCL 31 into a network, you have to set its address and create connections between the individual BCLs.

Notice!

The setting of the address takes place most conveniently together with a connection unit. In the connection units, there are rotary coding switches for address setting.

Here it is described how you may set the address without a connection unit:

As an example, a BCL 31 with the address 5 is to be included into the multiNet plus with an MA 31 110 as the master.

Please connect through the following connection from slave to slave: VIN, GND, RS485_A, RS485_B, RS485 GND (shield).

To set the address (address 5), you connect the pins /MA0 and /MA2 with a jumper lead to the GND of the voltage supply. The address 0 is set if all /MAx pins are open.

The following table shows the possible settings:

Address	/MA0	/MA1	/MA2	/MA3	/MA4
1	GND	open	open	open	open
2	open	GND	open	open	open
3	GND	GND	open	open	open
4	open	open	GND	open	open
5	GND	open	GND	open	open
…	…	…	…	…	…
30	GND	GND	GND	GND	open
Parameter Reset	GND	GND	GND	GND	GND

Table 6.2: Address setting BCL 31

As the table shows, you may set the addresses 1 to 30. Address 31 is used for the parameter reset. The address is always adopted according to the connection of the /MA inputs when the BCL is switched on, and remains saved while it remains switched on. A parameter reset loads the parameter set with the default settings into the BCL. With regard to the meaning of a parameter reset please refer also to "Parameter sets" on page 31.

6.3.2 Connecting the BCL 32 (RS232)

BCL 32 Sub D pin assignments

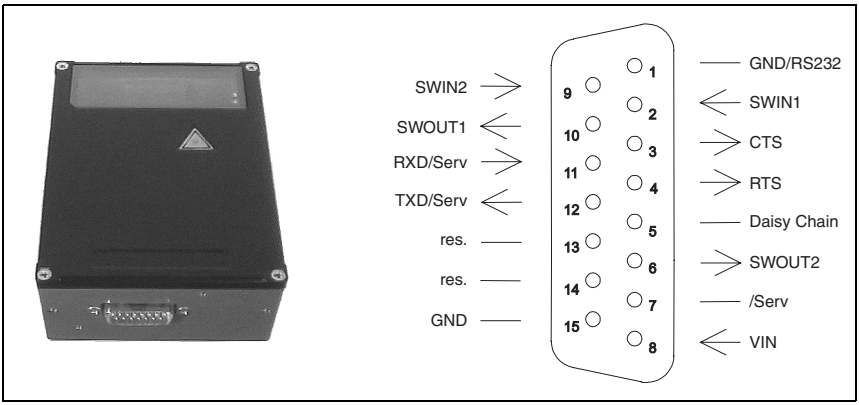


Figure 6.6: BCL 32 Sub D pin assignments

Wiring description

Pin 1	Res.	Reserved
Pin 2	SWIN1	Switching input 1 (+12 … 30VDC)
Pin 3	CTS	CTS signal, host interface RS 232
Pin 4	RTS	RTS signal, host interface RS232
Pin 5	Daisy Chain	Bridge with pin 15: Daisy chain is active
Pin 6	SWOUT2	Switching output 2 (max. 100mA)
Pin 7	/Serv	Bridge with pin 15: service operation
Pin 8	VIN	supply voltage +10 … 30VDC
Pin 9	SWIN2	Switching input 2 (+12 … 30VDC)
Pin 10	SWOUT1	Switching output 1 (max. 100mA)
Pin 11	RXD/Serv	RXD signal, service interface RS 232
Pin 12	TXD/Serv	TXD signal, service interface RS 232
Pin 13	Res.	Reserved
Pin 14	Res.	Reserved
Pin 15	GND	Supply voltage 0VDC

Table 6.3: Wiring description BCL 32

6.3.3 Connection of switching inputs and outputs

The BCL 31 has one switching input and one switching output — the BCL 32 has two switching inputs and two switching outputs each. The connection of the switching inputs and outputs is carried out according to Figure 6.7:

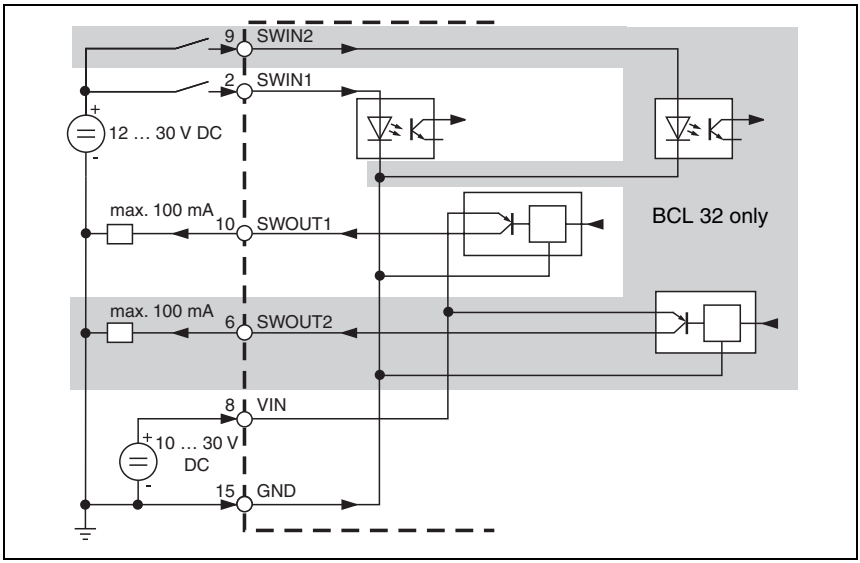


Figure 6.7: Connection diagram switching inputs and outputs BCL 31/32

Switching inputs

In the standard setting, you can trigger a reading action via the switching input connections SWIN1/SWIN2 by applying a voltage of 12 … 30 V DC between SWIN1 (pin 2) or SWIN2 (pin 9) and GND (pin 15).

Switching outputs

The switching output connections between SWOUT1 (pin 10) or SWOUT2 (pin 6) and GND (pin 15) are normally open. In the standard setting, SWOUT1 is closed in case of a reading error, SWOUT2 in the case of a detected code.

You can configure the switching inputs and outputs according to your needs, using the BCL Config program supplied.

Notice!

You can configure the switching inputs and outputs according to your needs, using the program BCL Config supplied.

6.3.4 Wire Lengths and Shielding

The following maximum lengths for wires and the type of shielding to be used must be observed:

Connecting	Interface	Max. wire length	Shielding
BCL 31/32 - Service	RS 232	10 m	absolutely required, shield meshing
BCL 31/MA 2 - Host	RS 485	1200m	absolutely required, flexible leads as twisted pairs
Switching inputs 1+2		10 m	not necessary
Switching outputs 1+2		10 m	not necessary

Table 6.4: Wire Lengths and Shielding

6.4 Disassembling, Packing, Disposing

Repacking

For later reuse, the device is to be packed so that it is protected against shocks and dampness. Optimal protection is achieved when using the original packaging.

Notice!

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 first commissioning

- *Before commissioning, familiarise yourself with the operation and configuration of the device(s)!*
- *Before switching on, recheck all connections and ensure that they have been properly made.*

Setting the device address

The device addresses are set via address bits. For setting instructions refer to Chapter 6.3.1.

If the BCL is connected to a connection unit, the device address can also be set conveniently via a rotary coding switch in the connection unit.

- *Set the device address to*
  - **0**, if the BCL 31/32 will not be operated in a network,
  - **1…30**, if several BCL 31 are operated in a network. Each multiNet plus network device must have a different device address assigned to it.
  - **31**, if you want to carry out a parameter reset. The parameters set with the default settings will then be loaded into the BCL when it is switched off and on.

Attention!

A *parameter reset overwrites all customer-specific settings. Make sure that you only set the address 31 if you want to work with the default settings and if you have saved your customer-specific settings e.g., using the "BCLConfig" program.*

Notice!

From the hardware address (device address > 0), the BCL 31 detects that networking is required. With the BCL 31/32, it is possible to perform a reset using the software and the online commands.In addition, it is possible to perform a reset by switching off the supply voltage.The parameters are not lost as a result of the reset. For information on the reset commands, see Chapter 9. The LED remains dark during a reset; the green LED illuminates when the device is ready for operation.

7.2 Function Test

"Power On" test

After connecting the operating voltage, the BCL 31/32 carry out an automatic "Power On" function test. Subsequently, the green LED lights up in the optics window of the BCL 31/32.

Interface

Proper function of the interface can be tested easiest in service operation using the service interface with the "BCLConfig" programming software and a notebook computer. For order numbers, see table 5.1 on page 16.

Online commands

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

Problems

Should problems occur during device commissioning, refer first to Chapter 8.2. Should a problem persist after checking all electrical connections and settings on the devices and host, please contact a Leuze service office near you (see the back page of this operating manual).

7.3 Setting the Parameters

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

In order to operate the BCL, it is typically sufficient to set code type and code length in accordance with the bar codes that are to be read. However, depending on the application, you will additionally activate the autoReflAct function and configure the switching inputs and outputs according to your requirements.

The setting of code type and code length is usually accomplished by using the program BCLConfig, see "Installing the "BCLConfig"-software" on page 35.

To understand what is happening during the parameter setting, the following Chapter 7.3.1 briefly explains the various parameter sets.

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

7.3.1 Parameter sets

In the BCL 31/32, three different parameter sets are administered:

- parameter set with the default settings in the ROM
- current parameter set in the EEPROM
- working copy of the current parameter set in the RAM

Before a parameter set is loaded into the memory of the BCL 31/32 processor, the validity of the parameter set is verified using checksums.

Factory default parameter set

This parameter set contains the default settings made ex works for all BCL 31/32 parameters. It is permanently stored in the ROM of the BCL 31/32. The parameter set with the default settings is loaded into the memory of the BCL 31/32

- the first time the device is commissioned after delivery,
- following the command "Factory Default" in the parameterisation program,
- if the checksums 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 BCL 31/32 is in operation, the parameter set is stored in the EEPROM of the BCL 31/32. 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 BCLConfig

The current parameter set is loaded into the memory of the BCL 31/32

- each time the supply voltage is connected
- following a software reset

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

- by a parameter reset, see page 30

7.3.2 Service Operating Mode

Setting the required parameters is carried out easiest in the "service" operating mode. The operating mode "service" makes the following defined operating parameters available on a separately wired RS232 interface, independent from the BCL's configuration for standard operation:

- transfer rate 9600 baud
- no parity
- 8 data bits
- 1 stop bit
- prefix: STX
- postfix: CR, LF

Service interface active

The service interface is activated via a bridge between the pins 7 and 15 on the 15-pin sub-D connector. If the BCL 31/32 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 BCL 31/32 via the serial interface and configure the BCL 31/32 through this connection. For this, you need a crossed RS 232 connection cable (null modem cable) that provides the connections RxD, TxD and GND. A hardware handshake via RTC, CTS is not supported at the service interface.

If the BCL is connected to a connection unit, you can use the 9-pin sub-D service connector in the connection unit. For the respective connection specifications please refer to the data sheet of the connection unit.

Service Operating Mode

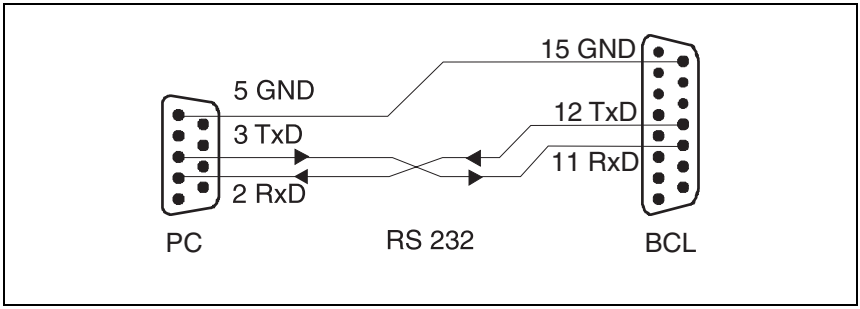


Figure 7.1: Connecting the service interface to a PC or terminal

8 Operation

8.1 Display Elements

On the BCL 31/32 there is an LED. It signals that the BCL is ready for operation.

8.2 Error Handling

Error, warning and status messages of the BCL 31/32 are transmitted via the host interface only.

Types of errors

Errors are divided up into the following types:

- Warnings
- Serious errors

Warnings

Warnings indicate temporary operating faults which do not effect the proper functioning of the device.

Serious errors

Serious errors impair the proper functioning of the device. The device must be re-initialised.

Troubleshooting

Isolated warnings can be ignored, since the BCL 31/32 will continue to function properly.

Following a serious error, you should re-initialise the BCL. It will then usually again function properly. If a hardware problem is present, the BCL 31/32 will not re-initialise.

Warnings and errors which occur frequently can be corrected easiest using the BCLConfig software.

If you cannot correct faults and errors with the software, please contact a Leuze electronic sales office or service facility. For addresses, please refer to the back page of this operating manual.

9 Communicating with the Device

Device parameters can be set using the automatic configuration "autoConfig", via commands at the serial interface or using the easy-to-use "BCLConfig 3.0" control software.

9.1 Installing the "BCLConfig"-software

- *Insert the installation diskette into your disk drive.*
- *Call up the installation file (e.g. Setup.exe).*

The following window appears:

Installation window

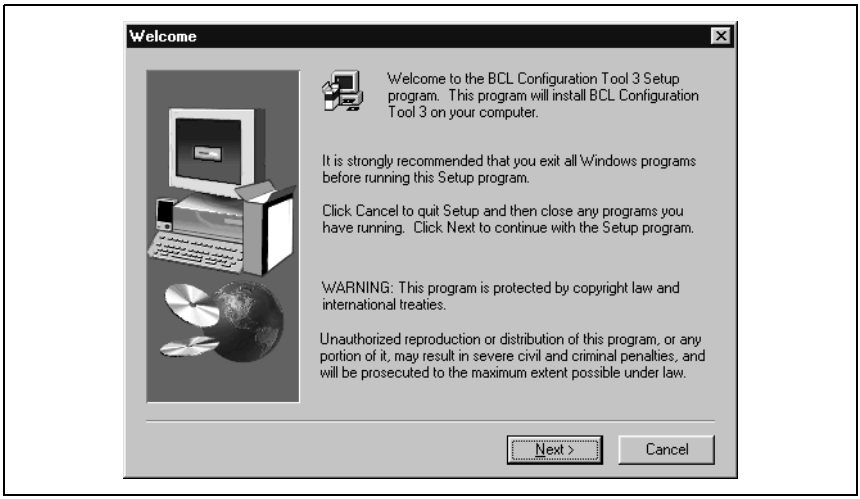


Figure 9.1: Installation window

- *Confirm the following licence agreement and select the installation path in the following window:*

Installation directory

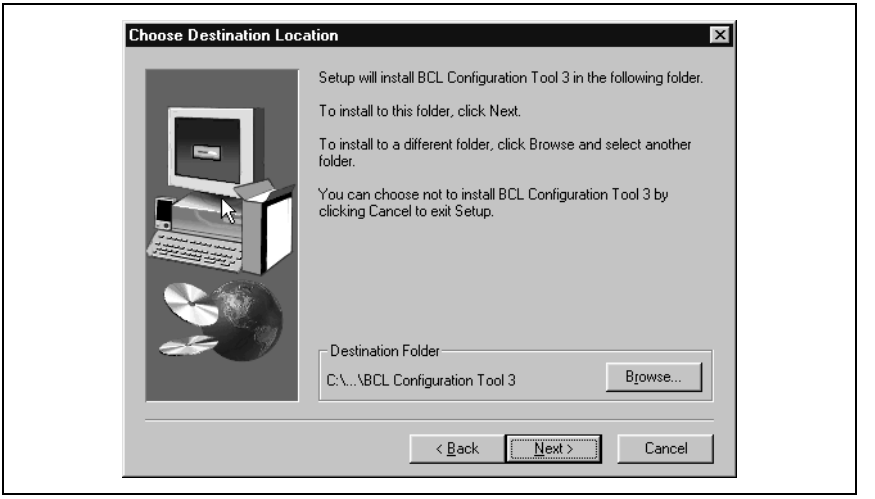


Figure 9.2: Installation directory

↳ *Confirm your entry with Continue, then follow the installation routine.*

For further information, please see the online help for the "BCLConfig" software.

↳ *After the successful installation, double-click on the file "BCLconfig.exe" to activate the configuration program.*

10 Important Parameters

10.1 Code menu

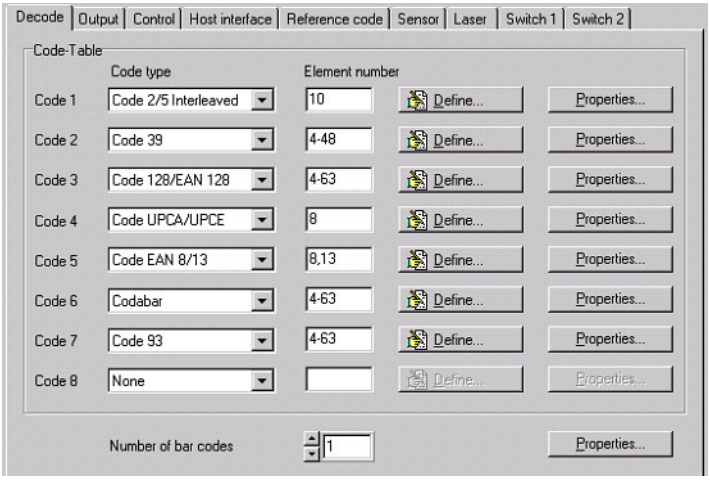


Figure 10.1: Default setting of the code menu

Code table Here, the codes which are to be decoded are set. We recommend enabling only the code types which are to actually be read with the corresponding element numbers.
IMPORTANT: Code 1 has to be selected always. For more than one code type select the codes in consecutive order Code 1, Code 2, … .

Element number In the field Element number, up to 3 element entries may be entered.
An area is represented by a dashed line: e.g. 4-40 digits.
With 2 or 3 different element entries
by a comma: e.g: 8,13 digits
The combination is also possible, but the range must
be specified first: e.g.: 4-10,20 digits

Notice!
If the code EAN128 is to be read, 3 additional characters are to be set for the code identifier.

Properties Behind the "Properties" button, to the right of the respective code, the code-specific settings, such as the check digit, can be selected.

Number of bar codes Here, the number of the bar codes to be decoded within a read cycle (one reading gate) is set.

10.1.1 Properties of the Code menu

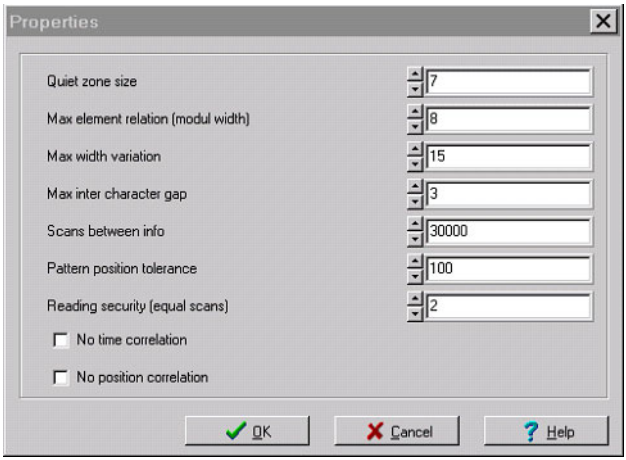


Figure 10.2: Standard setting of the properties of the code menu

Quiet zone size
Quiet zone: the area to the left and right of the bar code
Module: width of the narrowest line in the bar code
According to the code specifications, each bar code must have a quiet zone which is 10x as wide as the module of the bar code.
Ex: for a code having a module of 0.5mm, 5mm blank space must be present at both the left and right of the code.
By default, the scanner checks the a quiet zone which is 7 times greater than the module. This means that 7x or greater is o.k.

Reading Security (Equal Scans)
Specifies how often a code must be decoded before the result is valid and output. This value should be increased for inspection and test purposes only.

No time correlation
If this parameter is set, a gap between two identical labels is ignored and they are treated as a single label.

No position correlation
If this parameter is set, then the position of a bar code label in the reading beam is not taken into account. Identical labels are treated as a single label

Notice!

In general, the remaining parameters must not be changed. In the worst case, this could corrupt the reading result!

10.2 Output menu

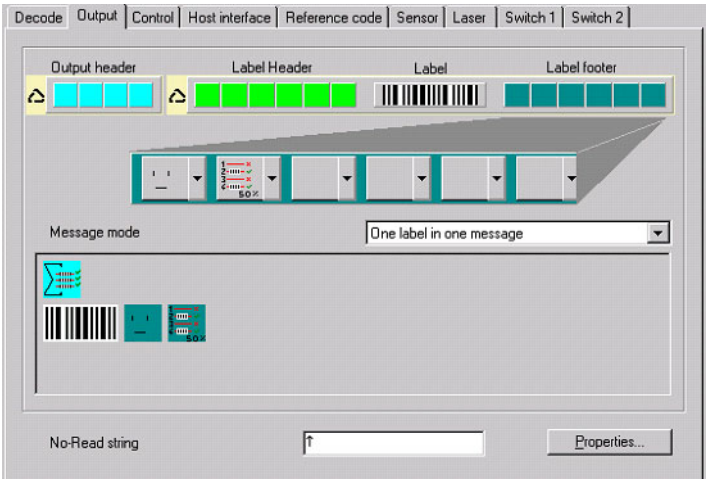


Figure 10.3: Output menu

Output header Select from the options listed below. The output header is sent in a separate message before the read result.

Label header The Label header is set directly before the code data.

Label footer The label footer is appended directly to the code data.

Message mode Selects whether the bar codes read are sent in concatenation or separately as individual strings.

Notice!

The structure of this message string is depicted symbolically in the preview window.

No read string This character is set for each unrecognised bar code. Multiple characters (=string) may be entered here. Up to 20 characters are possible.

Properties Set the desired formatting modes and formatting characters as necessary.

10.3 Control

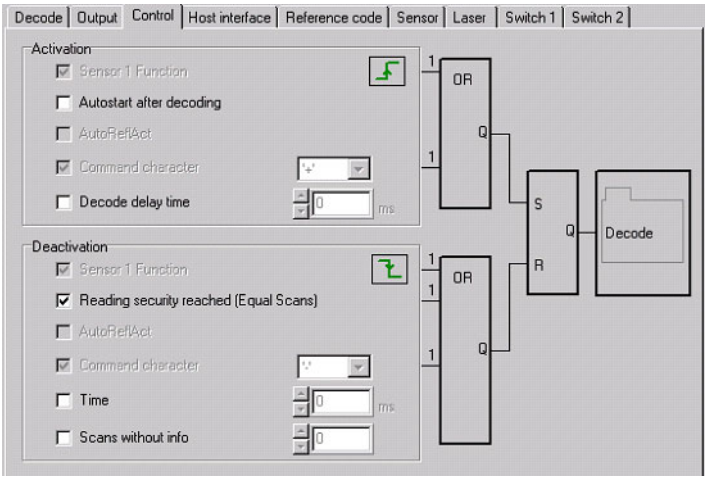


Figure 10.4: Control menu default settings

Activation

Sensor 1 function see menu "switching input"

Autostart after decoding In this mode, the scanner reads via an internal trigger signal with maximum performance. Attention: Up to 100 codes per second may be transmitted.

Command character The standard online character for the trigger start is the ´+´ character. This character can be changed only via the tree structure.

Decode delay time This point is usually used only for test purposes. After the time set here has passed, the scanner automatically reactivates itself following a reading gate end.

Deactivation

Sensor 1 function see menu "switching input"

Reading security reached (equal scans) If this item is activated, the read result is output immediately after the bar code is decoded.
If the item is deactivated, the read result is sent only after the trigger signal is returned (=end of reading gate).

Command character The standard online character for the trigger end is the ´-´ character. This character can be changed only via the tree structure.

Time For test purposes.
If the scanner is activated, the reading gate is automatically closed by the scanner after this preset time has elapsed.

Scans without info Following a successful read, the scanner waits for this number of scans (sequential scans with no read result) before it automatically deactivates itself.

10.4 Communication

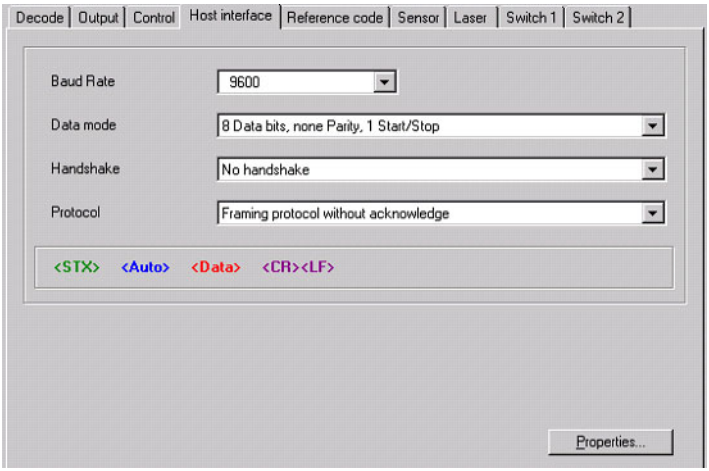


Figure 10.5: Standard setting of the communication menu

Select the desired baud rate, the stop bits, the data bits and the parity. In addition, various handshake modes and protocols can be set here.

The RK512/3964 protocol can be set here too. The single parameters for this protocol can be found in the configuration structure under: communication -> Host interface -> 3964 / RK 512 protocol.

Attention!

If the BCL 31 is operated in a network ("Leuze multiNet") no changes must be made here. The scanner adjusts itself automatically to the multiNet protocol.

10.4.1 Communication properties

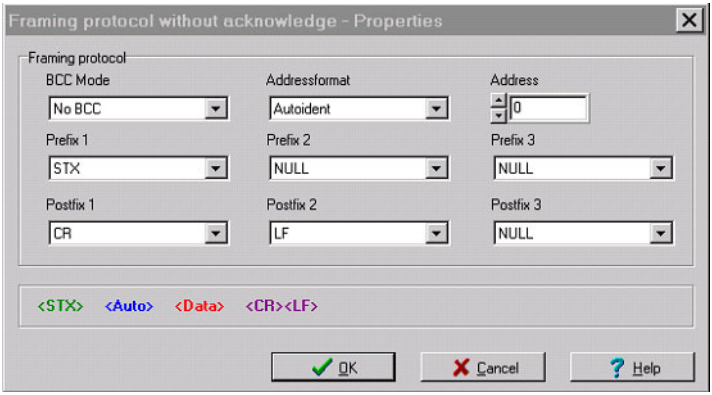


Figure 10.6: Standard setting of the property menu

The framing protocol (Prefix/Postfix), the address mode and a BCC mode can be set here.

Attention!

If the BCL 31 is operated in a network ("Leuze multiNet") no changes must be made here!

10.5 Reference code

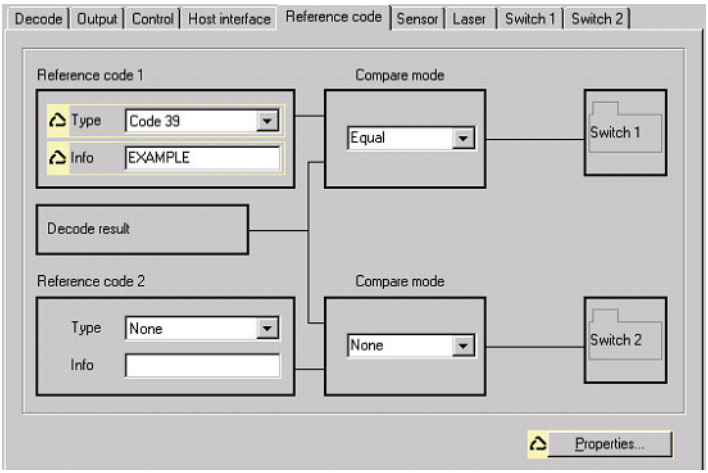


Figure 10.7: Reference code menu

A reference code is bar code information which is stored in the memory of the scanner.

This reference code can be compared with the current decoded bar code in various modes and, thus, set appropriately for the switching output. To do this, the switching output must still be set to "By comparison of reference code X" in the "Switch" menu.

One way to store the reference code is to enter it manually in this menu. You can find further options of the reference code teach-in in the chapter on online commands.

Type Select the code type.

Info Contents of the reference code

Compare mode Select here how the internally stored reference code is to be compared with the decoded result.
-> For additional comparison possibilities, please select the "Properties" menu

10.6 Sensor

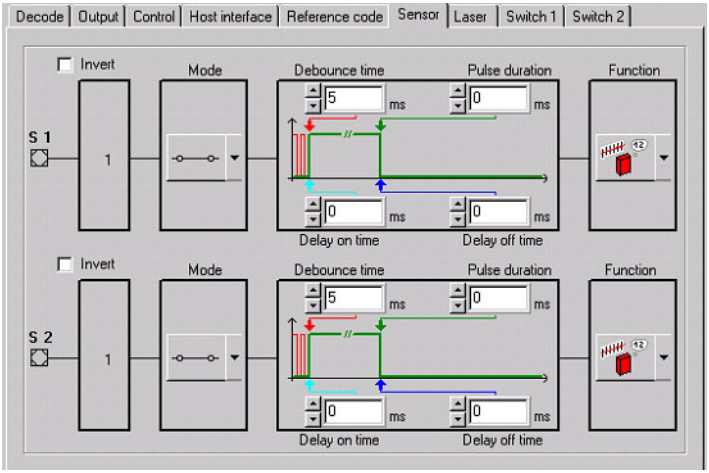


Figure 10.8: Standard setting of the switching input menu

Invert Here, the input level can be inverted.

Enable Switching input enabled or disabled.

Debounce time This time period must lapse until the trigger signal is regarded as valid.

Delay on time The trigger signal is passed on delayed by the specified time period.

Pulse duration If the value is higher than "0": duration of the activation, regardless of how long the trigger signal has been present.

Delay off time After the end of the trigger signal, the pulse is extended internally by this time period.

Notice!

If the switch-off delay is activated, the parameter "pulse duration" should be "0".

Function Event that is started when the switching input is activated.

10.7 Laser

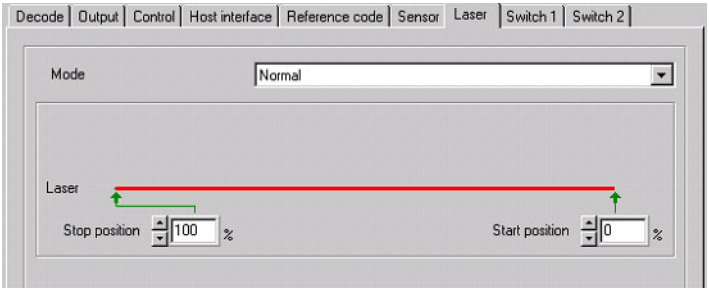


Figure 10.9: Laser menu

Start position and stop position Here, you can narrow down the reading field width of the laser beam.

Mode

- **Standard reading operation**
  This is the standard mode without the reflector polling function
- **Slow reflector polling with automatic reading gate control**
  In this mode, the decoding of the label is automatically started after the scanning beam to the reflector has been interrupted. The decoding is terminated no later than when the scanning beam to the reflector is cleared. This mode is intended for applications with slow transport speeds of about < 0.5 m/s.
- **Fast reflector polling without automatic reading gate control**
  In this mode, the decoding does not start automatically. Starting must be activated via a controller or via a switching input. This mode is intended for scanners with fast transport speeds of about > 0.5 m/s.
  This mode is also of interest if a programmable logic controller wants to know whether the scanning beam to the reflector is currently interrupted or not. If this is the case, the PLC can start the decoding by sending the + command. The PLC detects the change by receiving the characters "reflector discovered" or "reflector not discovered".
- **Fast reflector polling with automatic reading gate control**
  As mode 2 for fast transport speeds of about > 0.5 m/sec
- **Slow reflector polling without automatic reading gate control**
  As mode 3, but for slower transport speeds of about < 0.5 m/sec

Reflector polling

Reflector polling, also called autoReflAct, is an operating mode in which no external sensor is required. The activation and deactivation of the scanner is carried out via the reflector supplied. It must be installed within the scan range of the BCL 31/32.

For easy alignment in the autoReflAct mode, please select the menu "Assistant for AutoReflAct".

If you select this menu, the wizard tries to establish a connection to the BCL 31/32 connected. If this is successful, please select one of the four reflector polling modes under "mode" in the menu that appears. A screen like the following appears:

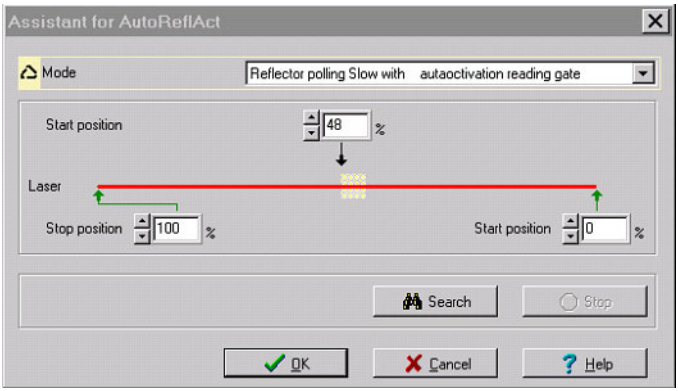


Figure 10.10:AutoReflAct Wizard

When you activate the "search" icon, the BCL 31/32 scans its reading range and tries to detect a reflector. For this, the reflector must be positioned in the reading range of the scanner.

After a reflector has been detected, it passes on the start position of the reflector in its reading range.

By clicking "OK", the values are stored in the scanner and in BCLConfig.

The scanner is now ready for the AutoReflAct operating mode.

Attention!

If reflecting objects other than the reflector are in the reading window of the scanner, the application must be checked carefully, as these reflecting objects may cause an incorrect triggering at the scanner!

The "fast reflector polling ..." modes are more suitable for applications with reflecting objects than the "slow reflector polling ..." modes

10.8 Switching output

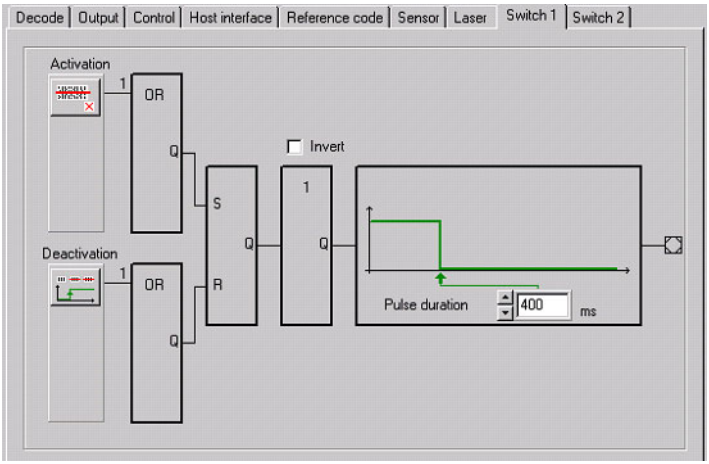


Figure 10.11:Standard setting of the switching output menu

Activation Select the desired event which is to initiate the switching of the switching output here. Multiple events can also be simultaneously activated.

Deactivation This implements the event that leads to the switching output being reset. (in case that the set pulse duration has not expired.) Multiple events can also be simultaneously activated.

Invert Level inverted

Pulse duration Duration of the switching output impulse. If the value"0" is entered here the output state is static, i.e. the signal is present until the event for deactivation occurs.

11 Online commands

11.1 Overview of Commands and Parameters

Online commands can be used to send commands directly to the device for control and configuration.

For this, the BCL 31/ 32 has to be connected to a host or service computer via the serial interface The commands can be sent either via the host or the service interface.

For information on the transmission protocol, please see Chapter 7.3.2.

With the commands, you can

Online commands

- Control/decode reading gate.
- Read/write/copy parameters.
- Carry out an automatic configuration.
- Teach/set reference code.
- Call up error messages.
- Call up statistical device information.
- Carry out a software reset in order to re-initialise the device.

Syntax

"Online" commands consist of one or two ASCII characters followed by command parameters.

No separation characters may be entered between the command and the command parameter(s). Both small and capitalised letters may be used.

Example:

Command **'CA'**: autoConfig function

Parameter **'+'**: Activation

Transmitted is: **'CA+'**

Notation

Commands, command parameters and returned data are enclosed between single quotation marks ' '.

Most "online" commands are acknowledged by the BCL 31/32 and any requested data returned. For commands that are not acknowledged, command execution can be observed or monitored directly on the device.

11.1.1 General 'Online' Commands

Software version number

Command	**'V'**
Description	Requests device version information
Parameter	no
Acknowledgement	**'BCL 3x V 01.00 08.01.1999'** The device type appears in the first line followed by the devices version number and date. The data which are actually displayed may vary from the values given here.

Notice!

This command allows you to check whether a host or service computer is correctly connected and configured. If you do not receive an acknowledgement, please check interface connections, protocol and service switches.

Software reset

Command	**'H'**
Description	Carries out a software reset. The device is restarted and reinitialised, leaving it in the same state as when the supply voltage is switched on.
Parameter	no
Acknowledgement	**'S'** (start signal)

autoConfig

Command	**'CA'**
Description	Activates or deactivates the 'autoConfig' function. Certain label reading parameters are programmed automatically in the setup by the labels which are read while the 'autoConfig' function is active.
Parameter	**'+'** activates 'autoConfig' **/** rejects the last code read **-** deactivates 'autoConfig' and stores the decoded data in the current parameter set.
Acknowledgement	**'CSx'** **x**: Status **'0'** valid **'CA'** command **'1'** invalid command **'2'** autoConfig could not be activated **'3'** autoConfig could not be deactivated **'4'** Result could not be deleted
Description	**'xx yy zzzzzz'** **xx**: Code type of the read code **'01'** 2/5 Interleaved **'02'** Code 39 **'06'** UPC (A, E) **'07'** EAN **'08'** Code 128, EAN 128 **'10'** EAN/UPC **'11'** Codabar **yy** Number of digits of the code detected **zzzzzz** Contents of the decoded label. The ↑ appears if the label was not correctly read.

Manual definition of the reference code

Command	RS
Description	This command can be used to define a new reference code in the BCL 2x by means of direct entry via the serial interface. The data are saved in the parameter set according to their input under reference code 1 through 9 and stored in the working buffer for direct further processing.
Parameter	**'RSyvxxzzzzzzzz'** **y**, **v, x** and **z** are placeholders (variables) for the actual input. **y**: def. reference code No **'1'** (Code 1) **'2'** (Code 2) … **'9'** (Code 9) **v** Storage location for the reference code: **'0'** RAM+EEPROM **'3'** only RAM **xx** def. Code type (see Command 'CA') **z** def. Code information (1 … 63 characters)
Acknowledgement	**'RSx'** **x**: Status **'0'** valid 'Rx' command **'1'** invalid command **'2'** insufficient memory for reference code **'3'** reference code has not been saved **'4'** reference code invalid
Example	Input = 'RS130678654331' (Code 1 (1), RAM only (3), UPC (06), code information

Teach-In

Command	'RT'
Description	This command enables a reference code to be defined quickly by reading an example label.
Parameter	**'RTy'** Function **'1'** defines reference code 1 **'2'** defines reference code 2 … **'9'** defines reference code 9 **'+'** activates the definition of reference code 1 up to the value of Parameter no_of_labels **-** Exit the Teach-In process
Acknowledgement	The BCL first responds with the command **'RS'** and corresponding status (see Command RS). After a barcode has been read, it sends the result in the following format: **'RCyvxxzzzzz'** **y**, **v, x** and **z** are placeholders (variables) for the actual input. **y**: def. reference code No **'1'** (Code 1) … **'9'** (Code 9) **v**: Storage location for reference code **'0'** RAM+EEPROM **'3'** only RAM **xx** def. Code type (see Command 'CA') **z** def. Code information (1 … 63 characters)

Notice!

With this function, only code types are recognised that are identified using the autoConfig-function or which were set in the setup.

- *After each reading via an 'RTx' command, explicitly switch off the function again since failure to do so will interfere with other commands as well as prevent execution of a new 'RTx' command.*

Reading a reference code

Command	**'RR'**
Description	The command reads out the reference code defined in the BCL. If no parameters are specified, all defined codes are output.
Parameter	<Reference code number> **'1' '9'** value range of reference codes 1 to 9
Acknowledgement	If no reference codes are defined, the BCL responds with the **'RS'** command and corresponding status (see Command RS)**.**For valid codes, the output corresponds to the following format: **RCyvxxzzzzzz** **y**, **v, x** and **z** are placeholders (variables) for the actual input. **y**: def. reference code No **'1'** (Code 1) … **'9'** (Code 9) **v**: Storage location for reference code **'0'** RAM+EEPROM **'3'** only RAM **xx** def. Code type (see Command 'CA') **z** def. Code information (1 … 63 characters)

11.1.2 'Online' Commands for System Control

Activate sensor input 1

Command	**'+'**
Description	The command activates decoding.
Parameter	no
Acknowledgement	no

Deactivate sensor input 1

Command	**'-'**
Description	The command deactivates decoding.
Parameter	no
Acknowledgement	no

Activate sensor input 2

Command	**';'**
Description	The command activates the definition of reference code 1.
Parameter	no
Acknowledgement	no

Deactivate sensor input 2

Command	**'.'**
Description	The command deactivates the definition of reference code 1.
Parameter	no
Acknowledgement	no

Activate switching output

Command	**'OA'**
Description	The command activates a selected switching output.
Parameter	**'OAx'**: Activate switching output **x**: Switching output No **'1'** (Output 1) **'2'** (Output 2)
Acknowledgement	no

Deactivate switching output

Command	**'OD'**
Description	The command deactivates a selected switching output.
Parameter	**'ODx'**: Deactivate switching output **x**: Switching output No **'1'** (Output 1) **'2'** (Output 2)
Acknowledgement	no

11.1.3 'Online' command for querying error messages

Query memory error messages

Command	'ER'
Description	The command queries the buffer memory of the error messages.
Parameter	no
Acknowledgement	1st line: **New: cc** 2nd through 11th lines: **'- 00.000'** if no error has occurred **'F tt.fff'** if a fatal error has occurred **'E tt.fff'** if an error has occurred **'C tt.fff'** if a critical warning has occurred **'W tt.fff'** if a warning has occurred
Description	**cc**: number of (new) errors in the error buffer **tt**: task/ function number **fff**: error number Upon output, the counter for the number of errors in the error buffer is deleted, but not the buffer itself!

Notice!

If an error occurs, note the error number and contact your local Leuze service organisation.The addresses can be found on the back page of this operating manual.

11.1.4 'Online' Commands for Parameter Set Operations

Definitions

- **<BCC type>** type of the checksum calculation
  '0': no checksum
  '3': XOR checksum (mode 3)
- **<PS type>** type of the parameter set
  '0': current parameter set (data stored in the EEPROM non-volatile)
  '1': reserved
  '2': standard parameter set (not changeable)
  '3': operating values (data in the RAM, will be lost after reset)
- **<Status>** mode of the parameter processing
  '0': does not perform a reset following the write operation; no other parameters follow.
  '1': does not perform a reset following the write operation; other parameters follow.
  '2': subsequently performs a reset, no other parameters follow.
- **<Start address>** Relative address of the parameter within the parameter set
  valid values from '000' to '893'
- **<Para0L> <Para0H>… <Para122L> <Para122H>**:
  Parameter-set data of the message. The sequence of the data is arranged identically to the BCL, i.e. when a word is transmitted, first the low byte is sent then the high byte. The parameter-set data are converted for transmission from HEX format to a 2-byte-ASCII format. In the conversion two ASCII characters - representing the lower and higher nipples - are created for each HEX value.
  Example:

Decimal	HEX	Transmission
4660	0x1234	**'1' '2' '3' '4'** = 31h 32h 33h 34h

- Para0H = 31h, Para0L = 32h, Para1H = 33h, Para1L = 34h
  Taking into consideration the maximum message length and the remaining command parameters, a maximum of 123 bytes of parameter data (246 bytes of message data) can be transmitted at one time.
  valid values: '0' … '9', 'A' … 'F'
- **<Acknowledgement>**:
  Acknowledgement of the transmitted message
  '0' valid transmission
  '1' invalid message
  '2' invalid length of message
  '3' invalid block check type
  '4' invalid block check checksum
  '5' invalid data length
  '6' invalid message data
  '7' invalid start address
  '8' invalid parameter set
  '9' invalid parameter type

Copy parameter set

Command	**'PC'**
Description	The command copies complete parameter sets.
Parameter	**'03'** copy parameters from the EEPROM into the RAM and initialise all associated functions **'20'** copy standard parameters from the FLASH into the EEPROM **and** RAM and initialise all relevant functions **'30'** copy parameters from the RAM into the EEPROM
Acknowledgement	**'PSx'** **x**: Status **'0'** valid transmission **'1'** invalid message **'2'** invalid message length **'3'** invalid block check type **'4'** invalid block check checksum **'5'** invalid data length **'6'** invalid message data **'7'** invalid start address **'8'** invalid parameter set **'9'** invalid parameter type

Request parameter set from the BCL

Command	**'PR'**
Description	The command requests parameter data from the BCL. The parameter <PS-Type> indicates from which parameter set the data are to be transmitted.
Parameter	<BCC type> <PS type> <Start address> <Data length>
Acknowledgement	**'PSx'** **x**: Status **'0'** valid transmission **'1'** invalid message **'2'** invalid message length **'3'** invalid block check type **'4'** invalid block check checksum **'5'** invalid data length **'6'** invalid message data **'7'** invalid start address **'8'** invalid parameter set **'9'** invalid parameter type

Acknowledge parameter message

Command	**'PS'**
Description	The command acknowledges the received message and delivers an acknowledgement status which indicates whether the message was valid or invalid.
Parameter	**'PSx'** **x**: Status **'0'** valid transmission **'1'** invalid message **'2'** invalid message length **'3'** invalid block check type **'4'** invalid block check checksum **'5'** invalid data length **'6'** invalid message data **'7'** invalid start address **'8'** invalid parameter set **'9'** invalid parameter type

Transmit parameters

Command	**'PT'**
Description	The command transmits parameter data from the specified address and stores them in an intermediate buffer. If the status indicates that additional messages follow, they are also stored in the intermediate buffer before being stored under the appropriate parameter-set type in the EEPROM. The transmission can optionally take place with a block-check test of the message data.
Parameter	<BCC type> <PS type> <Status> <Start address> <Para0L> <Para0H> [… <Para122L>][<BCC>]
Acknowledgement	**'PSx'** **x**: Status **'0'** valid transmission **'1'** invalid message **'2'** invalid message length **'3'** invalid block check type **'4'** invalid block check checksum **'5'** invalid data length **'6'** invalid message data **'7'** invalid start address **'8'** invalid parameter set **'9'** invalid parameter type

12 Maintenance

12.1 General Maintenance Information

Usually, the barcode reader BCL 31/32 does not require any maintenance by the operator.

Cleaning

Should it become soiled, clean the glass window of the BCL 31/32 with a soft cloth.

Notice!

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

12.2 Repairs, Servicing

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

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

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