



CLP 100 Bar Code Reader

SICK

Described software state

Software/Tool	Function	Revision index
CLP 100	Firmware	From V 1.10
CLP Setup	User interface (window-based)	From V 1.10
CLP Setup Help	On-line help (HTML)	From V 1.10
I-ViewPro™	Off-line browser (HTML)	V 2.38

Abbreviations used

- CLP** Code Leser Parallel (Code Reader Parallel)
CCD Charge Coupled Device
PLC Programmable Logic Controller
HTML Hyper Text Markup Language
LED Light Emitting Diode

Production state of the CLP 100

Device type	Revision index
CLP 100-0010	0000
CLP 100-2010	0000
CLP 100-0110	0000
CLP 100-2110	0000

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1 Notes on this document

1.1 Function

This document instructs you on using the CCD bar code reader CLP 100. It contains information on

- Device installation and electrical installation
- Startup
- Operation and configuration (parameterization)
- Maintenance

1.2 Target audience

The target audience for this document consists of electricians, service technicians and engineers.

1.3 Information content

This document contains all the information required for the installation, electrical installation and startup of the bar code reader CLP 100 with the **default setting in our works**.

All actions are described step-by-step.

Parameterization of the CLP 100 for the **application-specific reading configuration** is carried out with the CLP Setup user interface. Installation and use of the software are described in the appendix.

Further information on the construction of the bar code reader as well as the bar code technology can be obtained from SICK AG, Auto Ident Division.

1.4 Symbols used

Some information in this document is emphasized.

Note A "Note" informs on exceptional features.

Recommendation A "Recommendation" provides information on how to carry out an action optimally.

Hint A "Hint" explains the setting possibilities in the CLP Setup software.

THIS FONT characterizes a term used in the user interface of the CLP Setup software (for example, menu item, tab card).

2 Safety information

2.1 Authorized users

The CLP 100 must be installed and operated by qualified personnel in order to ensure that it functions correctly and safely. The following qualifications are required for the various activities:

Installation and maintenance

- Practical electrical training
- Knowledge of the common safety instructions at the workplace

Electrical installation and replacing devices

- Practical electrical training
- Knowledge of the common electrical safety instructions
- Knowledge of the operation and handling of the devices of the respective application (for example, packaging machines, clinical automatic analyzer, access control)

Startup, operation and configuration

- Knowledge of the operation and handling of the devices of the respective application (for example, packaging machines, clinical automatic analyzer, access control)
- Basic knowledge of Windows 95™, Windows 98™ or Windows NT™
- Basic knowledge of a HTML browser (for example, Netscape Navigator™)
- Basic knowledge of serial data transmission
- Basic knowledge of bar code technology

2.2 Intended use

The CLP 100 is used for the automatic detection and decoding of bar codes. It is installed as a reading station and reads, for example, bar codes on objects of a clinical automatic analyzer. The CLP 100 transmits the decoded bar code information via its host interface to a host computer for further processing.

The user forfeits any warranty claims against SICK AG in case of any other use as well as in case of changes to the device, also during device installation and electrical installation .

2.3 General safety instructions

- Read the general safety instructions thoroughly and observe them strictly at all activities at the bar code reader. This also applies to the warnings before the handling instructions in the individual chapters of this document.



LED lighting can endanger your eyes!

The CLP 100 uses an LED illumination line. The retina can be damaged if you look too long into the beam.

- Do not look directly into the LED illumination line.
-

2.4 Quick- Stop and Quick-Restart

2.4.1 Switching off the CLP 100

- Switch off the supply voltage.

At the most the last read result is lost.

2.4.2 Switching on the CLP 100 again

- Switch on the supply voltage.

The CLP 100 resumes operation with the last parameter set saved.

2.5 Environmental information

The CLP 100 is designed so that it harms the environment as little as possible. It does not contain or emit any substances harmful to the environment and is not a source of faults for, for example, coating wetting in paint shops.

The maximum power consumption of the CLP 100 amounts to 2 W.

2.5.1 Disposal after final removal from service

Dispose of unusable or irreparable devices in accordance with the respective state regulations on waste disposal in a manner compatible with the environment. The CLP 100 design allows it to be separated into recyclable secondary raw materials (housing) and hazardous waste (electronic scrap). *Also refer to Section 7.3, Page 27.* At present, SICK AG does not take back devices which have become unusable or irreparable.

3 Product description

3.1 Design

3.1.1 Scope of delivery

The **packing** of the CLP 100 contains the following:

- One bar code reader CLP 100
 - One information sheet (notes on device) with connection diagram and Quick-Start
- Depending on the **number of devices ordered** one or more of the following are included:
- These CLP 100 operating instructions in English and German
 - A set of DOS-formatted diskettes (3.5") containing the CLP Setup operating software for Windows™, the CLP Setup Help on-line help system and the HTML browser I-ViewPro™

3.1.2 Variants

At present the CLP 100 is available in the following variants:

Device	Light emission	Connection
CLP 100-0010	Front	9-pin D-Sub plug
CLP 100-2010	Side	9-pin D-Sub plug
CLP 100-0110	Front	Open cable end
CLP 100-2110	Side	Open cable end

Tab. 3-1: Variants of the CLP 100

3.1.3 System requirements

The following are required to start-up and operate the CLP 100:

- A public supply system device with an output voltage of 5 V DC \pm 5 % in accordance with IEC 742 (functional extra-low voltage) and at least 2 W power output
- In the case of external reading pulsing via the "Sensor" switching input: A suitable sensor for signaling an object with bar code, for example, a reflection photoelectric switch
- A PC with Windows 95™, Windows 98™ or Windows NT™ and a serial interface ("COM x" port)
- An RS-232 data connection cable (TxD and RxD transposed)
- In order to use a CLP Setup Help on-line help system an HTML browser, for example, Netscape Navigator™ or the enclosed I-ViewPro™ (*refer to Section 3.1.1 Scope of delivery*)

3.1.4 Design

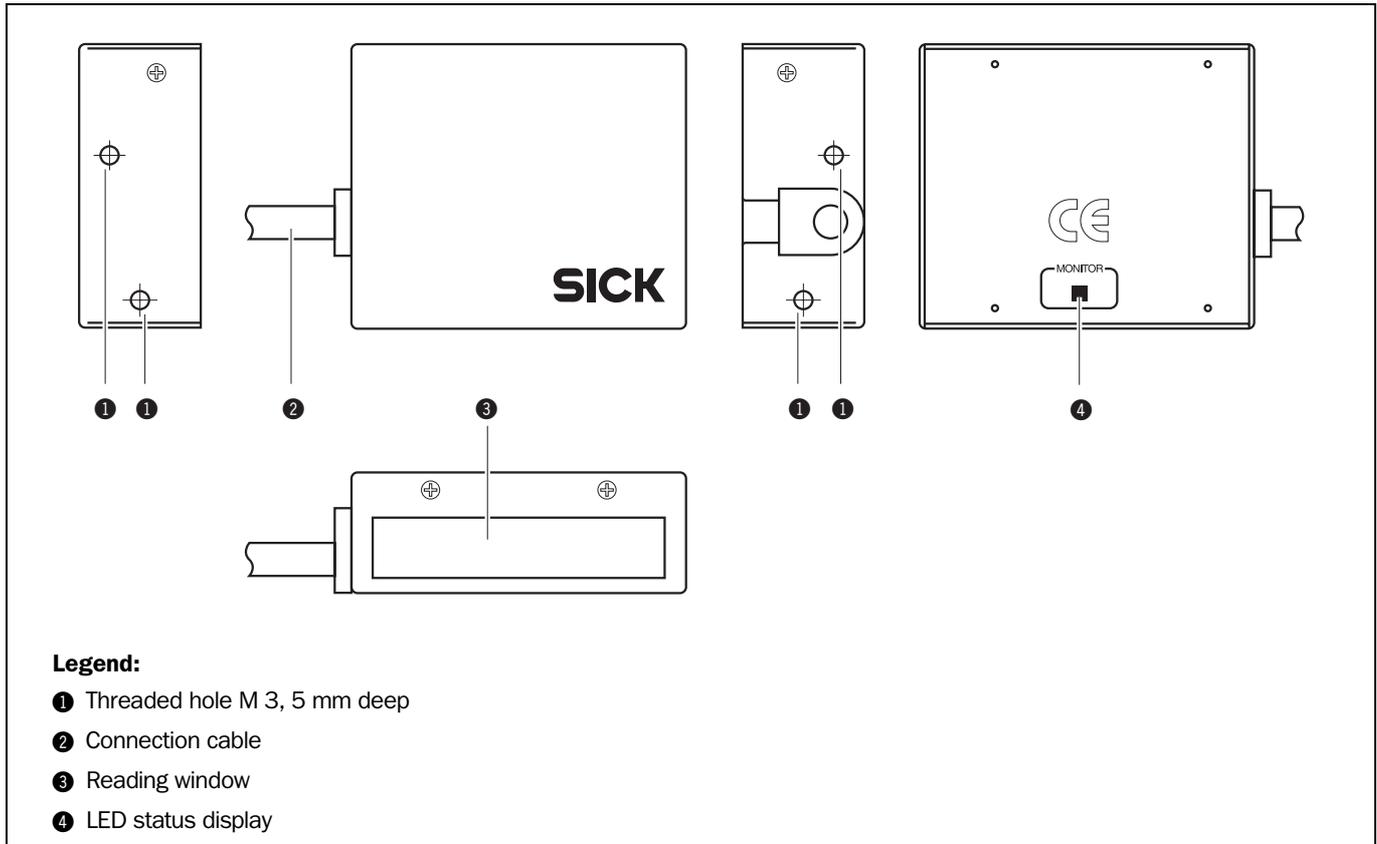


Fig. 3-1: Design of the CLP 100 with face-end light emission

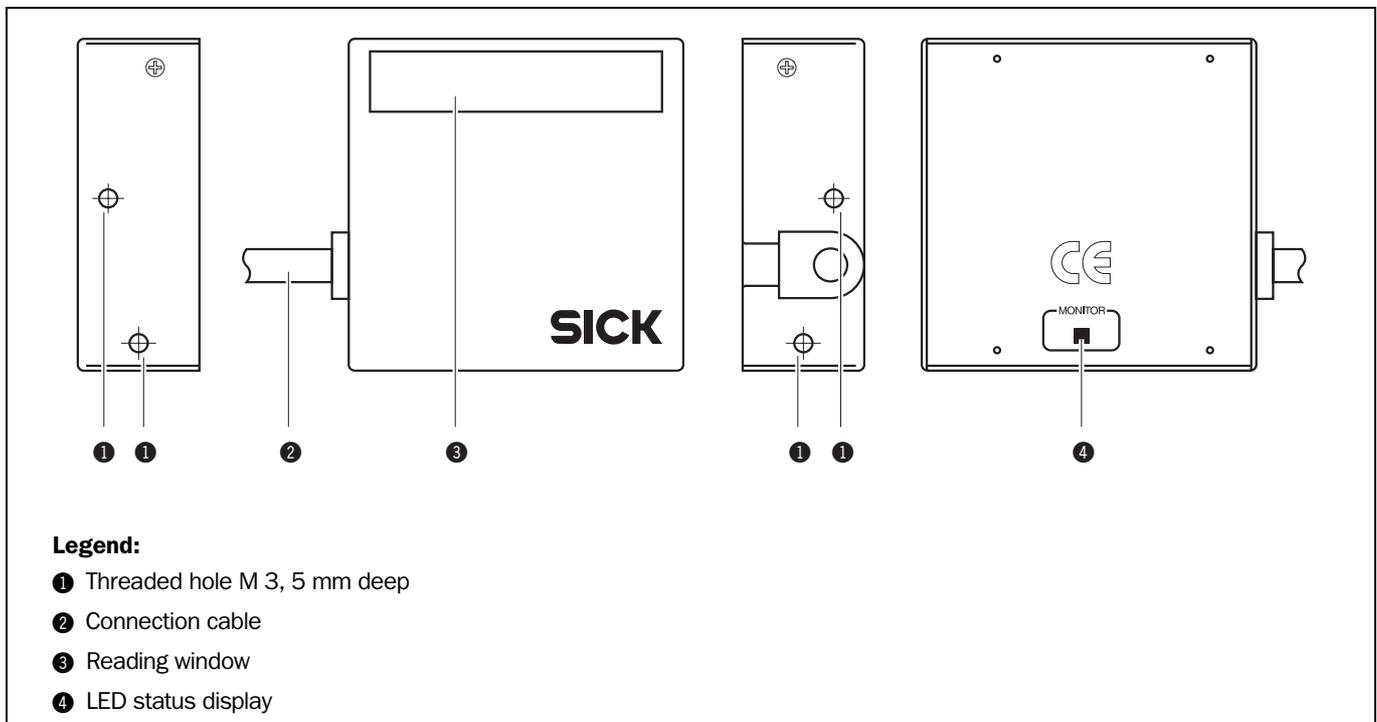


Fig. 3-2: Design of the CLP 100 with side light emission

3.2 Working method of the device

The CCD bar code reader CLP 100 detects bar codes in an illuminated scan field (scan line) and decodes the bar codes. The CLP 100 transmits this data via the serial host interface to a host/PC for further processing. Refer to *Figure 3-3* for an overview of the functionality of the CLP 100.

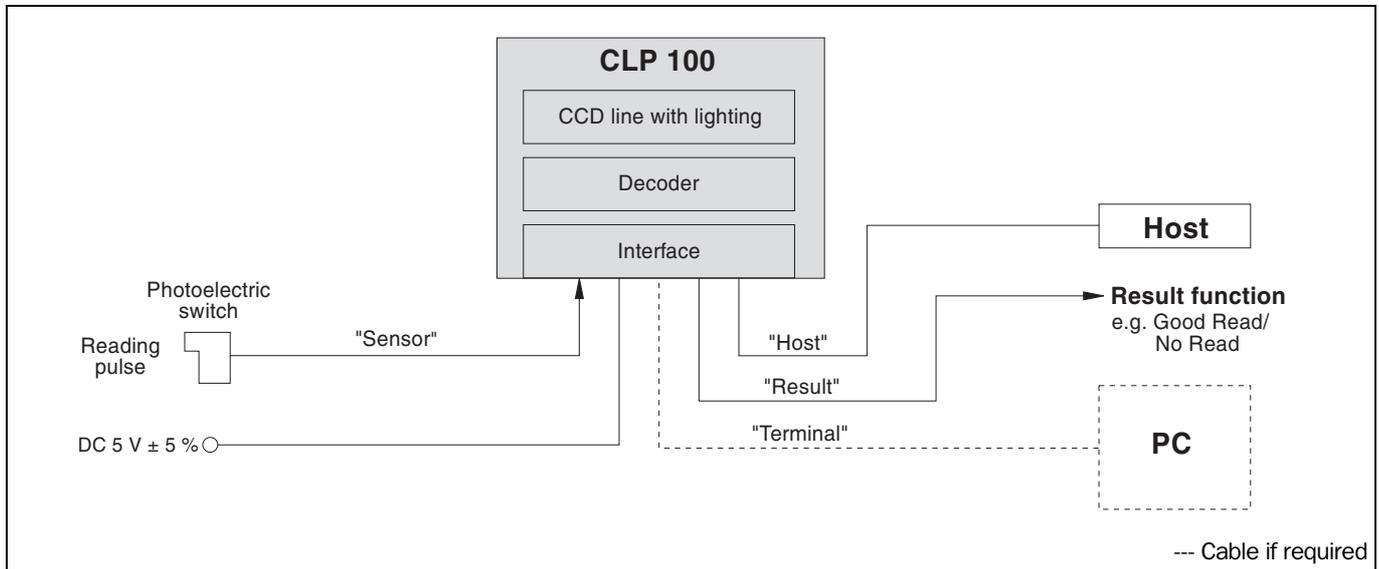


Fig. 3-3: Function of the CLP 100

The CLP 100 derives useful data for diagnostics from the reading processes. The quality of the reading data can be checked in the diagnosis mode.

The CLP 100 requires suitable pulsing (triggering) in order to start a reading process when there is an object in the reading area. This results in a time window for the reading process being opened in the CLP 100. Triggering is carried out either with an external sensor or with a command string via the host interface. Both options are active in the default setting.

The switching input ("Sensor" input) informs the CLP 100 when it must start a reading process. The switching output ("Result" output) can have result functions assigned to them and triggers external devices such as, for example, a PLC input.

3.3 Display and operating elements

The CLP 100 is operated or parameterized via the host interface by using the CLP Setup PC software or with command strings. The CLP 100 is adapted to various applications by means of parameterization. The CLP Setup software is used, for example, to carry out the following settings:

- Configuration of the code types to be read
- Read, evaluation and output properties
- Communication parameters of the host interface
- Structure of the data output strings of the host interface
- Function of the auxiliary interface (terminal interface)

Section 10.2, Page 33 describes the installation and handling of the CLP Setup software. The procedure for parameterizing the CLP 100 with the software is explained in *Section 6.5, Page 21*.

An LED status display ("Monitor") with two LEDs (red and green) on the rear of the CLP 100 indicates the current operating state of the device. The meaning of the display for the

respective operating mode is shown in *Table 3-2*. The display can be parameterized differently in some operating modes. The table lists all the possible meanings.

Operating mode	Display	Function
Start	Green/ red	<ul style="list-style-type: none"> Light up during the switching on phase if the self-test is successful Extinguish when changing to the read standby state
Reading mode	Green/ red	<ul style="list-style-type: none"> Light up when the signal for reading is given, until the beginning of the next reading cycle
	Green	<ul style="list-style-type: none"> Lights up after successful reading ("Good Read")
	Red	<ul style="list-style-type: none"> Extinguishes after successful reading ("Good Read")
Adjusting mode	Green	<ul style="list-style-type: none"> Extinguishes after unsuccessful reading ("No Read")
	Red	<ul style="list-style-type: none"> Lights up after unsuccessful reading ("No Read")
Matchcode operation	Green/ red	<ul style="list-style-type: none"> Extinguish, when there was no signal for reading and there is no read result
	Red	<ul style="list-style-type: none"> Lights up at "No Read" or "Read & No Match" or in accordance with the parameterization Lights up at "No Read" or "Read & Match"
	Green	<ul style="list-style-type: none"> Lights up at "Read & Match" or in accordance with the parameterization Lights up at "Read & No Match"

Tab. 3-2: Meaning of the LED displays

4 Installation

4.1 Installation sequence

- Select the installation site for the CLP 100
- Connect the power supply
- Align the CLP 100 to the bar code
- Install the CLP 100
- Adjust the CLP 100
- Install the external sensor for the reading pulse

4.2 Preparations for installation

4.2.1 Laying out the components to be installed ready

- CLP 100 bar code reader

4.2.2 Laying out the required tools ready

- 2 screws for fixing the CLP 100 to the installation site
Screw diameter: 3 mm,
Screw length depends on the wall thickness of the base.
Screws may not be screwed more than 5 mm into the CLP 100
- Tool
- Measuring tape
- Angulometer

4.2.3 Selecting the installation site

When selecting the installation site take the distance between the CLP 100 and the host as well as the distance between the CLP 100 and the bar code into consideration. The angle between the scan line and bar code is selected, so that a good reading is possible. The optimal setting of the angle is described further below.

The CLP 100 is fastened by means of two threaded holes (M 3) to the top or bottom of the device (refer to Figure 4-1). The complete housing dimensions are shown in Section 9.2, Page 32.

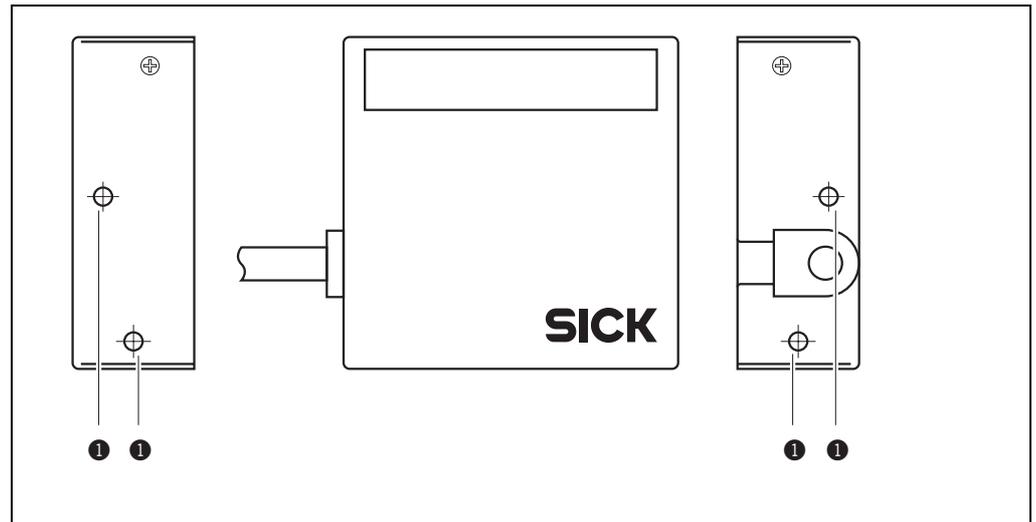


Fig. 4-1: Position of the threaded holes ❶ at CLP 100

Distance between the CLP 100 and the host

The maximum distance between the CLP 100 and the host when extension cables are used amounts to 12 m (host interface RS-232).

Distance between the CLP 100 and the bar code

The distance a between the reading window of the CLP 100 and the bar code must amount to 20 to 70 mm depending on the width of the bar code (refer to Figure 4-2). Section 10.3, Page 38 shows the width of the reading area of the CLP 100 in relation to the reading distance for various resolutions (module widths).

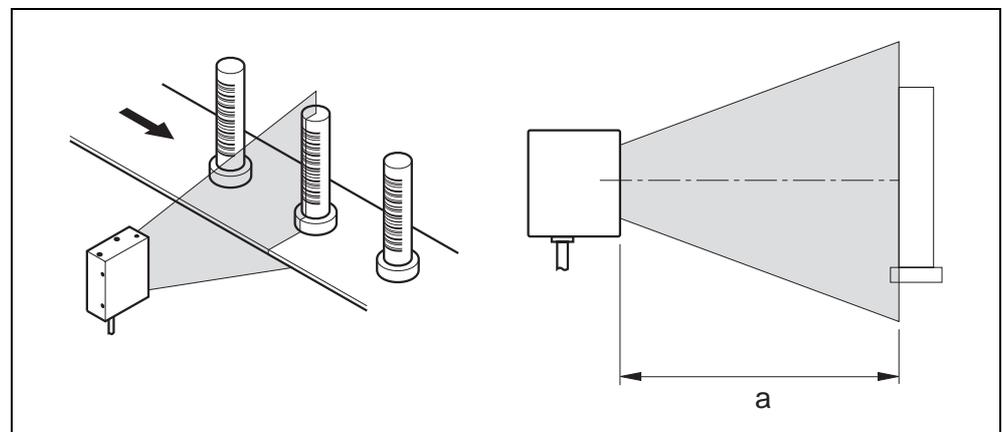


Fig. 4-2: Reading distance to the object

Angle alignment of the CLP 100

The optimum alignment of the CLP 100 is reached at an angle of 90° between the scan line and the bar code bars (refer to Figure 4-3). Possible reading angles which can arise between the scan line and the bar code bars must be taken into consideration (refer to Figure 4-4 and Table 4-1).

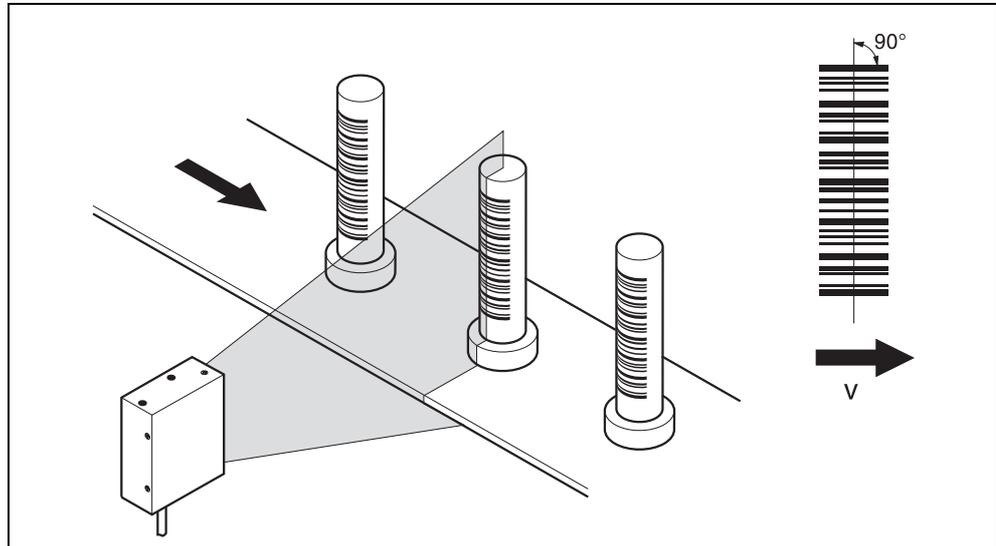


Fig. 4-3: 90° angle between the scan line and the bar code bars

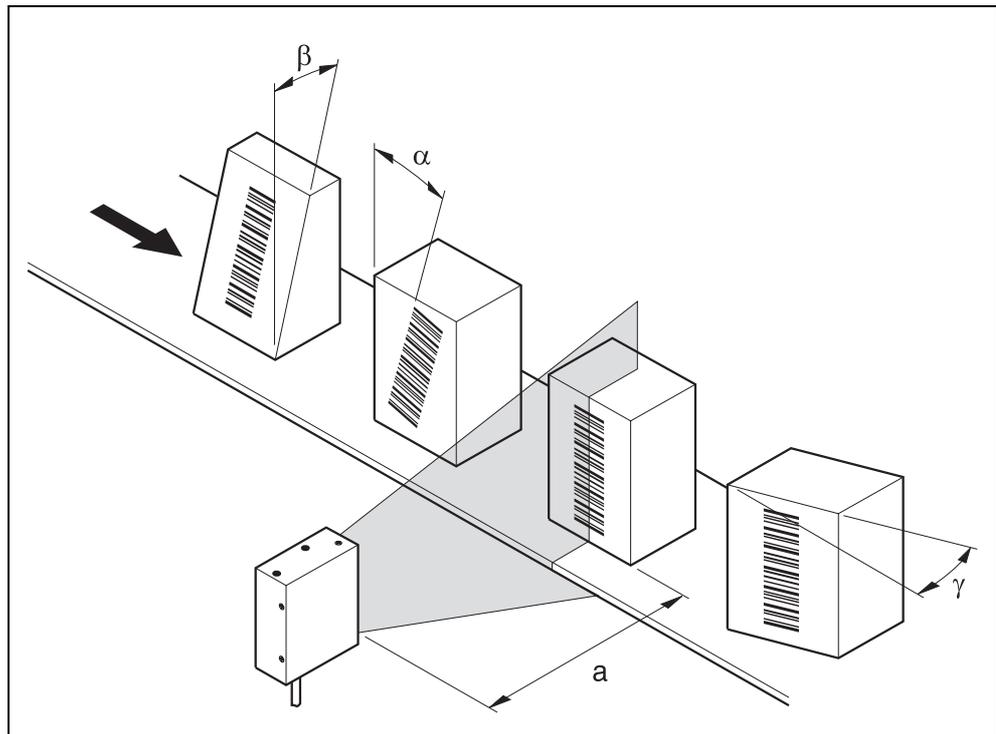


Fig. 4-4: Reading angle occurring between the scan line and the bar code bars

Angle	Limit
Tilt α	$0^\circ \pm 2^\circ$
Pitch β	$0^\circ \pm 5^\circ$
Skew γ	$10^\circ \pm 5^\circ$

Tab. 4-1: Permissible angle occurring between the scan line and the bar code bars

Note If the light of the scan line falls exactly vertically on the surface of the bar code, disturbing reflections can occur when the reflected light is received. In order to avoid this effect the CLP 100 must be installed so that the emitted light is tilted relative to the perpendicular (refer to Figure 4-5).

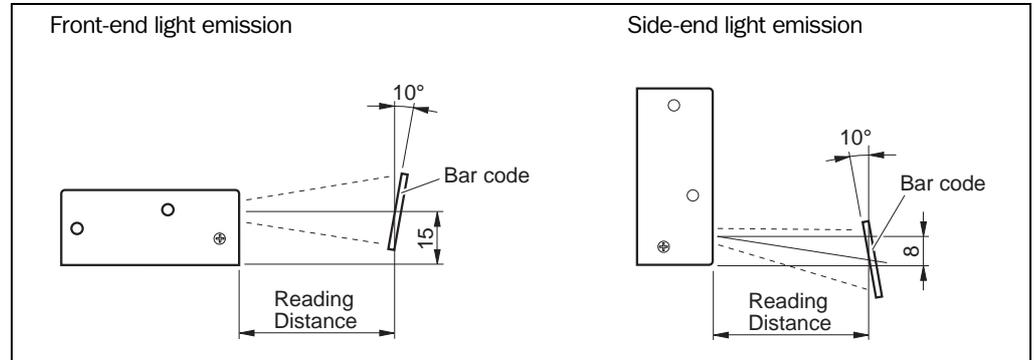


Fig. 4-5: Angle between the emitted light and the bar code (tilted to the perpendicular)

4.3 Installation and adjustment of the device

4.3.1 Installing the CLP 100

1. Align the CLP 100 so that the angle between the scan line and the bar code bars amounts to 90° . Take any possible reading angle occurring into consideration (refer to Figure 4-4).
2. In order to avoid disturbing reflections align the CLP 100 so that the emitted light impacts on the bar code at an angle of 100° (refer to Figures 4-5 and 4-6).



Damage to the housing

The screws may not be screwed more than 5 mm into the CLP 100. Longer screws may damage the housing.

- Use screws with a suitable length.

3. Screw the screws through the base to which the CLP 100 is fastened into the threaded hole.
4. Tighten the screws slightly.
5. Adjust the CLP 100 as described below.

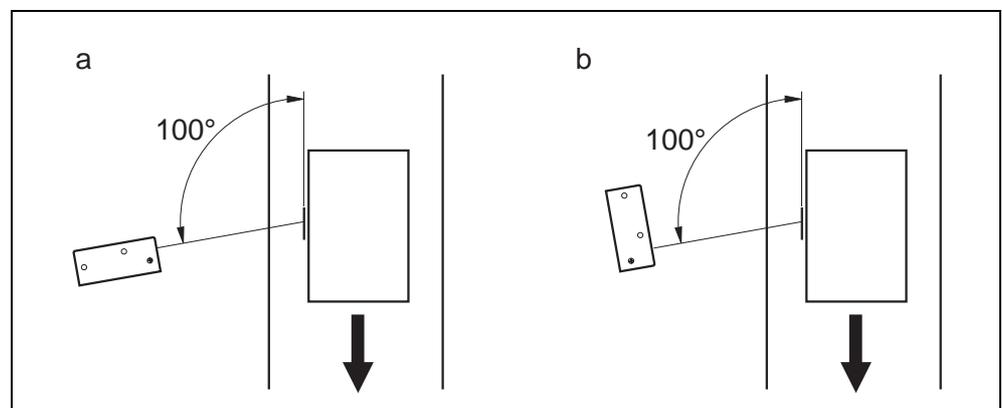


Fig. 4-6: Adjustment of the CLP 100 in order to avoid reflections;
a: With front-end light emission, b: With side-end light emission

4.3.2 Adjusting the CLP 100

The adjusting operating mode supports the adjustment of the CLP 100. In this operating mode the green LED extinguishes if the reading process fails ("No Read"). If the green LED does not light up, the CLP 100 cannot read the bar code. If the green LED flickers, the CLP 100 can only read the bar code badly. If the green LED shows steady light, the CLP 100 is aligned optimally. The scanning frequency in adjusting mode amounts to 500 Hz.

1. Connect the CLP 100 to the supply voltage and switch on the supply voltage.
2. Connect the CLP 100 to the PC.
3. Call up the CLP Setup user interface (refer to Section 10.2, Page 33).
4. In the CLP Setup select the DEVICE CONFIGURATION tab card.
5. Click in the OPERATING MODE field and select ADJUSTING MODE.
6. Click in the LED DISPLAY field and select No READ/GOOD READ.
7. Carry out the download to the CLP 100 (refer to Section 6.5.1, Page 21).
8. Guide objects with bar codes realistically into the reading area of the CLP 100. Ensure that the permitted reading angle is not exceeded.
9. Start the reading pulse: Cover the optical path of the sensor or make connection (refer to Section 4.4).
10. Align the CLP 100 so that the green LED lights up steadily as far as possible (reading result "Good Read").
11. Tighten the screws.

The CLP 100 is aligned optimally to the bar code.

4.4 Installing the reading-pulse sensor

If the CLP 100 is triggered via an external sensor, the sensor and a reflector have to be installed near the CLP 100. Figure 4-7 shows an example of the installation site of the sensor.

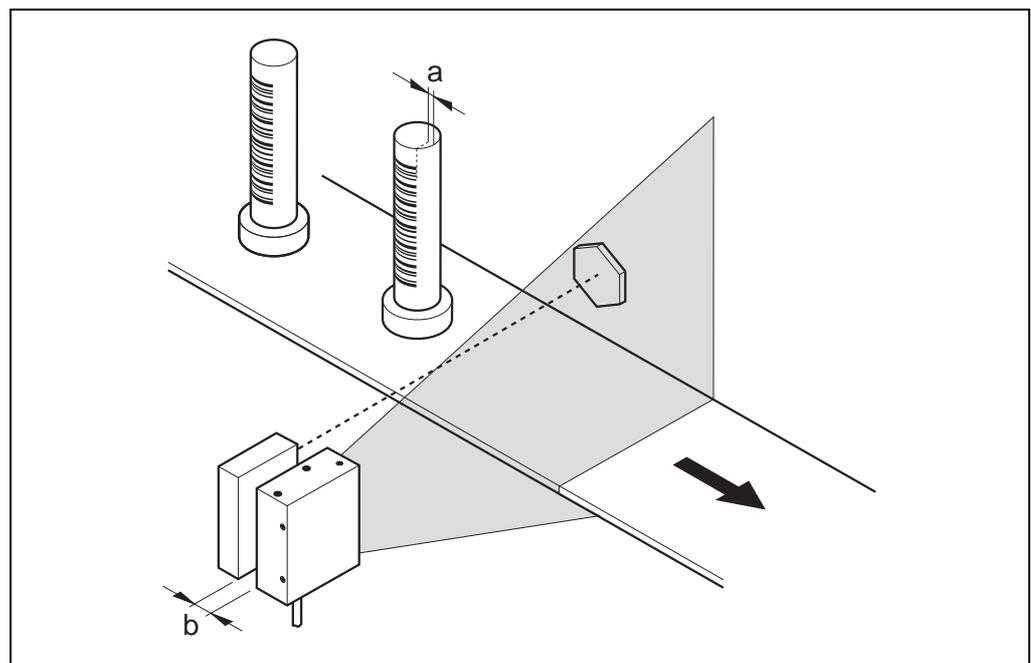


Fig. 4-7: Installation site for the reading-pulse sensor and the reflector (b smaller than a)

1. Install the reading-pulse sensor at the installation site.
2. Connect the reading-pulse sensor to the CLP 100 (refer to Section 5.4.5, Page 18).
3. Call up the CLP Setup and check the read result with the terminal emulator (refer to Section 6.5, Page 21).
4. Check whether the reading process of the CLP 100 is synchronized with the incoming objects.

4.5 Disassembling the device

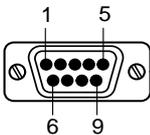
1. Switch off the supply voltage.
2. Disconnect the cable connection.
3. Screw off the CLP 100.
4. Dispose of the CLP 100 ecologically friendly (refer to Section 7.3, Page 27).

5 Electrical installation

5.1 Electrical connections

The electrical connection of the CLP 100 is carried out either via a 9-pin D-Sub cable plug or the open cable end.

5.2 Pin assignment of the connection plug or wire colors of the cable end



Pin	Signal
1	Sensor
2	RxD (Host)
3	TxD (Host)
4	Result "GO/NG"
5	GND
6	Not assigned
7	RxD (Terminal), TTL
8	TxD (Terminal), TTL
9	+5 V

Tab. 5-1: Pin assignment of the connection plug

Wire color open cable end	Signal
Pink	Sensor
Brown	RxD (Host)
Gray	TxD (Host)
White	Result "GO/NG"
Black	GND
Yellow	RxD (Terminal), TTL
Orange	TxD (Terminal), TTL
Red	+5 V
Blue	RTS
Green	CTS

Tab. 5-2: Assignment of the wire colors of the cable end

5.3 Planning the electrical installation

5.3.1 Requirements for the host interface

The host interface of the CLP 100 is operated as an RS-232 interface. For the pin assignment refer to *Table 5-1* or *Table 5-2*.

Table 5-3 shows the recommended maximum cable lengths as a function of the data transmission rate.

Interface type	Transmission rate	Max. distance to the host
RS-232	Up to 19,200 bits/s	12 m

Tab. 5-3: Maximum cables lengths between the CLP 100 and the host

Recommendation In order to avoid interferences, do not lay the cable parallel to the power-supply and motor cables (for example in cable ducts).

5.3.2 Supply voltage

For operation the CLP 100 requires a supply voltage of 5 V DC \pm 5 % in accordance with IEC 742 (functional extra-low voltage). The power supply unit must also fulfil IEC 742 and output a continuous output of 2 W.

5.4 Carry out the electrical installation

5.4.1 Installation steps

- Connecting the supply voltage
- Wiring the host interface (Connecting the PC)
- Wiring the "Sensor" switching input
- Wiring the "Result" switching output

5.4.2 Connecting the supply voltage

- Connect the supply voltage to Pin 5 and Pin 9 of the 9-pin plug (*refer to Table 5-1, Page 15*).

5.4.3 Wiring the host interface (Connecting the PC)

The CLP 100 is operated and configured with the CLP Setup software. For this purpose it must be connected to the PC via the host interface.

When the PC is connected, the communications parameters are set as described in *Section 6.5.1, Page 21*.

Figure 5-1 shows the wiring of the RS-232 host interface.

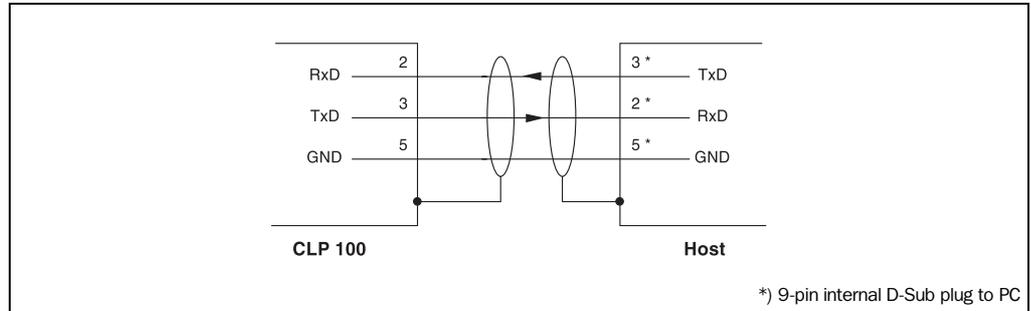


Fig. 5-1: Wiring the host interface



Damage to the interface module in the CLP 100!

Electronic components in the CLP 100 can be damaged if the host interface is wired incorrectly.

- Wire the host interface correctly in accordance with *Figure 5-1*.
- Check the wiring before switching on the CLP 100.

Recommendation

- Connect the host interface of the CLP 100 EMC-compatibly to the host by means of shielded cables (*refer to Figure 5-1*). Observe the maximum cable lengths (*refer to Table 5-3, Page 16*).

- Apply the shielding at one end.

1. Switch off the PC and the supply voltage of the CLP 100.
2. Connect the desired port "COM x" of the PC to the CLP 100. To this purpose use an RS-232 data connection cable (RxD and TxD transposed).
3. Switch on the PC and the supply voltage of the CLP 100.
4. Set the communication parameters of the PC (*refer to Section 10.2.3, Page 34*).

In the default setting the CLP 100 communicates via the RS-232 interface with the host using the values listed in *Table 5-4*.

Parameter	Host interface value	Terminal interface value
Data transmission rate	9600 bits/s	9600 bits/s
Data bit	8	8
Parity	None	None
Stop bit	1	1
Protocol	SICK: Sending start characters: STX Sending stop characters: ETX Repeat request: None Timeout: 50 ms	SICK: Sending start characters: STX Sending stop characters: ETX Repeat request: None Timeout: 50 ms

Tab. 5-4: Communication parameters of the host interface (default setting)

5.4.4 Wiring the terminal interface

As an alternative the PC may be connected to the terminal interface.

Figure 5-2 shows the wiring of the terminal interface.

Note The terminal interface is a TTL level interface.

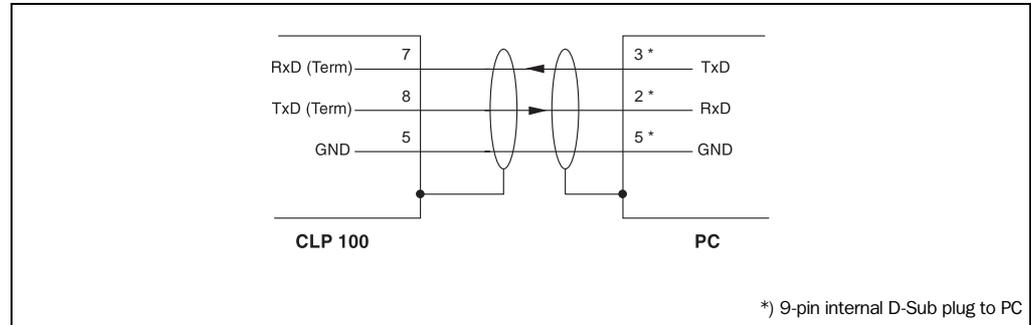


Fig. 5-2: Wiring the terminal interface

5.4.5 Wiring the "Sensor" switching input

If a reading process is to be triggered via an external sensor, connect the sensor to the "Sensor" switching input. This triggering type is selected as the default setting of the CLP 100. Figure 5-3 shows the wiring of the "Sensor" switching input. Table 5-5 lists the characteristic data of this switching input.

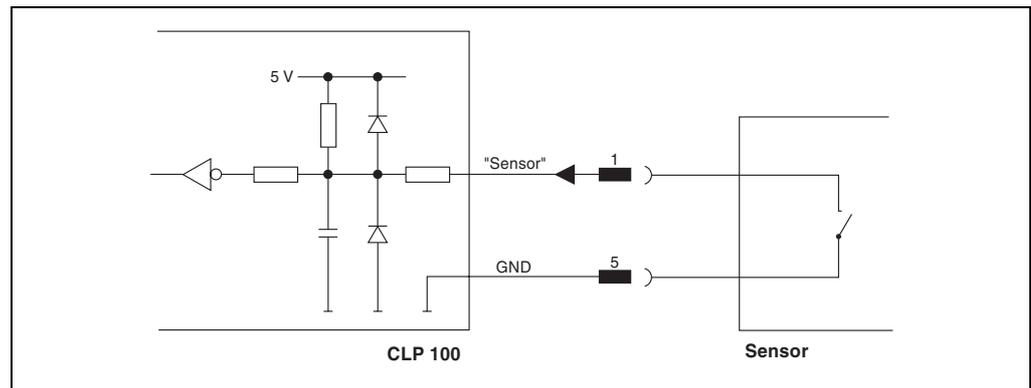


Fig. 5-3: Wiring of the "Sensor" switching input

➤ Connect the sensor as described in Figure 5-3.

Switching performance	Connecting GND to the input starts the read port of the CLP 100 (low)	
Properties	Not electrically separated	
Electrical values	Low (Read port active): $0\text{ V} \leq V_S \leq 0.8\text{ V}$ $I \leq 1.5\ \mu\text{A}$	High (Read port inactive): $2.4\text{ V} \leq V_S \leq 5\text{ V}$ $I \leq 1.5\ \mu\text{A}$

Tab. 5-5: Characteristic data of the "Sensor" switching input

Hint The DEVICE CONFIGURATION tab card of the CLP Setup software can be used to modify the response time of the "Sensor" input (debouncing).

5.4.6 Wiring the "Result" switching output

The switching output can have various result functions assigned to it. If the corresponding event occurs during a reading process, the switching output becomes live for the selected pulse duration. *Figure 5-4* shows the wiring of the "Result" switching output. *Table 5-5* lists the characteristic data of the switching output.

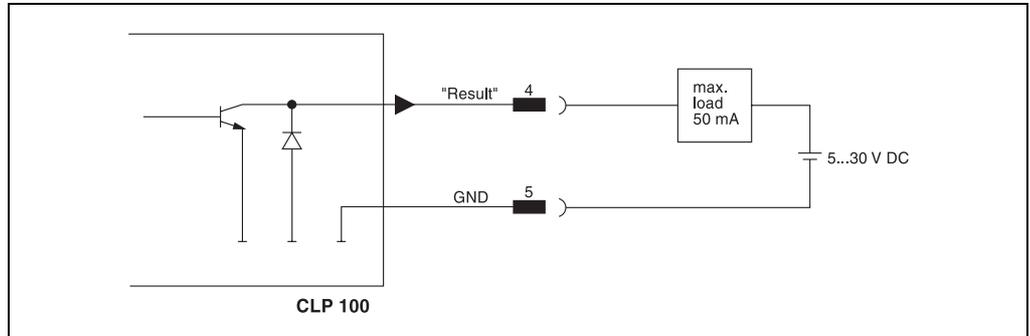


Fig. 5-4: Wiring of the "Result" switching output (NPN)

- Recommendation**
- In order to check the switching functions wire the switching output to a load and measure the voltage with a high-voltage digital voltmeter. This avoids the display of incorrect voltage values and switching states.
 - Wire the switching output as described in *Figure 5-4*.

Switching performance	NPN switching against GND
Properties	Not electrically separated
Electrical values	$5V \leq U \leq 30V$ $I \leq 50mA$

Tab. 5-6: Characteristic data of the "Result" switching output

Hint The DEVICE CONFIGURATION tab card of the CLP Setup software can be used to modify the function assignment, the pulse duration and the output instant of the signal.

6 Operation

6.1 Startup steps

- Startup of the CLP 100 with the default setting set by factory (Quick-Start).
The CLP 100 can be operated without a connection to the PC in this configuration.
- Connecting the PC (*refer to Section 5.4.4, Page 18*) and installing the CLP Setup software (*refer to Section 10.2, Page 33*).
- Parameterizing of the CLP 100 with the CLP Setup software or with command strings.

6.2 Default setting

Table 6-1 shows an overview of the default setting of our works for the CLP 100. The parameters in the default setting are selected so that the CLP 100 can be used directly for many applications in this configuration. With the default setting no PC is required for starting up.

Parameter	Default setting
Active code type	Code 39
Code length	Free
Multiple reading	2
Number of codes	1
Reading direction	Both
Send start/stop characters	Not active
Check digit	None
Reading pulse generation	Active low (unchangeable)
Switching output	Not active
Host interface	RS-232 (unchangeable)
Protocol	Start characters STX, Stop characters ETX
Transmission rate	9600 bits/s
Data format	8 data bits, no parity, 1 stop bit
Output instant	Immediately
No Read message	BR

Tab. 6-1: Default setting of the parameters of the CLP 100

If the CLP 100 is connected to a PC, the current parameters can be changed by using the CLP Setup software. The parameter set of the default setting is saved in the CLP Setup and in the CLP 100 and can be re-activated at any time.

The complete default setting can be viewed by using the CLP Setup software and printed out, if required:

1. In order to save the current settings: Select the **SAVE AS** menu item in the **FILE** menu bar and enter the file name.
2. Click on  in the toolbar.
The default setting is loaded and is displayed in the tab cards.
3. Click on  in the toolbar.
The **FILE PRINT** dialog box is opened.
4. Enter the comment for the header of the output and click on **OK**.
The dialog box for the print settings is opened.
5. Enter the settings for printing and click on **OK**.
CLP Setup prints out the default settings.

6.3 Quick-Start

1. Carry out the electrical installation in accordance with *Chapter 5, Page 15*. A PC does not have to be connected if the CLP 100 is operated with the default setting.
2. Switch on the supply voltage.
The LEDs of the CLP 100 light up and are extinguished after the self-test has been completed successfully.
3. Present the bar code sample from *Figure 6-1* to the CLP 100 at a distance of approx. 35 mm.
4. Start the reading pulse: Cover the optical path of the sensor (close the switch).
Both LEDs light up.

5. End the reading pulse: Unmask the optical path of the sensor (open the switch).
If the reading has been successful, the red LED is extinguished, the green LED lights up.
The CLP 100 is ready to operate with the default setting of our works.

The CLP 100 can be switched off without the configuration data being lost, since no changes were carried out to the parameter set.

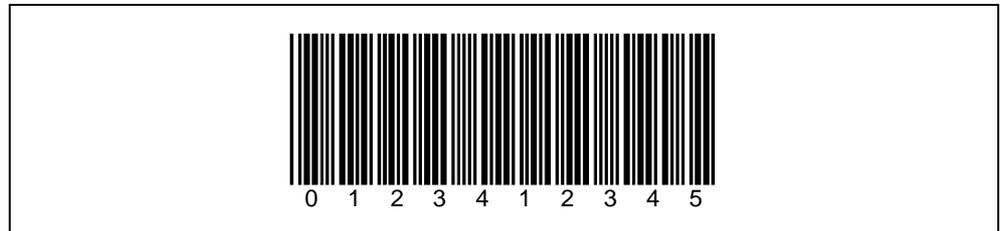


Fig. 6-1: Bar code sample (code 39, 0.35 mm, printing ratio 2:1)

6.4 Operating modes and output of the read result

When parameterizing the CLP 100, it is possible to choose between the following operating modes:

- Reading mode
- Diagnostic mode
- Adjusting mode
- On-line test mode

In *reading mode* the CLP 100 detects the presented bar codes and emits the read result at the end of the reading pulse via the host and terminal interface.

In *diagnosis mode* the quality of the bar code readings is judged. These are brought statistically into the read field of the CLP (no transport movement). The output is emitted via the host and terminal interface. For details on the diagnosis mode refer to Section 6.5.8, Page 24.

In *adjusting mode* the CLP 100 is adjusted to the bar code (refer to Section 4.3.2, Page 14).

In the *on-line test mode* the CLP 100 emits the read result only via the terminal interface and not via the host interface.

When outputting the read result, it is possible to choose between the normal reading function and the code comparison function (matchcode). The matchcode function allows the comparison of the read bar codes with a code which is entered at the CLP 100. It is possible to select between complete or partial matching of the codes.

6.5 Parameterization

The CLP 100 is adapted to the specific applications by means of the parameterization. Parameterization is carried out either with the CLP Setup software or with command strings. To this purpose a PC has to be connected and the CLP Setup has to be installed. Connection of the PC to the CLP 100 is described in Section 5.4.4, Page 18. Installation and handling of the CLP Setup software are described in the appendix (Section 10.2, Page 33).

6.5.1 Transferring the parameter set between the CLP Setup and CLP 100

In order to edit the current parameter set of the CLP 100 it must first be copied from the CLP 100 to the CLP Setup. This process is designated as **uploading**.

Changes to the parameter set carried out in the CLP Setup are not effective until they have been transferred to the CLP 100. CLP Setup always copies the complete parameter set. Saving the parameters to the CLP 100 is designated as **downloading**.

Uploading the parameter set from the CLP 100

- Click on  in the CLP Setup toolbar.

CLP Setup copies the parameter set last saved in the CLP 100 from the CLP 100 into its database and displays its values in the tab cards.

If the CLP Setup software does not recognize the loaded parameters during uploading, a warning is emitted. Unknown parameters can be edited in the terminal emulator under observance of the conventions for command strings. These parameters are also taken into consideration when the parameter set is saved.

Downloading the parameter set to the CLP 100

- Click on  in the CLP Setup toolbar.

The new parameter set is saved in the CLP 100.

Saving the parameter set in the CLP Setup

1. Select the SAVE AS menu item in the FILE menu bar in order to save the modified parameter set as the new configuration file in the CLP Setup or to overwrite an existing file.

The SAVE CLP FILE dialog box is opened.

2. Enter the path and file name in the dialog box (extension of the file name: "*.scl") and click on OK.

The new parameter set is saved in the CLP Setup.

6.5.2 Parameterize the CLP 100 with command strings

The CLP 100 can be parameterized for example by means of the terminal emulator by entering command strings. Parameters which are unknown to the CLP Setup can also be used.

The command language of the CLP 100 accesses the command interpreter of the device directly. *Figure 6-2* shows a view of the terminal emulator. A0 is entered as an example in the framed text field for entering commands. This input is repeated in the large output window. For a full description of the command language refer to *Table 10-3, Page 41*.

1. Click on  in the CLP Setup toolbar.
The terminal emulator window opens.
2. Enter the command in the framed text field and press the Return key.
The command is transmitted to the CLP 100.

Note The CLP 100 does not transmit an answer, but reacts immediately to the command.

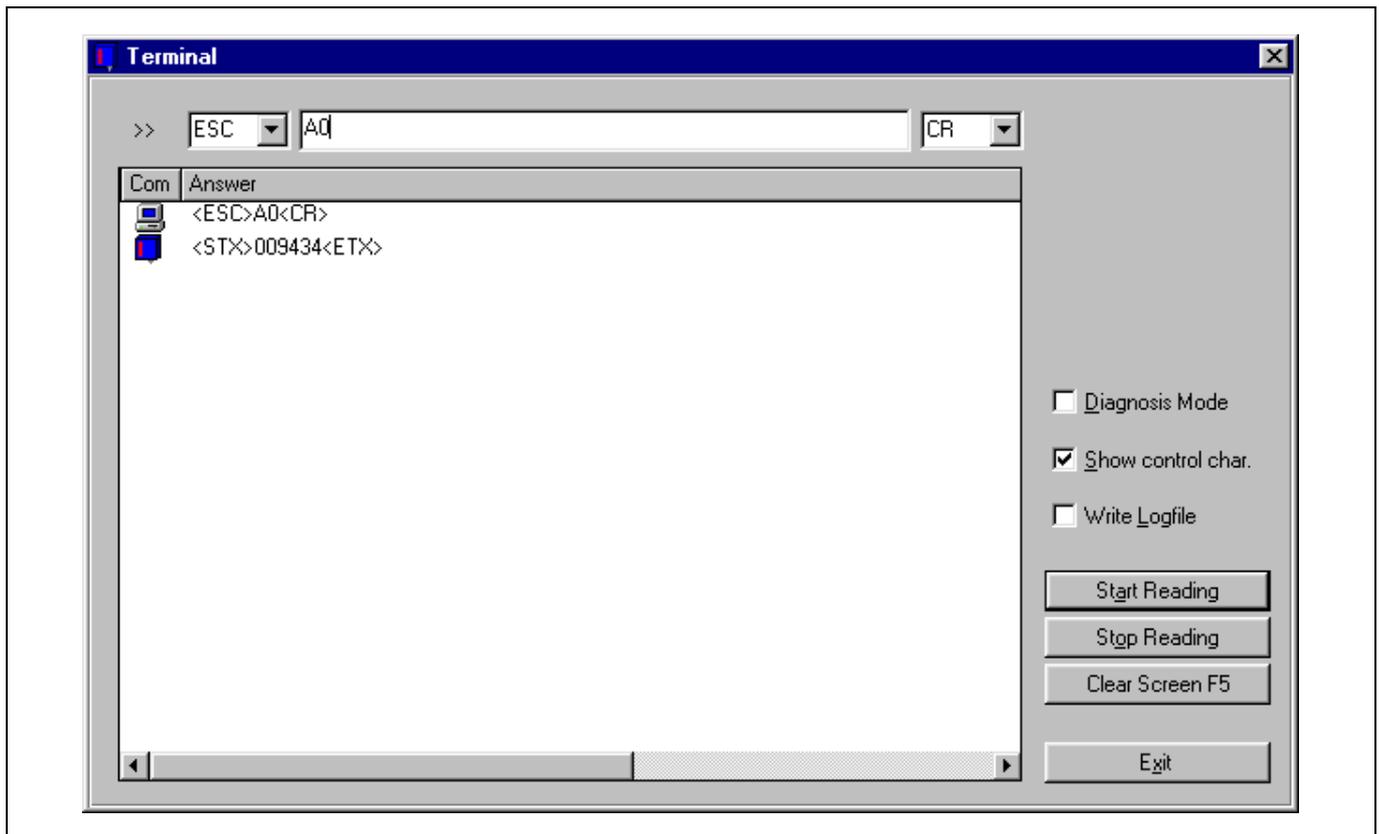


Fig. 6-2: Terminal emulator with input of a command string

6.5.3 Selecting reading mode

After being switched on the CLP 100 carries out a self-test and then changes over to the reading mode (default setting). Reading mode can be selected as follows if the CLP 100 is in another operating mode:

1. In the CLP Setup select the DEVICE CONFIGURATION tab card.
2. Click in the OPERATING MODE field and select READING MODE.
3. Carry out the download to CLP 100.

The CLP 100 is in reading mode.

6.5.4 Adjusting the reading pulse

In the CLP 100 default setting the reading pulse (trigger) is supplied by an external sensor. Debouncing of the sensor and the type of reading pulse end (through a time window or a sensor signal) can be set by means of the CLP Setup software.

1. In the CLP Setup select the DEVICE CONFIGURATION tab card.
2. Select the settings in the READING PULSE or READING PULSE END field.
3. Carry out the download to CLP 100.

6.5.5 Triggering the reading pulse

In its default setting the CLP 100 receives the reading pulse (trigger) via an external sensor or a command string (software trigger). For test purposes, the reading pulse can also be triggered directly via the terminal emulator.

1. Click on  in the CLP Setup toolbar.
The terminal emulator window opens. The CLP 100 is in reading mode.
2. Click on START READING.
3. Present the bar code.
4. Click on STOP READING.

The CLP 100 outputs the read result in the window of the terminal emulator.

6.5.6 Setting the structure of the read result

In its default setting the CLP 100 sends the data contents of the bar code to the host as the read result. In the default setting this data string is STX-/ETX-framed.

The structure of the data string can be selected by means of the HOST INTERFACE and READING CONFIGURATION tab cards.

1. In the CLP Setup select the READING CONFIGURATION tab card.
2. Click in the SEND PREFIX list box and select a prefix from the list (A-Z, 1-0).
3. Select the HOST INTERFACE tab card.
4. Click in the SEPARATOR list field and select a separator.
5. Carry out the download to CLP 100.

The CLP 100 operates with the new settings.

6.5.7 Setting the matchcode function

The matchcode function allows the comparison of the read bar codes with a code which is entered manually at the CLP 100 or trained in automatically (matchcode).

1. In the CLP Setup select the DEVICE CONFIGURATION tab card.
2. Click in the ACTIVE box in the COMPARE CODE field.
3. Enter the code which is to be used for comparison in the MATCHCODE text field.
4. If only a part of the code has to agree, enter the partial code in the PARTIAL COMPARISON OF THE MATCHCODE text field, and complete the field with question marks or @ characters.
5. Selection the function of the switching output in the SWITCHING OUTPUT AT CODE COMPARISON field.
6. Carry out the download to CLP 100.

The CLP 100 outputs a result either at agreement of the read codes with the matchcode or at non-agreement.

6.5.8 Setting the diagnosis mode

In diagnosis mode the quality of the bar code readings is judged. These are brought statistically into the read field of the CLP 100 (no transport movement). The CLP 100 carries out 100 readings after the reading pulse and evaluates them.

The data string in the diagnosis mode is STX-/ETX-framed. The data string contains the bar code information (data) at the first place, followed by a slash and a three-digit identifier. The data string is followed by the combination of slash and identifier repeated thrice (a total of four identifiers separated by slashes):

```
<STX>Data/www/xxx/yyy/zzz<ETX>.
```

The maximum value of an identifier is 100. If the value is lower (one- or two-digit number), the leading blanks will be filled with spaces. If the DISPLAY CONTROL CODE function is activated, a space is displayed as <SPC>. The identifiers mean:

- www = Number of successful readings ("Good reads")
- xxx = Number of successful decoding processes (with misinterpretations)
- yyy = Number of successful indentifications of a start or stop character (depending on the scan direction)
- zzz = Number of readings carried out (the CLP 100 carries out 100 readings each in the diagnosis mode)

Error-free reading and decoding of a bar code would thus have the following form:

```
<STX>Data/100/100/100/100<ETX>.
```

A reading with some failed decodings has, for example, the following form:

```
<STX>Data/<SPC>67/<SPC>67/100/100<ETX>.
```

If the CLP 100 has only recognized the start character, it transfers a question mark instead of the data string:

```
<STX>?/<SPC><SPC>0/<SPC><SPC>0/100/100<ETX>.
```

Figure 6-3 shows further examples of reading results in the diagnosis mode:

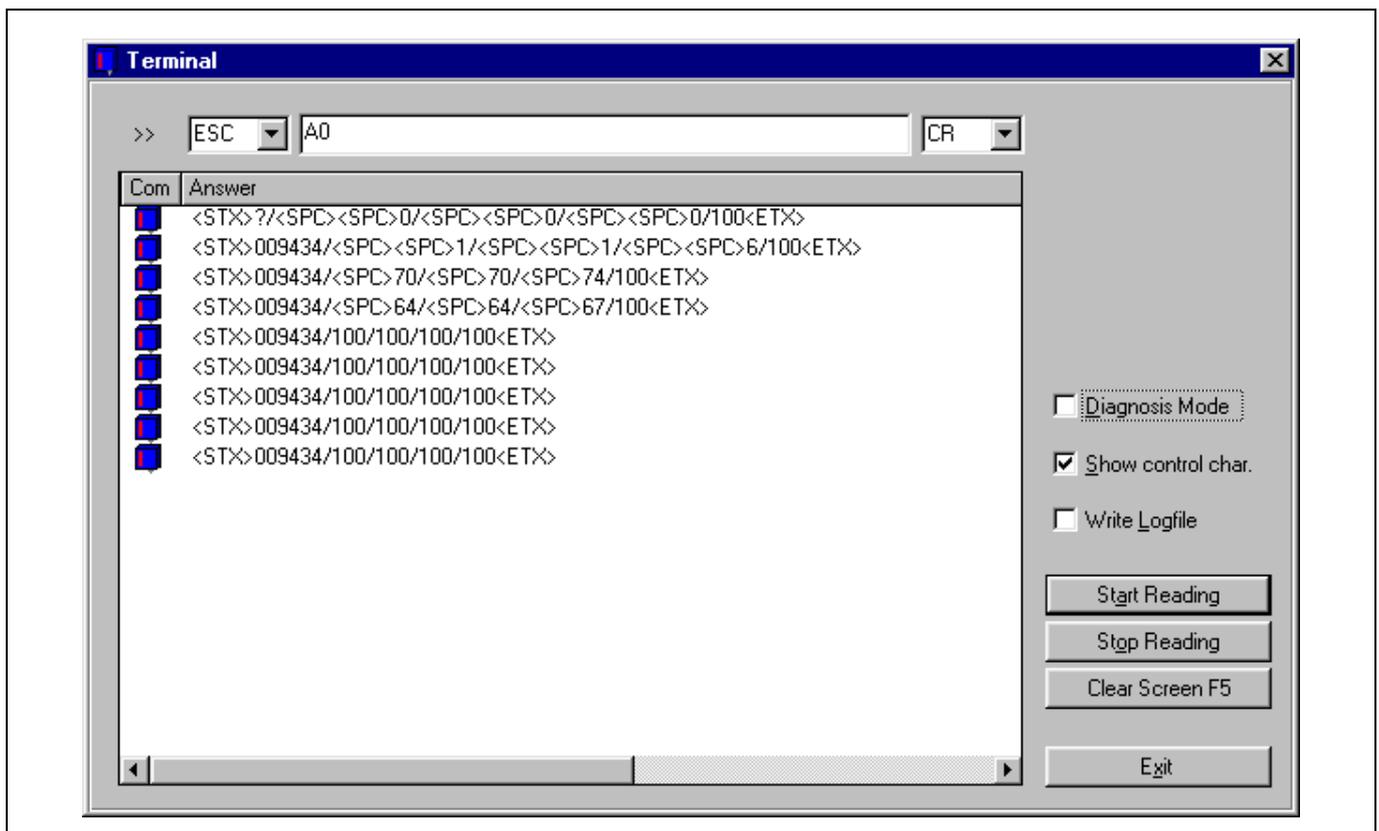


Fig. 6-3: Terminal emulator with reading results of the CLP 100 in diagnosis mode

The diagnosis mode can be selected directly in the terminal emulation window or set via the tab cards:

- If the terminal emulator window is active: Click in the DIAGNOSTIC MODE box and present the bar code.

The reading process is started automatically. The CLP 100 scans the bar code once per second.

- or -

1. If the terminal emulator window is not active: In the CLP Setup select the DEVICE CONFIGURATION tab card.
2. Click in the OPERATING MODE field and select DIAGNOSTIC MODE.
3. Carry out the download to CLP 100.
The CLP 100 is in diagnosis mode.
4. Click on  in the CLP Setup toolbar.
The terminal emulator window opens.
5. Click on START READING.
6. Present the bar code.
The CLP 100 outputs the read result in the window of the terminal emulator.
7. In order to return to reading mode proceed as described in Section 6.5.3.

6.6 Switching off the CLP 100

1. If the parameter set was changed, download the parameter set to the CP 100 and save the parameter set as a configuration file in the CLP Setup.
2. Switch off the supply voltage.
The last parameter set saved in the CLP 100 remains valid.

7 Maintenance

7.1 Maintenance during operation

The CLP 100 reading window is made of glass. The reading window (*Figure 7-1*) must be clean in order to achieve the complete reading performance of the CLP 100. Check the reading window regularly for dirt in particular in case of dirty or humid environments.

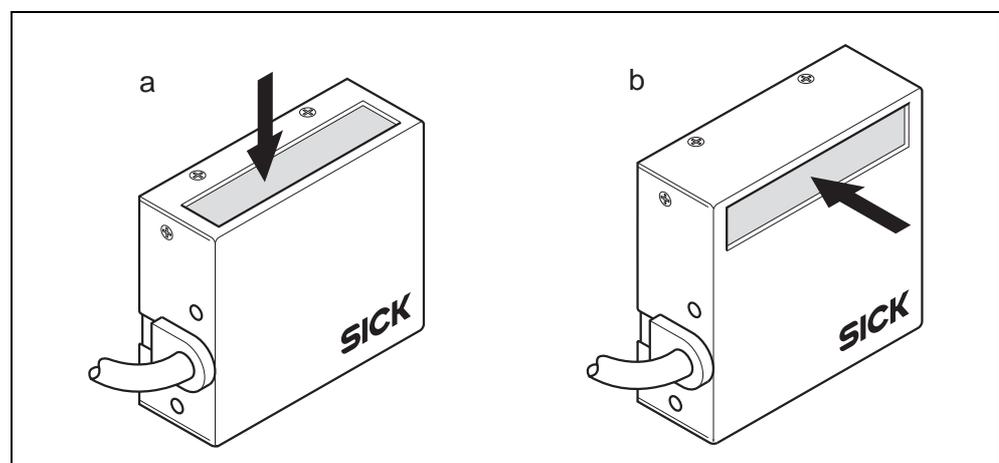


Fig. 7-1: CLP 100 with front-end reading window (a) and side-end reading window (b)

If a sensor is used for triggering, its window and the reflector have to be cleaned regularly. This avoids incorrect switching performance.

**LED lighting can endanger your eyes!**

The CLP 100 uses an LED illumination line. The retina can be damaged if you look too long into the laser beam.

- Do not look directly into the LED illumination line.

**Damage to the reading window!**

Scratches and streaks on the reading window impair the reading performance.

- Use a mild detergent without scouring agents.
 - Avoid cloths or sponges which scratch.
 - Clean the reading window carefully.
-
- Clean the reading window with a soft, non-fluffing cloth and mild detergent without scouring agents, for example antistatic glass cleaning fluid.
 - If necessary, clean the LED display on the device rear.
 - If necessary, clean the sensor window and reflector.

7.2 Maintenance

The CLP 100 operates maintenance-free.

7.3 Disposal

After removal from service dispose of unusable or irreparable devices in a manner which is not harmful to the environment. Observe the respective state regulations on waste disposal.

1. Remove the CLP 100 housing.
2. Remove the electronic modules and connection cable.
3. Recycle the housing.
4. Dispose of electronic modules and connection cable as hazardous waste.
5. Dispose of the glass as recycled glass.

At present, SICK AG does not take back devices which have become unusable or irreparable.

8 Troubleshooting

8.1 Possible errors and faults

8.1.1 Installation faults

- CLP 100 aligned unfavorably to the bar code (for example, reflections).
- Reading-pulse sensor positioned incorrectly

8.1.2 Faults during the electrical installation

- Interfaces of the CLP 100 wired incorrectly

8.1.3 Parameterization errors

- Functions not adapted to the local conditions, for example, communication parameters of the host interface set incorrectly

8.1.4 Faults during operation

- Device fault (hardware/software)

8.2 Troubleshooting table

Aids during troubleshooting:

- These operating instructions
- Multimeter for measuring voltage and current

Fault	Possible cause	Check	Remedy
1. When the supply voltage is applied to the CLP 100: The LEDs do not light up (LEDs must light up for three seconds after voltage is applied if the self-test is successful)	1.1 CLP 100 without supply voltage 1.2 CLP 100 has diagnosed a device fault during the self-test	1.1 Check the supply voltage 1.2 Switch the device off and on again. Do the LEDs light up?	1.1 Check the wiring and measure the supply voltage (DC 5 V ± 5 %) 1.2 If the LEDs do not light up, contact the SICK service (refer to Section 8.3, Page 30)
2. CLP 100 cannot be started via the external sensor, Scan field of the CLP 100 (red light) is not displayed or LEDs do not light up after an executed signal for reading	2.1 External sensor connected incorrectly 2.2 Photoelectric switch not aligned to the reflector or Optical path covered (light scanner or inductive sensor is not dampened) 2.3 CLP 100 does not receive command string for pulsing via the host interface	2.1 Check the wiring of the external sensor 2.2 Check the external sensor for functionality and a free optical path 2.3 Check the data connection between the host and the CLP 100. Check the command strings of the host computer	2.1 Measure the output signal of the external sensor and the input signal at the CLP 100 (active low) 2.2 Re-align the external sensor 2.3 Carry out the connection in accordance with Section 5.4, Page 16 and observe the pin assignment. Carry out an upload in the CLP Setup. On the HOST INTERFACE tab card set the data format, protocol, start and stop characters, baud rate correctly. Carry out the download to the CLP 100
3. Green LED does not light up after the end of the reading pulse (reading not successful)	3.1 No bar code in the reading area during the reading process 3.2 Scan field does not contact the bar code 3.3 Reading distance incorrect 3.4 Evaluation criteria for the code type set incorrectly 3.5 Reading angle under which the bar code appears is too large	3.1 Check the interval between the reading pulse and presence of the bar code in the reading area 3.2 Check the adjustment. Is the bar code in the middle of the scan field? 3.3 Check the reading distance 3.4 Check the code type and code length 3.5 Check the reading angle	3.1 Refer to Item 2 3.2 Readjust the CLP 100 (refer to Section 4.3.2, Page 14) 3.3 Set the correct reading distance, but take the module width into consideration (refer to Section 10.3, Page 38) 3.4 Enter correct code type in CLP Setup. Carry out download to CLP 100 3.5 Readjust the CLP 100 while ensuring that the maximum reading angle is observed (refer to Figure 4-4, Page 12)

Tab. 8-1: Troubleshooting table

Fault	Possible cause	Check	Remedy
–continued– 3. Green LED does not light up after the end of the reading pulse (reading not successful)	3.6 Fault due to reflection of the light at the bar code 3.7 Bar code quality is insufficient	3.6 Check the angle 3.7 Check the printing contrast, idle zones and print tolerances of the bar code	3.6 Readjust the CLP 100 and tilt it relative to the vertical (refer to Figure 4-5, Page 13) 3.7 Have the bar code checked (for example by the SICK service (refer to Section 8.3, Page 30))
4. CLP 100 does not transfer read results after the end of the reading pulse	4.1 No reading pulse occurred 4.2 Data connection cable wired incorrectly 4.3 Voltage level incorrect 4.4 Host interface parameterized incorrectly	4.1 Do the LEDs light up after the reading pulse? 4.2 Check the wiring 4.3 Check the voltage level 4.4 Check the data format, protocol, start and stop characters	4.1 Refer to Item 2 4.2 Carry out the wiring in accordance with the pin assignment and the connection scheme 4.3 Correct the voltage level 4.4 Carry out an upload in the CLP Setup. On the HOST INTERFACE tab card set the data format, protocol, start and stop characters, baud rate correctly. Carry out the download to the CLP 100

Tab. 8-1: Troubleshooting table

8.3 SICK support

The device may be defective if the error cannot be eliminated by means of the above measures. The CLP 100 does not have any components whose functionality can be restored by the user after a failure.

Please contact your local SICK office or subsidiary:

- The telephone and fax numbers are listed on the rear cover of this manual.
- Please contact SICK before submitting the device for repair.

9 Technical data

9.1 Data sheet CLP 100

Type	CLP 100
Scanner design	CCD bar code reader
Light source	Visible red light ($\lambda = 630 \text{ nm}$)
Artificial light compatability	0 ... 100 000 lux
Scanning/Decoding frequency	500 Hz
Reading distance/Resolution	30 ... 40 mm: 0.125 mm 30 ... 45 mm: 0.15 mm 25 ... 50 mm: 0.2 mm 25 ... 55 mm: 0.25 mm 20 ... 60 mm: 0.35 mm 25 ... 65 mm: 0.5 mm 20 ... 70 mm: 1 mm
Reading area width	80 mm (at a reading distance of 40 mm)
Minimum resolution	0.125 mm
Code types	All common bar codes
Optical displays	Status display with two LEDs (red and green)
Data interfaces	2 x (RS-232)
supply voltage	5 V DC \pm 5 %
Power consumption for reading operation	350 mA
Power consumption for standby mode	150 mA
Housing	Metal
Enclosure rating	IP 40
EMC test	In accordance with IEC 801
Weight	Approx. 200 g
Temperature (ambient service/storage)	0 °C ... +40 °C / -20 °C ... +70 °C
Maximum relative humidity	30 ... 85 %, non-condensing

Tab. 9-1: Technical specification of the CLP 100

9.2 Dimensional drawings

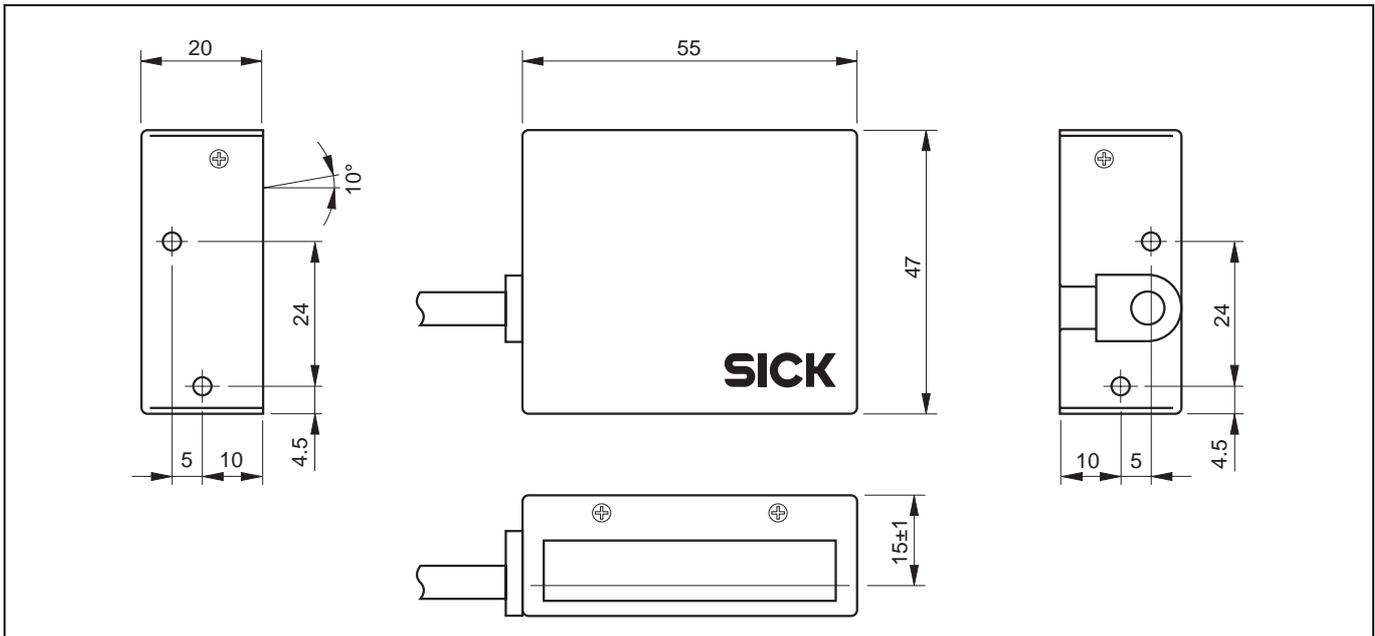


Fig. 9-1: Dimensions of the CLP 100 with front-end light emission in mm

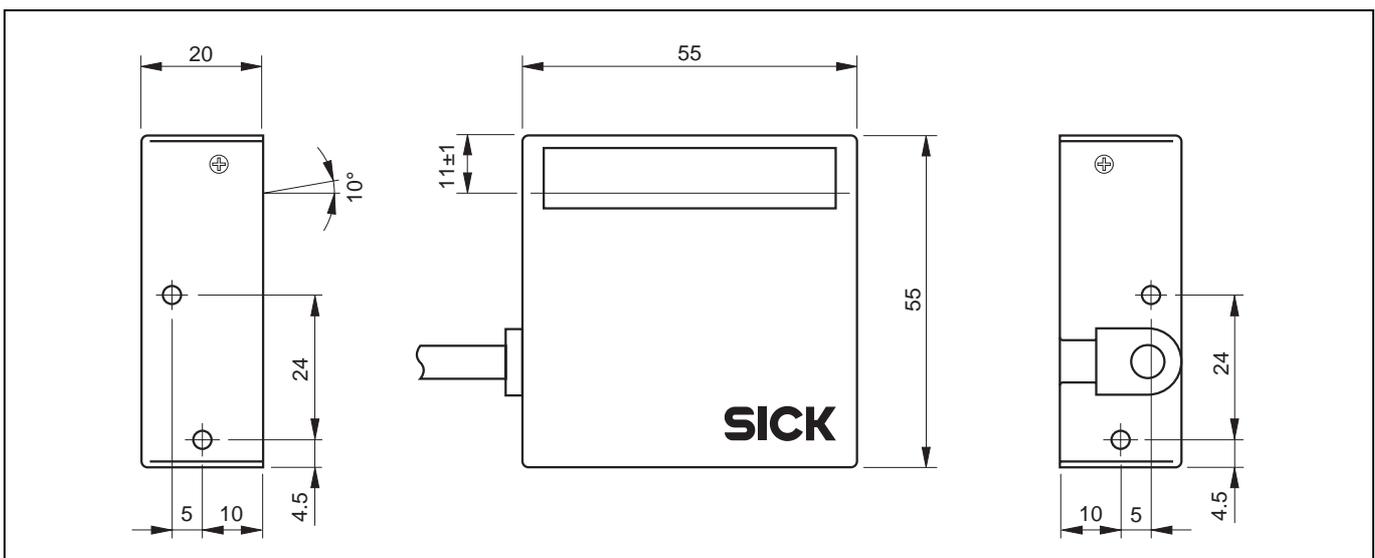


Fig. 9-2: Dimensions of the CLP 100 with side-end light emission in mm

10 Appendix

10.1 Appendix overview

- Installation and handling of the CLP Setup software
- Reading area diagram
- Calculation of the number of scans
- Calculation of the code length of a bar code
- Command language for CLP bar code readers

10.2 Installation and handling of the CLP Setup software

The scope of delivery of the CLP 100 includes a set of diskettes (3.5") with the CLP Setup software. A PC with the operating system Windows 95™, Windows 98™ or Windows NT™ is required in order to use the software. The memory requirement on the hard disk amounts to approx. 6.5 MB for the installation of CLP Setup, CLP Setup Help and I-ViewPro™.

10.2.1 Preparing the installation

1. Have the diskettes at hand.
2. Connect the PC to the host interface of the CLP 100 (*refer to Section 5.4.3, Page 17*).
3. Switch on the supply voltage of the CLP 100.
4. Switch on the PC and start Windows.

10.2.2 Carrying out the installation

During the installation of CLP Setup the installation program creates a main directory with subdirectories and the required links. CLP Setup can be removed completely from the PC by using the Uninstaller which is automatically installed as well.

First installation

1. Shut down all the applications under Windows.
2. Insert the diskette into the floppy disk drive.
3. Call up the RUN dialog box in Windows and enter the following command in the OPEN input field: "A:\CLP_xxx.exe" (replace xxx by the diskette label text). Click on OK.

- or -

Open the Explorer, open drive A and double-click on the file "CLP_xxx.exe" (xxx stands for the diskette label text).

The installation program starts and guides you through the installation with screen messages. The CLP Setup software and the CLP Setup Help on-line help are installed.

4. If required, install the I-ViewPro™ HTML browser (is prompted).
5. Observe the the latest information on the CLP Setup given in the Readme file.
6. Click on OK to confirm the final installation message.

The CLP Setup software and the CLP Setup Help on-line help are installed and ready for use.

Updating an installation

There are two possibilities of installing a new version of CLP Setup:

- Installation of the new version in addition to the old version
- or -
- Installation of the new version instead of the old version (overwriting)

Installation of the new version in addition to the old version

When the new version is installed in addition to the old version the new CLP Setup software is installed as described under *First installation*. When prompted for the target directory you have to enter a **new directory**. Both software versions are available parallel, but may not be started simultaneously. The configuration files of the old version can continue to be used in the new version.

Installation of the new version instead of the old version

When the new version is installed instead of the old one, the files of the old version have to be removed – with the exception of the configuration files "*.scl". The "*.scl" files contain the parameter sets of the CLP 100.

The Uninstaller removes the program files. The Uninstaller can be used to remove either all the files (with the exception of the configuration files) or only selected files. The default setting is the complete removal (the configuration files are not removed). In the case of user-specific removal the files are listed and only the selected files are removed. When selecting files ensure that the main directory together with the "*.scl" files is not deleted.

1. Select the Uninstaller for CLP Setup in the start menu of Windows under PROGRAMS.
The Uninstaller starts and guides you through the removal with screen messages.
2. Select the type of removal (complete or user-specific).
3. The new version of CLP Setup is installed as described under *First installation*. Select the same directory.
The new version of CLP Setup is installed. The configuration files of the old version can continue to be used.

10.2.3 Starting the CLP Setup software

The CLP Setup software starts with the following default setting:

Communication	COM 1, 9600 bauds, 8 data bits, 1 stop bit, no parity
Linear measures	Metric
Language	English
Browser	Not assigned
Directory for files	"Data" (configuration files for CLP 100)

Tab. 10-1: Default settings of CLP Setup

1. Switch on the PC and start Windows.
2. Select CLP Setup in the start menu.
The introductory dialog box is displayed after the identifier for the SICK software.
3. Click on OK.
CLP Setup checks whether a bar code reader is connected to the port "**COM 1**" of the PC and whether the values of the communication parameters between the bar code reader and the PC agree. If the values agree, CLP Setup enters CONNECTED in the top

right-hand of the status bar.

The software loads the internal description of the bar code reader and the default setting of the parameters from the database and displays it in the tab cards. Then the software copies the last set saved permanently in the CLP 100 from the CLP 100. Afterwards this is displayed in the tab cards.

The current parameter set can be edited in the tab cards.

Help in cases of problems

If the CLP Setup displays the message NO CONNECTION in the top right-hand of the status bar, the software could not establish a connection to the CLP 100. This can have two causes. The CLP 100 is not connected, or the communication parameters of the CLP 100 and the PC do not agree.

1. Connect the PC to the host interface of the CLP 100 as described in *Section 5.4.3, Page 17*.

2. Click on .

The AUTO BAUD DETECT dialog box is displayed. CLP Setup checks whether a bar code reader is connected to the port "COM 1" of the PC and whether the values of the communication parameters between the bar code reader and the PC agree. If the values agree, the CLP Setup displays the values of the communication parameters.

3. If CLP Setup still cannot establish a connection, click on CANCEL and select the SERIAL INTERFACE menu item in the OPTIONS menu.

CLP Setup displays the current settings of the communication parameters.

4. Set the following communication parameters: **Connected COM port, 9600 bauds, 8 data bits, 1 stop bit, no parity.**

5. Click on OK.

6. Click on .

The AUTO BAUD DETECT dialog box is displayed. CLP Setup attempts again to communicate with the CLP 100. If this is successful, CLP Setup displays the values of the communication parameters between the bar code reader and the PC.

7. Click on OK.

The dialog box prompts you whether the parameters of the connected device are to be loaded.

8. In order to copy the current parameter set to the CLP Setup click on YES.

CLP Setup displays CONNECTED. The current parameter set can be edited in the tab cards.

10.2.4 User interface

The user interface is largely self-explanatory. The online help describes how to use the user interface under HELP in the menu item PROGRAM INFORMATION. *Figure 10-1* shows a view of the user interface.

The user interface consists of the following elements:

- Title bar displaying the program name (CLP Setup) and the current configuration file
- Menu bar with pull-down menus
- Toolbar with icons which trigger a function when clicked on
- Status bar (top right) with scanner selection field and status field for displaying the connection to the bar code reader
- 3 tab cards (READING CONFIGURATION, DEVICE CONFIGURATION, HOST INTERFACE).

Further dialog boxes are opened in the tab cards, if necessary

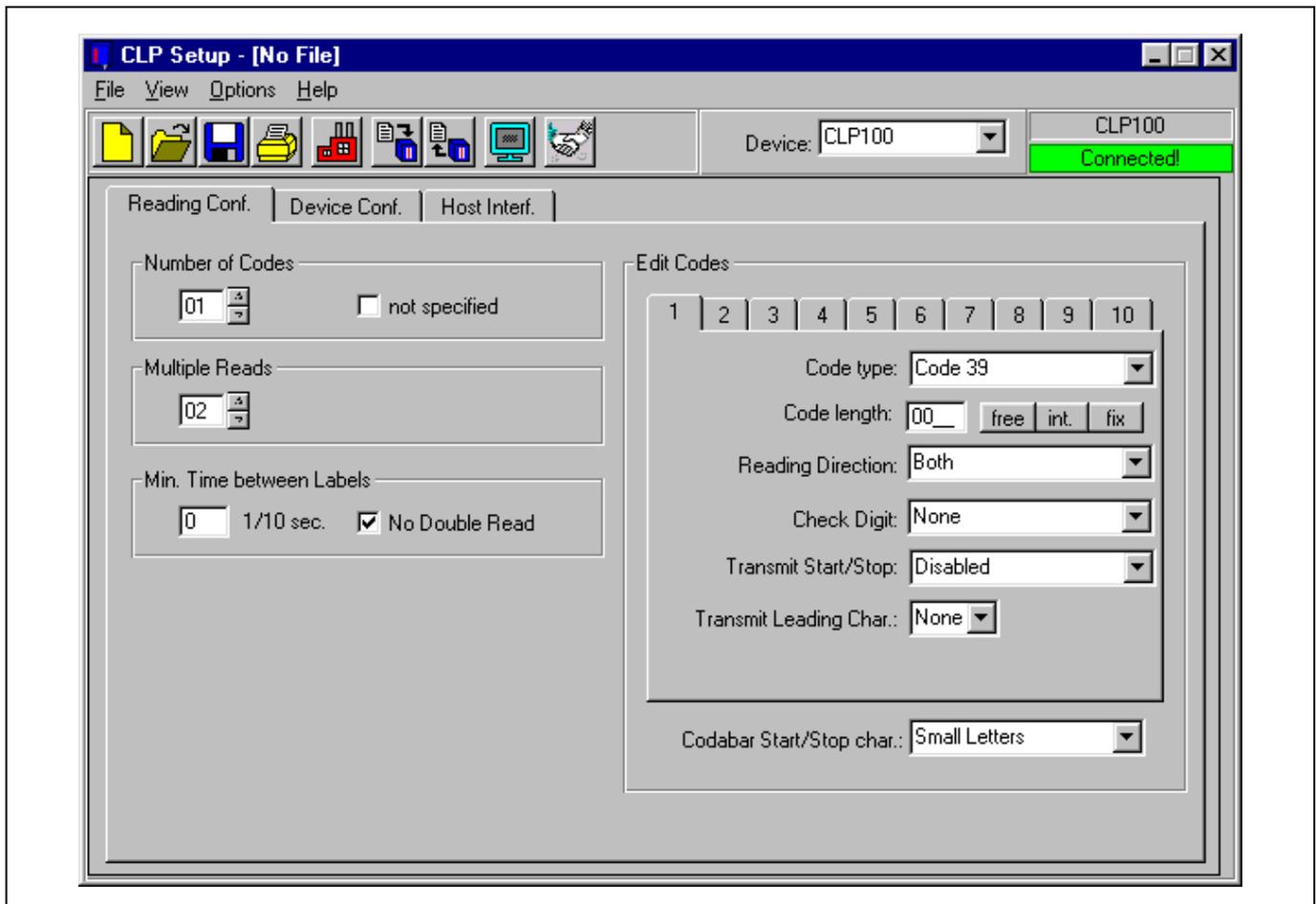


Fig. 10-1: User interface of the CLP Setup software

10.2.5 Functions

The CLP Setup software provides the following functions:

- Loading of the default setting of the parameter set from the database
- Automatic attempt to communicate with the CLP 100 when the program is started
- Uploading of the parameter set which is saved in the CLP 100
- Modifying the parameters
- Downloading the modified parameter set to the CLP 100
- Saving the modified parameter set in the CLP Setup as the configuration file
- Direct access to the CLP 100 by means of a terminal emulator (parameterizing via command strings, selection of the operating mode and triggering of the CLP 100 reading function)
- Selection of the COM ports for adapting the data transmission parameters
- Selection menu for units used
- Selection menu for the displayed language
- Display of the last 10 edited configuration files
- Context-specific help via <F1>

10.2.6 Using the CLP Setup Help on-line help

The CLP Setup Help on-line help helps you in using the CLP Setup software. The help runs under an HTML browser (for example, Netscape Navigator™, Microsoft Internet-Explorer™ or the supplied I-ViewPro™). The help can be called up context-specifically for the parameter being edited and describes the function of the parameter and possible values for the parameter.

- Press <F1> key.

The browser window opens and the help topic is displayed.

- If the browser is not found, enter the path for the browser in the opened dialog box (for example "Iviewpro32.exe" in the directory "I-ViewPro").
- In order to avoid multiple opening of the browser use the key combination <ALT>+<TAB> or the Windows status bar to toggle between the CLP Setup and the CLP Setup Help.
- In order to call up the help overview click on the CONTENTS menu item under HELP in the menu bar of the CLP Setup.

In the upper horizontal frame it is possible to also click on a tab card. The parameters are then displayed in the left-hand vertical frame. These can be selected by clicking on them.

10.3 Reading area diagram

The reading area diagram shows the reading width as a ratio of the reading distance for various resolutions. Disturbing optical effects (distortions) which can occur when the distance is too great are taken into account when specifying the reading width.

The module width is the narrowest bar of a bar code which is still resolved.

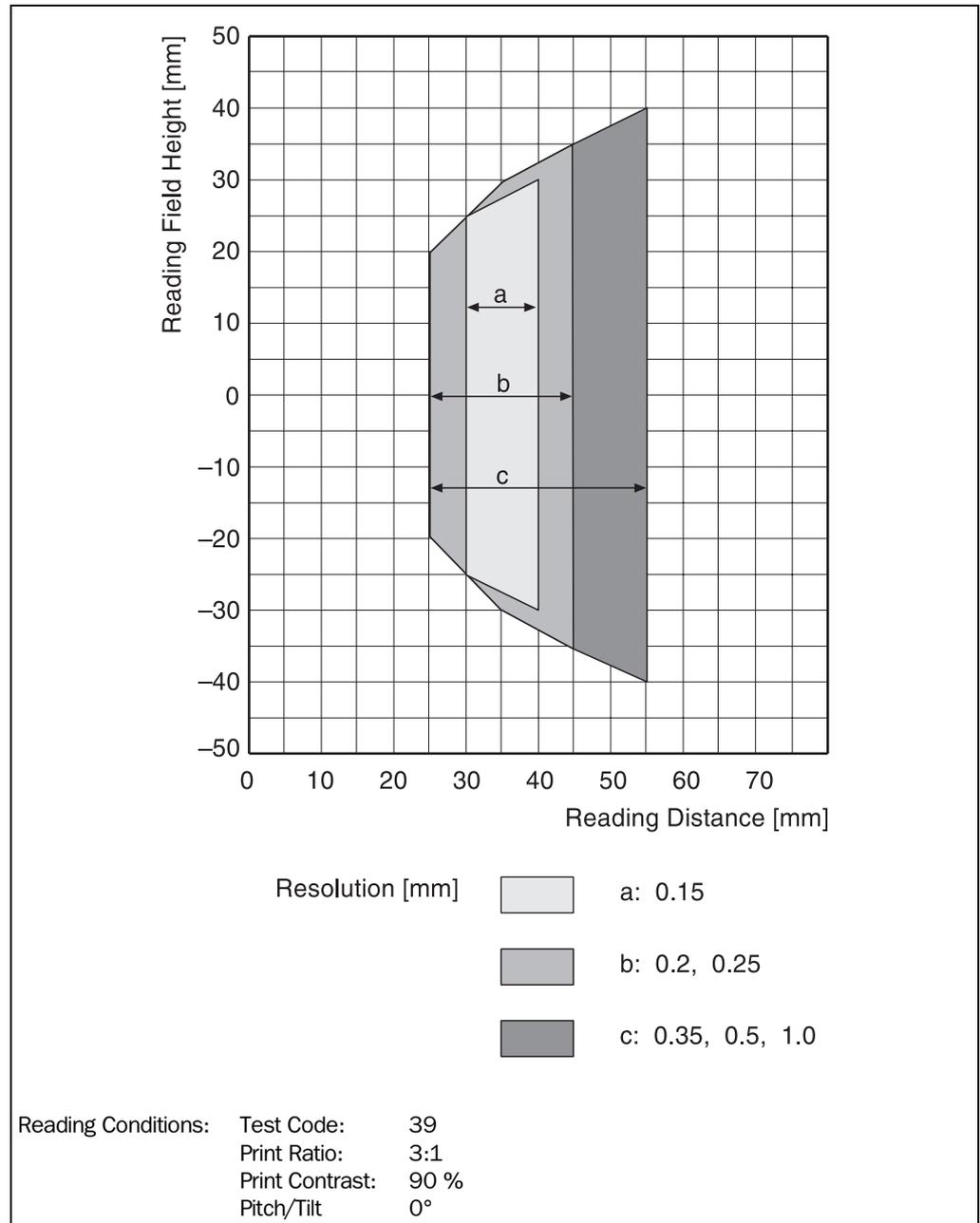


Fig. 10-2: Reading area diagram

10.4 Calculation of the number of scans

The maximum possible number of scans for a bar code depends on the transporting speed v . Figures 10-3 and 10-4 display one calculation example each for the possible number of scans at ladder and fencing positionings of the bar code bars.

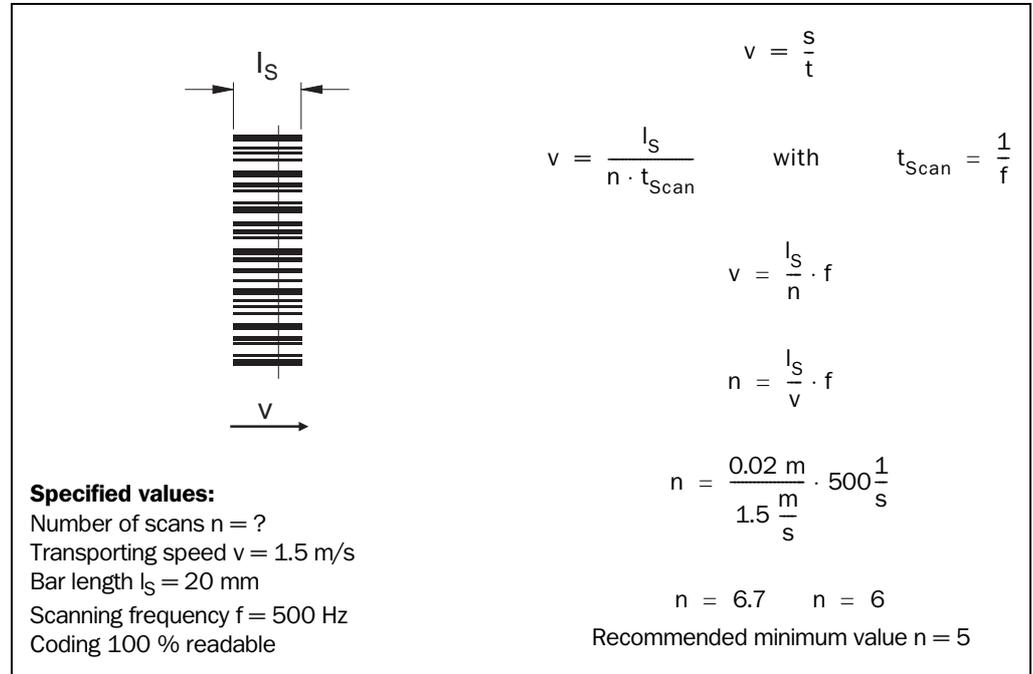


Fig. 10-3: Calculation example: Number of scans for ladder positioning of the bar code bars

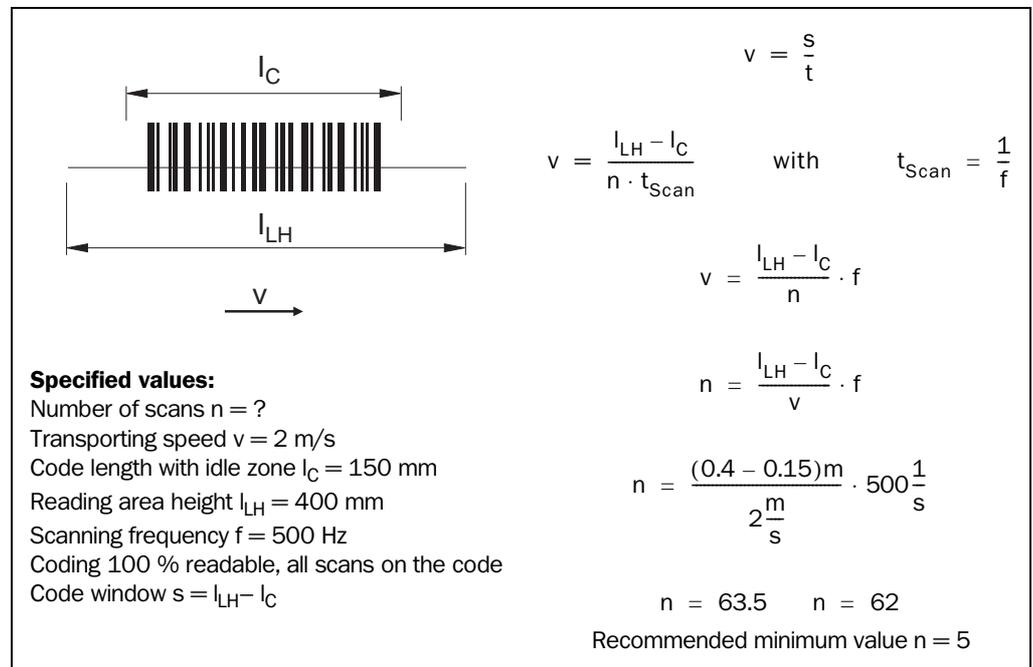


Fig. 10-4: Calculation example: Number of scans for fencing positioning of the bar code bars

10.5 Calculation of the code length of a bar code

The code length of a bar code corresponds to the number of used characters in the printing image including the check digits (if they exist). The fixed code length can be specified in the CLP Setup.

The code length can be determined by counting the bars and gaps if the code type of a bar code is known. The respective equation for calculation is shown in *Table 10-2*.

1. Count the bars and possibly gaps as specified in *Table 10-2*. Also count the start and stop characters.
2. Calculate the code length in accordance with the equation specified in the table.
3. Carry out the input in the CLP Setup as specified in Column 4 of *Table 10-2*.

Code type	Count	Calculation of the code length ¹⁾²⁾	Input in the CLP Setup
Code 39	Number of bars	$l_{\text{Code}} = \frac{\text{Number} - 10}{5}$	Calculated code length
2/5 Interleaved	Number of wide elements (bars and gaps)	$l_{\text{Code}} = \frac{\text{Number} - 1}{2}$	Calculated code length
EAN	Not applicable	13 characters (normal version) 8 characters (short version)	activate 13-digit activate 8-digit
UPC	Not applicable	12 characters (UPC A, normal version) 8 characters (UPC E, short version)	Activate Version A Activate Version E
Codabar	Number of bars	$l_{\text{Code}} = \frac{\text{Number} - 8}{4}$	Calculated code length
Code 128 (character set A)	Number of bars	$l_{\text{Code}} = \frac{\text{Number} - 10}{3}$	Calculated code length
EAN 128	Number of bars	$l_{\text{Code}} = \frac{\text{Number} - 10}{3}$	Calculated code length
1) Check digit optional for Code 39, 2/5 Interleaved, Codabar. Check digit always integrated in the bar code print at EAN, UPC, Code 128, EAN 128 in accordance with specification (is suppressed automatically at the output of the read result of the CLP 100)			
2) With few exceptions each printed character corresponds to an ASCII character which has to be decoded. In the case of Code 39 extended, Code 128 and EAN 128 the number of characters in the data string of the CLP 100 can exceed the number of characters in the printing image because it consists of several character sets.			

Tab. 10-2: Auxiliary table for calculating the code length of a bar code

10.6 Command language for CLP bar code readers

Table 10-3 lists the commands of the command language for CLP bar code readers. The default settings of the respective parameters are printed in bold.

Parameter	Character	Value
Sensor Input	A	0: LEVEL 0,mm: EDGE mm s (mm = 1-60 ms) 1: OFF
Code Type	B	0: ALL CODES 1: CODE 39 2: ITF 4: JAN (UPC) 5: ITF-B 7: CODE 128
Check Digits (Codabar Only)	C	0: NO CHECK 1: SEND C/D 3: NOT SEND C/D 0: NO CHECK 1: SEND M16 2: SEND 7DR 3: NOT SEND M16 4: NOT SEND 7DR
Reading Direction	D	0: NOT SPECIFIED 1: FORWARD 2: REVERSE
Option (Code 128)	E	0: NOT SEND 1: SEND THROUGH 2: SEND TRANSLATED
Baud Rate	F	0: 1200 1: 2400 3: 9600 4: 19200
Cs Control	H	0: NO CONTROL 1: CONTROL
Transmit Leading Character	K	0: NONE 2,"N": C = 0-9 (30h-39h) & Upper Character
Memory	M	0: DEFAULT 1: RECALL N. V. MEMORY 2: WRITE N. V. MEMORY
Code Length	N	0: FREE 1-32: Specified Digits (1-32)
Data/Parity/Stop Bits	P	0: 701 1: 702 2: 7E1 3: 7E2 4: 8N1 5: 8N2 6: 801 7: 802 8: 8E1 9: 8E2 10: 7N1 11: 7N2

Tab. 10-3: Command language for CLP bar code readers

Parameter	Character	Value
Error String	R	0: NOT SEND 1: BR 2: ? 3: <CAN> 4: ERROR
Transmit Start/ Stop	S	0: SEND 1: NOT SEND
Terminator	T	0: NONE 1: <SX>/<EX> 2: /<CR><LF> 3: /<CR> 4: <SX>/<EX><CR> 5: <EX>/<CR>
Read Out	W	0: VERSION INFORMATION 4: BAUD RATE/FRAME (1 STOP) 5: BAUD RATE/FRAME (2 STOP)
Multiple Reads	X	1-10: 1-10 Times 2: 2 Times
End Of Reading Interval	Y	0: GENERATED BY TRIGGER Y1,nn: 01-99 BY TIMER
Number Of Codes	UA	0: FREE 1-10: 1-10 Labels to be read with one Sens.
Output On Good Read	UB	0: AFTER SENSOR 1: AFTER READ
Operation Mode	UC	0: READING MODE 1: DIAGNOSIS MODE 2: ONLINE TESTING MODE 3: ADJUSTMENT MODE
Minimum Time Between Labels	UD	0: NOT READ nn: 01-99 = Prohibition Time 10-990 ms
Result Output Time	UE	0: HOLD 1-99: 10-990 ms 10: 100 ms One Shot
Result Output Timing	UF	0: AFTER READ 1: AFTER SENSOR OFF
Host Interface	UH	0: RS-232C
LED Control	UI	0: CCD ON (Red) & READING GATES ON (Green) 1: NO READ (Red) & GOOD READ (Green)
Result Function	UJ	0: DISABLED 1: GOOD READ 2: NO READ
Code Comparison	UN	0: NO 1: YES
Result Output On Code Comparison	UQ	0: ACTIVE HIGH ON READ & MATCH 1: ACTIVE HIGH ON READ & NO MATCH
Teach In Code Comparison	UR	0: NO 1: YES
Codabar Start/ Stop Character	US	0: LOWER CASE 1: UPPER CASE

Tab. 10-3: Command language for CLP bar code readers

Parameter	Character	Value
Separator	UT	0: NONE 1: & 2: 3: FS 4: GS 5: SP
Debouncing Sensor	UY	0: 1 ms 1: 5 ms 2: 10 ms

Tab. 10-3: Command language for CLP bar code readers

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