Command Language for CLV 41X Bar Code Systems

SICK

Contents

1. Notes on this data base

This internal data base describes parameterization and operation of bar code scanners CLV 41x (abbreviated hereafter as “CLV“) with the CLV command language, and lists all available command strings.

2. Described software versions

The command strings described in this manual cover the functions of the following software versions:

Device type	Software version
CLV 41x	from V 1.10 H757 to V 1.30 I415

2.1 Additional documentation

For a more detailed functional description of the individual device parameters and operating modes, consult on-line help (HTML) in the windows-oriented parameterization interface “CLV Setup“/ the reference manual which applies to all device lines, “Menu-driven Parameterization of CLVs“. The operating instructions also contain information for selecting the parameter values as well as the values of the basic setting.

3. Instructions for using the command strings

- The command strings have been developed for operating and parameterizing the CLV via the *host interface*. They can be used to set all parameters of the CLV.
- The command strings in this data base are listed according to the structure of the operator and parameterization menu of the CLV.
- Software-related restrictions are indicated in the description of the individual parameters in the command string.
- For information on special command strings in special software versions, please contact your nearest SICK representative.

4. Introduction

Operation and parameterization using command strings

The device parameters of the CLV 41x can be defined and modified with a simple but efficient command language via the host interface. The language consists of a set of clearly structured commands, the command strings, and is also the basis of the windows-oriented parameterization interface, “CLV setup”. The command language offers the advantage of allowing you to rapidly create complete parameterization sets for operating bar code scanners. This makes it possible for a general control data processing system (Host, PLC, PC) to configure the individual reading stations automatically on site, place them in operation, and adapt them quickly and conveniently to changing application requirements without any time-consuming disassembly.
Using command strings requires appropriate programming activity in the device issuing the command (EDP).

4.1 Preparations on the data input devices (interface parameters)

▶ The host/ PLC/ PC must be matched to the host interface of the CLV (basic setting) as follows:

Parameter(basic setting)	**Value**
Data transmission rate	9600 bits/s
Data bits	8
Parity	none
Stop bits	1

Table 4.1

4.2 Preparations for entering commands on the host interface

None**.**

4.3 Command string syntax with standard protocol

All command strings on the host interface are formed from the control characters *<Start>* and *<Stop>* and appropriate combinations of numbers of letters. A command characteristic digit always occurs in the first place after the control character. It initiates the following interpretation in the CLV:

Command characteristic digit	**Function in the CLV**
1	Switch operating modes
2	Start a device function
3	Configure the device (parameterization)
4	View and process operating data

Examples: **<Start> 13 <Stop>** Call "Parameterization" mode from reading mode

<Start> 3 ? E S <Stop> Query no read format

<Start> 3 ES N02 S45 52 C0 A1 <Stop> Define no read format

↑
Command characteristic digit

Note:
the contents of the command strings are printed *with extra spacing* for the sake of clarity. However, they are always entered by the host without a blank.

Exception: Entering the different code lengths with “fixed code length “, see command string <Start> 3 COx... <Stop>

Example: Representation in the text: <Start> 3 LT M1 T050 E0 C0... <Stop>
Input: <Start>3LTM1T050E0C0...<Stop>

The device responds to syntax errors or any words that are not included in the set of available parameter values by outputting a simple error message (see subsection 4.5).

Selecting the start and stop characters for the standard protocol

Because the start and stop characters of the host interface may differ for sending and receiving (user-specific specification), the appropriate control characters of the CLV are represented in this Technical Information manual as follows:

Control character		Direction	Basic setting
Receive start character:	**<Start>**	(from host to CLV)	<STX>
Receive stop character:	**<Stop>**	(from host to CLV)	<ETX>
Send start character:	**<START>**	(from CLV to host)	<STX>
Send stop character:	**<STOP>**	(from CLV to host)	<ETX>

Note:
The <Start> and <Stop> control characters sent by the host to the CLV must be identical to the start and stop characters defined for receiving in the CLV. Commonly used control characters are selected for this purpose in the basic factory setting (see above).
If you do not want to use the default values, the send and receive control characters of the CLV host interface can be modified using “CLV setup“ (Host interface card).

4.4 Response behavior of the CLV

The CLV acknowledges each command string received by transmitting a response. This can be an echo (complete command string) or an error message. Exceptions to this rule are noted individually.
In "Parameterization" mode, the complete command string is always output for a query or parametrization procedure, even if only *one* optional parameter value was modified.

Examples:

Action:	Host transmission to CLV:	Echo/ response from CLV:
Start of reading interval	**<Start> 21 <Stop>**	**<START> 21 <STOP>**
Query	**<Start> 3 ? MS <Stop>**	**<START> 3 MS B1 T0020 A1 <STOP>**
Parametrization	**<Start> 3 MS B2 <Stop>**	**<START> 3 MS B2 T0020 A1 <STOP>**

4.5 Error messages

Depending on the operating mode, the CLV outputs the following messages if invalid command strings are received:

Operating mode	Error message	Possible cause
Reading mode	<START> **E R R** <STOP>	- Syntax error in command string - Command interpretation on the host not enabled
Percentage evaluation	<START> **E R R** <STOP>	- Syntax error in command string - Attempt to change to a different operating mode without first returning to reading mode
Parametrization	<START> **3 E R R** <STOP>	- Syntax error in command string - Impermissible command string - Invalid parameter values
Operating data (process)	<START> **4 E R R** <STOP>	- Syntax error in command string - Invalid data values

Table 4.3

5. Command strings for switching operating mode

You can toggle between reading mode and the other CLV operating modes by means of simple commands.

It is <u>not</u> possible to change directly between two operating modes *without* first calling reading mode.

Operating mode	Command string	Function
Reading mode	<Start> **11** <Stop>	Return to normal reading mode from a different operating mode
Percentage evaluation	<Start> **12** <Stop>	Change from reading mode to percentage evaluation. (when calling via the host interface the CLV outputs the reading result here as well. This differs from operating via menu). Return to reading mode: <Start> **11** <Stop>
Parametrization	<Start> **13** <Stop>	Change from reading mode to parametrization mode Return to reading mode: <Start> **11** <Stop>
Operating data (process)	<Start> **14** <Stop>	Change from reading mode to operating data processing mode
AutoSetup	<Start> **16** <Stop>	Call AutoSetup from reading mode Return to reading mode: <Start> **11** <Stop>
Reading rate evaluation *(from V1.30 I415)*	<Start> **17** <Stop>	Call reading rate evaluation from reading mode (the CLV does not output any result to the host interface, reading rate is displayed only via the blinking frequency of the "result" LED or the signaling frequency of the beeper) Return to reading mode: <Start> **11** <Stop>

Table 5.1

Example 1:
1. operating mode — Reading mode
2. switch: <Start> **12** <Stop> — Percentage evaluation
3. switch: <Start> **11** <Stop> — Return to reading mode
4. switch: <Start> **14** <Stop> — Process operating data

Example 2:
1. operating mode — Reading mode
2. switch: <Start> **12** <Stop> — Percentage evaluation
3. switch: <Start> **14** <Stop> — Not possible

6. Command strings for parametrization

Not only can the command language be used to modify and permanently store individual parameters, the entire parameter set of the CLV or parts thereof, but also to query its current status.

When the user-specific parameter set is created, it is composed initially in the RAM of the CLV. In order to store it permanently, it must be transferred to the non-volatile area of the EEprom (*see command string <Start> 3 EEW <Stop>*). This applies even if only one parameter value is modified, for example.

6.1 Preparations for parametrization

In order to access the parameters, you must select "Parametrization" mode from one of the other operating modes. Since the device is usually in reading mode, this mode must be terminated in order to do so. The command string

<Start> **13** <Stop>

is used to call "Parametrization" mode. After you have exited this mode (new temporary parameter set, may have to be stored permanently), enter the command string

<Start> **11** <Stop>

to return to "Reading mode".

All command strings for parametrization have the value "3" in their first position as the *command characteristic digit*.

<Start> **3** . . . <Stop>

A 2-character *range identifier*, which consists of upper-case letters and follows the command characteristic digit, specifies the part of the parameter set that is to be queried or modified.

Identifiers for parameter ranges

Identifier	Meaning
AL	Upload/ download device parameter set
AQ	Query parameter set size in the CLV
AP	Query command groups in the CLV
CO	Code configuration
CV	Code comparison
DF	Restore basic setting
DS	Call basic setting 2
EE	Access the internal EEprom
ES	Error string (new notation) host interface
GN	Device number
HS	Host interface data format
LK	Reading configuration
LT	Reading pulse
MS	Master/ Slave
PR	Open parameter profile
RO	Switch outputs result 1 to 3
SE	Result of self-monitoring
SF	Result of the self-test in reading mode
SP	Host interface protocol
SZ	Sending points host interface
TF	Telegram format (host interface reading result)
TS	Test string host interface

Table 6.1

Insert a **"?"** in front of a range identifier for a query.

Examples: the identifier "LT" is used to parameterize the reading pulse

Query:	<Start> **3 ? LT** <Stop>	
Response:	<START> 3 LT M1 T000 <STOP>	(triggering: switching input)
Parametrization:	<Start> **3 LT M3** <Stop>	(new triggering: interface)
Response:	<START> 3 LT M3 T000 <STOP>	

Numeric values are entered in ASCII format and some parameter values are selected in Hex-ASCII (noted individually).

6.2 Parameterizing a CLV in the SICK network

You can also use command strings from the host to parameterize and operate a CLV connected to the SICK network (RS 485). In order to do so, you must assign each CLV a device number in the range 01 ... 31. The number 32 is reserved for the CLX 200 network controller. Each device number may only be used once as a network ID for a CLV.

The contents of the command string between the <Start> and <Stop> delimiters transmitted by the host must be identical to the characters defined for the header and terminator in the CLX 200. The device number of the CLV to be addressed must be specified in the second position between the delimiters. The start and stop characters defined for the standard protocol in the CLV have no meaning if the network protocol “CLX 200“ is selected.

Example:

1. CLV connected directly to the host (standard protocol)

<STX> 3 LT B0 **<ETX>** (standard STX and ETX setting to receive start and stop characters in the CLV)

2. CLV in the SICK network (network protocol: "CLX 200 standard")

<STX> 05 3 LT B0 **<ETX>** (basic setting for host interface of the CLX 200: STX as header and ETX as terminator. Device number here CLV ID = 05)

6.3 Parameterizing a CLV with the 3964 protocol

The data exchange procedure is specified as follows in the 3964 protocol:

Procedure	Host		CLV
1.	**<STX>**	⇨	
2.		⇦	**<DLE>**
3.	3 LT B0 **<DLE> <ETX>**	⇨	
4.		⇦	**<DLE>**

7. Code configuration

7.1 Configuring the code type(s) (3 CO...)

1. Query the current setting:

<Start> **3 ? CO x** <Stop> (x= Code type)

2. Response from CLV (example):

<START> **3 CO b A1 LF P1 M03 C0000 D0** <STOP>

<START> **3 CO Code type [active] [length] [check digit trans.] [multiple reads] [code-spec.] [Dec. alg.]** <STOP>

3. Parameter assignment:

<Start> **3 CO code type [active] [length] [check digit]**
x [Ax] [Lx] [Px]

[multiple reads] [code-spec.] <Stop>
[Mxx] [Cwxyz]

[ ]: optional input
Basic setting: see table 1.1 and 1.2

Parameter:

3 Command identifier
CO: Command group identifier

- -

x: Code type identifier

x:	Codabar:	a	*(from V1.10 H757)*
	Code 39:	b	*(from V1.10 H757)*
	UPC:	c	*(from V1.10 H757)*
	EAN:.....	d	*(from V1.10 H757)*
	2/5 Interleaved:	e	*(from V1.10 H757)*
	Code 93:	i	*(from V1.10 H757)*
	Code 128:.....	j	*(from V1.10 H757)*
	EAN 128:.....	n	*(from V1.10 H757)*
	Pharmacode[1)]:.....	o	*(from V1.10 H757)*

1) Evaluation of all other code types is set to inactive when activated.

Note: A single, complete command string should be sent to the CLV for each code type to be evaluated

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[active]:
(from V1.10 H757)

Ax Activate evaluation for selected code type

x: 0 Evaluation not active
1 Evaluation active

Note: [active] has no significance for EAN and UPC.
See also [EAN] or [UPC] under [code-spec.]

[length]: *(from V1.10 H757)*

LE x: fixed code length

x: 5 values (01...50)[1)], separated by a blank (20 hex)
Input example: LE05 07 14 15 00

LI y: Interval

y: 2 values (01...50)[1)2)], separated by a blank *(20 hex)*
Input example: LI05 14 (ascending)

LF: Freely selectable code length (max. 50 characters[1)])

1) Code 39 max. 49 characters, Pharmacode 4...16 characters, 2/5 Interleaved even-numbered lengths
2) The CLV automatically corrects incorrect value input (in ascending order). The values appear in the correct order in the CLV's response.

Note: [length] has no significance for EAN, UPC and Pharmacode. Input made here will be overwritten by parameters under [code-spec.].
On this subject, see [EAN], [UPC] or [Pharmacode] under [code-spec.]

[check digit]: *(from V1.10 H757)*

Px: Output check digit

x:
0 Check digit is not output in the reading result
1 Check digit is output in the reading result as part of the code (last character)

[multiple reads]: *(from V1.10 H757)*

Mxx Number of multiple read operations

x: 01...99
01 One read operation
99 99 identical read operations

[code-spec.]: Code type specific parameters

codabar: **C x y z**

x: *(from V1.10 H757)*
Condition for evaluation of the start and stop character

x:
0 Output of code regardless of whether the two characters are identical or different (basic setting)
1 Output of code only if the two characters are identical.

y:
Output of start and stop character in the read result (data output string)

(from V1.10 H757)

y:
0 Neither character is output (basic setting)
1 Both characters are output

z: *(from V1.10 H757)*
Check digit test

z:
0 No check digit test (basic setting)
1 Check digit test

code 39: **C w x y z**

w: Output of the two identical start and stop characters in the read result (data output string)

(from V1.10 H757)

w:	0	Neither character is output (basic setting)
	1	Both characters are output

x: Character set mode

(from V1.10 H757)

x:	0	Code 39 “standard“ (basic setting)
	1	Code 39 “full ASCII“

y: Check digit test

(from V1.10 H757)

y:	0	Check digit test (basic setting)
	1	Check digit test as per "mode 10"
	2	Check digit test as per "mode 43"

z: Output mode in read the result (data output string)

(from V1.10 H757)

z:	0	The code content is output in the form of *ASCII characters*. In “full ASCII” character set mode all control characters (00...1F hex) in the code are also each replaced by the “@“ character (basic setting)
	1	The code content is output in the form of *Hex ASCII characters* This makes it possible for control characters occurring in the code content to pass through transparently.

. . . . . .

UPC: **C x y z**

x[1)]**:** Decoding method “Version A“ (12 characters)

(from V1.10 H757)

x:	0	Evaluation not active
	1	Evaluation active (basic setting)

y[1)]**:** Decoding method “Version E“ (6 characters)

(from V1.10 H757)

y:	0	Evaluation not active
	1	Evaluation active (basic setting)
	2	Evaluation for expanded UPC active

z: Decoding method Appendix (add-on)

(from V1.10 H757)

z:	0	No add-on (basic setting)
	1	Appendix with 2 characters
	2	Appendix with 5 characters
	3	Appendix with 2 or 5 characters

1) Setting Cx and Cy affects parameter Ax in the same string. If x or y is set to “1“, for example the CLV automatically sets A to “1“ as well. But parameter Ax does not have any affect in the reverse direction on Cx or Cy.

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EAN: **C x y z**

x[1)]**:** Decoding method “13-character version“

(from V1.10 H757)

x:	0	Evaluation not active
	1	Evaluation active (basic setting)

y[1)]**:** Decoding method “8-character version“

(from V1.10 H757)

y:	0	Evaluation not active
	1	Evaluation active (basic setting)

z: Decoding method Appendix (add-on)[1)]

(from V1.10 H757) **z:**
- 0 No add-on (basic setting)
- 1 Appendix with 2 characters
- 2 Appendix with 5 characters
- 3 Appendix with 2 or 5 characters

1) Setting Cx and Cy affects parameter Ax in the same string. If x or y is set to "1", for example the CLV automatically sets A to "1" as well. But parameter Ax does not have any affect in the reverse direction on Cx or Cy.

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2/5 interleaved: **C x y**

x: Output of leading zero in read result (data output string)

(from V1.10 H757) **x:**
- 0 Leading zero not output
- 1 Leading zero output (basic setting)

y: Check digit test

(from V1.10 H757) **y:**
- 0 No check digit test (Basic setting)
- 1 Check digit test as per "mod 10"
- 2 Check digit test as per "mod 1R18"

(from V1.30 I415)
- 3 Check digit test as per "W49M10"

(from V1.30 I415)
- 4 Check digit test as per "W21M10"

. . . . . .

code 93: **C x**

x: Output mode in read result (data output string)

(from V1.10 H757) **x:**
- 0 Code content output in the form of *ASCII characters*. All control characters (00...1F hex) in the code are each replaced by the "@" character (basic setting)
- 1 Code content in output in the form of *Hex ASCII characters.* This makes it possible for control characters occurring in the code content to pass through transparently.

. . . . . .

code 128: **C x**

x: Output mode in read result (data output string)

(from V1.10 H757) **x:**
- 0 Code content output in the form of *ASCII characters*. All control characters (00...1F hex) in the code are each replaced by the "@" character (basic setting)
- 1 Code content in output in the form of *Hex ASCII characters.* This makes it possible for control characters occurring in the code content to pass through transparently.

. . . . . .

EAN 128: ***Note:*** the check digit is not output (parameter P = "0")

C x mm nn oo pp qq rr

x: Output mode in read result (data output string)

(from V1.10 H757) **x:**
- 0 Code content output in the form of *ASCII characters*. All control characters (00...1F hex) in the code are each replaced by the "@" character (basic setting)
- 1 Code content in output in the form of *Hex ASCII characters.* This makes it possible for control characters occurring in the code content to pass through transparently.

mm nn oo:
(from V1.10 H757)

Interpretation of FC 1 as the *first character* in the code (Basic setting)

mm: 1st character (01...7F hex), (basic setting: 5D hex =])
nn: 2nd character (01...7F hex), (basic setting: 43 hex = C)
oo: 3rd character (01...7F hex), (basic setting: 31 hex = 1)

pp qq rr:
(from V1.10 H757)

Interpretation of FC 1 *within* the code

pp: 1st character (01...7F hex), (basic setting: 1D hex = <GS>)
qq: 2nd character (01...7F hex), (basic setting: 00 hex = <NUL>)
rr: 3rd character (01...7F hex), (basic setting: 00 hex = <NUL>)

Note: If there are less than 3 characters, the remaining characters must be set to "00" hex.

. . . .

pharma code: **C x y**

x:
(from V1.10 H757)

Module width

x:
- 0 auto. not for code with only one bar width (basic setting)
- 1 0.35 mm
- 2 0.5 mm

y:
(from V1.10 H757)

Read direction

y:
- 0 forwards (CP 0...100); (basic setting)
- 1 backwards (CP 100...0)

- -

[dec. alg.]:[1)]
(from V1.10 H757)

Dx: Decoding algorithm (Stages of evaluation routine)

x:
- 0 Standard (1-stage, rapid evaluation)
- 1 Expanded (2-stage, more extensive evaluation) (basic setting)

Note: Function can be parameterized, but not has no affect since it is not implemented in the decoder. The basic setting is output upon query.

1) only for EAN, UPC, Code 93, Code 128 and EAN 128.
Activation of the desired evaluation routines in pairs for EAN/ UPC and Code 128/ EAN 128. If a code type with the desired evaluation routine is assigned for one of these pairs, the second code type is evaluated automatically even if it has not been assigned this evaluation routine. An evaluation routine will not be activated only if it has not been selected for both code types of the pair.

7.2 Restoring the basic factory setting, temporary in RAM (3 COD):

<Start> **3 CO D** <Stop> *(from V1.10 H757)*

Decoder: standard

	Code types									
Function	**Code 39**	**2/5 ITF**	**EAN (8/13)**	**UPC (6/12)**	**2/5 Ind.**	**2/5 Ind. B**	**Codabar**	**Code 128**	**Code 93**	**EAN 128**
from SW	V1.10	V1.10	V1.10	V1.10	-	-	-	V1.10	V1.10	V1.10
Activation	yes	yes	yes	yes	none	none	yes	yes	yes	yes
Code length	free	Interval 04 50	8/13	6/12	none	none	free	free	free	free
Multiple read	3	3	3	3	none	none	3	3	3	3
Check digit test	not active	not active	integr.	integr.	none	none	not active	integr.	integr.	integr.
Check digit carried over	yes	yes	yes	yes	none	none	yes	-	-	-
Start/Stop carried over	no	-	-	-	-	-	no	-	-	-
Start/Stop identical	-	-	-	-	-	-	no	-	-	-
Leading zero carried over	-	yes	-	-	-	-	-	-	-	-
Full ASCII	no	-	-	-	-	-	-	-	-	-
Output HexASCII	no	-	-	-	-	-	-	no	no	no
W. appendix	-	-	no	no	-	-	-	-	-	-
Interpretat. FC1	-	-	-	-	-	-	-	-	-	1st place 5D 43 31 hex
Module width	-	-	-	-	-	-	-	-	-	-
Read direction	-	-	-	-	-	-	-	-	-	-

Table 1a

	Code types									
Function	**Pharma**									
from SW	V1.10									
Activation	no									
Code length	fixed: 4									
Multiple read	3									
Check digit test	-									
Check digit carried over	-									
Start/Stop carried over	-									
Start/Stop identical	-									
Leading zero carried over	-									
Full ASCII	-									
Output HexASCII	-									
W. appendix	-									
Interpretat. FC1	-									
Module width	auto									
Read direction	forwards									

Table 1b

8. Device configuration

8.1 Reading configuration (3 LK...)

1. Query current setting:

<Start> **3 ? LK** <Stop>

2. Response from CLV (Example):

<START> **3 LK L0150 B033 S3 Maa P000 Q100 N1 O100**<STOP>

3. Parameter assignment:

<START> **3 LK [min. read dist.] [min. bar width] [scan freq.] [start/stop] [min. CP]**
[Lxxxx] [Byyy] [Sx] [Mxx] [Pxxx]
[max. CP][segmentation] [Absolute value idle zone] <STOP>
[Qxxx] [Nx] [Oxxx]
[ ]: optional input
Basic setting: see individual parameters

Parameter:

3 Command characteristic digit
LK: Range key

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[min. read.]: **Lxxxx:** Minimum reading distance to occur
(from V1.10 H757)

xxxx: 0020...0400 mm (basic setting: 50 mm)

- -

[min. bar.]: **Byyy:** **minimum bar width** (narrowest bar/gap) of the least refined code to occur (lowest resolution)
(from V1.10 H757) Unit: x (0.01 mm)= 1/100 mm

yyy: 010...100 (basic setting: 0.50 mm)

- -

[scan freq.]: **Sx** Scanning frequency, in increments of 50 Hz
(from V1.10 H757)

x:

1	200 Hz
2	250 Hz
3	300 Hz
4	350 Hz
5	400 Hz
6	450 Hz
7	500 Hz (basic setting)
8	550 Hz
9	600 Hz
:	650 Hz
;	700 Hz
<	750 Hz
=	800 Hz

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[start/stop]: *(from V1.10 H757)*

Mxx: Minimum value for quotient of white shoulder and edge bar

xx:
- aa — automatically (basic setting)
- 04...11 — freely selectable

[min. CP]: *(from V1.10 H757)*

Pxxx: Lower limit value of code position along the scan line

xxx: 000...100 CP (basic setting: 0 CP)

1) Output: String compatible with CLV 260/290 with its basic setting
2) Input: in the CLV 265/295, affects only distance configuration No. 1.
To parameterize distance configurations 1...8 however, use String <Start> 3 Ax...<Stop>.

[max. CP]: *(from V1.10 H757)*

Qxxx: Upper limit value for code position along scan line

xxx: 000...100 CP (basic setting: 100 CP)

1) Output: String compatible with CLV 260/290 with its basic setting
2) Input: in the CLV 265/295, affects only distance configuration No. 1.
To parameterize distance configurations 1...8 however, use String <Start> 3 Ax...<Stop>.

[segmentation]: *(from V1.10 H757)*

Nx: recognition procedure for beginning/end of the code

x:
- 0 — Start/Stop relation (basic setting)
  See below [Start relation.]
- 1 — Absolute value of the idle zone

[Absolute value idle zone]: *(from V1.10 H757)*

Oxxx: As recognition procedure, the CLV uses the input Absolute value of the idle zone before/after the code.
Requirement: the CLV reads in parameterized read distance
Unit: x (0.1 mm)= 1/10 mm

x: 001...255 (basic setting: 10 mm)

8.2 Reading pulse (3 LT...)

1. Query current setting:

<Start> **3 ? LT** <Stop>

2. Response from CLV (example):

<START> **3 LT M8 T050 C0 Z0010 A0 B4B S49 E0 F0** <STOP>

3. Parameter assignment:

<Start> **3 LT [mode] [time out] [pulse end] [timer]**
[Mx] [Txxx] [Cx] [Zxxxx]

[trig. single char.] [trig. start] [trig. stop] [debounce] [first pulse] <Stop>
[Ax] [Bxx] [Syy] [Ex] [Fx]

[ ]: optional input
Basic setting: see individual parameters

Parameter:

3 Command characteristic digit
LT: Range key

- -

[mode]: *(from V1.10 H757)*

Mx defines the trigger source for the internal read interval

x:
- 1 Pulse active if "Sensor" switching input energized (high) [1];
- 2 Pulse active if "Sensor" switching input not energized (low) [1]
- 3 Serial interface (command string) [1]
- 4 free-running [2] with [timeout] [1]
- 8 Reflector polling [4]

1) Security switch-off: ends open read interval after 10 min, from V1.10 H757)
2) The polling reflector is recognized only in mode 8 and in percentage evaluation

- -

[time out]: *(from V1.10 H757)*

Txxx Timeout for free-running reading (mode 4)
Unit: x (0.01 s) = 10 ms

xxx: 001... 999 (10 ms ... 9.99 s), (basic setting: 50 ms)

With free-running triggering, the CLV starts the internal reading interval as soon as it detects a valid code. The reading interval ends after the timeout has expired if no further codes are detected that trigger it again.

- -

[pulse end]: **Cx** Control of end of reading interval.
(from V1.10 H757)

x: 0 The read interval is ended by the selected trigger source (mode 1 ... 3)[)] (basic setting)
1 The [Timer Zxxxx] controls the end of the read interval[1)]

1) Security switch-off: end of the open read interval after 10 min

Note: Function not relevant for “free-running “ (mode 4)

[timer]: **Zxxxx** Timer for end of reading interval
(from V1.10 H757) Unit: x (0.01 s) = 10 ms

xxxx: 0001...9999 (10 ms ... 99.9 s); (basic setting: 1 s)

[trig. single char.]: **Ax** Trigger reading interval with command string (mode 3)
(from V1.10 H757)

x: 0 Read interval triggering via the serial interface with the standard command <Start> 21 <Stop> (start) and <Start> 22 <Stop> (stop); (basic setting)
1 Reading interval triggered via serial interface with the individual characters [Trig. start] and [Trig. stop] without frame

Requirement*:*
Use of the SICK protocol (standard).
Function not possible with network protocol or 3964 protocol.

[trig. start]: **Bxx** Character for start of reading interval (mode 3)
(from V1.10 H757)

xx: 01...7F hex, exceptions[1)], (basic setting: 4B hex = „K“)

1) 06 hex =<ACK>, 11 hex=<NAK>, 13 hex=<XOFF>, 15 hex=<XON>, selected protocol start/stop characters as well as [Trig. start]]

[trig. stop]: **Syy** Character for end of reading interval (mode 3)
(from V1.10 H757)

yy: 01...7F hex, exceptions[2)], (basic setting: 49 hex = „I“)

2) 06 hex =<ACK>, 11 hex=<NAK>, 13 hex=<XOFF>, 15 hex=<XON>, selected protocol start/stop characters as well as [Trig. start]

[debounce]: **Ex** Debouncing time of the "Sensor" switching input (mode 1 and 2).
(from V1.30 I415)

x: 0 Standard debouncing (10...20 ms); (basic setting)

1 Shortened debouncing (scan frequency dependent)

Scan frequency	Debounce time (type. values)
200 Hz	5 ms ... 10 ms
300 Hz	3.3 ms ... 6.7 ms
400 Hz	2.5 ms ... 5 ms
500 Hz	2 ms ... 4 ms
600 Hz	1.7 ms ... 3.3 ms
700 Hz	1.4 ms ... 2.9 ms
800 Hz	1.3 ms ... 2.5 ms

- -

[first pulse]: **Fx** Triggering of the first read interval with the first cycle (Mode 1, 2 and 8).

(from V1.30 I415)

x:
- 0 Slope triggering: read interval becomes active with the first external cycle slope (basic setting)
- 1 Level triggering: the read interval becomes active if a static level is present when the CLV is switched on

8.3 Switching outputs (3 RO...)

1. Query current setting:

<Start> **3 ? RO** <Stop>

2. Response from (example):

<START> **3 RO A0 B1 C2 D1 TA001 TB001 TC001 I00 V1**
L00000080 M5 N1 O00000050 P7 Q 1 X 005 <STOP>

3. Parameter assignment::

<Start> **3 RO [Result function] [Result duration] [Invert result] [beeper vol.] [limit1]**
[AxBxCxDx] [TAxxx TBxxx TCxxx] [Ixx] [Vx] [Lxxxxxxxx]

[reference1] [fault1] [limit2] [reference2] [fault2] [debounce counter] <Stop>
[Mx] [Nx] [Oxxxxxxxx] [Px] [Qx] [Xxxx]

[ ]: Optional input
Basic setting: See individual parameters

Parameter:

3 Command characteristic digit
RO: Range key

- -

[Result function]: **Ax Bx Cx Dx** assignment of result functions to the
(from V1.10 H757) switch outputs “Result 1..3“ and to the beeper

A Switch output Result 1
B Switch output Result 2
C Switch output Result 3
D Beeper

(from V1.10 H757)	**x:**	0	Device Ready[1)]
(from V1.10 H757)		1	Good Read
(from V1.10 H757)		2	No Read
(from V1.10 H757)		3	Number of codes read < Min. number of codes
(from V1.10 H757)		4	Number of codes read > Max. number of codes
(from V1.10 H757)		5	No Match
(from V1.10 H757)		6	Match 1
(from V1.10 H757)		7	Match 2
(from V1.10 H757)		8	Match 1 or Match 2
(from V1.10 H757)		9	Match 2 and Match 2
(from V1.10 H757)		A	Mismatch 1
(from V1.10 H757)		B	Mismatch 2
(from V1.30 I415)		C	Not assigned (Reserve)
(from V1.30 I415)		D	Not assigned (Reserve)
(from V1.30 I415)		E	Reference 1 < Limit 1
(from V1.30 I415)		F	Reference 1 > Limit 1
(from V1.30 I415)		G	Reference 2 < Limit 2
(from V1.30 I415)		H	Reference 2 > Limit 2
(from V1.30 I415)		I	Reference 1 > Limit 1 *and* Reference 2 < Limit 2
(from V1.30 I415)		J	Reference 1 < Limit 1 *or* Reference 2 > Limit 2

(from V1.30 I415) K Reference 1 < limit 1 a*nd* Reference 2 < limit 2
(from V1.30 I415) L Reference 1 > limit 1 a*nd* Reference 2 > limit 2
(from V1.30 I415) M Reference 1 < limit 1 *or* Reference 2 < limit 2
(from V1.30 I415) N Reference 1 > limit 1 *or* Reference 2 > limit 2
(from V1.30 I415) O Set/reset via host
(from V1.30 I415) P Barcode visible

1) not used for the beeper

Basic setting:

A0	Switch output Result 1	Device Ready
B1	Switch output Result 2	Good Read
C2	Switch output Result 3	No Read
D1	Beeper	Good Read

- -

[Result duration]: **TAxxx TBxxx TCxxx** Pulse duration of switch outputs Result 1..3“
(from V1.10 H757) Unit: x (0.01 s) = 10 ms

A Switch output Result 1
B Switch output Result 2
C Switch output Result 3

xxx: 000 Output behaves statically
001...999 Pulse duration 10 ms...9.99 s

Basic setting:

Switch output Result 1	100 ms
Switch output Result 2	100 ms
Switch output Result 3	100 ms

- -

[[Invert result]: **Ixx** Polarity of switch outputs “Result 1...3“
(from V1.10 H757)

xx: Input in hexadecimal representation

Bit 2 Result 3
Bit 1 Result 2
Bit 0 Result 1

Binary: 0: not inverted
1: inverted

Hex	Binary
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

Example: 05 hex: 101 Result 1 and 3 inverted
Result 2 not inverted

Basic setting: 00 hex =000 (all outputs not inverted)

[beeper vol.]: **Vx** Volume of the beeper
(from V1.10 H757)

x:
- 0 off
- 1 soft (basic setting)
- 2 loud

[limit 1]: **Lxxxx xxxx** 8-place limit value for Reference 1
(from V1.30 I415)

xxxxxxxx: 0000 0000 ... 9999 9999 (dec.)
(basic setting: 80)

[reference 1]: **Mxx** Reference 1
(from V1.30 I415)

x:
- 0 NC Number of read intervals
- 1 NG Number of good read
- 2 TT Duration of the read interval
- 3 MG Average read quality (in %)
- 4 CC Number of codes read
- 5 CG Identification quality (in %); (basic setting)
- 6 CL Code length
- 7 CP Code position
- 8 CS Code security

[fault 1]: **Nx** Switch behavior of the result output
(from V1.30 I415) to which reference 1 is assigned with content CG, CL, CP or CS for No read

x:
- 0 Result output remains inactive if the corresponding value for reference 1 can *not* be determined
- 1 Result output becomes active if the corresponding value for reference 1 can *not* be determined (Basic setting)

[limit 2]: **Oxxxx xxxx** 8-place limit value for reference 2
(from V1.30 I415)

xxxxxxxx: 0000 0000 ... 9999 9999 (dec.)
(Basic setting: 00)

[reference 2]: **Pxx** Reference for limit value 2
(from V1.30 I415)

xx:
- 0 NC Number of read intervals
- 1 NG Number of good read
- 2 TT Duration of the read interval
- 3 MG Average read quality (in %)
- 4 CC Number of codes read
- 5 CG Identification quality (in %)
- 6 CL Code length
- 7 CP Code position (basic setting)
- 8 CS Code security

[fault 2]: **Qx** Switch behavior of the result output *(from V1.30 I415* to which reference 2 is assigned with content CG, CL, CP or CS for No read

x:
- 0 Result output remains inactive, if the corresponding value for reference 2 can *not* be determined
- 1 Result output becomes active, if the associated value for reference 2 can *not* be determined (basic setting)

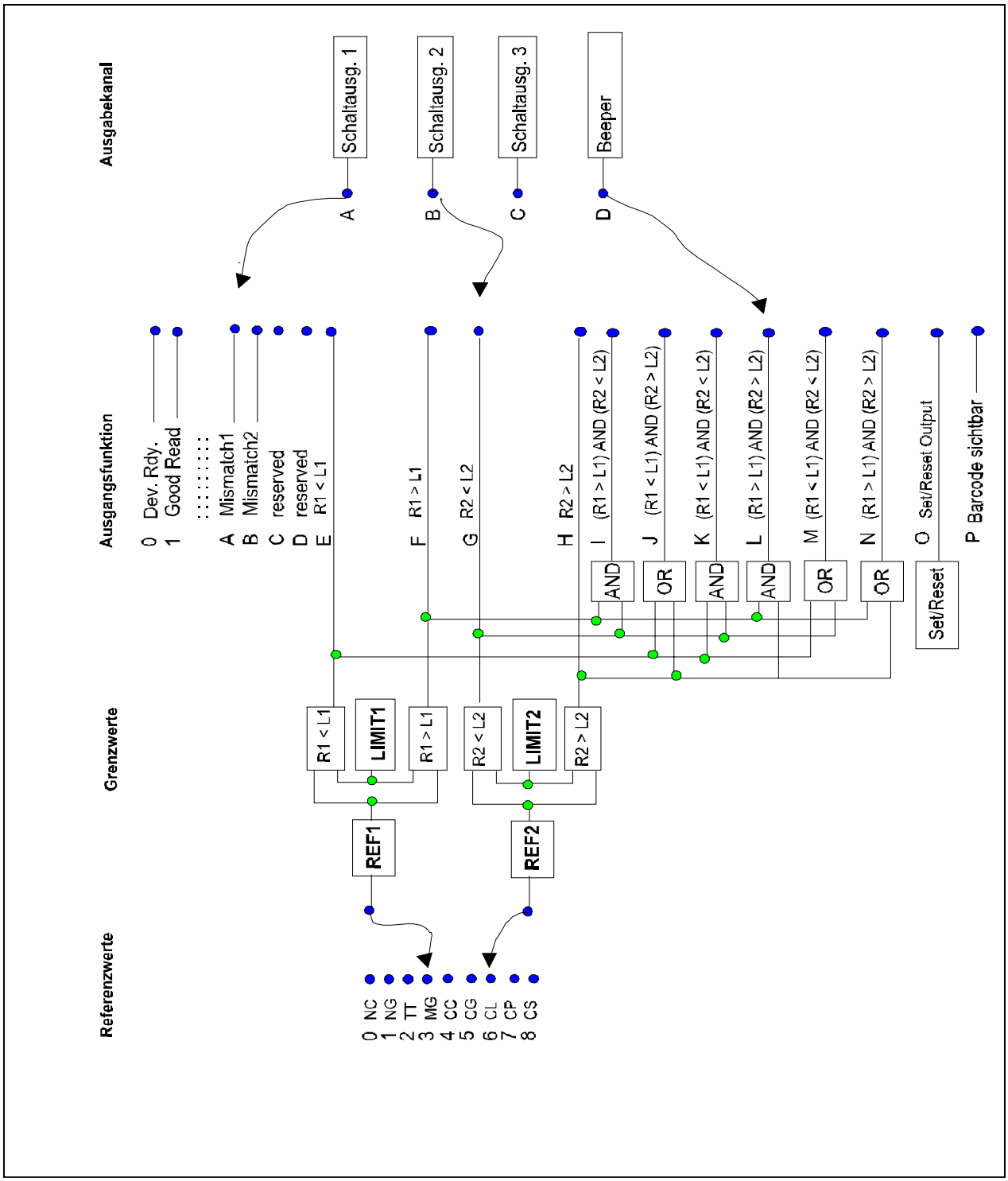
[Debounce counter]: *(from V1.30 I415)* **Xxxx** Maximum value of the debounce counter for the switch output that has been assigned a value with the result function “P“ (Barcode visible)

xxx: 001...255 (Basic setting: 005)

Event-independent affect of the states of the switch outputs and the beeper in reading mode:

See string <Start> **29 cbad** <Stop>

Schematic representation of the comparison with references for switch outputs / for the beeper:



Reference:

Ausgabefunktion	output function
Ausgabekanal	output channel
Grenzwerte	threshold values
Referenzwerte	reference values
Schaltausg.	switch output
sichtbar	visible

8.4 Matchcode comparison (3 CV...)

1. Query the current setting:

<Start> **3 ? CV** <Stop>

2. Response from CLV (example):

<START> **3 CV A0 Ix C05 123## F0 B1 Jx D07 8654321 G1 T0 R0** <STOP>

3. Parameter assignment:

<Start> 3 CV **[match code1 active] [code type1] [match code1] [filter match code1]**
[Ax] [Ix] [Cxx Code] [Fx]

[match code2 active] [code type2] [match code2] [filter match code2]
[Bx] [Jx] [Dxx Code] [Gx]

[Teachin] [CounterReset] <Stop>
[Tx] [Rx]

[ ]: Optional input
Basic setting: See individual parameters

Parameter:

3 Command characteristic digit
CV: Range key

- -

[match code 1 active]: *(from V1.10 H757)*
Ax Activate match code 1

x: 0 No match code comparison (basic setting)
1 Match code comparison

- -

[code type 1]: *(from V1.10 H757)*
Ix Code type for match code 1

x:
Codabar .....a
Code 39 ..... b
UPC c
EAN..... d
2/5 Interleaved ..... e
Code 93 i
Code 128.....j
EAN 128.....n
Pharmacode.....o
Code type irrelevant .....x (basic setting)

- -

[match code 1]: *(from V1.10 H757)*
C nn Code Enter of match code 1

nn: 01... 50 Number of subsequent characters

Code: ASCII characters of match code 1 in the same form as they are to be output on the host interface
e.g. - with/ without start/ stop characters

- full ASCII

Wildcard for individual chars: #
(basic setting: empty)

[filter match code 1]: *(from V1.10 H757)*

Fx Filter effect of match code 1 for output of reading result via the host interface

x:
0 No effect on data output string
1 Output read code content only if it is identical to match code 1. Otherwise no read format up to min. number of codes (basic setting)

[match code 2 active]: *(from V1.10 H757)*

Bx Activate match code 2

x:
0 No match code comparison (basic setting)
1 Match code comparison

[code type 2]: *(from V1.10 H757)*

Jx Code type for match code 2

x:

Codabar	a	
Code 39	b	
UPC	c	
EAN	d	
2/5 Interleaved	e	
Code 93	i	
Code 128	j	
EAN 128	n	
Pharmacode	o	
Code type irrelevant	x	(basic setting)

[match code 2]: *(from V1.10 H757)*

D nn Code Enter of match code 2

nn: 01 ... 50 Number of subsequent characters

Code: ASCII characters of match code 2 in the same form as they are to be output on the host interface
e.g. - with/ without start/ stop characters
- full ASCII
Wildcard for individual chars: #
(basic setting: empty)

[filter match code 2]: *(from V1.10 H757)*

Gx Filter effect of match code 2 for output of reading result via the host interface

x:
0 No effect on data output string
1 Output read code content only if it is identical to match code 2. Otherwise no read format up to min. number of codes (basic setting)

[Teachin]: *(from V1.20 H912)*

Tx type of teach-in mode for target code 1 (Teach-in)

x:

0 Dynamic Teach-in (basic setting)
The CLV can only teach in codes (code type, length) as target codes in the code configuration.

1 Static Teach-in *without* Pharmacode.
The CLV can also teach-in a code that is not released to the code configuration (code type, length) as target code 1
Upon success, the code type and length are entered into the code configuration and all other code types and lengths are blocked for subsequent reads.
Exception: Pharmacode must not be used here!

2 Static Teach-in *with* Pharmacode.
Used exclusively for Pharmacode teach-in
(Code length > 5 characters!) as target code 1. All other code types are inactive.
The new teach-in target code should be verified for correctness.

- -

[CounterReset]: *(from V1.20 H912)*

Rx Static Teach-in: reset the day counter if teach-in for a code was successful

x:

0 Reset data group DD
(daily operating hours, number of read intervals, number of good reads and average identification quality)

1 Counters of data group DD remain unmodified
(Basic setting)

8.5 Device number (3 GN...)

1. Query current setting:

<Start> **3 ? GN** <Stop>

2. Response from CLV (example):

<START> **3 GN 01** <STOP>

3. Parameter assignment:

<Start> **3 GN xx** <Stop>

Basic setting: See individual parameters

Parameter:

3 Command characteristic digit
GN: Range key

- -

xx: Device number for identification of the CLV
(from V1.10 H757) 01...99 general (basic setting: 01)
01...31 in the SICK Network

Note:

The selection of the device number also determines the switch-on point of The CLV's motor control (current peak = load of the supply network with many CLVs).

Device number GN	Switch-on delay
1; 11; 21; 31	0 ms
2; 12; 22	400 ms
3; 13; 23	800 ms
4; 14; 24	1200 ms
5; 15; 25	1600 ms
6; 16; 26	2000 ms
7; 17; 27	2400 ms
8; 18; 28	2800 ms
9; 19; 29	3200 ms
10; 20; 30	3600 ms

Master/ Slave configuration

- In the master/ slave configuration, only the device number GN enabled for transmission in the header of the master is relevant. The master enters here the logical device number (1 ... 7) of the slave (specified by the connection sequence) which issued the reading result (master: GN = 0). The reading result, therefore, can be assigned to a device in the host.
- Parameterized device numbers GNs are not required for slaves for this purpose.

SICK Network

- Each device in the network must be assigned a unique device number GN; this number is used by the CLX 200 network controller to identify the reading stations.
- If a master/ slave configuration is used within the network, all of the devices in the configuration must have the same device number GN.

8.6 Master/Slave (3 MS...)

1. Query the current setting:

<Start> **3 ? MS** <Stop>

2. Response from CLV (example):

<START> **3 MS B2 T0020 A3** <STOP>

3. Parameter assignment:

<Start> **3 MS [operating mode] [time out] [no. slaves]** <Stop>
[Bx] [Txxxx] [Ax]

[ ]: Optional input
Basic setting: See individual parameters

Parameter:

3 Command characteristic digit
MS: Range key

- -

[operating mode]: *(from V1.10 H757)*
Bx Logical physical arrangement of CLV

x:
1 Stand-alone (basic setting)
2 Master
3 Slave

- -

[time out]: *(from V1.10 H757)*
Txxxx Waiting period of master for reading result from slave after end of its own reading interval
Unit: x (0.01 s) = 10 ms

xxxx: 0000...9999 (10 ms...99.9 s); (basic setting: 200 ms)

- -

[no. slaves]: *(from V1.10 H757)*
Ax No. of slave devices

x: 1...7 (basic setting: 1)

Commands from the host (from the master via the host) to the slaves

a) to a selected slave

<Start> **S [Relative device No.] [command]** <Stop> *(from V1.10 H757)*

[Relative device No.]: n - i
n: Number of all slaves in the ring
i: Internal logical number of the selected CLV in the ring

b) to a;; slaves (broadcast message)

<Start> **B [Command]** <Stop> *(from V1.10 H757)*

Response of devices (slaves or master)

<Start> **R Slave_cnt response** <Stop> *(from V1.10 H757)*

Slave_cnt: sent from device with “0“ initialized

Note:

If the host (master) is to send command strings to the ring, care should be taken when setting the parameters that the data strings of the read result not contain the key letters “B“, “S“, “R“ or “D“ as the first element in the header.

When the "Master" or "Slave" operating mode is set up, some parameters in the relevant device are adapted automatically, regardless of the previous user settings. Subsequent manual modifications to these parameters may result in error messages/ malfunctions.

The following settings must be made manually:

Parameter	**Master**	**Slave**
Master timeout	greater than the value calculated internally[1)]	-
Test string	freely selectable (basic setting: no)	no (basic setting)
Auxiliary input	freely selectable	no
Reading pulse[2)]	switching input or serial interface	switching input or serial interface
RK-512 protocol	no response telegram	no response telegram
Send points	read result immediate end of pulse[3)]	read result: immediate end of pulse[3)]

1) See separate Technical Information "Master/slave configuration with bar code readers" (order no. 8 007 675)
2) Free-running operation and OPC trigger not possible
The reading interval must include the reading intervals of the slaves
3) Recommended output mode

The following general restrictions apply in master/ slave mode:

Function	**Master**	**Slave**
Min. number of codes	freely selectable	same number as or less than master
Max. number of codes	freely selectable	same number as or less than master
Output format	freely selectable	determined internally
Code sorting	freely selectable	no
XON/ XOFF	no	no
Send block check	no	no
Send handshake	no	no
Forward handshake	no	yes
Repeat data string for request	yes	no
Match code comparison	yes	no

1) Output of first good read within the master/ slave configuration

Protocol type: the individual parameters must be set identically on the master and slaves.

Restrictions when using the "SICK standard" protocol:

- The device number GN enabled for transmission in the header/ terminator is only relevant to the master. The logical device number entered here by the CLV is determined by the connection sequence (master "0", 1st slave "1" etc.) and designates the device that outputs the reading result.
- Block check not possible.
- XON/ XOFF not possible.
- Connection: ring open (CLV can only send data to the host)
  ring closed (commands can be sent to one specific device or to all devices)

Restrictions when using the "Network" protocol:

- An identical device number GN must be parameterized for all devices in the network (entire arrangement is regarded as *one* logical device by the CLX 200).
- Only "DNC 200 Standard" protocol (19200 Bd, 7 data bits, 1 stop bit, odd parity) possible, no ACK/ NAK operation
- Commands from host to ring via CLX 200 possible (to one specific device or all devices)
- Connection: ring must be closed

8.7 Choosing parameter profiles (3 PR...)

1. Query current setting:

<Start> **3 ? PR** <Stop>

2. Response from CLV (example)[1)]:

<START> **3 PR F1** <STOP>

1) The query calls the last parameter profile to be activated since switching on and permanently overwrites changes made to the parameter set since that time. If no profile has been called previously, an X appears in the field for class.

3. Parameter assignment::

<Start> **3 PR [class] [profile]** <Stop>
[x] [y]

[ ]: Optional input
Basic setting: See individual parameters

Parameter:

3 Command characteristic digit
PR: Range key

- -

[class]: *(from V1.10 H757)*
x Select the profile type

x:
F Full profile
H Host interface profile

X No profile called since the last switching on (only with query)

- -

[profile]: *(from V1.10 H757)*
y: Selection the parameter profile depending on the class

y:
1 Profile 1
2 Profile 2
3 Profile 3
4 Profile 4
5 Profile 5
6 Profile 6
7 Profile 7
8 Profile 8
9 Profile 9

0 No profile called since the last switching on (only with query)

The following profiles are available:

PRF 1 Complete basic setting of the CLV, corresponds to the command <Start> 3 DF <Stop>
All code types except for Pharmacode are activated.
Overwrites a code configuration that was generated by AutoSetup.
(from V1.10 H757), (basic setting)

PRF 2 Complete basic setting of the CLV, but with all code types inactive *(from V1.10 H757)*.

PRH 1 Concerns only the host interface: High speed application in stand-alone.
Deviations from PRF 1: baud rate 38400 Bd, no handshake, no timeout.
(corresponds to the individual strings <Start> 3 HSB8 <Stop> and <Start> 3 SPO001 <Stop>)
(from V1.10 H757)

PRH 2 Concerns the host interface and the device number: Network application
Deviations from PRF 1: Hardware: RS-422/485, Baudrate 38400 Bd, 7 data bits, odd parity, network protocol (standard), device number: 99.
(corresponds to the individual strings <Start> 3 HSB8D5 <Stop> and <Start> 3 SPT5O001 <Stop>)
(from V1.10 H757)

9. Host interface

9.1 Data format (3 HS...)

When setting parameters via the host interface, the parameters become valid upon exiting from parameterization mode.

1. Query the current setting:

<Start> **3 ? HS** <Stop>

2. Response from CLV (example):

<START> **3 HS B6 D1 S1** <STOP>

3. Parameter assignment:

<Start> **3 HS [baud] [data] [stop]** <Stop>
[Bx] [Dx] [Sx]

[ ]: Optional input
Basic setting: See individual parameters

Parameter:

3 Command characteristic digit
HS: Range key

- -

[baud]: **Bx** Baud rate
(from V1.10 H757)

x:		
1	300 Baud	
2	600 Baud	
3	1200 Baud	
4	2400 Baud	
5	4800 Baud	
6	9600 Baud	(basic setting)
7	19200 Baud	
8	38400 Baud [1)]	
9	57600 Baud [1)]	

1) Recommendation: use this baud rate only with RS-422/485 interfaces

- -

[data]: **Dx** No. of data bits/ parity
(from V1.10 H757)

x:	
1	8 data bits / no parity (Basic setting)
2	8 data bits/ even parity
3	7 data bits/ even parity
4	8 data bits/ odd parity
5	7 data bits/ odd parity
6	7 data bits/ “mark“ parity
7	7 data bits/ “space“ parity

- -

[stop]: **Sx** No. of stop bits
(from V1.10 H757)

x: 1 1 stop bit (basic setting)
2 2 stop bits

9.2 Output format of reading result (3 TF...)

1. Query the current setting:

<Start> **3 ? TF** <Stop>

2. Response from CLV (example):

<START> **3 TF H00 SST00 T0D0A00 R1 L00 M00** <STOP>

3. Parameter assignment:

<Start> **3 TF [header] [separator] [terminator] [code sequence]**
[H characters] [S chararacters] [T chararcters] [Rx]

[code length list] [format mask] <Stop>
[Laa bb ...] [Mxx xx...]

[ ]: Optional input
Basic setting: See individual parameters

Parameter:

3 Command characteristic digit
TF: Range key

- -

[header]: **H(characters)** Header of the output telegram (max. 10 elements)
(from V1.10 H757)

Characters: a) Characters from the range 01...7F hex

Exceptions:
- 06 hex = <ACK>
- 11 hex = <XON>
- 13 hex = <XOFF>
- 15 hex = <NAK>
- as well as selected start and stop characters

b) Variables:

AD[1)]	Number of decode attempts 00...99 dec.	(2 digit)
	Max. number of decoded characters 00...99 dec.	(2 digit)
CC	No of codes	(2 digit)
GN	Device number	(2 digit)

if there are less than 10 elements in the header, 00 hex must be entered as the terminator (suppresses subsequent characters)

example: H G N 2 0 0 0
Describes the Header: *Device number <Blank>*
(Basic setting: H 00 = empty)

1) Output format: <ID>xxyy<Blank>, with ID= Code type identification
Example: d1005, with d= code type EAN, 10= number of decode attempts, 05= maximum number of decoded characters

[separator]: **S(Characters)** separator block between the codes (max. 10 elements)
(from V1.10 H757)

Characters: a) Characters in the range 01...7F hex

Exceptions:
- 06 hex = <ACK>
- 11 hex = <XON>
- 13 hex = <XOFF>
- 15 hex = <NAK>
- as well as selected start and stop characters

b) Variables:

CA	Required scans Decimal value 001...999	(3 digit)
CG	Identification quality 000...100 %	(3 digit)
CK	Code continuity Decimal value 001... 99	(3 digit)
CL	Code length Decimal value 01...32	(2 digit)
CP	Code position Decimal value 000...100 (reference point: code mid-point)	(3 digit)
CS	Code reliability Decimal value 001...999	(3 digit)
ID	Code-ID	(1 digit)
ST	Error status of code	(1 digit)

If there are less than 10 elements in the separator, 00 hex must be entered as a terminator (suppresses subsequent characters)

*Example::*S 2 0 I D S T C G 1 C 0 0
Describes the separator:
<Blank> code type error status identification quality <FS>

(Basic setting: S 00 = empty)

[terminator]: **T(Characters)** End of output telegram (max. 10 elements)
(from V1.10 H757)

Characters: a) Characters in the range 01...7F hex

Exceptions:
- 06 hex = <ACK>
- 11 hex = <XON>
- 13 Hex = <XOFF>
- 15 Hex = <NAK>
- as well as selected start and stop characters

b) Variables:

AD[1)]	Number of decode attempts 00...99 dec. Max no. of decoded characters 00...99 dec.	(2 places) (2 places)
CC	No. of codes in the scan Decimal value 0...40	(2 places)
GN	Device number	(2 places)
MG	Average value of identification quality, exponentially smoothed	(3 places)
TT	Reading interval Resolution: 0.1 s Decimal value 0001 ... 0999	(4 places)

1) Output format: <ID>xxyy<Blank>, with ID= Code type identification
Example: d1005, with d= code type EAN, 10= number of decode attempts, 05= maximum number of decoded characters

If there are less than 10 elements in the separator, 00 hex must be entered as a terminator (suppresses subsequent characters)

Example: T T T 0 D 0 A 0 0
describes the terminator:
Reading interval <CR> <LF>

(Basic setting: T 00 = empty)

[code sequence]: **Rx** Output sequence for codes.
(from V1.10 H757)

x:
1 Output sorted according to code position. (Basic setting)
2 Output sorted according to time at which a code was first detected (first-in, first-out)
3 Output sorted inversely according to time at which a code was first detected (last-in, first-out).
4 Output sorted according to the [code length list]

[code length list]: **Laa bb cc dd ee ff gg hh ii jj**
(from V1.10 H757)

aa bb cc dd ee ff gg hh ii jj: Wildcards for codes

Range:

aa: 01...50 characters (basic setting: 0 characters)
bb: 01...50 characters (basic setting: 0 characters)
cc: 01...50 characters (basic setting: 0 characters)
dd: 01...50 characters (basic setting: 0 characters)
ee: 01...50 characters (basic setting: 0 characters)
ff: 01...50 characters (basic setting: 0 characters)
gg: 01...50 characters (basic setting: 0 characters)
hh: 01...50 characters (basic setting: 0 characters)
ii: 01...50 characters (basic setting: 0 characters)
jj: 01...50 characters (basic setting: 0 characters)

If there are less than 10 values, the list must be terminated with the value “00“.

- -

[format mask]: **Mxx xx ... xx** Wildcards, max. 50 in mask
(from V1.10 H757)

xx: Range per Wildcard:

00	Mask termination
01...90	Position in reading, result that is to appear in the output string of the host interface
91 = "ZZ"	Special function
92 = "--"	Special function
"ZZ":	The CLV enters the character "0" at corresponding position in the output string.
"--":	Defines a contiguous range within the reading result that is to appear in the output string. A maximum of 3 ranges is permitted in the mask.

(Basic setting: 00)

Examples: **using the format mask for the host interface**

Reading result:	A	B	C	D	E	F	G	H	I
Position:	1	2	3	4	5	6	7	8	9

Structure of format mask	Mask input	Output to host
05 04 03 00	05 04 03 00	E D C
ZZ ZZ 03 05 07 00	91 91 03 05 07 00	0 0 C E G
ZZ 03 -- 08 01 ZZ 00	91 03 -- 08 01 91 00	0 C D E F G H A 0
01 -- 03 ZZ 09 -- 07 00	01 -- 03 91 09 -- 07 00	A B C 0 I H G

Note:

- Basic setting for all 50 Wildcards: "00" (not affected by output string)
- If the Wildcard points to a position outside the code, then the filler character “@“ will be entered at this position of the output.

Example (with above reading result):

Structure of format mask	Mask input	Output to host
05 04 03 11 12 00	05 04 03 11 12 00	E D C @ @

- If it is necessary to select hex output to the host because of control characters in the code, ensure that each code character occupies two positions in the output string.

9.3 Error string (3 ES...)

1. Query the current setting:

<Start> **3 ? ES** <Stop>

2. Response from CLV (example):

<START> **3 ES N03 S45 52 52 00 C0 A1** <STOP>

3. Parameter assignment:

<Start> **3 ES [number] [character] [status 5] [status A]** <Stop>
[Nxx] [Saa bb..] [Cx] [Ax]

[ ]: Optional input
Basic setting: see individual parameters

Parameter:

3 Command characteristic digit
ES: Range key

- -

[number]: *(from V1.10 H757)*

Nxx Number of fillers.

xx: 00...50 (Basic setting: 6)

- -

[character]: *(from V1.10 H757)*

Saa bb cc ... Input of the max. 30 freely definable filler characters

aa bb cc ... : Wildcard

Range per wildcard:

aa: 00...07 hex (basic setting: 00 hex)
bb: 00...07 hex (basic setting: 00 hex)
.... 01...07 hex (basic setting: 00 hex)

Exception:
- 06 Hex = <ACK>
- 11 Hex = <XON>
- 13 Hex = <XOFF>
- 15 Hex = <NAK>
- selected start and stop characters

00 hex forms the terminator if less than 15 characters are to be defined.

(Basic setting: 4E 4F 52 45 41 44 00 hex = N O R E A D)

- -

[status 5]: *(from V1.10 H757)*

Cx Response action for error status ST = 5 of relevant code (required multiple read operation not reached)

x:
0 Output error string (basic setting)
1 Output code contents

- -

[status A]:
(from V1.10 H757)

Ax Response action for error status ST = A
(the CLV detects more codes with the error status ST= 0 than "Max. number of codes" permitted for output)

x:
0 No error if "Max. number of codes " is exceeded (Basic setting)
1 Error - no code contents output. Instead, "Min. number of codes" times the error string

Possible output combinations for error read format:

N = 00	Saa = 00 hex	no error string / no separator
N = 00	Saa > 00 hex	only error string
N > 00	Saa = 00 hex	only separator
N > 00	Saa > 00 hex	error string with n times the filler character x and separator (basic setting)

9.4 Interface protocol (3 SP...)

1. Query the current setting:

<Start> **3 ? SP** <Stop>

2. Response from CLV (example):

<START> **3 SP T1 O005 B02 E03 F02 G03 X0 C0** <STOP>

3. Parameter assignment:

<Start> **3 SP [type] [time out] [send start] [send stop] [rec. start] [rec. stop]**
[Tx] [Oxxx] [Bxx] [Exx] [Fxx] [Gxx]

[XON/XOFF] [block check] <Stop>
[Xx] [Cx]

[ ]: Optional input
Basic setting: see individual parameters

Parameter:

3 Command characteristic digit
SP: Range key

- -

[type]: **Tx** Type of protocol
(from V1.10 H757)

x:	1	NAK
	2	NAK framed: <Start> <NAK> <Stop>
	3	ACK/ NAK
	4	ACK/ NAK framed: <Start> . . . <Stop>
	5	CLX 200 link without ACK/ NAK
	6	CLX 200 link with ACK/ NAK
	7	No handshake (basic setting)

- -

[time out]: **Oxxx** Timeout for protocol type 1...4 and 7
(from V1.10 H757) Unit: x (0.01 s)= 10 ms

xxx: 001...999 (10 ms...9.99 s); (basic setting: 50 ms)

- -

[send start]: **Bxx** Send start character for protocol type 1...4 and 7
(from V1.10 H757)

xx: One character in the range 00...7F hex (basic setting: 02 hex)
Exceptions:
- 06 Hex = <ACK>
- 11 Hex = <XON>
- 13 Hex = <XOFF>
- 15 Hex = <NAK>
- selected send stop character

00 hex suppresses the send start character

Example:: B02 hex (describes *<STX>* as a send start character)

- -

[send stop]: **Exx** Send stop character for protocol type 1...4 and 7
(from V1.10 H757)

xx: One character in the range 00...7F hex (basic setting: 03 hex)
Exceptions:
- 06 Hex = <ACK>
- 11 Hex = <XON>
- 13 Hex = <XOFF>
- 15 Hex = <NAK>
- Selected send start character

00 hex suppresses the send stop character

Example: E 03 hex (describes *<ETX>* as send stop character)

[rec. start]: **Fxx** Receive start character for protocol type 1...4 and 7
(from V1.10 H757)

xx: One character in the range 01...7F hex (basic setting: 02 hex)
Exceptions:
- 06 Hex = <ACK>
- 11 Hex = <XON>
- 13 Hex = <XOFF>
- 15 Hex = <NAK>
- Selected receive stop character

Example: F02 hex (describes *<STX>* as receive start character)

[rec. stop]: **Gxx** Receive stop character for protocol type 1... 4 and 7
(from V1.10 H757)

xx: One character in the range 01... 7F hex (basic setting: 03 hex)
Exceptions:
- 06 Hex = <ACK>
- 11 Hex = <XON>
- 13 Hex = <XOFF>
- 15 Hex = <NAK>
- Selected receive start character

Example: G03 hex (describes *<ETX>* as receive stop character)

[XON/XOFF]: **Xx** Software handshake for protocol type 1...4 and 7
(from V1.10 H757)

x: 0 no XON/ XOFF (basic setting)
1 XON/ XOFF permitted

[block check][1)]**:** **Cx** Block check in data string sent by CLV
(from V1.10 H757) (for protocol type 1 ... 4 and 7)

x: 0 No block check (Basic setting)
1 Block check

1) If the CLV sends the data string with a block check, it also expects a block check for the received data strings (sent by the host)

9.5 Test string (3 TS...)

1. Query the current setting:

<Start> **3 ? TS** <Stop>

2. Response from CLV (example):

<START> **3 TS A1 S54 00 I030** <STOP>

3. Parameter assignment:

<Start> **3 TS [active] [string] [interval]** <Stop>
[Ax] [Sxx xx...] [Ixxx]

[ ]: optional input
Basic setting: see individual parameters

Parameter:

3 Command characteristic digit
TS: Range key

- -

[active]: **Ax** Activate test string
(from V1.10 H757)

x: 0 No test string (Basic setting)
1 Send test string

- -

[string]: **Sxx xx ... xx** Definition of string contents.
(from V1.10 H757) Max. 15 freely selectable characters

xx: Range: 01...7F hex (Representation in test string: Hex-ASCII)
Exceptions:
- 06 Hex = <ACK>
- 11 Hex = <XON>
- 13 Hex = <XOFF>
- 15 Hex = <NAK>
- Selected start and stop characters

00 hex must be entered as a terminator if
there are less than 15 characters
(suppresses the subsequent characters)

Example: S54 45 53 54 00 hex
Describes the test string: *T E S T*

(Basic setting: S2F GN 54 00 = / GN T)

- -

[interval]: **Ixxx** Send interval of test string
(from V1.10 H757) Unit: x 10 s

xxx: 001...999 (10 s ... 9990 s; 9990 s = 166.5 min)
Basic setting: 300 s = 5 min

[Interval] determines the period after the last reading result after which the CLV sends the test string automatically. A new reading result to be output within this period restarts the time interval.

9.6 Sending points (3 SZ...)

1. Query of current setting:

<Start> **3 ? SZ** <Stop>

2. Response from CLV (example)[1]:

<START> **3 SZ E0 S1 I01 A01 V1 D010** <STOP>

3. Parameter assignment:

<Start> **3 SZ [result] [separator] [min. no.] [max. no.] [comp. CP] [min.Dist.]** <Stop>
[Ex] [Sx] [Ixx] [Axx] [Vx] [Dxxx]

[ ]: Optional input
Basic setting: see individual parameters

Parameter:

3 Command characteristic digit
SZ: Range key

- -

[result]: *(from V1.10 H757)*

Ex Output time of reading result

x:

0 Result output at end of reading interval (basic setting) [1]

where:
Switching input "Sensor": switching edge
Serial interface: after command string for end of reading interval
Free-running: after end of time-out

1 Result output with premature end of reading interval = "immediate" output (if all evaluation conditions have been fulfilled)[1]

1) interface switch-off, end of open read interval after 10 min, from V1.10 H757

- -

[separator]: *(from V1.10 H757)*

Sx Sending point of separator

x:

0 The separator is output *before* the associated code
1 The separator is output *after* the associated code (basic setting)

- -

[min. no.]: *(from V1.10 H757)*

Ixx Minimum number of codes to be recognized

xx: 01...10 (Basic setting: 1)

With "immediate output" mode (E1), the output does not take place until the "Min. number of codes" has been reached.

- -

[max. no.]: *(from V1.10 H757)*	**Axx**	Maximum number of codes to be recognized
	xx:	01...10 (Basic setting: 1)

- -

[comp. CP]: *(from V1.10 H757*	**Vx**	Activate code position comparison for evaluation of multiple reading operations
	x:	0 no CP comparison (basic setting) 1 CP comparison active

- -

[min.Dist.]: *(from V1.10 H757)*	**Dxxx**	Minimum distance between two adjacent codes
	xxx:	010...999 mm (Basic setting: 10 mm)

10. Restoring the basic factory setting of all parameters (temporary)

<Start> **3 DF** <Stop>
(from V1.10 H757)

Host interface : SICK protocol, 9600 Bd

<Start> **3 DS** <Stop>
(from V1.30 I415)

Basic setting as for “3 DF“, except that:
1. Only code 39 is active
2. Result display Result 1: device ready
3. Result display Result 2: good read (static)
4. Result display Result 3: barcode visible (=mapping)
   maximum value of debounce counter: 005
5. Read cycle: switch input “sensor“, active high
6. Reading result: immediate output

11. Set host interface temporarily to basic setting

<Start> **3 DF TMP ON** <Stop>
(from V1.10 H757)

Set host interface temporarily to basic setting
(SICK protocol, 9600 Bd, 8 data bits, no parity, 1 Stop bit)
The values of the previously valid application-specific parameterization are kept.

<Start> **3 DF TMP OFF** <Stop>
(from V1.10 H757)

Return to previously valid parameterization

12. Storing the parameter set permanently in the CLV

<Start> **3 E E W** <Stop>
(from V1.10 H757)

Read from RAM and write to the EEprom

<Start> **3 E E R** <Stop>
(from V1.10 H757)

Read in RAM from the EEprom

13. Upload and download of the internal raw parameter set

13.1 Query parameter set size in the CLV (3 ? AQ)

(from V1.10 H757)

1. Query the current size of the parameter set (number of blocks):

<Start> **3 ? AQ** <Stop>

2. Response from CLV (Example):

<START> **3 AQ 18 V1.10 16 IH757** <STOP>

3. Response from CLV (general):

<START> **3 AQ tt vvvvv aa Ixxxx** <STOP>

Parameter:

3	Command characteristic digit
AQ:	Range key

- -

tt:	CLV device type (hex-ASCII code) 00: CLV ?? Detection not possible 18: CLV 410
vvvvv:	Software version
aa:	Parameter set size in blocks of 32 bytes (Number of parameter groups)
Ixxxx:	Change index

13.2 Query actual command groups in the CLV (3 ? AP)

(from V1.10 H757)

1. Query the current command groups (version-dependent):

<Start> **3 ? AP** <Stop>

2. Response from CLV (example):

<START> **3 AP V0xxP COb, COe, COd, COc, COa, COj, COi, COn, COo, CV, ES, GN, HS, LK, LT, MS, RO, SP, SZ, TS, TF...** <STOP>

3. Response from CLV (general):

<START> **3 AP VVVVP Command group, Command group, ...** <STOP>

Parameter:

3 Command characteristic digit
AP: Range key

- -

VVVVP: Software version????
Command group: list of command groups in use

13.3 Copy raw parameter set manually (without using the "Term" program)

(from V1.10 H757) ***Internal information only!***

The individual blocks of the raw parameter set are identified by the following ASCII table and are accessed during manual upload or download by the appropriate AL code:

Block index	**AL code n**
0	AL 0
1	AL 1
2	AL 2
3	AL 3
4	AL 4
5	AL 5
6	AL 6
7	AL 7
8	AL 8
9	AL 9
10	AL :
11	AL ;

Block-index	**AL code n**
12	AL <
13	AL =
14	AL >
15	AL ?
16	AL @
17	AL A
18	AL B
19	AL C
20	AL D
21	AL E
22	AL F

1. Upload a block from device 1 to the terminal / to the host:

<Start> **3 ? AL n** <Stop>

2. Answer from the CLV (general):

<START> **3 AL n (data) (checksum)** <STOP>

Parameter:

3 Command characteristic digit
AL: Range code

- -

n: 0... F hex CLV device type (Hex-ASCII coded)
X Output all max. 23 blocks one after the other

Example: <Start> **3 ? AL 7** <Stop>
Call transfer the content of block 7 to the terminal

Data: 64 characters (Hex-ASCII)

Checksum[1)]**:** 2 characters (Hex-ASCII)

1) The checksum is formed with an XOR operation with the previous character from “n“ and serves as a data security check during transfer (this is not the block check of the interface protocol.

Example: <START> **3 AL 7 41020607 ... 4004A** <STOP>
Content of block 7

3. Download a block from the terminal/host to device 2:

<Start> **3 AL n (Data) (Checksum)** <Stop>

Example: <Start> **3 ? AL 7 41020607 ... 4004A** <Stop>

During manual download, all character strings should be sent to device 2 one after the other as they are output from device 1. The parameter set is at first present in device 2 only temporarily in RAM. To be stored permanently, it should be written to the EEprom with the command

<Start> 3 EEW <Stop>

Note:

- The DOS program “Term“ facilitates uploading and downloading, etc. by reading or writing the complete parameter set from or to a file. The program also checks the compatibility of the parameter set that has been read in with the device type present and with the software of the target device.
- The program will refuse to transfer parameter sets between two devices that have different device types (for example parameter set from CLV 210 to CLV 290). Parameter sets can be transferred between devices with different software versions after confirmation by the user, but an appropriate amount of caution should be exercised. The parameter set in the target device should subsequently be checked with the function “Output configuration” to ensure that the parameter values are correct (see graphical user interface or user menu) and any necessary corrections should be made.
- In some older software versions, for reasons of storage space, the incompatible parameter set does not contain all associated parameter values (CLV 290 with software version up to V1.80). When the target device is checked, the appropriate parameter values should therefore be revised.
- If the type of the CLV cannot be read during a query (older software versions), there is no way to transfer its parameters to a device of the same type with a new software version by means of a download. The recommended procedure in this case is to call the parameter values of the source device with the function “Output configuration“ (see graphic user interface or user menu) and then to set the values corresponding on the target device after calling the entire basing setting.

14. Starting device functions

14.1 Reading mode: Triggering the reading gate

With the standard command

(from V1.10 H757)

<Start> **21** <Stop> Start reading interval
<Start> **22** <Stop> Stop reading interval

With individual characters (without frame)[1)]

(from V1.10 H757)

xx Start reading interval
yy Stop reading interval

xx and **yy**: 01...7F hex

1) possible only via the host interface

Note: the CLV does not send an echo

14.2 Reading mode: Determine device number in the SICK network directly

(from V1.10 H757)

<Start> **2 GN xx** <Stop>

Parameter:

2 Command characteristic digit
GN: Range key

---

xx[1)]**:** Device number for identifying the CLV
01...99 General (basic setting: 01)
01...31 In the SICK network

Note: It is not necessary to change the parameterization mode

1) See also the notes for the string <Start> 3 **GN xx** <Stop>

14.3 Teach-in[1)] of the target code 1

(from V1.20 H912)

<Start> **2 TE** <Stop> Start teach-in (enable).
The CLV starts a reading interval automatically internally

<Start> **2 TS** <Stop> End teach-in (stop/store).
The CLV closes the internal reading interval.

Dynamic teach-in:
Only a code for which the evaluation has been released (code type active, length), can be recognized.
If the CLV has read a code successfully, it stores its content, the code type and the resulting settings for target code 1 permanently in the EEprom.

Static teach-in:
The CLV can also recognize a code for which the evaluation has not been released (code type inactive).
If the CLV has read a code successfully, it stores its content, the code type and the resulting settings for the target code 1 permanently in the EEprom. At the same time it permanently sets the entire code configuration exclusively to the code type and code length recognized. All other code types and code lengths are stored immediately.
Depending on the parameterization, the CLV also resets the DD data group counters (daily operating hours, number of reading intervals, number of good reads and average identification quality since the last switch-on/static teach-in).
If the CLV does not recognize a code, the code configuration does not change.

1) The type of teach-in must first be determined with the command <Start> 3 CV TX RX <Stop>.
(basic setting dynamic, do not reset counter).

14.4 Reading mode: Set/reset switch outputs and beeper

from version V1.30 I415

<Start> **29 cbad** <Stop>

cbad: Switch inputs and beeper

c: Result 3
b: Result 2
a: Result 1
d: Beeper

x:
0 Switch output goes to “low“ state (no voltage)
1 Switch output goes to “high“ state
X Switch state remains unmodified

Example: <Start> 29 1 1 0 X <Stop>

Meaning:
Switch output 3 goes to “high“
Switch output 2 goes to “high“
Switch output 1 goes to “low“
Beeper remains unmodified

Note:

If internal events are also affecting the state of the switch outputs at the same time, it is possible that states set by the command string will be changed.

15. Processing operating data

15.1 Data group ID (queries only)

(from V1.10 H757)

1. Query data:

<Start> **4 ? ID** <Stop>

2. Response from CLV (example):

<START> **4 ID v _1.10 t CLV 410-0000 n1012965 f 96020381 d 30.01.98 q 502 a H757** <STOP>

3. Response from CLV (general):

<START> **4 ID vVVVV aAAAA tTTTTTTTTTTT nNNNNNNN fFFFFFFFF ddd.mm.yy q PPP** <STOP>

Parameter:

4	Command characteristic digit
ID:	Range key

- -

vVVVV:	Software version (e.g. v_1.20)
aAAAA:	Software revision (e.g. H757)
tT T T T T T T T T T T T T:	Device type (e.g. CLV 410-0000)
nNNNNNNN:	Order number (e.g. 1012965)
fFFFFFFFF:	Serial number (e.g. 98050381)
ddd.mm.yy:	Date of inspection (e.g. 30.01.98)
qPPP:	Initials of inspector (e.g. 502)

15.2 Data group TX (Queries and inputs)

(from V1.10 H757)

1. Query data:

<Start> **4 ? TX** <Stop>

2. Response from CLV (example):

<START> **4 TX u READ STATION Location 28** _ _ _**...** _ <STOP>

Note: Output is always filled with blanks to obtain the maximum length of 30 characters

3. Response from CLV (general):

<START> **4 TX u xxxxxxxxx...** <STOP>

Parameter:

4	Command characteristic digit

ID:	range key
x:	max. 30 ASCII characters

4. Entering text:

<Start> **4 TX u xxxx....** <Stop>

15.3 Data group DD (Queries and inputs)

(from V1.10 H757)

1. Query data:

<Start> **4 ? DD** <Stop>

2. Response from CLV (example):

<START> **4 DD t 0018.4 c 0000003438 o 0000003265 g 096%** <STOP>

3. Response from CLV (general):

<START> **4 DD t TTTTT c CCCCCCCCCC o OOOOOOOOOO g GGG%** <STOP>

Parameter:

4	Command characteristic digit
CN:	Range key
t TTTTT	Daily operating hours counter in hours, 5 places (for example 0018.4)
c CCCCCCCCCC	Number of reading intervals, 10 places (for example 0000003438)
o OOOOOOOOOO	Number of good reads, 10 places (for example 0000003265)
g GGG	Average identification quality in %, 3 places (for example 096%)
	for all values except the average identification quality: values since switching on or reset

3a. Reset individual data items:

Example: <Start> **4 R DD c o** <Stop>

3b. Response from CLV (example):

<START> **4 DD t 0018.4 c 0000000000 o 0000000000 g 096%** <STOP>

The following have been reset:
c The number of reading intervals, to zero
o The number of good reads, to zero

4a. Reset all data:

Example: <Start> **4 R DD c o t g** <Stop>

4b. Response from CLV (example):

<START>**4 DD t 0000.0 c 0000000000 o 0000000000 g 080 %** <STOP>

The following were reset:

t The daily operating hours counter, to zero
c The number of reading intervals, to zero
o The number of good reads, to zero
g The average identification quality, to 80%

Note:
All data with the exception of the “average identification quality” are automatically reset at *each switch-on*.

15.4 Data group HD (queries only)

(from V1.10 H757)

1. Query data:

<Start> **4 ? HD** <Stop>

2. Response from CLV (example):

<START> **4 HD t 00100 I0000003438** <STOP>

3. Response from CLV (general):

<START> **4 HD t TTTTTT IXXXXXXXXXX** <STOP>

Parameter:

4 Command characteristic digit
CC: Range key

- -

t TTTTTT: Operating hours counter in hours, 5 places (e.g. 00100)
IXXXXXXXXXX: Complete switch-on duration of the laser diode, 10 places, (e.g. 00000003438)

Note:
The entire switch-on duration of the laser diode is incremented at a cycle rate of 6 min. The data are stored and updated in the EEprom, and are not lost when operating power is turned off.

16. Self-test

16.1 Query if self-monitoring during all operating modes

(from V1.10 H757)

1. Query[1)]:

<Start> **2 ? SF** <Stop>

2. Response from CLV (example):

<START> **2 SF 000** <STOP>

3. Response from CLV (general):

<START> **2 SF xxx** <STOP>

xxx:

000	System OK
051	Motor fault
150	EEprom error
151	Security timer (laser diode switch-off) expired

051, 105 and 151 generate error status ST=3

1) Query or output of error status ST= 3 in a data output string (separator) reset the error variable “xxx” to zero.
If multiple device errors occur, each overwrites the previous one, so that only the last error recognized reaches the output.
If query is used, care should be taken that the host makes a logical distinction between the answer from the CLVand any read results transferred simultaneously from the CLV.
The query has no affect on the operating mode.

16.2 Query of the last 5 self-test results during reading mode

(from V1.10 H757)

1. Query:

<Start> **2 ? SE** <Stop>

2. Response from CLV (example)[1)]:

1) Most recent result in the first place to the left

<START> **2 SE 000 000 000 000 000** <STOP>

3. Response from CLV (general):

<START> **2 SE xxx xxx xxx xxx xxx** <STOP>

xxx:

000	System OK
051	Motor fault
150	EEprom error
151	Security timer (laser diode switch-off) expired
170	No polling for the CLV (network protocol)
171	Invalid trigger for master/ slave
172	Invalid protocol settings for master/ slave

173 Error with serial data
174 Slow host/ communication temporary memory used up
176 Test string active in slave mode of CLV
177 Master timeout setting is less than calculated minimum value

1) Query or output of error status ST= 3 in a data output string (separator) reset the error variable “xxx” to zero.
If multiple device errors occur, each overwrites the previous one, so that only the last error recognized reaches the output.
If query is used, care should be taken that the host makes a logical distinction between the answer from the CLV and any read results transferred simultaneously from the CLV.
The query has no affect on the operating mode.

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