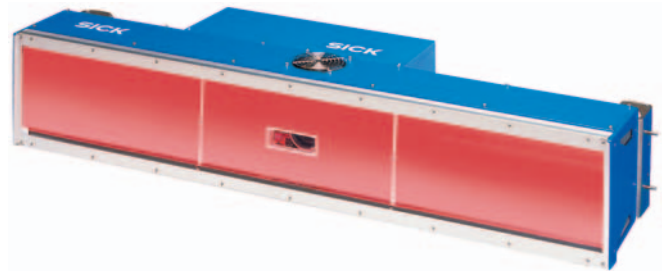


[ONLINE HELP](#)

ICR890 High-end CCD Camera System



Camera System for Reading 1-D and 2-D Codes with Superb
Image Quality suitable for OCR and Video Coding Applications



Software/Tool	Function	Version
Device description ICR890	Device specific software module for configuration software SOPAS-ET	V 2.10
SOPAS-ET	Configuration software	V 2.14

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Auto Ident, Werk Reute

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Germany

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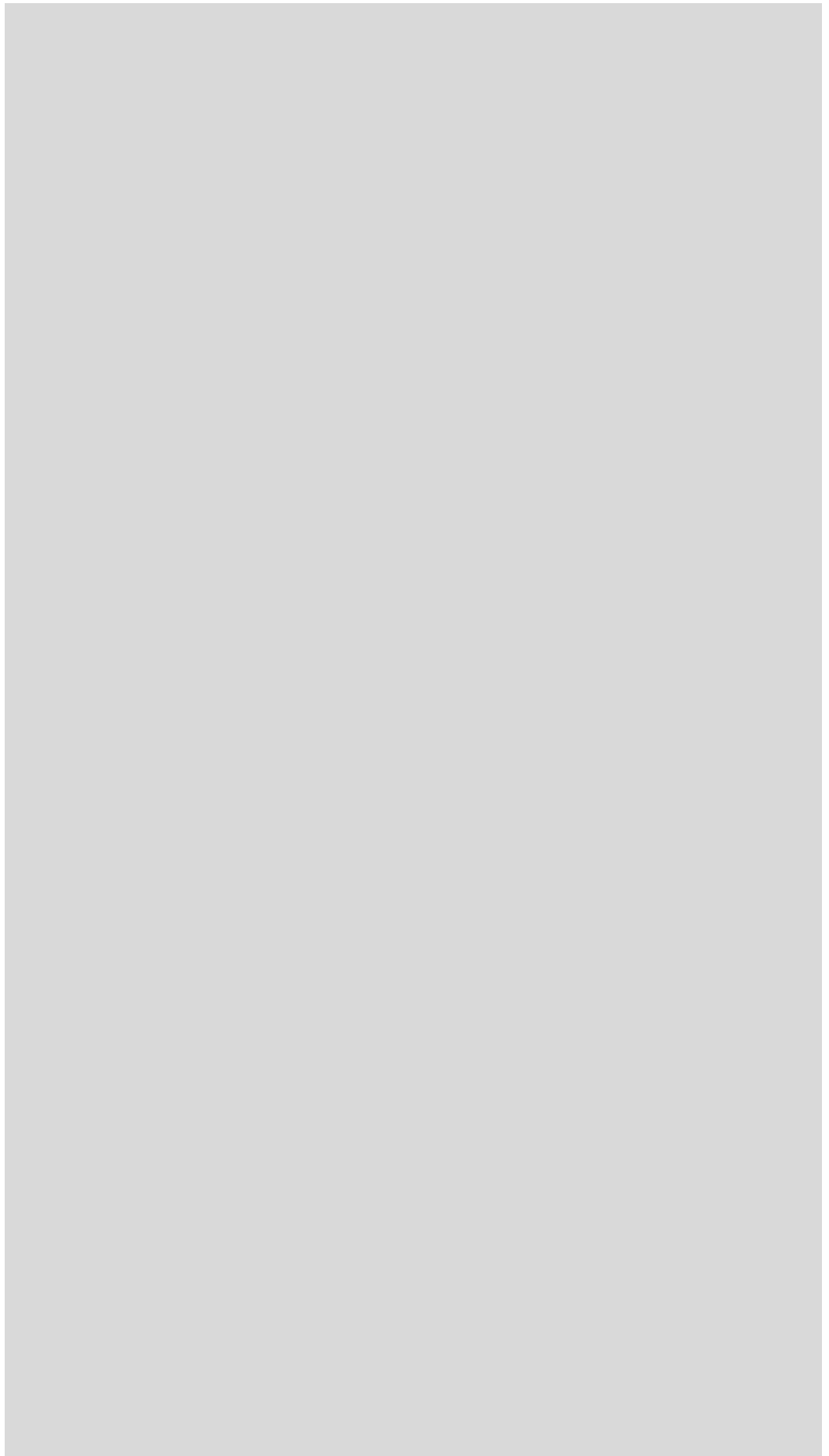
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Delivery version of the online help

The latest version of this online help for the SOPAS-ET device description is available as a PDF at www.sick.com.

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1 Notes on this document

Purpose This document provides instructions for technical staff on the configuration of the high-end CCD camera system ICR890 with the SOPAS-ET software.

This document provides information on all the parameters required for ICR890 system operation.

Target group The target group of this document is persons entrusted with the following activities:

Activities	Target group
Startup and configuration	Trained staff, e.g. technicians or engineers

Tab. 1-1: Target group

Depth of information This document contains all the information required for on-site configuration of the ICR890 system. The **factory configuration** (default setting) of the high-end CCD camera system is designed for use as a **stand-alone device**.

Information on mounting, installation, maintenance and troubleshooting are listed in the operating instructions of the ICR890 system (document no. 8011325).

Important Further information on the design of the ICR890 system as well as the barcode technology is available from SICK AG, Auto Ident division.

Online at **www.sick.com**.

Used symbols To provide easier access some information in this document is emphasised as follows:

Reference Blue underlined font shows a reference to more detailed information.



This symbol refers to special features.



This symbol refers to additional settings in the configuration software SOPAS-ET.



This symbol refers to additional technical documents.

2 ICR890

2.1 Parameter

2.1.1 Reading Configuration

Codelabel properties The reading parameters and properties of the barcode are set with the parameters of the [Codelabel properties](#) group.

Parameters	Function
Minimum code position	Enter the lower limit of the reading area. 0 = start of reading area 50 = middle of reading area 100 = end of reading area This value can also be considered for the image output (see chapter 2.1.4 Image Output, page 15).
Maximum code position	Enter the upper limit of the reading area. 0 = start of reading area 50 = middle of reading area 100 = end of reading area This value can also be considered for the image output (see chapter 2.1.4 Image Output, page 15).
Symbol contrast	Enter the ratio between light and dark areas of the code in per cent. Recommendation for standard applications: 27% Recommended for scanning barcodes on car tyres: 20%

Reading area The width (Y direction) and the height (Z direction) of the reading area referred to the reference point can be limited with the parameters of the [Reading area](#) group.

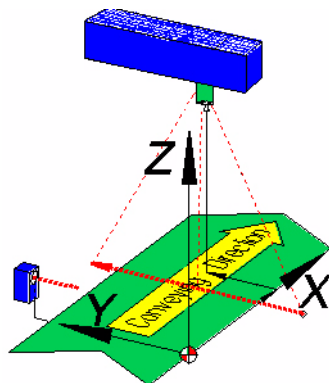


Fig. 2-1: X, Y and Z direction from the reference point

Parameters	Function
Left edge of conveyor	Enter maximum distance in Y direction to the reference point. If applicable, select unit.
Right edge of conveyor	Enter minimum distance in Y direction to the reference point. If applicable, select unit.
Maximum scanning height	Enter maximum object height (distance in Z direction to the reference point). If applicable, select unit.
Level of conveyor	Enter the height of the conveyor level to the reference point. If applicable, select unit.

Image capture properties Use the parameters of the *Image capture properties* group to set the parameters for image recording.

Parameters	Function
Digital zoom	Activate/Deactivate whether the image is to be recorded distance-independently with square resolution.
Zoom hysteresis	Enter threshold for digital zoom switching. If applicable, select unit.
Dynamic scanfrequency	Activate/Deactivate automatic adjustment of the scanfrequency to the conveyor speed.
Skew dependent gain adaption	Activate/Deactivate adjustment of the image brightness to the skew angle (only when reading from the side).
Gain adjustment factor	Enter the static brightness.
Image resolution	Adjust the image resolution to the maximum codelabel distance. The image resolution depends on the focal length of the lens (e.g. 135 mm): Codelabel distance 2 m: 250 dpi Codelabel distance 2.5 m: 200 dpi Codelabel distance 3 m: 170 dpi
CCD-line mirroring	Reverse the reading direction of the CCD by 180°. Depending on the installation situation it is necessary to guarantee correct image capture.

2.1.1.1 Object Trigger Control

Start/Stop of object trigger Use the parameters of the [Start/Stop of object trigger](#) group to configure the trigger source.

Parameters	Function
Control	Select the type of control (time or tracking controlled).
Start delay	Enter delay between start trigger and the opening of reading gate. Select possible delay unit. Select source of start trigger: <ul style="list-style-type: none"> • SENSOR 1 ... 2: For hardware trigger at ICR890 • COMMAND: For cycle via serial command • AUTO CYCLE: Test mode (internal generation of the trigger signal) • CAN 1 ... 2: Trigger reception via CAN
From	Enter the CAN address of the device from which the start trigger is derived.
Stop delay	Enter delay between start trigger and the closing of reading gate. Select possible delay unit. Select source/operation of stop trigger.
or	Select further source/operation of stop trigger (optional). This source is linked to the first source by a logical OR.
or	Select further source/operation of stop trigger (optional). This source is linked to both previous sources by a logical OR.
Position dependent expansion / delay	Select the type of cycle delay relative to the position of the camera (see chapter 2.1.2 Position, page 13).
Pre-expansion	Enter value for the expansion of the reading area against the conveyor direction. If applicable, select unit. Image recording is expanded by this value.
Post-expansion	Enter value for the expansion of the reading area in the conveyor direction. If applicable, select unit. Image recording is expanded by this value.
Pulse	Enter length of pulse for automatic cycle. If applicable, select unit.
Pause	Enter pause length between two pulses of the automatic cycle. If applicable, select unit.
Duration	Enter time/path after which a stop trigger is to be initiated. If applicable, select unit.

2.1.1.2 Focus Control

Options Use the parameters of the [Options](#) group to define the Focus Control Mode.

The focus position can be permanently set, dynamic or controlled via distance measurement by an external sensor.

Parameters	Function
Default position	Enter a default value for the position. If applicable, select unit. This value is used for "Fixed Focus".
Focus control mode	Select the type of focus control.
Focus ramp active	Constant adjustment of the digital zoom depends on whether the reading distance has been activated/deactivated.

Depth of field optimization Use the parameters of the [Depth of field optimization](#) group to define a distance-dependent offset of the focus position.

Parameters	Function
Offset at minimum	Enter the offset of the focus position (for a reading distance of 1000 mm). If applicable, select unit.
Offset at maximum	Enter the offset of the focus position (for a codelabel distance of 3000 mm). If applicable, select unit.

Distance measurement source Use the parameters of the [Distance measurement source](#) group to assign the external sensor for the distance measurement.

The focus position can be controlled via the distance measurement.

Parameters	Function
MLG	Activate/Deactivate MLG for the distance measurement.
from	Select link to MLG.
from	Enter CAN address of MLG.
VMS	Activate/Deactivate VMS for the distance measurement.
from	Select link to VMS.
from	Enter CAN address of VMS.

Distance measurement Use the parameters of the [Distance measurement](#) group to assign the settings of the external sensor for the distance measurement.

Parameters	Function
Behaviour	Select time of focus position switching: <ul style="list-style-type: none"> • IMMEDIATE: Focus is continuously re-adjusted • LATCHED: First focus value is retained for the entire reading cycle
Pre-expansion	Enter value by which the distance measurement is expanded against the X direction (conveyor direction). If applicable, select unit. The signal of the external sensor is then impressed earlier.
Post-expansion	Enter value by which the distance measurement is expanded in the X direction (conveyor direction). If applicable, select unit. The signal of the external sensor is then applied longer.
Preferred distance	Select the focus position at the start of the reading cycle: <ul style="list-style-type: none"> • DEFAULT FOCUS POSITION: Focus is always reset to default • DISTANCE OF LAST OBJECT: Focus remains at the distance of the last object
Focus hysteresis	Enter threshold for focus position switching. If applicable, select unit.

Dynamic focus Use the parameters of the [Dynamic focus](#) group to assign the values and the behaviour of the dynamic control mode.

Parameters	Function
Dynamic control mode	Select whether the focus position is switched via a control signal or at regular time intervals.
Timer	Enter the time after which switching to the next focus position value occurs.
Dynamic distance configurations	Enter up to eight fixed values for the focus position.
Order of dynamic distance configuration	The eight values ("1" to "8") for the focus position are set in the displayed order.

2.1.1.2.1 Limits

Focus control limits Use the parameters of the *Focus control limits* group to activate/deactivate the focus control limits deviating from the reading area.

Parameters	Function
Limits referred to conveyor belt	Activate/Deactivate relative focus control limits.

Limits referred to conveyor belt Use the parameters of the *Limits referred to conveyor belt* group to assign the focus control limits deviating from the reading area.

Parameters	Function
Right edge of conveyor	Enter minimum distance in Y direction to the reference point. If applicable, select unit.
Left edge of conveyor	Enter maximum distance in Y direction to the reference point. If applicable, select unit.
Level of conveyor	Enter the height of the conveyor level to the reference point. If applicable, select unit.
Maximum scanning height	Enter maximum height (distance in Z direction to the reference point). If applicable, select unit.

2.1.1.2.2 MLG Settings

General Use the parameters of the *General* group to configure, amongst other things, the position and the properties of the external distance measurement.

Parameters	Function
Distance between beams	Enter distance between the beams of the MLG.
Number of beams	Enter number of beams of the MLG.
X-position of MLG	Enter distance of MLG to the reference point in X direction (conveyor direction).
Z-position of MLG	Enter height of the first MLG light beam to the reference point in Z direction (height).

2.1.1.3 Illumination Control

Illumination mode Use the parameters of the *Illumination mode* group to define the conditions for illumination control.

Parameters	Function
Lamp on	Select condition for switching on the illumination.
Lamp off	Select condition for switching off the illumination.
Lamp timeout active	Activate/Deactivate automatic illumination switch-off.
Timeout	Enter the time after which the illumination is automatically switched off.

2.1.2 Position

Coordinates Use the parameters of the *Coordinates* group to set the camera position referred to the reference point.

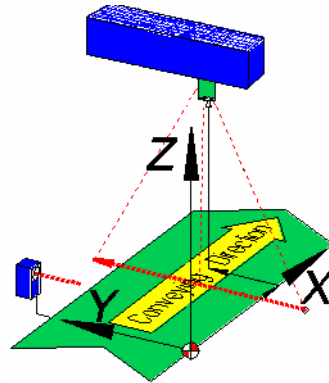


Fig. 2-2: Camera position referred to the reference point

Parameters	Function
X-coordinate	Enter distance of the camera fulcrum (middle of the holder) to the reference point in X direction. If applicable, select unit. Important When using a deflecting mirror, the position of the deflecting mirror fulcrum must be entered.
Y-coordinate	Enter the distance of the central camera point (lens) to the reference point in Y direction. If applicable, select unit.
Z-coordinate	Enter distance of the camera fulcrum (middle of the holder) to the reference point in Z direction. If applicable, select unit. Important When using a deflecting mirror, the position of the deflecting mirror fulcrum must be entered.
Distance to deflecting mirror	Enter distance between the camera and the deflecting mirror. If applicable, select unit.

Angle Use the parameters of the [Angle](#) group to define the position of the camera in a 3D space.

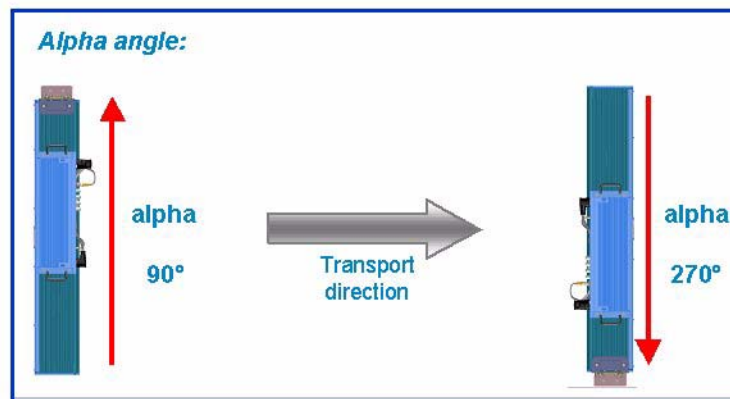


Fig. 2-3: Alpha angle (camera view against or in the conveyor direction)

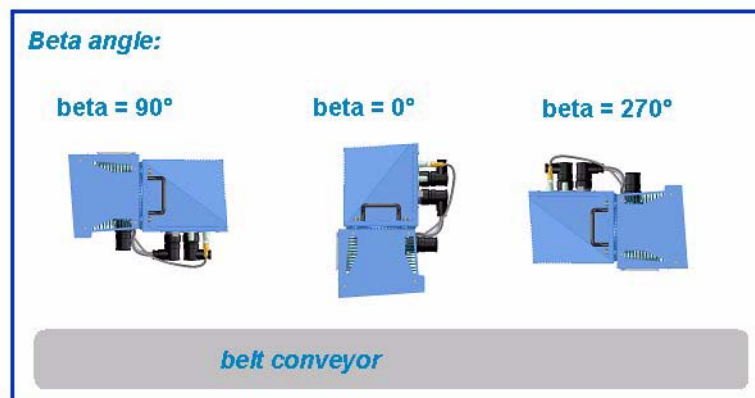


Fig. 2-4: Beta angle (alignment of the camera connections referred to the conveyor)

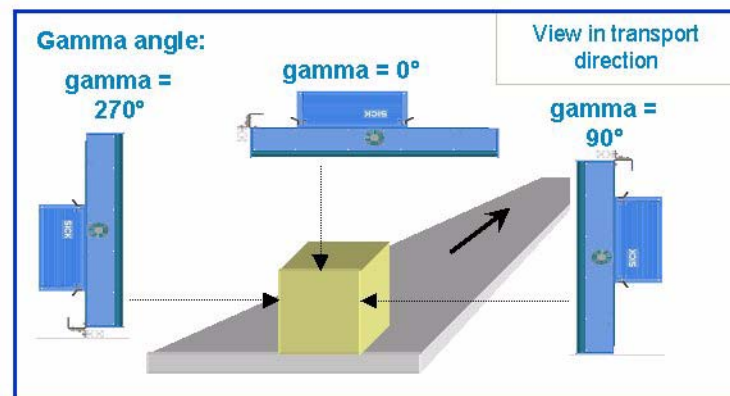


Fig. 2-5: Gamma angle (lateral position referred to the conveyor: top, bottom, left, right)

Parameters	Function
Alpha	Enter Alpha angle (see Fig. "Alpha angle"). Reading at right angle to conveyor 90°/270°
Beta	Enter Beta angle (see Fig. "Beta angle").
Beta decile	Enter decimal place for Beta angle for fine adjustment. The fine adjustment is particularly important for exact configuration of the side cameras.
Gamma	Enter Gamma angle (see Fig. "Gamma angle"). Reading from the top: 0° Reading from the side: 90°/270°

2.1.3 Increment

An external **incremental encoder** can be connected to determine the actual conveyor speed.

The conveyor speed results from the number of impulses and the resolution of the external incremental encoder. Alternatively, a fixed speed can be selected.

Increment The increment source and the resolution/speed are configured via the parameters of the [Increment](#) group.

Parameters	Function
Increment source	Select increment source.
Fixed speed	Enter speed of the conveyor distance. If applicable, select unit.
System increment resolution	Enter resolution of the external incremental encoder. If applicable, select unit.

2.1.4 Image Output

Condition Use the parameters of the [Condition](#) group to define the conditions for the image output.

Parameters	Function
Request	Activate/Deactivate image output and select condition for the image output.
Image format	Select file format for the image output.
Bitmap scaling	Select scaling factor for "bmp" file format. 100% = scale 1:1 50% = scale 1:2 25% = scale 1:4
JPEG quality	Enter image quality for JPEG compression.
Activate diagnosis output	Activate/Deactivate output of additional information together with the image output. Image diagnosis data is output as XML data.
Output limited by code position	Activate/Deactivate whether the minimum and maximum code position (see chapter 2.1.1 Reading Configuration, page 7) are to be considered for the image output.

2.1.5 1D Code

Symbologies Use the parameters of the [Symbologies](#) group to activate/deactivate decoding of the individual 1D code types.

This enables you to filter which code types are to be output:

- Codabar
- Code 39
- UPC / EAN
- 2/5 Interleaved
- Code 93
- Code 128 family

The activated code types can be configured individually. For this purpose, separate pages are available in the SOPAS-ET configuration software.

Parameters	Function
Codabar	Activate/Deactivate decoding of code type CODABAR. For configuration see chapter 2.1.5.1 Codabar, page 17
Code 39	Activate/Deactivate decoding of code type CODE 39 For configuration see chapter 2.1.5.2 Code 39, page 18
UPC / EAN	Activate/Deactivate decoding of code type UPC/EAN For configuration see chapter 2.1.5.3 UPC / EAN, page 19
2/5 Interleaved	Activate/Deactivate decoding of code type 2/5 INTERLEAVED For configuration see chapter 2.1.5.4 2/5 Interleaved, page 20
Code 93	Activate/Deactivate decoding of code type CODE 93 For configuration see chapter 2.1.5.5 Code 93, page 21
Code 128 family	Activate/Deactivate decoding of code type CODE 128 FAMILY For configuration see chapter 2.1.5.6 Code 128, page 22

2.1.5.1 Codabar

The code type CODABAR consists of a character set of 16 characters (10 digits, 6 special characters).



Fig. 2-6: Codabar example

General Use the parameters of the [General](#) group to configure the reading conditions for code type CODABAR.

Parameters	Function
Multiread	Enter the minimum number of required successful readings that must be achieved to accept a barcode as valid.
Start/Stop identical	Set whether only barcodes with identical start and stop characters are to be read.
Transmit start/stop	Activate/Deactivate output of the start and stop character together with code content.
Check-digit test	Select the type of check-digit test.

Length Use the parameters of the [Length](#) group to configure testing of the barcode length.

Parameters	Function
Code length mode	Select the type of code length test.
Interval	Enter minimum length of barcode. Enter maximum length of barcode. Only barcodes with lengths between these two values are read.
Fixed codelengths	Enter required lengths of barcode. Only barcodes with the entered lengths are read.

2.1.5.2 Code 39

CODE 39 can decode 43 characters. The symbology of the binary Code 39 character set consists of 10 digits, 26 alphabetic characters and 7 special characters. Each character consists of 9 elements (5 bars and 4 spaces). Three of the elements are wide and six are narrow. CODE 39 requires a lot of printing space.



Fig. 2-7: Code 39 example

General Use the parameters of the [General](#) group to configure the reading conditions for code type CODE 39.

Parameters	Function
Multiread	Enter the minimum number of required successful readings that must be achieved to accept a barcode as valid.
Transmit start/stop	Activate/Deactivate output of the start and stop character together with code content.
Check-digit test	Select the type of check-digit test.

Length Use the parameters of the [Length](#) group to configure testing of the barcode length.

Parameters	Function
Code length mode	Select the type of code length test.
Interval	Enter minimum length of barcode. Enter maximum length of barcode. Only barcodes with lengths between these two values are read.
Fixed codelengths	Enter required lengths of barcode. Only barcodes with the entered lengths are read.

2.1.5.3 UPC / EAN

The UPC (UNIVERSAL PRODUCT CODE) is used for food and consumer goods in the USA and Canada. It can be compared with the European EAN. The UPC is a numeric code with 12 digits (UPC A) or with 6 digits (UPC E). The last digit is the check-digit.



Fig. 2-8: UPC example

The EAN (EUROPEAN ARTICLE NUMBERING) is used for labelling food and consumer goods in Europe. It can be compared with the American UPC. The first two numbers indicate the country code, the following numbers the manufacturer and the article. The EAN code is a numeric code with 13 or 8 digits. The last two digits are always used as check-digits.



Fig. 2-9: EAN 13 example

The UPC A is compatible with EAN 13: If EAN 13 is printed with a 0 (zero) as the first digit, this code has the same bar sequence as the UPC A code. This type of code is decoded as a UPC A code in the evaluation routine of the EAN 13 and the UPC A. The scanner only decodes this 12-digit code as UPC A if UPC A or UPC A and EAN 13 have been activated. The code is only interpreted as EAN 13 with a leading zero if EAN 13 has been activated.

General Use the parameters of the [General](#) group to configure the reading conditions for the code types UPC and EAN.

Parameters	Function
Multiread	Enter the minimum number of required successful readings that must be achieved to accept a barcode as valid.
Add-on	Select type of output of the Add-on code. The Add-on code is a small additional code that can be added to the right-hand side of the UPC code. It can consist of 2 or 5 digits.
Add-on-length	Select the length of the Add-on code.

UPC Use the parameters of the [UPC](#) group to set which UPC code types are to be scanned.

Parameters	Function
UPC A	Activate/Deactivate scanning of code type UPC A.
UPC E	Activate/Deactivate scanning of code type UPC E.
UPC E Extended	Activate/Deactivate scanning of code type UPC E EXTENDED.

EAN Use the parameters of the [EAN](#) group to set which EAN code types are to be scanned.

Parameters	Function
EAN 8	Activate/Deactivate scanning of code type EAN 8.
EAN 13	Activate/Deactivate scanning of code type EAN 13.

2.1.5.4 2/5 Interleaved

The 2/5 INTERLEAVED (also called ITF) is a very common code type for coding numeric information. The main fields of application are in the industrial sector. The 2/5 INTERLEAVED is a binary code which encodes digits from 0-9.



Fig. 2-10: 2/5 Interleaved example

General Use the parameters of the [General](#) group to configure the reading conditions for the code type 2/5 INTERLEAVED.

Parameters	Function
Multiread #1	Enter the minimum number of required successful readings that must be achieved to accept a barcode as valid.
Check-digit test #1	Select the type of check-digit test for the first code length.
Check-digit test #2	Select the type of check-digit test for the second code length.
Check-digit test #3	Select the type of check-digit test for the third code length.
Check-digit test #4	Select the type of check-digit test for the fourth code length.
Check-digit test #5	Select the type of check-digit test for the fifth code length.

Length Use the parameters of the [Length](#) group to configure testing of the barcode length.

Parameters	Function
Code length mode	Select the type of code length test.
Interval	Enter minimum length of barcode. Enter maximum length of barcode. Only barcodes with lengths between these two values are read.
Fixed codelengths	Enter required lengths of barcode. Only barcodes with the entered lengths are read. Use the parameters of the General group to define the type of check-digit test.

2.1.5.5 Code 93

CODE 93 is an alphanumeric code comparable with CODE 39 (see [chapter 2.1.5.2 Code 39, page 18](#)). However, Code 93 requires less space. The same character set (10 digits, 26 characters and 7 special characters) can be encoded. The code is multiple-valued (valency 4).



Fig. 2-11: Code 93 example

General Use the parameters of the [General](#) group to configure the reading conditions for the code type CODE 93.

Parameters	Function
Multiread	Enter the minimum number of required successful readings that must be achieved to accept a barcode as valid.

Length Use the parameters of the [Length](#) group to configure testing of the barcode length.

Parameters	Function
Code length mode	Select the type of code length test.
Interval	Enter minimum length of barcode. Enter maximum length of barcode. Only barcodes with lengths between these two values are read.
Fixed codelengths	Enter required lengths of barcode. Only barcodes with the entered lengths are read.

2.1.5.6 Code 128

CODE 128 is an alphanumeric code that can indicate the complete ASCII character set with three character sets (set A, B and C). A check-digit test is always available.

- Character set A includes digits, uppercase letters and special characters.
- Character set B includes digits, uppercase and lowercase letters.
- Character set C only includes digits, but with a double density.

It is possible to start with one of these sets and to switch to another character set within the code. CODE 128 is multiple-valued code (valency 4).



Fig. 2-12: Code 128 example

General Use the parameters of the [General](#) group to configure the reading conditions for the code family CODE 128.

Parameters	Function
Code 128	Activate/Deactivate scanning of code type CODE 128.
EAN 128	Activate/Deactivate scanning of code type EAN 128.
Multiread	Enter the minimum number of required successful readings that must be achieved to accept a barcode as valid.

Length Use the parameters of the [Length](#) group to configure testing of the barcode length.

Parameters	Function
Code length mode	Select the type of code length test.
Interval	Enter minimum length of barcode. Enter maximum length of barcode. Only barcodes with lengths between these two values are read.
Fixed codelengths	Enter required lengths of barcode. Only barcodes with the entered lengths are read.

EAN 128 Use the parameters of the [EAN 128](#) group to assign the function characters FC1. These function characters identify the code as code type EAN 128. They can be at the beginning or in the middle of the code.



Fig. 2-13: EAN 128 example

Parameters	Function
FC1 value on first position	Enter FC1 values that have to be positioned at the beginning of codes that are to be read.
FC1 value within code	Enter FC1 values that have to be positioned in the middle of codes that are to be read.

2.1.6 2D Code

Symbologies Use the parameters of the [Symbologies](#) group to activate/deactivate decoding of the individual 2D code types.

This enables you to filter which code types are to be output:

- Data Matrix
- PDF 417

The activated code types can be configured individually. For this purpose, separate pages are available in the SOPAS-ET configuration software.

Parameters	Function
Data Matrix	Activate/Deactivate decoding of code type DATA MATRIX. For configuration see chapter 2.1.6.1 Data Matrix, page 23
PDF 417	Activate/Deactivate decoding of code type PDF 417. For configuration see chapter 2.1.6.2 PDF 417, page 25

2.1.6.1 Data Matrix

The Data Matrix Code (DMC) was developed at the end of the 1980s by International Data Matrix (USA) and has passed through several stages of development (ECC 0 to ECC 200). Data Matrix Code ECC 200 is currently applied; other versions are no longer used.



Fig. 2-14: Data Matrix example

A Data Matrix Code is limited by two search elements which are used as orientation when reading the code. Search elements are a horizontal and a vertical boundary line ("find pattern") which describe the corners. The number of code modules is defined by the two interrupted lines ("alternating grid") opposite the find pattern.

The size of the Data Matrix Code does not depend directly on the volume of data to be encoded, but on the size and number of cells. The data capacity can be up to 1558 characters (8 bit), due to error correction ECC 200 incorrect readings are almost impossible since the created redundancy codes can be reconstructed with up to 25% destroyed data content.

Symbol	Max. number of characters:	
	numerical	alphanumeric
10 * 10	6	3
12 * 12	10	6
14 * 14	16	10
16 * 16	24	16
18 * 18	36	25
20 * 20	44	31
22 * 22	60	43
24 * 24	72	52
26 * 26	88	64
32 * 32	124	91
36 * 36	172	127
40 * 40	228	169
44 * 44	288	214
48 * 48	348	259
52 * 52	408	304
64 * 64	560	418
72 * 72	736	550
80 * 80	912	682
88 * 88	1152	862
96 * 96	1392	1042
104 * 104	1632	1222

General Use the parameters of the [General](#) group to configure the reading conditions for the code type DATA MATRIX.

Parameters	Function
Background	Select whether black codes on a white background or white codes on a black background or both are to be decoded.
Max. allowed error correction	Enter the degree of error correction. 100% = max. reading capacity 0% = max. reliability against incorrect decoding

Length Use the parameters of the [Length](#) group to configure testing of the code length.

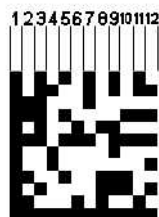


Fig. 2-15: Data Matrix symbol size

Parameters	Function
Code length mode	Select the type of code length test. Select up to five fixed square or rectangular code length ratios.

2.1.6.2 PDF 417

PDF417 (PDF is the abbreviation for "Portable Data File") is a stacked type of barcode

The properties of this coding are:

- Automatic discrimination of line spacing
- Correction of errors
- Separation of channel and source coding via separate assignment tables
- Application-specific configuration of the code redundancy (security levels)



Fig. 2-16: PDF 417 example

Code PDF417 defines the three standard operating modes ASCII, binary mode and numerical mode and contains nine further user-specific operating modes. In ASCII operating mode, a code word codes two alphanumerical characters and in the numerical operating mode 3 digits.

PDF417 is based on a (17,4,6) source coding with four bars and four spaces, divided to 17 modules. The maximum element width is six modules. Thus a PDF417 printout can contain maximum 2000 8-bit characters.

Further coding technical properties of PDF417 include the possibility to detect and correct errors. Therefore, a PDF417 reading symbol contains two check words to detect errors and a variable number of correction words. Data backup can be configured at nine levels. Level 0 does not allow corrections (i.e. only error detection), Level 8 allows the complete reconstruction of max. 510 destroyed code words for a reading symbol consisting of 925 code words. However, this security level results in less information density due to the insertion of check words.

General There are no further parameters for the [General](#) group.

2.1.7 Data Processing

Tracking Use the parameters of the *Tracking* group to configure the reading operating mode and the object release point.

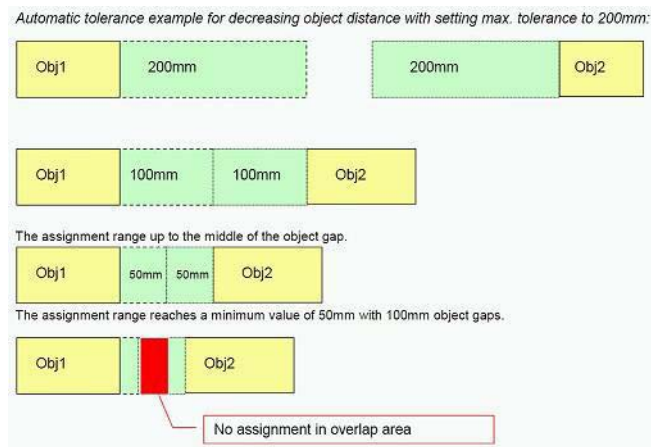


Fig. 2-17: Example of functioning of the label assignment tolerance parameter

Parameters	Function
Tracking mode	Activate/Deactivate the reading operating mode tracking.
Master timeout	Enter the timeout duration for the deactivated tracking mode.
Object release point	Enter the position of object release (distance to the reference point in X direction). If applicable, select unit.
Label assignment tolerance	Enter the max. value for the label assignment tolerance (see Fig. "Example of functioning of the LABEL ASSIGNMENT TOLERANCE parameter").
Max. tolerance	Enter max. value for distance-dependent code allocation to the object. If applicable, select unit.
Fixed tolerance	Enter fixed value for code allocation to the object. If applicable, select unit.




2.1.7.1 Output Control

Output control Use the parameters of the [Output control](#) group to configure the output of the read code contents.

Parameters	Function
Control	Select the type of control (time or tracking controlled).
Data transmission point	Select output time of the read code contents.
Related to	Select the reference edge for the activated tracking mode (see chapter 2.1.7 Data Processing, page 26). Important For data transmission related to the object front edge, the maximum object length must be added to the standard data transmission point (object rear edge).
at X-position	Enter the X position (distance to the reference point) at which the read code contents are to be output for activated tracking mode (see chapter 2.1.7 Data Processing, page 26). If applicable, select unit.
Time	Enter the time period after which the read code contents are to be output for activated tracking mode (see chapter 2.1.7 Data Processing, page 26).
Data transmission point	If the tracking mode has been deactivated (see chapter 2.1.7 Data Processing, page 26), the read code content is output with "Good Read".
Delay	Enter the delay for the data transmission point for deactivated tracking mode (see chapter 2.1.7 Data Processing, page 26). If applicable, select unit.
Timeout	Enter delay for the transmission of the reading data. If applicable, select unit.

2.1.7.2 Evaluation Conditions

Evaluation conditions The conditions are managed in the [Evaluation conditions](#) group. It is possible to define up to 48 conditions.

Parameters	Function
Conditions	 Edit condition.  Delete condition.  Create new condition.

Conditions can be created or edited in a separate window.

Parameters	Function
Condition type	Select the type of condition.
Name	Enter a name for the condition. Important The name should neither contain control characters nor begin with a number.
Deactivate condition	Activate/Deactivate bridging of the condition, e.g. for test purposes. Select the type of bridging.
OK	Close window and confirm entries. This button is greyed out as long as all the codes match the condition.
Cancel	Close window and reject entries.

Match code condition Use the parameters in the [Match code condition](#) window to define a default condition.
 If the background of a field is red, it has been filled out incorrectly.

Parameters	Function
Code content	Enter term that describes the content of the desired code.
>	Select predefined term.
Wildcards (? and *)	Select wildcards to describe the desired code content.
Regular expression	Select regular expression to describe the desired code content.
Test...	Tests whether the desired code matches the condition.
Min:	Enter minimum code length.
Max:	Enter maximum code length.
Don't care	Activate/Deactivate the code length check.
Code type:	Select desired code type.
Don't care	Activate/Deactivate the code type check.
Invert condition	Activate/Deactivate inversion of the condition.

Free condition Use the parameters in the [Free condition](#) window to define a free condition.

Parameters	Function
Add field	Define a part condition.
Modify field	Edit a part condition.
And	Link two part conditions with a logical AND operation. If both part conditions are true, then the result is true, otherwise, the result is false.
Or	Link two part conditions with a logical OR operation. If one or both part conditions are true, then the result is true, otherwise, the result is false.
Exclusive Or	Link two part conditions with a logical XOR (Exclusive OR) operation. If exactly one condition is true, then the result is true, otherwise, the result is false.
Not	If the following part condition is true, the result is false.
(Add bracket around part conditions.
)	Add bracket around part conditions.
Remove row	Remove part condition or link between two part conditions. Rows can also be shifted by drag & drag.

Combination condition Use the parameters in the [Combination condition](#) window to combine several conditions.

Parameters	Function
Add condition	Select a previously defined condition for linking with other conditions.
And	Link two conditions with a logical AND operation. If both conditions are true, then the result is true, otherwise, the result is false.
Or	Link two conditions with a logical OR operation. If one or both conditions are true, then the result is true, otherwise, the result is false.
Exclusive Or	Link two conditions with a logical XOR (Exclusive OR) operation. If exactly one condition is true, then the result is true, otherwise, the result is false.
Not	If the condition is true, the result is false.
(Add bracket around part conditions.
)	Add bracket around part conditions.
Remove row	Remove part condition or link between two conditions.

Example Conditions for the following example:

- Only barcodes of code type 128 that contain the character sequence "45" are to be output.
- Condition is met:Output of "MATCHCODE" and the code content in the output string.
- Condition is not met:Output of "NOMATCH" in the output string.
- No valid code could be read:Output of "NoRead" in the output string.

To achieve this result, the following CONDITION and an appropriate OUTPUT FORMAT must be created (see [chapter 2.1.7.4 Output Format, page 32](#)).

Match code condition

Condition type: Match-Code Condition

Name: Code128with45

Code content: *45* >

☒ Wildcards (? and *)

☐ Regular expression

Test...

Code length:

min: 1

max: 10

☐ Don't care

Code type: Code 128

☐ Don't care

☐ Invert condition



Teach in

☐ Deactivate condition As "false"

OK Cancel



2.1.7.3 Filter/Sorter for Output Formatter

Filter/Sorter for output format #1 Code contents for output format #1 are filtered and/or sorted via the parameters of the [Filter/Sorter for output format #1](#) group.

Parameters	Function
Filter	Filter code contents according to various criteria.  Define filter criteria. Only codes which correspond to the filter criterion are output.
Sorter	Sort code contents according to various criteria.  Define sorter criteria.

The filter and sorter can be arranged in any order and number by drag & drop. To arrange them parallel to each other, they must be moved between the margin and the available filter/sorter. To copy a filter/sorter by drag & drop, press the Ctrl button. To delete a filter/sorter, drag it into the recycle bin (mouse pointer must be above recycle bin).

Filter/Sorter for output format #2 Code contents for output format #2 are filtered and/or sorted via the parameters of the [Filter/Sorter for output format #2](#) group.

Parameters	Function
Filter	Filter code contents according to various criteria.  Define filter criteria. Only codes which correspond to the filter criterion are output.
Sorter	Sort code contents according to various criteria.  Define sorter criteria.

The filter and sorter can be arranged in any order and number by drag & drop. To arrange them parallel to each other, they must be moved between the margin and the available filter/sorter. To copy a filter/sorter by drag & drop, press the Ctrl button. To delete a filter/sorter, drag it into the recycle bin (mouse pointer must be above recycle bin).

2.1.7.4 Output Format

Output format #1 The reading results (decoded codes) are output by definable data interfaces. For this, two different output formats (telegrams) can be defined. The format can also depend on conditions.

Use the parameters of the *Output format #1* group to define the first format of the reading results.

Parameters	Function
Output format #1	Enter output format of the reading results. <input type="button" value="Open input field."/> <input type="button" value="Close input field."/> <input checked="" type="checkbox"/> Select condition. Right mouse click: Insert new condition, data field or special character. Click on the bottom row of the data field: Select attribute characteristics.
Accept	Confirm entries.

The created output format can be marked and copied into a text editor for saving. To copy it back, right mouse click on the *Output format #1* window and select the command "PASTE FROM EXTERN...".

Output format #2 The reading results (decoded codes) are output by definable data interfaces. For this, two different output formats (telegrams) can be defined. The format can also depend on conditions.

Use the parameters of the *Output format #2* group to define the second format of the reading results.

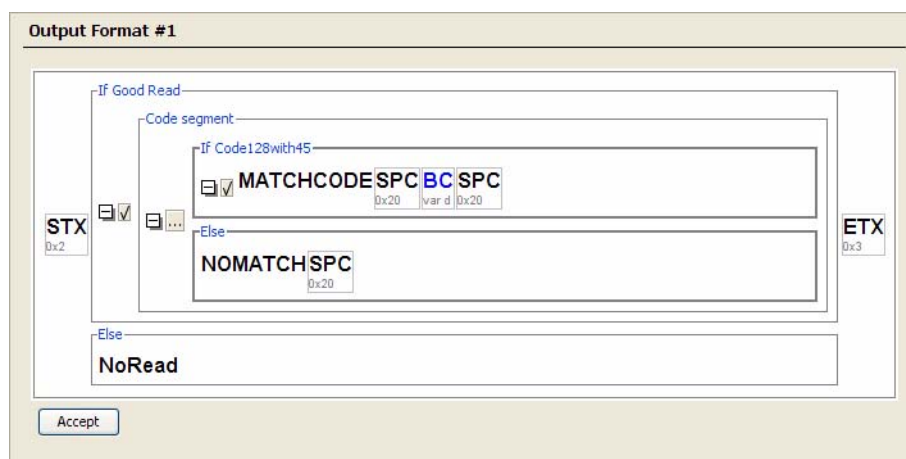
Parameters	Function
Output format #2	Enter output format of the reading results. <input type="button" value="Open input field."/> <input type="button" value="Close input field."/> <input checked="" type="checkbox"/> Select condition. Right mouse click: Insert new condition, data field or special character. Click on the bottom row of the data field: Select attribute characteristics.
Accept	Confirm entries.

The created output format can be marked and copied into a text editor for saving. To copy it back, right mouse click on the *Output format #2* window and select the command "PASTE FROM EXTERN...".

Example The following condition acts as an example (see. [chapter 2.1.7.2 Evaluation Conditions, page 28](#)):

- Only barcodes of code type 128 that contain the character sequence "45" are to be output.
- Condition is met:Output of "MATCHCODE" and the code content in the output string.
- Condition is not met:Output of "NOMATCH" in the output string.
- No valid code could be read:Output of "NoRead" in the output string.

To achieve this result, the following CONDITION (see [chapter 2.1.7.2 Evaluation Conditions, page 28](#)) and OUTPUT FORMAT must be created.



2.1.8 Network / Interfaces / IOs

Network options Use the parameters of the [Network options](#) group to assign the device ID in the network.

Parameters	Function
Device ID	Enter CAN Bus address of the device.
Device name	Enter device name. This name is displayed at the top of the project tree. The device name is used as the file name for the image output.

Master / Slave The master/slave connection of the scanner in the SICK CAN sensor network is defined via the parameters of the [Master / Slave](#) group.

Parameters	Function
Network function	In a master/slave connection the device is always the slave.
assign to	Select connection between the master and the slave.
Point of output	Select output time of reading results.

2.1.8.1 Serial

Serial host interface Use the parameters of the [Serial host interface](#) group to configure the host interfaces. The serial host interfaces provide the reading result for further processing by the host computer.

Parameters	Function
Protocol/Output format	Select output format via which the reading result is to be output via the serial host interface.
Baudrate	Select speed of serial host interface.
Stopbits	Select number of stopbits.
Databits/Parity	Select number of databits and parity.
Hardware	Select the type of serial host interface.

Serial auxiliary interface Use the parameters of the [Serial auxiliary interface](#) group to configure the auxiliary interface.

Parameters	Function
Protocol/Output format	Select whether the reading diagnosis is to be output via the serial auxiliary interface or not.

2.1.8.2 Ethernet

General Use the parameters of the [General](#) group to set the network settings of the device. These settings must be defined by the network administrator. Changes to the parameters of this group only become operative after a restart.

Parameters	Function
IP address	Enter IP address of the device.
Subnet mask	Enter subnet mask of the device.
Default gateway	Enter standard gateway of the device.
Speed	Select network speed.
MAC address	MAC address of the ICR890 is displayed.

Ethernet host port Use the parameters of the [Ethernet host port](#) to configure the Ethernet host interface.

Parameters	Function
Protocol	Select output format via which the reading result is to be output via the Ethernet host interface.
Server	The device always functions as a server.
IP port	Enter the IP port for the exchange of network data.

Ethernet aux port Use the parameters of the [Ethernet aux port](#) group to configure the Ethernet auxiliary interface.

The Ethernet auxiliary interface provides the function of the serial auxiliary interface in parallel.

Parameters	Function
Server	The device always functions as a server.
IP port	The value for the IP port (2111) is indicated.

2.1.8.3 GBit Ethernet

Use the two GBit Ethernet interfaces to transfer image data for further processing via the host computer.

GBit 1 Ethernet Use the parameters of the [GBit 1 Ethernet](#) group to set the network settings of the GBit 1 interface. These settings must be defined by the network administrator.

Parameters	Function
IP-address	Enter IP address for the GBit 1 interface. The IP addresses for the GBit 1 interface and the GBit 2 interface must not belong to the same subnet.
Subnet-mask	Enter subnet mask for the GBit 1 interface.
Default gateway	Enter default gateway for the GBit 1 interface.
Speed	Select network speed.

GBit 2 Ethernet Use the parameters of the [GBit 2 Ethernet](#) group to set the network settings of the GBit 2 interface. These settings must be defined by the network administrator.

Parameters	Function
IP-address	Enter IP address for the GBit 2 interface. The IP addresses for the GBit 1 interface and the GBit 2 interface must not belong to the same subnet.
Subnet-mask	Enter subnet mask for the GBit 2 interface.
Default gateway	Enter default gateway for the GBit 2 interface.
Speed	Select network speed.

2.1.8.3.1 GBit FTP

GBit FTP client Use the parameters of the [GBit FTP client](#) group to configure the FTP settings.

Parameters	Function
Enable	Activate/Deactivate the FTP for GBit Ethernet.
Server address	Enter IP address of the FTP server (receiver).
Host name	Enter host name of the FTP server (receiver). The host name can be added to the upload path.
Username	Enter FTP user name The user name has to be agreed with the receiver.
Password	Enter password for FTP access. The password has to be agreed with the receiver.
Upload path	Enter path for file storage at the FTP server.
Device specific upload path	Select whether the serial number or the host name is added to the upload path.
IP port	Indicates IP port for FTP.

2.1.8.4 CAN

CAN 1 Use the parameters of the [CAN 1](#) group to configure the CAN 1 data interface.

Parameters	Function
Mode	Select the type of CAN network.
Use device ID as node ID	The device ID of the device is used as the node ID in the CAN network. Assignment of the device ID: see chapter 2.1.8 Network / Interfaces / IOs, page 33
Device ID	Enter the node ID of the scanner in the CAN network.
Baudrate	Select network speed.

CAN 2 Use the parameters of the [CAN 2](#) group to configure the CAN 2 data interface.

Parameters	Function
Mode	Select the type of CAN network.
Use device ID as node ID	The device ID of the device is used as the node ID in the CAN network. Assignment of the device ID: see chapter 2.1.8 Network / Interfaces / IOs, page 33
Device ID	Enter the node ID of the scanner in the CAN network.
Baudrate	Select network speed.

2.1.8.5 Digital inputs

Sensor 1 Use the parameters of the [Sensor 1](#) group to configure the first digital input.

Parameters	Function
Sensitivity	Select whether the sensor reacts to the signal edge or the level.
Logic	Select logic of the triggered input.
Debouncing	Enter the minimum detection time for the signal at the input. If applicable, select unit.

Sensor 2 Use the parameters of the [Sensor 2](#) group to configure the second digital input.

Parameters	Function
Sensitivity	Select whether the sensor reacts to the signal edge or the level.
Logic	Select logic of the triggered input.
Debouncing	Enter the minimum detection time for the signal at the input. If applicable, select unit.

2.1.8.6 Digital Outputs

Output 1 Use the parameters of the [Output 1](#) group to configure the first digital output.

Parameters	Function
Output 1	Select event that is to trigger a signal at output 1.
Logic	Select logic level of the selected output 1.

Output 2 Use the parameters of the [Output 2](#) group to configure the second digital output.

Parameters	Function
Output 2	Select event that is to trigger a signal at output 2.
Logic	Select logic level of the selected output 2.

2.2 Service

2.2.1 Operating Data

Device information The identification data of the device is indicated via the parameters of the [Device information](#) group. This data is important for service work.

Parameters	Function
Manufacturer	Indicates the manufacturer of the scanner.
Device type	Indicates the device type of the scanner.
Software version	Indicates the version of the installed firmware.
Order number	Indicates the order number of the scanner.
Serial number	Indicates the serial number of the scanner.

Operating Data Information about previous device operation is indicated via the parameters of the [Operating Data](#) group.

Parameters	Function
Power-on counter	Indicates how often the device has been activated.
Operating hours	Indicates the total number of device operating hours.
Daily operating hours	Indicates the device operating time since the last activation.
Max. temperature image processor	Indicates the maximum temperature achieved by the image processor.
Current temperature image processor	Indicates the current temperature at the image processor.
Max. temperature digital board	Indicates the maximum temperature achieved by the digital board.
Current temperature digital board	Indicates the current temperature at the digital board.
Max. temperature CCD board	Indicates the maximum temperature achieved by the CCD board.
Current temperature CCD board	Indicates the current temperature at the CCD board.

Service information Information about service and maintenance is indicated via the parameters of the [Service information](#) group.

Parameters	Function
Last username	Indicates the last logged-in user.
Last parameterization	Indicates the date of the last parameterisation.
Last maintenance	Enter date of the last maintenance
Next maintenance	Enter date of the next maintenance.

2.2.1.1 Illumination

Device information The identification data of the illumination is indicated via the parameters of the *Device information* group. This data is important for service work.

Parameters	Function
Device type	The device type of the illumination is indicated.
Software version	The version of the installed firmware is indicated.
Order number	The order number of the illumination is indicated.
Serial number	The serial number of the illumination is indicated.

Operating data illumination Information about previous illumination operation is indicated via the parameters of the *Operating data illumination* group.

Parameters	Function
Power-on counter	Indicates how often the illumination has been activated.
Operating hours	Indicates the total number of illumination operating hours.
Fan rotation speed	Indicates the fan speed.
Supply voltage	Indicates the current supply voltage.

2.2.2 System Status
















System information The parameters of the *System information* group indicate system messages.

Parameters	Function
Type	Indicates the type of message.
First occurrence	Indicates the time of first occurrence.
Latest occurrence	Indicates the time of latest occurrence.
Number	Indicates the message number.
Description	Indicates the message text.
Info	Indicates further information concerning the message.
Status	Indicates the message status.
Counter	Indicates the number of message occurrences.

2.3 Analysis

2.3.1 Event Monitor

Event monitor Use the diagrams of the *Event monitor* group to monitor signals and inputs and outputs.

Symbol	Function
	Select signal that has to be monitored.
	Open a previously recorded monitoring diagram.
	Save the current monitoring diagram.
	Measure distances within the diagram.
	Start monitoring.
	Interrupt monitoring.
	Stop monitoring.
	Record monitoring.
	Enlarge diagram.
	Set zoom of the diagram to 100 %.
	Scale down diagram.
	Indicate time axis in diagram.
	Indicate increment axis in diagram.
	Activate/Deactivate matrix in diagram.
	Indicate values in diagram.

2.3.2 Image Viewer

Image viewer Use the *Image viewer* group to display and analyse captured images.

Australia

D\cbY'Z' *%' ' (- + '(%SS
' % SS' ' '(, 'S&l 'lc`ZY
9!A Uj` gU'Yg4 gJW'W'a "U

Belgium/Luxembourg

D\cbY'Z' &fSi&(' *') **
9!A Uj` jbz4 gJW'VY

Brasil

D\cbY'Z') '%%' &@ !(- SS
9!A Uj` gU'W'gJW'W'a "Vf

Ceská Republika

D\cbY'Z' (&S'&) + - '%%') S
E-Mail sick@sick.cz

China

D\cbY'Z') &l&+*' * - **
9!A Uj` [_4 gJW'W'a "_

Danmark

D\cbY'Z' () ' , &* (' SS
E-Mail sick@sick.dk

Deutschland

D\cbY'Z' (- ' &@%) ' S%\$S
9!A Uj` jbz4 gJW'XY

España

D\cbY'Z' (' ' '(, 'S' %SS
9!A Uj` jbz4 gJW'Yg

France

D\cbY'Z' ' '%* ('*&') ' SS
9!A Uj` jbz4 gJW'Zf

Great Britain

D\cbY'Z' (('fSi%+&+ , ' %&@%
9!A Uj` jbz4 gJW'W'i _

India

D\cbY'Z'- %d &&l & &+S, (
9!A Uj` jbz4 gJW'jbxU'W'a

Italia

D\cbY'Z' - 'S&&+ '(' '(%
9!A Uj` jbz4 gJW'jh

Japan

D\cbY'Z' , %fSE " ' ') , % (%
9!A Uj` g' ddcfh4 gJW'd

Nederlands

D\cbY'Z' %fSE S'&&- &) '((
9!A Uj` jbz4 gJW'b`

Norge

D\cbY'Z' (+ '*+ , %) S`SS
9!A Uj` U ghYZcfX4 gJW'bc

Österreich

D\cbY'Z' ('fSi&&' * * &' & , !S
9!A Uj` cZjW4 gJW'Uh

Polska

D\cbY'Z' (, ' && , ' + '(S) S
9!A Uj` jbz4 gJW'd`

Republic of Korea

D\cbY'Z' &l&+ , * * * ' &@#(
9!A Uj` _Ub[4 gJW_cfyUbyh

Republika Slovenija

D\cbY'Z' , * fSi@d(+ * - ' - S
9!A Uj` cZjW4 gJW'gl

România

D\cbY'Z' (S') * '%+%'&S`
9!A Uj` cZjW4 gJW'fc

Russia

D\cbY'Z'+ '(-) '++) 'S' ' (
E-Mail denis.kesaev@sick-
' U lca Ujcb'fi

Schweiz

D\cbY'Z' (% (%*% - &- ' -
9!A Uj` WbHUM4 gJW'W

Singapore

D\cbY'Z' *+ ((' ' + &
9!A Uj` Uxa jbz4 gJW'gl d'W'a "gl

Suomi

D\cbY'Z') , !- !& %@ , SS
9!A Uj` gJW4 gJW'Z

Sverige

D\cbY'Z' (* %\$ %@S %\$S`SS
9!A Uj` jbz4 gJW'gY

Taiwan

D\cbY'Z' , * ' &' *) !* &- &
9!A Uj` gJW' fV4 a g* ^ jbyhbyh

Türkiye

D\cbY'Z'- S'&@*) , ++ ('SS
9!A Uj` jbz4 gJW'W'a "f

USA/Canada/México

D\cbY'Z'%f) &L- (%*+ , S
' % , SS! &) +(&) ' l`ZY
9!A Uj` jbz4 gJW'i gU'W'a

A cfYfydFYgYbUhj YgUbXUj YbW'g
j b U`a U'cf jbx ghU' bUjcbgUhi
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