

LRS4000- Firmware release information 1.x.x



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General Information

Latest FW 1.9.1

Compatible for: LRS4581R

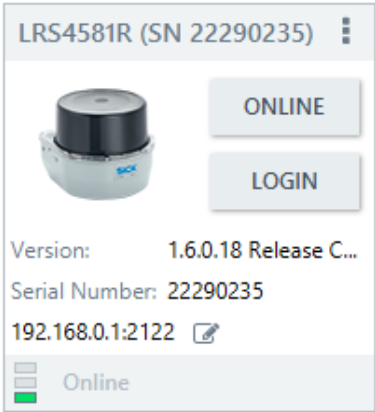
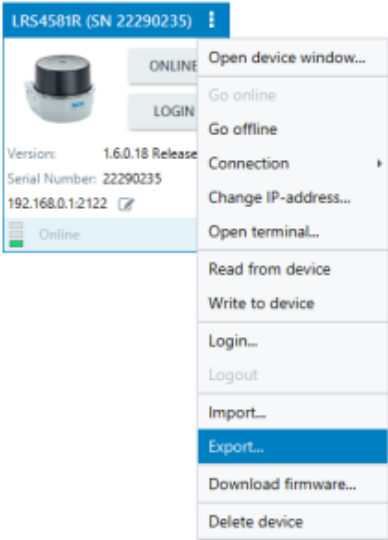
Release date: 01/2026

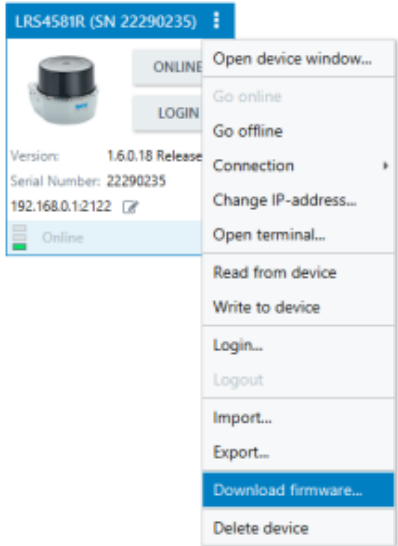
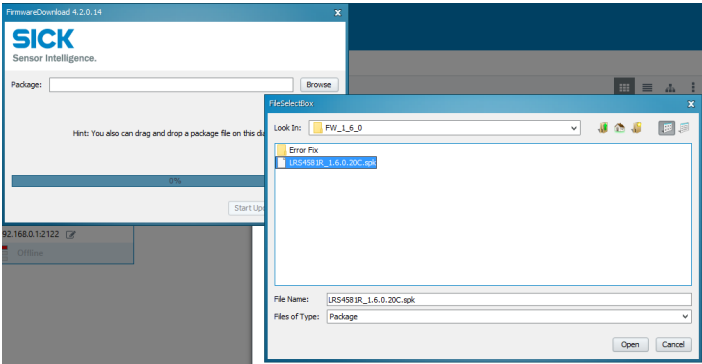
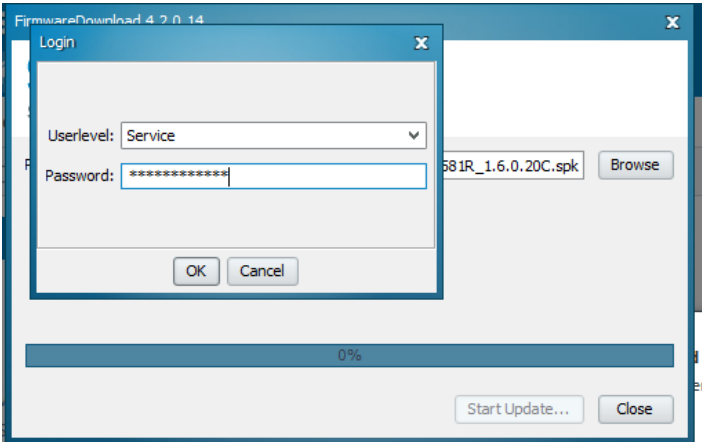
NOTE: Extended range feature is only available for devices with production date starting from 11/24 (**SN2442xxxxxx**) for update requests of older devices please contract with your responsible SICK contract.

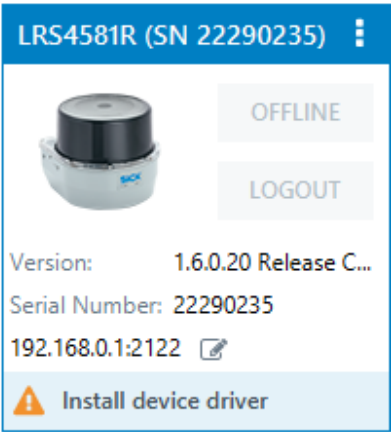
Update Instructions



Downgrade of firmware versions is not recommended!

1	Save and unpack the firmware files on your local hard disk (please use full admin rights on your PC).	
2	Make sure your LiDAR is connected via Ethernet to your PC, in the same subnet and booted up. Power supply must remain stable during the update process.	
3	Use SOPAS ET or AppManager for firmware updates. The following instructions refer to SOPAS ET only.	
4	Search for the connected LiDAR and drag and drop the device into the SOPAS project.	
5	Recommendation: Save your parameter file (.sopas file) before you start the update.	

<p>6 Open the settings and choose Download firmware.</p>	
<p>7 Select the firmware package (.spk) and start the update process.</p>	
<p>8 Log-in to the LiDAR with user level: Service and password: servicelevel</p> <p>The update procedure may take up to 2 minutes.</p>	
<p>9 Wait until the reboot is completed and the device LED turns green.</p>	

10	<p>Check the SOPAS window for the correct firmware version.</p> <p>Depending on the firmware update, the SOPAS ET device driver may need to be reinstalled by pressing "install device driver".</p>	
11	<p>Before the LiDAR is used for operation, ensure the device works as expected and that all parameters are set as intended.</p>	
12	<p>In case of uncertainty:</p> <ul style="list-style-type: none"> • Set factory defaults in the device (user level "Service") • Load your parameter file (.sopas) in the device 	
13	<p>Done</p>	

Firmware V1.9.1

New Features

Improvements

Motor Startup

The motor startup is optimized for softer start after power on.

Bug fix

Field Evaluation - Group activation via inputs

When activating Groups by dedicated inputs the assignment of input 1-3 leads to device errors. Additionally the assignment of real input and possible selection in the group tab was set with the wrong offset. This bug is now fixed.

Field Evaluation - Group activation behavior during Bootup

When configuring multiple Groups that would lead to a device overload in case all Groups are active at the same time, the device was running in an overload device error after bootup. This bug is now fixed.

Incompatibilities

None

Known Issues

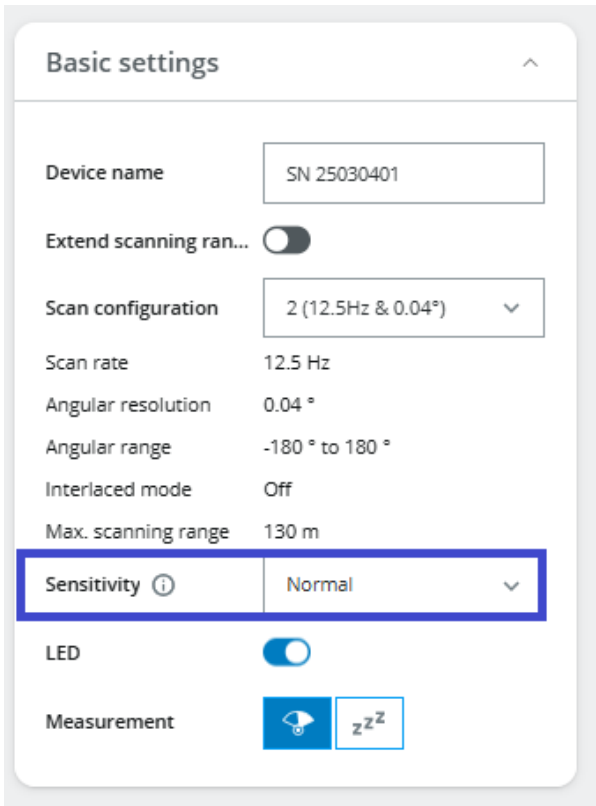
None

Firmware V1.9.0

New Features

Sensitivity Mode

The LRS4000 does now support a Sensitivity Mode that is able to increases the range of the device and the detection of high reflective targets.



The table below shows the new max range of the specific operation modes. Please note that this modes should only be used when the Ambient Light conditions according to the tables are meet e.g. in indoor or applications. A usage of the modes besides this conditions may lead to a lower detection probability and higher noise.

Sensitivity Mode	Max Range - Standard Mode	Max Range - Extended Range Mode	Ambient Light
Standard	55 m	100 m	80 klux
Sensitive	65 m	115 m	30 klux
Very Sensitive	70 m	120 m	10 klux

Improvements

None

Bug fix

None

Incompatibilities

None

Known Issues

None

Firmware V1.8.1

New Features

None

Improvements

Adjustment of TCP Transmit Timeout

The CoLa command "EtherColaTransmitTimeout" was introduced to adjust the transmit timeout for TCP connections on Port 2112 and 2111. The timeout is set to 15 s per default and can now be adjusted between 250 ms and 15 s to speed up the reconnection process after unwanted disconnects. Additional information can be found in the Telegram Listing section of the operating instruction.

The default value and standard behavior of the device remains unchanged.

Bug fix

Instable Network may lead to ignored commands on TCP based CoLa A Port 2111 and CoLa B Port 2112

A connection issue in the network between LRS4000 and customer PC/IPC/PLC may have lead to discard of ingoing CoLa commands from the sensor after reconnection. This issue could have happend on TCP port 2111 (CoLa A) or 2112 (CoLa B). With this fix, the issue does not exist anymore and the reliability of the device on instable customer networks was improved.

Incompatibilities

None

Known Issues

GUI Input/Output connector is showing male A encoding but should be female A connector

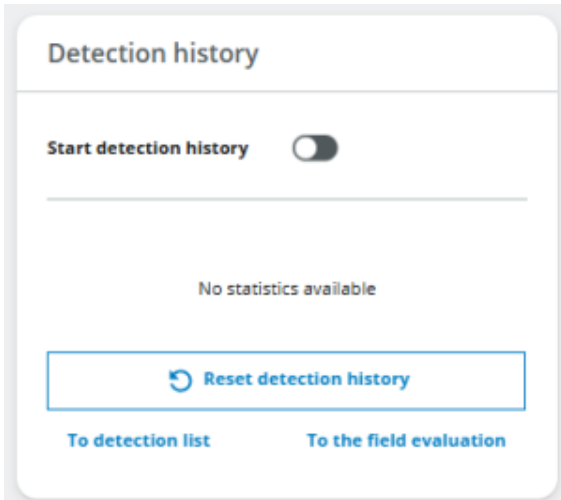
Firmware V1.8.0

New Features

Field Evaluation: Detection history Home screen

The Home window in the device GUI contains now a Detection history, which collects all field infringements and provides a link to other "Field Evaluation" related sub pages.

UI interface:



Field Evaluation: Teach-in

Teach-in is now available to teach in a static background. This teach-in can be triggered manual using a start/stop button or via input signal.

UI interface:

Teach-in ⓘ

Advanced settings ^

Distance in front of object ⓘ

-

250 mm

+

Distance behind object ⓘ

-

250 mm

+

ⓘ

Changes in the distances to the object take effect after the next teach-in.

Min. teach-in time ⓘ

-

250 ms

+

Start/stop by input signal

No selection ▾

Teach-in environment

Start

Teach-in deactivated

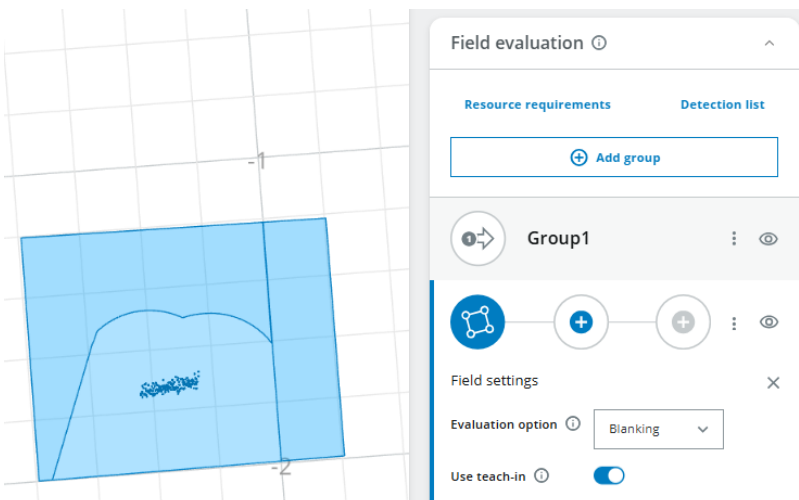
Field Evaluation: Teach-in Field settings feature

The taught background can be used in the Field settings in the following combinations

Blanking:

Blanking can be combined with teach-in to create the most efficient field of a static area with a dedicated distance to static objects like for perimeter protection.

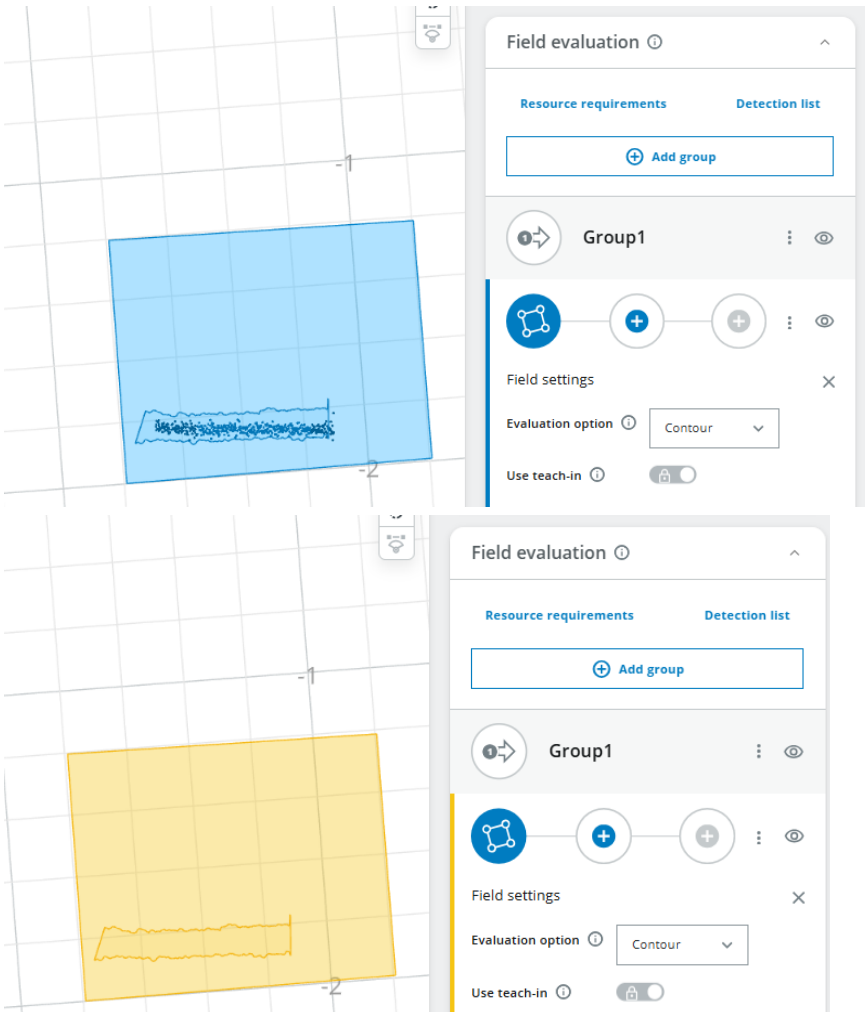
UI interface:



Contour:

This feature detects if an object was removed from a predefined and taught area.

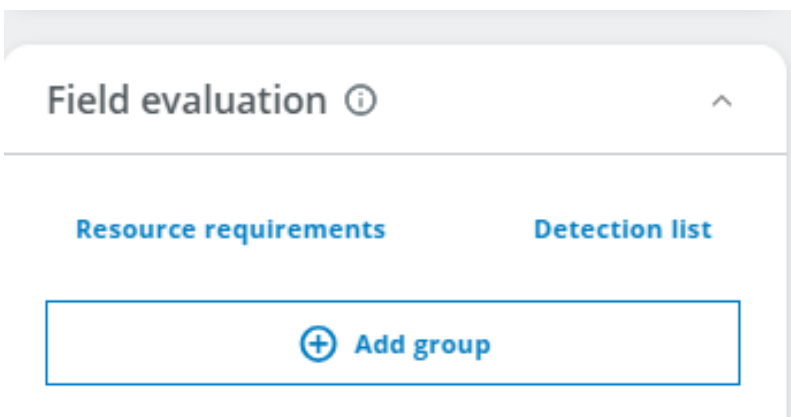
UI interface:

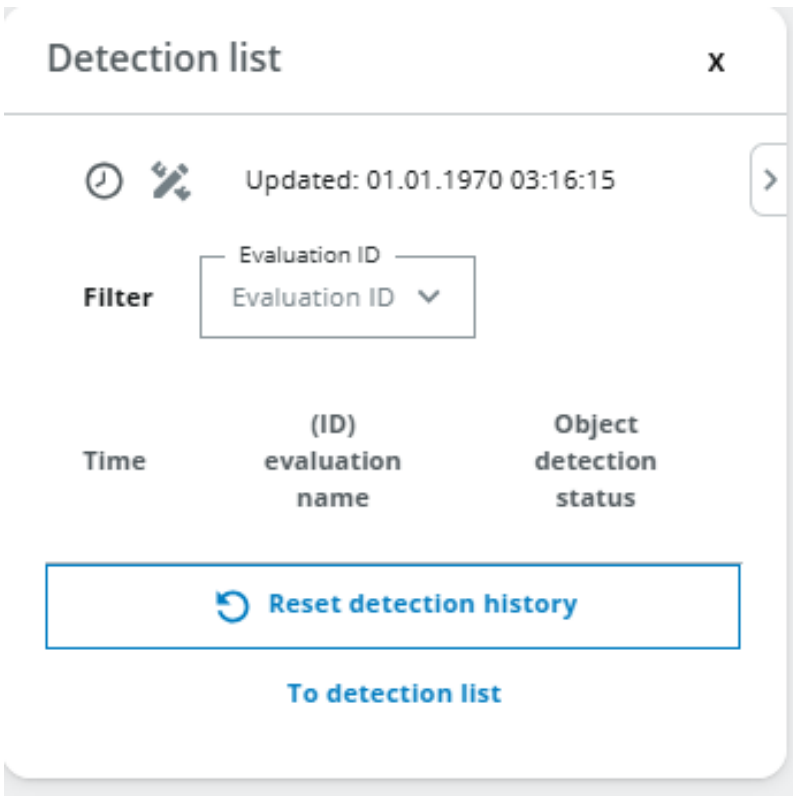


Field Evaluation: Detection list shortcut

The Field evaluation tab now contains also a "Detection list" shortcut to get a easy overview of infringed fields.

UI interface:





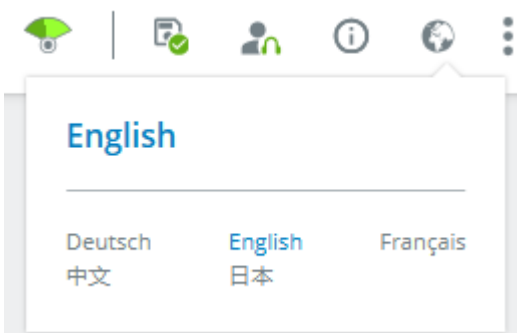
New Languages for GUI Interface

The list of available languages in the LRS4000 GUI was extended by

- Chinese
- Japanese
- French

The Language can be changed on the top right Icon.

UI interface:

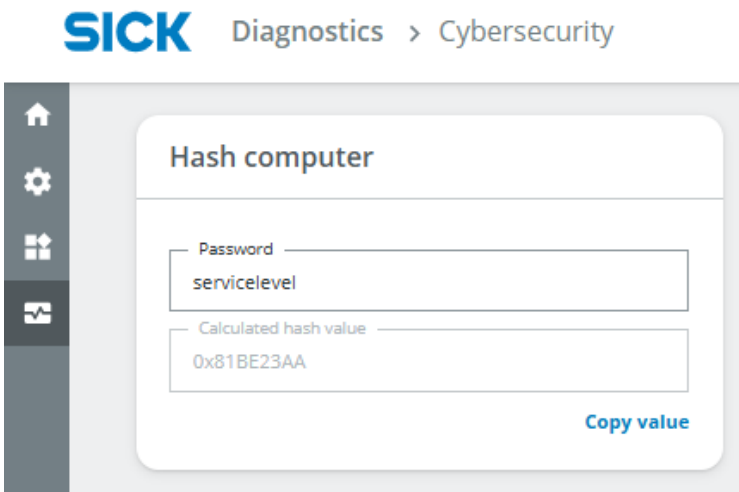


Cybersecurity tab including Hash- Calculator was added to GUI Interface

A new tab called "Cybersecurity" was added to the "Diagnostic" interface on the device GUI. This tab was created to group all cybersecurity related features and will be extended in the future.

The new Hash-Calculator is required to change the device password using CoLa A/B or to login using a SICK software driver.

UI interface:




Improvements

Field Evaluation: Evaluation renaming


Old appearance including FW V1.7.0

Do not regard an
echo as object
detected ⓘ



New appearance including FW V1.8.0

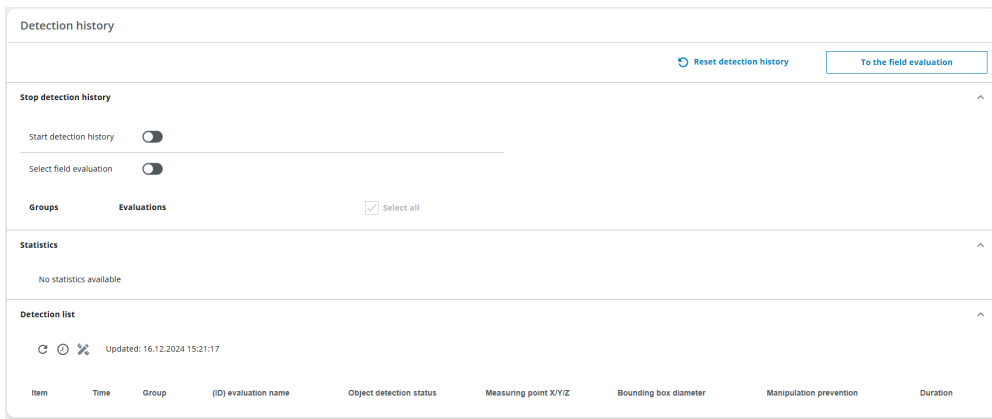
Ignore
missing echo ⓘ



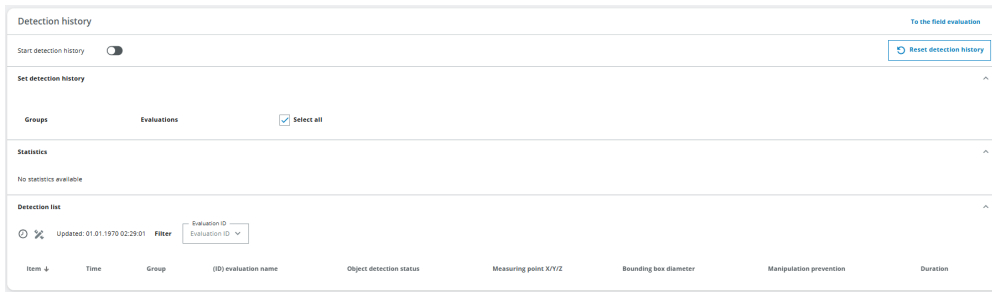
Field Evaluation: Detection history restructure

The graphical appearance of the "Detection history" was adjusted.

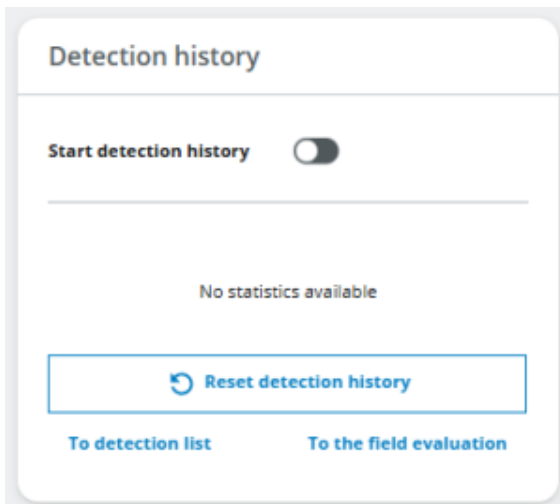
Old appearance including FW V1.7.0



New appearance including FW V1.8.0



UI interface:



Start & Stop Timestamp in Compact was adjusted

Start & Stop timestamp in compact data format is now transmitted as Linux system time

GUI Update for Date and system time

Old appearance including FW V1.7.0

Date and system time

Synchronization

Off

Date

12/16/2024

System time

01:17 PM

Apply system time from computer

Apply time

System time

16.12.2024 13:17:40

Date and system time

Synchronization

NTP

Time server IP address

192.168.1.20

Update time

-

600

s

+

Time zone

Amsterdam, Berlin, Rome, Bern, Stockholm, Vienna (UTC+01:00)

System time

16.12.2024 13:18:45

Date and system time

Synchronization

PTP

System time

16.12.2024 14:18:55

New appearance including FW V1.8.0

Date and system time
^

Synchronization

Off

Date

01/01/1970

System time

12:27 AM

Apply computer time

Information

When restarting, the time is reset to January 1, 1970.

Date and system time
^

Synchronization

NTP

Time server IP address

192.168.0.11

Update time

–

600

s

+

Time zone

Amsterdam, Berlin, Rome, Bern, Stockholm, Vienna (UTC+01:00)

Date

01/01/1970

System time

12:27 AM

Date and system time
^

Synchronization

PTP

Date

01/01/1970

System time

12:27 AM

Max value for Region of interest increased

The max value for scanning range was increased from 200 m to 300 m to fit all possible LRS4000 distance values.

Bug fix

LED enablement state was not reset on load application defaults

SOPAS ET device import does not export all parameter

Device import of LRS4000 does now work properly

Incompatibilities

None

Known Issues

GUI Input/Output connector is showing male A encoding but should be female A connector

Firmware V1.7.0

New Features

Extended range


The device supports now two operation modes. A normal mode which has the same measurement performance as the device with older firmware versions and an extended range mode, which increases the measurement distance up to 300 m.

The switch between normal mode and extended range mode can be performed by selecting a different scan configuration. For detailed information concerning scan configurations and additional limitation see device manual.

Please note that the "Scale factor" changes automatically when operation mode is changed.

Please note that this feature is only available for devices produced from 11/24 and serial number SN2442xxxx and higher. When updating older devices using the FW 1.6.0 or earlier, this feature can not be applied. These devices can be updated to FW1.7.0 as used to. Only the "extended range" feature will then not be available. When there is a need for firmware upgrade on inventory devices produced earlier than 11/24, please get in contract with your responsible SICK contract.

UI interface normal mode:

Basic settings		Output data format	
Device name	Example Device	RSSI	<input checked="" type="checkbox"/>
Range extended	<input type="checkbox"/>	RSSI type	8 bit
Scan configuration	2 (12.5Hz & 0.04°)	RSSI content	Count
Scan frequency	12.5 Hz	Device name	<input type="checkbox"/>
Angle resolution	0.04 °	Time stamp	<input type="checkbox"/>
Angular area	-180 ° to 180 °	Encoder	<input type="checkbox"/>
Interlace mode	Off	Output interval	- 1 +
Max. range	130 m	Scale factor	- 2 +
LED	<input checked="" type="checkbox"/>		
Measurement			

UI interface extended range enabled:

Basic settings

Device name

Example Device

Range extended

☒

Scan configuration

1 (12.5Hz & 0.04°) ▾

Scan frequency

12.5 Hz

Angle resolution

0.04 °

Angular area

-180 ° to 180 °

Interlace mode

2x



Max. range

300 m

LED

☒

Measurement

Output data format

RSSI

☐

RSSI type

8 bit ▾

RSSI content

Count ▾

Device name

☐

Time stamp

☐

Encoder

☐

Output interval

—

1

+

Scale factor


—

5

+

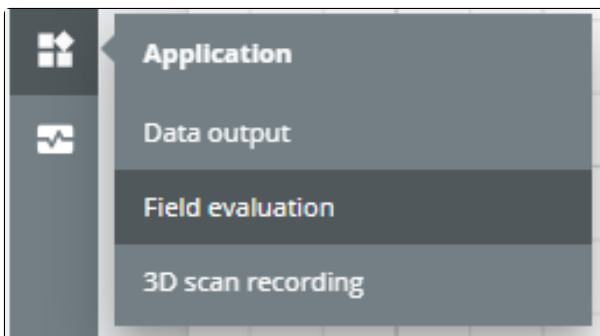
Selecting the "Range extended" switch, will change the selectable "Scan configuration" according to the current operation mode.

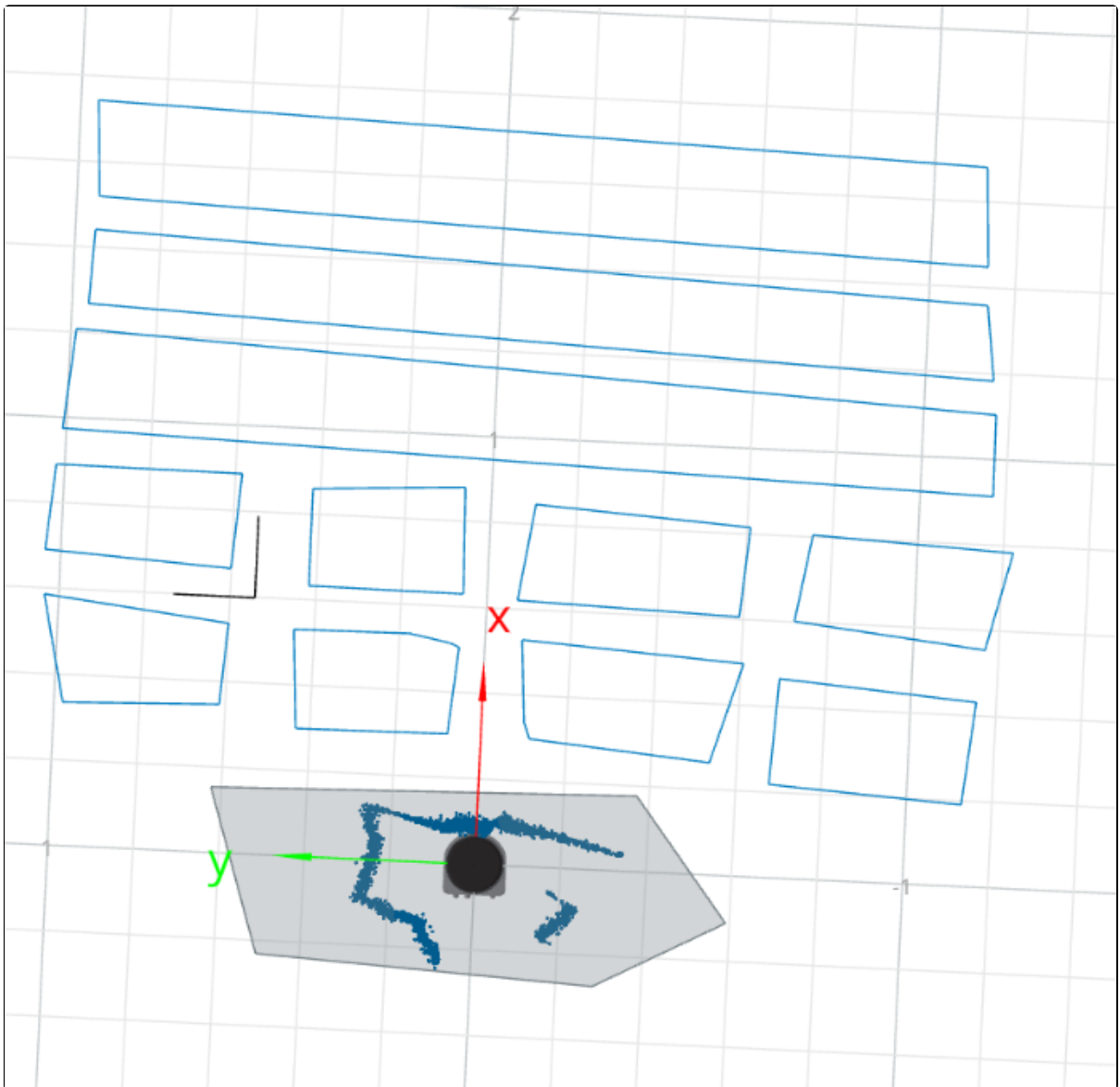
Field evaluation

Application for evaluating up to 16 user defined fields. You can use the  Icon to create user specific fields. Once a field is closed, it turns blue. A gray field shows invalid field which are not going to be evaluated. Please note that the number of fields depends on the field shape and the applications running in parallel on the device and may be smaller than 16. To reduce the workload you can disable the measurement data output.

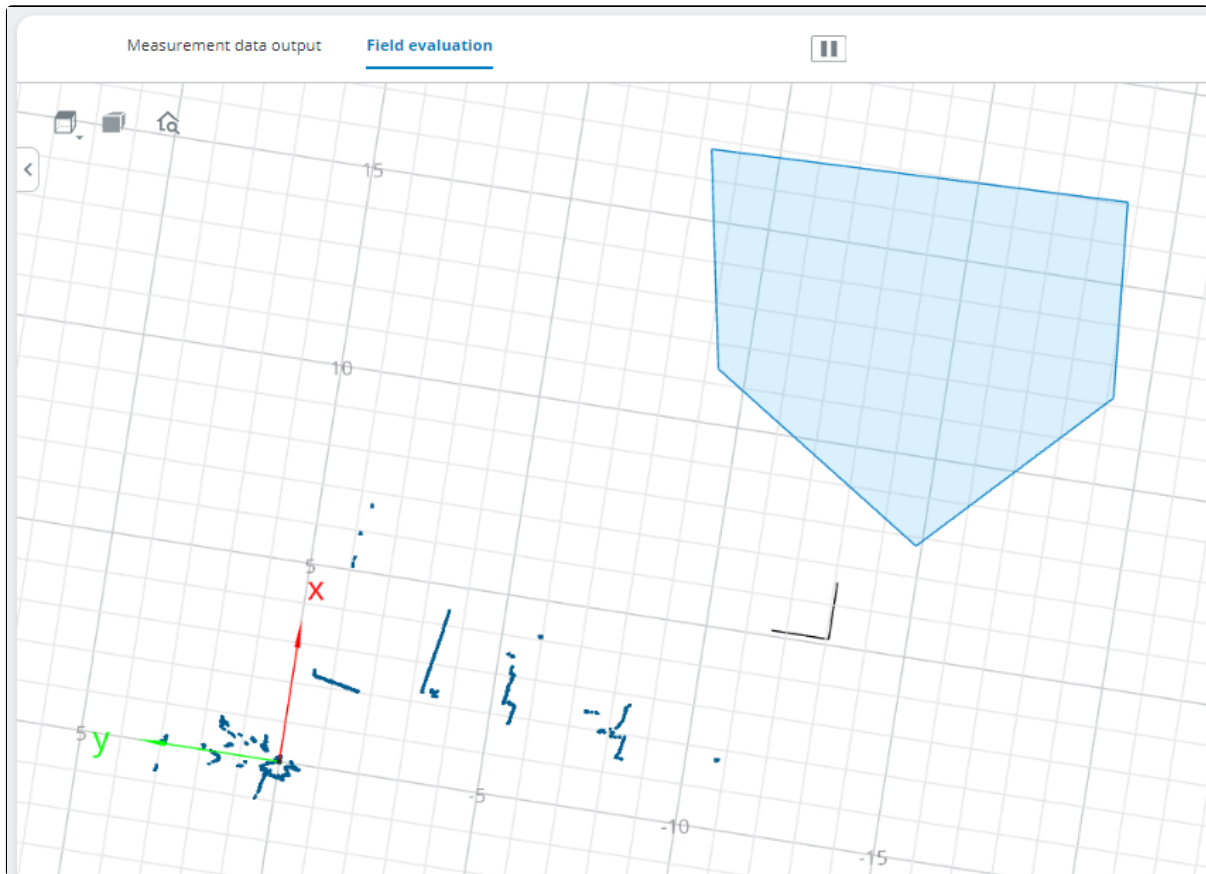
If you want a detailed instruction on how to setup the field evaluation, please open the general help in the top right bar and use the guided tour "Field evaluation application".

UI interface:










Gray field around the sensor is not going to be evaluated due to performance reasons.

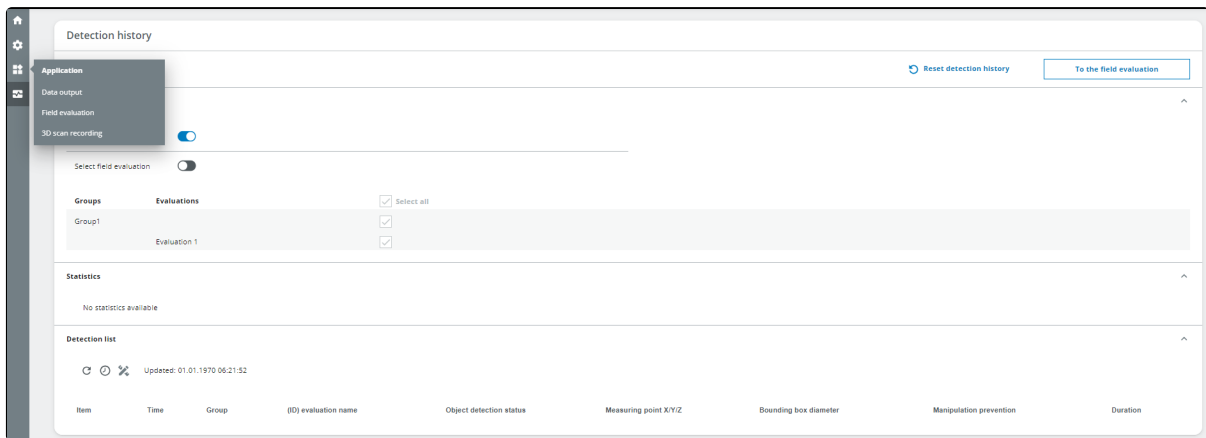


You can now also display the created fields on the landing page using the "Field evaluation" selection.

Status

-  **Device**
Device active
-  **Connection**
Device connected
192.168.0.2
-  **Measurement**
Measurement active
-  **Field evaluation application**
No object detected
-  **Data output application**
Data output active


The Status information contain now an additional field, providing active object detection information.



A detection history for activated fields was added to the diagnostics tab to keep track of .

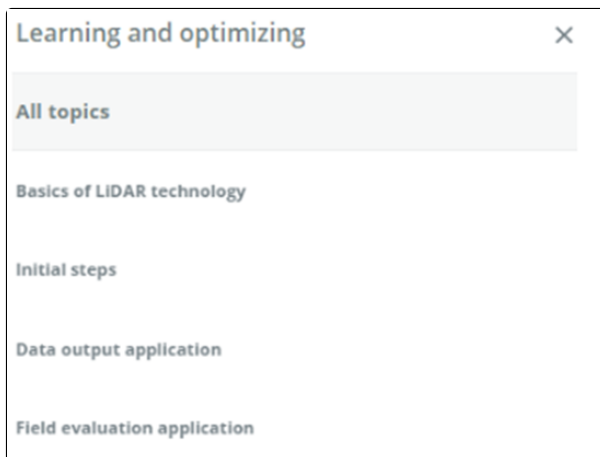
Online help

There is now a online help available for customers on the GUI.

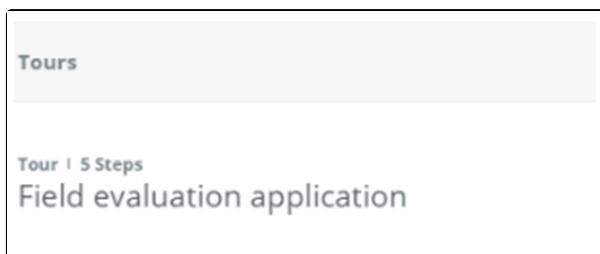
General help icon  was added to the top right bar.



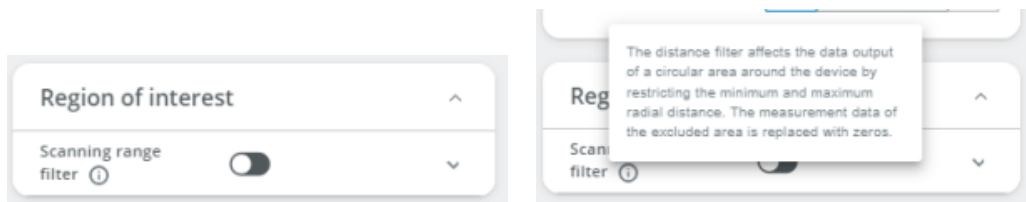
By pressing the general help button in the top menu a topic overview appears, which provides guided tours and general information related to device features. You can either explore some features by yourself by clicking trough the different topics



or you could jump into one of the guided tours, providing a step by step instruction of different topics



Additionally to the general help collection, some complex parameters contain an additional help text, displayed close to the parameter name itself. By selecting the specific ⓘ an additional help text is shown in the configured device language.

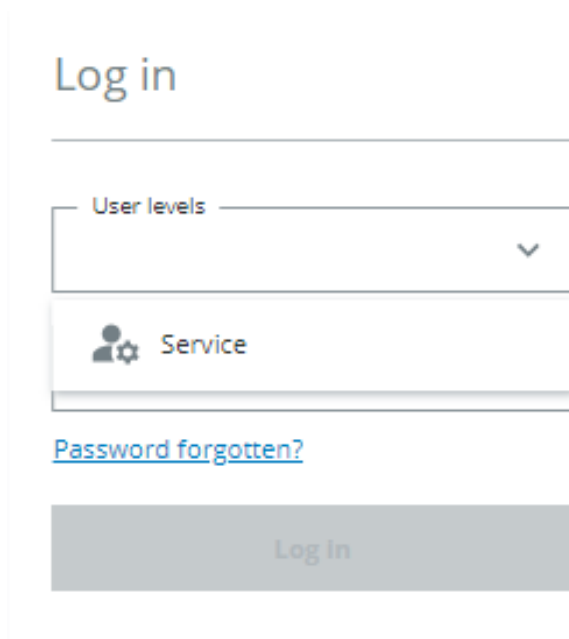


User level management

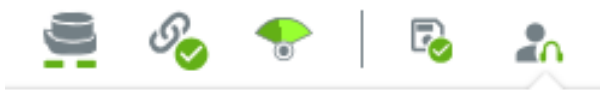
Only user "Service" is active by default on the web interface. Other user levels need to be enabled manually to be used via web interface. User levels for CoLa A/B are unaffected.

To activate other user levels you need to:

- 1) Log in with service level



- 2.) Activate the desired user level




Service

Logout

Change password

Activate user level

 Maintenance ☐

 Authorized Client ☐

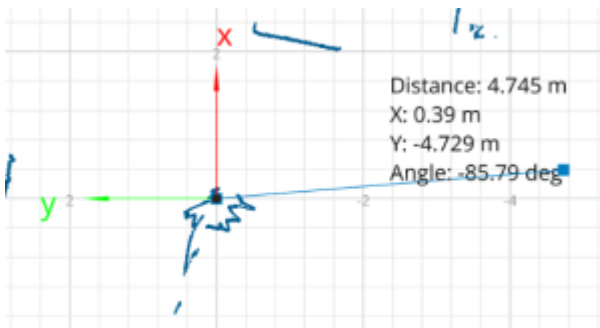
 SICK Service ☐

 Change user level

Distance measurement between two points

The scan view of the device is now able to measure the distance between two points like the device and a specific point using

the  button .



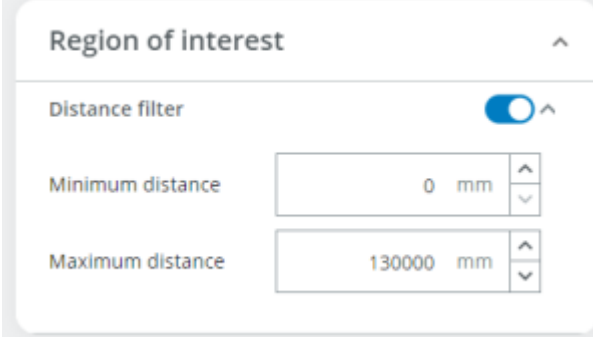
Improvements

Adaption of the Distance Filter

The "Distance filter" was renamed to "Scanning range filter" and it's graphical appearance was adapted. Additionally, the scan view shows now the ignored scan area in gray.

UI interface:

Old appearance including FW V1.6.0



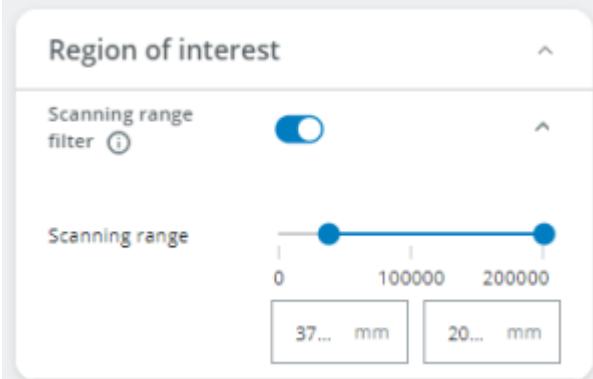
Region of interest

Distance filter ☒

Minimum distance 0 mm

Maximum distance 130000 mm

New appearance starting with FW V1.7.0



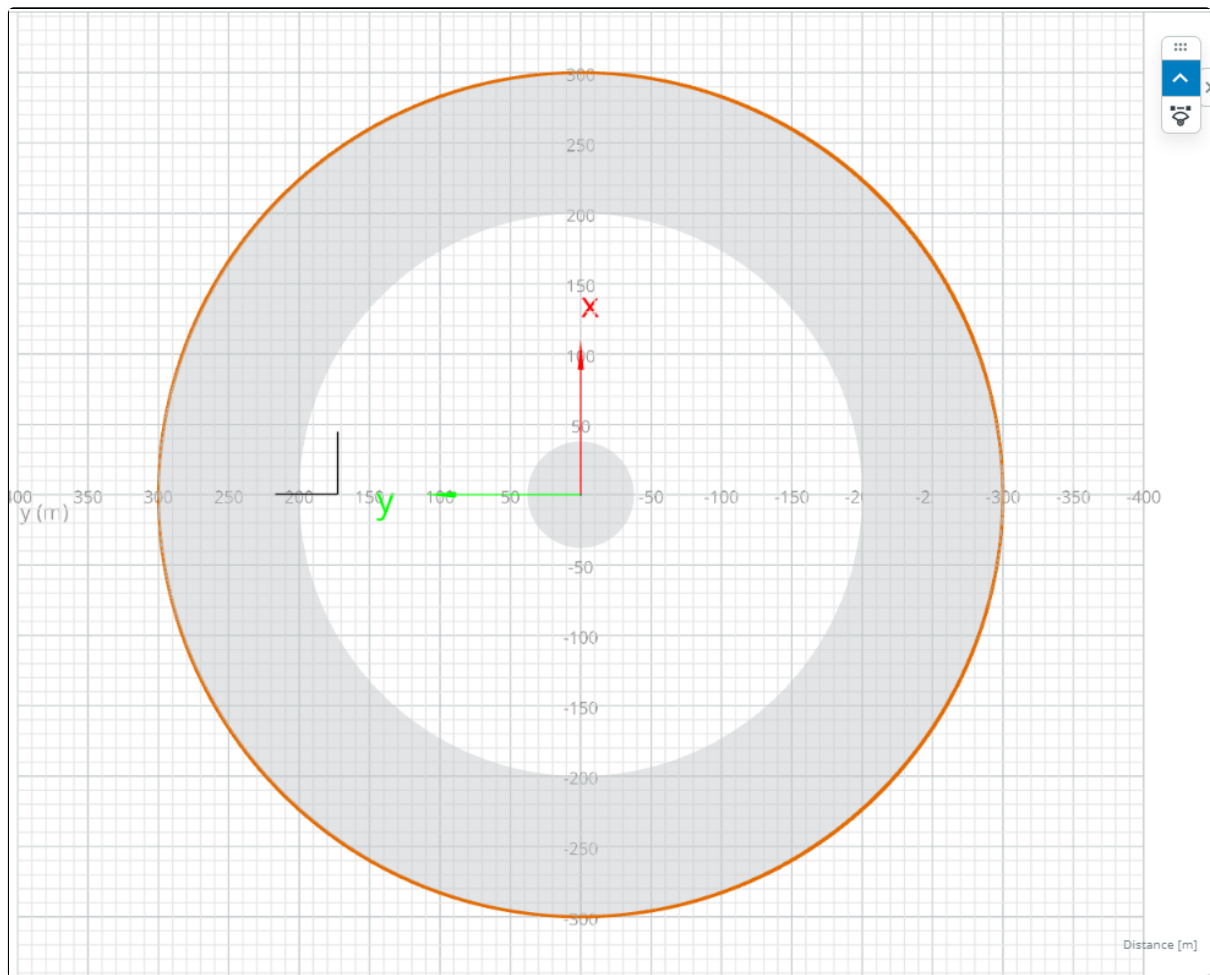
Region of interest

Scanning range filter ☒

Scanning range

0 100000 200000

37... mm 20... mm



Start and stop button 3D scan recording

The start and stop button was separated in two buttons before and is now integrated in one single button which changes functionality. This allows capturing without the need of moving the mouse.

Old view:

Recording



New view:

Recording



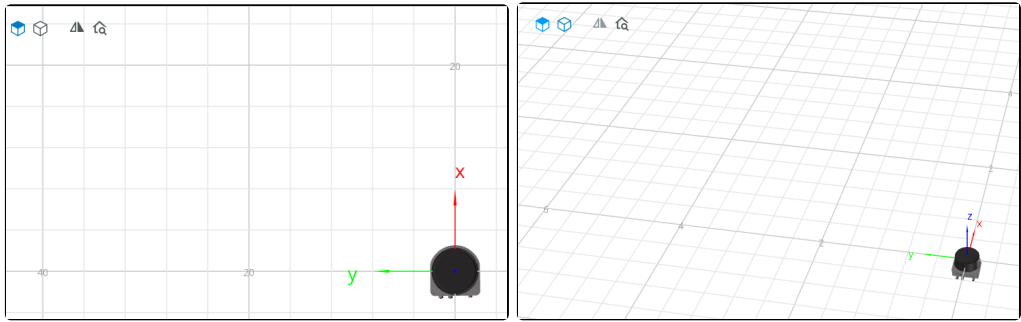
Recording



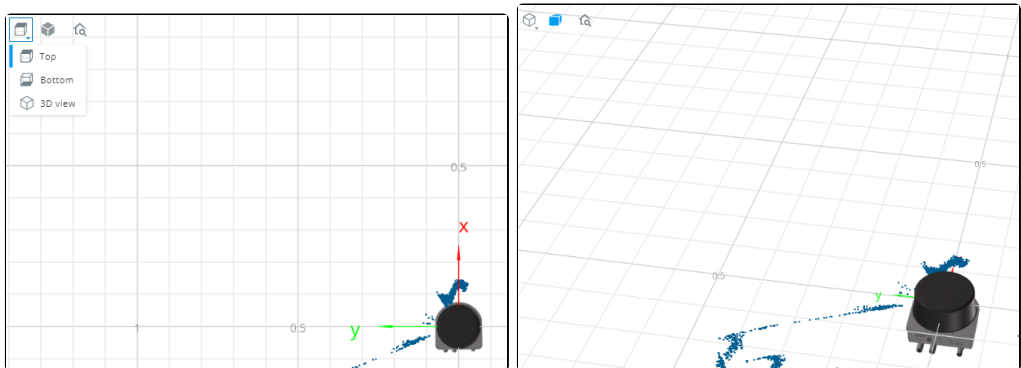
Change of 3D view

The scan view could be changed between 2D and 3D before. The appearance and some new options where added.

Old view:



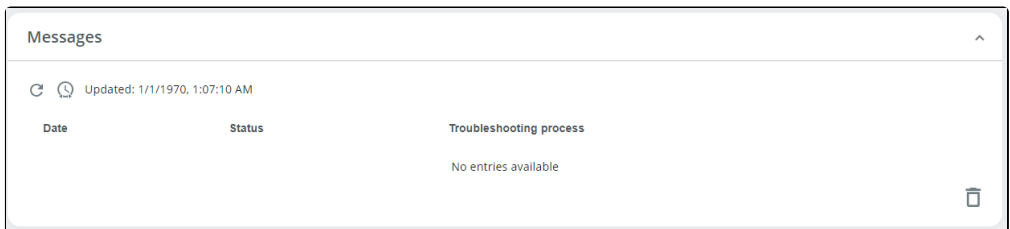
New view:



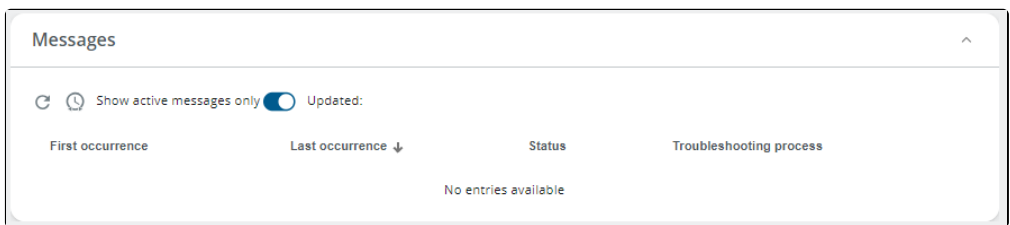
Improvement of the Diagnostic Overview Messages

The Messages section of the Diagnostic Overview contains now additional filter possibilities to change occurrence time base or to show only active messages .

Old view:



New view:



Bug fixes

Fatal Error based on device config

A Fatal device error could occur when all the following configurations are selected:

- Scan configuration with "Angular area" <360° (12.5Hz & 0.02°, 25Hz & 0.04°)
- Echofilter is set to either "First echo" or "Last echo"

Browser compatibility Update Chromium

New Chromium update requires adaption in scan data viewer

Incompatibilities

Default Value Echofilter

The default value of the echo filter changed from FIRST_ECHO to LAST_ECHO

Known Issues

3D scan recording

When performing a 3D scan recording and using the overtime measurement stop, the "stop" button does not change back to "start". For temporary fix, you can press the "stop" button twice to change it back to "start".

Firmware V1.6.0

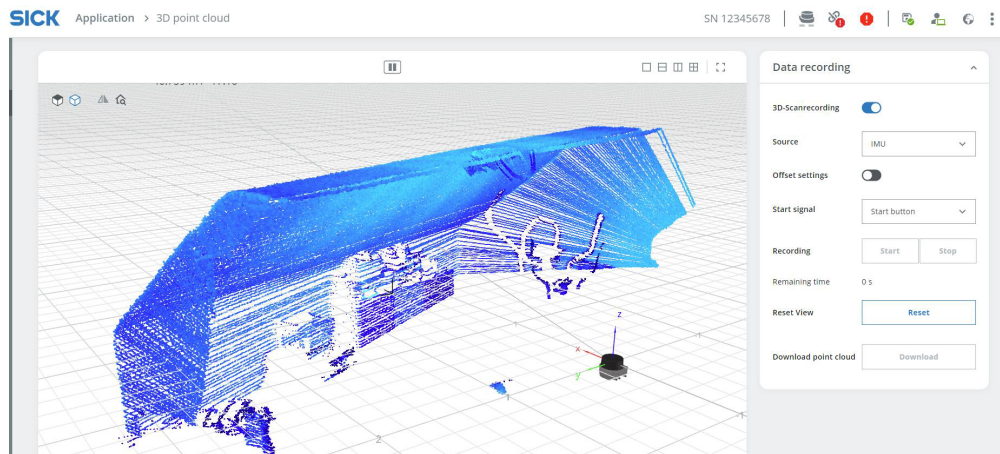
New Features

Scan Merge

The Scan Merger is an application intended for demonstration purpose. It merges a range of scans into a 3D point cloud. The current position and orientation is provided either by the internal IMU or an external encoder.

The feature can be found under Application > 3D point cloud.

UI interface:



1. The Data recording can be enabled by the user, it's disabled by default.
2. The point cloud source can be either the internal IMU or an external encoder.
3. A rotation offset can be set to account for a rotation around a pivot point.
4. The point cloud generation can be started by button press in the GUI or via Digital input 5 (merge runs while input 5 is HIGH)
5. When point cloud generation should be started by button press, the recording can be started and stopped in the GUI.
6. The maximum capturing time is shown here.
7. The view and the latest capture can be reseted by button press.
8. The point cloud can be downloaded via the browser. The download may need approval by the user.

Stream data over Compact data format on TCP

A new streaming format beside LMDscandata called Compact is introduced. The Data is streamed via **TCP port 2115** (streaming via UDP not possible due to large packet size)

Only one streaming format can be enabled at a time.

The feature can be found under Application > Data output.

UI interface:

Measurement data output

Format

Compact

Protocol

TCP

Port

2115

Note that the section “Output data format” does not affect the transmitted Compact data except the “Scale factor”.

Compact does not transmit all information of LMDscandata but requires therefore less bandwidth. Please check the “Data format description” of Compact on [Sick.com](#) for further information to the protocol definition.

Motor Synchronization

Synchronize rotation of multiple devices. All devices need to be synced by clock (PTP) or wire (Configure “Index signal” out on sender to an IO pin and connect signal to encoder 1 pin on receiver device). Adjust phase to define a rotation offset on the receiver. The synchronization is disabled by default.

The feature can be found under Configuration Basic settings.

UI interface:

Motor synchronization

Source

Wire (Index-signal + dig. input 1)

Phase offset

0

Status

Synced

Inputs and outputs

InOut3 | Port3

Port name

InOut3

Input

Output

×

Sources

Index signal

3

Add source

System diagnosis

The system diagnosis is available on the Diagnostic overview. The file contains device information that can be used for the troubleshooting process.

A reduced diagnosis is created automatically when an error occurs.

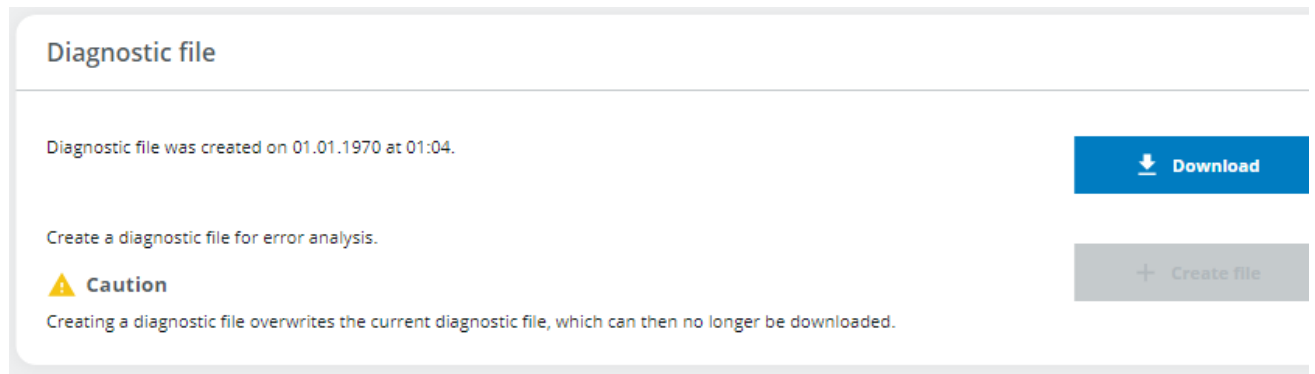
An extended diagnosis can be created when invoking "Create file" with user level "Service".

This deletes existing diagnosis files.

The most recently created diagnostic file can be Downloaded with any user level.

The feature can be found under Diagnostic Overview

UI interface:



Improvements

Increased robustness for swiveling applications

Device is now more robust in applications where the device is moved or swiveled.

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NOTE: This issue is fixed in FW V1.7.0. In case a firmware update is not possible, the Echofilter can be disabled or a different scan configuration can be selected to avoid this error.

Scan Data view in Chrome may not show scan data

New Chromium update requires adaption in scan data viewer

NOTE: This issue is fixed in FW V1.7.0.

Firmware V1.5.0

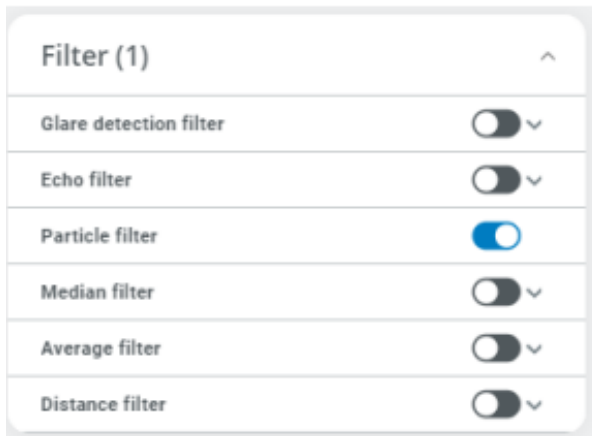
New Features

Particle Filter

The particle filter is used to filter small objects or measurement noise that is represented with one single measured echo, for example rain or dust. Configure the minimal threshold of required distance step between the echo to be filtered and the echoes of surrounding beam angles.

All filtered echoes were set to invalid.

UI interface:



Distance Filter

Restriction of the scan(s) to a specified distance range. The measured distances of the beams in the scan are found in the echo channel. Echos outside of the specified distance range are assigned the distance and RSSI value 0.

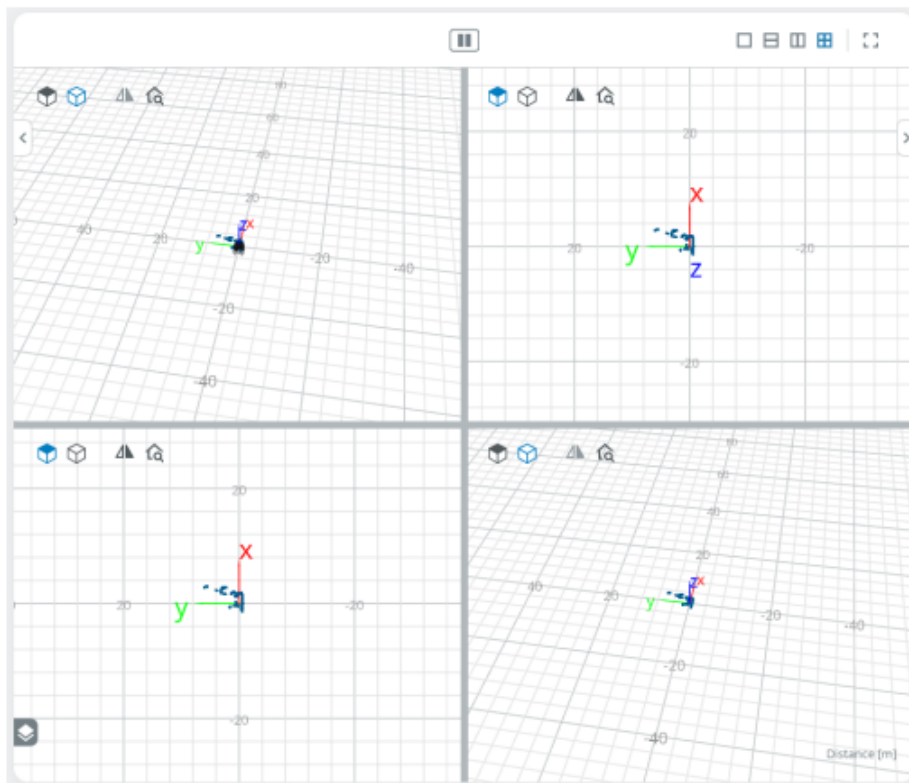
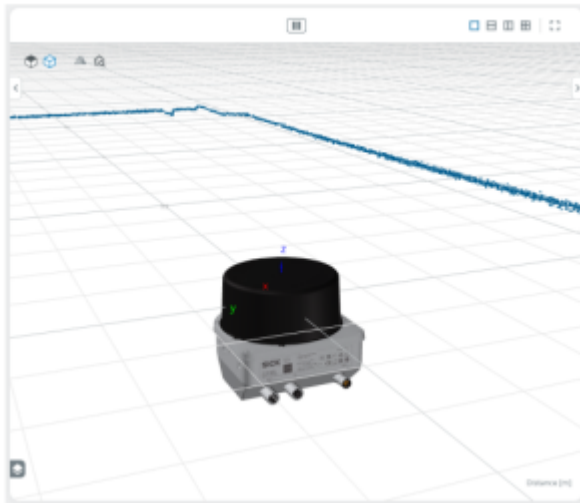
UI interface:



Improved UI viewer

The scan data viewer of device UI contains several new features like 3D view and Split view.

UI interface:



UI Prompt to change password

If password of specific access level is default, in UI now there is a prompt to change it.

UI interface:

Create password

×

You are logging in for the first time, change your password to a unique one.

New password

I

👁

Repeat new password

👁

Skip

or

Change

Keep default password

Improvements

-

Bug fixes

-

Incompatibilities

Customer passwords will reset

Due to use of increased secure user level password handling since release 1.5.0, all existing customer passwords set by former firmware <1.5.0 will reset to default. In 1.5.0 a change dialog will appear if passwords were not changed so far.

UI support to Glare Detection Filter removed

In 1.5.0 the functionality of Glare Detection Filter is replaced by new Particle Filter. Since the Particle Filter is easier to use the Glare Detection Filter is obsolete.



Known issues

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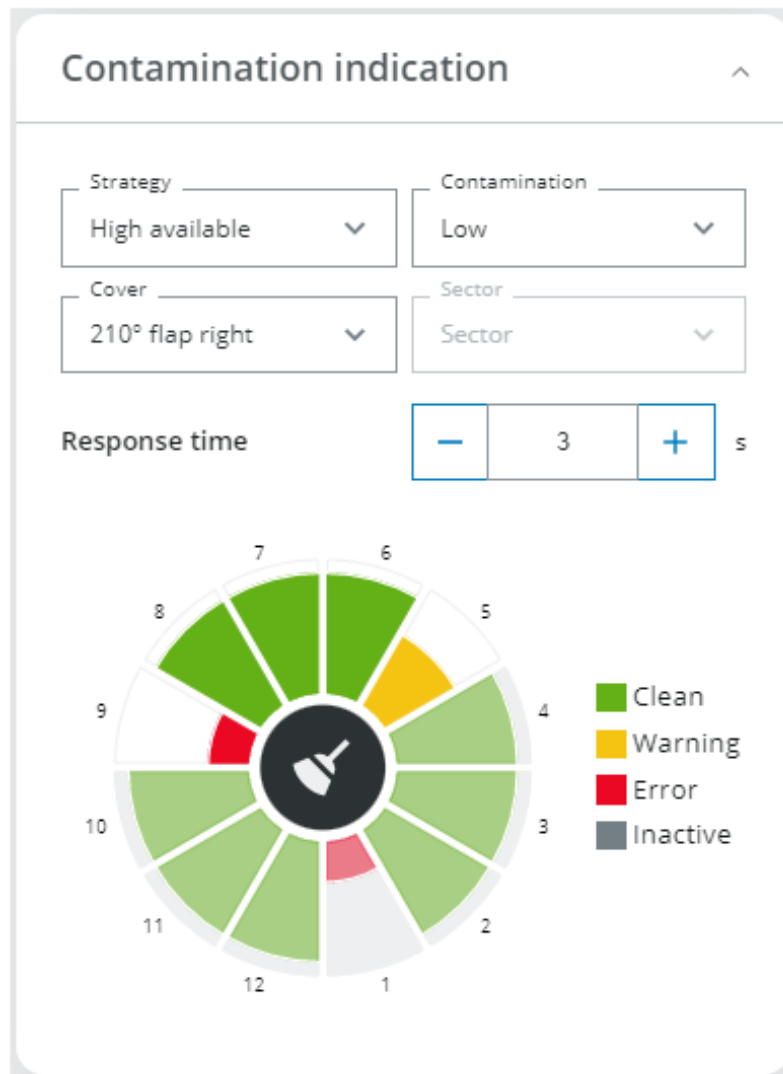
Firmware V1.4.0

New Features

Contamination Indication

The new contamination indication is available in SOPAS AIR as well as by telegrams.

UI interface:



Sectors

- LRS4 supports contamination measurement in 12 sectors around 360°
- In case of selected scan configuration -144° to +144° segments without measurement are set to state inactive

The result of the contamination indication measurement is provided for each sector. The related CoLa parameter is ContaminationData.

Thresholds

Low, Mid, High: Level for trigger of contamination warning and error. Parameter provides the possibility to adapt the indication to specific customer requirements.

Response Time

Error / warning reaction time

Cover

Selection of used weather protection cover. There are several predefined protection covers available from Sick.

For customization there is an additional parameter choice to select all sectors individually.

Related Parameters

- ContaminationConfig
- ContaminationData
- ContaminationActiveSectors
- ContaminationResult

Defaults

As default the contamination indication is inactive.

- The monitoring of each sector is running and visible for each sector in UI and command interface to support initial device integration into customer environment.

- Strategy and evaluation are disabled and therefore no device warning or errors will be invoked.

All related parameters can be saved permanently

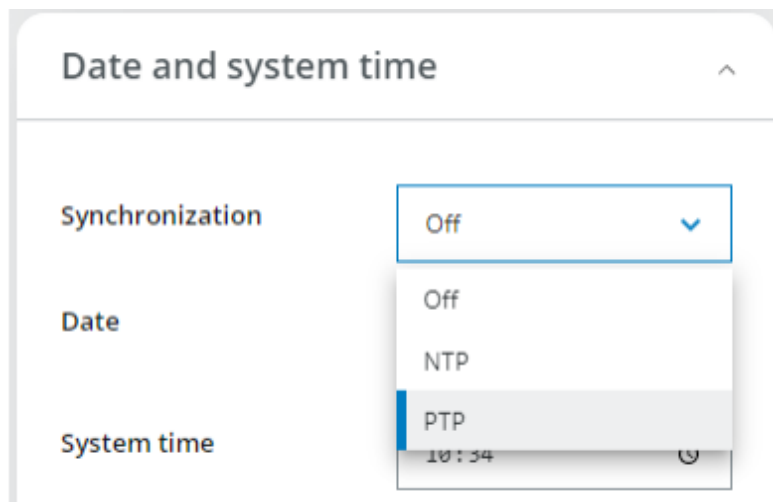
PTP Support

To enable PTP set device CoLa parameter TSCRole to .

Example: *sWN TSCRole 2*

Or switch synchronization strategy in web user interface.

UI interface:



IMU secondary data

Version 1.4.0 provides a data interface to access the internal IMU chip.
The data can be accessed by read or event output.

Variable Name	Access level	Type	Description
EnableInertialMeasurementUnit	Authorized Client	Bool DefaultValue = "False"	Enables/Disables the provision of InertialMeasurementUnit data
InertialMeasurementUnit	Authorized Client	Data struct	Provides access to the data of the InertialMeasurementUnit (IMU).

Data struct

	Size	Type	Description
Acceleration	Array[3]	Real	Vector (x,y,z) with accelerations (including gravity) along the three coordinate axes. [m/s ²]
AngularVelocity	Array[3]	Real	Vector (x,y,z) with rotation rates along the three coordinate axes. [rad/s]
MagneticField	Array[3]	Real	Vector (x,y,z) with magnetic field strength along the three coordinate axes. [T]
Orientation	Array[4]	Real	Orientation in the specified coordinate system given as quaternion (w,x,y,z).
TimeStamp	1	UDint	The time stamp in microseconds is synchronized to the sensor time since bootup.

The orientation of IMU data relates to the coordinate system of the scanner.

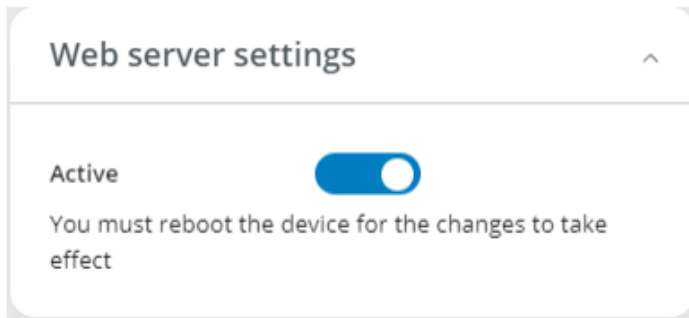


Option to disable Webserver

To disable the Webserver to prevent an unauthorized access there is now a configuration panel in the user interface on page Configuration\Connection Options.

Also new CoLa methods are available in the telegram listing:

Method Name	Parameter	Type	Description
SetWebserverEnabled	Enable	Bool DefaultValue = "True"	Disables Webserver if set to false. Port 80 will not be opened after reboot.
GetWebserverEnabled	-	-	Returns boolean state if Webserver is enabled.



At the next restart of the device the webserver isn't accessible any more. For a reactivation of the Web server the CoLa parameter can be used.

Option to disable ColaScan / AutoIP

To prevent an attack to the device via the network the new parameter EnableColaScan disables the ColaScan / AutoIP.

The Port 30178 will not be opened.

Changing IP address via ColaScan protocol is not possible any longer.

Parameter Name	Parameter	Type	Description
EnableColaScan	Enable	Bool DefaultValue = "True"	disables ColaScan / AutoIP. Port 30178 will not be opened. Changing IP address via ColaScan protocol not possible any longer.

Improvements

Access level of load factory defaults

Access level of functionality to load factory defaults was changed to level Service.

Improved update interval of 2d scan viewer

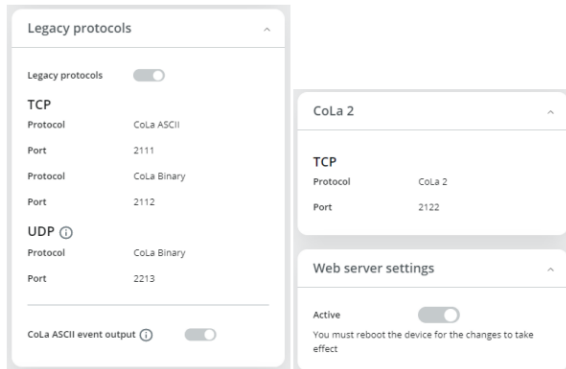
Especially when median filter was enabled, the update frequency of 2d scan visualization became slow. Now the interval depends adaptively on used rotation and filter settings.

Consolidation of page connection options

The page now shows one panel for each protocol type and additionally includes security parameters to switch off the related ports.

- Legacy protocols CoLa-A/B
- CoLa 2
- Web server port

UI interface:



Expert Mode removed

The unused expert mode has been removed.

Bug fixes

UDP port protocol dialect changed to CoLa-B

The default setting of UDP port CoLa dialect is changed to CoLa-B instead of CoLa-A.

Not all application parameters can be stored in Sopas ET parameter export

Since 1.40 the access to all application parameters is provided to the Sopas ET functionality of export and import them with the Sopas file.

Incompatibilities

CoLa 1

Since firmware 1.2.0 data output via CoLa-ASCII cannot be guaranteed without losses if using highest performance and all available features. The handling of compatibility functionality to former CoLa-A protocol doesn't affect only the ASCII protocol port itself but also all other CoLa1 ports. Therefore, the firmware 1.40 and higher doesn't support CoLa-A events anymore. CoLa-A port 2111 still provides access to poll device parameters but event based streaming output is limited to the ports 2112 (CoLa-B) and 2122 (CoLa2). A new parameter ("EtherCoLaAEventsEnable") can be used to enable CoLa-A event handling for compatibility purposes. A change requires a manually called save permanent and power reset. The resulting rate of data losses depends on used resolution and device configuration.

Warning: Enabling the event handling can cause side effects to other CoLa ports as well.

UI interface:



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Contact us

Product website

<https://www.sick.com/lrs4000>