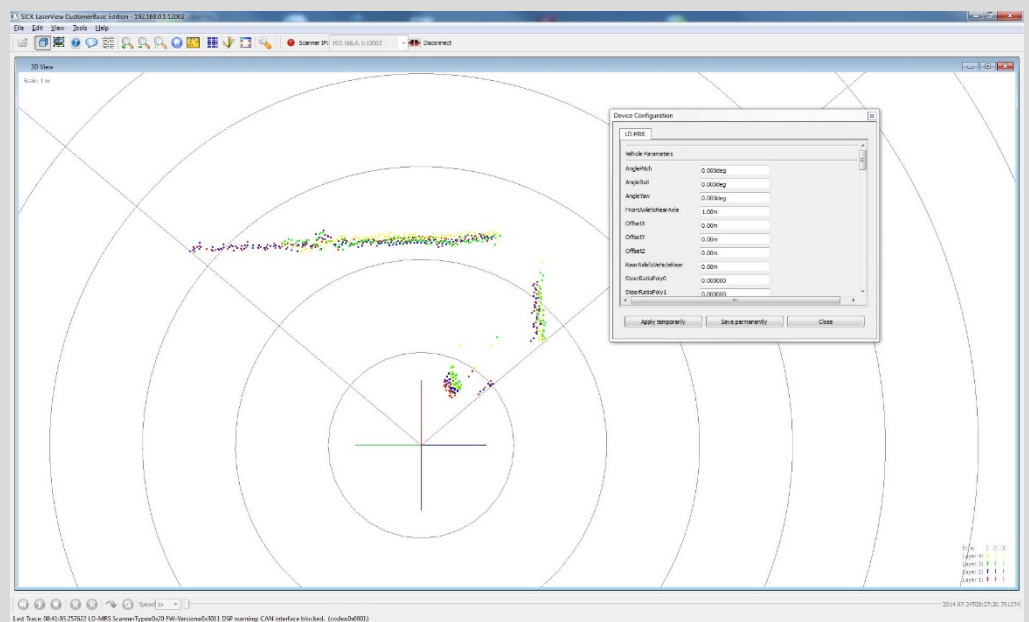# SICK LaserView Customer Edition

Configurations software for LD-MRS laser sensor

SICK
Sensor Intelligence.

Software	LaserView
Functions	Configuration software and visualization tool for measurement operating mode
Software version	3.20
Document version	The latest version of these operating instructions can be obtained as PDF at **www.sick.com**.
Trademarks	Windows XP^{TM} and Windows Vista^{TM} are registered trademarks or trademarks of Microsoft Corporation in the USA and other countries. Adobe® Reader® is a registered trademark of Adobe Systems Incorporated.

Contents

1 About this document

1.1 Function

These operating instructions are designed to address the technical personnel in regards to configure the LD-MRS laser scanner for measurement operating mode and to visualize the measured data using the LaserView View visualization tool.

The document contains information about the

- installation of the visualization tool
- configuration of the LD-MRS
- configuration of the object data of the LD-MRS 400xxx.S01
- visualization of the measured data All tasks are described step by step.

Important

In the following, the LaserView Customer Edition visualization tool is termed "LaserView" for short.

1.2 Target group

The intended target group for this document is people in the following positions:

Activities	Target group
Commissioning, configuration	Qualified personnel, e.g. technicians, engineers

1.3 Depth of information

This document contains all information required for installation and application of LaserView.

The features of the LD-MRS laser scanner as well as the mounting and electrical installation are described in the LD-MRS operating instructions (English: part no. 8012948, German: part no. 8012947).

Further information about laser measurement technology is available from SICK AG, Division Auto Ident, and on the internet at www.sick.com.

All variants of the LD-MRS (4000001.xxx and 400102) are referred to as "LD-MRS" for short. The device designation will be given in full, if necessary.

1.4 Symbology used

Recommendation

Recommendations are designed to give you assistance in the decision-making process with respect to a certain function or a technical measure.

Important

Sections marked "Important" provide information about special features of the device.

Explanation

Explanations provide background knowledge on technical relationships:

NOTE!

A note indicates potential hazards that could involve damage or degradation of the functionality of the LaserView or other devices.

Warning

> **WARNING**
> A warning indicates an actual or potential hazard. They are designed to help you to prevent accidents.
> The safety symbol beside the warning indicates the nature of the risk of accident, e.g. due to electricity. The warning category (DANGER, WARNING, CAUTION) indicates the severity of the hazard.
> ▶ Read carefully and follow the warning notices!

2 For your safety

This chapter deals with your own safety and the safety of the equipment operators.

▶ Please read this chapter carefully before working with the LaserView.

2.1 Authorised personnel

The LaserView must be mounted and operated by qualified personnel to ensure its proper and safe function.

The following qualifications are necessary for the various tasks:

Activities	Qualification
Mounting and maintenance	• Basic technical training • Knowledge of the current safety regulations in the workplace
Electrical installation and replacement	• Practical electrical training • Knowledge of current electrical safety regulations • Knowledge on the use and operation of devices in the related application (e.g. crane, assembly system)
Commissioning, operation and configuration	• Knowledge on the use and operation of devices in the related application (e.g. crane, assembly system) • Knowledge on the software and hardware environment in the related application (e.g. crane, assembly system) • Basic knowledge of the Windows operating system • Basic knowledge of data transmission

2.2 Correct use

LaserView is used to configure the LD-MRS for measurement operating mode and to display the measured data and object data.

Furthermore, measurements can be recorded and reproduced and then used for diagnostic purposes.

2.3 General safety notes and protective measures

Read the general safety notes carefully and strictly observe them in when working at or with the LD-MRS. Also observe the warning notes printed before the instructions in the individual chapters of this document.

Range of application

WARNING

Safety instructions

Please observe the following items in order to ensure the correct and safe use of the LD- MRS:

▶ The notices in these operating instructions (e.g. on use, mounting, installation or inte- gration into the existing machine controller) must be observed.

▶ When operating the LD-MRS, the national, local and statutory rules and regulations must be observed.

▶ National/international rules and regulations apply to the installation, commissioning, use and periodic technical inspections of the LD-MRS, in particular the work safety regulations/safety rules and other relevant health and safety regulations.

▶ Manufacturers and operators of the machine/system on which the LaserView is in- stalled are responsible for obtaining and observing all applicable safety regulations and rules.

▶ The tests must be carried out by specialist personnel or specially qualified and autho- rised personnel and must be recorded and documented to ensure that the tests can be reconstructed and retraced at any time.

▶ The operating instructions must be made available to the operator of the system where the LD-MRS is used. The operator of the system is to be instructed in the use of the de- vice by specialist personnel and must be instructed to read the operating instructions.

▶ The LD-MRS is not a device for the protection of people in the context of the related safety standards for machinery.

3   Configuration and Visualization

WARNING
Commissioning requires a thorough check by qualified personnel!
Before you operate a system equipped with the LD-MRS for the first time, make sure that the system is first checked and released by qualified personnel.
▶ On this issue, observe the notes in Chapter 2 Safety information of the LD-MRS operating instructions (part no. 8012948, English edition).
Commissioning and configuration of the LD-MRS are done with LaserView.
In normal operation, the LD-MRS is fully-automatic and does not require any operator inter- vention.

3.1   Overview of the commissioning steps

- Take the LD-MRS into operation with the factory defaults
- Install LaserView visualization tool on the PC
- Connect PC to LD-MRS
- To optimize the LD-MRS functionality, adjust the LD-MRS and adapt the configuration of the LD-MRS
- Test LD-MRS for correct functionality

3.2   Quick start with default settings

▶ Ensure that the Ethernet interface of the computer used for receiving data from the LD-MRS is not blocked by other data transmission processes.
1 Switch on the supply voltage for the LD-MRS. The LD-MRS starts.
2 Connect the LD-MRS via the Ethernet data cable to the PC, see Chapter 5 Electrical Installation of the LD-MRS operating instructions (part no. 8012948, English edition).
3 Switch on the PC and launch Windows^{TM} (minimum requirement Windows XP^{TM}).
4 Prepare the network interface of the PC.
For the default IP address of the LD-MRS (e.g. 192.168.0.1, subnet mask 255.255.255.0) see Section "Data interface" in Chapter 3 Product description of the LD-MRS operating instructions (part no. 8012948, English edition).
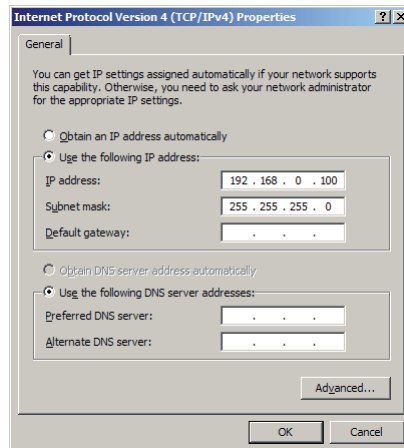5 Configure the PC network so that the LD-MRS can be accessed.

Figure shows a dialog box to set up the network settings for a Windows operating system. If necessary, consult the system administrator.
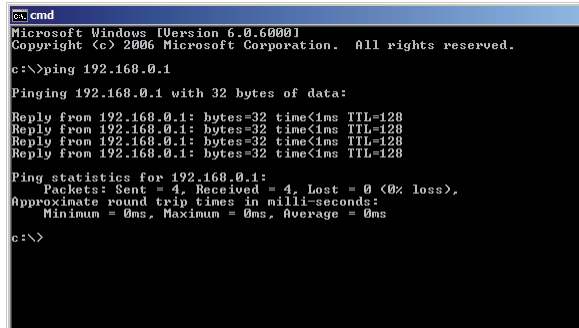– Subnet mask 255.255.255.0
– IP address range 192.168.0.2 ... 192.168.0.254
– IP addresses may only be assigned to one device within a network
– Gateway, DNS etc. may not be modified

NOTE!

With LaserView, it is also possible to configure a different IP address. If the current address of the scanner is not known, the connected scanner can search for the current IP address using "Tools" > "Connection Wizard" for this to be adjusted manually.

6 Test the configuration.
Call up the Windows prompt (cmd.exe).

```
cmd

Microsoft Windows [Version 6.0.6000]
Copyright (c) 2006 Microsoft Corporation.  All rights reserved.

c:\>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:

Reply from 192.168.0.1: bytes=32 time<1ms TTL=128
Reply from 192.168.0.1: bytes=32 time<1ms TTL=128
Reply from 192.168.0.1: bytes=32 time<1ms TTL=128
Reply from 192.168.0.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

c:\>
```

7 Into the prompt field, enter "ping <IP address>": e.g. "ping 192.168.0.1".
 – If the LD-MRS answers, the configuration was successful.
 The LD-MRS is operational.
 – If the LD-MRS does not respond, repeat the process from step 1 onwards.

3.3 LaserView visualization tool

LaserView is the visualization tool for configuration and visualization of the scan data of the LD-MRS.

There are three operating modes:

- waiting mode
- operating mode measurement
- replay mode

With LaserView, the LD-MRS is adjusted to the situation on site. This process bases on the factory default settings or on a user-specific parameter set that has already been created for the LD-MRS, see chapter 3.4 Basic settings, page 26.

3.3.1 System requirements for the PC

- recommendation: CPU 1.4 GHz, 1 GB RAM, CD-ROM drive, Ethernet interface, video board with OpenGL support and 512 MB RAM, mouse (recommended) and color monitor
- operating system Windows XPTM or higher
- free memory on the hard drive: approx. 45 MB for the LaserView visualization tool
- cables, see LD-MRS product information (part no. 8012945) on the provided CD-ROM "Manuals & Software LD-MRS".

### 3.3.2 Installation of the LD-MRS View visualization toolLaserView

The scope of delivery of the LD-MRS includes LaserView View delivery on CD-ROM.

During the installation of "LaserView Setup", the installation program creates a main directory "LaserView Setup" with the required links.

1 Switch on the PC and insert the installations CD.
2 If the installation does not start automatically, call up "setup.exe" on the CD.
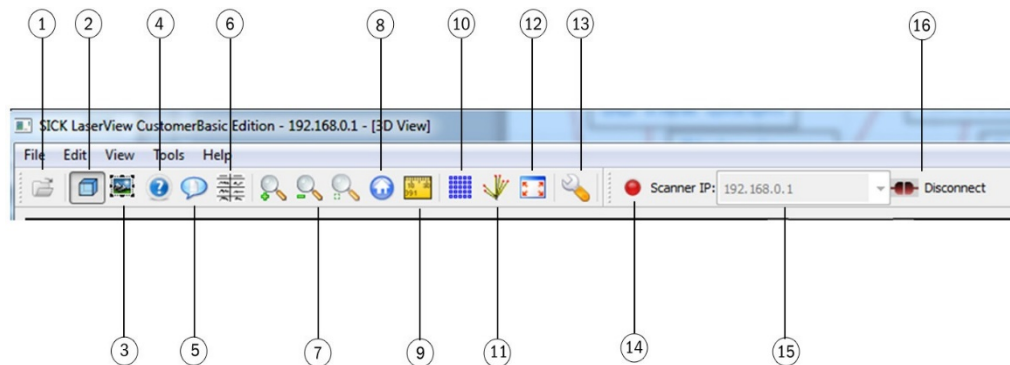3 To complete the installation, follow the instructions.

3.3.3 User interface of LaserView
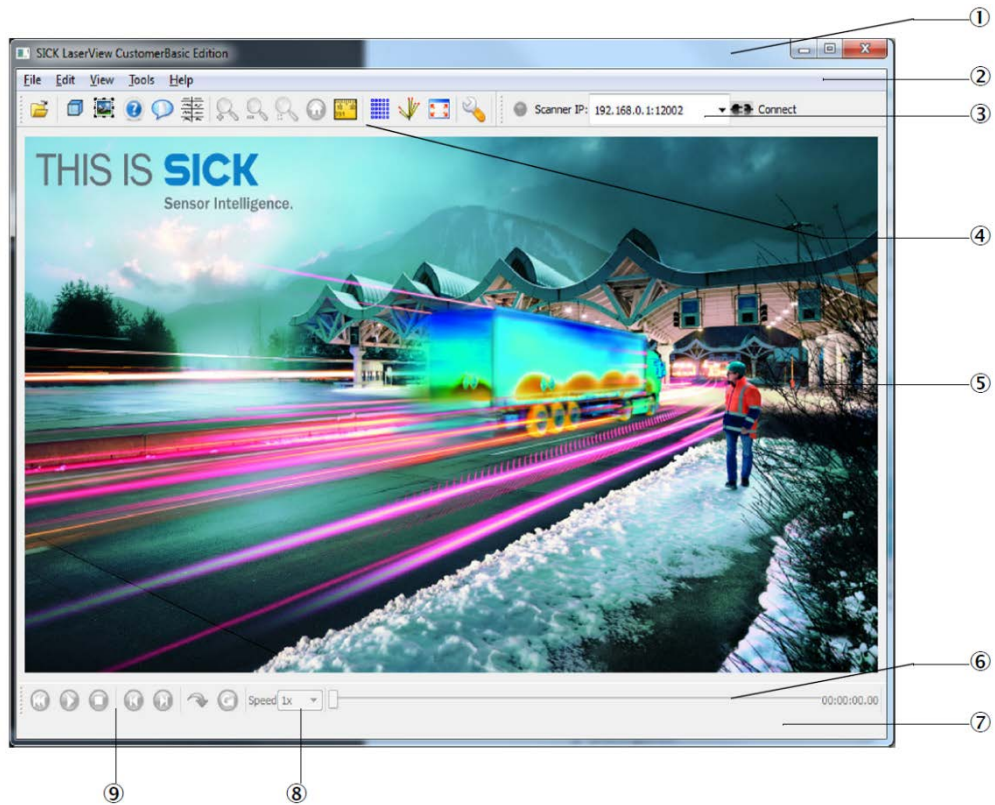
1 Title bar
2 Menu bar
3 Input field IP address
4 Tool bar
5 Display area
6 Time bar
7 Status bar
8 Playback speed
9 Player bar

3.3.4 Tool bar

1 Open and play a recorded *.idc log file
2 3D view On/Off
3 Video On/Off
4 State viewer

5 Trace log
6 FrameData viewer
7 Zoom
8 Refocus
9 Ruler
10 Grid mode
11 Show Laser Rays
12 Toggle Full Screen Mode
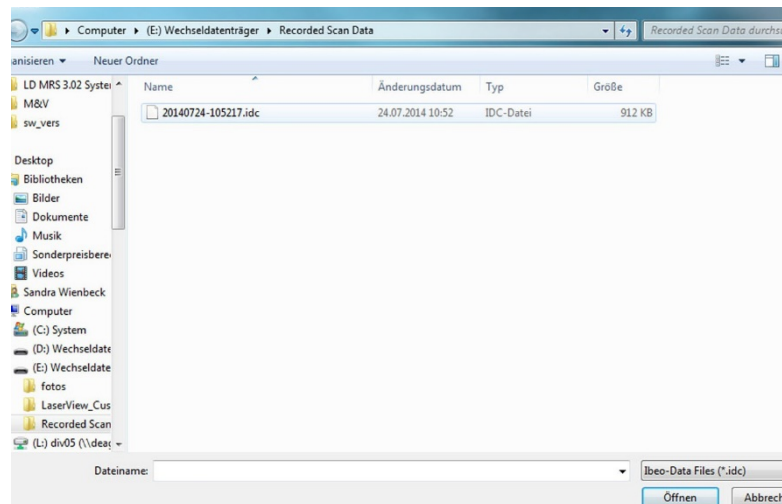13 Preferences
14 Record Button
15 Connect Button

You can find a description of the symbols in chapter 3.4 Basic settings, page 26.

File menu
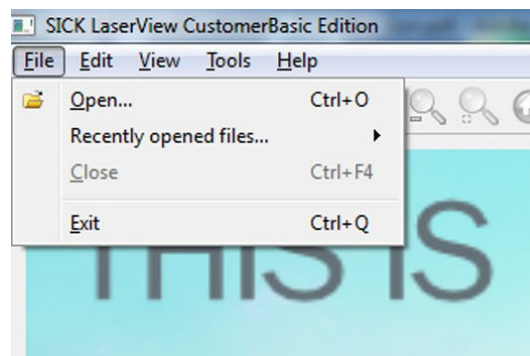
"File - Open..." command

▶ In the menu FILE select OPEN to open the dialog box "Load File".

In the dialog box "Load File" an existing * .idc file with recorded scan data can be opened.

"Edit" menu
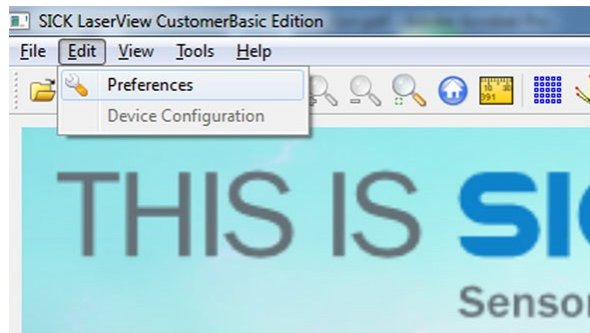
„Edit - Ruler" command

In the menu EDIT select RULER to activate the ruler, see also the button in chapter 3.3.4 Tool bar, page 10.

„Edit - Device Preferences" command

In the menu EDIT select PREFERENCES to view the settings, see also button under chapter 3.3.4 Tool bar, page 10 and chapter 3.3.15 Preferences, page 19.

„Edit - Device Configuration" command

In the menu EDIT select DEVICE CONFIGURATION to view the device settings and to modify them, if necessary, see section chapter 3.4.5 Changing and saving the device configuration of the LD-MRS, page 42.

„View" menu
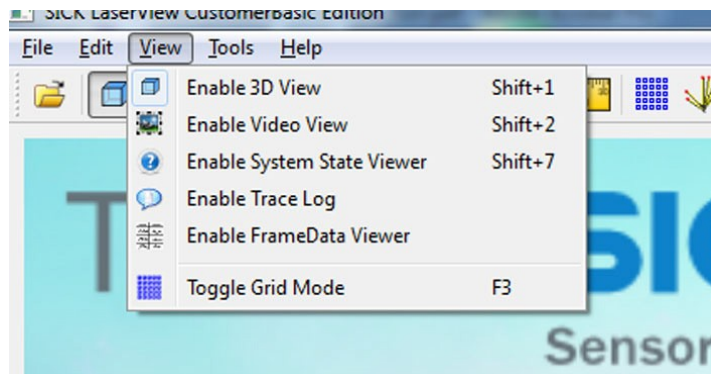
The commands are also available as button symbols in the toolbar; see table below.

Tool bar

The tool bar contains the buttons to control the visualization or the connected device.
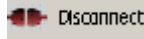
Important

Any window opened via a button in the tool bar can be closed by clicking this button again.

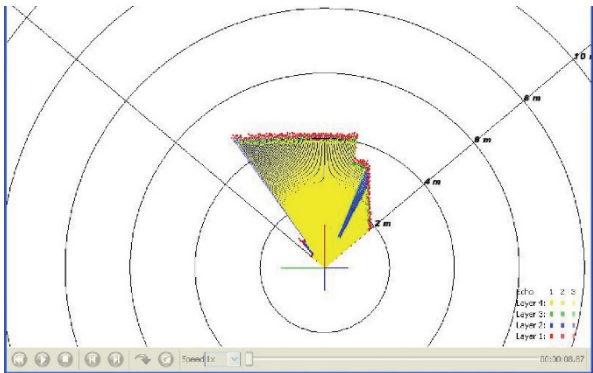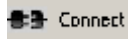| Button	Meaning
	Zoom in Clicking this button increases the size of the data display to allow for viewing the scan data in more detail.

| Button	Meaning
	Video View By clicking this button, you can show or hide video footage, e.g., for recorded data.
	State View By clicking this button, you can display or hide the status messages for the devices.
	Trace log Clicking this button will activate a dialog window for the information about the warnings and errors for the connected devices; see chapter 3.3.6 Trace log, page 15.
	Frame Data View By clicking this button, you can display or hide the telegram frame for the connected devices.
	Zoom in Clicking this button increases the size of the data display to allow for viewing the scan data in more detail.
	Zoom out Clicking this button decreases the size of the data display.
	Zoom focus Clicking this button will optimize the data display for the screen..
	Refocus Clicking this button sets the point of origin of the co-ordinate system to the centre of the bottom edge of the data display.
	Ruler Clicking this button activates the ruler in the operating modes measurement mode or replay mode. If the ruler is active, real distances can be measured in the data display, see chapter 3.3.5 Ruler, page 14.
	Toggle Grid Mode Clicking this button allows to toggle between different grid settings (Cartesian/Cartesian with ruler/radial/radial with ruler).
	Show Laser Rays Clicking this button displays the visualization of the laser beams to the scan points. This option connects the scan points with their initial co-ordinates by lines ("laser beams") to illustrate the measuring principle of the LD-MRS.

Button	Meaning
	Fullscreen Mode Clicking this button switches the data display window to full screen mode. Press the key F11 to switch back to window mode.
	Preferences Clicking this button activates a dialog box for the settings and the display of the data in LaserView, chapter 3.3.15 Preferences, page 19.
	Record Clicking this button records the scan data in a *.idc file, see chapter 3.3.7 Record, page 15.
	Connect Clicking this button connects the LaserView with a device with the set IP address, see chapter 3.3.8 Input field, page 15. Once the connection to a device is established, the button **Disconnect** is displayed next to the input field. The LD-MRS can only have one Ethernet connection per device at one time. LaserView accepts and establishes a second connection, but the first connection is then automatically closed.
	Disconnect Clicking this button disconnects the connection between LaserView and the device. Once the connection to a device is interrupted, the button **Connect** is displayed next to the input field.

NOTE!

Press the Shift key and move the mouse in the Y direction to gain a 3D view.

3.3.5 Ruler
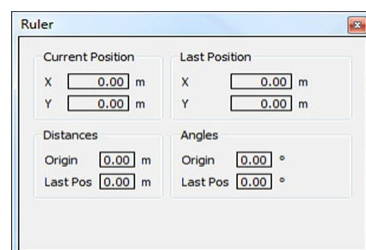
If the ruler is active in the operating mode measurement mode "Replay Mode", real distances can be measured.

▶ Use the left mouse button to mark the start point and end point of a distance in the display area.
The corresponding dialog box opens, containing information like length, angle, etc., about this distance.

3.3.6   Trace log
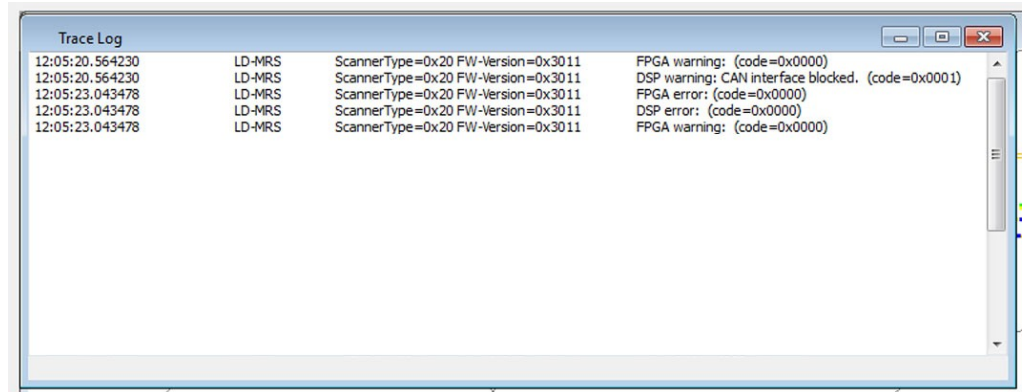
The dialog box "Trace log" informs about warnings and errors of the connected devices.

A message consists of the level (e.g. Note, Warning, Error), the source (e.g. LD-MRS) and the message text.

The most recent message is additionally shown in the status bar, see chapter 3.3.9 Status bar, page 15.

3.3.7   Record
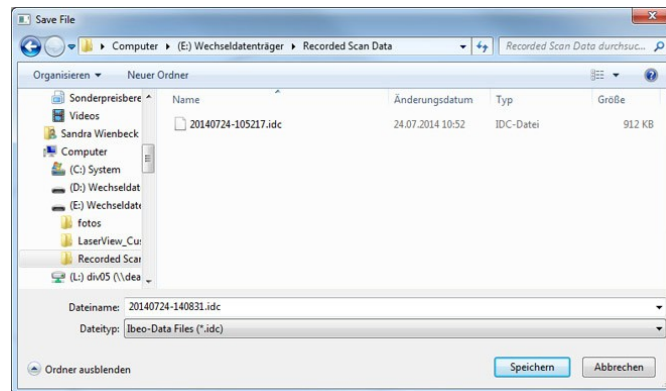
Scan data can be recorded in an *.idc file.

▶ To do so, open the dialog box RECORD and select a file path and a file name. After confirmation, recording starts.
▶ Clicking the record button again stops the the recording.

LaserView can play these data in replay mode, see chapter 3.3.12 Replay mode, page 17.

3.3.8   Input field

In the input field "Scanner IP:" enter the IP-address of the device that LaserView shall connect to, in order to receive data and to display them in the display area.

3.3.9   Status bar
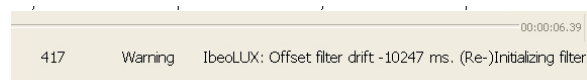
The status bar displays the most recent message of the warning or error messages of the connected devices.

Activate or deactivate the status bar with the command SHOW STATUS BAR in the menu VIEW.

The dialog box "Trace log" informs about warnings and errors of the connected devices, see chapter 3.3.6 Trace log, page 15.

3.3.10   Waiting mode
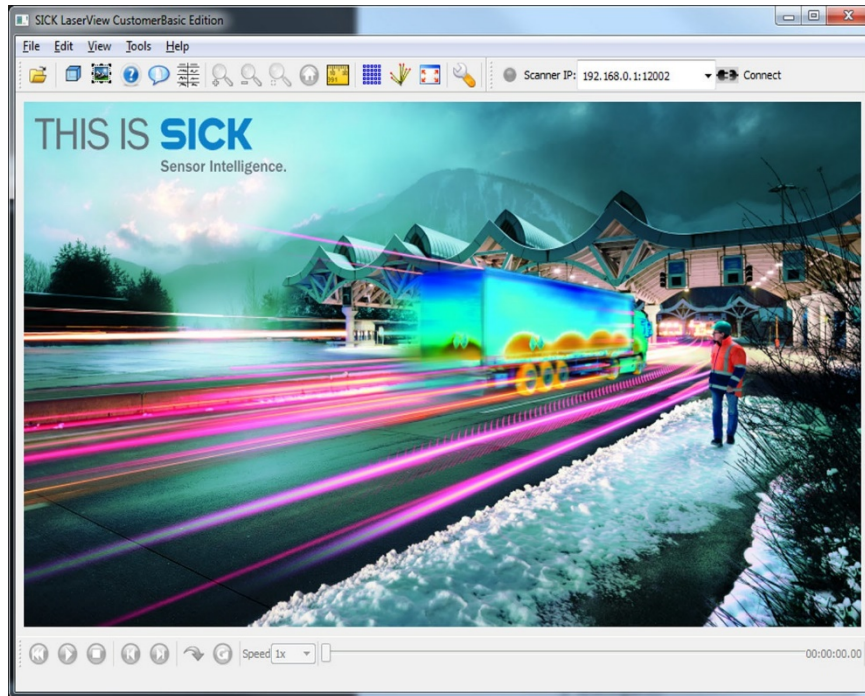
After starting LaserView, the start screen appears in the main screen. LaserView is in waiting mode and not connected to another LD-MRS.

3.3.11   Operating mode "Measurement mode"

In the operating mode "measurement mode", LaserView is connected to an LD-MRS via Ethernet. Activate or deactivate the scan data view by clicking the 3D button on the tool bar.

In this mode, real time scan data are displayed in the display area.

The individual scan planes (layers) and echoes are displayed in different colors. The planes differ by different colors, the individual echoes by different color saturation, see Section "Multi-layer technology" in Chapter 3 Product description of the LD-MRS operating instruc- tions (part no. 8012948, English edition).

▶ If no scan data are displayed, check the LaserView settings in the dialog box "Prefer- ences- General", see chapter 3.3.15 Preferences, page 19.
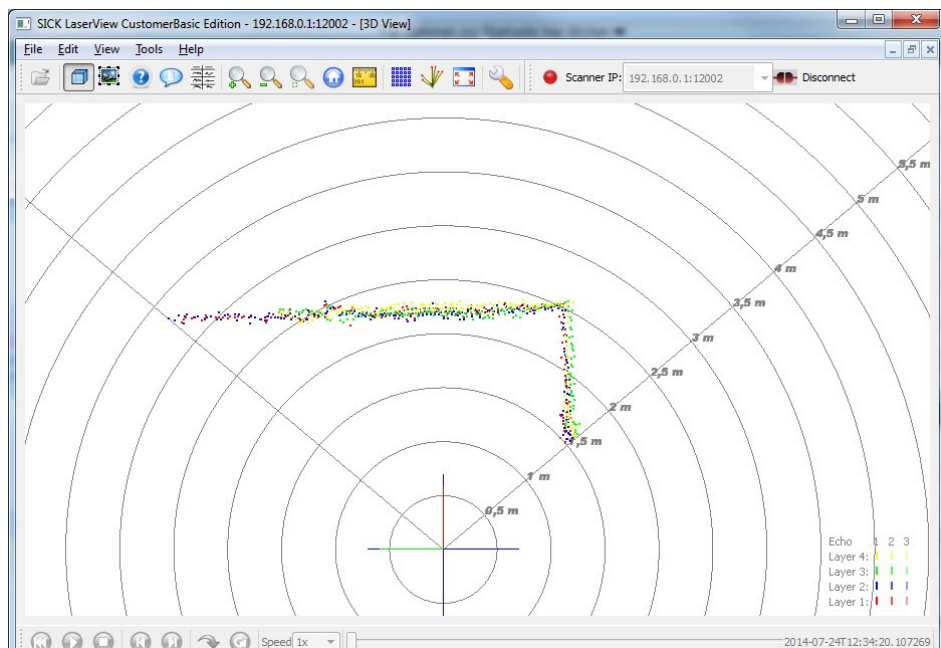
Starting the operating mode "Measurement mode"

1 Start LaserView.
2 Enter the IP address of the LD-MRS into the input field "Scanner IP:".
3 Press the button 🔌 Connect.
4 The LD-MRS starts the operating mode "Measurement mode" with the default settings.
5 The scan data are displayed in the display area.
6 In order to finish the measurement, press the button 🔌 Disconnect or the system button "EXIT".

3.3.12   Replay mode
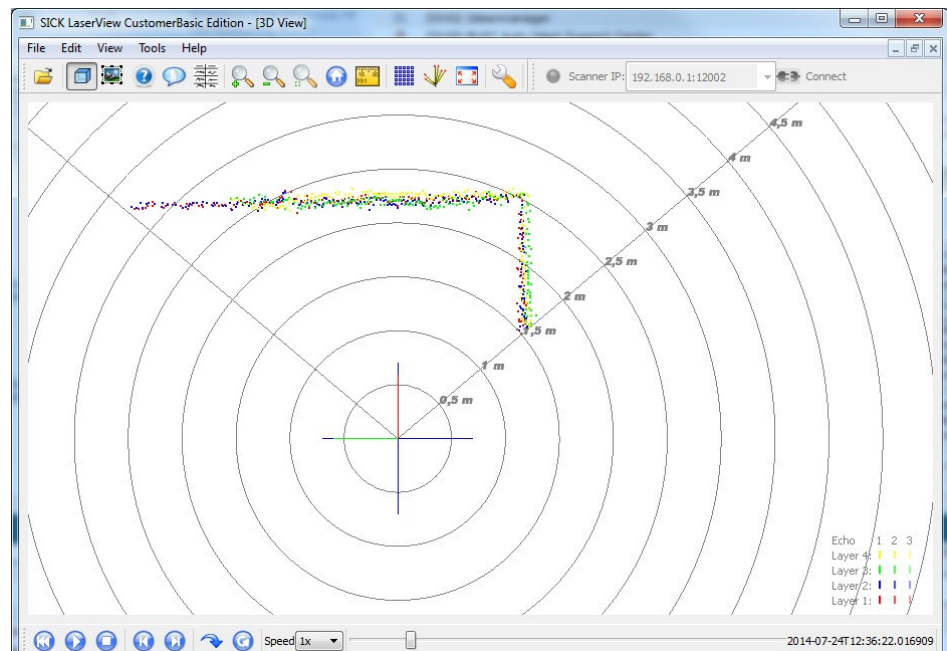
1 Player bar
2 Playback speed
3 Time bar
4 Display area

In replay mode, recorded data can be played. Activate or deactivate the scan data view by clicking the 3D button on the tool bar.

In the menu FILE OPEN, recorded data can be selected and opened.

In replay mode, the player bar is active and allows for controlling the playing process.

Player bar

The player bar contains the buttons to control the scan data display.

Last Trace: 15:56:52.379181 LD-MRS ScannerType=0x2A FW-Version=0x3033 DSP warning: CAN interface blocked. (code=0x0001)
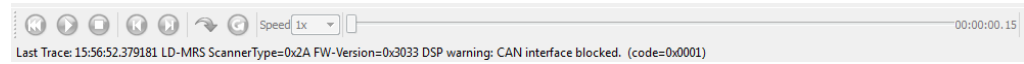
With the following buttons, scan data can be displayed or recorded:

Button	Meaning
	Start Click on this button to start the replay from the start.
	Replay Click on this button to start the replay.
	Stop Click on this button to stop the replay.
	Step Back Click on this button to rewind the replay by steps of one scan.
	Step Forward Click on this button to forward the replay by steps of one scan.
	Toggle Forward Click on this button to forward the replay.
	Loop Click on this button to repeat the replay automatically.

3.3.13   Playback speed
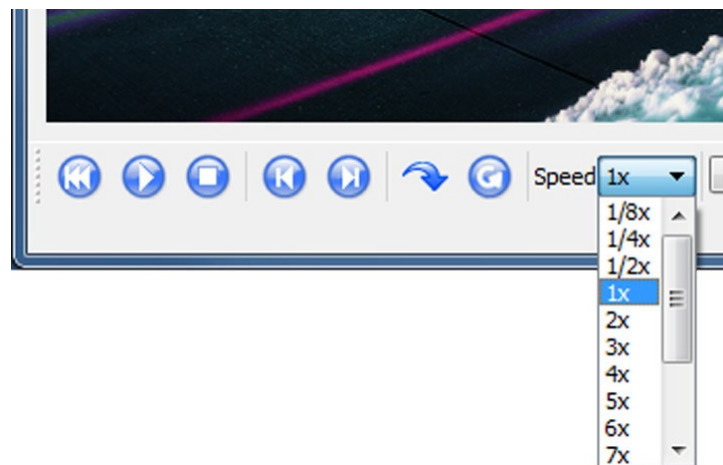
In the list field for the replay speed, the current replay speed for the scan data display can be selected and displayed.

3.3.14   Time bar

The time bar displays the current file position and the current time stamp.

3.3.15   Preferences

With different settings the dialog of LaserView regarding the scan data display can be controlled. This is done in the dialog box "Preferences".

The dialog box "Preferences" consists of five tabs

- General
- Scans
- Objects
- Live Camera
- Video Overlay

3.3.16   Tab "Preferences - General"
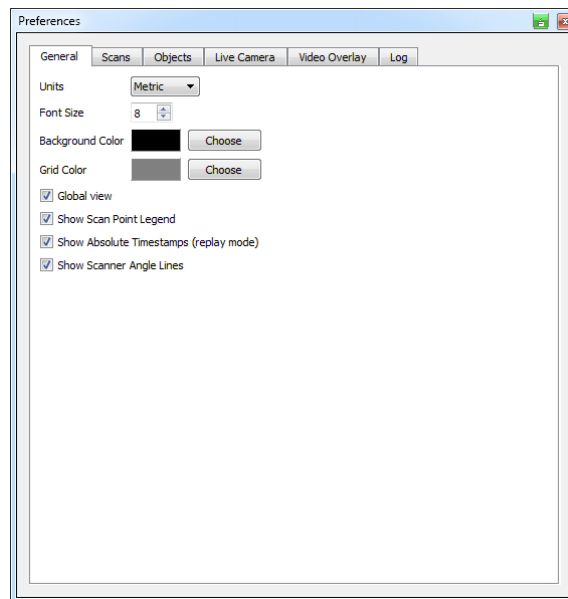
In the dialog box "Preferences - General" the general display can be set.

3.3.17 „Preferences-Scans" tab
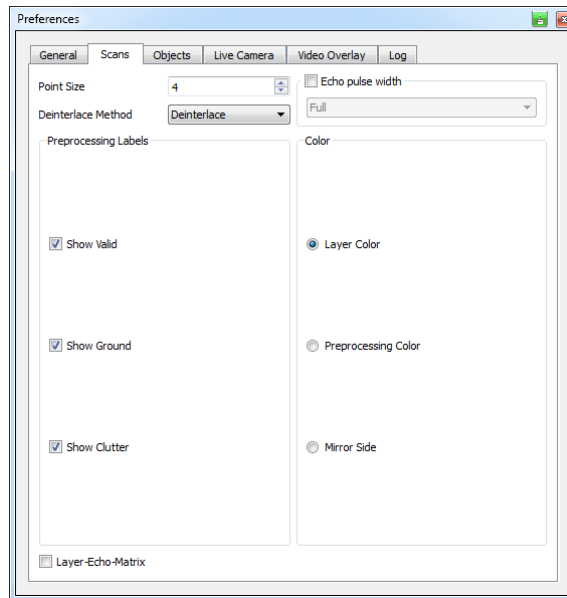
In the dialog box "Preferences-Scans" the type of display of the scan points in the display area can be selected.

Preferences Scans

- Point Size: Defines the size of the visualized measurement point.
- Deinterlaced Method: Measurements on the front and back of the rotary mirror are shown continuously to achieve a uniform display.
- Echo Pulse Width: Length display of the echo amplitude per angular step.
- Full: Displays the echo amplitude in full.
- Half: Optimized view of the echo amplitude (half length).
- Each scan point has a label (valid, ground or clutter).
- In the group field PREPROCESSING LABELS can be specified which scan points to display.

Preprocessing Labels

- Show valid: Only valid measurement are shown. If not selected, invalid measurements (low echo or beyond range) are displayed.
- Show ground: Activating this button displays all scan points marked as ground (brown) by the sensor.
- Show Clutter: Displays the measurements. If this button is activated, the scan points marked by the sensor as being measurements with a lowered threshold, e.g. because of dust or rain, are displayed.

Color

This setting determines the coloring of the scan data in the display.

- Layer Color: Displays the four layers in 4 colors: red (bottom layer), blue, green, and yellow (top layer).
- Preprocessing Color: Displays the measurement points according to the result of the filter defined by "Pre- processing Labels"
- Mirror-Side: Indicate in green and red which side of the mirror is actually presented.
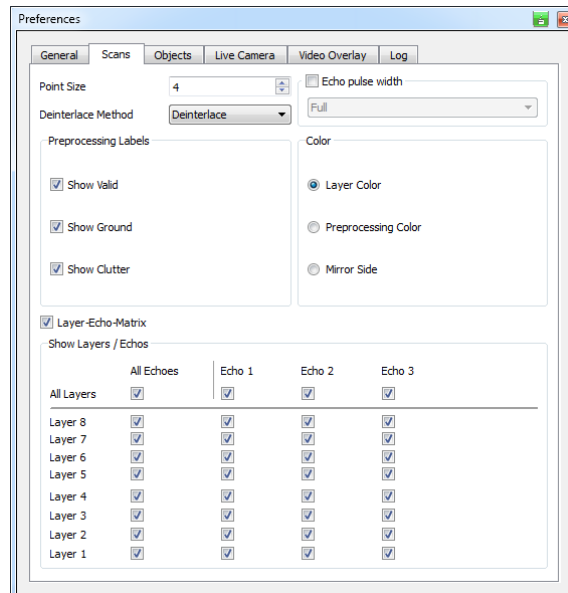
In the group field LAYER-ECHO-MATRIXCOLOR can be specified which layer and echoes (Show Layer / Echos) to display.

Objects

Faults and multiple measurements can be filtered by selecting the appropriate layer/echo. The "Activate last echo" filter refers only to the last echo and omits the measurement points of echo 1 and 2.
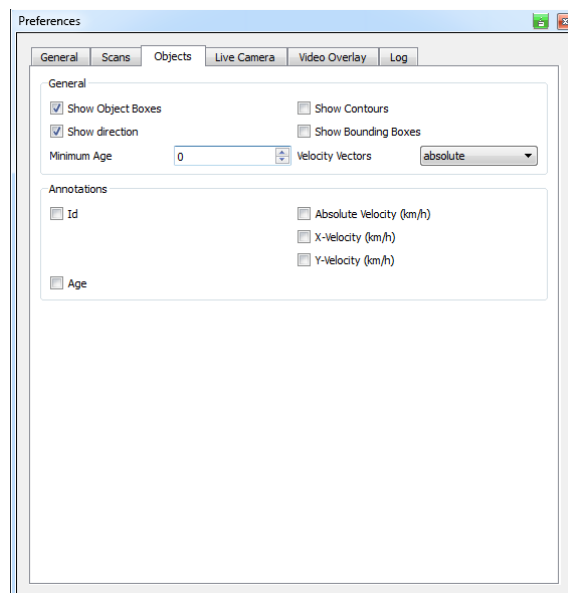
1 Scan data
2 Show contours: Outline of the objects generated from the current scan points.
3 Show bounding boxes: Rectangle around the contour representing the size of the object.
4 Object box: Represents the object with all generated object information.

Live Camera

The LaserView tool allows to record and replay scan data of the LD-MRS and live video simultaneously.

It is essential to install the camera driver prior to the start of LaserView.
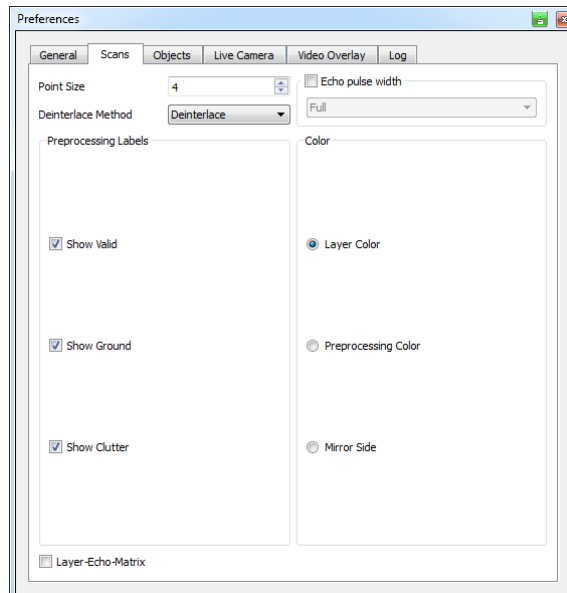
Live Camera settings:

- Activation
- Resolution
- Field of view of the camera
- Mounting position and orienation of the camera

(The mounting and field of view data are used to present the scans in the camera image.)

1 Install camera in accordance with manufacturer's instructions.
2 For the name of the video camera, refer to the entry in Device Manager. In this case, it is a "Webcam 250".

3 Activate the camera in LaserView by selecting "Enable direct camera support" under "Preference" > "Live Camera" in the menu.
4 Under "Device", enter the name of the camera installed.
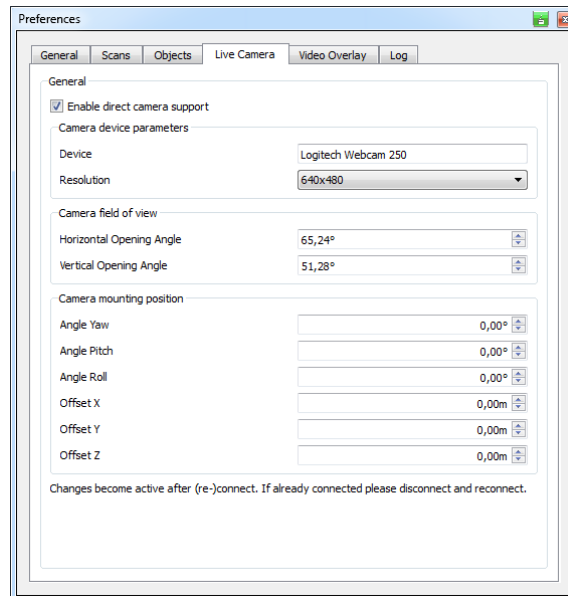
5 Under "View" > "Enable Video view", switch on the live footage from the camera connected.
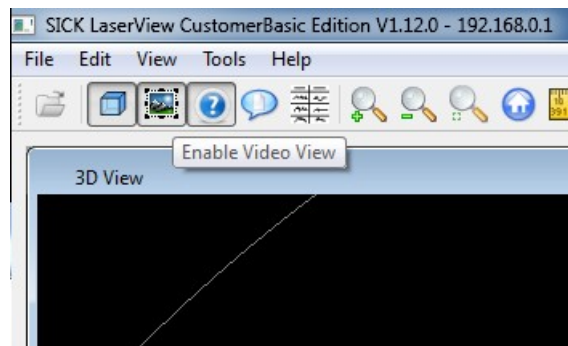
Video Overlay
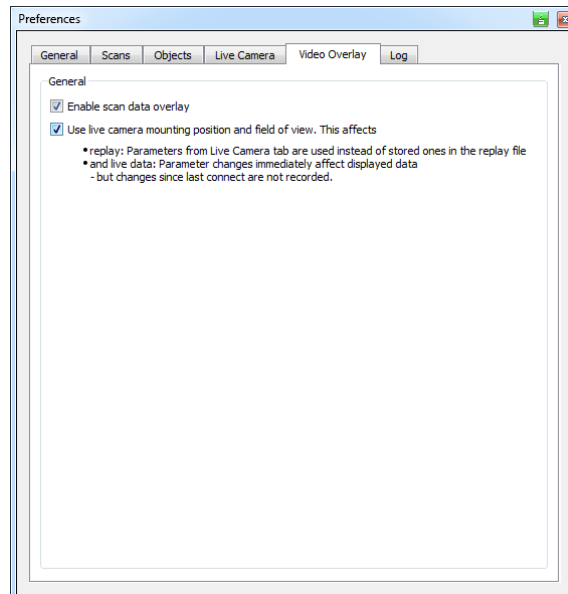
Allows to overlay scan data to the live scan data presentation.

The mounting position and orientation of camera are defined on the page "Live Camera"

1   Under "Video Overlay", activate "Enable scan data overlay" to show the scan data in the video footage.
2   Activate "Use live camera mounting position..." to ensure that the scan data is mapped correctly in the video footage.
3   Enter the coordinates and angles under "Preference" > "Camera mounting position".

3.3.18   Device configuration

With the command DEVICE CONFIGURATION in the menu EDIT, the current device configuration of the LD-MRS can be displayed and modified, if necessary. In initial commissioning this is the factory default, see chapter 3.4 Basic settings, page 33.

3.3.19   Firmware update

Firmware updates are also available for download by the SICK AG at the SICK homepage, if applicable. It can be transferred from the PC to the LD-MRS after download.

NOTE!

Loss of operability! During the update process, the supply voltage of the LD-MRS must not be interrupted! If the firmware update is not completed correctly, the LD-MRS must be sent to SICK Service.

Important

The firmware is permanently stored in the memory of the LD-MRS. The old firmware in the device is irrevocably overwritten during the update process.

If a connection to an LD-MRS is established, the menu bar contains the menu TOOLS.
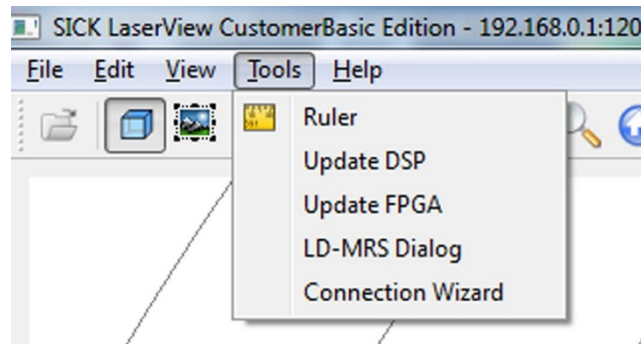
„Update FPGA" command

With this command, the firmware of the first processor in the device is updated.

▶   In the menu TOOLS select UPDATE FPGA.

The dialog box to select the Loader file (*.mcs), which contains the software, appears.
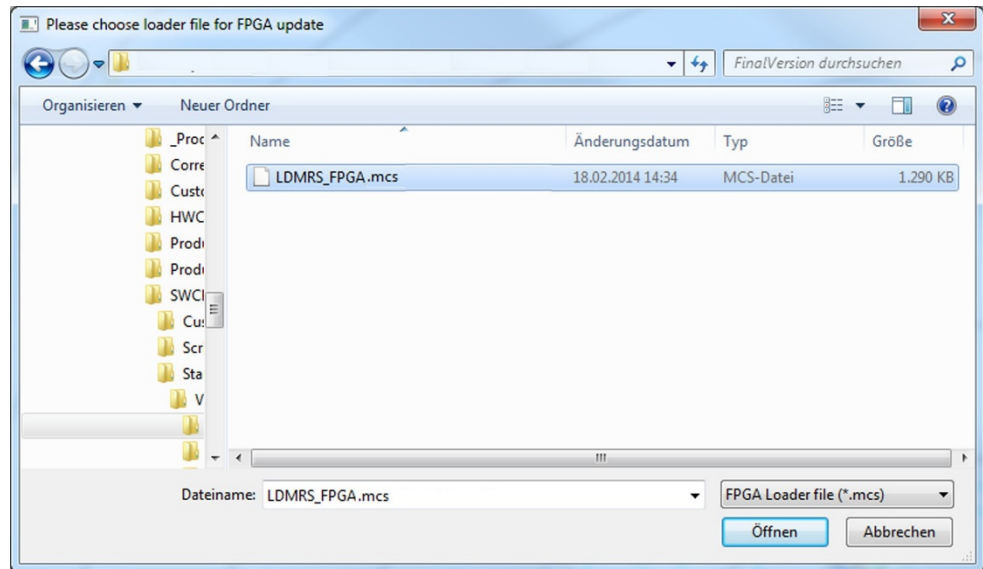
Select and confirm the file with LOAD. The firmware is transmitted to the LD-MRS.

„Update DSP" command

With the command UPDATE DSP the firmware version of the second processor (DSP) in the device can be updated.

"LD-MRSdialog" command

This command calls up a display of identification characteristics of the LD-MRS.

▶ In the menu TOOLS select LD-MRS DIALOG.
The dialog box LD-MRS DIALOG appears.
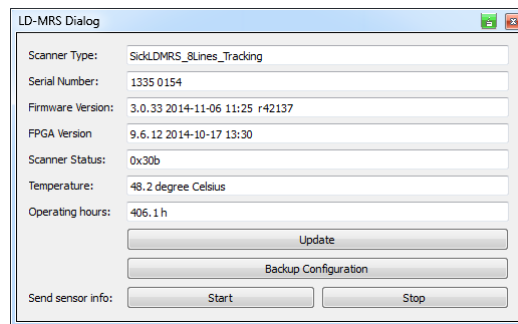
The dialog box displays the current firmware version, the FPGA version, the scanner status and the temperature of the device.

▶ In order to update the data, click on the button UPDATE.

"Wizard" command

The Wizard helps you to set up a connection to the connected devices.

"Scan" starts the Wizard's search for connected devices and lists them in the window.

To connect to the device, the corresponding line must be marked in the list and connected with "connect".

Communication settings such as IP address, port and mask for the device can be updated manually. Enter the desired values in advance and confirm these by pressing the 'change'

button. This may be of significance if, for example, the IP address does not match the IP address of the PC when you want to connect the device to a network.

Default settings:

- IP address: 192.168.0.1
- Port: 12001
- Mask: 255.255.255.0

3.4 Basic settings

3.4.1 LD-MRS basic settings (factory default)

The factory default settings of the device configuration of the LD-MRS have been defined to allow using the device without changing any settings, see chapter 3.2 Quick start with default settings, page 8.

Important

At initial commissioning, LaserView displays the basic settings. After changing the parame- ter values with LaserView, these settings can only be restored manually.

NOTE!

The parameters can also be changed via the telegram; see publication Telegram listing "Document Name Ethernet Protocol".

1 In the menu EDIT select DEVICE CONFIGURATION.
   The dialog box DEVICE CONFIGURATION opens.
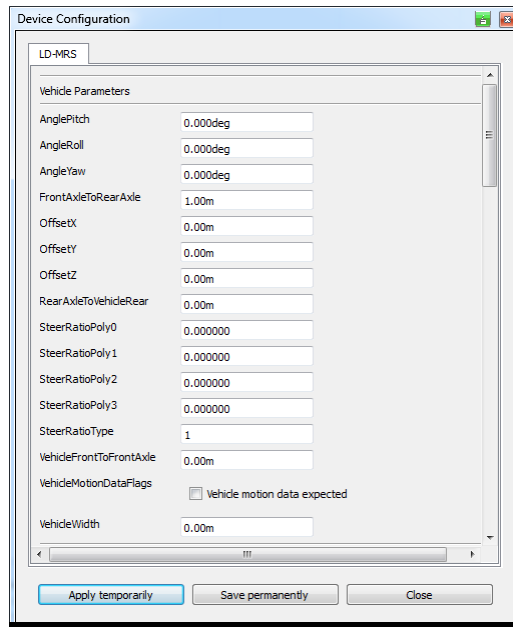
The following parameters are displayed in the "Device Configuration" dialog window:
– Vehicle Parameters
– Measurement Parameters
– Interfaces (CAN Interface Parameters; Interface Parameters; TCP/IP Parameters)
– FlexResolution Parameters

2 To close the DEVICE CONFIGURATION dialog window, click the CLOSE button.

The Vehicle Parameters, which ensure compliance with DIN 70000, are as follows:

- Angle Pitch
- Angle Roll
- Angle Yaw
- Front Axle To Rear Axle
- OffsetX
- OffsetY
- OffsetZ
- Rear Axle To Vehicle Rear
- SteerRatioPoly
- SteerRatioType
- VehicleFrontToFrontAxle
- VehicleMotionDataFlags
- VehicleWidth

Maintain the following sequence to position the scanner on the vehicle:

1 Yaw Angle
2 Pitch Angle
3 Rolling Angle

The rotation refers to the vehicle coordinates system in accordance with DIN 70000.
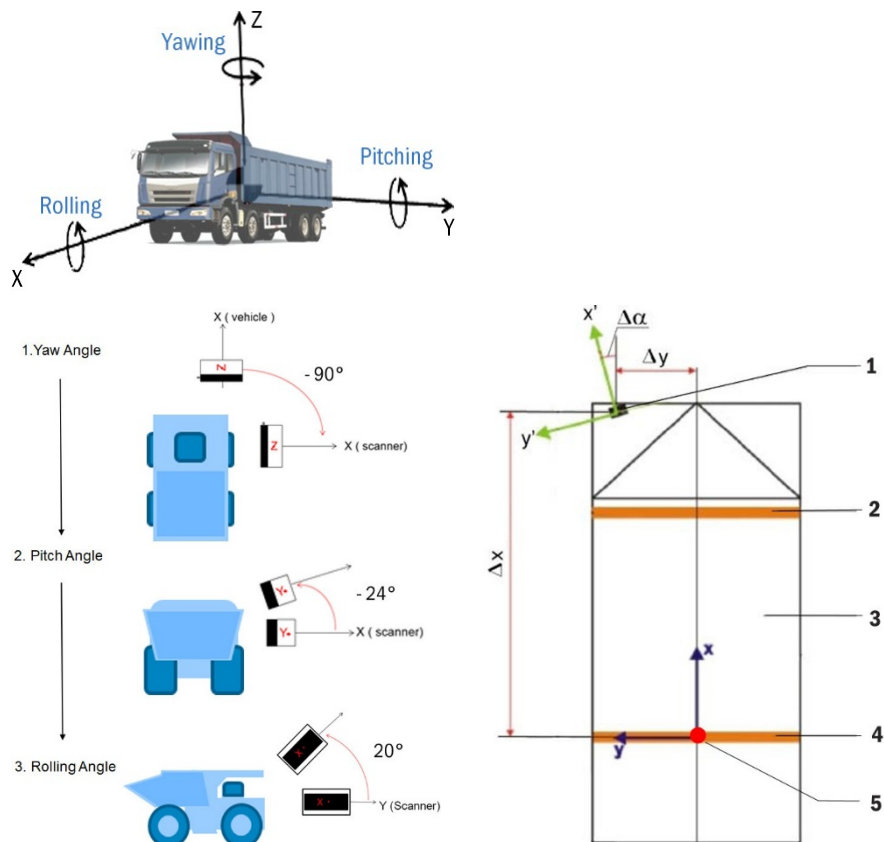
1 LD-MRS
2 Front axle
3 Vehicle
4 Rear axle
5 Navigation point

Δα Angle yaw

Δx Offset of the vehicle coordinates system on the X axle

Δy Offset of the vehicle coordinates system on the Y axle

x Vehicle coordinates system X axle

y Vehicle coordinates system Y axle

x' Sensor coordinates system X axle

y' Sensor coordinates system Y axle

The parameters for measurement mode (Measurement Parameters) are:

- angular resolution (AngularResolutionType): focused, constant, Flex. Res. or constantHigh (contantHigh only for device types LD-MRSxxx.S01)
  Or end angle of the scan area (ScanEndAngle)
- scanning frequency (ScanFrequency)
- start angle of the scan area (ScanStartAngle)
- SyncAngle

The CAN Interface Parameters are:

- CANBaseID
- CANBaudRate
- CANObjectDataOptions
- MaxObjectsViaCAN
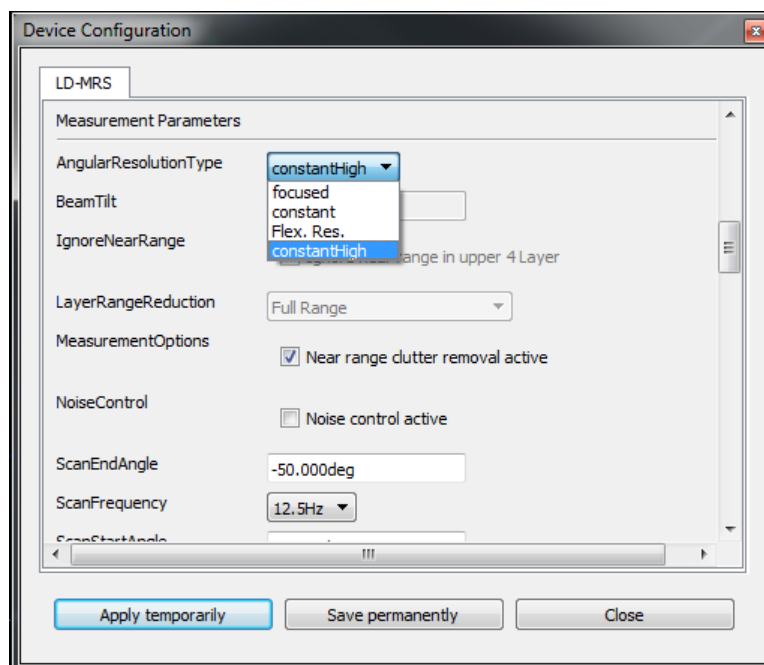
The parameter settings for the interface parameters are used to prioritize objects (reduction in amount of data) since the amount of data needs to be reduced due to a restriction on the CAN bus. The parameters are as follows:

- ContourPointDensity = output details for the object boxes
  – High density: Full scan resolution
  – Low density: Reduced resolution
  – Closest point only: Closest distance between scanner and object

- EnableDataOutput: Selects the data that is to be output.
- MaxPredictionAge: Maximum time in which objects will be pursued if visual contact is lost for the object. The input value refers to the number of scans (~12 scans = 1 s at 12.5 Hz)
- MinObjectAge: Minimum time period in which objects will be recorded before object data is output. The input value refers to the number of scans.
- ObjectPrioCriterion: You can set set up a restricted field to prioritize output objects via the CAN bus:
  - Radial: Object preference in the nearby scan area
  - Look ahead: Object preference in the middle of the scan area
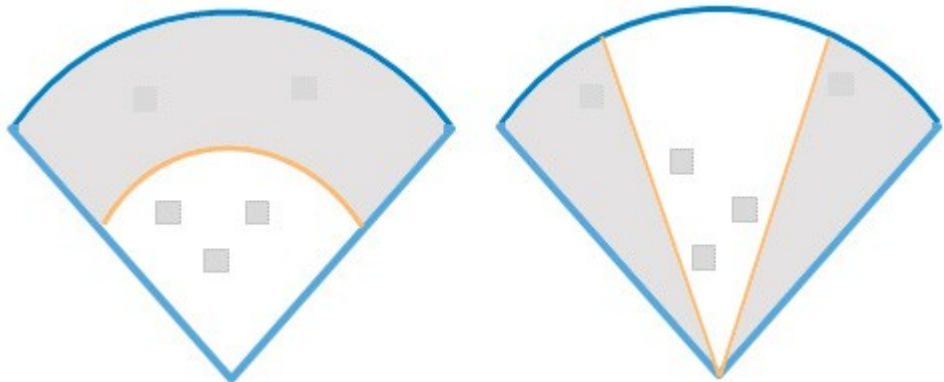
- RS232BaudRate

The parameters for the Ethernet interface (TCP/IP Parameters) are:

- IP address
- Port
- StdGateway
- Subnet mask
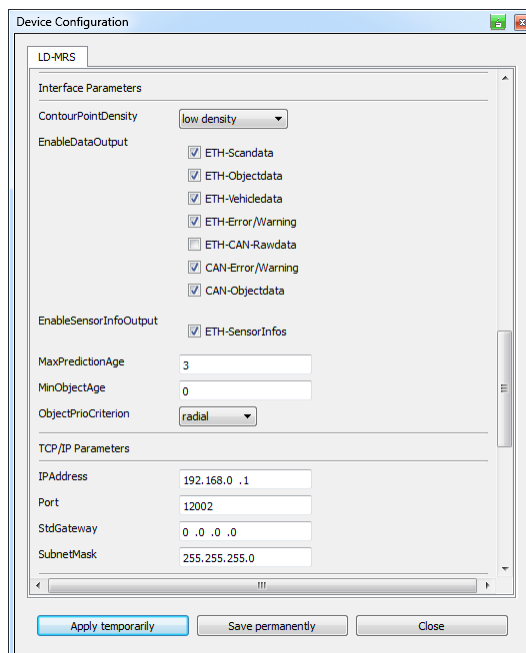
The FlexResolution Parameters are:

- NumberOfSectors
- SectorX_Resolution
- SectorX_StartAngle
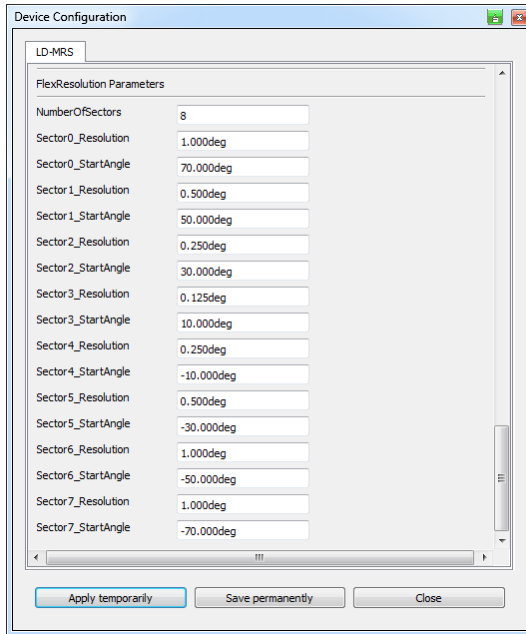
3.4.2 Filter IgnoreNearRange
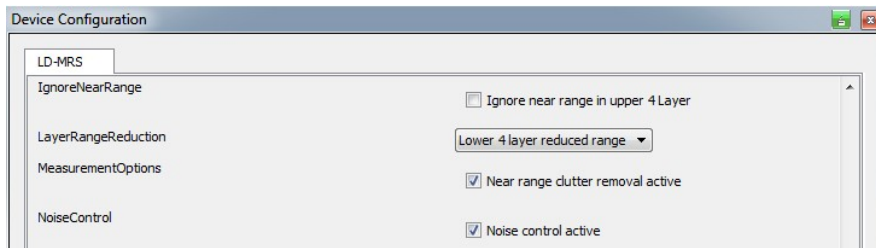
Activated "IgnoreNearRange" filter is only available for the lower 4 Layers.

If „Lower 4 layer reduced" at the setting „LayerRangeReduction" has been selected, the de-tected objects in the near field up to 15m will be not considered, but the longer Range of the upper 4 Layers is available:

- Lower 4 Layer: objects will be not measured due to the reduced sensitivity
- Upper 4 Layer: objects will be filtered out

This allows a more robust behavior in the near range for dusty heavy environment.

15 m
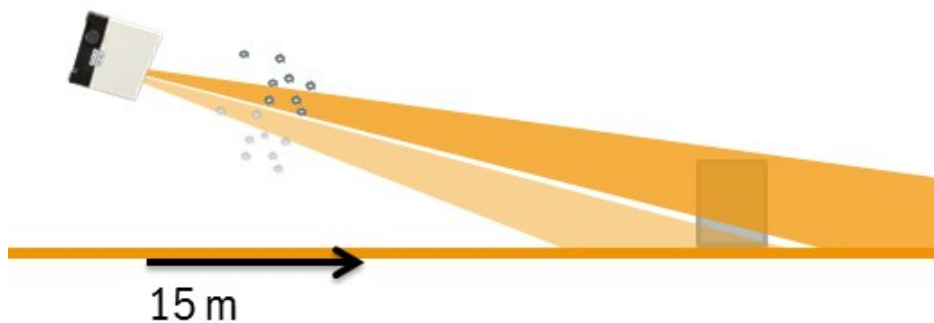
Near range clutter removal

Each incoming echo will be checked by 2 threshold (low and high).

If the high echo is higher than both thresholds, the target is normally solid. If only the lower threshold is exceeded, it is possibly a soft and diffuse target e.g. dust.

These measurement data will be tagged with „Clutter" and not considered fort the object tracking.

NOTE!

This filter should only be activated if the influences by bad measurement conditions are ex-pected, otherwise measurement object with low remission will be ignored.
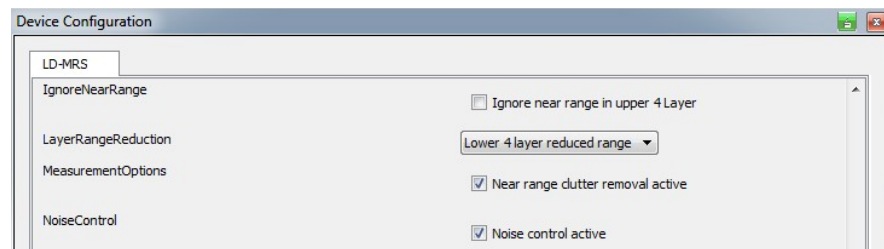
3.4.3   Noise Control

For extreme ambient light (e.g. sun radiation) erroneous measurements could occur, which may be filtered by an external computer by plausibility check.

By the function „Noise control active" an automatic sensitivity control will be activated, which monitors false measurement > 100m and reduces the sensitivity of the receiver accordingly.

NOTE!

This filter is only active for non-reduced levels.

For the automatic sensitivity control the range could be between maximum and the fixed adjustable sensitivity up to 60%.

3.4.4   Features

Upside down
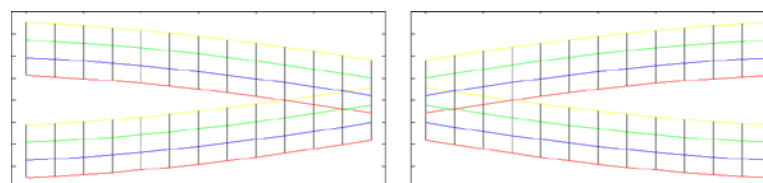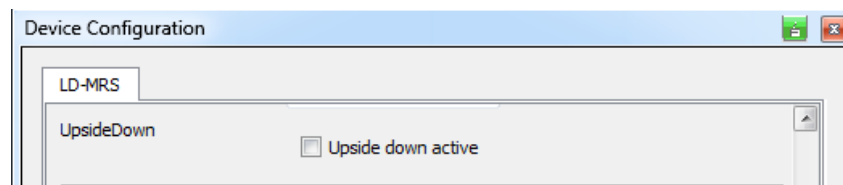
At a usage of the scanner in pairs to extend the scan area (~ 180°) a upside down mounting could be recommended for left scanner in respect to the driving direction.

By activating the mounting direction the presentation in LaserView and the output of the pa-rameter in the telegram will be corrected concerning scan data, coordinates and Object data.

LayerRangeReduction (8 Layer Version only)

Depending on the application a reduction of the sensitivity could avoid and filter wrong mea- surement. In case of the operation on a vehicle in dusty terrain the lower levels should be reduced, while the upper level keep the full range to detect far obstacles and objects:

Value	Upper layers	Lower layers	Application
0 (default)	Highest sensitivity	Highest sensitivity	Normal
1	Highest sensitivity	Highest sensitivity	Vehicle in dusty environment
2	Reduced sensitivity	Highest sensitivity	Horizontal measurement, possible errors due to setting sun
3	Reduced sensitivity	Highest sensitivity	Profile measurement with sun in background

If Upside-down setting is active, the sequence in the table will be adjusted accordingly.

NOTE!

The reduction of the sensitivity of a level deactivates the sensitivity control „Noise Control", because the sensitivity reduction causes a high immunity against ambient light.

3.4.5 Changing and saving the device configuration of the LD-MRS

WARNING

Malfunction due to incorrect configuration!

After every configuration change, the functionality of the application must be checked. SICK AG does not assume any liability of an LD-MRS is operated with incorrect configuration.

Important

Loss of access to the LD-MRS via Ethernet!

If an invalid IP address is set (address beyond the address range, double assignment, etc.) the device cannot be accessed after restarting the LD-MRS.

If necessary, use the RS-232 interface to view the currently set IP address and set the address again via Ethernet as described in chapter 3.2 Quick start with default settings, page 8.

For using the LD-MRS, the LaserView must be optimized to the requirements and actual situation. With the LD-MRS is adjusted to the situation on site.

This process bases on the factory default settings or on a user-specific parameter set that has already been created for the LD-MRS.

The parameters can be viewed and edited with LaserView, stored temporarily or permanently in the LD-MRS, and applied.
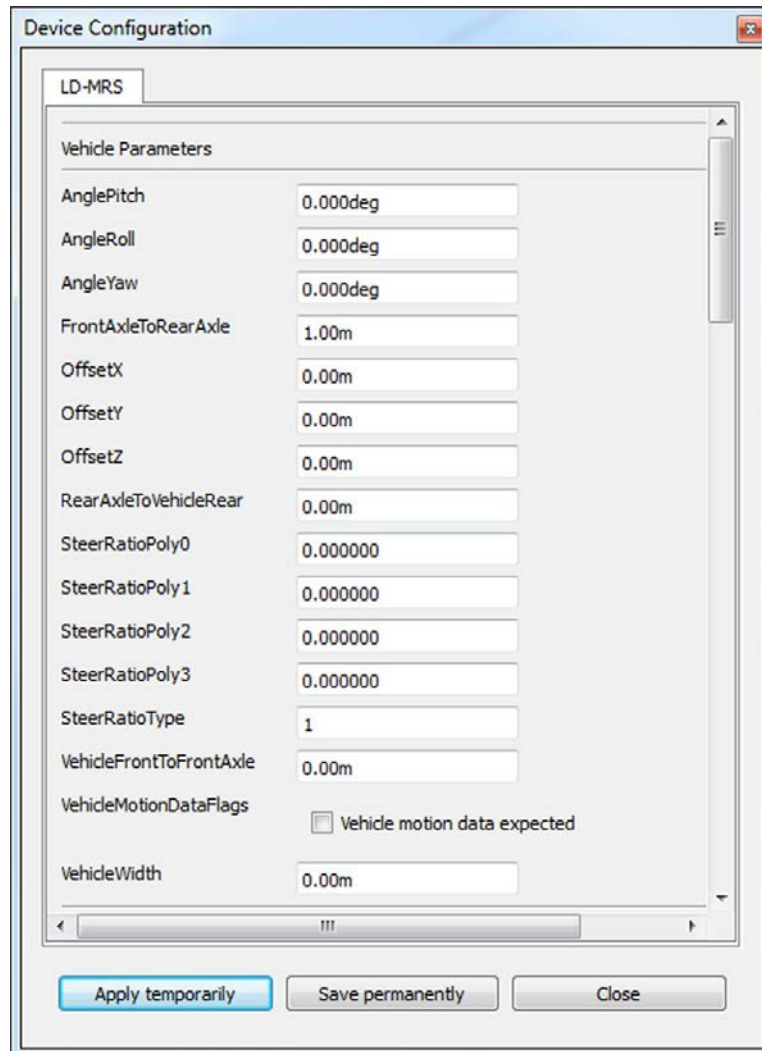
Opening the dialog box "Device Configuration" reads and displays the current settings of the LD-MRS.

If those settings can be modified, they can be adjusted here and either used temporarily in the device (APPLY TEMPORARILY) or stored permanently in the device (SAVE PERMANENTLY).

If parameters are only set temporarily, the LD-MRS uses the old, permanently set parameters at the next start (if the voltage supply has been interrupted or if the LD-MRS has been interrupted by a reset command).

With a few exceptions, the new settings are valid immediately.

The exceptions include parameters that are required for initialization of the device. These values (e.g. IP-address, Subnet Mask, ...) are permanently stored in the device and become effective after rebooting the device.

Parameters of measurement mode (Measurement Parameters)

By modifying the following parameters, the measuring properties of the LD-MRS can be influenced.

- Angular resolution (AngularResolutionType): focused or constant focused.
  Only at a scanning frequency of 12.5 Hz, the angular resolution can be set to be opti- mized towards the front.

Constant: The angular resolution is constant, see Section "Angular resolution and scanning frequency" in Chapter 3 Product description of the LD-MRS operating instructions (part no. 8012948, English edition).

- End angle of the scan range (ScanEndAngle)
  The end angle of the scan range must always be smaller than the start angle of the sensor coordinate system.
  The minimum value is -60°.
- Scanning frequency (ScanFrequency)
  Scanning frequencies of 12.5 Hz, 25 Hz and 50 Hz are possible, however, the available angular resolutions depend on the scanning frequency, see Section "Angular resolution and scanning frequency" in Chapter 3 Product description of the LD-MRS operating instructions (part no. 8012948, English edition).
- Start angle of the scan range (ScanStartAngle)
  The start angle of the scan range must always be greater than the end angle of the sensor coordinate system.
  The maximum value is +50°.
- SyncAngle
  Angle under which the LD-MRS measures at the time of the sync pulse.

Parameters of the interfaces (TCP/IP Parameters)

The interfaces provide specific and general configuration options.

- IP address
  Here the pre-set IP address can be modified and adjusted to the needs.
- Port
  Here the port can be modified and adjusted.
- StdGateway
  Here the standard gateway can be modified and adjusted.
- Subnet mask
  Please make sure that the selected subnet mask matches your network or the IP range used by the application.

To modify the parameter values of the LD-MRS and store them in the LD-MRS, proceed as follows:

1 In the menu EDIT select DEVICE CONFIGURATION. The dialog box "Device Configuration" opens.
2 Modify the parameter values
3 Click on the button APPLY TEMPORARILY to transmit the modified parameter values temporarily to the LD-MRS.
4 To apply the modifications permanently, click on the button SAVE PERMANENTLY.

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