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.

NOTICE

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.

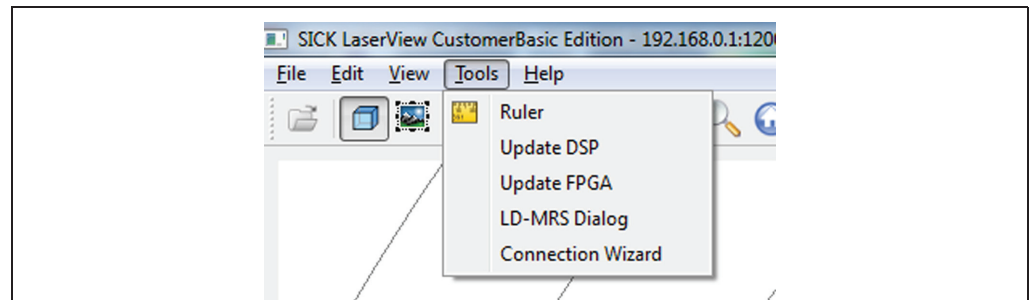If a connection to an LD-MRS is established, the menu bar contains the menu TOOLS.

Fig. 3-27:　　LaserView: Tools menu

„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 (*Abb. 3-28, Seite 32*)
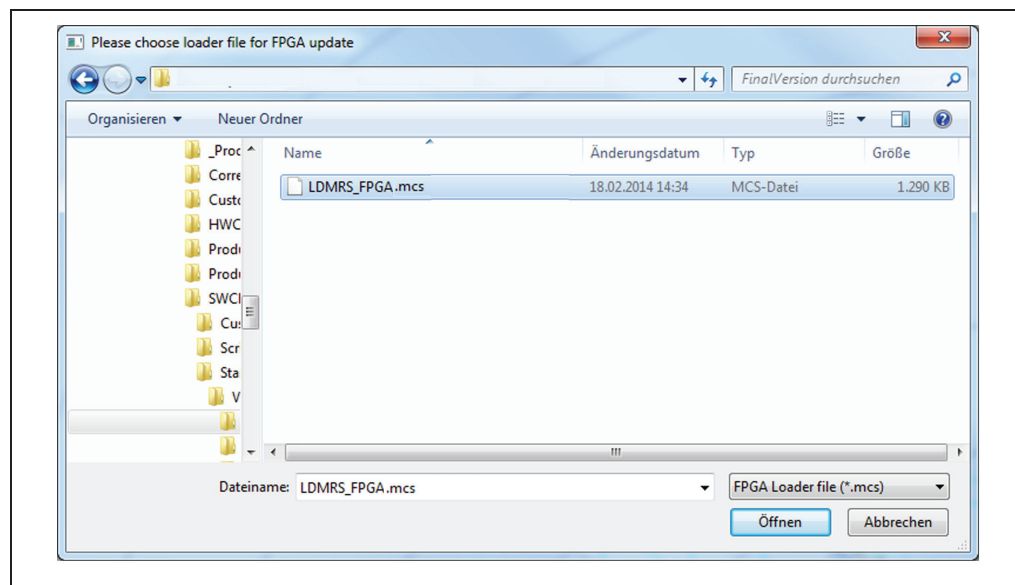
Fig. 3-28:   LaserView: Dialog box to select the Loader

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.
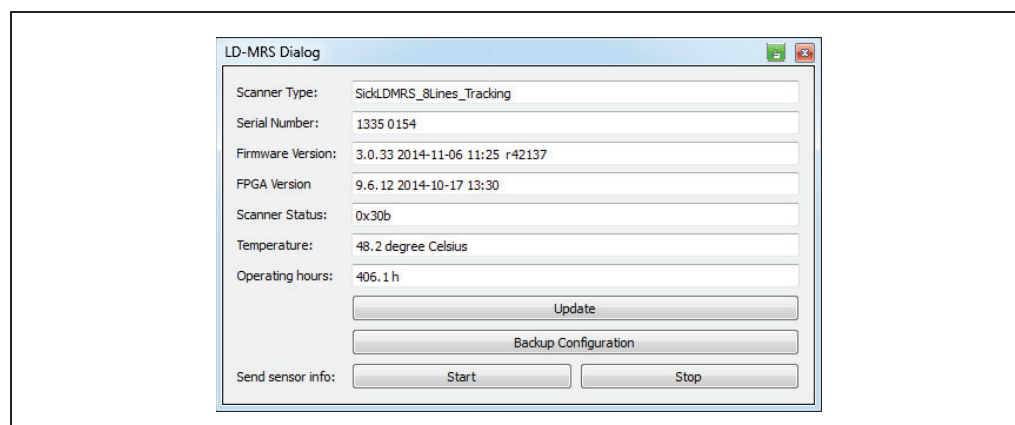   The dialog box LD-MRS DIALOG appears.

Fig. 3-29:   LaserView: LD-MRS Dialog box

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 10*.

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

NOTICE

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

1. In the menu EDIT select DEVICE CONFIGURATION.
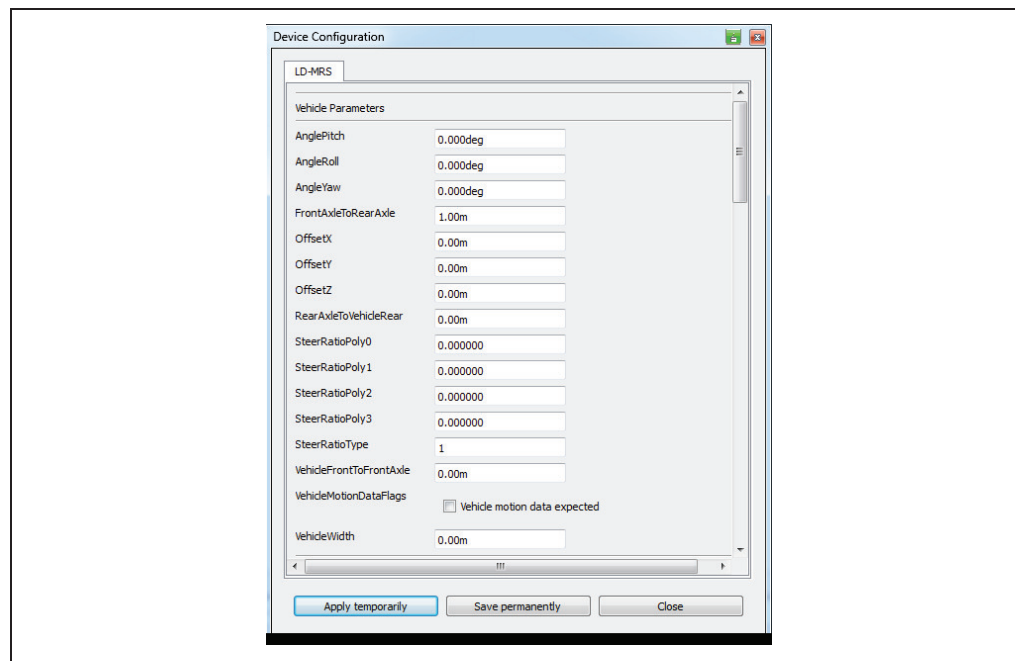   The dialog box DEVICE CONFIGURATION opens.

Fig. 3-30:   LaserView: "Device Configuration" dialog box with the basic settings values

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.
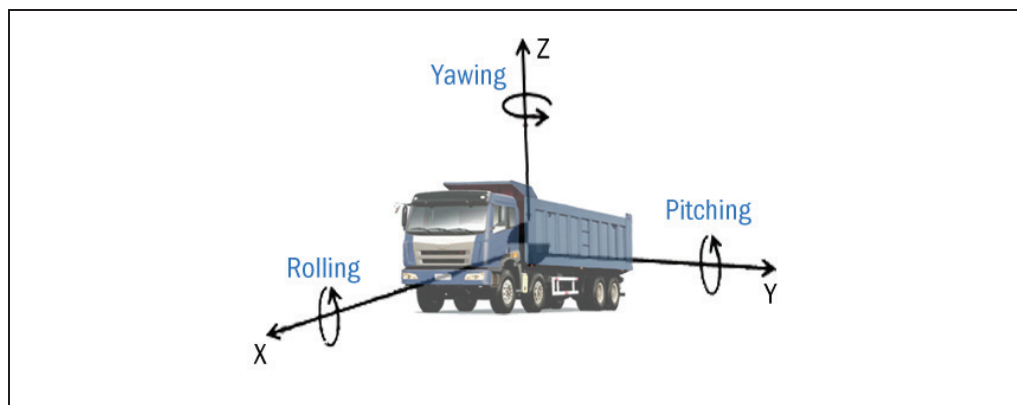

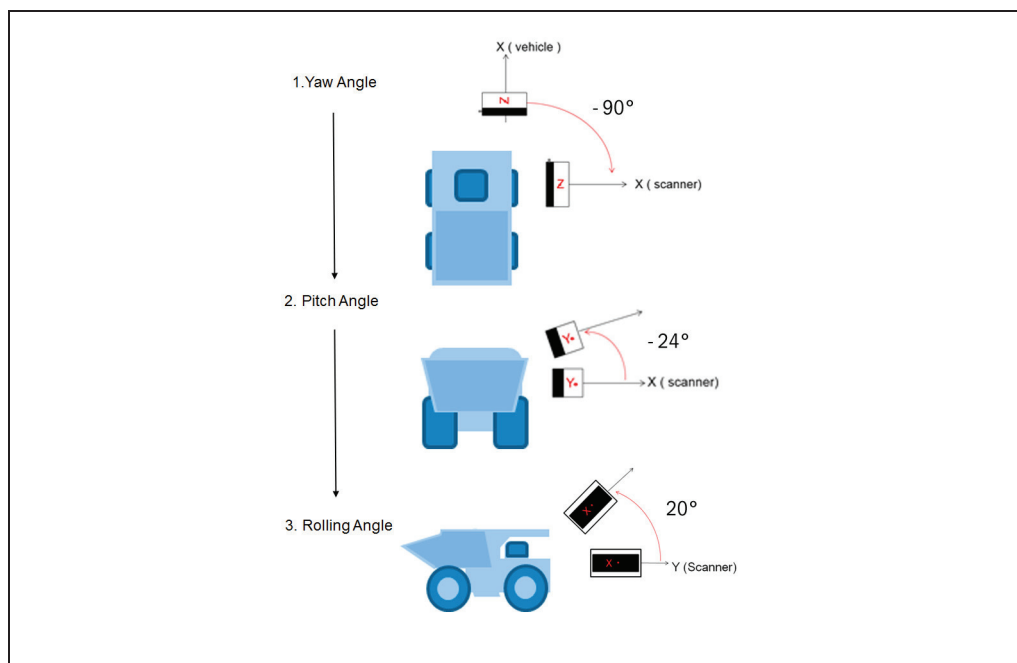Fig. 3-31:   LaserView: Scanner position example 1

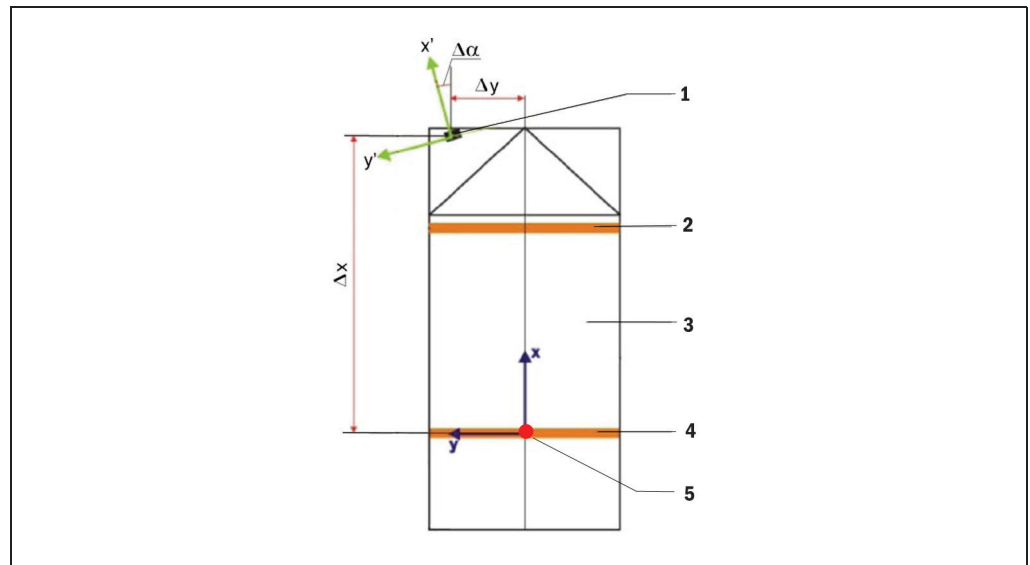Fig. 3-32:   LaserView: Scanner position example 2

Fig. 3-33:   LaserView: Coordinate system

Legend

1   LD-MRS
2   Front axle
3   Vehicle
4   Rear axle
5   Navigation point
$\Delta\alpha$ 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 or constant

*   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

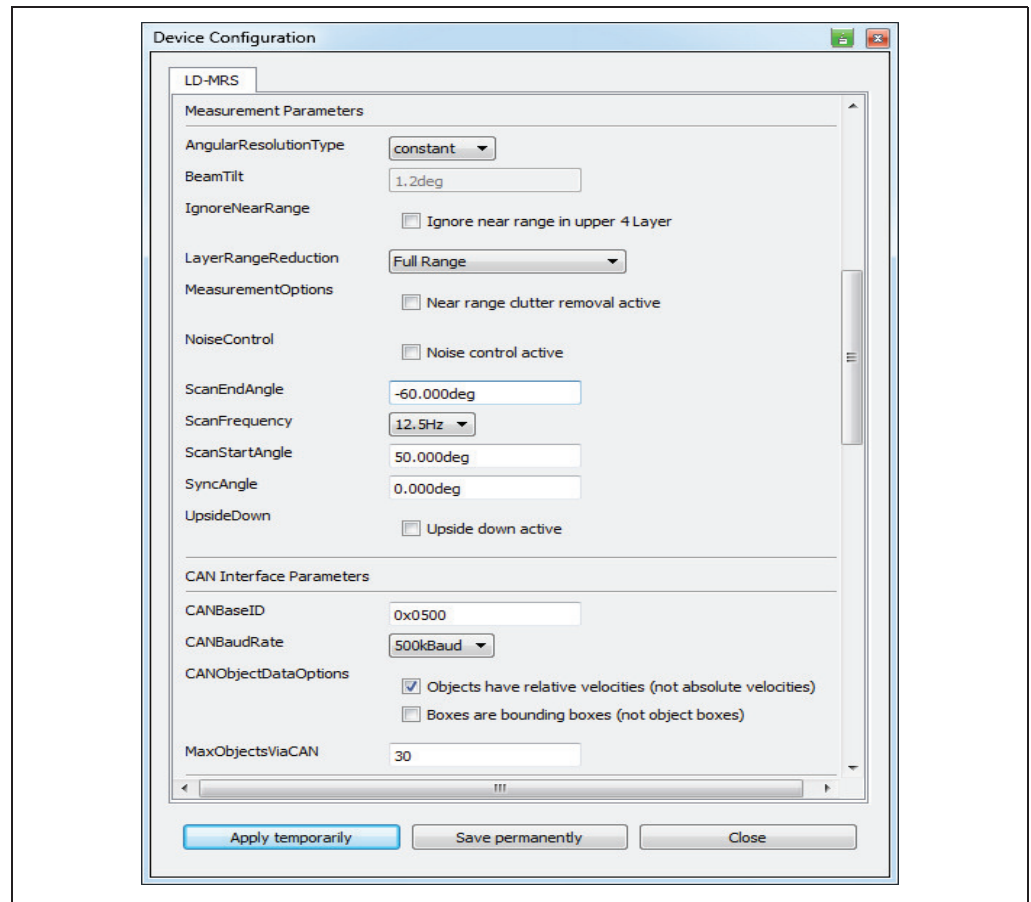*   CANObjectDataOptions

*   MaxObjectsViaCAN

Fig. 3-34:   LaserView: CAN interface

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

Fig. 3-35:   LaserView: Output details for the object boxes

- 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
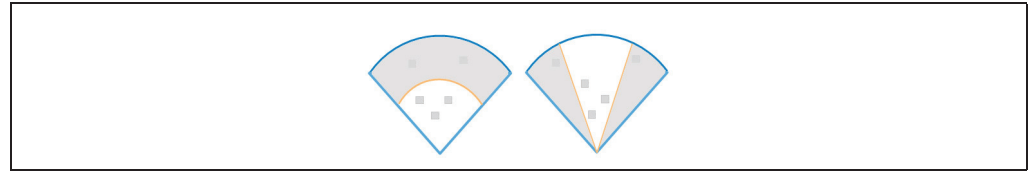 - Look ahead: Object preference in the middle of the scan area

Fig. 3-36:   LaserView: Output object priorities

- RS232BaudRate

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

- IP address
- Port
- StdGateway
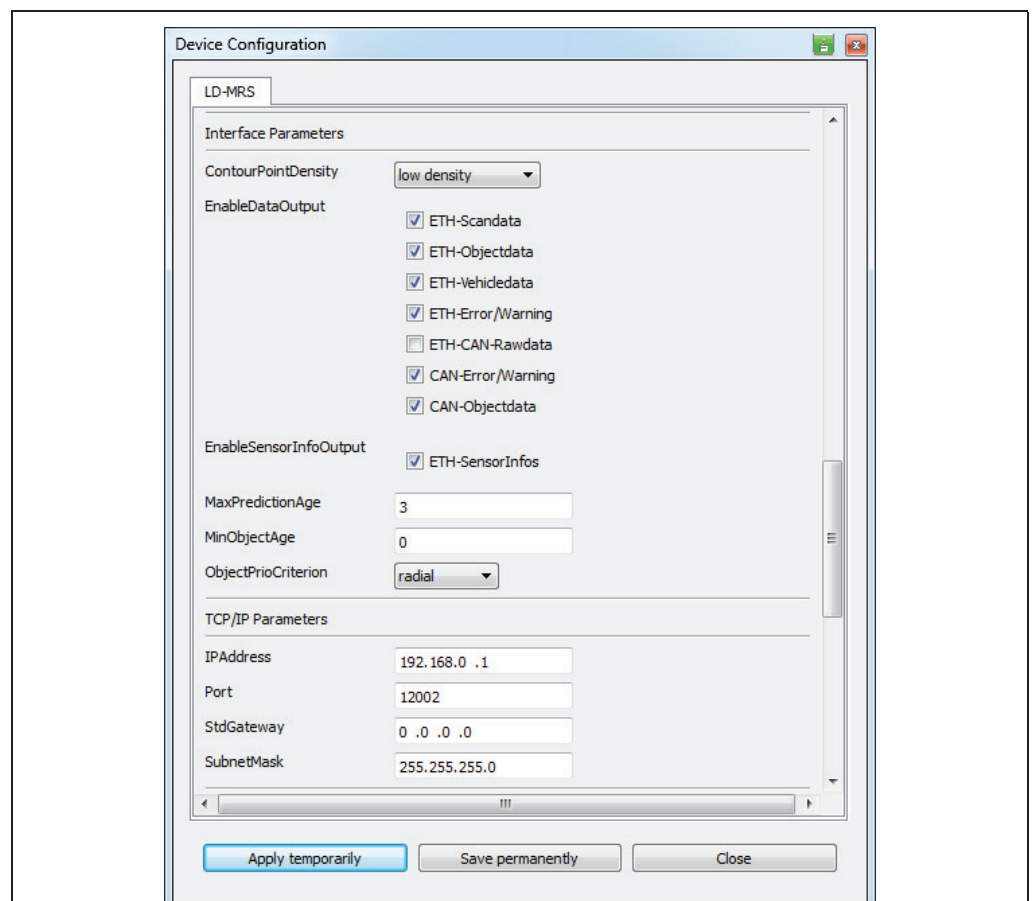- Subnet mask

Fig. 3-37:   LaserView: Interface parameters

The FlexResolution Parameters are:

- NumberOfSectors
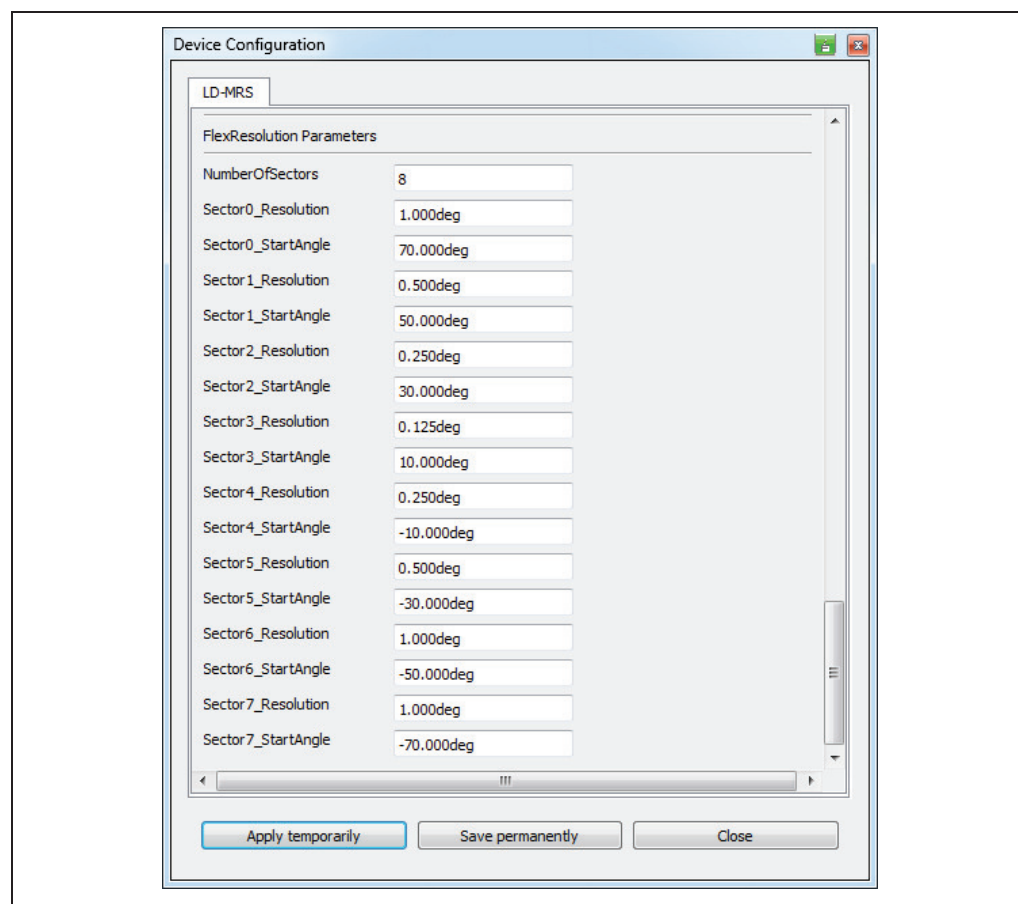- SectorX_Resolution
- SectorX_StartAngle

Fig. 3-38:   LaserView: FlexResolution parameters
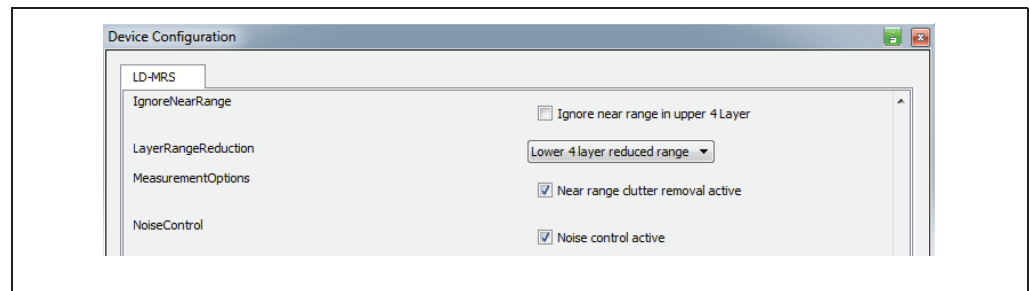
3.4.2   Filter

IgnoreNearRange

Fig. 3-39:   Ignore near range

Activated "IgnoreNearRange" filter is only available for the lower 4 Layers.

If „Lower 4 layer reduced" at the setting „LayerRangeReduction" has been selected, the detected 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.
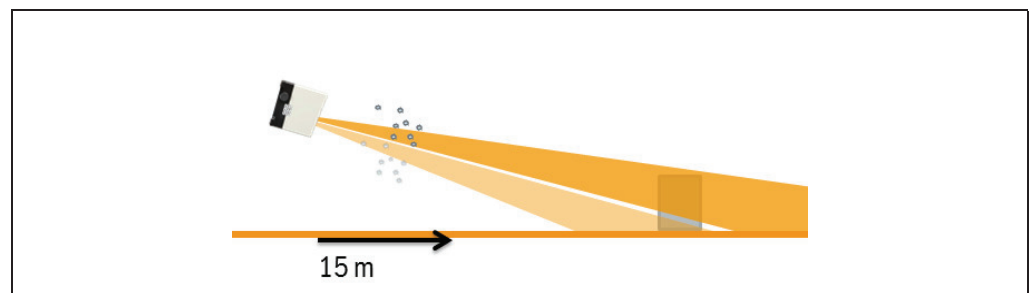
Fig. 3-40:   Ignore near range, behaviour

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.

NOTICE

This filter should only be activated if the influences by bad measurement conditions are expected, otherwise measurement object with low remission will be ignored.

Fig. 3-41:   Near range clutter

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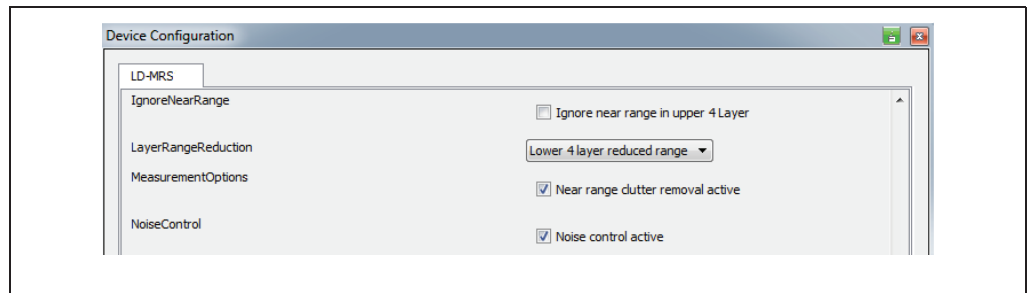
By the function „Noise control active" an automatic sensitivity control will be activated, which monitors false measurement > 100m and reduces the sensitivity of the receiver accordingly.

NOTICE

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
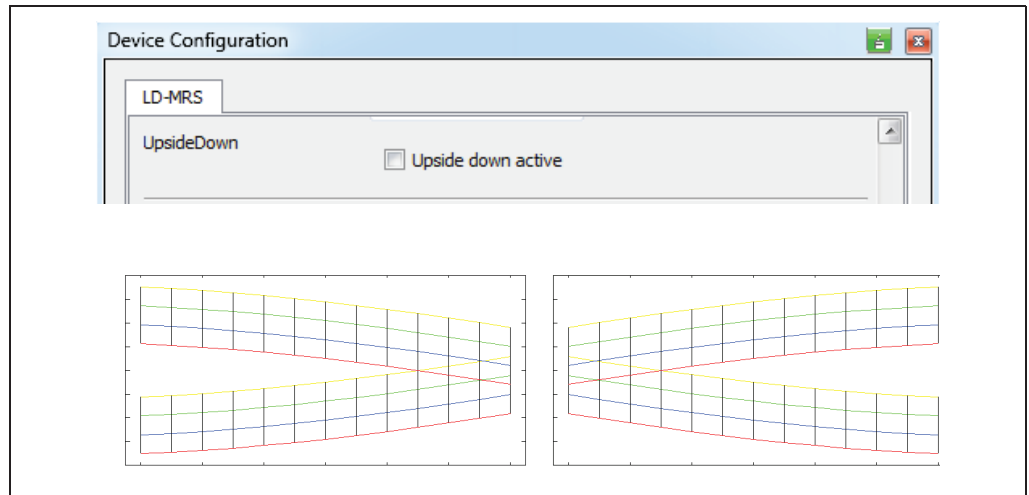
Fig. 3-42:   Layer position left side upside down installation, right side normal mounting

A possible application is the extension of the scan area by using 2 scanner.

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 parameter 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 measurement. 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	Reduced sensitivity	Vehicle in dusty environment
2	Reduced sensitivity	Highest sensitivity	Horizontal measurement, possible errors due to setting sun
3	Reduced sensitivity	Reduced sensitivity	Profile measurement with sun in background

Tab. 3-3:   Setting the layer sensitivity

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

NOTICE

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 10*.

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.

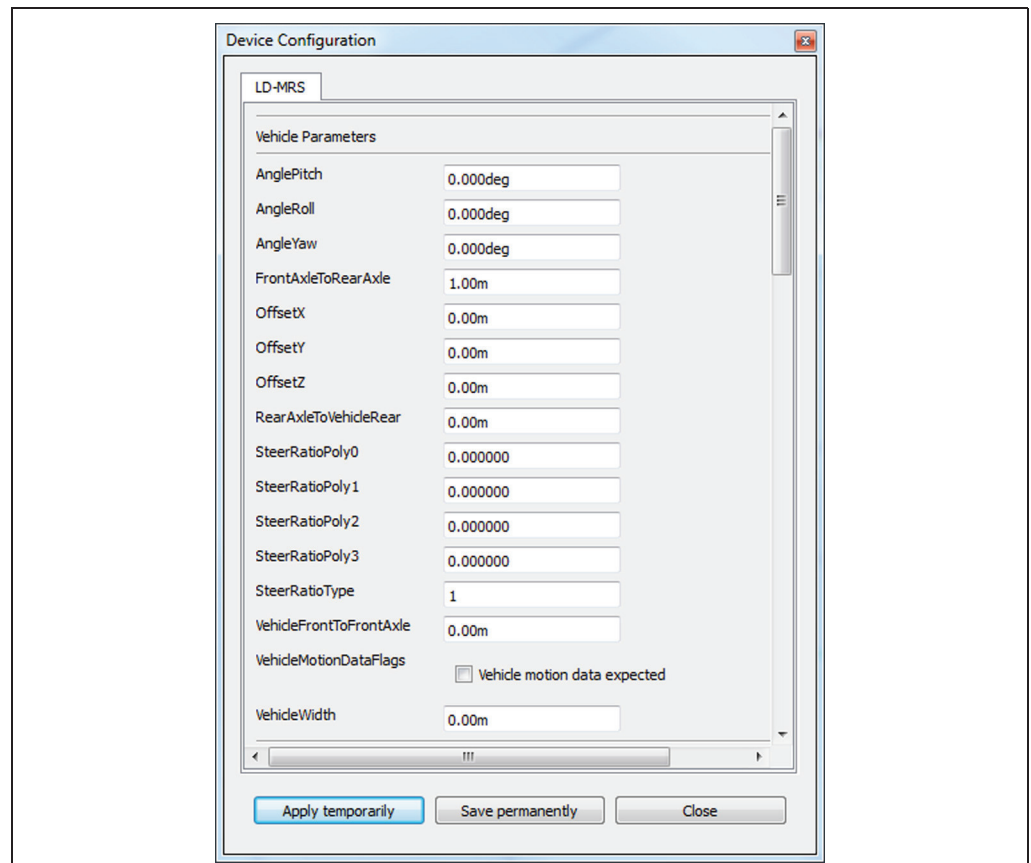**42**   8013787/YDB5/2014-09-30

Fig. 3-43: LaserView: "Device Configuration" to modify the parameter values dialog box

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 optimized 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 co-ordinate 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 co-ordinate 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.

Notes:

8013787/2014-09-11·5M/MC/TEO ‹FM10/PDF-A4 4c int35

Australia
Phone +61 3 9497 4100
     1800 33 48 02 – tollfree
E-Mail sales@sick.com.au

Belgium/Luxembourg
Phone +32 (0)2 466 55 66
E-Mail info@sick.be

Brasil
Phone +55 11 3215-4900
E-Mail sac@sick.com.br

Ceská Republika
Phone +420 2 57 91 18 50
E-Mail sick@sick.cz

China
Phone +852-2763 6966
E-Mail ghk@sick.com.hk

Danmark
Phone +45 45 82 64 00
E-Mail sick@sick.dk

Deutschland
Phone +49 211 5301-301
E-Mail kundenservice@sick.de

España
Phone +34 93 480 31 00
E-Mail info@sick.es

France
Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Great Britain
Phone +44 (0)1727 831121
E-Mail info@sick.co.uk

India
Phone +91–22–4033 8333
E-Mail info@sick-india.com

Israel
Phone +972-4-999-0590
E-Mail info@sick-sensors.com

Italia
Phone +39 02 27 43 41
E-Mail info@sick.it

Japan
Phone +81 (0)3 3358 1341
E-Mail support@sick.jp

Nederlands
Phone +31 (0)30 229 25 44
E-Mail info@sick.nl

Norge
Phone +47 67 81 50 00
E-Mail austefjord@sick.no

Österreich
Phone +43 (0)22 36 62 28 8-0
E-Mail office@sick.at

Polska
Phone +48 22 837 40 50
E-Mail info@sick.pl

Republic of Korea
Phone +82-2 786 6321/4
E-Mail info@sickkorea.net

Republika Slovenija
Phone +386 (0)1-47 69 990
E-Mail office@sick.si

România
Phone +40 356 171 120
E-Mail office@sick.ro

Russia
Phone +7 495 775 05 34
E-Mail info@sick-automation.ru

Schweiz
Phone +41 41 619 29 39
E-Mail contact@sick.ch

Singapore
Phone +65 6744 3732
E-Mail admin@sicksgp.com.sg

Suomi
Phone +358-9-25 15 800
E-Mail sick@sick.fi

Sverige
Phone +46 10 110 10 00
E-Mail info@sick.se

Taiwan
Phone +886 2 2375-6288
E-Mail sales@sick.com.tw

Türkiye
Phone +90 216 587 74 00
E-Mail info@sick.com.tr

United Arab Emirates
Phone +971 4 8865 878
E-Mail info@sick.ae

USA/Canada/México
Phone +1(952) 941-6780
     1 800-325-7425 – tollfree
E-Mail info@sickusa.com

More representatives and agencies
in all major industrial nations at
www.sick.com

SICK
Sensor Intelligence.