# Measuring With Laser Radar

This chapter covers connection and basic operation of the Nikon Laser Radar in SA.
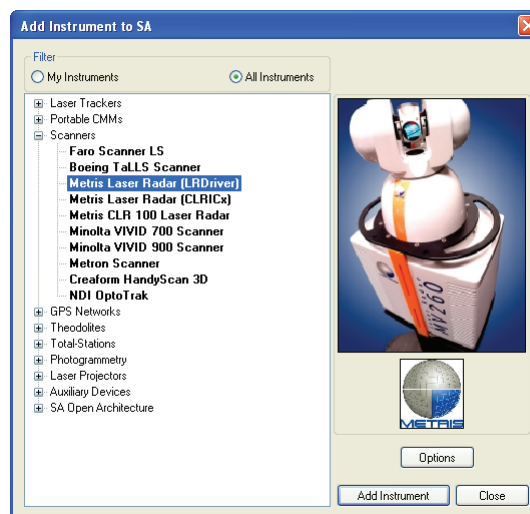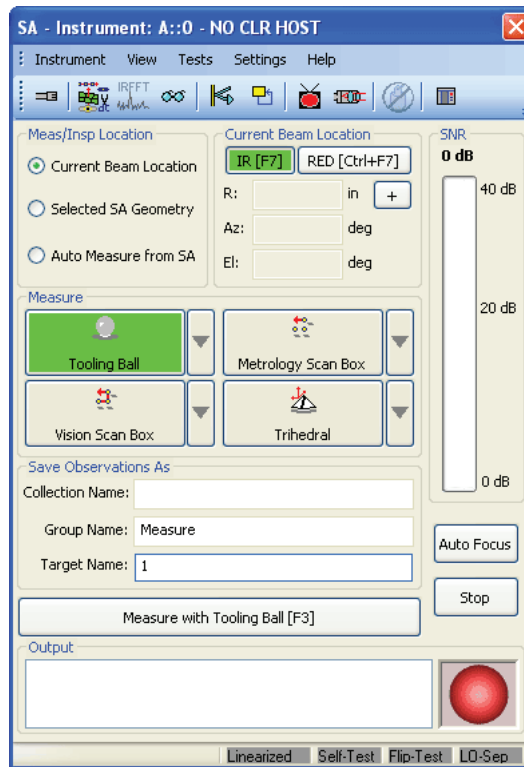
## Nikon Laser Radar

Add the Laser Radar Instrument by using or the menu item **Instrument>Add** (Figure 19-1).



**Figure 19-1.** Adding the Laser Radar to the job.

Start the instrument interface using or the menu item **Instrument>Run Interface Module and Connect**.

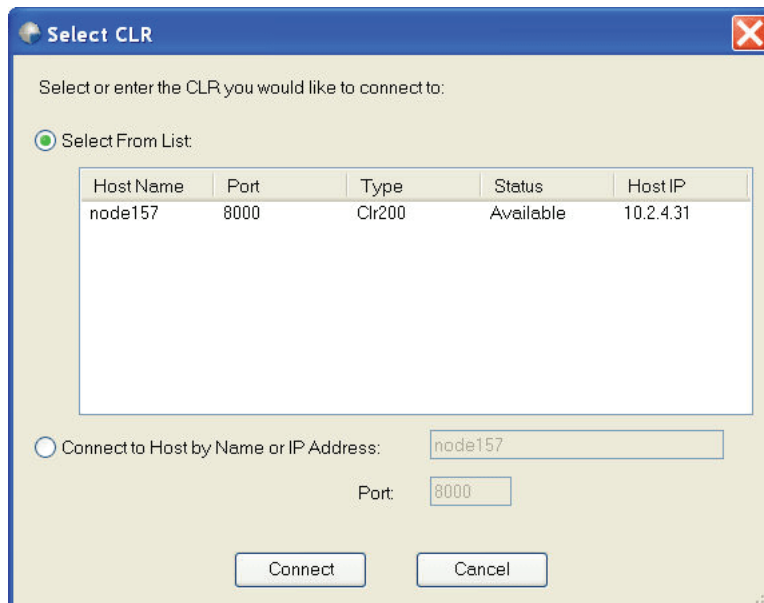**Figure 19-2.** The Laser Radar interface.

Use the Connect button ⊒ to display the Select CLR dialog. Select the respective instrument and press Connect (Figure 19-2).



**Figure 19-3.** Selecting the instrument to connect.

## Toolbar

**Figure 19-4.** The toolbar in the laser radar interface.



■ ⊒ **Connect/Disconnect.** Opens the LR Connection dialog (see

above).

▪  **Target Manager - Advanced.** Displays the target manager interface (Figure 19-5).
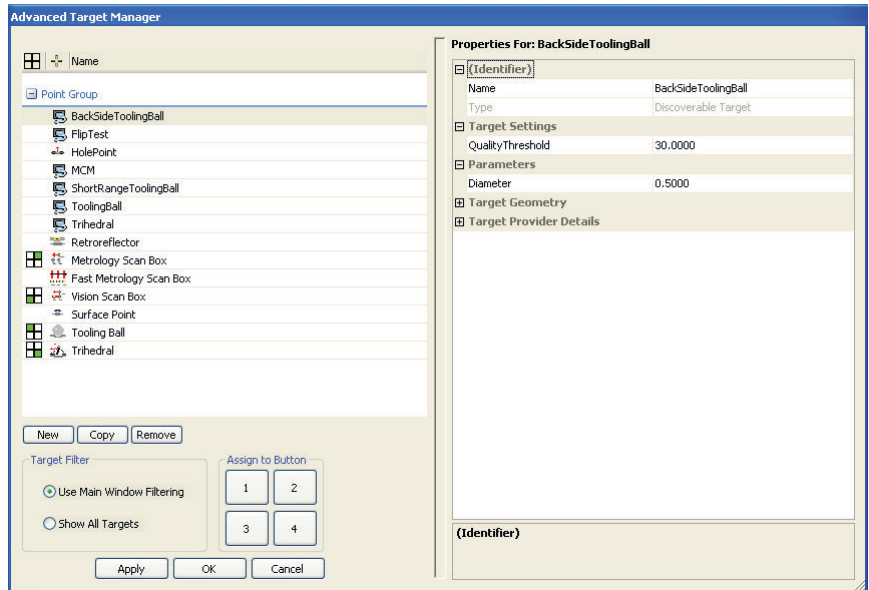


**Figure 19-5.** The Advanced Target Manager.

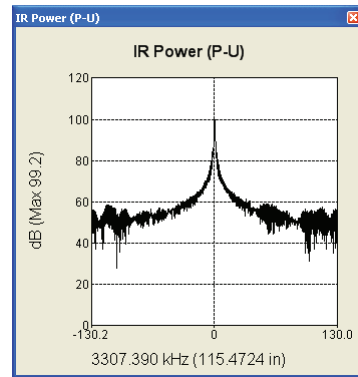▪  **Show/Hide FFT Window.** Toggles the FFT window visibility (Figure 19-6).



**Figure 19-6.** The FFT window.

▪ ∞ **Cloud Viewer.** Opens the cloud viewer interface (Figure 19-7).

**Figure 19-7.** The Cloud Viewer.
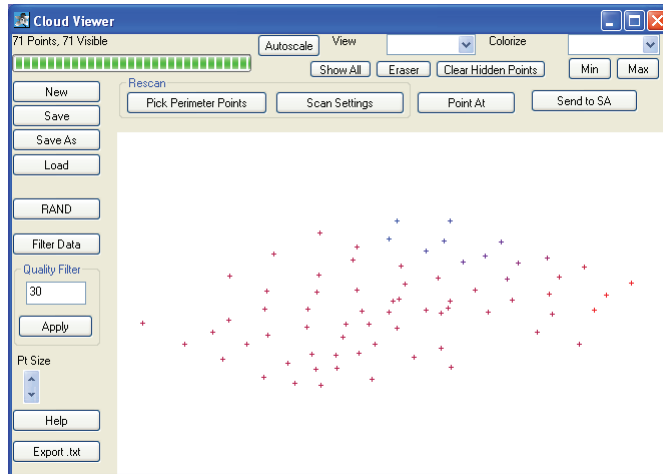
■  ⬚ **Mirror.** Displays the mirror target dialog (Figure 19-8).



**Figure 19-8.** The mirror target dialog.
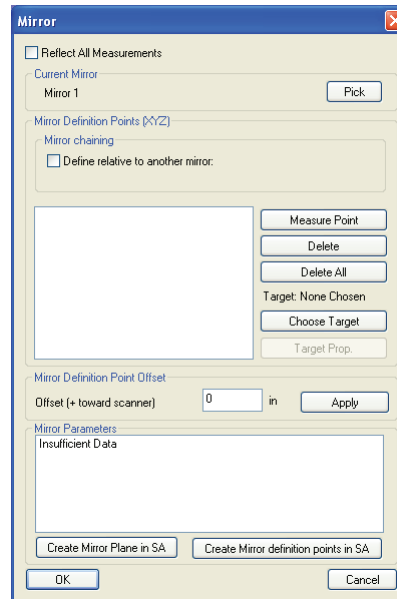
■  ⬚ **Continuously Repeat Command.** Sends updates by repeating the current measurement mode.

■  ⬚ **Video Window.** Toggles the video output window (Figure 19-9). Using **Ctrl** + **Shift** + **+** or **Ctrl** + **Shift** + "**-**" will increase or decrease the steering speed.
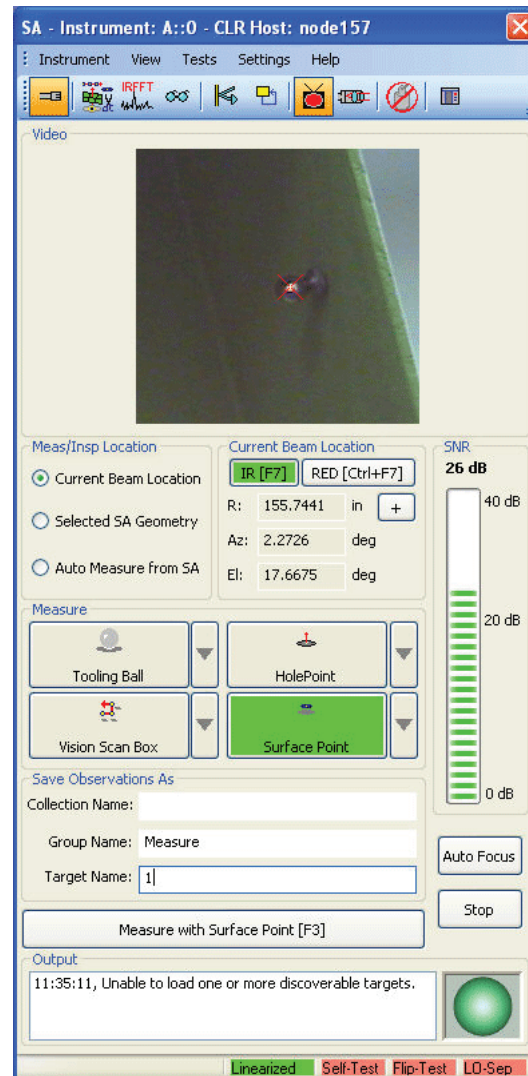
**Figure 19-9.** The video window.

- ▫ 📹 **Video Focus.** Displays slider for manual focusing of video camera.

- ▫ 🚫 **Shutdown.** Disconnect and shutdown scanner.

- ▫ 🗔 **Dock/Undock.** Docks or Undocks the instrument interface in SA.

## Target Naming



**Figure 19-10.** Specifying a target name to measure.
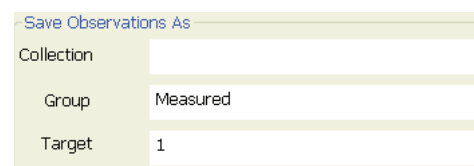
- ▪ **Collection Name.** Specify the collection name for the group and target to be stored. If left blank, the group and target will be stored in the active collection.

- **Group Name.** Specify group name for target to be stored.

- **Target Naming.** Specify name for target, target name will automatically increment after each measurement.

## Measure/Inspection Location

The LR interface supports three measure locations (Figure 19-11). When selected the user can configure the "measure" quick selects. When the measure operation is changed the "measure" quick selects will change.
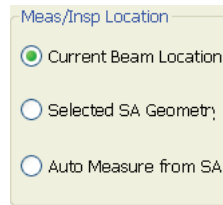
**Figure 19-11.** Measure quick-selects.



- **Current Beam Location.** Used to measure the current location of the beam.

- **Selected SA Geometry.** Used when a supported geometry is to be measure. An example would be a perimeter or a vector group.

- **Auto Measure from SA.** Used when SA sends an auto-measure request to the LR interface.

## Current Beam Location, SNR and Auto-Focus Limits

This allows the user to view the IR SNR (signal to noise ratio) or the Red (pointing laser) focus limits (Figure 19-12). When selected the display to the right will change. When "Red" is selected the user will have quick access to the focus limits. **F7** can be used to toggle between the two displays. Auto-focus can be accessed via the interface button or use **F8**.
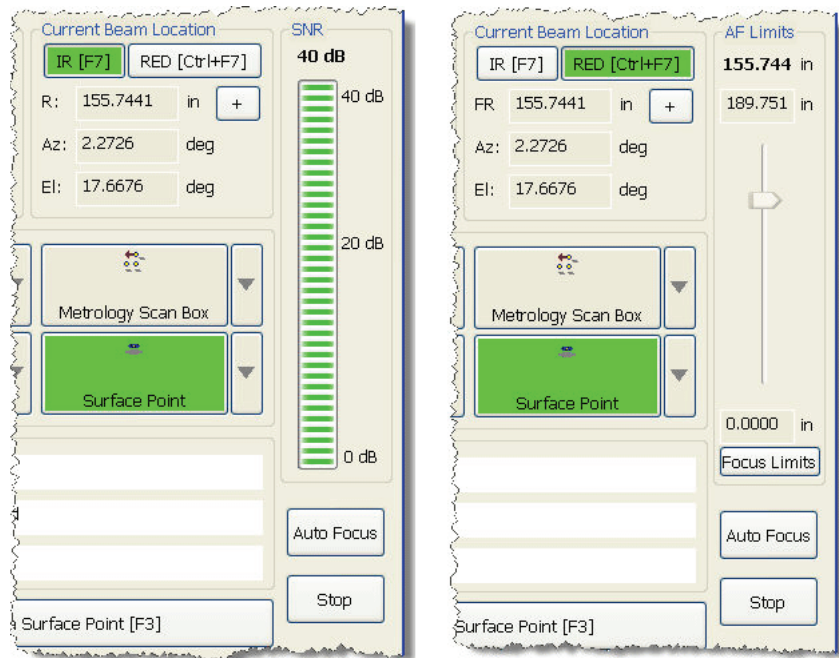
**Figure 19-12.** SNR/AF Limits.

## Measure and Advanced Target Manager

To select a Measure mode for a particular quick select, press the arrow button the right of the desired button. A list of measure types will appear for selection (Figure 19-13).

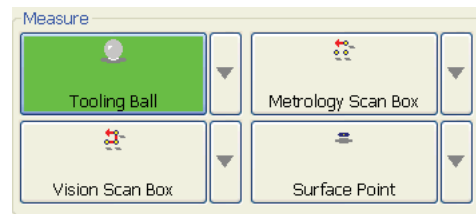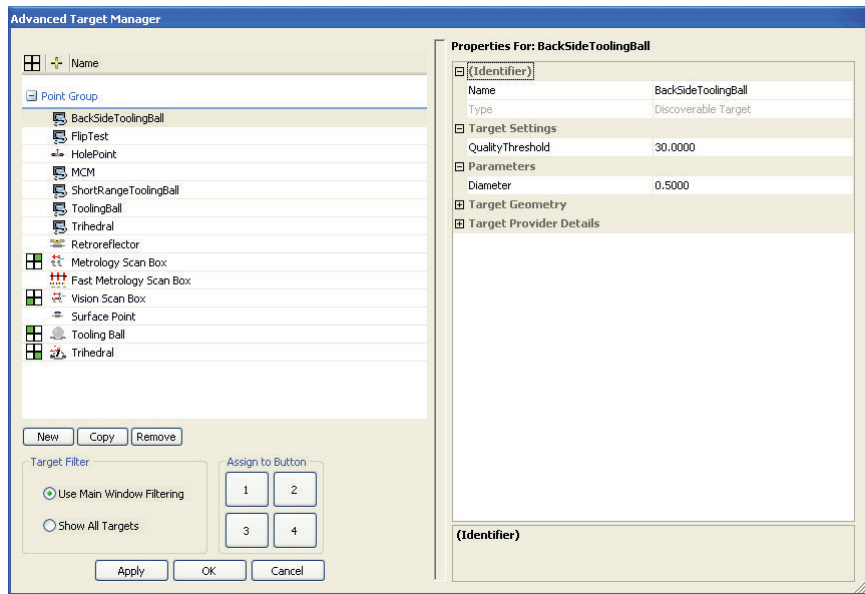

**Figure 19-13.** Measurement modes.

To access the parameters for the measure mode, double-left click and the *Advanced Target Manager* will appear (Figure 19-14). Here a user can tweak a particular profile to suit the measurement task at hand.
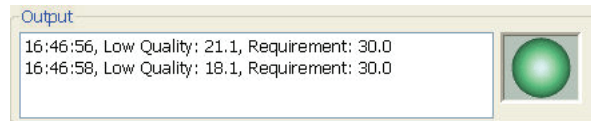
**Figure 19-14.** Specifying measurement details in the target manager.

## Output

Displays information regarding the current measurement process (Figure 19-15).



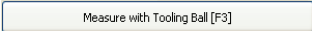**Figure 19-15.** The output window.

## LR Operational Tests

Access the Metris LR Operational checks under the menu item Tests. Consult the Metris documentation for operational check procedures.

## Single Point Measurements

This section will briefly cover some basic single point measurement types. For further information please consult Nikon Metrology.

### Tooling Ball

1. Select the desired tooling ball measurement mode for selected quick select. Use the drop-down arrow to pick the desired measurement mode. If the needed measurement does not exist, create a new one in the target manager .

2. Steer the laser to the tooling ball of choice. Point the laser to a surface near the tooling ball and press **F8** to perform an autofocus. Once complete aim the laser to the center of the tooling ball.

3. Press the measure button [Measure with Tooling Ball [F3]] or **F3**.

4. The point will be sent to SA, if not check the output box to check measurement failure details.

### Surface Point

1. Select the desired surface point measurement mode for selected quick select. Use the drop down arrow to pick the desired measurement mode. If the needed measurement does not exist, create a new one in the target manager 📋.

2. Steer the laser to the surface point of interest. Press **F8** to perform an auto-focus.

3. Press the measure button [ Measure with Surface Point [F3] ] or **F3**.

## Scanning Measurements

This section will briefly cover some basic scanning measurement types. For further information please consult Nikon Metrology.

### Box Scanning

Box scanning allows the scanner to perform a scan bounded by a box with prescribe dimensions.

1. Point the laser at the center of the area of interest.

2. Select the appropriate scan mode. Double click the measurement mode to access scan parameters. Enter the scan box dimensions.

3. Press Measure or **F3**.

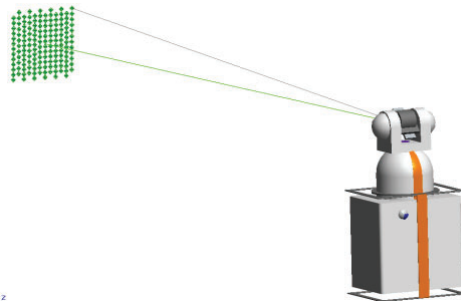4. A scan will be performed inside the bounding box (Figure 19-16).



**Figure 19-16.** Scanning a box.

### Perimeter Scanning

Perimeter scanning allows the scanning region of the LR to be constrained by a 3D perimeter.

1. In SA, select **Construct>Perimeter**. Select the measured or nominal points which describe the bounding region to be scanned. Two types of perimeters exist in SA, open and closed. A single perimeter can be changed from open to closed in the perimeter properties dialog.

2. In the LR Interface, change the *Meas/Inspec Location* to **Selected SA Geometry** (Figure 19-17).

**Figure 19-17.** Choosing *Selected SA Geometry*.
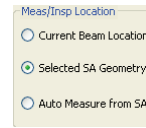


3. In SA, select the desired perimeter. Once selected, the quick selects will populate with measurement modes applicable to perimeters.

4. Double-click the measurement mode to access scan parameters (Figure 19-18). Often times a user will change the output format, grid rotation and point spacing.

**Figure 19-18.** Scan parameters.



| ⊟ Output | |
|---|---|
| TracePerim | False |
| NewGroupForEachScanLine | False |
| SendToCloud | False |
| SendToCloudViewer | False |
| SendToPtGrp | True |
| ⊟ Scan | |
| GridRotation | 0.0000 |
| LineSpacing | 1.0000 |
| PointSpacing | 1.0000 |

5. Press Measure or **F3**.