Measuring With Laser Radar 19

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

Nikon Laser Radar

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



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

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

Figure 19-2. The Laser Radar

interface.



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

Sele Sele	ect CLR ct or enter the CL elect From List.	R you would like	to connect to:		X
	Host Name	Port	Type	Status	Host IP
Figure 19-3. Selecting the instrument to connect.	node157	8000	Cir200	Available	102.4.31
	onnect to Host by	v Name or IP Add	ress: nod Port: 800	e157 D	

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).

	Properties For: BackSideT	oolingBall
H 🕂 Name	(Identifier)	
Point Group	Name	BackSideToolingBall
- RackSideToolingBall	Туре	Discoverable Target
ElinTest	Target Settings	
ele HolePoint	QualityThreshold	30.0000
	Parameters	
ShortRangeToolingBall	Diameter	0.5000
	Target Geometry	
E Tribedral	Target Provider Details	5
* Retroreflector		
Metrology Scap Box		
HT East Metrology Scan Box		
H 🐺 Vision Scan Box		
- Surface Point		
New Copy Berroug		
Target Filter Assign to Button		
Show All Targets		
3 4	(Identifier)	

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



Figure 19-6. The FFT window.

Figure 19-5. The Advanced Target

Manager.

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

🔀 Cloud Viewer					
71 Points, 71 Visible		Autoscale	View	Colorize	· · · · · · · · · · · · · · · · · · ·
New Save	Rescan Pick Perimeter Points		Show All	Eraser Clear Hidden Poin Point At	ts Min Max Send to SA
Save As Load RAND Filter Data Quality Filter 30		+	• • •	• • • • • • • • •	•
Apply Pt Size	* * * * *	• • • • • • •	* * * * *		• • • •

• **Mirror.** Displays the mirror target dialog (Figure 19-8).

Current Mirror			
Mirror 1			Pick
Mirror Definition Points (XYZ)			
Mirror chaining			
Define relative to another	mirror:		
		Me	asure Point
			Delete
			elete All
		Target: N	one Chosen
		Cho	ose Target
		Ta	rget Prop.
Mirror Definition Point Offset			
Offset (+ toward scanner)	0	in	Apply
dirror Parameters			
Insumcient Data			

- 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 19-7. The Cloud Viewer.



CHAPTER 19 • MEASURING WITH LASER RADAR

SA - Instrument: A::0 - CLR Host: node157	×
i Instrument View Tests Settings Help	
Video	
**	
Meas/Insp Location Current Beam Location	SNR
Current Beam Location IR [F7] RED [Ctrl+F7]	26 dB
Selected SA Geometry R: 155.7441 in + Az: 2.2726 deg	40 dB
O Auto Measure from SA El: 17.6675 deg	
Measure	20 dB
🚨 🚽 📥 🚽	Ξ
Tooling Ball HolePoint	Ξ
Vicion Scan Box	
Save Observations As	Ξ
Collection Name:	0 dB
Group Name: Measure	
Target Name: 1	
Measure with Surface Point [E3]	Stop
11:35:11, Unable to load one or more discoverable targets.	
Linearized Self-Test Flip-T	est LO-Sep

- Linearized Self-Test Flip-Test LD-Sep
 Wideo Focus. Displays slider for manual focusing of video
 - camera.
- Ø Shutdown. Disconnect and shutdown scanner.
- Dock/Undock. Docks or Undocks the instrument interface in SA.

	-Save Observatio	ins As
Figure 19-10. Specifying a target	Collection	
name to measure.	Group	Measured
	Target	1

 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.

Figure 19-9. The video window.

Target Naming

- **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.

	-Meas/Insp Location	
	 Current Beam Location 	
Figure 19-11. Measure quick-selects.	Selected SA Geometry	
	O Auto Measure from SA	

- 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.

CHAPTER 19 MEASURING WITH LASER RADAR

Current Beam Location SNR Current Beam Location AF Limits IR [F7] RED [Ctrl+F7] 40 dB IR [F7] RED [Ctrl+F7] 155.744 in 40 dB R: 155.7441 189.751 in in + FR 155.7441 in + Az: 2.2726 Az: 2.2726 deg deg El: 17.6676 deq El: 17.6676 deg 20 dB ** 10 Metrology Scan Box Metrology Scan Box Surface Point Surface Point 0.0000 in 0 dB Focus Limits Auto Focus Auto Focus Stop Stop Surface Point [F3] Śurface Point [F3] Acres and a second s

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).



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.

	Advanced Target Manager		
		Properties For: BackSideToolin	gBall
	H + Name	□ (Identifier)	
	E Point Group	Name	BackSideToolingBall
		Туре	Discoverable Target
	S backside roolingball	Target Settings	
		QualityThreshold	30.0000
		Parameters	
	ShortRangeToolingBall	Diameter	0.5000
		Target Geometry	
	🖳 Tribedral	Target Provider Details	
	The Retroreflector		
	🕂 👯 Metrology Scan Box		
Figure 19-14 Specifying mea-	III Fast Metrology Scan Box		
inguic 19 14. Specifying med	🖶 🗮 Vision Scan Box		
surement details in the target manager.	Surface Point		
je i standina standin	🗄 🧟 Tooling Ball		
	🛨 🏂 Trihedral		
	New Copy Remove		
	Target Filter Assign to Button		
	Use Main Window Filtering		
	O Show All Targets 3 4	(Identifier)	
	Apply OK Cancel		

Output

Output

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

16:46:56, Low Quality: 21.1, Requirement: 30.0 16:46:58, Low Quality: 18.1, Requirement: 30.0

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

- 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 <u>s</u>.
- 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

- 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 <u>s</u>.
- 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.

 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).

Meas/Insp Location	
O Current Beam Location	
 Selected SA Geometry 	
O Auto Measure from SA	

- **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.

Ξ	Output	
	TracePerim	False
	NewGroupForEachScanLine	False
	SendToCloud	False
	SendToCloudViewer	False
	SendToPtGrp	True
Ξ	Scan	
	GridRotation	0.0000
	LineSpacing	1.0000
	PointSpacing	1.0000

5. Press Measure or F3.

Figure 19-18. Scan parameters.