

## API Dynamic 9D Ladar

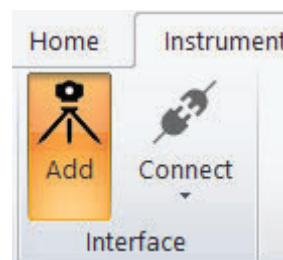


### Prerequisites and Connection

- SA version 2023.1 or newer
- Follow API's recommendations for the instrument mounting, set up and cabling.
- The default connection uses an ethernet connection and a 192.168.0.168 IP address.

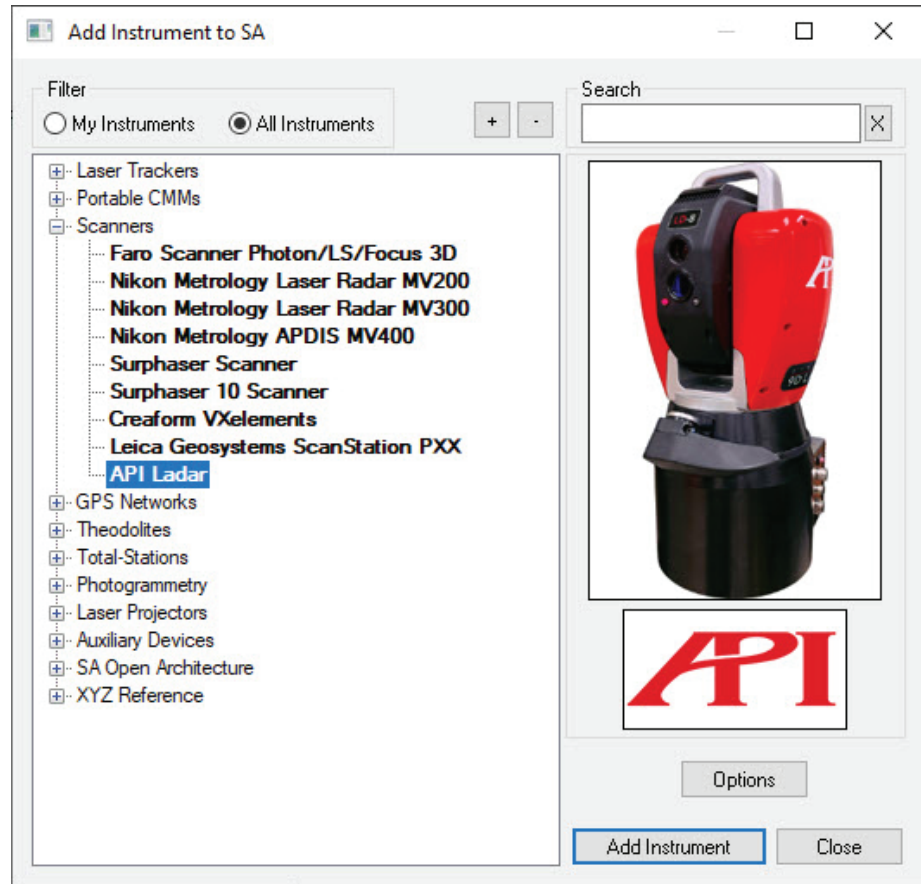
### Starting the Interface

1. Select **Instrument > Add** and choose the API Ladar from the *Add Instrument to SA* dialog (Figure 7-1).



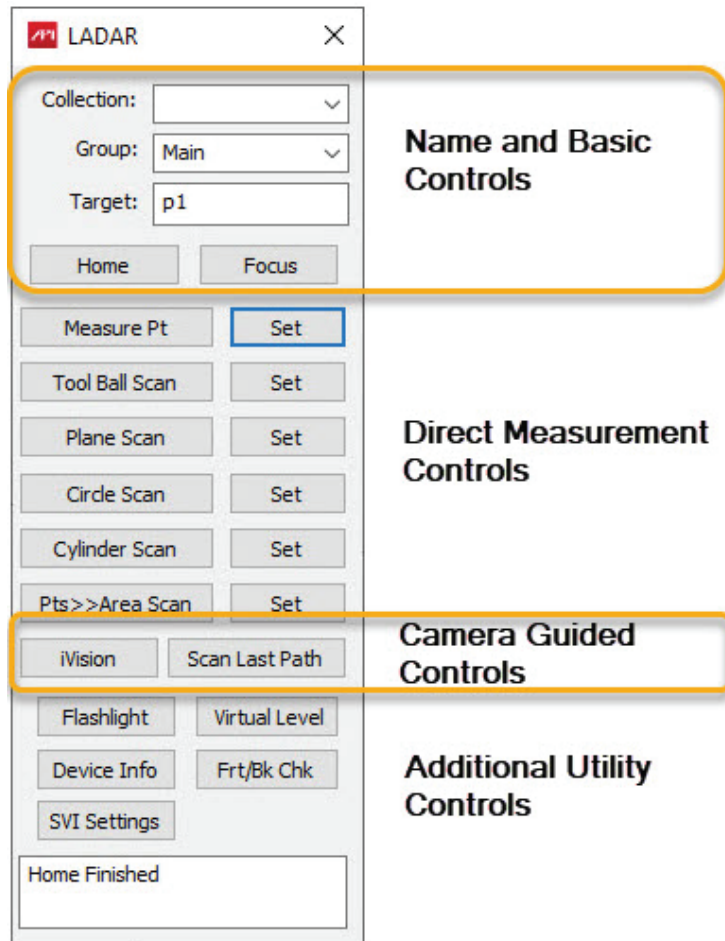
**Figure 7-1.** Add and Connect Button In SA on the Instrument Tab.

Under the **Options** button is the ability to control the default instrument placement and the ability to add a stand, if desired. You can also choose to auto Run the instrument when it is added (Figure 7-2).



**Figure 7-2.** Add New Instrument Selection Dialog

2. Now run the instrument interface module using the **Connect** button. The interface will then open (Figure 7-3).



**Figure 7-3.** API Ladar Interface

## Naming and Basic Controls

At the top of the API Ladar interface is a set of utility controls.

- **Collection:: Group:: Target.** The name control identifies the name of the next acquired point taken from the instrument.
- **Home.** Return home to the LADAR mounted nest and return to original position.
- **Focus.** Performs a beam focus operation at the current location.

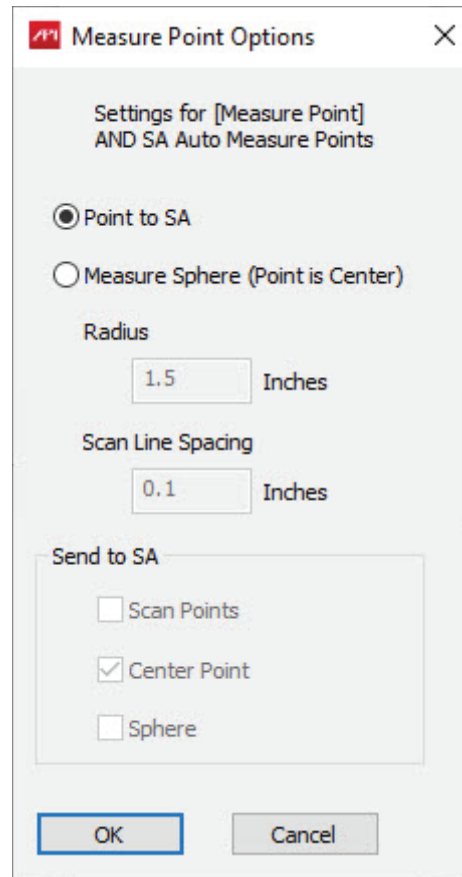
## Direct Measurement Controls

### Point Measurements

Basic measurements at the current beam location can be accomplished by pressing the *Measure Pt.* button.

- **Measure Pt.** This Option offers two options using the [Set] button: Send **Point to SA** and **Measure Sphere**. Point to SA Measures a point at current location and sends to SA. Selecting Measure

Sphere will perform of a scan of a sphere of a given size and the desired data will be returned (Figure 7-4).



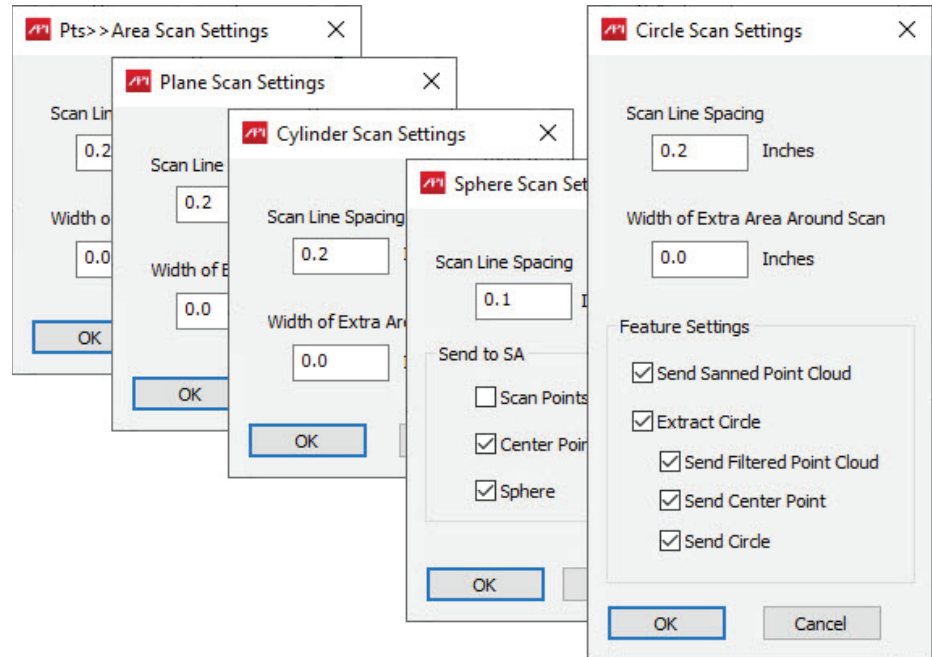
**Figure 7-4.** Measure Points Options.

## Measuring SA Objects

Direct measurement of selected objects can be performed with the Tooling Ball, Plane, Circle, and Cylinder Scan buttons. In each case the scan will use the settings saved for the feature type (Figure 7-5).

- **Tool Ball Scan.** Select sphere(s) from SA to measure. The [Set] button offers control over the scan parameters to use (Scan Line Spacing and data format to send).
- **Plane Scan.** Select plane(s) from SA to measure- The [Set] button offers control over the scan parameters to use (Scan Line Spacing and Width of Extra Area Around Scan).
- **Circle Scan.** Select circle(s) from SA to measure - The [Set] button offers control over the scan parameters to use (Scan Line Spacing and Width of Extra Area Around Scan, and what return data to record in SA).
- **Cylinder Scan.** Select cylinder(s) from SA to measure- The [Set] button offers control over the scan parameters to use (Scan Line Spacing and Width of Extra Area Around Scan).

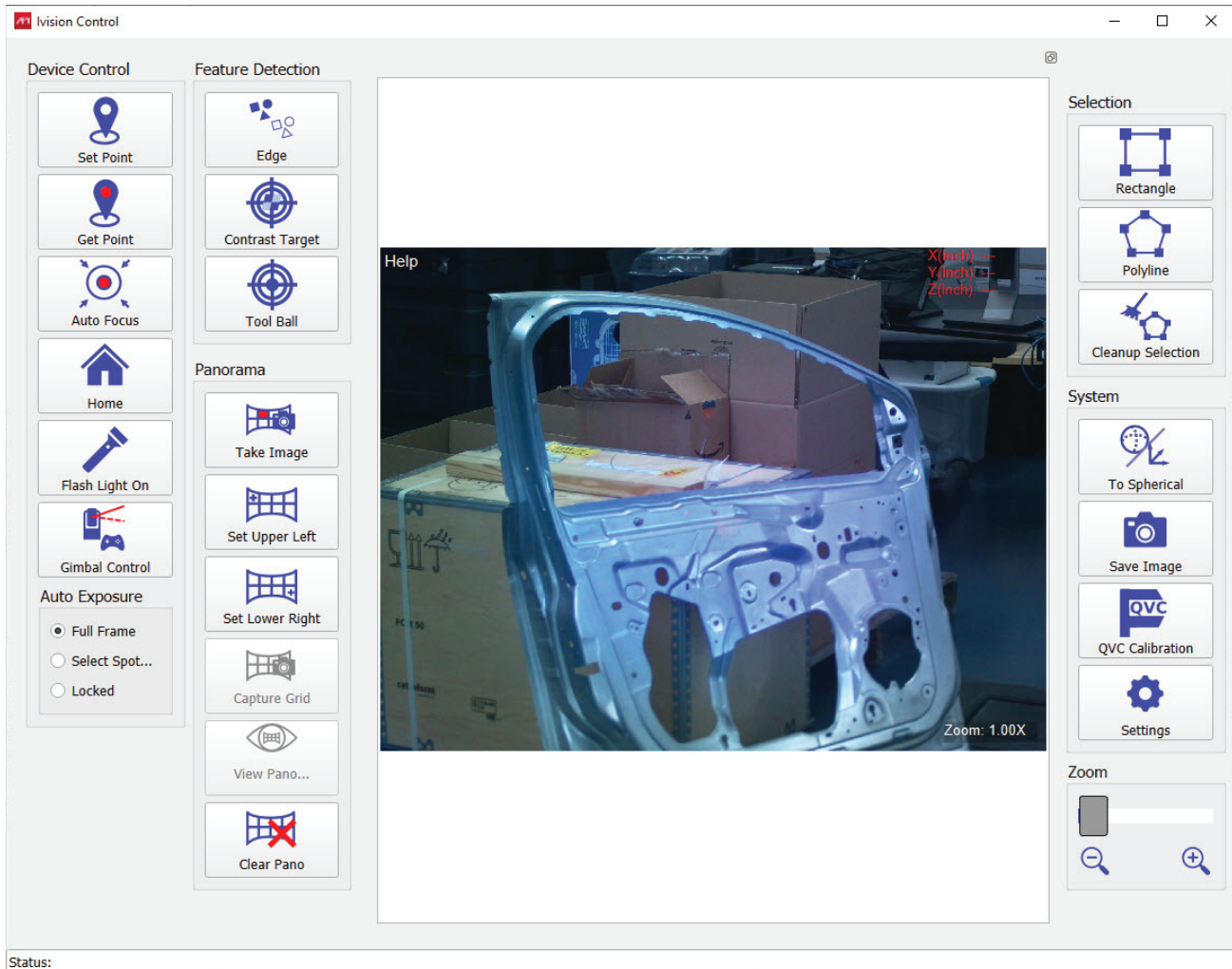
**Figure 7-5.** Setting Controls for object measurement operations



## Camera Guided Controls

### Measuring with the Camera

- **iVision.** This button will open video window which also offers near complete measured control (Figure 7-6).



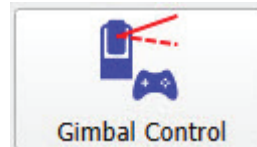
**Figure 7-6.** API iVision Screen

Refer to the API Ladar documentation for details on the use of the iVision Camera and its capabilities.

Common operations include:

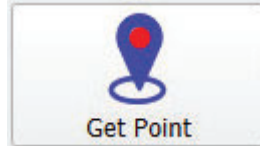
*Point Measurement:*

1. Drive the beam by clicking in the view. You can do this by clicking or by enabling the **Gimbal Control** which allows you



to click and hold to drive.

2. Under **Device Control** press the **Get Point** button.



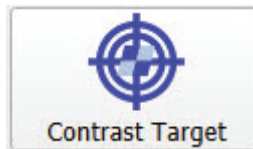
A point will be created in SA using the name currently entered in the interface. It will also be marked in the camera view.

3. Repeat as needed.

#### *Feature Detection:*

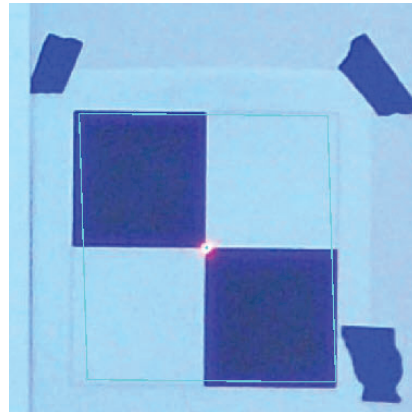
To measure a contrast target for example you have a couple of options.

1. Within the camera view you can press the **Contrast Target** but-



ton.

2. The vision control will search the camera view and identify targets in the view. You can then click on one to center on that target ([Figure 7-7](#)).



**Figure 7-7.** Centered on a Contrast Target in the camera view

3. You can use the **Get Point** button to trigger a measurement centered on the target.

Alternatively you can scan a contrast target and then extract the center point from within SA using the point extraction tool on the Instrument tab of the ribbon.

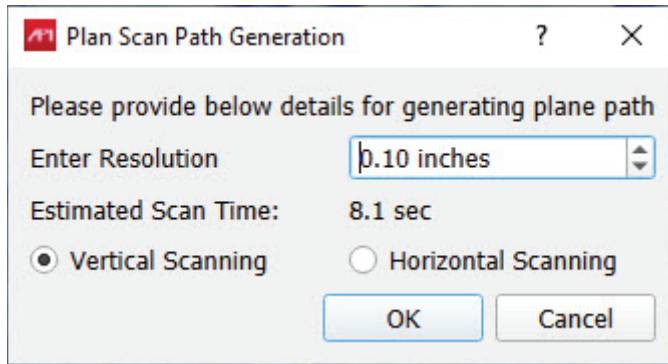
#### *Region Measurement:*

1. Select **Rectangle** or **Polyline** from the Selection section.
2. Define region to scan. In rectangle mode you click and drag to draw a rectangular region. In Polyline mode you click to define a perimeter in the camera view.
3. Right click on the region in the view and select Define Region. This is where you control the resolution of the scan ([Figure](#)



7-8).

**Figure 7-8.** Rectangular Region Settings



4. To begin the measurement, close the iVision window or bring up the interface control and press the **San Last Path** button within the instrument interface.

*Image Capture:*

The Ladar offers both individual image capture and the ability to de-

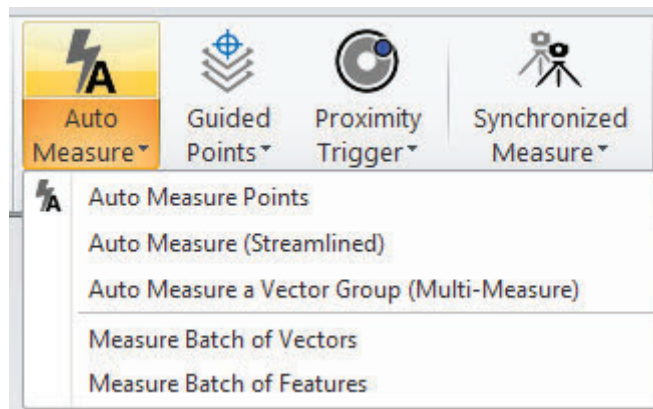


fine panoramic image.

In either case the image will first need to be saved (using the **Image Save** button) to disk and can then be transferred to SA by simply drag-drop in the SA graphics, or directly into an SA report, to add it as an embedded file for use in a report.

### Auto-Measure Operations

Supports the following in the SA >> Instrument >> Automatic Measurement menu(**Figure 7-9**):



**Figure 7-9.** Auto Measure Controls Within SA

- **Auto Measure Points.** Measures a point group and offers full control over the measurement process including repeat options.
- **Auto Measure Points (Streamlined).** Offers a quick means of



measuring a point group.

- **Auto Measure Vector Group (Multi-Measure).** Offers a full control dialog for measuring selected vectors within a vector group. The [SVI Settings] button can be used to control the resolution and tolerance of the scan process.
- **Measure Batch of Vectors.** Offers a quick way to measure all the vectors in a selected vector group. The SVI Settings button can be used to set the Surface Vector Intersection (SVI) resolution settings used by the Auto Measure Batch of Vectors function.
- **Measure Batch of Features.** Measures a series of GR-Features using the nominal object as the reference. It uses the individual [Set] button settings per feature type to control the resolution of the scan and the saved data.
- **Pts >> Area Scan.** This button will prompt the user to select points from SA to form a scan area (rectangle). It will then immediately scan and return a cloud using the saved settings within the corresponding [Set] button.

## Additional Utilities

- **Flashlight.** Toggles flashlight on/off
- **Virtual Level.** Performs virtual level operation and saves the results to SA Instrument History.
- **Device Info.** This operation will retrieve device information from the ladar and save this to the SA Instrument History. The instrument history can be accessed by right-clicking on the instrument in the tree.
- **Frnt/Bk Chk.** Perform a Front/Back check on the current location, and send results to SA Instrument History.

Status Box at Bottom of Interface Window - reports current status/pending action

\* Note: the unit takes several seconds to shut down and disconnect when the interface is closed "Disconnecting..." will show in status box.

## **MP/SDK Integration**

The following MP commands are supported for the Ladar:

- **Point At Target.**
- **Auto Measure Points.**
- **Auto-Measure Vectors.**
- **Auto-Measure Surface Vector Intersections.**
- **Auto-Measure Batch of Vectors**