
CimCore PowerINSPECT Scanning User Guide

by Delcam plc



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About this guide

This guide provides details on:

- Calibrating the laser probe.
- Setting the scanning parameters that control how data is recorded to PowerINSPECT.

Calibration is necessary to allow PowerINSPECT to measure parts accurately, and is carried out by measuring a calibration artefact with the laser probe.

The guide assumes that you have already assembled the particular hardware that you are going to use, and that you have installed the necessary drivers and software.

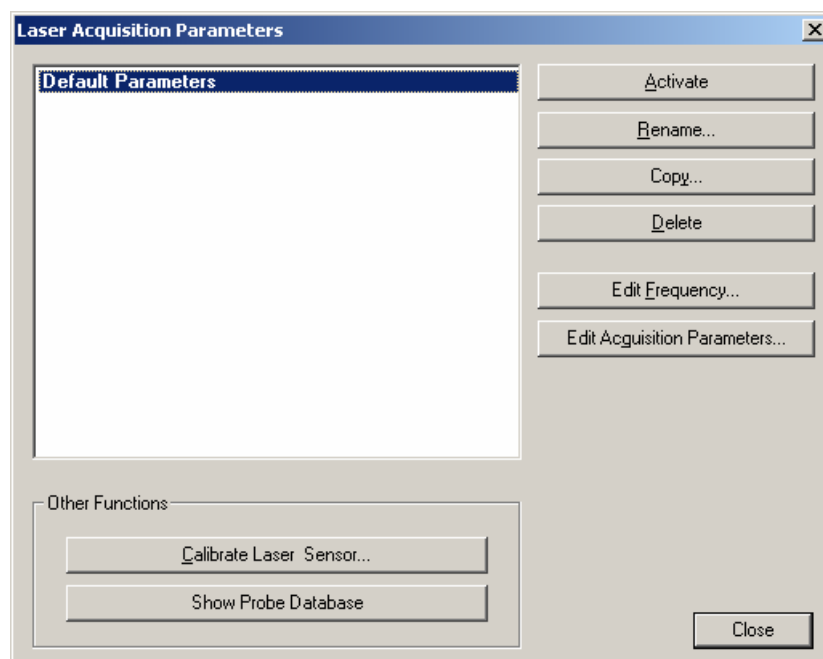


For all other information on the general use of PowerINSPECT, you should refer to the PowerINSPECT Reference Help.

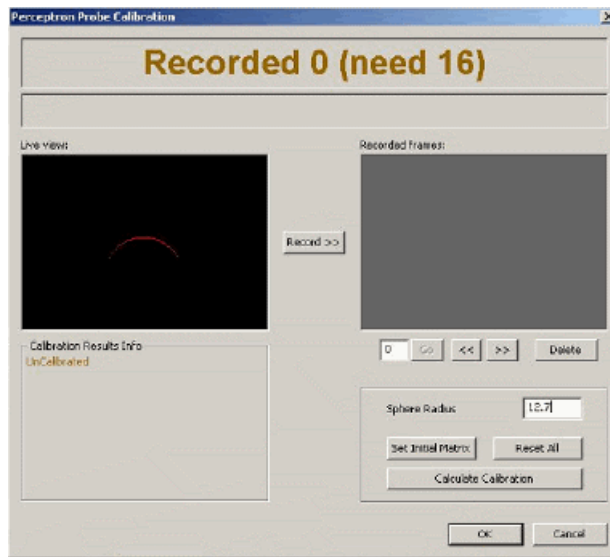
Calibrating Perceptron laser probes on CimCore arms

This method involves calibrating the Perceptron laser probe using the supplied calibration sphere:

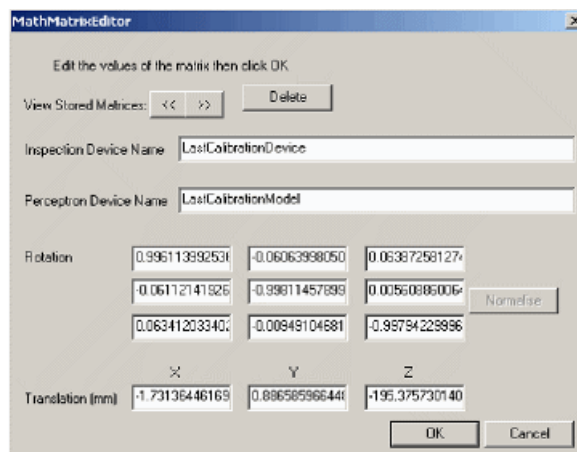
1. Click the **Change Probe** button  on the **Machine** toolbar (see page 5) to display the **Laser Acquisition Parameters** dialog:



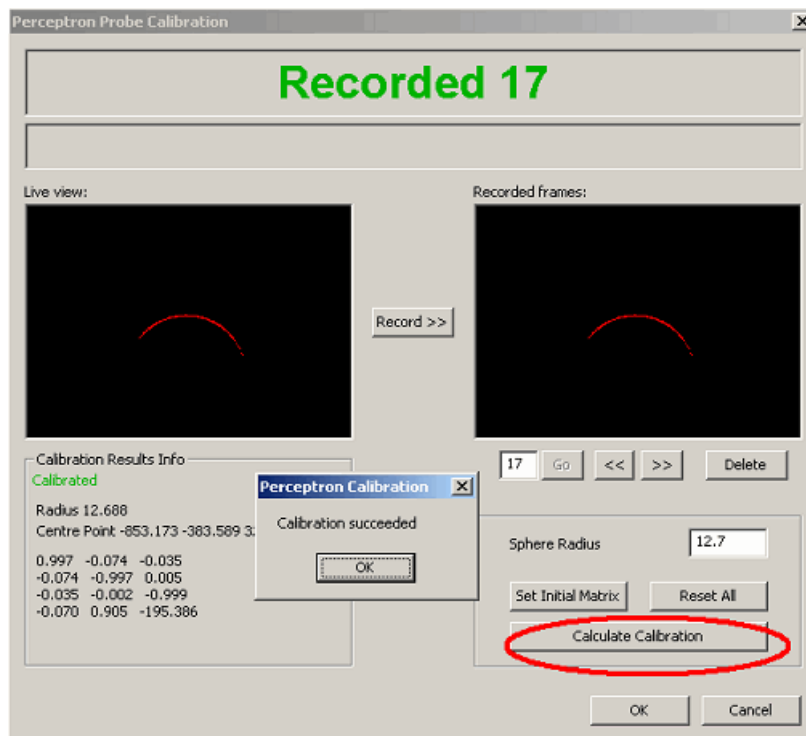
2. Click the **Calibrate Laser Sensor...** button to display the **Perceptron Probe Calibration** dialog:



3. In the **Live view** window, ensure that there is a valid frame on the calibration sphere, and then click the **Record >>** button to capture the frame in the **Recorded frames** window.
4. Repeat the previous step until you have captured at least sixteen frames around the entire calibration sphere. You can use the **<<** and **>>** buttons to navigate through the frames, or type the number of the recorded frame in the box to the left of these buttons, and then click the **Go** button to view the frame. You can also use the **Delete** button to remove the frame currently shown in the **Recorded frames** window.
5. Type the diameter (in mm) of the calibration sphere, in the **Sphere Radius** box.
6. Click the **Set Initial Matrix** button to display the **Math Matrix Editor** dialog:




7. Enter the correct values for the exact type of arm and laser probe you are using. Please consult your Perceptron dealer for further information.
8. Click the **OK** button to set the matrix values and close the **Math Matrix Editor** dialog.
9. Click the **Calculate Calibration** button to calibrate the laser probe:



10. Click the **OK** button to close the **Perceptron Probe Calibration** dialog.






Machine toolbar

If the **Machine** toolbar is not currently displayed in PowerINSPECT,

click the  button on the **Main** toolbar (this button toggles the display of the **Machine** toolbar on and off):




The **Machine Toolbar** buttons allow you to communicate with your measuring device. A brief summary of the buttons available on this toolbar is shown below:

Button	Description
	Connects PowerINSPECT to your measuring device.
	If the measuring device is a CNC/DCC controlled machine, this button moves the probe head to the home position.
	If the measuring device supports it, the Tracking Box button (see page 12) displays the current coordinates for the laser probe, and allows you to adjust various parameters.
	Shows the current status of the measuring device.
	Click this button to set the scanning parameters (see page 6) for your measuring device.

Setting the scanning parameters

Setting the scanning parameters controls how the laser probe records point cloud data to PowerINSPECT.

To access the parameters for the particular laser probe, you must first ensure that the laser probe is the active probe on the arm.

You set the parameters by clicking  on the **Machine** toolbar (see page 5) and then configuring them according to the type of feature being measured:

- when inspecting geometric features, you are advised to use unfiltered points (100% density):
- when inspecting surfaces, you are advised to use points filtered to approximately 25%.

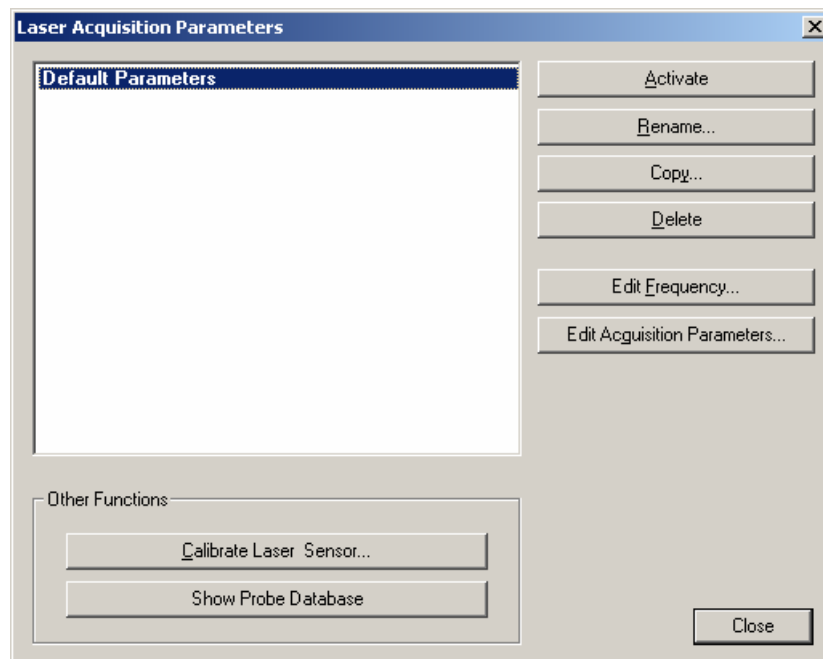


Experiment with the settings to discover what works best for you.

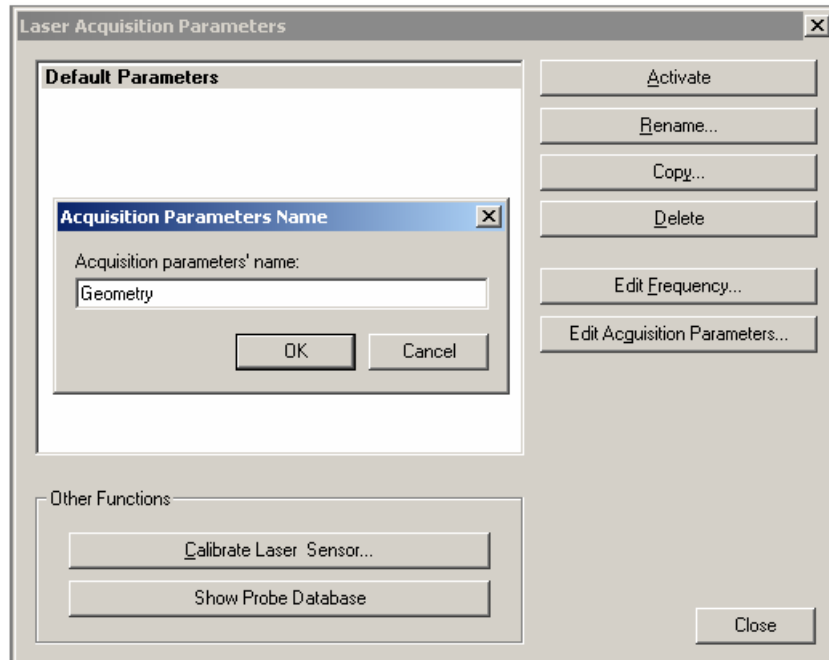
Configuring the parameters on a Perceptron laser probe

1. Ensure that the laser probe is attached to the arm.

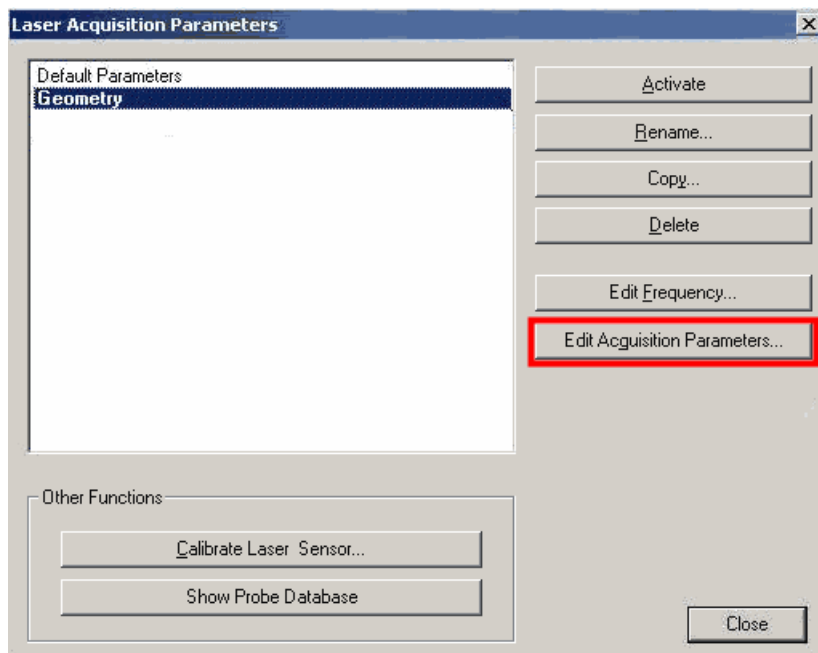
2. Click  on the **Machine** toolbar (see page 5) to display the **Laser Acquisition Parameters** dialog:



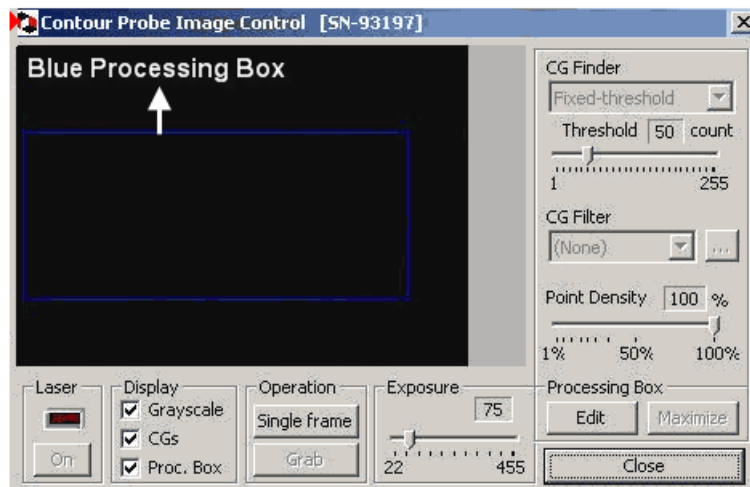
3. Initially, only the **Default Parameters** parameters are listed. Click the **Copy** button to duplicate them under a more specific name, for example **Geometry** for the specific parameters relating to the measurement of geometric features:



4. Select the set of parameters you want to work with:



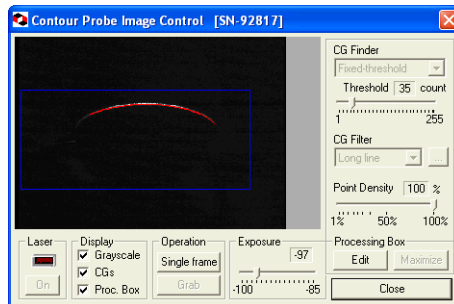
5. Click the **Edit Acquisition Parameters** button to display the **Contour Probe Image Control** dialog:



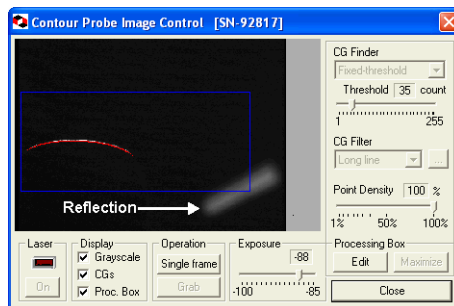
In the **Operation** area, there are two modes:

- **Single frame** – Use this mode to edit the parameters for the laser probe.
 - **Live video (Grab)** – Use this mode to monitor the 'view' of the laser probe in the dialog window.
6. Click the **Single Frame** button, and then use the following settings for the laser probe:
- **CG Finder** – Select the **Fixed-threshold** option.
 - **CG Filter** – Select the **Sprinkle** option (this is the option for all other operations other than calibration, which requires the **Long line** option).
 - **Point Density** – When inspecting geometric features, or calibrating, set the density to **100%**. When inspecting surfaces, set it to **25%**.
 - **Processing Box** - Ensure that any geometric features you scan are within the constraints of the blue processing box. Use the **Edit** button to adjust its size, and the **Display** option **Proc. Box** to show or hide the processing box in the dialog window.

- **Threshold** and **Exposure** – These settings are related. Click and drag on the sliders to obtain the best possible image in the dialog window. Balance the parameters to achieve a strong red line, which represents the points, while also maintaining a sharp white line, which represents the camera's view of the points:

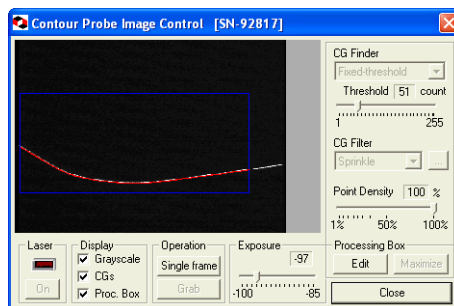


If the **Exposure** is too high, images from reflections or other light sources may appear:

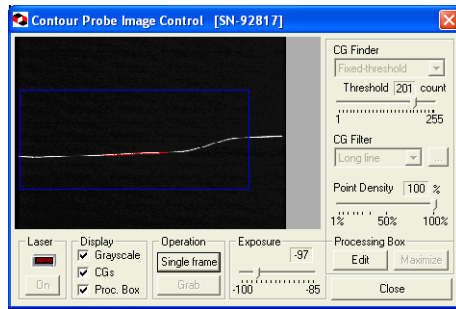


Alternatively, the surface itself may be too reflective, resulting in the image being flared, or the white line may be too broad and indistinct. If the **Exposure** is too low, the white line appears very dim (if at all).

Use the **Threshold** slider to determine the brightness needed to convert the white image into red points:



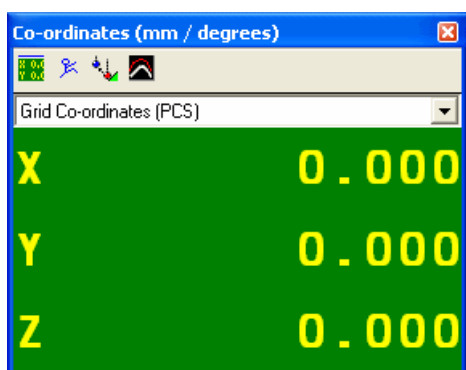
If the **Threshold** is too high, the white line cannot be converted into red points, for example:



The **Threshold** should be just low enough to produce a strong red line.


Adjusting parameters during an inspection

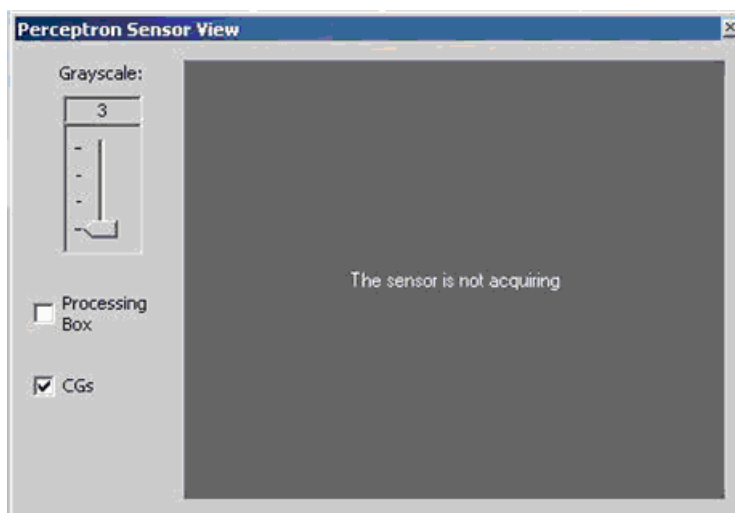
To adjust scanning parameters during an inspection session, click on the **Machine** toolbar to display the **Co-ordinates** dialog:




Click  to adjust the parameters.

Perceptron Sensor View dialog

Clicking  on the **Co-ordinates** dialog (see page 12) displays the **Perceptron Sensor View** dialog:



*You can also display the above dialog if you right-click the **Delcam CMM Driver**  icon in the taskbar and then select **Sensor View** from the context menu.*

You can adjust the following laser probe settings:

- In the **Grayscale** area, click and drag the slider to adjust the brightness, in the white camera view, of the points acquired by the laser probe.
- Select the **Processing Box** option. The box is displayed in the **Contour Probe Image Control** window (see page 7) in blue. Ensure that any geometric features you scan are within the constraints of the box.
- If you do not want to view the red line representing the points acquired by the laser probe, click to deselect the **CGs** option.