

# Surface Plane Advanced

## Purpose

The Plane Advanced tool provides measurements that report a best-fit plane's key features, e.g., normal and flatness.

Compared to the Surface Plane tool ( [Surface Plane Tool User Manual](#) ), this advanced version is more robust and is not overly dependent on the location of ROI due to a different algorithm, as shown in the above images.

## Inputs

Inputs	
Surface Input	Replay/Surfac...
Name	Description
Surface Input	The surface data (point cloud or uniform) that the tool will apply measurements to.

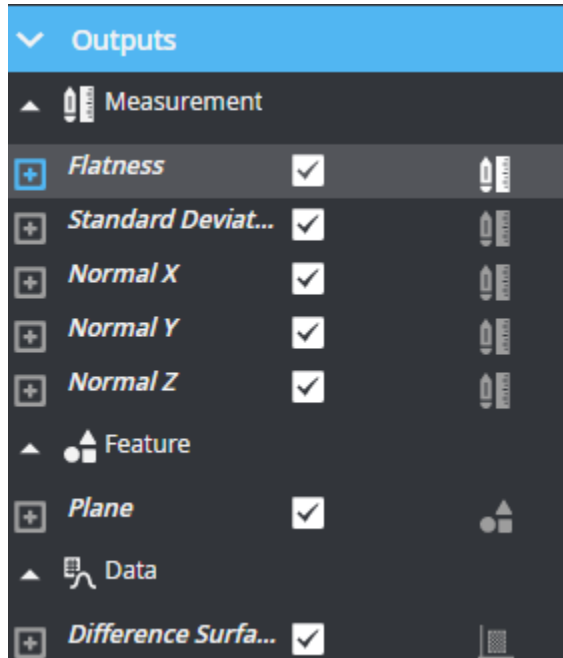
## Parameters

Parameters	
Use Region	<input type="checkbox"/>
Detection Mode	Eliminating outliers
Outlier Elimination	0.100 %
External ID	SurfacePlaneAdvanced-0
Detection Mode	Eliminating outliers
Outlier Elimination	0.100 %
External ID	SurfacePlaneAdvanced-0
Outputs	Eliminating outliers
Measurement	Using all points

Name	Description
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Use Region	When enabled, show a Region parameter.
Region	The region to which the tool's measurements will apply.
Detection Mode	<p>The plane detection mode. One of the following:</p> <p><b>Largest Area</b></p> <p><b>Plane at Top</b></p> <p><b>Plane at Bottom</b></p> <p>Use these options when more than one plane fit is possible in the region.</p> <p><b>Eliminating outliers</b></p> <p>Uses all data points of the scan data in the region, with some points with a maximum distance to the best-fit plane being considered as outliers, and excluded from the calculation.</p> <p><b>Using all points</b></p> <p>Uses all data points of the scan data in the region.</p>
Outlier Elimination	<p>This parameter is only related to the measurement output <b>Flatness</b> which is very sensitive to outliers.</p> <p>In detail, after we get the best-fit plane, the parameter will provide a way for the users to remove some points with a maximum distance to the best-fit plane being involved in the <b>Flatness</b> calculation</p>

## Outputs



Type	Name	Description
Measurement	Flatness	Flatness of the valid points to the best-fit plane
Measurement	Standard Deviation	The standard deviation of the data points from the fitted plane.
Measurement	Normal X/Y/Z	Normal vector of the best-fit plane
Feature Plane	Plane	The best-fit plane
Uniform Surface	Difference Surface	Shows the fit error at each point of the plane.

## Major Revisions (GDK 6.1.37.9)

- The name of this tool in Classic is “Surface Plane Fit”, in GoPXL, we decided to rename it as “Surface Plane Advanced”. This tool belongs to the Beta category.

- Removed the measurement “Processing Time” from GoPXL
- Removed the checkbox “Output Difference Surface” from GoPXL
- All the processed results are identical between the two versions.
- Speed performance is comparable based on [this test case](#) without adding any reason and using the tool default parameters.
  - GoPXL ~37.937ms/frame
  - Classic ~35.825ms/frame

## Application Examples

