LMI TECHNOLOGIES

# Profile Line Intersect Tool User Manual

## 1. General introduction

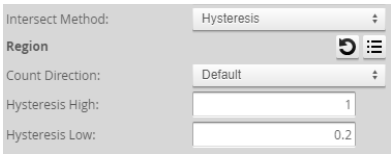
This tool is very handy to calculate the intersection point between a feature line and a profile. Two methods are provided:

1) Simple: Using this method, the intersection is simply calculated by intersecting the line with the current profile. If multiple intersections exist, users can select the point with a desired index.
2) Hysteresis: This method is often used to automatically detect the side points of an object lying on the flat surface. For example, when measuring the width of an object located on a plane, the left/right side points can both be detected using this tool and the width can be calculated by profile dimension. To detect the side point, a low and a high threshold must be chosen, see Section 2 for detail.

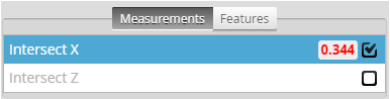
A feature line input is a prerequisite. Therefore this tool should be used with tools such as profile line. A region is provided so that the user can mask out some points not intended for intersect calculation.

This tool supports both uniform profile and profile point cloud.

## 2. Parameters and Output

| | | |
|---|---|---|
| Line | Feature line as input |  |
| Intersection Method | **Simple** |  |
| Region | Region of interest to find the intersection point. Intersections outside of the region are ignored. | |
| Count Direction | Option: Left to Right / Right to Left. | |
| Index | If multiple intersections exist, users can select the point with index. | |
| Intersection Method | **Hysteresis** |  |
| Region | Region of interest to find the intersection point. Intersections outside of the region are ignored. | |
| Count Direction | Option: Default / Reverse.<br>In the internal algorithm, the search is performed from one side or the other. The selection decides where the found point lies, on the left or right side, or at the top or bottom (for point cloud only when profile appears vertical). | |

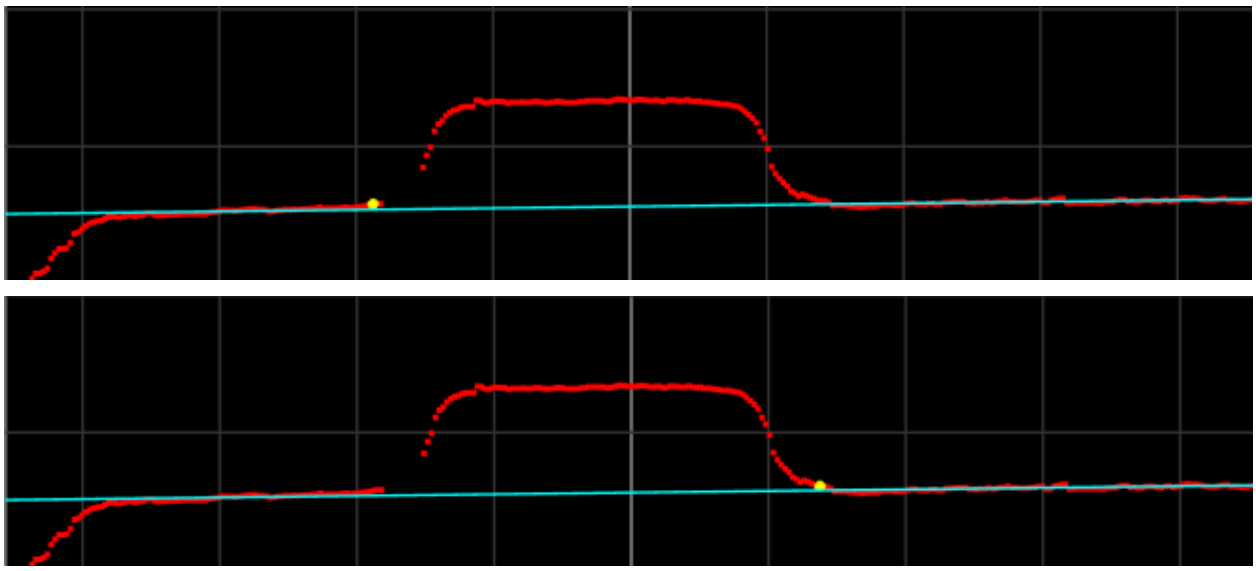
+1 604 636 1011
+1 604 516 8368
info@lmi3D.com
www.lmi3D.com
HEADQUARTERS
9200 Glenlyon Parkway
Burnaby, BC V5J 5J8
Canada

| | | |
|---|---|---|
| Hysteresis High | When searching for the feature point, the process searches along the profile in the direction of “Count Direction”, until it reaches a point with a distance-to-line equal/superior to “Hysteresis High”. This threshold ensures that part of the object above/below the feature input line does exist instead of mistakenly considering random noise as the intersection point. | |
| Hysteresis Low | Any point with a distance-to-line equal/inferior to “Hysteresis Low” will be considered as points on the line. Along the search direction with the first hit of “Hysteresis High”, the last point found within “Hysteresis Low”, will be output as the final intersect point. | |
| Measurements and Features | Intersection X and Z coordinates as measurement output. Intersection point as feature output. |  |

## 4. Application Example

Since the simple method is very intuitive. Here provides an application showing the usability of the tool using the Hysteresis method.

Following figure shows an electronic product with an element on a plate. The blue line shows the feature input line detected by Profile Line tool. By using hysteresis method with high threshold set to 0.05 and low threshold set to 0.01. The algorithm well detected the two sides of the element, the width of which can be calculated thereafter.



+1 604 636 1011
+1 604 516 8368
info@lmi3D.com
www.lmi3D.com

HEADQUARTERS
9200 Glenlyon Parkway
Burnaby, BC V5J 5J8
Canada