

TerraScan: Draw Plane Section Tool

TerraScan, versions 017.039 and above



GeoCue Group Support

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Revision 1.0

Introduction

A new tool has been introduced to TerraScan's [View Laser](#) tool box called "[Draw plane section](#)" (Figure 1). This tool can prove very useful when vectorizing planar features from a dataset. Using the previous viewing options (Draw section, etc.), it can be difficult and tedious to manually draw in a required line work at the correct position. This new tool restricts the drawing of the line work to the plane equation of the points used to create the Plane Section view. This feat is accomplished by the sampling of points on a surface and deriving a plane equation. TerraScan then determines which points fit to that plane and draws the section view of that plane.

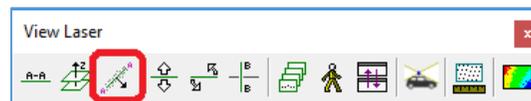


Figure 1: View Laser Tool Box

The Tool, how it works

To use this tool, start it from the View Laser tool box, MicroStation Ribbon, or key-in command, "Draw Plane Section". There are several settings in the tool dialog that opens (Figure 2). Set which classes from which to determine the plane equation (i.e. walls, signs, etc.). Users take samples of a surface to determine the plane equation for that object. The degree of fit that determines if a point is part of the planar surface is determined by the Tolerance and Depth settings. The software has the capability to force the calculated plane to be perfectly vertical or horizontal, if the plane equation is within two degrees from vertical or horizontal. It can also filter points based on their dimensions as determined through [Normal Vectors](#). Using this tool in conjunction with [TerraPhoto](#), imagery can be displayed in the plane section view to assist in digitization or feature review.

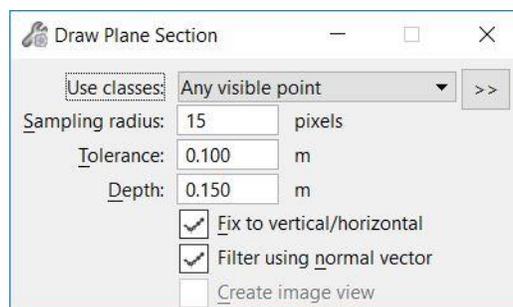


Figure 2: Draw Plane Section dialog

After the settings are defined, take sample data clicks on the points representing a planar surface. The color of the points will change, indicating that they are a part of the computed plane. After sampling of the surface, data click into another MicroStation view to see only the points on that plane from a

perpendicular perspective. From this new section view, MicroStation linework can be drawn directly onto the plane of the feature.

Examples

The first example is the use of the Draw Plane Section view to assist in the digitization of windows on the side of a building (Figure 3 and Figure 4). Since the side of the building is relatively large and not perfectly planar, multiple samples had to be taken to derive a suitable planar equation (Figure 3). In this case, the first sample data click was placed on the left side of the wall, resulting in an incomplete surface (yellow points). Taking another sample data click on the right side of the wall enabled the software to derive a plane that better fits to more points on the wall.



Figure 3: Plane equation on side of building. The blue points are Wall classification, and the yellow points are wall points that are determined to be a part of the same plane. **Left:** the plane as calculated after a single sample data click. **Right:** the plane as calculated after two sample data clicks.

After sampling the plane, and then data-clicking in another view, we can zoom into a single window and digitize its outline using “place smartline” (Figure 4). You can see that the linework was placed on the computed plane.

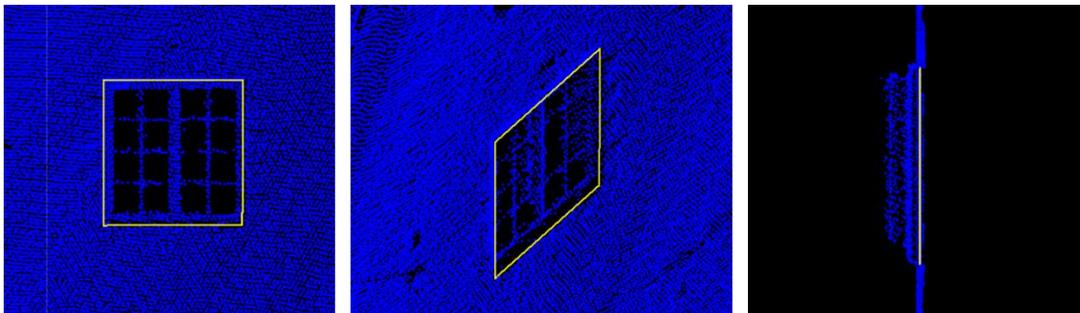


Figure 4: Digitalization of window sill. **Left:** Digitization as seen in the Plane Section view. **Center:** view of window sill from an oblique angle. **Right:** view of window sill perpendicular to the plane.

Another example is the use of the Draw Plane Section to assist in the digitization of street signs (Figure 5). A single sample data click on the house-shaped street sign was required to generate a suitable plane equation. The linework for the sign can then be easily placed in the planar section view, and the lines will be flush with the sign.

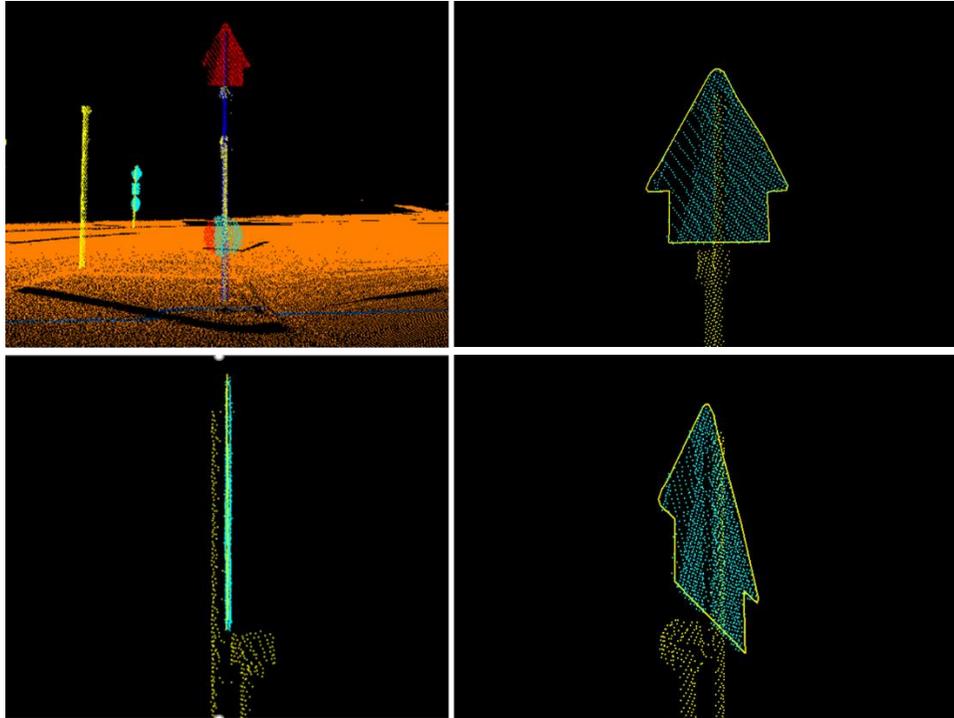


Figure 5: Digitization of a sign using the Plane Section view. Ground points are orange, pole points are yellow, and sign points are light blue. **Top Left:** a single sample of the plane on the house shaped sign. In this case, the sampled points are red. A dark blue line is projected onto the ground surface as a visual cue as to the orientation of the calculated plane. **Top Right:** Digitization as seen in the Plane Section view. **Bottom Left:** The Digitization as seen perpendicular to the plane. **Bottom Right:** The digitization as seen from an oblique angle.

The Draw Planar Section tool will prove to be a great support to feature digitization in projects that visualize vertical planes. If you have any questions on this new tool or associated workflow, please do not hesitate to contact us at support@geocue.com.