LiDARData.Net

User's Guide

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INTERNATIONAL

We Make a Difference

Contents

Publisher User Guide

The purpose of this document is to present the user with the procedures to successfully access and use the LiDARData.Net web map dialog. All project related Maps can be found on your organization's section of www.LiDARData.Net.

Gaining Access

1. Log Into www.LiDARData.net via Google Chrome, Firefox, or Microsoft Edge. Internet Explorer doesn't support HTML5.
   - If you do not have an active account, please email LiDARDataSupport@mbakerintl.com
   - Click "Sign In" on the right side of the dialog

After successfully logging in, a new heading labeled **Maps** will become available.

2. Click on the Maps heading.

The contents of the Available Maps dialog will vary, depending on your permissions. In most cases a client will have access to any publications assigned to them along with two demo maps that contain examples of various datasets and visual representations. Please note that the Sample Publication located on the "Home" page is the same as the Mobile LiDAR Demo publication shown under "Demo" on the Maps page.
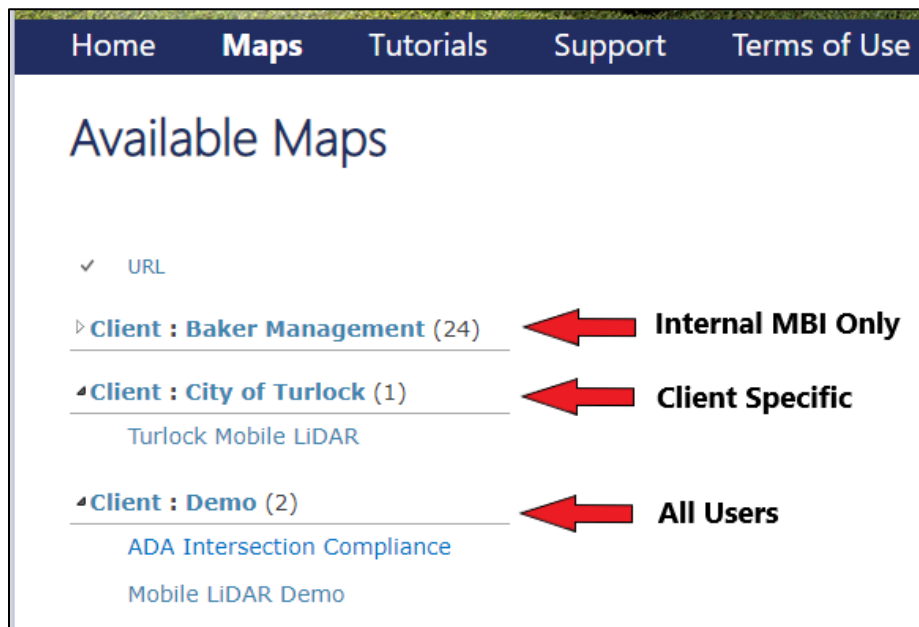
Please note that a new setting at version 22.4 allows the user to modify the Style of the publication. The visualization of the publication will depend on this setting. By Default, the style is set to Browser meaning whatever setting you have for the style of the browser will take precedent. For example, this examples for this documentation are being taken from a computer where the theme is set to Dark Mode, hence the darker color. This can be manually changed to either Dark or Light Mode in the General Settings. The style settings have no impact on the functionality of the software or the visual display of vector, raster, and mobile LiDAR data.
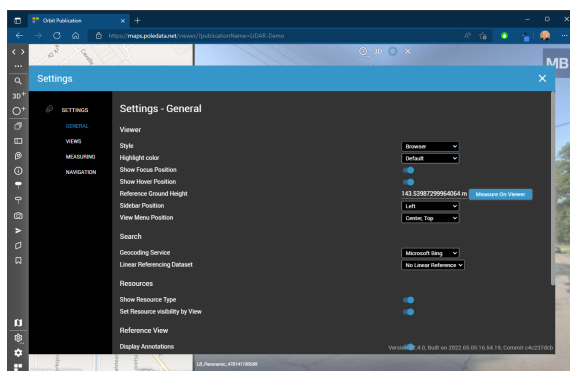
VS.
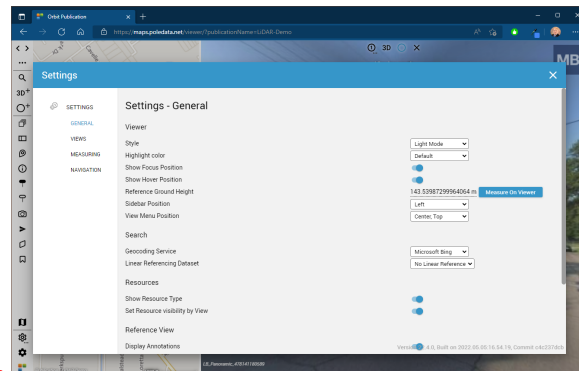
Getting Started

Publications have two separate security options for access to a publication. The first requires a username and password. This username IS NOT the same username utilized for the main LiDARData.net web page.

Other publications, like the lidar demo page, are shared publicly and do not require credentials for access. Usernames and passwords for organizations and/or individual users will be distributed on a project-by-project basis.

If any error messages are displayed underneath the user access area, please make a screenshot of the error message and send it to LiDARDataSupport@mbakerintl.com.

Please note that in some instances, the panoramic imagery may not immediately display and instead the user will see a blank view. This can be resolved by clicking the eye button at the top-center of the dialog and selecting "Spherical". This will turn on the panoramic imagery at the start point of the publication.
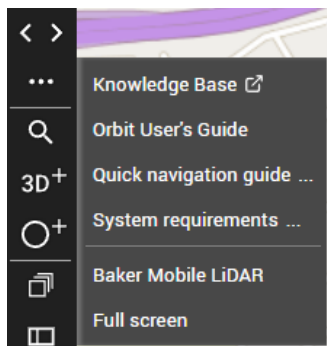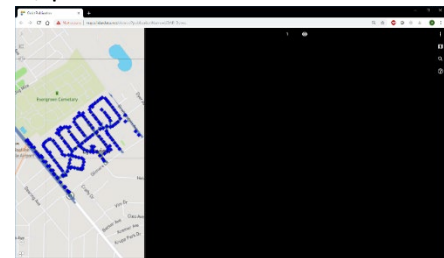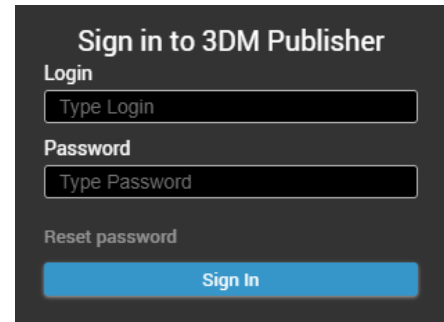
Navigating to the upper left corner of the publication, the user will see a series of buttons that serve various purposes. The top button, opposing arrows, expand and retract the sidebar seen on the left side of the screen. The next button, an ellipsis, gives the option to change the view to full-screen mode, removing the browser toolbars. Clicking F11 will return the view to its normal state. The top button includes a link to the Orbit knowledge base. Next, a link that allows for the download of this User's Guide. Below this link is another that provides a quick navigation guide detailing the various navigation techniques. Next, the system requirements can be viewed and finally, a link to the Michael Baker International Mobile LiDAR blog site is provided. All the topics discussed in this document can be found in the knowledge base. All available tools will be displayed on this toolbar. Each will be discussed briefly in this document.

Using the Web Publication

1. Most publications will be set up in a standard fashion with an overview map displaying a Bing Maps basemap on the left with the panoramic imagery on the right.
   - Note that the overview map is required for map publication but is not required for map usage after it has been launched.
   - To remove this frame, click on the left side of the map and select the icon directly below the right arrow. Click Workspace.
   - Select None for the Place Reference View option, Horizontal for the Arrange Views option. This will result in a window with two views, situated horizontal to each other. The user can experiment with these viewing options to best suit their needs.

2. Before moving forward, the user should review and alter the default map settings as needed. To open the settings dialog, click the gear symbol in the bottom of the table of contents in the lower left corner of the publication. Four separate categories of settings are available. For an in-depth discussion of each, please see the LiDARData.Net Settings Guide document located in the Support section of www.lidardata.net
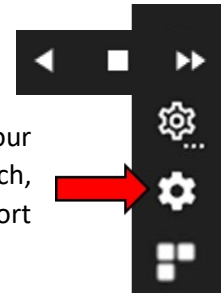
- The defaults can be maintained for the General and Viewing boxes. The user does have the option of changing many of the options if desired.
- The Measuring tab contains the projection and measurement units for the map. In most cases, the unit of measure will be set to Feet.
- The Navigation tab controls the mouse input settings and view synchronization. The default options can be used in most cases.
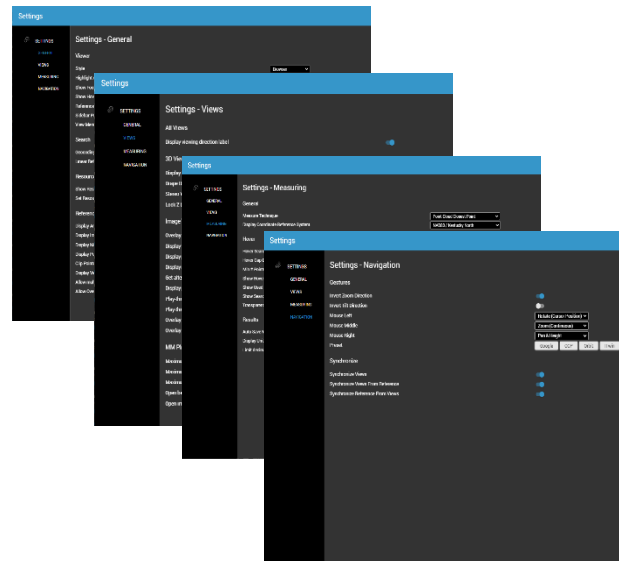
The Spherical View

By default, the spherical view will be what the end user sees when they first log into a publication. Users can pan and zoom, view vector datasets, change the overview background maps, and perform geocoding and XY coordinate searches.

In the middle-upper edge of the spherical view, there are four different icons. A number 1, 3D, a Circle, and an X.

Hovering over the number will display 7 different tools that can be used to navigate the spherical imagery. A single left click on the ellipsis under the number will pin the toolbar open. From top to bottom they are:

1. Move – Clicking the move button will activate a crosshair in the overview map. Clicking in a specific location in the overview map will change the POV in the spherical imagery to the location chosen. Additionally, the crosshair can be placed in the spherical view to change its location.
2. Info – A dialog with the metadata of the current panoramic image such as, the image name, coordinates, and coordinate system. This information can be help when trying to diagnose an issue.
3. Play – The play button will auto-increment the spherical view by one image at a time based upon the time settings set in the View Settings dialog. When activated, a new dialog will display a left facing arrowhead,

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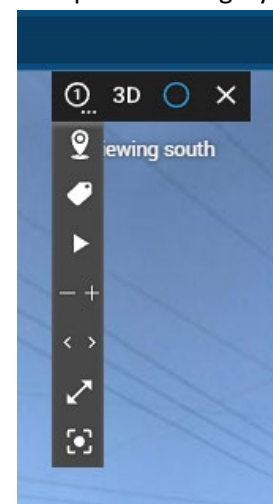
a square, and two right facing arrowheads. The left facing arrow will skip backwards the last 5 images while the two right facing arrows skip ahead 5 images. The square in between the two stops the current auto-increment. When stopped, the dialog displays an X between two opposite facing arrows. Clicking the X closes the dialog and returns to the original 4 options. Clicking the arrows will restart the auto-increment moving forwards or backwards.

4. Image Brightness – Clicking the "-" symbol will decrease the brightness of the image and clicking the "+" increases the brightness of the image.

5. Open Previous or Next Photo – The two arrows will manually display either the previous image or the next image, respectively.

6. Maximize the View. This tool maximizes the current image view. It will not maximize the entire dialog to full screen, it just maximizes to fill the entirety of the publication not covered by the reference map or toolbar. When expanded, the user can click the two inward facing arrows to reduce the view to its regular dimensions.

7. Focus All Views – Clicking this button will synchronize all views to meet the current extents of the view you use the tool in.

8. Close – If multiple views are open, this button closes that specific spherical view only, not the overall publication. If no panoramic imagery view remain after one is closed, the reference map will expand to fill the available space.

The 3D View

Clicking the 3D button will change the active map view into the 3D viewer. Depending on the density and size of the point cloud, it may take a few moments for the view to display fully. Multiple views with both the spherical and 3D views can be open at the same time. If no point cloud exists within the publication, it will turn black and display image point locations and/or vector datasets as configured within the publication settings. Clicking the circle button to the right of 3D will revert the view to the panoramic image at the current location.

Tool Sidebar

In most publications, the toolbar will appear vertically along the left edge of the publication. The location of the toolbar can me modified to meet the user's needs via the General Settings dialog.

1. Expand/Contract Sidebar - Represented by opposing arrows, this tool expands or contracts the toolbar. By default, the toolbar is collapsed thus requiring the user to expand it with the right facing arrow.

2. Info/Help Menu - In the Getting Started section of this document, we discussed the contents of the dialog accessed via the ellipsis button.
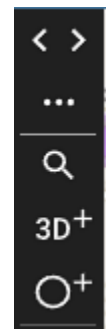
1. Search – The search dialog has three separate options. By default, the dialog is set to Search by Geocoding. If Geocoding is disabled in the publication, only the Annotations and Vector Attribute options will be available.
   a. Search by Geocoding
   b. Search by Annotations
   c. Search by Vector Attributes
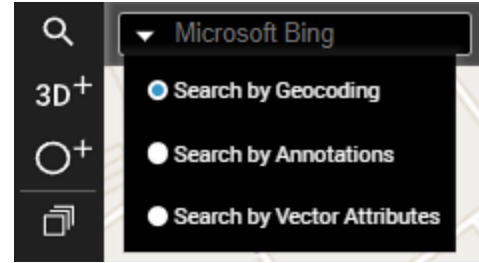
   The result of a search from all three options will focus the reference map on the location of that feature or address and open the image closest to that location in the current dataset. If nothing is located near a search result, a message stating that the image for that location does not exist.

2. Open 3D View – Activating this tool will turn the cursor into a crosshair that will then open a new 3D view anywhere you click within either the reference map or view (panoramic or 3D).
3. Open Panoramic View – As with the Open 3D view tool, this will open a new panoramic view anywhere withing a reference or view where there is data available.

Resources

The Resources tab provides access to the individual vector and LiDAR datasets that comprise a typical mobile mapping publication. As seen to the right, the resources toolbar provides the user with the option to turn resources on or off, control visibility by view, alter symbology for vector features, and alter the visualization options for points cloud datasets.
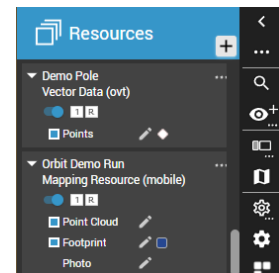
Point Cloud Resources

Mobile Mapping Resources – All point cloud resources will be identified as Mapping Resource (mobile) under the resource name. In the resources tab for the point cloud, there are three default options.

1. The first allows the user to turn on and off the point cloud and image points that are visible on the overview map. These features must be turned on in the global settings or they will not display.
2. The Point Cloud box simply turns the point cloud on and off. Clicking on the pencil button to the right of the Point Cloud button will open the Point Cloud Legend options.
   - Color By – By default this will be set to RGB. Other options are Fixed, Distance, Height, and Intensity. All the various ramp options will not be discussed here so the user should experiment with the options to get the most useful view for their task.
   - Ramp – Activated only when data is being colored by Distance, Height, and Intensity, the Ramp options allow the user to modify the visual representation of the point cloud.

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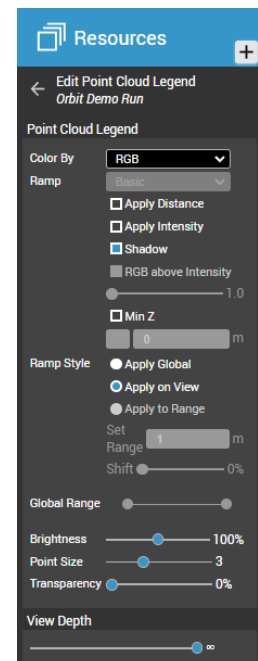
- A useful Ramp option is to activate the Shadow function. This can help sharpen the edges of the point cloud
- A recommended option would be to Set the Color to Height, the Ramp to Basic and click the box for "RGB above Intensity". This will produce a hybrid view that will allow the differences in elevation to be more discernable.
- Ramp Style, Brightness, Point Size, Transparency, and View Depth – Tools that can provide more flexibility for display options.

Vector Data Resources

Vector resources within a publication are the spatial representations of geographic features in 3 dimensions. Like the mobile mapping options, vector features have the same visibility options allowing for the features to be turned on and off. Clicking the pencil icon or the ellipsis in the upper right corner of the resource will open the legend editor for that specific layer.   At this point the user can change the visual representation of the features with this tool. The options, however, do leave much to be desired.   Default symbology is set up by the LiDARData.Net admin and is slightly more flexible than what is available here. The project manager should work with the LiDARData.Net admin to establish standard symbology for all features used on a project.

Note that any changes made in the legend editor are not permanent. They will only apply to the current map session. If a session is refreshed or opened again, the symbology will revert to the default established at the onset of the project.

At the top of the Resources toolbar there is a plus directly to the right. This allows the inclusion of resources that are not currently in the web map. As with symbology, this is limited to only the current open session. These can be added individually or from a directory. The following data formats are supported.

- Orbit Vector File (.ovf)
- Orbit Vector Tile (.ovt)
- Orbit XML (.oxf)
- Google KML/KMZ
- Web Feature Service (.owfs)
- Orbit Multiresolution Image (.omi)

- Orbit Point Cloud (.opc)
- Cesium 3DTiles (.3dtiles)
- Web-Ready Scalable Mesh (.w3sm)
- STereoLithography (.gltf, .glb)
- Orbit 3D Annotation File (.oaf)
- Orbit 3D Measurement File (.03m
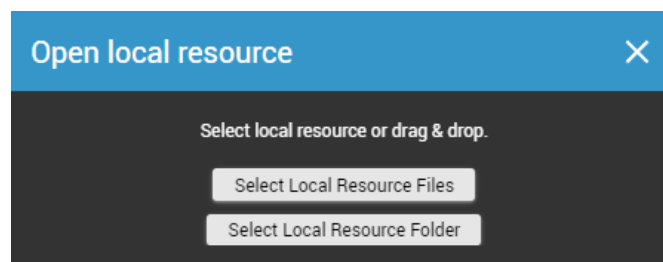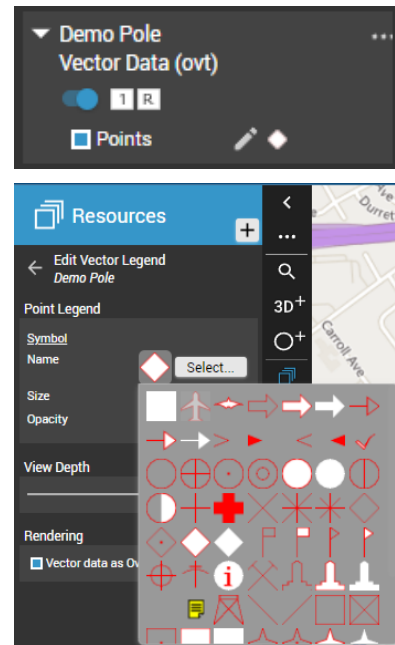
Workspace

Below the resources toolbar are the Workspace preferences. These settings allow the user to customize the layout of the Views within the publication along with changing background colors and establishing backdrops, both in 3D view. Views can be arranged in various configurations both vertically and horizontally depending on your project needs. Altered workspaces are only active for the current session. Please work with the LiDARData.Net administrator to design a default publication workspace that will meet your needs.
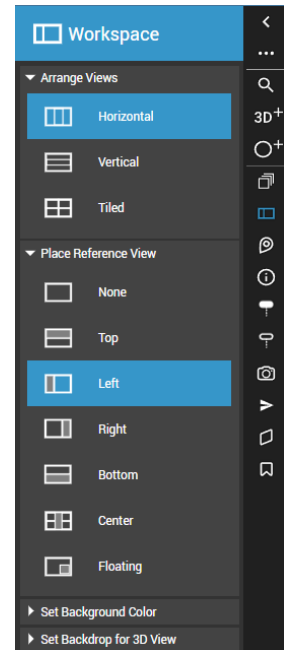

The background color can be changed in both reference and 3D views along with the backdrop in 3D views.
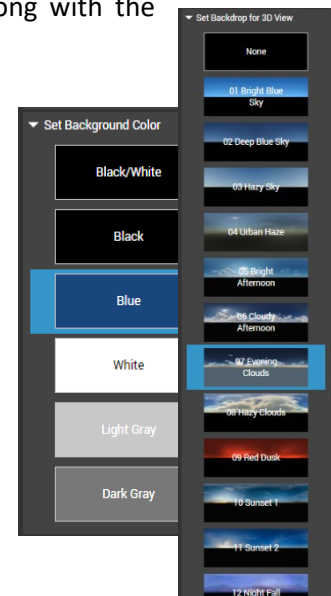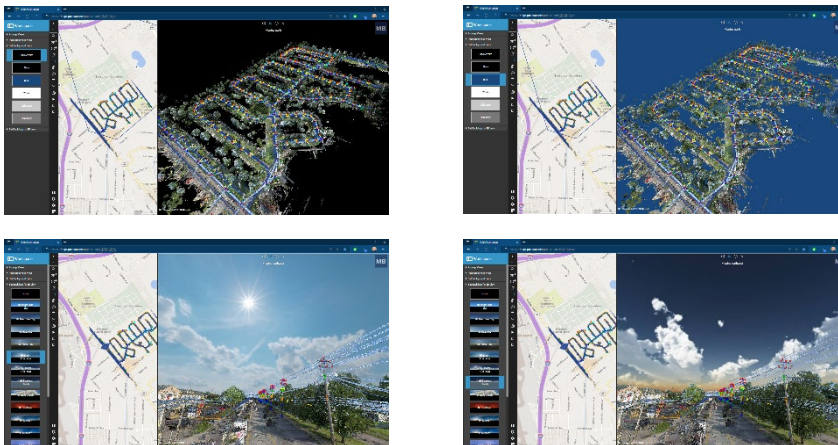
Making Measurements

A LiDARData.Net publication provides numerous options for making measurements, but we are going to discuss only the most utilized ones. Please feel free to test out the other measurements. Measurements can be made in both the 3D and Planar views. The corresponding location in the other view will be displayed when the measurement is made.
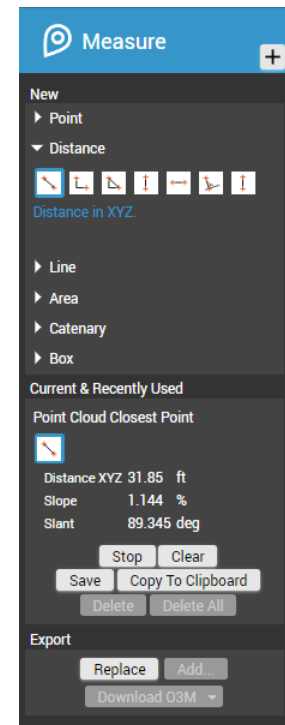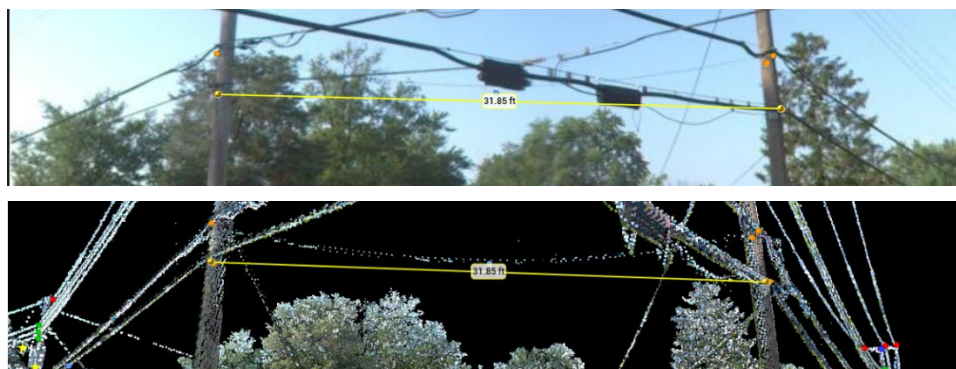
Line Measurements
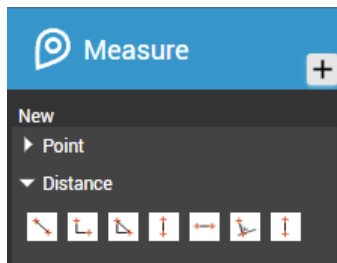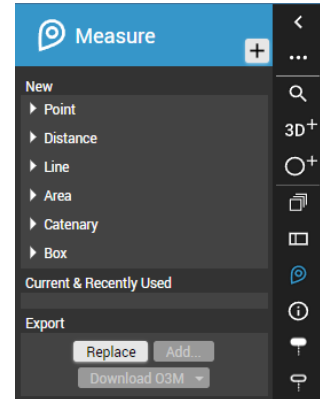
Linear measurements can be made with one of two dedicated toolsets, Distance and Line. Measurements using the Line subset of the tools are typically used for multipoint lines and are not necessarily the best option when making simple point to point measurements.
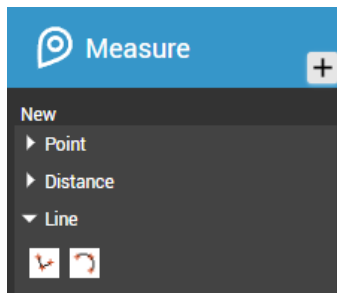
1. In the Measure toolbar, open the Distance tool options.
2. The two main tools that we are going to discuss are the "Distance in XYZ" and "Point with height from horizontal reference plane" tools.
3. The Distance in XYZ tool allows the user to measure from one point in the point cloud to another, providing the distance between the two.


4. Simply click once with the left mouse button from the beginning of where you wish to measure and click the right mouse button again at the end point. Measurements will then be displayed at the center of the line. If the measurements don't look realistic, check your map units, they may still be set to Meters.
5. Measurements made in one view will be displayed in their respective location within the same view in cases where it is manually changed or within any corresponding view that is open regardless of the measurement being made on the image view or 3D view.

6. Please note that these measurements are being made by hand and the user are not snapping to the point cloud during this process. This could lead to a very small variance in the actual measurement taken. More precise measurements can be made in a CAD environment.

7. As you can see in the Current and Recently Used dialog, not only is the length measurement display, but the slope percentage and slant direction are also calculated.

8. Below these measurements, the user can stop the current measuring session or clear the current measurements.

9. Clicking Save will add a line under the commands that allows the user to create a code and make a comment about the current measurement. When saving, the measurement itself is highlighted in red in any view in which the measurement is visible.
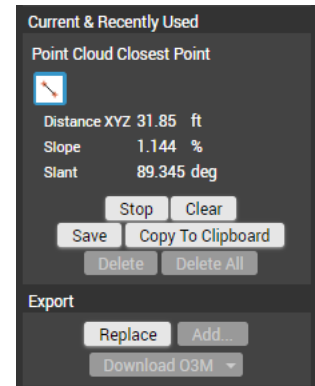
10. Stopping the measurement at this time will lock the measurement in the map. Successive measurements can be saved into these fields.

11. At any time, the user can delete the current measurement or all measurements from this table.

12. Copy to Clipboard allows the user to paste the current measurement into any ascii compliant product.

13. The export dialog provides three different options for working with new or existing measurements.
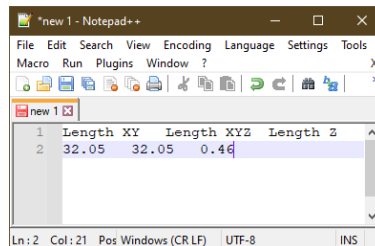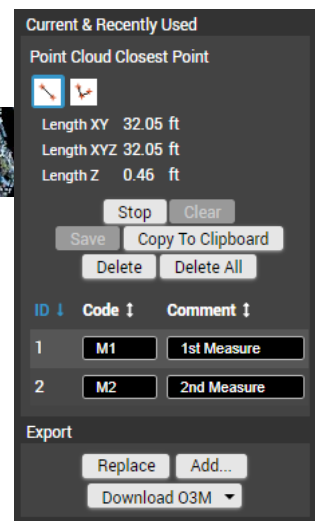
- The Replace option will open a Windows Explorer dialog from which the user can locate an existing Orbit o3m file and load it into the map, replacing all existing measurements.

- Clicking Add lets the user locate an o3m and add it to the current publication without removing any existing measurements.

- The Download dialog allows the user to export to three geospatial formats: o3m, KML, and GeoJson. The ability to export to each of these formats give the end user the option of sending measurements to other LiDARData.Net users or users of products such as Google Earth and ArcGIS Pro.
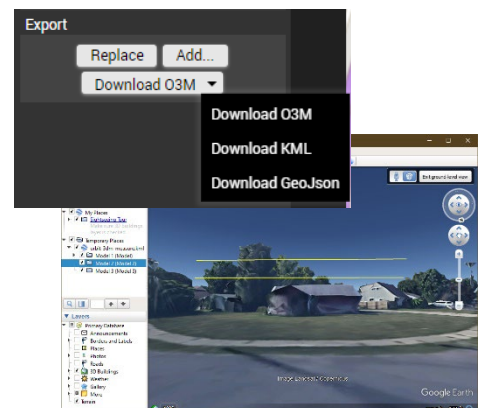
Point Measurements

Measurements from specific points can also be made to determine the height above the ground a certain location is.

1. The Measure a Point tool simply provides the X, Y, and Z of any location selected within the point cloud. If the publication has point cloud data associated with the imagery, the user can simply make a single left click anywhere in the either a spherical or 3D view.
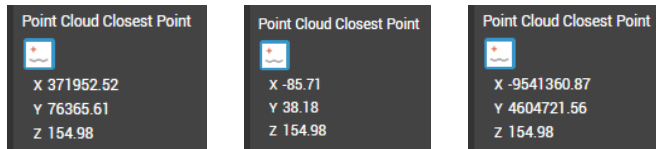
2. The point with height from horizontal reference plane measurement tool allows the user to click at any point at ground level and then click a point at the top of a feature. This will display the distance from that point to the ground perpendicular to that point.

3. The drop point to horizontal reference plane works in the opposite fashion of the height from the reference plane. Click a point at the top of the feature and then click at ground level to determine the distance between the two.
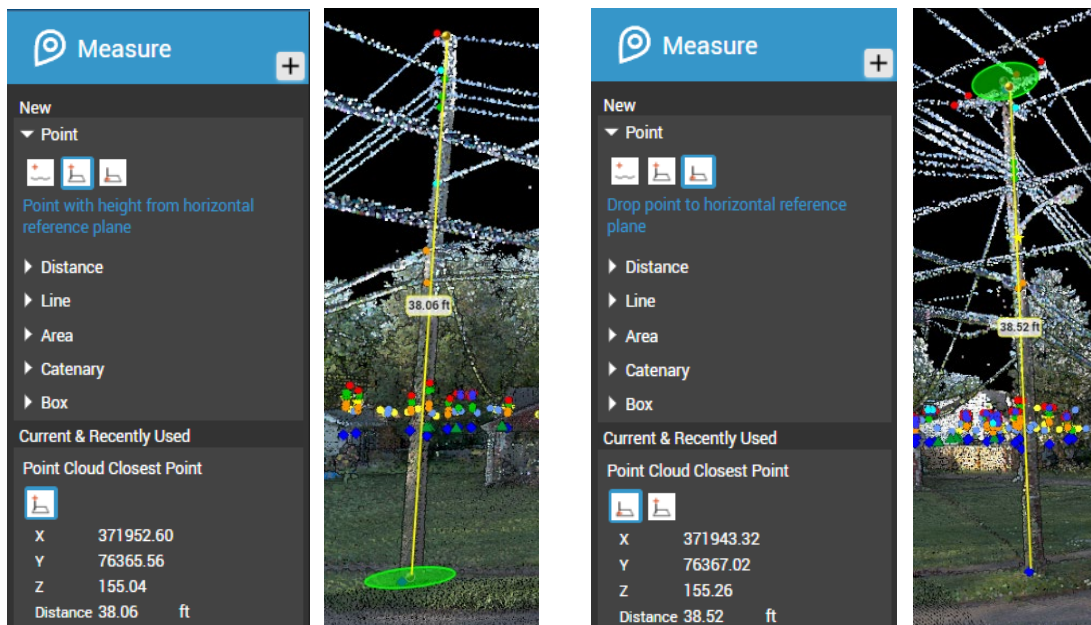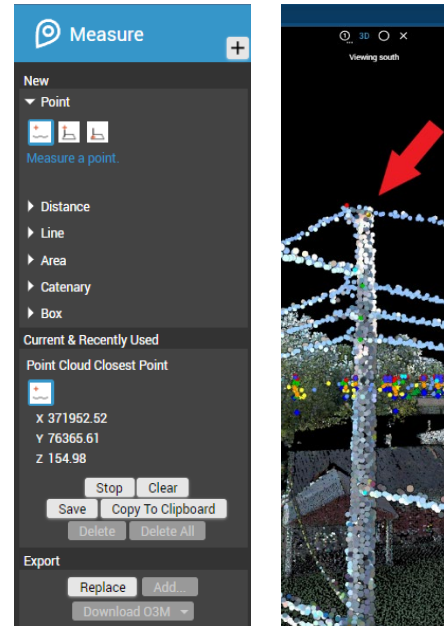
Inspector

The Inspector tool allows users to interrogate the various vector features that can be found in a LiDARData.Net publication.

Inspector has two primary selection methods.   Select and Search

1. Select – Choosing the select tool allows the user to click on any vector feature in the map and displays the attribute data for the feature in the bottom of the display. Multiple features within a vector layer can be selected at the same time.

   The Copy to Clipboard button will copy the contents to memory and allows the user to paste this information into any word processing application.
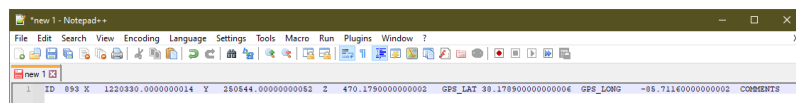
2. Search – The search functionality allows the user to conduct more refined queries by allowing them the ability to control the vector resource, attribute field name, and value. Multiple results can be shown as demonstrated by the different instances of Other Nodes associated with pole 893.

   Clicking the Focus button will move the current image location for both the overview and viewing dialogs to the image closest to the selected feature.

   Clicking the Auto-Focus box will force both views to automatically pan to the closest image to the feature selected for all future selection in the map session.
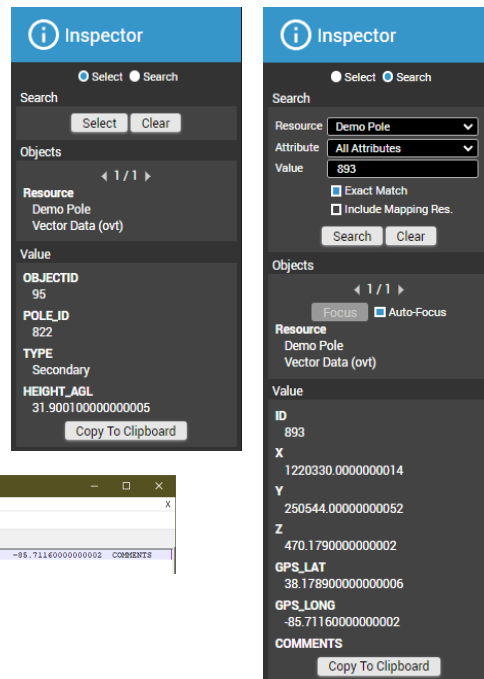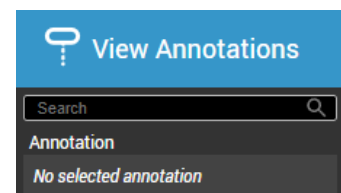
Annotations

This document will not go into an in-depth discussion of the individual annotation tools. Instead, we will look at the first option, Icon Annotation. The primary functionality for each of the options are much the same. Select Click an Annotation Icon and click anywhere in your view.
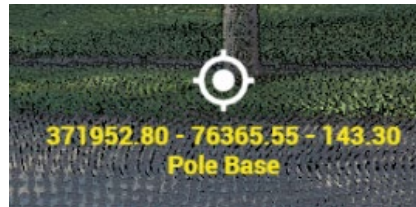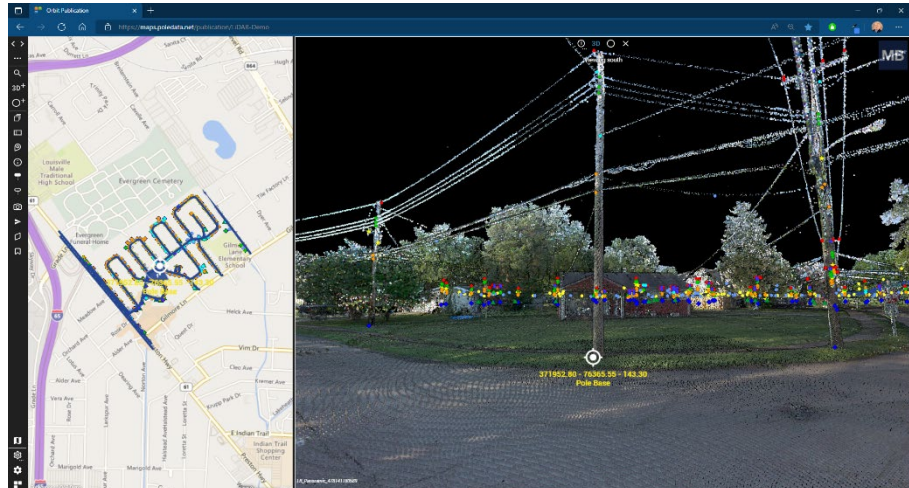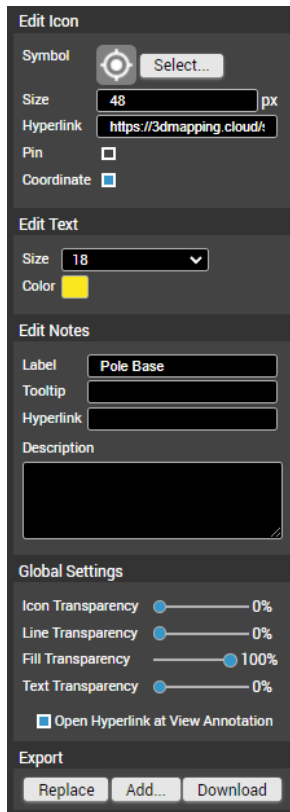
Annotations can be exported to the Orbit *.o3a format. This format can also be used to import annotation previously saved to the current map view and to add annotation to already existing items.

View Annotations

New at version 22.4, the View Annotations toolbar allows the user to filter existing annotation in their view. Options include tooltip, hyperlink, and description along with the label itself.
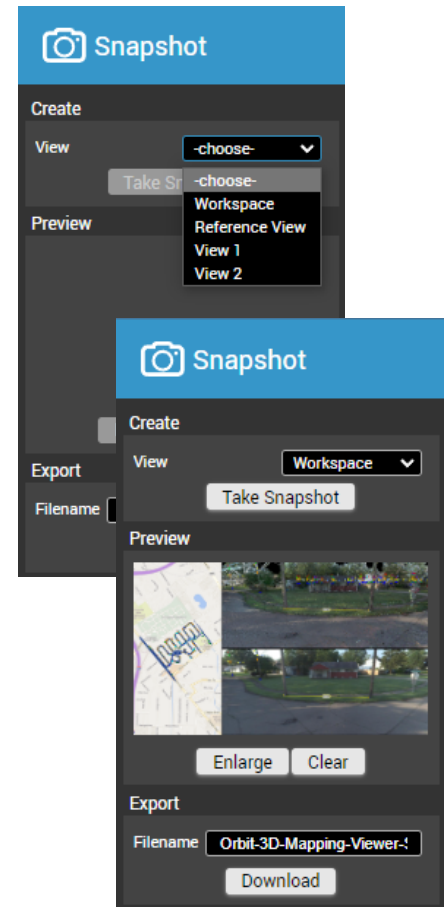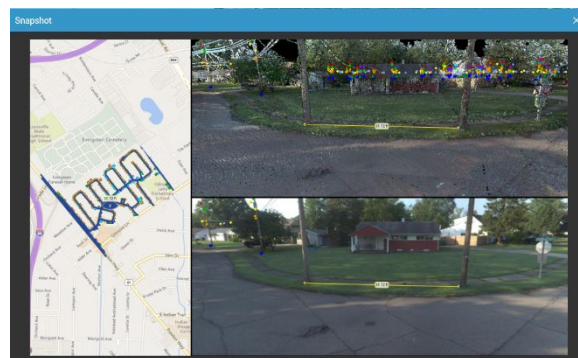
Snapshot

The snapshot tool gives the user the ability to take screenshots and export them as png image files. These snapshots will retain any active measurements and annotations within the field of view.

1. Choose the view for the snapshot. Please note the addition of Workspace as one of the options. This includes the reference view and all spherical/3D views currently open.
2. Click "Take Snapshot"

At this point in the process a thumbnail is produced in the snapshot tab. Clicking Enlarge will open a full resolution view of the image. Clicking Clear will simply clear the window.
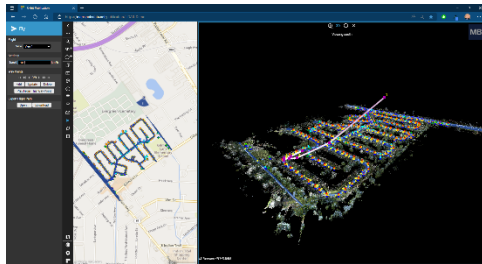

3. Enter a file name and click Download

The downloaded snapshot will be placed in the Downloads folder for that specific user. Creating multiple snapshots without renaming them or moving them will result in file names differentiated only by a trailing number in parentheses.
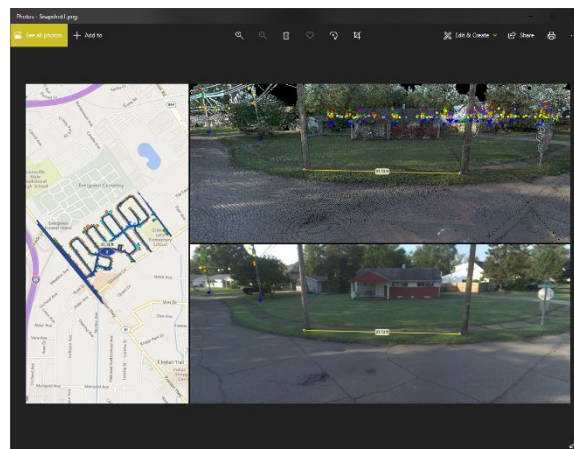
Fly

A fly-through movie is a simulated navigation from a 3D view following a predefined path. All visible 2D and 3D resources are included in the movie recordings as visible in the recorded view mode. A 3D view MUST be open for this tool to function.

Once in the 3D View, simply place waypoints by clicking the Add button in a location through which you would like the flythrough to travel. Navigate to other and place additional points within the view to create the path for the flythrough. Once satisfied with the path, choose a speed setting. Testing has found that Waypoints can be modified, added, or deleted as needed. speeds under 100 km/h tend to move slowly in the flythrough. When the path is finalized, it can be downloaded locally to an Orbit flight path .o3f format. These can be provided to another user who can then import the file in their own web browser. Note that this file only includes the X,Y, and Z locations of the waypoints and not any of the underlying data. Users must have access to the same LiDARData.Net publication for the flythrough to function.
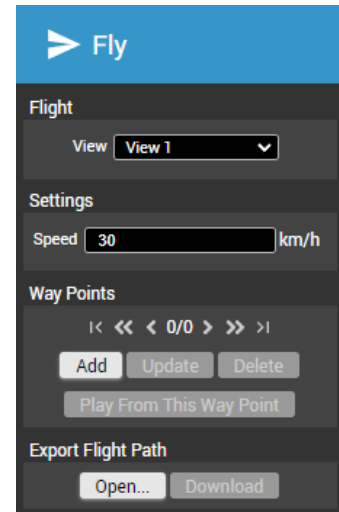
Slice

A slice represents a 2D representation of a chosen area from a 3D point cloud based on a defined plane. It can be a horizontal, vertical, or user-defined angular plane.
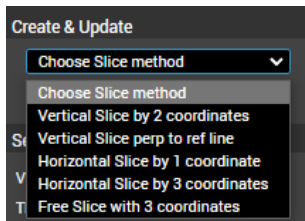
There are five different options for creating a slice view. Click Slice → Slice View → and choose the appropriate option. For this document, we will use Vertical Splice by 2 coordinates and Horizontal Slice by 1 coordinate.

Vertical Splice by 2 Coordinates

1. Choose Vertical Splice by 2 coordinates
2. Click New
3. Place one point at the base of the pole and a second at the top of the pole.

A new view will open that resembles a 3D view but is in fact a 2D representation of all data in that reference plane. Users can adjust the thickness which widens the display horizontally from the original placement of the line. Users
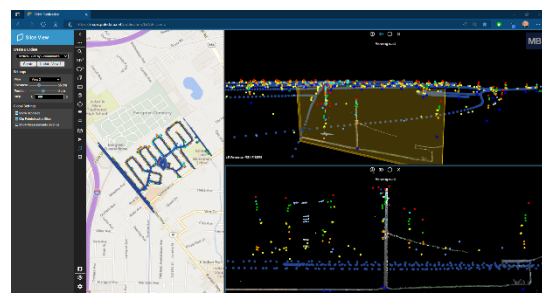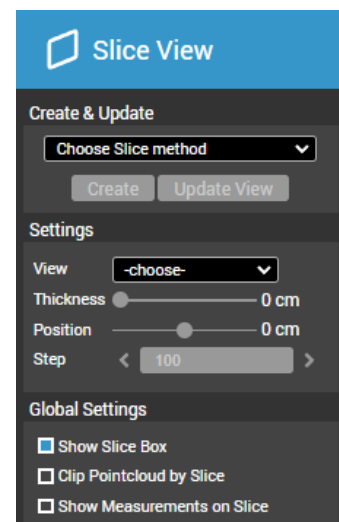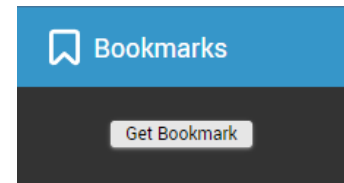
can also adjust the position, horizontally by a unit of measure slider or by manually entering a unit into the Step dialog. After creating the vertical slice, the user can make measurements with the standard measurement tools.

By clicking the Horizontal Slice by 1 coordinate, we can create a simple top-down view. In the example below, we've created a horizontal slice in the vicinity of a crossarm at the top of the pole on the left. Adjusting the thickness exposes point cloud data returns for all items in its vicinity.
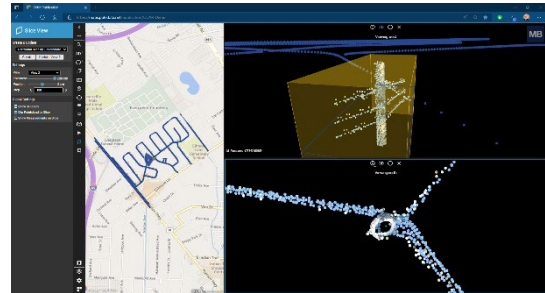
Bookmarks

A Bookmark is a saved setup of your 3D Mapping Cloud Viewer and its current settings. It holds the Resources, your Views, your Screen setup, your Point of View etc. It helps to go back to a viewpoint or situation that needs to be marked for a certain purpose. This provides an ideal way to share a view with someone operating remotely. Simply open the Bookmark tool and select, Get Bookmark. This places a url in the system clipboard which can be pasted into an email or a word processing document, an example of which is below. The recipient does not need to have anything but an HTML5 compliant web browser to view a bookmarked publication.

https://maps.poledata.net/publication/LiDAR-Demo?bookmark=LJMlVLyRygBmkoRqrke3