



Getting Started
With
LP360

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Getting Started with LP360

Welcome to LP360, a LIDAR extension for ArcGIS® and standalone application for Windows®. This “Getting Started with LP360” booklet will help make your initial use of LP360 as successful as possible.

What is LP360?

LP360 is an extension plug-in for the ArcGIS® environment. LP360 is a first-of-a-kind software package that allows users of LAS files to use LIDAR data in ArcGIS® like any other data layer. The extension leverages the multitude of data sources that can be displayed with the user’s LIDAR data such as orthophotography and base map data stored in geodatabases.

LP360 uses a specifically designed ArcMap™ data layer to display points directly from LAS files into the map in ArcMap™. This custom data layer (LIDAR Layer) has a one-to-many relationship with LAS files. The relationship is very similar to that of an image or raster catalog. The LAS files that are used can be the raw flight line files and do not require tiling.

Just like feature layers such as shapefiles, LIDAR Layers can be colored based on the attributes of the underlying data. In the case of a LIDAR Layer, the attributes are elevation, classification, intensity, return, and point source. The LIDAR Layer Property pages, similar to that of a feature layer, allow for complete control over the display aspects (such as coloring and size) of the points for each attribute or legend.

System Requirements

Computer and Processor	PC with a Pentium™ processor or equivalent, 2.2 GHz minimum; Hyper-threading or Multi-core recommended.
Memory	2GB of RAM required; 4 GB or more recommended.
Hard Disk	2.4 GB of available hard disk space. Additional space will be required for data storage.
Drive	CD-ROM or DVD-ROM drive.
Display	Super VGA resolution (1024x768) or higher with 256 colors or better.
Graphic Card	Open-GL version 2.0 runtime minimum capable video card with 64 MB of memory required, 256 MB or greater recommended.
Operating System	Windows XP, Windows 7 (32-bit and 64-bit), Windows 8 and 8.1 (32 bit and 64 bit), Windows 10 (32 bit and 64 bit)***
ESRI Software	ArcGIS® Desktop 9.3 or above.

License server and concurrent licensing requirements: TCP/IP Network card and .Net 4.0 Framework Runtime required

***At this current time Windows 10 support for ESRI begins at ArcGIS 10.3.1, LP360 for Windows is fully supported on Windows 10

Installing LP360

To install LP360:

1. To install LP360, the latest version of LP360 can be downloaded from:
<http://www.LP360.com/chkstatus.asp>
2. Paste your CD KEY in the form and click "Display CD Key Information." Then click on the Install link for the Latest Release.
3. Please find the LP360 Installation guide on our website at:
<http://www.LP360.com/support/updates.html>
4. Use your CD Key in the LP360 License Administrator, "Register" tab, to request your software authorization file (**required**).

How to Enable the LP360 Extension

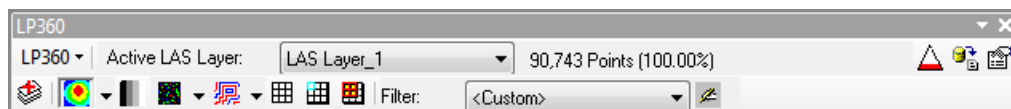
The LP360 extension will need to be enabled or "turned on" upon its first use.

1. In ArcMap™ 10, click the "Customize" menu and select "Extensions...". In ArcMap™ 9.3, this will be under the "Tools" menu.
2. In the Extensions dialog, click the check box for "LP360".
 - If the extension is currently not licensed, the "License Administrator" will open, prompting you to register the software. Follow the instructions for "licensing a product" to continue. Alternatively, the license administrator can be found in: **Programs>QCoherent>LP360>License Administrator**.
3. Click the "Close" button to dismiss the Extensions dialog. The LP360 extension should now be enabled.

How to Display the LP360 Toolbar

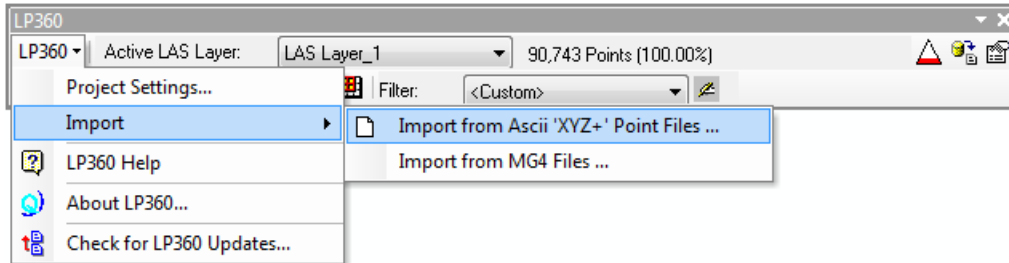
The LP360 Toolbars will need to be displayed upon first use.

1. In ArcMap™, click the "Customize" menu, and then the "Toolbars" submenu; or right-click anywhere in the toolbar area to bring up the "Toolbars" submenu.
2. Click the LP360 toolbar to turn on. All LP360 toolbars can be easily identified, as they start with "LP360".

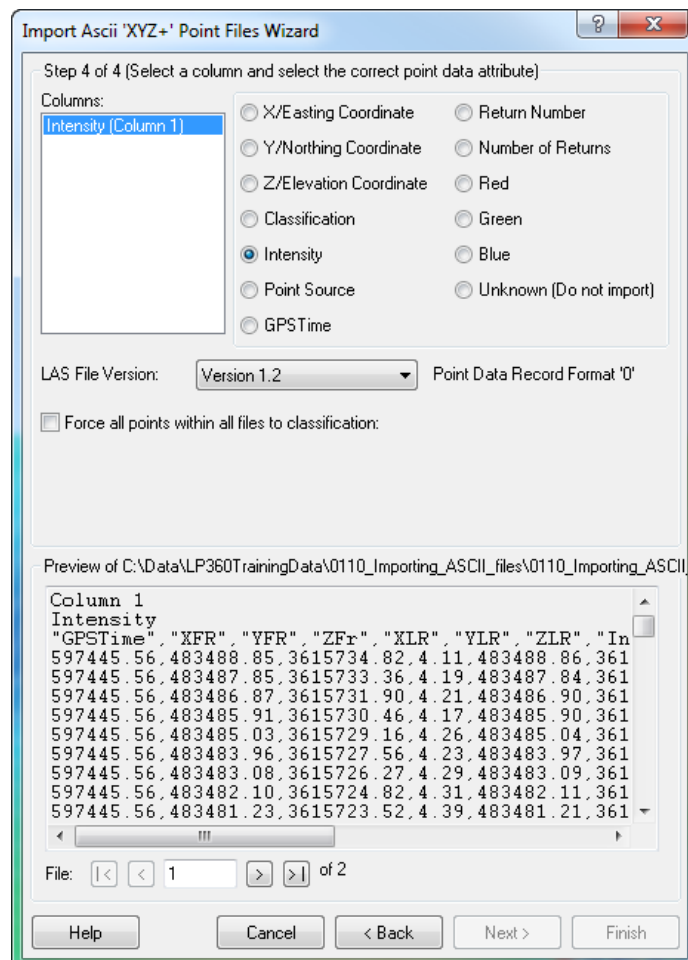


How to Import ASCII and MG4 Files

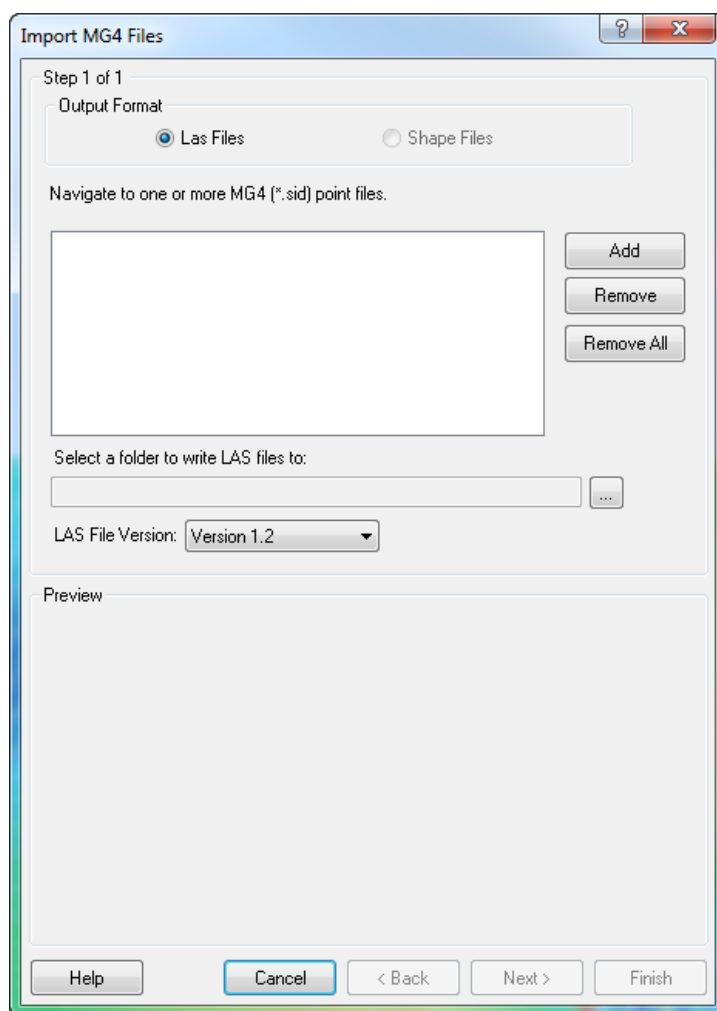
To use ASCII XYZ text files of LIDAR points in LP360, the text files must first be imported or converted to LAS files. Follow the instructions in the “ASCII File Import Wizard” Help topic to create LAS files from text files. This is found by going to “Import” on the LP360 drop-down menu on the LP360 toolbar and selecting “Import from Ascii XYZ Point Files ...”. At this point, the “ASCII File Import Wizard” dialog box will appear. Follow the four steps to import the files.



Proceed to the subsequent Help topic “Creating a Layer from LAS Files in LP360 for ArcMap” to learn how to use the LAS files that were created from the text files.



The MrSID MG4 LIDAR Import dialog shown below provides the ability to convert MG4 LIDAR files into LAS files. Unlike the ASCII Import wizard, which involves 4 steps, this dialog simply requires you to select the MG4 files for conversion, along with an output folder to write the converted files. When this is done, the "Finish" button will be enabled. You have the choice to select one of several LAS file versions to create. Not all point attributes can be imported with each LAS file version. For example, the RGB color fields can only be imported when version 1.2 or later is selected.



LAS Files

LAS is the standard format for storing and accessing LIDAR data. The LAS format is an industry standard recognized by ASPRS. LP360 takes advantage of the regular binary structure of the LAS format to achieve exceptional data access performance.

Follow the instructions in the Help topic “Creating a Layer from LAS Files in LP360 for ArcMap” to view existing LAS files on your system in ArcMap™.

For performance reasons, we strongly recommend that you pyramid LAS files. LP360 is capable of displaying pyramided or un-pyramided LAS files, but pyramided files display much more quickly. To pyramid LAS files, follow the steps in the topic below “Pyramiding LAS files”.

Creating a Layer from LAS Files



LAS files are viewed through a specially designed ArcMap™ data layer called a LIDAR Layer. The relationship between the LIDAR Layer and the LAS files is one-to-many, much like an image or raster catalog layer used in ArcMap™. The LAS files, whether tiled or in their raw flight line state, are encapsulated within a layer so that many LAS files representing a geographic area, such as a city or county, behave cohesively like one data layer.

The LIDAR Layer is integrated into the ArcGIS® user interface. When a LIDAR Layer is created and added to the map, it becomes another layer in the Table of Contents view that can be turned on or off, dragged up and down in the layers collection, or modified to have different layer properties. The LIDAR Layer can also be used with other native ArcMap™ toolbars and tools such as the “Identify” tool or the “Effects” toolbar to modify the transparency just like with other layers, such as feature or image layers.

In addition to displaying points in the map, the LIDAR Layer can also display the boundaries of the LAS files that are referenced by the layer. This is useful for large projects where LAS file management is important, such as locating a single file spatially or determining the spatial extent of a known file using LP360 tools. Whether you are adding one or multiple LAS files, the LAS file boundaries will display and the points will be loaded automatically.

How to Create a LIDAR Layer

Creating a LIDAR Layer from LAS file(s):

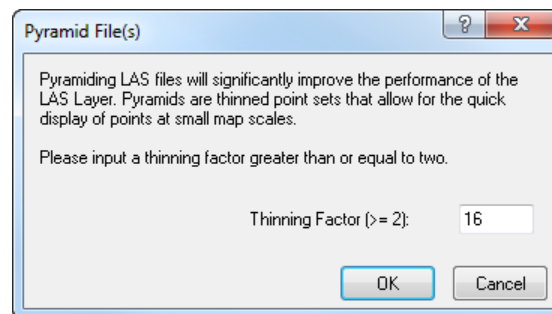
1. Click the “Add LIDAR Data layer” command in the LP360 toolbar. 
2. Click the “Add Files” button. 
3. Navigate to the folder containing the LAS files.
4. Select the LAS file(s) and click “Open”.
5. Click “OK” on the Add LAS files dialog.
6. Click “OK” again.

Pyramiding LAS Files

Like many GIS data sources, LAS files can be pyramided to provide faster display of points. The pyramids work similarly to image catalogs where the resolution or density of points increases as you zoom in on the map. The pyramiding process requires a thinning factor that determines the number of levels in the pyramid. The higher the thinning factor, the more changes you will see in the point densities as the map is zoomed in. With a lower thinning factor, point densities will appear to change much more gradually in the map as you zooms in. The lowest possible thinning factor is “2”, but note that such a small thinning factor creates index data approximately equal in size to the actual LAS files, effectively doubling the amount of data on disk. High values for thinning factors will create much smaller index files. We recommend an intermediate thinning factor of 16.


How to Pyramid LAS Files

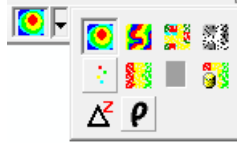
1. In the LAS Files Contents View, right-click on a LAS file label or an existing selection of LAS files.
2. Click the Pyramid File command. To pyramid all LAS files without selecting each file, right-click on the LIDAR Layer label and select "Pyramid All Files...".
3. Enter an integer greater than or equal to 2.
4. Click OK to begin indexing.
5. A confirmation dialog will display once the indexing is complete.




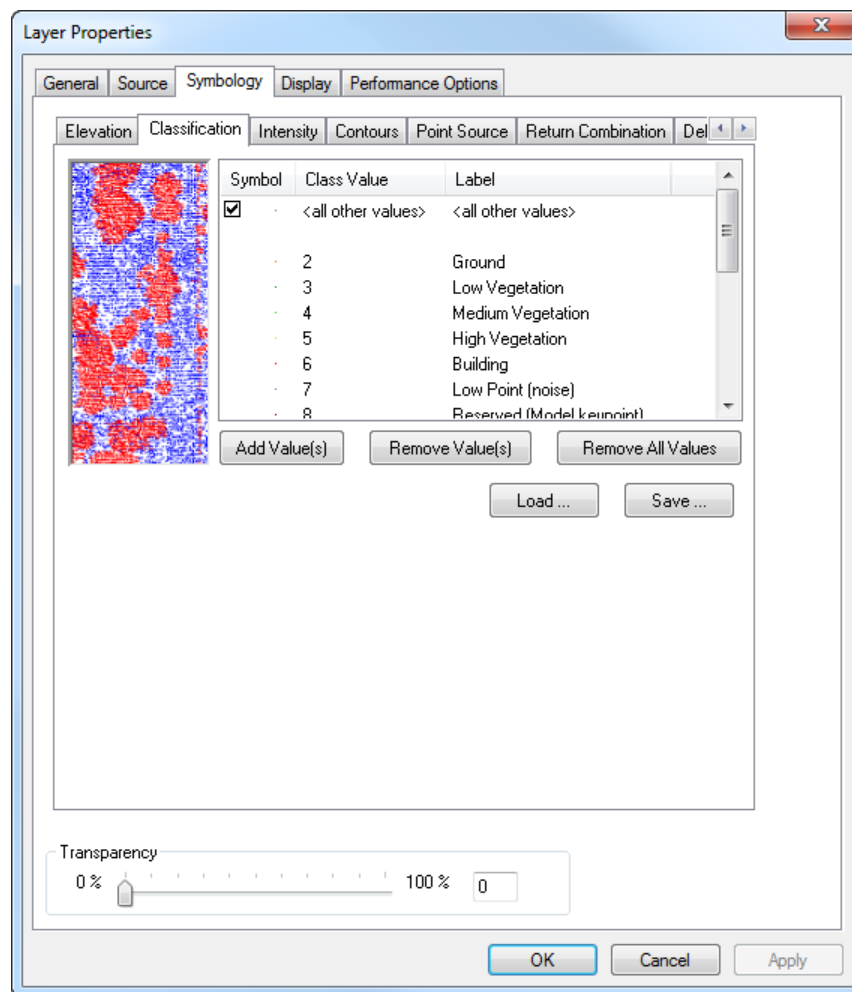
When pyramids are created, a file is created in the same directory as the LAS files called a LAS pyramiding file (*.qvr). You can choose to have LP360 automatically pyramid the LAS files when adding them by selecting the “Pyramid” option in the “Add LAS Files” dialog.

Viewing LAS Files

LP360 provides quick and easy access to manipulating the visualization of LAS data. You can access the “Layer Properties” page , where displayed points (Display tab) can be filtered and symbology changed (Symbology tab). Viewing options for quick symbology changes are located in a drop-down list on the LP360 toolbar.



LP360 also TINs and contours on the fly. The LP360 toolbar has a drop-down list, shown below, where you can select no points (by toggling the button off), points, TIN, points on TIN, wireframe, or points on wireframe to be drawn. Similarly, a “Display Contours” button  initiates contours to be drawn. You may choose between displaying the contours and displaying the contours with smooth contours. Contour settings can be adjusted in the LAS Layer Properties dialog by going to the Contours tab under Symbology. Contours are generated for all points active in the map. Therefore, if you only want to display ground contours, only the ground classification should be turned on in the LIDAR Layers Property Display tab.




Profile Viewer




The LP360 Viewer Integration toolbar provides controls for a profile or cross-section window. The “Turn on profile window” command opens the profile window. Initially, the profile window will be drawn in the lower bottom section of ArcGIS®. Depending on the Display settings, this window may need to be enlarged for viewing. Resizing can be accomplished by hovering over the top portion of the window until a directional arrow appears, clicking, and adjusting the window. The extent of points to be brought into the profile window is determined with the “Draw a profile line” button and a series of three clicks, first to draw the line over the desired viewing area, then to draw “out” to define a profile depth. Detailed navigation and additional profile viewer information can be located in the LP360 Help documentation.

3D Viewer



The LP360 Viewer Integration toolbar also provides controls for the 3D window. Turning on the 3D window in a new project places the 3D window in a default location. The 3D window can be re-sized and docked to your preferred location. The extent of data drawn in the 3D viewer is selected by selecting the “Define 3D Window Extent” button  and dragging the box to the desired extent. Detailed navigation and additional 3D viewer information can be located in the LP360 Help documentation.

Exporting

LP360 provides a wizard to export points and surfaces from the loaded LIDAR data. The export wizard is opened from the LP360 toolbar.  The export wizard contains options for exporting rasters, points, and contours. LP360’s export functions handle the merging of multiple LAS files within a single LIDAR Layer.

How to Get Help in LP360

- ❖ Commands and Tools – To get help on a command on a toolbar, hover over the item of interest and press F1 to bring up the LP360 Help Guide.
- ❖ Dialog Boxes – To get help for a control in a dialog box, left click the “?” control at the top right of the dialog box, then click the control of interest.

How to Use Help

- ❖ Contents Tab – Click the + next to or double click the books to open the topics in the book. Click each topic to view the help pages. Click the “Related Topics” button at the top of the help page to view other help pages related to the current topic.
- ❖ Index Tab – Type one or more keywords in the text box. Double-click on the index item to open the help topic associated with it.
- ❖ Search Tab – Type the word or combination of words that you want to find in the topics. All the topics in the Help system will be searched for the word(s) entered. When using a combination of words, use double quotation marks to string the words together in the search, so that the search results yield only those words when used together.
- ❖ Favorites Tab – Here you can add topics of interest for quick and easy access without searching

Technical Support for LP360

Technical Support Contacts:

Searchable Support Knowledgebase: support.LP360.com

E-mail: support@LP360.com

Phone: 1-256-461-8289

GeoCue Group provides both e-mail and telephone support. E-mail requests must be submitted through the designated support e-mail address: support@LP360.com. Telephone support is provided through GeoCue, and can be reached at 1-256-461-8289.

Business hours are 7am to 6pm, Monday through Friday, CST excluding federal holidays.

Visit us at <http://www.LP360.com>

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GeoCue Group

GeoCue is an innovative provider of high-capacity, LIDAR software tools. We are a company whose founders have a wide array of experience with LIDAR and the mapping sciences. Our extensive knowledge of geospatial software and LIDAR in particular focuses on the long-standing need for an Environmental Systems Research Institute (ESRI) ArcGIS™ extension for viewing and analyzing LIDAR data. Our first product, LP360, was released in August 2006 and was exceptionally well received. Subsequently we have provided additional flexibility to our clients offering co-licensed standalone products (LP360 Standalone & LP360 EQC) as well as a free standalone viewer.

Our Mission

Our mission at GeoCue is to develop LIDAR software that enables users of point cloud data to easily and efficiently access and interface point cloud data with day-to-day operations. We strive to continue to be the provider of choice for LIDAR software solutions.

What We Do

At GeoCue we use our extensive experience with LIDAR to focus on specific functionality that enables users to maximize LAS LIDAR point clouds. We believe that LIDAR has significant and often untapped value. We focus on integrating LIDAR into workflows that already provide substantial value but lack sufficient architecture and/or specialized functionality for maximizing LIDAR investments. Our customers include all aspects of LIDAR users including commercial LIDAR data collection and processing providers, federal agencies, state government, local government, environmental and civil engineering firms, consulting firms, research facilities... in short, groups like yours who desire an easy and effective way to use LIDAR.

Thank you for your business!



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