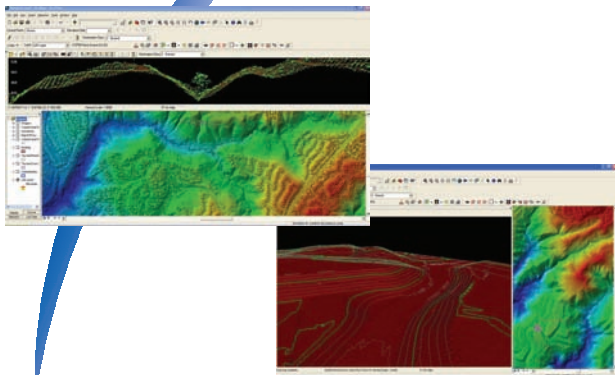


Getting Started with

LP₃₆₀



LP360



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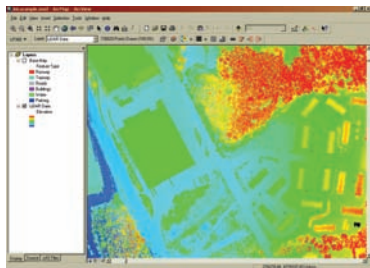
Getting Started with LP360

Welcome to **LP360**, the LIDAR Extension for ArcGIS®. 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 or 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 your LIDAR data such as orthophotography and base map data stored in geodatabases.

LP360 uses a specially designed ArcMap™ data layer to display points directly from LAS files onto the screen 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 coloring of the points for each attribute or legend.

System Requirements

Computer and processor: PC with a Pentium processor or equivalent, recommended 1 GHz Pentium III processor or above

Memory: 512 MB of RAM required; 1 GB or more recommended

Hard Disk: 200 MB of available hard-disk space

Drive: CD-ROM or DVD-ROM drive

Display: 1024 x 768 or higher

Graphic Card: 32 MB is required but 64 MB or higher is recommended

Operating System : Windows 2000 with Service Pack 3 or Windows XP or later

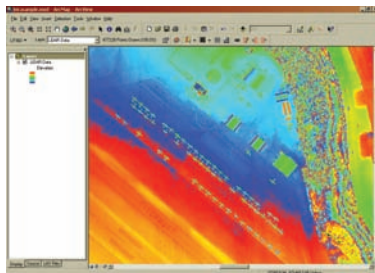
ESRI Software: ArcGIS® Desktop 9.1 or above

License server and concurrent licensing requirements: TCP/IP Network card and Net 1.1 Framework Runtime required

Installing LP360

To install **LP360**, insert the CD-ROM into the CD drive. If Autorun is disabled, use Windows Explorer to browse to the root of the CD-ROM file system, and double-click on the Setup.exe to start installation.

Follow the instructions as presented by the setup program. You will be asked to accept the End User License Agreement (EULA), and you will also be prompted for where to install **LP360** on the file system. The last step of the installation is to launch the **LP360** help system. The **LP360** help system contains the information you need to successfully operate **LP360**.



How to Enable the LP360 Extension

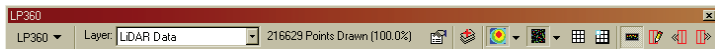
The LP360 extension will need to be enabled or "turned on" upon its first use.

1. Within ArcMap, left click the "Tools" menu and select the "Extensions..." command.
2. In the Extensions dialog, left click the check box for the list item named "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 under Programs>LP360>License Administrator.
3. Left 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 the extensions's first use.

1. Within ArcMap, left click the "View" menu, and then the "Toolbars" submenu.
2. Left click the item to turn on the toolbars. All LP360 toolbars can be easily identified as they start with "LP360"



How to Display the Sample Data

Upon installation of LP360 sample LAS files are packed in the "SampleData" folder of the destination folder (e.g., "c:/program files/lp360/"). Follow the instructions in the subsequent topic "Creating a Layer from LAS Files" to view the sample LAS files in ArcMap.

How to Import ASCII Files

□ To use ASCII X,Y,Z,+ 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 Input Wizard” help topic to create LAS files from text files.

□ Proceed to the subsequent topic "Creating a Layer from LAS Files" to learn how to use the LAS files that were created from the text files.



LAS Files

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

□ Follow the instructions in the subsequent topic “Creating a Layer from LAS Files” 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 subsequent topic “Pyramiding LAS Files”.

Creating a Layer from LAS Files

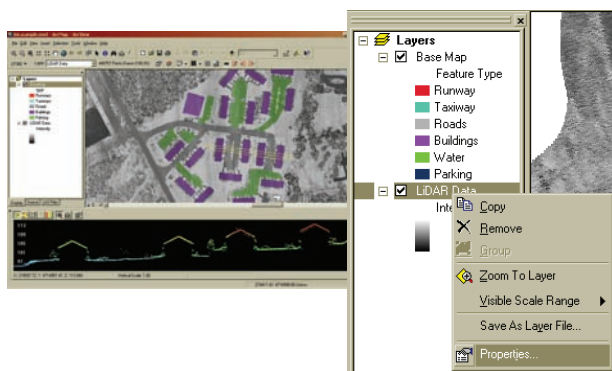
LAS files are viewed through a specially designed ArcMap data layer called a LIDAR layer. The relationship between the LIDAR layer and the LAS files is one-to-many much like an image or raster catalog layer used in ArcMap. The LAS files, whether tiled or in their raw flight line state, are encapsulated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

Depending on the number of LAS files selected to create a LIDAR layer, the layer is initialized differently. If a single LAS file is selected to create the layer, the LAS file boundaries are not displayed by default, the single LAS file is loaded, and when the layer is added to the map, points will be displayed immediately. However, if more than one LAS file is selected, then the boundaries of the LAS files are displayed by default and the LAS files are not loaded. When the layer is added to the map, points will not be displayed until at least one LAS file is loaded.



How to Create a LIDAR layer:

Creating a LIDAR layer from multiple LAS files

1. Left click on the "Add LIDAR layer" command in the [LP360](#) toolbar.
2. Navigate to the folder containing the LAS files.
3. Select the LAS files and left click "Add".



If using more than one LAS file, the created LIDAR layer will only display the LAS file boundaries. To see points, you must first load the LAS files.

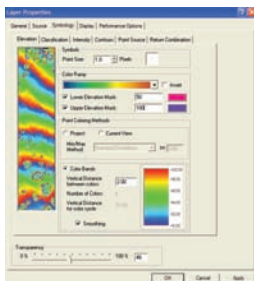
Indexing LAS Files

Like many GIS data sources, LAS files can be pyramided to provide faster display of points. The pyramids work similar to image catalogs where the resolution or density of points increases as the user zooms 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 the user 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 the user 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. Higher values for thinning factors will create much smaller index files. We recommend an intermediate thinning factor of 16.

How to Index LAS Files

1. In the LAS Files Contents View, right click on an LAS file label or an existing selection of LAS files.
2. Left click on the Pyramid File command.
3. Input 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. Click OK.

Viewing LAS Files



LP360 provides quick and easy access to manipulating the visualization of LAS data. All windows provide access to a "Properties" page where displayed points (Display tab) can be filtered and symbology changed (Symbology tab). Viewing toggles for quick symbology changes are located in a pull-down GUI on the LP360 toolbar.



LP360 also TINs and contours on the fly. The LP360 toolbar has a pull-down GUI where the user can select no points, points, or a TIN

to be drawn. Similarly, a contour GUI initiates contours to be drawn. Contour settings can be adjusted in the Properties dialog. Contours are generated for all points active in the Display. Therefore, if only ground contours are desired only the ground classification should be turned on in the LIDAR Layers Property Display tab.



Profile Viewer



The **LP360** Viewer Integration toolbar provides GUIs for a profile or cross section window. The “Turn on profile window” GUI 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, left clicking, and adjusting the window. The extent of points to be brought into the profile window is determined with the “Draw a profile line” GUI and a series of three clicks. Detailed navigation and additional profile viewer information can be located in the **LP360** Help documentation.

3D Viewer



The **LP360** Viewer Integration toolbar provides GUIs for a 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 the users preferred location. The extent of data drawn in the 3D viewer is selected by selecting the “Define 3D Window Extent” GUI and drag boxing the desired extent. Detailed navigation and additional 3D viewer information can be located in the **LP360** Help documentation.

Exporting

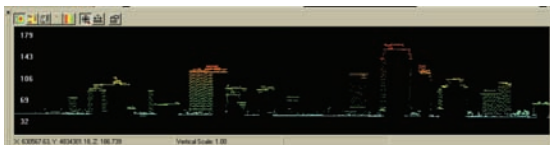


LP360 provides a wizard to export points and surfaces from the Loaded LIDAR data. The export wizard is opened from the **LP360** toolbar. The export wizard contains options for exporting rasters, points, and contours. **LP360**'s export functions handle the merging of multiple LAS files within a single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

How to Get Help in LP360



- ☐ **Commands and Tools** - To get help on a command on a toolbar, left click the "What's This?" button on the Standard toolbar in ArcMap, then left click the item of interest. To get help for a command in a menu, highlight the command and press "Shift" + "F1".
- ☐ **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 left click the control of interest.
- ☐ **Profile Window** - To get help in the profile window, position the cursor over the item of interest and press "F1" to open help for that item. **Note:** Do not use "Shift" + "F1" in the Profile Window.



How to Use Help

- ☐ **Contents Tab** - Left click or double click the books to open the topics within the book. Left click each topic to view the help pages.
- ☐ **Index Tab** - Type one or more keywords in the text box. Double click on the index item to open.
- ☐ **Search Tab** - Type the word or combination of words that should be contained in the topics you want to find. All the topics in the Help system will be searched for the word or words entered. When using a combination of words, use double quotation marks to string together the words in the search.
- ☐ **Topic Pages** - Each topic page will discuss the topic in the "About" section of the help page. The "How To" section is the step-by-step instructions for completing the task.
 - ☐ **Sections** - Left click the plus and minus buttons to expand or collapse the "About" and "How To" sections.
 - ☐ **Related Topics** - Left click the "Related Topics" button at the top of the each help page to view other help pages that may be of interest related to the current topic.

Technical Support Contacts:

E-mail: support@qcoherent.com

Phone: 1-256-461-8289

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

Support requests will be acknowledged within a minimum of 4 hours during business hours, or within the first 4 hours of the next business day. After an initial response, a full response to an issue will occur within 3 business days of the original request.

Business hours are 7am to 5pm, Monday through Friday, CST, excluding federal holidays.

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QCoherent Software, creator of **LP360**, a LIDAR software extension for ArcGIS

QCoherent Software is an innovative provider of high-capacity, integrated LIDAR software tools. Our extensive knowledge of GIS software in general and LIDAR software in particular has been applied to the long-standing need for an ESRI® extension for LIDAR point cloud data, hence **LP360**.

Our Mission

Our mission at QCoherent Software is to develop LIDAR software that enables users of LIDAR data to easily and efficiently access and interface point cloud data with day-to-day operations.

Thank You For Your Business!



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