

LizardTech™



**LiDAR***Compressor*

**User Manual**

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## Chapter 1: Introduction

Thank you for using LizardTech™ LiDAR Compressor. We're confident that you will find LiDAR Compressor to be everything you need to make the most of your LiDAR data. Whether you're compressing individual LAS or text LiDAR files or creating LiDAR mosaics from multiple LAS, text or MG4 files, LiDAR Compressor makes it fast, easy and intuitive.

The purpose of this user manual is to introduce you to LiDAR Compressor and give you quick information about how to use it. To access this documentation as WebHelp within the application, click the question mark icon on the toolbar.

If you have not yet installed LiDAR Compressor, see "Installing LiDAR Compressor" on page 3. For a quick visual overview of the user interface, see "The LiDAR Compressor User Interface" on page 4. Compression options and other procedures are covered in other chapters.

## Why Compress LiDAR Data?

### ***More Value from Your LiDAR Data***

If the size of your raw data has meant that you only take delivery of DEMs or contours rather than your entire point cloud, we've got good news! LizardTech™ LiDAR Compressor enables you to compress the whole point cloud to MrSID and then use that compressed file to create your own derivatives, eliminating the need to return to your vendor for new products. Why not use all of the elevation data that you paid for?

### ***Lossless LiDAR File Compression***

Numerically lossless compression with Lizard-Tech LiDAR Compressor enables you to reduce LiDAR file sizes by 75 percent or more while retaining all of your points and all of the precision and accuracy of your point data. If storage requirements are critical, you can reduce your LiDAR file sizes by 90 percent or more by choosing a higher compression ratio and letting LiDAR Compressor select the best way to reach a desired file size (lossy compression).

### ***The Assurance of Using the MrSID Format***

LiDAR Compressor compresses your LiDAR data to the industry standard MrSID format, trusted as a raster format by geospatial professionals since 1992 and supported in virtually all GIS applications. With the release of LiDAR Compressor LizardTech unveils a new and improved version of the format, MrSID Generation 4 (MG4). It's still LizardTech and it's still MrSID, so you know you're using the highest quality file format with the most advanced compression technology available. MG4 enables you to view and access your LiDAR data faster.

### ***Support in Many Different Applications***

Previous versions of the MrSID format have been supported in all major GIS applications. Likewise, MG4 is already supported in Global Mapper, MARS and ArcGIS 3D Analyst, and more third-party support is on the way, so you won't need to change your workflow. There are no plug-ins or add-ons to install. Just import your compressed files into your viewing application and keep working. MG4 files

are also viewable in LizardTech's standalone GeoViewer, available as a free download at [www.lizardtech.com](http://www.lizardtech.com).

### ***Easy Workflow and Minimal Training***

LiDAR Compressor is an easy-to-use application with a straightforward workflow. You don't have to deal with a lot of confusing options. In most cases, simply load your files, preview, and encode. You can be compressing LiDAR data to MG4 from both LAS and text files in a few minutes.

## **System Requirements**

The following system is recommended for installing and running LiDAR Compressor:

- One of the following operating systems:
  - Microsoft Windows XP, 32-bit, Service Pack 3
  - Microsoft Windows XP, 64-bit, Service Pack 2
  - Microsoft Windows Vista, 32-bit, Service Pack 1
  - Microsoft Windows Vista, 64-bit, Service Pack 1
  - Microsoft Windows 7, 32- or 64-bit
- Microsoft .NET Framework 3.5, Service Pack 1 (included)
- 1-GHz processor
- DVD drive
- 2 gigabytes (GB) RAM (4 GB recommended)

In order to use LiDAR Compressor's viewer, your system must also be running Microsoft DirectX 9.0c. LiDAR Compressor's installation process prompts you to install it from the DVD. LiDAR Compressor will still compress data without DirectX but the View tab will not be operational.

As a guideline, a 1-terabyte (TB) input file requires 250 GB (or 0.25 TB) of disk space for the output file. This is in addition to the temp space mentioned below.

LiDAR Compressor comes in both 32-bit and 64-bit versions. You cannot run the 32-bit version on a 64-bit system or vice versa.

### **Temp Space Requirement**

As a guideline, a 1-terabyte (TB) input file requires 250 GB (or 0.25 TB) of temp space during compression. You should set your temp directory to a folder that you know can accommodate your temp space requirements.

#### ***To specify your temporary directory:***

1. Open the application and click the **Set preferences** button on the Application toolbar. The Preferences dialog appears.
2. Select the **Application** tab.
3. Browse for or enter a path to the desired directory, then click **OK**.

## Chapter 2: Getting Started

This chapter covers how to install and license your LiDAR Compressor software and gives you a tour of its user interface.

### Installing LiDAR Compressor

Before installing LiDAR Compressor, log on to your computer with the appropriate administrator permissions. On Windows platforms you must install and license the software as an administrative user. You do not need administrative privileges to run the software once it is installed and licensed.

**NOTE:** If you are upgrading from a previous version of LiDAR Compressor, you must first uninstall the old version. We recommend making a note of any custom fields you have defined or other important preferences, since they will not be preserved.

#### *To install LiDAR Compressor:*

1. Insert the LiDAR Compressor DVD-ROM into your DVD drive.
2. Navigate to and run the file **setup.exe**. The Installation Wizard appears.
3. Follow the instructions in the Installation Wizard. You will have an opportunity to specify a destination location for the installed files. The default location is "C:\Program Files\LizardTech\LiDAR Compressor".
4. When you are done click **Finish**.


If you have installed a trial version and wish to continue using LiDAR Compressor beyond the 30 day trial period, you must license your product (see "Licensing LiDAR Compressor" on page 3).

**TIP:** LizardTech's free standalone viewer, GeoViewer 4.0, views compressed LiDAR data in MrSID format. GeoViewer can be downloaded at <http://www.lizardtech.com/download/>.

### Licensing LiDAR Compressor

LiDAR Compressor runs for 30 days as a trial version. In order to continue using the product beyond that time you must license it.

#### *To license your version of LiDAR Compressor:*

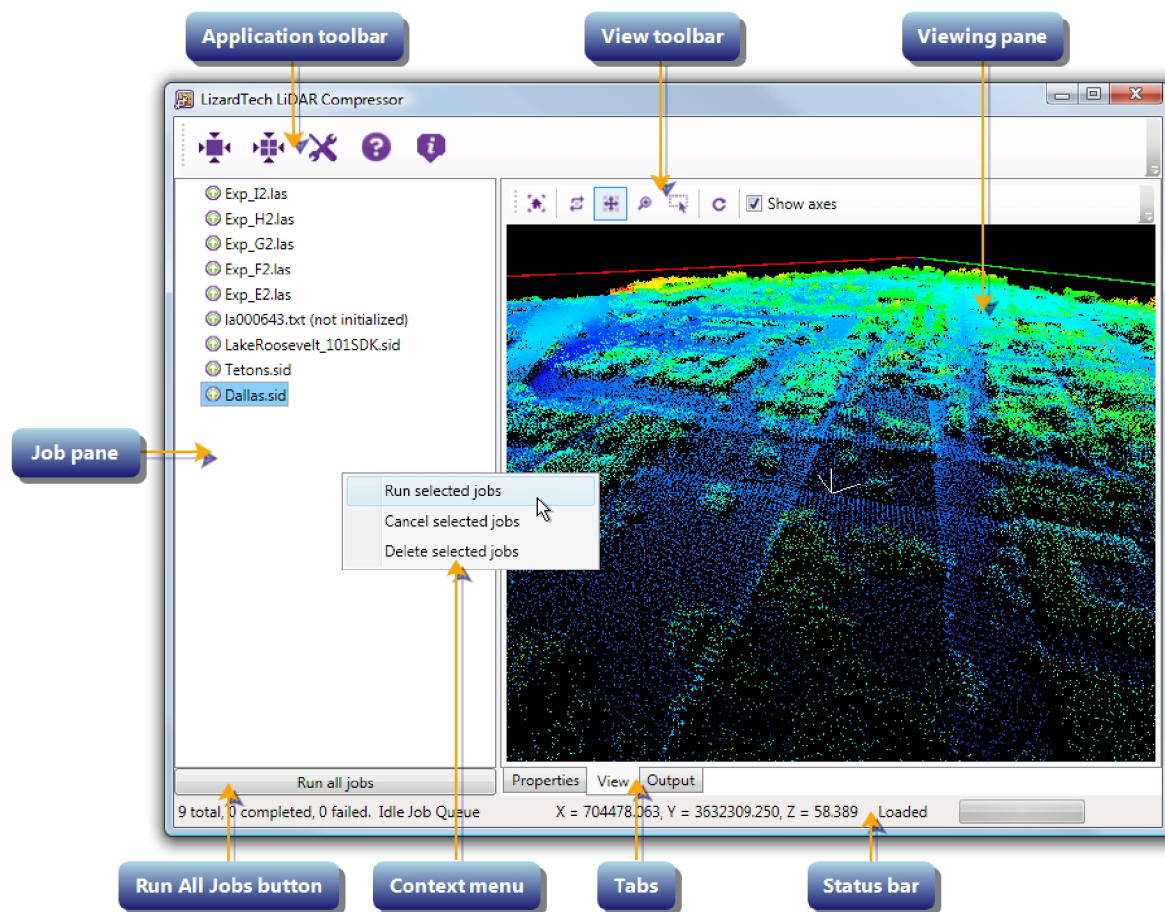
1. Click the **Set preferences** icon . The Preferences dialog appears.
2. Select the **Licensing** tab.
3. Make a note of the locking code, which has the pattern XX-XXXXX (alternatively, click the **Copy license information to clipboard** button, then paste the text into a text editor) and the serial number found inside your DVD case. **Note:** if you purchase LiDAR Compressor as a web download your serial number is sent to you via email.
4. Activate your product:
  - a. Determine which activation page you need:
    - If you are using a trial copy and have not yet purchased LiDAR Compressor, go to <https://www.lizardtech.com/purchase/lidar.php>.

- If you have already purchased LiDAR Compressor, go to <https://www.lizardtech.com/support/activation.php>.
- b. Fill out the form, entering the locking code and serial number in their fields. You will receive your license code via email.
- c. Copy and paste the license code (including the asterisk and pound sign) into the **License Code** field on the Licensing tab of the Preferences dialog.
- d. Click **OK**.

The next time you run LiDAR Compressor it will run as a licensed version.

## The LiDAR Compressor User Interface

LiDAR Compressor's user interface is simple and easy to use. Its main components are labeled in the following illustration and described below.



### The Job Pane

The Job pane is where you load your files as compression jobs to be run. It occupies the left side of the user interface.








Each mosaic job and each file added as an individual job is given an icon identifying its state of readiness (for more information, see "Running Jobs" on page 15). Files that are added as part of a mosaic job are not given an icon.

## The Application Toolbar

The Application toolbar is located at the top of the user interface above the Job pane (there is a separate toolbar for navigation on the View tab – see "Viewing Input" on page 12). The toolbar offers tools identified by the following icons:

### Application Toolbar Icons

	Add file(s) to compress individually	Enables you to browse for a file or multiple files to add for compression as individual jobs
	Add files to compress as a mosaic	Enables you to browse for files to add for compression as a mosaic job
	Set preferences	Displays the Preferences dialog, where you can set user interface, performance and text parsing preferences, change defaults, and find licensing information
	Help	Opens this WebHelp documentation
	About LiDAR Compressor	Displays LiDAR Compressor version and copyright information

## The Tabs

Three tabs – Properties, View and Output – share the right side of the user interface.

The Properties tab displays the input properties (filename, file size, number of points in the file, and extents if they are available) and enables you specify output properties such as compression ratio, output directory and output file name. If the file has a coordinate reference system (CRS), LiDAR Compressor displays it as a well known text string (WKT) in the large box in the center of the tab. The Properties tab is displayed by default when you open the application. For more information see "Setting Basic Compression Options" on page 8.

The View tab displays the job selected in the Job pane. The View tab is shown in the above illustration. Above the Viewing pane on this tab is a View toolbar with a number of navigation tool icons for exploring your LiDAR data three-dimensionally. The coordinates of your focal point (identified by the short white axis markings) are displayed on the status bar along the bottom of the application window. For more information see "Viewing Input" on page 12.

The Output tab enables you to view the progress and log information of jobs that are being compressed, or consult the log information for jobs that have already been run. For more information see "Viewing Output Information" on page 16.

### **The Run All Jobs Button**

The Run All Jobs button is located below the Job pane. It runs all ready jobs in the list.

### **The Context Menu**

Right-clicking anywhere in the Job pane displays the context menu. A context menu (sometimes called a "right-click" or "pop-up" menu) offers quick access to common actions.

### **The Status Bar**

The Status bar runs along the bottom of the application window. The Status bar tells you whether jobs are running and how many jobs have completed and how many failed. It also displays the coordinates of your focal point (identified by the short white axis markings on the view tab). When you refresh points, a progress indicator at the right end of the Status bar tells you that points are loading.

## Chapter 3: Working with LiDAR Data

This chapter tells you how to add and view input files, set your encode options, run your jobs and monitor the output information.

### Supported Formats

LiDAR Compressor supports the following input formats:

- LAS 1.0, 1.1 and 1.2 (including all four "point data record" types)
- MrSID Generation 4 (MG4)
- ASCII

LiDAR Compressor outputs MG4 files.

### Adding Files to Compress


You can add LiDAR files for compression as individual files or for mosaicking. Once a file or group of files is loaded into LiDAR Compressor we refer to it as a "job". You can also remove jobs you have added.

If you are adding a text file such as an ASCII file, you may have to tell LiDAR Compressor how to parse the data (see "Setting Basic Compression Options" on page 8).


#### Adding Files to the Job Pane

You can have both individual and mosaic jobs, as well as files of LAS, text and MrSID formats, in the Job pane at the same time.


***To add files for individual compression do one of the following:***

- Click the **Add file(s) to compress individually** icon , browse for a file or files, and click **Open**.
- Drag a file or files from a Windows Explorer folder into the Job pane.

***To add files for mosaicking do one of the following:***

- Click the **Add files to compress as a mosaic** icon , browse for a file or files, and click **Open**.
- If you wish to add a file to an existing mosaic job, drag it from a Windows Explorer and drop it into that mosaic group on the Job pane.

When you add files to compress as a mosaic, a mosaic group is automatically created in the Job pane. The mosaic file takes its name from the first file loaded as part of that mosaic job.

Jobs that are ready to be run are identified in the Job pane with the Ready icon . For more information about the various states of job readiness, see "Running Jobs" on page 15.

## Removing Files from the Job Pane

*To remove a file from the Job pane, right-click it and choose "Delete selected jobs" from the context menu.*

*To remove multiple files from the Job pane, select them, then right-click and choose "Delete selected jobs" from the context menu.*

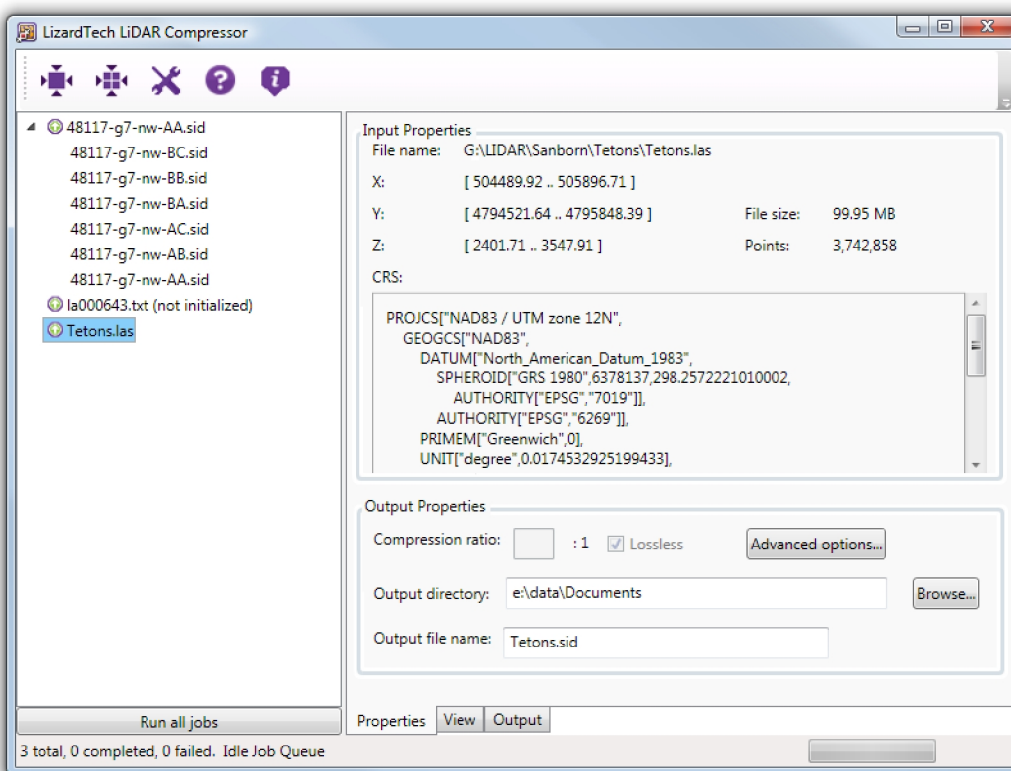
**TIP:** Use the **Shift + Click** method to select several consecutive files to add. Use **Ctrl + Click** to select nonconsecutive files or to deselect a file from a group you have selected.

## Sample Data

Your installation DVD contains a directory called `SampleData`, which includes several LiDAR files for you to use in familiarizing yourself with LiDAR Compressor. This sample data is copyright Sanborn Map Company Inc. and is used by permission.

## Setting Basic Compression Options

Basic compression options are set on the Properties tab. Shown below in the lower half of the interface, these basic options are the compression ratio, output directory and output filename. Several more compression options and all the text import settings are available on the Advanced Options dialog (see "Setting Advanced Options" on page 9).



The default compression ratio is lossless (1:1), which means that no information is discarded and no accuracy is lost. Clear the **Lossless** checkbox if you wish to enter a higher compression ratio. A compression ratio of 10:1 means that the output file will be smaller by a factor of 10 than the input file. Decimal values such as 3.6 are valid entries in the compression ratio field.

By default, your output directory is your Documents folder. You can enter a path to or browse for a different folder if you wish. If you wish to specify a different default directory, you can do that on the Preferences dialog (see "Chapter 5: Setting Preferences" on page 27).

By default the filename matches the name in the Job pane except that the original file extension is replaced with the MrSID (.sid) extension. Again, you can enter a different filename if you wish.

**TIP:** You can change the defaults for many of the compression and text import settings so that you don't have to set them for each job (see "Chapter 5: Setting Preferences" on page 27).

## Setting Advanced Options

By clicking **Advanced options** on the Properties tab you can set further compression options such as block size, number of levels, whether or not your LAS file's custom metadata should be omitted from the output file, and options for text file parsing.

**TIP:** You can change the defaults for many of the compression and text import settings so that you don't have to set them for each job (see "Chapter 5: Setting Preferences" on page 27).

### Advanced Compression Options

**WARNING:** Lowering block size or number of levels values will reduce memory usage but will slow down the compression process and in lossy compression may result in less accuracy in the output data.

Block size is the number of points that are processed and stored at a time during compression. The range of valid values is 2048 to 131072. The default is 4096.

Number of levels refers to the number of wavelet decomposition levels for each channel. By default, LiDAR Compressor uses the number of points and the block size to determine the optimal number of levels.

The LAS specification includes several variable length records (VLRs), which are arbitrary binary data. Your LAS file may also include custom VLRs. LiDAR Compressor always preserves metadata outlined by the LAS specification (georeferencing information and the classification lookup table), but by default does not carry over any custom user metadata contained in a LAS file.

#### *To specify advanced encode options:*

1. If it is not already open, click the **Advanced Options** button on the **Properties Tab**.
2. Click the **Compression** tab.
3. [Optional and not recommended] Specify block size.
4. [Optional and not recommended] Clear the **Determine automatically** checkbox, then enter a value in the **Number of levels** field.

5. If there is custom metadata you wish to preserve, for example copyright information, clear the **Omit custom LAS VLR metadata from output** checkbox.
6. Click **OK**.

## Text Parsing Options

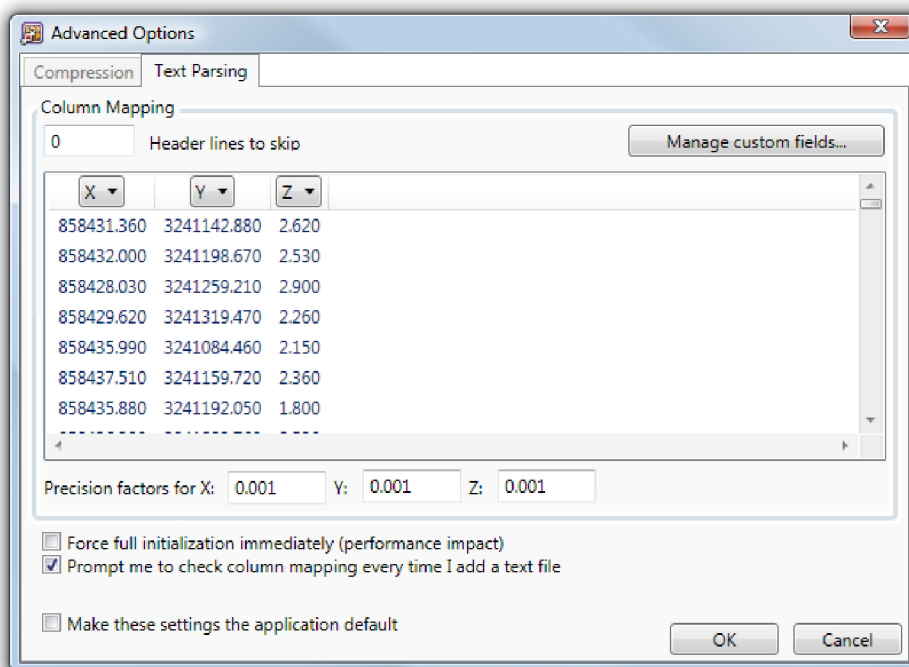
In order for LiDAR Compressor to properly read text data such as ASCII files, data columns must be specified for the x, y and z axes. If any of these axes are unassigned when you load a text file into LiDAR Compressor, you are prompted to assign them via the Text Parsing tab of the Advanced Options dialog. You can also set many of the text import options at any time after loading your text files.

**NOTE:** LiDAR Compressor cannot tell you which column should be the x, y, or z axis. You must know which column maps to which axis. If you do not know, consult your data provider, but here are some clues: if a file has only three columns, they are most likely x, y, and z, and in most cases the data in x and y will be more similar to each other than either will be to the data in z; furthermore, the data in the z column tend to be smaller numbers because it is elevation data, although this is not always the case. Some files contain commented header lines that tell you how to map the columns. LiDAR Compressor displays these upon import, but you must skip them before running the job.

The following procedure is a general one for setting text parsing options. See below for notes on the various options.

### *To specify text parsing options:*

1. If it is not already open, click the **Advanced Options** button on the **Properties Tab**.
2. Click the **Text Parsing** tab. The tab appears as shown below:



3. Assign x, y and z headings to the appropriate columns using the drop-down menus above each column. You may also assign headings to other available columns as desired.
4. Make other changes as desired.
5. If you wish to make these settings the defaults, select the **Make these settings the application default** checkbox.
6. Click **OK**.

### ***Skipping Header Lines***

The Text Parsing tab displays the columns of data in your text file. There may be descriptive header information that you can instruct LiDAR Compressor to skip when listing the column data. By default LiDAR Compressor skips zero (0) lines (shows all of the header lines), but if you want to skip one or more lines, you can enter a number in the **Header lines to skip** field.

### ***Text File Column Mapping Prompt***

If you want to add text files to the Job pane without being prompted to check column mapping, clear the **Prompt me to check column mapping every time I add a text file** checkbox. If column mapping for an added job is invalid, the job will be marked with an exclamation point in the Job pane so that you can map columns later.

### ***Forcing Full Initialization***

You can choose whether you want LiDAR Compressor to initialize your text file immediately or wait until it is being run as a job. Initializing the file requires reading all the data and could take many hours depending on the size of source file. If you want to go ahead and initialize right away, select the **Force full initialization immediately** checkbox. By default this checkbox is cleared.

### ***Specifying Precision Factor***

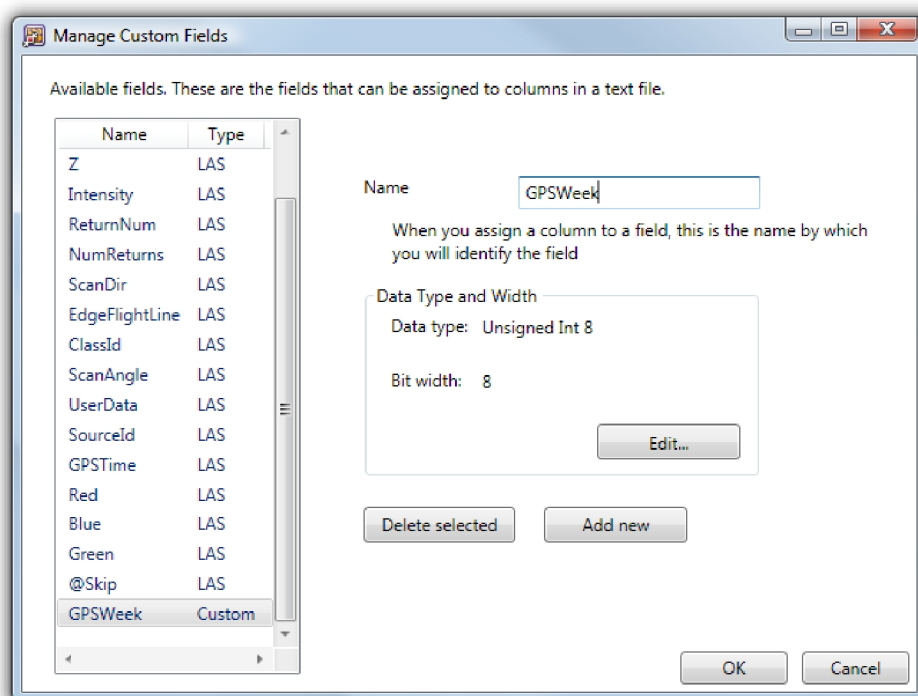
When a job is run, each number in the data columns is represented by an offset and the default precision factor of .001. The **Precision factor** fields enable you to change the factor by which the data in any or all three axis columns will be represented to account for the number of significant decimal places in those columns.

### ***Managing Custom Fields***

Your files may contain columns of data that don't map to any of the headings or *fields* in the LAS specification. LiDAR Compressor allows you to create custom fields for this data. When you create a custom field, it becomes available in the drop-down menus above the columns of data on the Text Parsing tab so you can map fields to your columns as desired.

#### ***To add a custom field:***

1. Click the **Manage custom fields** button. The Manage Custom Fields dialog appears.
2. Click **Add new** and enter a name for the new field.
3. [Optional] Click **Edit**. The Edit Data Type dialog appears. Select a data type from the drop-down menu and enter a bit width, then click **OK** to dismiss the dialog. The name of your new custom field appears at the bottom of the list of fields, as shown below.



4. Click **OK**. Your custom field is now available in the drop-down menus above the column data.

You can also edit, change the name of, or delete any existing custom fields using the Manage Custom Fields dialog.

## Viewing Input

Once a file is loaded into LiDAR Compressor, you can orbit, pan and zoom the data in three dimensions (3D) by clicking the View tab and using the navigation toolbar above the Viewing pane. These tools are identified in the following table and described below.

### Navigation Toolbar Icons

	Restore original view	Repositions your viewpoint to its original position zoomed out along your z axis.
	Orbit focal point	Moves your viewpoint in an orbit around your focal point.
	Pan data	"Moves" the data from side to side or up and down.
	Zoom in and out	Enables you to zoom in or out by clicking and moving the mouse back or forward
	Select zoom region	Enables you to zoom in by clicking and dragging to specify a region of interest.






Refresh points

Freshly displays a configurable number of points that fall within the current view.

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When you first view a job on the View tab:

- the Pan tool  is selected
- your viewpoint is positioned at the "top" of your z axis

## Navigating in Three Dimensions

Imagine that when you view your data, you are looking at the center of a sphere. Let's call it the *orbital sphere*. The outer surface of the orbital sphere represents the infinite possible positions your viewpoint can occupy. Your *focal point* is always the center of an orbital sphere no matter how you navigate. (On LiDAR Compressor's View tab, you can show or hide the axis marks that indicate your focal point – just click **Show Axes**.) When you first view your data on the View tab, that data is centered where the focal point is, but it is important to recognize that *the data and the focal point are not bound together*.

When you orbit the data, your viewpoint is essentially revolving around the focal point, and if you have not yet panned the data, your viewpoint is also revolving around the center of the body of data. Imagine your viewpoint swirling around on the surface of the orbital sphere like a camera on a spherical scaffold. Relative to the viewpoint, your data appears to turn and roll around according to your orbiting movements.

Panning the data is different in that the viewpoint does not move along the surface of the sphere, but up and down or sideways *on the plane tangential to the sphere*. This makes the entire body of data appear to move sideways or up or down, regardless of what angle you are viewing it from. What is actually happening is that your focal point is shifting as you pan, relative to the data, so that your viewpoint now rests on the surface of a new orbital sphere.

With all this in mind, we recommend that you simply take the navigation tools for a test drive. You will notice several things right away.

- Zooming in reduces the diameter of your orbital sphere. You can zoom in to the "space" occupied by the data points so far that you can then use the orbit tool to revolve in a very tight circle, so that the data appears to revolve behind you. In fact you are still orbiting the focal point, but at a much tighter radius.
- You cannot zoom in past your focal point. If your focal point is in the middle of the body of data, it may be "in the air" above a building or other item you wish to view, and you cannot zoom in any closer to the object behind it. In this case, you should zoom back out a little, orbit so that you can see the relationship of your target to your focal point (make sure axes are showing) and then use the Pan tool to "move" the data so that your focal point is behind your target.
- If you pan far enough, it is possible to "move" your data so that it no longer lies in your orbital sphere at all.

In a very short time, you will develop patterns of panning, zooming and orbiting that best suit your workflow. To start out, you may want to pan a little, zoom a little, then orbit a little to explore the data,

then repeat the process, panning again as necessary to place your focal point properly in relation to the data you wish to view more closely.

## Showing and Hiding Axes




Your focal point is identified by three short axis markings that form what looks like a corner. They help you orient your viewpoint among the data. You may choose not to display the axes.

**To show or hide the axes click the "Show axes" button on the Navigation toolbar.**

**NOTE:** The location of your focal point is displayed on the Status bar.

## Zooming In and Out

You can zoom into and out of your LiDAR data in any of the following ways (**Note:** see also "Keyboard Shortcuts" below):

- Select the **Zoom** tool , then click and move your mouse backward or forward to zoom in or out.
- If your mouse has a scroll wheel, move the scroll wheel forward (away from you) to zoom in and backward (toward you) to zoom out; you can do this no matter which tool is selected.
- Select the **Select Zoom Region** tool , then click and drag on the Viewing pane to define the region you wish to zoom to.
- Click the **Restore Original View** button  to reposition your viewpoint on the z axis, zoomed out so that all of your data points lie within the Viewing pane.


**TIP:** You cannot zoom in beyond the focal point. If your focal point is in front of your target, zoom out again and pan to reposition it so that it lies behind your target.

## Keyboard Shortcuts

There are several keyboard shortcuts (sometimes called *hotkeys*) that enable easier navigation in the view tab. The keyboard shortcuts are as follows:

- While holding down the **Ctrl** key, click and drag up or down to zoom smoothly out or in.
- While holding down the **Shift** key, click and drag in any direction to rotate the view.
- While holding down both the **Ctrl** and **Shift** keys, click and drag to define the region you wish to zoom to.


## Refreshing Points

The Viewing pane shows 500,000 points of data by default. You can change this number on the Viewing tab of the Preferences dialog. When you first open your data in the Viewing pane, those points are distributed over the entire volume of the data. When you zoom in among the data points, shapes and contours may be harder to see and the data may appear "thinner". You can increase the density of points in your area of interest by clicking the Refresh Points button .

When you refresh the points, LiDAR Compressor again displays 500,000 points, but all of the points displayed after the refresh command are located within your current view, which makes for greater density in the region you are inspecting.

**TIP:** Refreshing points is more effective if you are viewing perpendicular to the earth or other foundational surface in your data when you refresh. If your view tilts upward toward a "horizon", then a broader region will be included and the points will be distributed evenly throughout it. A good rule of thumb is to zoom in closely over your target while viewing perpendicular to the ground, then refresh your points, then orbit to explore the data.

## Restoring Original View

If you get lost, or you pan your data right out of the Viewing pane and can't find it, or for any other reason you need to start your viewing over again, click the **Restore Original View** button . This repositions your viewpoint on the z axis, zoomed out so that all of your data points lie within the Viewing pane as they were when you first viewed the job.

## Running Jobs

You can run any or all ready jobs. See the table below for job state icons.

**To run all jobs, click the Run all jobs button below the Job pane.**

**To run selected jobs, select the job or jobs you want to run in the Job pane, then right-click to access the context menu and choose Run selected jobs.**

**NOTE:** Not ready jobs and jobs already running cannot be run.

## Canceling Jobs




You can cancel jobs using the context menu or the cancel button on the Output tab.

**To cancel all jobs queued to run, click "Cancel all" on the Output tab.**




**To cancel a selected job or jobs, select the job or jobs in the Job pane, then right-click and choose "Cancel selected jobs" from the context menu.**

The following table shows the icons that identify the state of each job.

**Job State Icons**

	Ready	Job is ready to be run
	Not Ready	Job is not ready to be run, either because it is not yet fully loaded or because it failed to initialize. The reason a loaded file might fail to initialize is usually because it is a text file and the column mapping is invalid (see "Setting Basic Compression Options" on page 8).
	Waiting	Job is in the queue to be run

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	Running	Job is currently being run
	Finished	Job has been successfully run
	Canceled	Job has been canceled

---

## Monitoring Job Progress

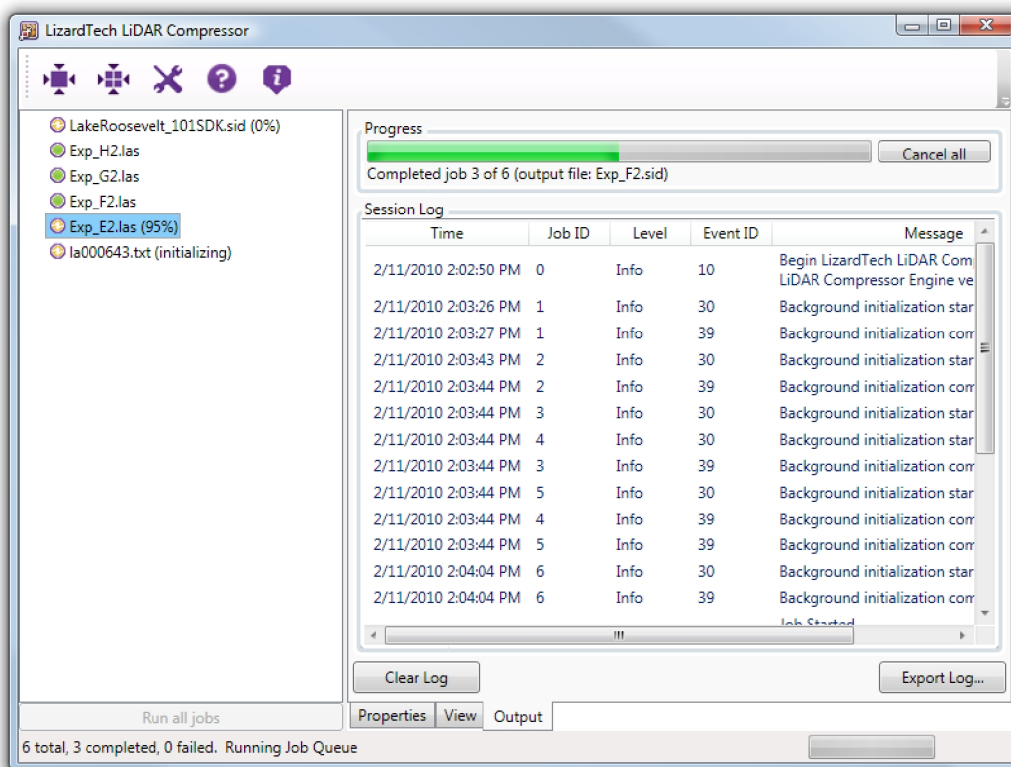
While a job is running, its individual progress is indicated by a percentage next to its name in the Job pane. Jobs run simultaneously, not sequentially, so you will see the percentages for several jobs changing at the same time if you run more than one job.

When you run jobs, the Output tab is displayed and the progress bar shows how many jobs have been completed of the total number of jobs. For more information see "Viewing Output Information" on page 16.

Because you may wish to return to the Properties or View tab while jobs are running, the Status bar also shows a summary of the job progress. The Status bar is always visible.

## Viewing Output Information

When you run a job, the Output tab is displayed with a progress bar, several buttons, and log information, as shown below.



The progress bar shows you how many jobs are completed out of the total number.

The "Cancel all" button enables you to cancel all jobs in the queue.

Below the progress bar and is the session log, which contains information about jobs that are being run or have already been run during this session. The session log can be sorted by any column. The columns are:

- Time
- Job ID
- Level
- Event ID
- Message

***To sort by a column click the heading of that column.***

***To sort in the reverse order, click the heading again.***

***To clear the log information and start with a new session log, click "Clear Log".***

You can view the session log any time by selecting the Output tab.

## Exporting Log Information

You can export the log as a comma separated value (.csv) file or as a text file for later viewing in your favorite spreadsheet application.

***To export log information:***

1. Click **Export Log**. The Export Log dialog appears.
2. Specify a directory and file name, then click **Save**.

## Viewing Format Version of MrSID Files

LiDAR Compressor's installation includes a Windows Explorer shell extension that enables you to add to any Windows Explorer directory a column that identifies MrSID files by their format version and tells you whether a file is a raster image or a LiDAR file.

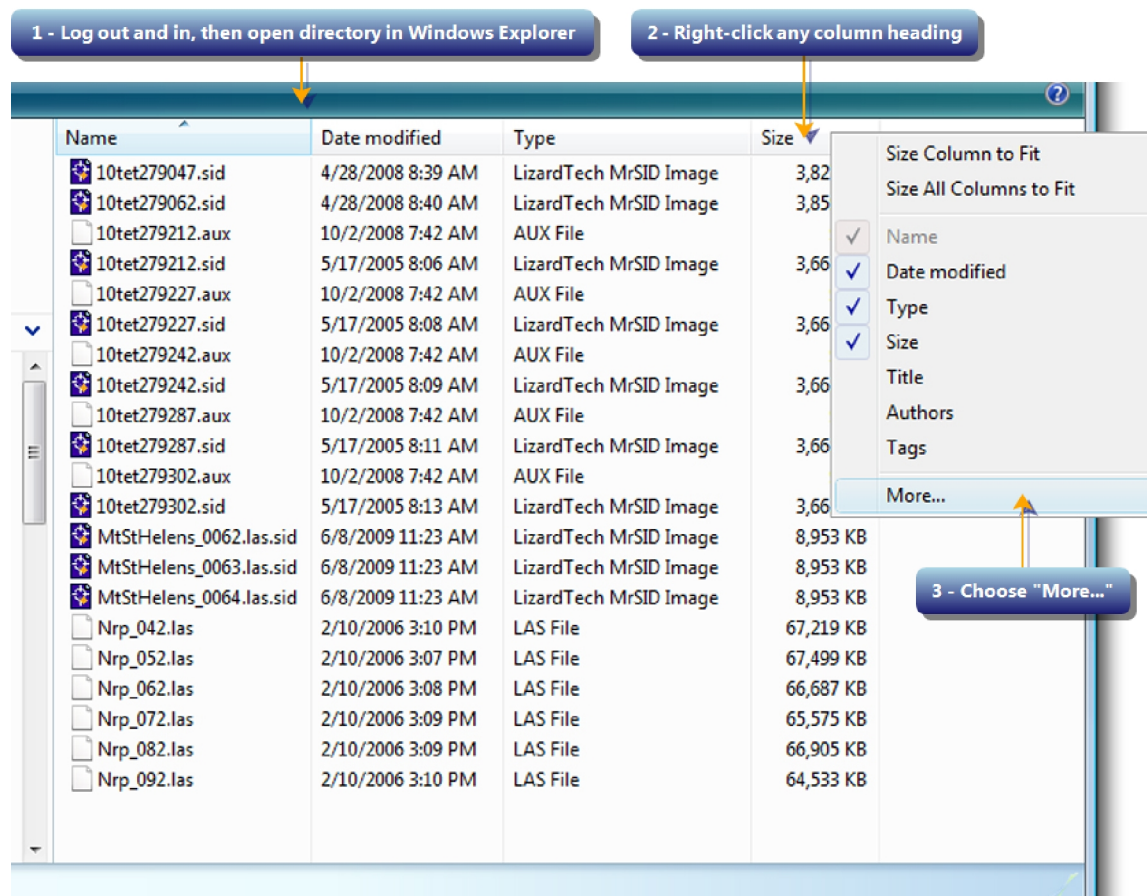
***To enable the MrSID Version column after installation of LiDAR Compressor:***

1. Log out and back in, then open the desired directory in Windows Explorer.
2. Right-click any column heading. A context menu appears.
3. Choose **More**. The Choose Details dialog box appears.
4. Scroll to find the **MrSID Version** checkbox and select it. Use the **Move Up** and **Move Down** buttons to position the column as desired among the other selected columns, then click **OK**.
5. The new column is now visible in the directory. You can click the column heading to sort the contents of the directory by MrSID version.

The illustrations below demonstrate the steps above.

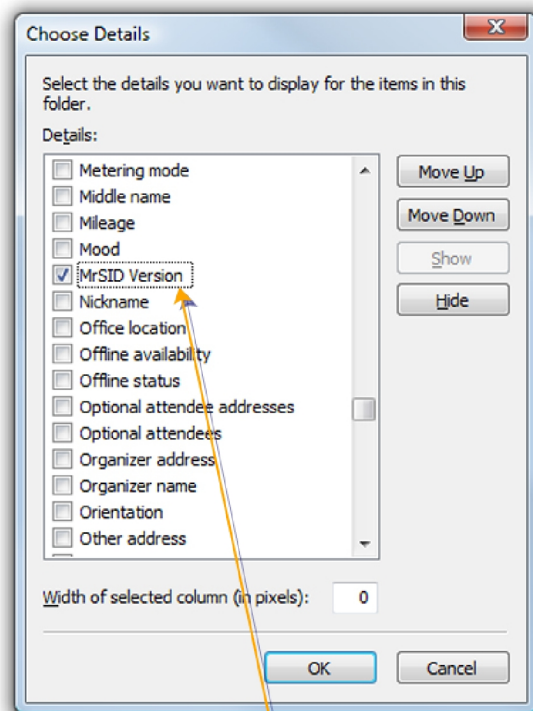
1 - Log out and in, then open directory in Windows Explorer

2 - Right-click any column heading



Name	Date modified	Type	Size
10tet279047.sid	4/28/2008 8:39 AM	LizardTech MrSID Image	3,82
10tet279062.sid	4/28/2008 8:40 AM	LizardTech MrSID Image	3,85
10tet279212.aux	10/2/2008 7:42 AM	AUX File	
10tet279212.sid	5/17/2005 8:06 AM	LizardTech MrSID Image	3,66
10tet279227.aux	10/2/2008 7:42 AM	AUX File	
10tet279227.sid	5/17/2005 8:08 AM	LizardTech MrSID Image	3,66
10tet279242.aux	10/2/2008 7:42 AM	AUX File	
10tet279242.sid	5/17/2005 8:09 AM	LizardTech MrSID Image	3,66
10tet279287.aux	10/2/2008 7:42 AM	AUX File	
10tet279287.sid	5/17/2005 8:11 AM	LizardTech MrSID Image	3,66
10tet279302.aux	10/2/2008 7:42 AM	AUX File	
10tet279302.sid	5/17/2005 8:13 AM	LizardTech MrSID Image	3,66
MtStHelens_0062.las.sid	6/8/2009 11:23 AM	LizardTech MrSID Image	8,953 KB
MtStHelens_0063.las.sid	6/8/2009 11:23 AM	LizardTech MrSID Image	8,953 KB
MtStHelens_0064.las.sid	6/8/2009 11:23 AM	LizardTech MrSID Image	8,953 KB
Nrp_042.las	2/10/2006 3:10 PM	LAS File	67,219 KB
Nrp_052.las	2/10/2006 3:07 PM	LAS File	67,499 KB
Nrp_062.las	2/10/2006 3:08 PM	LAS File	66,687 KB
Nrp_072.las	2/10/2006 3:09 PM	LAS File	65,575 KB
Nrp_082.las	2/10/2006 3:09 PM	LAS File	66,905 KB
Nrp_092.las	2/10/2006 3:10 PM	LAS File	64,533 KB

3 - Choose "More..."



4 - Select the "MrSID Version" checkbox, position as desired, and click "OK"

5 - Click here to sort by version!

Name	Date modified	Type	MrSID Version	Size
10tet279047.sid	4/28/2008 8:39 AM	LizardTech MrSID Image	Generation 2 Raster	3,827 KB
10tet279062.sid	4/28/2008 8:40 AM	LizardTech MrSID Image	Generation 2 Raster	3,859 KB
10tet279212.aux	10/2/2008 7:42 AM	AUX File		9 KB
10tet279212.sid	5/17/2005 8:06 AM	LizardTech MrSID Image	Generation 3 Raster	3,663 KB
10tet279227.aux	10/2/2008 7:42 AM	AUX File		9 KB
10tet279227.sid	5/17/2005 8:08 AM	LizardTech MrSID Image	Generation 3 Raster	3,663 KB
10tet279242.aux	10/2/2008 7:42 AM	AUX File		9 KB
10tet279242.sid	5/17/2005 8:09 AM	LizardTech MrSID Image	Generation 3 Raster	3,663 KB
10tet279287.aux	10/2/2008 7:42 AM	AUX File		9 KB
10tet279287.sid	5/17/2005 8:11 AM	LizardTech MrSID Image	Generation 3 Raster	3,663 KB
10tet279302.aux	10/2/2008 7:42 AM	AUX File		9 KB
10tet279302.sid	5/17/2005 8:13 AM	LizardTech MrSID Image	Generation 3 Raster	3,663 KB
MtStHelens_0062.las.sid	6/8/2009 11:23 AM	LizardTech MrSID Image	Generation 4 LiDAR	8,953 KB
MtStHelens_0063.las.sid	6/8/2009 11:23 AM	LizardTech MrSID Image	Generation 4 LiDAR	8,953 KB
MtStHelens_0064.las.sid	6/8/2009 11:23 AM	LizardTech MrSID Image	Generation 4 LiDAR	8,953 KB
Nrp_042.las	2/10/2006 3:10 PM	LAS File		67,219 KB
Nrp_052.las	2/10/2006 3:07 PM	LAS File		67,499 KB
Nrp_062.las	2/10/2006 3:08 PM	LAS File		66,687 KB
Nrp_072.las	2/10/2006 3:09 PM	LAS File		65,575 KB
Nrp_082.las	2/10/2006 3:09 PM	LAS File		66,905 KB
Nrp_092.las	2/10/2006 3:10 PM	LAS File		64,533 KB

**To remove the column, right-click any column heading again, choose "More", then clear the "MrSID Version" checkbox and click "OK".**



## Chapter 4: Using LiDAR Compressor's Command Line Tools

Your installation of LizardTech LiDAR Compressor includes several command line tools you may find useful for decompressing MrSID Generation 4 (MG4) files or viewing information about MG4, LAS or text LiDAR files. These tools are located in your installation's `Bin` directory.

### Viewing File Information

Your installation of LizardTech LiDAR Compressor includes a command line tool called `lidarinfo`. Located in your installation's `Bin` directory, `lidardinfo` enables you to view the information in LAS or text files in text form.

#### Usage

The only required parameter for LAS files is `-inputFile` (or `-i`), which specifies the input file name. Text input files also require the `-parse` (or `-p`) parameter, which describes the order of the fields.

You may add other options and parameters as described in the table of switches below. The order of the switches in the syntax has no bearing on the output.

For examples of how to form a command, see "Example" on page 23.

**lidarinfo Switches**

<b>lidarinfo Switches</b>		
<code>-inputFile (-i)</code>	string	(Required) Specifies the name of the input file.
<code>-parse (-p)</code>	string	(Required for text input) Parse format that describes the fields in a text input file. Valid values are: x - x point values y - y point values z - z point values i - intensity r - return number n - number of returns d - scan direction e - edge of flight line a - scan angle c - class id p - source id u - user data t - GPS time R - red G - green B - blue s - skip this column  Example: If you have five fields in the order GPS time, intensity, x, y and z and you only want the time and the point values, then specify <code>-parse tsxyz</code> , which skips the second (intensity) column and correctly labels the other four.
<code>-metadata (-m)</code>		Tells <code>lidarinfo</code> to display all metadata.
<code>-bounds (-b)</code>		Tells <code>lidarinfo</code> to determine the extents of the data by reading the data itself instead of reading min and max values reported in the header.
<code>-skipHeader (-skip)</code>	unsigned integer	Tells <code>lidarinfo</code> to skip the first <i>n</i> lines of text input files.
<code>-h (-?)</code>		Displays a short usage message.
<code>-help</code>		Displays a detailed usage message.
<code>-version (-v)</code>		Displays version information.
<code>-verbose (-V)</code>		Tells <code>lidarinfo</code> to display more verbose

*Continued >*

<code>-returns (-r)</code>	error messages. Decodes the points and displays a histogram of the number of points per return value.
<code>-classification (-c)</code>	Decodes the points and displays a histogram of the number of points per classification.
<code>-credits</code>	Displays credits and copyrights.

## Example

The command

```
lidarinfo -i \\data\Lidar\pugetsoundlidar.ess.washi gton.edu\sids\LakeRoosevelt_2.sid
```

returns the following information:

```
Basic LiDAR Info:
  Format:                MG4 4.0.0.1
  Number of Points:     3144893399
  Bounds Min:           408841.780000 5370276.770000 391.350000
  Bounds Max:           447234.600000 5422959.680000 1188.890000
  Scale:                0.001 0.001 0.001
  Offset:               408841.780000 5370276.770000 391.350000
  Supported Fields:     GPSTime X Y Z Intensity ReturnNum NumReturns
                        ClassId ScanDir ScanAngle UserData SourceId
  Spatial Reference:    None
```

## Decompressing MG4 Files

Your installation of LizardTech LiDAR Compressor includes a command line tool called `lidardecode`. Located in your installation's Bin directory, `lidardecode` enables you to decompress MG4 files to LAS or text files.

### Usage

The only required parameters are `-inputFile` (or `-i`), which specifies the input file name, and `-outputFile` (or `-o`), which specifies the output file name.

If no output format (`-outputFormat` or `-of`) is specified, the file extension specified in the `-outputFile` parameter is used as the output format.

If no output format (`-outputFormat` or `-of`) is specified and no file extension is specified in the output file name, then `lidardecode` decodes the file to the default format (text) and appends the default suffix (.txt) to the output file name.

You may add other options and parameters as described in the table of switches below. The order of the switches in the syntax has no bearing on the output.

For examples of how to form a command, see "Examples" on page 25.

## lidardecode Switches

lidardecode Switches		
<code>-inputFile (-i)</code>	string	(Required) Specifies name of input MG4 file.
<code>-outputFile (-o)</code>	string	(Required) Specifies name of output file. If no file extension is provided, default is to concatenate a format suffix to input file.
<code>-outputFormat (-of)</code>	string	Specifies output format. Acceptable values are TXT, LAS10, LAS11, LAS12. Default is TXT.
<code>-subsample (-s)</code>	unsigned integer	Tells <code>lidardecode</code> to subsample, taking every $n$ -th point. <code>-s 2</code> leaves one half the file, <code>-s 3</code> leaves one third.
<code>-crop (-c)</code>	FLOAT0 FLOAT1 FLOAT2 FLOAT3 FLOAT4 FLOAT5	Tells <code>lidardecode</code> to crop to the specified box (world coordinates: x-min, x-max, y-min, y-max, z-min, z-max). A value of <code>-inf</code> (for a minimum) or <code>+inf</code> (maximum) means no-crop in that direction.
<code>-offset (-ofs)</code>	FLOAT0 FLOAT1 FLOAT2	Specifies the offset from which the points will be specified (world coordinates: x[0], y[0], z[0]. Default is to use the origin of the bounding box.

<code>-outFields (-ofld)</code>	<code>string</code>	Tells <code>lidardecode</code> to include particular fields. By default <code>lidardecode</code> outputs all those supported by the output format and are in the input file. <ul style="list-style-type: none"><li>x - x point values</li><li>y - y point values</li><li>z - z point values</li><li>i - intensity</li><li>r - return number</li><li>n - number of returns</li><li>d - scan direction</li><li>e - edge of flight line</li><li>a - scan angle</li><li>c - class id</li><li>p - source id</li><li>u - user data</li><li>t - GPS time</li><li>R - red</li><li>G - green</li><li>B - blue</li></ul>
---------------------------------	---------------------	--

*Continued >*

<code>-scale (-sc)</code>	<code>FLOAT0</code> <code>FLOAT1</code> <code>FLOAT2</code>	Specifies the scale (or <i>precision</i> ) factor (x-scale, y-scale, z-scale). Default is 0.001, 0.001, 0.001.
<code>-h (-?)</code>		Displays a short usage message.
<code>-help</code>		Displays a detailed usage message.
<code>-version (-v)</code>		Displays version information.
<code>-verbose (-V)</code>		Tells <code>lidardecode</code> to display more verbose error messages.
<code>-credits</code>		Displays credits and copyrights.

## Examples

The following command uses the minimum required parameters and decodes to a text file called "Exp\_D2\_1.txt".

```
lidardecode -i E:\Data\localTestImages\Exp_D2_1.sid
```

The following command produces the same result as the previous one, but because the user wants to change the output file name, the `-o` parameter has been included and the text output is explicitly called for.

```
lidardecode -i E:\Data\localTestImages\Exp_D2_1.sid -o E:\Data-  
\localTestImages\Exp_D2_2.txt
```

The following command decodes to a LAS file.

```
lidardecode -i E:\Data\localTestImages\Exp_D2_1.sid -o E:\Data-  
\localTestImages\Exp_D2_1.las
```


The following command decodes to a text file called "Exp\_D2\_1.xyz" (any extension other than .las results in a text file) and limits the data in the file to four fields (GPS time, x, y and z).

```
lidardecode -i E:\Data\localTestImages\Exp_D2_1.sid -o E:\Data-  
\localTestImages\Exp_D2_1.xyz -ofld xyz
```

## Chapter 5: Setting Preferences

You can change the defaults for many of the compression and text import settings so that you don't have to set them for each job. Of course, you can still change the settings for any job even if you have set them in your preferences.

### *To change your preferences:*

1. Click the **Preferences icon**  on the toolbar. The Preferences dialog appears.
2. Select a tab and make changes as desired.
3. Click **OK**.

Following are some notes about the settings you can change on the various tabs of the Preferences dialog and their default values.

### Compression Preferences

**WARNING:** Lowering block size or number of levels values will reduce memory usage but will slow down the compression process and in lossy compression may result in less accuracy in the output data.

Block size is the number of points that are processed and stored at a time during compression. LiDAR Compressor's factory default is 4096. The range of valid values is 2048 to 131,072.

Number of levels refers to the number of wavelet decomposition levels for each channel. By factory default, LiDAR Compressor uses the number of points and the block size to determine the optimal number of levels. You can clear the "Determine automatically" checkbox and enter a number of levels.

Compression ratio is the ratio at which the data is compressed. The factory default ratio of 1:1 means a lossless compression (no data will be discarded). A ratio of 10:1 means that the output file will be smaller by a factor of 10 than the input file, but the accuracy of point placement will be degraded.

By default, your output directory is your Documents folder and the path to that folder is listed on the Properties tab. For any individual job, you can always change the output directory on the Properties tab, but if you want a different folder to be the default output directory, specify that folder here.

The LAS specification includes several variable length records (VLRs), which are arbitrary binary data. Your LAS file may also include custom VLRs. LiDAR Compressor always preserves metadata outlined by the LAS specification (georeferencing information and the classification lookup table), but by default the **Omit custom LAS VLR metadata from output** checkbox is selected and LiDAR Compressor does not carry over any custom user metadata contained in a LAS file.

### Viewing Preferences

By default LiDAR Compressor displays 500,000 points in a given view. You can make the default number higher or lower. Lower numbers will display more quickly. Higher numbers of points take longer to display but reveal greater detail.

## Text Parsing Preferences

You can choose whether LiDAR Compressor initializes your text file immediately or waits until it is being run as a job. Initializing the file requires reading all the data and could take a long time. If you want LiDAR Compressor to initialize the file immediately by default, select the **Force full initialization immediately** checkbox. By factory default, this checkbox is cleared. You can still force initialization for any individual job.

If you want to add text files to the Job pane without being prompted to check column mapping, clear the **Prompt me to check column mapping every time I add a text file** checkbox. If column mapping for an added job is invalid, the job will be marked with an exclamation point in the Job pane so that you can map columns later.

## Manage Custom Fields

You may add, delete or edit custom fields either as part of an individual job or as a default setting. For more information see "Managing Custom Fields" on page 11.

## Application Preferences

The maximum number of jobs that can be run concurrently, by default, is one more than the number of central processing units (CPUs) detected. You can specify a different number, but performance may suffer.

By default the temporary file directory is `<user>\AppData\Local\Temp\`. You can change this to any desired folder.

**IMPORTANT:** As a guideline, a 1-terabyte (TB) input file requires 250 GB (or 0.25 TB) of temp space during compression. You should set your temp directory to a folder that you know can accommodate your temp space requirements.

## Licensing Preferences

The Licensing tab tells you whether your version of LiDAR Compressor is licensed or running in Trial mode. A locking code is displayed that you must use to license your application.

Once your license code has been returned and you have activated your license, a serial number is also displayed for troubleshooting with LizardTech Support.



## Chapter 6: Troubleshooting and Support

The following topics will help you get the help you need when things don't go the way they're supposed to.

### Getting Help

Most technical issues can be resolved using the various resources you have available. In addition to the product documentation and the README file, LizardTech offers a knowledge base and product updates on the LizardTech website.

#### Knowledge Base

<http://www.lizardtech.com/support/kb/>

The LizardTech Knowledge Base contains articles about known technical and usage issues and is frequently updated.

#### Community Forums

<http://www.lizardtech.com/forums/>

The forums comprise a place to engage in intelligent discourse with the geospatial community. Ask questions, provide answers, and share product usage tips with other LizardTech customers around the world.

#### Support Plans

<http://www.lizardtech.com/purchase/other.php>

Protect your investment in LizardTech software by participating in a LizardTech support plan. For more details, please contact your regional LizardTech office.

#### Contacting Technical Support

<http://www.lizardtech.com/support>

To contact technical support, visit the website at the above URL and use the Contact link on the left navigation pane.

In an emergency, call 206-902-2845 between the hours of 8 AM and 5 PM Pacific Time.

**IMPORTANT:** Please have the following information available to assist LizardTech Technical Support in resolving your problem:

- Which version of LiDAR Compressor you are running (see "Finding Your LiDAR Compressor Version Number" on page 30)
- Other LizardTech products you have installed
- Which operating system you use
- How much free hard drive space your computer has
- How much RAM your computer has

- The type and size of file you are encoding
- The task you were working on when the problem occurred
- The command you typed prior to the problem, if applicable
- The exact error message, if applicable
- Whether you have restarted the computer and attempted to reproduce the problem
- Any other information you feel is relevant

## Finding Your LiDAR Compressor Version Number

You may need to know your the version and build number of your LiDAR Compressor software in order to communicate with LizardTech Technical Support.

***To find your version and build numbers, click the About icon on the Application toolbar. The About box appears as shown below.***



The version and build numbers are listed on a single line below the name of the product. We've highlighted this line in the above illustration:

Version: 1.1.0.2793

In this case, the version number is 1.1.0 and the build number is 2793.

# Appendix

## About LizardTech

Since 1992, LizardTech has delivered state-of-the-art software products for managing and distributing massive, high-resolution geospatial data such as aerial and satellite imagery and LiDAR data. LizardTech pioneered MrSID® (Multiresolution Seamless Image Database) technology, a powerful wavelet-based image encoder, viewer, and file format, and sits on the Technical Committee of the Open Geospatial Consortium (OGC) for the purpose of extending the capabilities of JPEG 2000 to geospatial applications, driving cross-platform interoperability and rapid Internet distribution for geospatial imagery. LizardTech has offices in Seattle, London and Tokyo and is a division of Celartem Technology Inc., (Hercules: 4330). For more information about LizardTech, visit [www.lizardtech.com](http://www.lizardtech.com).

## Other LizardTech Products

Thank you for using LizardTech™ LiDAR Compressor. We at LizardTech are glad to have you as a customer. While you're "in the shop," explore LizardTech's other products for managing high-quality images and LiDAR data.

### GeoViewer

#### ***Efficient Viewing and Exporting of MrSID and JPEG 2000 Layers***

GeoViewer is LizardTech's free, standalone application for viewing geospatial imagery, vector overlays and LiDAR data. GeoViewer enables you to combine, view and export visual layers from varied sources, such as local repositories, Express Server catalogs, and WMS and JPIP servers. GeoViewer supports a wide range of input formats and exports to GeoTIFF, PNG and JPEG. It's the most efficient means of viewing MrSID and JPEG 2000 files.

For more information about GeoViewer visit <http://www.lizardtech.com/download/>.

### ExpressView Browser Plug-in

#### ***Fast Network Viewing of Large Images and Data Sets***

If you like the features in GeoViewer, consider ExpressView Browser Plug-in. ExpressView enables you to view, navigate and print MrSID and JPEG 2000 files in Internet Explorer or Firefox. Like GeoViewer, ExpressView enables you to save a portion of a file in a number of other formats. ExpressView Browser Plug-in is quickly downloaded, easily installed, and free for individual use. It's the most convenient way to view MrSID and JPEG 2000 files over networks!

For more information about ExpressView Browser Plug-in visit <http://www.lizardtech.com/download/>.

## **GeoExpress**

### ***The Industry's Best Image Manipulation and Compression Software***

With powerful tools for reprojecting, color balancing, mosaicking, and more, GeoExpress is the industry's choice for manipulating and compressing geospatial imagery to industry standard formats. You can also configure Express Server and Spatial Express directly from GeoExpress, which makes it the ideal command center for your storage and distribution workflows.

For more information about GeoExpress visit [www.lizardtech.com/solutions/geo/](http://www.lizardtech.com/solutions/geo/).

## **Express Server**

### ***Image Delivery Software for Geospatial Workflows***

LizardTech Express Server is the best solution for distributing imagery in MrSID or JPEG 2000 format. With Express Server, users on any device access imagery faster, even over low-bandwidth connections. Express Server is faster, more stable and easier to use than any other solution for delivering high-resolution raster imagery.

Express Server catalogs and manages the distribution of imagery, enabling you to integrate the world's best raster delivery technology with geospatial data stores anywhere. Express Server streams compressed images for the fastest possible delivery, whether conventionally to broadband devices and desktops or wirelessly to field personnel using low-bandwidth connections.

For more information about Express Server visit [www.lizardtech.com/solutions/exp/](http://www.lizardtech.com/solutions/exp/).

## **Spatial Express**

### ***Database Storage and Retrieval Tools for Massive Geospatial Imagery***

Spatial Express enables you to store, manage, and access massive image datasets efficiently using your Oracle Spatial database. Whether you want to maximize return on your database investment by storing raster image data hundreds of gigabytes in size, or reduce storage space requirements for that imagery by up to 95 percent while retaining image quality, or view the imagery in your geospatial applications, Spatial Express is the key link between your imagery, your database, and your users.

For more information about Spatial Express visit [www.lizardtech.com/solutions/spatial/](http://www.lizardtech.com/solutions/spatial/).

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