LiDAR360 FAQ

1. Software installation and activation

Q: Why does the software prompt that the license has expired after installing LiDAR360?

A: The problem can be caused by the following reasons:

- System time change: During the trial process of LiDAR360, certain reasons may cause the system to change. Time changes cause the trial to expire.
- Trial expiration: the trial period of LiDAR360 should normally be either 15 or 30 days.
- Other reasons: Please contact support@greenvalleyintl.com for further information.

Q: Where can I apply for a trial license for the software?

A: Contact one of the following:

- info@greenvalleyintl.com
- support@greenvalleyintl.com
- One of the GVI sales or support representatives.

Q: What functions can be used after the trial period expires?

A: The viewer functions of LiDAR360 (including data import, point cloud display, selection tools, measurement tools, etc.).

Q: If the computer is damaged and the license cannot be revoked, how can I continue to use the license on another computer?

A: Please contact info@greenvalleyintl.com, support@greenvalleyintl.com, or one of the GVI sales or support representatives, provide your license number (at least the first and last four letters) to request a remote revoke service.

Q: Why can't the user manual be opened by clicking the help button?

A: Please set the default program for opening pdf documents.

Q: Why is an error code pop up when I am trying to activate the license in the license manager?

A: Please visit https://bit.bitanswer.cn/doc/?t=error_code to learn more information about the error code and possible solutions. If the problem persists, please contact support@greenvalleyintl.com with the error code.

Common error codes:

- Error 264: Please check network settings, may try to use another network option such as phone's hotspot.
- Error 1795: The license can only be activated on a single computer at a time. Please revoke the license on the current activated computer and try again.
- Error 1797: Please contact GVI to enable the license.
- Error 1927: Please delete C:\ProgramData\BitAnswer folder and try again. This is a hidden folder so you may need to turn on the view hidden files option to find this folder.

2. General questions

Q: Why can't the "Recent Files" on the home page of LiDAR360 be opened?

A: It may be that the attributes of the files have changed, or the storage location of the file has

changed.

Q: Why does the software crashed or exit abnormally?
A: Please check:
- Whether you have opened screen information extraction or recording software.
- Whether there is enough storage space or memory space.

Q: Why does the progress bar move slowly after running the data processing tool?
A: Please confirm the size of the data file, or whether there are other programs occupying the performance of the computer. May try to process the data with subsampling tool to decrease the size to improve efficiency.

Q: What data formats does LiDAR360 support?
A: The data types that can be imported by LiDAR360 are divided into five categories: point cloud, raster, vector, table and model.
The specific format is as follows:
Point cloud: LiData file (*.LiData custom point cloud format), LAS file (*.las,*.laz),
ASCII files (*.txt, *.asc, *.neu, *.xyz, *.pts, *.csv), PLY files (*.ply).
- Raster: Image data (*.tif,*.jpg).
- Vector: Vector data (*.shp).
- Table: Tabular data (*.csv).
- Model: custom model file (*.LiModel custom model file, *.LiTin custom TIN files), OSG models (*.osgb, *.ive, *.desc, *.obj).
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The data formats that LiDAR360 can export are as follows:
- Point cloud: LiData file (*.LiData custom point cloud format), LAS file (*.las,*.laz), ASCII files (*.txt, *.asc, *.neu, *.xyz, *.pts, *.csv), PLY files
files (*.ply).
- Raster: image data (*.tif, *.jpg, *.bmp).
- Vector: vector data (*.shp,*.dxf).
- Table: Tabular data (*.csv).
- Model: Custom model files (*.LiModel, *.LiTin).

Q: The color bar in LiDAR360 is not displayed correctly, how to set it?
A: Right-click on the desktop, select NVIDIA Control Panel, selecte Manage 3D Settings -> Program settings -> Add LiDAR360 to the high performance graphics list.

Q: Why is the effect of EDL not obvious when adding multiple data in the same window?
A: It is recommended to drag the data that is far apart to a different window for EDL display (or remove the irrelevant data in the current window).

Q: What is the unit of point cloud data processed by LiDAR360 software?
A: Since version 5.2, user-defined unit settings are supported. Users can set the custom unit in the measurement settings. Currently supported units are meters, feet, decimeters, centimeters,

millimeters, inches.

Q: Can LiDAR360 process point clouds generated from images/photogrammetry?
A: Yes, as long as it is a data format supported by LiDAR360.

Q: Can I select the center of rotation when using the multi-point selection tool?
A: Yes, when using the multi-point selection tool, hold down the Ctrl key on the keyboard and select the rotation center with the left mouse button.

Q: What are the POS data formats supported by LiDAR360?
A: LiDAR360 supports POS data in text file format (*.pos) and binary format (*.out, customized by Applanix).

Q: What filtering algorithm is used in the LiDAR360 software?
A: LiDAR360 uses an improved progressive encryption triangulation fiter algorithm (Improved Progressive TIN Densification, IPTD). To understand the algorithm principles, please refer to this paper: Zhao et al (2016) Improved progressive TIN densification filtering algorithm for airborne lidar data in forested areas.

Q: What is the definition and relationship of filling and excavation in earthwork measurement in LiDAR360?
A: 1) Excavation. Corresponding quotas shall be applied respectively according to soil classification, and the quota unit shall be natural dense square.
2) Filling. Apply the corresponding compaction quota, and the quota unit is the compaction square.

Q: Can the software automatically identify the boundaries similar to rivers, and can some smoothing be done when generating the boundaries?
A: At present, it is not possible to automatically identify rivers, but it can achieve semi-automatic identification and extraction of road shoulders, and the extracted results are vector lines. If you want to extract the river, you can only rely on manual vector editing tools.

Q: Why is the text in the dialog box of the pick point tool incomplete? Or if encounter any display-related issues?
A: 1. Make sure the storage space is enough where the software is installed.
2. If there is any antivirus software installed, try turning the antivirus off, re-install the software, and see whether the problem persists.
3. Update the graphics card drivers to the latest, and set the software to run on high-performance mode.

Please refer to the below workflow for Windows 10:
a. Open the Windows Settings page
b. Click "Gaming"
c. Under "Related settings", click "Graphics settings"
d. Click "Browse", and look for the LiDAR360.exe in the software installation directory, default:

C:\Program Files\GreenValley Suite\LiDAR360\5.4.0.0\LiDAR360.exe (5.4.0.0 refers to the version number, which can vary)
e. Click "Options", and choose "High performance" for LiDAR360.exe

For Windows 11:
1. Go to settings.
2. System -> Display -> Graphics settings.
3. Browse for LiDAR360.exe in the list or in the LiDAR360 installation directory.
4. Set LiDAR360.exe to run on high-performance mode and save.

Q: LiDAR360 software fonts and icons are too large or too small on high-resolution screens, how to adjust?
A: Please first locate to the installation directory of LiDAR360 -> GreenValley Suite -> LiDAR360 -> 6.0.3.0 (this can vary by version) -> LiDAR360.exe -> right click -> Properties -> Compatibility -> Change high DPI settings -> check the box of "Override high DPI scaling behaviour" -> System.

Q: LiDAR360 software prompts that a certain exe/dll file is missing, how to deal with it?
A: This kind of problem should mainly be caused by antivirus programs that accidentally deleted or blocked certain files of LiDAR360. Please re-install the software and add the software into the whitelist of any installed antivirus.

3. Pre-processing tools

Q: Can LiDAR360 verify the point cloud accuracy by control points?
A: Yes, the specific operation is "Preprocessing -> Control Point Report" or open the control point file as points to manually measure the differences.

Q: How does LiDAR360 perform seven-parameter transformation?
A: The process is as follows: Click Data Management -> Projection and Coordinate Transformation -> Reprojection, and enter the values of the seven parameters. If the point cloud data has no projection information, you need to define the projection first. In addition to manually inputting parameters, after LiDAR360 v5.2, it supports importing existing parameter files for calculation.

Q: Why do we need to subsample the point cloud?
A: Subsampling can reduce the size of the data and optimize the processing speed while ensuring the data quality.

Q: How to uniformly thin out the point cloud?
A: LiDAR360 provides three thinning/subsampling methods: minimum point spacing, percentage and octree, among which, the thinning method according to the octree is uniform (the process is as follows: data management -> point cloud tools -> resampling, Select Octree as the sampling type, and set the corresponding subdivision level).

Q: Why are the point cloud coordinates incorrect after conversion with LiDAR360's 3D affine transformation?

A: The units of Rx, Ry, and Rz in LiDAR360 are degrees, so you need to perform radians and degree of conversion. (angle=180*radian/π).

Q: Why the data error after geometric correction is very large, how to solve it?
A: The selected point pairs may have larger residuals, and the point pairs with large residuals can be removed.

Q: What is the time reference for POS data in LiDAR360? Does it have to be GPS time?
A: The time of POS data in LiDAR360 is consistent with the time reference in point cloud data (like GPSTime or UTCTime). Usually, the time in point cloud data is based on weeks, seconds or days. , if the time base is different, a corresponding conversion is required.

Q: Why some areas of the data do not have good alignment effect after strip alignment? Some areas cannot be aligned and have crossover?
A: At present, the strip alignment module mainly achieves the matching between the flight strips by eliminating the placement error between the laser sensor and the inertial measurement unit. If the POS accuracy cannot meet the requirements, the point cloud data will be partially deformed, and the positioning error calibration alone cannot meet the flight strip alignment results. Generally, this situation exists in the POS files with low accuracy obtained by real-time processing.

Q: Why is the point cloud data clipped with the pos trajectory, but no results are generated?
A: Please check whether the start and end GPS time of the pos data overlaps with the GPS time range of the point cloud, or whether the time units of the trajectory and the point cloud are consistent. The clipping of the point cloud can only be completed if the units are consistent and there is overlap in time.

Q: What is the difference between boresight calibration and trajectory adjustment?
A: The boresight calibration fixes the systematic error of equipment installation, and the trajectory adjustment is the overall adjustment of the error of pos and point cloud.

Q: If the accuracy still cannot meet the requirements after the automatic boresight calibration and trajectory adjustment, can the error correction be calculated through the control point adjustment?
A: No, the control point report here is only an accuracy report on the Z value, and has nothing to do with the correction of the installation error. The current boresight calibration module mainly realizes the alignment between the flight strips by eliminating the installation error between the laser sensor and the inertial measurement unit. The precondition is that the accuracy of the POS data also meets the requirements of the corresponding specifications. It is suggested that the user can manually adjust the boresight error value for calibration based on the automatic calculation result.

Q: For the data collected by the DJI L1 device, the pos time reference is inconsistent with the point cloud GPS time reference. For example, the pos time is weeks and seconds, and the point cloud time information is the GPS time adjustment? (The range of GPS weeks and seconds is 0~604800, which can be used to distinguish GPS weeks and seconds and adjust GPS)
A: The GPS time conversion process is as follows: Preprocessing > Trajectory Adjustment, input the

trajectory file, the DJI L1 device trajectory file is in .out format. After inputting the trajectory file, the GPS time conversion and coordinate system selection dialog box will pop up, check the "Convert GPS Time" option, define the "Input GPS Time" and "Convert to", select the date for the pos collection date, and convert the pos time to match the point cloud time.

Q: Using the geoid model for reprojection, the elevation of the point cloud does not change. What may be the reason?
A: The software provides EGM2008 geoid model elevation conversion by default. If you need to support geoid models in other regions, you need to download the corresponding grid data files. You can operate by referring to the method introduced in the user manual "Geoid Model". In addition, due to the different geoid models applicable to different regions, their generation can be checked on the PROJ Datumgrid CDN website.

4. Classification

Q: What should I do if the machine learning classification fails to achieve the expected effect?
A: The classification method of machine learning depends on the matching degree between the training samples and the test samples. To ensure that the labels of the training samples are accurate and have a high degree of overlap with the test samples, you can try several schemes to determine how much data the classification effect is good for.

Q: The ground points automatically generated by LiDAR software are the lowest point cloud, will it affect the accuracy of dem, point cloud smoothing and extraction of median ground points, will it conflict with automatic ground point classification?
A: No, the rule of ground point classification is to divide the block according to certain rules and take the bottom layer point as the ground point. Generally speaking, the position of this point will be discrete compared with other ground points, and the median ground point is extracted. The relative position of the ground point can be corrected as a whole. Point cloud smoothing can thin the discrete point cloud, and can cooperate with the extraction of the median ground point to obtain a more suitable ground point.

Q: Can LiDAR360 achieve specific area classification, such as lakes, river areas?
A: After LiDAR360 v5.2, the classification of specific areas is supported. The specific operation process is as follows: Classification->Classification Editor->Partition->TIN->Add Breakline->Flat Area (Lake)/Double Breakline (River) -> set initial class, target class, such as water body -> add, complete lake area classification.

Q: After the point cloud classification is completed, how to export it as raster data?
A: You can export the data to a raster format through the "Point Cloud Conversion" under the "Tools" tab. In addition, the conversion of point cloud data also supports: Convert LiData to LiData, convert to ASCII, convert to TIFF , Convert to Shp, Convert to DXF, Convert to LAS, Convert to E57, Convert Las to LiData, etc.

Q: Can a certain type of points be deleted separately, such as low points?
A: LiDAR360 supports extracting point cloud data by class. In the "Tools" tab, select "Extract by

Class" under the Extract drop-down menu. For "From Class" setting, uncheck the class(es) that needs to be removed, such as "Low Point", the low point data can be removed.

Q: After converting the classified point cloud data into tiff, will the attribute table contain classified attributes?
A: After the point cloud data is converted to raster data, the attribute table does not contain classified attributes.

5. Terrain module

Q: What is the difference between remove outliers and noise filter?
A: Different from the remove outliers function, noise filtering has a better processing effect on objects with a planar surface (such as walls, tunnel inner walls, and ground), and filters more noise points.

Q: The actual laser point density collected is far greater than the point requirement of the corresponding DEM for production. Can the data be thinned out?
A: If the actual collected lidar point density is much higher than the production demand, you can use the subsampling function to achieve data thinning. LiDAR360 provides three thinning methods: minimum point spacing, percentage and octree.

Q: LiDAR360 has the function of generating contour lines from point clouds. Why are there interruptions in the generated contour lines?
A: The place where the contour line is interrupted is caused by the lack of ground points. By increasing the parameter "Triangle's Maximum Length (m)" on the interface (for example: adjust 30 meters to 50 meters) to make the contour line continuous. After V5.2, when generating contour lines, it supports importing break lines to optimize the contour model.

Q: When scanning the features of paddy fields and cultivated land, because there are no ground points entered, there is no real value for this crop area when producing DEM. Can the software automatically optimize this issue?
A: Due to occlusion, the point cloud of the real ground point is not scanned. At present, when the software is producing DEM, if the missing range is not large, the built-in interpolation algorithm can automatically repair the elevation of the missing point cloud to generate DEM. If the range is large, the missing values may not be filled in automatically. For such a situation where large ground points are missing, it is recommended that technicians use RTK to measure the real topographic points where the point cloud is missing. The number of control points is determined according to actual needs, and then the control points are imported into LiDAR360 and displayed as point clouds, and then use the classification tool to classify the control points into ground points, and then this newly generated point cloud is merged with the original point cloud to reproduce the DEM.

Q: Is it possible to uniformly assign an elevation to a point cloud within a vector range?
A: After LiDAR360 V5.2, the breakline function has been optimized, and it supports the insertion of breaklines in closed areas. Unified assignment of elevation values first enables "Classification Editor", generates a TIN based on ground points, clicks "Insert Breakline", and selects "Closed area

break line", draw the area to be unified elevation, you can specify the elevation, or you can use the mouse to pick up the triangular mesh points to unify the elevation.

Q: Is the elevation adjustment of the LiDAR360 software the elevation surface or the elevation difference correction?
A: The elevation adjustment of LiDAR360 software is elevation difference correction.

Q: Why does the DEM generated by LiDAR360 show scattered points and black blocks in some areas?
A: This problem is usually caused by the low density of ground points. You can increase the resolution of DEM generation (ie Xsize, Ysize parameters) within the required range, or adjust the parameters according to the content of the user manual to generate denser ground points, and then use the DEM function again.

Q: The control point reporting function in LiDAR360, why can't the result be calculated?
A: Before using the control point report function, you need to classify the ground point first. Set the ground point as the initial class, and the result can be calculated. When the control point is on a hard surface other than the ground, you can also classify the object and select it as one of the classes.

Q: After using the DEM sheet join tool in LiDAR360, why can I still see the DEM boundary clearly, and it will also show obvious boundaries when imported into other software?
A: The DEM after joining still has two data, and the shadow rendering is performed separately. In the view mode of LiDAR360, uncheck the "Combination Hillshader" option, and the border will disappear. Use the "Raster Mosaic" function to merge multiple DEMs into one file, and the boundaries of DEM blocks will not be displayed even when opened in other software.

6. Forestry module

Q: How to choose the proper interpolation method to generate DSM?
A: For forest areas, it is recommended to use IDW. For urban areas, it is recommended to use spike-free TIN.

Q: Can LiDAR360 generate CHMs in batches?
A: LiDAR360 can generate CHM in batches (the process is as follows: Toolbox->ALS Forest->Batch Process->Canopy Height Model (CHM) Segmentation).

Q: How to evaluate the accuracy of the single tree segmentation results?
A: The evaluation of single tree segmentation accuracy can refer to the article of Li et al. (Li et al., 2012). By comparing with the measured value, the total number of trees obtained by segmentation, the number of correctly segmented trees, the number of incorrectly segmented trees, and the number of missed. Calculate the values of recall (r), precision (p) and F-score (F) respectively. Recall indicates the detection rate of the tree, precision indicates the correct rate of tree segmentation, and F-score is the overall accuracy considering both misclassification and omission. The variation range of the three is between 0-1. For more information on the principles and formulas used, please refer to the LiDAR360 user manual.

Q: Which parameters affect the CHM segmentation accuracy, and how should these parameters be set?

A: The accuracy of CHM segmentation is affected by the CHM resolution and Gaussian smoothing factor. CHM is the difference between DSM and DEM, and its resolution is determined by the resolution of DSM and DEM. Generally speaking, this value should not exceed one-third of the crown width, and the setting range is 0.3-1 meter. Usually, Setting the resolution to 0.5-0.6 meters can get higher segmentation accuracy. Sigma is the Gaussian smoothing factor (the default is "1"), the larger the value, the higher the degree of smoothing, and vice versa. The degree of smoothness affects the number of divided trees. If there is under-segmentation, it is recommended to reduce the value (eg: 0.5), otherwise, if there is over-segmentation, it is recommended to increase the value (eg: 1.5).

Q: After CHM segmentation, how to remove some results with small crown area?

A: After CHM segmentation, a shp file containing tree boundaries can be obtained. The attribute table contains the ID, center position coordinates, tree height, crown diameter and crown area of each tree. This data can be imported into third-party software (such as ArcGIS), filter according to the crown area attribute, and delete the segmentation results with small crown area.

Q: How to make point cloud data below 2m participate in segmentation?

A: The parameter "height above the ground" on the point cloud segmentation interface indicates that points below this value are considered not to be part of the tree and will be ignored during the segmentation process. The default value is 2 m. This value can be adjusted appropriately so point cloud under 2 m can be included.

Q: Which segmentation method can be used to obtain higher accuracy for the mixed coniferous and broad-leaved forest data?

A: For large-scale coniferous and broad-leaved mixed forests, CHM segmentation is recommended. For small-scale coniferous and broad-leaved mixed forests, it is recommended to use single tree segmentation based on seed points after manually adding seed points.

Q: The growth of trees is different, how to segment to get higher accuracy?

A: For the data with a large difference in growth, it is recommended to save the point clouds of different growths as different files through the selection tool or the cropping tool, and process them separately.

Q: How to export the single tree segmentation results of LiDAR 360 to third-party software for analysis?

A: Click ALS Forest -> Extract by Tree ID, you can export the segmented point cloud to LiData, CSV and LAS formats, and use other software for subsequent analysis. The software supports exporting each tree as a separate CSV file, or all points as one file.

Q: At least how many plot survey data are needed for regression analysis?

A: The number of sample plots used for regression analysis is generally not clearly defined.

Generally speaking, under the premise of ensuring the location of sample plots and the accuracy of sample plot measurement, the more sample plots there are, the higher the accuracy of regression analysis will be. Sample plots should be randomly selected and representative, able to cover different forest types in the study area. A sample size of less than 30 is called a small sample, and a sample size greater than or equal to 30 is called a large sample. In order to ensure regression accuracy analysis, it is recommended that the number of samples should be greater than or equal to 30 (considering the size of the research area and complexity, etc.), The number of samples should be greater than the number of independent variables in the regression.

Q: How to choose independent variables to participate in regression analysis?
A: The variables involved in the regression analysis generally choose the height percentile variable obtained from the lidar data, but different research areas, different parameter variables, the selection of the specific height percentile parameter variable is not the same, there is no universality.

Q: What should I do if the coordinates of the seed points in the CSV table of the result of single tree segmentation are not in latitude and longitude? I need latitude and longitude.
A: First copy the tree ID, x coordinate, and y coordinate in this CSV table, then paste it into a newly created TXT document, and then use the toolbox in LiDAR360 - data management - projection and coordinate conversion - convert ASCII to BLH tool, convert the coordinates in this file into latitude and longitude, and finally paste the coordinates in the generated new document back to the original tree segmentation table.

Q: Why is the tree flat when the scanned data is viewed in cross-section? Is there any way to improve it (the scan is scanned according to the normal trajectory), so that there will be problems in fitting the diameter at breast height through the software?
A: Considering that the tree trunks are flat in the tree scanning results, it may be because the saplings are relatively small. For large-scale woodland data, it is recommended that the scanning trajectory be more curved; when processing the raw data, in LiFuser-BP software, uncheck the smoothing option first, and do not perform smoothing on the data.

Q: There is a large difference between the single tree segmentation result and the actual number of single trees. Exclude the inaccurate DBH fitting and parameter setting problems?
A: The reason for this problem may be that the unit of the original data is inconsistent with the unit of LiDAR360 parameter setting. For example, the unit of the original data is feet, while the unit of LiDAR360 data processing is unified as meters. Unit conversion is required before data processing. Conversion method: If the original data is in las format, directly "Convert Las to LiData" and select "feet" as the source unit. If the original data format is LiData, first "Convert to Las" and then perform the above operations.

Q: Why can't I generate seed points or perform CHM segmentation after the CHM file is generated?
A: This problem is usually caused by poor CHM quality, which is difficult to identify by the algorithm, and is usually associated with poor DEM quality. According to the content of the manual, TIN can be generated based on point cloud, edit TIN to ensure terrain quality, generate high-quality DEM based on TIN, and then perform CHM to generate seed points/segmentation.

Q: Why is the number of single trees in the segmentation result different from the number of seed points in the single tree segmentation based on seed points? How to deal with this situation?

A: The single tree segmentation adopts a competitive strategy. When some trees are in poor shape, they may be identified into other trees. Import the CSV table and the seed point table generated by single tree segmentation into the software at the same time. The position of the single tree and the seed point are usually very close, and a point pair will be formed. At this time, the isolated point is the seed point that has not formed a single tree. Perform manual editing to the segmented cloud to improve the results.

7. Data management

Q: Why is the DJI L1 data opened by LiDAR360 a straight line (the data display is incorrect)?

A: This is because LiDAR360 only supports the display of projected coordinates. It is necessary to convert geographic coordinates to projected coordinates. Through Data Management - Point Cloud Conversion - Convert Las to LiData, the converted data can be displayed correctly after being re-imported into the software.

Q: When importing DJI L1 data, the projection information is not properly read. Do I need to redefine the projection?

A: You can use the Define Projection tool to manually define the projection system.

Q: How to enable the sub-window rendering mode?

A: Before using this function, you need to check whether the "Use Shader Color Strategy" is checked in the "Rendering" tab in the settings which can be opened in the upper right corner of the software interface. If it is not checked, you need to check this option and restart the software to make the window-by-window rendering function take effect.

Q: When a vector file in *.dxf format is imported into LiDAR360, why does the position shift?

A: The default data unit of LiDAR360 in *.dxf format is meters. When the data unit imported from outside is not meters, conflicts will occur, and the position will be offset.

There are two ways to solve this problem:

1. Set the file unit of *.dxf format to meter in the external software, and then perform the export operation.

2. Open the file in text format (such as *.txt), and manually set the unit to meter. Usually, the unit will be represented by a number, and the number "6" represents the "meter" unit.