



## VG4D SmartLiDAR™ Solution Modules

### SmartLiDAR Solution Modules

Designed to expand on the underlying enabling platform, LiDAR Explorer, the VG4D SmartLiDAR Solution Modules enable users to fully exploit any type of LiDAR data to its fullest. The solution modules allow users to affordably address their specific needs by clustering and packaging logical feature sets to be purchased as needed. Additional modules allow for an infinitely expandable solution that extends and increases value incrementally over time.

### Calibrator Module

LiDAR Calibrator software provides a complete toolset to solve data calibration. Providing simple solutions for both airborne and mobile LiDAR data, strip to control point adjustment, strip to strip adjustment, easy control point report generation and more, the software satisfies the data correction and adjustment problems with an effective and highly efficient process.

- Stand-alone; no 3rd party software required
- Supports aerial and mobile LiDAR Data
- Automatic Control Point enforced normalization and matching (XYZ or Z only)
- Detailed Survey Control Points Comparison/Accuracy Report
- Stops and Turns removal tool
- Strip validation against another Trusted or non-trusted Strip
- Strip validation against Control Points,
- Easy to use and Interactive GUI
- One click Report Generation –Strip-to-Strip, Strip-by-Strip, Strip-to-Control point, Easy export
- Customizable All-In-One project reporting
- Automatic loading of Area of Interest (AOI)
- Simple and Intuitive workflow

### Smart Classification Module

Smart classification techniques to extract key features like Road Center Lines, Curbs, Lane Markings, Rails, Power Lines, Buildings and more to meet PTC, NERC, FERC, ADAS and other requirements.

- Optimized workflow for various industries (road, powerline, etc.)
- Automatic LiDAR data classification filters
- Automatic digitization of all road breaklines (road lines, lane markings, curbs, flow lines, etc.)
- Automatic digitization of all powerline catenary wires along with ability to extract tower locations and clearance information.
- Manual override capabilities to enhance auto-digitization
- Customizable taxonomy/ feature code integration (PLS-CADD, DOT Feature codes, custom lists, etc.)
- Automatically embed feature codes into deliverables for external engineering, CAD or GIS software application
- Extraction and QA/QC integrated workflows
- Export to Land XML, TSS or Simple ASCII for seamless integration

### Application Tools Module

The SmartLiDAR Tools Module is loaded with highly productive utility functionality for analyzing, transforming and processing any type of LiDAR data set.

#### Transformation Tools

- XYZ adjustment, rotation, scaling, noise removal, etc
- LAS merge / split / subsample
- LAS header update

#### Analysis Tools

- LAS information viewer
- Analyze point density, slope, gradients, elevation statistics, profiling, etc
- Control point LAS extraction
- Cross-section / profile extraction
- Points to polygon extraction
- Calculate LAS direction, point density, Z statistics
- Create KML with images

#### Raster Tools

- Convert between raster and point formats
- Ortho rectification
- TIFF band splitter
- Create TIFFWorld (TFW) from GeoTIFF
- GeoTIFF handling, etc

#### RGB tools

- Create intensity from RGB
- Convert RGB to non-RGB files
- RGB intensity normalization

#### Processing tools

- Batch filter LiDAR data
- Batch create overviews

## 3D Coordinate Conversion/Reprojection Module

The Reprojection Module provides fast, efficient and powerful 3D coordinate conversion capabilities.

- 3D coordinate conversion tool
- LAS or ASCII inputs
- Convert to and from lat long, ECEF, UTM, state planes
- Ability to convert orthometric elevation to geoid elevation
- Grid to ground scaling option available
- Option to suggest false-easting and false-northing
- Batchable routines
- Supports meters, feet, and US survey feet
- Easy coordinate system reprojection tool

## Asset Management

SmartLiDAR Asset Management capabilities provide powerful utilization of LiDAR information to identify and attribute corporate infrastructure assets. This integration allows user to view LiDAR and corresponding imagery simultaneously to digitize and extract attributed feature information. The software provides seamless integration with existing GIS asset management databases and works with raw imagery and point cloud data.

- Asset management templates for railroads, roads, powerlines, buildings/insurance, vegetation, clearances (bridge, structure, overhead lines), etc. included with module
- Fully integratable intelligent asset management capability
- Compatible with automatic feature classification capabilities of Smart Classification module
- LiDAR-based asset attribution
- Highly customizable GIS and industry data schemas
- Image based asset management
- Utilizes existing GIS database and information
- Automatic extraction of LiDAR snippets and images extraction capability

## GIS Integration Module

GIS integration facilitates easy interoperability with existing GIS applications.

- Vector conversion by GIS polygon
- Delete selected shapes
- Add record ID
- Remove duplicate vertices
- Crop to polygon
- Buffer shapes
- Convert polylines to polygon / polygons to polylines
- Split lines / Create line ends / remove short lines
- Shape reprojection and interpolation tools
- Shape merging ASCII to shape/shape to ASCII conversion tools
- Polyline / polygon handling tools
- Shape/GIS Tools - To Merge, Search, Delete, Crop, Re-project, Convert GIS Shapes, Import, etc.

## Field Analyzer Module

LiDAR Field Analyzer software provides powerful collection of toolsets designed to identify and measure the quality of LiDAR data as soon as it is collected in the field. Featuring intelligent 3D visualization and reporting interfaces created to enable data collecting field engineers to make critical quality-based decisions about the information being collected right there on the job-site, while in the field, avoiding the costly return trips to the field to recollect data.

- LiDAR analysis tool for LiDAR Field Checks
- Powerful Tolerance filtering and exception alert capability
- Data Statistic Extraction
  - Individual strips (noise, gaps, etc.)
  - Strip to Strip (overlap identification, characteristic analysis)
- 3D visualization
- Field quality report generation
- Batch create overview files
- Potential problematic area extraction and 3D visualization

## Boresite Module

The SmartLiDAR Boresite Module provides a powerful yet simple 3D interface to quickly and easily determine the correct roll, pitch, and heading offset values for airborne and mobile LiDAR sensors utilizing only two opposing strips. The software features real-time visual feedback allowing the user to visually align the data and automatically calculate the correct boresite offsets necessary to accurately calibrate the sensor.

- Airborne and mobile sensor boresiting
- Calculate roll pitch heading, elevation offset, scale factors
- Delta Z visualization
- On-the fly triangulation
- Only 2 strips required
- Real-time visualization
- Create and use area of interest (AOI) polygons
- Import control points or any user defined points