



New Features in GeoCue 2014 Products

November 21, 2014

Important Note: This guide provides information only about changes from GeoCue 2013 to 2014. Please see the appropriate On-line Help for full information regarding the use of GeoCue products.

GeoCue LLC
9668 Madison Blvd.
Suite 202
Madison, AL 35758

1-256-461-8289
www.geocuellc.com

NOTICES

The material in GeoCue documents is protected by United States Copyright laws.

You may make as many copies of this document for use internal to your company as you desire. Please do not distribute this document outside of your company without first discussing with us.

Trademarks, Service Marks

- *ESRI* is a trademark of Environmental Systems Research Institute
- *Windows* and *.NET* are trademarks of Microsoft Corporation
- *MicroStation* is a trademark of Bentley Systems Incorporated
- *TerraScan* is a trademark of Terrasolid Oy
- *ImageStation, OrthoPro and DMC* are trademarks of Intergraph Corporation, a Hexagon company
- GeoCue®, NIIRS10®, CuePac® are registered trademarks of GeoCue Group Inc.
- SO CET SET is a trademark of BAE Systems
- GPro/XPro are service marks of Hexagon Geospatial Solutions
- LYNX™ is a Trademark of Optech

Getting Help

This guide contains information about features new to Version 2014 of the GeoCue product family.

We are sure that you will experience different problems with GeoCue that range from installation issues to defects that made it through our testing undetected. We hope that you will immediately contact us with any problems or questions and have the patience to work with us through a successful GeoCue deployment.

Please contact us via email for assistance with or comments about GeoCue products.

email: support@geocue.com

Contents

1	An Overview of GeoCue 2014	1
2	GeoCue Client/Server	2
2.1	Dramatically Simplified Installation and Client Start-Up	2
2.2	Improved Performance of Distributed Workflows	2
2.3	Email Alerts on Dispatched Jobs	2
2.4	New Window Arrangement Feature.....	2
2.5	New Coordinate Reference Systems and Vertical Datum	3
3	LIDAR 1 CuePac	3
3.1	LAS 1.4 Support.....	3
3.1.1	Interaction with TerraScan	4
3.1.2	Update LAS File	4
3.1.3	Recommended TerraScan Workflow for LAS V1.4	6
3.2	Terrasolid Lidar Editing Workflow Guide	7
3.3	Additional Options for DirectDrive of MicroStation/Terrasolid	7
4	DMC PPS CuePac (<i>available from GeoCue and Hexagon</i>)	7
4.1	Improved Look Up Table (LUT) Support	7
5	RCD30 CuePac (<i>available from GeoCue and Hexagon</i>)	7
5.1	Enhanced FramePro Data Import	7
5.2	Streamlined Workflow	7

1 An Overview of GeoCue 2014

GeoCue 2014 is the major GeoCue feature upgrade release for 2014. GeoCue has now been in heavy day-to-day production (in commercial release) for about 10 years. Many of the new features that have appeared in GeoCue are a direct result of the feedback that we received from our user base of GeoCue customers.

One significant new feature is the added support for LAS 1.4. If you are involved in LIDAR workflows in North America, you will immediately understand the value of supporting LAS Version 1.4, Point Data Record Format 6 through 8 as these will be the required deliverable format for the USGS 3D Elevation Program. Of course, this will drive all standard LIDAR deliverables in North America so it will be critical for you to move to the new PDRF's available only in LAS version 1.4. If you are a current Terrasolid owner but haven't yet deployed GeoCue, you will be interested in the seamless LAS V1.4 workflows GeoCue now offers along with the increased functionality in the batch processing of Terrasolid macros via GeoCue's Command Dispatch System. We have added tools to GeoCue 2014 allowing you to continue processing data in LAS 1.1 – LAS 1.3 but convert to LAS 1.4 for final delivery packaging.

If you own a RCD30 sensor system, you will want to take advantage of the integration of FramePro into GeoCue to provide seamless workflows and advanced batch processing capabilities. Our benchmark testing has demonstrated a reliable increase of 2.0-2.5x processing throughput over standalone FramePro environments.

If you are a DMC owner you will want to take advantage of the tighter GeoCue integration with PPS. As with the RCD30 workflow, benchmark testing for the DMC workflow shows an increase of 2.0-2.5x processing throughput over standalone PPS environments

The highlights of the new features in GeoCue Version 2014 are described in the following sections with details provided in the on-line help

2 GeoCue Client/Server

2.1 *Dramatically Simplified Installation and Client Start-Up*

GeoCue now has a Quick Installer that automates the vast majority of installation and configuration tasks for both new installations and updates. As part of the streamlined installation we have removed the web interfaces for User Manager and License Manager to simplify the product (no IIS requirements!). Users will also see a new clean start-up screen when launching GeoCue Client with simple “New”, “Open” or “Last” project options.

2.2 *Improved Performance of Distributed Workflows*

GeoCue’s Command Dispatch System (CDS) components for distributed processing have been further optimized resulting in a 5% improvement over GeoCue 2013 distributed processing times.

2.3 *Email Alerts on Dispatched Jobs*

You can now configure email alerts to fire on completion of batch processing jobs submitted to the Command Dispatch System (CDS). Completion or exception alerts can be configured on the Configuration tab of Dispatch Manager.

E-Mail Notification

Enabled

Task Events

Successful Completion

Exception

Recipients

Task Submitter

Users and Groups:

2.4 *New Window Arrangement Feature*

Each GeoCue Client user can now create and save an arrangement of windows and toolbars on a per-environment basis. Saved arrangements become that user’s default arrangement for new projects of the same environment.

Administrators can publish per environment window arrangements to the

server, providing everyone on the team with a common view into the workflow. Default simplified arrangements are supplied for the provided environments.

2.5 *New Coordinate Reference Systems and Vertical Datum*

We have added more CRS and additional vertical datum including Canadian datum CGVD2013 and geoid model CGG2013.

3 LIDAR 1 CuePac

3.1 *LAS 1.4 Support*

We have added support for V1.4 of the ASPRS LAS data format. If you are involved in LIDAR workflows in North America, you will immediately understand the value of supporting LAS Version 1.4, Point Data Record Format 6 through 8. These will be the required deliverable format for the USGS 3D Elevation Program. Of course, this will drive all standard LIDAR deliverables in North America so it will be critical for you to move to the new PDRF's available only in LAS version 1.4.

To manage different LAS versions within a GeoCue project, each LIDAR source entity and LAS Working Segment now includes a FormatID attribute that stores the LAS version and point data record format (PDRF) for the associated LAS data file. This attribute is automatically populated when entities are created or populated from source data, or as format updates are applied. The attribute is located on the LAS Working Segment tab of the Properties pane. GeoCue supports PDRF's 0-8. PDRF's 9-10 cover the addition of wave packets for waveform data and are not currently supported in GeoCue. The reading of LAS PDRF's with waveform data is enabled, but the waveform information is removed during the population of Working Segments.

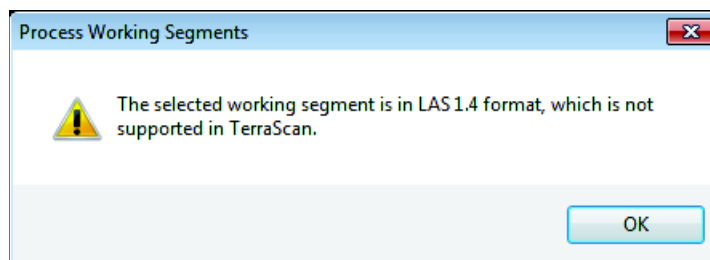
PDRF	Description
0	Core 20 bytes shared by PDRFs 0-5
1	Adds GPS time information.
2	Adds three color channels for storing RGB values (colorized points).
3	Adds GPS time and RGB channels.
4	Adds GPS time and wave packets (for waveform data)
5	Adds GPS time, RGB channels and wave packets.
6	Core 30 bytes shared by PDRFs 6-10 including mandatory GPS time.
7	Adds three color channels for storing RGB values (colorized points).
8	Adds RGB channels and a fourth NIR channel.
9	Adds wave packets.
10	Adds wave packets and RGB channels.

Note the additional 10 bytes included in the core group for PDRFs 6-10 cover more bits for return numbers (up to 15), point classifications (up to 255), higher precision scan angles (16 bits instead of 8) and the mandatory GPS time. The addition of this extra information in PDRFs 6-10 has implications for conversion strategies between formats, in particular for backwards conversion to earlier formats.

GeoCue currently supports converting earlier versions to LAS V1.4 (as discussed below), but does not support backwards conversions of LAS V1.4 files to earlier versions. Note that up-conversion of earlier formats is not technically the same as generating the initial LAS files from the raw LIDAR data directly in LAS V1.4 PDRFs 6-10. For example the greater scan angle precision available in PDRFs 6-10 cannot be recreated from an earlier LAS version file. Care should be taken to verify up-conversion is an acceptable method of creating LAS V1.4 PDRF 6-10 files for your end-user.

3.1.1 Interaction with TerraScan

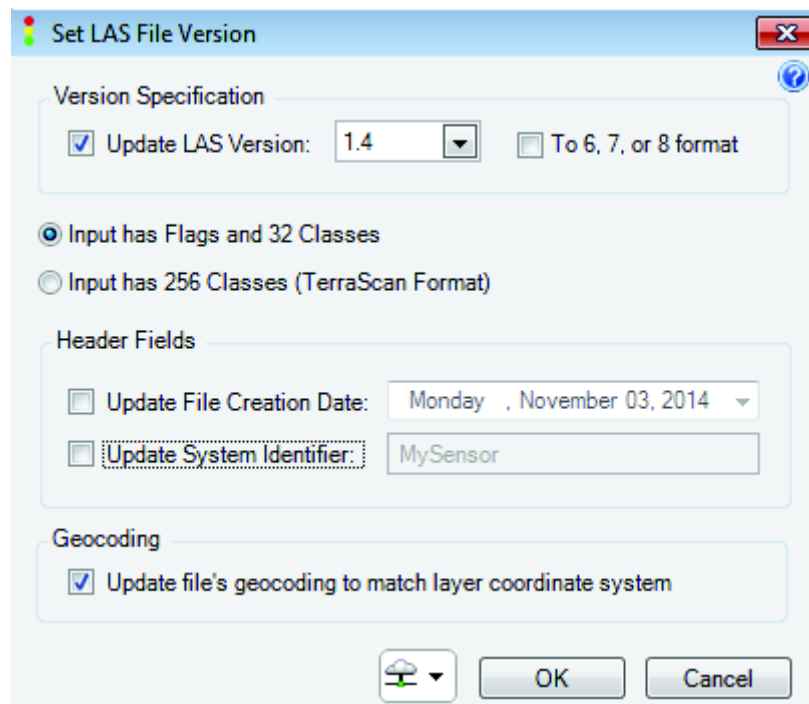
Terrasolid's TerraScan software is used in many LIDAR production shops, however, it does not currently support LAS V1.4 files. Importing V1.4 files into TerraScan can result in the loss of information and potential file corruption. To prevent this, GeoCue enforces strict compliance with the LAS data file format in TerraScan workflows; you will not be able to load entities with LAS V1.4 data files into TerraScan, or to assign and run TerraScan macros against them. A suitable warning message will be displayed to the user should this case be detected. This restriction does not apply for editing tools that do support LAS V1.4, such as LP360, or LP360 EQC.



3.1.2 Update LAS File

We have modified the Update LAS File utility step to allow you to convert LAS data files to V1.4. The step can be found on the Utilities tab of the LAS Working Segment checklist, or you can add it to the appropriate portion of your custom checklist using Environment Builder. The tool can be run against multiple LAS Working Segments at once as in standard GeoCue multi-entity processing and

can also be dispatched, or distributed for processing using GeoCue's command dispatch system .



To update a LAS file, specify the version you want to convert to in the first section. Typically this will be V1.4. Also specify if you want to update the PDRF version to include the additional core bytes (PDRF 6, 7 or 8). If you select this option, GeoCue will automatically determine if your data is PDRF 6, 7, or 8 based on the data file itself, you do not need to specify. Note you can generate V1.4 files preserving PDRF versions of 0-5, LAS V1.4 does not require PDRF 6 or higher. However, most V1.4 deliverables, such as to USGS, will likely be in LAS V1.4 PDRF 6-8.

The second section of the dialog specifies how to handle the classification byte when up-converting to LAS V1.4. This byte can either follow the official LAS standard classification byte definition consisting of four flags (e.g. withheld) and 32 standard classes, or commonly (but not the official LAS standard in V1.1 – 1.3) 256 classes (the full byte). In LAS V1.4 this single byte gets expanded into two bytes. If you have flags set in your data, and you want to preserve these during conversion, you will specify the first option. If you are not using flags, and have an extended class table (> 32 classes), and want to preserve the classifications during the conversion you will specify the second option. GeoCue will then handle the upper bits of the classification byte appropriately as flags or classes during the conversion.

You can also chose to update the header information for file creation date and system identifier.

Finally, if you chose to update the geocoding, the LAS file geotags will be updated to match the GeoCue layer coordinate system. This simply updates the tags, it doesn't implement any reprojection of the point data. When GeoCue writes a LAS v1.4 file it will correct and properly format the georeference information as Open Geospatial Consortium (OGC) well known text (WKT) in the headers as per the new specification.

3.1.3 Recommended TerraScan Workflow for LAS V1.4

Because of the current LAS version restrictions with the TerraScan software and the limitations on backwards conversion from LAS V1.4 in GeoCue, we recommend you implement the following workflow in GeoCue when needing to deliver LAS V1.4 files and planning on using TerraScan as your primary production tool. Please note it is important to verify with the end user if partial processing in earlier versions of LAS is permitted prior to delivery in V1.4. If processing in V1.4 needs to be strictly enforced throughout the processing, we recommend moving to an LP360 workflow.

1. Output your LAS data from your sensor manufacturer's processing software in LAS V1.2, PDRF 1-3 as appropriate.
2. Import your source data into GeoCue.
3. Create and populate your working segments/blocks as per normal. These blocks will be in LAS V1.2, as per the source data.
4. Follow the normal TerraScan workflow for running classification macros, interactive editing and QA/QC review.
5. Apply any final reprojections or datum conversions as per a normal GeoCue workflow.
6. Run the Update LAS File utility to convert to LAS V1.4 with the appropriate PDRF. Typically this will be LAS V1.4 PDRF 6 for USGS deliverables. We strongly recommend turning on GeoCue's automatic file versioning for the Update LAS File step. This will create a prior LAS version backup of the data file that you can roll back to should there be any problems.
7. Export the LAS V1.4 files for delivery to your client using the Export Files checklist step
8. For re-work or additional editing of the final tiles, add an LP360 EQC step to your workflow. LP360 EQC handles LAS V1.4 directly, and can be used for all interactive rework or additional editing without requiring any format conversions.

Tip: If at any point you are uncertain which blocks/tile have been converted to LAS V1.4 in your project and which have not, you can run a quick query in Entity Manager against the FormatID attribute to isolate the tiles with a specific LAS format.

3.2 *Terrasolid Lidar Editing Workflow Guide*

We have added a default workflow guide covering LIDAR editing in Terrasolid software. This guide can be modified or customized to your specific process flow and linked to your in-house documentation for quality management purposes.

3.3 *Additional Options for DirectDrive of MicroStation/Terrasolid*

We have added options so you can specify your desired MicroStation interface and project configurations when running TerraScan via DirectDrive. You can now also auto load TerraModeler, TerraMatch and/or TerraPhoto as needed when starting a DirectDrive session.

4 *DMC PPS CuePac (available from GeoCue and Hexagon)*

Updates to the DMC Post-Processing System (PPS) CuePac include performance enhancements as well as full support for ZIPPS v6.8.

4.1 *Improved Look Up Table (LUT) Support*

We have made some significant improvements to streamline the workflow, focusing on multiple Look Up Tables (LUTs) created in DIA and re-visiting DIA and being able to easily load existing LUTs.

5 *RCD30 CuePac (available from GeoCue and Hexagon)*

5.1 *Enhanced FramePro Data Import*

Importing FramePro data has been made easier and faster by consolidating multiple import steps into one dialog.

Subsequent imports of FramePro data into the open GeoCue project are now supported, which allows for incremental imports of FramePro data into existing or newly created project layers.

5.2 *Streamlined Workflow*

The processing workflow has been streamlined to use default processing parameters when available. *(Default FramePro parameters remain user definable using Environment Builder.)*