

# AIRBORNE DATA PROCESSING SOFTWARE

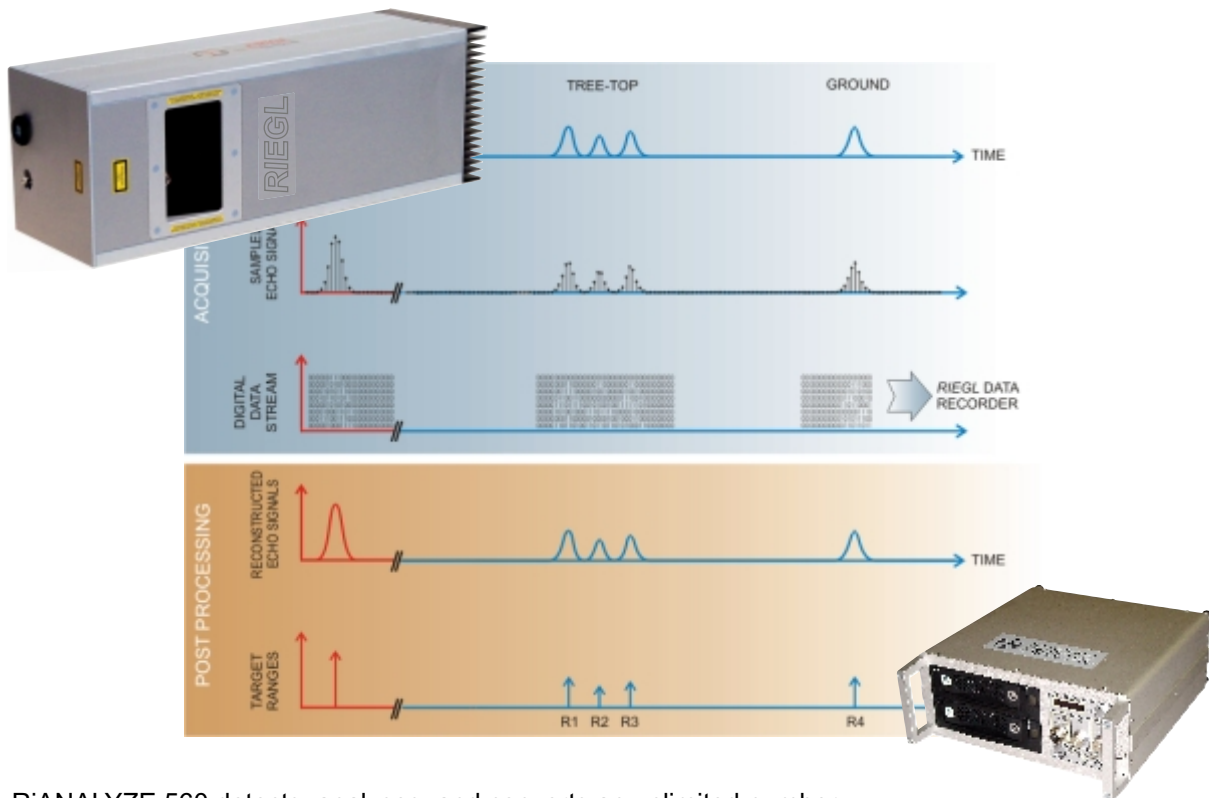
# **RiANALYZE 560**

## FOR FULL WAVEFORM ANALYSIS

The airborne laser scanner *RIEGL* LMS-Q560 digitizes the waveform of the echo signal for each emitted laser pulse. The sample data is stored on the hard disks of the *RIEGL* airborne data recorder during data acquisition.

RiANALYZE 560 applies the so-called **Full Waveform Analysis** to the digitized echo signals provided by the laser scanner and additionally transforms the geometry data (i.e., range and scan angle) into Cartesian coordinates. Thus RiANALYZE 560 converts the digitized echo signal data into data compatible with conventional airborne laser data processing packages for further processing. The output is a point cloud in the well-defined Scanner's Own Coordinate System, SOCS, with additional descriptors for every point, e.g., a precise time stamp, an echo signal intensity, an echo pulse width, a classification according to first, second, up to last target.

Different approaches have been proposed for performing the full waveform analysis of digitized echo signals of an airborne laser scanner. RiANALYZE 560 implements three different algorithms which can be used alternatively allowing optimizing processing time or processing accuracy.



RiANALYZE 560 detects, analyses, and converts an unlimited number of targets per emitted laser pulse based on the stored digital sample data.

For each single target the following parameters are extracted and provided:

- range, scan angle
- x, y, z - coordinates
- time stamp (UTC, GPS)
- pulse width
- pulse amplitude
- first, second, ..., last target indication

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RiANALYZE 560 supports either direct access to the sample data files stored on the *RIEGL* DR560 or *RIEGL* DR560-RD or to data stored on local hard disks or in a local area network. Sequential processing of an arbitrary number of sample data files allows analyzing the sample data unattended without user attendance.

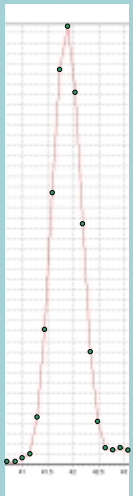
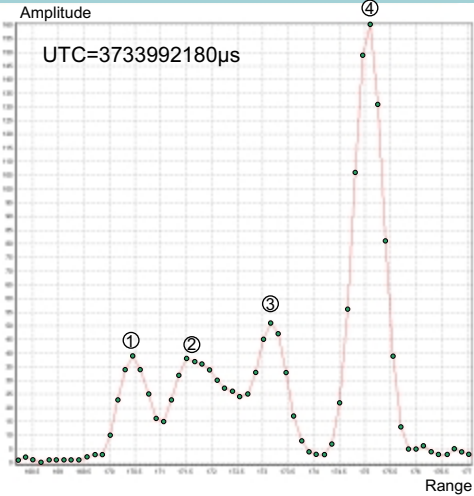
Additionally, RiANALYZE 560 is smoothly integrated into the project-oriented processing tool RiPROCESS via the application server RiSERVER.

The primary output is a binary data file in a well-documented format. This output is usually the input to RiWORLD for transforming scan data into WGS84. Alternative data formats are available to allow straightforward processing of the resulting point cloud with third party software packages.

### Key Features

- Target detection and target parameter estimation applied to digitized echo signals of the *RIEGL* LMS-Q560, frequently addressed as Full Waveform Analysis
- Different analysis algorithms available with configurable parameters
- Extraction of an unlimited number of targets per emitted laser pulse
- Coordinate transformation into the well-defined scanner's own coordinate system
- Output as point cloud with additional target descriptors
- Provides different data output formats for a variety of post-processing software packages
- Command interface for sequential unattended processing of sample data files
- Smooth integration into RiPROCESS

### Input / Output Data:

Input:		Output:																											
																													
Digitized laser pulse	Digitized echo signal (targets 1-4 indicated)																												
		<table border="1"> <thead> <tr> <th>UTC</th> <th>Target</th> <th>Range</th> <th>Amplitude</th> <th>Width</th> </tr> </thead> <tbody> <tr> <td>3733992180</td> <td>1</td> <td>128,3</td> <td>36</td> <td>3,83</td> </tr> <tr> <td>3733992180</td> <td>2</td> <td>129,6</td> <td>36</td> <td>8,98</td> </tr> <tr> <td>3733992180</td> <td>3</td> <td>131,1</td> <td>47</td> <td>4,73</td> </tr> <tr> <td>3733992180</td> <td>4</td> <td>133</td> <td>167</td> <td>4,48</td> </tr> </tbody> </table>	UTC	Target	Range	Amplitude	Width	3733992180	1	128,3	36	3,83	3733992180	2	129,6	36	8,98	3733992180	3	131,1	47	4,73	3733992180	4	133	167	4,48		
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		ASCII - data output file for target 1 - 4 ready for postprocessing with third - party software like, e.g., SCOP++, TerraScan or others																											

### System Requirements:

- Windows 2000 or XP platforms
- Standard desktop PC or laptop

Information contained herein is believed to be accurate and reliable. However, no responsibility is assumed by *RIEGL* for its use. Technical data are subject to change without notice. Data sheet, RiAnalyze, 13/09/2007



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