

# RiANALYZE

for RIEGL Airborne Laser Scanners

- full waveform analysis of digitized echo signals acquired by RIEGL LMS-Q560 and LMS-Q680(i)
- extraction of an unlimited number of targets
- coordinate transformation into scanner's own coordinate system
- output as 2D point cloud with additional target description

The airborne laser scanners RIEGL® LMS-Q560 and LMS-Q680(i) digitize the waveform of the echo signal for every emitted laser pulse.

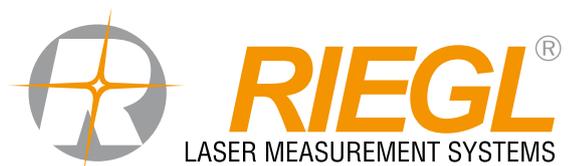
RiANALYZE applies the so-called **Full Waveform Analysis** to the digitized echo signals provided by the laser scanner and additionally transforms the geometry data (i.e., range and scan angle) into Cartesian coordinates. Thus RiANALYZE converts the digitized echo signal data to data compatible with 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, the echo signal intensity, the 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 implements three different algorithms which can be used alternatively allowing the user to optimize processing time or processing accuracy.



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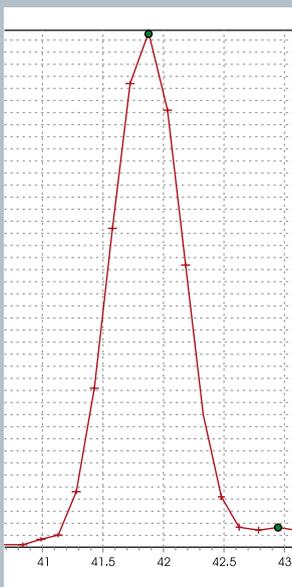


RiANALYZE supports either direct access to the sample data files stored on local hard disks or in a local area network. Sequential processing of an arbitrary number of sample data files allows the analysis of sample data without user attendance.

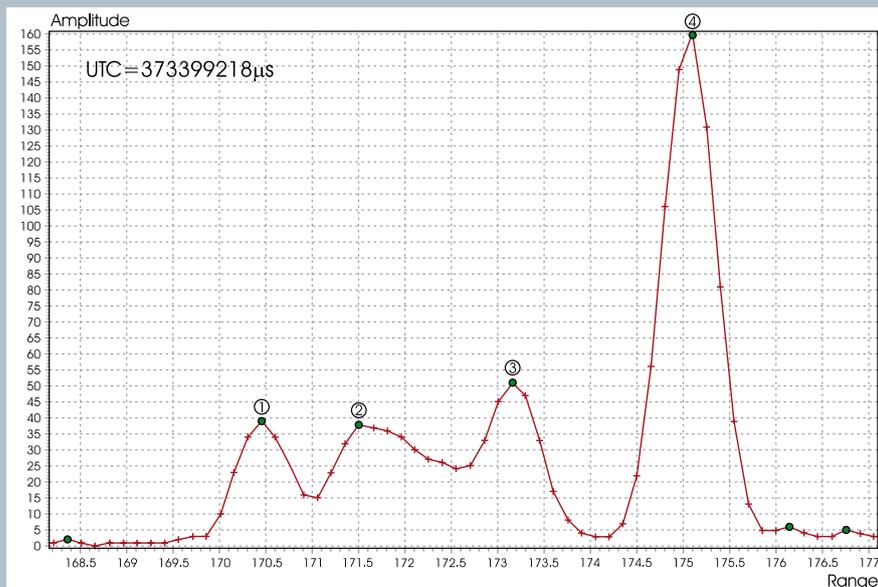
Additionally, RiANALYZE is smoothly integrated into the project-oriented processing software RiPROCESS via the application server RiSERVER.

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.

**Input Data:**



digitized laser pulse

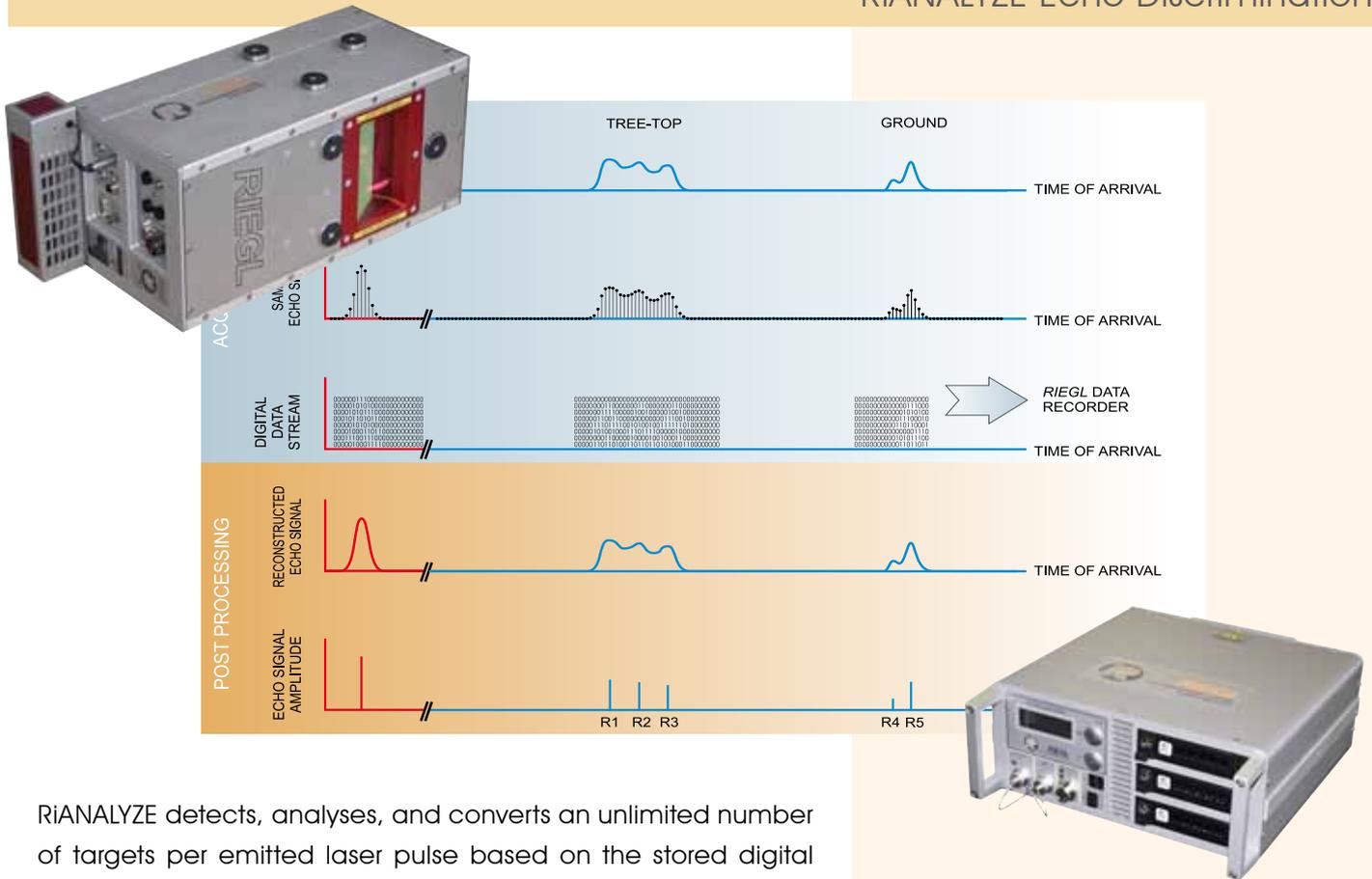


digitized echo signal (targets 1-4 indicated)

**Output Data:**

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	267	4,48

ASCII-data output file for target 1 - 4 ready for postprocessing with third-party software like, e.g., SCOP++, TerraScan or others



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

## RiANALYZE Key Features

- **Target detection and target parameter estimation applied to digitized echo signals of the RIEGL Airborne Laser Scanners LMS-Q560 or LMS-Q680(i), frequently referred to 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 2D point cloud with additional target descriptors**
- **Provides different data output formats for a variety of post-processing software packages**
- **Command line interface for sequential unattended processing of sample data files**
- **Smooth integration into RiPROCESS**

## RiANALYZE System Requirements

### Operating systems:

Windows XP Professional, Windows Vista Professional, Windows 7 Professional, 32 or 64 bit operating system  
Note: In case of Windows Vista and Windows 7, please ensure that you have up-to-date device drivers installed (especially for the graphic card).

### Memory requirements:

1024 MB RAM minimum, 2048 MB (32 bit) / 4096 MB (64 bit) or more recommended  
Note: On 32 bit operating systems, RiANALYZE can use up to 3 GB RAM and on 64 bit operating systems up to 4 GB RAM.

### Disk space requirements:

approx. 5 MB of free disk space for the program

## RiANALYZE Download Information

To download RiANALYZE please navigate to <http://www.riegl.com/> and click on „DOWNLOADS“.  
(Download after e-mail registration only.)



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