RIEGL LMS-Q780

ALS

The *RIEGL* LMS-Q780 full waveform airborne laser scanner offers great versatility, accuracy, and data quality. The scanner enables you to successfully deliver your projects with industry leading efficiency.

The Versatile, High Altitude Airborne LIDAR Sensor

Typical Applications

• High Altitude Wide Area Mapping • Glacier & Snowfield Mapping • Topography & Mining • Flood Zone Mapping
• Corridor Mapping • Large Scale National Mapping • Mapping of Lakesides & River Banks • Agriculture & Forestry

Scan this QR code with your smart phone to get further information about the *RIEGL* LMS-Q780.

www.riegl.com

RIEGL®
LASER MEASUREMENT SYSTEMS

RIEGL LMS GmbH, Austria | ***RIEGL USA Inc.*** | ***RIEGL Japan Ltd.***

Innovation in 3D

Colored Point Cloud
Ötscher, Austria, 2012

Acquisition Parameter:

Scanner: *RIEGL* LMS-Q780
Data Recorder: DR680
Field of View: 60°
PRR: 400 kHz
Scan Area: 57 km²
Scan Points: 716 Mio.
Scan Time: 0:27 h

Average Point Density:
13 points/m²

Flight Parameter:

997m - 2420 m AGL
(3000 m above MSL)
110 knots
Flight Time: 0:45 h

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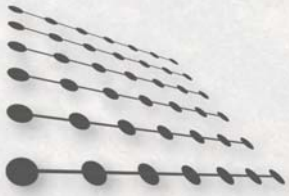
RIEGL®
LASER MEASUREMENT SYSTEMS

Take off with the *RIEGL* LMS-Q780!

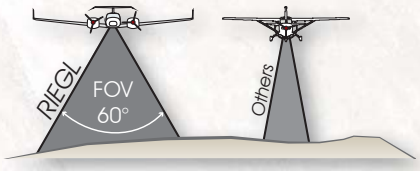
The *RIEGL* LMS-Q780 is the versatile high altitude airborne LIDAR sensor for all projects: from corridor to wide-area, and large-scale national mapping. *RIEGL* delivers unrivaled efficiency at low operating costs.

Highlights

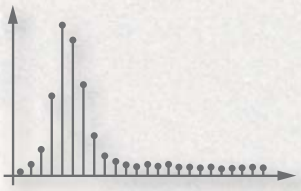
The *RIEGL* LMS-Q780, with up to 10 simultaneous pulses in the air, results in the most effective spacing on the ground. This eliminates the need of terrain following while retaining a high effective rate. Industry leading digital signal processing, combined with the comprehensive *RIEGL* software suite, delivers high-quality LIDAR Data.



The *RIEGL* LMS-Q780 delivers straight parallel scan lines and more equally spaced laser footprints on the ground. Even small objects can be detected by the high-resolution Matrix Scan Pattern.



The *RIEGL* LMS-Q780, operated at up to 10,000 feet above ground with its full Field of View of 60 degrees, provides both a wide effective swath width and a narrow point spacing simultaneously. This results in minimizing operating costs.



The *RIEGL* LMS-Q780 digital full waveform sensor provides access to detailed target parameters by digitizing the echo signal online during data acquisition and subsequent offline waveform analysis.

The instrument is ideally suited for tightly coupled GNSS/IMU integration for acquiring position and orientation of the platform within a global coordinate system.

Conclusions

- Great versatility, accuracy and data quality
- Up to 10 pulses in the air handled simultaneously, offering industry leading digital signal processing and software
- The *RIEGL* LMS-Q780 delivers perfectly, straight parallel and high resolution scan lines - described as Matrix Scan Pattern
- With a very wide effective swath width, the *RIEGL* LMS-Q780 delivers unrivaled operating efficiency
- Applicable from high altitude wide area mapping to low flight altitude corridor mapping

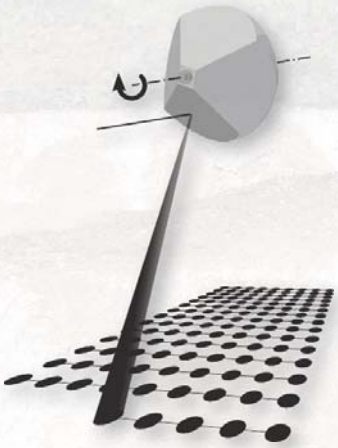
The *RIEGL* LMS-Q780 is your versatile airborne sensor solution!

Leading Technology in Airborne Scanning

- **Rotating Polygon Mirror -** resulting in straight, parallel scan lines on the ground
- **RiSOFTWARE -** complete data acquisition and processing software suite for airborne mapping
- **Reliability -** trust in the high quality of *RIEGL* products and software solutions

Rotating Polygon Mirror

The clear advantage of polygon mirrors compared to other currently used techniques on the market is the continuous and smooth rotation of the mirror which leads to straight parallel scan lines on the ground. The achievable scan rates are high and allow flexible adjustment for obtaining an even distribution of points on the ground. Furthermore low vibrations and low stress on the deflecting mirror surfaces and the scan mechanism maintain constant and replicable measurement accuracy and reliability.



RiSOFTWARE

RiACQUIRE

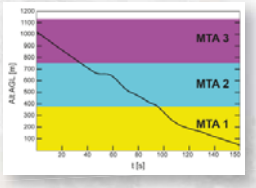
- Project-oriented scandata acquisition and scanner control
- Online visualization of geo-referenced monitoring data during acquisition
- Quality assurance with detailed history of events, systen parameters and operator's interactions
- Status feedback for fast recognition by the operator
- 3D visualization
- Simplifies the acquisition process easily and effectively

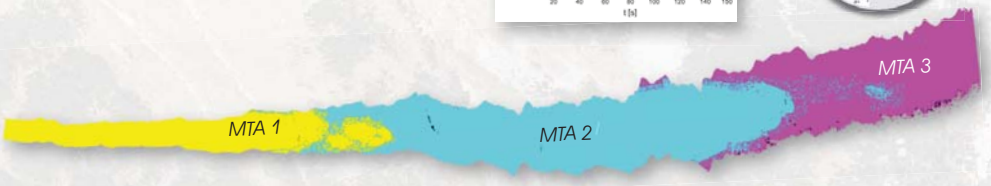
RiPROCESS

- Project-oriented scandata software for managing and processing *RIEGL* ALS and MLS data
- Operation in a multiple-workstation environment, parallel task processing
- Fast access to data for inspection in different visualization formats
- System calibration and scandata adjustment
- Statistical analysis of referencing, matching quality
- Interfacing to third party software packages
- Resulting in a very high quality geo-referenced point cloud

RiMTA – handling multiple pulses in the air, simultaneously!

- Automatic resolution of range ambiguity in time-of-flight ranging
- Unlimited number of MTA zones
- Smoothly integrated in the *RIEGL* data processing workflow
- No terrain following required





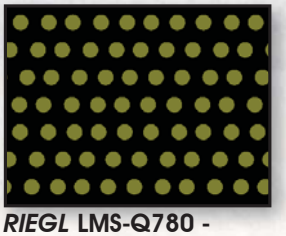
Reliability

Our customers rely on the *RIEGL* LMS-Q780 to work smoothly in demanding environments. The overall system design and quality of manufacturing provides the legendary *RIEGL* reliability.

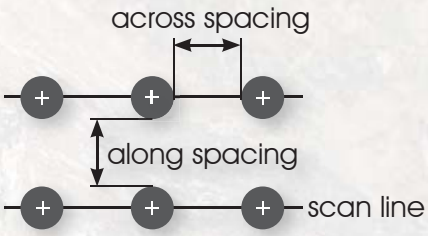
Scan Performance - Maximum Operating Efficiency

- **Matrix Scan Pattern -** stands for equally spaced laser footprints on the ground
- **Wide Effective Swath Width -** results in a very low number of necessary flight lines

Matrix Scan Pattern

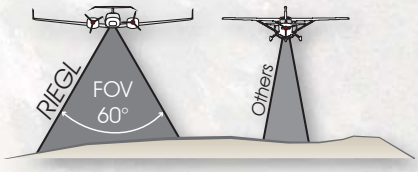


***RIEGL* LMS-Q780 - point distribution**

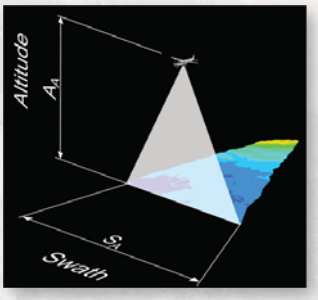


The *RIEGL* LMS-Q780 scanner delivers straight parallel scan lines and an equally dense laser footprint on the ground. Even small objects may be detected by the high resolution Matrix Scan Pattern. The parameters "across spacing" and "along spacing" refer to the point distance within a scan line and between the scan lines, respectively. There is a large difference between along spacing and across spacing leading to significant gaps in the point cloud which also means a reduction of the sampling quality. The shorter the maximum gap between measurements on the ground, the better small objects may be detected. **Small, consistent gaps represent a high sampling quality, which is enabled by *RIEGL's* Matrix Scan Pattern.**

Wide Effective Swath Width



The broad swath width of the *RIEGL* LMS-Q780 results in a low number of necessary flight lines for surveying a designated area. It takes about twice the number of flight lines to survey the same area with other instruments on the market, because the user is forced to apply a quite narrow FOV and hence to fly for considerably longer time. A side effect of this is that with a smaller swath also the straightness of the lines is more critical in order to provide sufficient overlap which poses higher demands on the pilots or requires the use of stabilized platforms.



The *RIEGL* LMS-Q780 offers a wide effective swath width from different altitudes.

The necessary flight lines for surveying a designated area are reduced to a minimum.

The Acquisition Time to cover a certain area of 10 km x 10 km with at least 4 measurements per square meter, will take with the *RIEGL* LMS-Q780 only a shade more than one hour.
The *RIEGL* LMS-Q780 offers outstanding operating efficiency.

Key Facts

- **Technical Data**
- **Main Features**
- **Complete Data Acquisition & Processing Software Suite**

Technical Data

not intrinsically eye safe

pulse repetition rate PRR (peak)

waveform data output

max. operating flight altitude AGL

multiple target capability

full waveform processing

Eye Safety Class	Laser Class 3B*
Max. Range Target Reflectivity 60%	5400 m
Max. Range Target Reflectivity 20%	3750 m
Minimum Range	50 m
Accuracy	20 mm
Effective Measurement Rate	up to 266 000 meas./sec
Field of View (FOV)	up to 60°
Max. Operating Flight Altitude AGL	3050 m / 10.000 ft

*Class 3B Laser Product according to IEC60825-1:2007

Main Features

- up to 266 000 measurements/sec on the ground even from a typical operating flight altitude of 6700 ft
- multiple time around processing: up to 10 pulses (MTA 10) simultaneously in the air
- full waveform analysis for unlimited number of target echoes
- high laser pulse repetition rate up to 400 kHz
- high ranging accuracy up to 20 mm
- wide scan field of view up to 60°
- suited for measuring snowy and icy terrain

Complete Data Acquisition & Processing Software Suite

- RiACQUIRE
- RiANALYZE
- RiWORLD
- RiPROCESS
- RiMTA

RIEGL LMS-Q780 Datasheet

RIEGL LMS-Q780 White Paper

RiACQUIRE ALS Software

RiPROCESS ALS Software

RiMTA ALS Software

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Visit our website to read the Datasheets, White Paper, and get further information, also about the broad *RIEGL* Product Line.

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