

The NEW RIEGL VMQ[®]-450



The RIEGL VMQ-450 is a compact, economically priced single scanner mapping system, well suited for a variety of mobile mapping applications.

The system comprises the measuring head including laser scanner RIEGL VQ-450 and integrated IMU/GNSS unit, as well as a compact control unit for system operation. The optional integration of up to four cameras allows simultaneous acquisition of image data to complement LIDAR data.



NEW Compact Single Scanner Mobile Mapping System

Typical Applications

- Mapping of Transportation Infrastructure
- Road Surface Measurement
- City Modeling
- Fast Mapping of Construction Sites and Bulk Materials
- Surveying in Open-Pit Mining
- GIS Mapping and Asset Management
- As-Built Surveying



www.riegl.com



RIEGL LMS GmbH, Austria

RIEGL USA Inc.

RIEGL Japan Ltd.

RIEGL China Ltd.

Key Features

• 360° Vertical Field of View in a Single Pass

A 360° vertical field of view and an effective measurement rate up to 550 kHz at 200 lines per second enables acquisition of dense point cloud patterns even with single passes at common traffic speeds. At 75 km/h acquisition speed the typical average point density is about 10 cm line spacing and 1 cm point spacing on the road surface.

• Multi-target Capability

Excellent multi-target capability as well as calibrated amplitude and reflectance values provide valuable point cloud attributes and feature-rich data.

• Camera Interface

An integrated camera interface enables triggering of up to 4 cameras for image capture and precise time stamping. A wide range of cameras can be added to the system like DSLR cameras, thermal or hemispherical cameras as well as fully integrated 5-megapixel or 9-megapixel cameras.

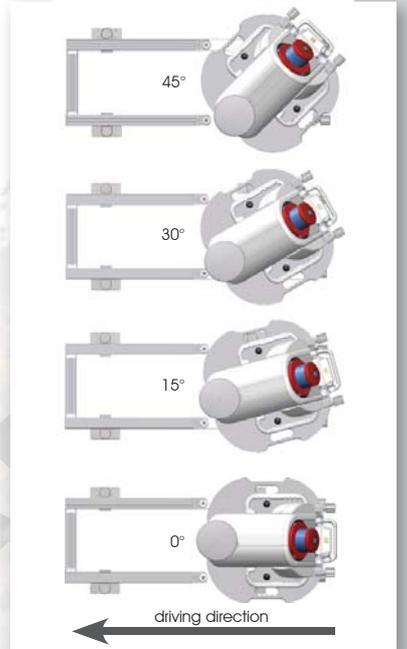
• Multiple Swivel Positions

By means of the swivel plate the measuring head can be set to seven different predefined mounting angles (-45° to +45° in 15° increments). This flexible system configuration allows the generation of different point cloud patterns meeting diverse project requirements.

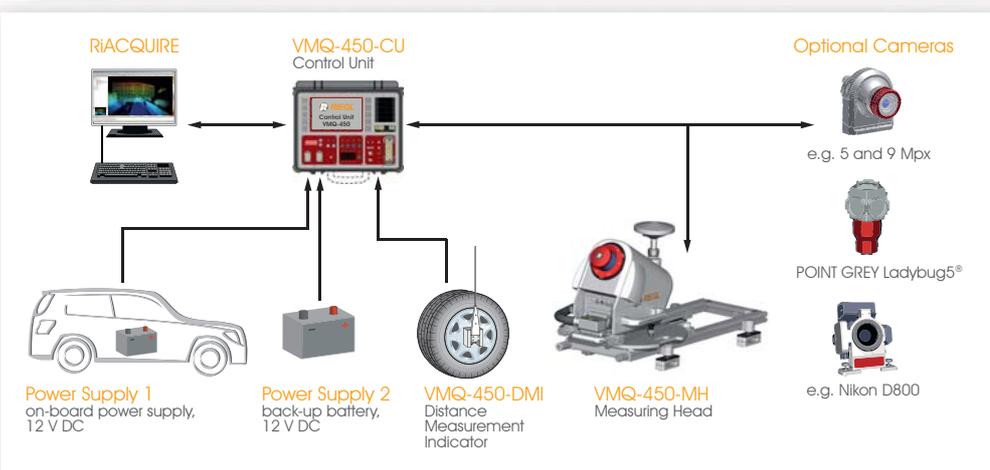
The possibility of scan data acquisition with different horizontal orientation of the measuring head improves the scan pattern especially for multi-pass applications. Scanning two passes with different swivel positions of the measuring head (e.g. -30° and +30°) generates an overlapping scan pattern which assists in the feature extraction process.

• Seamless RIEGL Workflow

Seamless RIEGL workflow for MLS data acquisition, processing and adjustment is provided by RIEGL's proven software suite.



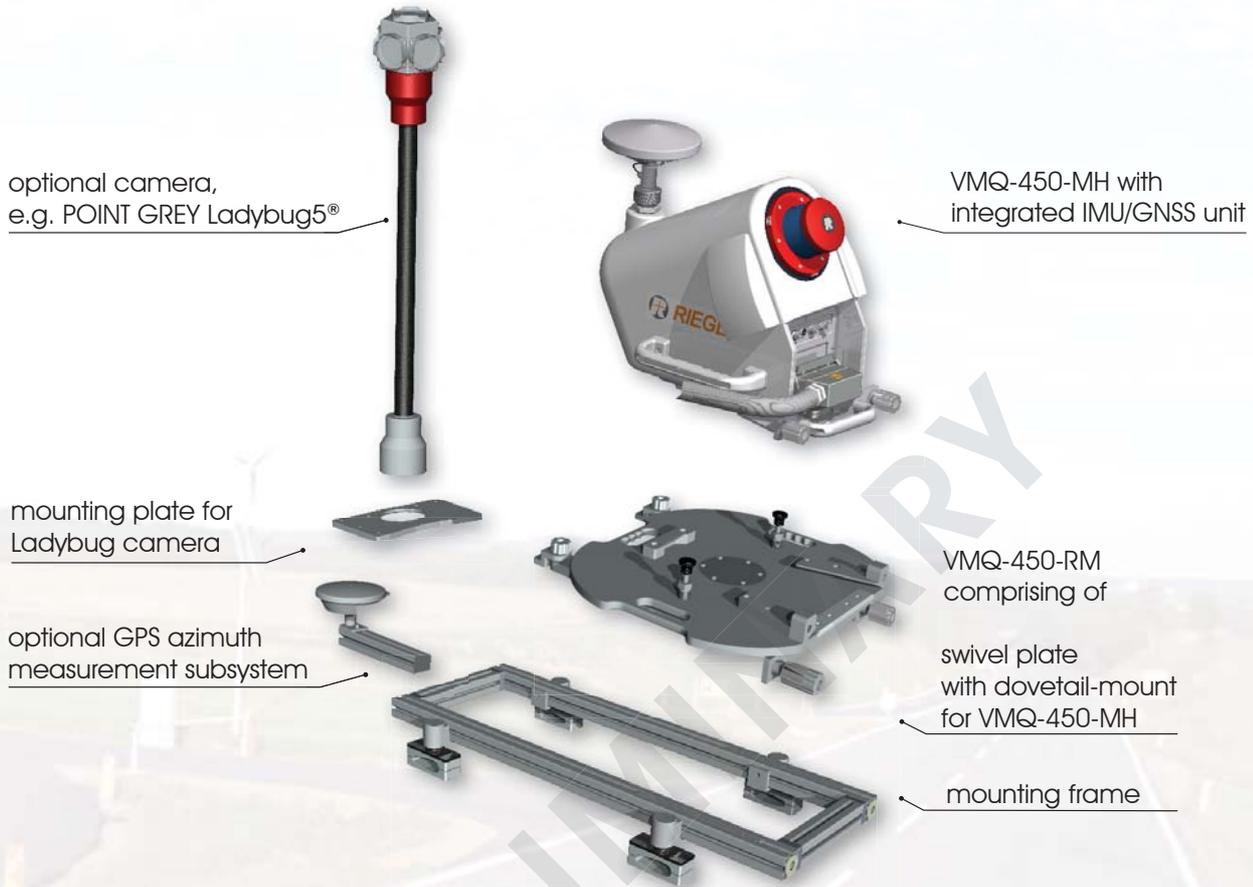
RIEGL VMQ-450 System Block Diagram



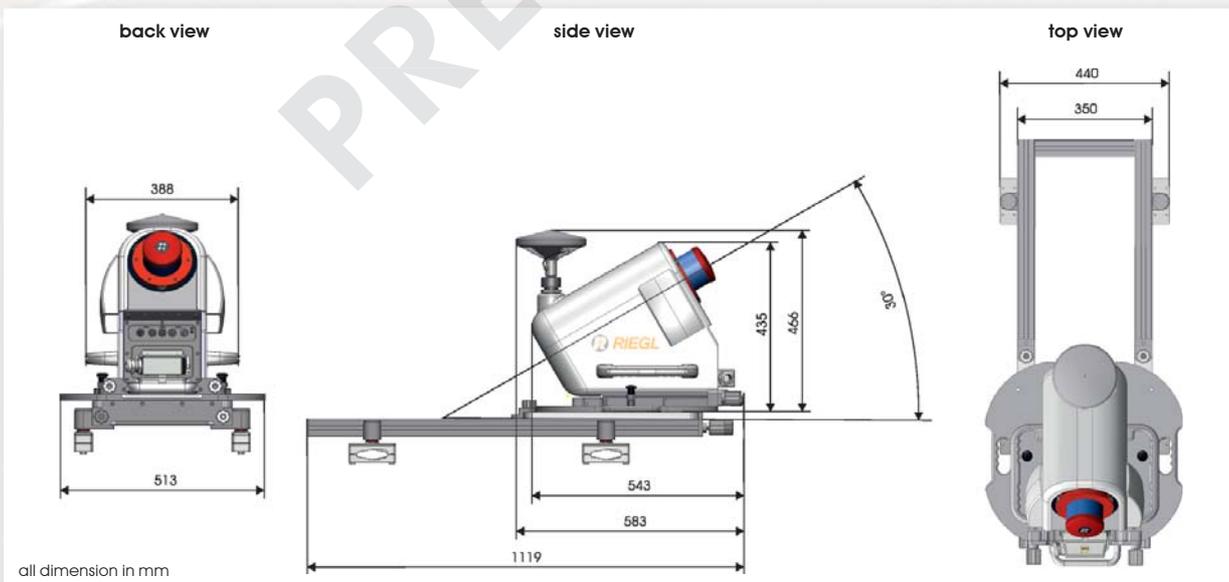
RIEGL VMQ-450 System Components:

- RIEGL VMQ-450-MH Measuring Head
- RIEGL VMQ-450-CU Control Unit
- VMQ-450-DMI Distance Measurement Indicator
- up to 4 cameras (optional)
- sustainable power supply with back-up battery
- connecting cables

RIEGL VMQ-450 Setup and Components



RIEGL VMQ-450 Dimensional Drawings



Physical Data	Main Dimensions (L x W x H)	Weight (approx.)
VMQ-450-MH Measuring Head	583 x 388 x 466 mm	25 kg
VMQ-450-RM Roof Mount		
Mounting Frame	1119 x 440 x 110 mm	9 kg
Swivel Plate	583 x 513 x 70 mm	13 kg
VMQ-450-CU Control Unit	560 x 455 x 265 mm	26 kg
VMQ-450-MC Main Cable	standard length 3 m	5 kg

RIEGL VMQ-450 Technical Data

max. measurement range

pulse repetition rate PRR (peak)

online waveform processing

optional digital camera

multiple target capability

eye safe operation at Laser Class 1

VMQ-450 Scanner Performance

Eye Safety Class	Laser Class 1 (Class 1 Laser Product according to IEC60825-1:2007)			
Effective Measurement Rate ¹⁾	150 kHz	200 kHz	300 kHz	550 kHz
Max. Range Target Reflectivity $\rho \geq 80\%$ ²⁾	800 m	700 m	450 m	220 m
Max. Range Target Reflectivity $\rho \geq 10\%$ ²⁾	300 m	260 m	200 m	140 m
Max. Number of Targets per Pulse	practically unlimited (details on request)			
Minimum Range	1.5 m			
Accuracy ^{3) 5)} / Precision ^{4) 5)}	8 mm / 5 mm			
Field of View	360°			
Line Scan Speed (selectable)	up to 200 lines/sec			

- 1) Rounded values, selectable by measurement program.
- 2) The following conditions are assumed: target larger than the footprint of the laser beam, perpendicular angle of incidence, visibility 23 km, average ambient brightness.
- 3) Accuracy is the degree of conformity of a measured quantity to its actual (true) value.
- 4) Precision, also called reproducibility or repeatability, is the degree to which further measurements show the same result.
- 5) One sigma @ 50 m range under RIEGL test conditions.

IMU/GNSS Performance ⁶⁾

Position Accuracy (absolute)	typ. 20 - 50 mm
Roll & Pitch Accuracy	0.015°
Heading Accuracy	0.05°

- 6) One sigma values, no GNSS outage, with DMI option, post-processed using base station data.

Electrical Data

Power Supply Input Voltage	11 - 15 V DC
Power Consumption	typ. 270 W (max. 390 W)

Interfaces

Interfaces Measuring Head (VQ-450-MH)	Interfaces Control Unit (VMQ-450-CU)
4 x trigger pulse, exposure pulse, NMEA data (e.g. for optional cameras or additional devices) 1 x PPS out pulse for synchronization of additional device 2 x LAN, 1000 Mbit/sec for data transfer to control unit of external devices (e.g. image data acquisition) 1 x secondary antenna connector for GPS azimuth measurement subsystem	1 x DMI input (for distance measuring indicator; odometer) 1 x synchronization output NMEA + PPS (for synchronization of additional device) 1 x NAV RS232 (COM port for IMU/GNSS for RTK, SBAS) 1 x LAN, 1000 Mbit/sec (e.g. connect additional computer) 2 x USB 3.0 (e.g. image data transfer from Point Grey Ladybug5®) 1 x touch screen incl. USB (for system operation) 1 x DVI (additional video output of main system PC)
VMQ-450-MC Main Cable (single cable connection between VMQ-450-MH and VMQ-450-CU)	

Further Information



RIEGL VQ-450 Data Sheet



RIACQUIRE Data Sheet



RIPROCESS Data Sheet



RIWORLD Data Sheet



RIPRECISION MLS Brochure



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