

RIEGL VMY[®]-1



EXTREMELY COMPACT SINGLE SCANNER MOBILE MAPPING SYSTEM:

150 scan lines/sec scan speed
300 kHz Pulse Repetition Rate

The **RIEGL VMY-1** is an extremely compact, economically priced mapping system of small dimensions, that is well suited for a variety of basic mobile mapping applications.

The central part of the system is the **RIEGL miniVUX-HA** LiDAR sensor providing 150 scan lines/second and up to 300 kHz pulse repetition rate.

The optional integration of up to four cameras (DSLR camera(s) and / or a spherical camera) allows simultaneous acquisition of images to complement the measurement data.

The innovative design of the system enables folding for convenient transport and space-saving storage.

An easy-to-use interface, accessible via laptop, and the **RIEGL** data acquisition software facilitate the operator's task in the field by providing real-time visualization of the acquired scan data and imagery.



Extremely Compact Single Scanner Mobile Mapping System

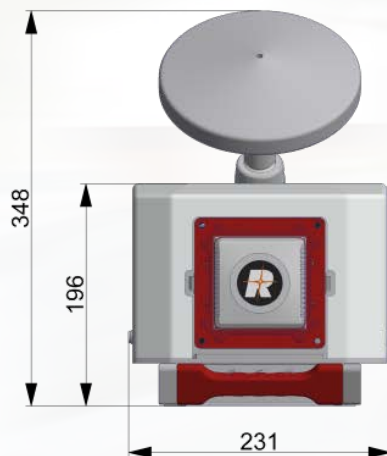
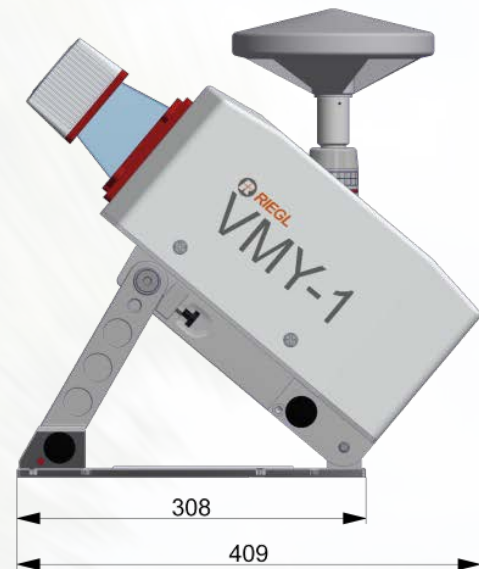
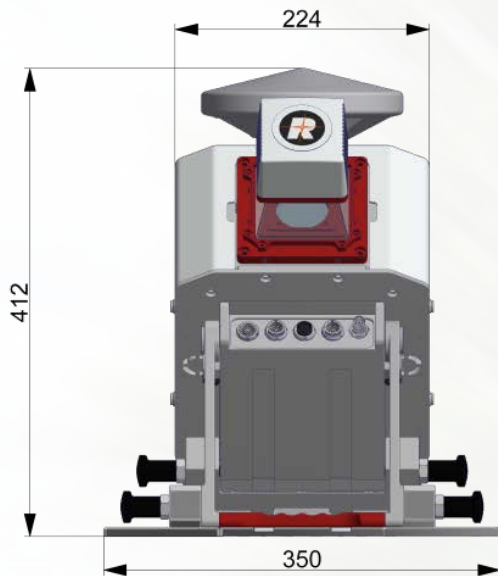
Typical Applications

- GIS Mapping & Asset Management
- Transportation Infrastructure Mapping
- HD Mapping for Autonomous Vehicles
- City Modeling
- Rapid Capture of Construction Sites and Bulk Material
- Open-Pit Mine Surveying
- As-Built Surveying

Contact us



RIEGL VMY-1 Technical Data



VMY-1MH shown with antenna type of AP subsystem,
dimensions in mm

Physical Data

	Main Dimensions (L x W x H)	Weight (approx.)
VMY-1MH Measuring Head (in measuring position) with IMU	409 x 350 x 412 mm	8.4 kg
VMY-RM Roof Mount including mounting plate and mounting brackets, without GAMS	1006 x 441 x 171 mm	12.0 kg
VM Power Supply Box	415 x 330 x 175 mm	7.8 kg
VMY-MC Main Cable	standard length 5 m	0.6 kg

RIEGL VMY Foldable Design

The innovative design of the system enables folding and thus a convenient transport and space-saving storage.



RIEGL VMY Multi-Position-Plate (optional)

The VMY-1MH Measuring Head can be easily set to three different positions (-15 deg / 0 deg / +15 deg) by using the VMY Multi-Position-Plate mounted onto the VMY-RM Roof Mount. This allows the operator to achieve different point cloud patterns to meet the specific project requirements.



position +15°



position 0°



position -15°

RIEGL VMY-1 Technical Data

 max.
measurement range

 pulse repetition
rate (peak)

 online waveform
processing

 optional
digital camera

 multiple
target capability

 eye safe operation
at Laser Class 1

VMY-1 Scanner Performance

Laser Class	Laser Class 1 (Class 1 Laser Product according to IEC 60825-1:2014)		
Effective Measurement Rate ¹⁾	100 kHz	200 kHz	300 kHz
Max. Range, Target Reflectivity $\rho \geq 80\%$ ²⁾	270 m	240 m	200 m
Max. Range, Target Reflectivity $\rho \geq 60\%$ ²⁾	240 m	210 m	170 m
Max. Range, Target Reflectivity $\rho \geq 20\%$ ²⁾	140 m	120 m	100 m
Max. Number of Targets per Pulse ³⁾	5	5	5
Minimum Range	1 m		
Accuracy ^{4) 6)} / Precision ^{5) 6) 7)}	5 mm / 4 mm		
Field of View (selectable)	up to 360°		
Scan Speed ⁸⁾ (selectable)	up to 150 scans/sec		

1) Rounded values.

2) Typical values for average conditions. Maximum range is specified for flat targets with size in excess of the laser beam diameter, perpendicular angle of incidence, and for atmospheric visibility of 23 km. In bright sunlight, the max. range is shorter than under overcast sky.

3) If more than one target is hit, the total laser transmitter power is split and, accordingly, the achievable range is reduced.

4) Accuracy is the degree of conformity of a measured quantity to its actual (true) value.

5) Precision, also called reproducibility or repeatability, is the degree to which further measurements show the same result.

6) One sigma @ 16 m range under RIEGL test conditions.

7) Degraded precision on targets with very low reflectivity below 1.5 m range.

8) Equivalent to revolutions per second.

IMU/GNSS Performance

	APX-20	AP+30	AP+50	RIEGL RiLOC-F ¹¹⁾
Position Accuracy Horizontal	typ. 0.02 m	typ. 0.02 m	typ. 0.02 m	typ. 0.02 m
Position Accuracy Vertical	typ. 0.03 m	typ. 0.03 m	typ. 0.03 m	typ. 0.03 m
Roll & Pitch Accuracy	0.015° ⁹⁾	0.010° ⁹⁾	0.005° ⁹⁾	0.005°
Heading Accuracy	0.05° ⁹⁾	0.025° ^{9) 10)}	0.015° ^{9) 10)}	0.020°

9) Absolute accuracy specifications (RMS). Typical performance. Actual results are dependent upon satellite configuration, atmospheric conditions, and other environmental effects. Post processed using base station data. No GNSS outages, with DMI option.

10) Improved heading accuracy with dual antenna option @ 2 m base line.

11) Typical accuracy under ideal conditions, RMS values, no GNSS outages, short baseline < 10km. Positioning performance depends on satellite visibility, atmospheric conditions, and other environmental effects. Navigation performance depends on vehicle dynamics.

RIEGL RiLOC®-F (Localization/Orientation Component) Additional Data

IMU Sampling Rate	more than 700 Hz
IMU Acceleration Range	± 8 g
IMU Angular Rate Range	± 300°/sec
GNSS System	multi-constellations (GPS, GLONASS, Galileo, and BeiDou) up to triple-frequency
IMU/GNSS/LiDAR Performance RiLOC-F ¹²⁾	
3D Point Accuracy / 3D Point Precision	0.02 - 0.03 m / 0.01- 0.02 m

12) Typical accuracy/precision (1 sigma @ 50 m range) after integrated georeferencing, under RIEGL test conditions. Accuracy depends on GNSS positioning, above caveats apply (short baseline < 10km, no GNSS outages). Overlapping scan data, varied environment geometry and/or man-made objects with planar features are required. Recommended maximum mission duration: 4 h

RIEGL VMY-1 Technical Data

General Technical Data

Power Supply Input Voltage	11 - 15 V DC
Power Consumption with APX-20 with AP+30 / AP+50 with RILOC-F	typ. 43 W ¹³⁾ typ. 46 W ¹³⁾ typ. 39 W ¹³⁾
Temperature Range	-10°C up to +40°C (operation) / -20°C up to +50°C (storage)
Humidity	max 80% non condensing @+31°C

¹³⁾ with 1x spherical camera

Interfaces

Interfaces Measuring Head (VMY-1MH)	VM Power Supply Box
4x trigger pulse, exposure pulse, NMEA data (e.g. for optional cameras or additional devices) ¹⁴⁾ 1x PPS out pulse for synchronization of additional device 1x secondary antenna connector for GPS azimuth measurement subsystem ¹⁵⁾	1x DMI input (for distance measuring indicator; odometer) 3x power supply socket (2x 24V DC / 1x 12V DC)

¹⁴⁾ without integrated RISYS-CU-23 Box only 2 cameras interfaces available

¹⁵⁾ only applicable with IMU/GNSS type AP+30 / AP+50 system

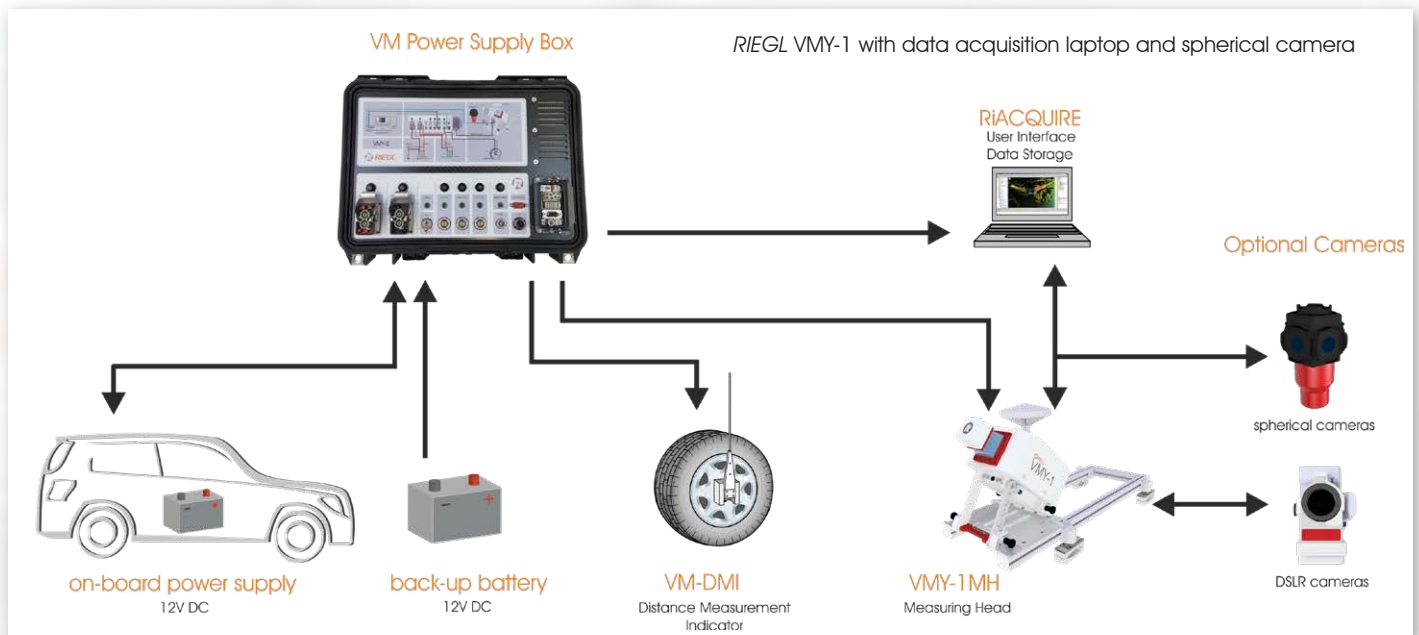
RIEGL VMY-1 System Block Diagram

RIEGL VMY-1 System Components

- RIEGL VMY-1MH Measuring Head
- RIEGL VM Power Supply Box
- VM-DMI Distance Measurement Indicator
- sustainable power supply with back-up battery
- connecting cables



RIEGL MLS Systems
Camera Options



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