

2D LASER SCANNER **LMS-Q240**

The **RIEGL LMS-Q240** 2D - laser scanner makes use of the pulsed time-of-flight range measurement principle and beam scanning by means of an opto-mechanical scan mechanism, providing fully linear, unidirectional and parallel scan lines.



The instrument is extremely rugged, therefore ideally suited for the installation on board of an aircraft, and also compact and lightweight enough to be used under narrow space conditions (e.g. in small single-engined planes, helicopters or on other vehicles). The instrument needs only a single supply voltage and provides the scan data via integrated Ethernet LAN interface. The binary data stream can easily be post-processed by user's software using the available software library. The laser scanner LMS-Q240 offers a unique combination of wide scanning angle, high range, high measuring accuracy, narrow laser beam, all that within a compact and robust housing.

- **Range 450 m @ 80 % target**
- **Range accuracy 20 mm**
- **Data rate 10 000 meas. / sec**
- **Scanning rate up to 80 scans / sec**
- **Scanning range up to 80°**
- **Perfectly linear scan**
- **Rugged IP64 housing**
- **Integrated LAN TCP/IP interface**
- **Synchronisation input for GPS pulses**

Typical applications include

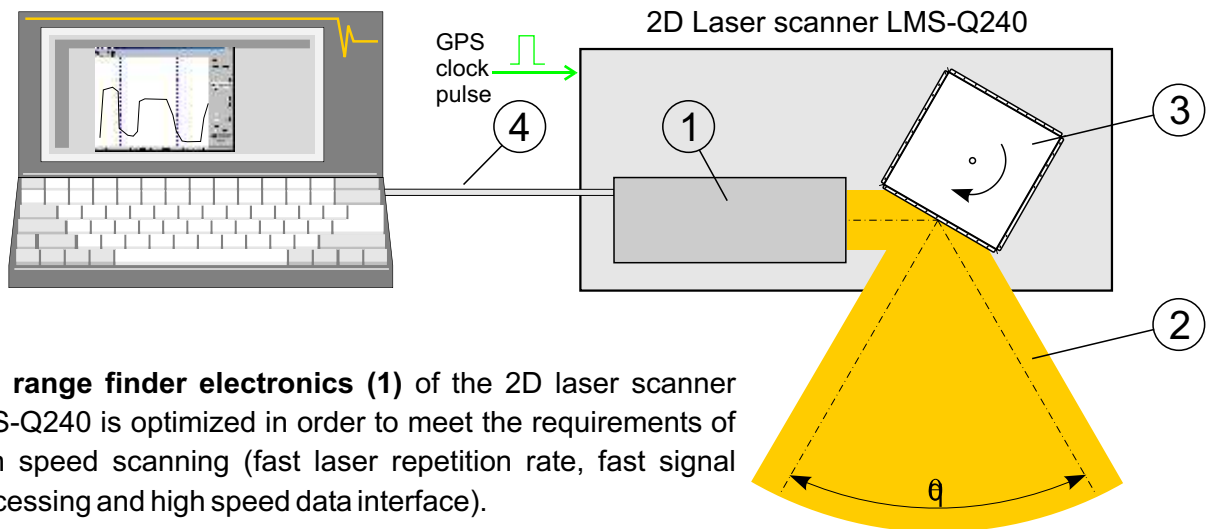
- **Airborne laser scanning**
- **Long-range guidance of autonomous vehicles**

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LASER MEASUREMENT SYSTEMS

Principle of operation *RIEGL* LMS-Q240

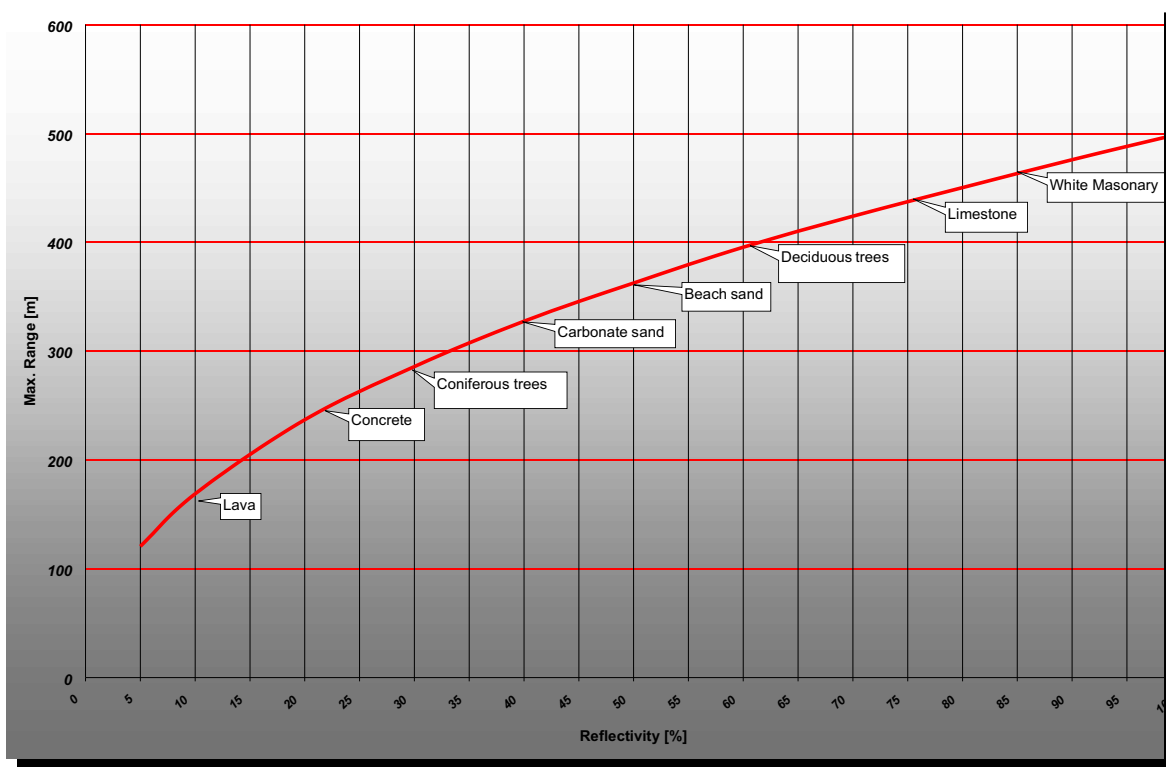


The **range finder electronics (1)** of the 2D laser scanner LMS-Q240 is optimized in order to meet the requirements of high speed scanning (fast laser repetition rate, fast signal processing and high speed data interface).

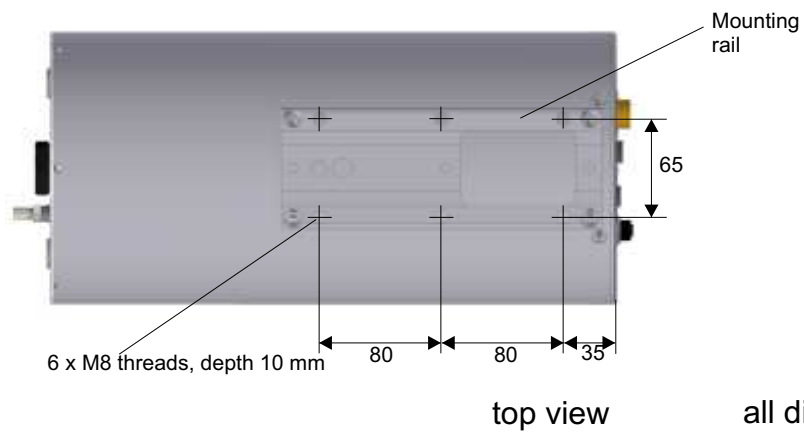
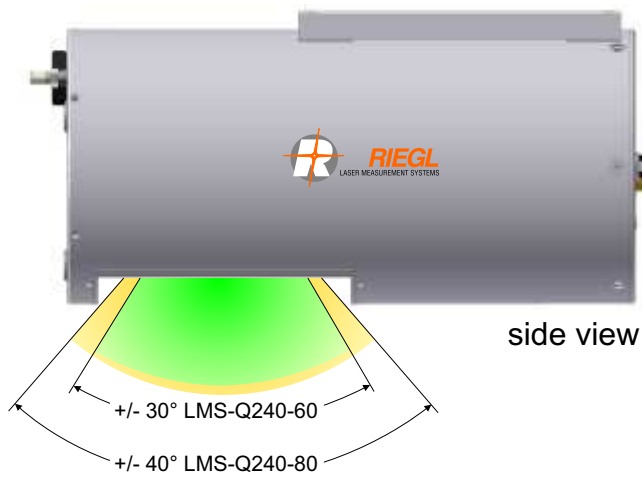
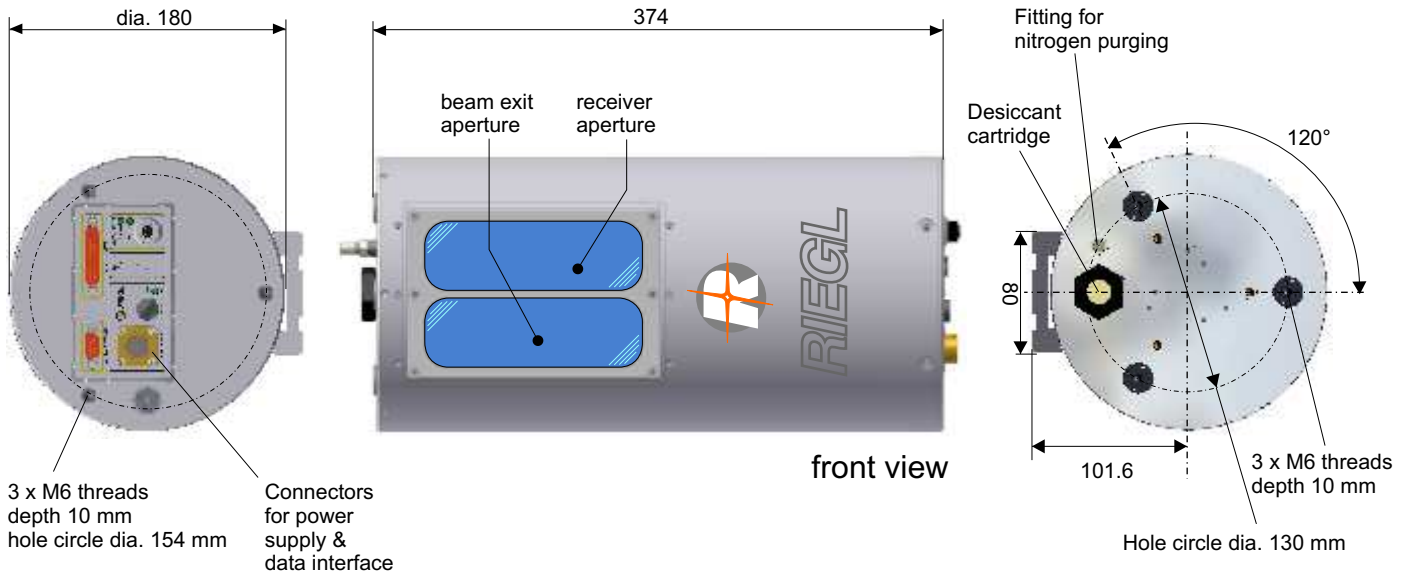
The angular deflection of the **laser beam (2)** is realized by a **rotating polygon (3)** with a number of reflective surfaces. It rotates continuously at adjustable speed to provide an unidirectional scan within an angle of $\theta = 60^\circ$ (LMS-Q240-60) or $\theta = 80^\circ$ (LMS-Q240-80).

The gained information of RANGE, ANGLE, SIGNAL AMPLITUDE, and TIMER is provided via an **Ethernet LAN interface (4)**. The LMS-Q240 is prepared to accept a GPS clock pulse (i.e. 1 pps) to reset an internal timer, which therefore can be synchronized to an external event.

Maximum range vs. target reflectivity of *RIEGL* LMS-Q240



Dimensional drawings of RIEGL LMS-Q240



all dimensions in mm

Technical data of *RIEGL* LMS-Q240

Rangefinder performance

Measurement range ¹⁾	230 m
for natural targets, $\rho \geq 20\%$	450 m
for natural targets, $\rho \geq 80\%$	
Minimum range	2 m
Measurement accuracy ²⁾	typ. ± 20 mm
Measurement resolution	5 mm
Laser PRR	30 000 Hz
Effective measurement rate	10 000 Hz
Laser wavelength	near infrared
Beam divergence ³⁾	2.7 mrad
Target detection modes ⁴⁾	First target, last target ⁵⁾ , or alternating
Eye safety class according to IEC60825-1:1993+A1:1997+A2:2001	Class 1 for the scanned laser beam



Scanner performance

	LMS-Q240-60	LMS-Q240-80
Scanning range ⁶⁾	± 30 deg = 60 deg total	± 40 deg = 80 deg total
Scanning mechanism	Rotating polygon mirror	
Scanning rate ⁶⁾	6 to 80 scans/sec	5 to 60 scans/sec
Minimum angle step width	0.04 deg	
Angular resolution	0.005 deg	

General technical data

Interface: for configuration & data output	Ethernet TCP/IP, 10/100 MBit/sec
for configuration	RS 232, 19.2 kBd
for data output	ECP standard (enhanced capability port) parallel
Input voltage range	18 - 32 V DC
Current consumption	approx. 1.8 A @ 24 V DC
Main dimensions	180 x 374 mm (Diameter x Length)
Weight	approx. 7 kg
Temperature range	-10 °C up to +50°C (operation), -20°C up to +60°C (storage)
Protection class	IP64, dust and splashwater proof
Mounting	M6 and M8 steel thread inserts

- 1) The following conditions are assumed: - target is larger than footprint of laser beam
- normal incidence angle of laser beam
- visibility 10 km
- average ambient brightness
- 2) Standard deviation, plus distance depending error $\leq \pm 20$ ppm
- 3) 2.7 mrad correspond to 27 cm beamwidth per 100 m of range
- 4) Only one target distance per measurement can be supplied.
- 5) For last target measurement, the last echo of up to 4 echoes is supplied.
For n echoes with $n > 4$, always echo number 4 is supplied as last pulse target distance.
- 6) Scanning parameters are selectable via RS232 or Ethernet configuration interface.

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, LMS-Q240, 20/04/2006



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