

# 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 an integrated TCP/IP Ethernet 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 maximum range, high measuring accuracy, narrow laser beam, all that within a compact and robust housing.

- **Maximum range 450 m @ 80 % target**
- **Ranging 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 TCP/IP Ethernet interface**
- **Input for GPS time synchronization**

### **Typical applications include**

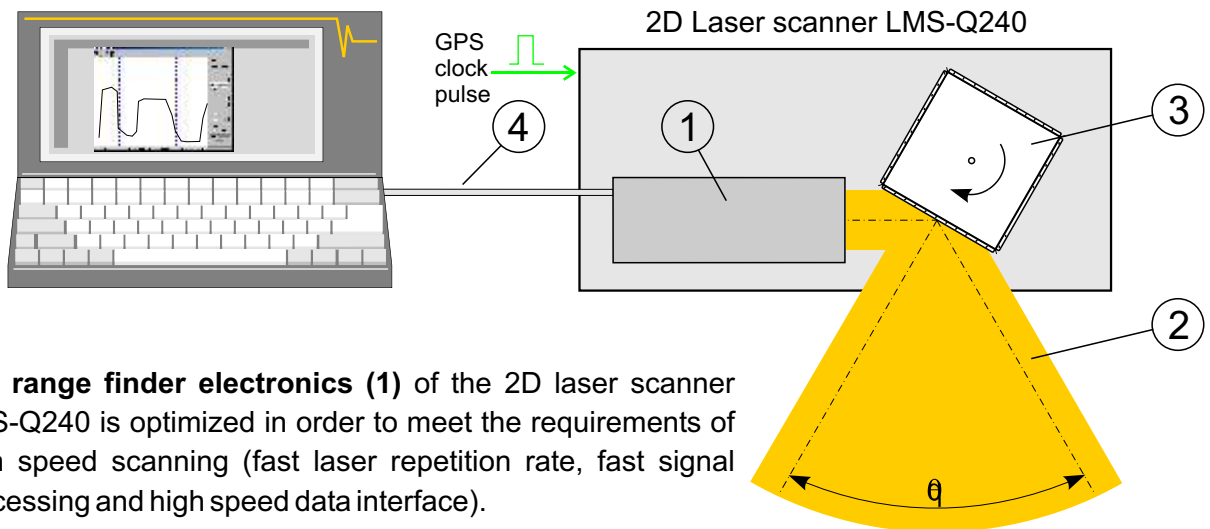
- **Airborne laser scanning**
- **Long-range guidance of autonomous vehicles**

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LASER MEASUREMENT SYSTEMS

## Principle of operation *RIEGL* LMS-Q240

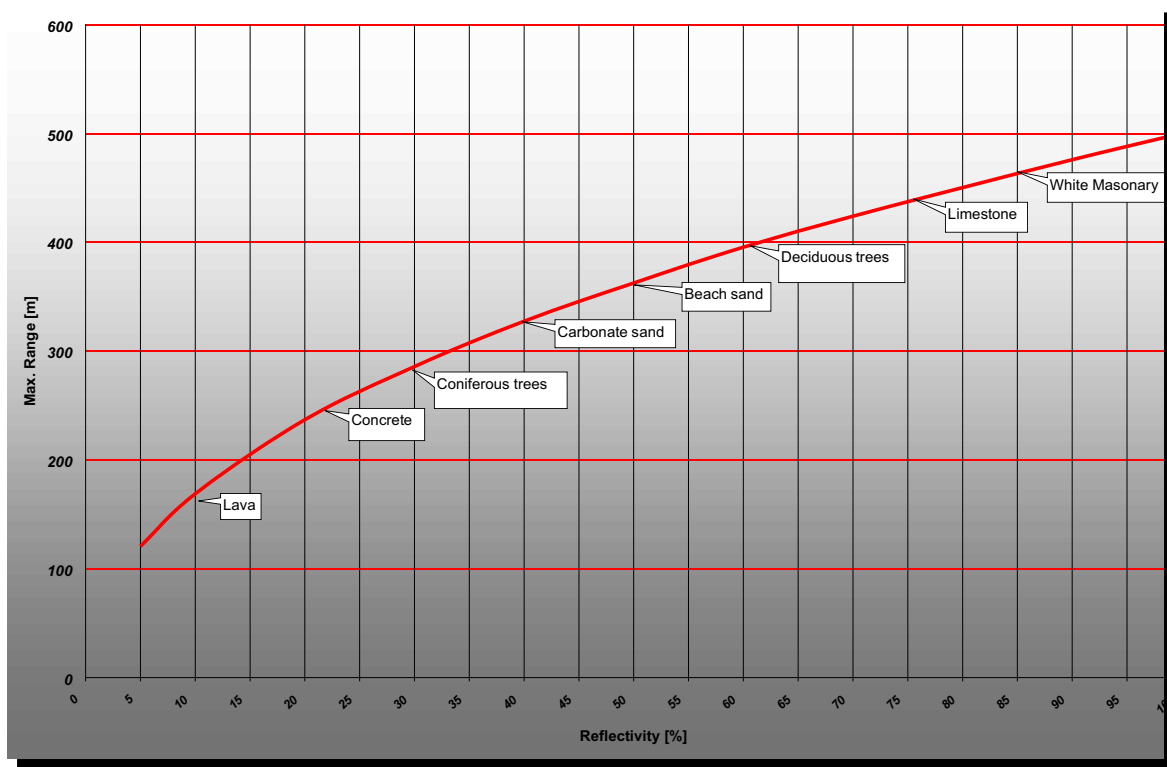


The **range finder electronics (1)** of the 2D laser scanner LMS-Q240 is optimized in order to meet the requirements of high speed scanning (fast laser repetition rate, fast signal processing and high speed data interface).

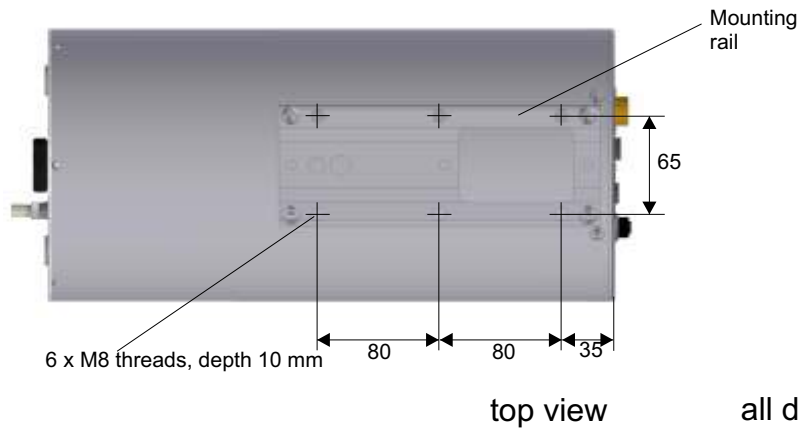
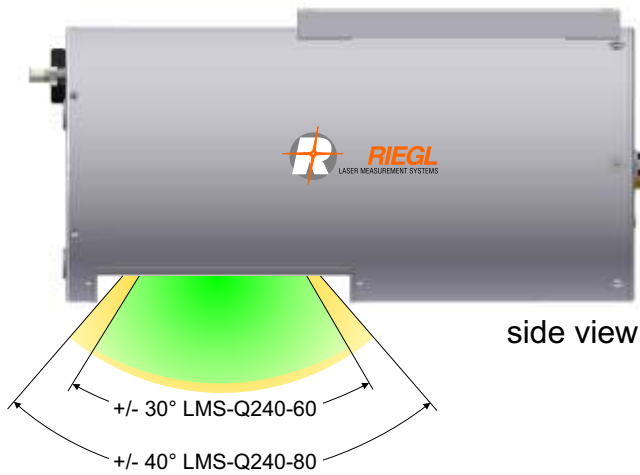
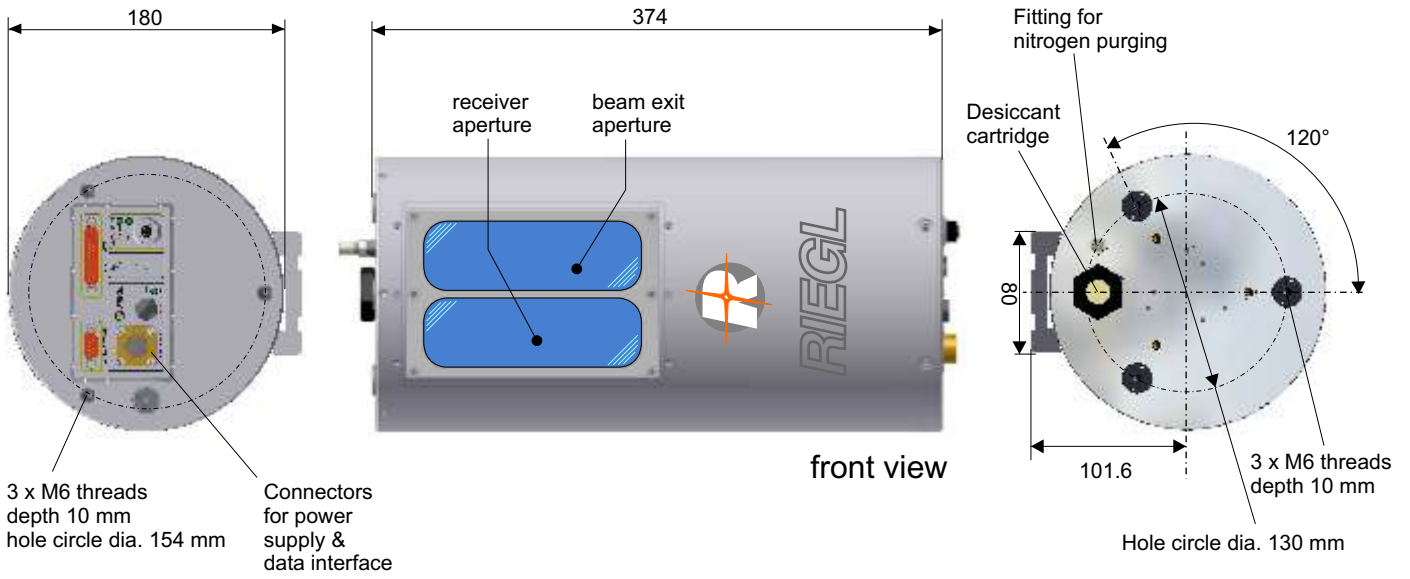
The angular deflection of the **laser beam (2)** is realized by a **rotating polygon (3)** with a number of reflective surfaces. It rotates continuously at an adjustable speed to provide a unidirectional scan within an angle of  $\theta = 60^\circ$  (LMS-Q240-60) or  $\theta = 80^\circ$  (LMS-Q240-80).

For every measurement RANGE, SCAN ANGLE, SIGNAL AMPLITUDE, and optionally a **TIMESTAMP** are provided via a **TCP/IP Ethernet interface (4)**. The LMS-Q240 is prepared to accept a TTL-signal (i.e., 1 pulse per second) from, e.g., a GPS receiver, to reset an internal timer, which is used to timestamp every measurement.

## 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

Maximum measurement range <sup>1)</sup>	230 m
for natural targets, $\rho \geq 20\%$	450 m
for natural targets, $\rho \geq 80\%$	
Minimum range	2 m
Accuracy <sup>2)</sup>	20 mm
Precision <sup>2)</sup>	15 mm
Laser PRR	30 000 Hz
Effective measurement rate	10 000 Hz
Laser wavelength	near infrared
Beam divergence <sup>3)</sup>	2.7 mrad
Target detection modes <sup>4)</sup>	First target, last target <sup>5)</sup> , or alternating
Eye safety class according to IEC60825-1:1993+A1:1997+A2:2001	Class 1 for the scanned laser beam

The following clause applies for instruments delivered into the United States: Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.



## Scanner performance

	LMS-Q240-60	LMS-Q240-80
Scanning range <sup>6)</sup>	$\pm 30$ deg = 60 deg total	$\pm 40$ deg = 80 deg total
Scanning mechanism	Rotating polygon mirror	
Scanning rate	6 to 80 scans/sec	5 to 60 scans/sec
Angle step width D J <sup>6)</sup> between consecutive laser shots	D J <sup>3</sup> 0.04 deg	
Angular resolution	0.005 deg	
Internal Sync Timer	Option for GPS-synchronized time stamping of scan data	
Scan Sync	Option for synchronizing scan lines to external timing signal	

## General technical data

Interface:	for configuration & data output	TCP/IP Ethernet, 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 of laser beam; visibility 10 km; average ambient brightness
- 2) One sigma @ 50 m range under RIEGL test conditions.
- 3) 2.7 mrad correspond to 27 cm increase of 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 can be set via RS232 or TCP/IP 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, 14/09/2006



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