

Lightweight Anti-Collision Laser Sensor

LMS-Q160



The *RIEGL* LMS-Q160 is a compact and extremely lightweight 2D scanning laser radar optimized for detecting even low-cross-section targets such as wires, thin branches etc.

The instrument is designed for operation as an anti-collision sensor for unmanned airborne vehicles but can also be advantageously used for land vehicles and surveillance applications. It is based on the time-of-flight measurement principle using short infra-red laser pulses and opto-mechanical scanning to provide on-line range and angle data of targets within the scanner's field-of-view (FOV).

The instrument needs only one power supply and provides scan data online via an integrated TCP/IP Ethernet interface. The binary data stream can easily be decoded and processed using the available software library.

The mechanical structure of the LMS-Q160 is extremely lightweight but on the other hand robust enough to withstand the shock and vibration load of land based or airborne vehicles.

Main applications include:

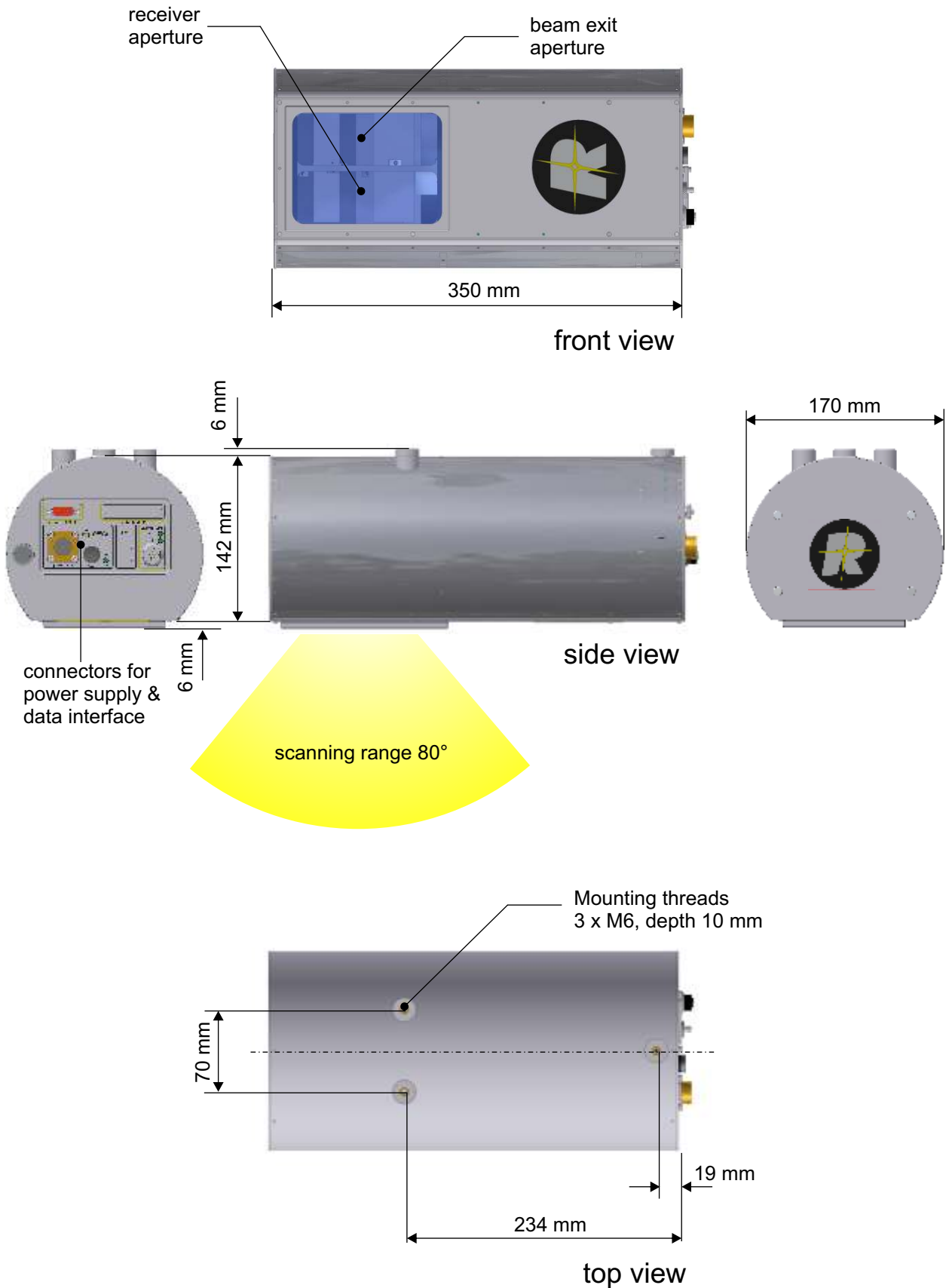
- ***Collision avoidance***
- ***Surveillance***

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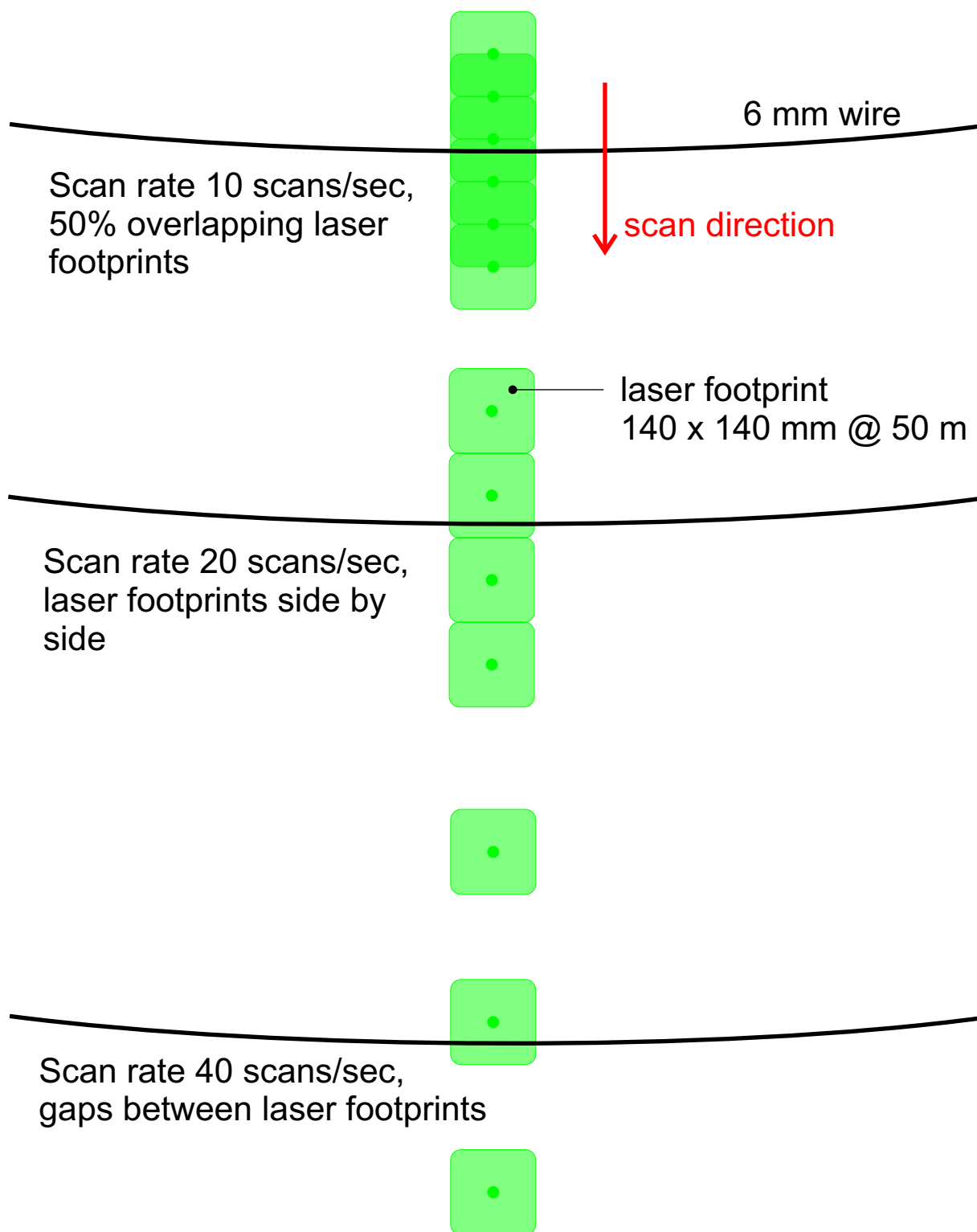
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LASER MEASUREMENT SYSTEMS

Dimensional Drawings LMS-Q160 Anti-Collision Laser Sensor



Laser Footprint Pattern LMS-Q160 Anti-Collision Laser Sensor

The graphics show examples of laser footprint patterns for different scan rates at a target distance of 50 m, the target object is a horizontally orientated wire, the scanning direction is vertical.



Technical Data LMS-Q160 Anti-Collision Laser Sensor

Rangefinder performance¹⁾

Laser product classification

according to IEC60825-1:2007
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.

Class 1 for the scanned laser beam



Maximum measurement range

for wire targets²⁾

up to 60 m

for natural flat targets³⁾

up to 200 m

Minimum range

2 m

Accuracy^{4) 6)}

20 mm

Precision^{5) 6)}

15 mm

Effective measurement rate

10 000 measurements/sec

Multi target resolution

8 m

Laser wavelength

near infrared

Beam divergence⁷⁾

2.7 mrad

- 1) First or last target mode selectable. Maximum measurement range and accuracy is defined below for a visibility >1km, overcast sky or night.
- 2) Diameter of wire in excess of 6 mm. Diffuse reflectivity of wire surface in excess of 15%. Beam incidence perpendicular to wire. The maximum measurement range to the specified target drops to 50 m in case of an angle of incidence of 45 deg, provided that the surface of the wire is reflecting strictly diffusely.
- 3) Diffuse reflectivity in excess of 10%. Beam incidence perpendicular to target. Size in excess of laser beam diameter. Max. measurement range for an extended flat target of 15% reflectivity will drop to 160m for an angle of incidence of 45°.
- 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 @ 50 m range under RIEGL test conditions.
- 7) 2.7 mrad correspond to 27 cm increase of beam width per 100 m of range.

Scanner performance

Scan angle range

+/- 40° = 80°

Scanning mechanism

rotating polygon mirror

Scan speed⁸⁾

5 scans/sec to 60 scans/sec

Angle measurement resolution

0.01°

Measurements per line

500 @ 20 scans/sec, 1000 @ 10 scans/sec

Internal Sync Timer

Option for real-time synchronized time stamping of scan data

Scan Sync

Option for synchronizing scan lines to external timing signal

- 8) Scanning parameters can be set via TCP/IP configuration interface.

General technical data

Interface

TCP/IP Ethernet, 10/100 MBit/sec

Power supply input voltage

18 - 32 V DC

Power consumption

typ. 48 W

Current consumption

typ. 2.0 A @ 24 V DC

Temperature range

-10°C to +50°C (operation)

-20°C to +60°C (storage)

Main dimensions

170 x 350 mm (diameter x length)

Weight

approx. 4.6 kg

Protection class

IP 54

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-Q160, 19/10/2009



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