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RANGER-XL

The **RANGER-XL** is a lightweight airborne laser scanner, especially designed for use on UAS and small manned airplanes or helicopters. With a wide field of view of 75 degrees and an extremely fast data acquisition rate of up to 1800 kHz, the **RANGER-XL** is perfectly suited for high point density corridor mapping applications such as power line, railway track and pipeline inspection.

FEATURES

- Easily mountable to unmanned platforms (UAVs) and to helicopters, gyrocopters, and other small manned aircrafts.
- Operating flight altitude up to 1,400 m/4,600 ft
- Scan speed up to 400 lines/second



QUICK SPECS

ABSOLUTE ACCURACY

25-50 mm @ 350 m range

PP ATTITUDE HEADING RMS ERROR

0.010° / 0.019° IMU options

WEIGHT (including AIR NavBox)

4.7 kg / 10.4 lbs

DIMENSIONS (with AIR NavBox)

348.5 x 164 x 189 mm

LASER RANGE

1200 m @ 20% reflectivity

SCAN RATE

1800 kHz, up to 15 returns

PLATFORM

OVERALL DIMENSIONS (with AIR NavBox)	352 x 164 x 185 mm
OPERATING VOLTAGE	14 - 28 VDC
POWER CONSUMPTION	75 W
OPERATING TEMPERATURE	0° - +40° C
WEIGHT (including Air NavBox)	4.7 kg / 10.4 lbs

LiDAR SENSOR

LASER PROPERTIES	1550 nm
RANGE MIN	5 m
MAX EFFECTIVE MEASUREMENT RATE	up to 1,500,000 meas./sec
HORIZONTAL FIELD OF VIEW	75°
ACCURACY	20 mm
Precision	15 mm
LASER BEAM DIVERGENCE	0.35 mrad
LASER BEAM FOOTPRINT (Gaussian beam definition)	35 mm @ 100 m, 175 mm @ 500 m, 350 mm @ 1000 m
MAX MEASURING RANGE p 20% (p 60%)	1200 m (1900 m)
SENSOR CLASSIFICATION	IP64 dust and splash-proof
WEIGHT	≤ 3.8 kg (without IMU/GNSS)
POWER CONSUMPTION	65 W

NAVIGATION SYSTEM

CONSTELLATION SUPPORT	GPS + GLONASS + BEIDOU + GALILEO
SUPPORTED ALIGNMENT	Kinematic, Dual-Antenna
OPERATION MODES	Real-time, Post-Processed
ACCURACY POSITION	1 cm + 1 ppm GNSS baseline RMS Horizontal
ACCURACY ATTITUDE ⁽⁵⁾	
ROLL, PITCH	0.002° RMS
HEADING	0.007° RMS

APPLICATIONS



UTILITIES MAPPING



RAILWAY TRACK MAPPING



AGRICULTURE & FORESTRY MONITORING

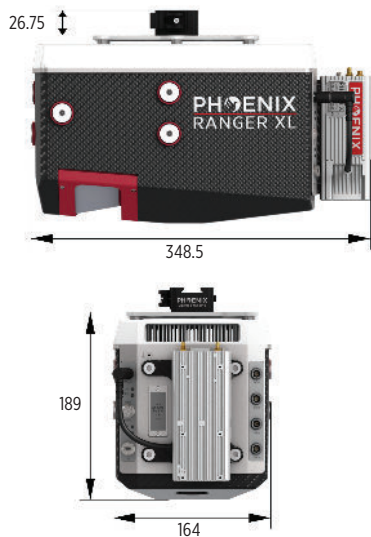


OPEN PIT MINING OPERATIONS



GENERAL MAPPING

RANGER-XL DIMENSIONS (mm)

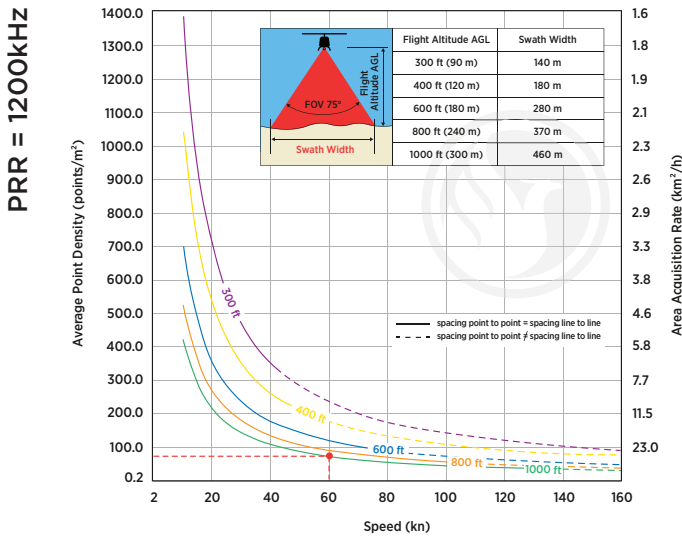


RANGE MEASUREMENT PERFORMANCE

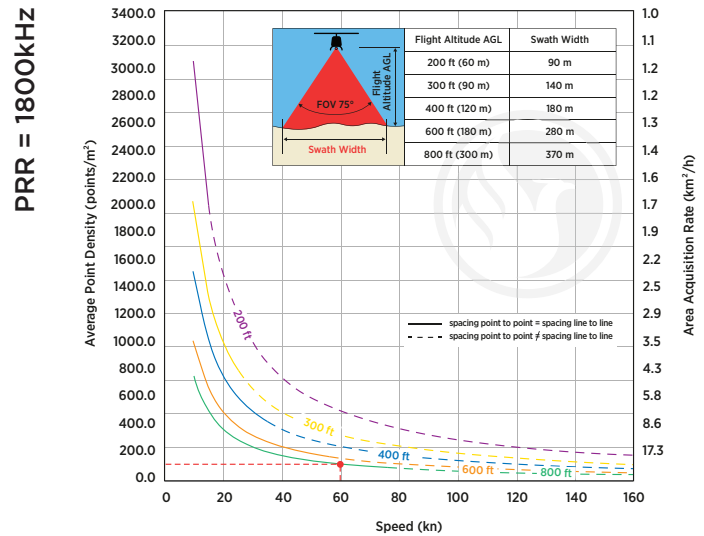
Laser Pulse Repetition Rate PRR ¹⁾	150 kHz	300 kHz	600 kHz	1200 kHz	1800 kHz
Max. Measuring Range ^{2) 3)} natural targets $\rho \geq 20\%$ natural targets $\rho \geq 60\%$	1200 m 1900 m	850 m 1400 m	650 m 1050 m	450 m 750 m	350 m 650 m
Max. Operating Flight Altitude AGL ^{2) 4)} @ $\rho \geq 20\%$ @ $\rho \geq 60\%$	900 m (2950 ft) 1400 m (4600 ft)	600 m (1950 ft) 1050 m (3450 ft)	500 m (1650 ft) 900 m (2950 ft)	350 m (1150 ft) 550 m (1800 ft)	250 m (800 ft) 500 m (1650 ft)
Max. Number of Targets per Pulse ⁵⁾	15	15	15	8	5

- 1) Rounded average PRR.
- 2) Typical values for average conditions and average ambient brightness. In bright sunlight, the max. range is shorter than under an overcast sky.
- 3) The 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. Range ambiguities have to be resolved by multiple-time-around processing.
- 4) Effective FOV 75°, additional roll angle ± 5°.
- 5) If the laser beam hits, in part, more than one target, the laser's pulse power is split accordingly. Thus the achievable range is reduced.

MAX MEASUREMENT RANGE & POINT DENSITY RANGER-XL



EXAMPLE VUX-240 at 1,200,000 pulses/sec, laser power level 100% Altitude = 1,000 ft AGL, Speed 60 kn **RESULTING POINT DENSITY 60 pts/m²**



EXAMPLE VUX-240 at 1,800,000 pulses/sec, laser power level 100% Altitude = 800 ft AGL, Speed 60 kn **RESULTING POINT DENSITY 120 pts/m²**

RANGER-XL ACCESSORIES



EXPLORE A PHOENIX LiDAR SYSTEM FOR YOUR TEAM, CONTACT US!

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