PHOENIX LiDAR SYSTEMS

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RANGER-UAV^{22} LITE

The **RANGER-UAV^{22} LITE** adds high pulse rate measurement capability to a scanner that excels at measurement accuracy. Ideal for completing UAS missions with the highest degree of data quality, this member of the RANGER lineup is vehicle flexible and is an excellent choice to suit many roles. High density UAS missions, detailed mobile mapping projects, and even low altitude piloted aircraft surveys can all be conducted.

FEATURES

- A 360° scanner FOV creates a payload designed for flexible mounting options
- Class leading 10 mm range measurement accuracy
- Integrated camera options for an outstanding all-in-one remote sensing payload

VTOL UAV VEHICLE BACKPACK HELI

QUICK SPECS

ABSOLUTE ACCURACY (1)(2)(3)
1.5 - 3.0 cm RMSEz @ 120 m

INTRASWATH PRECISION (1)(2)(4)
2.0 cm RMSDz @ 120 m

EXAMPLE ACQUISITIONS:

UAV

» 100 m AGL , 10 m/s, 90° FOV, 1200 kHz
» Swath Width = 200 m
» Avg. Density = 150 points/m^2
» Collection Rate = ~7 km^2/hr

HELICOPTER

» 180 m AGL , 50 knots, 90° FOV, 400 kHz
» Swath Width = 360 m
» Avg. Density = 11 points/m^2
» Collection Rate = ~33 km^2/hr

APPLICATIONS

- UTILITIES MAPPING
- OIL & GAS SURVEYING
- RAILWAY TRACK MAPPING
- CONSTRUCTION SITE SURVEYING
- GENERAL MAPPING

PAYLOAD

* Without Accessories

OVERALL DIMENSIONS*	23.5 x 18.0 x 18.7 cm
OPERATING VOLTAGE	14 - 28 VDC
POWER CONSUMPTION*	75 W typical
OPERATING TEMPERATURE	0° - 40° C / 32° - 104° F
WEIGHT*	4.15 kg / 9.15 lbs

LiDAR SENSOR

Source: RIEGL Laser Measurement Systems

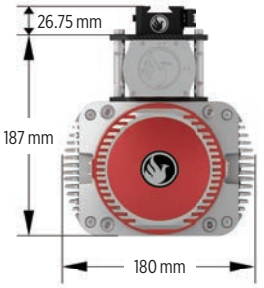
LASER WAVELENGTH	1550 nm
RANGE MIN	1.5 m at ≥1 MHz PRR
RANGE MAX	755 m at 20% reflectivity, 50 kHz PRR
PULSE REPETITION FREQUENCY	Up to 1200 kHz
SCAN SPEED	10 - 200 lines/second
MAX RETURN COUNT	15
BEAM COUNT	1 facet rotating mirror
BEAM DIVERGENCE	0.35 mrad @ 1/e
HORIZONTAL FIELD OF VIEW	360°
LASER ACCURACY	10 mm One sigma @ 150 m
LASER SAFETY	CLASS 1

NAVIGATION SYSTEM

CONSTELLATION SUPPORT	GPS + GLONASS + BEIDOU + GALILEO
SUPPORT ALIGNMENT	Static, 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

(1) Approximate values based on PLS test methods described at https://docs.phoenixlidar.com/accuracy-standards-and-quantification.
(2) Using a 90° max downward field of view.
(3) Expected RMSEz when following the PLS recommended acquisition & processing workflow and ASPRS check point guidelines.
(4) Flat surfaces with >20% reflectivity at the laser's wavelength.
(5) Estimated post-processed accuracy with IMU-30.

RANGER-UAV²² LITE DIMENSIONS



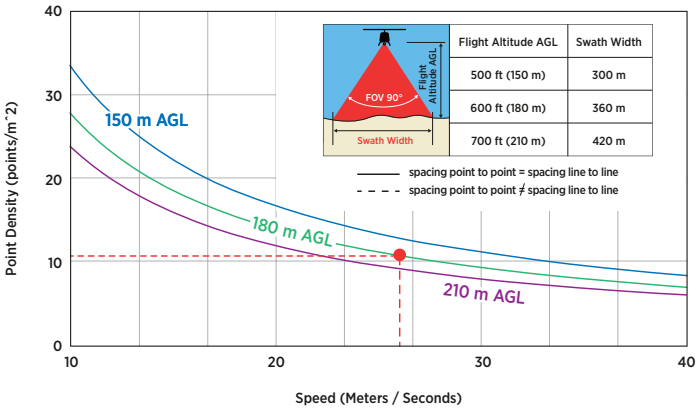
MEASUREMENT PERFORMANCE

Laser Pulse Repetition Rate PRR [1) 5)]	50 kHz	100 kHz	200 kHz	400 kHz	800 kHz	1200 kHz
Max. Measuring Range [3) 4)]						
natural targets ρ ≥ 20% (e.g. Dry roads)	755 m	545 m	390 m	280 m	200 m	160 m
natural targets ρ ≥ 60% (e.g. Sand)	1250 m	910 m	660 m	480 m	340 m	280 m
natural targets ρ ≥ 80% (e.g. Limestone)	1415 m	1040 m	755 m	550 m	390 m	320 m
Max. Operating Flight Altitude AGL [2) 5)]						
@ ρ ≥ 20%	490 m (1590 ft)	350 m (1150 ft)	250 m (820 ft)	180 m (590 ft)	130 m (420 ft)	100 m (340 ft)
@ ρ ≥ 60%	800 m (2640 ft)	580 m (1920 ft)	420 m (1390 ft)	310 m (1010 ft)	220 m (720 ft)	180 m (590 ft)

1) Rounded values.
2) Setting of intermediate PRR values possible.
3) 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.
4) Ambiguity to be resolved by post-processing.
5) Flat terrain assumed, scan angle +/- 45°.
6) If more than one target is hit, the total laser transmitter power is split and, accordingly, the achievable range is reduced.

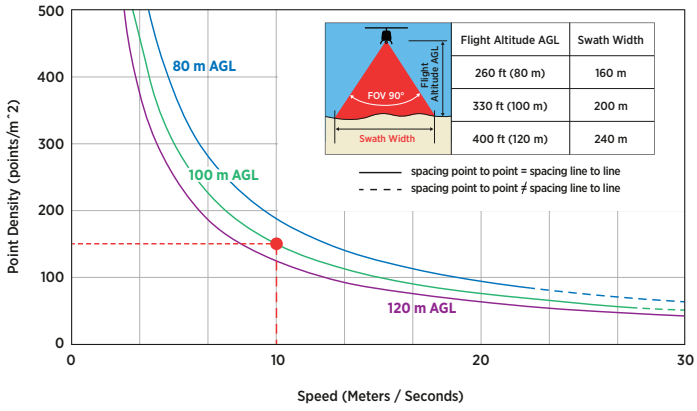
RANGE & POINT DENSITY EXAMPLES

PRR = 400 kHz



EXAMPLE	RESULTS
RANGER-UAV²² LITE at 400 kHz, 90° Field of View, Flying Height AGL = 180 m, Flying Speed = 50 knots (26 m/s)	11 points/m² density ~ 33 km²/hr collection rate

PRR = 1200 kHz



EXAMPLE	RESULTS
RANGER-UAV²² LITE at 1200 kHz, 90° Field of View, Flying Height AGL = 100 m, Flying Speed = 10 m/s	150 points/m² density ~ 7 km²/hr collection rate

RANGER-UAV²² CAMERA OPTIONS

PhaseOne iXM-100

61MP A7R4-Lite

360° Mobile Camera

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

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