



VEHICLE



BACKPACK

RANGER-HA

The Ranger Series **Ranger-HA** is a solution designed for the most demanding ground mapping applications. With 1 Million shots per second and virtually unlimited returns, the **RANGER-HA** offers sub centimeter level accuracy with incredible pointcloud density.

FEATURES

- » Survey-grade (sub cm-level) accuracy with incredible density and outstanding intensity calibration
- » IMU and dual-GPS upgrade options for increased accuracy
- » Fully autonomous, can be mounted on any ground vehicle
- » Modular upgrade options: Dual LiDAR Sensors, DSLR, GeniCam, GigEVision, thermal, multispectral, hyperspectral and custom sensors
- » Designed by surveyors for surveyors

QUICK SPECS

Absolute Accuracy

25-35 mm RMSE @ 250m Range

PP Attitude Heading RMS Error

0.007 / 0.009° IMU options

Weight

5.3 kg / 11.7 lbs.

Dimensions

30.8 L x 18 W x 12.9 H (cm)

Laser Range

145 m @ 1 mHz, 295 m @ 500 kHz

Scan Rate

up to 1 mio shots/s, up to unlimited returns

PLATFORM

OVERALL DIMENSIONS (Sensor)	308 x 180 x 129 mm
OVERALL DIMENSIONS (Nav Box)	161 x 118 x 96 mm
OPERATING VOLTAGE	12 - 28 V
POWER CONSUMPTION	90 W
WEIGHT (incl. Sensor + cabling)	5.44 kg / 12 lbs
OPERATING TEMPERATURE	0° - +40° C

LiDAR SENSOR

LASER PROPERTIES	1550 nm Class 1 (eye safe)
RANGE MIN	1.2 m
LASER BEAM FOOTPRINT	4.5 mm @ Exit, 5 mm @ 5 m, 6.6 mm @ 10 m, 13 mm @ 25 m, 25 mm @ 50 m, 50 mm @ 100 m
MAX EFFECTIVE MEASUREMENT RATE	1,000,000 meas./s
FIELD OF VIEW	360°
ACCURACY	5 mm one Sigma @ 30m

NAVIGATION SYSTEM

CONSTELLATION SUPPORT	GPS + GLONASS
SUPPORT ALIGNMENT	Static, Kinematic, Dual-Antenna
OPERATION MODES	Real-time, Post-processing optional
ACCURACY POSITION	1 cm + 1 ppm RMS horizontal

SCANNER PERFORMANCE

SCANNING MECHANISM	Rotating Mirror
MIRROR SPEED	10-250 scans/sec
ANGULAR STEP WIDTH $\Delta\theta$	$0.0036^\circ \leq \Delta\theta \leq 0.3^\circ$ between consecutive shots
ANGLE MEASUREMENT RESOLUTION	0.001°
INTERNAL SYNC TIMER	for real-time synchronized time stamping of data

APPLICATIONS



» Oil & Gas Surveying



» Utilities Mapping



» Railway Track Mapping



» Agriculture & Forestry Monitoring



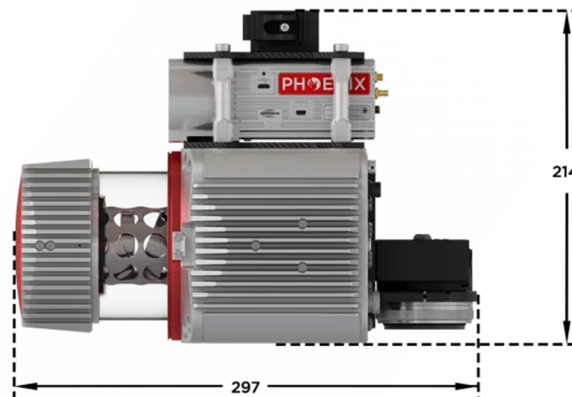
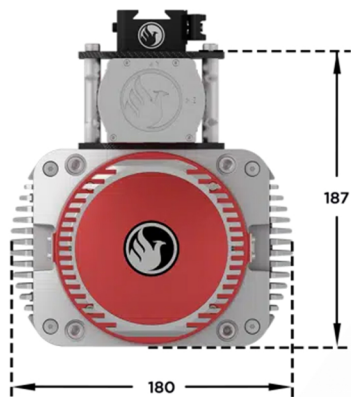
» Construction Site Surveying



» Open Pit Mining Operations

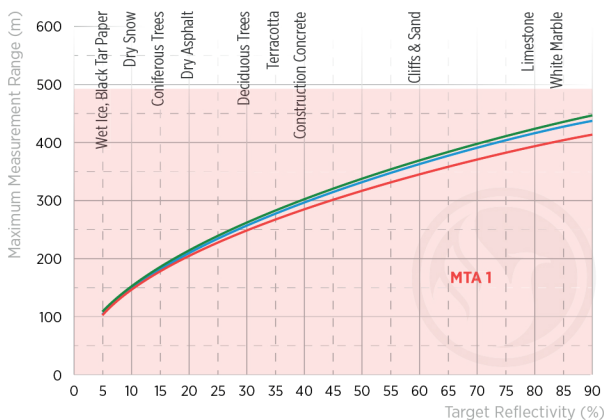


» General Mapping



MAX MEASUREMENT RANGE & POINT DENSITY RANGER-HA

PRR = 300kHz

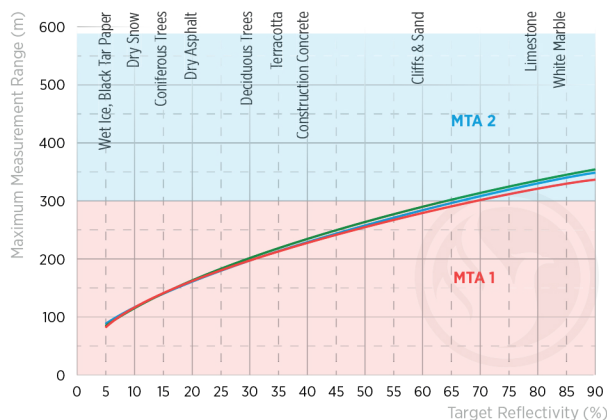


MTA 1

No ambiguity / one transmitted pulse "in the air"

- @ visibility 23km
- @ visibility 15km
- @ visibility 8km

PRR = 500kHz

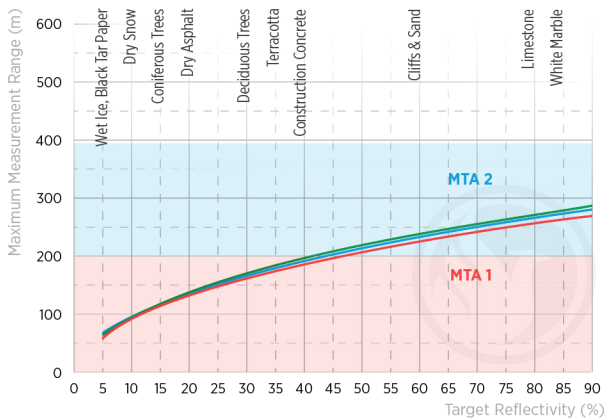


MTA 1

No ambiguity / one transmitted pulse "in the air"

- @ visibility 23km
- @ visibility 15km
- @ visibility 8km

PRR = 750kHz

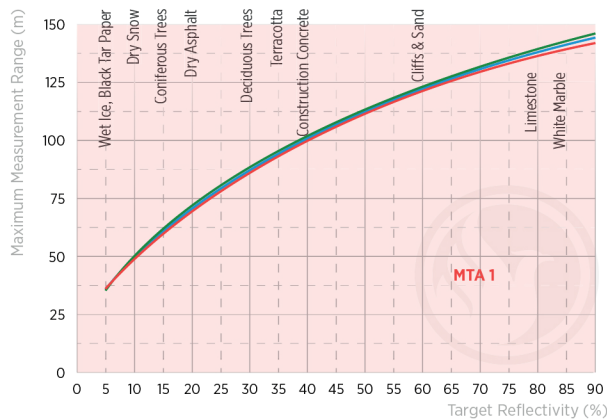


MTA 1

No ambiguity / one transmitted pulse "in the air"

- @ visibility 23km
- @ visibility 15km
- @ visibility 8km

PRR = 750kHz Reduced Power



MTA 1

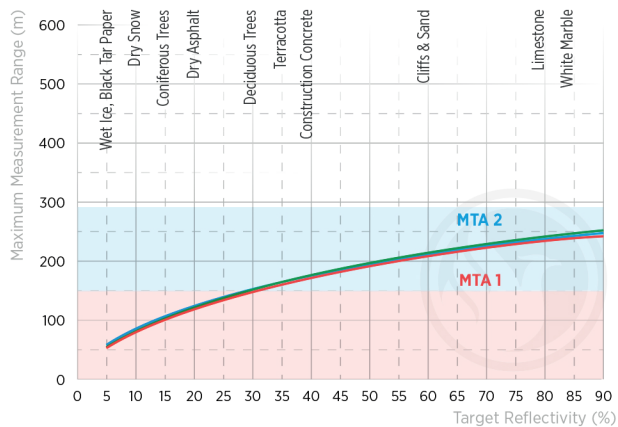
No ambiguity / one transmitted pulse "in the air"

- @ visibility 23km
- @ visibility 15km
- @ visibility 8km

The following conditions are assumed for the Operating Flight Altitude AGL

- ambiguity resolved by multiple-time-around (MTA) processing and flight planning
- average ambient brightness
- target size ≥ laser footprint
- operating flight altitude given at a FOV of +/-45°

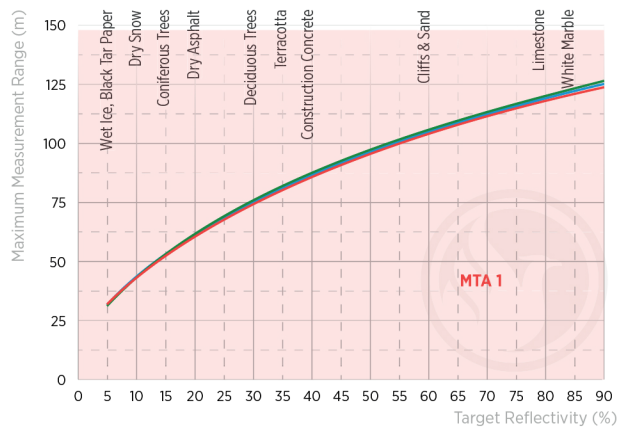
PRR = 1000kHz



MTA 1
No ambiguity / one transmitted pulse "in the air"

- @ visibility 23km
- @ visibility 15km
- @ visibility 8km

PRR = 1000kHz Reduced Power



MTA 1
No ambiguity / one transmitted pulse "in the air"

- @ visibility 23km
- @ visibility 15km
- @ visibility 8km

The following conditions are assumed for the Operating Flight Altitude AGL

- ambiguity resolved by multiple-time-around (MTA) processing and flight planning
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Source: RIEGL Laser Measurement Systems. All specifications are subject to change without notice

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

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