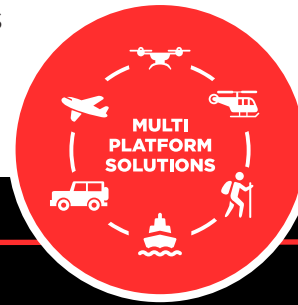


THE RANGER-UAV

The **Ranger Series Ranger-UAV** is designed for the most demanding mapping applications, no compromises made. With a 920 meter laser range, this system produces photorealistic 3D point clouds of very large regions. The Ranger is a true universal payload in that it's designed for manned and unmanned aircraft as well as ground vehicles.



FEATURES

- » Survey-grade (cm-level) accuracy with 920m laser range and outstanding intensity calibration
- » IMU and dual-GPS upgrade options for increased accuracy
- » Fully autonomous, can be mounted on any drone, car, boat and/or even backpacks
- » Modular upgrade options: Dual LiDAR Sensors, DSLR, GeniCam, GigEVision, thermal, multispectral, hyperspectral and custom sensors
- » Designed by surveyors for surveyors



AUTOMOTIVE MOUNT



AERIAL MOUNT

По любым вопросам относительно спецификации, стоимости и доставки обращайтесь по телефону или эл почте

✉ lidar@technokauf.ru
www.technokauf.ru

☎ +7 (495) 363-15-59

QUICK SPECS

Absolute Accuracy
25 / 35 mm RMSE @ 250m Range

PP Attitude Heading RMS Error
0.007 / 0.009° IMU options

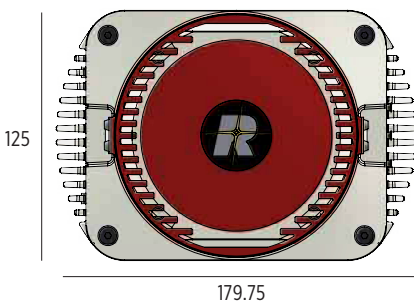
Weight
5.3kg / 11.7lb

Dimensions
30.8 L x 18 W x 12.9 H (cm)

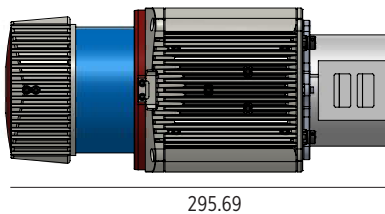
Laser Range
920m @ 60% Reflectivity

Scan Rate
up to 500k shots/s, up to 7 returns

Ranger LiDAR Sensor | Front View



Ranger LiDAR Sensor | Side View



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

NAVIGATION SYSTEM

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

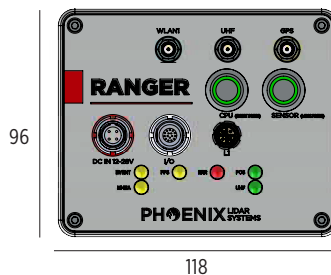
LiDAR SENSOR

LASER PROPERTIES	Class 1 (eye safe), 1550 nm
RANGE MIN	3 m
LASER BEAM FOOTPRINT	50mm @ 100m, 150mm @ 250m, 250mm @ 500m
MAX EFFECTIVE MEASUREMENT RATE	500,000 meas./s
FIELD OF VIEW	360°
ACCURACY	10 mm one Sigma @ 150m

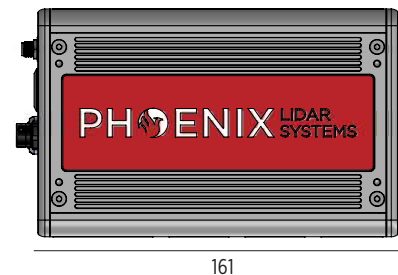
SCANNER PERFORMANCE

SCANNING MECHANISM	Rotating Mirror
MIRROR SPEED	10-200 scans/sec
ANGULAR STEP WIDTH $\Delta\theta$	$0.006^\circ \leq \Delta\theta \leq 1.5^\circ$ between consecutive laser shots
ANGLE MEASUREMENT RESOLUTION	0.001°
INTERNAL SYNC TIMER	for real-time synchronized time stamping of data

Ranger Nav Box | Inputs



Ranger Nav Box | Side Profile

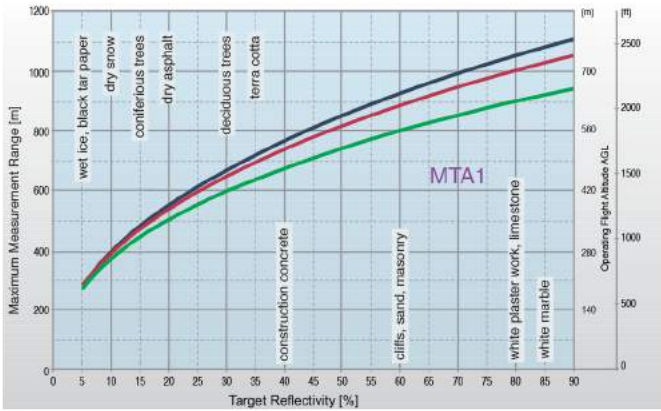


Values in millimeters



MAX MEASUREMENT RANGE & POINT DENSITY RANGER-LR

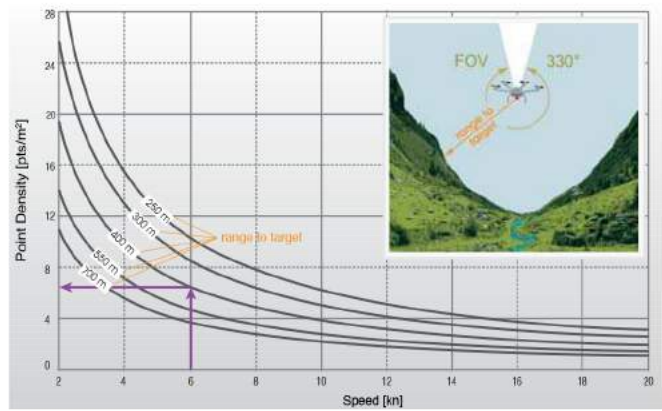
PRR = 50 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“

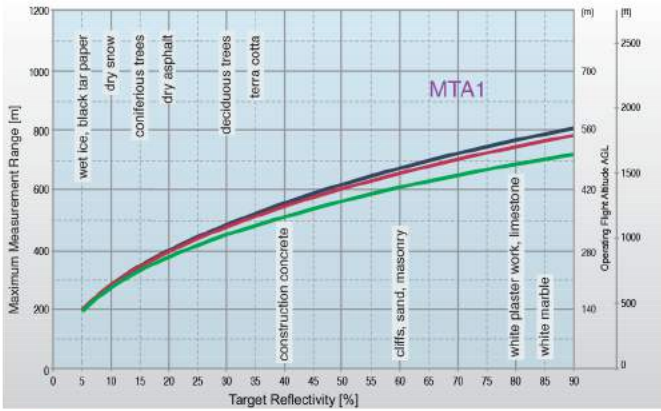
— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 50 kHz



Example: VUX-UAV at 50,000 pulses/second
 range to target = 400 m, speed = 6 kn
 Resulting Point Density ~ 6.5 pts/m²

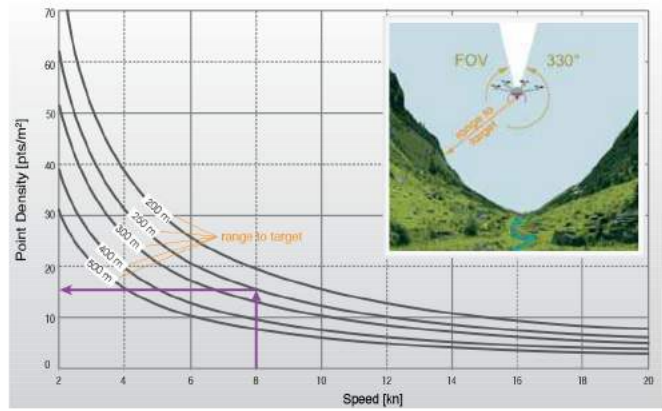
PRR = 100 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“

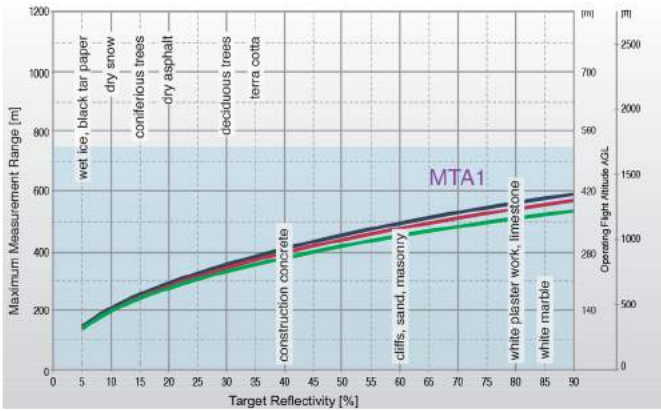
— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 100 kHz



Example: VUX-UAV at 100,000 pulses/second
 range to target = 250 m, speed = 8 kn
 Resulting Point Density ~ 15.5 pts/m²

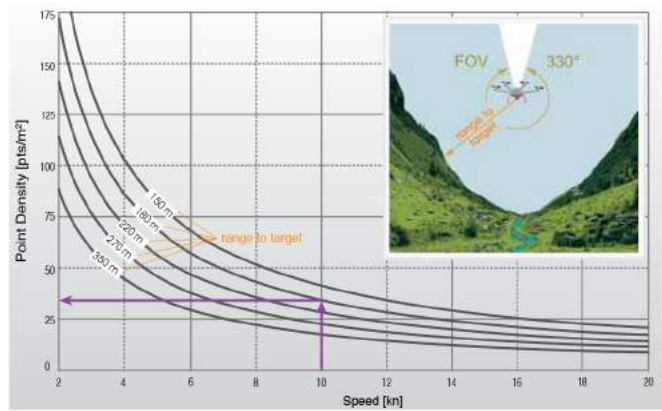
PRR = 200 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“

— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 200 kHz



Example: VUX-UAV at 200,000 pulses/second
 range to target = 180 m, speed = 10 kn
 Resulting Point Density ~ 34 pts/m²

The following conditions are assumed for the Operating Flight Altitude AGL

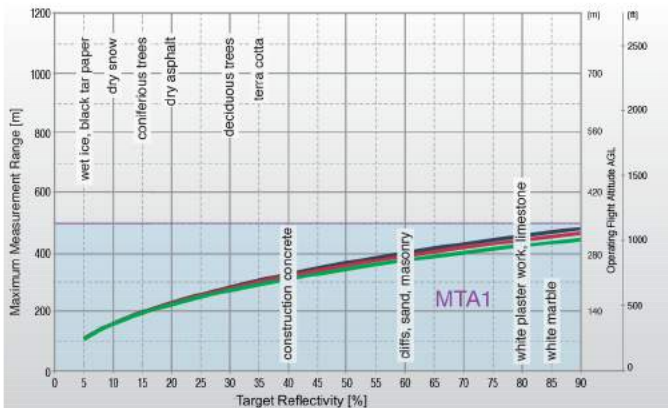
- ambiguity resolved by multiple-time-around (MTA) processing & flight planning
- target size ≥ laser footprint

- average ambient brightness
- operating flight altituded given at a FOV of +/-45°



MAX MEASUREMENT RANGE & POINT DENSITY RANGER-LR

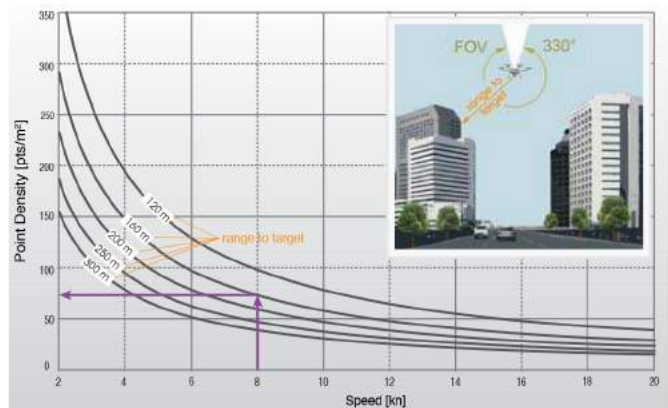
PRR = 300 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“

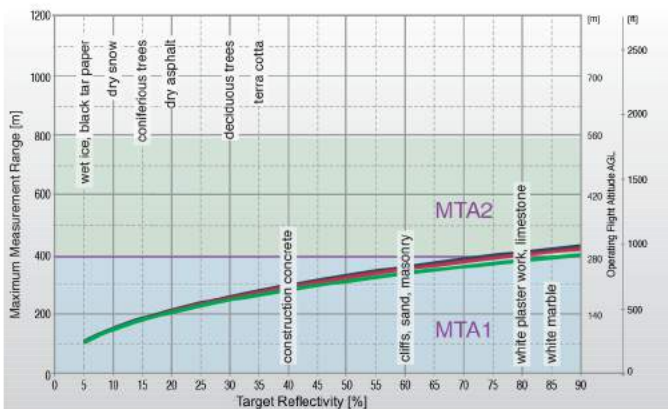
- @ visibility 23 km
- @ visibility 15 km
- @ visibility 8 km

PRR = 300 kHz



Example: VUX-UAV at 300,000 pulses/second
range to target = 160 m, speed = 8 kn
Resulting Point Density ~ 72 pts/m²

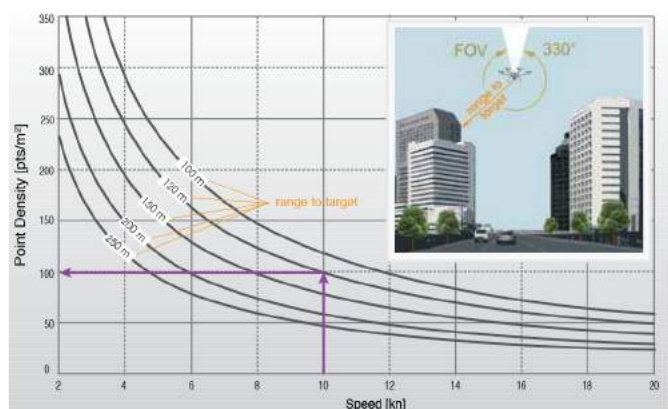
PRR = 380 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“
MTA2: two transmitted pulses „in the air“

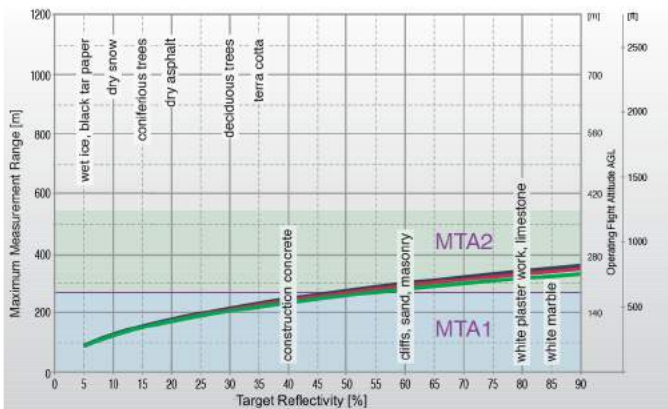
- @ visibility 23 km
- @ visibility 15 km
- @ visibility 8 km

PRR = 380 kHz



Example: VUX-UAV of 380,000 pulses/second
range to target = 120 m, speed = 10 kn
Resulting Point Density ~ 95 pts/m²

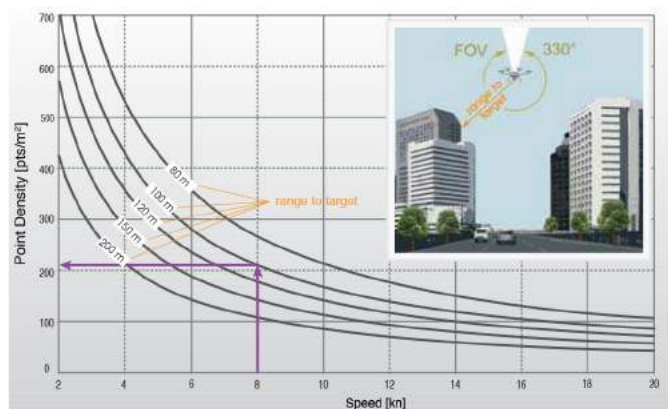
PRR = 550 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“
MTA2: two transmitted pulses „in the air“

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

PRR = 550 kHz



Example: VUX-UAV at 550,000 pulses/second
range to target = 100 m, speed = 8 kn
Resulting Point Density ~ 210 pts/m²

The following conditions are assumed for the Operating Flight Altitude AGL

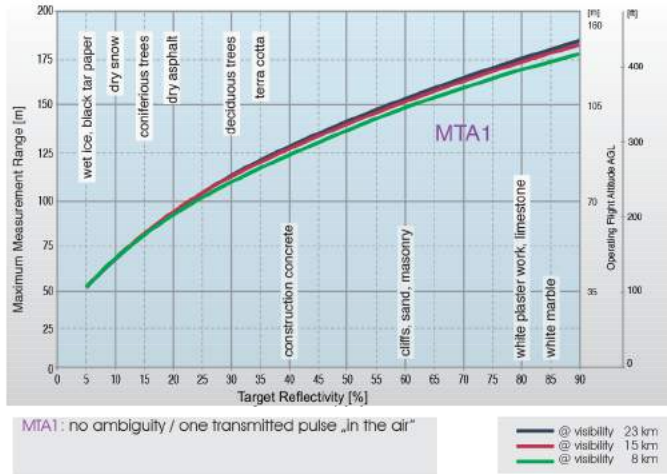
- ambiguity resolved by multiple-time-around (MTA) processing & flight planning
- target size ≥ laser footprint

- average ambient brightness
- operating flight altituded given at a FOV of +/-45°

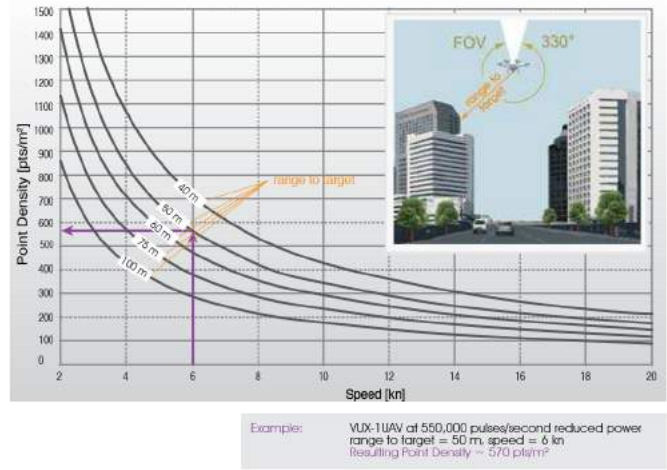


MAX MEASUREMENT RANGE & POINT DENSITY RANGER-LR

PRR = 550 kHz reduced power



PRR = 550 kHz reduced power



The following conditions are assumed for the Operating Flight Altitude AGL

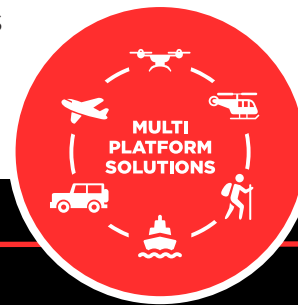
- ambiguity resolved by multiple-time-around (MTA) processing & flight planning
- target size ≥ laser footprint

- average ambient brightness
- operating flight altituded given at a FOV of +/-45°



THE RANGER-LR

The Ranger Series Ranger-LR is designed for the most demanding mapping applications, no compromises made. With a 1350 meter laser range, this system produces photorealistic 3D point clouds of very large regions. The Ranger is a true universal payload in that it's designed for manned and unmanned aircraft as well as ground vehicles.



FEATURES

- » Survey-grade (cm-level) accuracy with 1000m+ laser range and outstanding intensity calibration
- » IMU and dual-GPS upgrade options for increased accuracy
- » Fully autonomous, can be mounted on any drone, car, boat and/or even backpacks
- » Modular upgrade options: Dual LiDAR Sensors, DSLR, GeniCam, GigEVision, thermal, multispectral, hyperspectral and custom sensors
- » Designed by surveyors for surveyors



AUTOMOTIVE MOUNT



AERIAL MOUNT

По любым вопросам относительно спецификации, стоимости и доставки обращайтесь по телефону или эл почте

✉ lidar@technokauf.ru
www.technokauf.ru

☎ +7 (495) 363-15-59

QUICK SPECS

Absolute Accuracy
25 / 35 mm RMSE @ 250m Range

PP Attitude Heading RMS Error
0.007 / 0.009° IMU options

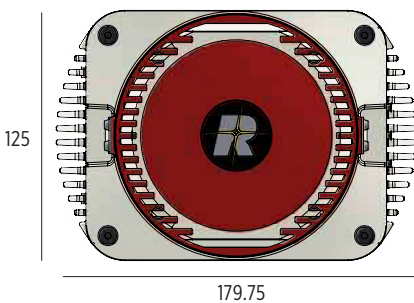
Weight
5.3kg / 11.7lb

Dimensions
30.8 L x 18 W x 12.9 H (cm)

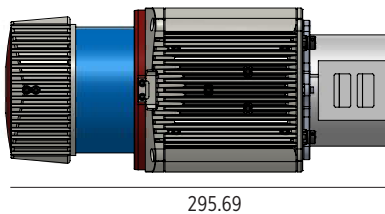
Laser Range
1350m @ 60% Reflectivity

Scan Rate
up to 750k shots/s, up to 7 returns

Ranger LiDAR Sensor | Front View



Ranger LiDAR Sensor | Side View



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

NAVIGATION SYSTEM

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

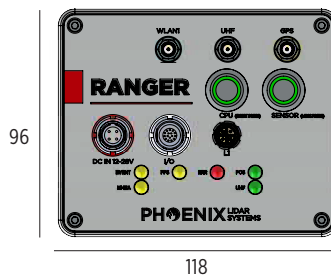
LiDAR SENSOR

LASER PROPERTIES	Class 1 (eye safe), 1550 nm
RANGE MIN	5 m
LASER BEAM FOOTPRINT	50mm @ 100m, 150mm @ 250m, 250mm @ 500m
MAX EFFECTIVE MEASUREMENT RATE	750,000 meas./s
FIELD OF VIEW	360°
ACCURACY	15 mm one Sigma @ 150m

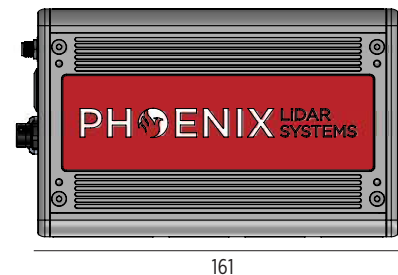
SCANNER PERFORMANCE

SCANNING MECHANISM	Rotating Mirror
MIRROR SPEED	10-200 scans/sec
ANGULAR STEP WIDTH $\Delta\theta$	$0.004^\circ \leq \Delta\theta \leq 1.5^\circ$ between consecutive laser shots
ANGLE MEASUREMENT RESOLUTION	0.001°
INTERNAL SYNC TIMER	for real-time synchronized time stamping of data

Ranger Nav Box | Inputs



Ranger Nav Box | Side Profile

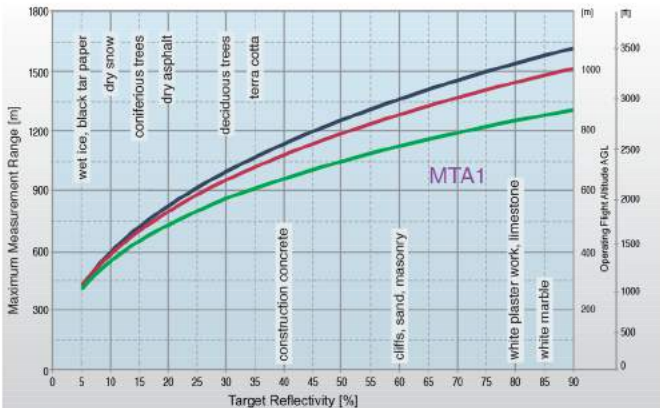


Values in millimeters



MAX MEASUREMENT RANGE & POINT DENSITY RANGER-LR

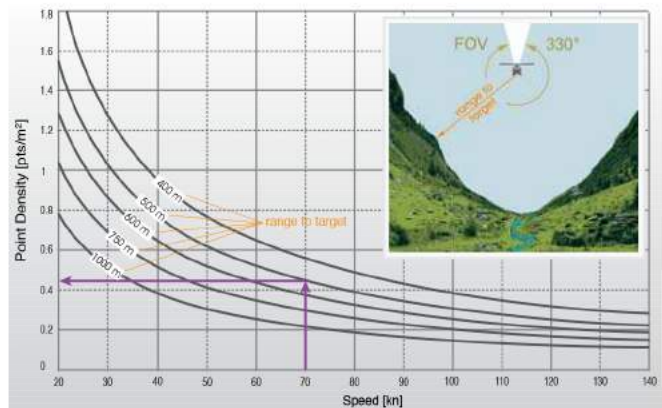
PRR = 50 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“

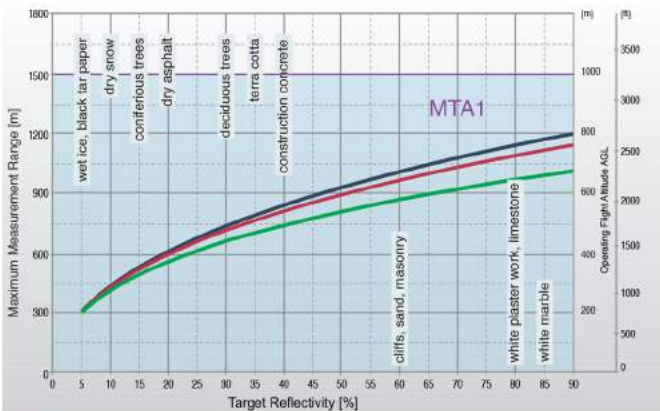
— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 50 kHz



Example: VUX-1LR of 50,000 pulses/second
 range to target = 600 m, speed = 70 km
 Resulting Point Density ~ 0.44 pts/m²

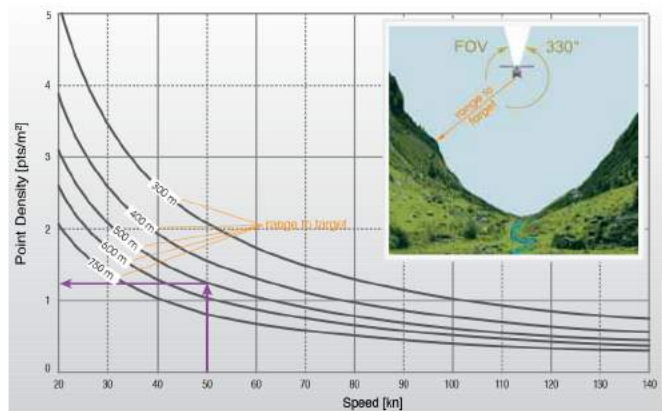
PRR = 100 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“

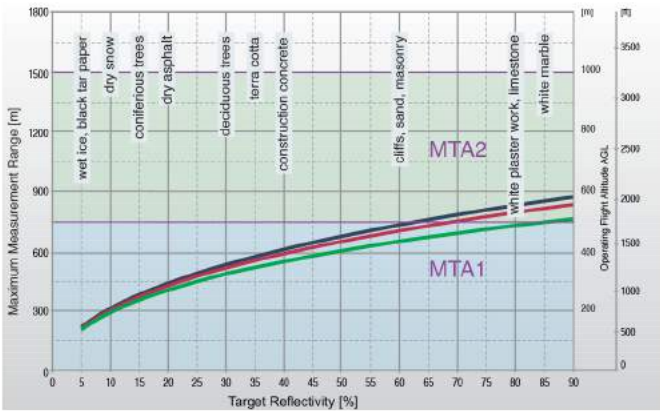
— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 100 kHz



Example: VUX-1LR of 100,000 pulses/second
 range to target = 600 m, speed = 50 km
 Resulting Point Density ~ 1.2 pts/m²

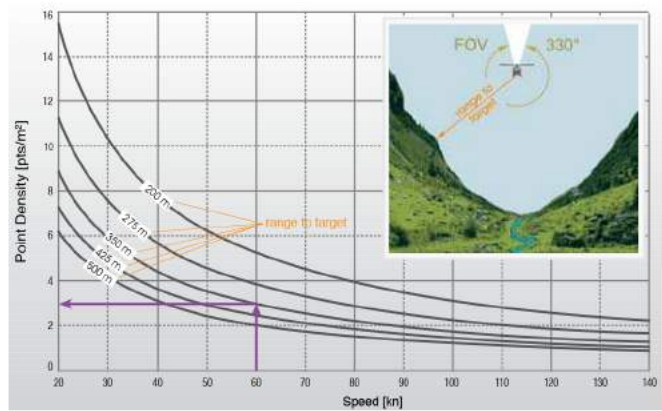
PRR = 200 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“
 MTA2: two transmitted pulses „in the air“

— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 200 kHz



Example: VUX-1LR of 200,000 pulses/second
 range to target = 350 m, speed = 60 km
 Resulting Point Density ~ 3.0 pts/m²

The following conditions are assumed for the Operating Flight Altitude AGL

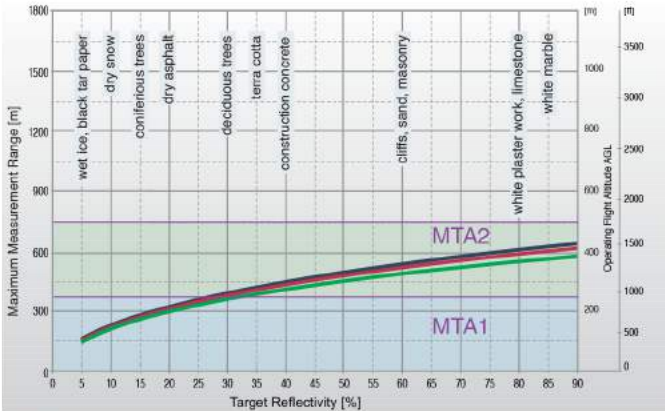
- ambiguity resolved by multiple-time-around (MTA) processing & flight planning
- target size ≥ laser footprint

- average ambient brightness
- operating flight altituded given at a FOV of +/-45°



MAX MEASUREMENT RANGE & POINT DENSITY RANGER-LR

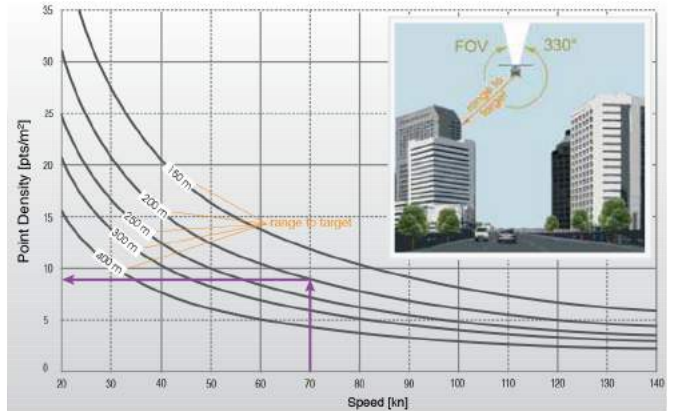
PRR = 400 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“
 MTA2: two transmitted pulses „in the air“

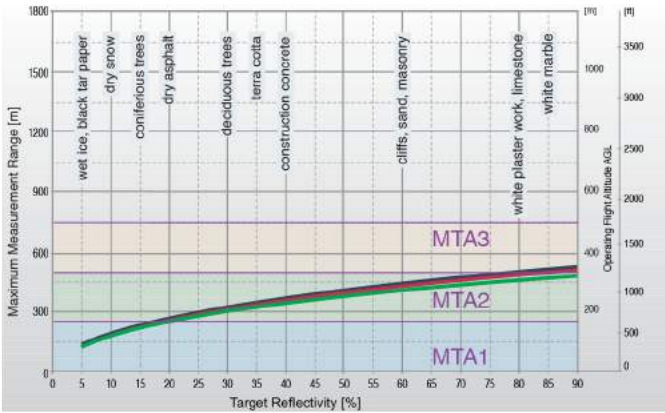
— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 400 kHz



Example: VUX-1LR at 400,000 pulses/second
 range to target = 200 m, speed = 70 km
 Resulting Point Density ~ 9.8 pts/m²

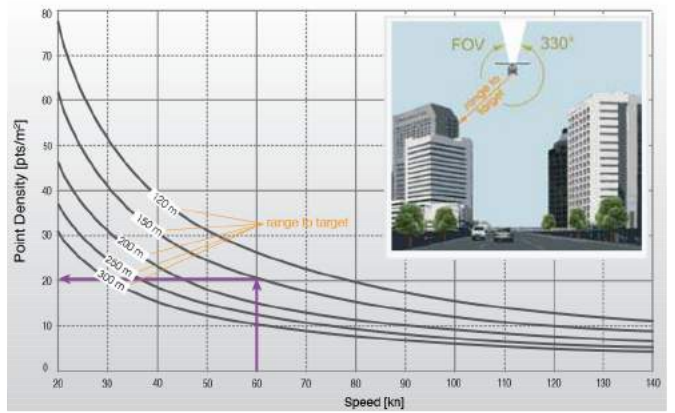
PRR = 600 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“
 MTA2: two transmitted pulses „in the air“
 MTA3: three transmitted pulses „in the air“

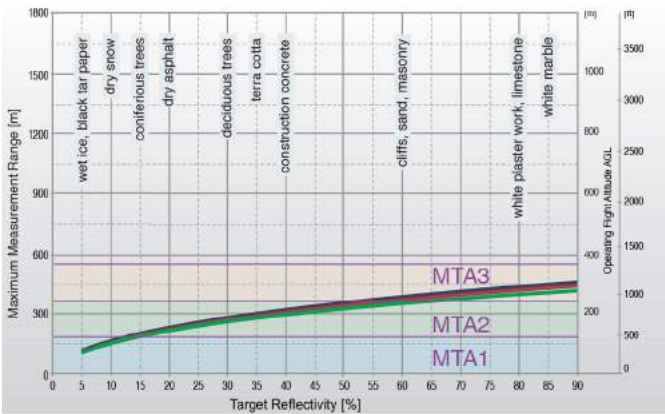
— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 600 kHz



Example: VUX-1LR at 600,000 pulses/second
 range to target = 150 m, speed = 60 km
 Resulting Point Density ~ 21 pts/m²

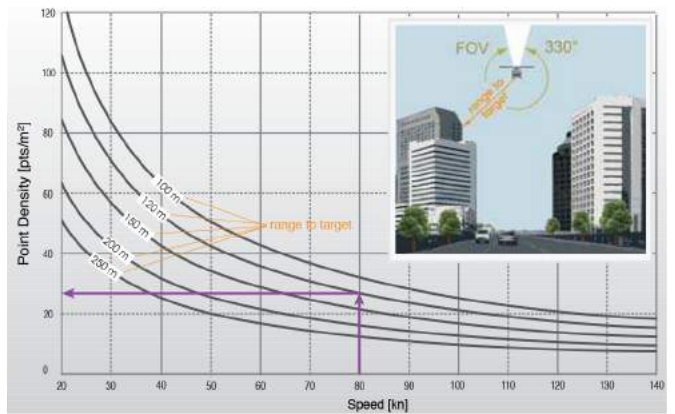
PRR = 820 kHz



MTA1: no ambiguity / one transmitted pulse „in the air“
 MTA2: two transmitted pulses „in the air“
 MTA3: three transmitted pulses „in the air“

— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 820 kHz



Example: VUX-1LR at 820,000 pulses/second
 range to target = 120 m, speed = 80 km
 Resulting Point Density ~ 26 pts/m²

The following conditions are assumed for the Operating Flight Altitude AGL

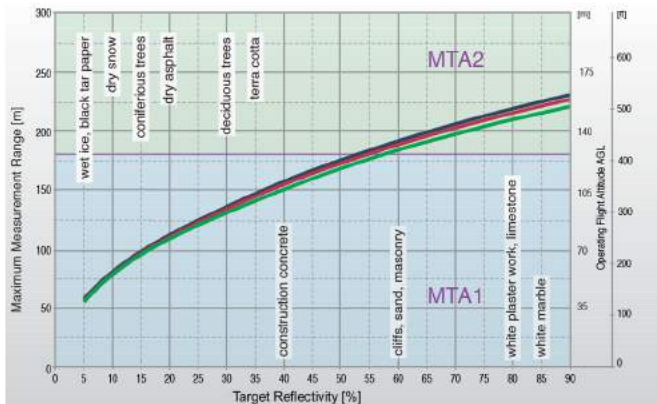
- ambiguity resolved by multiple-time-around (MTA) processing & flight planning
- target size ≥ laser footprint

- average ambient brightness
- operating flight altituded given at a FOV of +/-45°



MAX MEASUREMENT RANGE & POINT DENSITY RANGER-LR

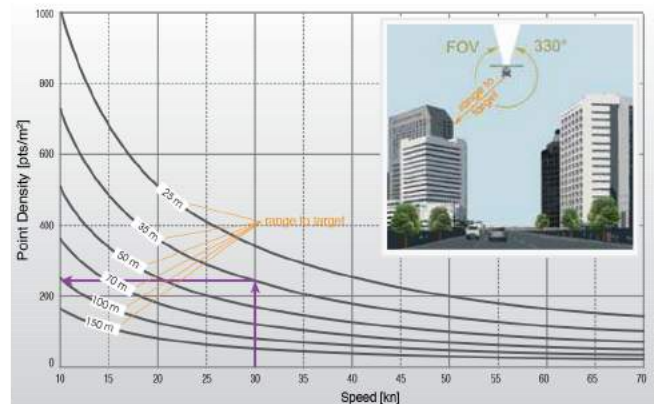
PRR = 820 kHz reduced power



MTA1: no ambiguity / one transmitted pulse „in the air“
 MTA2: two transmitted pulses „in the air“

— @ visibility 23 km
 — @ visibility 15 km
 — @ visibility 8 km

PRR = 820 kHz reduced power



Example: VUX-1LR at 820,000 pulses/second reduced range to target = 35 m, speed = 30 km
 Resulting Point Density ~ 240 pts/m²

The following conditions are assumed for the Operating Flight Altitude AGL

- ambiguity resolved by multiple-time-around (MTA) processing & flight planning
- target size \geq laser footprint

- average ambient brightness
- operating flight altituded given at a FOV of +/-45°

