PHOENIX LiDAR SYSTEMS

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RECON-F4

LiDAR Mill COMPATIBLE

VTOL UAV

The **RECON-F4** is an advanced, lightweight aerial LiDAR surveying solution designed specifically for small to mid-size drones such as the DJI M400 and Freefly Astro Max. The **RECON-F4** seamlessly combines cutting-edge lightweight LiDAR technology with a high-accuracy drone optimized GNSS-INS system and an industrial-grade full-frame orthophoto camera all in a compact survey-grade 3D laser mapping solution. Combined with Phoenix LiDAR flight planning and post processing software, the **RECON-F4** an efficient and cost effective solution for 3D data acquisition and processing.

FEATURES

- Weighing only 1.3 kg, the **RECON-F4** is ideal for small to mid-size drones such as the DJI M400 and Freefly Astro Max
- Integrated 45 MP full-frame calibrated orthographic RGB camera provides high resolution image mapping textures for efficient 3D model reconstruction with realistic point cloud colorization
- The powerful laser range capability combined with a wide 80° horizontal field yields a 30% - 40% increase in data acquisition efficiency over competing solutions

QUICK SPECS

ABSOLUTE ACCURACY (1)(2)(3)
2 - 3.5 cm RMSEz @ 120 m

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

EXAMPLE ACQUISITIONS:

UAV

» 120 m AGL, 6 m/s, 80° FOV, 550 kHz
» Swath Width = 200 m
» Avg. Density = 300 points/m²
» Collection Rate = 4.32 km²/hr

PAYLOAD

OVERALL DIMENSIONS (L x W x H)	17.5 x 11.4 x 10.3 cm
POWER CONSUMPTION	Up to 40 W (36 W typical)
WEIGHT	1.3 kg / 2.86 lbs
OPERATING TEMPERATURE	-20° to +50°C (-4° to +122°F)
OPERATING VOLTAGE	13.7 - 32.0 V DC

LIDAR SENSOR

LASER WAVELENGTH	1535 nm (CLASS 1)
RANGE MIN	5 m
RANGE MAX	360 m at 20% reflectivity, 100 kHz PRR
PULSE REPETITION RATE	100 to 550 kHz
SCAN SPEED	30 - 300 lines/second
MAX RETURN COUNT	≤ 7
MIRROR TYPE	3 facet rotating mirror
BEAM DIVERGENCE	0.5 mrad @ 1/e
FIELD OF VIEW	80°
LASER ACCURACY (*)	10 mm One sigma @ 100 m
LASER PRECISION (**)	5 mm One sigma @ 100 m

(*) Laser accuracy is the degree of conformity of a measured quantity to its actual (true) value.
(**) Laser precision is the degree to which further measurements show the same results.

CAMERA

RESOLUTION	45 MP
FOCAL LENGTH (FOV)	18 mm (89.84° H x 67.16° V)
SENSOR SIZE	35.9 mm x 24 mm (8184 x 5460)

NAVIGATION SYSTEM

CONSTELLATION SUPPORT	GPS + GLONASS + BEIDOU + GALILEO
ACCURACY POSITION	1 cm + 1 ppm GNSS baseline RMS horizontal
IMU SAMPLING RATE	1000 Hz
ACCURACY ATTITUDE (5)	ROLL, PITCH: 0.005° RMS HEADING: 0.012° RMS

APPLICATIONS

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

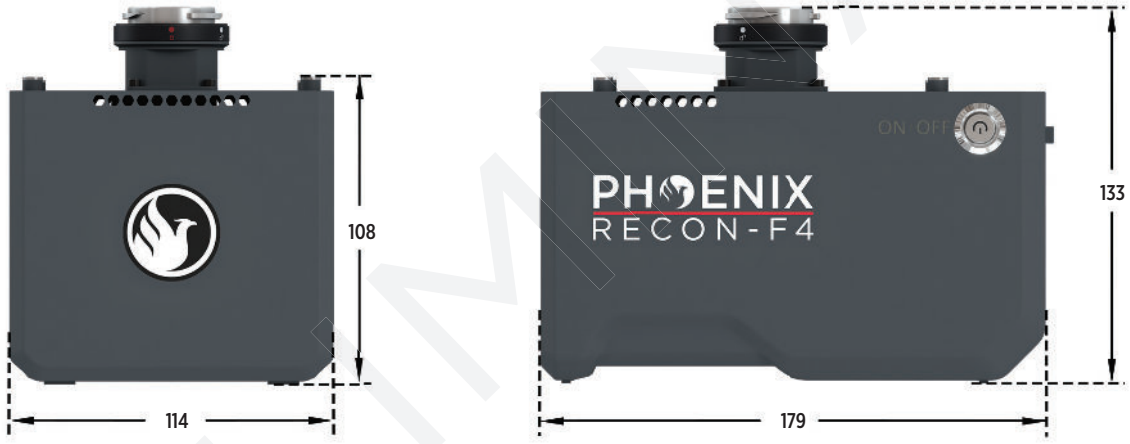
(1) Approximate values based on PLS test methods described at https://docs.phoenixlidar.com/accuracy-standards-and-quantification.
(2) Using a 100° max downward field of view.
(3) Expected RMSEz when following the PLS recommended acquisition & processing workflow and ASPRS check point guidelines.
(4) Flat surfaces with >20% reflectivity at the laser's wavelength.
(5) Estimated post-processed accuracy with IMU-27.

MEASUREMENT PERFORMANCE

Laser Pulse Repetition Rate PRR [1) 5)]	100 kHz	200 kHz	300 kHz	400 kHz	550 kHz
Max. Measuring Range [3) 4)]					
natural targets ρ ≥ 20% (e.g. Dry roads)	360 m	330 m	280 m	220 m	200 m
natural targets ρ ≥ 80% (e.g. Limestone)	750 m	680 m	500 m	375 m	300 m
Max. Operating Flight Altitude AGL [2) 5)]					
@ ρ ≥ 20%	260 m (850 ft)	230 m (755 ft)	200 m (656 ft)	160 m (525 ft)	150 m (492 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 +/- 40°.
6) If more than one target is hit, the total laser transmitter power is split and, accordingly, the achievable range is reduced.

RECON-F4 DIMENSIONS (CM)



DJI M400 DRONE INTEGRATION KIT

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

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 2025-9-22