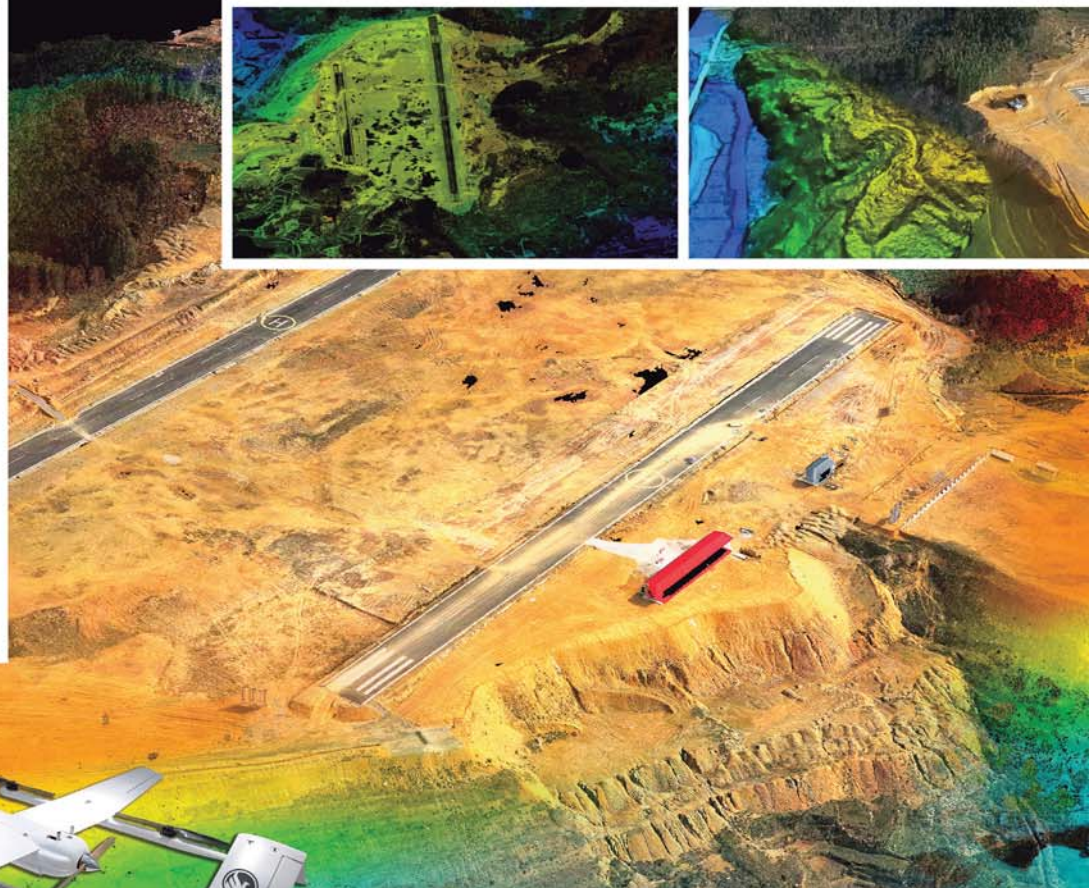


KEY FEATURES & BENEFITS

- » **Combined Fixed-Wing/VTOL**
Fixed-Wing Stability and Speed
VTOL Convenience and Safety
- » **Reduced Operational Footprint**
No runway equipment required
No approach obstacle issues
- » **Portable**
No launch/recovery equipment
makes transportation easy
- » **Industry-Leading Integration**
Powerful RANGER LR-T LIDAR System
Up to 2-hr flight endurance
Up to 52 km² mapped in one flight
Absolute accuracy down to 2 cm



Phoenix TerraHawk CW-30

The Phoenix TerraHawk CW-30 is a fixed-wing VTOL UAV LiDAR system that features the Phoenix RANGER LR-T, a custom configuration of our most powerful LiDAR system. This next-generation system enables you to leverage the altitude and speed of a fixed-wing aircraft with a VTOL system that makes take-off and landing easy, even in challenging environments.

The Phoenix RANGER LR-T is perfect for mapping utility corridors and tackling the most difficult surveying conditions, including high speed, high altitude, dense vegetation, and large scan areas. Paired with the Phoenix TerraHawk CW-30 UAV, this system boasts 2-hour autonomous flight times, an auto-return system, and a backup auto-landing system that initiates safe, multi-rotor landings if a problem is ever detected.

See videos of the Phoenix TerraHawk CW-30 and browse sample data on our website!

Why TerraHawk CW-30?

- » **Operating AGL:** Up to 350 m
- » **Live Data Feed:** View/analyze data in real time
- » **Remote Data View:** Transmit live data to remote viewers via 4G connection
- » **Acquisition Upgrades:** High-Res DSLR; RGB GigE Cam; thermal, hyperspectral cameras
- » **Complete Ground Control:** Payload is directly controlled through the JOUAV Ground Control Station
- » **Advanced Multi-Rotor Backup:** Initiates multi-rotor auto-landing if abnormalities are detected



This system integrates proprietary Phoenix LiDAR hardware and software, with hardware from JOUAV and RIEGL.



RANGER LR-T: A special configuration of our most powerful LiDAR system, the RANGER Series.



» **Challenging Utility and Power Infrastructure Corridors**



» **Complex Industrial Areas and Installations**



» **Long Distance Oil & Gas Pipeline Corridors**



» **Dense Vegetation Penetration and Forest Terrain**



» **Large Open Pit Mining Operations**



UAV SPECIFICATIONS

Wingspan/Length	4 m / 2.2 m
Assembly/Deployment Time	15 min
Weight (w/LiDAR)	33 kg / 72.7 lbs.
Endurance	Up to 2 hours
Takeoff/Landing	VTOL
Communication Range	Up to 30 km (250 m AGL)
Cruise Speed	28 m/s 55 kn 100 km/h
Max. Speed	36 m/s 70 kn 130 km/h
Max. Takeoff Altitude	4,000 m
V. Positioning Accuracy	2 cm
H. Positioning Accuracy	1 cm+ 1 ppm
Propulsion System	Gas Engine / Electric Motors

CAMERA

Resolution	24 Megapixels
Features	Hi-Res Camera + 35 mm Lens
HFOV / VFOV	55° / 38°

Additional Camera / Lens Options Available

COVERAGE ESTIMATES

Surface area covered by LiDAR + High Resolution Photo

- **16 km² mapped** at 250 m AGL, 60° LiDAR FOV, 60% overlap
 - 3 cm GSD
 - LiDAR Density: 30 pts/m²
- **21 km² mapped** at 300 m AGL, 60° LiDAR FOV, 60% overlap
 - 4 cm GSD
 - LiDAR Density: 27 pts/m²

Surface area covered by LiDAR with No Photo

- **40 km² mapped** at 250 m AGL, 60° LiDAR FOV, 20% side overlap
 - LiDAR Density: 22 pts/m²
- **52 km² mapped** at 300 m AGL, 60° LiDAR FOV, 20% side overlap
 - LiDAR Density: 19 pts/m²

POINT DENSITY AND SWATH WIDTH

AGL (m)	200 kHz	400 kHz	600 kHz	820 kHz	Swath Width (m)
100	12 pts/m ²	23 pts/m ²	34 pts/m ²	44 pts/m ²	238
150	8 pts/m ²	15 pts/m ²	23 pts/m ²	29 pts/m ²	358
200	6 pts/m ²	11 pts/m ²	17 pts/m ²	22 pts/m ²	478
250	5 pts/m ²	9 pts/m ²	14 pts/m ²	18 pts/m ²	598
300	4 pts/m ²	8 pts/m ²	11 pts/m ²	---	716
350	3 pts/m ²	7 pts/m ²	---	---	404
400	3 pts/m ²	6 pts/m ²	---	---	956
450	3 pts/m ²	---	---	---	1,016
500	2 pts/m ²	---	---	---	1,159m

The following conditions are assumed for the Operating Flight Altitude AGL

- ambiguity resolved by multiple-time-around (MTA) processing & flight planning
- average ambient brightness
- target size ≥ laser footprint
- swath width given at a 100° FOV

LiDAR SENSOR

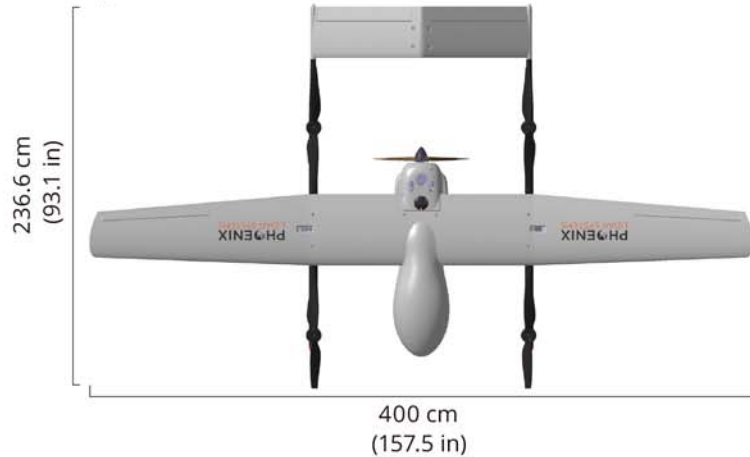
Max. Range at 20% Reflectivity	820 m
Max. Effective Measurement Rate	750,000 meas./s
PP Attitude Heading RMS Error	0.019°
Range Accuracy	15 mm one Sigma @ 150m
Max FOV of LiDAR in CW-30	110°
Payload Weight	4.5 kg / 9.92 lbs.

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
PP Attitude Heading RMS Error	0.019° IMU options

DIMENSIONS

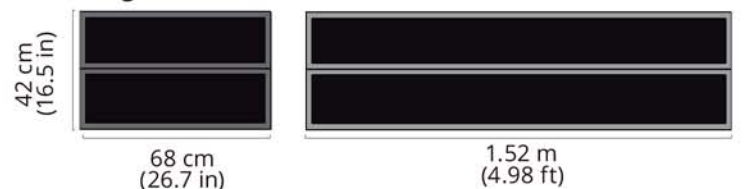
Top View



Side View



Wing & Rotor Case



Fuselage Case

