CHCNAV

AlphaAir 450
UAV LiDAR SOLUTIONS

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MAPPING
& GEOSPATIAL

THE BEST COST-PERFORMANCE UAV LiDAR IN CLASS

The CHCNAV AlphaAir 450 is very likely the best UAV LiDAR solution with integrated Livox Avia. The AlphaAir 450 is a major breakthrough in the democratization of mobile mapping technology, allowing its use by non-professional users in the geospatial reality capture industry and to those who have never been able to access such technology before. The AlphaAir 450 is the next generation of CHCNAV LiDAR solutions, which are widely used for power line inspection, topographic mapping, emergency response, agricultural and forestry surveys, and more. This all-in-one, lightweight and rugged system integrates a high-performance laser scanner with an industrial-grade professional 24 MP camera and a high-precision inertial navigation system for quality data collection.

LIGHTEST UNIT IN CLASS

The AlphaAir is the latest UAV-based LiDAR system with Livox Avia scanner and integrated high-resolution camera launched by CHCNAV in the market. The LiDAR's weight is a constraint for any UAV. The drone needs to lift the entire payload, as otherwise no data acquisition is possible! The lighter the unit, the greater the productivity as the UAV can fly longer.

ADVANCED ACCURACY

The AlphaAir 450 combines industrial-grade GNSS and high-precision IMU. The high-accuracy INS is pivotal to collect high quality LiDAR data because without it, your point cloud would be nothing more than an arbitrary collection of points. This allows the AA450 to deliver an absolute accuracy of 5 to 10 cm. To further improve accuracy and precision, users can apply adjustment algorithms in the CoPre software.

INDUSTRIAL RELIABILITY

AlphaAir 450 users can rely on a high level of protection (IP64) and extended operating temperature performance (down to -20°C and up to +50°C) in any field environment, as one never knows what the weather or site conditions will be like the day of the survey mission.

EFFICIENT SCANNING

Thanks to the high-performance Livox Avia laser scanner, users will benefit from long-range scanning up to 450 m with a great points' density on the measured surface. At a flying height of 100 m and a velocity of UAV 10 m/s, a single flight with a DJI M300 and the AlphaAir 450 can collect data covering about 2 km^2 area with more than 200 pts/m^2 density.

FLEXIBLE INTEGRATION

The AlphaAir 450 supports a variety of UAV platforms. With its integrated Skyport, it is fully compatible with a direct connection to the DJI M300. In addition, it can easily be installed on our CHCNAV BB4, VTOL and other multi-rotor UAVs with a shock absorbing mounting platform. Alternatively, the AlphaAir 450 can also be fitted to any third-party UAV that can carry its weight: multi-rotor or fixed-wing VTOL UAVs.

QUICK ROI

The AlphaAir 450 is a worldwide breakthrough in the democratization of 3D mobile mapping technology. It means that it addresses not only UAV LiDAR survey experts, but also users who had no access to this technology before, due to high investments and complicated workflow, which is not the case with the AA450.

Integrated DJI Skyport

The AlphaAir 450 has a built-in Skyport interface for direct connection to the DJI M300.

One touch to start

The LEDs and speaker indicate the AA450's status and there is only one button to operate, no parameter settings are required.

Easy data transfer

The 256 GB memory allows 10 flight missions.160 Mb/s high-speed data transfer via USB Type-C interface without powering the unit.

All-in-one software

CHC CoPre V2.0 processes the AA450 trajectories. No longer need to invest in costly 3rd party software.

SPECIFICATIONS

General system performance

Absolute accuracy	<10 cm HZ <5 cm V
Accuracy conditions	Without control points, @50 m flight altitude AGL
Mounting	Skyport for DJI M300 External power source with the dedicated port for other UAVs (CHCNAV Alphaport interface)
Weight of instrument [1]	1 kg
Dimensions of instrument	13.6 × 12.8 × 7.7 cm 5.11 " × 4.72 " × 2.75 "
Communications	1× port for GNSS antenna Skyport interface 1× USB Type-C, copy speed up to 160 Mb/s
Data storage	256 GB
Point density on UAV setup 5 m/s (18 km/h) speed	570 pts/sqm @ 50 m AGL 280 pts/sqm @ 100 m AGL
Covered area	2 km² area by 30 min UAV flight
Operation	One-touch acquisition or remote control via DJI M300 Smart controller enterprise
Transport box	1× protected soft bag with custom precut foam

Laser scanner

Laser class	1 (in accordance with IEC 60825-1:2014)
Max.range, reflectivity > 80% [2]	450 m
Max.range, reflectivity > 10% [2]	190 m
Max. returns supported	Up to 3
Accuracy [3]	20 mm @ 20 m 30 mm @100 m
Precision [4]	15 mm
Field of view	70.4° (Horizontal) × 4.5° (Vertical)
Scan rate	240 000 pts/sec (first or strongest return) 480 000 pts/sec (dual return) 720 000 pts/sec (triple return)

Positioning and orientation system

GNSS system	Multi-frequency GNSS GPS, GLONASS, BeiDou, Galileo, sampling frequency 5Hz
IMU update rate	600 Hz
Position accuracy NO GNSS outage	0.010 m RMS horizontal, 0.020 m RMS vertical, 0.01 degrees RMS pitch/roll, 0.04 degrees RMS heading

Imaging system

Camera type	Built-in calibrated Sony A5100
Resolution	6000 × 4000
Effective pixels	24.3 MP, 11 fps

Environmental

Operating temperature	-20°C ~ +50°C
Storage temperature	-20°C ~ +65°C
IP rating	IP64
Humidity (operating)	80%, non-condensing

Electrial

Input voltage	DC 12 ~ 14 V
Power consumption	32 W
Power source	Depending on UAV battery, or by Skyport from DJI M300

* Specifications are subject to change without notice.
(1) Weight calculated with integrated camera. (2) Typical values for average conditions. (3) Accuracy is the degree of conformity of a measured quantity to its actual (true) value. (4) Precision is the degree to which further measurements show the same results. Improved by CHCNAV COPre SW.
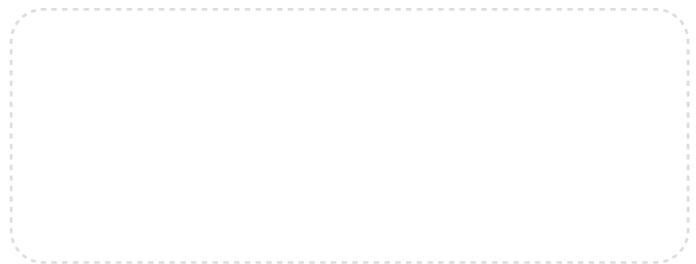
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