

**CHCN**AV

# AlphaUni 20

**MULTI-PLATFORM HIGH-END  
LiDAR SOLUTIONS**



**MAPPING  
& GEOSPATIAL**

# NEW GENERATION OF FLEXIBLE & EFFICIENT LIDAR SOLUTIONS

AlphaUni 20 is a new generation of cost effective multiplatform mobile mapping system which built based on fully CHCNAV state-of-the-art LiDAR technology focusing on democratization of geospatial market. The unique in the market flexible installation design with best combination of point cloud density, precision, and survey-grade accuracy by CHC LiDAR technology can provide accurate point cloud and immersive panoramic imagery for applications such as road surfaces, highway maintenance, or asset management by vehicle survey. On airborne scenarios AlphaUni 20 can offer an excellent data performance for vegetation penetration ability, measurement range, high-accuracy, and density of collected data.

## OUTSTANDING ACCURACY

AlphaUni 20 integrates CHCNAV self-designed high precision navigation algorithm inside which be dedicated more than 19 years. Together with the repeated ranging accuracy of scanner of 5 mm gives ability to achieve high absolute accuracy between 2-5 cm even in challenging environment.

## PREMIUM LASER

Long-range scanning up to 1450 m. Extremely high-speed scanning of 2 M points per second. A continuously rotating mirror wheel enables scan speeds of up to 250 scans per second. Get high quality of point cloud with low range noise.

## INDUSTRIAL RELIABILITY

From all Alpha family solutions users can expect same highest level of protection and operation performance in any field environment as we never know what weather surprise or site condition will be today during the survey mission.

## LIGHT-WEIGHT

AlphaUni 20 LiDAR is very light and compact, totally 2.75 kg and 3.25 kg with ortho camera, for new car set with LB5+ total weight is just 10.7 kg.

## MULTI-PLATFORM DESIGN

AlphaUni 20 follows CHCNAV's long-standing multi-platform LiDAR design philosophy: it can be installed on both manned aircraft or unmanned aircraft for airborne scanning, or setup on car, boat, train, and other ground vehicle for mobile mapping, or install on backpack for narrow area survey.

## STRONG PENETRATION

With the advanced multiple target capability, AlphaUni 20 supports maximum 16 targets echoes, which can provide strong vegetation penetration ability to easily obtain ground surface and generate real DEM, DSM output results.

## EFFICIENT WORKFLOW

CHCNAV offers the complete package to add LiDAR solution to user geomatic services. Fully automated reality capturing and real time mission monitoring using CoCapture SW and intelligent point cloud processing by CoPre desktop SW.

## HIGHLY INTEGRATED

Quick release design within one click by Alphaport connections to power source and camera makes AlphaUni 20 installation fast and easy.



# ALPHAPANO INSTALLATION



### Airborne setup

AlphaUni 20 can be easily installed on any airborne (UAV, helicopters & planes) platform that can carry its weight of 2.6 kg.



### Simple vehicle setup

For road measurements and some special tasks, you can switch to the vehicle mode in 5 minutes by using any car.



### AlphaPano kit

Practical Mobile Mapping system combining precise LiDAR data and immersive panoramic imagery with SLAM.



### Backpack survey

Narrow streets or steep slopes where cars can't go, or UAVs will not fly is not a limit of survey with our backpack setup.



# SPECIFICATIONS

## General system performance

|                                     |  |
|-------------------------------------|--|
| Absolute Hz & V accuracy            | < 0.025 m RMS @ 30 m range<br>< 0.050 m RMS @ 150 m range  |
| Accuracy conditions                 | Without control points, UAV survey with 7 m/s speed, car survey without DMI with 9.7 m/s speed   |
| Mounting                            | Multi-platform, quickly install & release design, easily switch between airborne, vehicle and backpack mode  |
| SLAM                                | AlphaPano vehicle installation platform which include panoramic camera and SLAM scanner integration for optimised position in challenging for trajectory environment |
| Weight of instrument <sup>(1)</sup> | 2.75 kg / 3.25 kg (with C5 camera)<br>10.7 kg AlphaPano vehicle platform   |
| Dimensions of instrument            | 262.3 × 161 × 141.5 mm   |
| Data storage                        | 512 G (Optional for 1T)  |
| Remote control                      | Up to 5 km, wireless control of instrument parameters and data recording in real time  |
| Coping speed                        | 80 Mb/s  |

## Laser scanner

|  |  |
|--|--|
| Laser class                                  | 1 (in accordance with IEC 60825-1:2014)      |
| Max. range, reflectivity >80% <sup>(2)</sup> | 1450 m                                       |
| Minimum range                                | 1.5 m  |
| Accuracy <sup>(3)</sup>                      | 5 mm @ 30 m range<br>15 mm @ 150 m range     |
| Precision <sup>(4)</sup>                     | 5 mm   |
| Field of view                                | 360°, selectable                             |
| Maximum scan rate                            | 2 000 000 pts/sec<br>(depending on the mode) |
| Scan speed (selectable)                      | Up to 250 scans/sec                          |
| Return numbers                               | Up to 16                                     |
| Angular resolution                           | 0.001°                                       |

## Positioning and orientation system

|   |   |
|---|---|
| GNSS system                             | Multiple GPS, GLONASS, Galileo, BeiDou, SBAS and QZSS constellation |
| IMU update rate                         | 600 Hz  |
| Attitude accuracy after post-processing | 0.005 degrees RMS pitch/roll,<br>0.010 degrees RMS heading          |
| Position accuracy after post-processing | 0.010 m RMS horizontal,<br>0.020 m RMS vertical                     |

## Imaging system UAV

|                      |                             |
|----------------------|-----------------------------|
| Resolution           | 45 MP                       |
| Focal length         | 21 mm / 35 mm               |
| Sensor size          | 36 mm x 24 mm (8184 x 5460) |
| Pixel size           | 4.4 um                      |
| Min trigger interval | 1 s                         |
| FOV                  | 81°*59.5 / 53.4°*37.8       |

## AlphaPano Imaging system

|                          |   |
|--------------------------|---|
| Camera type              | 360° Spherical camera, additional adjustable external cameras as option |
| Numbers of camera        | 6 sensors   |
| CCD size                 | 2048 × 2448, 3.45 μm pixel size   |
| Lens                     | 4.4 mm  |
| Resolution               | 30 MP (5 MP × 6 sensors), 10 FPS<br>JPEG compressed                     |
| Coverage                 | 90% of full sphere  |
| High Dynamic Range (HDR) | Cycle 4 gain and exposure presets                                       |

## Environmental

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

## Electrical

|                   |  |
|-------------------|--|
| Input voltage     | 24 V (Range 15 - 28 V)   |
| Power consumption | 60 W   |
| Power source      | Depending on UAV battery.<br>External battery in for car setup, also support direct vehicle power source |

## Equipped software

|   |   |
|---|---|
| CoPre pre-processing software             | Data copy, POS solve, Adjust & Refine, Generate point cloud   |
| CoProcess point cloud processing software | Terrain module, road module, extraction module, volume module |

\* Specifications are subject to change without notice.

(1) Weight calculated with & without 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.

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