TELEDYNE

Teledyne Geospatial
Solutions for Land and Water

OPTECH CLS-A V2

UAV and Mobile Survey Grade Lidar System

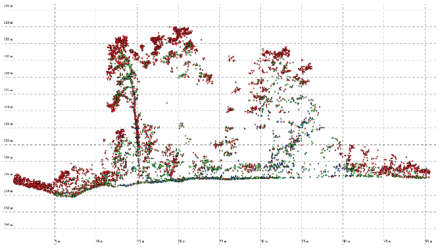
THE OPTECH CLS-A allows the operator to rapidly capture survey-grade lidar data from UAV or ground vehicle platforms. The CLS-A v2 supports laser pulse rates up-to 2Mhz and 250Hz scan speed to generate dense, photo-realistic point clouds which engineering-grade precision ideal for applications such as electric utility modeling and transportation surveying where accurate as-built data is critical.

KEY FEATURES

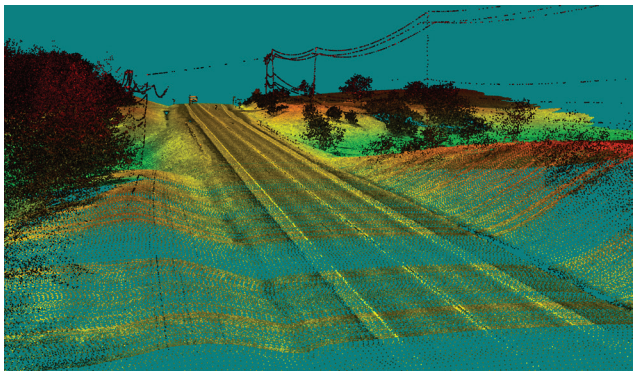
- Survey-Grade Lidar point cloud from 120 m (400 ft) agl
- Multiple returns per shot through dense vegetation
- Laser pulse rate upto 2Mhz
- Tightly integrated GNSS and IMU data
- LMS Software for one solution lidar and photogrammetric data processing
- North American manufactured
- 24-7 worldwide manufacturer support
- Multiple service plan options

APPLICATIONS

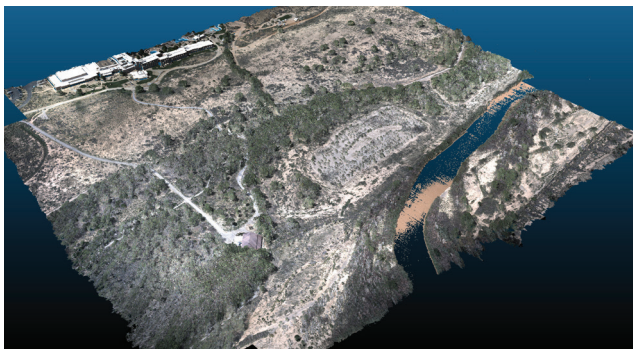
- Hard-Surface Engineering Surveys
- Electricity Vegetation Management
- Topographic Surveys
- Corridor Monitoring
- Road / Railway
- Forestry
- Construction
- Mining
- Archeology



Clear returns of the ground through vegetation due to narrow beam divergence and multiple returns



Point cloud of distribution powerlines and road collected at 120 m agl and offset to safely avoid flying over people and assets while simultaneously capturing a wide swath.



Colorized Topographic Survey collected with CLS-A.

SURVEY-GRADE LIDAR DATA

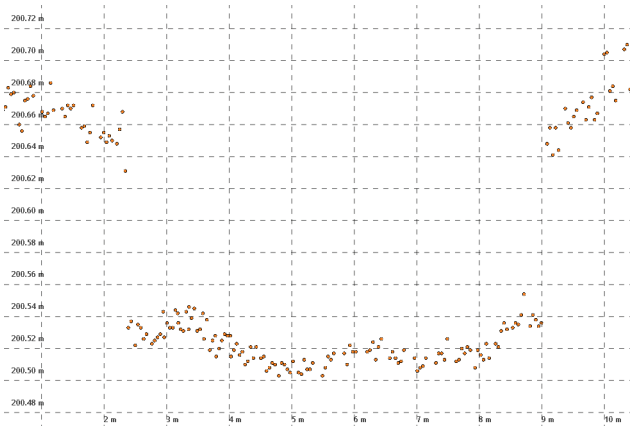
The CLS-A incorporates a survey grade laser scanner and high accuracy positioning and orientation system to generate high precision and accuracy point clouds that capture the finest features for topography, 3D model and GIS asset collection. The 360-degree field of view enables the capture of both wide swaths for increased surveying productivity, and vertical surfaces for 3D modelling applications.

INTEGRATED LIDAR AND CAMERA SOLUTION

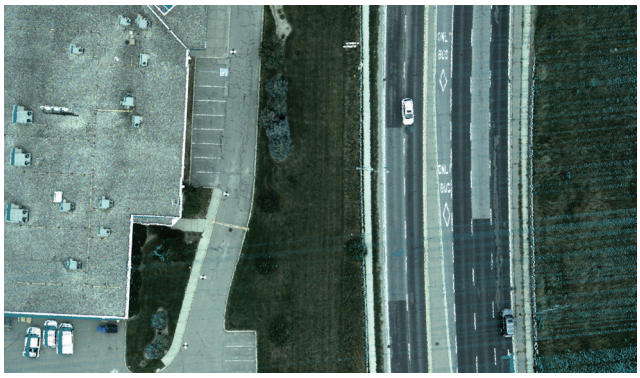
The CLS-A includes a calibrated non-mechanical global shutter color camera to accurately colorize the lidar data. Lidar data is colorized by raytracing the camera imagery to the lidar points to correctly color vertical surfaces. Camera imagery can also be used to guide analytics in third-party software to augment the analysis of lidar data.

SIMPLE VEHICLE INTEGRATION

The CLS-A can be easily integrated onto many UAV and ground vehicle platforms with multiple integration options available.



Side profile of road with hard curbs and asphalt surface captured with high precision and accuracy.



CLS-A colorized Lidar data from an engineering-grade survey of road and building hard surfaces.

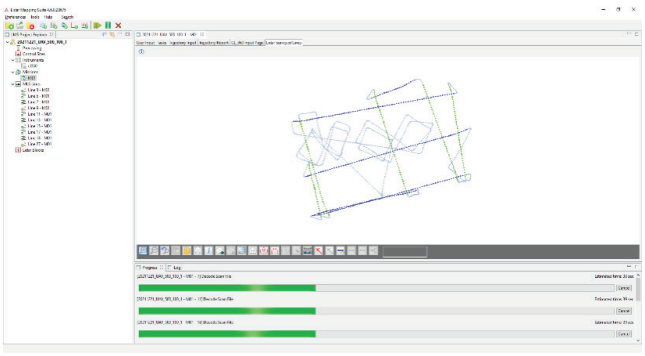
CLS-A Vehicle Mount

CLS-A Integrated with Freefly Alta-X UAV.

OPTECH LMS—ONE SOLUTION FOR LIDAR AND PHOTOGRAMMETRIC PROCESSING

KEY FEATURES

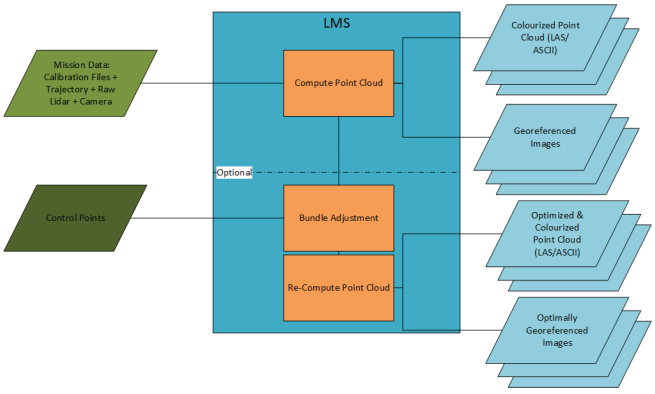
- Designed for commercial production processing
- Integrated processing for lidar / camera sensors
- Quality assurance processes for optimal accuracy
- Quality control tools for efficient and robust project validation



LIDAR AND PHOTOGRAMMETRIC PROCESSING SOFTWARE

The processing and output of accurate point cloud/ imagery data has traditionally been a critical element of airborne data collection. Efficiency is crucial to overall project success when generating verifiably accurate data suitable for detailed information extraction, especially in projects with stringent accuracy requirements and large survey areas.

Optech LMS (Lidar Mapping Suite) is a comprehensive data processing platform for the calibration, boresight and accuracy quantification of both active and passive imaging sensors. Designed to serve as a single central processing hub of raw lidar and image data, LMS combines powerful least-squares algorithms with batch processing methods and the latest in distributed and multi-threaded processing routines to automate sensor calibration, compute project-wide accuracies, and maximize data throughput. Embedded data quality assurance and control tools enable the user to comprehensively optimize and validate the accuracy of their data, without the need for external toolsets.



SYSTEM SPECIFICATIONS

LASER PULSE REPETITION FREQUENCY (PRF)	200kHz	500kHz	1000kHz	1500kHz	2000kHz
Max Range Capacity[1,2] @ 10% target reflectivity @ 20% target reflectivity @ 50% target reflectivity	 310 m 435 m 740 m	 195 m 250 m 250 m	 125 m 130 m 130 m	 40 m 85 m 85 m	 40 m 45 m 45 m
Recommended Applications Airborne / UAS Mobile	 x x	 x x	 x	 x	 x
Typical Max Operating Altitude [1, 2, 3] @20% target reflectivity	275 m	160 m			
Range Accuracy, 1sigma[1]	5 mm				
Range Precision, 1sigma[1]	4 mm				

1. Nominal, Teledyne Optech Test Conditions, contact for details.
2. Target size >= laser footprint, perpendicular angle of incidence, 23km clear visibility
3. Nadir +/- 45deg

LIDAR	
Laser	1550 nm, 0.3 mrad (1/e²) beam divergence
Laser Safety	Class 1 (IEC 60825-1:2014)
Number of returns	Up to 4 (first 2 and last 2)
Range Resolution	2 mm
Minimum Target Separation	0.7 m (discrete)
Scanner	360 deg field of view, 50-250 lines/second scan speed

INERTIAL NAVIGATION SYSTEM	APPLANIX APX-20 UAV	APPLANIX APX-15 UAV
Position Accuracy	0.02-0.05 m	0.02-0.05 m
Roll & Pitch Accuracy [deg][4]	0.015 deg	0.025 deg
True Heading [deg][4]	0.035 deg	0.08 deg

4. RMS Error

CAMERA OPTION	24MP
Sensor	Sony IMX540, CMOS global shutter, 4/3" sensor size, 2.74 µm pixel size
Resolution	5320 x 4600
Lens Field of View	80 deg (8.5 mm focal length)
Ground Sampling Distance	5 mm @ 60 m agl, 6.5 mm @ 80 m agl, 8 mm @ 100 m agl, 10 mm @ 120 m agl
Features	Mid-exposure timetag, Intrinsic Calibration, Flat Field Correction

PHYSICAL & ENVIRONMENTAL[5]	
Size	310 mm L x 160 mm H x 116 mm W
Weight	< 4.4 kg; <3.9 kg without camera
Ingress	IP67
Temperature[1]	-10°C to +40°C Operation, -20°C to +50°C Storage

5. Excluding camera

DATA PROCESSING	
Hardware Output	Raw Lidar, Raw Camera, Raw INS, Realtime LAS
Storage Size	960 GB
Data Transfer	Wifi, Gigabit Ethernet
Inertial Navigation Software	Applanix POSPac UAV, Applanix POSPac MMS
Lidar & Camera Processing Software	Teledyne Optech LMS Pro

VEHICLE MOUNTING OPTIONS	
UAV Integration Options	Inspired Flight IF1200A Freefly Alta-X Watts Prism Sky/Lite DJI M600 Pro
Ground Integration Options	Roof rack mounting kit

Revision Date: 2024 07 30