



Aerialtronics and Applanix combine on a highly accurate UAV solution for aerial photogrammetry



AERIALTRONICS
COMMERCIAL UNMANNED AIRCRAFT SYSTEMS

British surveying company Plowman Craven utilizes cutting-edge, integrated solution for many applications in the rail industry

Customized, integrated drones with various sensors and payloads for virtually any survey application.

Solution

Trimble APX-15 EI UAV

GNSS-Inertial Direct Georeferencing solution with Dual IMUs.

www.applanix.com/products/dg-uavs.htm

Aerialtronics Altura Zenith

The world's most versatile commercial drone.

www.aerialtronics.com/en/products/altura-zenith

OVERVIEW

Aerialtronics is an end-to-end solution developer that utilises drones, artificial intelligence and IoT data to provide businesses with augmented and actionable insights that create a perfect synergy between aerial applications and everyday business operations. Over ten years, Aerialtronics has developed and provided drone solutions for professional applications, including survey, agriculture, inspection, and mapping. Plowman Craven, a leading survey company, turned to Aerialtronics for a UAV-based survey solution for rail.



Location Europe



PLATFORM: ALTURA ZENITH

The Altura Zenith commercial drone from Aerialtronics is equipped with a high-capacity battery, can fly for up to 40 minutes, has eight motors to ensure redundancy, is coupled with the largest payload compatibility, and has fast and simple "click and go" operations. Virtually any payload can be adapted to fit.

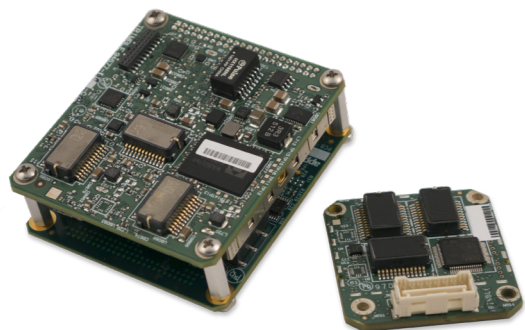


Altura Zenith commercial drone by Aerialtronics

An Integrated Solution with Applanix DG for Aerial Survey

For each client, Aerialtronics can build an integrated, custom payload and solution for the specific requirements.

One such integration is with the Trimble APX-15 EI and POSPac UAV GNSS-Inertial post-processing SW. The APX15-EI is a compact solution comprising a survey grade GNSS receiver and dual inertial measurement units, one embedded onto the GNSS/Inertial board and one as an external unit connected remotely. With this feature, the APX-15 EI can provide automatic support to the Zenith gimbaled platform. This together with the POSPac UAV SW, enables pixels to be geolocated at the centimetre to millimetre level without GCPs while reducing the amount of sidelap flown, thus increasing the area flown per mission.



APX-15 EI

Applications for Applanix DG Solutions

Used every day to obtain the most accurate UAV data collected from multispectral, hyperspectral, radar, LiDAR and RGB cameras. It enables a great variety of mapping products to be generated without the use of ground control.

Examples of UAV applications include: Topographical Survey, 3D Mapping, Utility Inspections, Asset Management, Agriculture. The Applanix DG is the enabling technology for: Corridor Mapping (one flight line), Large Area Mapping, Multi-flight missions or BVLOS operations.

CHALLENGE

Traditional rail surveys are more expensive due to rail closures while also requiring dangerous and difficult access to busy railways. For many years, Plowman Craven has been an industry leader in the provision of rail survey data. Plowman Craven sought a better solution, one where it will:

- Reduce the risk associated with accessing rail tracks
- Reduce the cost and time associated with ground control points
- Collect the data quickly
- Provide high accuracy

Introducing the Vogel R3D from British surveyor Plowman Craven for Rail Infrastructure Survey

Plowman Craven provides integrated measurement and consultancy services to the property and infrastructure markets. Pioneering technical innovation to deliver proven expertise and trusted results throughout the project lifecycle, it plays a key role in some of the most prestigious construction and redevelopment projects in the UK and overseas.

Plowman Craven turned to Aerialtronics for a custom solution. Aerialtronics built a system comprised of the Aerialtronics Altura Zenith ATX8 drone with an integrated APX-15 EI with POSPac UAV SW and a Phase One iXM100 with an 80mm lens called the Vogel R3D.

"The Vogel R3D revolutionises rail survey and inspection. It removes the need to access the tracks physically and all of the expenses and time required. Fast data capture, data accuracy quality superior to traditional laser-scanning systems and a sub 5mm accuracy suitable for detailed track design, make Vogel R3D a very attractive proposition with a wide range of applications. In addition, the high-definition photography we obtain effectively supplements current survey deliverables," says Tom Wren, Technical Consultant – Infrastructure Services at Plowman Craven.

RESULTS

Plowman Craven's solution, called the Vogel R3D, is a unique, UAV-based solution capable of comprehensive drone surveys of rail infrastructure to a sub-5mm accuracy in a fraction of the time of traditional methods.



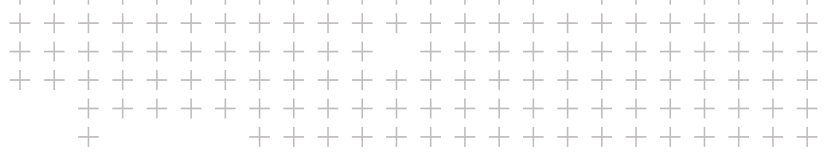
Plowman Craven uses the Phase One iXM100 with an 80 mm lens

This ground-breaking system captures overlapping aerial images of an entire site. That imagery can be converted into 3D point cloud data that can be used to create a range of deliverables, including track alignments, detailed topographic surveys, 3D BIM models and interactive site visualisations. The Vogel R3D has been successfully trialled by Network Rail, with the survey accuracy results approved, and has now been utilised on over 70 live projects.

The costs involved in closing an operational railway for maintenance or inspection can be incredibly expensive, costing thousands and taking many months to plan. Having this integrated solution is a considerable cost and programme saving!

BENEFITS

- Centimetre accuracy in a fraction of the time of traditional methods
- No need for Ground Control Points (GCPs)
 - No need to access tracks
 - Increased safety
 - Enables regular inspection of rail track condition
- Reduction in maintenance costs
- Increased reliability
- Compact, Easy-to-Operate and Cost-Effective solution
- Can produce 3D mapping products
- Improved Productivity — with optimized workflow means final products are generated within hours



ABOUT APPLANIX AERIAL SURVEY

UAV photogrammetry is undergoing an unprecedented evolution thanks to the progress in Direct Georeferencing, cameras, computer power, automatic SW solutions and the advent of machine learning and AI. The current advances are enabling the appearance of a new cost-effective generation of photogrammetric data, with greater accuracies, reliability and focused information for specific missions.

The latest generation of Applanix Direct Georeferencing offers a compelling value proposition for this new era in photogrammetry by bringing the latest in GNSS/Inertial HW, sensor fusion and post-processing SW.

Plowman Craven's end-to-end solution for critical infrastructure and asset monitoring proves this evolution by providing rail survey data with mm-level accuracy without GCP's in an intelligent and automated fashion.

ABOUT AERIALTRONICS

Enabling a multitude of professionals to easily survey, inspect and analyse data in real time. Aerialtronics is an end-to-end solution developer that utilises drones, artificial intelligence and IoT data to provide businesses with augmented and actionable insights that create a perfect synergy between aerial applications and everyday business operations. www.aerialtronics.com

ABOUT PLOWMAN CRAVEN

Plowman Craven provides integrated measurement and consultancy services to the property and infrastructure markets, pioneering the use of technical innovation to deliver proven expertise and trusted results throughout the project lifecycle. www.plowmancraven.co.uk



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