



# Terra Drone uses Applanix Direct Georeferencing technology to create the Terra LiDAR One



The *Terra LiDAR One* drone solution produces automated centimetre-level accurate mapping and surveying products!

The Terra LiDAR One with Applanix Direct Georeferencing is an easy-to-use, low-cost, and high-accuracy drone-based mapping solution that addresses the challenges of an ageing workforce coupled with the need to survey a deteriorating global infrastructure.

## Solution

Trimble APX-15 UAV with POSPac® UAV Cloud Software  
Single board GNSS-Inertial Direct Georeferencing solution for UAVs with POSPac® UAV Cloud post-processing 'as-a-service'  
[www.applanix.com/products/dg-uavs.htm](http://www.applanix.com/products/dg-uavs.htm)  
[www.applanix.com/products/pospac.htm](http://www.applanix.com/products/pospac.htm)

**Terra Drone, Terra LiDAR One**  
Terra Drone is one of the biggest drone service providers.  
[www.terra-drone.eu](http://www.terra-drone.eu)

# OVERVIEW

Terra Drone is one of the world's largest providers of industrial drone solutions for aerial survey, infrastructure inspection, and drone data processing and analysis. Terra Drone provides drone solutions in many industries and has conducted more than 1,500 drone surveys. One client is Ugo Sokki Co., a company that uses information and communications technology in rivers and roads governed by Japan's Ministry of Land, Infrastructure, Transport and Tourism.



Location  
Tokyo, Japan



## CHALLENGE

The use of drone technology for surveying and mapping has grown tremendously in recent years due to savings in cost and time, and by offering a simpler, more convenient solution.

Due to an ageing workforce, Japan's construction and mapping industries have faced a decline in the working population while facing a higher demand in services to address deteriorating infrastructure. Now more than ever, it is essential to have:

- Easy-to-operate, low-cost, and high-accuracy mapping solutions that require both fewer operators and person-hours to perform
- Solutions that remove personnel from dangerous duties such as accessing hard to reach structures and areas
- Solutions with complete and automated workflows that deliver accurate data quickly and cost-effectively with minimal interaction



Terra LiDAR One

## SOLUTION

A survey drone can quickly and easily produce high-resolution survey data (i.e. orthomosaic imagery, LiDAR point clouds) and detailed 3D models of areas where low-quality, outdated, or no data are currently available. High-accuracy maps and models are produced quickly and easily, even in complex or difficult-to-access environments. Costs are significantly reduced versus using traditional methods of collecting data from the ground or crewed airplanes.

To provide the best drone solutions for each application and specific project, Terra Drone developed a payload for an uncrewed aerial vehicle (UAV) with a laser scanner and camera as part of a new, highly accurate drone solution – the *Terra LiDAR One*. The *Terra LiDAR One* solution includes the payload, UAV, and Cloud-based processing software to seamlessly generate the final map products. To ensure accuracy and efficiency, Terra Drone knew it needed a DG solution with hardware small and light enough for a UAV, yet still highly accurate and reliable with automated processing.

With this in mind, Terra Drone turned to Applanix's DG for UAV solutions. Using the **Trimble APX-15 UAV** with **Applanix POSPac® UAV Cloud**, Terra Drone developed a lightweight LiDAR and camera payload. It provides an accurate, georeferenced map of the surveyed area which means that

every bit of sensor data is geographically located to the centimetre level.

The **Trimble APX-15 UAV** is a single board GNSS-inertial solution specifically designed to be flown by UAVs. It is small, lightweight, and low-power. The APX-15 UAV's data is processed using the **Applanix POSPac® UAV Cloud** post-processing software to automatically generate the final, highest accuracy trajectory (position and orientation) in the cloud. It also uses the **POSPac® LiDAR QC Tools** module to automatically boresight and adjusts the trajectory using the LiDAR data.

The result is the *Terra LiDAR One*, a drone solution for high-accuracy mapping that can be flown in all environments, including areas with dense vegetation and difficult-to-reach areas.

## BENEFITS

- Centimetre accuracy in a fraction of the time of traditional methods
- Cost-effective and highly accurate solution
- No need for Ground Control Points (GCPs)
  - No need for crew to access difficult or dangerous areas
  - Increased safety
- Compact and easy-to-operate
- Can produce 3D mapping-grade products
- Improved productivity - with optimized workflow means final products are generated within hours

## RESULTS

"The advantages of a *Terra LiDAR One* are numerous. The ability to perform simple analysis on-site allows users to check for omissions without coming back to redo the survey later. This saves time and money!" says Ugo Sokki Co, a satisfied customer utilizing Terra LiDAR One.

## ABOUT APPLANIX

Applanix's Position and Orientation Systems (POS®) has become the world's industry-standard for airborne, land, marine, and indoor mobile survey operations. With global reach, unequalled engineering excellence, and worldwide 24/7 customer support, Applanix, a Trimble (TRMB on NASDAQ) company since 2003, leads the world in high-productivity in-motion surveying, direct data georeferencing, and robust mobile mapping. Applanix POS technology is now powering new revolutions in both autonomous vehicle technology and mobile mapping in GNSS-denied spaces.

## ABOUT TERRA DRONE

Established in 2016, Terra Drone Corporation is a drone startup that has expanded its global footprint to become a leading provider of global industrial drone solutions. Its head office is located in Tokyo, Japan, with branches spread throughout the Asia-Pacific, European Union, Africa, and South America. Terra Drone provides innovative and reliable drone services by leveraging the advances in uncrewed hardware, sophisticated LiDAR and photogrammetric surveying methods, and drone data processing techniques powered by machine learning and artificial intelligence technologies. Terra Drone also enables governments, enterprises, and organizations worldwide to bridge the gap between crewed and uncrewed aviation through its proprietary drone traffic management system or UTM (uncrewed traffic management) platform.



LiDAR Sensor in the Terra LiDAR One

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