

# UAS for Photogrammetric Aerial Mapping



Trimble (USA) has introduced its Unmanned Aircraft System (UAS): the Trimble UX5 aerial imaging rover with the Trimble Access aerial imaging application. The solution builds upon its predecessor, the Trimble Gatewing X100. Combined with the Trimble Business Center photogrammetry office software module, the Trimble UX5 has been developed to offer a complete UAS photogrammetric mapping solution for surveyors and geospatial professionals, aimed specifically at large projects.

A variety of traditional surveying applications such as topographic surveying, site & route planning, progress monitoring, volume calculations, disaster analysis and as-builts in industries such as surveying, oil & gas, mining, environmental services, and agriculture can benefit from aerial imaging by allowing professionals to safely collect large amounts of

accurate data in a short time.

The Trimble Access aerial imaging application is field software for planning UAS missions, performing flight checks and monitoring flights, using intuitive workflows.

The imaging application is used to define the project area, avoidance zones, and flight parameters as well as take-off and landing locations. In the field, it is used to perform pre- and post-flight checks and download the flight data and images after landing. The new wizard-like digital checklists give the operator a complete “to do list” so critical steps are not bypassed or missed in the field that can enhance reliable and safe flights. The software also includes fixed post-flight procedures to ensure that operators do not leave the field with a dataset that is incomplete or inconsistent.

Flights are fully automated, from launch to landing, and require no piloting skills. The operator facilitates the aircraft’s operation and built-in safety procedures can ensure safe and successful launches. Data collection can be performed remotely without exposing individuals to hazardous terrain, environmental contaminants or heavy equipment and machinery.

## Enhanced Imagery

Incorporating a mirrorless 16-megapixel camera with a fixed focal-length external lens, the [Trimble UX5](#) provides high-resolution imagery and accurate deliverables. The field of view from the camera allows the UX5 to cover 50-75% more area to enhance efficiency and reduce operational costs. In addition to the increase in flight efficiency, the Trimble UX5 is capable of producing 3D surface deliverables with a ground sampling distance of approximately 2.4cm (approximately 1.0 inch).

## Durability and Performance

Designed to operate in real-world conditions, the Trimble UX5 is capable of flights between 75 and 750m (approximately 246 and 2,460 feet) above ground level and can be flown in light rain and windy conditions, up to 65km/h (approximately 40mph).

The Trimble UX5 airframe is comprised of a carbon frame inside expanded polypropylene. Impact-resistant plastics and composite fibers are used for the aircraft components, including winglets and belly plate. This design and choice of materials results in a rigid aircraft with strong torsional stability and the ability to withstand rough landings.

Performance enhancements also include the ability to execute steep landing approaches and thrust reversal for accurate and repeatable landings. The landing procedure starts only 300m (approximately 984 feet) from the landing location allowing the UX5 to be used for jobs that have site restrictions such as buildings, towers or trees.

## Deliverables with Software

Orthophotos, contour maps, point clouds, digital surface models (DSMs) and feature maps can easily be created from aerial images using the Trimble Business Center photogrammetry module. Single-click processing for stitching images streamlines the office process for generating powerful deliverables.