



TRIMBLE UX5 AERIAL IMAGING SOLUTION

FOR SURVEYING AND MAPPING





TRIMBLE UX5 AERIAL IMAGING SOLUTION:

INDUSTRY-LEADING UAS MAPPING SOLUTION FOR ALL YOUR APPLICATION NEEDS

Trimble prides itself on being a leader in innovation. By setting new industry standards to improve our users' efficiencies and deliverables, we are proud to provide even more breadth and depth to our portfolio by offering the first, and only, complete aerial imaging solution specifically designed for surveyors and geospatial professionals.

WHY UAS AERIAL IMAGING?

many surveying and mapping professionals across the world successfully use the Trimble UX5 Aerial Imaging solution for their applications because it is:

- An economic solution that enables aerial mapping, once reserved for the largest surveying & engineering firms to be used by the masses
- A safe solution that enables surveying of rugged, hazardous, hard-to-reach or unhealthy areas without risking injury
- An efficient tool giving the ability to collect and process data faster than traditional terrestrial-based survey technology
- designed to quickly plan a flight and collect data, allowing rapid response to your customers' needs
- An advanced technology that can easily be used to serve numerous professional markets and applications

BUILT FOR ALL YOUR APPLICATION NEEDS

The Trimble UX5 Aerial Imaging solution is designed to drastically reduce time and cost to collect aerial data and guarantee the reliability you need for a range of applications including:

- engineering & Surveying
- mining
- civil & heavy earthworks construction
- Oil & Gas
- environmental & Landfi
- Public Agencies
- Agriculture & forestry

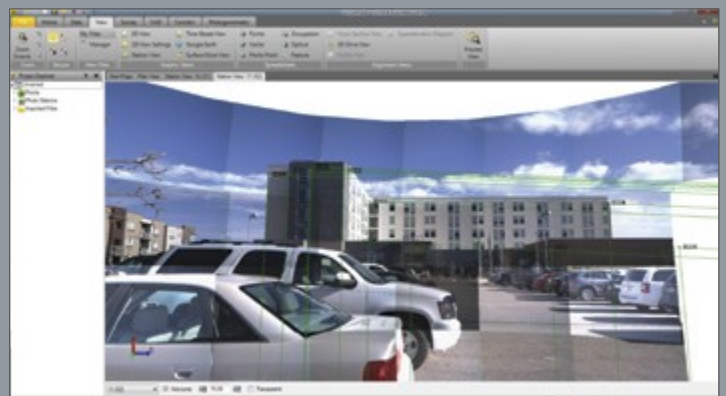
within each of these industries, aerial imaging can be used to perform a variety of tasks and produce a range of deliverables. The Trimble UX5 Aerial Imaging solution is being used to perform boundary & topographic surveys, site & route planning, progress monitoring, as-builts, volume determination, vegetation health and disaster analysis. from a single fl operators are able to generate feature maps, topographic contours, 3d surface models, orthophotographs, and Normalized difference Vegetation Index (NdVI) maps for vegetation.



TRIMBLE VISION: MEASURE WITH SPEED AND SAFETY

Deliverables collected with the Trimble UX5 can be combined with Trimble® VISION™ technology such as Trimble total stations and Trimble 3D laser scanners for a one-of-a-kind solution. By combining data collected with Trimble's leading-edge photogrammetry technology, such as the Trimble V10 Imaging Rover, Trimble VX™ Spatial Station, and Trimble TX8 3D Laser Scanner, users can visualize their project from multiple perspectives, measure points within the images and create 3D models of the infrastructure and terrain.

Learn more about Trimble VISION technology at www.trimble.com/TrimbleVision



TRIMBLE UX5 AERIAL IMAGING ROVER



A NEW STANDARD IN MAPPING – NO MATTER WHAT THE JOB

eNGINEered TO heLP mAPPING AND SURVeyING PrOfESSIONALS whO reqUIre The hIGheST AccUrAcY wOrk mOre effIcIeNTly, The TrImBlE UX5 SeTS A New STANdArD IN mAPPING AND SURVeyING By cOmBINING A rObUST AND hIGHly User-frIeNdlY SySTem wITH A cUSTOm-deSIGNed cAmErA ThAT OfferS The mOST ImPreSSIVe deLIvErABLES. The TrImBlE UX5 keePS yOU PrOdUcTIVe ALL dAy LONG – whATeVer JOB yOU're wOrKING ON.

WHY THE TRIMBLE UX5?

- Leading image acquisition quality and data accuracy
- All-terrain and all-weather performance
- Precise landings in confi spaces
- A durable and reliable solution for intensive use
- fully automatic workfl for ease-of-use and safe operation



SMALL PLATFORM – HIGH IMAGE ACQUISITION QUALITY

The Trimble® UX5 Aerial Imaging solution uses the latest developments in the ‘prosumer’ camera market, ensuring optimal image quality along with maximum photogrammetric accuracy. The UX5 camera has – unlike a traditional compact camera – a large imaging sensor that captures very sharp, color-rich images, even in dark and cloudy conditions. The camera and its custom optics give the UX5 the ability to capture data down to an incredible 2.4 cm resolution.

WORKFLOWS ENSURING EASE-OF-USE

The all-new Trimble Access™ Aerial Imaging application runs on the Trimble Tablet rugged Pc and allows users to plan their aerial missions, performing pre-flight checks and monitoring your flight – all with intuitive workflow that ensure reliable results. In the field the operator is guided through the pre- and post-flight sequences with step-by-step digital checklists. Many of the Trimble UX5 checks are automatically verified by the software and do not require any interaction from the operator. The fast and intuitive workflow allows the Trimble UX5 to be ready to fly in less than 10 minutes, ensuring minimal downtime.

MAXIMUM PERFORMANCE

To keep the Trimble UX5 users productive all day long even in harsh weather conditions, we have focused on a very robust design when engineering the system. Conditions such as heavy wind, light rain, heat and very cold temperatures are absolutely no challenge for the Trimble UX5 which makes it your dependable solution to gather quality data without compromising coverage.



POWERFUL DELIVERABLES WITH TRIMBLE OFFICE SOFTWARE FOR PROCESSING UAS DATA

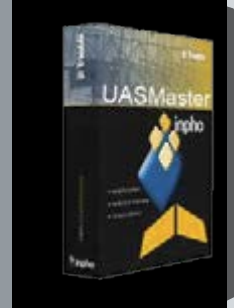
TBC Aerial Photogrammetry Module

- High resolution orthomosaic
- True color point cloud (DTM & DSM)
- Relative and adjustment with ground control
- Coordinate system management
- CAD & drafting tools
- GNSS baseline and total station processing
- Survey network adjustment and site calibration
- Volume calculations
- Advanced CAD and COGO tools



UASMaster – inpho

- High resolution orthomosaic
- True color point cloud (DTM & D)
- Relative and adjustment with ground control
- Coordinate system management
- CAD & drafting tools
- Support for non-Trimble UAV platforms
- Integration with Inpho
- Interactive editing workflow with seamlines
- Manual measurements of tie points



EXAMPLE

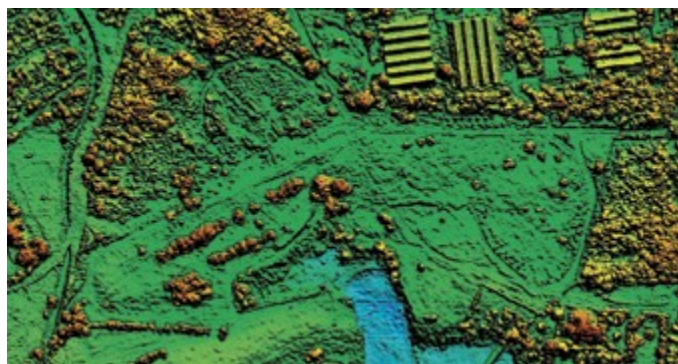
TYPE	LOCATION	IMAGES	GSD	AREA	GCP	VERSION	PROCESSING TIME	NUMBER OF POINTS PC	ERROR X, Y	ERROR Z
Agriculture	Belgium	NIR, 400	3.2 cm	0.3 km ²	7	TBC 3.20	4 h	20.230.127	3 cm	3.5 cm
Mining site inspection	Australia	RGB, 250	4 cm	0.2 km ²	7	TBC 3.20	3 h	18.778.101	6 cm	9.5 cm
Urban Planning	Dom. Republic	RGB, 299	6.4 cm	0.7 km ²	—	TBC 3.20	3 h	20.017.479	—	—
Agriculture	Belgium	RGB, 543	2.4	0.25 km ²	7	UASMaster	8 h	20.168.482	2 cm	3.5 cm
Mining (volume calculations)	Belgium	RGB, 531	2.4	0.15	21	UASMaster	8 h	28.634.342	2 cm	4 cm

TRIMBLE BUSINESS CENTER AERIAL PHOTOGRAMMETRY MODULE

STATE-OF-THE-ART IMAGE PROCESSING TECHNOLOGY

Trimble UX5 aerial image data can be processed into powerful deliverables with the Trimble Business center (TBC) Aerial Photogrammetry module.

The TBC APm works seamlessly with TBC standard and advanced survey modules, making it possible to process complete mapping projects including aerial imagery, Trimble VISION imagery, GNSS and total station observations.



ADVANCED UAS WORKFLOW

The new Advanced UAS functionality is a completely automated workflow for aerial photogrammetry, enabling you to adjust photo stations and create deliverables using a single command.

MEASURE PHOTOGRAMMETRY POINTS

TBC's "virtual telescope" intersects points from multiple aerial photo stations and/or terrestrial Trimble VISION photo stations, to enable measurement of discrete points. Accurately and efficiently measure the locations of features including utilities, treetops, and the corners of buildings.

CREATE 3D POINT CLOUDS

Automatically create 3D point clouds from adjusted photo stations. The fully automatic process adapts parameters to guarantee precision, providing extremely detailed and accurate results at a speed of about 3 seconds per image with about 1–2 pixels height accuracy in digital Surface model (dSm) mode, while point cloud extraction in the digital Terrain model mode (dTm) enables rapid mapping by focusing on the bare terrain only and providing high horizontal accuracy.



CREATE DSMS AND DTMS

3D raster digital elevation models are created automatically from the generated point cloud. In dSm mode, the model is refined using sophisticated interpolation routines, noise filtering, edge modeling and outlier detection to achieve rich detail and high vertical accuracy within surface models. In dTm mode, extensive noise filtering and interpolation ensures a rapidly generated smooth bare terrain model resulting in noise-free classic orthomosaics with high horizontal accuracy.

CREATE CLASSIC AND TRUE ORTHOMOSAICS

Automatically create classic orthomosaics generated from digital Terrain models or true orthomosaics generated from digital Surface models. Rigid "True-Ortho" rectification combined with outstanding geometric feature-based seamline filtering and radiometric balancing results in perfect looking seamless orthomosaics. Seams are adaptively blended according to image texture analysis. Radiometric single image corrections as well as image group corrections are applied for perfect homogeneous colors and intensity, ready for GIS use. The automatic process only takes about 4 seconds per image.



SPECIFICATIONS

	ITEM	TRIMBLE UX5
Hardware	Type	Fixed wing
	Weight	2.5 kg (5.51 lb)
	Wing span	1 m (3.28 ft)
	Wing area	34 dm
	Dimensions	100 cm x 65 cm x 10 cm (39.37 in x 25.59 in x 4.13 in)
	Material	EPP foam; Carbon frame structure; Composite elements
	Propulsion	Electric pusher propeller; brushless 700 W motor
	Battery	14.8 V, 6000 mAh
Software	Project management	✓
	Mission planning	Multiple fl
	Automated pre-fl checks	✓
	Automatic take off, fl and landing	✓
	Autonomous camera triggering	✓
	Automated fail-safe routines	✓
	User-controlled fail-safe commands	✓
Automated post-fl checks	✓	
Operation	Endurance ¹	50 minutes
	Range ¹	60 km (37.28 mi)
	Cruise speed	80 kmh (49.71 mph)
	Maximum ceiling	5,000 m (16,404 ft)
	Pre-fl system setup time	5 minutes
	Take off type	Catapult launch
	Take off angle	30 degrees
	Landing type	Belly landing
	Landing angle	14 degrees
	Recommend landing spacing (LxW) ²	50 m x 30 m (164 ft x 98.43 ft)
	Weather limit	65 kmh (40.39 mph) and light rain
	Communication and control frequency	2.4 GHz
	Communication and control range	Up to 5 km (3.11 mi)
Acquisition Performance	Resolution (GSD)	2.4 cm to 24 cm (0.95 in x 9.45 in)
	Height above take-off location (AGL)	75 m to 750 m (246 ft x 2,460 ft)
	Coverage	See datasheet coverage table

¹ ISO standard atmosphere conditions.

² In head wind conditions.

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