

# Unmanned Aircraft Solutions

# Trusted Performance Superior Image Accuracy



## WHY TRIMBLE UAS?

Surveying and mapping professionals across the world rely on and successfully use Trimble UAS. Whether it's a multi-rotor aircraft to fly into and out of tight places or a longer-range fixed-winged craft with a highly precise camera and GNSS receiver, Trimble UAS are ideal for the job—any job. With industry-leading field and office software to make data capture and processing as simple as possible, Trimble solutions deliver greater:

- ▶ **Affordability.** While UAS was once reserved for firms with large budgets, Trimble's cost effective solutions are practical for a wide range of users.
- ▶ **Safety.** Trimble UAS enables surveying of rugged, hazardous or hard-to-reach areas without risk of injury.
- ▶ **Efficiency.** Trimble UAS makes data collection easier and faster, especially compared to traditional, terrestrial based surveying technology.
- ▶ **Responsiveness.** With the ability to quickly execute a flight and capture data, Trimble UAS enables rapid response to customer needs.

- ▶ **Versatility.** Trimble UAS is an advanced technology that can easily serve numerous professional markets and applications.

## BUILT FOR ALL YOUR APPLICATION NEEDS

Trimble UAS solutions are designed to drastically reduce the time and costs for collecting aerial data and guarantee the reliability you need for a diversity of markets including:

- ▶ Engineering & Surveying
- ▶ Mining
- ▶ Civil & Heavy Earthworks Construction
- ▶ Oil & Gas
- ▶ Environmental & Landfill
- ▶ Public Agencies
- ▶ Agriculture & Forestry



# Industry-leading survey and mapping solutions.

Trimble is a leader in aerial imaging innovation. By setting new industry standards in high-precision UAS technology, we enable smarter decision making through better spatial data—improving your deliverables and the efficiency at which you can provide them.



Within each of these industries, customers rely on Trimble UAS for:

- ▶ Boundary & topographic surveys
- ▶ Survey grade mapping
- ▶ Power line modeling
- ▶ Field leveling
- ▶ Site & route planning
- ▶ Progress monitoring
- ▶ As-built surveys
- ▶ Resource mapping
- ▶ Disaster analyses
- ▶ Volume determinations

From a single flight, operators can produce a range of deliverables including:

- ▶ Topographic contours
- ▶ 3D surface models
- ▶ Orthophotographs
- ▶ Normalized Difference Vegetation Index (NDVI) maps



# UX5 HP Unmanned Aircraft



## HIGH ACCURACY TECHNOLOGY

The Trimble UX5 HP Unmanned Aircraft System sets a new standard in high-accuracy UAS technology. It's engineered to capture sharp, color-rich images for superior geospatial deliverables. The UX5 HP features an integrated Trimble GNSS receiver and a 36 MP camera for industry-leading image quality and data accuracy.

### High-precision Imaging for Superior Deliverables

The UX5 HP utilizes the most recent advances in digital imaging, ensuring optimal image quality and the highest photogrammetric accuracy. Integrating a high-performance GNSS receiver with a high resolution camera, the UX5 HP collects precise data and achieves a leading level of image resolution—capturing precision-sharp aerial photographs down to 1 cm GSD. The UX5 HP's postprocessed kinematic (PPK) GNSS technology lets you establish image locations in absolute coordinate systems, minimizing or eliminating the need for ground control points. You'll spend less time preparing to fly and more time capturing highly precise data.



Trimble's next generation,  
high precision solution  
delivers unrivaled accuracy.



### Configure For The Job

No two projects are the same. That's why the UX5 HP comes with increased system flexibility. You can choose a near-infrared or a red-green-blue (RGB) sensor and lens combination based on your project needs. Lens options range from a 35 mm for high accuracy, a 15 mm wide-angle for greater coverage, or a 25 mm for the best of both: detailed imagery and superb coverage.

## UX5 HP Features

- ▶ High-performance Trimble GNSS receiver
- ▶ Postprocessed kinematic (PPK) GNSS technology
- ▶ Survey quality accuracy without ground control
- ▶ 36 MP, Sony a7R, full-frame, high-resolution camera
- ▶ Orthomosaic resolution down to 1 cm GSD & 3D models with 1,000 pts/m<sup>2</sup>
- ▶ Fully automated Trimble® Access™ software workflows for ease-of-use and safe operation
- ▶ Simple data processing with Trimble Business Center photogrammetry module



# UX5 Unmanned Aircraft



## SETTING THE STANDARD

For mapping and surveying professionals around the world, Trimble's UX5 Unmanned Aircraft System has set the standard in UAS performance, delivering unparalleled results and efficiency.

The UX5 is a cost-effective solution for general survey and agriculture applications. And, with the 24 MP Sony Alpha a5100 camera for enhanced image accuracy, the UX5 represents a tremendous benefit at a competitive value—offering more for less.

### Trusted Performance

Trimble's unmanned systems are robust and durable. Made from impact-resistant foam, they deliver trusted performance, even in harsh environments.

You can depend on Trimble UX5 and UX5 HP to stand up to whatever nature dishes out: from extreme temperatures and winds up to 65 km, to light rain. Each model is ideal for conditions where many other unmanned aerial vehicles struggle to operate.



Trimble's popular unmanned system is a robust and effective solution at a competitive value.



Trimble's motor-propeller design ensures reliable takeoffs, and our advanced reverse-thrust technology means you'll have accurate and predictable landings even in confined areas.

Whether you work in icy snow caps, windy coastlines, or rocky terrains, the UX5 and UX5 HP will continue to capture the highest quality data, flight after flight.

## UX5 Features

- ▶ 24 MP camera for high image acquisition quality and data accuracy
- ▶ All-terrain and all-weather performance
- ▶ Reverse thrust for precise landings in confined spaces
- ▶ A durable and reliable solution for intensive use
- ▶ Fully automated Trimble Access workflows for ease-of-use and safe operation
- ▶ Simple data processing with Trimble Business Center photogrammetry module



# ZX5 Multirotor



## TESTED AND PROVEN

Tested and proven, the Trimble ZX5 Multirotor is built to execute tough, everyday jobs quickly, even in tight spaces. It requires no launcher, is easy to assemble and includes everything you need to capture high quality geo-referenced photos for applications such as aerial mapping and inspections.

### Precise Data, Fast Processing

The Trimble ZX5 Multirotor includes a 24 MP camera, which enables you to capture high quality aerial imagery and achieve image resolution down to 1 cm for superior image quality. The ZX5 is equipped to capture live video imagery for inspection applications such as civil infrastructure, utilities, and oil and gas pipelines.





Everything you need  
to capture reliable,  
accurate aerial data.



### It Goes to Work Fast. So You Can Get in and out Quickly

The Trimble ZX5 sets up in minutes and comes equipped with an industry leading flight control system for unprecedented performance and precision. Its vertical takeoff and landing capability enables users to work in tight places and obstructed environments where fixed wing solutions are less suitable. And you can count on it to stay on the job, flight after flight, thanks to its proven and reliable design, rugged, durable chassis made from light, fracture-resistant carbon and the highest quality components available.

## ZX5 Features

- ▶ Outstanding flight stability and performance even in strong winds
- ▶ Includes a 24 MP Sony camera system and Trimble Access Aerial Imaging flight planning software
- ▶ Image resolution down to 1 cm
- ▶ Light, compact, foldable carbon design
- ▶ Up to 20 minute mission duration and 2 km range
- ▶ Easy data processing in Trimble Business Center Photogrammetry Module or Trimble Inpho® UASMaster module



## TRIMBLE VISION

### Measure With Speed and Accuracy

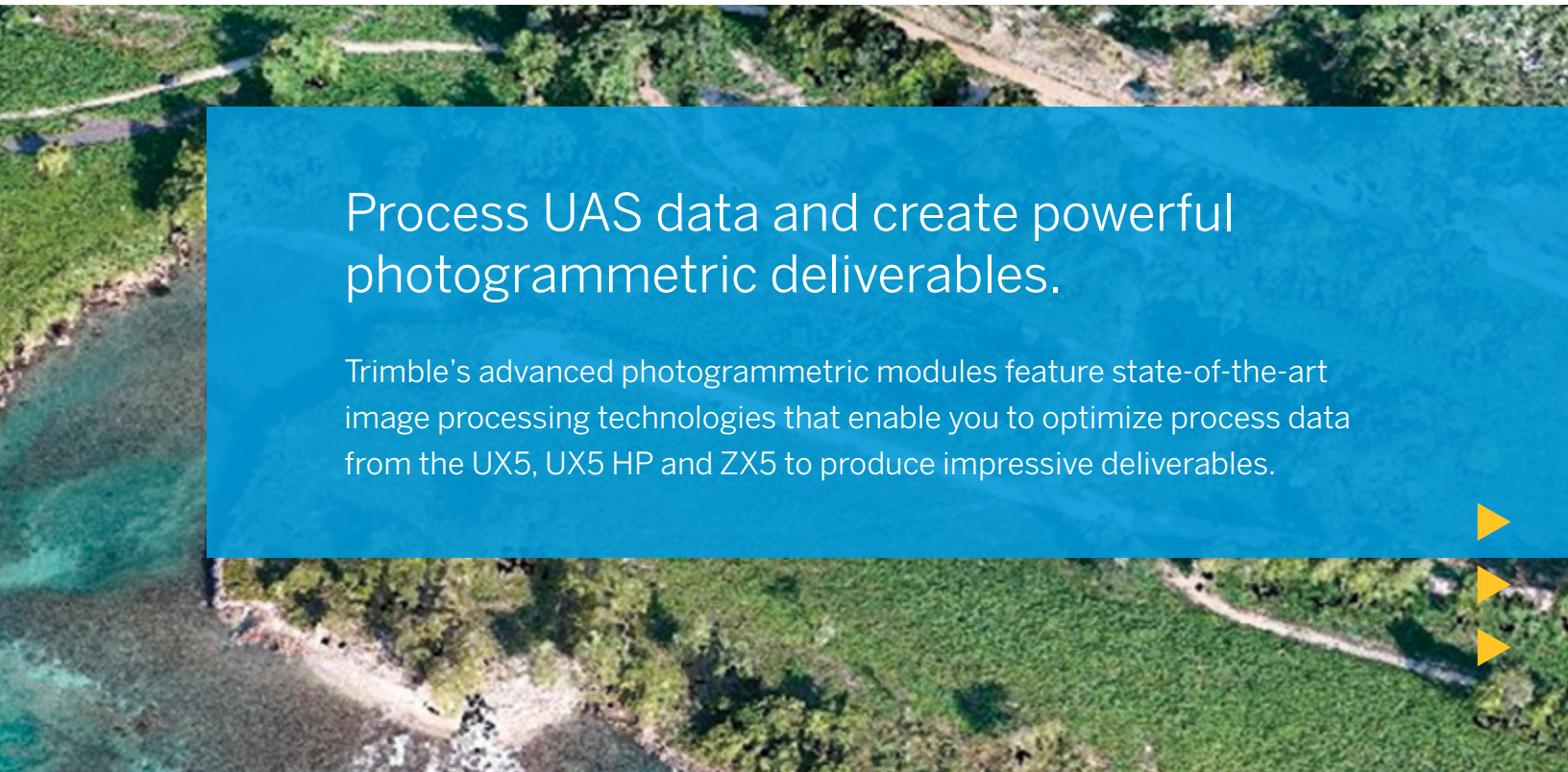
The data you collect with Trimble UAS can be integrated using Trimble VISION™ technology. Whether it's our total stations, the TX8, 3D Laser scanners, or the innovative V10 imaging rover, you'll get a one-of-a-kind solution.

By combining data collected with Trimble's leading-edge photogrammetry technology—you'll be able to visualize your project from multiple perspectives, measure points within the images and create 3D models of the infrastructure and terrain.

## POWERFUL OFFICE SOFTWARE FOR DATA PROCESSING

### Trimble Business Center Aerial Photogrammetry Module

The Trimble Business Center Aerial Photogrammetry module is designed to work seamlessly with Trimble Business Center standard and advanced survey modules, making it possible to process complete mapping projects including aerial imagery, Trimble VISION imagery and total station observations. Additionally, GNSS information, base station data, and onboard images can be imported into the module to produce point clouds, Triangulated Irregular Network (TIN) models, and contour maps of the area flown. These can then be used in calculating volumes, excavation planning, drainage planning and many other functions.



## Process UAS data and create powerful photogrammetric deliverables.

Trimble's advanced photogrammetric modules feature state-of-the-art image processing technologies that enable you to optimize process data from the UX5, UX5 HP and ZX5 to produce impressive deliverables.



### Trimble Inpho UASMaster Module

The Trimble Inpho UASMaster module combines ease of use with the full power of a photogrammetric workstation for creating powerful deliverables from images collected from UAS aerial mapping and surveying systems. Based on state-of-the-art Trimble Inpho technology, the software bridges the gap between simple near black-box workflows for nonphotogrammetrists and photogrammetry expert workflows. UASMaster includes advanced technology that has been customized to provide high quality results from the special characteristics of UAS data and easily integrates into the Inpho world of photogrammetry and 3rd party workflows.

### SIMPLE WORKFLOWS WITH TRIMBLE ACCESS

With the Trimble Access Aerial Imaging application loaded onto the Trimble Tablet Rugged PC or on a Windows Tablet, you have an easy-to-use, single software tool for planning our aerial missions, performing pre-flight checks and monitoring your flights. The intuitive workflows are so quick and simple that the UX5 and ZX5 systems can be prepared for flight in only 5 minutes, greatly minimizing downtime. While 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.





Specifications				
	Item	Trimble UX5	Trimble UX5 HP	Trimble ZX5
Hardware	Type	Fixed wing	Fixed wing	Rotary wing
	Weight	2.5 kg (5.5 lb)	2.9 kg (6.4 lb)	2.7 kg (6 lb)
	Maximum takeoff mass	-	-	5 kg (11 lb)
	Payload capability	-	-	2.3 kg (5.1 lb)
	Wing span	1 m (39.4 in)	1 m (39.4 in)	-
	Wing area	34 dm <sup>2</sup>	34 dm <sup>2</sup>	-
	Dimensions	100 cm x 65 cm x 10 cm (39.4 in x 25.6 in x 4.1 in)	100 cm x 65 cm x 10 cm (39.4 in x 25.6 in x 4.1 in)	85 cm x 49 cm (33.5 in x 19.3 in)
	Material	EPP foam; carbon frame structure; composite elements	EPP foam; carbon frame structure; composite elements	Carbon frame structure
	Propulsion	Electric pusher propeller; brushless 700 W motor	Electric pusher propeller; brushless 1200 W motor	Electric pusher propeller; 6 brushless motor
	Battery	14.8 V, 6000 mAh	14.8 V, 6600 mAh	14.8 V, 2 x 6600 mAh
Camera	24 MP mirrorless APSC	36 MP mirrorless full frame with custom 15, 25 or 35 mm lens	24 MP with interchangeable 16-50 mm and 16 mm lens	
Software	Project management	√	√	√
	Mission planning	Multiple flights	Multiple flights	Multiple flights
	Automated pre-flight checks	√	√	√
	Automatic take off, flight, and landing	√	√	√
	Autonomous camera triggering	√	√	√
	Automated fail-safe routines	√	√	√
	User-controlled fail-safe commands	√	√	√
Automated post-flight checks	√	√	√	
Operation	Endurance <sup>1</sup>	50 minutes	35 minutes	20 minutes
	Range <sup>1</sup>	60 km (37.3 ml)	52 km (32.3 ml)	-
	Cruise speed	80 kmh (49.7 mph)	85 kmh (52.8 mph)	32 kmh (20 mph)
	Maximum ceiling <sup>2</sup>	5,000 m (16,400 ft)	5,000 m (16,400 ft)	3000 m (9,843 ft)
	Pre-flight system setup time	5 minutes	5 minutes	5 minutes
	Take off type	Catapult launch	Catapult launch	Vertical
	Take off angle	30 degrees	30 degrees	-
	Landing type	Belly landing	Belly landing	Vertical
	Landing angle	14 degrees	14 degrees	-
	Recommend landing spacing (LxW) <sup>2</sup>	50 m x 30 m (164 ft x 98 ft)	50 m x 30 m (164 ft x 98 ft)	-
	Weather limit	65 kmh (40 mph) and light rain	55 kmh (35 mph) and light rain	36 kmh (22 mph)
	Communication and control frequency	2.4 GHz	2.4 GHz	2.4 GHz
	Communication and control range	Up to 5 km (3.10 miles)	Up to 5 km (3.10 miles)	up to 2 km (1.2 miles)
Video frequency	-	-	5.8 GHz	
Acquisition Performance	Resolution (GSD)	2 to 19.5 cm (0.79 to 7.67 in)	1 to 25 cm (0.4 to 9.9 in)	1 to 19.5 cm (0.04 to 7.7 in)
	Height above take-off location (AGL)	75 to 750 m (246 to 2,460 ft)	75 to 750 m (246 to 2,460 ft)	5 to 750 m (16.5 to 2,460 ft)
	Coverage	See datasheet coverage table	See datasheet coverage table	-

1 ISO standard atmosphere conditions

2 In head wind conditions

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