



Trimble UX5

MULTISPECTRAL UNMANNED AIRCRAFT SYSTEM

THE STANDARD IN AGRICULTURAL MAPPING

The Trimble® UX5 Multispectral combines the power and reliability of the Trimble UX5 platform with the precision and dependability of the 5-band MicaSense RedEdge® narrowband Multispectral camera and (optional) Downwelling Light Sensor. Driven by the Trimble Access™ Aerial Imaging field software, this complete system provides an intuitive, integrated and robust workflow that allows you to generate the highest quality vegetation maps for precision agriculture. Crop properties such as vegetation vigor and leaf chlorophyll can now be mapped at high resolution and repeatedly with the radiometric confidence required for site-specific crop management.

Superior Multispectral image quality with the MicaSense RedEdge

The MicaSense RedEdge® collects five discrete, narrow bands (blue, green, red, red edge and near-infrared) using global electronic shutters into distortion-free 12 bit uncompressed TIFF files, resulting in a radiometric data quality equivalent to trusted Multispectral satellite systems. Reflectance calibration is achieved by acquiring pre- and post-flight images of a white calibration panel, for which Trimble Access Aerial Imaging offers an easy and integrated procedure. Additionally, the user has the option to connect a Downwelling Light Sensor offered by MicaSense to enable continuous ambient light corrections. The availability of five bands combined with a sound radiometric calibration enables the user to calculate many tailored vegetation indices for customized applications.

The Trimble UX5, the go-to platform for narrowband Multispectral imaging

Based on its unrivaled stability during cruise flight, the Trimble UX5 is the go-to platform to use for a narrowband Multispectral camera by minimizing variations in orientation angles within flight lines, which is important to minimize view angle effects that can degrade

narrowband Multispectral image quality. The Trimble UX5 also offers class-leading coverage area per flight without compromising on lateral overlap, again important to avoid degrading view angle effects in the resulting orthomosaics. The ability to achieve this performance in high wind conditions typical of open and exposed farmland is a key feature of the Trimble UX5 Multispectral, making it the premier solution for time-critical image acquisition requirements in precision agriculture. The UX5 Multispectral comes with a kit to mount your MicaSense RedEdge kit parts in a single compact, efficient and reliable unit, safely strapped into the protective payload bay. On the bottom side, the UX5 Multispectral protects the MicaSense RedEdge lenses with a protective filter specifically selected to maintain spectral data quality.

Intuitive workflows with Trimble Access Aerial Imaging

The Trimble Access Aerial Imaging application operates the UX5 Multispectral and is a single software tool for planning your aerial missions, performing pre-flight checks and monitoring your flights. You can map any shape of field, cover disconnected fields in a single flight or automatically split large fields of interest into contiguous flights, change landing location during flight, and perform flight simulations to validate flight plans. Additionally, Trimble Access Aerial Imaging ensures correct operation of the MicaSense RedEdge and guides you through the acquisition of pre- and post-flight reflectance calibration images in an efficient way. Before concluding on-site flight operations, Aerial Imaging allows you to verify the consistency of the collected MicaSense RedEdge data. Upon returning to the office, simply import the contents of the SD card into the MicaSense ATLAS™ cloud upload tool or any other Micasense-compatible image processing tool. Once completed, orthomosaics can be displayed and analyzed in Trimble ConnectedFarm®, Trimble eCognition® Essentials or other farm management and remote sensing analysis applications.

Key Features

- ▶ Supports the MicaSense RedEdge, a true Multispectral camera with five discrete, narrow bands
- ▶ Optionally connect a Downwelling Light Sensor
- ▶ Easily and reliably mount your MicaSense RedEdge kit parts into the protective payload bay
- ▶ A durable and reliable solution for intensive use
- ▶ All-terrain and high wind performance
- ▶ Create Multispectral orthomosaics down to 6 cm GSD
- ▶ Fully integrated Trimble Access Aerial Imaging workflow ensuring ease of use and data quality before returning to the office
- ▶ Simple data processing on the MicaSense ATLAS cloud or locally



Trimble UX5 MULTISPECTRAL UNMANNED AIRCRAFT SYSTEM

PERFORMANCE SPECIFICATIONS

- Maximized coverage per flight and per hour due to high cruise speed and endurance
- Reversed thrust technology for a short and steep landing circuit
- Powerful propulsion system for steep climbs and high altitude flights
- High airframe service life due to wing robustness and maintainability
- Short setup time with automated procedures including pre- and post-flight assisted reflectance calibration in Trimble Access Aerial Imaging field software
- Self-check and failsafe procedures for safe operation

HARDWARE

Type Fixed wing
 Weight 2.5 kg (5.51 lb)
 Wingspan 1 m (3.28 ft)
 Wing area 34 dm²
 Dimensions 100 cm x 65 cm X 10.5 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 Compatible with UX5 battery (14.8 V, 6000 mAh)
 Camera MicaSense RedEdge Compatible
 Controller Compatible with MicaSense RedEdge including Downwelling Light Sensor

SOFTWARE – TRIMBLE ACCESS AERIAL IMAGING APPLICATION

- Project management
- Flexible mission planning
- Automated pre-flight checks
- Assisted pre- and post-flight reflectance calibration using the MicaSense reflectance calibration panel
- Automatic takeoff, flight and landing
- Autopilot-based camera triggering
- Autonomous onboard image EXIF geotagging
- Automated failsafe routines
- User controlled emergency commands
- Post-flight data consistency checks

AREA COVERAGE TABLE

Height	GSD	Coverage/flight (km ²) at different overlap settings (1)(2)		
		70%	80%	90%
90 m (295 ft)	6.1 cm (2.42 in)	1.2 km ²	0.8 km ²	0.4 km ²
120 m (394 ft)	8.2 cm (3.22 in)	1.7 km ²	1.1 km ²	0.5 km ²
150 m (492 ft)	10.2 cm (4.03 in)	2.1 km ²	1.4 km ²	0.7 km ²
300 m (984 ft)	20.5 cm (8.05 in)	4.0 km ²	2.7 km ²	1.4 km ²
600 m (1969 ft)	40.9 cm (16.10 in)	8.3 km ²	5.6 km ²	2.7 km ²
750 m (2461 ft)	51.1 cm (20.13 in)	10.0 km ²	6.7 km ²	3.4 km ²

(1) For a 2:1 aspect ratio of a single rectangular flight block, including 5 minutes of flight time from takeoff site to the flight block and back to the landing site.
 (2) To ensure spectral quality of the orthomosaic and spatial quality of the DSM, Trimble strongly recommends to adhere to the default of 80% forward and sideward overlap at the vegetation canopy level of the area of interest. If the vegetation canopy of the area of interest is lower in elevation than the takeoff point, a lower overlap may be planned. Adversely, if the canopy is higher than the takeoff point, a higher overlap should be set.

1 ISO standard atmosphere conditions.
 2 1 sigma for wind <30 kph (19 mph).

Specifications subject to change without notice.

OPERATION

Endurance¹ 45 minutes
 Range¹ 54 km (33.55 mi)
 Cruise speed 80 kph (50 mph)
 Maximum ceiling 5000 m (16,404 ft)
 Pre-flight system setup time 8 minutes (including reflectance calibration)
 Take off
 Type Catapult launch
 Angle 20 degrees
 Landing
 Type Belly landing
 Angle 14 degrees
 Landing space (L x W)²
 Typical 20 m x 6 m (66 ft x 20 ft)
 Recommended 50 m x 30 m (164 ft x 98 ft)
 Weather limit 55 kph (34.17 mph), dry weather
 Communication & control frequency 2.4 GHz (FHSS)
 Communication & control range Up to 5 km (3.10 mi)

ACQUISITION PERFORMANCE

Resolution (GSD) 6.1 cm to 51.1 cm (2.4 in to 20.118 in)
 Height above take-off location (AGL) 90 m to 750 m (295 ft to 2,460 ft)



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