

UAV Hyperspectral Imager

ATE9010

Features

- Band Range: 400~1000nm
- Optimal Hyperspectral Resolution: Better than 1.5nm
- Wide Field of View: 16°@f=25mm (dependent on lens)
- Instantaneous Field of View: 0.167mrad@f=35mm (dependent on lens)
- Flight Altitude: 50~1000 meters, recommended 100-300m
- Compatible with DJI M350 drone, offering higher adaptability and lighter overall weight;
- Supports remote control via DJI M350 remote controller
- Ultra-Long Flight Time: Approximately 45 minutes, enabling extensive coverage.

Applications

- Geological and Mineral Resource Exploration, Soil Monitoring
- Precision Agriculture, Crop Growth and Yield Assessment
- Forest Pest and Disease Monitoring, and Fire Surveillance
- Coastline and Marine Environment Monitoring
- Grassland Productivity and Pasture Monitoring, Ecological Environmental Protection, and Mine Surveillance
- Remote Sensing Education and Scientific Research, Meteorological Studies, Disaster Prevention and Control
- Lake and Watershed Environment Monitoring, Water Quality Inspection
- Agricultural and Livestock Product Quality Inspection
- Military, Defense, and National Security traditional benchtop spectrometers as well as portable miniature spectrometers for field applications.

Description

The ATE9010 series drone-borne hyperspectral imagers represent the third-generation product launched by Optosky. This series consists of compact and lightweight micro-hyperspectral imaging systems designed for drone integration. Each system is composed of a highly stable hexacopter/quadcopter drone platform, a precision gimbal, a hyperspectral imager, a high-capacity storage system, and a GPS navigation module.

ATE9010 (standard configuration) and ATE9010-W (wide field of view) are equipped with high-performance imaging detectors featuring 1920×1200 pixels and 2048×2048 pixels, respectively, delivering clear images with minimal noise. The ATE9010 series also includes a professional hyperspectral data acquisition and processing software package.

The ATE9010 series drone hyperspectral imagers are designed for real-time acquisition and analysis of spectral information and imaging data from vegetation, water bodies, soil, and other targets. By analyzing hyperspectral imagery, correlations can be established between spectral features and the physicochemical properties of objects (such as plant species and growth conditions), making them suitable for applications like vegetation classification and growth monitoring. The entire system is compactly engineered, with the imaging spectrometer offering high spectral resolution. Utilizing an external push-broom imaging method, it enables efficient and flexible aerial remote sensing operations when mounted on drone platforms.



Figure 1: ATE9010 Hexacopter (Left); ATE9010 Quadcopter (Right)

1. Selection Guide

Model	Features
ATE9010	Band range 400-1000nm, standard equipped with DJI M350, optional hexacopter, flight time 45 minutes
ATE9010-W	Wide-Field Type, Band Range 400-1000nm, Standard DJI M350, Optional Hexacopter, Flight Time 45 Minutes
ATE9010-4-17	Heavy-Duty Hexacopter Drone, Band Range 400-1700nm
ATE9010-4-25	Heavy-Duty Hexacopter Drone, Band Range 400-2500nm

*Note:

1.W stands for Wide (wide field of view);

2.The wide-band-range hyperspectral imager, due to its considerable weight, cannot typically be carried by standard fixed-wing drones. If required, a customized solution can be provided, though the cost of fixed-wing drones with high payload capacity is significantly higher.

2. Parameter

Hyperspectral Imager		
Model	ATE9010	ATE9010-W
Data Interface	USB3.0	
Imaging Mode	Push-broom imaging	
Effective Pixels (Before Binning)	1920 (spectral dimension) × 1200 (spatial dimension)	2048 (spatial dimension) × 2048 (spectral dimension)
Effective Pixels (Before Binning)	480 (spectral dimension) × 300 (spatial dimension)	512 (spatial dimension) × 512 (spectral dimension)
Spectral Range	400~1000nm	
Spectral Resolution	Without Binning: ≤1.3nm With 4×4 Binning: ≤2.7nm	Without Binning: ≤1.3nm 4×4 Binning: ≤2.2nm
Lens Focal Length	Default: 35mm. Optional lenses: 25mm and 16mm focal lengths.	
Field of View	11.5°@f=35 mm 16.0°@f=25 mm	18.3°@f=35 mm 25.4°@f=25mm
Instantaneous Field of View (IFOV)	0.167mrad @ f=35 mm 0.234mrad @f=25 mm	0.157mrad @ f=35 mm 0.220mrad @f=25 mm
Slit Width	25μm, with 15μm optional	
System Numerical Aperture	F/2.6	
Sensor Type	CMOS	
Dynamic Range	73 dB	60 dB
Data Bit Depth	12 bit	
Maximum Frame Rate	164fps	90fps
Remote Control	Supported (DJI only)	
Onboard Storage Capacity	256GB, up to 512GB maximum	
Detector Power Supply	5V, 3.4Wf	
Operating Temperature Range	-20 ~50 °C	

Storage Temperature Range	-30 ~70°C
Operating Humidity Range	≤85% RH
Software	
Basic Functions	Flexibly configurable exposure and speed; dynamic real-time display of hyperspectral images and curves.
Focus Adjustment	Dynamically display hyperspectral images in real-time for scientific focus adjustment (brightness/darkness based) to avoid human visual focusing errors.
Software System	Data Acquisition Software: Capable of real-time dynamic display of hyperspectral images and curves, with flexible parameter settings such as exposure time and speed. Data Processing Software: Enables functions including spectral viewing, image cropping, stitching, reflectance correction, vegetation index calculation, cluster analysis and supervised classification, as well as water quality inversion.
Flight Platform	Customized long-endurance, high-payload large hexacopter drone.
Gimbal	Three-axis DC brushless motor high-stability gimbal.
Number of Rotors	6-rotor (hexacopter)
Takeoff and Landing Method	Vertical Take-Off and Landing (VTOL)
Wheelbase	1500 mm
Maximum Payload	6 Kg
Maximum Altitude Ceiling	5000 m
Drone Dimensions	1650×1410×500 mm
GPS Positioning Accuracy	0.5 m, with optional RTK (0.1m)
Flight Endurance / Duration	>45 minutes
Ground Station Operating Range	10 Km
Flight Platform	DJI Matrice 350 RTK (M350 RTK) Drone
Gimbal	Three-axis DC brushless motor high-stability gimbal
Number of Rotors	4-rotor (quadcopter)
Takeoff and Landing Method	Vertical Take-Off and Landing (VTOL)
Dimensions (Unfolded)	810×670×430mm
Dimensions (Folded)	430×420×430 mm
Weight (Including Battery)	Approximately 3.7 kg
Maximum Takeoff Weight (MTOW)	9.2 kg (including dual batteries and payload)
Maximum Payload Capacity	2.7 kg (when equipped with dual batteries)
Hovering Time	55 minutes (no payload, windless conditions); 30-40 minutes (with typical payload, e.g., H20T camera).
Maximum Wind Resistance Level	12 m/s (Level 6 Wind)
Operating Temperature Range	-20°C to 50°C
Protection Level (IP Rating)	IP55 (Dust and water resistant, suitable for rainy and snowy weather)

3. Accessory List and Optional Accessories

No.	Standard Accessories	Specifications	Quantity
1	Hyperspectral Imager Main Unit	400-1000nm	1
2	Drone Flight Platform	DJI M350	1
3	High-Reliability Drone Gimbal	Three-axis Stabilization	1
4	Drone Landing Gear and Shock Absorption Structure	/	1
5	Memory Card	256G	1
6	Card Reader	/	1
7	Drone Battery	5880mAh	2
8	Diffuse Reflectance Standard White Panel	50×50cm, 95% Reflectance	1
9	Camera Connection Cable	USB3.0	1

