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FS60C/62C UAV hyperspectral measurement system

- Dji M350/300RTK is used as the flight bearing platform.
- Ultra-high speed spectral scanning imaging device with high signal-to-noise ratio provides high stability spectral image acquisition.
- The self-developed image processing algorithm with high efficiency and low power consumption can greatly prolong the flight time and reduce the power consumption of the system.
- Through real-time measurement of spectral image information of plants, water bodies, soil and other ground objects, application and precision agriculture, crop growth and yield assessment, forest pest monitoring and fire prevention monitoring, coastline and Marine environment monitoring, lake and watershed environmental monitoring and other applications.
- Compact system design, imaging spectrometer host spectral resolution up to 2.5nm.
- The whole machine consists of: high stability head, hyperspectral imager, embedded data acquisition, processing and storage unit, wireless image transmission system, GPS-RTK navigation system, ground receiving workstation, ground control system, reflectivity calibration board.

Parameters

Hyperspectral camera FS-60C

Lighting mode	Passive lighting (without light source)
Spectroscopic method	Transmission grating
Spectral range	400-1000nm
Spectral band	1200
Spectral resolution (FWHM)	2.5 nm
Slit width	25um
Transmission efficiency	> 60%
Stray light	< 0.5%
Number of spatial pixels	Max. 1920 (software configurable)
Pixel size	5.86 um
Imaging speed	Full band 128Hz, after ROI can achieve 3300Hz
probe	CMOS
Signal-to-noise ratio	600/1
Camera output	USB3.0 or Gigabit network
Camera interface	C-Mount
attachment	USB3.0 or Gigabit network
ROI	Multiple regions
Embedded data acquisition Processing storage unit	Embedded processor 512GSSD storage
dimension	20.5 cmx18.5 cmx12.9 cm
weight	1200g
Power dissipation	40W

- Easy to operate, no need for professional drone operator, can achieve single operation
- The ground station can observe the sampling site of the aircraft in real time and set the preview and correction functions of the route data collected point by point by using the ground station: radiometric correction, reflectivity correction, and area correction support batch processing
- Real-time common vegetation index calculation function
- Support custom real-time analysis model input function
- ENVI is perfectly compatible with multiple data formats

Hyperspectral camera FS-62C

Spectroscopic method	Transmission grating
Spectral range	900-1700nm
Spectral channel number	1024
Spectral resolution (FWHM)	6.5nm
Slit width	25um
Transmission efficiency	> 60%
Stray light	< 0.5%
Number of spatial pixels	1280
Pixel size	5um
Imaging speed	Full band 70Hz, maximum 1800Hz
probe	InGaAs
Signal-to-noise ratio	600/1
exportation	start
Camera interface	C-Mount
attachment	Lens, USB cable, power supply
ROI	Multiple regions
Built-in processing unit	Windows operating system, 8GB of RAM 512GB SSD and camera integrated Design (optional 1TB)
Heat dissipation mode	Internal air cooling heat dissipation
Mode of operation	Easy to operate, no need for professional drone operation Hand control, can achieve single operation

Observation mode	Real-time observation of aircraft sampling sites, hyperspectral images and spectral data by ground stations
Correction mode	Radiometric correction, reflectivity correction, and area correction support batch processing
Data format	Compatible with spe, hdr, and scp formats
Camera size	Less than 135*82*100 mm (L * W * H) (Including lens and built-in embedded data acquisition and processing unit, excluding head) Less than 190*129*100 mm (L * W * H) (Including lens and built-in embedded data acquisition and processing unit, including head)
Camera weight	≤ 740g (including lens and built-in embedded data acquisition and processing unit, excluding PTZ) ≤ 1085g (including lens and built-in embedded data acquisition and processing unit, including head)
attachments	Reflectance calibration board
Lens focal length	25mm
Camera scene	> 25°
Application software	FIGSPEC UAV real-time flight control software,FIGSPEC Merge puzzle software, FIGSPEC Studion image analysis software

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FS-60UC Series UAV hyperspectral measurement system

- Dji M350/300RTK is used as the flight bearing platform.
- Ultra-high speed spectral scanning imaging device with high signal-to-noise ratio provides high stability spectral image acquisition.
- The self-developed image processing algorithm with high efficiency and low power consumption can greatly prolong the flight time and reduce the power consumption of the system.
- Through real-time measurement of spectral image information of plants, water bodies, soil and other ground objects, application and precision agriculture, crop growth and yield assessment, forest pest monitoring and fire prevention monitoring, coastline and Marine environment monitoring, lake and watershed environmental monitoring and other applications.
- Compact system design, imaging spectrometer host spectral resolution up to 2.5nm.
- The whole machine consists of: high stability head, hyperspectral imager, embedded data acquisition, processing and storage unit, wireless image transmission system, GPS-RTK navigation system, ground receiving workstation, ground control system, reflectivity calibration board.

Parameters

Product model	FS-60UC	FS-62UC	FS-64UC
Spectroscopic method	Transmission grating spectroscopy		
Spectral range	400-1000nm	900-1700nm	400-1700nm
Spectral band	1200	1024	250
Spectral resolution	2.5nm	6.5nm	18nm
Slit width	25um		
Spectral efficiency	＞60%		
Stray light	＜0.5%		
Spatial pixel count	1920	1280	640
Pixel size	5.86um*5.86um	5um*5um	
Imaging speed	Full band 128Hz	Full band 70Hz	Full band 200Hz
Detector	CMOS	InGaAs	
SNR(Peak)	600/1		
Camera output interface	USB		USB or Gigabit Ethernet
Camera lens interface	C-Mount		
Built-in embedded data acquisition and processing unit	Embedded processor with 512G SSD storage		
Heat dissipation method	155*95*119mm(L*W*H)	Internal air cooling heat dissipation	/
Camera size	≤840g	135*82*100mm(L*W*H)	/
Camera weight	≤740g		
Accessories	Reflectance calibration panel		
Lens focal length	25mm		
Lens field of view	＞25°		
Flying platform	DJI M350 RTK / M300 RTK		
Aircraft size	In unfolded state, without propellers.:L*W*H 810*670*430 mm		
Aircraft weight	In folded state, with propellers.:L*W*H 430*420*430 mm		
Maximum takeoff weight of aircraft	Empty weight without battery: about 3.77kg. Empty weight with battery: about 6.47kg		
Fastest ascent speed of aircraft	9.2kg		
Fastest horizontal flight speed of aircraft	6m/s		
Maximum flight time	23m/s		
Operation mode	55 minutes (measured by flying forward at a speed of about 8 meters per second until the remaining battery level is 0% in a windless environment and under no-load conditions. For reference only. The actual usage time may vary due to different flight modes, accessories and environments)		
Observation mode	It is easy to operate and does not require a professional drone operator. Single-person operation can be achieved		
Correction method	Real-time observation of the aircraft sampling location, hyperspectral image and spectral data through the ground station. Functions include radiance correction, reflectance correction and area correction, which support batch processing.		
Data format	Compatible with spe format, hdr format and scp format.		
Application software	FIGSPEC UAV, FIGSPEC Merage mosaic software, and FIGSPEC Studion application software and image analysis software.		

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Lidar UAV hyperspectral system FS60-UCR

The FS60-UCR series Lidar UAV hyperspectral system is a multifunctional unmanned aerial vehicle detection device that integrates lidar and hyperspectral imaging to obtain lidar and hyperspectral image data.

The main functions include: hyperspectral imaging, with a spectral range of 400-1700nm; a multi-threaded lidar with a ranging distance of up to 300m; an ultra-clear preview camera; a built-in control system in the host; high-precision inertial navigation and solid-state storage. It is suitable for being carried by various drones.

- Spectral range: 400-1700nm
- Spectral resolution: better than 2.5nm
- Spatial pixel count: 1920
- High-precision multi-threaded lidar synchronous measurement
- Ranging distance: 300m.
- Mounted on DJI M350/300 to measure large-area data images.
- Equipped with acquisition and analysis software.

Parameters

Product model	FS-60UCR	FS-62UCR	FS-64UCR
Spectral splitting method	Transmission grating spectral splitting		
Spectral range	400-1000nm	900-1700nm	400-1700nm
Spectral bands	1200	1024	250
Spectral resolution	2.5nm	6.5nm	18nm
Slit width	25um		
Spectral efficiency	> 60%		
Stray light	< 0.5%		
Spatial pixel count	1920	1280	640
Pixel size	5.86um*5.86um	5um*5um	
Imaging speed	Full band 128Hz	Full band 70Hz	Full band 200Hz
Detector	CMOS	InGaAs	
SNR (Peak)	600/1		
Camera output interface	USB		USB or Gigabit Ethernet
Camera lens interface	C-Mount		
Built-in embedded data acquisition and processing unit	Embedded processor with 512GB SSD storage		
Heat dissipation method	155*95*119mm(L*W*H)	Internal air cooling	/
Spectral camera size	135*82*100mm(L*W*H)		
Accessories	Reflectance calibration plate		
Focal length of spectral camera lens	25mm		
Field of view of spectral camera lens	> 25°		
Measurement accuracy of lidar system	5cm		
Lidar ranging distance	300m		
Lidar scanning field of view angle	40.3° (vertical) * 360° (horizontal)		
Lidar point frequency	640,000 points/second (single echo) 1,280,000 points/second (double echo) 1,920,000 points/second (triple echo)		
Lidar built-in camera pixel	26 million (6252*4168)		
Lidar lens focal length	16mm		
Flight platform	DJI M350 RTK / M300 RTK.		
Aircraft size	Unfolded state, without blades: length * width * height 810*670*430 mm Folded state, with blades: length * width * height 430*420*430 mm		
Aircraft weight	Empty aircraft without battery: about 3.77 kg. Empty aircraft with battery: about 6.47 kg		
Maximum takeoff weight of aircraft	9.2kg		
Fastest ascent speed of aircraft	6m/s		
Maximum horizontal flight speed of aircraft	23m/s		
Longest flight time	55 minutes (measured in a windless environment and under no-load conditions by flying forward at a speed of approximately 8 meters per second until the remaining battery power is 0%. For reference only. The actual usage time may vary due to different flight methods, accessories, and environments)		
Operation mode	Easy to operate. No professional drone operator is required. Single-person operation can be realized		
Observation mode	Real-time observation of the aircraft sampling location, hyperspectral image, and spectral data through the ground station. Function		
Correction mode	Radiance correction, reflectance correction, and area correction support batch processing		
Data format	Compatible with spe format, hdr format, and scp format		
Application software	FIGSPEC UAV, FIGSPEC Merage mosaic software, FIGSPEC Studion application software, image analysis software		

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Multispectral camera FS-50 series

The FigSpec® FS-50 series is a new generation of unmanned multispectral cameras from Color Spectrum Technology Company, adapted to the DJI M350/M300RTK flight platform, with 30-180 spectral channels and 2K resolution.

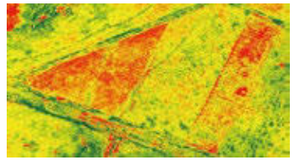
It can meet the application needs of precision agriculture, military defense and homeland security, disaster prevention and forestry monitoring, river and lake ecology, target identification and other industries.

- Ultra-high spectral channels: 30-180 spectral channels (different models)
- 2K spatial resolution
- Global shutter, 12bit high precision sampling data
- Ground station real-time preview data acquisition
- DJI X-Port control and power supply, 512GSSD mass storage
- Dji M350/M300 RTK UAV customization, plug and play
- FIGSPEC UAV real-time flight control software, FIGSPEC Merge puzzle software, FIGSPEC Studion image analysis software

Parameters

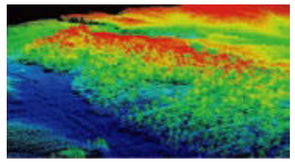
Model number	FS-50/30	FS-50/60	FS-50/90	FS-50/120	FS-50/150	FS-50/180
Number of spectral channels	30	60	90	120	150	180
Spectral channel wavelength	400-1000nm	400-1000nm	400-1000nm	400-1000nm	400-1000nm	400-1000nm
	Per 20nm	Per 10nm	Per 6.6nm	Per 5nm	Per 4nm	Per 3.3nm
	Output a wavelength	Output a wavelength	Output a wavelength	Output a wavelength	Output a wavelength	Output a wavelength
Spectral resolution/half wave width	3.5nm	3.5nm	3.5nm	2.5nm	2.5nm	2.5nm
Spatial resolution	1920					
Sampling rate	128 line/S					
Image sensor	1/1.1 inch CMOS					
Effective pixel	1920					
Shutter type	Global shutter					
Quantization number	12bit					
Visual field	25.36 °					
Ground resolution	2.8 cm @ h120m					
Covering width	54m@h120m					
Optical window	High transmittance optical glass window					
Main engine size	≤155*95*119mm					
Main engine weight	≤840g					
Installation/power supply port	X-Port					
Work loss	45w					
Picture format	12bit.SPE (compatible with third party analysis software such as envi)					
Data storage space	512SSD					
Application software	FIGSPEC UAV real-time flight control software, FIGSPEC Merge puzzle software, FIGSPEC Studion image analysis software					
Shooting method	Real-time acquisition					

Typical application



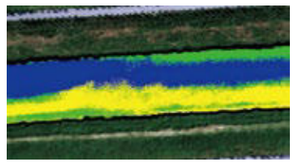
Crop growth assessment Crop growth assessment

FigSpec Studio software is built with NDVI and other vegetation factors to accurately quantify the state of vegetation canopy at different spatial scales, quantitatively assess the health, stress and growth of crops and vegetation, and provide data support for crop growth assessment, yield prediction, disease and pest detection, etc.



Coverage evaluation

Based on the spectral fingerprint information of plants, accurate classification of plants in the region and crop area statistics are carried out to provide quantitative vegetation canopy data to provide data support for scientific research and production of agriculture and forestry ecological industry.



Water quality analysis and monitoring

Using the spectral data and chemical analysis results, the analysis model is constructed to realize the inversion of the classification and water quality parameters of black and odorous water bodies. Combined with spatial information to monitor the impact of domestic sewage and industrial wastewater on surrounding water bodies, help pollution source investigation and water environment assessment.

Water eutrophication monitoring

Spectral data are used to form a classification index to monitor water eutrophication and conduct spatial information statistics. Following the evaluation standards of water eutrophication status, it assists in analyzing water pollution sources such as farmland, aquaculture and fishery, and provides data and powerful data collection tools for pollution source investigation and water environment assessment.