

Drone Hyperspectral Imaging System

ATH9010/11/12

Features:

Integrated VIS camera : support the montage of flight path and realize 3D modeling

Centimeter positioning accuracy: employs RTK technology, GPS positioning accuracy at a class of centimeter.

Push-broom Camer: High working efficiency Full load synchronized trigger: hyperspectral camera, vis camera, POS system synchronized trigger, and accurate GPS data

Remote control: use Bluetooth of laptop or tablet to remote control drone loading

Cloud platform : self-designed double-axis cloud platform

Customized development : Stable cloud platform and loading are available in customized development.

Application:

Monitor Agriculture: plant diseases and insect pest, disaster, categories ID etc.

Forestry: Tree categories identification, Phytomass, nutrient elements, forest health etc.

Water Environment: Water quality parameters, water waste spatial distribution and migration analysis

Soil Pollution: heavy metal waste

Minerals: Mineral mapping, ingredients explore, metallogenic prognosis etc.

City geological substances classification and identification

Description:

It employs DJI M600Pro Drone-borne hyperspectral remote system, which in perfect combination of hyperspectral camera, vis camera and DJI M600Pro, through independent cloud-platform. Our self-developed cloud platform structure and individual POS modular can both in stable control and RTK, rather than depending on drone, as a result it reserves more ports for flying platform. The system fits to large area hyperspectral data synchronization archive, and available in customized development.





ATH-9010:

SN	Components	Items	Specification	Remarks
1	Hyperspectral Camera	Spectral Range	400-1000nm	
2		Spectral Resolution	<2.8nm	Optional
3		Spatial Resolution @35mm lens	0.7mrad@300m	changeable with flying height
4		Spatial Channels	400	4pixels binning
5		Spectral Channels	270	4pixels binning
6		Dynamic Range	12bit	
7		Frame Rate	120Hz	
8		FOV width @35mm lens	15.2°	
9		Focus	16, 25, 35, 75mm	Customized
10	GPS	Accuracy	Positioning accuracy of meter	
11	UAV	Life Span	>15minutes	
12		Max flying	500m	

		height		
13	Reflectance Calibration Board	Reflectance	50%, 15% , 30%, 75%, 95%	Customized
14		Size	0.5m×0.5m	Customized
15		Quantity	1	Customized
16	Cloud Platform	Self stability axis	2 axis	
17		Working time	40min	
18		Motors per axis	2	
19	UAV Loaded Data & Control System	CPU	I5	
20		Memory	8G	Customized
21		Hard disk	120G	Customized

ATP-9011

SN	Components	Items	Specification	Remarks
1	Hyperspectral Camera	Spectral Range	400-950nm	
2		Spectral Resolution	<2.3nm	Optional
3		Spatial Resolution @35mm lens	0.7m@300m	changeable with flying height
4		Spatial Channels	348/696	4/2pixels binning
5		Spectral Channels	260	4pixels binning
6		Dynamic Range	12bit	
7		Frame Rate	50Hz	
8		FOV width @35mm lens	14.6°	
9		Focus	16, 25, 35, 75mm	Customized
10	VIS Camera	Resolution	15-mega Pixels	
11		Take pictures interval	Above 2s adjustable	
12		Life Span	>30minutes	
13	GPS	Accuracy	@centimeter	
14		Frame Rate	50Hz	
15	UAV	Life Span	>15minutes	
16		Max flying height	500m	
17	Ground Station	Working Distance	Radius 10km	Barrier-free
18		Life Span	12h	
19		Control System	Android APP	
20	Reflectance Calibration Board	Reflectance	50%, 15%, 30%, 75%, 95%	Customized
21		Size	0.5m×0.5m	Customized
22		Quantity	1	Customized
23		Self stability axis	2 axis	
24		Working time	40min	

25	Cloud Platform	Motors per axis	2	
26	UAV Loaded Data & Control System	CPU	I5	
27		Memory	8G	Customized
28		Hard disk	240G	Customized

ATP-9012

SN	Components	Items	Specification	Remarks
1	Hyperspectral Camera	Spectral Range	400-1000nm	
2		Spectral Resolution	< 2.3nm	optional
3		Spatial Resolution @35mm lens	0.9mrad@35mm	Change with flying height
4		Spatial Channels	480/960	42pixels binning
5		Spectral Channels	270	4pixels binning
6		Dynamic Range	12bit	
7		Frame Rate	80Hz	
8		FOV width @35mm lens	21.6°	Change with flying height
9	VIS Camera	Resolution	15-mega pixels	
10		Take pictures interval	Above 2s adjustable	
11		Life Span	>30minutes	
12	Inertial Navigation System	Accuracy	@ centimeter	
13		Frequency	80Hz	
14	UAV	Life Span	>15minutes	
15		Max fly height	500m	
16	Ground Station	Working Distance	Radius 10km	Barrier-free
17		Life Span	12h	
18		Control System	Android APP	
19	Reflectance Calibration Board	Reflectance	50%, 15%, 30%, 75%, 95%	Customized
20		Size	0.5m×0.5m	Customized
21		Quantity	1	Customized
22	Cloud Platform	Self stability axis	2 axis	
23		Working time	40min	
24		Motors per axis	2	
25	UAV Loaded Data & Control System	CPU	I7	
26		Memory	8G	Customized
27		Hard disk	480G	Customized

Accessories:

1	ATH-9010 hyperspectral camera
2	UAV MJI M600 Pro (remote-control unit)
3	UAV battery 1set

4	Ipad
5	Standard board
6	Cloud platform battery
7	35mm Lens
8	Sky controlled data acquisition and control software
9	UAV battery charger*1/ipad charger*1/cloud platform battery charger*1
10	Wireless mouse
Optional Accessories:	
1	Standard board/cloth (reflectance10%/20%/30%/40%50% customized)
2	Cloud platform battery
3	Lens(Focal Length16mm/25mm/35mm)
4	Illuminometer
5	Wind meter
6	UAV battery
7	UAV remote control unit
8	Ground station antenna data transfer antenna(ATH9020 & ATH9030)

Software	
Basic functions	Flexible to set exposure time, gain, speed, dynamic display hyperspectral image and curve
Data processing & analyzing	It can acquire cluster analysis, single band, true-and-false color, 20 categories of vegetation colors(customized), 3D image cut, target spectra identification at one button, and unmanned processing batch Not require the 3rd party software
Focusing	Real-time dynamic displaying of hyper-spectral image, scientifically focusing light and dark, Avoid visual focusing error

Material List:

PN	Materials list	QTY	Optional
1	Hyperspectral Imaging Camera (400-1000nm) Host	1set	Standard Config
2	Push-broom equipment	1set	Optional Config
3	Objectives and intensity degree calibration	1set	Standard Config
4	System platform (including operative controller and controlling software)	1set	Standard Config
5	Indoor scan PTZ	1 set	Standard Config
6	Halogen lamp	4 pcs	Standard Config
7	Standard calibration board	1 pcs	Standard Config
8	Exclusive field calibration cloth (1.2m×1.2m)	1 pcs	Standard Config
9	360 field rotation platform	1pcs	Standard Config
10	Tripod	1pcs	Standard Config
11	Exclusive field high capacity Li-battery	2 pcs	Standard Config
12	Dark chamber measurement	1 pcs	Standard Config
13	Transportable field container	1 pcs	Standard Config

14	Calibration white board 10"	1pcs	Optional Config
15	DJI M600pro	1pcs	Optional Config
16	Drone undercarriage	1pcs	Optional Config
17	Airborne data storage and control module	1set	Optional Config

1. Application

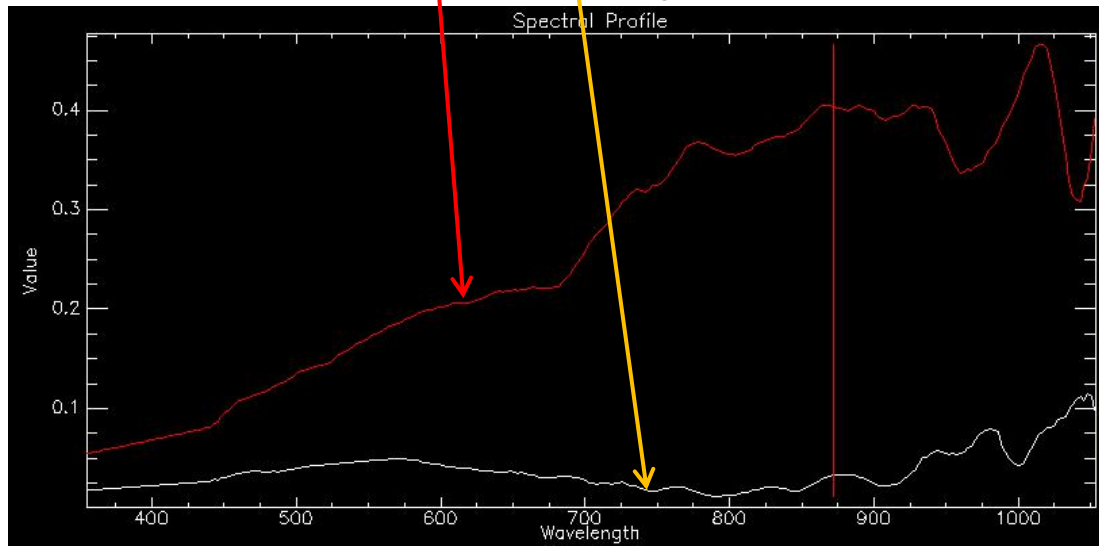
1.1 Airborne Hyperspectral System







RGM combined image



50 Band



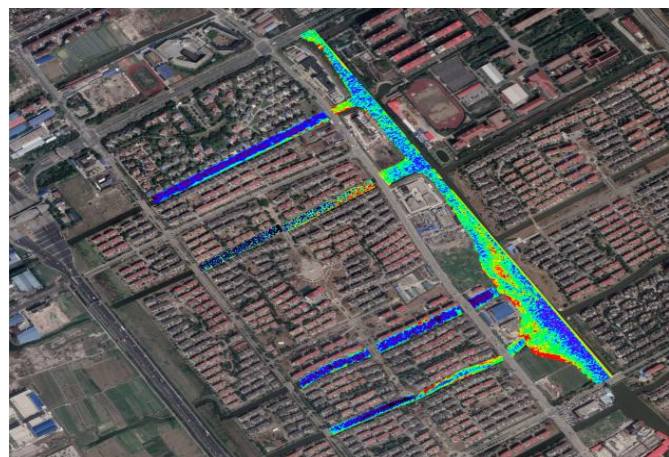
100 Band



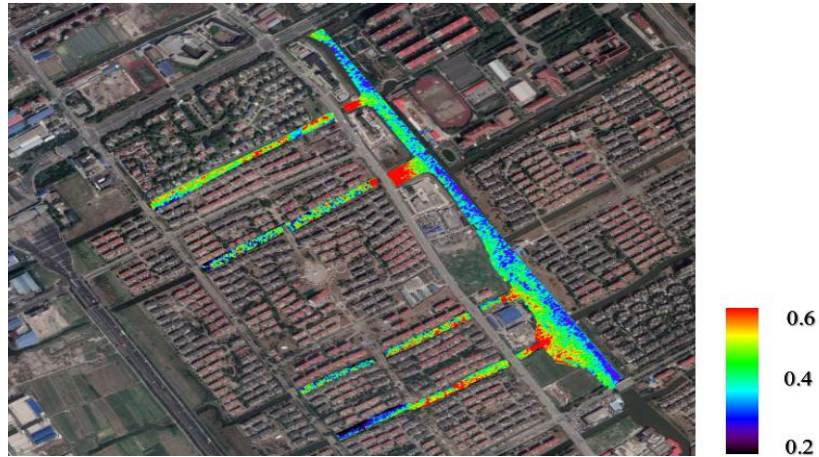
200 Band



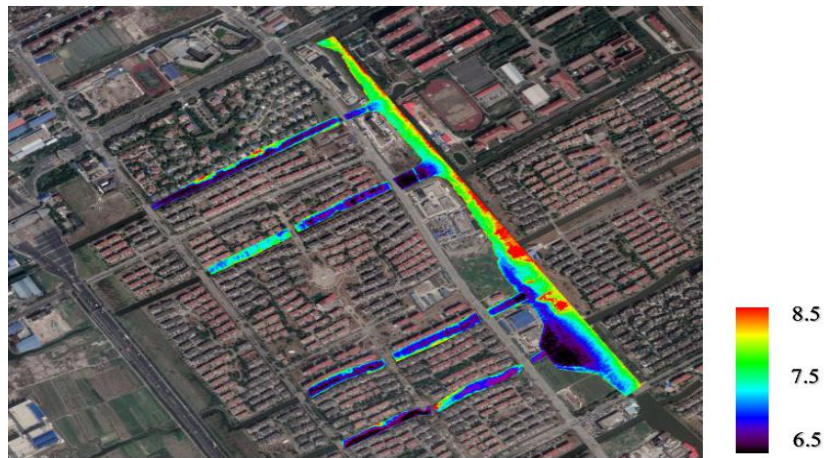
TP concentration distribution



CODMn concentration distribution

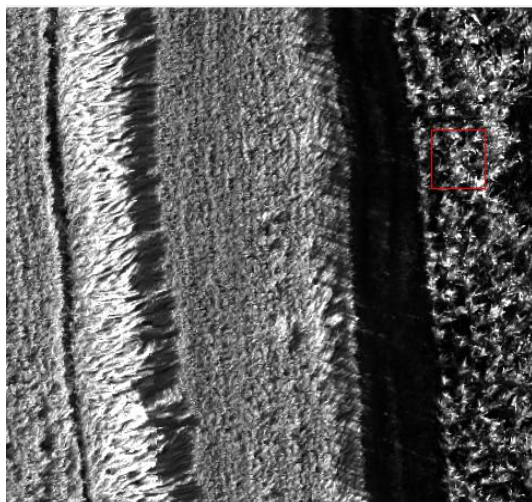


NH3-N concentration distribution

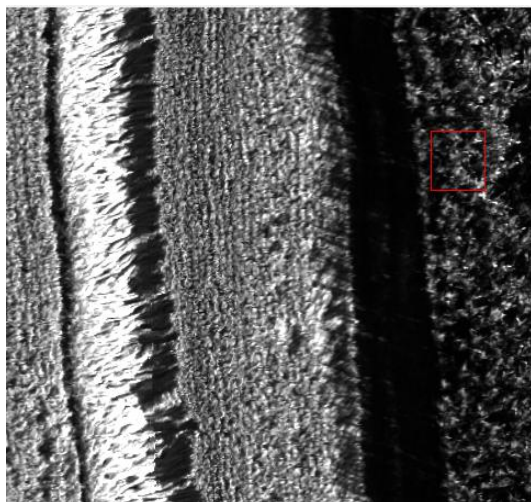


DO concentration distribution

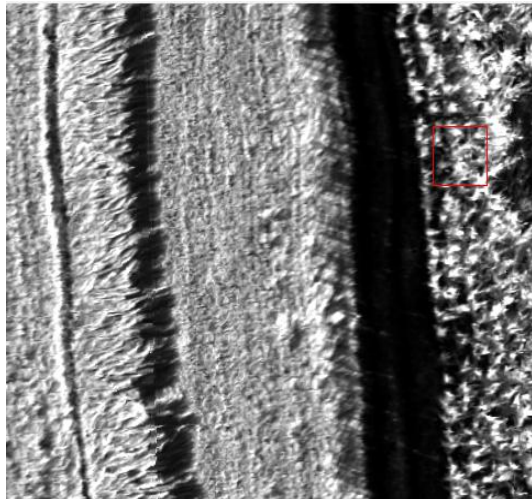
1.2 Airborne Hyperspectral Imaging System Monitors Agriculture



30 Band

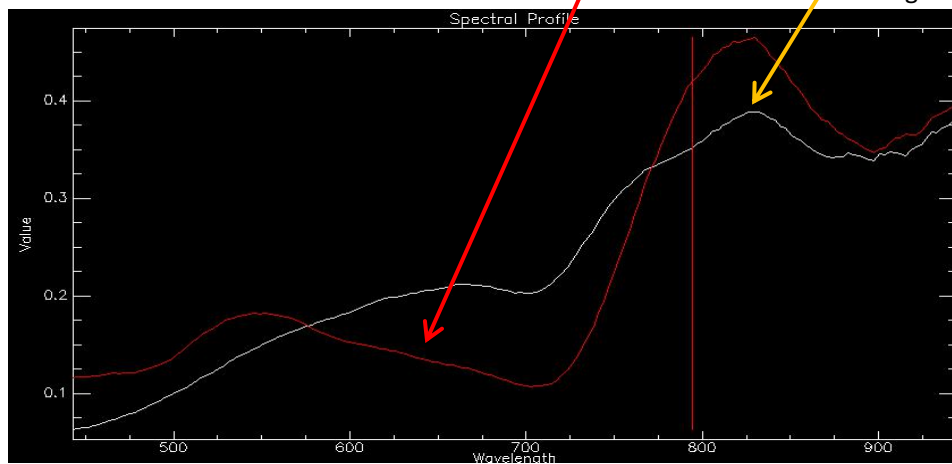


90 Band



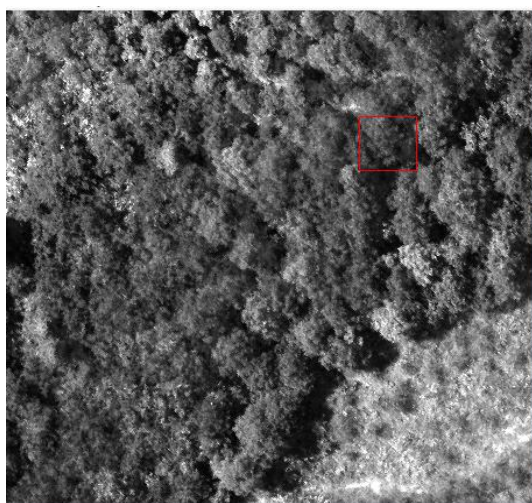
120 Band

RGM combined image

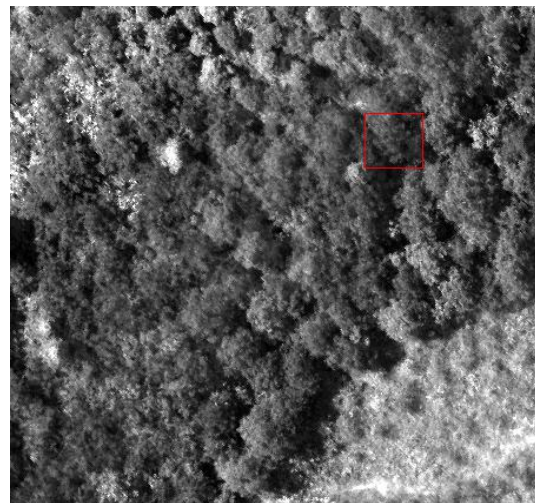


Comparison of spectral curves

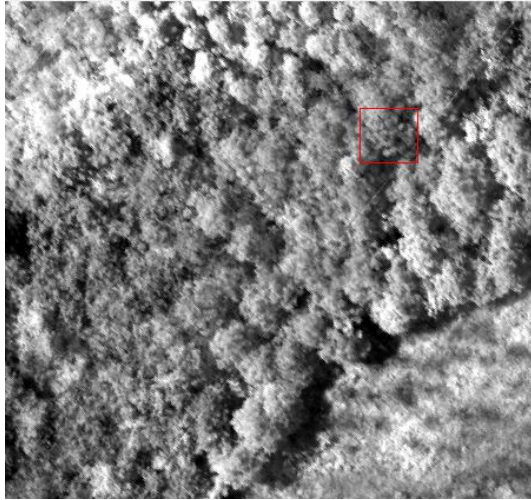
1.2 Airborne Hyperspectral Imaging System Monitors Forestry



50 Band



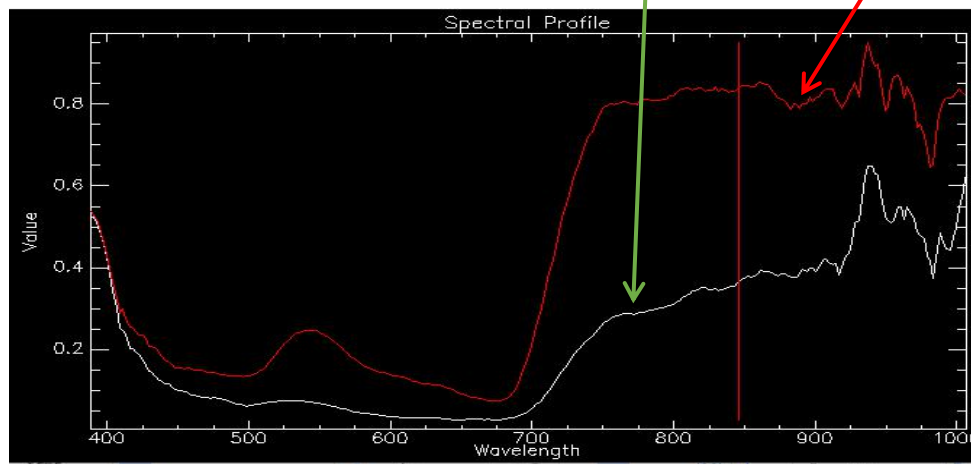
100 Band



50 Band



RGM combined image



Comparison of spectral curves



orthoimage binning



3D modeling