

VNIR Hyperspectral Imager

ATH1010

Features

- Wavelength: 380~1000nm
- Spectral resolution: <1.3 nm
- Optical bench: PGP design
- Max. FOV: 31.7°
- Min. FOV: 1.2 mrad
- Excellent imaging quality
- Advanced algorithm for impression images
- Compact size: 279×64×55 mm
- Light weight < 700g
- No mechanical scan improve reliability

Application

- Geology and mine exploration
- Agricultural growth and output appraisal
- Forestry and plant disease monitor
- Fire prevention monitor
- Coastline and sea environment monitor
- Pasture grass production and growth monitor
- Lake and river monitor
- Remote sensing teaching & research
- Meteorological research
- Ecosystem protection and mine monitor
- Water quality, soils monitor
- Agriculture and animal products quality
- Military, defense and land security
- Disaster prevention

Description

ATH1010 is compact and light VNIR hyperspectral camera fit to be mounted to the drone. With features of high spatial and spectral resolution, wide field imaging.

ATH1010 is made of two parts, imaging lens and hyperspectral imager designed PGP transmission grating technology with excellent aberration.

ATH1010 uses 1920×1200 pixels narrow FOV, or 2048×2048 wide FOV, high performance CCD imaging part with clear imaging and low noise. ATH1010 shape long tube fit to multi-rotor drone. But ATH1010L shape bending optical bench design can fit more to fixed wing drone or short landing gear drone.

ATH1010 can fit to in field measure spectral information of plants, water, soils, the obtained spectrum used for analysis. The physical and chemical properties of plants build modeling with spectral database to be applied to plants classification, plants growth etc. With compact design, high resolution, push broom imaging, this hyper camera can be extended to many application in field, including rotary and indoor scan system, mounted on the drone for remote sensing.

Model	Features
ATH1010	Narrow FOV, 1920×1200 pixels
ATH1010W	Wide FOV, 2048×2048 pixels
ATH1010EM	Cooled high-sensitivity EMCCD, 1280X1024 pixels
ATH1010K	ATH1010 plus housing
ATH1010L	L-shape design, Narrow FOV, fit to fixed wing drone or with short landing gear
ATH1010LT	Straight tube design, narrow FOV, suitable for multi-rotor UAVs
ATH1010LW	L-shape design, Wide FOV, fit to fixed wing drone or with short landing gear



Fig 1 ATH1010K designed housing

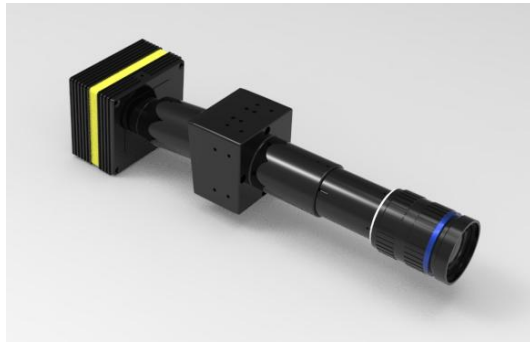
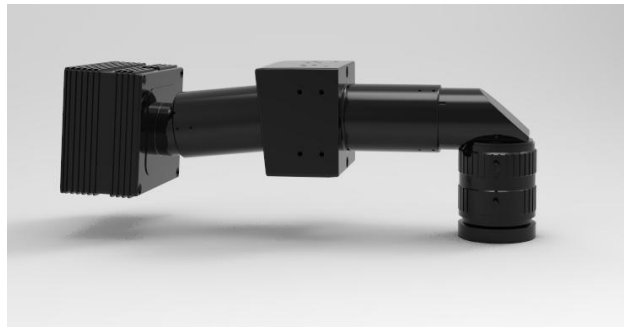


Fig 2 ATH1010



ATH1010L for fixed wing

S/N	Items	Specification			
		ATH1010	ATH1010W	ATH1010LT	ATH1010EM (Devices are under developing.)
1	Spectral Range	400~1000 nm	400~1000 nm	400~1000 nm	400~835 nm
2	Spectral Resolution (FWHM)	no binning: better than 1.3 nm 4X4binning: 1.7nm	No Binning: better than1.3nm 4X4binning: 2.2nm	no binning: better than 1.3 nm 4X4binning: 2.8nm	1.6 nm
3	Sampling Interval	0.31 nm	0.29 nm	0.52 nm	0.42 nm
4	F/#	F/2.6	F/2.6	F/2.6	F/2.6
5	Sensor	CMOS	CMOS	CMOS	Cooled EMCCD
6	Data interface	USB3.0	USB3.0	USB3.0	CamLink
7	Power Consumption	USB power, 3.4 W	USB power, 4.5 W	USB power, 3.4 W	<20W
8	Sensor Size	1/1.2", 11.3 mm × 7.03 mm	11.26 × 11.26 mm	1/1.2", 11.3 mm × 7.03 mm	10.24 x 8.19 mm
9	Sensor Resolution	1920 × 1200	2048 × 2048	1920 × 1200	1280 x 1024
10	Pixel Size	5.86 μm x 5.86 μm	5.5 μm x 5.5 μm	5.86 μm x 5.86 μm	8μm x 8μm
11	Bit Depth	12 bits	14 bits	12 bits	12 bits
12	SNR	45 dB	43 dB	45 dB	NA
13	Dynamic range	73 dB	60 dB	73 dB	55dB
14	Slit Width	15 μm,25μm,etc. optional	15 μm, 25μm,etc. optional	15 μm, 25μm,etc. optional	15 μm, 25μm,etc. optional
15	Binning Mode	4×4 / 2×4	4×4 / 2×4	4×4 / 2×4	1X2
16	Max spatial Bands	1200	2048	1200	1280
17	Max Spectral Bands	1920	2048	1920	1024
18	FOV	11.4°@f=35 mm	18.2°@f=35 mm	11.4°@f=35 mm	12.2°@f=35 mm
19	IIFOV	0.167mrad@f=35 mm	0.157mrad@f=35 mm	0.167mrad@f=35 mm	0.85mrad@f=35 mm
20	Max frame rate	164 fps	90 fps	164 fps	25Hz
21	focal length	25 mm, 35mm optional	25 mm, 35mm optional	25 mm, 35mm optional	25 mm, 35mm optional
22	Dimension	279 mm × 64 mm × 55 mm	239.7mm × 68 mm × 84.9 mm	240 mm × 86 mm × 70 mm	239.7mm × 68 mm × 84.9 mm
23	spatial resolution	0.016m (@35mm, flying height 100m)	0.015m (@35mm, flying height 100m)	0.016m (@35mm, flying height 100m)	none
24	Weight	Less than 545 g	Less than 680 g	Less than 880g	1.2Kg
25	Working Temperature	-20 ~ 50°C			
26	Storage Temperature	-30 ~ 70°C			

Remarks:

*1: Measure in the 2X2 binning, Binning can improve SNR, ATH1010 imaging test

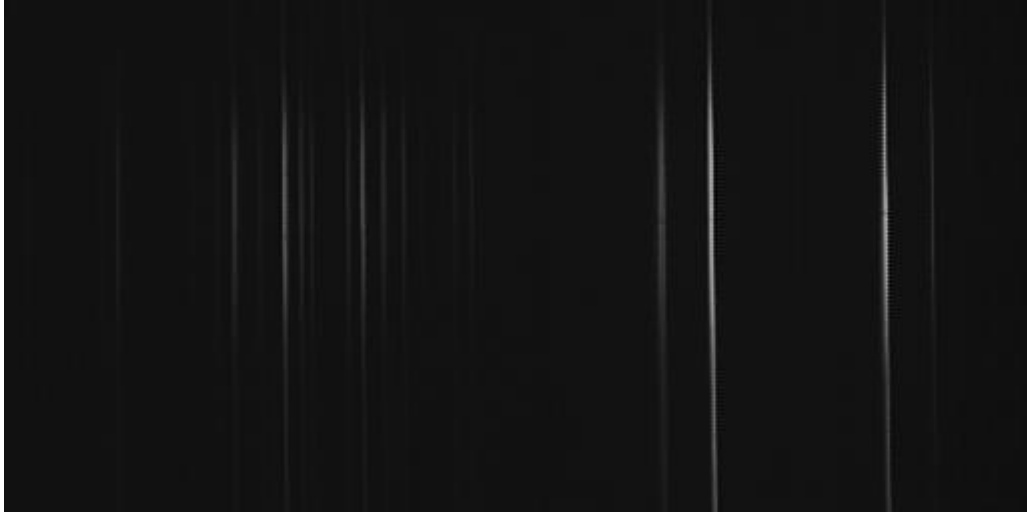


Fig 3 ATH1010 Hg lamp spectrum, resolution $< 1.3 @ 578 \text{ nm}$ (No binning)

1. ATH1010 Field images



Fig 3 ATH1010K/ATH1010KW (ATH1010 和 ATH1010W added housing)



Fig 4 ATH1010K/ATH1010KW



Product data information is current as of publication data. Products conform to specifications per the terms of Optosky Standard warranty.



Fig 5 ATH1010 outlook

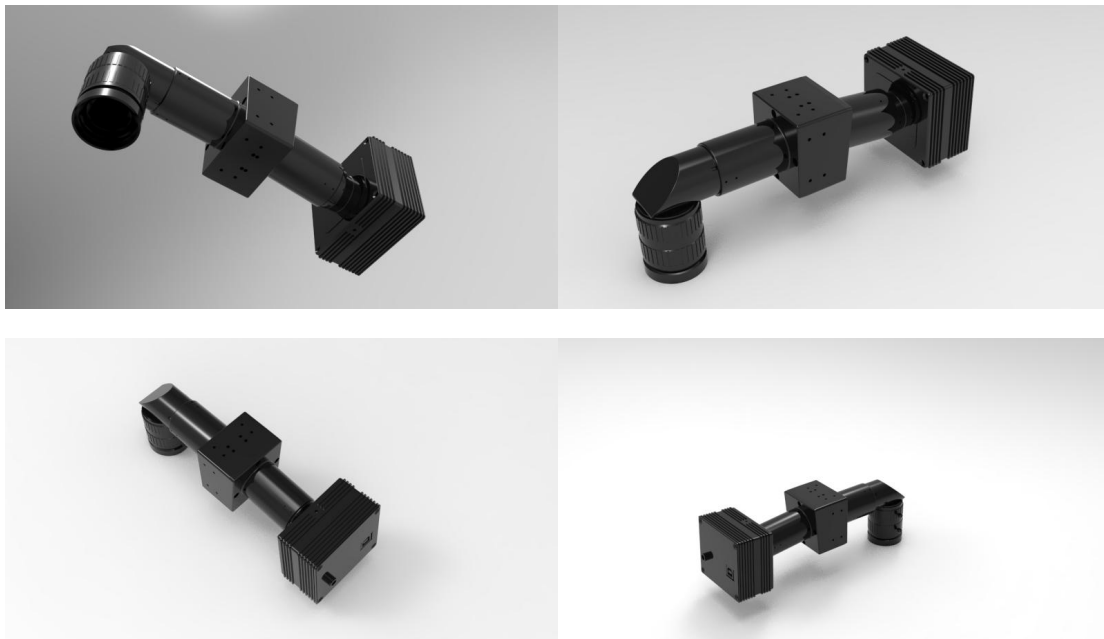


Fig 6 ATH1010L outlook



F 7 ATH1010 mounted on the drone



Fig 8 ATH1010 高光谱成像仪

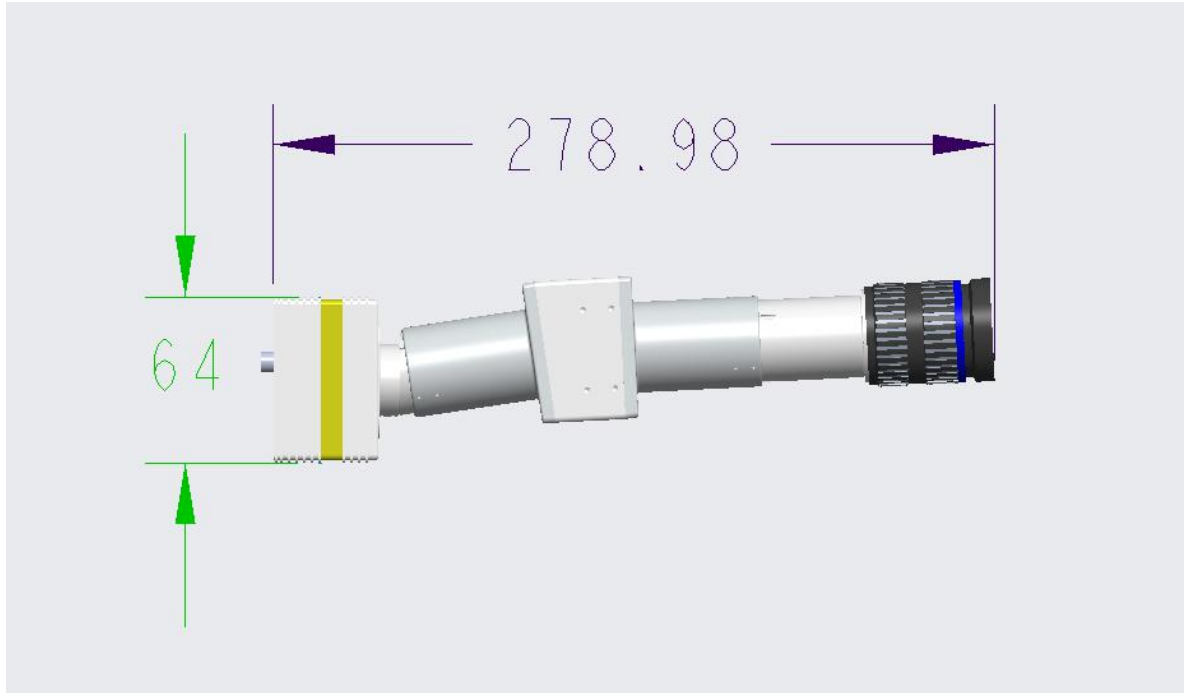


Fig 9 ATH1010 outlook dimension

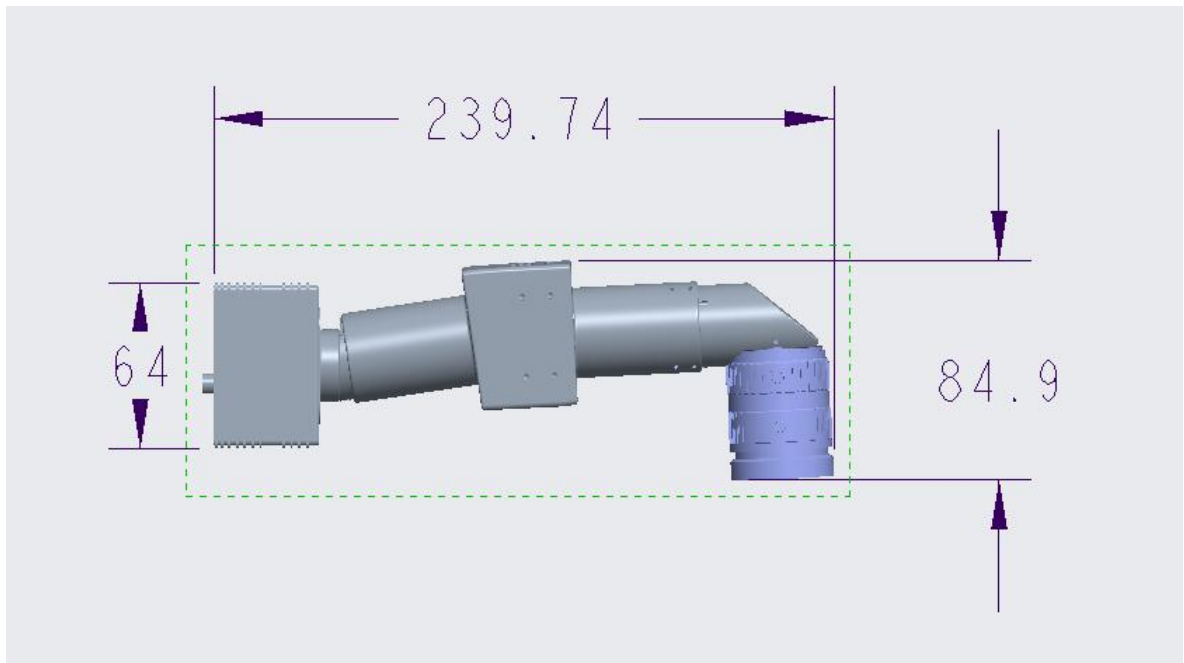


Fig 10 ATH1010L outlook dimension