彩谱® FIGSPEC®

FIGSPEC FS2X Series
Imaging Hyperspectral Cameras

FigSpec® series of imaging hyperspectral cameras adopt transmission grating splitter module with high diffraction efficiency and high sensitivity surface array camera, combined with built-in scanning imaging and auxiliary camera technology, which solves the difficult problems of traditional hyperspectral cameras, such as external push scan imaging mechanism and complex focus. It can be directly integrated with standard C interface imaging lens or microscope to achieve rapid spectral image acquisition.

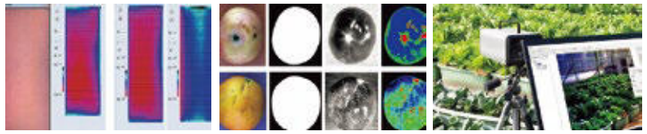
Visible spectrum/NIR：

- Spectral range: 400-1000nm, wavelength resolution better than 2.5nm, up to 1200 spectral channels.
- Image resolution up to 1920*1920

SW-NIR：

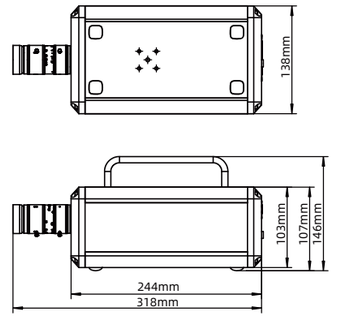
- Spectral range: 900-1700nm, wavelength resolution better than 8nm, up to 254 spectral channels
- Image resolution up to 320*320

Application fields



Screen detection | Fruit and vegetable sorting | Plant pests and diseases detection

Exterior dimensional drawing



Parameters

Model	FS-20	FS-22	FS-23	FS-25
Spectroscopic method	Grating	Grating	Grating	Grating
Image resolution	1920*1920	1920*1920	1920*1920	320*320
Dynamic range	12 bits	12 bits	12 bits	14 bits
Imaging speed	≤15 seconds	≤15 seconds	≤5 seconds	≤5 seconds
Spectral channels number	600	300	1200	254
Spectral region	400-700nm	400-1000nm	400-1000nm	900-1700nm
Spectral FWHM	2.5nm	5nm	2.5nm	8nm
Slit width	25um	25um	25um	25um
Transmission efficiency	60%	60%	60%	60%
Stray light level	0.5%	0.5%	0.5%	0.5%
Pixel size	5.86um*5.86um	5.86um*5.86um	5.86um*5.86um	30um*30um
Detector type	CMOS	CMOS	CMOS	InGaAs
Sensor imaging surface size	11.3*7.1mm	11.3*7.1mm	11.3*7.1mm	9.6mm x 7.68mm
Standard lens focal length	25mm	25mm	25mm	25mm
Minimum working distance	100mm-∞	150mm-∞	100mm-∞	100mm-∞
Field angle	25°	25°	25°	17°
Minimum exposure time	34us	21us	21us	1us
Maximum exposure time	10 seconds	10 seconds	10 seconds	1 seconds
SNR	600/1	600/1	600/1	600/1
Data interface	USB3.0	USB3.0	USB3.0	Gigabit network
Camera lens interface	C-Mount	C-Mount	C-Mount	C-Mount
Accessories	USB3.0 transmission line	USB3.0 transmission line	USB3.0 transmission line	Gigabit network transmission line
Imaging features	With ROI function Single area ROI can be achieved	With ROI function Single area ROI can be achieved	With ROI function Multi area ROI can be achieved	With ROI function Single area ROI can be achieved
Auxiliary imaging features	Auxiliary framing camera to monitor the shooting area	Auxiliary framing camera to monitor the shooting area	Auxiliary framing camera to monitor the shooting area	Auxiliary framing camera to monitor the shooting area
Power supply mode	Built-in battery	Built-in battery	Built-in battery	Built-in battery
Host engine size *	25.5cm*13.8cm*10.7cm	25.5cm*13.8cm*10.7cm	25.5cm*13.8cm*10.7cm	33.5cm*18.2cm*14.3cm
Weight**	Less than 2.8KG	Less than 2.8KG	Less than 2.8KG	Less than 5.3KG
Power dissipation	50W	50W	50W	50W

* size without lens and handle ** weight without lens

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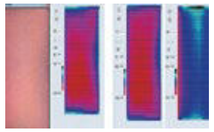
Imaging hyperspectral camera FS-27

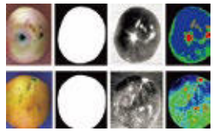
FS-27 imaging hyperspectral camera adopts transmission grating spectral module with high diffraction efficiency and high sensitivity surface array camera, combined with built-in scanning imaging and auxiliary camera technology, to solve the traditional hyperspectral camera needs external push-scan imaging mechanism and difficult to operate such as complex focusing. It can be directly integrated with the standard C interface imaging lens or microscope to achieve fast acquisition of spectral images.

- Spectral method: transmission grating
- Spectral range: 900-1700nm
- Spectral channel: 1024
- Spectral resolution: Better than 6.5nm
- Image resolution: 1280*1280
- Imaging speed: ≤5 seconds
- Slit width: 25unm
- Camera interface: C-Mount

Application fields

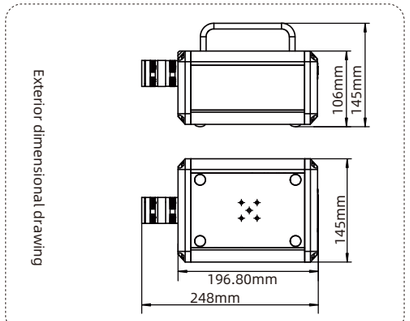


Screen detection



Fruit and vegetable sorting

Plant pests and diseases detection



Parameters

Model number	FS-27
Spectroscopic method	Transmission grating
Image resolution	1280 * 1280
Dynamic range	12 bits
Imaging speed	≤ 5s
Spectral channel	1024
Spectral range	900-1700nm
Spectral resolution (FWHM)	6nm
Slit width	25um
Transmission efficiency	> 60%
Stray light level	< 0.5%
Pixel size	5um*5um
Detector type	InGaAs
Sensor imaging surface dimensions	9.6mm x 7.68mm
Standard lens focal length	25mm
Minimum working distance	150mm
Field Angle	14.5 °
Minimum exposure time	1us
Maximum exposure time	Ten seconds
Signal-to-noise ratio	600/1
Data interface	start
Camera interface	C-Mount
attachment	USB3.0 transmission line
Imaging function	Have ROI capability Multiple regional ROIs can be achieved
Auxiliary imaging function	Auxiliary view camera to realize the monitoring of the shooting area
Power supply mode	Built-in battery power
dimension	Length x width x height :24.8cm*14.5cm*14.5cm
weight	2535g
Power dissipation	50W

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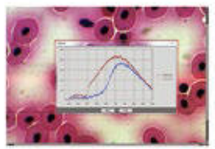
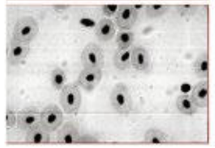
Microscopic hyperspectral imaging system



Any point spectrum

400-1000NM
Hyperspectral imaging



single spectrum imaging

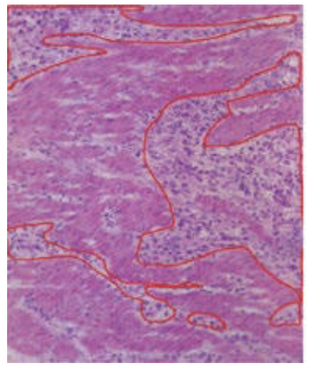
- Combining the advantages of microscope and imaging spectrometer, hyperspectral data acquisition of microscopic images can be performed at any time.
- It can transform existing biological microscopes, fluorescence microscopes, stereo microscopes, metallographic microscopes, etc., and easily transform ordinary microscopes into hyperspectral microscopes.
- Customers can customize microscope models according to their needs.
- The FigSpec® series of imaging spectrometers integrate a visual camera and a hyperspectral camera internally. The visual camera can be used to quickly preview the sampled images, and the hyperspectral image data collection can be performed after confirming that the images meet the requirements.

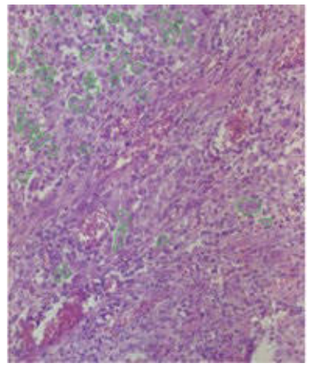
System composition

Hyperspectral imaging spectroscopic camera (optional FS-20/FS-22/FS-23)*1，Lens*1，Microscope (any manufacturer's model can be specified)*1，PC application software*1

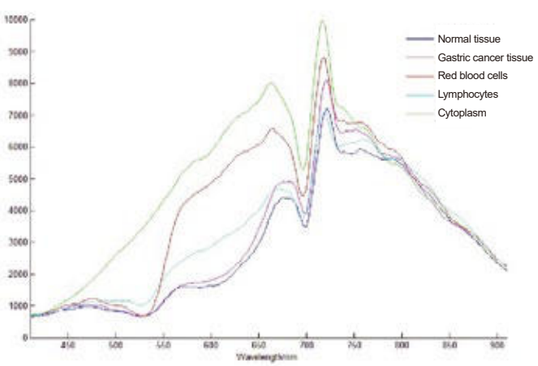
Applications

Example 1: Hyperspectral detection of gastric cancer tissue



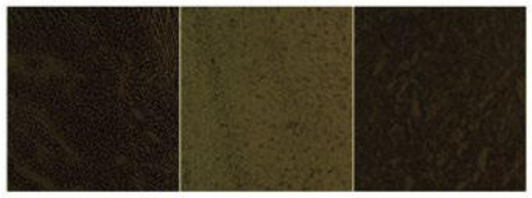


△Gastric cancer tissue markers and gastric cancer cell markers

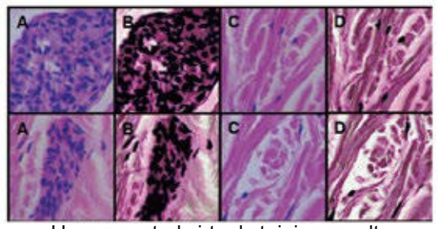


△Comparison of spectral derivatives between gastric cancer tissue and normal tissue

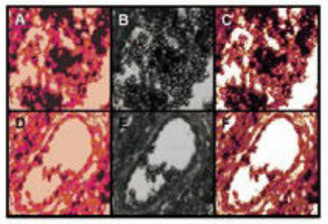
Example 2: Virtual staining of pathological sections based on hyperspectral technology



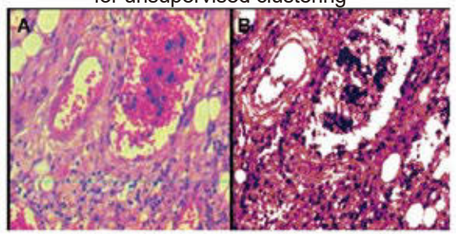
Hyperspectral pseudocolor images of unstained sections



Hyperspectral virtual staining results for unsupervised clustering



Hyperspectral virtual staining results of unsupervised clustering combined but spectral images



Comparison of hyperspectral virtual staining results and H-E staining