

Industrial VNIR

Hyperspectral Cameras

➤ Description

This visible near-infrared hyperspectral camera is specifically designed for use in production and testing scenarios, including food quality inspection, grain grading, and tobacco quality testing.



Large field of view



High cost-effectiveness



Fast processing speed



The IC series industrial grade hyperspectral cameras, independently developed by NWSPEC using prism grating dispersion spectroscopic technology, offer advantages such as high spectral resolution, high efficiency, good consistency, and easy use. At the same time, industrial applications require equipment with high speed, powerful, and stable performance.

The IC series high frame rate and large field of view characteristics can meet the higher efficiency requirements of industrial users, and its extremely high cost-effectiveness can help customers obtain higher investment returns.




Specification

Industrial VNIR Hyperspectral Cameras				
	IC-10C	IC-10N	IC-10U	IC-10S
Spectral range	400-780nm	400-1000nm	400-1000nm	400-1000nm
Spectral resolution	≤ 2.5nm	≤ 2.5nm	≤ 2nm	≤ 5nm
F-number	F/2.6	F/2.4	F/2.4	F/1.7
Sensor	CMOS	CMOS	CMOS	CMOS
Data interface	CameraLink	CameraLink	CameraLink	CameraLink
Power supply	12V DC, <10W	12V DC, <10W	12V DC, <10W	12V DC, <10W
Pixel size	9μm x 9μm	9μm x 9μm	9μm x 9μm	9μm x 9μm
Bit depth	12 bits	12 bits	12 bits	12 bits
Spatial pixels	1200	1200	≥1500	≥1150
Spectral bands	360(2x)	360(2x)	228 (4x)	224
Field of View (FOV)	≥65°@f=8mm	≥65°@f=8mm	≥80°@f=8mm	≥80°@f=8mm
Instantaneous Field of View (IFOV)	3.125mrad@f=8mm	3.125mrad@f=8mm	3.125mrad@f=8mm	3.91mrad@f=8mm
Frame rate(at full bands)	≥750fps (4x)	≥500fps (4x)	≥450fps (4x)	≥1000fps (4x)
Lens mount	C-Mount			
Dimensions	220*80*80mm (excluding lens)	250*80*80mm (excluding lens)	250*80*80mm (excluding lens)	200*160*80mm (excluding lens)
Weight	< 2.5 kg	< 3 kg	< 2.5 kg	< 3 kg
Operating temperature	0-40°C			
Storage temperature	0-50°C			

Industrial NIR

Hyperspectral Cameras

➤ Description

It can be applied to the online process of classification and recycling of plastic waste. By using the IC near-infrared hyperspectral camera, automatic sorting software, and deep learning algorithm developed by NWSPEC, plastic waste with different compositions can be accurately and quickly classified, achieving a maximum sorting speed of over 5m/s.



Large field of view



High cost-effectiveness



Fast processing speed



The IC series industrial-grade hyperspectral cameras, independently developed by NWSPEC using prism grating dispersion spectroscopic technology, offer advantages such as high spectral resolution, high efficiency, good consistency, and ease of use. Meanwhile, industrial applications demand equipment with high speed, strong performance, and stable operation. The IC series high frame rate and large field of view characteristics can meet the high-efficiency requirements of industrial users, while its extremely high cost-effectiveness helps customers achieve higher investment returns.

The IC series hyperspectral cameras have flexible pixel merging and band selection functions, which greatly reduce the difficulty of online data transmission and processing for users. They can be widely used in industrial sorting, precision agriculture, food testing, pharmaceuticals, environmental monitoring, and other fields.



**Specification**

Industrial NIR hyperspectral cameras		
	IC-17U	IC-17S
Spectral range	900-1700nm	900-1700nm
Spectral resolution	≤ 6nm	≤ 8nm
F-number	F/2.0	F/2.0
Sensor	InGaAs (TE Cooled)	InGaAs (TE Cooled)
Data interface	Camera Link	Camera Link
Power supply	12V DC, 8.4W (TEC OFF) / 16W (TEC ON)	12V DC, 8.4W (TEC OFF) / 16W (TEC ON)
Pixel size	15μm x 15μm	15μm x 15μm
Bit depth	12 bits	12 bits
Spatial pixels	640	640
Spectral bands	512	>224
Field of View (FOV)	≥60°@f=8mm	≥75°@f=8mm
Instantaneous Field of View (IFOV)	1.875mrad@f=8mm	2.5mrad@f=8mm
Frame rate(at full bands)	700fps	1400fps
Lens mount	C-Mount	C-Mount
Dimensions	326*105*85mm (excluding lens)	244*205*98mm (excluding lens)
Weight	< 3kg	< 4kg
Operating temperature	0-40°C	0-40°C
Storage temperature	0-50°C	0-50°C



250-490nm UV

Hyperspectral Cameras

› Description

The RC-30-02 ultraviolet hyperspectral camera employs NWSPEC's proprietary prism-grating dispersion spectroscopy technology. This technology offers multiple advantages, including high spectral resolution, high efficiency, good consistency, and ease of use. It delivers high-quality "all-in-one spectrum" data and finds extensive applications in fields such as biomedical research, forensic science, art authentication, and environmental monitoring.



› Application

• High-voltage transmission line detection

The use of ultraviolet cameras can effectively monitor high-voltage power grid arcs in real time: ultraviolet cameras can quickly capture weak ultraviolet arc discharge signals in the early stages of arc discharge, and detect potential safety hazards in a timely manner. Meanwhile, UV cameras can accurately distinguish arc discharge signals from other light source signals, reducing false alarm rates.

• Flame detection

In the steel industry and aerospace sector, high-temperature flames in corresponding devices often reflect the working status of related equipment and the health status of processes. Monitoring can be carried out using ultraviolet hyperspectral cameras.



UV Hyperspectral Camera	
	RC-30-02
Spectral range	250-490nm
Spectral resolution	≤ 2nm
F-number	F/2.8
Sensor	CMOS
Data interface	GigE
Power supply	12V DC, 13.6w
Sensor resolution	1280 x 1024
Pixel size	7.4μm x 7.4μm
Bit depth	12 bit
Effective slit length	8.8mm
Slit width	20μm
Recommended binning	4×4
Spatial pixels	>560 (2x)
Spectral bands	>250 (2x)
Field of View (FOV)	18.8°@25mm
Instantaneous Field of View (IFOV)	0.8mrad@25mm
Frame rate	40fps@12bit / 200fps@10bit
Dimensions	Approx. 335mm x 88mm x 83mm
Weight	< 2Kg
Operating temperature	0-40°C
Storage temperature	0-50°C

400-1000nm VNIR

Hyperspectral Cameras

◁ Description

The RC series hyperspectral cameras feature a proprietary slit-based prism-grating imaging system that employs push-broom scanning. This design leverages the technical advantages of volume holographic gratings, ensuring internationally competitive performance across key indicators.

Available in modular configurations, the RC series offers multiple spectral bands across the 400-1000 nm range. Users can select from detector options optimized for applications such as vis-NIR spectroscopy, macroscopic imaging, and extended near-infrared analysis.



- The frequency range covers 400-1000nm;
- By using a prism grating splitting method, more accurate and high-resolution spectral data can be obtained;
- The self-developed module can be adapted to various detectors, with multiple spectral bands, sizes, and detector types to choose from;
- The product has the advantages of small size, light weight, good spectral characteristics, and high cost-effectiveness;
- High imaging quality optical design for the entire target area, with a spot diameter of < 0.5 pixels;
- The lens interface is a standard C-Mount, and the focal length can be changed according to user needs;


Specification

VNIR Hyperspectral Cameras			
	RC-30-01	RC-60-01	RC-60-03
Spectral range	400-1000nm	400-1000nm	400-1000nm
Spectral resolution	≤ 2.8nm	≤ 2.3nm	≤ 2.3nm
F-number	F/2.6	F/2.4	F/2.4
Sensor	CMOS	CMOS	SCMOS(TE Cooled)
Data interface	GigE / USB3.0	GigE	USB3.0
Power supply	12-24V DC, 3W	12V DC, 4.3W	12V DC, 4.3W
Sensor resolution	1920 x 1200	1600 x 1100	2048*2048
Pixel size	5.86 μm x 5.86 μm	9 μm x 9 μm	6.5 μm x 6.5 μm
Bit depth	12bits	12bits	12bits
Effective slit length	11.3mm	14.2mm	13.3mm
Slit width	25μm	30μm	30μm
Recommended binning	4x4	4x4	4x4
Spatial pixels	480	390	512
Spectral bands	300	228	300
Field of View (FOV)	15.6°@f=35mm	22.9°@f=35mm	21°@f=35mm
Instantaneous Field of View (IFOV)	0.71mrad@f=35mm	0.85mrad@f=35mm	0.74mrad@f=35mm
Frame rate	50fps/128fps	68fps	72fps
Dimensions	Approx.240x80x70 mm	Approx.280x80x70mm	Approx.350x90x90mm
Weight	< 1.5 kg		< 2 kg
Operating temperature	0-40°C		
Storage temperature	0-50°C		

900-1700nm NIR

Hyperspectral Cameras

› Description

The RC series hyperspectral camera employs NWSPEC's proprietary prism-grating dispersion spectroscopy technology. This technology offers multiple advantages, including high spectral resolution, high efficiency, good consistency, and ease of use. It finds extensive applications in industrial sorting, precision agriculture, color inspection, food safety testing, pharmaceutical quality control, environmental monitoring, and other related fields.



- **High-fidelity and more precise spectral data**

For all industrial online application scenarios, dispersive linear array push-broom imaging technology is optimal for acquiring stable high-speed data. The RC series industrial-grade hyperspectral cameras not only enable high-speed imaging but also capture spectral information across all wavelength bands in the target area simultaneously, ensuring the spectral fidelity and accuracy of each spatial pixel.

- **High sensitivity**

The RC series hyperspectral cameras feature a high-transmittance optical design (F/2.0), typically requiring only a single line light source to meet data quality standards. In contrast, other spectroscopic techniques—such as tunable filters or linear variable filters—demand a larger light source area and tens of times the light intensity to achieve comparable signal-to-noise ratios (SNR).



**Specification**

NIR Hyperspectral Cameras		
	RC-10-01	RC-10-05
Spectral range	900-1700nm	900-1700nm
Spectral resolution	≤ 5nm	≤ 6nm
F-number	F/2.0	F/2.0
Sensor	InGaAs(TE Cooled)	InGaAs(TE Cooled)
Data interface	GigE	GigE
Power supply	12V DC, <5 W (TEC off) / 12W (TEC on)	12V DC, 8.4W (TEC OFF) / 16W (TEC ON)
Sensor resolution	320*256	640*512
Pixel size	30 μm x 30 μm	15μm x 15μm
Bit depth	14 bits	14 bits
Effective slit length	9.6mm	9.6mm
Slit width	30μm	30μm
Recommended binning	1x1	1x1
Spatial pixels	320	640
Spectral bands	256	512
Field of View (FOV)	15.6°@f=35mm	15.6°@f=35mm
Instantaneous Field of View (IFOV)	0.85mrad@f=35mm	0.43mrad@f=35mm
Frame rate	100fps/300fps	175fps
Dimensions	300mm*105mm*90mm (excluding lens)	300mm*105mm*90mm (excluding lens)
Weight	< 3kg	< 3kg
Operating temperature	0-40°C	0-40°C
Storage temperature	0-50°C	0-50°C



1000-2500nm SWIR

Hyperspectral Cameras

➤ Description

The RC series short-wave infrared (SWIR) hyperspectral cameras leverage NWSPEC's proprietary prism-grating dispersion spectroscopy technology, which offers key advantages including high spectral resolution (≤ 5 nm), operational efficiency, consistency, and ease of use.



➤ Application

Mining

Geological Prospecting | Ore Quality Screening | Mineral Mapping | Mineral Composition Analysis

Industry

Industrial Sorting (e.g., crops, fruits, waste classification, etc.)
Defect Detection (e.g., steel products, photovoltaic modules, LCD screens, etc.)
Inspection (e.g., photovoltaic power generation system inspection, etc.)

Defense & Justice

Enemy situation investigation; Anti camouflage, anti landmine;
Criminal investigation and technical investigation;



Specification

	RC-10-01	RC-10-03
Spectral range	1000-2500nm	1000-2500nm
Spectral resolution	≤ 10nm	≤ 10nm
F-number	F/2.0	F/2.0
Sensor	HgCdTe (TEC)	HgCdTe (Stirling)
Data interface	Camera Link	USB 3.0/GigE
Power supply	12V DC, Max.52w	24V DC
Sensor resolution	320 x 256	640 x 512
Pixel size	30 μm x 30 μm	15 μm x 15 μm
Bit depth	14bits	14bits
Effective slit length	9.6mm	9.6mm
Slit width	30μm	30μm
Recommended binning	1x1	1x1
Spatial pixels	320	640
Spectral bands	256	≥400
Field of View (FOV)	21.8°@f=25mm	21.8°@f=25mm
Instantaneous Field of View (IFOV)	1.2mrad@f=25mm	1.2mrad@f=25mm
Frame rate	340fps	100fps
Dimensions	350mm*150mm*150mm (excluding lens)	500mm*150mm*150mm (excluding lens)
Weight	< 6kg	< 8kg
Operating temperature	0-40°C	0-40°C
Storage temperature	0-50°C	0-50°C



400~1700nm

Hyperspectral Cameras

VNIR-NIR Broadband Hyperspectral Camera		
	RC-10-01	
	VNIR	NIR
Spectral range	400-1000nm	900-1700nm
Merged spectral range	400-1700nm	
Spectral bands	300	512
Combined spectral bands	≥700	
Spectral resolution	≤ 2.8nm	≤ 6nm
F-number	F/2.6	F/2.0
Sensor	CMOS	InGaAs(TE Cooled)
Data interface	USB 3.0	GigE
Pixel size	5.86 μm x 5.86 μm	15μm x 15μm
Bit depth	12bits	14bits
Effective slit length	11.3mm	9.6mm
Slit width	25μm	25μm
Recommended binning	1x1	1x1
Spatial pixels	1920	640
Merged Spatial pixels	640	
Combined Field of View (FOV)	21°@f=25mm	
Combined instantaneous field of view (IFOV)	1mrad@f=25mm	
Frame rate (Max Frame)	128fps	125fps
Power supply	12V DC, 4.3W	12V DC, 16W (TEC ON)
Total power	Max 20-25w	

400~2500nm

Hyperspectral Cameras

VNIR-SWIR Broadband Hyperspectral Camera		
	RC-10-05	
	VNIR	SWIR
Spectral range	400-1000nm	1000-2500nm
Merged spectral range	400-2500nm	
Spectral bands	300	≥400
Combined spectral bands	≥640	
Spectral resolution	≤ 2.8nm	≤ 10nm
F-number	F/2.6	F/2.0
Sensor	CMOS	HgCdTe (Stirling Cooler)
Data interface	USB 3.0	CameraLink/GigE
Pixel size	5.86 μm x 5.86 μm	15μm x 15μm
Bit depth	12bits	14bits
Effective slit length	11.3mm	9.6mm
Slit width	25μm	25μm
Recommended binning	1x1	1x1
Spatial pixels	1920	640
Merged Spatial pixels	640	
Combined Field of View (FOV)	21°@f=25mm	
Combined instantaneous field of view (IFOV)	1mrad@f=25mm	
Frame rate (Max Frame)	128 fps	100 fps
Power supply	12V DC, 4.3W	24V DC, 30W
Total power	Max 35w	