

HYPER SPECTRAL NIR CAMERA



ISO 9001:2015 Certified

Hyper spectral Cameras



Specifications

Model	UV-HIC200G	VIS-HIC400G	VIS-HIC550P
			
Hyper Spectral Camera	Wavelength Range 200-400nm	Wavelength Range 400-800nm	Wavelength Range 400-950nm
Optical Layout	Czerny-Turner	Czerny-Turner	PB Design
Dispersion Element			Prism
Mirror Design	Off-axis parabolic	Off-axis parabolic	Off-axis parabolic
Focal Length	100 mm	100 mm	
Entrance/Exit Ports	1	1	1
Slit Type	Fixed Slit Design	Fixed Slit Design	Fixed Slit Design
Wavelength Range	200 - 400 nm	400 - 800 nm	400 - 950 nm
Output Focal Plane	12 × 12 mm	12 × 12 mm	: 12 × 12 mm
Sensor Type	Progressive Scan CMOS	CMOS	CMOS
Imaging Sensor	Sony IMX296 Phosphor Coated		
Pixel Pitch	3.4 μm	4 μm	4 μm
Pixel Format		Mono16	Mono16
Dynamic Range	66 dB	60 dB	60 dB
Exposure Time	29 μs to 30 sec	4 μs to 145 milli Sec.	4 μs to 145 milli Sec.
Shutter Type	Global	Globa	Global
Interface	USB 3.0	USB 3.0	USB 3.0
Spectral Channels	1440	1280	1280
Spatial Pixels	1080	1024	1024
Spectral Imaging Ratio	1080 × 1 (Single Shot)	1280 × 1 (Single Shot)	1280 × 1 (Single Shot)
Average Spectral Resolution	1nm	1nm	1.5nm
Output Format	.bil or equivalent	.bil or equivalent	.bil or equivalent
Front Optics	8/16mm VIS f4 Fixed focal length Lens	8/16mm VIS f4 Fixed focal length Lens	8/16mm VIS f4 Fixed focal length Lens
Lens Mount	C Mount	C Mount	C Mount
Operating Temperature	-20 to 50 Degree C	-20 to 50 Degree C	: -20 to 50 Degree C
Construction	Aluminum Alloy B51S	Aluminum Alloy B51S	Aluminum Alloy B51S
Finish	Black Anodized	Black Anodized	Black Anodized

Model	SWIR-HIC800G	VIS-SWIR-HIC1300P
		
Hyper Spectral Camera	Wavelength Range 900-1700nm	Wavelength Range 400-1700nm
Optical Layout	Czerny-Turner	PB Design
Dispersion Element		Prism
Mirror Design	Off-axis parabolic	Off-axis parabolic
Focal Length	100 mm	
Wavelength Range	900 - 1700 nm	
Grating	SWIR Grating	
Entrance/Exit Ports	1	1
Slit Type	Fixed Slit Design	Fixed Slit Design
Output Focal Plane	12 × 12 mm	12 × 12 mm
Sensor Type	InGaAs (Dual Mode: Linear & Log)	SenSWIR
Cooling		TEC1
Pixel Pitch	15 μ m	5 μ m
Gain Range		: 0- 42 dB Analog and Digital
Dynamic Range	120 dB (Log), 63 dB (Low Gain), 49 dB (High Gain)	57 dB
Exposure Time		20.5 μ s to 10 Sec.
Shutter Type	Global Snapshot	Global
Interface	USB 3.0	USB 3.0
Cooling	TEC1	
Spectral Channels	640	640
Spatial Pixels	480	480
Spectral Imaging Ratio	640 × 1 (Single Shot)	640 × 1 (Single Shot)
Average Spectral Resolution	2.5 nm	5nm
Output Format	.bil or equivalent	.bil or equivalent
Front Optics	8/16mm SWIR f4 Fixed focal length Lens	8/16mm VIS-SWIR f4 Fixed focal length Lens
Lens Mount	C Mount	C Mount
Operating Temperature	-20 to 50 Degree C	: -20 to 50 Degree
Construction	Aluminum Alloy B51S	Aluminum Alloy B51S
Finish	Black Anodized	Black Anodized

Hyper Spectral Imaging Systems



Hyper Spectral Imaging,

- Benchtop – Reflectance Mapping
- Benchtop – Reflectance + Transmission Mapping
- Outdoor Portable Hyperspectral Imaging System – Rotary Scanning
- Airborne Hyperspectral Imaging System – Remote Sensing
- Aquatic Hyperspectral Imaging, Drone-Based System
- Laser Induced Fluorescence & PL hyperspectral imaging
- Microscopic Hyperspectral Imaging System



Hyper Spectral Imaging, Benchtop – Reflectance Mapping

Model : HO-HIS-B300R

Comprehensive Optical Characterization of Samples

A benchtop hyperspectral reflectance mapping system is ideal for analyzing the optical properties of materials by capturing both spatial and spectral information across the visible–NIR/SWIR range.

Key Advantage: Reflectance mapping allows non-contact, non-destructive, full-field spectral analysis, enabling researchers to extract chemical, physical, and structural information from every pixel.

Choose Camera (Options)	UV-HIC200G, 200-400nm VIS-HIC400G, 400-800nm VIS-HIC550P, 400-950nm SWIR-HIC800G, 900-1700nm VIS-SWIR-HIC1300P, VIS-SWIR-HIC1300P
Scan Assembly & Sample Stage	
Scan Bed Design	Conveyor/Flat bed
Operation	
Drive Mechanism	
Resolution	
Scan Bed Scan Length	300 mm
Scan Bed Width	300 mm
Sample Stage Operation	Motorized
Drive Mechanism	Stepper Motor Controlled
Resolution	0.1 mm
Scanning	Programmable
Construction	Aluminum Alloy B51S
Finish	Black Anodized
Illumination System	
Type	Angled Illumination
Number of Lamps	2
Light Source	Quartz Halogen Lamp
Wavelength Range	380 - 2400 nm
Illumination Design	Line Illumination
Lamp Housing	Forced Air-Cooled Type
Housing Material	Black Anodized Aluminum and SS
Software Synchronized ON/OFF control	Yes

Example Applications

Pharmaceuticals

- Mapping chemical uniformity in tablets and capsules.
- Detecting counterfeit drugs by comparing reflectance spectra to reference libraries.

Geology & Mining

- Differentiating minerals (quartz, kaolinite, hematite, carbonates, clays) based on unique reflectance signatures.
- Fast, non-destructive mineral classification for exploration and sample validation.

Food Quality & Agriculture

- Measuring surface reflectance to detect bruises, ripeness, or contamination in fruits and grains.
- Quantifying moisture, sugar, or fat content in agricultural produce.

Cultural Heritage & Art Conservation

- Reflectance mapping of paintings and manuscripts to reveal underdrawings, pigment distribution, or hidden restorations.
- Identifying degradation or chemical changes in artifacts.

Advanced Material Research

- Thin-film thickness and coating uniformity measurements.
- Characterization of semiconductors, polymers, or composite surfaces.

Hyper Spectral Imaging, Benchtop – Transmission & Reflectance Mapping

Model : HO-HIS-B300RT

By combining reflectance and transmission hyperspectral imaging in a single benchtop setup, researchers can obtain a complete spectral fingerprint of a material. Reflectance reveals surface and coating properties, while transmission uncovers internal composition and thickness-dependent features.

- **Key Advantage:** The dual-mode mapping approach enables surface + bulk analysis in one system, making it especially valuable for industries where both external quality and internal composition matter.

Model No	HO-HIS-B300RT
Choose Camera (Options)	UV-HIC200G, 200-400nm VIS-HIC400G, 400-800nm VIS-HIC550P, 400-950nm SWIR-HIC800G, 900-1700nm VIS-SWIR-HIC1300P, VIS-SWIR-HIC1300P
Scan Assembly & Sample Stage	
Scan Bed Design	Conveyor/Flat bed
Scan Bed Scan Length	300 mm
Scan Bed Width	300 mm
Sample Stage Operation	Motorized
Drive Mechanism	Motor Controlled
Resolution	0.1 mm
Scanning	Programmable
Construction	Aluminum Alloy B51S
Finish	Black Anodized
Illumination System	
Type	Angled Illumination & Bottom Scan Illumination
Number of Lamps	3
Light Source	Quartz Halogen Lamp
Wavelength Range	380 - 2400 nm
Illumination Design	Line Illumination
Lamp Housing	Forced Air-Cooled Type
Housing Material	Black Anodized Aluminum and SS
Software Synchronized ON/OFF control	Yes

Example Applications

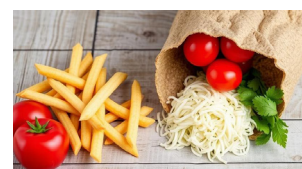
Pharmaceuticals & Life Sciences

- **Reflectance mapping:** Detects surface coatings, uniformity of tablet glazing, and defects.
- **Transmission mapping:** Reveals active ingredient distribution, concentration, and hidden layers inside tablets or capsules.



Food Quality & Agriculture

- **Reflectance:** Identifies surface spoilage, ripeness, or contamination.
- **Transmission:** Quantifies internal parameters such as moisture, sugar, or fat content, enabling grading of fruits, grains, and processed foods.



Polymers & Thin Films

- **Reflectance:** Evaluates surface roughness, gloss, or coating defects.
- **Transmission:** Measures film thickness, multi-layer composition, and optical clarity.



Biological & Biomedical Research

- **Reflectance:** Provides surface morphology and diagnostic signatures of tissues.
- **Transmission:** Allows label-free imaging of cell layers, blood samples, and tissue slices for pathology research.

Materials & Mineralogy

- **Reflectance:** Surface mineral identification (e.g., oxides, clays, sulfides).
- **Transmission:** Internal mapping of crystal inclusions, grain boundaries, and impurities.

Outdoor Portable Hyperspectral Imaging System – Rotary Scanning

Model : HO-HIS-P360R

Deployable Hyperspectral Surveying

The rotary scanning portable hyperspectral system is designed for outdoor environments, enabling panoramic spectral mapping of landscapes, vegetation, infrastructure, or geological outcrops. The portability and rotary mechanism allow rapid deployment without the need for large drones or satellites

Model No	
Choose Camera (Options)	UV-HIC200G, 200-400nm VIS-HIC400G, 400-800nm VIS-HIC550P, 400-950nm SWIR-HIC800G, 900-1700nm VIS-SWIR-HIC1300P, VIS-SWIR-HIC1300P
Scan Assembly & Sample Stage	
Scan Bed Design	Rotary Stage
Operation	Motorized
Drive Mechanism	Stepper Motor Controlled
Resolution	0.05 Degree
Scan Bed Scan Length	
Scan Bed Width	
Sample Stage Operation	
Drive Mechanism	
Resolution	
Scanning	Programmable
Construction	Aluminum Alloy B51S
Finish	Black Anodized
Illumination System	
Type	Angled Illumination
Number of Lamps	1
Light Source	Quartz Halogen Lamp
Wavelength Range	380 - 2400 nm
Illumination Design	Line Illumination
Lamp Housing	Forced Air-Cooled Type
Housing Material	Black Anodized Aluminum and SS
Software Synchronized ON/OFF control	Yes

Example Applications

Agriculture & Forestry

- Crop health monitoring through vegetation indices.
- Detecting nutrient deficiencies, disease outbreaks, or pest damage.
- Geology & Mining
- Field mineral mapping by scanning outcrops and mine faces.
- Identifying ore zones (iron oxides, clays, carbonates) through unique spectral signatures.



Environmental Monitoring

- Monitoring water bodies for algal blooms, suspended sediments, or pollution plumes.
- Assessing soil erosion and land degradation in vulnerable ecosystems.
- Tracking vegetation regrowth after deforestation or wildfire.

Infrastructure & Civil Applications

- Inspecting building facades, bridges, or roads for material degradation.
- Detecting surface cracks, corrosion, or moisture ingress using spectral contrast.

Defence & Security

- Camouflage detection and material differentiation in outdoor environments.
- Border surveillance with spectral discrimination of natural vs. artificial objects.

Airborne Hyperspectral Imaging System – Remote Sensing

Model : HO-HIS-AR360R

Large-Scale, High-Resolution Environmental & Resource Monitoring Airborne hyperspectral imaging systems are mounted on drones, aircraft, or UAVs, enabling wide-area spectral mapping with high spatial and spectral resolution. This makes them a powerful alternative to satellite-based sensors, with the benefit of custom flight paths, higher revisit rates, and finer detail.

Agriculture & Precision Farming



- Monitoring crop growth, stress, and disease at field-to-regional scale.
- Identifying nutrient deficiencies for site-specific fertilizer application.
- Yield prediction and precision irrigation management

Camera Choices

UV-HIC200G, 200-400nm
VIS-HIC400G, 400-800nm
VIS-HIC550P, 400-950nm
SWIR-HIC800G, 900-1700nm
VIS-SWIR-HIC1300P
VIS-SWIR-HIC1300P

Geology & Mineral Exploration



- Regional mineral mapping for exploration projects.
- Identifying alteration zones and ore deposits from airborne surveys.
- Differentiating soil/rock types across inaccessible terrains.

Forestry & Ecology

- Forest health assessment, biomass estimation, and carbon stock evaluation.
- Species-level vegetation classification.
- Detecting invasive species and forest degradation.



Water Resources & Coastal Monitoring

- Mapping turbidity, chlorophyll, and suspended solids in lakes, rivers, and coastal zones.
- Monitoring algal blooms and water quality over large water bodies.
- Wetland ecosystem assessment and conservation planning.



Disaster Management

Rapid damage assessment after floods, wildfires, or landslides.

Detecting oil spills and chemical leaks in coastal/marine regions.



Urban & Infrastructure Studies

Monitoring urban heat islands and land-use changes.

Detecting roofing materials, cracks, or deterioration in large-scale civil infrastructure.

Smart city planning with spectral mapping of roads, vegetation, and construction zones



Aquatic Hyperspectral Imaging – Drone-Based System

Model : HO-HIS-AQ360R

Large-Scale, High-Resolution Environmental & Resource Monitoring Airborne hyperspectral imaging systems are mounted on drones, aircraft, or UAVs, enabling wide-area spectral mapping with high spatial and spectral resolution. This makes them a powerful alternative to satellite-based sensors, with the benefit of custom flight paths, higher revisit rates, and finer detail.

Water Quality Assessment

- Detecting chlorophyll-a, turbidity, and dissolved organic matter.
- Identifying pollution sources such as industrial effluents or sewage discharge.
- Monitoring seasonal and diurnal variations in water health.

Algal Bloom Detection & Management

- Early detection of harmful algal blooms (HABs) that threaten aquatic life and human health.
- Differentiating algal species using spectral fingerprints.
- Supporting decision-making for water treatment and fisheries.

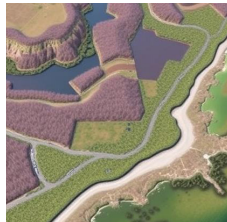
Aquaculture Monitoring

- Assessing pond/lake water conditions for fish/shrimp farming.
- Detecting oxygen stress zones and harmful microbial growth.
- Optimizing feed and harvest cycles based on ecosystem health.



Coastal & Wetland Studies

- Mapping mangrove ecosystems and seagrass beds.
- Detecting sediment transport and erosion patterns.
- Monitoring saltwater intrusion in estuaries.



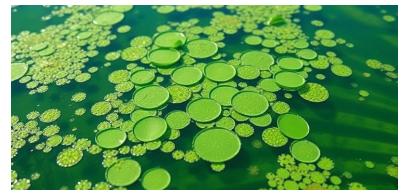
Environmental Protection & Regulation

- Tracking the spread of oil spills and chemical contamination.
- Supporting government agencies in compliance monitoring.
- Enabling rapid response during water-related disasters.



Camera Choices

UV-HIC200G, 200-400nm
VIS-HIC400G, 400-800nm
VIS-HIC550P, 400-950nm
SWIR-HIC800G, 900-1700nm
VIS-SWIR-HIC1300P
VIS-SWIR-HIC1300P



Key Advantage: A drone-based aquatic hyperspectral system delivers real-time, high-resolution insights into water ecosystems, providing a practical tool for researchers, environmental agencies, aquaculture industries, and disaster managers.

Laser Induced Fluorescence (LIF) & Photoluminescence (PL) Hyperspectral Imaging

Model : HO-HIS-LIF300

Material Characterization and Biomedical Diagnostics

LIF & PL hyperspectral imaging systems combine the high sensitivity of fluorescence/ luminescence detection with the rich spectral resolution of hyperspectral imaging, enabling detailed analysis of biological samples, semiconductors, and advanced materials.

Camera Choices

UV-HIC200G, 200-400nm
VIS-HIC400G, 400-800nm
VIS-HIC550P, 400-950nm
SWIR-HIC800G, 900-1700nm
VIS-SWIR-HIC1300P,
VIS-SWIR-HIC1300P



- Non-invasive detection of early-stage cancers using autofluorescence signatures.
- Mapping metabolic activity in tissues and cells.
- Fluorescence-based detection of bacterial or fungal contamination.



- Studying chlorophyll fluorescence to evaluate plant stress, nutrient deficiencies, or disease onset.
- Tracking pesticide residue or chemical uptake in crops.

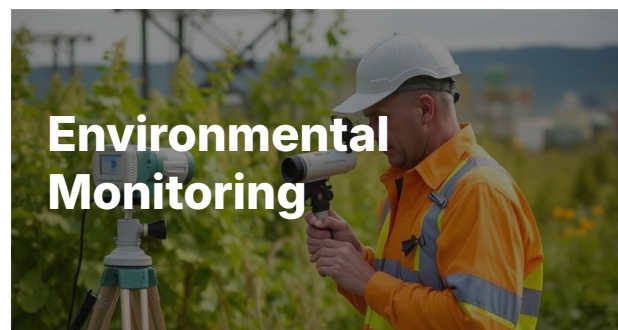
Pharmaceuticals

- Quality control of drug formulations using fluorescence mapping.
- Identifying counterfeit medicines by unique spectral signatures.



Semiconductor & Optoelectronic Materials

- Photoluminescence hyperspectral imaging for defect detection in wafers, LEDs, solar cells, and quantum dots.
- Identifying non-uniformities in bandgap and emission efficiency.
- Mapping carrier lifetime and recombination properties in advanced materials.



Detecting toxic pollutants via their unique fluorescence responses.

Monitoring organic matter content in soil and water

Key Advantage: LIF & PL hyperspectral imaging provides non-destructive, highly sensitive detection and mapping of chemical and structural variations, making it invaluable for biomedical, semiconductor, pharmaceutical, and agricultural applications

Forensic Applications

- Identifying forged documents, currency, or hidden traces using fluorescence mapping.
- Detection of residues and latent evidence invisible under normal light



Microscope Based Hyperspectral Imaging System

Model : HO-HIS-M1000R

Material Characterization and Biomedical Diagnostics

LIF & PL hyperspectral imaging systems combine the high sensitivity of fluorescence/ luminescence detection with the rich spectral resolution of hyperspectral imaging, enabling detailed analysis of biological samples, semiconductors, and advanced materials.

Camera Choices

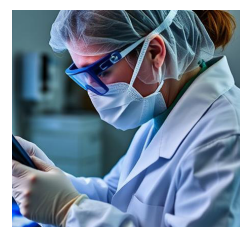
UV-HIC200G, 200-400nm
VIS-HIC400G, 400-800nm
VIS-HIC550P, 400-950nm
SWIR-HIC800G, 900-1700nm
VIS-SWIR-HIC1300P,
VIS-SWIR-HIC1300P

Biomedical & Life Sciences

- Label-free imaging of cells, tissues, and microorganisms based on natural spectral fingerprints.
- Detecting cancerous vs. healthy cells without staining.
- Mapping biomolecular distributions such as proteins, lipids, and pigments

Forensic Science

- Detecting trace evidence such as fibers, hair, or residues with spectral signatures.
- Authenticating inks, pigments, and paints in questioned documents.



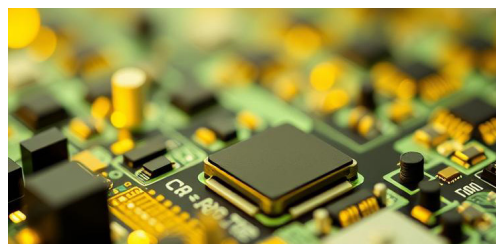
Pharmaceutical Research

- Studying drug-cell interactions at microscopic level.
- Detecting drug crystallinity and polymorphism in formulations

Material Science & Nanotechnology

- Identifying chemical heterogeneity in polymers, composites, and thin films.
- Characterization of nanomaterials, coatings, and surface defects.

Semiconductors & Photonics



- Microscopic defect detection in wafers, MEMS, LEDs, and quantum dots.
- Spectral mapping of photonic crystals and microstructured materials.

Geology & Mineralogy

- Microscale identification of mineral inclusions and microfossils.
- Mapping trace elements or impurities in rocks and crystals.



Key Advantage: Microscopic hyperspectral imaging enables high-resolution chemical mapping at the cellular and material level, offering a powerful, non-destructive tool for research, quality control, and forensic investigations.

Agricultural Applications of Hyperspectral Imaging

Hyperspectral cameras are powerful tools in precision agriculture, offering early and accurate insights into crop health and productivity. By capturing both spatial and spectral information, these systems enable detection of subtle changes in plants that are invisible to the human eye.

Plant health monitoring:

Early detection of stress from pests, diseases, water shortage, or nutrient deficiency. For example, night time hyperspectral imaging has been shown to improve detection of spider mite infestations by nearly 30% in accuracy.



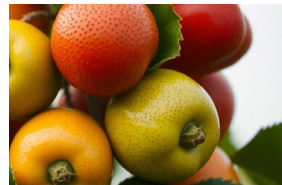
Impact:

Hyperspectral imaging enables non-destructive, high-throughput, and objective assessment of crops, providing valuable data for improving yield, optimizing resource use, and enhancing food security



Disease detection:

High-accuracy identification of crop diseases such as citrus canker (94–100% accuracy) and stem rust in wheat (88% accuracy), both in laboratory and field conditions.



Nutrient analysis:

Non-destructive prediction of macronutrient levels such as nitrogen, phosphorus, potassium, and calcium in crops like strawberries and grapevines.



Seed and fruit quality: Differentiation of viable vs. non-viable seeds (e.g., *Corymbia*) and evaluation of fruit ripeness and quality.
Impact:

Environmental Monitoring with Hyperspectral Imaging

Hyperspectral cameras are increasingly applied in environmental sciences to assess ecosystem health, detect pollutants, and monitor natural resources. By capturing fine spectral signatures, these systems provide accurate, non-destructive insights into air, water, and soil quality.

Algal bloom detection:



Airborne hyperspectral imaging has been used by NOAA and the University of Michigan to track harmful algal blooms in Lake Erie, supporting early warning and mitigation efforts.

River contamination mapping:



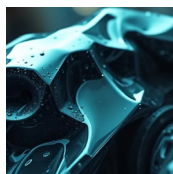
n-situ monitoring of rivers (e.g., Mississippi River Watershed) enables detection of nutrients (nitrates, phosphates) and sediments, offering real-time water quality assessment.

Impact:

Hyperspectral imaging provides a powerful toolset for sustainable environmental management, enabling early detection of contamination, precise mapping of ecosystems, and better-informed conservation strategies.

Plastic & microplastic detection:

Both aquatic drones and lab-based systems equipped with hyperspectral imagers can detect plastic debris and microplastics down to 100 microns, aiding marine pollution studies



Environmental robotics:

Robotic teams integrated with hyperspectral cameras can autonomously map and classify unfamiliar environments, extending monitoring capabilities in remote or hazardous areas

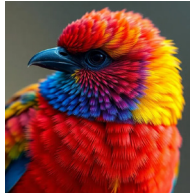


Biotechnology and Biomedical Applications of Hyperspectral Imaging

Hyperspectral imaging (HSI) has emerged as a valuable tool in life sciences, biotechnology, and medical research, offering non-invasive, high-resolution insights into biological structures, tissues, and molecular processes. By combining imaging with spectral analysis, it enables detection of subtle biochemical and physiological variations.

Animal biology:

Analysis of bird plumage coloration across visible and ultraviolet ranges provides insights into evolutionary biology and animal visual systems.



Medical diagnostics:

HSI has been used for vein detection across diverse skin tones, offering a non-invasive aid for clinical procedures



Drug discovery & fluorescence research:

Bio-LIF hyperspectral fluorescence systems accelerate development of new fluorophores for diagnostics and therapeutic applications.

Cancer treatment monitoring:

Quantification of liver tissue ablation during radiofrequency treatments supports better evaluation of cancer therapies.

Microbial ecology:

Non-invasive pigment mapping in microbial communities reveals the spatial organization of phototrophic organisms at single-cell resolution.

Wound assessment

Hyperspectral imaging provides detailed spectral signatures of wounds, supporting objective monitoring of healing processes.

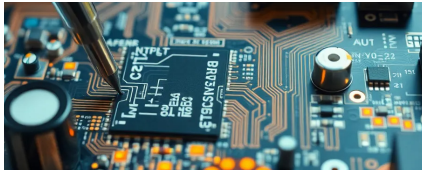
Impact:

In biotechnology, hyperspectral imaging enables non-destructive, quantitative, and high-precision analysis of biological samples. Its versatility supports applications from basic research to clinical diagnostics, helping to improve healthcare outcomes, accelerate drug discovery, and expand our understanding of complex biological systems.

Industrial Applications of Hyperspectral Imaging

Hyperspectral imaging (HSI) is a powerful tool for industrial inspection, automation, and quality control. By capturing detailed spectral information beyond human vision, HSI enables detection of subtle material differences and defects that conventional cameras cannot resolve. Integrated with machine vision, these systems can provide automated feedback for sorting, grading, labeling, and process control.

Electronics & PCB inspection:



Automated assessment of solder quality on circuit boards, enabling defect detection and ensuring manufacturing uniformity.

Pharmaceuticals:



Detection of counterfeit or defective pills, ensuring correct prescriptions and reducing risks in drug manufacturing.

Material & product identification:



Real-time classification of thousands of laminate products and other finished goods, even when visually identical.

Textile sorting:



Hyperspectral sorting systems can differentiate textile types and grades, supporting efficient recycling and reuse.

Impact:

By offering unmatched sensitivity to material and color differences, hyperspectral machine vision improves reliability, throughput, and safety in industrial production. It is a key enabling technology for Industry 4.0, allowing integration with robotics and smart manufacturing systems.

Hyperspectral NIR Camera

The Hyperspectral NIR Camera is an advanced spectral imaging system designed for precise material characterization in the 950-1700 nm wavelength range. It integrates a high-throughput NIR spectrometer, motorized scanning assembly, and a 150W quartz halogen illumination system for superior imaging performance.

The system features a Czerny-Turner spectrometer with an f/4 aperture, ensuring high spectral resolution (~2.5 nm avg), and an The motorized scan bed enables precise scanning for capturing high-quality hyperspectral data. This fully automated system is controlled via Holmarc Spectra Scan software, offering real-time data acquisition, scanning, and analysis with a user-friendly GUI. The system is ideal for applications such as coal quality analysis, agriculture, food inspection, pharmaceuticals, and remote sensing.

This Hyperspectral NIR Camera System is a state-of-the-art imaging solution, offering superior spectral and spatial resolution for diverse scientific and industrial applications.

Specifications

Detector Specifications

Sensor Type	InGaAs (Dual Mode: Linear & Log)
Pixel Pitch	15 μ m
Wavelength Range	900 - 1700 nm
Dynamic Range	120 dB (Log), 63 dB (Low Gain), 49 dB (High Gain)
Shutter Type	Global Snapshot
Maximum Frame Rate	508 fps
Interface	USB 3.0

Spectral Imaging System

Spectral Channels	640
Spatial Pixels	480
Spectral Imaging Area	640 mm $\times$ 1 mm (Single Shot)
Average Spectral Resolution	2.5 nm
Spatial Resolution	1 mm
Output Format	.bil or equivalent

Scan Assembly & Sample Stage

Scan Bed Design	Motorized (Stepper Motor Controlled)
Scan Bed Length	300 mm
Sample Stage Operation	Motorized
Drive Mechanism	Stepper Motor Controlled
Resolution	0.1 mm
Scanning	Programmable
Construction	Aluminum Alloy B51S
Finish	Black Anodized



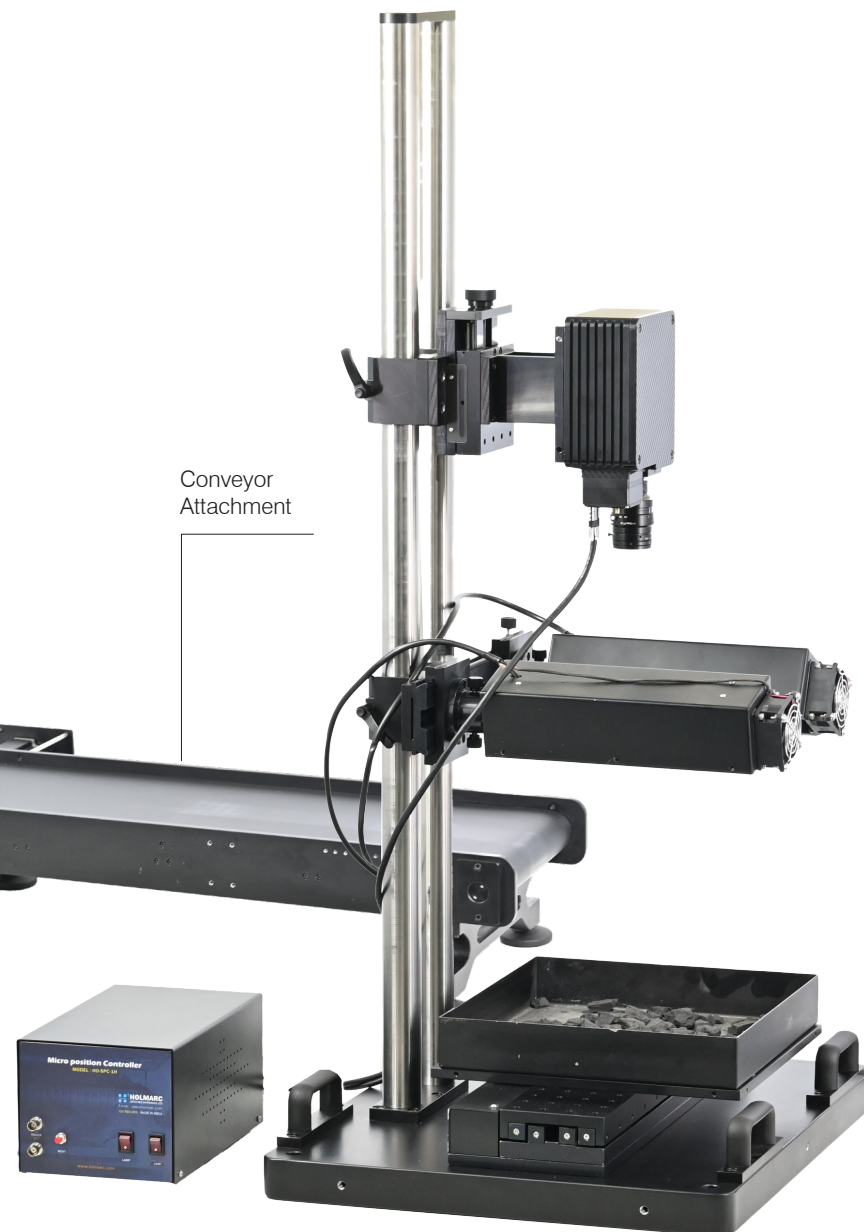
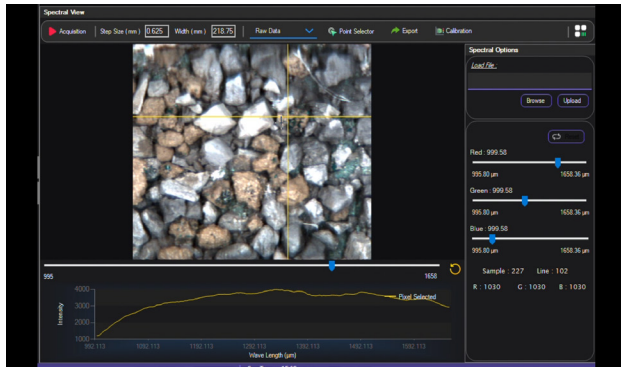
Illumination System

Light Source	150W Quartz Halogen Lamp
Type	Tungsten Halogen
Wavelength Range	340 - 2700 nm
Illumination Design	Cylindrical Lens-Based Line Scan Illumination
Lamp Housing	Forced Air-Cooled Type
Cooling	Forced Air Cooling
Light Coupling	Lens-Based
Housing Material	Black Anodized Aluminum
Power Supply	Constant Current Fixed Supply
Current Display	Yes

Software Features

- Platform: Windows
- Framework: .net 4.5.2
- Communication: USB 3.0 for Camera and USB 2.0 or above for Conveyor
- Camera:
- Live view of single line spectrum having 640 bands
- Settings for Camera exposure and default settings
- Graph view of horizontal and vertical intensities through selected point
- Device Control
- Forward and backward movement of conveyor with free and fixed value
- Conveyor movement speed control
- Spectral View
- Step size and Scan length
- Graph to view spectral information of a selected point
- RGB band selector to view image which is created using selected band RGB bands
- Import pre acquired .bil to view





1. Device Specification

- Camera: NIT - WIDY Sens 640V-ST (Sensor Size 640 x 480)
- Lens: NIT – Wavelength Compact Lens
- Connection: USB 3.0
- Camera Temperature: 15 °C
- Lighting:
- Stage: Standard Conveyor (For Sample movement)
- Spectral Box
- Slit Size: 1 micron
- Mirrors: 2 mirrors for reflection
- Grating:
- Wavelength Range: 1000 nm – 1620 nm
- Wavelength Unit: Nano meter

Operational Parameters (Output Format)

- Bit Depth: 14 bits
- Scale Factor: 16383 (Pixel values to be divided by 16383 to obtain in range from 0-1 in single scan line spectrum)
- Corrections: Gaussian Blur (window size of 5x5 with X = 1 and Y = 1) applied to single scan line spectrum

Image Size:

- Step Size: 0.526 mm (Depends upon current camera position)
- Scan length: User Defined (As using continue moving conveyor user can set the scan length in mm)
- Output Image Size: (Scan length/step size) pixels x 480 pixels
- Output Cube Size: image Size x 640 bands
- Cube Data type: 12 (ENVI data type)
- Cube Format: .bil file with corresponding .hdr file having metadata file in ENVI format
- Cube Band: Byte order = 0 (each band writes with pixel space as 0 and line space as 0)
- Scanning method: Push broom method (where sample moves with step size through conveyor)

Note:

- further details including camera details, exposure time. Etc can be added to hdr file
- User can export cube data with or without Correction applied
- No dark data correction applied as camera work with default corrected NUC file with available exposure time
- Currently 640 Bands are available and can be further reduced to 160 using band averaging/ band skipping method.



HYPERSPECTRAL NIR CAMERA

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