

Headwall is the proud recipient of these honors and more...



MV.C NIR™

Hyperspectral Imaging System for Real-Time Advanced Machine Vision



FEATURES

- Fast, rugged hyperspectral NIR sensor for industrial use
- NIR wavelength range (900 to 1,700 nm)
- IP-54 rated
- Compatible with perClass Mira®
- Integration with industrial control systems
- Ideal for meat inspection and grading



[DATASHEET](#)

REVISION NOV 2023 PRELIMINARY REV A



NIR FOR ADVANCED MACHINE VISION APPLICATIONS

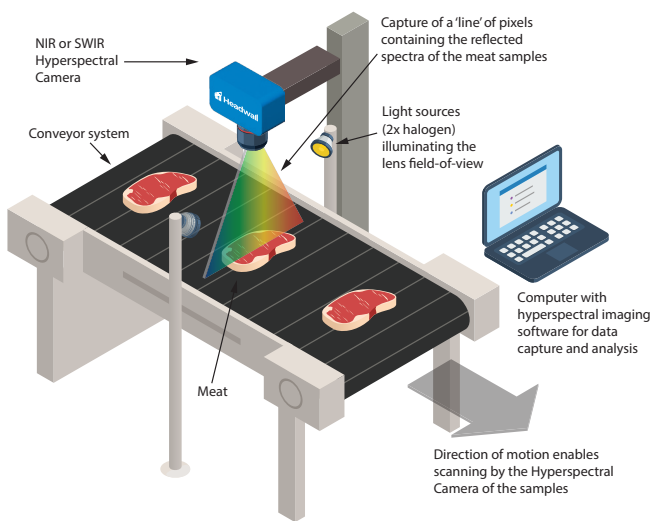
Headwall introduces the **MV.C NIR™**, designed for challenging industrial environments and featuring a 900 to 1,700nm wavelength range.

Benefits of NIR Range

Numerous applications benefit from hyperspectral imaging in the NIR wavelength range, including inspection and grading of beef and pork, chemicals, polymers, processed foodstuffs, as well as measurement of moisture in a variety of material.

Hyperspectral Classification to Action

The MV.C NIR can be directly controlled by the powerful **perClass Mira®** software for hyperspectral image acquisition, training for spectral classification, and deployment for real-time image interpretation so that



The MV.C NIR can be mounted above industrial conveyor systems or on offline scanning systems for classification-model development or research.

FEATURE	HEADWALL	COMPETITION
Rugged, IP-Rated Enclosure	✓	✗
Compact, Easily Deployable Form Factor	✓	✗
CE-Certified (pending)	✓	✗
All-Reflective, Aberration-Corrected Design	✓	✗
Factory-Made Holographic Gratings	✓	✗
Variety of Lenses Available	✓	✗
perClass Mira® Compatible	✓	✗
Flexible Mounting Options	✓	✗

actions such as sorting or rejection can be performed along the production/processing line.

Hyperspectral classification models can be created using an offline scanning system for testing small batches of product or raw material. When ready, the model can be uploaded to a host computer or even an edge-computing appliance with onboard processing.

As material passes underneath the MV.C NIR, a hyperspectral dataset is acquired and the classification model applied. A processed false-color image or even simply coordinates are generated and sent to robots down the line to take action in real time. Actions can include product sorting, rejection of unwanted debris or material, or even the treatment of the product. All of this based on rapid, accurate information obtained by the hyperspectral imaging system and data processing and analysis by spectrally savvy software.

DATASHEET

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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REVISION BLOCK					
ZONE	REV.	DESCRIPTION	DATE	REVISED BY	APPROVED
	A	INITIAL RELEASE	9/27/2022		

NOTES:

- SUBJECT TO CHANGE
- WEIGHT: 2.6 KG (WITHOUT LENS)
- POWER INPUT: +12 VDC (± 10%)

DO NOT SCALE THIS METRIC DRAWING

UNLESS OTHERWISE SPECIFIED:
-ALL DIMENSIONS ARE IN MILLIMETERS.

TOLERANCES: XX ±0.5mm
XX.X ±0.25mm
XX.XX ±0.10mm
ANGLES ±0.5°

OP-75-001 F002 REVISION 1

GD&T PER ASME Y14.5-2009

THIRD ANGLE PROJECTION

FORMAT: SOLID WORKS

Headwall Photonics, Inc.
580 Main St, Bolton, MA 01740
Phone: 978-353-4100 Fax: 978-348-1864

MVc NIR 900-1700

CD-1595

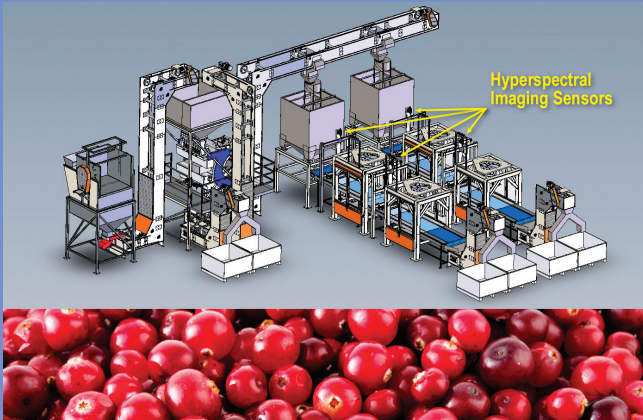
SHEET 1 OF 1

The Headwall MV.C NIR sensor is shown here. It has a more compact form factor than the previous-generation Hyperspec® NIR sensors that it replaces and also features an IP-rated enclosure. All user-accessible ports for power and data I/O are clearly labeled, as is the direction of subject movement. Contact Headwall Customer Support for more complete dimensional drawings if desired.

The screenshot shows the perClass Mira software interface. The main window displays a hyperspectral image of leaves with classification results. The left sidebar shows a class list with 'Unknown', 'background', 'plant', 'soil', and 'pot'. The bottom panel shows the regression results for a feature F1:A/B, including the equation $I = R \cdot N$ with $R = 1379.1419$ and $N = 1417.1457$. The regression parameters are: Param 1 from 1379 nm to 1419 nm (11 bands) and Param 2 from 1417 nm to 1457 nm (11 bands). The color map is set to 'plasma' and 'Auto scale' is checked.

The MV.C NIR can also be controlled using perClass Mira® software. Mira can be used for hyperspectral image data acquisition, as well as for training and creation of real-time spectral classification models for deployment in industrial inspection and grading environments.

**ROBUST SYSTEMS FOR HYPERSPECTRAL
ADVANCED MACHINE VISION APPLICATIONS**



Developed originally for remote-sensing applications involving aircraft and satellite imagery, hyperspectral sensors – and sensors in general – deployed in a factory/processing environment need to be robust and reliable, as well as intuitive to operate. Headwall sensors for advanced machine vision are designed from the start to fulfill these requirements.

Headwall’s experience implementing efficient and streamlined workflows for applications such as food safety and grading, and even screening of incoming raw material can help improve your process, yielding a high return on your investment. Our products offer a broad selection of wavelength ranges and capabilities.



Well-positioned hyperspectral sensors and optimized broadband lighting enable the highest performance in the challenging factory environment.

SPECIFICATIONS

Wavelength Range	900 – 1,700 nm
Spectral Bands ¹	201 / 213
Spatial Pixels	640
Camera Technology	InGaAs
Cooling Technology	TE Cooled
Pixel Pitch	15 μ
Aperture	f/2.5
Dispersion/Pixel	3.75 nm/pixel
Entrance Slit Width	30 μ
Maximum Frame Rate	547 Hz
ADC Bit Depth	12-bits
Digital Interface	GigE
CE Certified	Pending ²
Weight	2.2 kg / 4.85 lbs (without lens)
Dimensions (without lens)	135 x 173 x 76 mm / 5.31 x 6.81 x 3.00 in
Input Power	12 VDC
Maximum Power	6 W
Operational Temp Range	Pending ²
Storage Temp Range	-20 – 60 °C / 14 – 140 °F

¹ 201 bands when subsampling using perClass Mira, 213 otherwise

² Pending ongoing test results

Part Number	Description
1007A-10551	MV.C NIR Hyperspectral Imaging System
1003A-20600	MV.C NIR Spectrometer (Sensor Only)
1008A-00113	perClass Mira® Classification GUI
1008A-00114	perClass Mira® Classification Software, Runtime License
1004A-21536	25mm f/2.5 lens, telecentric, 250mm min focus
1004A-21543	50mm f/1.4 lens, 300mm min focus
1004A-21564	85mm f/2.5 lens, telecentric, 12m min focus



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