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

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analytik

Headwall

Hyperspec® MV Series

MV.C VNIR • MV.C NIR • MV.X

FEATURES

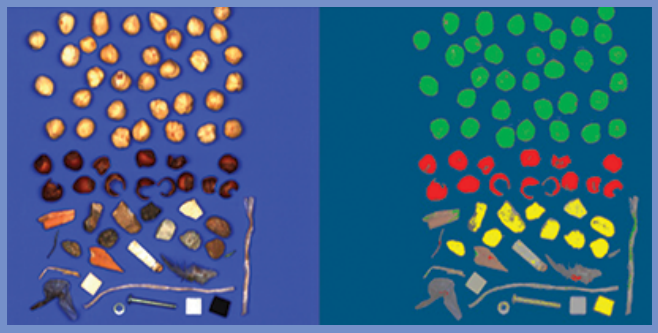
- IP-Rated for Industrial Machine Vision Use
- VNIR (400–1000nm) and NIR (900–1700nm)
- Real Time Spectral Classification
- Compatible with perClass Mira®
- Integration with Industrial Control Systems
- Compact form factors with multiple mounting options

REVISION MAR23

DATASHEET

APPLICATION EXAMPLES

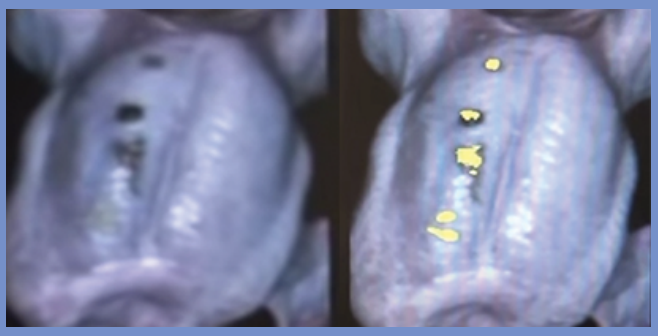
FOREIGN OBJECT DETECTION



Left: Color image of hazelnuts, shells, and foreign objects. Right: Spectrally classified image showing good product, shells, and two types of foreign objects.

While most foreign objects can be separated during initial screening, objects that are similar in appearance to acceptable-quality product are often very hard to catch. Final sorting of products like tree nuts can benefit from the power of HSI. Processors can both optimize their use of manpower and improve quality by adopting automation powered by hyperspectral imaging.

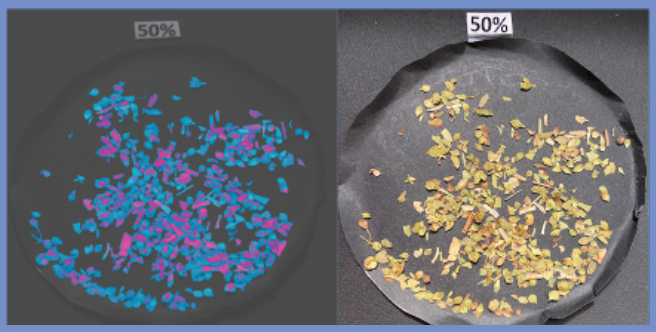
CONTAMINATION DETECTION



Headwall customer images of fecal contamination and skin tumors detected in poultry with hyperspectral imaging classification techniques.

From a regulatory perspective, few industries depend on rigorous inspection more than poultry and meat processing. Use of HSI to inspect poultry for wholesomeness, detection of fecal contamination, septicemia, and skin tumors early in the process can help save significant processing costs and reduce the risk of recalls. When processing livestock, the technique helps accurately pinpoint areas on a carcass that require attention.

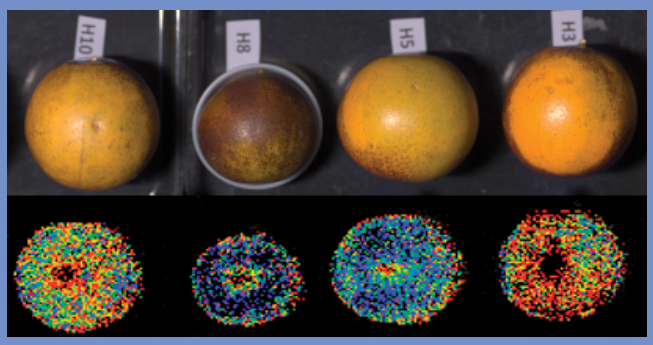
ADULTERATION IN FOOD



Headwall's Hyperspec® MV.X system was used to identify ragwort in a mix of parsley and thistle herbs. Spectral classification makes the task less challenging by providing a clear indication of presence of ragwort (magenta) in a mix of parsley (green) and thistle (blue).

Herbs and spices are one of the rockstars of food fraud; their complex cross-border supply chains, high price per kilogram, and the fact that they are often sold in powder or particulate forms make them prime targets for adulteration, dilution, and substitution with cheaper materials.[1] Scanning with a Hyperspectral Imaging (HSI) system can quickly show the user if non-oregano ingredients are present in the sample and help quantify them.

PROCESS ANALYTICS



Brix, a commonly used measurement of dissolved solids in liquid, is often used to determine sugar content in citrus fruit.

Deployment of process analytical technologies (PAT) in food and pharmaceuticals is accelerated by the growing adoption of Industry 4.0 concepts. Our HSI systems can be networked directly into plant controls. They can serve as a non-contact, real-time analytical solution for prediction of product characteristics, including sweetness, pH, intramuscular fat content, histamine levels, and other critical attributes that traditionally require sampling and laboratory testing.

MACHINE VISION PRODUCTS

HYPERSPEC MV.C VNIR™

The **MV.C VNIR™** sensor features higher spatial resolution and more spectral bands for customers who need an exceptionally small and light form factor for OEM instrumentation or for deloyment in environments where space is at a premium. USB 3.1 interface provides power and fast transfer to your integrated data system. Standard C-mount allows a selection of lenses appropriate to your application.

HYPERSPEC MV.X™

Packaged in a compact, dust-resistant, and watertight housing, the **Hyperspec® MV.X™** is designed to be used in advanced machine vision, quality monitoring, and process analytical applications. This rugged solution can be installed in both inside and outside production environments.

The award-winning Hyperspec® MV.X™ introduces to the industry a fully integrated hyperspectral imaging (HSI) system that enables users to realize the value of spatial and spectral information in industrial applications like automated sorting, quality inspection, authenticity verification, and process monitoring.

Hyperspectral imaging (HSI) has been gaining ground as a technique that enables food processors to apply advanced automated sorting and inspection solutions to alleviate some of the most tedious and labor-intensive tasks. Collecting highly resolved spectral information for each pixel in the image enables the detection of slight differences in color or composition to improve sorting and grading decisions.

Spectral data collected in the VNIR (400–1000nm) range helps detect or quantify features that traditional vision techniques cannot see. Hyperspectral systems have historically faced significant hurdles in industrial deployment due to the need to handle vast amounts of raw data as well ascope with the complexity of model development. Headwall's MV.X platform overcomes these obstacles by combining a high-performance spectrometer with powerful embedded computing to extract actionable results in real time.

HYPERSPEC MV.C NIR™

The **MV.C NIR™** is designed for challenging industrial environments and features a 900 to 1,700nm wavelength 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 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.

PERCLASS MIRA®

All Headwall MV-series sensors 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 actions such as sorting or rejection can be performed along the production/processing line.

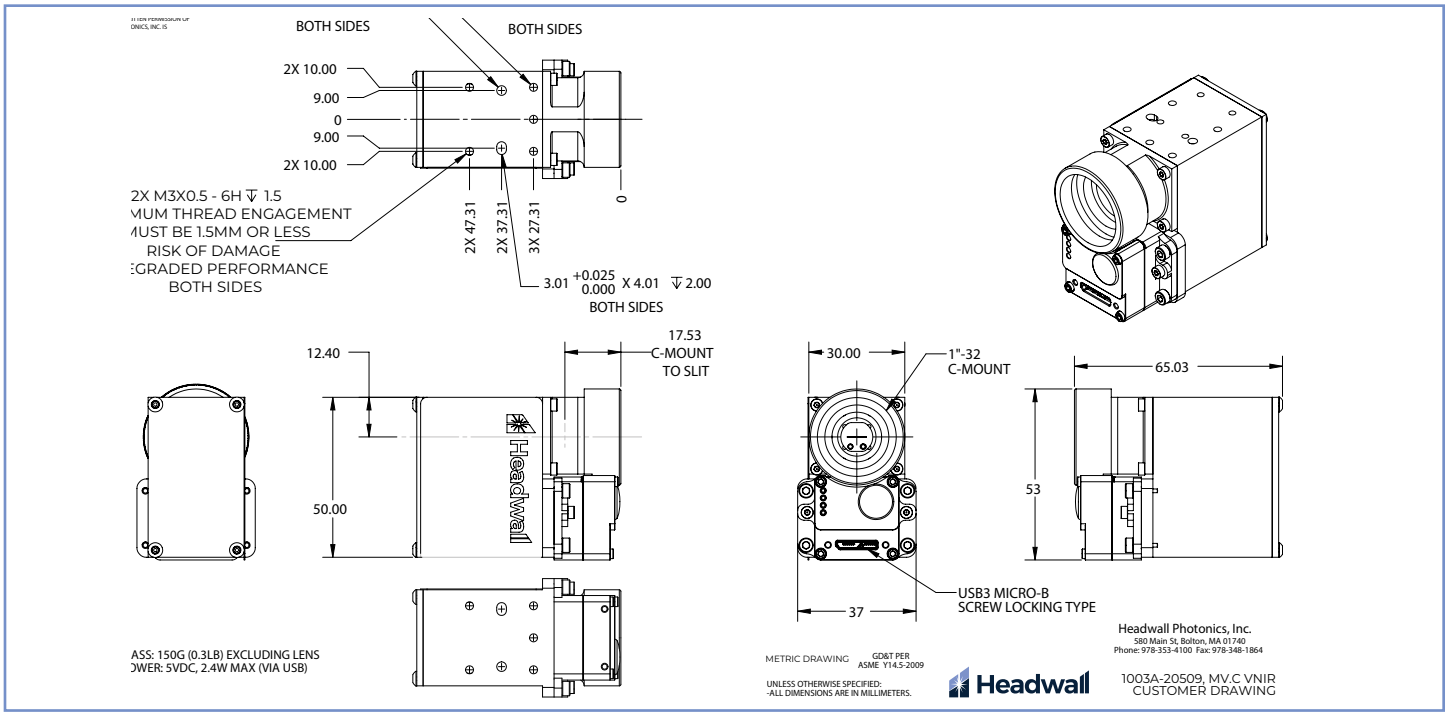
perClass Mira features the industry's most intuitive and powerful interface. Quickly build and save spectral classification and regression models that can be uploaded and executed on the Hyperspec MV.X, taking advantage of its built-in computing power or executed by the perClass Mira Runtime on a PC.

DATASHEET

HYPERSPEC™ MV SERIES
MV.C VNIR • MV.C NIR • MV.X

SPECIFICATIONS	MV.C VNIR	MV.C NIR	MV.X
Wavelength Range	400 – 1,000 nm	900 – 1,700 nm	400 – 1,000 nm
Spectral Bands	342	214	301
Spatial Pixels	1024	640	1020
Camera Technology	CMOS	InGaAs	CMOS
Pixel Pitch	5.86 µm	15 µ	5.86 µm
Aperture	f/2.5	f/2.5	f/2.5
Dispersion/Pixel	1.75 nm	3.75 nm/pixel	1.75 nm
Entrance Slit Width	20 µm	30 µm	20 µm
FWHM Slit Image	6 nm	7.5 nm	6 nm
ADC Bit Depth	12-bits	12-bits	12-bits
Spectrograph Design	Aberration-Corrected Concentric	Aberration-Corrected Concentric	Aberration-Corrected Concentric
Interface(s)	USB 3.1	GigE Vision	· GenICam, WebSocket · MQTT, RS-232/422, and 5V TTL in development
Weight	0.3 kg / 10.6 oz (without lens)	2.2 kg / 4.85 lbs (without lens)	3 kg / 6.6 lbs (with 24mm lens)
Dimensions (without lens)	64 x 50 x 38 mm / 2.5 x 2.0 x 1.5 in	135 x 173 x 76 mm / 5.31 x 6.81 x 3.00 in	255 x 136 x 136 mm / 10.0 x 5.4 x 5.4 in
Power Input	5 VDC	12 VDC	12–30 VDC
Operational Temp Range	0 – 50 °C / 32 – 122 °F	0 – 50 °C / 32 – 132 °F	0 – 50 °C / 32 – 122 °F
Storage Temp Range	-20 – 60 °C / 14 – 140 °F	-20 – 60 °C / 14 – 140 °F	-10 – 60 °C / 14 – 140 °F

[1] Higher frame rates attainable with certain configurations



Manufactured by Headwall Photonics, distributed in the UK and Ireland by **analytik**.