



Snapshot VIS / RedNIR / NIR spectral video imaging camera

Imec's spectral snapshot evaluation kit offers a simple, fast and user-friendly solution for the spectral acquisition of sample materials and their subsequent analysis. Our system is flexible and designed to make spectral imaging easy to use and enable application development by delivering relevant snapshot and video data already within minutes after initial installation. It includes all required components; imec's spectral image sensor inside a very compact XIMEA camera, optics, dedicated lighting and imec's HSI Mosaic software.

Spectral imaging technology for real-time, video - rate applications

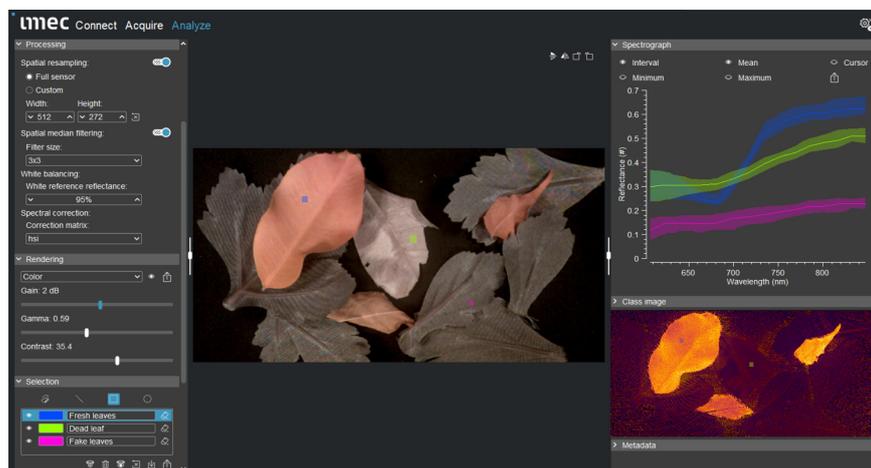
Imec's snapshot spectral cameras enables real-time, video-rate spectral images. This is key for applications where objects are moving (e.g. in assisted surgery or in security & surveillance application), or where the camera is moving (e.g. robot or UAV mounted) or to image dynamic processes (e.g. perfusion of oxygen level monitoring in medical imaging).

Key benefits

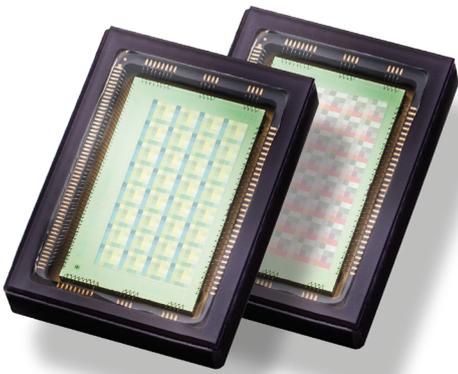
- **Video-rate** acquisition of spectral imaging data cubes with no motion artifacts, perfectly suited for acquisition of moving objects or scenes.
- **Easy set-up** with all standard components (USB3, C-mount optics)
- **Easy to use even for new users of spectral imaging**, with full software for image acquisition, cube pre-processing, visualisation and classification
- **Compact design**, miniaturized, robust and cost-effective
- **API**, for integration in automated systems

Customized solutions: Bringing the technology to the final application

Custom snapshot imagers can be developed to match specific application requirements. This customization can be achieved by modifying the design of our filters over the CMOS sensor pixel array providing solutions optimized for size, cost and performance.



User interface of imec in house acquisition software, designed for user-friendly hyperspectral imaging operations.



Snapshot spectral image sensors conceptual view of the per-pixel filter deposited mosaic.

Spectral snapshot camera product specifications

Spatial resolution	2048x1088 (2MP after reconstruction)
Spectral resolution	16 bands in 460-600 nm range (VIS) 15 bands in 600 – 850 nm range (RedNIR) 24 bands in 665 – 960 nm range (NIR)
Bandwidth per band (FWHM)	-10 - 15 nm (collimated)
Base imager type	AMS CMV2000 CMOS detector
Acquisition speed	Up to 120 spectral cubes/second
Pixel pitch	5.5 μm
Bit depth	10 bit
Optics	C-mount
Interface	USB3.0 + GPIO for triggering
Software	HSI Mosaic software for raw image acquisition, data pre-processing, data cube visualization and classification & API for acquisition and pre-processing in custom software
Power Consumption	1.5 Watt
Dimensions (WxHxD)	26 x 26 x 31 mm
Weight	32 g (without optics)
Included accessories	USB3 and trigger cables

Snapshot camera evaluation kit

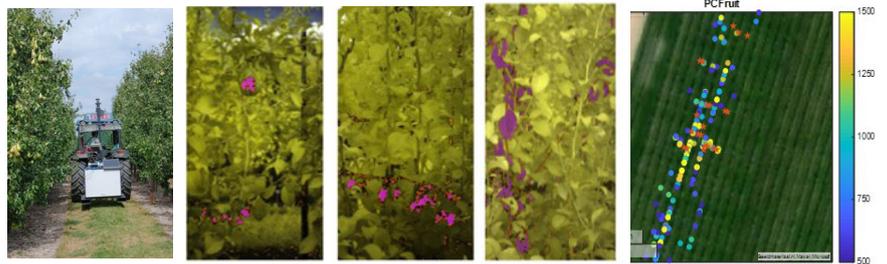
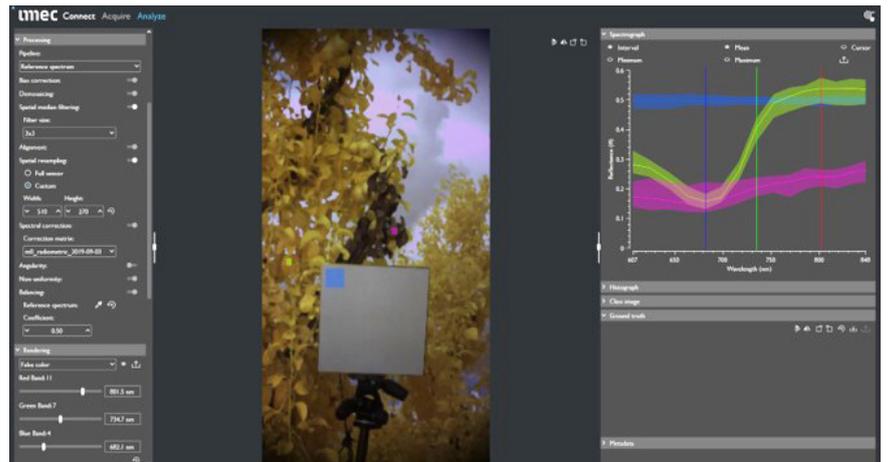
- Snapshot spectral imaging mosaic camera
- Lens
- Full lab setup including illumination
- HSI Mosaic software with permanent user license
- C & Python API for acquisition and data pre-processing in custom software
- Support on installation, software and application

Applications

- **Assisted surgery**
 - Robotic surgery
 - Endoscopy
 - Surgical microscopy
 - Tissue regeneration monitoring
- **Space**
 - Global scale monitoring and sensing
 - Disaster management
- **In-field detection**
 - Robotic anomaly detection
 - Security & surveillance
 - Precision Agriculture
 - Mining & mineralogy
- **Advanced machine vision**
 - Waste management
 - Food safety and inspection
 - Material detection
 - Process monitoring
- **UAV remote sensing**
 - Environment sensing
 - Marine plastic pollution

Real-world spectral imaging applications

Detection of fireblight in orchards



XIMEA spectral cameras with imec snapshot sensors have been used for fire blight detection in apple and pear plantations. The designed prototype allows the synchronization of two snapshot RedNIR cameras along with GPS data. After the analysis of the spectral data, the possible presence of fire blight can be identified. The differences in the spectral signature between the healthy and disease affected leaves were successfully detected.

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