imec

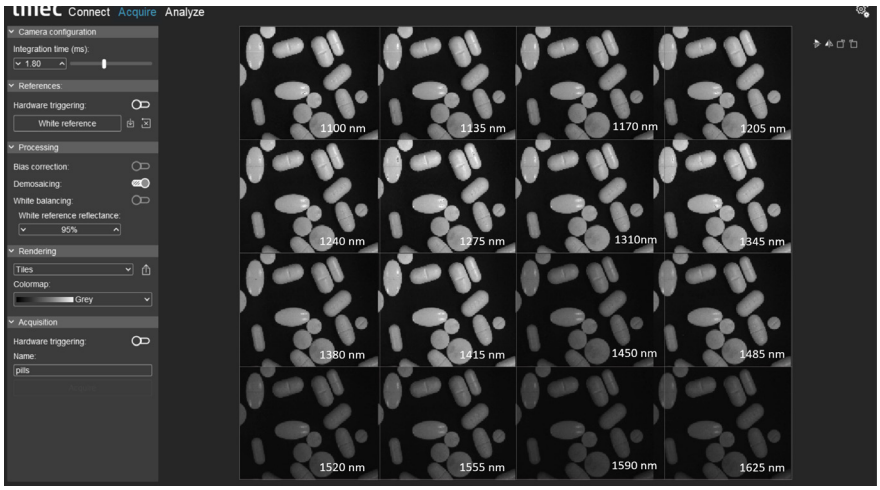
embracing a better life

Snapshot SWIR hyperspectral imaging camera

Imec's snapshot SWIR range hyperspectral imaging camera offers a simple, fast and easy to setup system for your hyperspectral acquisition and analysis of sample materials. Our solution is flexible and designed to enable application development using hyperspectral imaging technology, delivering relevant test data within a few minutes after initial installation. It includes all required components, from imager to camera, lens, interface cables and software and can be easily rebuilt into different configurations.

For real-time, video-rate commercial applications

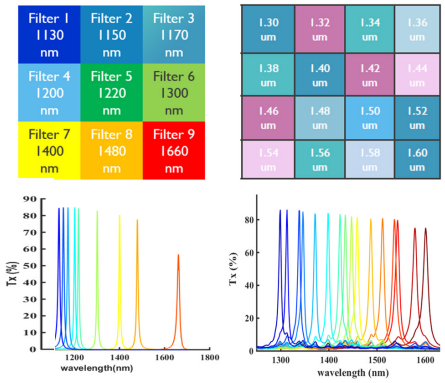
Snapshot filter based hyperspectral cameras enable real-time, video-rate processing of spectral imaging data. This is key for applications where objects are moving (e.g. sorting some food on a conveyor belt), or where the camera is moving (e.g. when carried on a drone UAV) or simply in static mode to prevent any motion artifacts during long time acquisitions (e.g. respiration movements of tissues in medical imaging, or moving target in security & surveillance applications)



Hyperspectral imaging acquisition software of imec: several objects (dry and wetted cake, plastic PET and PVC, nuts and their shell) are show in the SNm3x3 = 9 spectral colors tiled view. The HSI data-cube can be classified in real-time at 120+ FPS (see next page)

Key benefits

- **Video-rate** acquisition of hyperspectral imaging data cubes with no motion artifacts, perfectly suited for acquisition of moving objects or scenes and in conditions of vibrations of the field of view
- **Easy set-up** of the complete system
- **Flexible configuration:** quickly modify the set-up once you get more acquainted with the hyperspectral imaging snapshot technology hardware and software



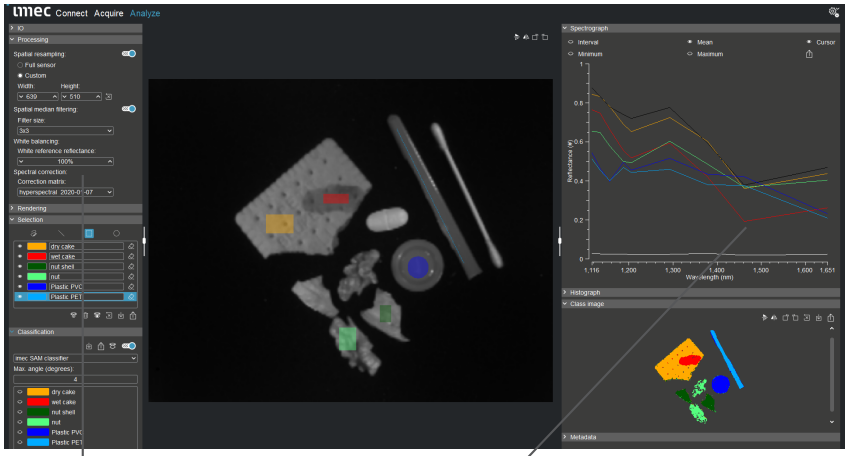
Snapshot mosaic hyperspectral image sensors with 3x3 = 9 colors and 4x4 = 16 spectral bands. Each filter is patterned at pixel level and integrated into the Cardinal 640 InGaAs image sensor from SCD

Imec hyperspectral imager & camera hardware specifications

Spatial resolution	640 x 512
Spectral resolution	9 bands
Spectral range	1100-1650 nm (SWIR)
Base imager type	InGaAs based, Cardinal 640 sensor with TEC cooler electronic
Acquisition speed	up to 120 hyperspectralcubes per second (SCD Cardinal 640 InGaAs detector)
Pixel pitch	15 µm pixels
Bit depth	13 bits
Optics	16 / 25 / 35 / 50 mm lenses C-mount
Interface	USB3.0 + GPIO for triggering (TTL)
Software	HSI Mosaic software for raw image acquisition, data pre-processing, hypercube visualization and classification; C and Python API for acquisition and data pre-processing in custom software
Power Consumption	2 Watts at 60 FPS
Dimensions (W x H x D)	65 x 65 x 130 cm
Camera weight	260 g (without lens)
included accessories	USB 3.0 and power + trigger cables
Cooling	Passive & active cooling (fan-based +TEC)
Mechanical	Integrated mechanical shutter for automatic dark-counts, tripod mount (1/4" - 20) + side-mounting M5 holes

Applications

- Optical sorting in machine vision
- Chemical analysis of material composition
- Food safety and inspection
- Medical & healthcare
- Pharmaceutical manufacturing
- Semiconductor & photovoltaic
- Waste recycling
- Human machine interface
- Minerology & mining
- Precision agriculture
- Security & surveillance



Main control panel

- Camera exposure time, framerate
- Hardware triggering
- Cube / frame export
- Light calibration
- Reflectance calculation
- Superresolution

Visualization panel

- Spectral plot
- Color reconstruction
- False color image
- NDVI
- Live view
- Classification

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

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