



SNAPSCAN HYPERSPPECTRAL IMAGING CAMERA

Imec's snapscan system is a major breakthrough for hyperspectral imaging application research. Within as little as a few hundred's of milliseconds, high quality hypercube data-sets are created with unmatched signal-to-noise ratio and spatial and spectral resolution. The snapscan demo-kit enables application research of the highest quality, while still being user-friendly. It integrates all key components required: the spectral image sensor, camera, optics, piezo scanning, active cooling system, lighting, tripod mounts, and HSIImager: the most advanced hyperspectral imaging software ever developed by imec research teams.

SNAPSHOT HYPERSPPECTRAL IMAGING FOR REAL-WORLD APPLICATIONS

After years of research and development, imec now combines the best of its system-level hardware and software expertise in the snapscan: one unique system platform (patent pending) combining the high SNR, spatial and spectral resolution of linescan imaging camera with the fast and convenient way that snapshot HSI cameras acquire hypercube data-sets.

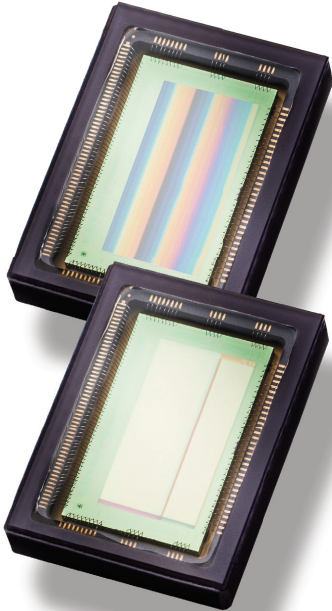
KEY BENEFITS

- **Snapshot acquisition** made easy and user-friendly with integrated ultrasonic scanning mechanism directly inside the camera to reach sub-second acquisition times
- **Highest spatial** (up to 7Mpx) & **spectral** (150+bands) **resolutions** possible for snapshot-based hyperspectral imaging in a compact, lightweight and mass-manufacturable design
- **Highest SNR** ever reached with imec on-chip filter technology thanks to active cooling and advanced software features for cube reconstruction and spectral correction



RGB true color rendering with imec snapscan hyperspectral imaging software with spectra plotted out and classification of a sample of various pharmaceutical pills

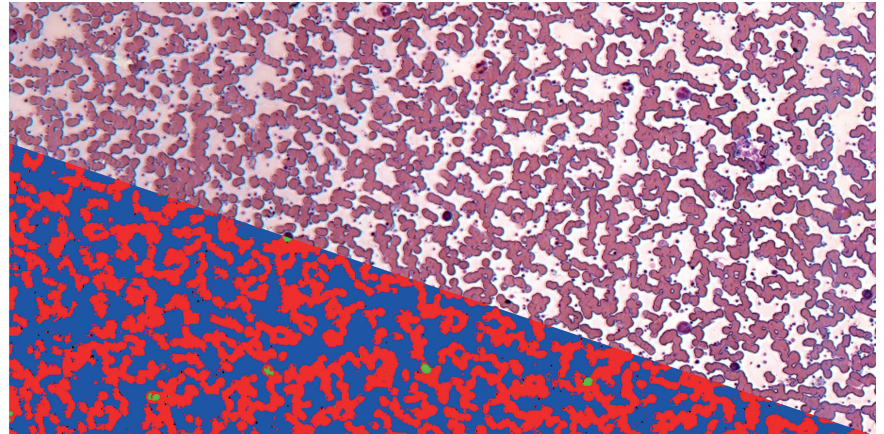
SNAPSCAN SYSTEM PRODUCT SPECIFICATION



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|---------------------|--|
| Spatial resolution | up to 3650 x 2048 px (7Mpx RAW per band) |
| Spectral resolution | 100+ bands (NIR version) or 150+ bands (VNIR version) |
| Spectral range | 600 – 970 nm (NIR version) or 470 – 900 nm (VNIR version) |
| FWHM | - 10 – 15 nm (collimated) |
| Acquisition speed | - 200ms - 20 seconds, depending on acquisition parameters, lighting and object) |
| SNR | > 100 - 200, flat SNR over spectral range |
| SW scanning modes | Digital TDI (x5-8 stages max) Multi-exposures HDR (high-dynamic-range) Digital binning (2x2, 3x3, 4x4) Spectral ROI - Region of Interest (1 to 8 bands max) Spatial ROI - Region of Interest (2048 x custom scanning length) |
| Dynamic range | 8/10 bit |
| Optics | 20/24/35/50 mm lenses – F2.0 – C-mount |
| Smile & keystone | Software corrected |
| Interface | USB3.0 + GPIO + I/O for triggering |
| Cooling | Passive & active cooling (fan based + TEC) |
| Temperature | 35°C to 45°C (operation), 5°C to 50°C (transport) |
| Mechanical | Integrated mechanical shutter for automatic dark-counts, Tripod mount (1/4"-20) + side mounting M5 holes |
| Dimensions (LxWxH) | 10 x 7 x 6.5 cm |
| Weight | 580 g (without optics) |



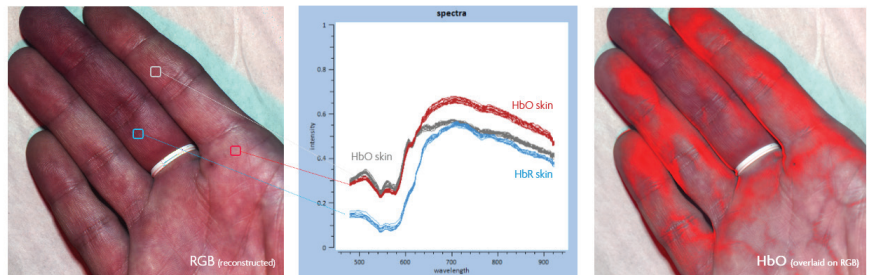
NIR & VNIR Linescan hyperspectral image sensors integrated into the snapscan camera system



RGB rendering & image with classification (red blood cells versus white blood cells) from a single snapshot of 150+ spectral images with 7Mpx spatial resolution (snapscan camera was mounted onto a LEICA microscope for spectral imaging of one blood smear test sample)

APPLICATIONS

- Digital microscopy for pathology, cytogenetics & research
- Wound healing & diagnostics
- Medical endoscopy
- Medical guided surgery
- Agriculture & robotics
- Industrial machine vision
- Mineral & material characterization
- General application research for hyperspectral imaging in both lab and outdoor environments



4MP hyperspectral data-cube acquisition of hand: true color RGB rendering picture, spectral plots of few spatial points and HbO overlaid image showing variations of oxygenation within hand when one finger blood circulation is blocked by rubber band

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