Model 4250 VNIR

Setting the standard in intelligent hyperspectral imaging

The HinaLea® 4250 system represents the next generation of intelligent hyperspectral imagers. Based on front-staring Fabry–Pérot technology, the 4250 includes the hardware and software required to support a broad range of hyperspectral imaging applications. Whether you are working in the field, laboratory or a production facility, the 4250 sets the standard in performance, portability and application versatility.

HIGHLIGHTS

- High spatial and spectral resolution
- Real-time imaging and classification
- VIS-NIR (400 – 1000 nm)
- Up to 300 spectral bands
- 4 nm (FWHM)
- Sensor Spatial Resolution - 2.3 MP
- < 1 nm repeatability
- Lens interchangeability

Based on patented Fabry–Pérot interferometer technology, the 4250 model does not require mechanical scanning of the instrument. In this technique, a tunable filter that can sequentially select spectral bands is placed in front of the sensor and generates the hyper-spectral cube by collecting complete images at each spectral band-pass. The major features and benefits of the 4250 system include:

- **Speed of acquisition:** One of the unique attributes of the 4250 system is its wavelength selectivity which can be dynamically controlled based on the application and object to be imaged. The system allows a range of operational modes from high spectral resolution static image capture with hundreds of bands to real-time and even video rate image capture and classification with a few band-passes of interest in a multi-spectral configuration
- **Complete solution:** At HinaLea, our goal is to develop intelligent imaging solutions to customer problems. As such, our systems include application software for not only acquisition but also image exploration and classification. Easy to use tools allow the easy and intuitive application of sophisticated segmentation algorithms that are presented immediately to the user.
- **High resolution:** The 4250 model offers high spectral and spatial resolution without the image uniformity challenges that line-scanning hyperspectral and patterned-filter snapshot multi-spectral imagers present.
- **Application flexibility:** Front-staring systems offer other advantages over line-scanning technologies for environmental monitoring applications, most notably more versatile viewing geometry options. Such systems can not only be mounted statically, but they can also be used by field operators or mounted on airborne platforms and land vehicles.
- **Cost:** HinaLea's systems are designed with mass manufacturability in mind. As such, our systems typically cost a fraction of competitive solutions with similar levels of performance

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4250 System Technical Specifications

Mechanical	
Dimensions (LxWxH)	197.7mm (7.78") x 81mm (3.19") x 78mm (3.07") 15° FOV lenses add 45.5mm (1.79") when focused at infinity (see below) 30° FOV lenses add 130.7mm (5.15") when focused at infinity (see below)
Mass (Weight)	1.25 kg (2.75 lbs.)
Electrical	
Input Voltage	110 VAC at 60Hz / 220 VAC at 50Hz
Data Interfaces	USB 2.0, 3.0
Environmental	
Operating Temperature	20°C ± 5°C
Humidity	65% non-condensing
Scan Performance	
Standard Lens	15° Field of View (FOV) – 150 mm to ∞ 30° Field of View (FOV) – 150 mm to ∞
Sensor Spatial Resolution	2.3 MP[+]
Spectral Range	400 – 1,000 nm
Spectral Bands	300 nominal
Spectral Resolution	4 nm (FWHM)
Dynamic Range	User selectable 8 or 16 bit
Spatial Resolution	2.3 MP with demosaicing
Illumination	Optional

[+] RGGB sensor; effective monochromatic equivalent 588,544 pixels without demosaicing

HINALEA ADVANTAGES

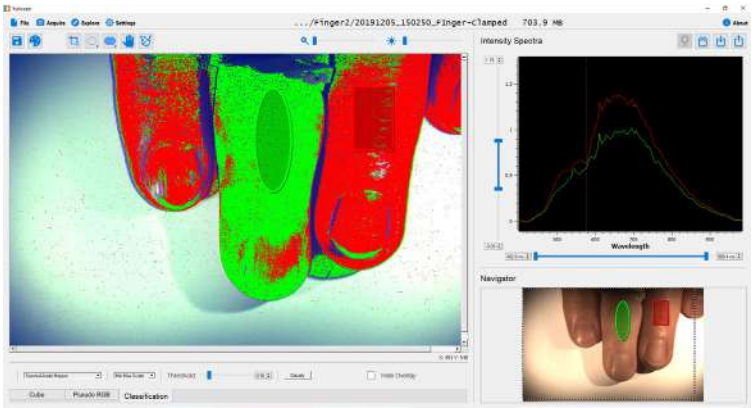
» **Staring Hyperspectral Imaging**
No mechanical scanning is required, resulting in a lower-cost, reliable system that produces more uniform images.

» **Off-Sensor Spectral Filtering**
Decoupling the spectral filtering from the image sensor means not compromising one for the other and enables both high spatial and spectral resolution

» **True Hyperspectral Imaging**
Unlike color-filter arrays, with the HinaLea® solution, there is no tradeoff between number of spectral bands and effective spatial resolution.

» **Customizable**
HinaLea will work with strategic partners to optimize camera performance for specific applications and will consider OEM models.

Application Software



The 4250 system includes proprietary application software featuring fast and easy hyper-cube capture and intuitive image classification/segmentation as part of a suite of powerful spectral image exploration tools.

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