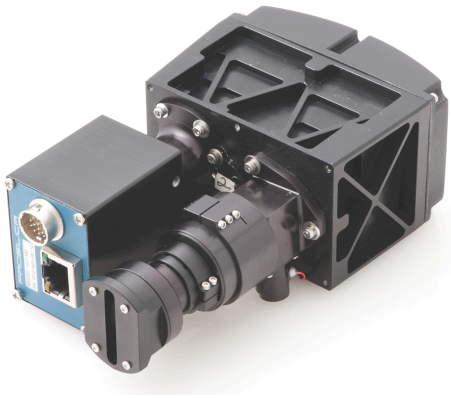
Compact Hyperspectral Advanced Imager for Visible-NIR

CHAI V-640 (Rev-C)

Compact and economical; ideal for UAV and field use

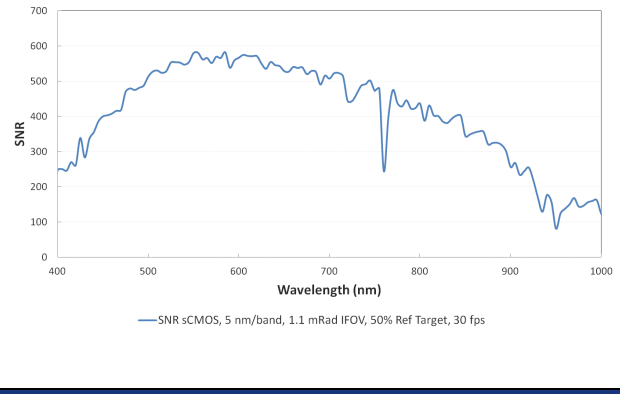
DESCRIPTION

The CHAI V-640 is the instrument of choice for applications requiring a ultra-compact, lightweight yet high-performance hyperspectral imager. The V-640 integrates a Fully-depleted Backside Illuminated CMOS image sensor with a powerful Dyson spectrometer to achieve excellent image quality with high sensitivity. The V-640 form factor is suitable for multi-unit arrangements, including side-by-side, fore- and aft- viewing angles, and varying polarizations.



CHAI V-640C Instrument

(Prior version shown, new instrument will use FBX CMOS camera.)



CHAI V-640 Signal to Noise Ratio

APPLICATIONS

- Earth Science
- Aerial Survey and Precision Agriculture
- Machine Vision
- Microscopy

PLATFORMS

- Airborne and Drone
- Ground Pan-tilt Mount
- Ground vehicle-based

ADVANTAGES

- High Sensitivity using Deep Depletion CMOS
- Lower Cost
- Compact
- Low Power

Contact us for application-specific performance modeling and benchmarking.

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BRANDYWINE PHOTONICS

SPECIFICATIONS

MECHANICALS	ESTIMATE
Size (with lens) Size (with telescope)	125 x 101 x 75 mm 200 x 101 x 75 mm
Weight	.48 kg [.99 lbs]
Power	20 watts
Temperature Range	-20 to +50 C
Size does not include NS/GPS	

OPTICS	SPECIFICATION
Spectrometer Type	Dyson
Telescope	All-reflective telescope
Field of View	40 degrees
Cross Track Pixels	640
F-Number	f/2
Spectral Range	350-1080 nm (Reflective) 400-1000 nm (Refractive)
Smile Distortion	< 0.1 pixels
Keystone Distortion	< 0.1 pixels
Stray Light	< 1e-4 Point Source Transmission
Spectral Bands	256
Spectral Sampling	2.5, 5, 10 nm
Peak Grating Efficiency	88%
Slit Size	9.6 x .015 mm

IMAGE SENSOR	
Image Sensor	640 x 512, with 15 μm pixels
Full Well Capacity	Gain 0: 500,000 Gain 1: 60,000 Gain 2: 10,000
Read Noise	Gain 0: < 63 electrons Gain 1: < 42 electrons Gain 1: < 10 electrons
Maximum Frame Rate	1000 frames/second
Quantum Efficiency	> 50% @ 380 nm 80% @ 400-900 nm > 30% @ 1000 nm
Camera Interface	USB-3
Data Acquisition	500 MB Solid State Recorder Serial Interface for GPS/INS

CHAI SOFTWARE	
Trigger Modes	Pilot, GUI, electronic, and Lat/Long triggered acquisition
Visualization	3-band RGB waterfall display of real-time and recorded data
Metadata	Temperature, pressure, and humidity
Data Format	RAW, ENVI BIL, or Processed
Processing	EXPRESSO™

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