

P R E L I M I N A R Y

SENSORS
UNLIMITED



1.25 x 1.25 x 1.10 inches
31.8 x 31.8 x 28 mm

Micro-SWIR™ 640CSX Legacy Camera

Mil-Rugged, High Sensitivity, Small SWaP, InGaAs SWIR Camera

The compact **640CSX** is Sensors Unlimited Inc.'s SWIR video camera designed for applications requiring small Size, Weight, and Power (SWaP) as well as high sensitivity. These cameras feature a 640x512 pixel, high-sensitivity, stabilized InGaAs snapshot imager and utilize Sensors Unlimited's image enhancement algorithms to produce highest quality imagery in all lighting conditions. The camera provides real-time daylight to low-light imaging in the Short Wave Infrared (SWIR) wavelength spectrum for persistent surveillance, laser detection, and penetration through fog, haze, and smoke.

On-board Automatic Gain Control (AGC) optimizes the camera's imagery throughout day and night imaging scenarios. Camera Link® digital output provides for plug-and-play video with 12-bit images for digital image processing or transmission. The light weight, compact size, and low power is ideally suited for integration into commercial systems and small UAS. Optional NIR/SWIR technology is available to extend the sensitivity of Sensors Unlimited cameras below 0.9 μm , offering the advantage of both Near Infrared (NIR) and Short Wave Infrared wavelength response.

FEATURES

- 640 x 512 pixel format, 12.5 μm pitch
- 30 Hz full frame rate
- 1.7 W power consumption (@ 20° C)
- High sensitivity 0.9 to 1.7 μm spectrum response imager; NIR/SWIR, from 0.7 to 1.7 μm
- Partial moonlight to day time imaging
- Compact size
- All solid-state InGaAs imager
- Snapshot exposure
- On-board, real time non-uniformity corrections
- Digital 12-bit base Camera Link® output
- Automatic Gain Control (AGC)
- C-mount base optic format; adapters available
- Available mounting accessories
- Digital Pixel Binning



MECHANICAL SPECIFICATIONS

Model	SU640CSX-12.5B-ENC housed series SU640CSX-12.5B-OEM
Dimensions (width x height x depth) (includes connectors, excludes lens)	ENC Series: 1.25"W x 1.25"H x 1.21"D 31.8 x 31.8 x 30.7 mm OEM Series: 1.21"W x 1.21"H x 1.19"D 30.7 x 30.7 x 30.2 mm
Weight	ENC Series: ≤65 grams OEM Series: ≤57 grams
Lens mount	C-mount
Camera Link Connector	Airborn NK-2B2-025-228-TH00
Power Input Connector	Airborn NK-2B2-015-228-TH00
Pixel Pitch	12.5 μm
Focal Plane Array Format	640 x 512 pixels

ENVIRONMENTAL & POWER SPECIFICATIONS

Operating Case Temperature	-40°C to 70°C
Storage Temperature	-54°C to 85°C
Humidity	5-95% relative humidity – non-condensing
Power Requirements:	
DC Voltage	+4.5-8 V
Steady State Power	1.7 W at 20°C case temperature
Max Power	<4.25 W
Functional Shock, Random Vibration, Thermal Shock	MIL-STD-810G compliant design

ELECTRICAL SPECIFICATIONS

Optical Fill Factor	100 %
Spectral Response	Standard, 0.9 μm to 1.7 μm NIR/SWIR, 0.7 μm to 1.7 μm
Quantum Efficiency	Standard, > 65% from 1 μm to 1.6 μm NIR/SWIR, > 65% from 0.9 μm to 1.6 μm
Mean Detectivity, D*¹	2.8 x 10 ¹³ cm√Hz/W (typical)
Noise Equivalent Irradiance¹	8.8 x 10 ⁹ photons/cm ² /s (typical)
Noise (RMS)¹	35 electrons (typical)
Dynamic Range¹	460:1 (high gain) 950:1 (low gain) (minimum)
Non-Uniformity Corrections	At least 16 pre-configured operational settings (OPRs)
Operability²	> 99 %
Exposure Times, preconfigured	30 μs to 32 ms
Image Correction	non-uniformity corrections 2 point
Output Format	12 bit base Camera Link®
Digital Output Frame Rate	30 fps
Scan Mode	Continuous

¹Wavelength = 1.55 μm, exposure time = 32 ms, case temperature = 20° C, highest sensitivity gain setting, no lens, x1 digital gain with enhancement, AGC, and correction off

² The fraction of pixels with responsivity deviation between +/- 35% from the mean.

