



SENSORS UNLIMITED MICRO-SWIR™ 640CSX CAMERA

MIL RUGGED, HIGH SENSITIVITY AND SMALL SWAP INGAAS SWIR CAMERA

The compact Sensors Unlimited Micro-SWIR™ 640CSX is the next-generation SWIR video camera, designed for applications requiring small Size, Weight and Power (SWaP) applications and available without ITAR restriction.

It features a 640 x 512 pixel, high-sensitivity, stabilized InGaAs snapshot imager and uses our advanced image enhancement algorithms to produce the 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 a range of applications that include industrial process monitoring, enhanced vision and persistent surveillance. On-board Automatic Gain Control (AGC) optimizes the

camera's dynamic response throughout day and night imaging scenarios. Camera Link® digital output provides for plug-and-play video with 12-bit images for digital image output.

The light weight, compact size and low power draw are ideally suited for integration into commercial systems and industrial process monitoring applications. Optional NIR/SWIR technology is available to extend the sensitivity of the 640CSX below 0.9 μm , offering the advantage of both Near Infrared (NIR) and Short Wave Infrared wavelength response.

KEY FEATURES AND BENEFITS

- 640 x 512 pixel format, 12.5 μm pitch
- 30 or 60 frames per second full frame rate
- 1.5 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
- Low light to daytime imaging
- Compact size
- All solid-state InGaAs imager
- Snapshot exposure
- On-board, real-time non-uniformity corrections
- Digital 12-bit Camera Link base output (other output options available upon request)
- Automatic Gain Control (AGC)
- C-mount compatible; adapters available
- Selectable contrast enhancement modes
- User-defined Region of Interest (ROI) windowing mode
- Digital pixel binning
- FCC Part 15 and MIL-STD-461F certified
- Tested to MIL-STD-810G for functional shock, vibration, thermal shock, storage temperature and humidity
- Operation from -40° C to 70° C case temperature



MECHANICAL SPECIFICATIONS

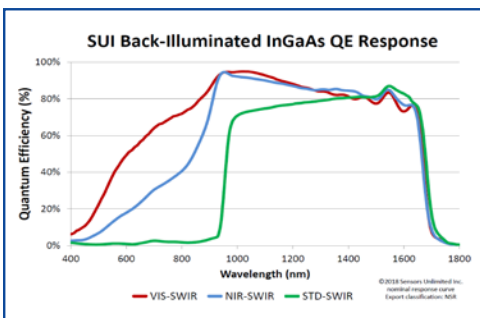


Model	SU640CSX-12.5B-ENC housed series SU640CSX-12.5B-OEM
Dimensions (width x height x depth) (excludes connectors, excludes lens)	ENC Series: 1.25"W x 1.25"H x 1.10"D 31.8 x 31.8 x 28 mm OEM Series: 1.25"W x 1.25"H x 1.10"D 31.8 x 31.8 x 28 mm
Weight	ENC Series: <45 grams OEM Series: <41 grams
Lens mount	C-mount
Camera link connector	26-pin SDR standard connector Board-to-board connector option for OEM model
Power input connector	14-pin SDR standard connector
Pixel pitch	12.5 μm
Focal plane array format	640 x 512 pixels
Active area	8.0 mm x 6.4 mm (10.2 mm diagonal)

ENVIRONMENTAL AND POWER SPECIFICATIONS

Operating case temperature	-40° C to 70° C
Storage temperature	-54° C to 85° C
Humidity	95% RH non-condensing
Power requirements: AC adapter supplied DC voltage Power	DC voltage: +4.5-16V Power: 1.5 W at 20° C case temperature, max <4.25 W
Functional shock, random vibration, thermal shock	MIL-STD-810G compliant design

ELECTRICAL SPECIFICATIONS



	30 fps	60 fps
Optical fill factor	100%	100%
Spectral response	Standard, 0.9 μm to 1.7 μm NIR/SWIR, 0.7 μm to 1.7 μm	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	Standard, >65% from 1 μm to 1.6 μm NIR/SWIR, >65% from 0.9 μm to 1.6 μm
Mean detectivity, D^*^1	>2.5 x 10 ¹³ cm $\sqrt{\text{Hz/W}}$ (typical)	>2.8 x 10 ¹³ cm $\sqrt{\text{Hz/W}}$ (typical)
Noise equivalent irradiance ¹	<9.7 x 10 ⁸ photons/cm ² /s (typical)	<1.2 x 10 ⁹ photons/cm ² /s (typical)
Noise (RMS) ¹	<35 electrons (typical)	<25 electrons (typical)
Dynamic range ¹	>2500:1 at low gain >800:1 at high gain	>2500:1 at low gain >1100:1 at high gain
Operability ²	>99%	>99%
Exposure times, preconfigured	200 μs to 33 ms	200 μs to 33 ms
Image correction	2-point (offset and gain) pixel by pixel, user selectable	2-point (offset and gain) pixel by pixel, user selectable
Output format	12-bit base Camera Link	12-bit base Camera Link
Digital output frame rate	30 fps	60 fps
Scan mode	Continuous	Continuous

¹ $\lambda = 1.55 \mu\text{m}$, exposure time = 33 ms (30fps), 16.67 ms (60 fps), 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.

Specifications subject to change without notice.
Front photo courtesy of www.marines.mil and Lance Cpl. Adam Montero.



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