



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

Micro-SWIR™ 640CSX Camera

Mil-Rugged, High Sensitivity, 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.

FEATURES

- 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) (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: 1.25"W x 1.25"H x 1.21"D 31.8 x 31.8 x 30.7 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 x 10.2 mm diagonal

ENVIRONMENTAL & POWER SPECIFICATIONS

Operating Case Temperature	-40°C to 70°C
Storage Temperature	-54°C to 85°C
Humidity	95% relative humidity – 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 ² /Hz/W (typical)	> 2.8 x 10 ¹³ cm ² /Hz/W (typical)
Noise Equivalent Irradiance¹	< 9.7 x 10 ⁹ 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 Range¹	> 2500:1 at low gain > 800:1 at high gain	> 2500:1 at low gain > 1100:1 at high gain
Operability²	> 99 %	> 99 %
Exposure Times, preconfigured	200 μs to 32 ms	200 μs to 32 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 typical, λ = 1550 nm, exposure time = 33 ms (30FPS) / 16.67 ms (60FPS), case temperature = 20°C, highest sensitivity gain setting, no lens, corrections off, 1x digital gain, with AGC, enhancement, and correction off.

² The percentage of pixels with responsivity deviation less than 35% from the mean.

