



1.65 x 1.60 x 1.60 inches  
41.9 x 40.6 x 40.6 mm

## Sensors Unlimited Mini-SWIR™ Snapshot Camera

High Resolution, Mil-Rugged, High-Sensitivity InGaAs SWIR Camera with Snapshot Exposure

The compact J-Series is Sensors Unlimited's next generation SWIR digital video camera featuring a 1.3MP high-resolution, high-sensitivity InGaAs imager. It 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, dust, and smoke. In addition, the camera employs on-board Automatic Gain Control (AGC) and built-in non-uniformity corrections (NUCs), allowing it to address the challenges of high-dynamic-range urban night imaging without blooming. Camera Link® digital output provides for plug-and-play video with 12-bit images for digital image processing or transmission. The light-weight and compact size enables easy integration into aerial, mobile and hand-held surveillance systems. Optional NIR/SWIR technology is available to extend the sensitivity of Sensors Unlimited cameras down to 0.7  $\mu\text{m}$ , offering the advantage of both Near Infrared (NIR) and SWIR wavelength response.

### APPLICATIONS

- Low-light level imaging
- Covert surveillance with passive 24 hr/7 day operation
- Multi-laser spotting and tracking
- Imaging through atmospheric obscurants
- OEM version for easy integration into Unmanned Aerial Systems, handheld, or robotic systems
- Driver Vision Enhancement (DVE)

### FEATURES

- 1280 x 1024 pixel format, 12.5  $\mu\text{m}$  pitch
- 30 frames per second full frame rate
- High sensitivity in 0.9 to 1.7  $\mu\text{m}$  spectrum; NIR/SWIR, from 0.7 to 1.7  $\mu\text{m}$
- Low power, < 3.8 W at 20°C
- Partial moonlight to day time imaging
- Compact OEM module size, < 4.5 in<sup>3</sup>
- All solid-state InGaAs imager with snapshot exposure capability
- On-board, real time non-uniformity corrections
- Digital 12-bit base CameraLink® output
- Automatic Gain Control (AGC)
- Improved Dynamic Range Enhancements (Local Area Processing)
- Operation from -40° to +70°C
- Tested to MIL-STD-810G for functional shock, vibration, thermal shock, storage temperature, altitude, humidity, and acceleration



# P R E L I M I N A R Y

## MECHANICAL SPECIFICATIONS

	Enclosed	OEM
<b>Module dimensions Width x Height x Depth</b>	2.00 x 2.00 x 2.43 inches, 50.8 x 50.8 x 61.7 mm (with I/O connectors, no lens or mount)	1.65 x 1.60 x 1.60 inches, 41.9 x 40.6 x 40.6 mm (no optional output panel and lens mount)
<b>Weight (no lens)</b>	≤ 235 g	≤ 120 g
<b>Lens Mount</b>	M42x1 mount	Optional M42x1 mount bracket
<b>Included Lens</b>	f/1.4, 50 mm, 18° FOV width, M42x1-mount	none
<b>Camera Link Connector</b>	3M SDR26 Connector	none
<b>Interface Connector</b>	Not applicable	Samtec LSHM-130-030-L-DV-A-N
<b>Pixel Pitch</b>	12.5 μm	12.5 μm
<b>Focal Plane Array Format</b>	1280 x 1024 pixels	1280 x 1024 pixels
<b>Active Area</b>	16.0 mm x 12.8 mm x 20.5 mm diagonal	16.0 mm x 12.8 mm x 20.5 mm diagonal

## ENVIRONMENTAL & POWER SPECIFICATIONS

<b>Operating Case Temperature</b>	-40°C to 70°C
<b>Storage Temperature</b>	-54°C to 85°C, MIL-STD-810G Method 501.5 and 502.5
<b>Humidity</b>	95% relative humidity, MIL-STD-810G Method 507.5 Procedure II
<b>Power Requirements:</b>	
<b>AC Adapter Supplied</b>	100-240 VAC, 47-63 Hz
<b>DC Voltage</b>	+8-16 V
<b>Power</b>	≤ 3.8 W at 20°C (case temperature), ≤ 8.5 W maximum
<b>Functional Shock, Random Vibration, Thermal Shock, Temperature/Altitude/ Humidity Combine, Acceleration</b>	MIL-STD-810G compliant
<b>Conducted and Radiated Emissions</b>	FCC Part 15, Subpart B, MIL-STD-461F RE102, CE102, CS115, CS116, RS103
<b>CE compliance</b>	EN 61326-1, EN 60950-1
<b>Mean Time Between Failure</b>	≥ 10,000 hours, MIL-HDBK-217 with VITA 51.1 Supplement Telcordia Issue 2
<b>Fungus-Inert Material</b>	MIL-HDBK-454B

## ELECTRICAL SPECIFICATIONS

<b>Optical Fill Factor</b>	100%
<b>Spectral Response</b>	Standard, 0.9 μm to 1.7 μm NIR/SWIR, 0.7 μm to 1.7 μm
<b>Quantum Efficiency</b>	Standard, ≥ 65% from 1 μm to 1.6 μm NIR/SWIR, ≥ 65% from 0.9 μm to 1.6 μm
<b>Mean Detectivity, D* (Typical) <sup>1</sup></b>	1.3 x 10 <sup>13</sup> cm <sup>2</sup> /Hz/W
<b>Noise Equivalent Irradiance (Typical) <sup>1</sup></b>	1.8 x 10 <sup>9</sup> photons/cm <sup>2</sup> xs
<b>Noise (RMS, Typical) <sup>1</sup></b>	75 electrons
<b>Full Well Capacity <sup>2</sup></b>	4.7 x 10 <sup>5</sup> electrons
<b>Dynamic Range (Typical) <sup>3</sup></b>	1500:1
<b>Non-Uniformity Corrections</b>	23 pre-configured operational settings (OPRs)
<b>Operability <sup>4</sup></b>	≥ 99%
<b>Exposure Times</b>	27 μs to 32 ms
<b>Image Correction</b>	2-point (offset and gain) pixel by pixel, user selectable
<b>Digital Output Format</b>	12 bit base Camera Link®
<b>Digital Output Frame Rate</b>	30 fps
<b>Scan Mode</b>	Continuous or 3 externally triggered modes

<sup>1</sup> λ = 1.55 μm, exposure time = 32 ms, 20°C TEC setpoint, high gain, no lens, x1 digital gain with enhancement, AGC, and correction off.

<sup>2</sup> Exposure time = 27 μs, 20°C TEC setpoint, low gain.

<sup>3</sup> In high dynamic range OPR settings. Able to achieve 300:1 in highest sensitivity OPR settings.

<sup>4</sup> Fraction of pixels with responsivity deviation between +/-35% from the mean.

