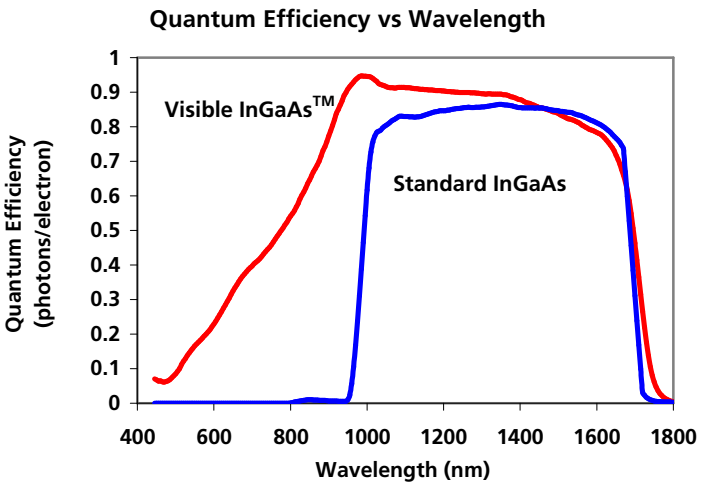
SU640SDWH-1.7RT
SU640SDWHVIS-1.7RT
High Resolution Windowing InGaAs and Vis-InGaAs™ SWIR Cameras

These *high-speed* SU640SDWH and SU640SDWHVis InGaAs room-temperature 640 x 512 pixel solid-state cameras allow users to capture full-sized images at 109 frames per second (fps) or smaller Regions of Interest (ROI) at over 15,000 fps. The camera features a Camera Link® compatible interface and internal non-uniformity corrections for the full-frame operational modes. The SU640SDWH camera's focal plane array responds to light within the shortwave infrared (SWIR) spectrum range of 0.9 to 1.7 µm while the SU640SDWHVis includes the visible, covering 0.4 to 1.7 µm.

APPLICATIONS

- Real-time tracking & aligning of free- space communications lasers or guide-stars
- Adaptive optics systems
- Machine vision & motion analysis of fast moving objects
- Pulsed or CW laser beam profiling
- High speed semiconductor inspection
- Assembly & monitoring of optical switches
- Hyperspectral imaging



FEATURES

- High-sensitivity solid-state InGaAs or Vis-InGaAs image sensor with 100% fill factor
- 640 x 512 pixel resolution on 25 µm pitch
- Ultra-high frame rates with preset and user-programmable Regions of Interest (ROI)
- External trigger of full-frame or ROI acquisition
- User programmable exposure times > 10 µs
- Choice of wavelength range: 0.4 to 1.7 µm or 0.9 to 1.7 µm
- Room temperature operation of FPA
- Anti-blooming protection
- Extensive interactive command set enables user customization of most parameters, and start-up states
- 14-bit digital Camera Link® compatible output, base configuration
- Buffered EIA170 compatible analog output displays ROI images on standard monitors

3490 U.S. Route 1 • Princeton, New Jersey 08540
Phone: (609) 520-0610 • Fax: (609) 520-0638
www.sensorsinc.com • sui_sales@goodrich.com

SUI knows IR™

Doc. No. 4110-0056 Rev. B

Effective Date: 31-Mar-09

ELECTRO-OPTICAL PERFORMANCE

Optical Fill Factor	100%	
Spectral Response	SDWH: SDWHVis:	0.9 to 1.7 µm 0.4 to 1.7 µm
Quantum Efficiency	> 65% from 1 µm to 1.6 µm	
Mean Detectivity, D* [1]	> 6 x 10^{12} cm √Hz/W	
Noise Equivalent Irradiance[1]	< 2.5 x 10^{9} photons/cm^2·s	
Noise (rms)	< 300 electrons	
Gain	50e^-/count (nominal)	
Full Well	800k electrons (typical)	
True Dynamic Range[2]	> 2500:1	
Operability [3]	> 99.2%	

[1] λ =1.55 µm, exposure time = 33.19 ms (no lens), corrections & AGC off
[2] Average pixel response in a single image at the nominal gain (50e^-/count)
[3] The % of pixels with responsivity deviation within 35% from the mean

MECHANICAL

Length x Width x Height:	15.80 cm x 7.62 cm x 7.62 cm 6.22 in x 3.00 in x 3.00 in Length includes mounting flange and I/O connectors
Weight:	< 1.1 kg (no lens)
Focal Plane Array Format:	640 x 512 pixels
Pixel Pitch:	25 µm
Active Area:	16 x 12.8 mm, 20.5 mm diagonal
Lens Mount:	M42x1 thread, optional F-mount and FD-mount adaptors available
Sensor focal plane	17.3 mm +/- 1 mm behind optical mount flange

INTERFACES

Control	MDR 26-pin connector (Camera Link®)
Image Data	MDR 26-pin connector (Camera Link®)
Power	Hirose HR25-7TR-8S connector
Analog Video	75 Ω BNC, 1 V max output
Trigger	75 Ω BNC, 5 V TTL max input
Camera Body Mount	¼-20 and M6 tapped holes (bottom) M42 x 1 threaded hole (front) 4 x 8-32 holes on 2 inch centers (front) 4 x M4 x 0.7 holes spaced 50 mm wide x 40 mm high (front)
Status LED	Power indicator, imager temperature control status

ENVIRONMENTAL & POWER

Operating Temperature[4]	-10°C to 40°C
Storage Temperature	-10°C to 60°C
Humidity	Non-condensing
Power Requirements: AC Adapter Supplied DC (Voltage/Power)[4]	 100-240 VAC, 47-63 Hz, < 1.0 A 7-28 V, < 8 W at 25°C, < 11 W at 40°C

[4] Camera Body Temperature

SYSTEM PERFORMANCE & OPERATIONAL MODES

Scan Mode	Continuous or triggered		
Exposure Mode	Snapshot (all pixels exposed simultaneously)		
Frame Rate	109 frames/s full resolution maximum		
Exposure Times	Factory set from 150 µs to 33.2 ms for full-frame acquisition with corrections Programmable with external trigger > 10 µs		
Image Correction	2-point (offset and gain) pixel by pixel user selectable, 8 settings		
Digital Output Format	14 bit Camera Link® base compatible (corrected and uncorrected modes available)		
Analog Output Format	Buffered EIA170 compatible video or Sync Out (active high during integration)		
Acquisition Modes	Full-frame window, preset ROI window, variable ROI window		
Preset Window Modes (region centered in array)	Window size in pixels	Integration Time	Frame Rate
	16 x 16	61 µs	15220 fps
	64 x 64	305 µs	3200 fps
	128 x128	795 µs	1240 fps
	320 x 256	2.70 ms	365 fps
	640 x 512	9.13 ms	109 fps
Variable Window Mode (Arbitrary location)	Min. of 16 col. x 8 rows up to 640 x 512 in steps of 4 pixels e.g., 640 col x 20 rows: max integration time: 360 us, frame rate: 2500 fps		
External Trigger Modes Full-frame Mode	Pre-set exposure (set by integration time), Variable exposure (integrates while trigger high, min. of 10 µs), Burst with pre-set exposure (standby while trigger low, free-run while high)		
ROI Window Trigger Mode	Single frame (short trigger pulse), or burst (pause while trigger low, free-run while high)		
External Trigger Delay (typical)	with preset exposure: 550 ns with external set exposure: 370 ns to start of exposure, 2.7 µs to end		

Contact SUI to discuss lens and data acquisition options available for these cameras