Raytheon
An RTX Business

Sensors Unlimited: 2048R InGaAs Linescan camera

2048 pixels with >147K lines per second

High-resolution 2048R SWIR camera with capture rates of 10,000 to 147,000 lines per second for (SD)-OCT.

BENEFITS

- 2048 x 1 pixel array with 10 µm pitch
- High QE from 0.98 µm to 1.65 µm
- Solid-state FPA with snapshot exposure
- User controlled exposure and line period
- Line rates from 9.5K to >147K lps in three speed ranges
- >1590:1 dynamic range in low sensitivity
- > 510:1 in high sensitivity
- External triggering of line and exposure via Camera Link® CC1 line
- Enclosed body < 136 cm^3 (< 8.3 in3)
- Low power < 4 W over 6-12 V
- Acquires and saves user non-uniformity corrections
- Medium 12-bit Camera Link® interfaces

The Sensors Unlimited 2048R Linescan camera boosts the speed of spectral-domain optical coherence tomography, imaging to >147,000 lines per second (lps) via the medium Camera Link® interface. To optimize performance, there are three speed ranges providing the flexibility lacking in swept-source systems. They deliver the high resolution, stability and reliability needed for optical coherence tomography (OCT) of blood flow or capturing large tissue volumes. Compact and slim, the camera features an InGaAs PDA of 2048 pixels on 10-µm pitch with an aperture height of 210 µm. High-spectral resolution and QE are provided over the short-wave infrared (SWIR) wavelengths from 0.98 to 1.65 µm, enabling deeper imaging. The simultaneous acquisition across all pixels delivers the superiority, repeatability and long operating life needed for for vital bio-medical and deep tissue imaging.

Applications

- OCT at: 1.04 µm, 1.31 µm and 1.55 µm.
- High-resolution spectroscopy of transient spectra from .940 to 1680 nm.
- SWIR machine vision of ultra-fast moving objects.

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Environmental and power	
Operating case temperature	+10°C to +35°C
Storage temperature	-10°C to +60°C
Humidity	Up to 95% and non-condensing
Power requirements:	
AC adapter supplied	100 to 240 VAC, 47 to 63 Hz
DC voltage	+6 to 12 VDC (maximum: 13.1 VDC)
Typical power	< 4 W at 30°C case temp[1]
In-rush current	< 1.25 A at 12 VDC

Interfaces	
Control and data	Dual SDR 26-pin connectors
Power connector	CUI Inc. PJ-056, 1.0 mm x 3.8 mm power jack
Trigger: input	Via Camera Link® CC1 line
Status LED:	Green: power on
Tested framegrabbers	National Instruments PCIe-1429, -1433, Matrox Solios eV-CL PCIe-X4

Mechanical	
Width x height x depth	8.3 cm x 10.2 cm x 1.6 cm (excludes I/O connectors, and lens adapter) 3.25 in x 4 in x 0.64 in (excludes I/O connectors, and lens adapter)
Weight:	< 240 g or 8.6 oz (no lens or adapter)
Threaded lens mount and optional lens mount adapters	M42x1-6H with ~6 mm to image plane. None, fixed distance C-Mount adapter or adjustable distance F-Mount adapter
Spectrometer mount	Four tapped 8-32 holes in 2 in^2 pattern, two tapped 8-32 holes in-line with image axis, O-ring light seal, 1.9 in diameter, 1/16th thickness
Camera tripod mount	Two tapped ¼-20 holes, one on bottom, one on side wall.

Opto-electronic performance	
Sensor format[1]	2048 pixels with 2048 readout ADCs
Optical aperture (pixel height)[1]	210 µm
Quantum efficiency[1]	> 60% 0.98 µm-1.65 µm; > 70% peak response at 1.55 µm
Exposure time[1,2]	4.5 µs to 10 ms, user programmed in pixel clock cycles or via the width of the external trigger
Trigger modes[2]	Free run, single-line per trigger (ET set by camera) or variable exposure
Self-triggered line rates	Three ranges: 9.5 k to 80 k, 73 k to 126 k, and 114k to 147 k-lps
Pixel rate	301 Mpix/s with 4 x 12-bit words transferred on each Camera Link® strobe clock at 80 MHz
Digital output format	12-bit medium Camera Link®; recommend NI PCIe-1433 or frame grabber with throughput of >606 Mbytes/s to PC motherboard (minimum of four bi-directional PCIe express lanes in PC)
Readout mode	Integrate-while-read, differential double sampling

[1]Actual formats and performance governed by pixel size options (dark current may limit longest usable ET, especially at high gain).
[2]User selectable by command over Camera Link® serial lines.

Corrections (preset OPRs):
Factory calibrated gain, offset, and bad pixel replace.

Specifications subject to change without notice.

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Contact
Raytheon
Advanced Products & Solutions
Sensors Unlimited Inc.
330 Carter Road
Princeton, New Jersey
08540 USA
(609) 333-8000
sensorsinc.com

www.RTX.com