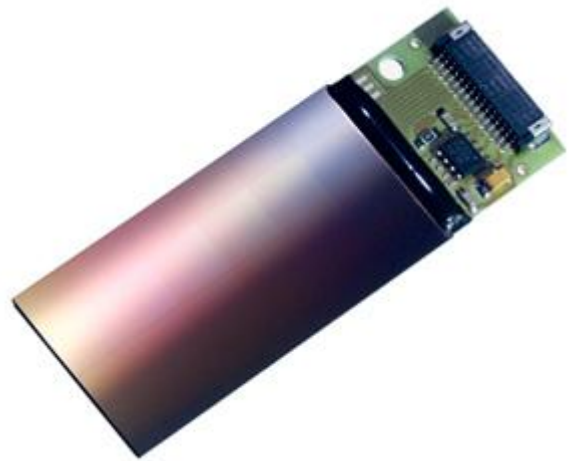


RadEye™ Sensors

RadEye™ Large-Area Image Sensors

The RadEye large-area image sensors are fully integrated CMOS photodiode arrays designed for both visible and radiation imaging. The large active area consists of a 512 by 1024 matrix of silicon photodiodes on either 48 μm (RadEye1) or 96 μm (RadEye100) centers. The sensors are designed with extremely narrow edges along three sides to allow tiling in two dimensions, in order to achieve even larger active areas. Used directly to detect visible light, or with a scintillator to detect x-rays and other energetic radiation, the RadEye sensors are the perfect solution for applications ranging from medical diagnostics to industrial inspection (NDT) and scientific imaging.

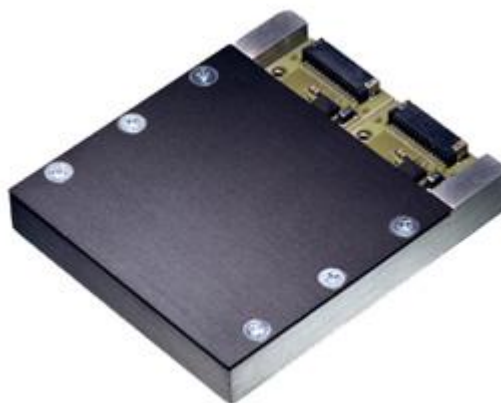


The RadEye image sensors include control logic and readout circuitry that allow them to run off a single 5 V power supply and a master clock. An optional frame start input can be used to control the frame rate externally. A fast-scan mode, a high-speed binning (sparse sampling) mode, and a non-destructive readout mode further add to the flexibility of these devices. Video data is read out sequentially through a high-speed differential analog output at up to 2.5 MHz.

	RadEye1	RadEye100	Units
Active Area	24.6 by 49.2	98.3 by 49.2	mm
Pixel Size	48	96	μm
Avg. Dark Current (23°C)	4000	15,000	elec/sec
Read Noise (rms)	150	250	electrons
Saturation Signal	2,800,000	5,000,000	electrons
Dynamic Range	85	86	dB
Conversion Gain	0.5	0.18	$\mu\text{V}/\text{elec}$
Quantum Efficiency (550nm)	> 30	50	%
Max. Frame Rate	4.5	1.8	fps
Max. Data (Pixel) Rate	2.5	1.0	MHz

RadEye™ X-Ray Sensor Modules

The RadEye series large-area x-ray sensor modules are fully packaged x-ray image sensors that consist of several tiled RadEye sensors in a robust aluminum housing with scintillator and graphite entrance window. The standard product line features sensor modules with active areas ranging from 50x50mm (2" square) up to 100x100mm (4" square), although larger custom configurations are also possible. All modules are available either with direct-coupled GdOS (Gadox) scintillator for low-energy (<50kV) and low-dose applications, or with an integrated fiber-optic faceplate (FOP) for applications requiring higher x-ray energies (up to 160kV) and dose rates.



The RadEye sensor modules feature several parallel analog outputs, similar to a multi-tapped CCD sensor. Please see our reference design described in Application Note AN11 for an example of how to interface to the sensor and digitize the signal. For a complete camera solution using these sensors, please see our Shad-o-Box or Shad-o-Snap product lines.

Device	Active Area	Number of Outputs
RadEye2	49.3 mm by 49.2 mm	2
RadEye3	73.9 mm by 49.2 mm	3
RadEye4	98.6 mm by 49.2 mm	4
RadEye8	98.6 mm by 98.4 mm	8

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