

Remote RadEye™

Detachable X-Ray Sensor for small spaces



Key Features:

- Detachable, rugged sensor module on 1 meter cable
- Up to 50 mm (2") active area
- 10 lp/mm (48 μ m) resolution
- Energy range from 10 to 160 kV
- 12-bit digital video output
- Digital frame grabber or USB interface
- Ready-to-run software and drivers

The Remote RadEye™ detachable x-ray sensor is designed to fit into small spaces where a complete imaging camera won't fit. Available with either a RadEye1 or RadEye2 sensor head, the Remote RadEye module sits at the end of a detachable cable that can reach into tight corners. The camera electronics are mounted in a separate enclosure which can be placed up to one meter away. While designed for portable NDT applications, the Remote RadEye can also be used in fixed installations.

Description:

The Remote RadEye™ is a complete detection system for high-resolution radiation imaging. Available with either a RadEye1 (512x1024 pixels) or a RadEye2 (1024x1024 pixels) sensor head, each sensor module contains a two-dimensional photodiode array with 48 μm pixel spacing. A Gd₂O₂S scintillator screen, placed in direct contact with the photodiode array, converts incident x-ray photons to light, which in turn is detected by the photodiodes. Both our standard sensor for the 10-50 kV range and the EV version for the extended 10-160 kV range are offered.

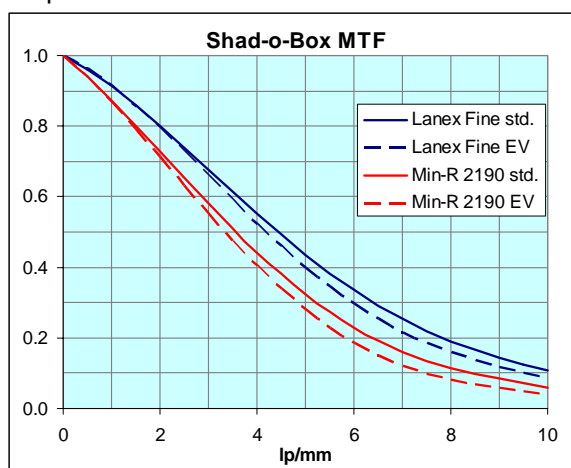
The sensor modules feature a rugged aluminum enclosure with a stainless steel cover and a carbon-fiber window that shields the sensor against ambient light and protects the sensitive electronics from accidental damage. A one meter shielded cable (or two cables for the RadEye2) is included to connect the sensor head to the electronics module. Here the analog video signal is processed, digitized to 12-bit resolution and made available for transmission to a PC.

The Remote RadEye electronics module features either a high-speed parallel digital frame grabber interface, or a USB connection for use with a PC or laptop. Please refer to our Shad-o-Box™ 512/1024 and Shad-o-Snap™ 1024 data sheets for complete details.

The standard version of the Remote RadEye electronics module delivers 4000:1 dynamic range (defined as the maximum signal divided by the read noise) at a frame rate of up to 2.7 frames per second. A special high-gain version boosts the sensitivity of the analog front end by almost a factor of five, at the expense of slightly lower dynamic range and a reduced data rate. All models operate from a standard desktop power supply and consume less than five Watts of power.

Resolution:

The intrinsic resolution of the Remote RadEye detector is 48 μm, which corresponds to just over 10 line pairs per mm. The actual Modulation Transfer Function (MTF) for two different scintillators is shown in the graph to the right. A thicker phosphor screen will produce more signal, but at the expense of high-frequency contrast. Please refer to our appnote AN07 for more information on scintillator performance and tradeoffs.



Specifications:

Detector Specifications	<i>Standard</i>	<i>High Gain</i>	<i>Units</i>
Avg. dark current (23°C)*	8	16	ADU/s**
Read noise (rms)	< 1	< 1	ADU
Dynamic range	4000:1	4000:1	
Digitization	12	12	bits
Conversion gain	500	250	electr/ADU
Sensor data rate (per channel)	1500	1500	kHz

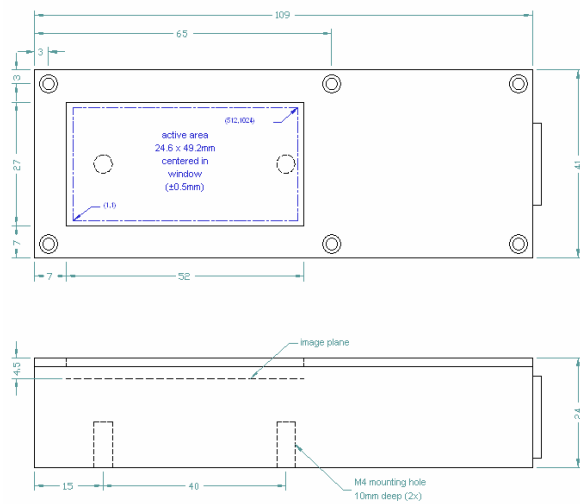
* dark current doubles approx. every 8°C

** ADU = Analog-Digital Unit = 1 LSB (Least Significant Bit)

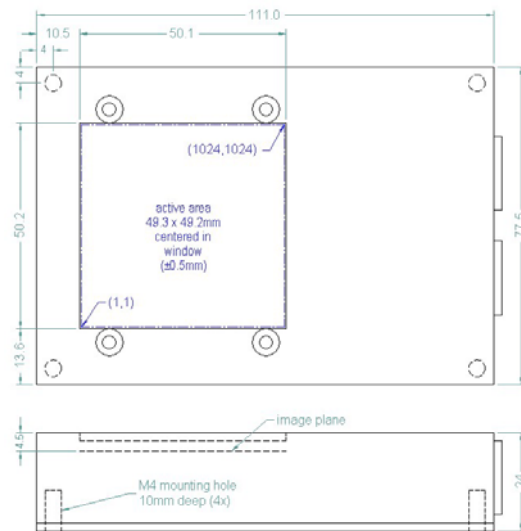
General Specifications	<i>All Versions</i>	<i>Units</i>
Operating Temperature	0 to 50	°C
Storage Temperature	-25 to +85	°C
Humidity (non-condensing)	10 to 80	% R.H.

Mechanical Dimensions:

The size of the electronics enclosure is 160 by 160 by 32 mm. The sensor cable length is 1m – see drawing below for connector sizes. The dimensions of the sensor modules are given below:



RadEye1 Remote Sensor Head



RadEye2 Remote Sensor Head

Ordering Information:

All Remote RadEye detectors can be ordered in two image quality grades (Standard and Premium), and with either with a Kodak Min-R® 2190 or Lanex® Fine scintillator. Additional scintillators may be available by special order. Both standard models for the 10-50 kV energy range and EV models for the 10-160 kV range are available. All cables are included.

The electronics modules are available with either a Shad-o-Box digital frame grabber interface or a Shad-o-Snap USB interface. Electronics modules ship with a desktop power supply and cables for 120V/60Hz. For international orders, please specify a universal input power supply (90-264V, 50-60Hz) and the type of power cord you require.

P/N	Description
RM1158	Shad-o-Box 512 Electronics Module
RM1159	Shad-o-Box 1024 Electronics Module
RM1160	Shad-o-Snap 512 Electronics Module
RM1161	Shad-o-Snap 1024 Electronics Module
RM1162	RadEye1 Remote Sensor Module (10-50 kV)
RM1163	RadEye1 EV Remote Sensor Module (10-160 kV)
RM1164	RadEye2 Remote Sensor Module (10-50 kV)
RM1165	RadEye2 EV Remote Sensor Module (10-160 kV)
-01	Premium Grade ¹ , Min-R 2190
-02	Standard Grade ² , Min-R 2190
-03	Premium Grade, Lanex Fine
-04	Standard Grade, Lanex Fine

¹ no line defects ² up to three line defects

