

# XRD 0840 ML/MG IND

## Digital X-Ray Detector



### Overview

The XRD 0840 IND series detectors are digital x-ray detectors based on 8" amorphous silicon sensors operating as two-dimensional photodiode arrays. The detectors are well suited to perform digital x-ray imaging and contain all drive and readout electronics, including an x-ray interlock. X-rays are converted into light using a Kodak® Lanex® Fast, Lanex® Fine, or a CsI scintillator.

The information is digitized in 16 bits to achieve highest dynamic range and contrast. With a pixel size of 400 µm, an image size of 512 x 512 pixels, and a frame rate of 7.4 Hz, the XRD 0840 IND detectors are designed to fulfill the requirements for a variety of demanding industrial applications.

The XRD 0840 IND series detectors are connected to a PCI computer, transferring data via a customized parallel interface. Up to four detectors, each using its own frame grabber, can be connected to a single PC. The image integration time is variable—between 135 ms and 5 s in steps of 1 ms (internal timer) or set between 135 ms and 12.8 s in eight fixed steps (free running). The XRD 0840 IND series provides the advantage of synchronization between the detector and x-ray source, or manipulator, by using an external trigger signal.

The XRD 0840 IND, the XRD-EP Power Supply Unit, and the PCI I/O board are optimized for the highest performance. The XRD

### Key Features

- ▶ Complete digital x-ray detector
- ▶ Monolithic flat panel
- ▶ 400 µm pixel pitch
- ▶ 65,536 shades of gray
- ▶ High sensitivity
- ▶ Live images @ 7.4 fps
- ▶ Suitable for a wide range of x-ray energies
- ▶ Windows compatible (requires PCI bus)

### Applications

- ▶ Non-destructive testing
- ▶ 3D CT reconstruction
- ▶ Scientific applications

image acquisition and demonstration software and the image acquisition software library are included. The software library can be used to integrate the specific detector functions into various types of image processing software. The library supports functions for:

- acquisition of a single frame or a sequence
- selection of integration times
- selection of trigger modes
  - free running
  - external trigger source
  - internal timer
  - software trigger
- calibration procedures to acquire offset and gain correction files
- perform offset, gain and pixel correction on acquired frames (online correction)

## Technical Specifications

### Sensor Specifications

Scintillator screen (standard):	Lanex®Fine/Lanex®Fast
(optional):	CsI
Pixel number:	512 x 512
Active pixel number:	500 x 500
Pitch:	400 µm
Total area:	204.8 x 204.8 mm <sup>2</sup>
Saturation charge:	84 pC

### Electronics Specifications

Charge amplifier:	8 x 128 channel ASIC
ADC:	8 x 16 bit A/D @ 256 kSps
Saturation charge of ASIC:	5 pC (XRD 0840 AL) 25 pC (XRD 0840 AG)
Integration time (minimum):	135 ms
Non-linearity:	< 1% (10% to 90% of FSR)

### Detector Specifications

Dynamic range:	> 80 dB
Response non-uniformity:	< ± 1% (10% to 90% of FSR)
Image lag: (standard)	< 8% (1 <sup>st</sup> frame)
(CsI-option)	< 10% (1 <sup>st</sup> frame)
Frame rate (max):	7.4 Hz
Radiation energy:	40 keV–350 keV
Detector housing:	335 x 320 x 52 mm <sup>3</sup>
For CsI option (75 kVp, 20 mm Al filtration, 7 mm Al HVL):	
MTF (0.25 lp/mm)	80% (typical > 90%)
MTF (1.0 lp/mm)	30% (typical > 50%)
DQE (0.25 lp/mm)	56% (typical 69%)
DQE (1.0 lp/mm)	28% (typical 43%)

### Requirements

Power supply:	XRD-EP (95510254)
Frame grabber:	XRD-FG (95510214)
	16 bit @ 16 MHz
PC requirements:	CPU > 2.4 GHz
	RAM > 1 GB
	PCI Bus
	Windows®2000, XP, NT4.0

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