

XRD 0820 MN

Digital X-Ray Detector



Overview

The XRD 0820 MN is a digital X-Ray detector based on a 8" amorphous silicon sensor operating as a two-dimensional photodiode array. The XRD 0820 MN is well suited to perform digital X-Ray imaging and contains all drive and read-out electronics including an X-Ray interlock. X-Rays are converted into light using a Kodak™ Lanex Fast, Lanex Fine, Kasei DRZ Standard, DRZ Plus, or a CsI scintillator. The information is digitized in 16 bits to achieve highest dynamic range and contrast. With a pixel size of 200 μm, an image size of 1024 x 1024 pixels, and a frame rate of 7.50 Hz, the detector is designed to fulfil the requirements of a variety of Industrial and Medical Applications.

The XRD 0820 MN series detectors are connected to a PCI computer, with the data transferred via a customized parallel interface. Up to four detectors, each using its own Frame Grabber can be connected to one PC. The XRD 0820 MN, the XRD-EP Power Supply Unit and the PCI I/O board are optimized for the highest performance. The image integration time is variable between 133 ms and 5 sec in steps of 1 ms (internal timer) or can be set between 133 ms and 2 sec in eight fixed steps (free running). The XRD 0820 MN series provides the advantage of synchronization between the detector and x-ray source or manipulator by using an external trigger signal.

Features and Benefits

- Complete Digital X-Ray Detector
- Monolithic Flat Panel
- > 1 Million Pixels
- 200 μm Pixel Pitch
- 65.536 Grey Levels
- Ultra High Sensitivity
- Live Images @ 7.50fps
- Suitable for a wide range of X-Ray energies
- Selectable Gain Setting

Applications

- Non-Destructive Testing
- 3D CT Reconstruction
- Scientific & Medical Applications

The XRD image acquisition and demonstration software and the XRD 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 gain setting
- selection of trigger modes
 - Free Running;
 - External Trigger Source
 - Internal Timer
 - Software Trigger
- calibration procedures to acquire offset and gain correction files
- perform online corrections for
 - Offset correction
 - Multiple Gain Correction
 - Pixel Correction

Panel Specification	
Scintillator screen (standard):	Lanex™Fine*/Lanex™Fast*/DRZ**-STD/DRZ**-PLUS
(optional)	CsI
Pixel number:	1024 x 1024
Active Pixel number	1000 x 1000
Pitch:	200 µm
Total area:	204.8 x 204.8 mm ²
Diode Capacity	2.1 pF

Electronics Specification	
Charge Amplifier	16 x 128 channel ASIC
Feedback capacitance (gain)	0.25 pF, 0.5 pF, 1 pF, 2 pF, 4 pF, 8 pF
ADC:	16 x 16bit A/D @ 1MSps
Integration time (minimum):	133.0 ms @ 200µm 66.2 ms @ 400µm (2x2 Binning)
Non-Linearity ¹	< 1 % (10 % to 90 % FSR)

Detector Specification	
Dynamic range ¹	> 80 dB
Response Non Uniformity ¹	±2 % (10 % to 90 % FSR)
Image lag: (standard)	< 8 % (1 st frame)
(CsI-option)	< 10 % (1 st frame)
Frame rate (max):	7.5 fps @ 200µm 15 fps @ 400µm (2x2 Binning)
Radiation energy:	40 keV – 450 keV
Detector housing:	335 x 320 x 52 mm ³

For CsI Option (75 kVp, 20 mm Al filtration, 7 mm Al HVL):	
MTF (0.5 lp/mm)	80% (typical 90%)
MTF (2.0 lp/mm)	30% (typical 38%)
DQE (0.5 lp/mm)	56% (typical 58%)
DQE (2.0 lp/mm)	28% (typical 37%)

Requirements	
Power Supply	XRD-EP (95510254H)
Frame Grabber:	XRD-FG (95510214H)
PC-Requirements***:	CPU > 3 GHz
	RAM > 1 GB
	PCI Bus
	Windows™2000, XP

¹ At 1pF Gain and 7.5 frames per second
 *Lanex™ is a registered trademark of Eastman Kodak Company; **DRZ is a trademark of Kasei Optonix
 ***Windows™2000 and Windows™ XP are registered trademarks of Microsoft Cooperation

Worldwide Headquarters
PerkinElmer Optoelectronics
 44370 Christy Street
 Fremont, CA 94538-3180
 Telephone: +1 510-979-6500
 Toll free: (North America) +1 800-775-OPTO (6786)
 Fax: +1 510-687-1140
 Email: opto@perkinelmer.com
www.optoelectronics.perkinelmer.com

European Headquarters
PerkinElmer Optoelectronics
 Wenzel-Jaksch-Str. 31
 65199 Wiesbaden, Germany
 Telephone: (+49) 611-492-247
 Fax: (+49) 611-492-430
 Email: opto.Europe@perkinelmer.com

Asia Headquarters
PerkinElmer Optoelectronics
 47 Ayer Rajah Crescent #06-12
 Singapore 139947
 Telephone: (+65) 6775-2022
 Fax: (+65) 6775-1008
 Email: opto.Asia@perkinelmer.com



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