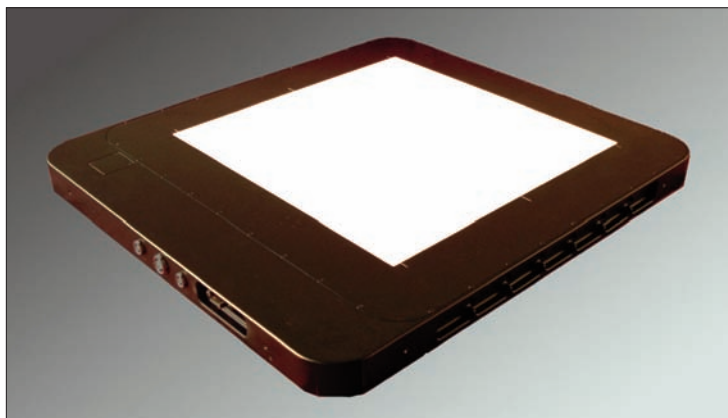


# XRD 1621 N ES Series

## by PerkinElmer

### 16-inch Digital X-ray Detectors



#### Overview

The XRD 1621 N ES (“enhanced speed”) series detectors are the newest additions to the PerkinElmer family of 16-inch amorphous silicon (a-Si) digital x-ray detectors. They produce a higher throughput by providing double the frame rate of previous models, while maintaining an industry-leading 16-bit resolution and the ability to perform real-time digital x-ray imaging. The detectors’ radiation-hardened design allows them to perform in harsh environments, making them the ideal choice for 24/7 NDT applications.

The XRD 1621 N ES series of digital x-Ray detectors is based on a 16-inch a-Si sensor operating as a two-dimensional photodiode array. X-rays are converted into light using a Kasei DRZ Standard, DRZ Plus, or a CsI scintillator. The information is digitized in 16 bits to achieve highest dynamic range and contrast. The detectors offer a pixel size of 200  $\mu\text{m}$ , an image size of 2048 x 2048 pixels,

and a frame rate of 15 or 30 fps with a 2 x 2 binning.

The XRD 1621 N ES series provides the advantage of synchronization between the detector and x-ray source or manipulator by using an external trigger signal. The detectors are connected to the XRD FGX Opto Frame Grabber with a customized glass fiber optical interface. This robust glass fiber interface provides galvanic isolation between detector and frame grabber and IP68 proofed plugs at the detector and both sides of the extension cables.

The XRD FGX Opto Frame Grabber provides an FPGA and 256 MB RAM to perform on-board corrections including Multiple Gain Correction at up to 10 signal levels.

The XRD 1621 N ES detectors, when combined with a XRD-EP Power Supply unit and the XRD FGX Opto Frame Grabber, are optimized for the highest performance with real-time corrections.

#### Features and Benefits

- ▶ Complete digital x-ray detector
- ▶ Monolithic flat panel
- ▶ Radiation-hardened for harsh environments
- ▶ Live Images @ 30 fps—twice as fast as prior models—while maintaining 16-bit resolution
- ▶ > 1 Million pixels
- ▶ 200  $\mu\text{m}$  Pixel pitch
- ▶ 65,536 Gray levels
- ▶ Ultra-high sensitivity
- ▶ Suitable for X-ray energies from 20 keV – 450 keV
- ▶ Selectable gain setting
- ▶ RoHS-compliant

#### Applications

- ▶ Nondestructive testing (NDT)
- ▶ In-line manufacturing inspection
- ▶ Pipeline inspection
- ▶ 3D Cone beam CT
- ▶ Metrology
- ▶ Medical
- ▶ Scientific and veterinary

The image integration time is variable between 66.5 ms (33.25 ms @ 2 x 2 binning) and 5 sec, in steps of 1 ms (internal timer) or can be set between 66.5 ms and 1 sec, in eight fixed steps (free-running).

Two models of the XRD 1621 ES are available: The XRD 1621 AN ES which is suitable for radiation energies from 40 keV – 15 MeV, and the XRD 1621 CN ES which is suitable for radiation energies from 20 keV – 15 MeV. Both are ideal for NDT applications including in-line manufacturing inspection, PCB inspection, and pipeline inspection.

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
- performing real-time (on-board) corrections for:
  - offset correction
  - multiple gain correction with up to 10 signal levels
  - pixel correction.

## XRD 1621 TECHNICAL SPECIFICATIONS

Panel	
Scintillator screen* (standard) (optional)	DRZ Plus / DRZ Standard Csl, needles directly deposited on the a-Si photodiodes
Pixel number	2048 x 2048
Active Pixel number	2024 x 2024
Pitch	200 µm
Total area	409.6 x 409.6 mm <sup>2</sup>
Diode capacity	2.1 pF

Electronics	
Charge amplifier	32 x 128 channel ASIC
Feedback capacitance (gain)	0.25 pF, 0.5 pF, 1 pF, 2 pF, 4 pF, 8 pF
ADC	32 x 16 bit A/D @ 1 MSps
Integration time (minimum):	66.5 ms @ 200 µm 33.25 ms @ 400 µm (2 x 2 Binning)
Non-linearity <sup>1</sup>	< 1 % (10 % to 90 % FSR)

Detector	
Dynamic range <sup>1</sup>	> 77 dB
Response Non Uniformity <sup>1</sup>	± 2 % (10 % to 90 % FSR)
Image lag (standard) (Csl-option)	< 8 % (1st frame) < 10 % (1st frame)
Frame rate (max)	15 Hz @ 200 µm 30 Hz @ 400 µm (2 x 2 Binning)
Radiation energy	40 keV – 15 MeV (XRD 1620 AN ES) 20 keV – 15 MeV (XRD 1620 CN ES)
Detector housing	672 x 599 x 44 mm <sup>3</sup>

Requirements	
Power supply	XRD-EP (95510254H)
Frame grabber	XRD-FGX Opto (95510215H)
PC-requirements**	CPU > 3 GHz RAM > 1 GB PCI-X Bus Windows™ 2000, XP Professional

<sup>1</sup> At 1 pF Gain, 15 fps; 200 µm resolution and all corrections applied

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\*\*Windows™ 2000 and Windows™ XP are registered trademarks of Microsoft Corporation

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