

Xineos-1501/2301

CMOS X-ray Detectors for Frame-Based Extra-Oral Dental Scanning



Key Features

- Best in class low-dose image quality
- 99 μ m pixel pitch
- 300fps at full resolution
- 1,000fps or more in 198 μ m ROI-mode
- Pixel saturation dose switchable through communications interface
- Frame based imaging for focal plane optimization (reconstructed 2D)
- Digital TDI mode for retrofitting to traditional CCD-TDI systems
- Stable offset calibration
- Low power dissipation
- Gigabit Ethernet data interface (LVDS option available on request)

Typical Applications

- Dental Panoramic
- Dental Cephalometric

Xineos CMOS Scanning X-ray Detectors

The Xineos-1501 and Xineos-2301 CMOS detectors set a new benchmark in low dose imaging performance, which is critical for high frame rate scanning applications. Built with our sixth generation CMOS technology, these detectors offer seamlessly switchable saturation dose to maximize dynamic range or sensitivity on demand.

The Xineos-1501 detector delivers excellent image quality at high frame rates, supporting image sequence acquisition at high angular resolution to enable reconstructing Panoramic images with optimized focal planes through the patient-specific dental arch. Such functionality eliminates the risk of excess dose to the patient in case of scan trajectory misalignment.

The Xineos-1501 and Xineos 2301 also feature a novel integrated “Digital Time Delayed Integration” (or DTDI) acquisition mode, to simulate the image acquisition mode of traditional (analog) CCD-TDI scanning detector. In this mode, the detectors deliver signal-to-noise, sensitivity and dynamic range performance rivaling those of CCD-TDI detectors, and make it easy to retrofit these cost effective detectors to existing Dental Panoramic and Cephalometric systems that lack the processing power to support advanced frame based reconstruction software.

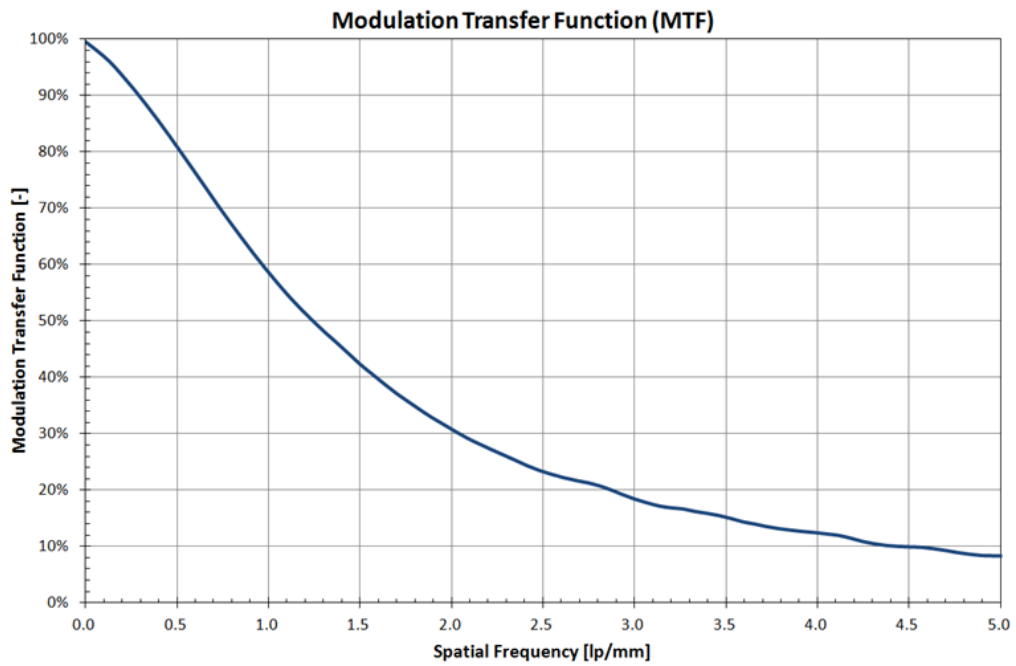
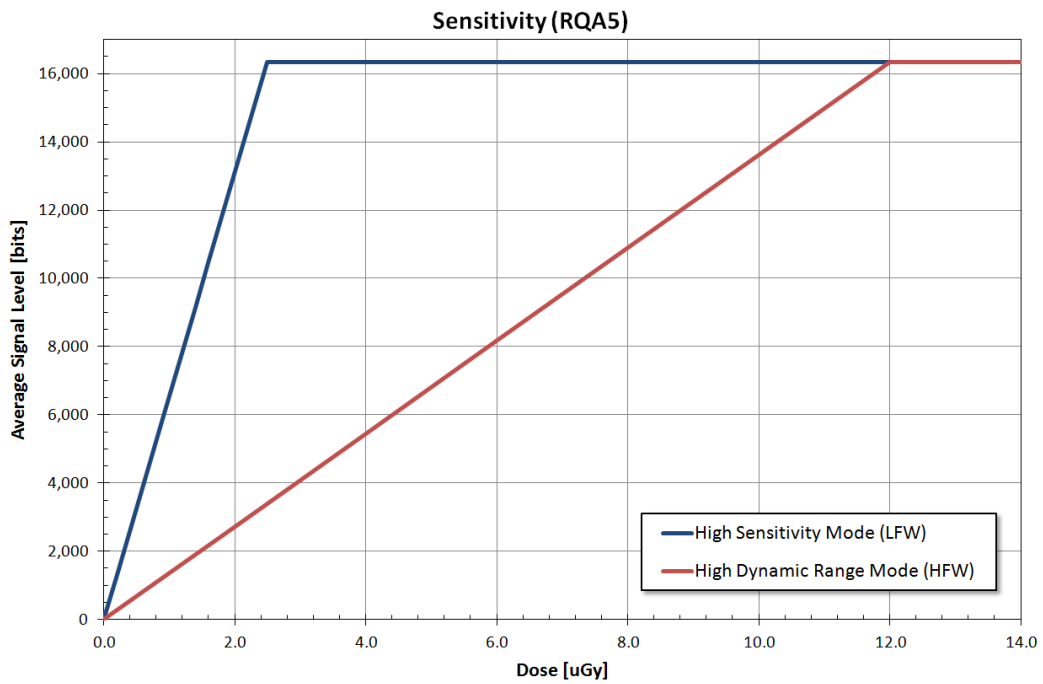
With only 6mm edge distance at the patient shoulder side, these detectors enable improved patient access and compact enclosure designs.

SPECIFICATIONS (TYPICAL VALUES @ RQA5)

Parameter	Xineos-1501	Xineos-2301
Pixel Pitch	99 μ m	99 μ m
Active Area	152x6.5mm ²	228x6.5mm ²
Resolution	1536x68	2304x68
Binning support	1x1 / 2x2	1x1 / 2x2
Scintillator	Medical-grade columnar CsI	
Seamlessly switchable saturation modes	2 modes, software switchable	
Saturation Dose, RQA5 (per mode)	2.5uGy / 12uGy	2.5uGy / 12uGy
Dynamic Range (per mode)	72dB / 76dB	72dB / 76dB
MTF @ 1lp/mm / 2lp/mm	60% / 30%	60% / 30%
Non-linearity	<1%	<1%
ADC Conversion	14-bit	14-bit
Data Interface	GigE	GigE
Frame Rate		
- Full size, full resolution	300fps	300fps
- Full size, 2x2 binning	600fps	600fps
ROI readout	Programmable position & width	
Trigger modes	Continuous or Synchronized	
X-Ray Energy Range	40..125kVp	
Power Consumption (active)	7W	
Dimensions (WxHxD)	91x240x21mm	
Weight	0.6kg	

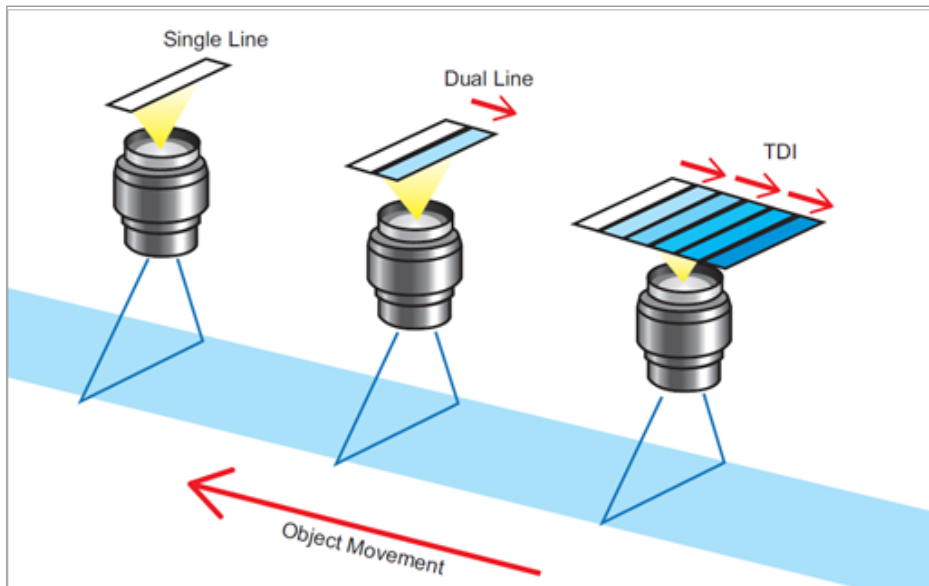
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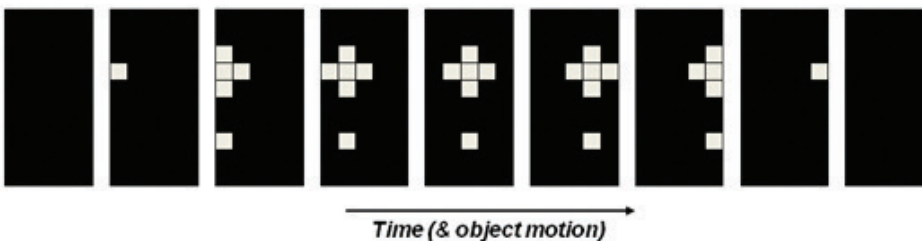


Digital Time Delayed Integration Mode (DTDI)

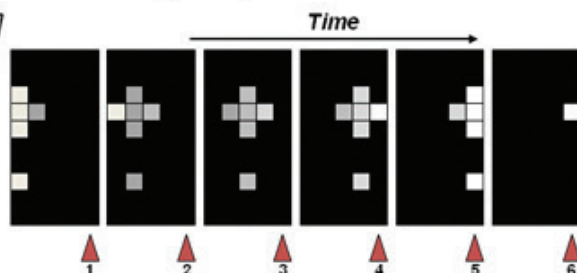
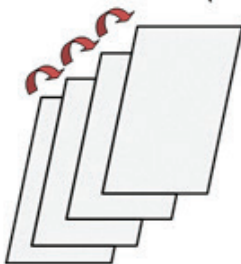
In Digital TDI mode, the Xineos-1501/2301 detectors capture and write full image frames to the internal memory, synchronized to the systems scanning motion, but outputs single line images to the system. Successive images are summed inside the detectors memory, while the frame memory is shifted after each line output. In this way, the effective integration time is extended while image sharpness is maintained.

Various line-scan technologies: single-line, dual-line and time delay integration (TDI). To achieve high responsivity, TDI uses multiple stages to capture multiple exposures. In these stages, photogenerated signal charges are transferred in sync with object motion. Dual-line scans are considered two-stage TDI's.

1. Capture individual frames (internal to detector)

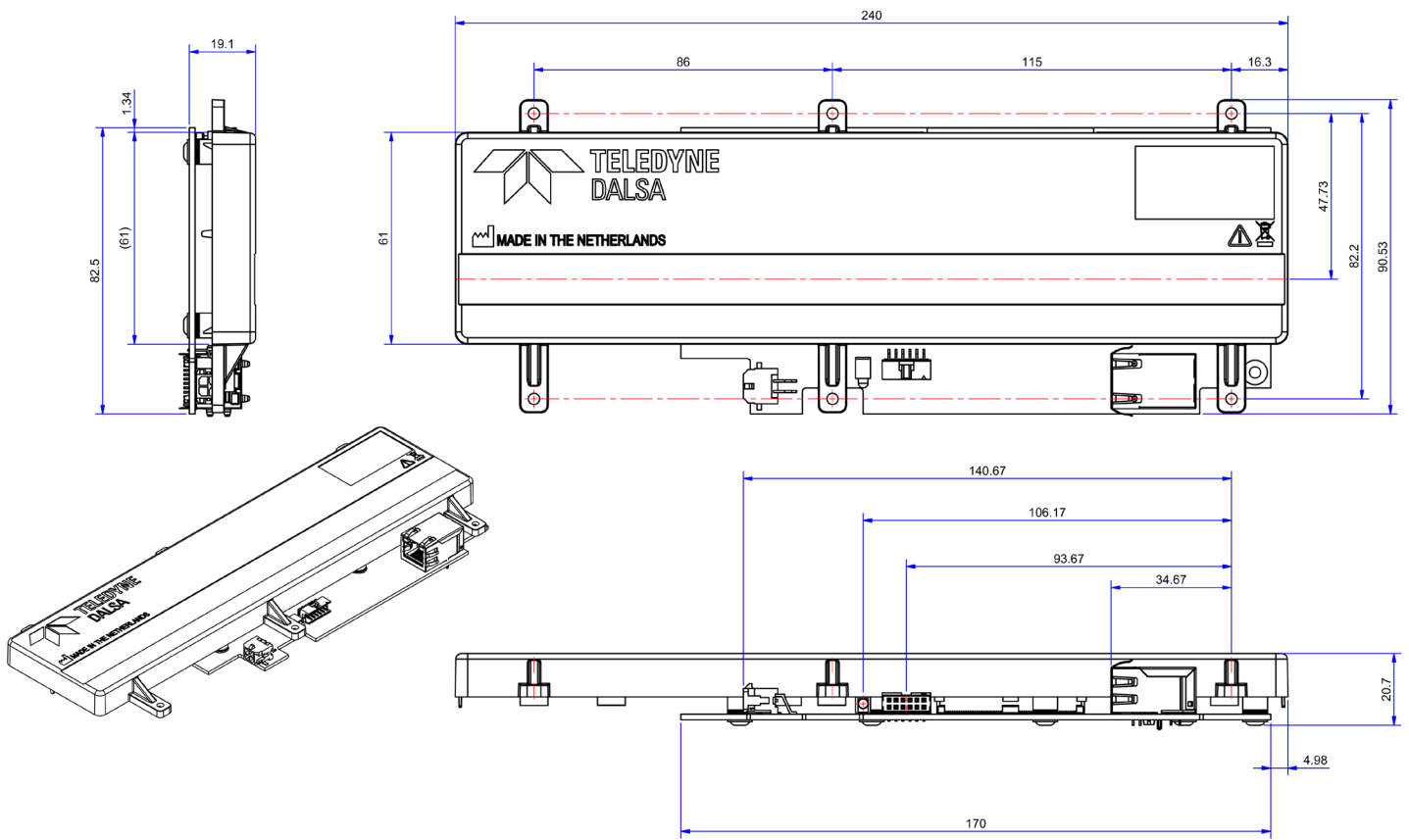


2. Row Shift & Add (in detector memory buffer)



3. Output integrated rows





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