XINEOS - 1501(S) & 2301(S)

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

KEY FEATURES

- Latest generation CMOS technology; even lower noise, lower power consumption
- Best in class low-dose sensitivity and signal-to-noise ratio
- Over 1,000 fps in ROI binning mode
- Frame based imaging for increased depth-of-field (reconstructed 2D)
- Digital TDI mode for retrofitting to legacy CCD-TDI systems
- Gigabit Ethernet data interface (LVDS option available on request)

TYPICAL APPLICATIONS

- Dental Panoramic
- Dental Cephalometric
- Bone Densitometry
- Pathology

Xineos CMOS Scanning X-Ray Detectors

The Xineos-1501 and Xineos-2301 CMOS detectors set a new low-dose imaging performance benchmark, which is critical in high frame rate scanning applications.
Using our sixth generation CMOS active pixel technology, these detectors offer seamlessly switchable saturation dose levels to maximize either dynamic range or sensitivity on demand. The Xineos-1501S and Xineos-2301S models feature an ultra-sensitive, low-noise pixel design that delivers optimal signal-to-electronic-noise ratio (SENR) in any exposure-critical imaging application.

Each model is capable of delivering excellent image quality at high frame rate, supporting the acquisition of projection sequences at high temporal or angular resolution. When paired with Teledyne DALSA's advanced tomographic 2D reconstruction library, this enables reconstruction of synthesized panoramic images with an optimized focal plane through the patient-specific dental arch, increasing diagnostic confidence and eliminating retakes.

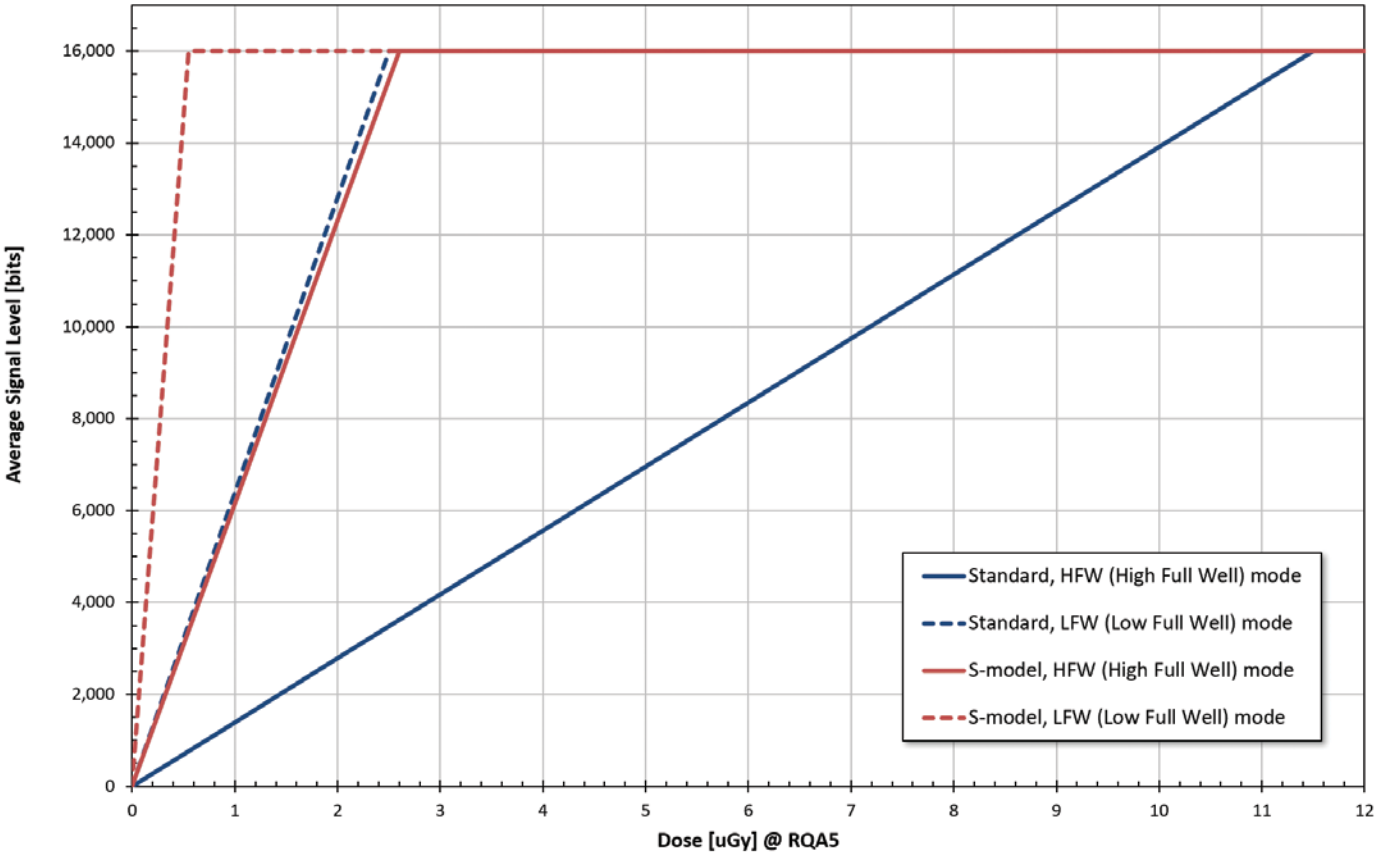
All models support an integrated 16-bit "Digital Time Delayed Integration" (or DTDI) acquisition mode, to simulate the image acquisition mode of traditional (analog) CCD-TDI scanning detectors. In DTDI mode, the detectors deliver outstanding image quality at strongly reduced data rate. This facilitates an easy retrofit of these cost effective detectors to dental panoramic and cephalometric systems that lack the processing power to support advanced frame based reconstruction.

With only 6 mm edge distance at the patient shoulder side and low power consumption, these detectors enable compact enclosure design offering improved patient access.

SPECIFICATIONS (Typical Values @ RQA5)

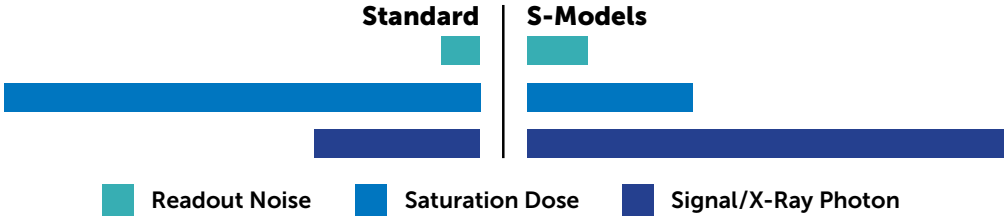
Parameter	Xineos-1501(S)	Xineos-2301(S)
Pixel Pitch	99 µm	
Active Area	152 x 6.7 mm^2	228 x 6.7 mm^2
Resolution	1536 x 68	2304 x 68
Binning Support	1 x 1 / 2 x 2	
Scintillator	Medical-grade columnar CsI	
Seamlessly Switchable Saturation	2 modes, software switchable	
Saturation Dose, RQA5 (per mode)	Standard: 2.5 µGy / 12 µGy S Model: 0.5 µGy / 2.6 µGy	
Dynamic Range (per mode)	Standard: 72 dB / 76 dB S Model: 66 dB / 72 dB	
MTF @ 1lp/mm / 2lp/mm	60% / 30%	
Non Linearity	<1%	
ADC Conversion	14-bit	
Data Interface	Gigabit Ethernet (GigE)	
Maximum Frame Rate (Full Area)	300 fps (1 x 1) / 600 fps (2 x 2)	
ROI Readout	Programmable position & width	
Trigger Modes	Continuous or Synchronized	
X-Ray Energy Range	40..125 kVp	
Power Consumption (active)	7 W	
Dimensions (WxHxD)	91 x 240 x 21 mm	
Weight	0.6 kg	

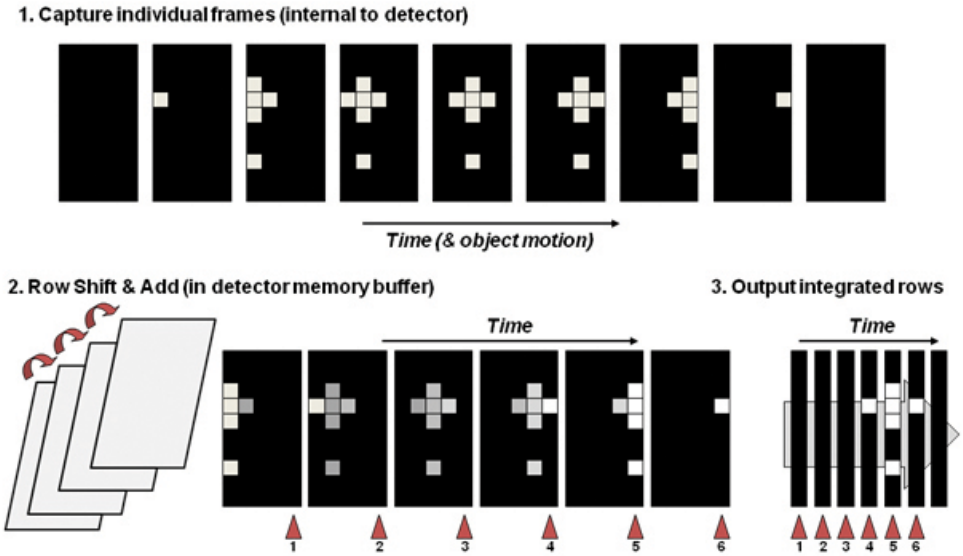
SPECIFICATIONS



How to Choose

The pixel design of **Standard** models prioritizes dynamic range, to bridge large differences in tissue absorption without saturating clinically important features. The **S-models** feature a pixel design which prioritizes sensitivity, to maximize signal output in exposure critical application conditions.

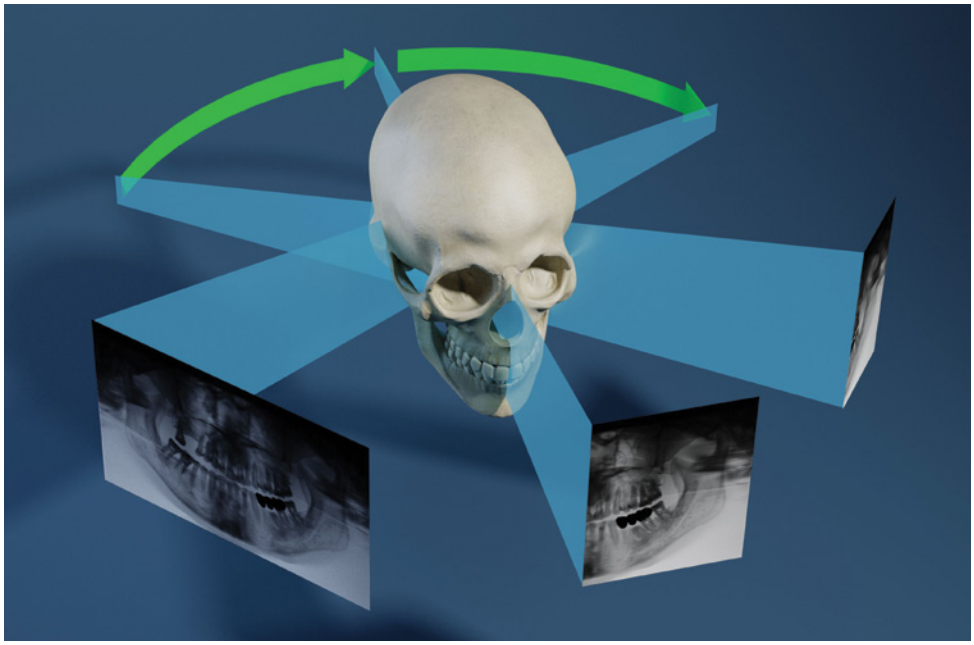




Digital Time Delayed Integration Mode (DTDI)

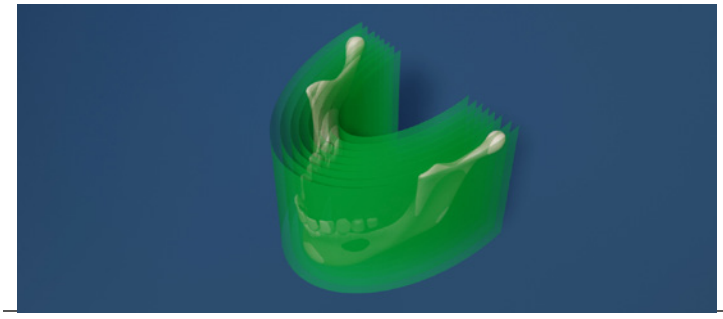
In Digital TDI mode, the Xineos-1501(S) and 2301(S) detectors capture and write full image frames to the internal memory, synchronized to the systems scanning motion, but outputs single line images to the system. Successive images are summed inside the detectors memory, while the frame memory is shifted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

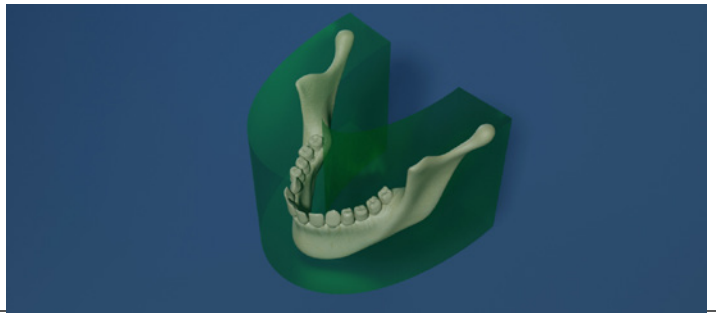
Xineos X-Ray Image Reconstruction Technology

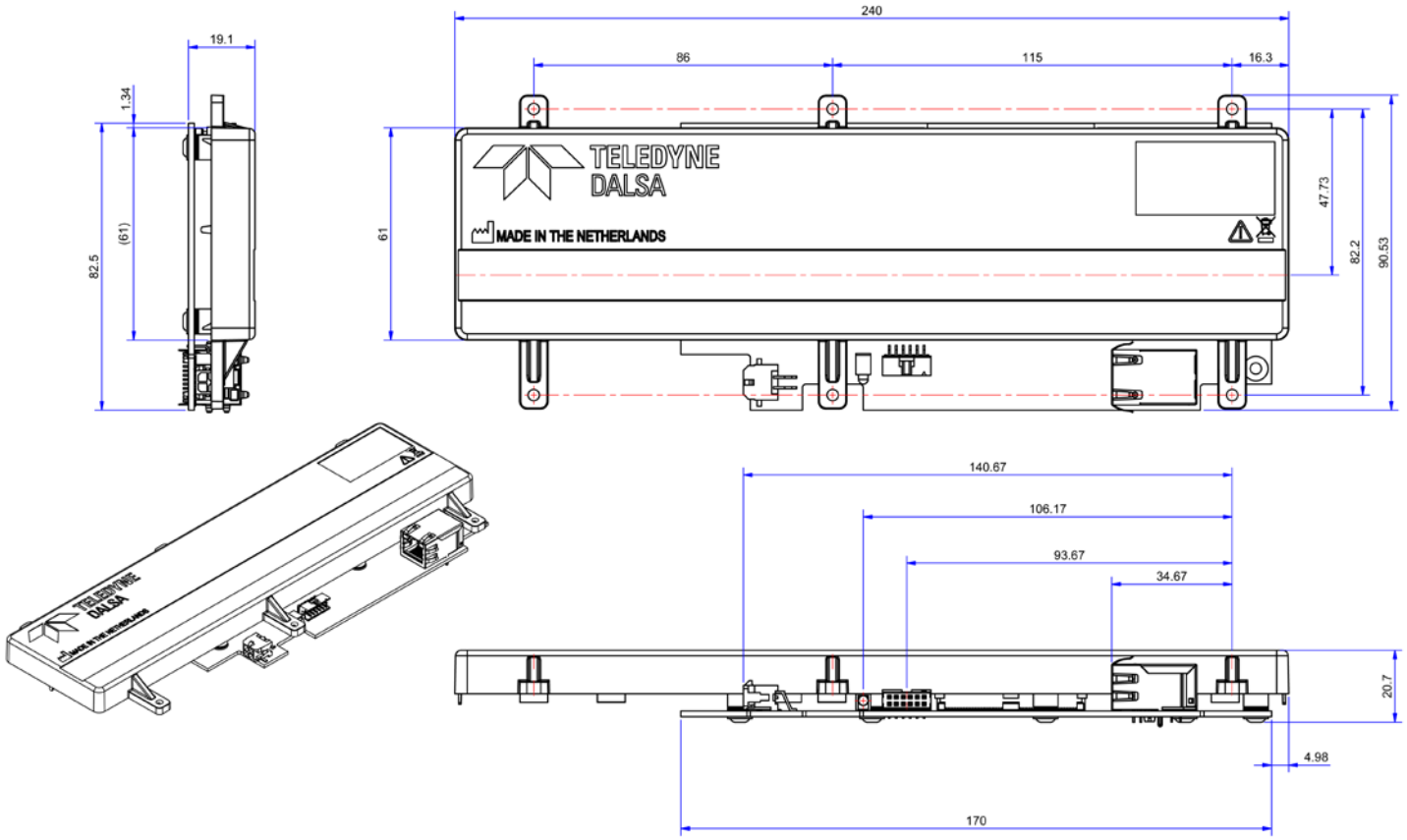


Reconstructed 2D

Using frame readout, Xineos-1501(S) and 2301(S) detectors capture and output the image frames to the host system, synchronized to the systems scanning motion. Using Teledyne DALSA's 2D reconstruction library, a tomographic stack of imaging places is created including a depth map locating features of interest. Combining relevant information from the full tomographic stack, a single 2D image can be synthesized containing an optimized depth-of-field.







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