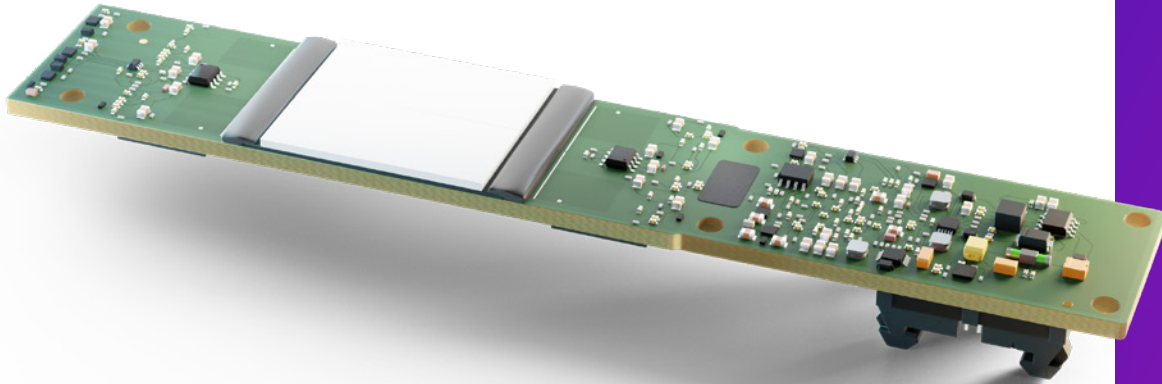


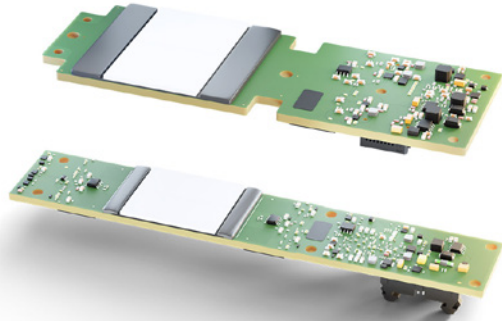
X-ACE



Off-the-shelf medical CT detector series



- Sets a new industry standard as the first off-the-shelf detector series optimized for value and mainstream medical CT systems
- Built on a well-proven platform that features the highest integration level
- Streamlines multi-slice system designs and detector integration
- Speeds up the time-to-market
- Brings total cost savings
- Provides superior image quality with low doses at fast scanning speeds
- Features robust structure, and reliable mechanical and electrical interfaces
- Comes with the developer kit



The X-ACE is the industry's first standard detector series optimized for value and mainstream medical CT (computed tomography) imaging needs. The plug-and-play-type solution is available as 16-slice and 32-slice detector cards, and alternatively as a complete subsystem that includes the the X-ACE 16, X-ACE 16 HD or X-ACE 32 detector modules, the X-DCB2 data combiner board and adapter, software libraries, and all the necessary accessories. The investment-free series brings notable total cost savings and speeds up the time-to-market of advanced CT systems in the highly competitive medical imaging segments.

The X-ACE product family is built on the well-proven and modular platform. The platform covers a wide imaging area and features the highest level of integration, as a scintillator, a photodiode, analog-to-digital converters (ADC), and a field-programmable gate array (FPGA) are assembled to a single printed circuit board (PCB). As a benefit, this means simplified system designs, straightforward integration, minimized risks, a streamlined supply chain, and detector solutions that are mechanically more robust and digitally enhanced.

The platform easily scales up from 16-slice to 32-slice system configurations to cover a wide range of set-ups, and enables either 10- or 20-millimeter coverage at the isocenter. The X-ACE 16 is a 16-slice detector for 20-mm, and the high-resolution HD version for 10- or 20-mm anatomical coverage based on the mode. Whereas the X-ACE 32 provides high-resolution, true 32-slice imaging with the 20-mm coverage.

The X-ACE series provides high image quality with low doses at fast scanning speeds for enhanced patient safety and experience. State-of-the-art performance is enabled by a pixelated, ultra-fast ceramic scintillator, coupled with a high-performance frontside-illuminated (FSI) photodiode. The scintillator is made of high-light-output and medical grade GOS (Gadolinium Oxysulfide) compound. The characteristics of the most sensitive and ultra-low dark current photodiode are enabled by utilizing a unique FSI photodiode manufacturing process.

The detectors come with a 24-bit ADC providing fast, low noise, and high-resolution analog-to-digital conversion. Furthermore, the detector modules feature an adjustable full-scale range. The solution is compatible with an X-Link digital LVDS (low-voltage differential signaling) interface.

High-speed data collection from the X-ACE detector boards is enabled by the X-DCB2 data combiner board. An associated adapter board is provided for slirping-based systems. The X-ACE detector subsystem has an optical datalink from the X-DCB2 to the host computer.

Key features

- Scintillator, photodiode, ADC, and FPGA on a single PCBA
- High-light-output, ultra-fast medical-grade GOS scintillator
- Highly sensitivity, ultra-low dark current FSI photodiode
- Low noise, high resolution 24-bit ADC
- Adjustable integration time 200 μ s to 100 ms
- No charge loss sampling
- 20 mm anatomical coverage at the isocenter
- Digital LVDS interface
- Adjustable full-scale range – 6.25 to 150 pC

Applications

- Medical CT imaging

For speeding up design and system integration, world-class engineering support and a customer evaluation unit are available.

Technical specifications of X-ACE detector modules

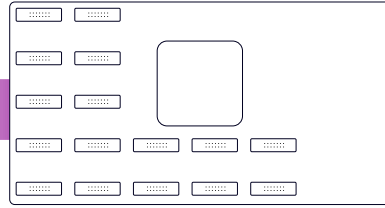
Product	X-ACE 16	X-ACE 16 HD	X-ACE 32
			
Number of pixels in Z-axis (data output)	16	16	32
Number of pixels in X-axis	48	48	32
Number of output channels	768	768	1024
Pixel pitch in Z-axis (mm)	2.00	1.00 / 2.00	1.12
Pixel pitch in X-axis (mm)	1.08	1.08	1.06
Anatomical coverage in iso-center (mm)		20	
Scintillator material		GOS	
Scintillator thickness (mm)		1.4	
AD conversion		24-bit	
Adjustable FSR (pC)		6.25, 12.5, 25, 37.5, 50, 75, 100, 150	
Adjustable integration time		200 μ s – 100 ms	

Example subsystem configurations with X-DCB2

Feature	X-ACE 16 and 16 HD subsystems	X-ACE 32 subsystem
Number of X-Link segments	5	8
Detector cards for each X-Link segment	4	4
Maximum number of detector cards	20	32
Minimum view time	200 μ s	
Maximum throughput	2.5 Gbps (CL) / 5.0 Gbps (SFP+)	
Maximum pixel quantity	15,360	30,720
Supported data interface	Camera Link / Optical SFP+	
Other interfaces	ABZ encoder, command, power input	
Voltage input	12-24V \pm 10%.	
Power consumption	<20 Watt	
G-force	20 G	
Mechanical dimensions	X-DCB2: 247 mm (L) x 120 mm (W) x 30 mm (H) Camera link adapter: 155.93 mm (L) x 116.6 mm (W) x 31.1 mm (H)	
Operating temperature	10 $^{\circ}$ C—+50 $^{\circ}$ C	
Operating humidity	10-80% RH (non-condensing)	
Storage temperature	-40 $^{\circ}$ C—+60 $^{\circ}$ C	
Storage humidity	10-85% RH (non-condensing)	



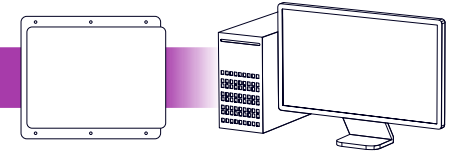
X-DCB2 data combiner board



CT slip ring

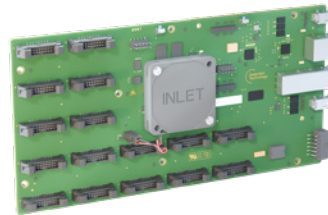
X-DCB2 CL adapter

PC



An example of a subsystem connection topology

High-speed data collection from the X-ACE detector boards is enabled by the X-DCB2 data combiner board. An associated adapter board is provided for slipring-based systems. The X-ACE detector subsystem has an optical datalink from the X-DCB2 data combiner board to the X-DCB2 CL adapter, and a Camera Link interface from the adapter to the host computer.



X-DCB2 data combiner board



X-DCB2 adapter