

CMOS X-RAY DETECTORS

for Industrial Non-Destructive Testing

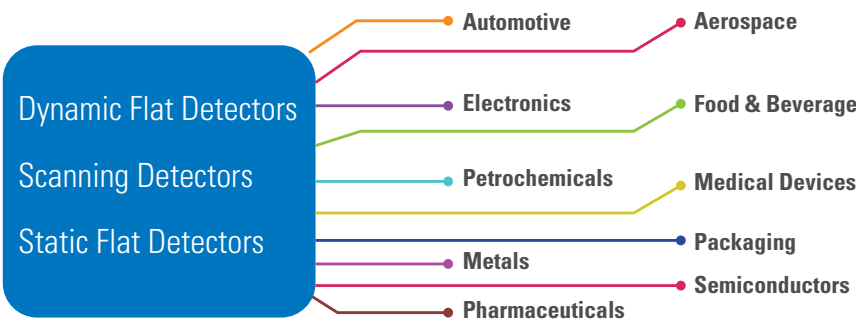


COMMITTED TO PEOPLE. DRIVEN BY INNOVATION.

Teledyne DALSA Industrial X-Ray Detectors

X-Ray Solutions for Non-Destructive Testing

Teledyne DALSA offers a complete portfolio of innovative CMOS and CCD X-Ray detectors tailored specifically to meet the demanding and diverse needs of non-destructive testing (NDT) applications. Our innovative and reliable products offer solutions for all types of industrial applications.



CMOS X-Ray Advantages

HIGH IMAGE QUALITY AND LOW DOSE

- The very low noise of the CMOS material and the proprietary active pixel architecture of Teledyne DALSA's CMOS detectors ensure improved signal-to-noise ratio (SNR) with respect to the a-Si-based and even other CMOS-based competing products.

HIGH SPEED IMAGING

- Enabled by high-speed electronics and the high electron mobility of the crystalline silicon material, CMOS detectors set an industry benchmark for speed at full resolution, while remaining lag- and artifact-free. Frame rates of >100fps are achievable.

HIGH RESOLUTION

- Our advanced pixel design is responsible for the very high fill factor (80-90%), even at small pixel sizes of 50-100µm. The small pixel pitch combined with proprietary optical stack give rise to high spatial resolution (or MTF) performance.

INNOVATIVE DESIGN

- Our sixth-generation proprietary technology enables radiation hard pixel design, with adjustable saturation dose levels that make our detectors suitable for all industrial applications.

LONG LIFETIME

- The high integration level of our CMOS design reduces the number of discrete components and interconnects, thus significantly improving the product reliability. The built-in radiation-hardness of our detectors enables long operating lifetime and less frequent calibration routines.

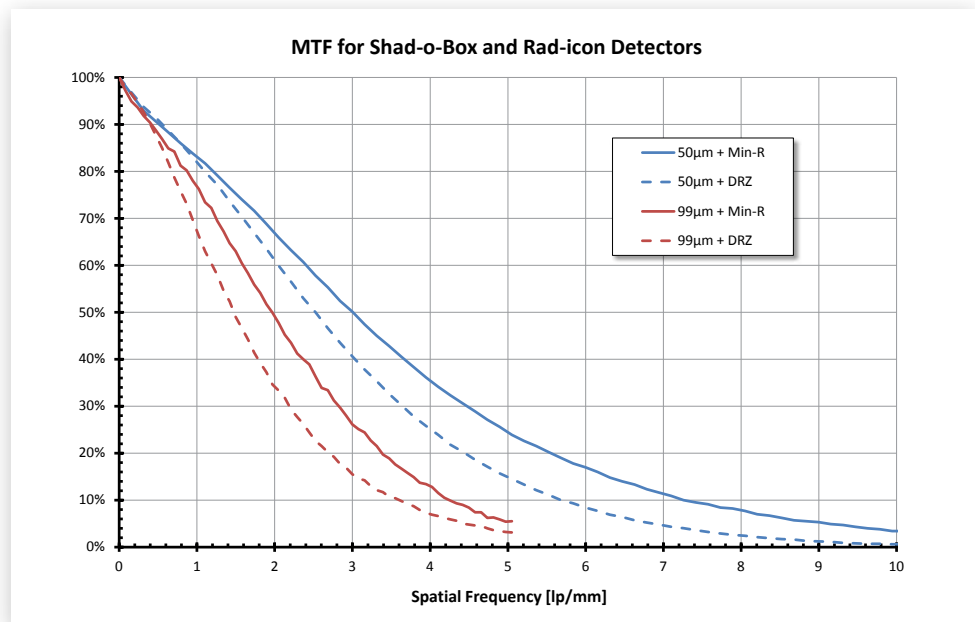


Portfolio of Industrial CMOS X-Ray Detectors



Features

- HIGH RESOLUTION
- WIDE ENERGY RANGE
- LOW POWER CONSUMPTION
- CHOICE OF SCINTILLATOR
- STANDARD DATA INTERFACE
- ROBUST MECHANICAL DESIGN

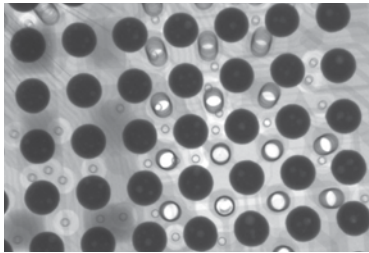


Rad-icon™ Large-Area Detectors

Utilizing Teledyne DALSA's proprietary CMOS active pixel technology, the Rad-icon family of real-time CMOS X-Ray detectors is the industry's first to exceed the low-dose performance of image intensified detectors, setting new industry benchmarks in DQE, low power dissipation and radiation lifetime.

RAD-ICON FAMILY SPECIFICATIONS

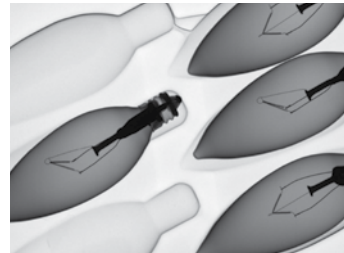
PARAMETER	UNIT	RAD-ICON 1520	RAD-ICON 2022	RAD-ICON 3030
GENERAL				
TECHNOLOGY		CMOS ACTIVE PIXEL	CMOS ACTIVE PIXEL	CMOS ACTIVE PIXEL
PIXEL PITCH	[µm]	99	99	99
PIXEL CAPACITY MODES	[#]	2	2	2
ACTIVE AREA	[mm]	153X204	204X221	307X307
RESOLUTION	[pxl]	1548X2064	2064X2236	3096X3096
BANDWIDTH				
DATA INTERFACE	[-]	GigE	CameraLink	CameraLink
ADC CONVERSION	[bits]	14	14	14
FRAME RATE - 1X1 (GIGE)	[fps]	20	30	30
POWER CONSUMPTION				
POWER SUPPLY	[Vdc]	10..25	10..25	10..25
POWER CONSUMPTION	[W]	12	15	18
ACTIVE COOLING	[y/n]	NO	NO	NO
INTEGRATION				
FOOTPRINT (WXHXT)	[mm]	229X204X36	292X237X59	377X329X59
WEIGHT	[kg]	3.5	5	8
EXTERNAL INTERFACE MODULE	[y/n]	NO	NO	NO
ENVIRONMENTAL				
OPERATIONAL TEMPERATURE	[°C]	0..+40	0..+40	0..+40
STORAGE TEMPERATURE	[°C]	-10..+50	-10..+50	-10..+50
HUMIDITY	[% R.H.]	10 TO 80	10 TO 80	10 TO 80
X-RAY RANGE	[kV]	10..225	10..225	10..225



BALL GRID ARRAY



CHECK VALVE



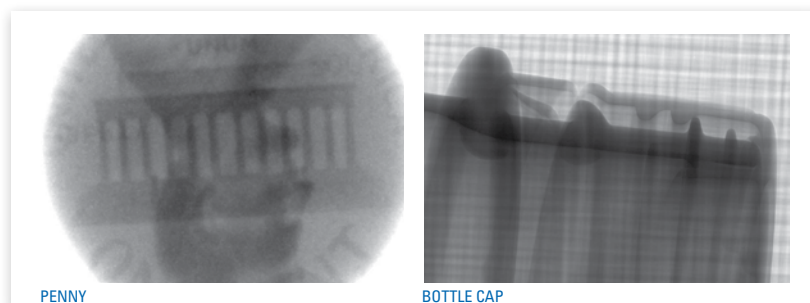
LIGHT BULBS

Remote RadEye™ Modules

The Remote RadEye X-Ray sensor module provides the ultimate flexibility in design and product options for the most complex imaging applications. Our unique detector design separates the X-Ray sensor module from its supporting electronics: the module is mounted on a detachable cable enabling easy installation into tight spaces or on gantry systems. Choose among five different sensor modules, paired with one of three electronic modules offering a choice of LVDS, USB or Ethernet interfaces.

REMOTE RADEYE FAMILY SPECIFICATIONS

PARAMETER	UNIT	RADEYE1	RADEYE2	RADEYE4	RADEYE HR	RADEYE200
GENERAL						
TECHNOLOGY		CMOS ACTIVE PIXEL	CMOS ACTIVE PIXEL	CMOS ACTIVE PIXEL	CMOS ACTIVE PIXEL	CMOS ACTIVE PIXEL
PIXEL PITCH	[µm]	48	48	48	20	96
PIXEL CAPACITY MODES	[#]	1	1	1	1	1
ACTIVE AREA	[mm]	24.6X49.2	49.3X49.2	98.6X49.2	33.0X24.9	98.4X96.0
RESOLUTION	[pxl]	512X1024	1024X1024	2048X1024	1650X1246	1024X1000
BANDWIDTH						
DATA INTERFACE	[-]	ANALOG	ANALOG	ANALOG	DIRECT USB	ANALOG
ADC CONVERSION	[bits]	14	14	14	12	14
FRAME RATE	[fps]	2.7	2.7	2.7	-	0.75
POWER CONSUMPTION						
POWER SUPPLY	[Vdc]	6.5	6.5	6.5	5V (USB)	6.5
POWER CONSUMPTION	[W]	<5W	<5W	<5W	<1W	<5W
ACTIVE COOLING	[y/n]	NO	NO	NO	NO	NO
INTEGRATION						
FOOTPRINT (WXHXT)	[mm]	109X41X24	111X78X22	132X129X22	50X40X12.7	180X128X22
WEIGHT (SENSOR HEAD)	[kg]	0.3	0.8	1	0.2	1
WEIGHT (CAMERA MODULE)	[kg]	1.7	1.7	1.7	NA	1.7
EXTERNAL INTERFACE MODULE	[y/n]	YES	YES	YES	NO	YES
ENVIRONMENTAL						
OPERATIONAL TEMPERATURE	[°C]	0..+50	0..+50	0..+50	0..+50	0..+50
STORAGE TEMPERATURE	[°C]	-10..+65	-10..+65	-10..+65	-10..+65	-10..+65
HUMIDITY	[% R.H.]	10..80	10..80	10..80	10..80	10..80
X-RAY RANGE	[kV]	5..160	5..160	5..160	5..160	5..160

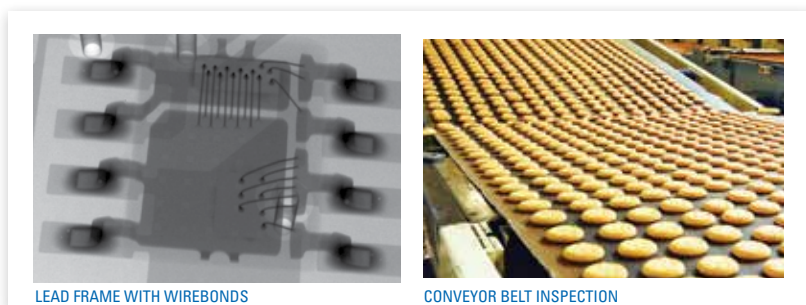


Line Scan X-Ray Detectors

Teledyne DALSA's line scan detectors, Argus and Shad-o-Scan, are based on the analog CCD Time Delay Integration (TDI) line scan technology. TDI line scan delivers an unmatched combination of sensitivity and speed by accumulating multiple exposures of the same (moving) object, effectively increasing the integration time available to capture the incident X-Ray quanta. The object motion must be synchronized with the exposures to ensure a crisp image.

LINE SCAN FAMILY SPECIFICATIONS

PARAMETER	UNIT	ARGUS-CEPH	SHAD-O-SCAN 8K
GENERAL			
TECHNOLOGY			CCD TDI
PIXEL PITCH	[µm]		27
ACTIVE AREA	[mm]		220X7
RESOLUTION	[pxl]		8160X256
BANDWIDTH			
DATA INTERFACE	[-]	GigE	CameraLink
ADC CONVERSION	[bits]		16
LINE RATE - 2X2	[kHz]		2
POWER CONSUMPTION			
POWER SUPPLY	[Vdc]		12
POWER CONSUMPTION	[W]		15
ACTIVE COOLING	[y/n]		NO
INTEGRATION			
FOOTPRINT (WXH)	[mm]	254X84X46	292X60X40
HOUSING		OPEN	ENCLOSED
WEIGHT	[kg]	0.7	1
EXTERNAL INTERFACE MODULE	[y/n]		NO
ENVIRONMENTAL			
OPERATIONAL TEMPERATURE	[°C]		+10..+40
STORAGE TEMPERATURE	[°C]		0..+60
HUMIDITY	[% R.H.]		10 TO 80
X-RAY RANGE	[KV]		10..225



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www.teledynedalsa.com

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