



Key Features

- TDI CCD image sensor for ultimate sensitivity
- Radiation hardened CCD technology ensures long lifetime
- 16-bit ADC delivers 84 dB typical dynamic range
- Flexible pixel size control
- Internal and external synchronization options
- Industry-standard CameraLink interface
- Industrial grade CsI scintillator
- Low power consumption (no active cooling required)

Applications

- Non-destructive testing (NDT)
- Electronics inspection (2D/3D)
- Food inspection
- Scientific imaging

Shad-o-Scan™ Scanning X-ray Detectors: Ultimate Sensitivity and Resolution

Overview

With the release of the Shad-o-Scan 8K, Teledyne DALSA introduces a new family of scanning x-ray detectors specifically designed for the challenging requirements of high-performance industrial and scientific x-ray applications. Industry-leading TDI CCD performance from Teledyne DALSA enables the ultimate sensitivity and highest resolution in the industry, and ensures long detector lifetime in even the harshest radiation environments.

The Shad-o-Scan 8K evolved from more than 30 years of Teledyne DALSA experience in supplying the Machine Vision market with industry-leading image scanning technology. This compact, reliable, and power-efficient detector satisfies a wide range of imaging requirements with built-in flexibility on controlling the imaging mode and configuring the x-ray sensor. Requiring only 15 Watts at full speed operation, the Shad-o-Scan 8K detector has no need for external cooling, reducing cost and maintenance concerns on the system level. Comprehensive self-diagnostics and 100% in-field firmware upgradeability minimizes service overhead.

The Shad-o-Scan 8K detector also has among the highest dynamic range in the industry, featuring state-of-the-art 16-bit digitization which allows for x-ray imaging at diminishingly low dose levels. Our unique industrial-grade x-ray conversion stack effectively eliminates imaging artifacts associated with image lag and gain hysteresis. Several scintillators options (CsI and GdOS) are available.

Specifications

Detector Specifications		Units
Resolution	8160 (H) x 256 (V)	Pixels
Number of integration stages	256	
Pixel size	27 x 27	µm
Programmable pixel sizes	27/54/81/108/135/162	µm
Line rate at full resolution	> 2	kHz
Line rate at max. pixel size	2	kHz
ADC conversion	16 bits (65536)	
No missing codes	guaranteed	
Analog gain	1x-6x, 64 steps	
Dynamic range (54µm pixel)	> 80	dB

X-Ray Performance		Units
X-ray sensitive area	220 x 7	mm
Scintillator absorption (RQA5)	80	%
MTF @ 3 lp/mm, RQA5+CsI	30	
@ 5 lp/mm, RQA5+CsI	15	%
@ 7 lp/mm, RQA5+CsI	6	
X-ray energy range	< 160	kVp
Image lag (at max. line rate)	negligible	
X-ray sensor lifetime dose	> 100	krad

General Specifications		Units
Data and control interface	CameraLink Base	
Synchronization	Software control one-shot, Programmable line rate, External synchronization	
Supply voltage (DC)	+12	Volts
Power consumption (max)	15	Watts
Weight	< 1	kg

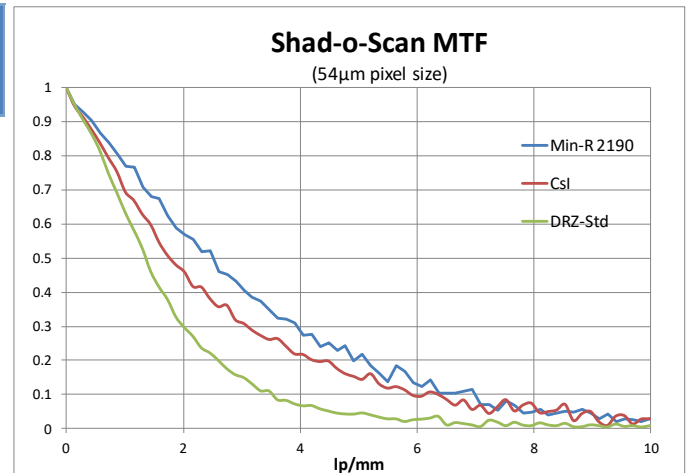
Resolution & Sensitivity

The Shad-o-Scan detectors are designed to work with x-ray sources operating at a wide range of kVp settings. X-ray energies as low as 10-15 keV can be detected. The cameras can be used with x-ray energies as high as 160kV, although we recommend the use of additional shielding and/or collimation at higher energies in order to protect the sensor element and electronics from damage.

The pixel spacing of each camera model determines the limiting resolution of the sensor. The actual Modulation Transfer Function (MTF) of the detector depends on the type of scintillator that is installed, as well as the binning mode selected. A thicker phosphor screen will produce more signal, but at the expense of high-frequency contrast. Typical MTF curves for the three standard scintillator options are shown in the graph below.

Scintillator	Typical Sensitivity ⁽¹⁾ [ADU/μGy]		
	35kVp	50kVp	80kVp
Min-R 2190	51.1	61.7	81.4
CsI	42.6	63.7	100.5
DRZ-Std	133.4	179.1	275.9

⁽¹⁾ W target, 2mm glass window, no filtration
2x2 binned area mode (54μm pixel)



Accessories

All Shad-o-Scan detectors require a CameraLink (base) frame grabber, a CameraLink cable, and the appropriate image acquisition software and/or SDK. A 12 VDC power supply and a 1m power cable are included with the camera. Please keep in mind that the CL connector on the camera requires a high-density shrunk mini-D (SDR26) connector.

We recommend using a Teledyne DALSA Xcelera-CL frame grabber and Sapera software (sold separately) to operate the Shad-o-Scan camera. For more information on these products, please contact your nearest sales representative, or visit our website at <http://www.teledynedalsa.com/imaging/products/>.

Ordering Information

All Shad-o-Scan detectors are shipped with a universal input power supply (90-264V, 50-60Hz) or power cable. Please contact your nearest sales representative for additional options.

P/N	Description
SB1525-01	Shad-o-Scan 8K with Min-R 2190 Scintillator
SB1525-02	Shad-o-Scan 8K with DRZ-Std Scintillator
SB1525-03	Shad-o-Scan 8K with CsI Scintillator

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