

# X-ray Time Delay Integration (TDI) CMOS camera



## Harrier CMOS TDI

The Harrier XT19080X series of time delayed integration (TDI) cameras provide high sensitivity and resolution compared to traditional linear diode arrays. The accumulation of signal by combining 8 rows of pixels increases signal, decreases signal to noise ratios, providing higher sensitivity that

allows faster scan rates or reduction in X-Ray power. Normally, reducing pixel size in half will reduce the signal to each pixel by 4 times but TDI technology allows the resolution to be doubled while retaining very similar sensitivity. The 0.2mm TDI has the same sensitivity per pixel as a 0.4mm LDA.

### Key Features

- Wide range of resolutions & selection of lengths
- Compact form factor
  - 0.2mm Resolution available for all applications
  - 0.4 and 0.8mm resolution available for all nonfood related applications
  - Low noise, wide dynamic range, high sensitivity
  - High MTF
- 16-bit analog-to-digital conversion
- Supports variable scan speed with position synchronization
- Software development kit
- Device drivers, libraries, standard API
- With x-ray tube voltages 15 – 160 kV
- GigE/Camera Link/USB3 interface

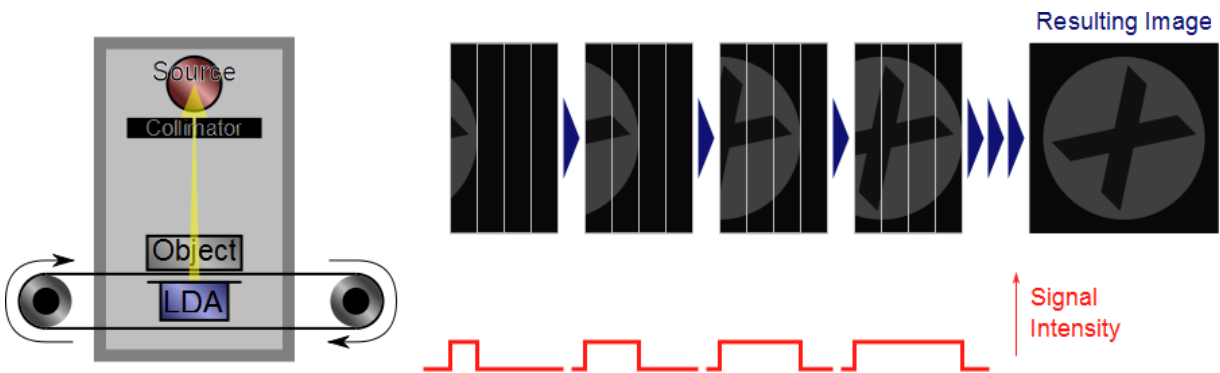


### Applications

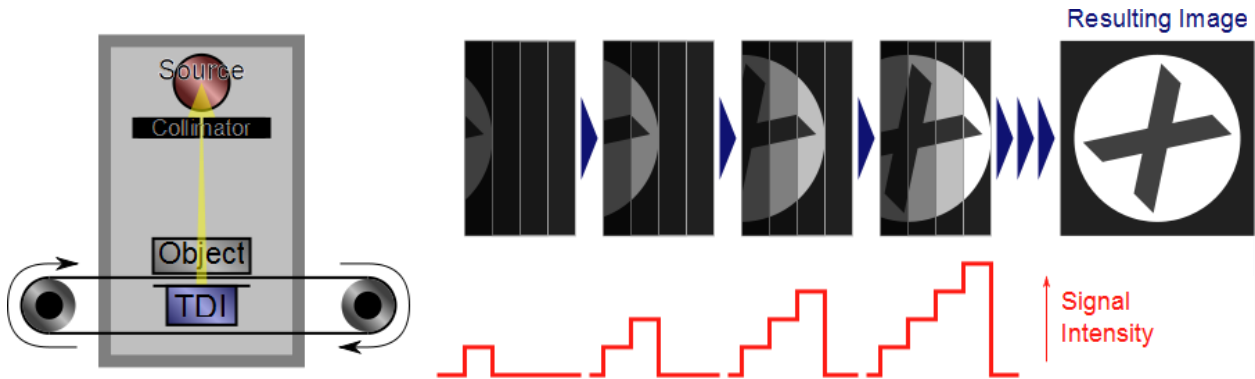
- Security Screening
- Food and Industrial applications
- Package content inspection
- Security and cargo screening
- Industrial non-destructive testing (NDT)

### Principal of operation

In the operation of both traditional Linear Diode Array (LDA) and TDI detectors, objects must be moving relative to the detectors. In an LDA, a single line of diodes collect signal. Once the object has past the diode line, no more signal is collected. A TDI device has multiple diode lines and the signal for each line can be passed to the next line. As the object passes over each line, each line collects signal and then passes the signal to the following line. After the object passes the final line, the full integrated signal is read out. When the TDI device is synchronized to the moving object, an image with higher resolution at lower light level is achieved. As a result, signal-to-noise ratio in TDI camera is much higher than that in a line-scan camera.



Traditional LDA Application

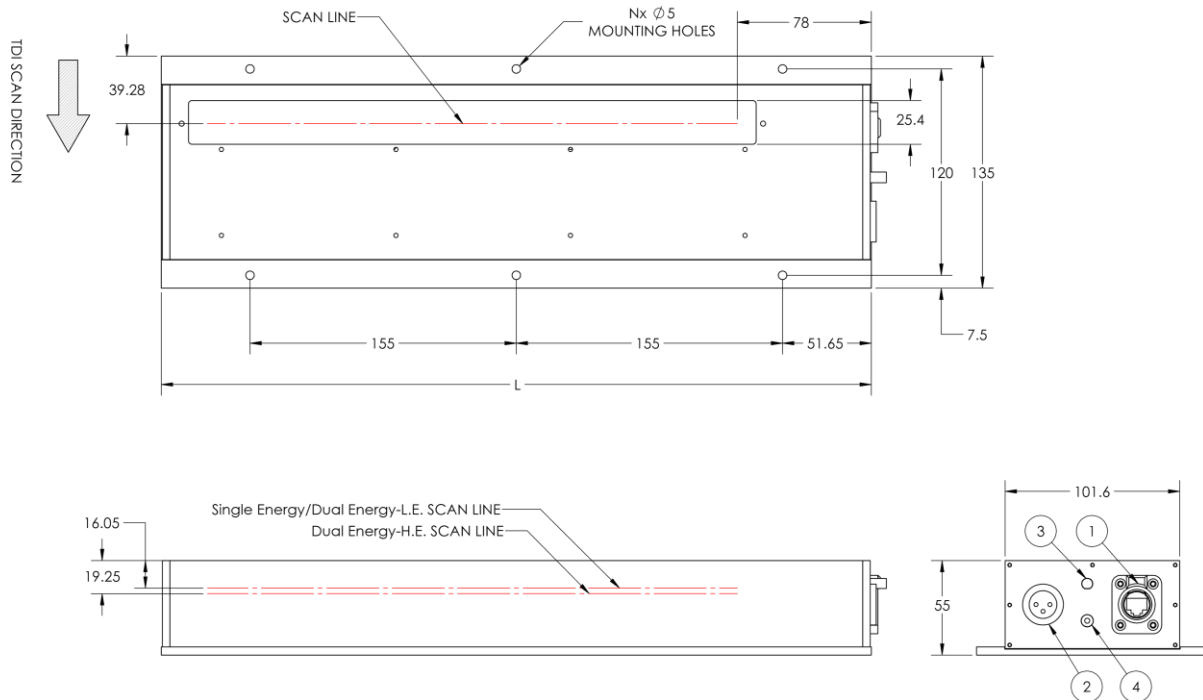


TDI Application

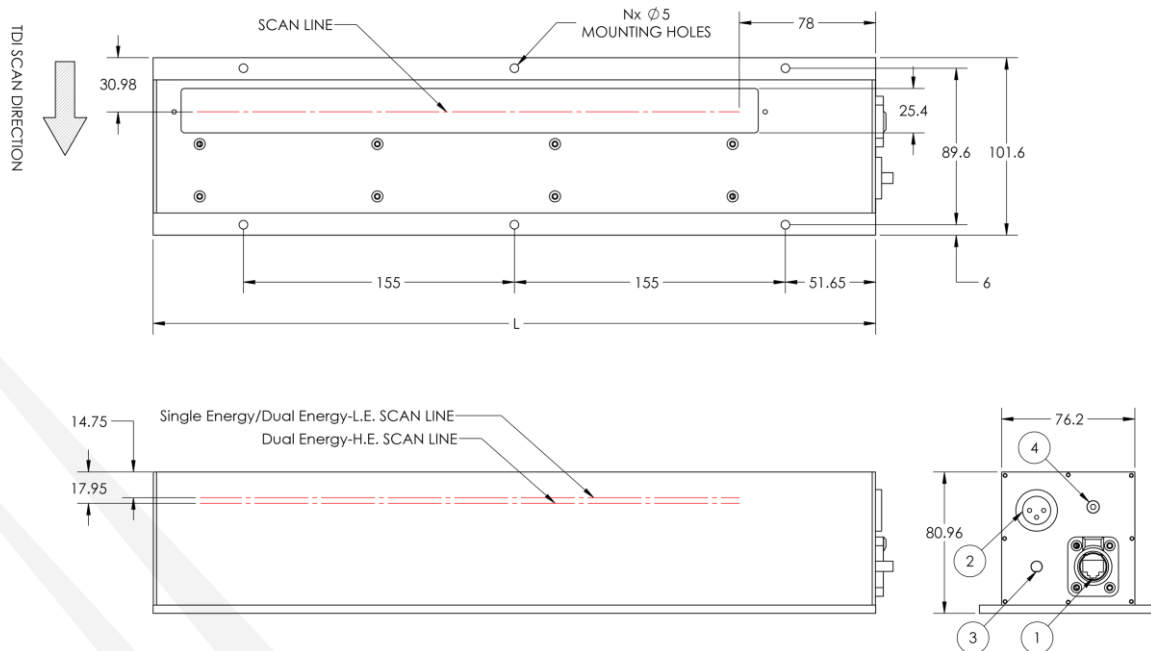
## Mechanical Configurations

X-Scan Imaging housings are available in two form factors. The DR housing is a low profile, wider detector to fit under conveyor systems or other tight spaces. The DS housing is a taller, narrower profile. The standard X-Scan Imaging detectors, Single Energy, Dual Energy, and CMOS TDI all share the same mounting hole pattern.

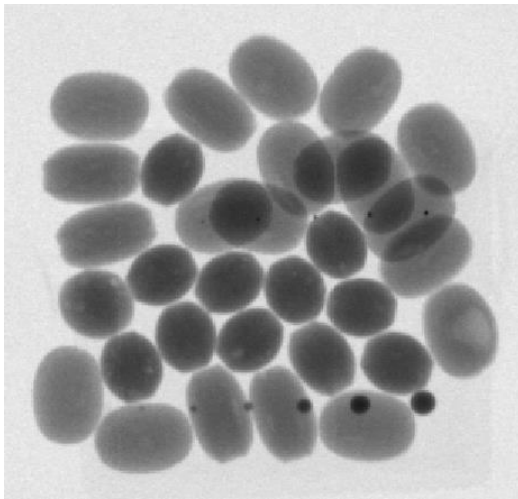
### DR:



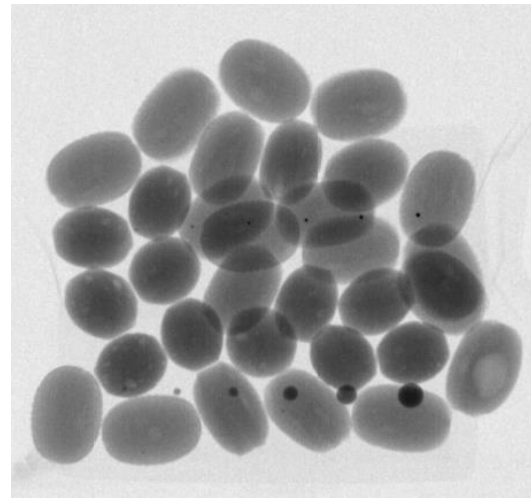
### DS:



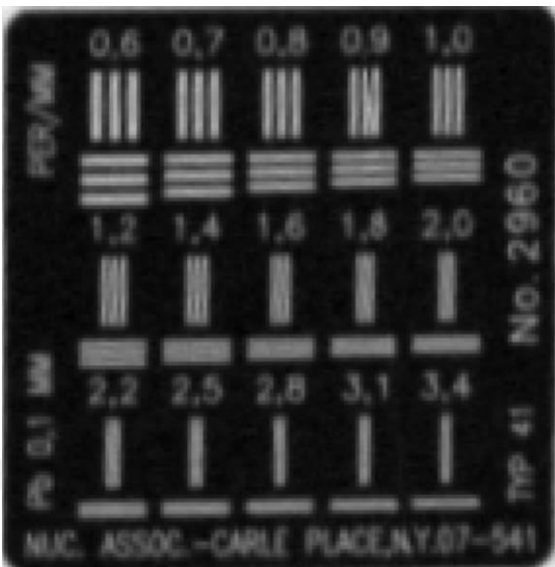
Comparison images



0.4 mm LDA



0.2 mm TDI



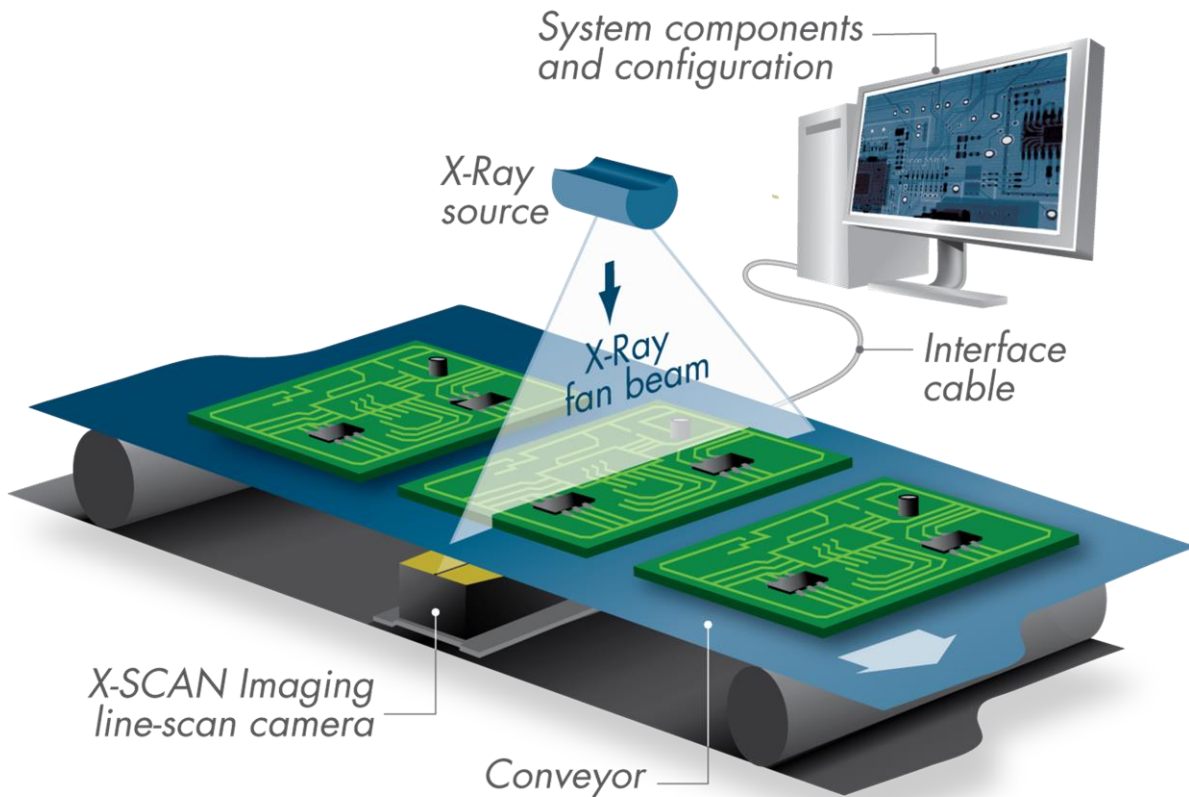
0.4 mm LDA



0.2 mm TDI

## Setup

The XI8800 series camera system includes a camera unit, a software development kit, power adapter and cabling. The frame-grabber to be installed in the computer is provided optionally. Interfaces available include GigE, Camera Link, and USB3.0.



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