**The Thermo Scientific SpectraCAM XDR scientific grade imaging system is based on the new 2048 x 2048 pixel, random access Charge Injection Device (RACID) imager architecture featuring low noise, arbitrary pixel selection and readout, and Non Destructive Read-out capabilities.**
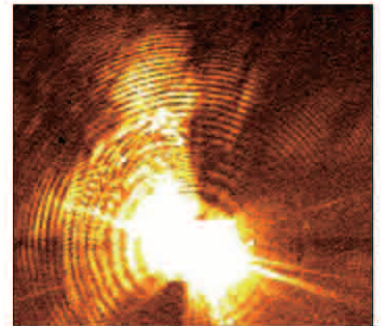
# Thermo Scientific SpectraCAM XDR™

### Designed for Versatility

Designed for applications requiring extremely wide linear dynamic range, or adaptive exposure control, the Thermo Scientific SpectraCAM XDR imaging system uses unique random access integration techniques employing true random pixel addressability, Non-Destructive Read Out (NDRO), and selective Region of Interest (ROI) clearing to provide high dynamic range that may exceed 10(7) or 24-bits allowing the user to read very dim pixels in the presence of highly illuminated pixels. The SpectraCAM XDR employs artificial intelligence (AI) algorithms for the readout or injection of ROIs based upon the experimentally observed signal.

The hermetically sealed TE cooled 16bit SpectraCAM XDR system is configured for end users or OEM applications.

### Performance Options

The random access CID is sensitive from 185nm - 1100nm, and is capable of direct UV imaging. Application specific coatings such as GdO2S for imaging of mid to high level X-Rays, as well as LUMOGEN for extending the UV range below 185nm are available. The camera controller is based upon a custom FPGA with 16-bit A/D and a PowerPC® based CPU enabling dynamic control of ROI data acquisition algorithms and real-time video processing.
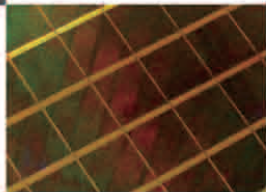
The camera software supports export of data in various imaging (.FITS, .TIF, .JPEG, and .CID) and spreadsheet formats. Along with programmable position and size, each ROI may be individually programmed for completley independent NDRO.

### Features:

. CID (Charge Injection Device) Imager technology
. High 16-bit Linear Dynamic Range, up to 24-bits (with 100 NDRO's)
. True Random Pixel Addressability
. Non-Destructive Pixel Readout
. Wide Wavelength Response
. GigE (Gigabit Ethernet) output
. Non-Destructive Readout of selectable Regions
. Virtually No Blooming Under Severe Light conditions
. Contiguous Pixel Structure with High Fill Factor

### Applications:

. Spectroscopy
. Biological Imaging
. Other Scientific Applications>

**Thermo** SCIENTIFIC

The SpectraCAM XDR imaging system is part of a line of scientific grade cameras and imagers with applications spanning a full spectrum of industries and applications. Thermo Scientific CIDTEC Cameras & Imagers has been in business for over 25 years with imaging products in scientific, machine vision, aerospace, medical, and radiation hardened markets.

## SpectraCAM XDR scientific imaging systems

| | |
|---|---|
| **Imager:** CID820: 2048 x 2048 pixels | **Pixel Full Well** >210,000 e- |
| **Readout Noise** <40e- single read @ 2 MHz <10e- with 128 NDRO's | **Non-destructive Read Out** Any pixel on the CID820 can be interrogated (or measured) at any point in time without affecting the photon-generated charge in that pixel site (or any other pixel site). |
| **Pixel Size:** 12microns by 12microns | **Dark Current:** <7 e- per second per pixel at -45 |
| **Linearity** +/- 3% from 3% to 80% of saturation | **ROI** <20usec. delay between ROI selection |
| **Quantum Efficiency** >45% @ 550nm and >20% @ 200nm *Deep UV and X-Ray converter coatings available for use below 185nm | **Cooling:** 3 stage TE cooler with water recirculation |
| **Readout Speed Selectable:** Slow Scan 2 MHz | **Sealed:** Hermetic sealed 3 years, Integrated water jacket |

**RAI (Random Access Integration) Software Drivers    - Currently in development -**
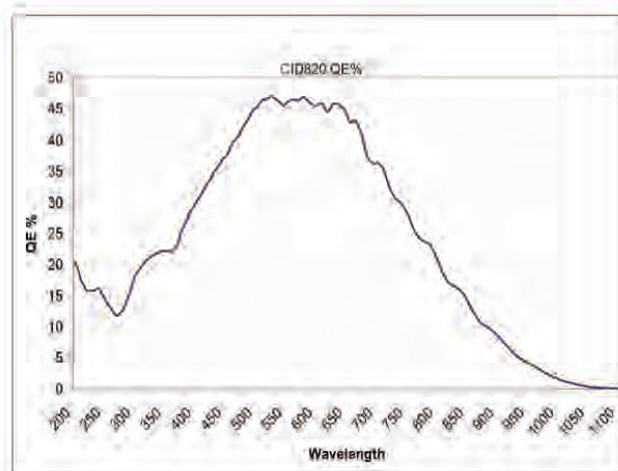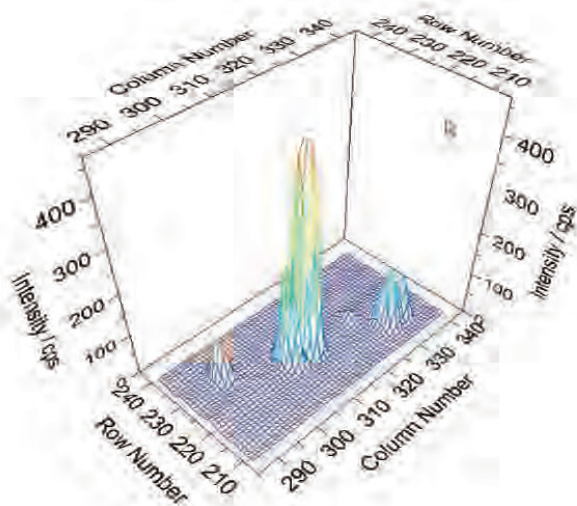Fixed Exposure Time: User programmed ROIs integrated for user-selected exposure time analogous to CCD exposure.
Random Access Integration: Integration time automatically varied at ROI site based on experimentally observed signal.
Using non-destructive read and ROI clear features, intensely illuminated ROIs are integrated for multiple short integration times while weakly illuminated ROIs are simultaneously allowed to integrate for longer periods, allowing for the extension of the dynamic range up to 10(7) or 24-bits.

**TRS (Time Resolve) Software Drivers (OPTIONAL)     - Currently in development -**
TRS Drivers allow for the observation of ROI signal profile with respect to time for multiple ROIs. The algorithms allow user programmable time resolution as short as 100 microseconds for a single ROI. The algorithms are specifically designed for time-resolved techniques such as gas and liquid chromatography, flow injection analysis, and laser or spark ablation.

**AutoIntegrate Drivers (OPTIONAL)**
ExtremeDR drivers allow the user to automatically combine the complete field of view offered by a full-frame "Fixed-Time" exposure with the extended dynamic range of the "Random Access Integration" algorithms described above, allowing for simultaneous 10(7) linear dynamic range (24-bits) on a full-frame image without compromising precision.

ISO 9001

Thermo CIDTEC, Liverpool NY is ISO9001:2000 certified

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