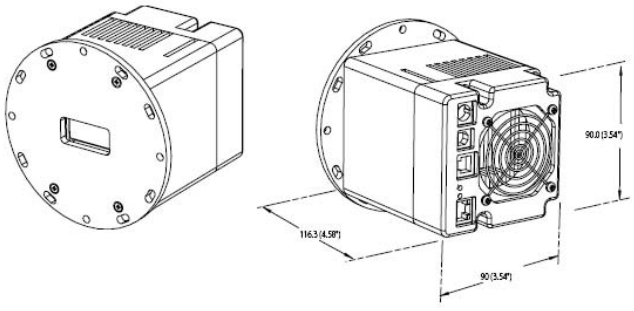
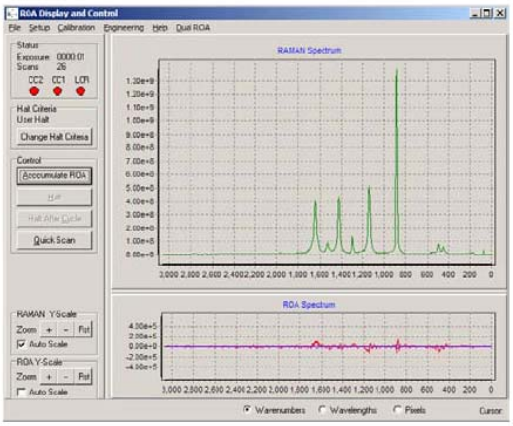
CCDsp™ Scientific Camera with DSP

- **High-performance scientific camera**
- **Integrated digital signal processor (DSP)**
- **Designed for very low-light applications**
- **Thermo-electrically cooled to -30°C**
- **Requires no interface card**
- **Flexible communication options**
- **Customizable**

Features	Benefits
On-board DSP State of the art floating point DSP	Eliminates the need for external interface cards Processing done on-board camera Makes stand-alone application practical
Binning Binning in CCD and DSP	Combination of binning in CCD and DSP can be used to optimize read-out speed and dynamic range
TE Cooling Cooling to -30° C	Reduces dark current Temperature performance guaranteed for 5 years
Software Simple yet powerful DLL interface	Rapid application development and deployment Sample application provided
Multiple communications options Ethernet USB 2.0 High-speed serial	High-speed access over intranet/internet High-speed interface to PC's and laptops Connection to legacy PC

Compact Design





Spectrum obtained from sample application

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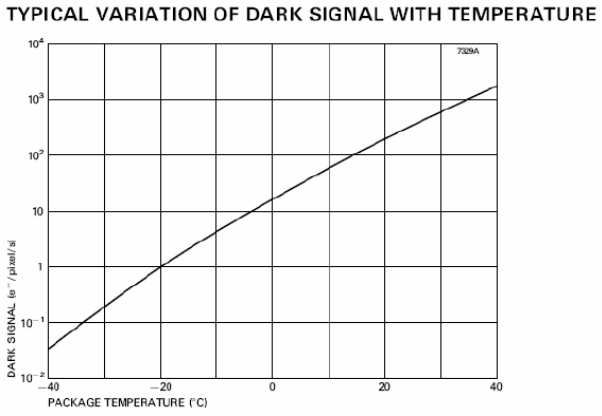


Specifications

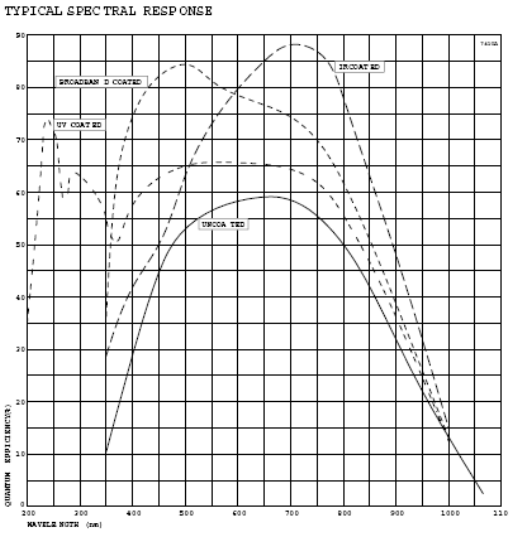
CCD:
Pixel Size: 26um square
Image Area: 26.6 x 6.7 mm
Full Well Capacity: ~300,000 e˜
Dark Current: < e˜/ pixel / sec.

Electrical:
Voltage: 110V/220 VAC
(50 Hz/60 Hz)

Cooling:
Type: Thermo-electric -30°C
(From ambient 20°C)

Communications:
Ethernet: 10/100BaseT
Serial: 115kbps, RS232
USB

Mechanical Dimensions:
3.86" L x 3.94" W x 3.54"H



High performance CCD

Based on the e2v CCD30-11 sensor

- Back illuminated or front illuminated versions available.
- 1024 x 255 pixels 26um square. Standard version uses Grade 1 CCD. Grade 0 CCD available as an option.
- Other CCD's can be adapted upon request.

Binning

- Very flexible binning support built right in
  - DSP performs binning operations on-board, minimizing amount of data that must be transferred from the camera.
  - Any number of lines can be binned in the CCD, and/or in the DSP
    - Binning in the CCD improves speed, but limits saturation level.
    - Binning in the DSP improves dynamic range at the expense of speed.
    - Combination of CCD and DSP binning can provide optimum performance.
    - Discarded lines
  - Discarded lines can be binned in the CCD for speed or can be cleared individually to minimize residuals.
  - Simple DLL interface allows complete flexibility in binning and reading out camera.

Cooling

- Thermoelectrically cooled to -30°C (from ambient of 20° C).
- Sealed CCD chamber is filled with inert gas to eliminate fogging, while avoiding the problem of vacuum leaks.
- Ethernet allows the camera to be operated at maximum speed, locally or remotely over standard networking equipment.
- USB provides high performance with a local PC.

Communications

- Included as standard on the **CCD*sp*™** are Ethernet, USB and serial ports.
  - Serial port provides a simple interface to legacy PC's.

DSP Processing

- **CCD*sp*™** takes advantage of Critical Link's **Mity*DSP*™** engine.
- DSP can be programmed to perform in-camera processing, such as peak finding, signature matching and other functions.
- High performance floating point DSP paired with a powerful Xilinx field programmable gate array (FPGA).
  - DSP capable of 600 Mflops performance.
  - FPGA provides a sea of logic gates which can be configured to perform any desired function, such as specialized binning or signal processing.
  - 2 MB of flash memory and 8 MB of RAM provide enough resources for almost any application.
- Both the DSP and FPGA firmware in flash can be updated through a serial port connected to a PC.
- Critical Link can provide customization services to port any application or to create a completely new application.

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