

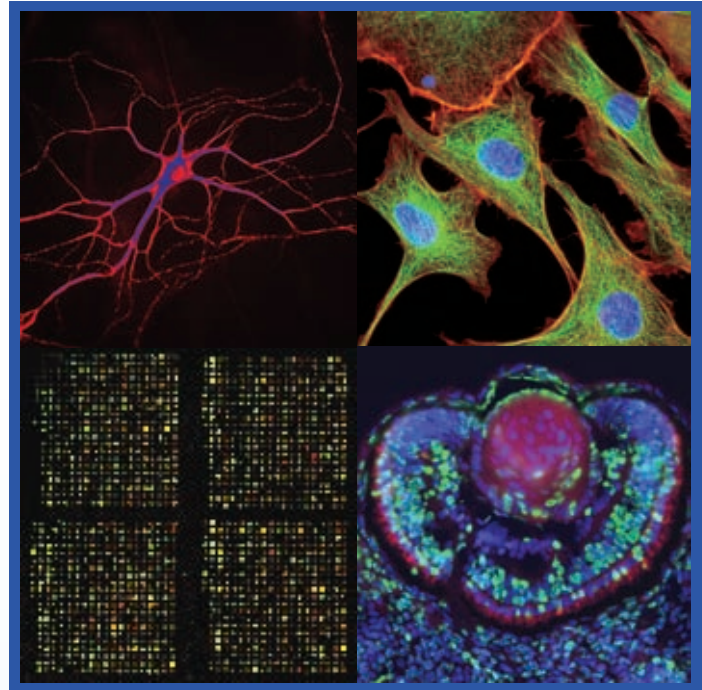


High Performance Cooled CCD Camera System ALTA



We've selected the four most popular CCDs in life science imaging and integrated them into clean, fast, 16-bit digitization with deep cooling. The result is simple, low-cost, publication quality imaging, whether for bright field or low light fluorescence. The cameras are available with a monochrome or color sensors. See www.ccd.com for the complete line of Apogee Instruments cameras.

- 5 MHz 12-bit and 1 MHz 16-bit digitization
- 32Mbyte camera memory
- USB 2.0 interface: no plug in cards or external controllers
- Programmable, intelligent cooling to 75°C below ambient
- Binning up to 8 Horizontal x Height of CCD (up to 4095)
- Subarray readout and fast sequencing modes
- Kinetics mode readout
- Programmable fan speed for low / zero vibration
- Optional liquid circulation (most models)
- Two serial port outputs for control of peripheral devices
- General purpose programmable I/O port
- External triggering and strobe controls
- ActiveX drivers included with every system
- Field upgradeable firmware
- Fused silica windows with MgF2 or BBAR coating both sides



Clockwise from upper left: image courtesy Dr. Dale Hunter, Tufts University; Scientific Instrument Company; Dr. David Rapaport, UCSD

CCD SPECIFICATIONS

	Alta U2000	Alta U4000	Alta U32
CCD	Kodak KAI-2020	Kodak KAI-4022	Kodak KAF-3200
Array Size (pixels)	1600 x 1200	2048 x 2048	2184 x 1472
Pixel Size (microns)	7.4 x 7.4	7.4 x 7.4	6.8 x 6.8
Active Area (mm)	11.8 x 8.9 mm	15.2 x 15.2 mm	14.8 x 10.0
Active Area (mm ²)	105	149	105
Imaging Diagonal	14.8 mm	21.4 mm	17.9 mm
Video Imager Size	0.93"	1.34"	1.12"
Typical cooling	Δ 54C	Δ 54C	Δ 50C
Dark current (e/p/s)	0.3	0.4	0.1
Readout Noise (e-)	7 e-	7 e-	8 e-
Linear Full Well (typical)	40K e-	40K e-	55K e-

For complete CCD specifications, including cosmetic grading, see data sheet from manufacturer.

CAMERA DATA SHEETS

A complete set of camera data sheets as well as mechanical drawings are on our Integration Starter Kit CD, or at www.ccd.com



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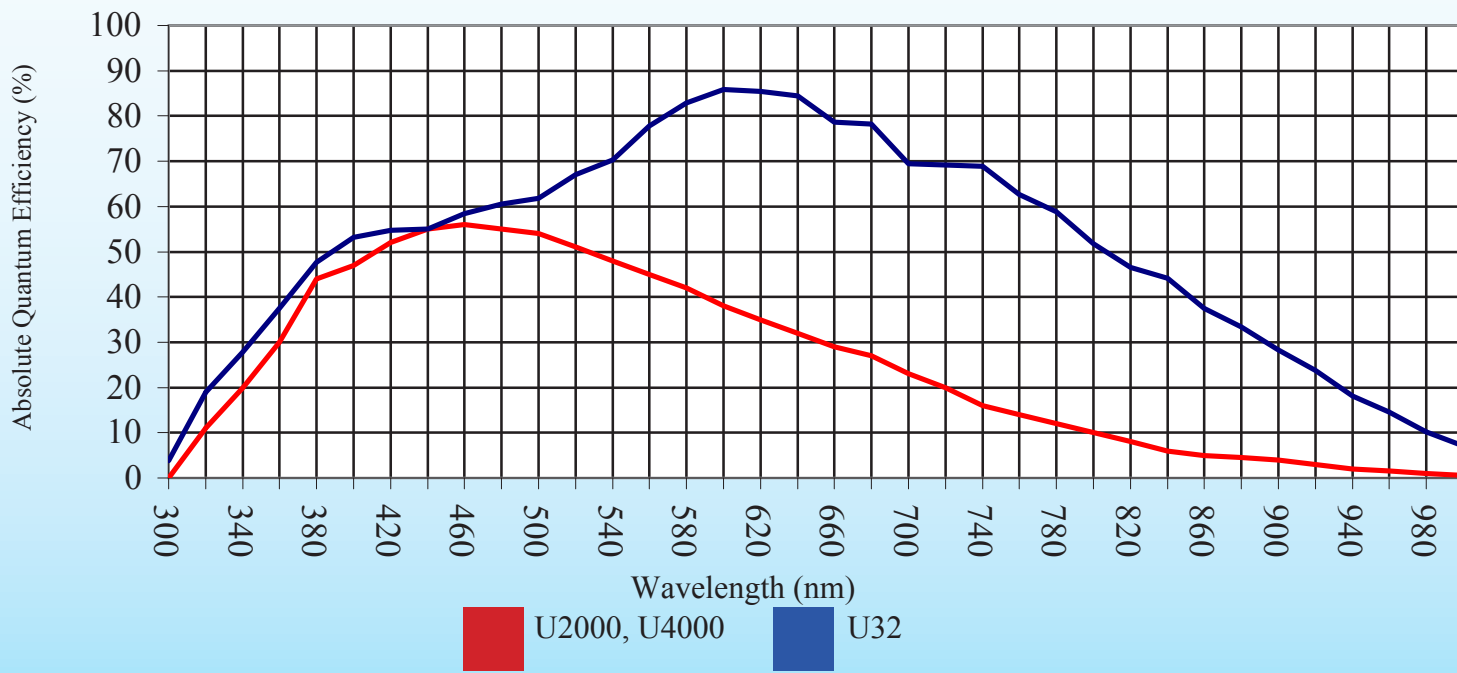
1020 Sundown Way, Ste 150
Roseville CA 95661 USA
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<http://www.ccd.com>

ALTA Camera System Performance



PC Interface	USB 2.0
USB2 Cable	Std.: 5m. Extensions: 5 meters between hubs; 5 hubs maximum (max. total of 30m) Wide variety of extenders available, including fiber optics to 10 km.
Digital Resolution	5 MHz 12-bit and 1 MHz 16-bit digitization
Pixel Binning	1 x 1 to 8 x height of CCD
Exposure Time	Minimum 100 microseconds; max.183 minutes
Image Sequencing	1 to 65535 image sequences under software control
Frame Sizes	Full frame, subframe, focus mode
Cooling (typical)	Thermoelectric cooler. Maximum forced air cooling 50-55°C below ambient temperature.
Temperature Stability	± 0.1°C
Camera Head Size	6" x 6" x 2.1" (15 x 15 x 6.25 cm) Weight: 3.1 lb. (1.4 kg)
Housing Type	Standard: D01. Low profile: D05. Aluminum, hard blue anodized.
Mounting	C-mount (1" 32 tpi thread). 3.5" bolt circle. Optional Nikon F-mount adapters.
Back Focal Distance	C-mount standard: 0.69" (17.5 mm). [optical]
Operating Environment	-30°C to 35°C. Relative humidity: 10 to 90% non-condensing.
Op.Sys.Support	Windows, Linux, Mac OSX
Power	20W maximum power with internal shutter open and cooling maximum. AC/DC "brick" supply with int'l AC input plug (100-240V, 50-60 Hz). Alternate 12V input from user's source.
Shutter	U2000/U4000: Electronic. U32: internal electromechanical shutter (Vincent 25mm)
Remote Triggering	LVTTL input allows exposure to start within 25 microseconds of rising edge of trigger

CCD SENSITIVITY



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