

High Performance Cooled CCD Camera System ALTA U9000HC



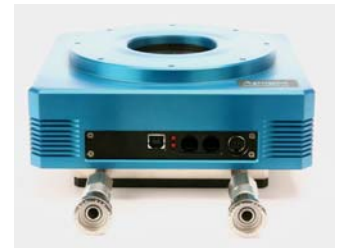
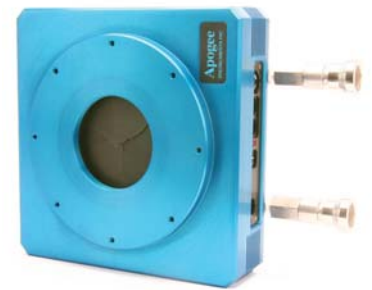
The Alta U9000HC uses a very large format 9-megapixel full frame sensor with anti-blooming gates, ideal for applications requiring large field of view, such as astrophotography, sky surveys, and radiology. The HC version increases cooling by 20C compared to the U9000 and is available with liquid circulation only.

Imaging Area of CCD

In the June 2007 issue of *Sky & Telescope* in an S&T Test Report, Senior Editor Dennis di Cicco had this to say about the Alta U9000: "The quality exceeds anything I've been able to do in the past with film or any other CCD camera."

- 3056 x 3056 array, 12 x 12 micron pixels
- 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 60°C below ambient
- Binning up to 8 Horizontal x 3056 Vertical
- Subarray readout and fast sequencing modes
- Precision time delayed integration (TDI) and kinetics mode readout
- Programmable fan speed for low / zero vibration
- 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
- Runs from single 12V supply with input voltage monitor
- Compact enclosure
- Programmable status indicators

- Astronomy
- Radiology
- Optical testing
- Non-destructive testing



CCD SPECIFICATIONS

CCD	Kodak KAF-09000
Array Size (pixels)	3056 x 3056
Pixel Size	12 x 12 microns
Imaging Area	36.7 x 36.7 mm (1345 mm ²)
Imaging Diagonal	51.9 mm
Video Imager Size	3.24"
Linear Full Well (typical)	110K electrons
Dynamic Range	84 dB
QE at 400 nm	37%
Peak QE (550 nm)	64%
Anti-blooming	>100X

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



With optional LR001 Liquid Recirculation Unit

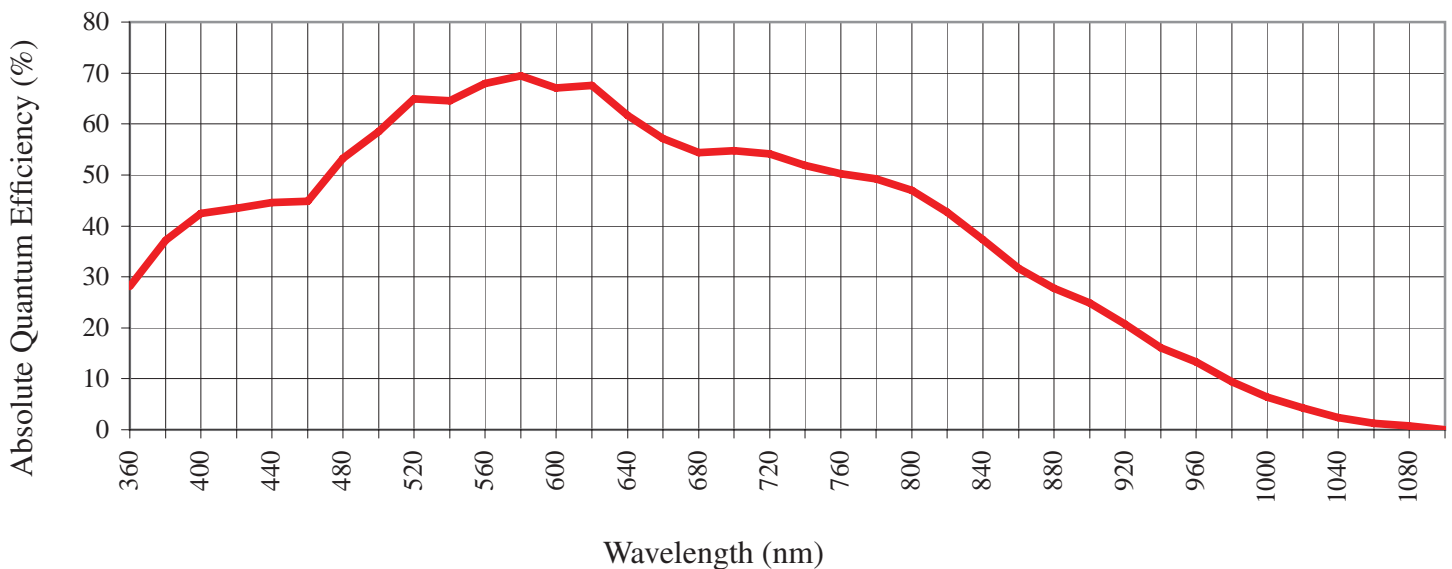
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ALTA U9000HC Camera System Performance



PC Interface	USB 2.0
Max. Cable Length	5 meters between hubs; 5 hubs maximum (max. total of 30m)
Digital Resolution	16 bits at 1 MHz and 12 bits at 5 MHz
System Noise (typical)	7 e ⁻ RMS at 1 MHz and 2 counts at 5 MHz
Pixel Binning	1x1 to 8x3058 on-chip
Exposure Time	30 milliseconds to 183 minutes (2.56 microsecond increments)
Image Sequencing	1 to 65535 image sequences under software control
Frame Sizes	Full frame, subframe, focus mode
Cooling (typical)	Thermoelectric cooler with liquid circulation. Maximum cooling 60°C below ambient temperature
Dark Current (typical)	0.04 e ⁻ /pixel/sec (-40°C)
Temperature Stability	± 0.1°C
Camera Head Size	D9. Aluminum, hard blue anodized. 7" x 7" x 3.24" (17.8 x 17.8 x 8.2 cm) Weight: 4.2 lb. (1.9 kg)
Mounting	5,125" bolt circle. Optional Nikon F-mount or Canon FD mount.
Back Focal Distance	1.363" (34.62 mm) [optical]
Operating Environment	-22° to 27°C. Relative humidity: 10 to 90% non-condensing.
Cable Length	Standard: 15 ft (4.5m)
Power	40W maximum power with 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	Melles Griot 63mm.
Remote Triggering	LVTTL input allows exposure to start within 25 microseconds of rising edge of trigger

CCD SENSITIVITY



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