



Apogee Instruments Inc.

PRELIMINARY

# High Performance Cooled CCD Camera System ASCENT A4000

The Ascent A4000 has a square format 4-megapixel interline transfer sensor with high quantum efficiency. The camera is available with a monochrome sensor (M version) or color sensor with a Bayer mosaic. Low noise and small pixels are ideal for OEM applications, biological sciences, and fundus imaging.

- Astronomy
- Fluorescence microscopy
- Luminance testing

- 2048 x 2048 array, 7.4 x 7.4 micron pixels
- 32 Mbyte SDRAM image buffer
- Programmable dual channel 16-bit digitization speeds up to 10 Mpixels/sec per channel
- USB 2.0 interface: no plug in cards or external controllers
- Programmable, intelligent cooling to 40°C below ambient
- Binning up to 4 Horizontal x CCD height
- Subarray readout and fast sequencing modes
- Programmable offset and gain
- External triggering and strobe controls
- ActiveX drivers included with every system
- Field upgradeable firmware
- BK7 windows (optional fused silica)
- Optional internal vane or external electromechanical shutter
- Optional C-mount, Nikon F-mount, or 2" slip fit adapter
- Single 6V supply with input voltage protection system
- Compact enclosure: 23 oz. (0.65 kg)
- Programmable status indicators

Imaging Area of CCD



## CCD SPECIFICATIONS

CCD	Kodak KAI-4021M (mono) or MC (color)
Array Size (pixels)	2048 x 2048
Pixel Size	7.4 x 7.4 microns
Imaging Area	15.2 x 15.2 mm (230 mm <sup>2</sup> )
Imaging Diagonal	21.4 mm
Video Imager Size	1.34"
Linear Full Well	40K electrons (typical)
Dynamic Range	77 dB
QE at 400 nm	45%
Peak QE (500 nm)	55%
Anti-blooming	300X (nominal)

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

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Actual Size of Camera



1020 Sundown Way, Ste 150  
 Roseville CA 95661 USA  
 tel 916-218-7450  
 fax 916-218-7451  
<http://www.ccd.com>



# ASCENT

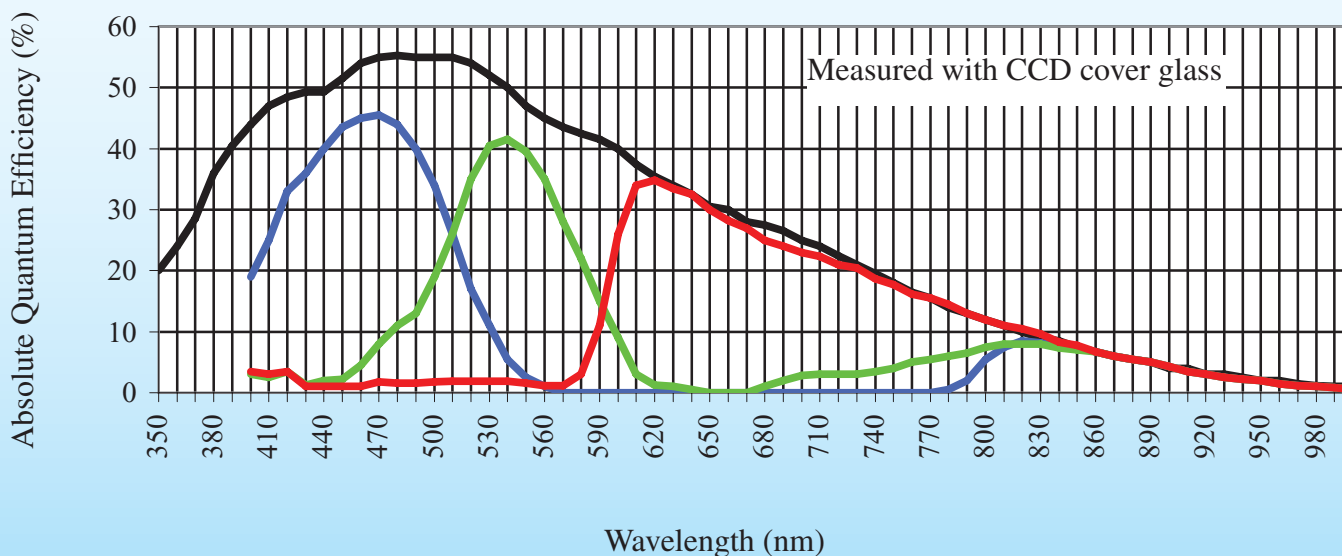
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## ASCENT A4000 Camera System Performance



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	16 bits at up to 10 Mpixels/sec per each of two channels
System Noise (typical)	15 e <sup>-</sup> RMS at 1.5 MHz
Pixel Binning	1 x 1 to 4 x 2048 on-chip
Exposure Time	Minimum 100 microseconds (no vane shutter); 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 40°C below ambient temperature.
Dark Current (typical)	Photodiode: 0.6 e <sup>-</sup> /pixel/sec. Storage diode: 6 e <sup>-</sup> /pixel/sec. (-15°C)
Temperature Stability	± 0.1°C
Camera Head Size	Aluminum. 3.2" x 5.7" x 1.3" (8.1 x 14.5 x 3.3 cm) Weight: 1.4 lb. (0.65 kg)
Mounting	1.5" x 2.5" bolt pattern, 6-32 thread. Optional C-mount (1" 32 tpi thread), Nikon F-mount, or 2" slip-fit adapters.
Back Focal Distance	Standard: 0.32" (0.81 cm). [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 6V input from user's source.
Shutter	Standard: Electronic Optional internal vane or external electromechanical shutter.
Remote Triggering	LVTTTL input allows exposure to start within 25 microseconds of rising edge of trigger

### CCD SENSITIVITY



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