



ASCENT

Apogee Instruments Inc.

PRELIMINARY

High Performance Cooled CCD Camera System ASCENT EM247

The Ascent EM247 has an interline frame transfer EMCCD with a special charge multiplication circuit that amplifies charge on the CCD before readout. With an on-CCD gain of 1, the sensor behaves much like a normal CCD with maximum well depth of 28 ke⁻ and a typical noise of 20 e⁻. With higher gains on-CCD, output noise approaches 1e⁻ with severe reduction in well depth.

- 658 x 496 array, 10 x 10 micron pixels
- 32 Mbyte SDRAM image buffer
- Programmable 16-bit digitization speeds up to 10 Mpixels/sec
- 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)
- Precision time delayed integration (TDI) and kinetics mode readout
- 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

- Neurology
- Astronomical guiders / adaptive optics
- Real-time low light fluorescence
- Surveillance

Imaging Area of CCD



CCD SPECIFICATIONS

CCD	TI TC-247
Array Size (pixels)	658 x 496
Pixel Size	10 x 10 microns
Imaging Area	6.6 x 4.96 mm (32.6 mm ²)
Imaging Diagonal	8.24 mm
Video Imager Size	0.52"
Linear Full Well (typical)	28K electrons (gain = 1)
Dynamic Range	63 dB
QE at 400 nm	43%
Peak QE (530 nm)	52%
Anti-blooming (nominal)	none

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

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Actual Size of Camera



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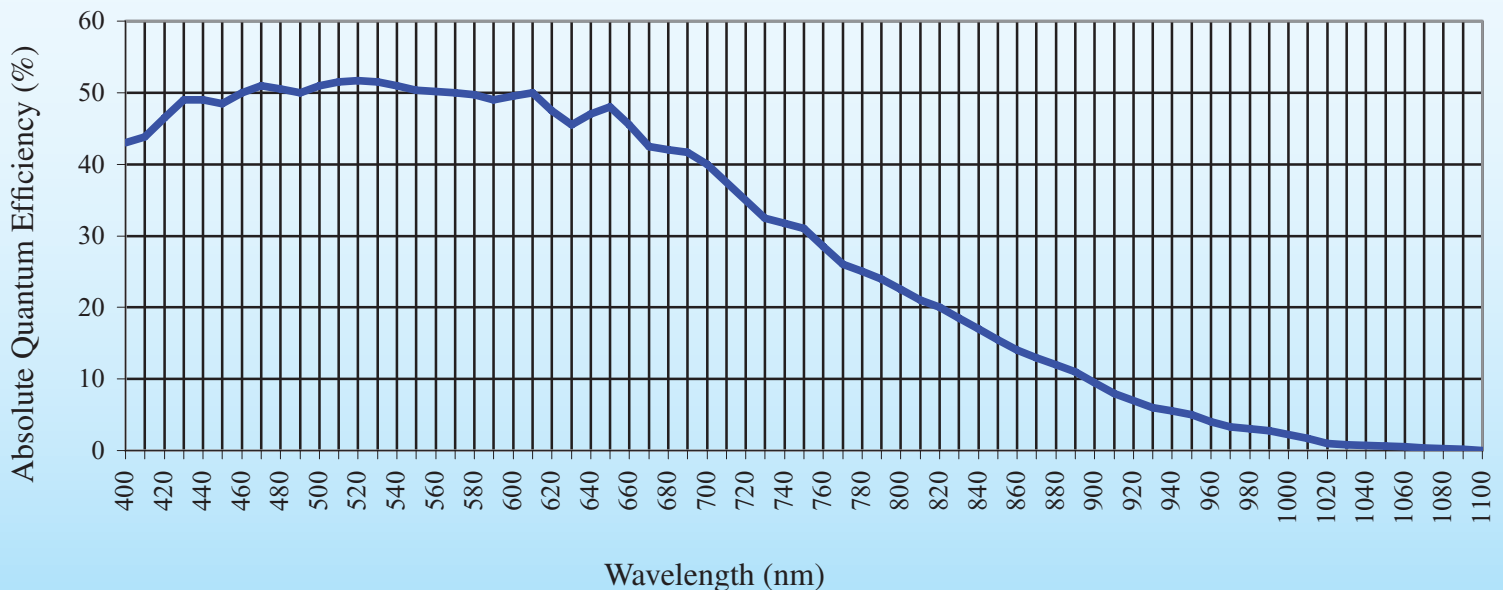
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ASCENT EM247 Camera System Performance



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
System Noise (typical)	Gain 1: 20 e ⁻ RMS at 1.5 MHz; Gain 200: 1 e ⁻ RMS at 1.5 MHz
Pixel Binning	1 x 1 to 4 x 496 on-chip
Exposure Time	Minimum 100 milliseconds using 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)	2 e ⁻ /pixel/sec. (-20°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	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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