

## Specifications: SPECS

- CCD Grades:**
- SPOT Camera:
    - Grade 3 Kodak 1400 CCD
    - Total Point Defects  $\leq 20$
    - Total Cluster Defects  $\leq 8$
    - Total Column Defects  $\leq 4$
    - (also available with Grade 2, 1 or 0 CCD)
  - SPOT-2 Camera:
    - Grade 2 Kodak 1400 CCD
    - Total Point Defects  $\leq 10$
    - Total Cluster Defects  $\leq 4$
    - Total Column Defects  $\leq 2$
    - (also available with Grade 3, 1 or 0 CCD)

- CCD Format and Resolution:**
- 1315 x 1033 pixels (1,358,395 pixels)
  - 6.8 micron x 6.8 micron pixel size
  - Active area 8.94mm x 7.02mm

- Image Acquisition Bit Depth:**
- 8 bit and 12 bit grayscale; 24 bit and 36 bit RGB color

- Digitization:**
- Pixel-by-pixel digitization in camera head

- CCD Cooling:**
- Thermoelectric cooler with forced air
  - Cooled to  $-12^{\circ}\text{C}$  ( $37^{\circ}$  differential at typical room temperature of  $25^{\circ}\text{C}$ )
  - Temperature stability  $\pm 1^{\circ}\text{C}$  in 8 hour period

- Full Scale:**
- 38,250 e (set to 85% of 45,000 e full well capacity)

- Dark Current:**
- 0.05 e/p/s at  $-12^{\circ}\text{C}$  (typical)
  - 0.2 e/p/s at  $-12^{\circ}\text{C}$  (max)

- Read Noise:**
- 13 e rms (typical)
  - 20 e rms (max)

- Signal to Noise Ratio:**
- 69 dB (typical)
  - 66 dB (min)

- Binning Modes:**
- 2x2, 3x3, 4x4

- Color & IR Filter:**
- SPOT Camera: fixed
  - SPOT-2 Camera: on slider

- Operating Environment:**
- 10%-80% relative humidity
  - 15-30°C ambient

- Pixel Readout Rate:**
- 1.08 MHz

- Exposure:**
- Choice of auto or manual exposure settings, exposure range 80ms-17 minutes per color

- Lens Mount:**
- Nikon "F" bayonet mount (adapters available for almost all new and older microscopes), can accept Nikon macro lenses

- Window:**
- SPOT-2 has special ultra-broad band anti-reflection coating on all clear windows (under 1% reflection from 420nm to 820nm)

- Fast Focus:**
- 4 subframes per second (typical)

- File Sizes:**
- 8 bit = 1.33 MB
  - 12 bit = 1.99 MB
  - 16 bit = 2.66 MB
  - 24 bit = 3.98 MB
  - 36 bit = 5.98 MB
  - 48 bit = 7.97 MB

- Computer Interface:**
- PCI Bus

- External Shutter Control:**
- BNC connector on PCI plug-in board; TTL level output for shuttering fluorescence illuminator

- Power Supply:**
- Factory configurable to 100V, 120V, 220V or 230V, 50/60Hz
  - Dimensions: 5.0"H x 10.5"W x 8.0"D
  - Weight: 12 lbs.

### Software and Operating System:

- For Windows 95/98/NT (Mac version pending) proprietary software environment includes:
  - Auto exposure • Auto white balance • Image database
  - Report generator • Calibration mark imprinting
  - Distance, area and angle measurement • Editing tools (histogram, sharpen, gamma, ect.) • Annotation
  - Flatfield correction • Background subtract • Twain driver • Device driver available for several image analysis programs
- For Mac Power PC:
  - Twain driver (for use with Adobe Photoshop and other Twain compliant software)

### Computer Requirements PC:

- Pentium required (P166 or faster recommended)
- 64MB RAM required (128MB recommended)
- Video card should provide 24 bit RGB "millions of colors" at desired monitor resolution (8MB VRAM required for recommended 21" monitor operating at 1600 x 1200 resolution)

### Computer Requirements MAC:

- Power PC with a PCI bus running MAC OS 7.6 or greater
- 64MB RAM required (128MB recommended)
- Video card should provide "millions of colors" at desired monitor resolution (8MB VRAM recommended for resolution of 1280 x 1024 at refresh rate of 70Hz)

### Camera Head:

- SPOT Camera:
  - Dimensions: 5.0"H x 7.0"W x 7.25"D
  - Weight: 7 lbs.
- SPOT-2 Camera:
  - Dimensions: 5.0"H x 7.0"W x 7.25"D
  - Weight: 7 lbs.

Quantum Efficiency of Kodak KAF-1400 CCD

