

PIXIS:400

1340 x 400 CCD array | 20 x 20- μ m pixels



The Princeton Instruments PIXIS:400 is a fully integrated system with permanent vacuum / deep cooling. It uses a high-performance, spectroscopic-format CCD designed exclusively for Princeton Instruments/Acton. These special devices are thermoelectrically cooled (air) down to -75°C to provide the lowest dark charge. The 1340 x 400 array with 8-mm chip height and 27-mm spectral coverage is ideal for multistribe spectroscopy and maximum light collecting area. This detector delivers much higher resolution and sensitivity than industry-standard "1024 pixel" sensors. Another exclusive feature is the integration of two software-selectable amplifiers to achieve the highest sensitivity for low signal levels and the highest dynamic range with higher signal levels. The high system reliability is ideal for OEM and laboratory applications.

Applications: multistribe Raman, LIBS, multistribe absorbance, emission, reflectance

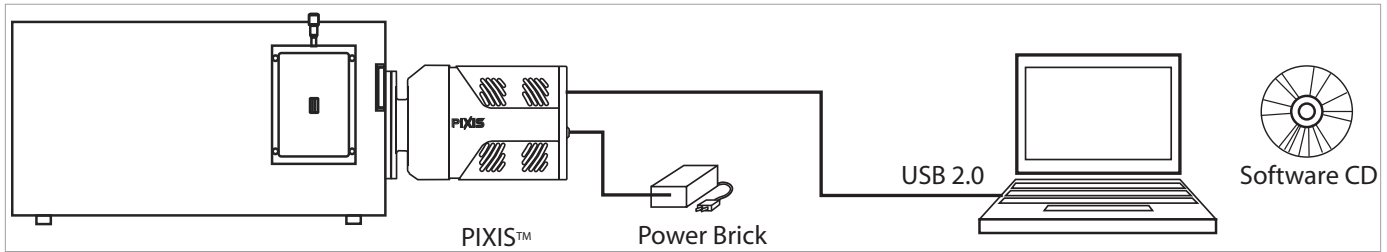
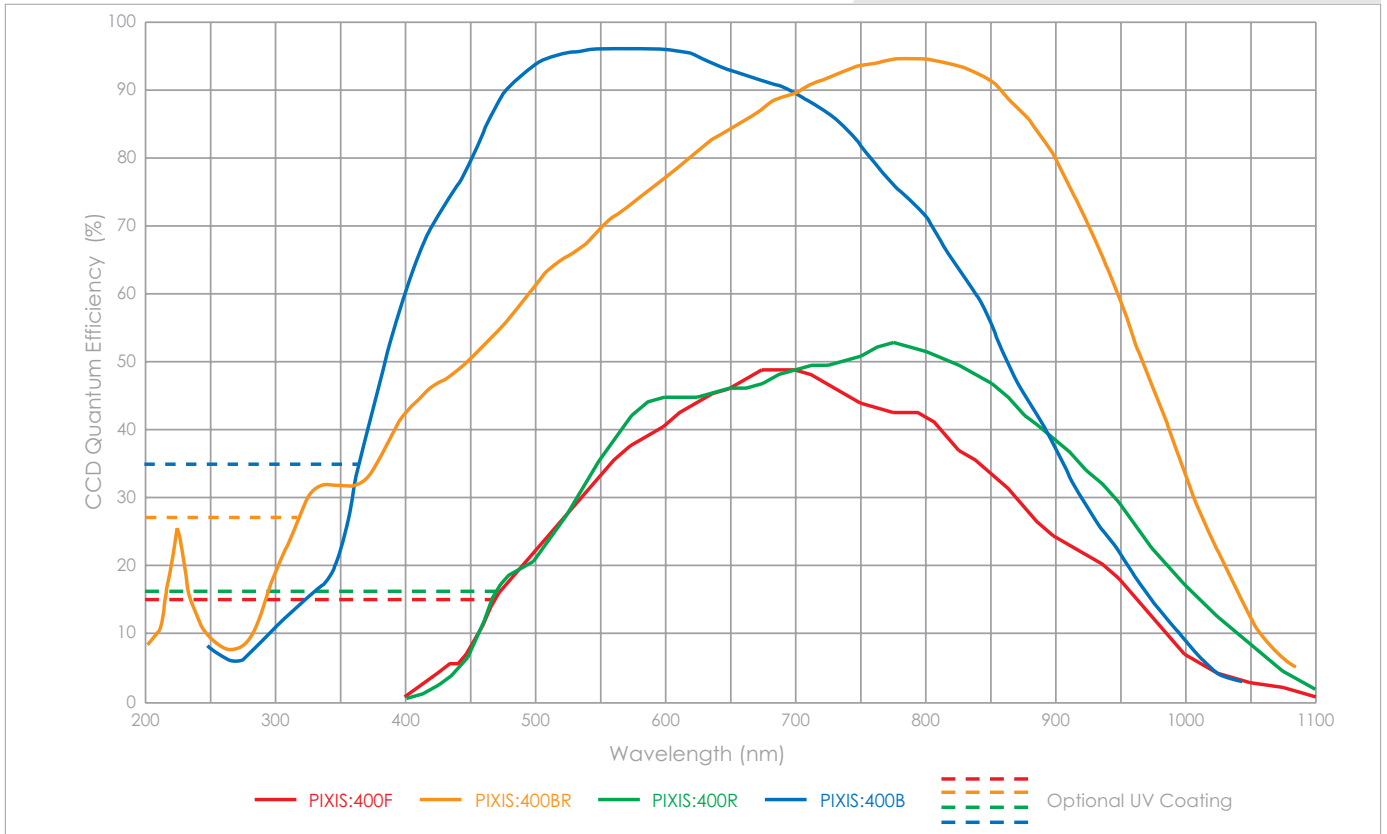
| Features | Benefits |
|---|---|
| Permanent vacuum | Guaranteed temperature performance and worry free operation with all metal seals |
| Deep thermoelectric cooling / air | Operate without the need for circulating liquid or an additional power supply |
| Compact design | Complete system integrated into a small footprint Ideal for integration into applications where space is at a premium |
| Exclusive CCD architecture | Provides industry's lowest-noise CCD system |
| 1340 x 400 CCD array | Exclusive format provides superior resolution over industry-standard "1024 pixel" format |
| 8-mm chip height | Ideal for rapid spectral acquisition |
| Software-selectable amplifiers | Exclusive feature provides choice of superior sensitivity or superior SNR |
| Dual-digitizer option | Multiple-speed digitization allows complete freedom to select between "slow operation" for low noise and highest SNR or "fast operation" for rapid spectral acquisition |
| Single optical window | No losses due to multiple optical surfaces |
| Standard spectrometer mount | Easily interfaces with most spectrometers |
| TTL input and output | External trigger input with programmable polarity TTL output with exposure or readout monitor |
| USB 2.0 interface | Seamless, plug-n-play connection to PC notebooks and desktops, no need for external control box or installing PCI cards Easy OEM integration |
| Renowned WinSpec software | Offers easy-yet-sophisticated Windows® GUI controls Automates data acquisition, analysis and display |
| PICAM® for VB, C, C++ and Scientific Imaging Toolkit for LabVIEW™ | Respected application program interface provides a universal interface to all Princeton Instruments/Acton hardware |

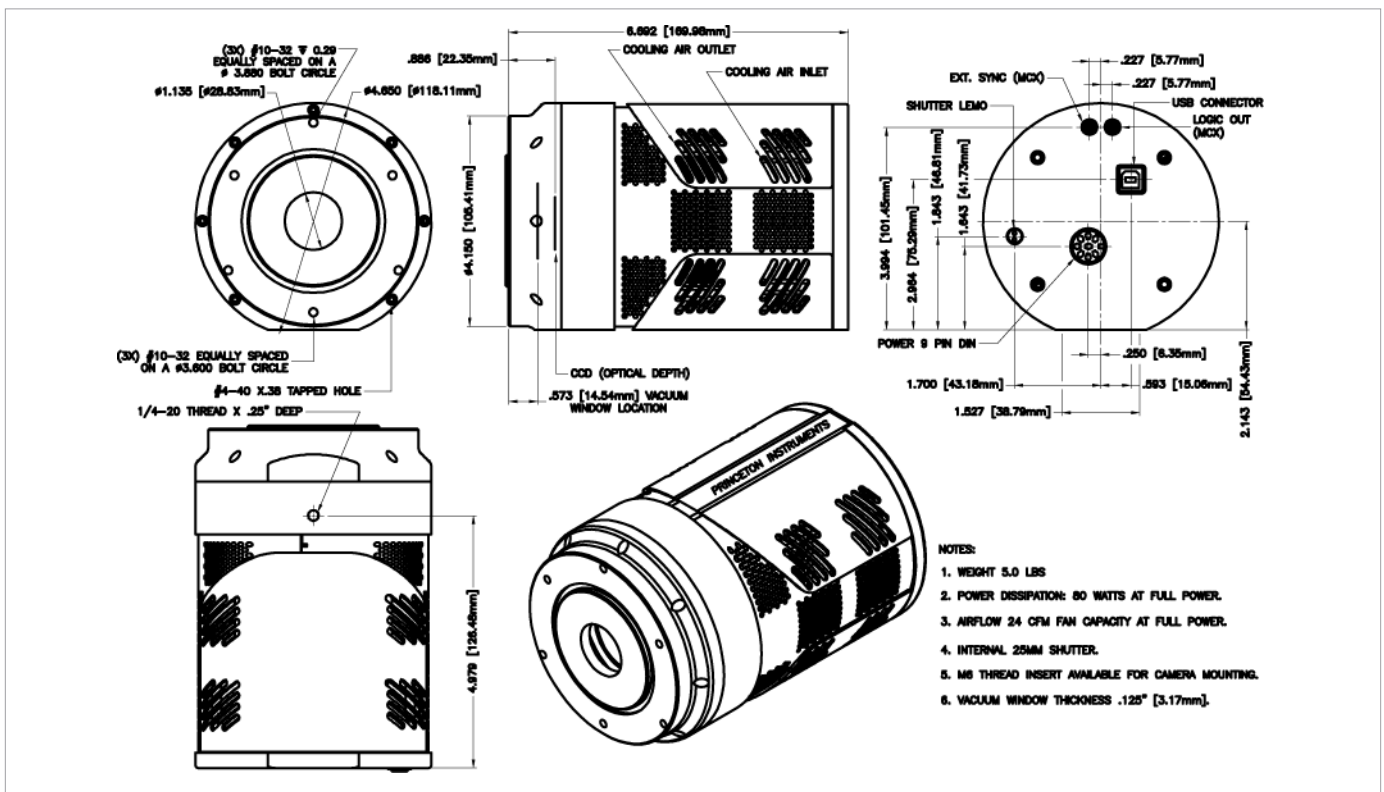
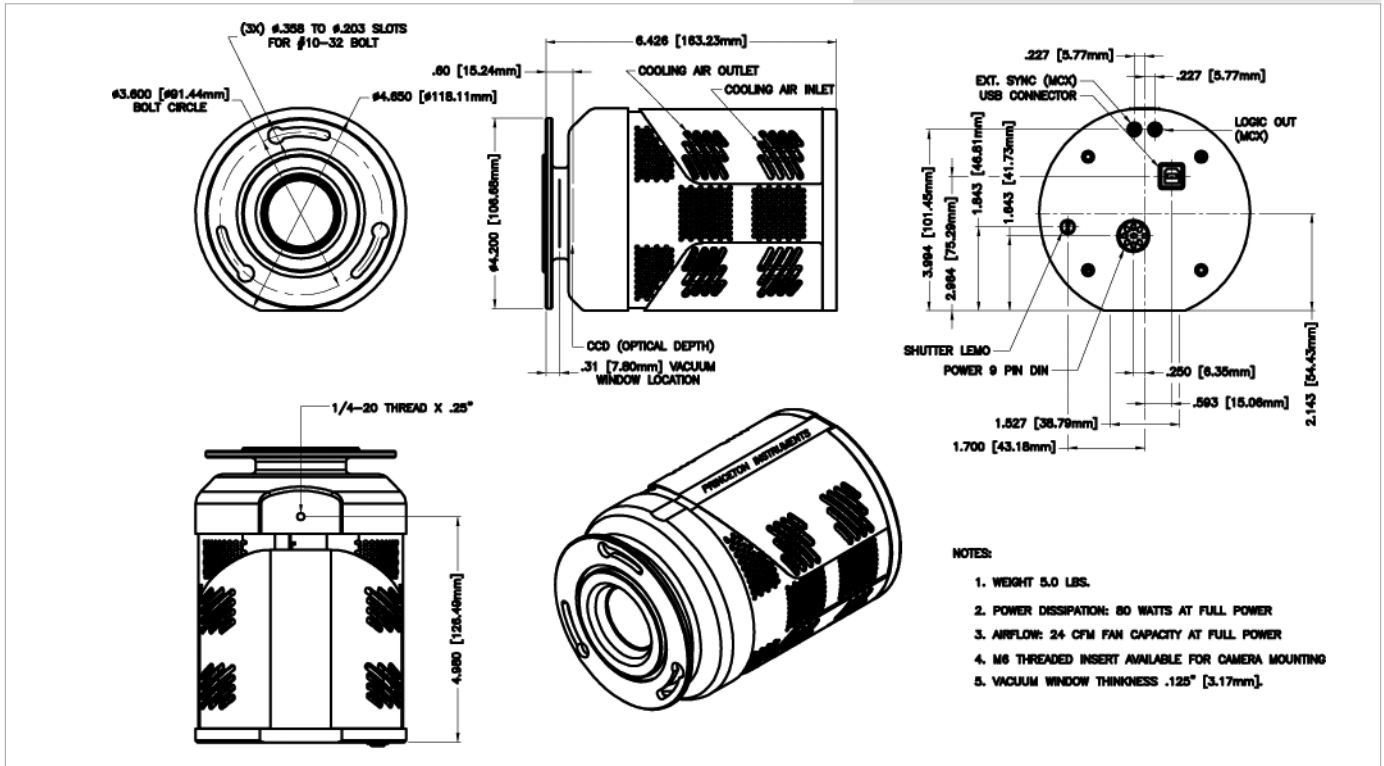
PIXIS:400 Specifications

| | PIXIS:400F | PIXIS:400R | PIXIS:400B | PIXIS:400BR |
|---|---|--------------------------------------|-------------------------------------|-------------------------------------|
| CCD Image Sensor | front-illuminated | front-illuminated; deep depletion | back-illuminated | back-illuminated; deep depletion |
| Dark Current @ -75°C (e/p/s) | Typical 0.0025 Maximum 0.005 | Typical 0.15 Maximum 0.3 | Typical 0.005 Maximum 0.01 | Typical 0.04 Maximum 0.065 |
| | Front-illuminated | | Back-illuminated | |
| | Typical | Maximum | Typical | Maximum |
| System Read Noise @100kHz readout @2MHz readout | 3 e- rms 12 e- rms | 4 e- rms 15 e- rms | 3.5 e- rms 13 e- rms | 5 e- rms 16 e- rms |
| Vertical shift rate (software adjust option) | 15 μsec/row | | | |
| Spectral rate¹ @100kHz @2MHz @2MHz | 58 spectra/sec (FVB) 260 spectra/sec (FVB) 700 spectra/sec (1.0 mm high) | | | |
| | All PIXIS:400s | | | |
| CCD Image Sensor | Princeton Instruments/Acton exclusive, scientific grade 1, MPP device, optional UV coatings available | | | |
| CCD format | 1340 x 400, 20 x 20 μm pixels, 26.8 x 8.0 mm imaging area | | | |
| | Minimum | | Typical | |
| Spectrometric Well Capacity High Sensitivity High Capacity | 250 ke- 800 ke- | | 300 ke- 1 Me- | |
| Deepest Cooling Temperature | -75°C | | -75°C | |
| Thermostat Precision | ±0.05°C across entire temperature range | | | |
| Software-selectable gains High Sensitivity High Capacity | High 1 e-/ct 4 e-/ct | Mid 2 e-/ct 8 e-/ct | Low 4 e-/ct 16 e-/ct | |
| Dynamic Range | 16 bits | | | |
| Nonlinearity @ 100 kHz readout @ 2 MHz readout | <1% <2% | | | |

Notes: All specifications subject to change.
¹ Typical achievable spectral rates using custom timing mode

QE Curve





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