# Princeton Instruments

X-RAY GROUP

# PIXIS-XF: 1024

**1024 x 1024 imaging array | 13 x 13 μm pixels**

*Powered by LightField®*

The PIXIS-XF: 1024 series of fully integrated, low noise cameras utilizes front illuminated and back illuminated CCDs, and is designed for indirect imaging X-rays using specially designed phosphor screens and other lambertian sources. The unique camera design, with a fiberoptic faceplate extended outside the vacuum, offers outstanding flexibility for optimizing system performance at any X-ray energy. Dual speed operation at 100 kHz or 2 MHz enables the camera to be used for steady state as well as high speed applications, while its 1024 x 1024 imaging array, 13.0 μm pixels (38 lp/mm), 100% fill factor, 1:1 fiberoptic ratio, ultra low-noise electronics, -35° C thermoelectric cooling with air or water, and its compact design make the PIXIS-XF ideal for worry-free operation in research and OEM environments.

| FEATURES | BENEFITS |
|---|---|
| Back Illuminated CCD (1024B) | For highest sensitivity |
| Front illuminated CCD (1024F) | Affordable technology for moderate light level applications |
| Ultra low noise electronics | Best possible system performance for low light level applications |
| 1:1 fiberoptic ratio* | Distortion and vignetting-free optical coupling |
| Deep thermoelectric air cooling | Low dark noise allows detection of faint signals;  Maintenance-free operation;  NO need for a liquid circulator or additional power supply |
| Deep thermoelectric water cooling | CoolCUBE II, a compact room temperature coolant circulator, is available for vibration sensitive environments |
| Custom phosphors* | Gd2O2S:Tb;  Available for 8 keV and 17 keV;  Resolution of 60 to 80 mm  Emission wavelength ~550 nm |
| 1024 x 1024 imaging array, 13 x 13 μm pixels | Highest spatial resolution |
| Dual digitizers | Dual-speed digitization allows complete freedom to select between "slow operation" for low noise and highest SNR or "fast operation" for rapid image acquisition |
| Software selectable gains for each digitization speed | Allows optimization of system performance for lowest noise to highest SNR |
| Flexible user-selectable binning & readout | Total flexibility to optimize experiments and SNR |
| Flexible ROI/binning | Allows faster frame rate and/or sensitivity |
| USB 2.0 data interface  Optional fiber optic interface | Seamless, plug-and-play connection to PC notebooks & desktops;  Easy OEM integration;  Ideal for remote operation |
| **Optional:** LightField® for 64-bit Windows 7 | Offers intuitive, cutting edge user interface;  Provides data acquisition, defect correction, display and analysis |
| **Optional:** WinView and WinSpec for 32-bit Windows XP/7 | Offers powerful, easy-to-use set of Windows GUI controls;  Automates data acquisition, background and flat field corrections and display |
| SITK™ for LabVIEW™ | Easy integration into complex experimental setup |
| PICAM (64-bit)/PVCAM (32-bit) software development kits (SDKs) | Universal programming interfaces for easy custom programming;  Compatible with Windows XP/7 (32-bit) and Windows 7 (64-bit) |

*\* Contact your local sales representative for information about additional fiber optics, fiber ratios and phosphors*

## Applications:

X-ray Microtomography, Streak Tube and CRT Readout, Industrial & Medical Imaging
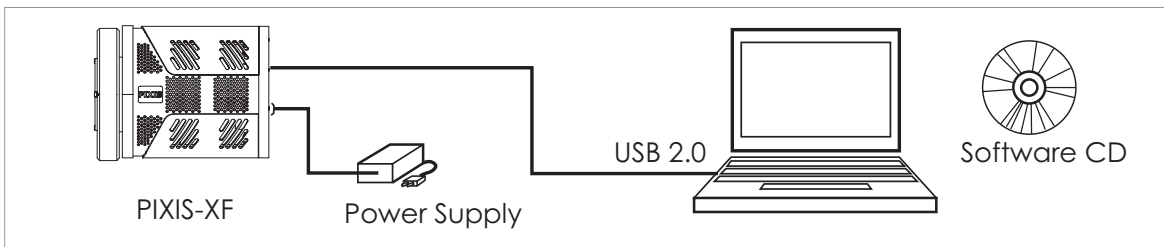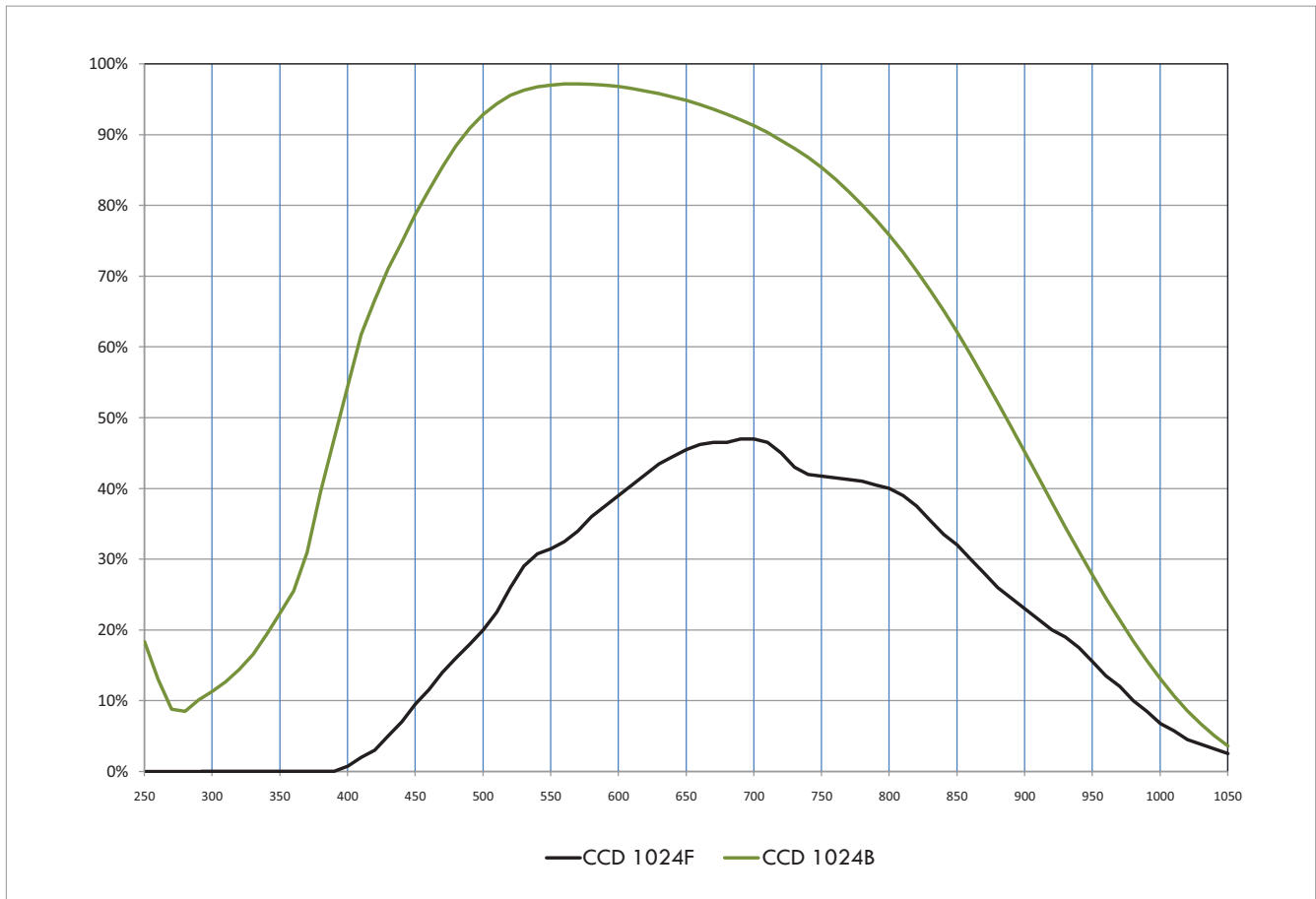
# SPECIFICATIONS

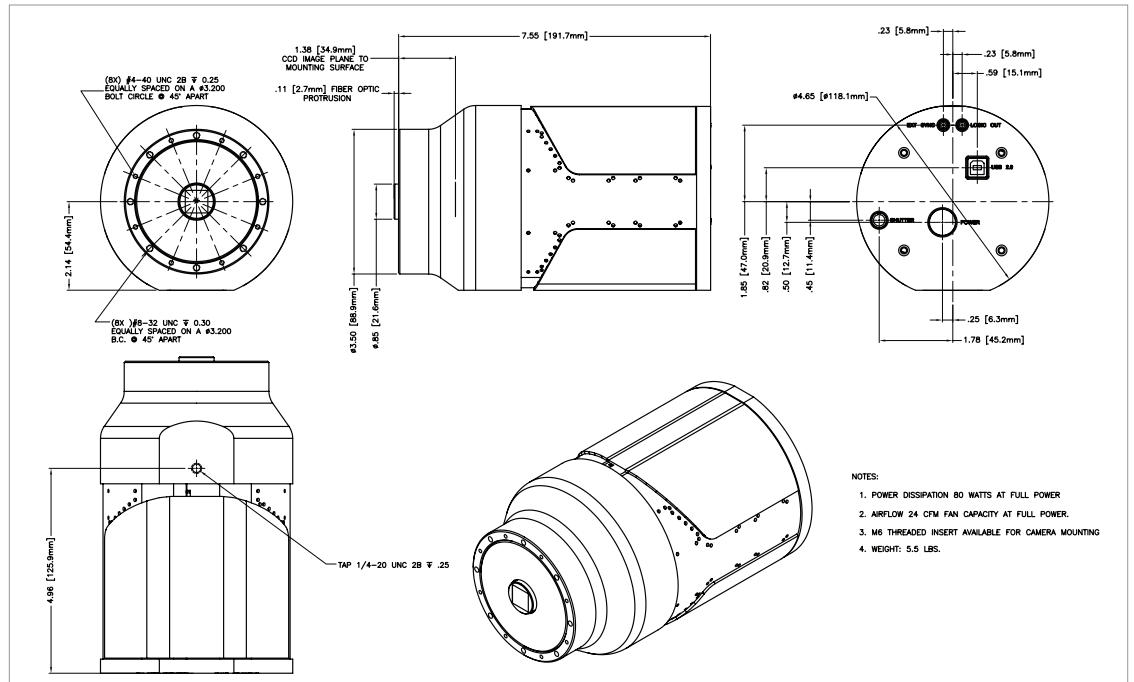| | PIXIS-XF: 1024F | PIXIS-XF: 1024B |
|---|---|---|
| Features | Front-illuminated CCD for moderate light level applications | Back-illuminated CCD for low light level applications. |
| CCD Image Sensor | e2v CCD47-10; front-illuminated; scientific grade 1; AIMO | e2v CCD47-10; back-illuminated; scientific grade 1; AIMO |
| Dark current @ -40° C | 0.035 e-/p/sec (typical) 0.2 e-/p/sec (max) | 0.035 e-/p/sec (typical) 0.2 e-/p/sec (max) |
| CCD format | 1024 x 1024 imaging pixels; 13 x 13-$\mu$m pixels; 100% fill factor; 13.3 x 13.3 mm (optically centered) | |
| Deepest cooling temperature (with ambient air @ +20° C) | -40° C typical; -35° C guaranteed | |
| Thermostating precision | ±0.05° C | |
| Cooling method | Thermoelectric air (standard) or liquid cooling (CoolCUBE II required) | |
| Full well | Single pixel:   100 ke- (typical), 60 ke- (minimum) Output node:  250 ke- (typical), 200 ke- (minimum) | |
| ADC speed/bits | 100 kHz/16-bit and 2 MHz/16-bit | |
| System read noise    @100kHz                          @2MHz | 4.5 e- rms (typical),   6.5 e- rms (max) 12.5 e- rms (typical), 16 e- rms (max) | |
| Vertical shift speed | < 3.2 µsec/row  to 18 µsec/row (programmable) | |
| Non-linearity | < 1% @ 100 kHz | |
| Software selectable gains | 1, 2, 4 e-/ADU; available at all speeds | |
| Operating systems supported | Windows XP/Vista/7; Linux | |
| Data interface | USB2.0 (5m interface cable provided); Optional Fiberoptic interface is available for remote operation | |
| I/O signals | Two MCX connectors for programmable frame readout, shutter, trigger in | |
| Operating environment | +5° C to +30° C non-condensing | |
| Certification | CE | |
| Dimensions / Weight | 19.8 cm (7.80") x 11.81 cm (4.65") x 11.38 cm (4.48") (L x W x H)  /  2.55 kg (5.65 lbs) | |

**NOTES:**  All specifications subject to change

## Readout Rates

| Binning | @ 2 MHz | @100 kHz |
|---|---|---|
| 1 x 1 | 0.58 sec | 10.0 sec |
| 2 x 2 | 0.28 sec | 2.8 sec |
| 4 x 4 | 0.14 sec | 0.85 sec |

# Quantum Efficiency Curve



— CCD 1024F  — CCD 1024B



PIXIS-XF      Power Supply      USB 2.0      Software CD

![Princeton Instruments X-RAY GROUP logo]

## Without Phosphor Kit



## With Phosphor Kit

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Visit the Princeton Instruments website to find a dealer in your area.

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