

## Product Sheet SC-XRD 504

### PHOTON 100 CMOS detector upgrades Stay ahead of the game

Bruker recognizes the significant investment you have made in your equipment, and we appreciate your trust in making us your partner in single crystal X-ray diffraction. With this in mind, we have always designed our systems to facilitate upgrades, allowing you to benefit from the latest technical advances.

Upgrading can make dramatic performance differences, and is a worthwhile endeavor with the potential to add several more years of life and to gain back premium functionality for your existing system. This is a very appealing option considering that the investment for upgrading involves only a fraction of the cost typically spent when buying a new system.

With the recent advances in detector technology, one of the most rewarding upgrades is replacing an aging CCD detector with the latest PHOTON 100 CMOS for significant value and performance benefits.

Detector upgrades are easily accomplished with short service visits and minimal instrument downtime.

#### Impressive characteristics: sensitivity, size and reliability

CMOS (Complementary Metal-Oxide-Semiconductor) technology is now the perfect solution for high-performance crystallography. CMOS technology pioneers the implementation of advanced on-chip electronics and very large sensors unachievable with CCD manufacturing processes. The PHOTON 100 is the premier CMOS active-pixel sensor (APS) detector for crystallography: proven performance and reliability with all the features to meet the requirements of cutting-edge crystallographic data acquisition.

- Large 10 cm × 10 cm area for fast and efficient data collection
- High quantum gain for highest sensitivity and performance
- Taper-free design for best spatial resolution
- No gaps between sensors for superior data
- Air cooling for low maintenance
- On-camera processing for best efficiency
- Continuous scans for reduced systematic error
- Shutterless data collection for unprecedented acquisition speed and data quality
- High reliability and 3-year warranty for peace of mind

#### Possible upgrades

At this time all APEX, APEX II and PROTEUM 135 systems based on the D8 goniometer can be upgraded with the new PHOTON 100 detector. Contact us if you have questions about whether your system is suitable for this upgrade.



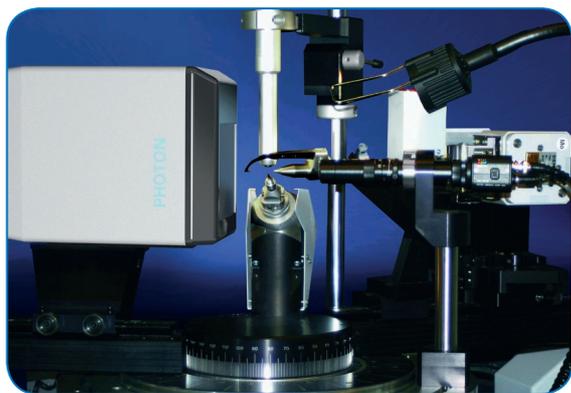
PHOTON 100, the premier CMOS active-pixel sensor detector

## Science in the fast lane with shutterless mode

The PHOTON 100 CMOS detector offers several advantages over CCD detectors that significantly reduce data acquisition time and improve data quality. On-camera data processing and shutterless data acquisition are features that are not available with CCD technology.

## On-camera data processing for best efficiency

The PHOTON 100 detector is unique in that all the necessary corrections are applied in a special real-time processor in the camera electronics which facilitates operation of the detector in a true dead-time-free shutterless mode with continuous sample rotation.



PHOTON 100 detector installed on a SMART system

## Shutterless data acquisition for overhead-free data collection

CCD detector systems require a very precise mechanical shutter, because a CCD cannot be exposed to X-rays while it is read out. During readout, the shutter needs to be closed, the goniometer has to be stopped and repositioned for concurrent measurements, and then ramped up back to speed for the next exposure. As a result, mechanical jitter is introduced which adds significant systematic error to the data. During readout, the system is idle and cannot collect X-rays, which adds wasteful overhead time to the experiment.

## Appealing PHOTON 100 detector

CMOS technology in a PHOTON 100 works differently and allows data to be read out while the camera is exposed to X-rays. This eliminates both: the need to open and close the X-ray shutter and the need to stop, reposition, and start the goniometer. In shutterless mode, the sample is constantly



PHOTON 100 detector installed on a KAPPA system

exposed to X-rays and continuously rotated—maximizing data acquisition efficiency and eliminating mechanical jitter. This enables the PHOTON 100 to deliver the superb data quality you have come to expect in a fraction of the time.

## New detector, new computer: proven APEX2 software

The PHOTON 100 detector upgrade also includes a computer modernization. As part of the package, you will receive a Windows 7 PC with the latest version of the instrument control software and the APEX2 suite for crystallography installed. APEX2's continuous improvement now also includes recent enhancements to SHELXT. This comprehensive makeover will dramatically expand your experimental experience and tremendously increase your lab's efficiency.

### PHOTON 100 specifications

Active area	10 cm × 10 cm CMOS sensor
Cooling	Air-cooled
Sensor format (pixels)	1,024 × 1,024
Sensor full well (e <sup>-</sup> )	5,000,000
Pixel size (μm)	96
Demagnification	1:1 (no taper)
Quantum gain (e <sup>-</sup> /X-ray photon)	261 (Mo K $\alpha$ ) 119 (Cu K $\alpha$ ) 328 (Ag K $\alpha$ )
Operation modes	Shutterless and "shuttered"
Warranty	3 years

## ● Bruker AXS GmbH

Karlsruhe · Germany  
Phone +49 721 50997-0  
Fax +49 721 50997-5654  
info@bruker-axs.de

[www.bruker.com](http://www.bruker.com)