



Xspress 3

Xspress 3 mini

Technical Datasheet



Many solid-state detectors are not limited by their intrinsic rate capability, but by the readout system connected to them. Xspress 3 was developed to maximize the throughput and resolution of such detectors and remove the bottleneck at the readout stage.

There is a large body of data available to prove the performance of Xspress 3, with more than 40 units now installed around the world at synchrotrons including the APS, Spring-8, Diamond, SSRL, the Canadian Light Source, BESSY, PETRA III, MAX IV, CHESS, NSLS-II, ... These customers have in most cases bought more than one Xspress 3 unit, showing not only that the specifications on paper and the price justify the outlay, but also that the installation, support and performance of the systems at the beamline offer just what the scientists need.

Xspress 3 is now available with the same world leading performance in a compact, lower priced unit: Xspress 3 mini.

Benefits

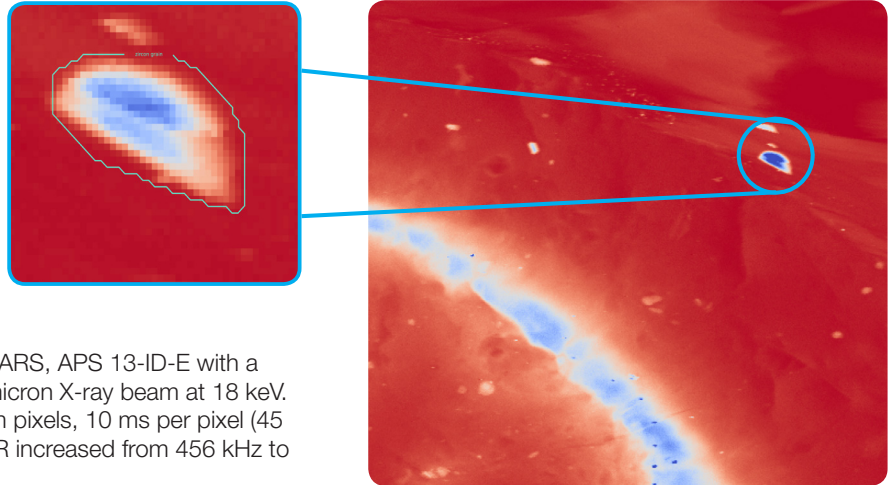
- **30X faster than standard readout technology**
- **>4 Mcps output rate***
- **125eV resolution measured at Mn at 35 kcps***
- **1 or 2 channels**
- **EPICS and TANGO drivers**
- Both in service at synchrotron beamlines*
- **Software selectable input range**

*tested with Xspress 3



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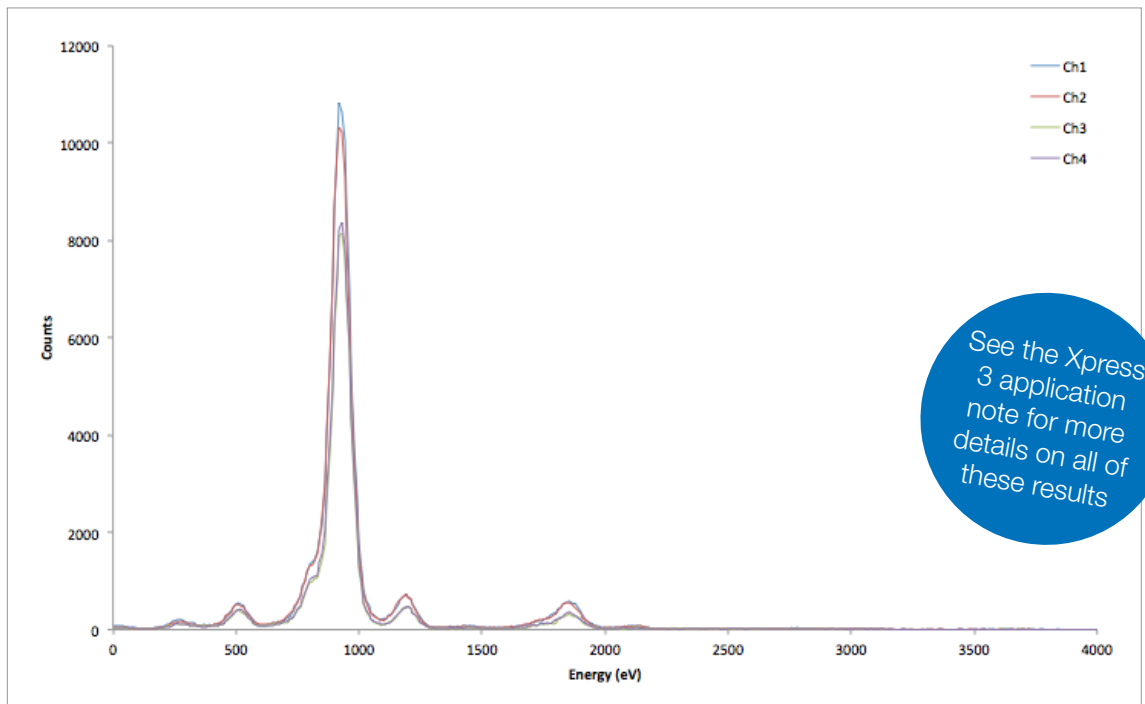
Xspress 3



Data collected at GSECARS, APS 13-ID-E with a Vortex ME4 and 2 x 2 micron X-ray beam at 18 keV. 1 x 1 mm area, 2 x 2 μm pixels, 10 ms per pixel (45 minute acquisition). OCR increased from 456 kHz to 5.5 MHz

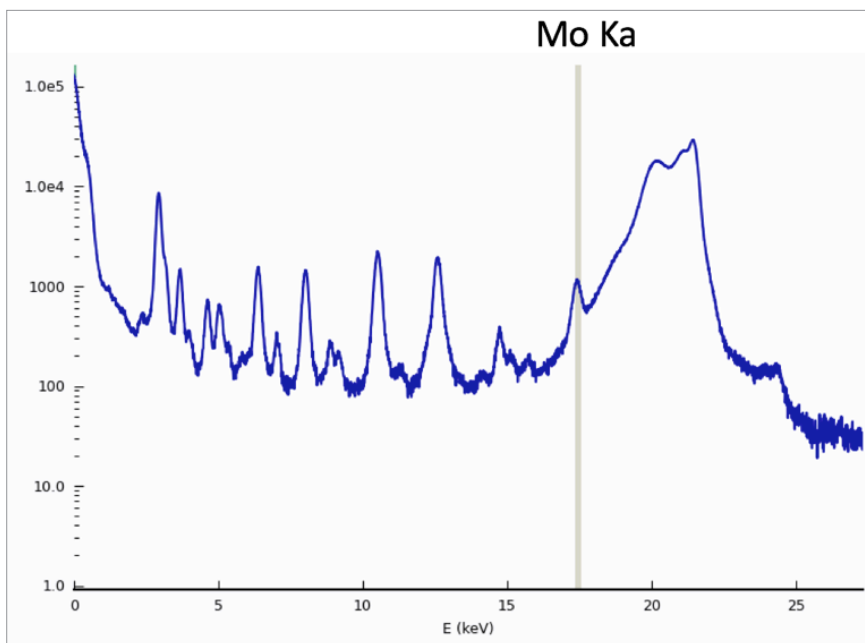
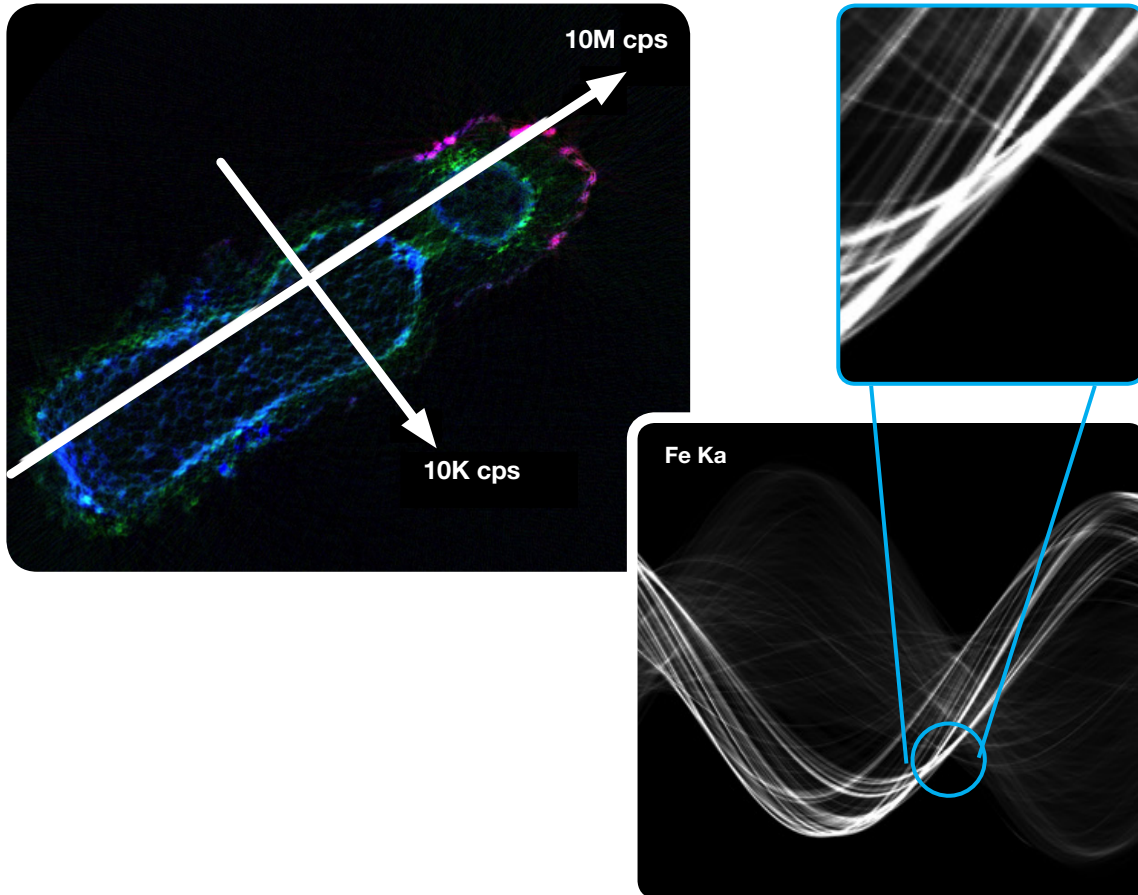
Low Energy

- Xspress 3 pre calibration at SPring-8-BL25SU showed data in the range 900 eV upwards.
- After recalibration Xspress 3 allowed us to see all the fluorescence peaks in the copper oxide on carbon tape sample.
- This included previously undetectable peaks for carbon (277 eV) and oxygen (524 eV).



Copper oxide on carbon tape with 10s exposure at 300 kcps. The plot is shown on linear scale. Clearly visible are carbon (277eV), oxygen (524 eV), and copper L α (927 eV).

10k to 10M cps ICR



See the Xpress
3 application
note for more
details on all of
these results

EXAFS scan with 13 femtograms of Mo with large adjacent scatter peak.



Xspress 3

Performance

Maximum Output Rate	>4 Mcps*
Deadtime / event	≤100ns
ADC bit depth	16
Sample rate	80Mhz / 12.5ns
TTL Channels	2 In and 2 Out
Time between frames	<1μs
Max number of time frames	>16,000
Peaking time	Adaptive (≤12.5ns)

Compatibility

Channel Count	1 or 2
Input Range	Factory Set ±2v as standard
Software Infrastructure	EPICS TANGO Web GUI

Data Format

Points per MCA	4096
File Format from EPICS	HDF5 Accessible during frame write

I/O

Interface to PC	Gigabit Ethernet
Power	5V, <5A input
TTL (x4)	LEMO
Signal Input	LEMO

Set-Up

Input Range	User customisable Autoset using software
Calibration	Via user friendly GUI

Dimensions

W	216 mm
D	218 mm
H	44 mm