PIMEGA

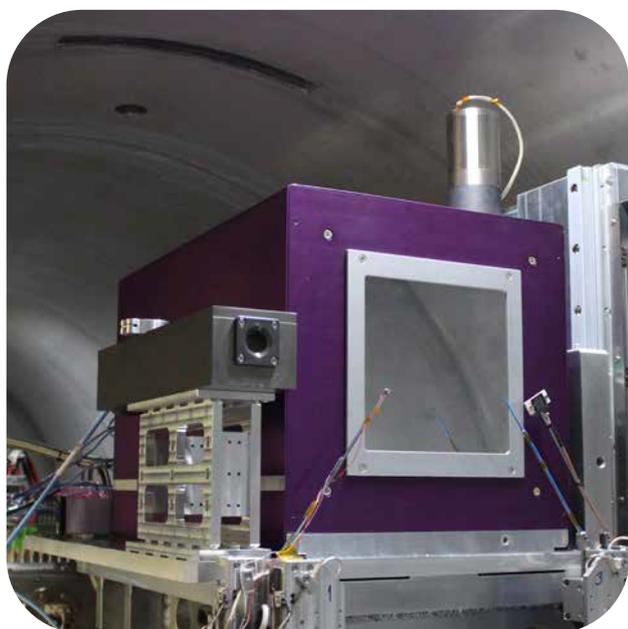## Advanced X-Ray Detectors
for Synchrotron Light Sources

ADVANCED DETECTOR SOLUTIONS

πtec

A Lumentum Company

PIMEGA Detector Line

PIMEGA is a family of hybrid pixel, photon counting detectors based on Medipix3RX. These large area X-ray detectors enable noise-free, direct X-ray detection with high speed and efficiency to address synchrotron demands.

PIMEGA 540D

9.6 MPIXELS
170 x 170 mm^2

PIMEGA 135D

2.4 MPIXELS
85 x 85 mm^2

PIMEGA 450D

7.9 MPIXELS
14 x 1710 mm^2

Key Features:

- Noise-free hybrid pixel technology
- Two thresholds for energy discrimination
- Photon counting
- Small pixel size - 55 µm
- High frame rate - 2000 Hz
- High dynamic range - 24 bits
- Continuous data acquisition
- Short readout time
- Low dead area
- Silicon or Cadmium Telluride sensors
- Overlapped sensors option
- EPICS compatible
- Vacuum compatible

Applications:

- Macromolecular crystallography
- Small angle X-ray scattering (SAXS)
- Wide angle X-ray scattering (WAXS)
- X-ray powder dffraction
- Coherent X-ray imaging
- Cone beam tomography
- X-ray projection imaging

Technical Specifications

	PIMEGA 135D			PIMEGA 540D			PIMEGA 450D			PIMEGA 450D-s		
Number of ASICs MEDIPIX 3RX	6 x 6			12 x 12			1 x 120			2 x 60		
Pixel size $[\mu m^2]$	55 x 55			55 x 55			55 x 55			55 x 55		
Pixel arrangement	1553 x 1548			3106 x 3096			31060 x 256			512 x 15360		
Detection area $[mm^2]$	85 x 85			170 x 170			1710 x 14			878,46 x 30,91		
Sensor type / thickness $[\mu m]$	Si 300	Si 675	CdTe 1000	Si 300	Si 675	CdTe 1000	Si 300	Si 675	CdTe 1000	Si 300	Si 675	CdTe 1000
Threshold energy [KeV]	2 – 20 ≥ 25% efficiency	2–26.5 ≥ 25% efficiency	5–100 ≥ 60% efficiency	2 – 20 ≥ 25% efficiency	2–26.5 ≥ 25% efficiency	5–100 ≥ 60% efficiency	2 – 20 ≥ 25% efficiency	2–26.5 ≥ 25% efficiency	5–100 ≥ 60% efficiency	2 – 20 ≥ 25% efficiency	2–26.5 ≥ 25% efficiency	5–100 ≥ 60% efficiency
Readout mode	Sequential and continuous			Sequential and continuous			Sequential and continuous			Sequential and continous		
Readout time $[\mu s]$	492 (sequential mode)			492 (sequential mode)			984 (sequential mode)			984 (sequential mode)		
Depth dynamic range [bits]	12 and 24			12 and 24			12 and 24			12 and 24		
Frame rate @ 12bits [fps]	2000			2000			1000			1000		
File format	HDF5 (32 bits)			HDF5 (32 bits)			HDF5 (32 bits)			HDF5 (32 bits)		
Trigger mode	Internal and External			Internal and External			Internal and External			Internal and External		
Module cooling	Water-cooled			Water-cooled			Water-cooled (sensors only)			Water-cooled (sensors only)		
Vacuum compatibility [mbar]	Below $3x10^{-3}$			Below $3x10^{-3}$			No			No		