

PILATUS **6M**



**A new era in
macro-molecular
crystallography**

PILATUS 6M

The PILATUS 6M is the flagship of the DECTRIS detector systems and explicitly targeted for macromolecular crystallography (MX).

It is based on the newly developed CMOS hybrid-pixel technology and operates in single-photon-counting mode.

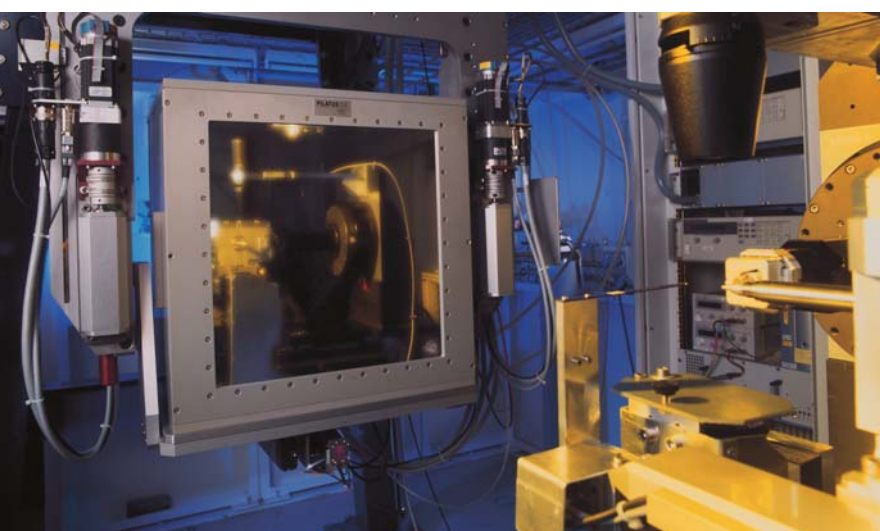
With its outstanding capabilities, which are common to all DECTRIS detector systems, its large active area, its noiseless readout and a frame rate of 12 Hz, it is the most advanced detector system for macromolecular crystallography on the market.

With the PILATUS 6M it is for the first time possible to collect shutterless crystallographic data in continuous rotation mode. Fine Φ -slicing is possible, profiting from

the noiseless readout of the detector. PILATUS 6M improves the quality of diffraction data and reduces measurement time significantly, heralding a new era in MX.

The PILATUS 6M detector system is, like all other DECTRIS detector systems, operated at room temperature, with a cooling unit for temperature stabilization. It comes as a complete system with detector, water cooler, a high-end server to achieve a high data transfer rate, an optional RAID system for image storage and the powerful data acquisition and analysis software package TVX.

The PILATUS 6M is delivered fully calibrated and ready to use.



PILATUS 6M prototype at the X06SA macromolecular beamline, SLS

Applications

- Macromolecular crystallography (MX)
- Diffuse scattering experiments
- Energy-sliced Laue diffraction

Key features

- Direct detection of X-rays in single-photon-counting mode
- Radiation-tolerant design
- High dynamic range
- Short readout time
- High frame rates
- High counting rates
- No dark current or readout noise
- Adjustable threshold to suppress fluorescence
- Excellent point-spread function
- Electronically gateable
- Shutterless operation

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Technical specifications

Number of modules	5 x 12 = 60
Sensor	Reverse-biased silicon diode array
Sensor thickness	320 μm
Pixel size	172 x 172 μm^2
Format	2463 x 2527 = 6,224,001 pixels
Area	431 x 448 mm^2
Intermodule gap	x: 7 pixels, y: 17 pixels, 8.4% of total area
Dynamic range	20 bits (1:1,048,576)
Counting rate per pixel	> 2 x 10 ⁶ X-ray/s
Energy range	3 – 30 keV
Quantum efficiency (calculated)	3 keV: 80% 8 keV: 99% 15 keV: 55%
Energy resolution	500 eV
Adjustable threshold range	2 – 20 keV
Threshold dispersion	50 eV
Readout time	3.6 ms
Framing rate	12 Hz
Point-spread function	1 pixel
Data formats	Raw data, TIF, EDF, CBF
External trigger/gate	5V TTL, 3 different modes
Software interface	Through socket connection; clients for EPICS, SPEC and stand-alone operation are available
Cooling	Close-circuit cooling unit for temperature stabilization
Power consumption	350 W
Dimensions (WHD)	Approx. 600 x 600 x 550 mm
Weight	Approx. 95 kg