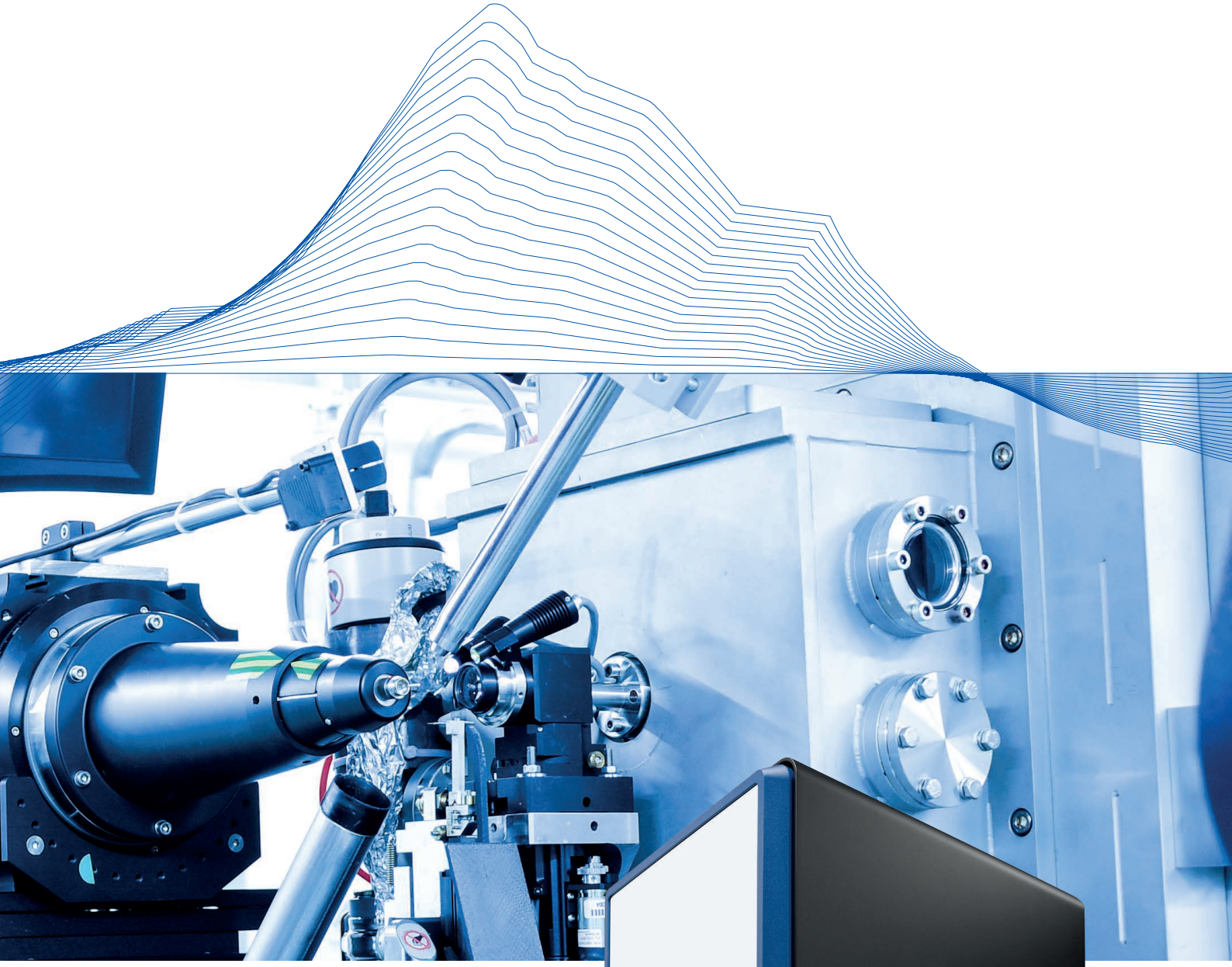
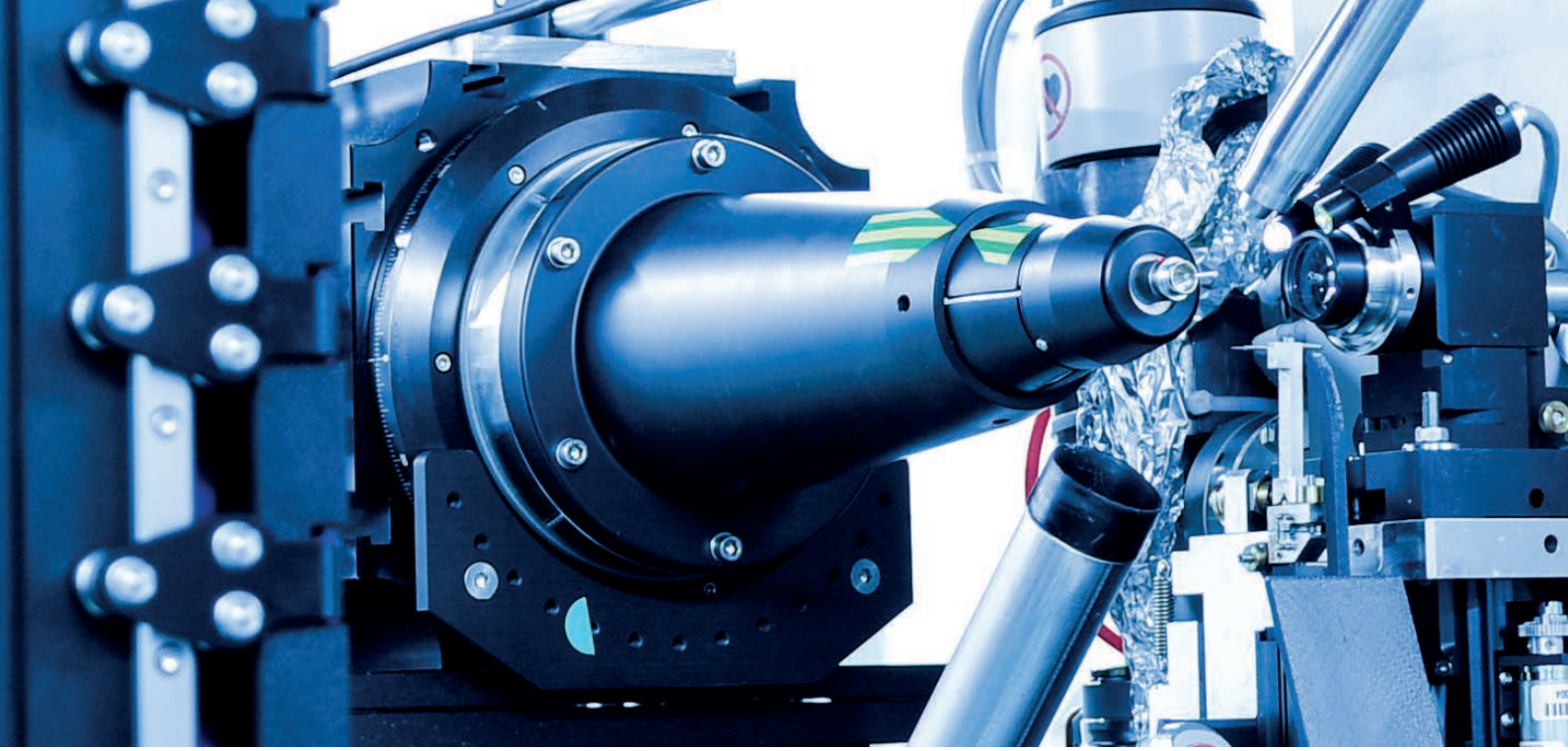
DECTRIS
detecting the future



EIGER X

Ultimate performance for the most demanding synchrotron applications



The summit of Hybrid Photon Counting

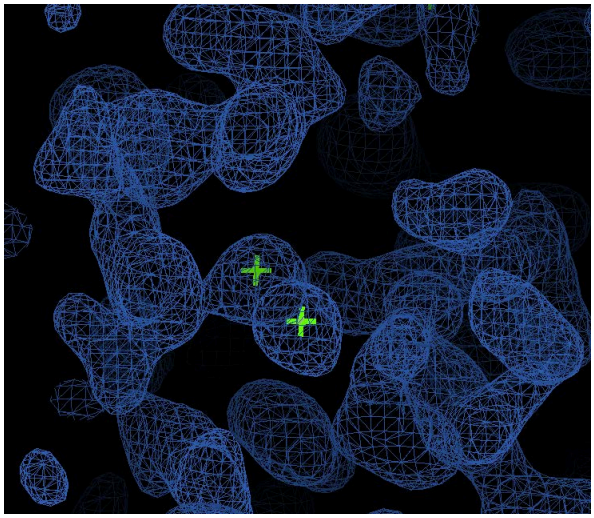
Research is a continuous quest for excellence driven by curiosity and the desire to overcome limitations. The goal of this quest is perfection of measurement protocols and setups, and the tremendous progress in synchrotron science and instrumentation is a powerful manifestation of this drive. The EIGER X detector family provides ultimate performance for the most demanding synchrotron applications.

Key Advantages

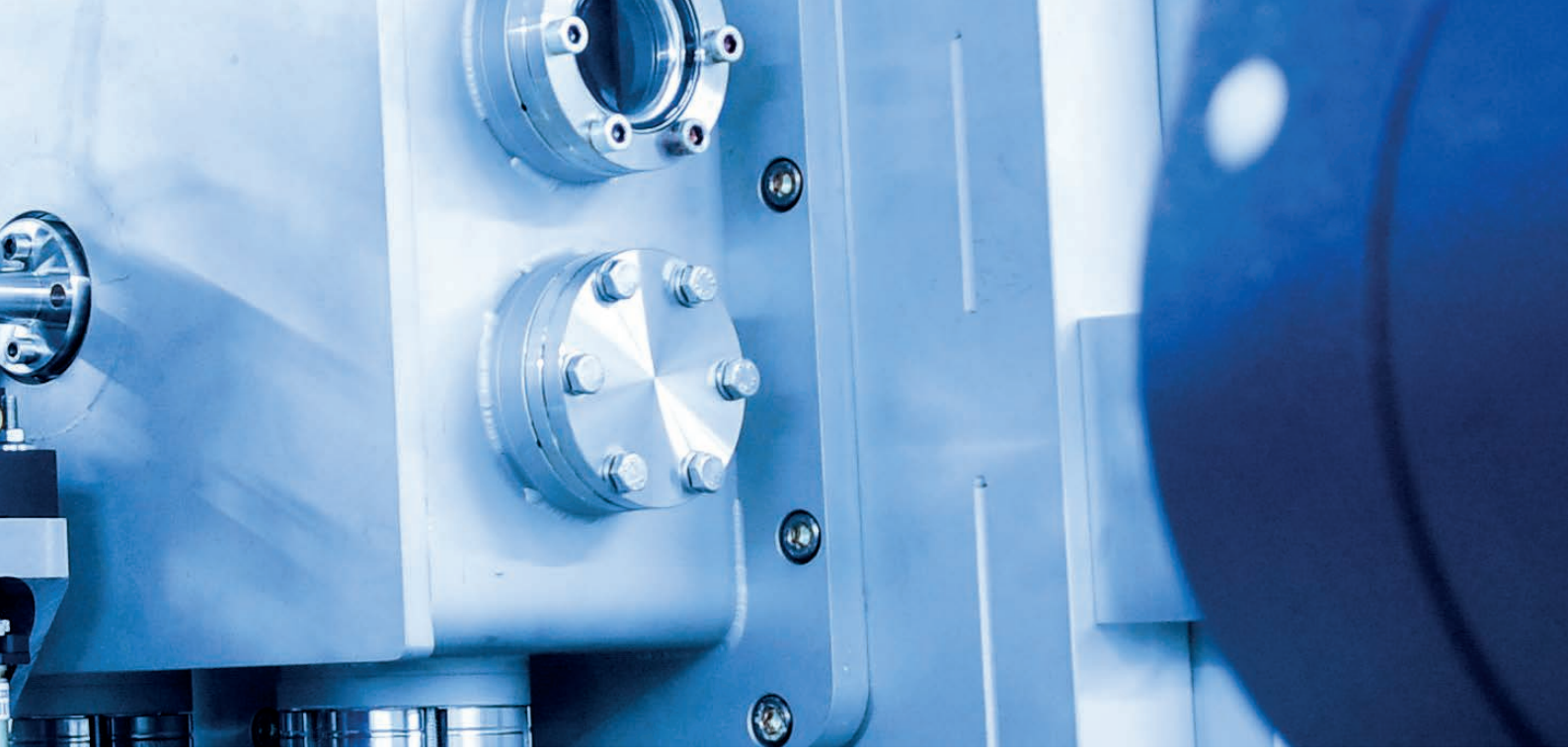
- Hybrid Photon Counting: Direct detection of X-rays in single-photon-counting mode
- Kilohertz frame rates with duty cycle > 99%
- Continuous readout with 3 µs dead time
- High spatial resolution with 75 µm pixel size

Applications

- X-ray photon correlation spectroscopy (XPCS)
- Ptychography
- Time-resolved experiments
- Macromolecular crystallography (MX)
- Single crystal diffraction (SCD)
- Powder diffraction (PD)
- Surface diffraction
- Small- and wide-angle X-ray scattering (SAXS/WAXS)
- X-ray imaging



Highly accurate data: EIGER detectors are capable of delivering outstanding data quality. Data were collected from an insulin crystal at 12 keV with an EIGER 1M prototype at a detector distance of 60 mm. Only 360° data are sufficient for successful S-SAD phasing at 12 keV.

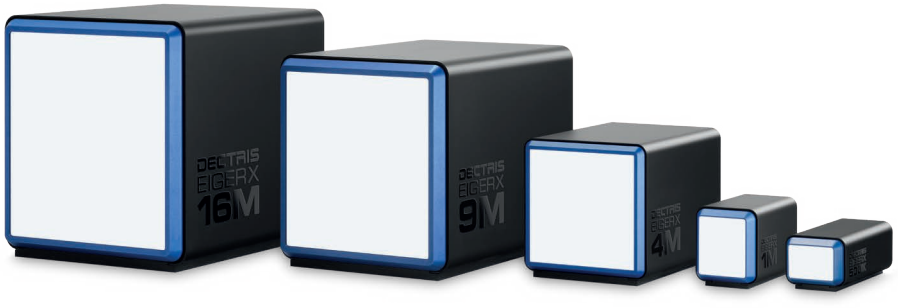


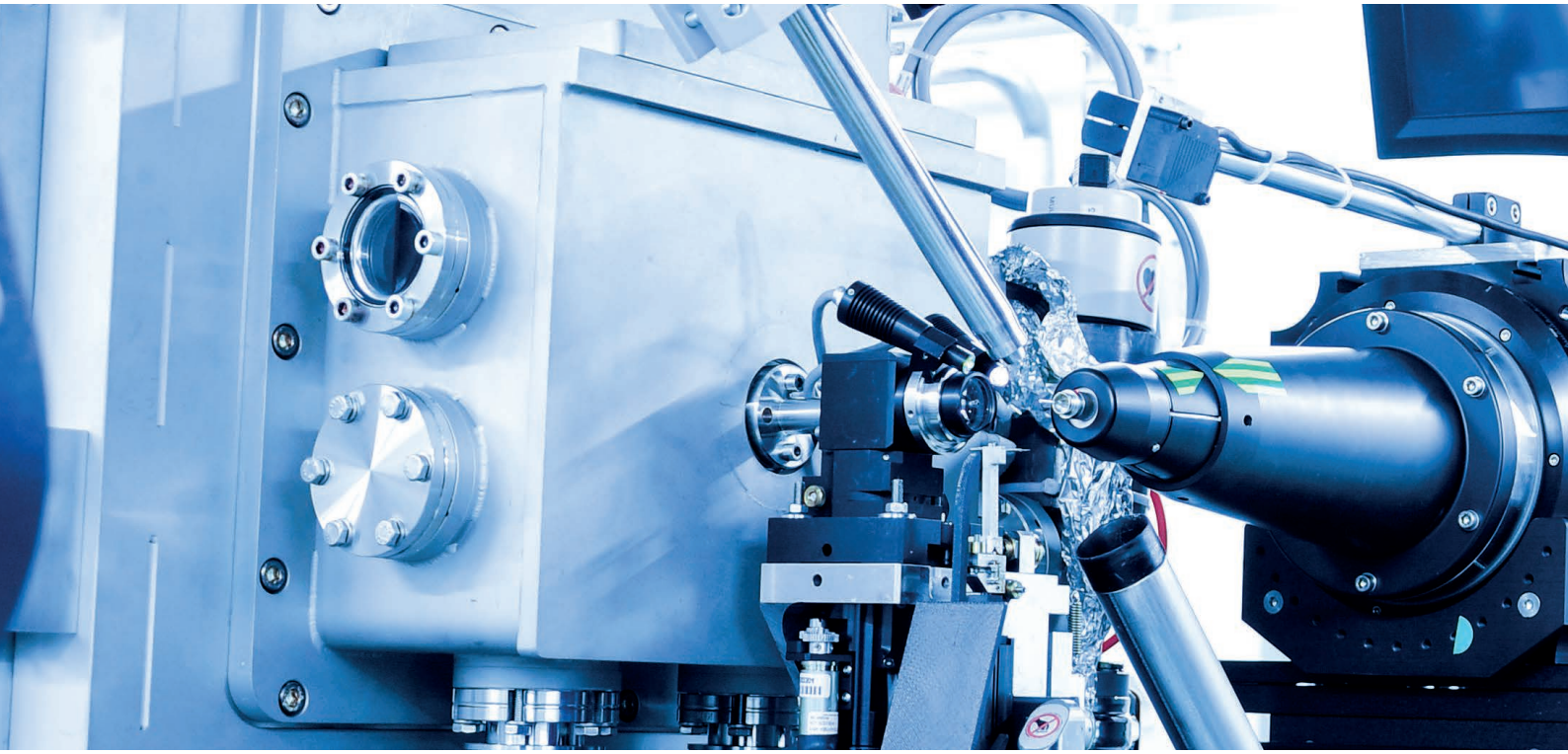
Technical specifications

EIGER X	500K	1M	4M	9M	16M
Number of detector modules	1	1 × 2	2 × 4	3 × 6	4 × 8
Sensitive area (width × height) [mm²]	77.2 x 38.6	77.2 × 79.9	155.2 × 162.5	233.2 × 245.2	311.2 × 327.8
Pixel size [µm²]			75 × 75		
Total number of pixels	1030 x 514 = 529,420	1030 x 1065 = 1,096,950	2070 x 2167 = 4,485,690	3110 x3269 = 10,166,590	4150 x 4371 = 18,139,650
Gap width, (horiz./vert.) [pixel]	- / -	- / 37	10 / 37	10 / 37	10 / 37
Inactive area [%]	0	3.55	5.6	6.3	6.6
Defective pixels [%]			<0.03		
Maximum frame rate* [Hz]	3000, 4500**, 9000**,	3000	750	238	133
Counter bit depth [bit]	12, 8, 4	12	12	12	12
Readout time			continuous readout, 3 µs dead time, duty cycle > 99.6%***		
Point-spread function [pixel]			1		
Sensor thickness [µm]			450		
Threshold energy [keV]			2.7 - 18		
Maximum count rate [phts/s/mm²]			$5 \cdot 10^8$		
Image bit depth [bit]			16 or 32		
Data format			HDF5 / NeXus		
Dimensions (WHD) [mm³]	114 x 92 x 242	114 × 133 × 240	235 × 235 × 372	340 × 370 × 500	400 × 430 × 500
Weight [kg]	3.3	3.9	15	41	55
Power consumption [W]	70	75	300	750	1200

* Theoretical limit at maximum bandwidth, ** 30 s burst, *** at 3000 Hz

All specifications are subject to change without notice.





DECTRIS Ltd.
Täfernweg 1
5405 Baden-Dättwil
Switzerland

Phone +41 56 500 21 00
Fax +41 56 500 21 01
E-Mail sales@dectris.com
www.dectris.com

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