

High Energy Detection

Solutions Beyond The Visible



High Energy Detection Solutions

Benefiting from over 20 years of cutting edge development and manufacture, Andor's comprehensive range of high energy camera detection systems addresses a wide variety of imaging and spectroscopy applications from cell structure studies - medical research to material analysis.

These Direct or Indirect detection systems can be used at varying energy levels and are configured to operate across a number of sampling interfaces. Cameras can interface with

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the vacuum chamber via a range of standard mounting flanges. Fiber-optic coupled configurations are also available to integrate with external scintillators or imaging relays, such as streak tubes.

Andor's high energy detection platforms are built to last and are engineered from the outset with ease of use in mind. Every system is developed to integrate quickly and directly into the heart of the experimental setup.

ANDOR

G

iKon-L SC

Andor also offers expertise in bespoke customization to create novel detection solutions to your specific experimental requirements.

Find out more andor.com/hed

The CSR Process



At Andor we realize that, sometimes, even our adaptable and flexible off-the-shelf products are not enough to meet some of the more demanding application requirements of our customers.

For this reason, we provide a bespoke service, whereby a dedicated, highly experienced team of engineers and application specialists provide customer specific solutions. The CSR service is at the heart of the Andor ethos of offering high performance, high quality products and solution developments for each and every customer.

The process involves discussing your core requirements, advising on possible solutions, design development, quotation, final build and delivery.



Got A Special Request?

Get in touch with your local Andor respresentative to find out more about what our CSR team can do for you and your project.



Direct Detection Solutions

Andor employs the notation 'S' to indicate cameras that are optimal for the detection of 'soft', lower energy photons.

With direct detection, the incident VUV to soft X-Ray photon is absorbed directly within the silicon of the sensor resulting in the production of multiple electron-hole pairs. This method of detection limits the range of usage of the sensor to photon energies that silicon can absorb directly.

The design and architecture of the sensor and camera directly affect the detection range. Therefore, an uncoated backilluminated sensor will allow low energy photons to pass into the depletion zone to be absorbed, while a deep-depletion device allows higher energy photons to be absorbed by the active silicon.

Open-front cameras



Couple seamlessly to the outside of vacuum chambers through a robust, high vacuum-compatible knife-edge sealed flange.

Standalone cameras

Incorporate a window (typically Beryllium filters as thin as 200 µm) that blocks visible wavelengths but allows higher energy photons through to the sensor.

Features

Imaging sensor formats up to 16 MP ('O' range) or 4 MP ('Y' range)
High resolution and high capacity pixel options
Peak QE up to 95%
Deep TE-cooling down to -100°C
Low-noise electronics
Plug-and-play USB interface
LabView, MatLab, Linux and EPICS compatibility

Key Applications

Soft X-Ray imaging and spectroscopy
X-Ray microscopy
Phase contrast imaging
X-Ray Diffraction (XRD)
X-Ray plasma diagnostics
High Harmonic Generation (HHG)

NEW iKon-XL SO – Very large area direct detection CCD

The iKon-XL 'SO' is a TE-cooled, very large area CCD camera platform, accommodating big field of view sensors that are ideally suited to low light X-Ray imaging applications.

It thermoelectrically cools back-illuminated 16.8 Megapixel sensors (e2v) down to -75°C, avoiding inconvenient maintenance-intensive LN2 cooling interface or unreliable cryo coolers. 16.8 Megapixel sensors

Down to 2.1 e⁻ read noise

-75°C TE cooled

Up to 350,000 e⁻ well depth

18-bit Extended Dynamic Range

USB 3.0 and direct long distance fiber optic connection

DN160CF / 8" CF / CF-203 rotatable flange and knife-edge



Quantum Efficiency Curves



Direct Detection Portfolio



Our Direct Detection imaging range includes the iKon-L SO (i) and iKon-M SY (ii) cameras, whilst our spectroscopy range includes Newton SO (iii) and Newton SY (iv) cameras. Find out more at andor.com/hed.

Indirect Detection Solutions

Andor employs the notation 'H' to indicate cameras that are optimal for detection of 'hard' higher energy photons.

Indirect detection employs a material, such as a scintillator or phosphor, to convert incident high energy X-Ray or gamma photons to visible wavelength photons, which can then be detected directly by the sensor.

A fiber-optic can be used to couple the scintillator to the camera. This provides several advantages including protection of the sensor from damage by the higher energy photons, improving the camera's spatial resolution and, with tapers, providing the ability to extend the detection field of view beyond that defined by the active area of the sensor.

Fiber-optic cameras



Direct connection to scintillators, streak tubes or open-Micro Channel Plates (MCPs) with maximum throughput performance.

Lens-coupled cameras

Free-space, lens-based coupling between a scintillator and the detector for highest modularity and resolution.

Features

Imaging sensor formats up to 5.5 MP (sCMOS range) or 4 MP (CCD range)

High resolution and high capacity pixel options

Acquisition rates up to 100 fps

High peak QE back-illuminated options

Highly modular scintillator and filter configurations

Wide range of high-resolution or high throughput scintillators

LabView, MatLab, Linux and EPICS compatibility

Key Applications

Soft and Hard X-Ray imaging and spectroscopy
Micro-Tomography (X-Ray or neutron)
Crystallography
X-Ray plasma diagnostics
Electron microscopy

Zyla-HF sCMOS - High resolution X-Ray imaging at 100 fps

The Zyla-HF's outstanding design delivers the highest transmission and spatial resolution performance associated with state-of-the-art single fiber optic plate bonding, while also taking advantage of the very fast frame rate, ultra-low noise performance and exceptional field of view of the Zyla 5.5 sCMOS.



Scintillator Options

Camera platform [pixel size]	Best Resolution			Best throughput / resolution balance		
	Scintillator characteristics	Spatial resolution	Energy range	Scintillator characteristics	Spatial resolution	Energy range
Zyla-HF 5.5 [6.5 μm]	YAG:Ce, 20 µm thick on 3 mm FOP	> 30 lp/mm	2 - 100 keV	YAG:Ce, 70 µm thick on 3 mm FOP	~ 20 lp/mm	2 - 100 keV
iKon-M 934 [13 μm]	YAG:Ce, 40 µm thick on 3 mm FOP	> 15 lp/mm	2 - 100 keV	Csl:Tl 150 µm thick on 3 mm FOP	~ 10 lp/mm	10 - 100 keV
iKon-L 936 [13.5 μm]	YAG:Ce, 40 µm thick on 3 mm FOP	> 15 lp/mm	2 - 100 keV	Csl:Tl 150 µm thick on 3 mm FOP	~ 10 lp/mm	10 - 100 keV

Indirect Detection Portfolio



Our Indirect Detection imaging range features the iXon-HF (v), iKon-HF (vi) cameras. It also includes iKon-L (vii) and the Neo and Zyla sCMOS (viii) cameras. Find out more at andor.com/hed.



Customer Support

Andor products are regularly used in critical applications and we can provide a variety of customer support services to maximize the return on your investment and ensure that your product continues to operate at its optimum performance.

Andor has customer support teams located across North America, Asia and Europe, allowing us to provide local technical assistance and advice. Requests for support can be made at any time by contacting our technical support team at andor.com/support.

Andor offers a variety of support under the following format:

- On-site product specialists can assist you with the installation and commissioning of your chosen product
- Training services can be provided on-site or remotely via the Internet
- A testing service to confirm the integrity and optimize the performance of existing equipment in the field is also available on request.

A range of extended warranty packages are available for Andor products giving you the flexibility to choose one appropriate for your needs. These warranties allow you to obtain additional levels of service and include both on-site and remote support options, and may be purchased on a multi-year basis allowing users to fix their support costs over the operating life cycle of the products.

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