OXFORD INSTRUMENTS | ANDOR

iXon Life

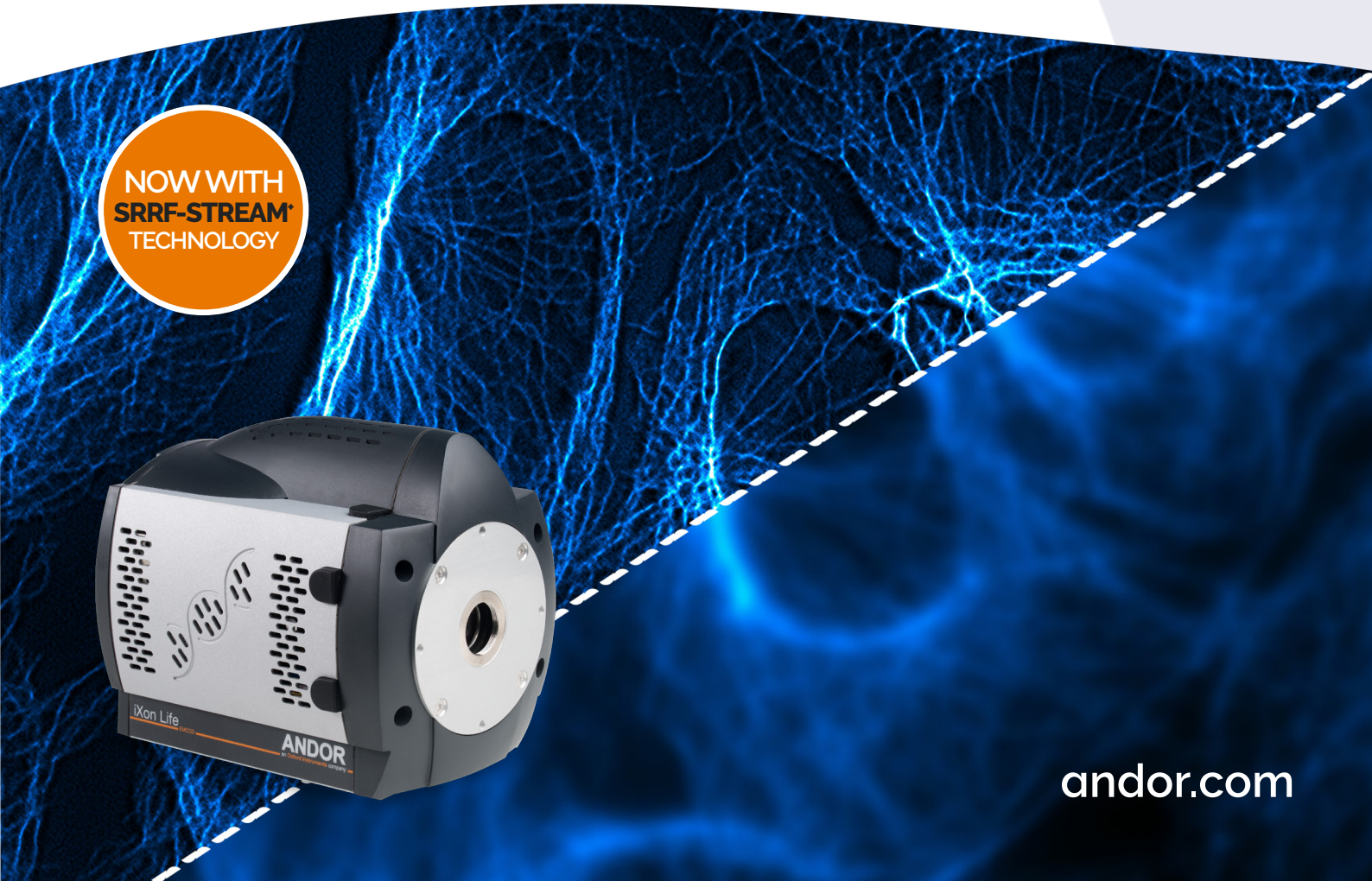
EMCCD Performance...Superb Value

Key Specifications

- ✓ High Sensitivity: Up to 95% QE
- ✓ Fast Speeds: Up to 56 fps
- ✓ TE cooling to -80°C
- ✓ NEW SRRF-Stream+
- ✓ Stunning price/performance
- ✓ UltraVac™ vacuum technology
- ✓ FPGA Timestamp: 10 ns accuracy

Key Applications

- ✓ Fluorescence microscopy
- ✓ Single molecule detection
- ✓ Virology studies
- ✓ Super-resolution
- ✓ Live cell microscopy
- ✓ Luminescence
- ✓ Dynamic biological processes



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iXon Life

EMCCD ultrasensitivity...breakthrough price!

Andor's latest iXon Life EMCCD (Electron Multiplying CCD) platform is available exclusively for fluorescence microscopy applications and is engineered to deliver single photon sensitivity with absolutely unparalleled price/performance.

Available in 1024 x 1024 and 512 x 512 sensor formats, each back-illuminated, to deliver the highest and broadest QE of any microscopy camera, and deep cooled down to -80°C for minimal darkcurrent, iXon Life represents a way to access, quite simply, the ultimate detector technology for single molecule biophysics and low-light live cell microscopy, in a distinctly budget friendly format.

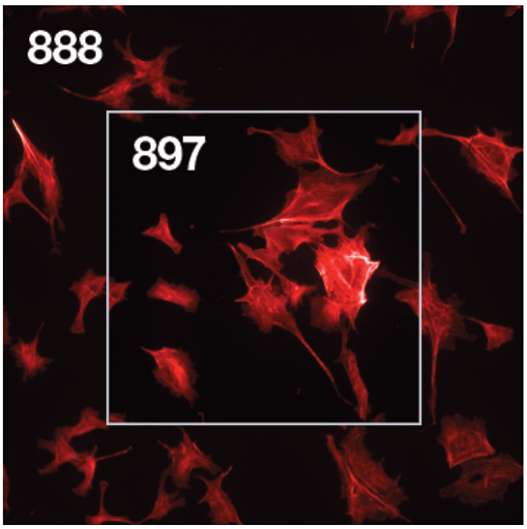
Available with NEW SRRF-Stream+ technology, converting most modern conventional microscopes into a real time super-resolution microscope, for imaging live and fixed cells at low excitation intensities with standard fluorophores and dyes e.g. GFP and AlexFluor series. Find out about the benefits of the latest improved version in the SRRF-Stream+ technical note.

EMCCD Technology Perfected

Andor are the market leaders in EMCCD technology, innovating and perfecting this stimulating technology space for almost 20 years, with well beyond 10,000 EMCCD cameras used in countless publications.

Andor's superb reputation for performance and quality has been brought to bear in this latest generation platform in an amazing value format that has been designed exclusively for fluorescence microscopy customers, yet without compromising on the key performance attributes that are critical for this challenging area of research.

Specification	888	897
Active pixels (H x V)	1024 x 1024	512 x 512
Pixel Size (H x V: µm)	13 x 13	16 x 16
Active Area Pixel Well Depth (e^-)	80,000	180,000
Max Readout Rate (MHz)	30	17



Relative sensor size of the iXon Life models:

Model	Image Area (W x H, mm)	Diagonal (mm)
888	13.3 x 13.3	18.8
897	8.2 x 8.2	11.6

Features & Benefits

Feature	Benefit
Single Photon Sensitive & > 95% QE	Optimal SNR in light starved applications such as single molecule detection and quantum physics.
NEW 'SRRF-Stream+' (optional)	Real time, cell super-resolution functionality. Living and fixed cells, works on most modern fluorescence microscopes. Now updated to deliver even better super-resolution down to 50nm.
Overclocked readout speeds	Follow highly dynamic intracellular processes.
Crop Mode	Continuous imaging with fastest possible frame rate from centrally positioned ROIs. Highly enabling for live cell super-resolution and much more (e.g. 251 fps with 256 x 256 ROI).
TE cooling to -80°C	Elimination of dark current noise contributions.
Superior Baseline Clamp and EM Stability	Essential for quantitative accuracy of dynamic measurements.
RealGain™	Absolute EMCCD gain selectable directly from a linear and quantitative scale.
OptAcquire	Optimize the highly flexible iXon for different application requirements at the click of a button. Makes using EMCCD easy.
Count Convert	Quantify your data in electrons or incident photons capture and view data in electrons or incident photons. Applied either in real-time or post-processing, Count Convert does this important conversion for you.
EMCAL™	Patented user-initiated self-recalibration of EM gain. Maintains stability year after year.
Minimal Clock-Induced Charge	Unique pixel clocking parameters, yields minimized spurious noise floor.
UltraVac™	Critical for sustained vacuum integrity and maintains unequalled cooling and QE performance, year after year. Seven year vacuum warranty.
Spurious Noise Filter	Intelligent algorithms to filter clock induced charge events from the background. Real-time or post-processing.
iCam	Exposure time fast switching provides market leading acquisition efficiency.
FPGA Timestamp	Hardware generated timestamp with 10 ns accuracy.

What difference can the iXon Life EMCCD make?

The new iXon Life delivers on the key attributes of ultra-sensitivity that thousands of Andor iXon EMCCD customers have been benefiting from for many years:

✓ **Single Molecule Detection** – Single molecule experiments present us with the considerable challenge of imaging within the limited photon budget of dynamic, individual fluorescent molecules, while also avoiding photobleaching. Andor iXon EMCCDs remain the definitive detector for the most demanding low light applications, capable of working at light levels below that of any sCMOS detector.

✓ **Reduced phototoxicity** – iXon Life facilitates use of lowest possible excitation power while maintaining superb signal to noise ratio, minimizing phototoxic effects. No other camera is this good at preserving your cell's physiological behaviour over extended periods of measurement.

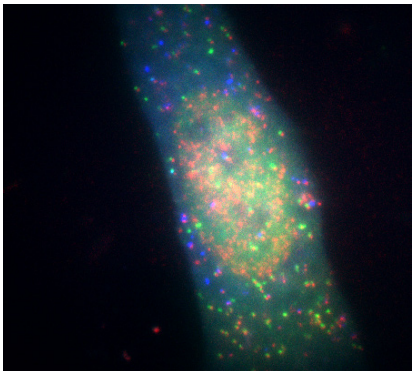
✓ **Lowest dye concentrations** – There is an ongoing drive in fluorescence microscopy to push to lower and lower fluorophore concentrations in order not to perturb the physiology of the living cells being studied. iXon Life's superior sensitivity facilitates use of unprecedentedly low label concentrations, thus minimizing the 'observer effect'.

Application Focus

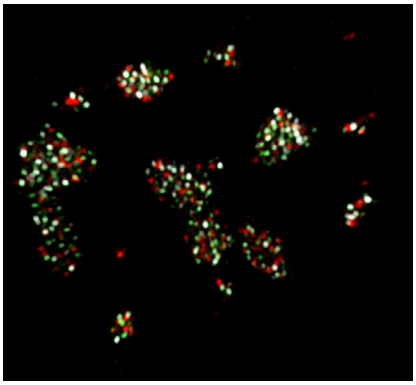
Single Molecule Detection

For many years, Andor's iXon EMCCDs have been the gold standard detectors of the biophysics laboratory and virology laboratories. To this day they remain the dominant detector type, operating in a low light regime that has been shown to be less suitedto even back-illuminated sCMOS cameras, especially under the critically demanding conditions of minimized fluorophore photobleaching.

The accelerated readout rates of the iXon Life, especially combined with 'Optically Centred Crop Mode', means that dynamic single molecule processes can be better characterised. The 13 µm pixel of the 888 model provides superb single molecule resolving capability at the diffraction limit, while preserving optical photon collection efficiency.



Single molecule imaging mRNA (red), during translation, and proteins, FLAG-KDM5B (green) and HA-KDM5B (blue). Courtesy of Timothy J. Stasevich, IGAF, Colorado State University.



Ch. 1 (green) is the cellular replication protein A (RPA32) Ch. 2 (white) is vDNA labeled by FISH. Ch. 3 (red) is the viral LT protein. Image courtesy of Douglas Peters, Garcea Lab

Virology Studies

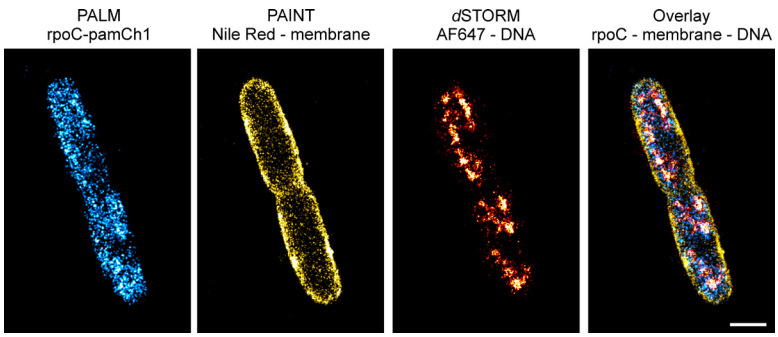
Fluorescence imaging techniques such as STORM, TIRF and SIM, alongside improved labelling strategies are helping greatly in our understanding of viruses and the intricate relationships with the host cell. iXon EMCCD cameras have a proven history as the detectors of choice for the most challenging virology imaging applications. Andor's latest iXon Life EMCCD cameras are perfectly suited to capturing the inherently weak signals found in these experiments and provide higher speeds and wider fields of view than previous generations of EMCCD cameras.

Image on the right of MuPyV infected cells treated with HU (Hydroxyurea) used to investigate organization within virus replication centres (VRC). C57BL/6 mouse embryonic fibroblasts (MEFs) cells were treated with HU then allowed to recover for 4hrs prior to fixation.

Super-resolution

Take a look at many super-resolution systems from dSTORM, PALM, STED, DNA Paint to 3D-SIM, and more often than not you will find an iXon EMCCD camera! This comes as no surprise as these high-end imaging systems need the most sensitive detector available. The new iXon Life EMCCD also provides an option for the growing number of self-build super-resolution systems.

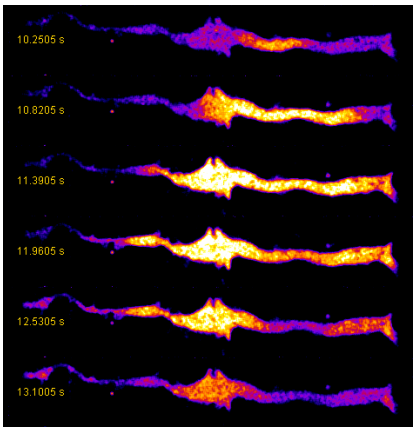
Two sensor sizes and pixel size options provide flexibility and extract the highest speeds from the format. This combines to deliver a superior solution to that of back-illuminated sCMOS when the highest sensitivity is required.



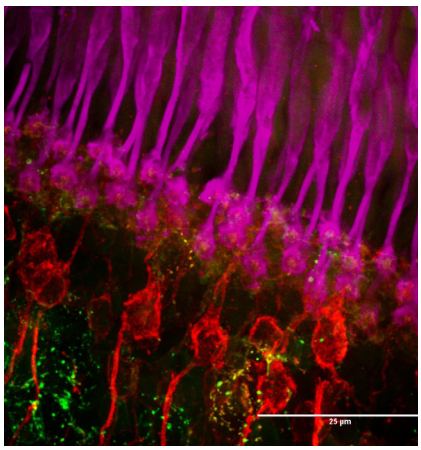
Sequential PALM (RNAp), PAINT(membrane) and dSTORM (DNA) imaging of E.coli cells. Scale bar is 1 µm. Courtesy of Christoph Spahn, Ulrike Endesfelder & Mike Heilemann, Institute of Physical and Theoretical Chemistry, Goethe-University Frankfurt.

Physiology / Ion Imaging & Cell Motility

Capturing fast and dynamic events such as calcium sparks and waves is difficult from an imaging perspective. Having a fast detector is simply not enough in practice since the photon levels are highly restricted during these short exposures. sCMOS cameras, though capable of faster frame rates, may require longer exposures and this ultimately imposes the limit on their true frame rates. With iXon Life, using EM gain allows operation at the lowest signal levels present in very short exposures. For this reason, the sensitivity of EMCCD and superb custom ROI speeds combine to make the iXon Life 888 and 897 the best possible detectors for many experiments. For when signal levels are higher we recommend Zyla and Sona sCMOS cameras as we can exploit the larger fields of view. requiring high temporal resolution. The same advantages play equally well to imaging of motile cells.



Initiation, propagation and termination of a Ca^{2+} wave visualized with FURA-2 dye. Courtesy of Mark Hollywoood, Dundalk Institute of Technology.



Adult zebrafish retina: cone photoreceptors (pink) and two subpopulations of bipolar cells (red and green). Courtesy of Tim McGinn, University of Idaho.

Spinning Disk Confocal

The iXon Life 888 is the ideal detector to drive superlative performance from confocal spinning disk technology. Whilst affording superb confocality and low rates of phototoxicity, spinning disk experiments are inherently photon starved, by virtue of the photon rejection that results from optical sectioning. The superior sensitivity of the iXon Life detector brings these low light images to life!

Often, confocal systems such as the Andor Dragonfly multi-modal confocal system are equipped with a second Andor sCMOS camera. This allows for maximum flexibility of EMCCD sensitivity when required, and when higher light levels are present, the sCMOS camera can provide a wider field of view and higher imaging speeds.

Luminescence

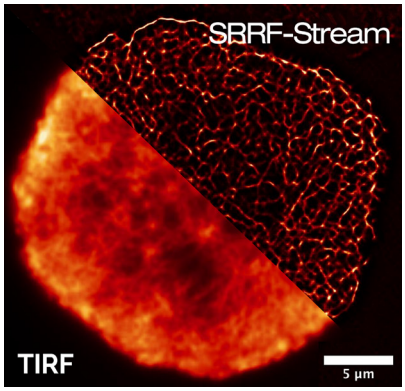
Not all studies require high speed imaging. Luminescence based studies require extended exposures of many minutes and even longer. Luciferase reporter systems may have photon levels as low as 0.05 photons per μm^2 of the sensor and due to extended exposures required, experiments are limited by dark current.

Andor CCD and EMCCD cameras feature the deepest possible cooling- possible using exclusive permanent vacuum technology. These deep-cooled CCD detectors have the lowest dark current - 100 to 1000 fold lower than sCMOS cameras. Broad QE response, superior thermal stability and quantitative accuracy combine to ensure the most accurate results over these extended exposures.

For general luminescence studies the iKon CCD series is highly suitable. For the weakest signals e.g. for investigating single cells or plant growth promoting bacteria within rhizomes, the iXon EMCCD cameras are recommended. Read more in our solution note here.

SRRF-STREAM+

Super-resolution techniques such as STORM, PALM and STED have broken the diffraction barrier and enable the structures and inner workings of cells to be seen in greater detail than ever before. However, many of these techniques require specialized fluorophores, high illumination intensities or complex and expensive optical setups. SRRF (Super-resolution Radial Fluctuations) captures a burst of image frames of short exposure, with the SRRF algorithm building up each superresolved image based on radial fluctuations of the fluorophores over time (Gustafsson et al., 2016). Thus, SRRF offers a highly effective software-based approach that is applicable to many cell biology studies

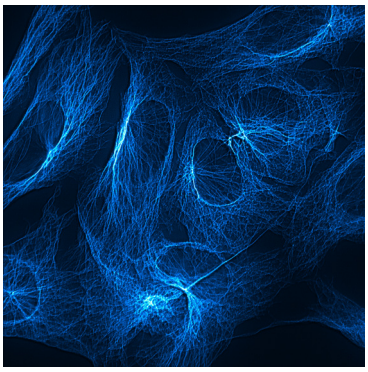


Right: Comparative TIRF image compared to TIRF with SRRF-Stream super-resolution. Live-imaging of Jurkat T cells. Courtesy of Ricardo Henriques, MCR LMB, University College London.

Making Real-Time Live Super-resolution possible with SRRF-Stream

Exclusive to compatible Andor cameras, SRRF-Stream leverages GPU optimization to greatly increase processing of the SRRF algorithm. This makes it possible to perform super-resolution microscopy on conventional modern fluorescence microscopes in real-time!

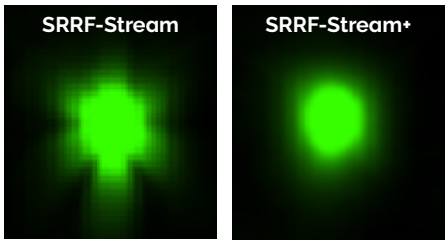
- ✓ **Real Time** – enhanced workflow, avoids post-processing. View in 'Live Mode'.
- ✓ **Low Excitation Intensities** – prolonged live cell observations & accurate physiology.
- ✓ **Conventional Fluorophores**– simple labelling, no photo-switching required.
- ✓ **Live Cell Dynamics** – full FOV super-res images every 1-2 secs. > 10 fps using ROI.
- ✓ **Cost-Effective** – convert conventional fluorescence microscopes to super-resolution microscopes.



Right: Microtubule structure in fluorescently labelled BPAE cells (Fluocells, revealed in high resolution with SRRF-Stream.

NEW SRRF-Stream+

The latest version, "SRRF-Stream+" has been updated to improve image quality further. By updating and optimizing GPU processing efficiency it has been possible to increase the number of axis of radiality used in processing intensity gradients from 6 to 24, without impacting speed. This has the effect of eliminating any artefacts due to limited axes that could be observed in the original SRRF-Stream for some data sets. With SRRF-Stream+ image quality is therefore enhanced, while all the other benefits of SRRF-Stream have been maintained. Refer to the SRRF Stream+ technical note to find out more.



SRRF-Stream+ uses 24 axis during intensity mapping allowing for a more accurate processing of radiality information.

What do I need to run SRRF-Stream+?

SRRF-Stream+ runs exclusively on Andor SRRF-Stream compatible iXon Life and Ultra cameras The following is required for SRRF-Stream+ enabled super-resolution:

- ✓ SRRF-Stream compatible Andor camera
- ✓ SRRF-Stream license (one per camera)
- ✓ PC with GPU (Nvidia CUDA enabled)
- ✓ Software: MicroManager, Fusion or via Andor SDK

To find out more about how to run SRRF-Stream, refer to the SRRF-Stream technical note

Users of the original SRRF-Stream can also avail of this enhanced performance. A SRRF-Stream+ updater utility is available from your local Andor product support team as a fast and hassle-free way to upgrade.

EMCCD or Back-illuminated sCMOS?

Since the first sCMOS cameras were introduced by Andor, many have made comparisons with Electron Multiplying (EMCCD) cameras to determine their suitability for different applications. The arrival of back-illuminated sCMOS cameras has seen renewed interest in comparisons of relative performance against EMCCD. With many tests being done, we can now get a clearer picture of how the latest models of the different technologies compare.

For general fluorescence microscopy, when light is not in the order of single figure photons per pixel, the strengths of sCMOS such as low noise, speed and large fields of view make sCMOS ideally suited. However, for applications such as single molecule studies, or when techniques such as confocal, TIRF or other techniques that aim to optically section light are used, light is inherently limited. Therefore, in these more challenging imaging conditions EMCCD are the preferred solution. Electron multiplication that happens before readout of EMCCD cameras boosts the signal many fold above the noise floor and thus allows EMCCD cameras to operate at light levels below that of even the latest back-illuminated sCMOS models. Not only does this mean shorter exposures, or lower illumination is possible– it means detecting a signal in the first instance.

Upgrading an older EMCCD Camera

Upgrading to the latest EMCCD camera like the iXon Life 888 will bring higher speeds and wider fields of view. They will also have comparable, or superior sensitivity. If you only use lower gain settings and have higher level signals then you may be able to use a back-illuminated sCMOS camera such as the Sona 4.2B-11 to allow even faster speeds over wider fields of view.

Working Magnifications

Imaging at lower magnifications requires a smaller effective pixel size to ensure that the resolution of the optical system is maintained. sCMOS cameras like the Sona 4.2B-6 have smaller pixels compared to EMCCD cameras making them perfectly suited to 40x and 60x. With large 13 or 16 µm pixels, iXon Life EMCCD cameras prioritize photon collection and imaging at higher magnifications e.g. 100x. Note that additional magnification can be added to reduce effective size to improve sampling.

Imaging into the UV or Infrared

Some studies call for optimum sensitivity within the UV or NIR regions. iXon Ultra EMCCD models provide extended response into these regions.

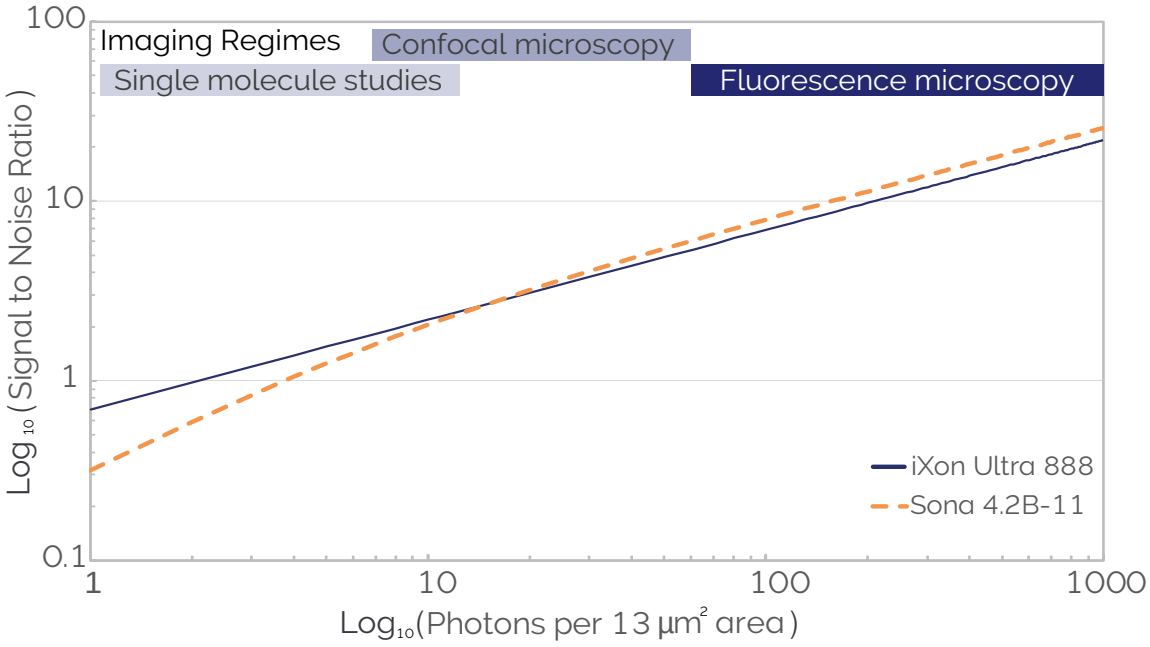
Upgrading sCMOS or Interline CCD Cameras

Upgrading an older sCMOS or interline CCD camera to the latest back-illuminated sCMOS cameras with deep cooled vacuum technology such as the Sona 4.2B-6 eliminating hot pixels.

Sona 4.2B-6: familiar 4.2 Megapixel sensor format making an convenient way to access improved sensitivity provided by 95% QE and deeper cooling.

Sona 4.2B-11: Improved sensitivity and at 32 mm, the widest available field of view.

Still not sure which to choose? Andor have the most sensitive EMCCD and back-illuminated sCMOS cameras available. Contact your local Andor representative to arrange a demo of the best of each of these technologies.



Technical Specifications

System Specifications •2

	iXon Life 888		iXon Life 897	
Sensor	BV: Back Illuminated, standard AR coated			
Active pixels	1024 x 1024		512 x 512	
Pixel size	13 x 13 µm		16 x 16 µm	
Image area	13.3 x 13.3 mm with 100% fill factor		8.2 x 8.2 mm with 100% fill factor	
Pixel Readout Rate	30 MHz•3	10 MHz	17 MHz	10 MHz
Minimum temperature, air cooled, ambient 20°C Chiller liquid cooling, coolant @ 10°C, >0.75l/min	-55°C -65°C	-70°C -80°C	-70°C -80°C	-70°C -80°C
Thermostatic Precision	± 0.01°C			
Triggering	Internal, External, External Start, External Exposure, Software Trigger			
System window type	UV-grade fused silica, Broadband Visible-Near Infrared, 0.5 degree wedge			
Blemish specification	Grade 1 sensor from supplier. Camera blemishes as defined by Andor Grade A			
Digitization	16-bit (at all speeds)			
PC Interface	USB 3.0•12		USB 2.0	
Lens Mount	C-mount			

Advanced Performance Specifications •2

	iXon Life 888	iXon Life 897
Dark current and background events•4,5		
Dark current (e^-/pixel/sec) @ -80°C	0.00025	0.0007
Spurious background (events/pix) @ 1000x gain / -80°C	0.005	0.0018
Active area pixel well depth	80,000 e^-	180,000 e^-
Gain register pixel well depth•6	730,000 e^-	800, 000 e^-
Pixel readout rates	30, 10 MHz	17, 10 MHz
Read noise (e^-)•7	< 1	< 1
Linear absolute Electron Multiplier gain	1 - 1000 times via RealGain™ (calibration stable at all cooling temperatures)	
Linearity•8	Better than 99.9%	
Vertical clock speed	0.6 to 4.33 µs (user selectable)	0.3 to 3.3 µs (user selectable)
Timestamp accuracy	10 ns	
NEW SRRF-Stream mode	Optional	

iXon Life 888 - Frame Rates

Standard Mode [3,9]

	Array size						
Binning	**1024 x 1024**	**512 x 512**	**256 x 256**	**128 x 128**	**1024 x 100**	**1024 x 32**	**1024 x 1**
1 x 1	26	50	95	171	220	498	1163
2 x 2	50	94	170	285	368	699	-
4 x 4	92	167	281	426	552	870	-

Crop Mode (Optically Centred frame rates in brackets) [3,9]

	Array size						
Binning	**512 x 512**	**256 x 256**	**128 x 128**	**64 x 64**	**1024 x 100**	**1024 x 32**	**1024 x 1**
1 x 1	93 (78)	190 (251)	670 (697)	2053 (1319)	259	778	9690
2 x 2	170 (143)	350 (426)	1150 (1019)	3123 (1646)	492	1416	-
4 x 4	291 (245)	601 (653)	1772 (1504)	4109 (1857)	887	2370	-

iXon Life 897 - Frame Rates

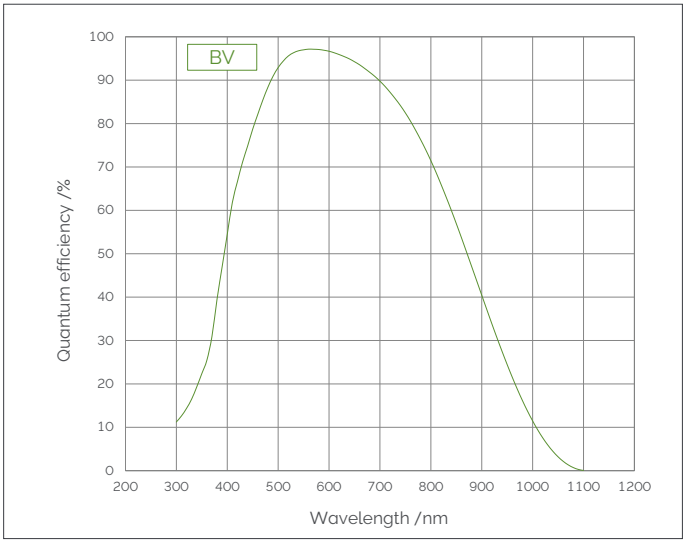
(Standard Mode) [10]

	Array size						
Binning	**512 x 512**	**256 x 256**	**128 x 128**	**64 x 64**	**512 x 100**	**512 x 32**	**512 x 1**
1 x 1	56	110	212	397	277	704	2,857
2 x 2	109	210	394	699	503	1,136	-
4 x 4	206	385	680	1,099	840	1,613	-

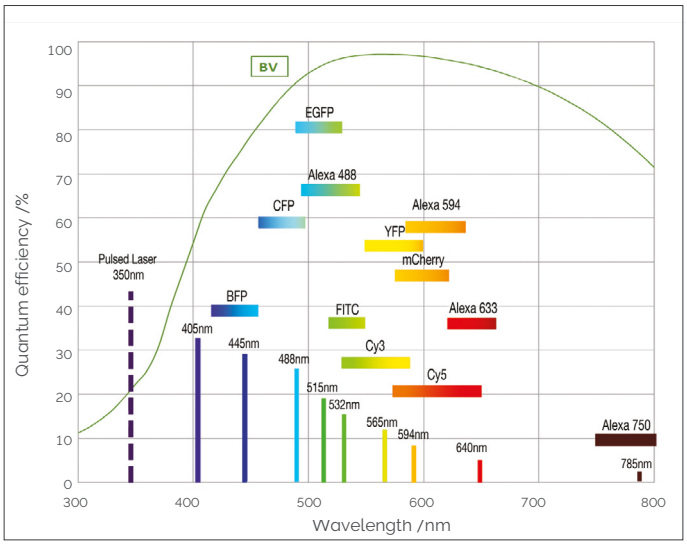
Crop Mode - (Optically Centred frame rates in brackets) [10]

	Array size						
Binning	**256 x 256**	**128 x 128**	**64 x 64**	**32 x 32**	**512 x 100**	**512 x 32**	**512 x 1**
1 x 1	111 (174)	595 (569)	1,433 (1,492)	3,532 (3,024)	296	857	11,074
2 x 2	215 (329)	1,085 (1,014)	2,433 (2,329)	5,325 (4,054)	570	1,589	-
4 x 4	402 (594)	1,802 (1,662)	3,577 (3,237)	6,579 (5,252)	1,050	2,682	-

Quantum Efficiency (QE) Curve [11]

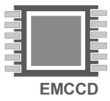


QE vs. Fluorophore Emissions



Creating The Optimum Product for You

Step 1. Choose the camera type option



Camera Type

Description	Code
iXon Life 888: Back-illuminated 1024 x 1024 EMCCD, BV - standard AR coated, max. 30 MHz, with USB 3.0	**iXon-L-888**
iXon Life 897: Back-illuminated 512 x 512 EMCCD, BV - standard AR coated, max. 17 MHz, with USB 2.0	**iXon-L-897**

NOTE: If SRRF-Stream real time super-resolution functionality is required with your iXon Life, please order as an 'accessory' in step 2 below.

Step 2. Select the required accessories

Accessories

Description	Order Code
SRRF-Stream real time super-resolution functionality, compatible with iXon Ultra and iXon Life EMCCD platforms. Camera must be connected to acquisition PC workstation containing an NVidia GPU card (compute capability v3.0, or above, and 4GB or greater on-board GPU RAM)	**SRRF-STREAM-IXON**
SRRF-Stream Dell Workstation (English), pre-installed with a recommended and tested GPU card, alongside SRRF-Stream enabled MicroManager and Andor SDK2 with SRRF-Stream	**WKST-SRRF-9ZY**
Monitor (optional) - Dell UltraSharp U3417W - 34.14" Curved LED	**FUS-MNTR-34W**
Dell UltraSharp UP3017 - 30" with PremierColor	**FUS-MNTR-30**
OptoMask accessory, used to mask unwanted sensor area during Crop Mode acquisition (refer to OptoMask Specification Sheet for further information).	**OPTMSK-L/OPTMSK-OC-L/ OPTMSK-OC-S**
Re-circulator for enhanced cooling performance and/or vibration sensitive measurements	**XW-RECR**
Oasis 160 Ultra compact chiller unit (tubing to be ordered separately) and/or vibration sensitive measurements	**ACC-XW-CHIL-160**
6 mm tubing options for ACC-XW-CHIL-160 (2x2.5 m or 2x5m lengths)	**ACC-6MM-TUBING-2X2.5/ACC-6MM-TUBING-2X5M**
15 m Active USB 3.0 connector cable (power supply not required) Icron for iXon Life 888	**ACC-ASE-06887**
Adjustable feet for secure mounting to microscope side ports	**TR-IXON-MNT-110**

Step 3. Select the required software

Software

The iXon Life series requires one of the following software options:

Solis Imaging A 32-bit and fully 64-bit enabled application for Windows (8, 8.1 and 10) offering rich functionality for data acquisition and processing. AndorBasic provides macro language control of data acquisition, processing, display and export.

Andor SDK A software development kit that allows you to control the Andor range of cameras from your own application. Available as 32 and 64-bit libraries for Windows (8, 8.1 and 10), compatible with C/C++, C#, Delphi, VB.NET, LabVIEW and Matlab. Linux SDK compatible with C/C++.

Andor iQ A comprehensive multi-dimensional imaging software package. Offers tight synchronization of EMCCD with a comprehensive range of microscopy hardware, along with comprehensive rendering and analysis functionality. Modular architecture for best price/performance package on the market.

Third party software compatibility
Drivers are available so that the iXon range can be operated through a large variety of third party imaging packages. See Andor website for detail.

For SRRF-Stream

The iXon must be operated either through MicroManager (Open Imaging) open source microscopy software platform, or through the Andor SDK, if SRRF-Stream functionality is to be accessed.

Have you found what you are looking for?

Need more flexibility? The iXon Ultra series represents the absolute top of the range in terms of EMCCD performance and rich feature set. For example, the Ultra models include both EMCCD and conventional slow scan CCD modes and a greater selection of readout speeds. The Ultra also extends cooling down to -95°C!

Need faster frame rates? The Zyla sCMOS platform, configured with CameraLink interface, can deliver 100 fps from a full 4.2 or 5.5 Megapixel array, faster still with sub-array selection.

Need smaller pixels? The Zyla and Sona 4.2B-6 sCMOS cameras offer sensors with 6.5 µm pixel pitch, ideal for x60 objectives without additional C-mount magnification.

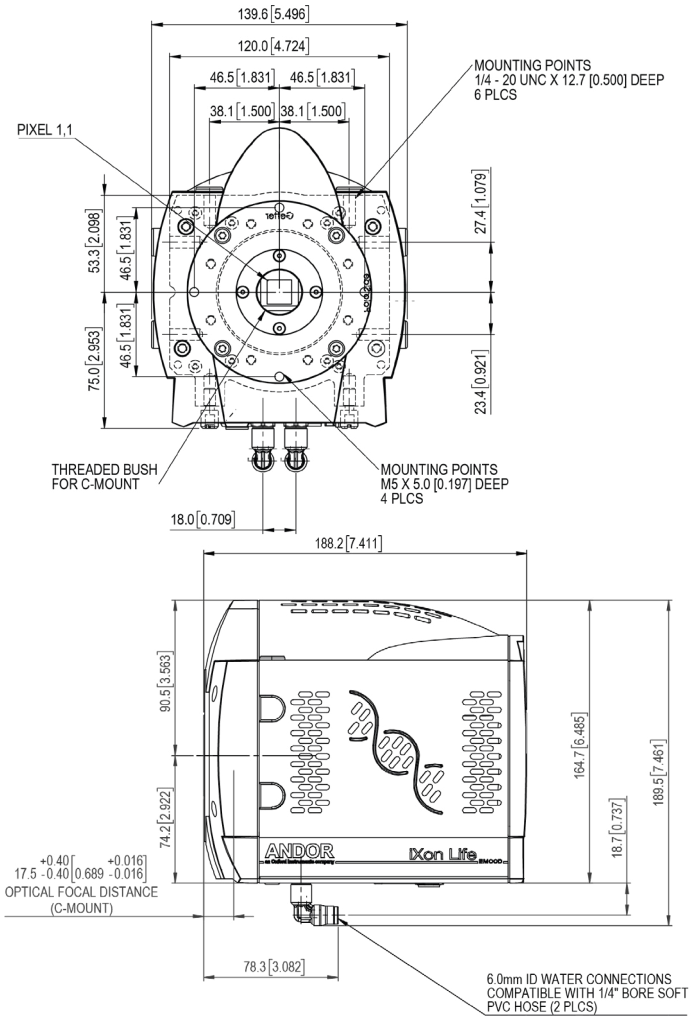
Need even broader QE? The iXon Ultra range offers sensor options that extend QE further into the both the blue and NIR ends of the range, accompanied by fringe suppression options for reduced etaloning when imaging in the NIR. Alternatively, if you are not speed challenged then why not consider the 'BEX2-DD' sensor option of the iKon-M or iKon-L CCD platforms – it doesn't come broader than that!

Product Drawings

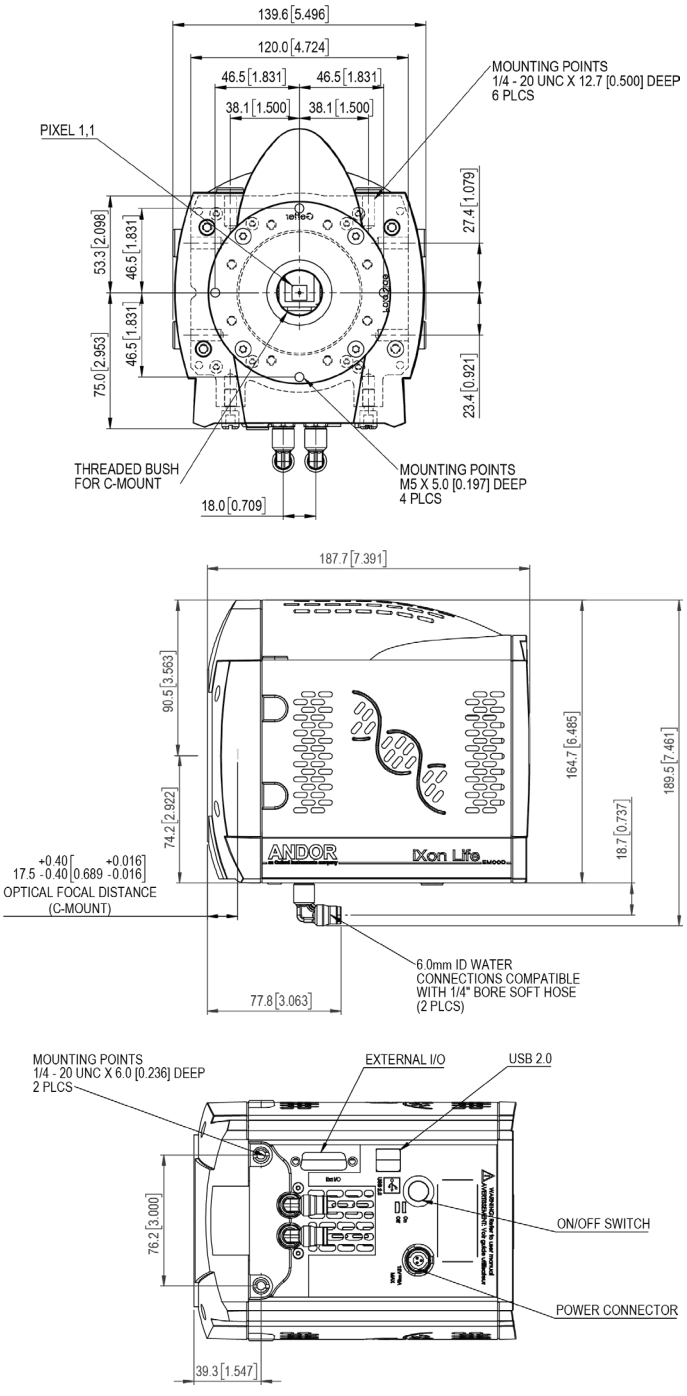
Dimensions in mm [inches]

Third-angle projection

iXon Life 888



iXon Life 897



iXon Life 888 Power Requirements

- Power Input: +12 VDC ± 5% @ 8 A
- Power Consumption: 96 W max
- Ripple and noise: 120 mV max (peak-peak 0 - 20 MHz)
- External Power Supply: 100 - 240 VAC 50/60 Hz

iXon Life 897 Power Requirements

- Power Input: +12 VDC ± 5% @ 6 A
- Power Consumption: 72 W max
- Ripple and noise: 120 mV max (peak-peak 0 - 20 MHz)
- External Power Supply: 100 - 240 VAC 50/60 Hz

Logic: Connector type: 26 way D Type with 8 programmable digital inputs or outputs for control and sensing of up to 8 external devices,
Minimum cable clearance required: 90 mm, Weight: 3.7 kg [8 lb 3 oz] approx.

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Need more information? At Andor we are committed to finding the correct solution for you. With a dedicated team of technical advisors, we are able to offer you one-to-one guidance and technical support on all Andor products. For a full listing of our local sales offices, please see: andor.com/contact

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Items shipped: iXon Life 897:

1x Andor ACZ-03463: 2m Multi I/O timing cable, offering Fire, External Trigger, Shutter and Arm
1x 3m USB 2.0 cable Type A to Type B
1x Power supply with mains cable
1x Quick Start guide
1x CD containing Andor user manuals
1x SRRF-Stream Quick Start guide (if applicable)
1x Individual system performance booklet

Items shipped: iXon Life 888:

1x Andor ACZ-03463: 2m Multi I/O timing cable, offering Fire, External Trigger, Shutter and Arm
1x 3m USB 3.0 cable Type A to Type B
PCIe USB 3.0 Card Adapter (2-Port)[*12]
1x Power supply with mains cable
1x Quick Start guide
1x CD containing Andor user manuals
1x SRRF-Stream Quick Start guide (if applicable)
1x Individual system performance booklet

Recommended Computer Requirements:

- 3.0 GHz single core or 2.6 GHz multi core processor
- 2 GB RAM
- 100 MB free disc space to install software (at least 1 GB recommended for data spooling)
- USB 3.0 Super Speed Host Controller capable of a sustained rate of 60MB/s for iXon Life 888
- USB 2.0 High Speed Host Controller capable of
- sustained rate of 40MB/s for iXon Life 897
- Soild-state drive (SSD) capable of a minimum sustained write speed of 100MB/S for spooling data
- Windows (8, 8.1 and 10) or Linux
- SRRF-Stream - If selected, the PC requires an Nvidia GPU card. See page 7 for further details.

Operating & Storage Conditions

- Operating Temperature: 0°C to 30°C ambient
- Relative Humidity: < 70% (non-condensing)
- Storage Temperature: -25°C to 50°C

Power Requirements

- Please refer to page 8

Footnotes: Specifications are subject to change without notice

1. Assembled in a state-of-the-art cleanroom facility, Andor's UltraVac™ vacuum process combines a permanent hermetic vacuum seal (no o-rings), with a stringent protocol to minimize outgassing, including use of proprietary materials.
2. Figures are typical unless otherwise stated.
3. At 30 MHz overclocked pixel readout rate, thermal dissipation from the sensor is higher since a greater proportion of time is spent vertical shifting, and it is necessary to set a higher sensor cooling temperature at this rate. Furthermore, stable cooling performance will depend on other variables such as vertical clock speed, Region of Interest size (Standard or Crop Mode) and ambient temp. As such, user testing is advised to determine the stable sensor cooling temperature for selected conditions. Status of temperature stability is apparent through the acquisition software.
4. The dark current measurement is averaged over the sensor area excluding any regions of blemishes.
5. Using Electron Multiplication the iXon is capable of detecting single photons, therefore the true camera detection limit is set by the number of 'dark' background events. These events consist of both residual thermally generated electrons and Clock Induced Charge (CIC) electrons (also referred to as Spurious Noise), each appearing as random single spikes above the read noise floor. A thresholding scheme is employed to count these single electron events and is quoted as a probability of an event per pixel. Acquisition conditions are full resolution and max frame rate (30 MHz readout; frame-transfer mode; 1.1 µs vertical clock speed; x 1000 EM gain; 10 ms exposure; -80°C).
6. The EM register on CCD201 sensors has a linear response up to ~400,000 electrons and a full well depth of ~730,000 electrons.
7. Readout noise is for the entire system. It is a combination of sensor readout noise and A/D noise. Measurement is for Single Pixel readout with the sensor at a temperature of -75°C and minimum exposure time under dark conditions. Under Electron Multiplying conditions, the effective system readout noise is reduced to sub 1 e- levels.
8. Linearity is measured from a plot of counts vs. exposure time under constant photon flux up to the saturation point of the system.
9. All measurements are made at 30 MHz pixel readout speed with 0.6 µs vertical clock speed. It also assumes internal trigger mode of operation. Crop Mode frame rates shown are for 'Corner Tethered' ROIs, with 'Optically Centred' ROI frame rates shown within brackets.
10. All measurements are made at 17 MHz pixel readout speed with 0.5 µs vertical clock speed. It also assumes internal trigger mode of operation. Crop Mode frame rates shown are for 'Corner Tethered' ROIs, with 'Optically Centred' ROI frame rates shown within brackets.
11. Quantum efficiency of the sensor at 25°C, as supplied by the sensor manufacturer.
12. iXon Life 888 should work with any modern USB 3.0 enabled PC/laptop, as every USB 3.0 port should have its own host controller. iXon Life 888 also ships with a USB 3.0 PCI card as a means to add a USB 3.0 port to an older PC, or as a diagnostic aid to interoperability issues.