OXFORD INSTRUMENTS

Andor iXon Ultra

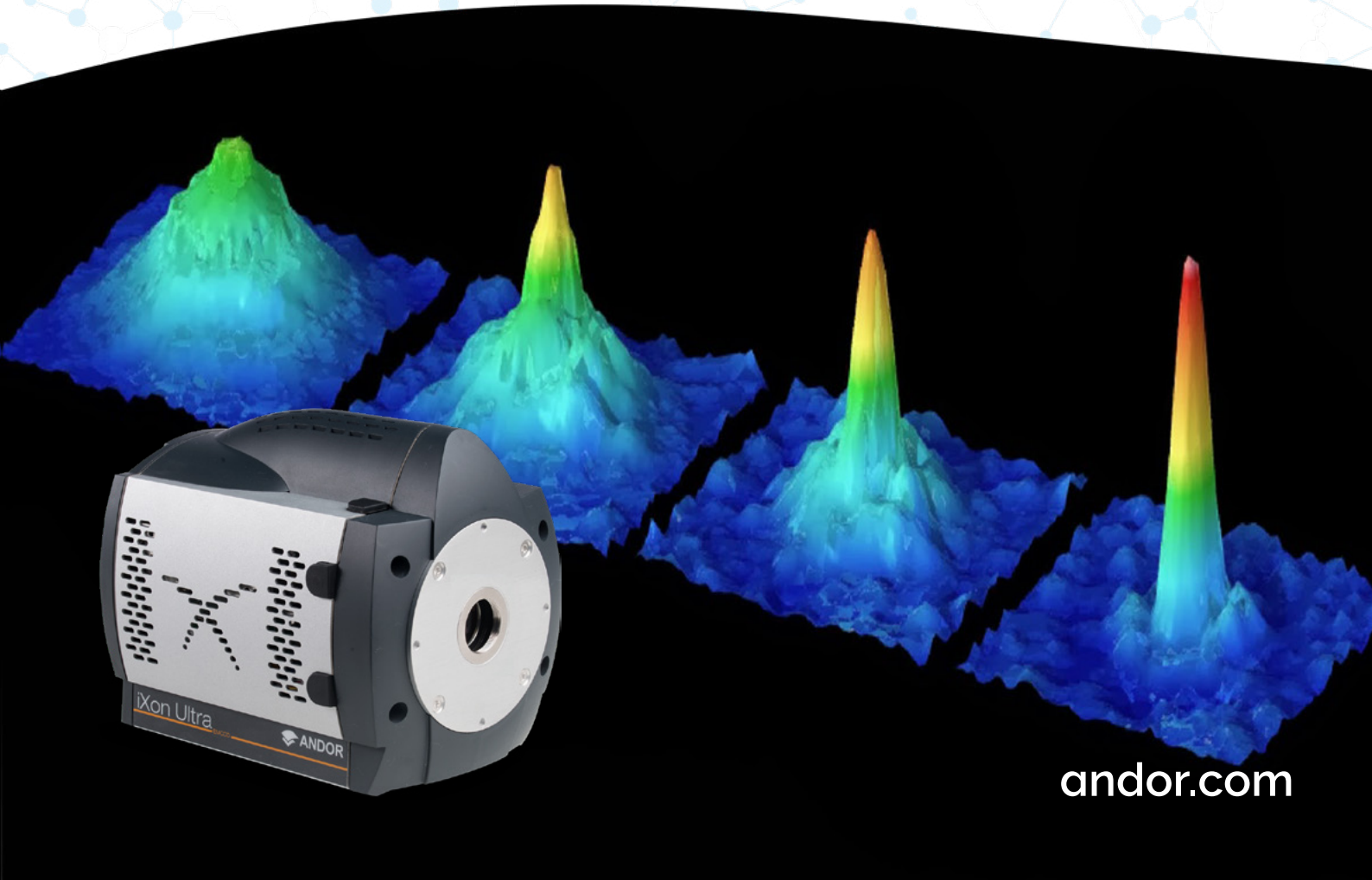
The World's Highest Performance Back-illuminated EMCCDs

Key Specifications

- ✓ Single photon sensitive
- ✓ Exceptional QE > 95%
- ✓ 13 or 16 µm pixel size
- ✓ Active pixels: 1024 x 1024 or 512 x 512
- ✓ TE cooling down to -95 or -100°C
- ✓ 26 or 56 fps full frame
- ✓ SRRF-Stream+ real time super-resolution

Key Applications

- ✓ Quantum imaging
- ✓ Fast astronomy
- ✓ Tomography
- ✓ Fast spectroscopy
- ✓ Single molecule detection
- ✓ Super-resolution



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iXon Ultra

iXon Ultra is available in two formats:

iXon Ultra 888

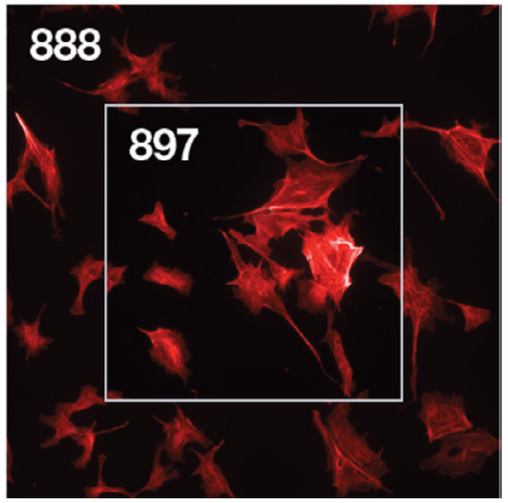
The highly innovative iXon Ultra 888 megapixel, back-illuminated EMCCD camera offers single photon sensitivity across a large field of view.

The iXon Ultra 888 has been fundamentally re-engineered to facilitate a 3x acceleration of the pixel readout speed to an unprecedented 30 MHz, whilst maintaining quantitative stability. Furthermore, Andor's unique 'Crop Mode' can be employed to further boost frame rates from a user defined subregion, for example pushing a 512 x 512 sub-array to 93 fps and a 128 x 128 area to 697 fps.

With a 1024 x 1024 sensor format and 13 µm pixel size, the resolving power, field of view and unparalleled speed of the iXon Ultra 888 render it the most attractive and versatile EMCCD option for demanding applications such as high time resolution astronomy, quantum imaging and single molecule biophysics.

iXon Ultra 897

The iXon Ultra 897 platform takes the popular back-illuminated 512 x 512 sensor with 16 µm pixel, and overclocks readout to push speed performance to an outstanding 56 fps (full frame), whilst maintaining single photon sensitivity and quantitative stability throughout. This format is ideal for applications that do not require megapixel resolution, focusing on speed and ultra-sensitivity.



Field of View Comparison between iXon Ultra models. The 888 model has a x2.6 greater sensitive area than the 897 model.

Key iXon Ultra 888 Specifications

Active pixels (H x V)	1024 x 1024
Pixel size (W x H; µm)	13 x 13
Image area (mm)	13.3 x 13.3
Active Area Pixel Well Depth (e-)	80,000
Max Readout Rate (MHz)	30
Frame rates (fps)	26 (full frame) - 9690
Read noise (e-)	<1 with EM gain
QE Max	>95%

Key iXon Ultra 897 Specifications

Active pixels (H x V)	512 x 512
Pixel size (W x H; µm)	16 x 16
Image area (mm)	8.2 x 8.2
Active Area Pixel Well Depth (e-)	180,000
Max Readout Rate (MHz)	17
Frame rates (fps)	56 (full frame) - 11,074
Read noise (e-)	<1 with EM gain
QE Max	>95%

The iXon Ultra Platform

The iXon Ultra platform maintains all the advanced performance attributes that have defined the industry-leading iXon EMCCD brand, such as deep vacuum cooling, extremely low spurious noise and rapid frame rate modes. The iXon Ultra platform is designed to be the most flexible yet easy to use EMCCD on the market, optimizable for a wide variety of application requirements in a single click via the OptAcquire™ feature. Count Convert functionality means signal can be quantitatively calibrated in units of electrons or photons, either in real time or postprocessing. Patented, pioneering technology offers automated recalibration of EM gain, alongside anti-ageing protection. Additional features of the iXon Ultra include plug and play USB connectivity, a lower noise conventional CCD mode and an additional Camera Link output, offering the unique ability to directly access data for 'on the fly' processing with minimal data-latency, ideally suited to rapid closed loop experimental systems.

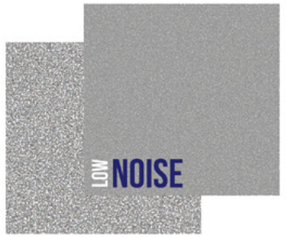
Crucially, the iXon brand carries an outstanding reputation within the industry for quality and reliability, brandishing an unparalleled track record of minimal field failures.

Features & Benefits

Single Photon Sensitive & > 95% QE	Optimal SNR in light starved applications such as single molecule detection and quantum imaging.
Overclocked readout speeds	Follow dynamic changing processes.
Crop Mode	Continuous imaging with fastest possible frame rate from centrally positioned ROIs. Highly enabling for quantum imaging and much more (e.g. 251 fps with 256 x 256 ROI).
TE cooling to -100°C	Elimination of dark current detection limit.
RealGain™	Absolute EMCCD gain selectable directly from a linear and quantitative scale.
'2-in-1' Flexibility	EMCCD mode for ultra-sensitivity at speed, CCD mode for longer exposures.
Fringe Suppression (optional)	Reduced etaloning in NIR.
OptAcquire	Optimize the highly flexible iXon for different application requirements at the click of a button.
Count Convert	Quantitatively capture and view data in electrons or incident photons. Count Convert does this important conversion for you.
NEW 'SRRF-Stream+' (optional)	Real time, cell super-resolution functionality. Living and fixed cells, works on most modern fluorescence microscopes. Super-resolution down to 50 nm.
EMCAL™	Patented user-initiated self-recalibration of EM gain.
Qualified down to -20°C ambient temperature	Excellent for use at observatories.
Minimal Clock-Induced Charge	Confident discrimination of single photon events in Quantum Imaging.
UltraVac™	Critical for sustained vacuum integrity and to maintain 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.
Minimal Data Latency	Camera Link output port to facilitate direct access to data for 'on the fly' processing and fast feedback loops..
Enhanced photon counting modes	Intuitive single photon counting modes ideal for Quantum Imaging. Real time or post-processing.
FPGA Timestamp	Hardware generated timestamp with 10 ns accuracy.
ASTRO.control compatibility (Ultra only)	Redlogix ASTRO.control is a dedicated platform for control of astronomical telescopes and instrumentation http://www.andor.com/astrocontrol.aspx

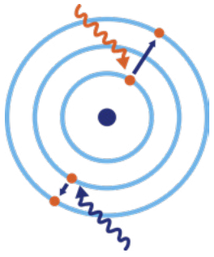
Key Features

Single Photon Sensitive



- Single Photon Sensitive
- Photon Counting
- Detect and quantify trapped Ions/Atoms

iXon Ultra uses Electron Multiplying CCD (EMCCD) technology to amplify signal from even single photon events to well above the read noise floor of the camera, thus rendering single photon sensitivity, even under high speed readout. iXon Ultra is therefore ideally suited to fast detection of extremely weak signal, including single photon counting. Photon Counting performance is further enhanced through suppression of spurious background events, both through vacuum cooling suppression of thermal electrons and events and electronic optimization of Clock Induced Charge events.



Back-illuminated QE

- > 95% peak QE
- EXF option for broader wavelength range
- Fringe Suppression (optional)

iXon Ultra exclusively employs back-illuminated sensors to maximize QE response. An 'EXF' dual anti-reflection coated version is available for a broader response, which also includes Fringe Suppression technology for reduction of etaloning, especially in the NIR.

High Speed

- 56 fps full frame (897 model)
- Crop Mode: Huge ROI speed boost
- 100% duty cycle – no photons wasted

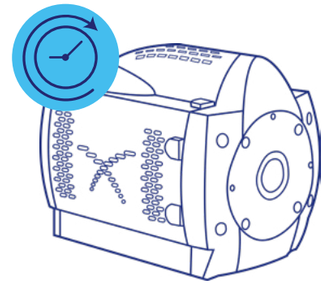
The iXon Ultra platform has been re-engineered to offer stable 'overclocked' readout modes, setting a very high bar in terms of frame rates. The frame transfer architecture of the sensor is ideal for efficiency, meaning that the image readout happens while the subsequent image is being exposed, thus avoiding 'dead time' or photon wastage. Furthermore, the innovative Crop Mode allows significantly accelerated frame rates of Region of Interest, for example achieving 697 fps from the iXon Ultra 888 cropped to a 128 x 128 ROI.

2-in-1 Flexibility

- EMCCD-mode: single photon sensitivity at speed
- CCD-mode: long exposure capture of weak signal

iXon Ultra models offer '2 in 1' performance flexibility, in terms of operating as a single photon EMCCD or a low noise conventional CCD, In photon starved applications, choosing the EMCCD amplifier usually yields better signal to noise ratio when under faster frame rates conditions (> 1 fps), whereas often the CCD amplifier can yield better signal to noise ratio when longer exposures can be applied and when the sensor can be read out slowly (i.e. 'seconds per frame' rather than 'frames per second').

Long Exposure Capability



- Vacuum TEC cooled to -100°C
- < 0.0002 e-/p/sec darkcurrent
- Luminescence & Astronomy

iXon Ultra uses sensor cooling down to -100°C (-95°C for 888 model) for minimization of darkcurrent., allowing access to longer exposures, up to several minutes, especially useful in 'CCD mode'. This broadens the application flexibility of this model, making it ideal for long exposure luminescence measurements and astro-photometry.

Smart Features

- Count Convert - Data in electrons or incident photons
- OptAcquire – Preset application optimization
- FPGA timestamp – 10ns accuracy

iXon Ultra is packed with clever, useful innovation. For example, Count Convert offers the capability to quantitatively capture and present data in units of electrons or photons, this conversion applied either in real time in post-processing. The iXon Ultra platform is designed to be the most flexible yet easy to use EMCCD on the market, optimizable for a wide variety of application requirements in a single click via the OptAcquire™ feature.

Minimal Data Latency

- Additional Camera Link output
- Suitable for 'on-the-fly' rapid processing
- Ideal for closed-loop experimental systems

As well as the USB interface, the iXon Ultra includes an additional Camera Link output port, facilitating more direct access to the image data stream, in order that real-time analysis can be performed. The Camera Link channel intercepts the image data stream in the camera head immediately after the on-head FPGA processing step, but before the USB frame buffer, therefore undergoes the same amount of on-head image processing. The USB data stream is concurrently accessible.

RealGain™ & EMCAL™

- RealGain™ linear calibration of EMCCD gain
- EMCAL™ user-initiated self-calibration of EM gain.

iXon Ultra set new standards in quantitative EMCCD usage and general EMCCD longevity expectations. RealGain™ allows the user to select absolute EM gain direct from a linear and directly quantitative software scale, x1 to x1000. The EM gain you ask for is the EM gain you get.

EMCAL™ is an Innovative, user-initiated, self-recalibration of EM gain, utilizing a patented method of automated EM gain assessment and Andor's unique Linear and Real Quantitative gain implementation.

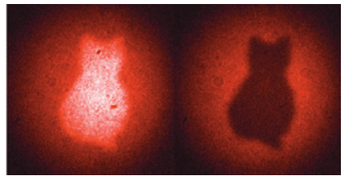
Application Focus

The Physicist's Choice

The unique high-performance specifications of the optimized iXon range have been serving the physical scientist and astronomer in scenarios that demand more than simply an EM sensor in a camera. Andor have worked with numerous scientists to deliver solutions that work for their particular application requirements, such as specific coatings, coupling to fibre optic scintillators and 'minimized latency' direct data access solutions.

Quantum Entanglement

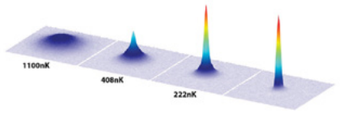
iXon Ultra is the leading detector for imaging entangled photon systems, offering the following key advantages: (a) single photon sensitivity and > 90% QE means the vast majority of incident photon events are detected, (b) deep cooling and low spurious noise events means false positives are minimized, significantly enhancing detection statistics, (c) arrays of up to 1 megapixel are ideal for massively parallel detection of quantum correlations, (d) rapid frame rates yield accelerated measurement throughput, (e) superb charge transfer efficiency offers confident detection of bi-photon pairs in adjacent pixels.



Quantum entanglement, see Quantum imaging finally saves Schrödinger's cat. Courtesy of Anton Zeilinger, Institute for Quantum Optics and Quantum Information, University of Vienna.

Quantum Gases

The 2-in-1 flexibility of iXon Ultra makes it a highly versatile detector for quantum gas experiments. Operate in CCD mode for BEC absorption experiments yielding density distributions of the atom cloud (while still availing of 'Fast Kinetics' microsecond dynamics). Operate in EMCCD mode for dynamic fluorescence imaging of small numbers of trapped species, down to individual atoms or ions.



A phase transition and BEC formation in a gas of erbium atoms imaged at 401 nm matched by camera's QE at approx. 75%. Courtesy of K. Aikawa et al., University of Innsbruck, Austria.

Fast Astronomy

Extremely fast and ultra-sensitive performance of binned sub-regions make the iXon Ultra an ideal Shack Hartmann AO detector. The large FOV of the iXon Ultra 888 and fast frame rate are ideal for Lucky Imaging and Speckle Interferometry. Qualified down to -20°C ambient, perfect for night observation.

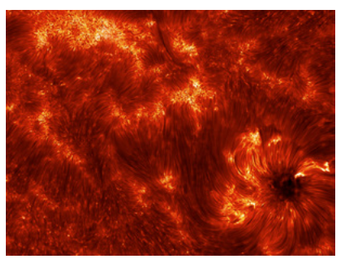
The iXon Ultra 888 serves as the Focal Plane Imager of the SOFIA telescope. Courtesy of Pasquale Temi & E.E. Becklin, NASA.

Tomography

Lens coupled or customer fibre coupled, the iXon Ultra provides the superlative ultrasensitive, large array solution for fast tomography.

Fast Spectroscopy

The iXon Ultra has been a very valuable detector for fast spectroscopy applications, such for rapid spectroscopic mapping or fast monitoring of fast chemical reactions. When operated in full vertical binning the cameras can be pushed to thousands of spectra per second, accessing sub-ms dynamics. The iXon Ultra camera models are fully compatible with Andor's Kymera and Shamrock range of high-end spectrographs.



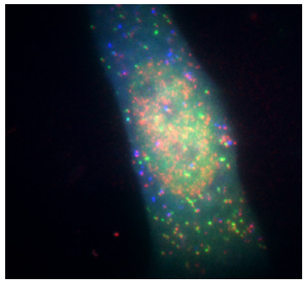
Magnetic fibrils that weave through the solar chromosphere. Courtesy of Kevin Reardon, National Solar Observatory.

The Biologist's Choice

In applications such as single molecule microscopy, super-resolution, live cell microscopy (including confocal), calcium signalling, transport/motile imaging and intracellular bioluminescence, weak, rapidly changing fluorescent signals from cells must be dynamically imaged. Andor's iXon technology offers an ideal detection solution. Ultra-sensitive detection capability in fluorescence microscopy facilitates use of lower excitation powers (thereby reducing photobleaching and phototoxicity) and lower dye concentrations.

Single Molecule Detection

Andor's iXon EMCCD has long been the gold standard detector of the biophysics laboratory, and remains the dominant detector type, operating in a low light regime that is less suited to sCMOS cameras. The 3x accelerated 30 MHz readout speed of the iXon Ultra 888, especially combined with 'Optically Centred Crop Mode', means that dynamic single molecule processes can be better characterized. The 13 µm pixel provides superb resolving capability at the diffraction limit.

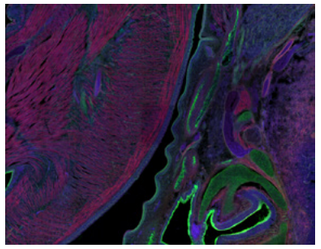


Single molecule imaging mRNA (red), during translation, and proteins, FLAG-KDM5B (green) and HA-KDM5B (blue). Courtesy of Timothy J. Stasevich, IGAF, Colorado State University.

Spinning disk confocal

The iXon Ultra 888 is the ultimate detector to drive stunning 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 implicit to optical sectioning.

The superior sensitivity of the iXon Ultra detector brings these low light images to life.



Spinning disk confocal image (right) of a mouse embryo section with F-actin (AF568-phalloidin), membrane glycoproteins (AF488-WGA), and DNA (DAPI) labelling.

Luminescence

The iXon Ultra can be used in either single photon counting mode (EM amplifier) or in slow scan, deep cooled CCD mode (CCD amplifier) as a highly sensitive and flexible detector in this typically long exposure, extreme low light application.

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.

Andor's new "**SRRF-Stream+**" provides even better performance. The original SRRF-Stream, localization was limited to 6-axes, which provided a compromise of image quality and speed for most datasets. However. for SRRF-Stream+ it has been possible to increase the axes of radiality to 24, by maximising GPU processing, enhancing image quality with minimal impact to speed. Find out more in the SRRF-Stream+ technical note.

Users of the original SRRF-Stream can upgrade to the new SRRF-Stream+ using an updater utility from their local Andor product support.

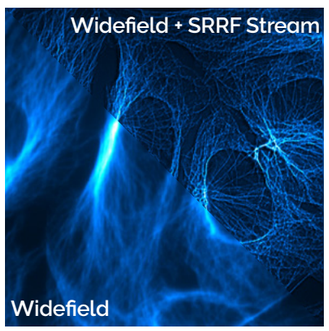


Image comparison of a fluorescently labelled fixed BPAE cell, recorded with a widefield fluorescence microscope and a SRRF-Stream enabled iXon 888 camera.

Technical Specifications

System Specifications •2

	Ultra 888		Ultra 897	
Sensor QE options	#BV: Back Illuminated, standard AR coated UVB: Back Illuminated, standard AR with additional lumogen coating EXF: Back illuminated, dual AR coated with fringe suppression			
Fringe Suppression	Available on EXF sensor option			
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 Minimum temperature, air cooled, ambient 20°C Chiller liquid cooling, coolant @ 10°C, >0.75l/min	10 MHz -80°C -95°C	30 MHz•3 -60°C -75°C	10 MHz -80°C -100°C	17 MHz -80°C -100°C
Thermostatic Precision	± 0.01°C			
Triggering	Internal, External, External Start, External Exposure, Software Trigger			
System window type	#BV: UV-grade fused silica, Broadband Visible-Near Infrared, 0.5 degree wedge UVB, EXF: UV-grade fused silica, Broadband Vacuum Ultraviolet-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			
Direct Data Access	Camera Link 3-tap output			

Advanced Performance Specifications •2

	Ultra 888						Ultra 897						
Dark current and background events•4,5													
Dark current (e-/pixel/sec) @ -80°C Dark current (e-/pixel/sec) @ max cooling	0.00025 0.00011						0.00030 0.00015						
Spurious background (events/pix) @ 1000x gain / -85°C	0.005						0.0018						
Active area pixel well depth	80,000 e⁻						180,000 e⁻						
Gain register pixel well depth•6,7	730,000 e⁻						800,000 e⁻						
Pixel readout rates	EM Amplifier: 30, 20, 10 & 1 MHz Conventional Amplifier: 1 & 0.1 MHz						EM Amplifier: 17, 10, 5 & 1 MHz Conventional Amplifier: 3, 1 & 0.08 MHz						
Read noise (e-)•7	EMCCD Amplifier				Conventional Amplifier		EMCCD Amplifier				Conventional Amplifier		
MHz	30	20	10	1	1	0.1	17	10	5	1	3	1	0.08
Without Electron Multiplication	130	80	40	12	6	3.5	89	65	37	15	9.6	5.3	2.7
With Electron Multiplication	< 1	< 1	< 1	< 1	-	-	< 1	< 1	< 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 3.33 µs (user selectable)						
Timestamp accuracy	10 ns												
NEW SRRF-Stream+ mode	Optional												

iXon Ultra 888 Frame Rates

Standard Mode•3,9

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

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 Ultra 897 Frame Rates

Standard Mode•10

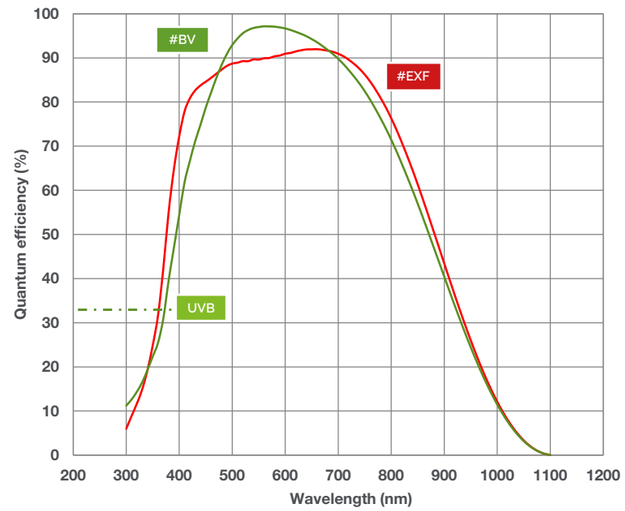
Binning	512 x 512	256 x 256	128 x 128	64 x 64	512 x 100	512 x 32	512 x 1
1 x 1	56	110	212	398	267	708	2,881
2 x 2	109	210	394	699	486	1,141	-
4 x 4	206	385	682	1,109	820	1,615	-

Crop Mode - Optically Centred frame rates in brackets•10

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 (1,490)	3,533 (3,021)	282	857	11,074
2 x 2	215 (329)	1,094 (1,013)	2,481 (2,325)	5,555 (4,048)	541	1,607	-
4 x 4	405 (593)	1 ,883 (1,661)	3,906 (3,236)	7,751 (4,878)	1,005	2,865	-

Quantum Efficiency (QE) Curves•11

#BV	Most sensitivity 480 to 690nm.
UVB	Optimized specifically for UV region.
#EXF	For the broadest response.



Creating The Optimum Product for You

Step 1. Choose the camera type

Camera Type

Description	Code
iXon Ultra 888: 1024 x 1024 EMCCD, max. 30 MHz, with USB 3.0	**DU-888U3-CS0-**
iXon Ultra 897: 512 x 512 EMCCD, max. 17 MHz, with USB 2.0	**DU-897U-CS0-**

Add sensor type code to camera code (see step 2)
NOTE: If **SRRF-Stream**+ real time super-resolution functionality is required with your iXon Ultra, please order as an 'accessory' in step 4 below.

Step 2. Choose the sensor type option

Sensor Type

Description	Code
Back-illuminated, standard AR coated	**#BV**
Back Illuminated, standard AR with additional lumogen coating	**UVB**

Description	Code
Back-illuminated, EX2 dual AR coated with fringe suppression	**EXF**

Add sensor type code to camera code (step 1)

Step 3. Select an alternative camera window (optional)

Camera Window

The standard window has been selected to satisfy most applications. However, other options are available. The alternative camera window code must be specified at time of ordering.
To view and select other window options please refer to the 'Camera Windows Supplementary Specification Sheet' which gives the transmission characteristics, product codes and procedure for entering the order. Further detailed information on the windows is in the Technical note – 'Camera Windows: Optimizing for Different Spectral Regions'.

Step 4. 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**

Description	Order Code
Re-circulator for enhanced cooling performance	**XW-RECR**
Oasis 160 Ultra compact chiller unit (tubing to be ordered separately)	**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**
C-mount to Nikon F-mount adapter	**OA-CNAF**
C-mount to Olympus adapter	**OA-COFM**
C-mount to T-mount adapter	**OA-CTOT**
15 m Active USB 3.0 connector cable (power supply not required) Icron for Ultra 888	**ACC-ASE-06887**
50 m Fibre Optic USB 3.0 extender solution inc. power supply (Adnaco) for Ultra 888	**ACC-ASE-08762**
100 m Fibre Optic USB 3.0 extender solution inc. power supply (Adnaco) for Ultra 888	**ACC-ASE-07860**

Step 5. Select the required software

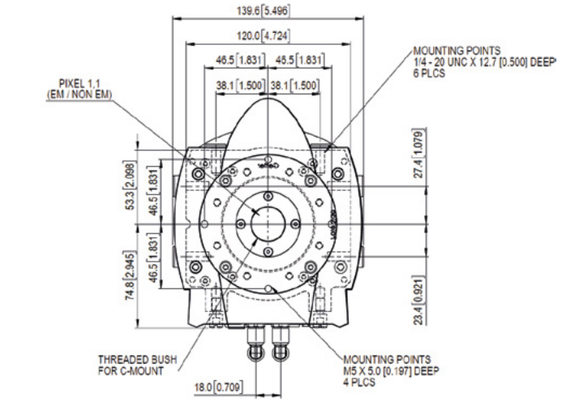
Software

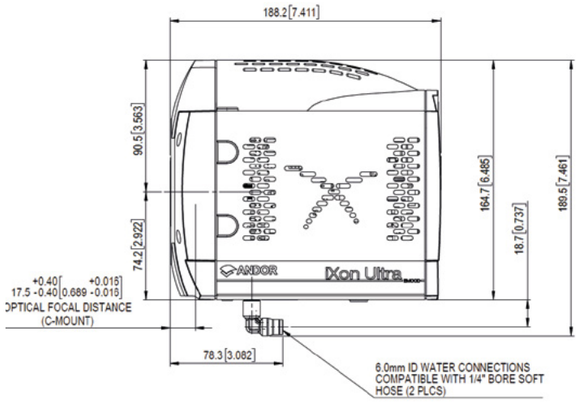
The iXon Ultra series requires one of the following software options:
Solis Imaging: A 32-bit and fully 64-bit enabled application for Windows (8, 8.1, 10 and 11) offering rich functionality for data acquisition and processing. AndorBasic provides macro language control of data acquisition, processing, 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, 10 and 11), 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 for a variety of third party imaging packages.
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.

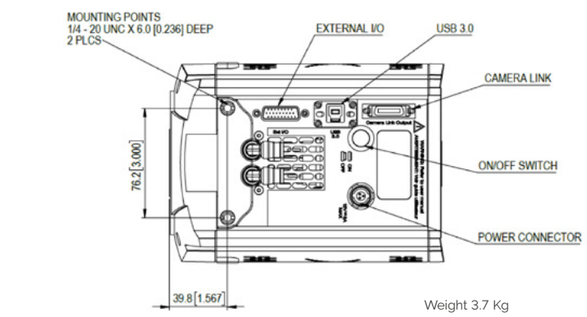
Product Drawings

Dimensions in mm [inches]

iXon Ultra 888

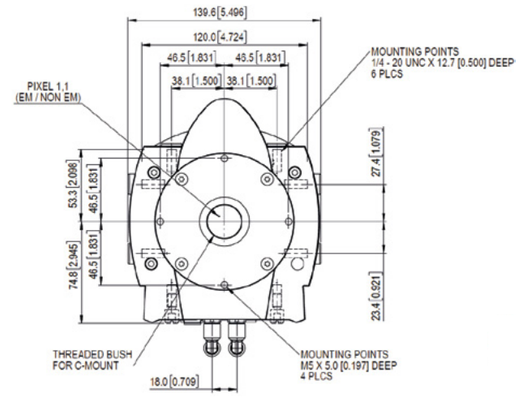


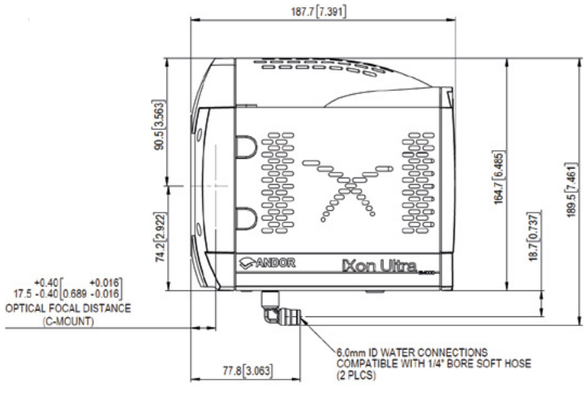


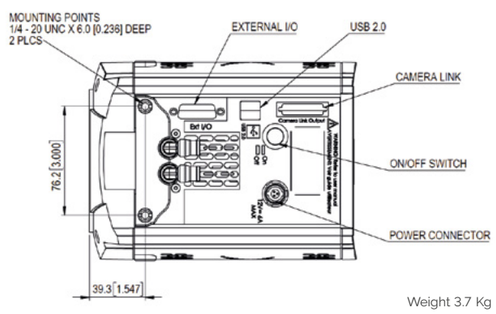


Weight 3.7 Kg

iXon Ultra 897







Weight 3.7 Kg

Ultra 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

Ultra 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.

Order Today

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.oxinst.com/contact

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Fax +1 (860) 290 9566

China
Beijing | Shanghai | Guangzhou
Phone +86 (400) 678 0609
Fax +86 (10) 5884 7901

Items shipped with your iXon Ultra 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 unit with mains cable
1x Quick Start guide
1x Electronic copy of user manuals
1x SRRF-Stream Quick Start guide (if applicable)
1x Individual system performance booklet

Items shipped with your iXon Ultra 897:
1x Andor ACZ-03463: 2 m 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 unit with mains cable
1x Quick Start guide
1x Electronic copy of 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 Ultra 888
- USB 2.0 High Speed Host Controller capable of sustained rate of 40MB/s for iXon Ultra 897
- Solid-state drive (SSD) capable of a minimum sustained write speed of 100MB/S for spooling data
- Windows (8.1, 10 and 11) or Linux
- SRRF-Stream+ - If selected, the PC requires a Nvidia GPU card. See page 10 for further details.

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; -95°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, at 10 MHz readout speed.
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. Standard and 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 0.3 µs vertical clock speed. It also assumes internal trigger mode of operation. Standard and 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 Ultra 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 Ultra 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.

Operating & Storage Conditions
- Operating Temperature: -20°C to 30°C ambient
- Relative Humidity: < 70% (non-condensing)
- Storage Temperature: -25°C to 50°C

Power Requirements
- Please refer to page 11