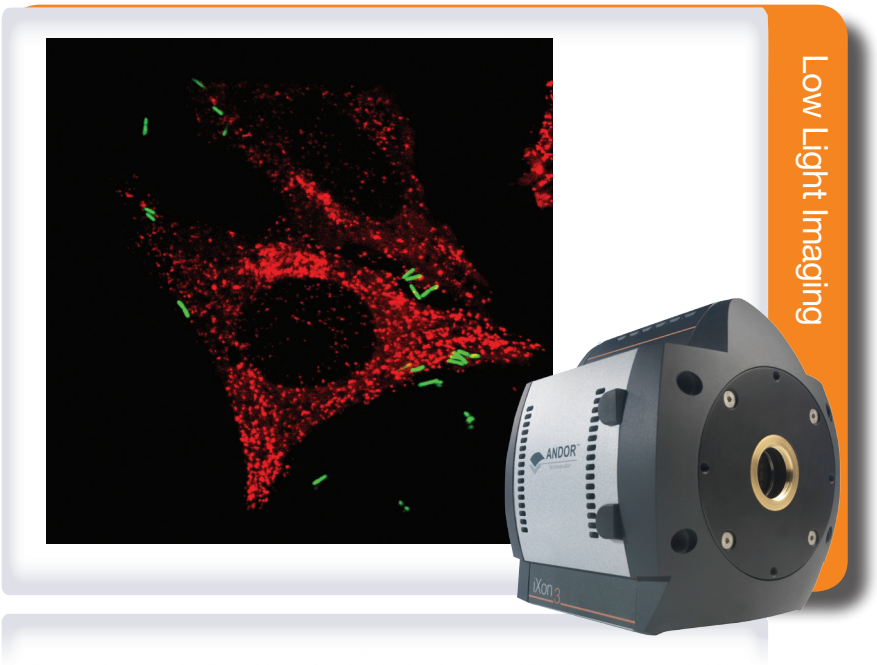
Features and Benefits

- **TE cooling to -95°C**
  Fast frame rates ideal for ion signalling microscopy and adaptive optics
- **OptAcquire**
  Optimize the highly flexible iXon3 for different application requirements at the click of a button
- **Cropped Sensor Mode**
  Specialised acquisition mode for continuous imaging with fastest possible temporal resolution
- **35 MHz readout**
  31 frames/sec at full megapixel resolution; 60 frames/sec when 2x2 binned
- **8 x 8 µm pixel size (fully binnable)**
  Excellent balance of NyQuist resolution and photon collection
- **RealGain™**
  Absolute EMCCD gain selectable directly from a linear and quantitative scale
- **Negligible EM Gain ageing**
  No requirement for gain recalibration
- **Spurious Noise Filters**
  Intelligent algorithms to filter clock induced charge events from the background, Real-time or post-processing
- **iCam**
  The market-leading exposure time fast-switching software
- **Extended red response**
  Significantly higher sensitivity to red-emitting dyes such as CY5, mCherry, dsRed and Alexa680. Also ideal for Bose Einstein Condensation in NIR
- **UltraVac™ •1**
  Critical for sustained vacuum integrity and to maintain unequalled cooling and QE performance, year after year
- **Superior Baseline Clamp and EM stability**
  Quantitative accuracy of dynamic measurements
- **Real Time Signal Averaging**
  Recursive and frame averaging functions for improved SNR
- **Built-in C-mount compatible shutter (optional)**
  Easy means to record reference dark images



High Resolution, Fast, Megapixel EMCCD

The iXon3 885's megapixel sensor format and 8 x 8 µm pixel size of the 885 presents an attractive combination of field of view and resolution, offering excellent Nyquist over-sampling for cell microscopy. A full resolution frame rate of 31 frames/sec is achievable; 60 frames/sec with 2 x 2 binning.

RealGain™ provides a quantitative EM gain calibration. Unlike other EMCCDs, the 885 is non-ageing and does not require routine EM gain recalibration. OptAcquire provides a user-friendly approach to optimizing this highly flexible camera for a wide range of application scenarios and Cropped Sensor Mode pushes acquisition frame rates to new extremes. Extended red QE response is ideally matched to popular red-emitting fluorophores and for imaging of Bose Einstein Condensates using NIR probe laser.

Specifications Summary

Active pixels	**1004 x 1002**
Pixel size (W x H)	**8 x 8 µm**
Active area pixel well depth	**32,000 e^-**
Gain register pixel well depth	**80,000 e^-**
Maximum readout rate	**35 MHz**
Frame rate	**31.4 - 13,812 fps**
Read noise	**< 1 e^- with EM gain**
Maximum cooling	**-95°C**

System Specifications [•2]

Model number	**885**	
Sensor options	**VP**: Virtual Phase, front illuminated	
Active pixels	1004 x 1002	
Pixel size	8 x 8 µm	
Image area	8 x 8 mm with 100% fill factor	
	DV option	DU option
Minimum temperature air cooled	-70°C	-80°C
Coolant recirculator	-80°C	-90°C
Coolant chiller, coolant @ 10°C, 0.75l/min	-85°C	-95°C
Digitization	14 bit @ 35, 27 & 13 MHz readout rate	
Triggering	Internal, External, External Start, External Exposure, Software Trigger	
System window type	Quartz uncoated window	

Advanced Performance Specifications [•2]

Dark current and background events [•3, 4]		
Dark current (e^-/pixel/sec) @ -85°C	0.01	
Spurious background (events/pix) @ 1000x gain and -85°C	0.04	
Gain register pixel well depth	80,000 e^-	
Pixel readout rates	35, 27,13 MHz	
Read noise (e^-) [•5]	Typical	With Electron Multiplication
35 MHz through EMCCD amplifier	25	< 1
27 MHz through EMCCD amplifier	22	< 1
13 MHz through EMCCD amplifier	12	< 1
Linear absolute Electron Multiplier gain	1 - 1000x via RealGain™ (calibration stable at all cooling temperatures)	
Linearity [•6]	Better than 99%	
Vertical clock speed	0.5 to 1.9 µs (variable)	

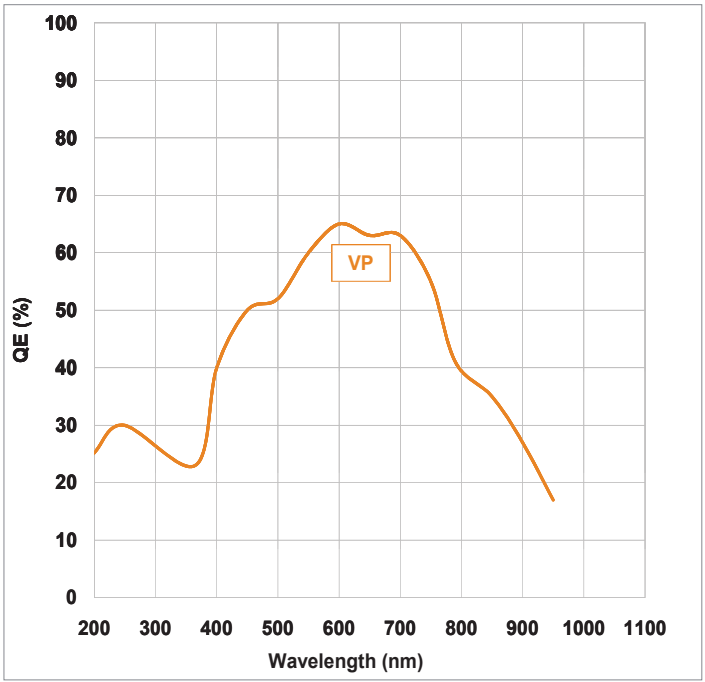
Frame Rates (Standard Mode) [•7]

	Array size						
Binning	**1004 x 1002**	**502 x 501**	**251 x 250**	**125 x 125**	**75 x 75**	**32 x 32**	**1004 x 1**
1 x 1	31.4	62	118	218	340	588	1370
2 x 2	60.5	116	215	376	543	826	-
4 x 4	112.6	208	366	581	775	1031	-
8 x 8	197	347	559	813	980	1177	-

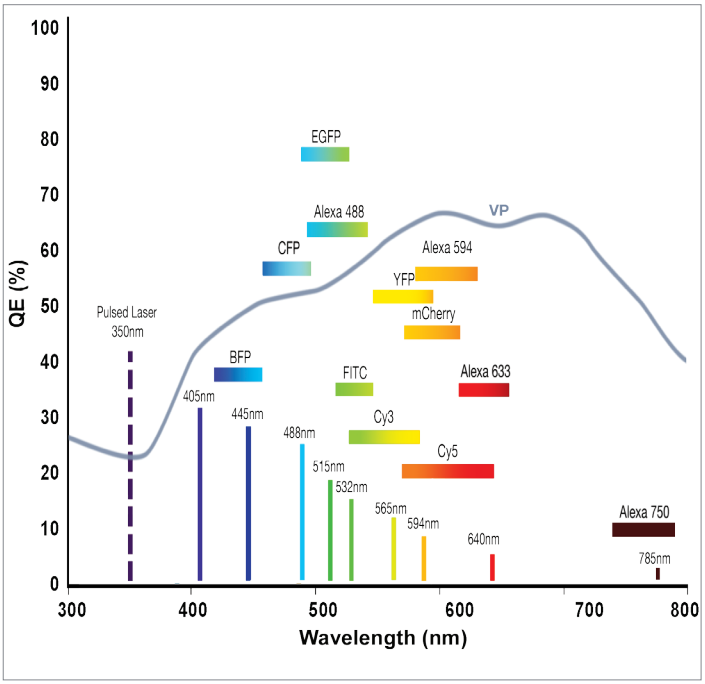
Frame Rates (Cropped Mode) [•7]

	Array size					
Binning	**502 x 501**	**251 x 250**	**125 x 125**	**75 x 75**	**32 x 32**	**1004 x 1**
1 x 1	62	231	465	763	1704	13812
2 x 2	118	426	859	1401	2976	-
4 x 4	213	735	1474	2404	4746	-
8 x 8	361	1144	2341	3637	6757	-

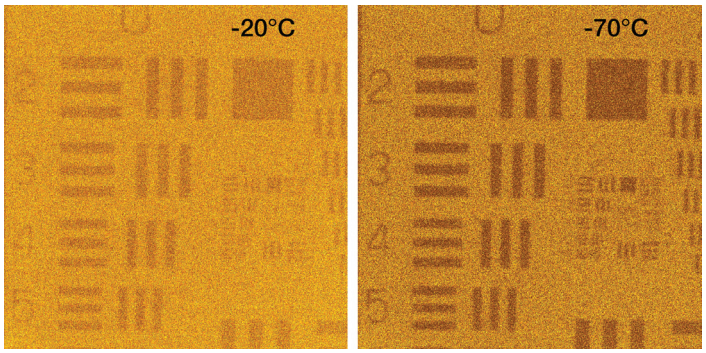
Quantum Efficiency Curves [8]



QE v Fluorophores Curve

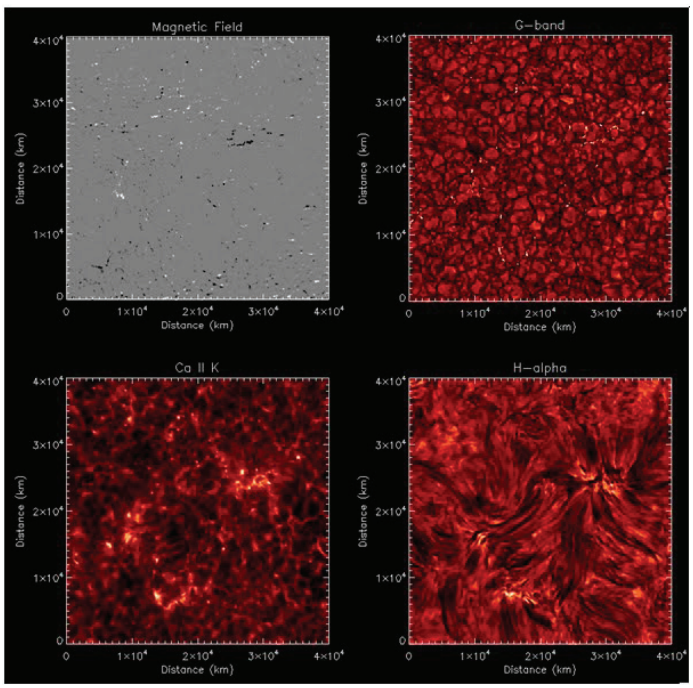


Deep Cooling



885 images from an extremely weak LED illuminating a resolution chart in a light-tight environment, taken in each case with x1000 EM gain, 15s exposure time at 2 different cooling temperatures. -20°C shows significantly poorer contrast (and hence resolution) due to elevated levels of EM-amplified darkcurrent in the 'dark' regions. Note that with EM gain off, this signal level would be completely absorbed in the read noise floor.

Application Image



Faces of our Sun: A portion of our nearest star observed simultaneously with four iXon[EM]+ 885 cameras. The images reflect heights of 50-2000 km above the solar surface.
Courtesy of Professor Mihalis Mathioudalis and Mr David Jess, Solar Physics Group, Queen's University Belfast.

Creating The Optimum Product for You

How to customise the iXon3 885 :

Step 1.

Simply select from the 2 cooling options that best suit your needs from the selection opposite.

Step 2.

Verify lens mount suitability.

Step 3.

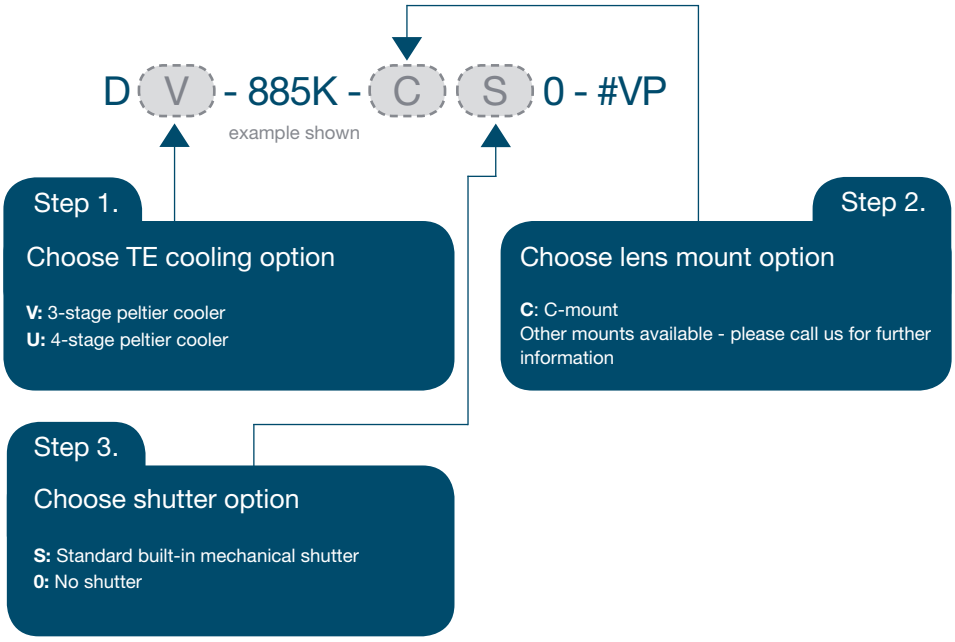
Please indicate if you require a shutter fitted to your iXon3 885.

Step 4.

Please indicate which software and controller card you require.

Step 5.

For compatibility, please indicate which accessories are required.



Step 4.

The iXon3 885 requires at least one of the following controller card and software options:

CCI-23 PCI Controller card.
CCI-24 PCIe Controller card.

Solis for Imaging A 32-bit application compatible with 32 and 64-bit Windows (XP, Vista and 7) 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 (XP, Vista and 7) and Linux. Compatible with C/C++, C#, Delphi, VB6, VB.NET, LabVIEW and Matlab.

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.

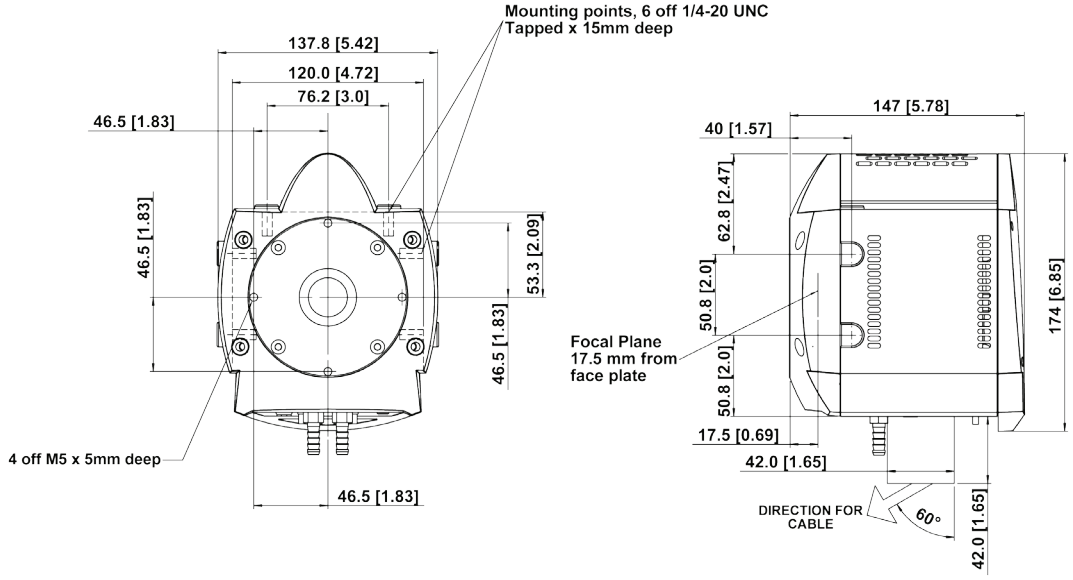
Third party software compatibility
Drivers are available so that the iXon3 range can be operated through a large variety of third party imaging packages. See Andor web site for detail: http://www.andor.com/software/

Step 5.

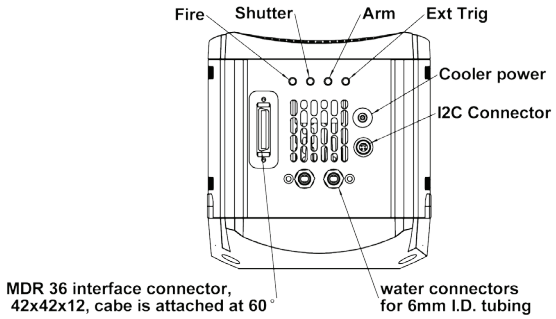
The following accessories are available:
OPTOMASK Optomask microscopy accessory, used to mask unwanted sensor area during Cropped Sensor mode acquisition.
XW-RECR Re-circulator for enhanced cooling performance
ACC-XW-CHIL-160 Oasis 160 Ultra compact chiller unit
OA-CNAF C-mount to Nikon F-mount adapter
OA-COFM C-mount to Olympus adapter
OA-CTOT C-mount to T-mount adapter

Product Drawings

Dimensions in mm [inches]



Weight: 3.4 kg [7 lb 8 oz]



Connector panel

Connecting to the iXon3

Camera Control
Connector type: PCI or PCIe

TTL / Logic
Connector type: SMB, provided with SMB - BNC cable
Fire (Output), Shutter (Output), Arm (Output), External Trigger (Input)

I²C connector
Compatible with Fischer SC102A053-130, pinouts as follow:
1 = I²C Clock, 2 = I²C Data, 3 = Ground , 4 = +5 Vdc

Minimum cable clearance required at rear of camera
90 mm

Typical Applications

Super Resolution (PALM, STORM)
TIRF Microscopy
Spinning Disk Confocal Microscopy
Selective/Single Plane Illumination Microscopy (SPIM)
Calcium Flux
FRET / FRAP
Bose Einstein Condensation

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: www.andor.com/contact

Our regional headquarters are:

Europe
Belfast, Northern Ireland
Phone +44 (28) 9023 7126
Fax +44 (28) 9031 0792

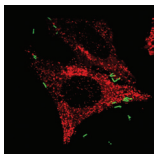
Japan
Tokyo
Phone +81 (3) 3518 6488
Fax +81 (3) 3518 6489

North America
Connecticut, USA
Phone +1 (885) 290 9211
Fax +1 (885) 290 9566

China
Beijing
Phone +86 (10) 5129 4977
Fax +86 (10) 6445 5401

Items shipped with your camera:

1x PCI or PCIe controller card + SATA adapter
1x Controller card splitter/fly-lead (if required)
1x 3m iXon3 detector cable
2x 2m SMB - BNC conection cables
1x Power supply with mains cable
1x Quick launch guide
1x CD containing Andor user manuals
1x Individual system performance booklet
1x Disposable ESD wrist strap



Front cover image: GFP-tagged Listeria HeLa cells expressing the clathrin light chain tagged with fluorescent protein (Tomato). Full resolution, 100ms exposure images, taken with the 885 camera integrated into the Andor Revolution confocal spinning disk system.
Courtesy of Dr. Esteban Veiga, Dept. of Cellular Biology and Infection, Institute Pasteur, Paris.

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. The dark current measurement is averaged over the sensor area excluding any regions of blemishes.
4. Using Electron Multiplication (EM) the iXon3 is capable of detecting single photons, therefore the true camera detection limit is set by the number of 'dark' background events. These background events consist of both residual thermally generated electrons and Clock Induced Charge (CIC) electrons (also referred to as Spurious Charge), each appearing as random single spikes that are well 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 (35 MHz readout; frame-transfer mode; 1 µs vertical clock speed; x 1000 EM gain; 10 ms exposure; -85°C).
5. 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.
6. Linearity is measured from a plot of counts vs exposure time under constant photon flux up to the saturation point of the system.
7. All measurements are made with 0.5 µs vertical clock speed. It also assumes internal trigger mode of operation.
8. Quantum efficiency of the sensor at 20°C, as measured by the sensor Manufacturer.

Recommended Computer Requirements:

- 3.0 GHz single core or 2.6 GHz multi core processor
- 2 GB RAM
- 100 MB free hard disc to install software (at least 1GB recommended for data spooling)
- PCI 2.2 or PCIe slot
- 10,000 rpm SATA hard drive preferred for extended kinetic series (SATA RAID 0 recommended, e.g. Seagate Barracuda, Western Digital Caviar RE or VelociRaptor, etc.)
- Windows (XP, Vista and 7) or Linux

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

110 - 240 VAC, 50/60 Hz

LiXon3885SS 0311 R2