

## Features and Benefits

- 24 x 24 µm pixel size**  
 Excellent dynamic range and photon collection area
- TE cooling to -100°C**  
 Critical for elimination of dark current detection limit
- QE<sub>max</sub> 95% from back-illuminated sensor**  
 Highest photon collection efficiency
- Ultra low noise readout**  
 Intelligent low-noise electronics offer the most 'silent' system noise performance available
- Multi-Megahertz pixel readout**  
 High frame rates achievable
- UltraVac™ \*1**  
 Critical for sustained vacuum integrity and to maintain unequalled cooling and QE performance, year after year
- USB 2.0 connection**  
 Simple Plug & Play connection
- Integrated shutter**  
 C-mount shutter as standard. Closed during readout to avoid vertical smear
- Windows, Linux & Labview**  
 Andor's user-friendly SDK supports both Windows and Linux OS. Labview VI package available
- Integrated in EPICS**  
 Platform is fully integrated into the EPICS control software

## Very High Well Depth and Superb Photon Collection

Andor's back-illuminated iKon M 912 camera offers the ultimate in dynamic range and photon sensitivity, by virtue of a large 24 µm, high well depth pixel architecture. The camera also offers a QE<sub>max</sub> of 95% and exceptionally low readout noise.

The iKon-M 912 benefits from negligible dark current with industry-leading thermoelectric cooling down to -100°C, enabling use of significantly longer exposure times than offered by any other camera on the market using this same sensor. The iKon-M platform offers Multi-Megahertz readout for more rapid acquisition or fast focusing, along with direct USB 2.0 connectivity to PC.

## Specifications Summary

Active pixels	512 x 512
Sensor size	12.3 x 12.3 mm
Pixel size (W x H)	24 µm x 24 µm
Active area pixel well depth	300,000 e <sup>-</sup>
Maximum readout rate	5 MHz
Read noise	3 e <sup>-</sup>
Maximum cooling	-100°C
Frame rate	14.4 fps (full frame)

## System Specifications<sup>\*2</sup>

Sensor options	BV: Back Illuminated CCD, Vis optimized
Active pixels	512 x 512
Pixel size	24 x 24 µm
Image area	12.3 x 12.3 mm with 100% fill factor
Minimum temperatures <sup>*3</sup> Air cooled Coolant recirculator Coolant chiller, coolant @ 10°C, 0.75l/min	-80°C -95°C -100°C
Digitization	16-bit
Blemish specifications	Grade 1 sensor from supplier. Camera blemishes as defined by Andor Grade A: <a href="http://www.andor.com/learning-academy/ccd-blemishes-and-non-uniformities-black-pixels-and-hot-pixels-on-a-ccd-sensor">www.andor.com/learning-academy/ccd-blemishes-and-non-uniformities-black-pixels-and-hot-pixels-on-a-ccd-sensor</a>
System window type	UV-grade fused silica, 'Broadband VIS-NIR', wedged
Interface	USB 2.0
Lens mount	C-mount

## Advanced Performance Specifications<sup>\*2</sup>

Dark current, e <sup>-</sup> /pixel/sec <sup>*4</sup> @ -80°C @ -100°C	0.0011 0.0006
Pixel readout rates	5.0, 3.0, 1.0, 0.05 MHz
Active area pixel well depth	300,000 e <sup>-</sup>
Read noise (e <sup>-</sup> ) <sup>*5</sup>  0.05 MHz 1.0 MHz 3.0 MHz 5.0 MHz <sup>*8</sup>	  3.0 8.0 13.2 18.2
Linearity <sup>*6</sup>	Better than 99%

## Frame Rates<sup>\*7</sup>

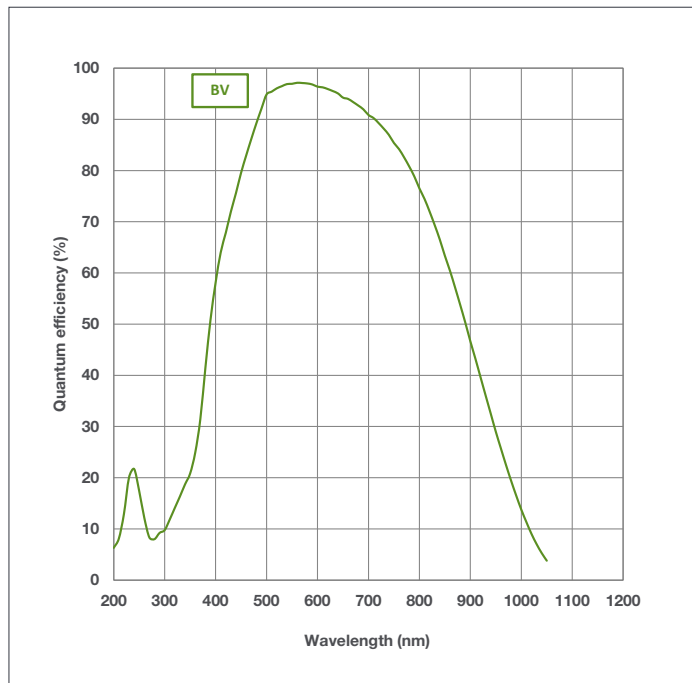
50 kHz				
Binning	Full Frame	256 x 256	128 x 128	64 x 64
1 x 1	0.18	0.36	0.72	1.39
2 x 2	0.69	0.93	1.57	2.78
4 x 4	2.36	2.1	3.14	5.12
8 x 8	6.56	4.19	5.71	8.55
16 x 16	12.85	7.39	9.33	12.69

1.0 MHz				
Binning	Full Frame	256 x 256	128 x 128	64 x 64
1 x 1	3.49	6.73	12.58	22.28
2 x 2	10.24	14.91	23.83	37.09
4 x 4	23.64	27.67	38.93	53.71
8 x 8	40.85	43.23	55.07	68.49
16 x 16	55.49	58.0	68.73	79.19

3.0 MHz				
Binning	Full Frame	256 x 256	128 x 128	64 x 64
1 x 1	9.37	17.25	29.74	46.66
2 x 2	16.83	29.12	45.87	64.43
4 x 4	27.95	44.4	62.97	79.55
8 x 8	41.74	60.2	77.34	90.17
16 x 16	55.4	73.26	87.34	96.62

5.0 MHz (Visualisation Mode) <sup>*8</sup>				
Binning	Full Frame	256 x 256	128 x 128	64 x 64
1 x 1	14.43	25.53	41.49	60.35
2 x 2	24.62	40.29	59.07	77.04
4 x 4	38.07	56.66	74.96	89.37
8 x 8	52.38	71.12	86.58	97.18
16 x 16	64.47	81.5	93.9	101.63

## Quantum Efficiency Curves <sup>9</sup>



## Have you found what you are looking for?

**Need a larger sensor?** The iKon-L 936 houses a 4 megapixel, back-illuminated CCD sensor (27.6 mm x 27.6 mm), cooling to -100°C, low noise performance and up to 5 MHz readout.

**Need the ultimate in sensitivity?** The iXon back-illuminated EMCCD series offers > 90% QE and single photon sensitivity, combined with fast frame rate performance.

**Need faster frame rates?** The Neo and Zyla sCMOS deliver up to 100 frames/sec (full frame).

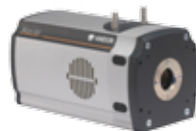
**Need smaller pixels?** Check out the the Neo and Zyla sCMOS.

**Need sensitive performance in the red/NIR with zero fringing (etaloning)?** The iKon-M 934 BEX2-DD is a deep depletion CCD with superb red/NIR quantum efficiency, also incorporating fringe suppression technology. The single photon sensitive iXon EMCCD cameras also offers excellent sensitivity across the red/NIR wavelength region with zero fringing.

**Need a customised version?** Please contact us to discuss our Customer Special Request options.

**Check out Andor's New Neo and Zyla sCMOS.** *Simultaneously* offering, ultra-sensitivity, high speed, high-resolution, large field of view & high dynamic range!

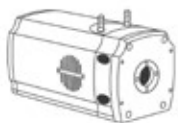
## Creating The Optimum Product for You



DU912P-BV



### Step 1. Select the Camera Type



Camera Type

Description	Code
iKon-M 912 Camera, Back Illuminated CCD, Vis optimized	DU912P-BV

### Step 2. 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 can be found in the Technical note – 'Camera Windows: Optimizing for Different Spectral Regions'.

### Step 3. Select the required accessories and adapters



Accessories & Adapters

Description	Order Code
Re-circulator for enhanced cooling performance	XW-RECR
Oasis 160 Ultra compact chiller unit	ACC-XW-CHIL-160
C-mount to Canon FD-mount adapter	OA-CCFM
C-mount to Nikon F-mount adapter	OA-CNAF
C-mount to Olympus OM adapter	OA-COFM
C-mount to T-mount adapter	OA-CTOT
Auto extension tubes (set of 3) for Canon EF	OA-ECAF
Auto extension tubes (set of 3) for C-mount	OA-ECMT
Auto extension tubes (set of 3) for Nikon F	OA-ENAF
USB Extender: Icron USB 2.0 Ranger 2201 (100 m) - EU/UK/US	ACC-USBX-EU ACC-USBX-UK ACC-USBX-US

### Step 4. Select the required software



Software

**The iKon-M requires at least one of the following software options:**

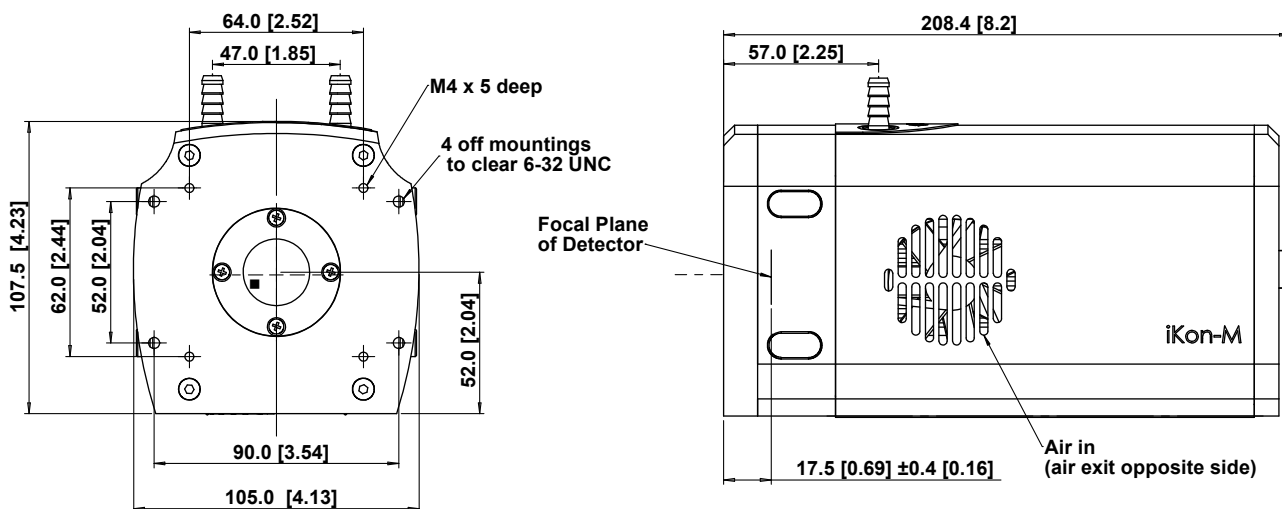
**Solis for Imaging** A 32-bit and fully 64-bit enabled application for Windows (XP, Vista, 7 and 8) Linux and Labview, offering rich functionality for data acquisition and processing. AndorBasic provides macro language control of data acquisition, processing, display and export.

**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, 7 and 8), compatible with C/C++, C#, Delphi, VB6, VB.NET, LabVIEW and Matlab. Linux SDK compatible with C/C++.

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

## Product Drawings

Dimensions in mm [inches]



■ = position of pixel 1,1

Weight: 2.2 kg [4 lb 13 oz]

## Connecting to the iKon-M

### Camera Control

Connector type: USB 2.0

### TTL / Logic

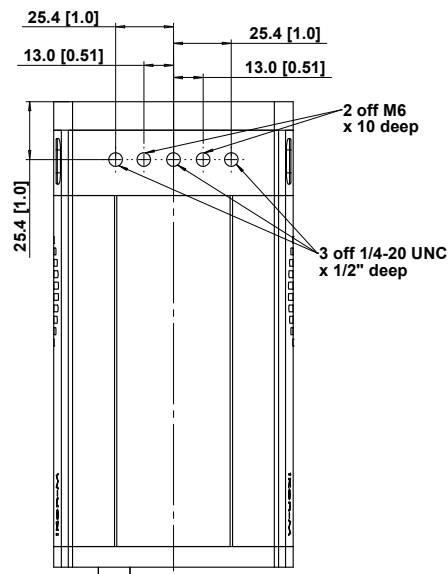
Connector type: SMB, provided with SMB - BNC cable  
Fire (Output), External Trigger (Input), Shutter (Output)

### I<sup>2</sup>C connector

Compatible with Fischer SC102A054-130  
Shutter (TTL), I<sup>2</sup>C Clock, I<sup>2</sup>C Data, +5 Vdc, Ground

### Minimum cable clearance required at rear of camera

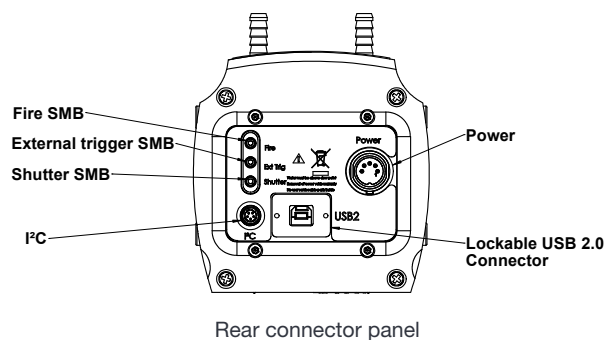
90 mm



Mounting hole locations

## Typical Applications

- ✓ Astronomy
- ✓ Bioluminescence/Chemiluminescence
- ✓ Absorption measurement
- ✓ Photon Emission Microscopy
- ✓ Hyper-Spectral Imaging
- ✓ Laser Induced Fluorescence (LIF)
- ✓ Brewster Angle Microscopy (BAM)



Rear connector panel



## 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 regional sales offices, please see: [www.andor.com/contact](http://www.andor.com/contact)

Our regional headquarters are:

### Europe

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

### Japan

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Phone +81 (3) 6732 8968  
Fax +81 (3) 6732 8939

### North America

Concord, MA, USA  
Phone +1 (860) 290 9211  
Fax +1 (860) 290 9566

### China

Beijing  
Phone +86 (10) 8271 9066  
Fax +86 (10) 8271 9055

### Items shipped with your camera

- 1x 2 m BNC - SMB connection cable
- 1x 3 m USB 2.0 cable Type A to Type B
- 1x Power supply with mains cable
- 1x Quick launch guide
- 1x CD containing Andor user guides
- 1x Individual system performance booklet

**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 material.
2. Figures are typical unless otherwise stated.
3. Specified minimum air cooled temperature assumes ambient temperature of 25°C. Specified minimum temperature with coolant assumes coolant temperature of 10°C.
4. The dark current measurement is averaged over the sensor area excluding any regions of blemishes.
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 -80°C and minimum exposure time under dark conditions.
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. The frame rates shown are for a range of binning or array size combinations. All measurements are made with 11.29 μs vertical shift speed. It also assumes internal trigger mode of operation and minimum exposure time.
8. 5 MHz is for focusing/visualization mode only.
9. Quantum efficiency of the sensor at 25°C as supplied by the sensor manufacturer.



### Minimum Computer Requirements:

- 3.0 GHz single core or 2.4 GHz multi core processor
- 2 GB RAM
- 100 MB free hard disc to install software (at least 1GB recommended for data spooling)
- USB 2.0 High Speed Host Controller capable of sustained rate of 40MB/s
- Windows (XP, Vista, 7 and 8) 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

- 100 - 240 VAC, 50 - 60 Hz



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LabVIEW is a registered trademark of National Instruments.  
MATLAB is a registered trademark of The MathWorks Inc.

LiKonM912SS 0716 R1