ANDOR

Zyla sCMOS

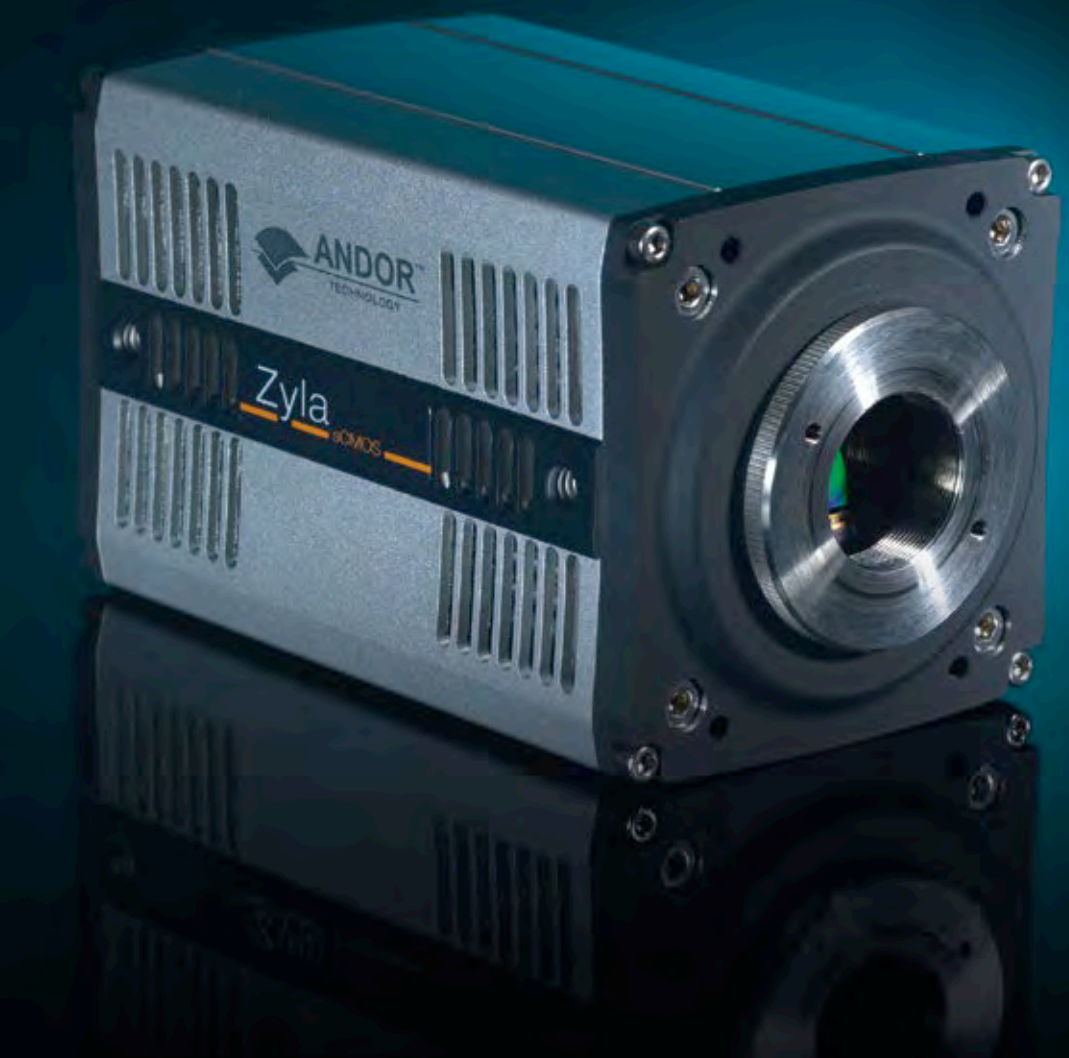
WIDEN YOUR EXPECTATIONS

INTRODUCING
THE NEW ZYLA 4.2!

- 4.2 megapixel
- 72% QE
- 0.9 e^- read noise
- 0.14 e^-/p/sec darkcurrent
- 100 fps
- 33,000:1 dynamic range

ZYLA 5.5

- 5.5 megapixel
- Rolling & True Global Shutter
- 1.2 e- read noise
- 0.14 e^-/p/sec darkcurrent
- 100 fps
- 25,000:1 dynamic range



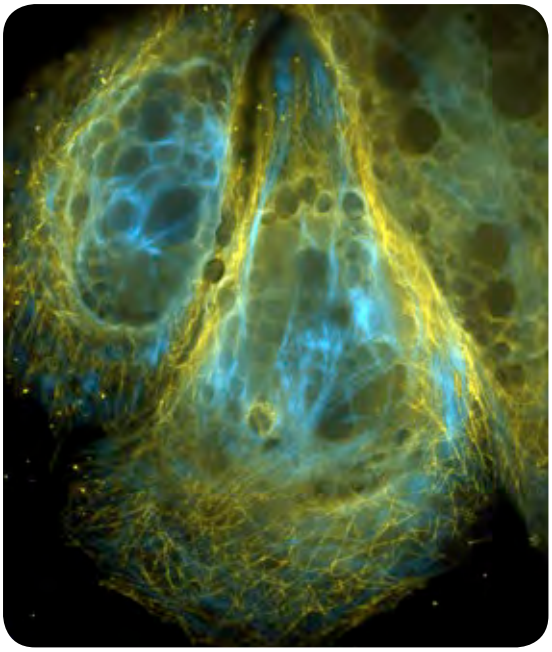
INTRODUCING ZYLA sCMOS

Andor's Zyla sCMOS camera platform offers high speed, high sensitivity, high resolution imaging performance in a remarkably light and compact, thermoelectrically-cooled design, integrating perfectly into both research and OEM applications alike. Zyla is ideally suited to many cutting edge experiments that push the boundaries of speed and sensitivity, offering sustained performance of up to 100 fps, faster with ROIs, and read noise down to 0.9 e^-. Zyla's unique Dark Noise Suppression (DNS) Technology ensures the low noise advantage is maintained over a wide range of exposure conditions.

However, the unprecedented value and flexibility of the Zyla means it is also re-defining the concept of a 'workhorse' camera, for instance, rapidly displacing interline CCDs as the gold standard microscope detector.

Zyla Sensor Variants

The Zyla sCMOS platform offers two distinct model choices, differing by the characteristics of the integrated sensor variants.



sCMOS image courtesy of Ulrike Engel, PhD
Nikon Imaging Center, Heidelberg

New!

Zyla 4.2

Offering the highest QE available from sCMOS technology, coupled with extremely low read noise and 100 fps frame rate, Zyla 4.2 is ideal for applications such as TIRF, super-resolution microscopy, light sheet microscopy and ion signalling.

- **4.2 megapixel**
- **72% QE**
- **0.9 e^- read noise**
- **0.14 e^-/p/sec darkcurrent**
- **100 fps**
- **33,000:1 dynamic range**
- **Ultra low fan vibration**

The 4.2 Megapixel sensor has 6.5 µm pixels and blazes along at up to 100 fps with 16-bit data range. Andor have optimized read noise in this sensor to deliver down to 0.9 e^- (median) / 1.4 e^- (rms). The '4T' (4-transistor) design of the sensor pixel permits more photons to enter, driving Quantum Efficiency up to 72 % (@ 580nm). The 4T design also means that it is fundamentally a Rolling Shutter sensor. However, a feature called 'Global Clear' has been implemented, which allows for a *simulated* Global Exposure mode, requiring TTL communication between the camera and a pulsed light source.

Zyla 5.5

Zyla 5.5 is truly unique in offering both Rolling and true Global shutter capability in one sensor. Global shutter offers 'snapshot' imaging capability, whereby all pixels in the area are exposed simultaneously, and is directly analogous to that which is available in interline CCDs. Global Shutter offers greater application flexibility and is ideal for tight synchronization with microscope peripheral devices such as z-stage or switchable light source.

- **5.5 megapixel**
- **Rolling & *True* Global Shutter**
- **1.2 e^- read noise**
- **0.14 e^-/p/sec darkcurrent**
- **100 fps**
- **25,000:1 dynamic range**

This 5.5 Megapixel sensor also has 6.5 µm pixels and delivers up to 100 fps. Read noise is maintained at a very low value of 1.2 e^- (median) / 1.7 e^- (rms). The '5T' (5-transistor) design of the sensor pixel carries the distinct advantage of offering both Rolling and *true* Global Shutter, readily selectable from within software.

FEATURES & BENEFITS

Feature	Benefit
~ 1 e⁻ Read Noise	Noise floor down to 0.9 e⁻. Lower detection limit than any CCD
Dark Noise Suppression (DNS) technology	Extremely competitive low darkcurrent of 0.14 e/pix/sec with fan cooling. Maintains low noise advantage across range of exposure conditions.
High and Broad QE	Excellent photon capture. 72% QE from Zyla 4.2; 60% QE from Zyla 5.5
Rapid Frame Rates	100 fps sustained (full frame).
5.5 & 4.2 megapixel sensor formats & 6.5 µm pixels	Extremely sharp resolution over a 22 mm (Zyla 5.5) and 19 mm (Zyla 4.2) diagonal field of view. Ideal for cell microscopy, astronomy and area scanning applications.
Rolling and Global shutter (Zyla 5.5)	Maximum exposure and readout flexibility across all applications. Global Shutter for 'interline CCD mode' freeze frame capture of fast moving/changing events.
Dual-Gain Amplifiers	Extended dynamic range of up to 33,000:1.
Ultra Low Fan Vibration (NEW for Zyla 4.2)	Designed with vibration sensitive experiments in mind, such as super-resolution microscopy.
TE cooling to 0°C in 35 °C ambient	Ideal for OEM integration into enclosed systems.
Water Cooled Option	Zyla 5.5 and Zyla 4.2 available as water cooled variant, for absolute lowest vibration and -10°C cooling / reduced darkcurrent.
Compact and Light	Ideal for integration into space restrictive set-ups. Ideal for OEM.
Extensive FPGA on-head data processing	Essential to ensure best image quality and quantitative fidelity.
Dynamic Baseline Clamp	Ensure quantitative stability.
Hardware Timestamp	FPGA generated timestamp with 25ns accuracy.
iCam	Fast exposure switching time with minimal overheads, ideal for multi-channel microscopy.

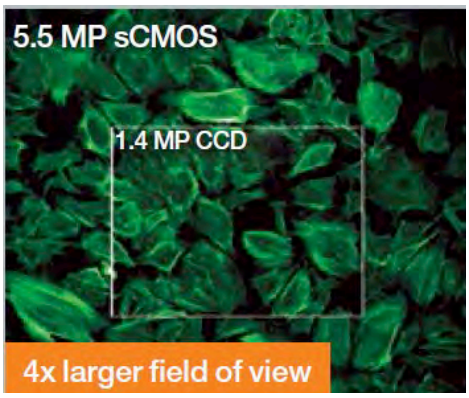
Upgrade your microscope performance using Zyla sCMOS

Zyla remains within the same price bracket as interline CCDs, yet offers remarkable performance improvements:

- 4x more pixels
- 5x more sensitive
- 10x more dynamic range
- 16x faster

Can the '4T' sensor variant be described as 'Gen II'?

The 4T sensor, utilized in Zyla 4.2, is being strongly positioned elsewhere in the market as a 'Gen II' sensor. Andor would offer the view that it is misleading to apply such an aggressive claim to what is a relatively minor variation on the pixel design, especially as both 4T (rolling shutter) and 5T (global shutter) CMOS concepts have been around for some time and are well documented. While a 4T design can be considered beneficial in affording an improved QE response, it does so at the expense of true Global Shutter capability. This trade-off should be borne in mind when making an informed, application based decision.



Zyla
THE BIOLOGIST'S CHOICE

Zyla sCMOS has proven a superb camera choice for the biologist and microscopist. Many simply see the Zyla as an **amazing value**, superb price/performance 'workhorse' camera with which to replace their existing interline CCD and **upgrade** the performance of their fluorescence microscope. Others are driven by distinct **application performance criteria** that only sCMOS can answer.

Quality, Throughput, Performance, Accessibility…

- **High Sensitivity & Wide Dynamic Range** – quantify very weak and very bright structures with one image.
- **Superb Image Quality** – high resolution and uniform backgrounds for publication quality imaging.
- **Capture Everything** – the larger field of view matches that of modern microscopes. Achieve better statistics and higher throughout in high content experiments.
- **Blazingly Fast** – more and more studies of cell processes require greater temporal resolution.
- **Ease of use** – designed to get you up and imaging with minimal fuss.
- **Flexible** – fast or slow, big or small, weak or bright… Zyla is adaptable for all of your imaging challenges.

Example Areas of Application

Physiology / Ion Imaging
The fast frame rate and excellent sensitivity of Zyla is ideally suited to the particular needs of ion signalling microscopy. Zyla 4.2 offers superlative sensitivity at speed, but electrophysiology may require the Global Shutter exposure mode of Zyla 5.5 to ensure temporal correlation across the whole image.

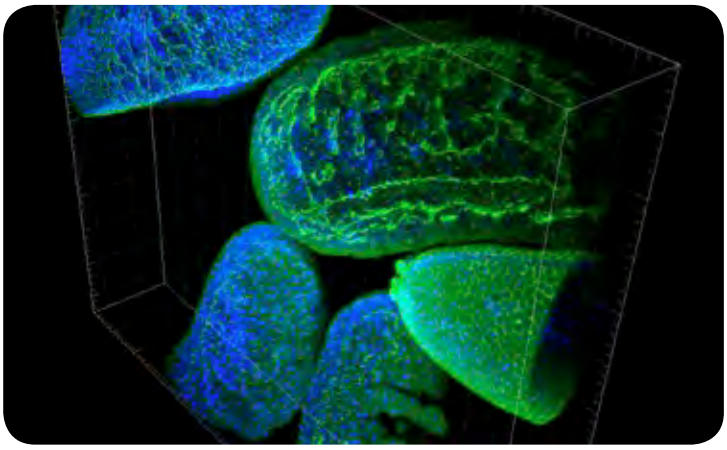
Super Resolution Microscopy
The low vibration, high QE, low noise and speed capability of Zyla 4.2 is well suited to the particular detection criteria of single molecule based 'STORM / PALM' approaches, and is used by some as an alternative to EMCCDs for this purpose. Note, this should be considered distinct from the general needs of single molecule microscopy, which are best served by back-illuminated EMCCD cameras (see Andor iXon EMCCD range).

Cell Motility
The motile cell is captured extremely well by the speed and resolution of the Zyla. Generally, the rolling shutter of Zyla 4.2 is suited, but care must be taken of distortive effects if the cell is moving particularly fast. For example, it has been noted that the Zyla 5.5 in global shutter mode was required to image motile sperm cells.

Developmental / Embryo
The large field of view and high pixel resolution of Zyla is very suited to embryo imaging. Furthermore, Andor sCMOS cameras have been at the forefront of innovative **Light Sheet Microscopy** development.

High Content Screening
Zyla sCMOS yields markedly improved throughput and statistical validity of data in high content analysis. For example, a larger field of view results in analysis of more cells per image, wider dynamic range means a field of variable intensity cells can be quantified in only one acquisition, and higher sensitivity results in reduced acquisition times.
For further information, view this article: highcontentreview.com/scmos/

TIRF Microscopy
The Zyla's fine pixel resolution, great sensitivity, large field of view and fast imaging speed offers a superb choice of platform for following/tracking fast processes at the cell membrane. Multi-wavelength TIRF may benefit from Zyla 5.5 in global shutter.



Other biological applications include:
Neuroscience, Vesicle Transport, Parasitology, Blood Flow, Ophthalmology

Zyla
THE PHYSICIST'S CHOICE

Zyla sCMOS has become a well established detector amongst physicists, biophysicists and astronomers, the advanced combination of speed, sensitivity and dynamic range enabling new ground to be broken.

Performance & Adaptability

- **Dual Amplifier** – novel pixel architecture means you don't need to pre-select gain. Access lowest read noise and full well depth simultaneously.
- **1000 fps** – Access extremely fast frame rates through user definable Region of Interest control, suited to many applications within the physical sciences.
- **Global Shutter** – Zyla 5.5 offers this important mode that completely avoids spatial distortion, and ensures temporal correlation across all regions of the sensor.
- **Low darkcurrent** – low read noise is complimented by extremely competitive darkcurrent, also ensuring minimized hot pixel blemishes.
- **Cooling options** – standard Zyla 5.5 camera air cools to 0ºC at up to +35ºC ambient. Water cooled option available on request.
- **Blemish correction maps and advanced control** – upon request, Andor provide bespoke capability to turn off/on blemish correction, for those who prefer to perform this themselves. Blemish maps can be provided.
- **Compact and Light** – the extremely small volume footprint of Zyla renders it adaptable to intricate optical set-ups.

Example Areas of Application

Lucky / Speckle Imaging
Zyla's fast frame rate and large field of view are ideal for this resolution enhancing technique.

Solar Astronomy
Fast frame rates, wide dynamic range and great linearity present a very formidable solution to the specific detector needs of next generation large solar telescopes.

Bose Einstein Condensation
The QE profile of Zyla is very good in the red/NIR region, ideal for BEC of Rb.

Adaptive Optics
Accessing > 1000 fps using ROIs renders the Zyla an ideal Wavefront detector. Use with data splitter to enable direct data access.

Fluorescence Correlation Spectroscopy
Superb temporal resolution from small ROIs are excellent for accurately measuring diffusion coefficients.

X-ray / Neutron Tomography
The Zyla can be readily lens coupled to scintillators and phosphors, presenting a high resolution, sensitive and fast solution for tomography.*

sCMOS image courtesy of Jin Ma, Xinglong Observatory
National Astronomical Observatory of Chinese Academy of Sciences

***Fiber-Optic coupled Zyla**
Please enquire for details on Andor's new Fiber-Optic coupled Zyla

ROLLING & GLOBAL SHUTTER

The Zyla 5.5 uniquely offers both Rolling and *true* Global Shutter exposure modes. This provides superior application and synchronization flexibility and the ability, through global exposure, to closely emulate the familiar 'Snapshot' exposure mechanism of interline CCDs.

Key Benefits of *True* Global Exposure

Global exposure in particular is viewed as an important mode for the biologist, as it's benefits are deeply synergistic with the core imaging requirements of live cell microscopy.

- **NO Spatial Distortion** – avoiding the spatial distortion risk of rolling exposure
- Recommended for **3D / 4D microscopy** – Tight syncing to **peripheral switching devices**
- **Higher Signal to Noise** due to **reduced dead time** – the entire exposure cycle can be used
- **Simplicity** – all the benefits of an **'interline exposure mode'**
- **Continuous or Pulsed** light sources

'Simulated' Global Exposure in Zyla 4.2

Click here to read more about this mode and other Frequently Asked Questions on Rolling and Global Exposure modes.

Rolling & Global Shutter Mechanisms

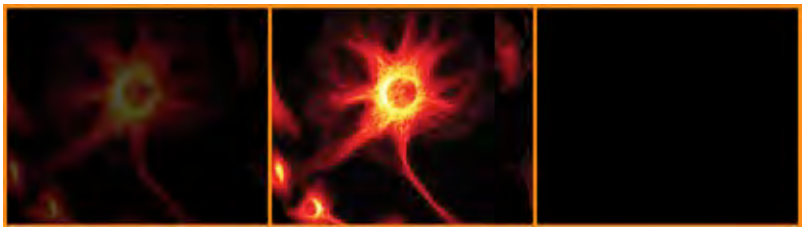
Rolling and *true* Global Shutter modes describe two distinct types of exposure and readout sequence.

In rolling shutter, available in Zyla 4.2 and Zyla 5.5, different lines of the array are exposed at different times as the read out 'wave' sweeps through the sensor. 10 ms is required at the start to 'activate' the sensor to expose, and then 10 ms is required at the end to readout the sensor. Use when not synchronizing to peripheral devices AND only when there is a minimal risk of spatial distortion from moving samples.

In *true* global shutter, available in Zyla 5.5, each pixel in the sensor begins the exposure simultaneously and ends the exposure simultaneously. This provides a true 'Snapshot' exposure capability for moving samples that is both 'photon-efficient' and easy to synchronize to, especially useful for 3D / 4D microscopy. Zyla 4.2, while utilizing a rolling shutter sensor, offers a *Simulated* Global Exposure mechanism to overcome risk of spatial distortion. This mechanism is more elaborate and less photon/time efficient than *true* Global Shutter.

Click here to read more about Rolling and Global shutter modes on our Zyla camera.

Global Shutter exposure and readout (single scan)



Exposure Start | Exposure | Exposure End

Rolling Shutter exposure and readout (single scan)

Exposure Start | Exposure | Readout

For further information of Rolling and Global Shutter, please access the following technical notes through the Andor Learning Centre: 1) Rolling and Global Shutter 2) Synchronizing to Rolling and Global Shutter sCMOS cameras

sCMOS or EMCCD?

Since the market introduction of sCMOS technology by Andor, the question of the performance comparison against the more established Electron Multiplying CCD (EMCCD) has been common.

Being a very fast, low noise technology, sCMOS does hold some potential to offer an alternative technology to these single photon sensitive detectors across some applications and techniques, including to an extent, super-resolution microscopy and TIRF microscopy. Whilst the read noise of sCMOS is very low compared to CCDs, EMCCD technology holds the distinct advantage of being able to practically eliminate read noise, rendering them single photon sensitive.

After the first few years of sCMOS being in the market, we are concluding that the primary applications for which EMCCDs were originally purchased, such as single molecule detection and low light spinning disk confocal microscopy, are continuing to benefit from this ultrasensitive technology. EMCCDs offer a raw sensitivity that cannot be surpassed in the very low light regime. However, EMCCDs remain relatively expensive, so they will always be considered a more selective, 'high-end' solution.

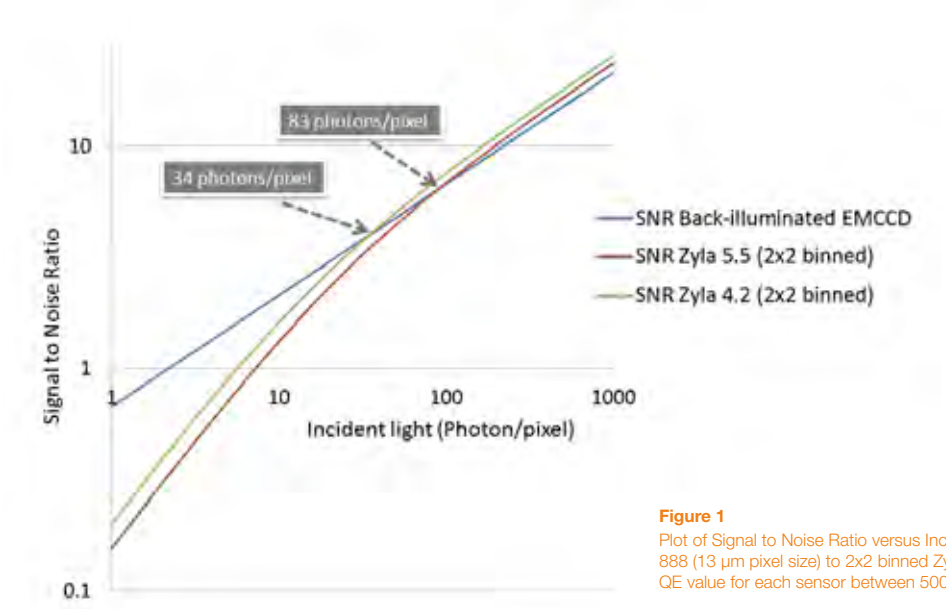


Figure 1
Plot of Signal to Noise Ratio versus Incident Photon Intensity, comparing back-illuminated EMCCD iXon 888 (13 µm pixel size) to 2x2 binned Zyla sCMOS cameras (13 µm pixel size after binning). An average QE value for each sensor between 500-750 nm was used.

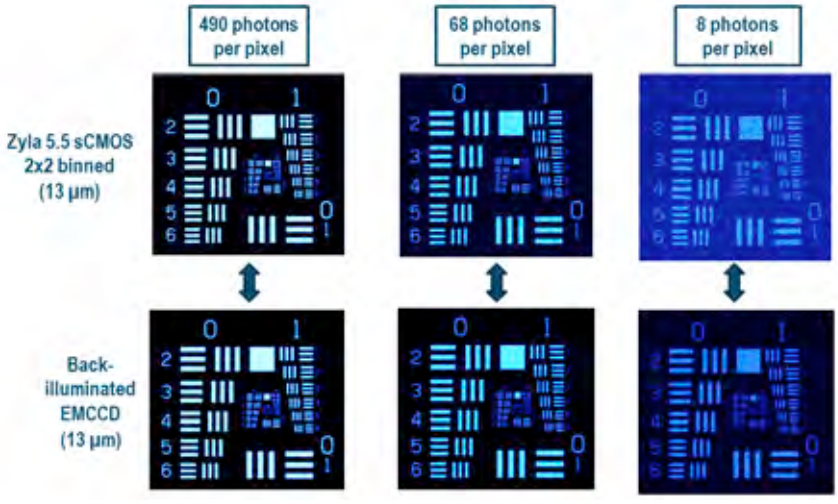


Figure 2
Images at a range of incident light intensity, acquired using back-illuminated EMCCD iXon 888 and Zyla 5.5 sCMOS cameras (2x2 binned pixels). At low light intensities, the Signal to Noise Ratio advantage of the EMCCD is apparent

MODEL SPECIFIC SPECIFICATIONS[•1]

Model	Zyla 5.5			Zyla 4.2	
Sensor type	Front Illuminated Scientific CMOS			Front Illuminated Scientific CMOS	
Active pixels (W x H)	2560 x 2160 (5.5 Megapixel)			2048 x 2048 (4.2 Megapixel)	
Sensor size	16.6 x 14.0 mm 21.8 mm diagonal			13.3 x 13.3 mm 18.8 mm diagonal	
Pixel readout rate (MHz)	200 (100 MHz x 2 sensor halves) 560 (280 MHz x 2 sensor halves)			Slow Read 216 (108 MHz x 2 sensor halves) Fast Read 540 (270 MHz x 2 sensor halves)	
		Rolling Shutter	**Global Shutter**		**Rolling Shutter**
Read noise (e^-) Median [rms] [•2]	@ 200 MHz	1.2 [1.7]	2.4 [2.7]	@ 216 MHz	0.90 [1.4]
	@ 560 MHz	1.45 [1.8]	2.6 [2.9]	@ 540 MHz	1.10 [1.6]
Maximum Quantum Efficiency [•3]	60%			72%	
Sensor Operating Temperature					
Air cooled	0°C (up to 35°C ambient)			0°C (up to 27°C ambient)	
Water cooled	-10°C (10°C water)			-10°C (10°C water)	
Dark current, e^-/pixel/sec @ min temp [•4]					
Air cooled	0.14			0.14	
Water cooled	0.04			0.04	
Readout modes	Rolling Shutter and True Global Shutter (Snapshot)			Rolling Shutter and Global Clear [•8]	
Maximum dynamic range	25,000:1			33,000:1	
Photon Response Non-Uniformity (PRNU)	< 0.5%			< 0.1%	
Pre-defined Region of Interest (ROI)	2048 x 2048, 1920 x 1080, 1392 x 1040, 512 x 512, 128 x 128			1920 x 1080, 1392 x 1040, 512 x 512, 128 x 128	
User defined ROI granularity	1 pixel *				
Data range	12-bit and 16-bit			12-bit and 16-bit	
Interface options	Camera Link 3-tap Camera Link 10-tap			Camera Link 10-tap	

* Minimum ROI size possible: 16 x 12 in 12-bit mode and 12 x 12 in 16-bit mode

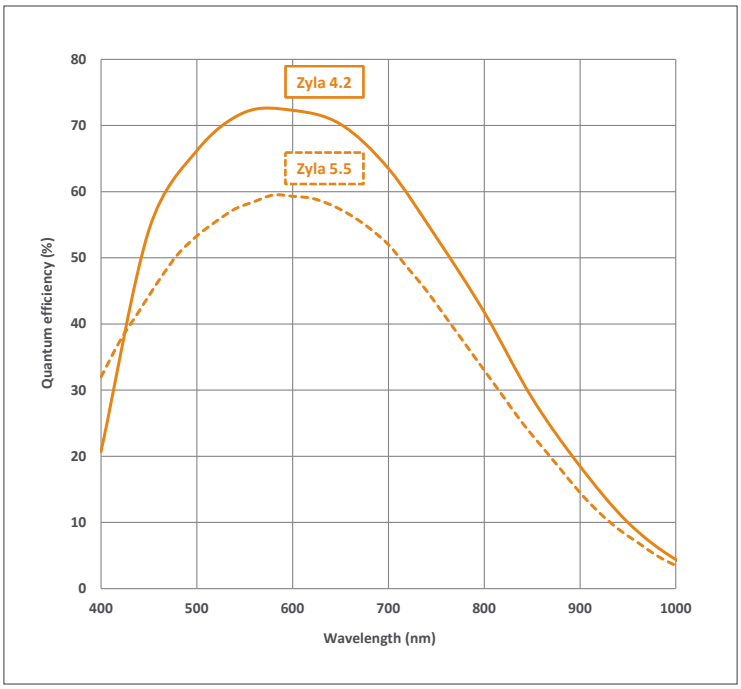
GENERAL SPECIFICATIONS[•1]

Pixel size (W x H)	6.5 µm
Pixel well depth (e^-)	30,000
Linearity (%, maximum) [•5]	Better than 99%
MTF (Nyquist @ 555 nm)	45%
Pixel binning	Hardware binning: 2 x 2, 3 x 3, 4 x 4, 8 x 8
I/O	External Trigger, Fire, Fire n, Fire All, Fire Any, Arm
Trigger Modes	Internal, External, External Start, External Exposure, Software Trigger
Software Exposure Events[•6]	Start exposure - End exposure (row 1), Start exposure - End exposure (row n)
Hardware timestamp accuracy	25 ns
Anti-blooming factor	x 10,000

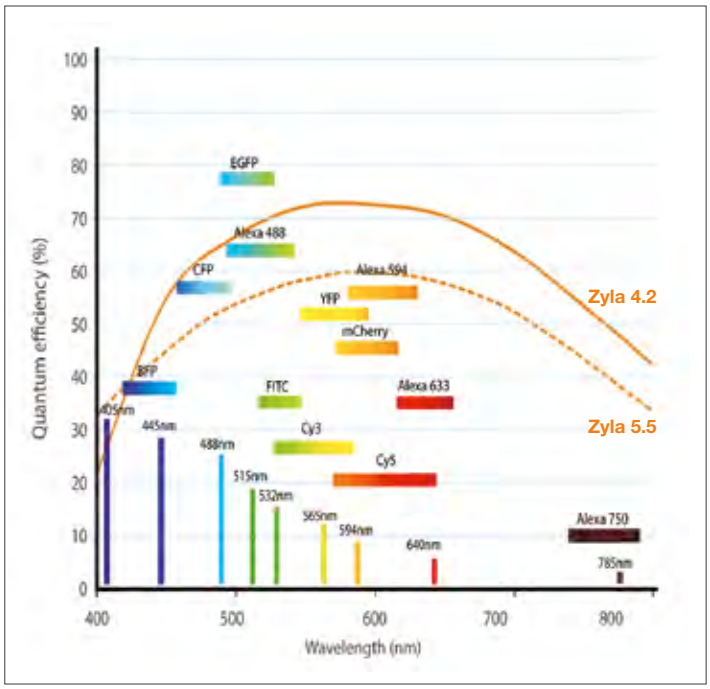
MAXIMUM FRAME RATE TABLE[•7]

Array Size	Zyla 5.5 3-tap		Zyla 5.5 10-tap		Zyla 4.2 10-tap
	Rolling Shutter	Global Shutter	Rolling Shutter	Global Shutter	Rolling Shutter
2560 x 2160	**30**	**30**	**100**	**50**	**-**
2048 x 2048	**39**	**39**	**105**	**52**	**100**
1920 x 1080	**80**	**80**	**198**	**97**	**189**
512 x 512	**419**	**201**	**419**	**201**	**398**
128 x 128	**1,639**	**721**	**1,639**	**721**	**1,559**

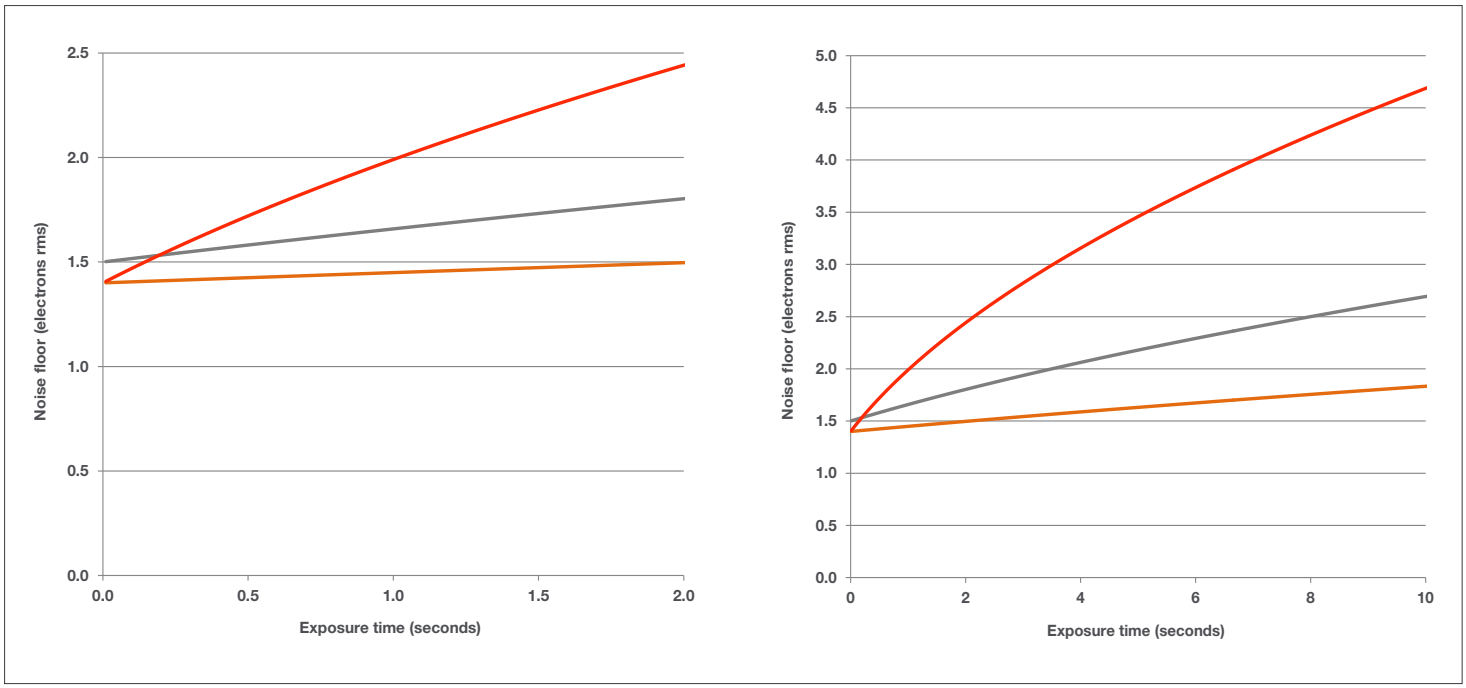
QUANTUM EFFICIENCY (QE) CURVE [3]



QE VS. FLUOROPHORE EMISSIONS



EXPOSURE TIME VS. SIGNAL TO NOISE PLOTS (AIR COOLED)



CREATING THE OPTIMUM PRODUCT FOR YOU

How to customize the Zyla:

Step 1.

Quote the camera type.

Step 2.

Please indicate which software you require.

Step 3.

Please indicate which accessories are required.

Step 1.

Choose camera type:

ZYLA-4.2-CL10	4.2 Megapixel, Rolling shutter, 100 fps, Camera Link 10-tap
ZYLA-5.5-CL3	5.5 Megapixel, Rolling and Global shutter, 30 fps, Camera Link 3-tap
ZYLA-5.5-CL10	5.5 Megapixel, Rolling and Global shutter, 100 fps, Camera Link 10-tap

*For water cooled option, add **-W** to your selected camera code*

Step 2.

The Zyla also requires at least one of the following software options:

Solis Imaging A 32-bit application compatible with 64 and 32-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 iQ A comprehensive multi-dimensional imaging software package. Offers tight synchronization of the camera with a comprehensive range of microscopy hardware, along with comprehensive rendering and analysis functionality. Modular architecture for best price/performance package on the market.

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++, LabView and Matlab.

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

Step 3.

The following accessories are available:

ACC-MEC-05609 CS-mount adapter

ACM-05574 F-mount adapter

OA-ECMT Auto extension tubes (set of 3) for C-mount

OA-ENAF Auto extension tubes (set of 3) for Nikon AF

ACC-ASE-02992 5 meter Camera Link connector cable. Note, order x2 if using with Zyla Camera Link 10-tap models.

ACC-ASE-06931 10 meter active Camera Link connector cable, including power supply. For use with Zyla 5.5 3-tap Camera Link model.

ACC-ASE-06962 10 meter active Camera Link connector cable, including power supply. For use with Zyla 10-tap Camera Link models.

ACC-ZYLFOX-3TAP-30M 30 meter fibre-optic extender solution for use with Zyla 5.5 Camera Link 3-tap model.

ACC-ZYLFOX-3TAP-100M 100 meter fibre-optic extender solution for use with Zyla 5.5 Camera Link 3-tap model.

ACC-ZYLFOX-10TAP-30M 30 meter fibre-optic extender solution for use with Zyla Camera Link 10-tap models.

ACC-ZYLFOX-10TAP-100 100 meter fibre-optic extender solution for use with Zyla Camera Link 10-tap models.

WKST-1 WIN PC Workstation for up to 100 fps continuous spooling to hard drives, acquiring up to 120,000 12-bit full resolution images: Dell T7600, 2.3 GHz Six Core, 8 GB RAM, 4 x 250GB SSD hard drive configured in RAID 0.

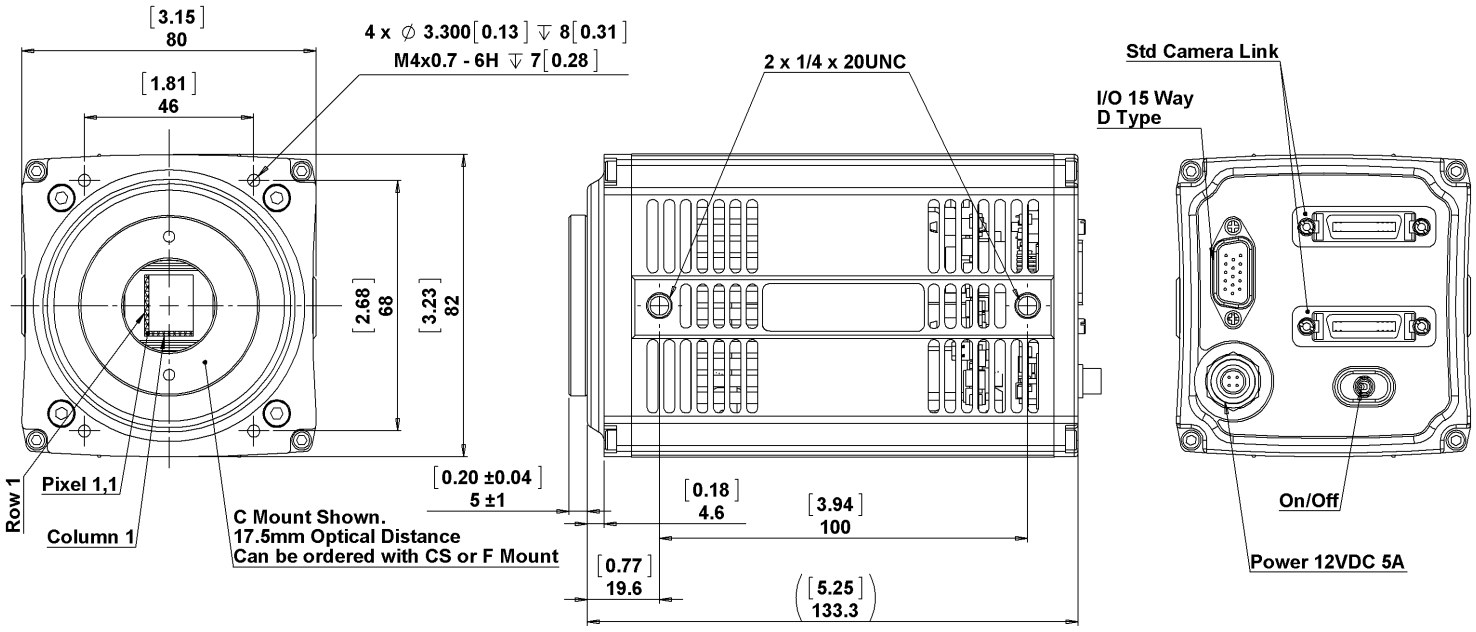
WKST-2 WIN PC Workstation for up to 30 fps continuous spooling to RAM, acquiring up to 60,000 12-bit full resolution images: Dell T3600, 3.6 GHz Quad Core, 8 GB RAM, 2 x 250 GB SSD hard drives configured in RAID 0.

WKST-3 WIN PC Workstation for up to 100 fps continuous spooling to RAM, acquiring up to 6,000 12-bit full resolution images: Dell T3600, 3.6 GHz Quad Core, 64 GB RAM.

PRODUCT DRAWINGS

Dimensions in mm [inches]

Third-angle projection



Weight:
1Kg [2 lbs 3 oz]

Product drawings of the water cooled Zyla can be found at http://www.andor.com/watercooledzyla

CONNECTING TO THE ZYLA

Camera Control
Connector type: 3 meter Camera Link 3-tap or 10-tap connectors (longer cable lengths available as accessories)

TTL / Logic
Connector type: 15 way D Type with TTL I/Os for External Trigger, Frame Readout and Fire Pulse

REGULATORY COMPLIANCE

- RoHS compliant
- EU EMC Directive
- EU LV Directive
- IEC 61010-1 CB Scheme

EXTERNAL POWER SUPPLY COMPLIANCE

- UL-certified for Canada and USA
- Japanese PSE Mark

POWER SUPPLY REQUIREMENTS

- Power: +12 VDC ± 5% @ 5A
- Ripple: 200 mV peak-peak 0 - 20 MHz
- 120 - 240 VAC 50/60 Hz external power supply

15-WAY D-TYPE PINOUTS

1	ARM	Output
2	Aux_Out_1*	Output
3	FIRE row n	Output
4	FIRE row 1	Output
5	Aux_Out_2	Output
6	Ground	GND
7	External Trigger	Input
8	Spare Input	Input
9	Reserved	N/A
10	Reserved	N/A
11	Reserved	N/A
12	Reserved	N/A
13	Reserved	N/A
14	Reserved	N/A
15	Reserved	N/A

* Aux_Out_1 is configurable as Fire, Fire n, Fire All or Fire Any. Refer to the Zyla hardware manual.

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: andor.com/contact

Our regional headquarters are:

EUROPE
Belfast, Northern Ireland
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Connecticut, USA
Phone +1 (860) 290 9211
Fax +1 (860) 290 9566

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

ITEMS SHIPPED WITH YOUR CAMERA

1x Camera Link card and 3 meter connector cable(s).
1x Power supply with mains cable
1x 7-way Multi I/O timing cable, offering Fire, External Trigger and Arm (3 meter)
1x Quick Start Guide
1x CD containing Andor user guides
1x Individual system performance sheet

FOOTNOTES: Specifications are subject to change without notice

1. Figures are typical unless otherwise stated.
2. Readout noise is for the entire system and is taken as a median over the sensor area excluding any regions of blemishes. It is a combination of sensor readout noise and A/D noise.
3. Quantum efficiency of the sensor at 20°C as supplied by the manufacturer.
4. Dark current measurement is taken as a median over the sensor area excluding any regions of blemishes.
5. Linearity is measured from a plot of Signal vs. Exposure Time over the full dynamic range.
6. Software Exposure Events provide rapid software notification (SDK only) of the start and end of acquisition, useful for tight synchronization to moving peripheral devices e.g. Z-stage.
7. The maximum frames/s table for Zyla indicate the maximum speed at which the device can acquire images in a standard system at full frame and also a range of sub-array size, for both rolling and global shutter read modes (Zyla 5.5), 12-bit single amplifier (rates also apply to dual amplifier 16-bit for Zyla 4.2). Note that the write speed of the PC hard drive can impose a further restriction to achieving sustained kinetic series acquisition.
8. 'Global Clear' is an optional keep clean mechanism that can be implemented in rolling shutter mode, which purges charge from all rows of the sensor simultaneously, at the exposure start. The exposure end is still rolling shutter. It can be used alongside the Fire All output of the camera and a pulsed light source to simulate Global Exposure mechanism, albeit less efficiently than the true Global Shutter exposure mode of Zyla 5.5. Furthermore Global Clear differs from true Global Shutter in that it can only be used in 'non-overlap' readout mode, i.e. sequential exposure and readout phases rather than simultaneous.

MINIMUM COMPUTER REQUIREMENTS:

- 2.4 GHz Quad Core
- 4GB RAM (increase RAM if to be used for continuous data spooling)
- Hard Drive:
  Minimum 250 MB/s continuous write for CameraLink 3-tap model
  Minimum 850 MB/s continuous write for CameraLink 10-tap models
- PCI Express x4 or greater for CameraLink 3-tap model
- PCI Express x8 or greater for CameraLink 10-tap models
- Windows (XP, Vista or 7) or Linux

* See technical note entitled: '*PC Recommendations for sCMOS*'
** Note, Andor supply PC workstations for Zyla, see page 10.

Operating and Storage Conditions

- Operating Temperature: 0°C to 30°C ambient (Zyla 5.5); 0°C to 27°C ambient (Zyla 4.2)
- Relative Humidity: < 70% (non-condensing)
- Storage Temperature: -10°C to 50°C

Power Requirements

- Please refer to page 11