OXFORD INSTRUMENTS | ANDOR

Zyla OEM

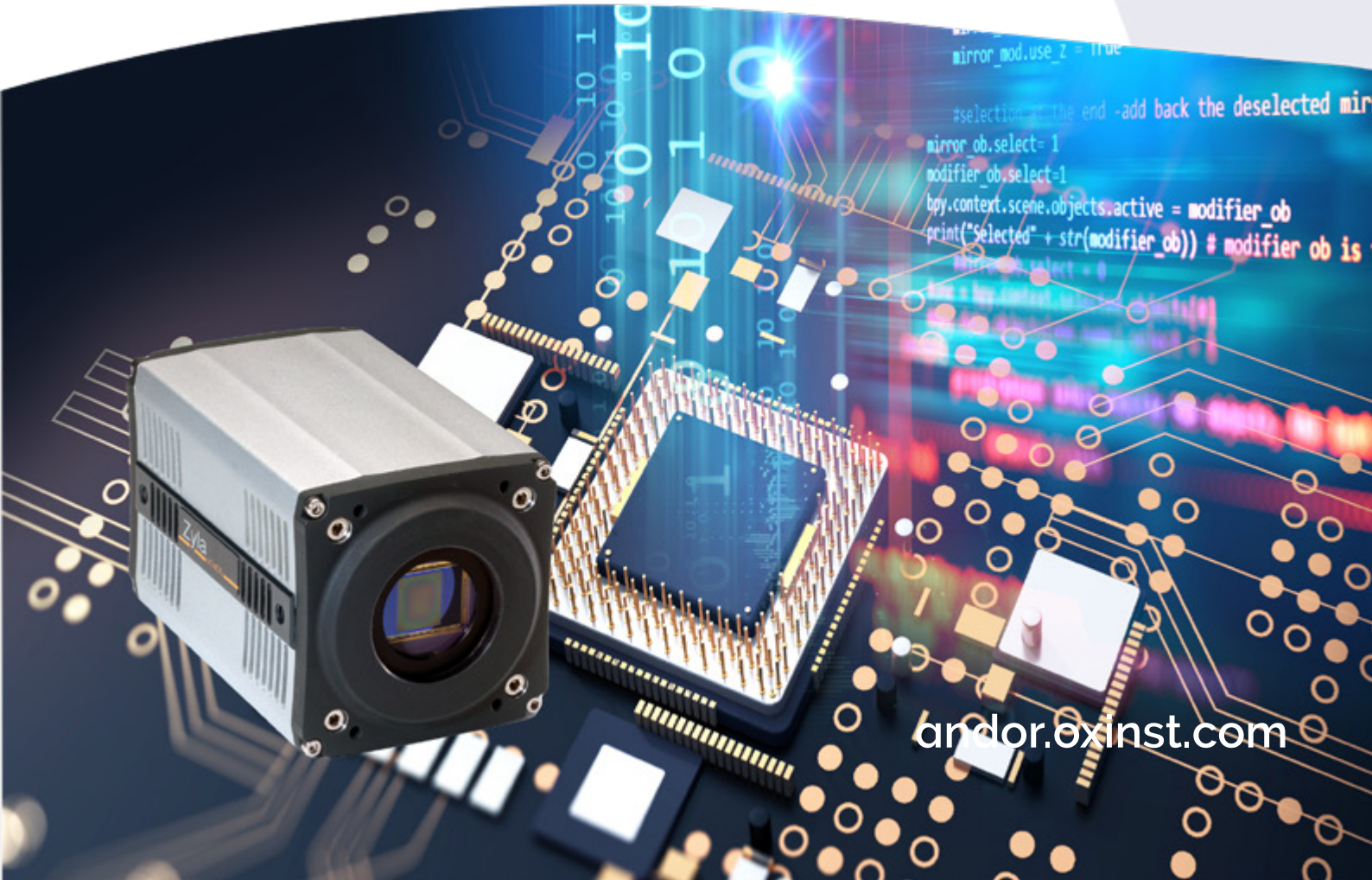
Fast, Sensitive, and Compact sCMOS Camera

Key Features

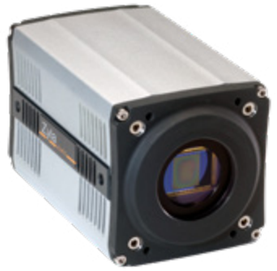
- ✓ 4.2 and 5.5 Megapixel options
- ✓ Rolling and Global Shutter
- ✓ Pixel size: 6.5 µm
- ✓ QE up to 82 %
- ✓ Read noise: <1 e-
- ✓ Pixel well depth: 30,000 e-
- ✓ Maximum frame rate: 100 fps (CL)

Key Applications

- ✓ High Content Screening
- ✓ Gene Sequencing
- ✓ Digital Pathology
- ✓ Particle Imaging Velocimetry
- ✓ Fluorescence Microscopy
- ✓ Hyperspectral Imaging
- ✓ X-ray Imaging/Tomography



Introducing Zyla for OEM



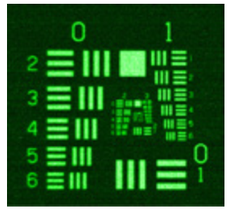
Offering a compelling blend of ultra low noise, high sensitivity, high speed, wide dynamic range and high resolution, the Andor Zyla sCMOS OEM camera platform is ideally suited to a broad range of industrial and scientific instrumentation application needs.

The cost-effective, multi-functional, compact, thermoelectrically cooled design of Zyla OEM benefits from a re-engineered and enhanced sensor chamber, with field reliability and minimised service intervals in mind.

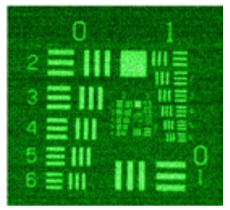
As an Andor OEM partner, benefit from high volume manufacturing capacity, predictability of supply, quality manufacturing, customisation services and OEM-dedicated engineering support.

Loaded with intelligence, the Zyla sCMOS drives optimal performance and superior image quality across two distinct sensor options. Zyla 4.2 provides exceptional sensitivity from a combination of 82% QE and very low 0.9 e- read noise from a 4.2 Megapixel sensor. Zyla 5.5 is a highly cost-effective and flexible solution that delivers a superior field of view from a 5.5 Megapixel sensor, with 2-in-1 rolling and global shutter functionality.

Superior Noise Levels

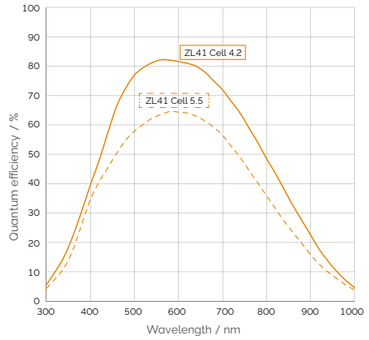


Andor sCMOS
< 1.0 e^- read noise



Interline CCD
5.5 e^- read noise

Superb Quantum Efficiency[8] (QE)



Applications Guide

	Zyla 4.2	Zyla 5.5
High Content Screening	●	○
Gene Sequencing		●
Digital Pathology		●
Particle Imaging Velocimetry		●
Fluorescence Microscopy	●	○
Hyperspectral Imaging		●
X-ray Imaging/Tomography	○	●

○ = Suitable
● = Optimum

Feature	Benefits
NEW Sensor chamber	An updated sensor chamber provides even greater long-term protection from condensation in high humidity environments (3 year warranty).
QE boosted up to 82%	Highest and broadest available photon capture efficiency across visible/NIR.
ZERO etaloning in the NIR	Front illuminated sensor architecture, no unwanted signal modulation in the NIR compared to back-illuminated devices.
Compact and Light	Ideal for integration into space restrictive set-ups.
< 1 e- Read Noise	Noise floor down to 0.9 e-. Lower detection limit than any CCD.
Fast frame rates	100 fps sustained via Camera Link, industry fastest USB 3.0 frame rates.
5.5 & 4.2 megapixel sensor formats and 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 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.
PIV capability (Zyla OEM 5.5)	Perfect for fluid dynamics. Global shutter mode of Zyla 5.5 facilitating image pair acquisition with an inter-frame gap of down to 100 ns.
Dual-Gain Amplifiers	Extended dynamic range of up to 33,000:1.
Extended Dynamic Range	Unique 'dual gain amplifier' sensor architecture offering dynamic range of 33,000:1. Zyla OEM can also be operated in single amplifier mode.
Better than 99.8% linearity	Unparalleled quantitative measurement accuracy across the full dynamic range,
Very Low Fan Vibration	Designed with vibration sensitive experiments in mind, such as super-resolution microscopy.
TE cooling to 0°C in up to 30°C ambient (Zyla 5.5)[9]	Ideal for OEM integration into enclosed systems . Customisable for higher ambient temperatures.
Extensive on-head image processing and QC	Essential to ensure best image quality and quantitative fidelity.
GPU Express	Simplify and optimize data transfers from camera to Graphical Processing Unit (GPU) card to facilitate accelerated GPU processing as part of the acquisition pipeline.
Linux, Windows, Python, LabView and MATLAB ready	Full and flexible SDK options for a wide variety of programming environments.

Customisable and Flexible

As a truly dedicated OEM platform, the Zyla can offer levels of customisation, including:

- ✓ Cable connection flexibility
- ✓ Optical mount configurations
- ✓ Chassis mounting options
- ✓ Water cooling option
- ✓ Fan options for different ambient temperatures
- ✓ Custom window options
- ✓ Private labelled enclosure
- ✓ Alternative form factors
- ✓ Custom pixel blemish compensation
- ✓ Custom FPGA processing
- ✓ Specific QC / testing
- ✓ Lockable connectors
- ✓ Flexible pricing structure scalable with volume requirements.

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)	
Read noise (e-) Median [rms][•2]		Rolling Shutter	Global Shutter		Rolling Shutter
	@ 200 MHz	0.9 [1.2]	2.3 [2.5]	@ 216 MHz	0.90 [1.1]
	@ 560 MHz	1.2 [1.6]	2.4 [2.6]	@ 540 MHz	1.10 [1.3]
Maximum Quantum Efficiency[•3]	60%			82%	
Sensor Operating Temperature* Air cooled Water cooled**	0°C (up to 30°C ambient)[•10] -10°C			0°C (up to 27°C ambient) -10°C	
Dark current, e-/pixel/sec @ min temp[•4] Air cooled Water cooled	0.10 0.019			0.10 0.019	
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%	
Data range	12-bit and 16-bit			12-bit and 16-bit	
Interface options	USB 3.0 [•9] Camera Link 10-tap			USB 3.0 [•9] Camera Link 10-tap	

General Specifications[•1]

Pixel size (W x H)	6.5 µm
Pixel well depth (e^-)	30,000
Linearity (%, maximum) [•5]	Better than 99.8%
MTF (Nyquist @ 555 nm)	45%
Pixel binning	Hardware binning: 2 x 2, 3 x 3, 4 x 4, 8 x 8
User defined ROI (granularity)	Yes (1 pixel) ***
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

* Zyla OEM models can be configured to operate in higher ambient conditions of 35°C+, available on request.
** Coolant temperature must be above dew point. Zyla 5.5 with operation up to +35°C ambient is available on request.
*** Minimum ROI size 4 x 8 (W x H)

Frame Rate Table - 12-bit (16-Bit)[•6]

Array Size	Zyla 5.5 USB 3.0		Zyla 5.5 10-tap		Zyla 4.2 10-tap	Zyla 4.2 USB 3.0
	Rolling Shutter	Global Shutter	Rolling Shutter	Global Shutter	Rolling Shutter	Rolling Shutter
2560 x 2160	40 (30)	40 (30)	100 (75)	49 (49)	-	-
2048 x 2048	53 (40)	52 (39)	105 (98)	52 (52)	101 (101)	53 (40)
1920 x 1080	107 (80)	98 (80)	200 (200)	97 (97)	192 (192)	107 (80)
512 x 512	422 (422)	201 (201)	422 (422)	201 (201)	406 (406)	406 (406)
128 x 128	1691 (1691)	716 (716)	1691 (1691)	716 (716)	1627 (1627)	1627 (1627)

Operating and Storage Conditions

Operating Temperature	Zyla 5.5: 0°C to 30°C [•10] Zyla 4.2: 0°C to 27°C
Relative Humidity	< 70% (non-condensing)
Storage Temperature	-10°C to 50°C
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% @ 5 A
Ripple	200 mV peak-peak 0 - 20 MHz
External Power Supply	100 - 240 VAC 50/60 Hz
Power Consumption	12 V @ 5 A Max, 12 V @ 2.5 A Nominal

Working with Andor as your OEM Partner

With a reputation for cutting edge innovation, unparalleled quality, and designed-in reliability, we are industry leaders, providing detection solutions to OEMs in various industries and environments. Our products form an integral part of our industrial partners' instrumentation. We are a trusted partner with many top companies in precision instrument manufacturing. We have many years of experience of product development in partnerships with external companies. From concept development right through to customer care during the product's lifetime in the market.

✓ World Class Manufacturing Facilities

With years of academic and industrial experience, Andor's OEM experts specialize in the creation of complete system solutions, from tailored collection optics and spectrographs to software that gives you the levels of control and functionality you require. Whether you are creating a brand new analytical device, or incorporating new functionality into an existing configuration.

✓ First Class Quality

Andor runs many quality improvement programmes, including some that are focused on its manufacturing process and yield improvement. Operating a quality management system since 1998, the company fully complies with the requirements of BS EN ISO9001:2000

✓ The dedicated OEM partner team

Across the organization we appreciate and understand the critical nature as an OEM supplier and partner. The success of your instrument, brand and customer is directly linked to our ability to consistently supply you with a quality solution that is bespoke to your very specific needs.

✓ Wide array of Solution Capabilities

We have specific resources dedicated to each account and each project. In addition to having a wide range of engineering, manufacturing and commercial resources available to the OEM, we have an ever-expanding breadth of product portfolio.

Creating The Optimum Product for You

Step 1. Select the camera type

Camera Type

Description	Code
ZYLA 4.2, 4.2 Megapixel, Rolling shutter, 100 fps, Camera Link 10-tap	**ZYLA-4.2P-CL10**
ZYLA 4.2, 4.2 Megapixel, Rolling shutter, 53 fps, USB 3.0	**ZYLA-4.2P-USB3**
ZYLA 5.5, 5.5 Megapixel, Rolling and Global shutter, 100 fps, Camera Link 10-tap	**ZYLA-5.5-CL10**
ZYLA 5.5, 5.5 Megapixel, Rolling and Global shutter, 40 fps, USB 3.0	**ZYLA-5.5-USB3**

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

Step 2. Select your accessories

Accessories

Optional Accessory	Code
CS-mount adapter	**ACC-MEC-05609**
F-mount adapter	**ACM-05574**
Auto extension tubes (set of 3) for C-mount	**OA-ECMT**
Auto extension tubes (set of 3) for Nikon F	**OA-ENAF**
Re-circulator for enhanced cooling performance (for water cooled models)	**XW-RECR**
3 metre 7-way Multi I/O timing cable, offering Fire, External Trigger, Shutter and Arm	**ACC-ACZ-05612**
5 metre cable for use with Axion frame grabber (for Camera Link 10-tap models).	**ACC-ASE-13532**
30 metre fibre-optic extender solution (for Camera Link 10-tap models).	**ACC-ZYLFOX-10TAP-30M**
100 metre fibre-optic extender solution (for Camera Link 10-tap models).	**ACC-ZYLFOX-10TAP-100**
15 metre active USB 3.0 connector cable (power supply not required) (For USB 3.0 models).	**ACC-ASE-06887**
50 metre fibre optic USB 3.0 extender solution includes power supply (For USB 3.0 models).	**ACC-ASE-08762**
100 metre fibre optic USB 3.0 extender solution includes power supply (For USB 3.0 models).	**ACC-ASE-07860**

For further information on PC workstations for Zyla, please refer to the technical note PC Specifications for sCMOS

Step 3. Select the required software

Software

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

Andor SDK3 A software development kit that allows you to control Andor sCMOS cameras from your own application. Available as 32 and 64-bit libraries for Windows (8, 8.1 and 10) and Linux. Compatible with C/C++, LabView and Matlab.

Solis for 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.

GPU Express Andor GPU Express library has been created to simplify and optimize data transfers from camera to a CUDA-enabled Nvidia Graphical Processing Unit (GPU) card to facilitate accelerated GPU processing as part of the acquisition pipeline. Integrates easily with Andor SDK3 for Windows.

Step 4. Your custom requirements

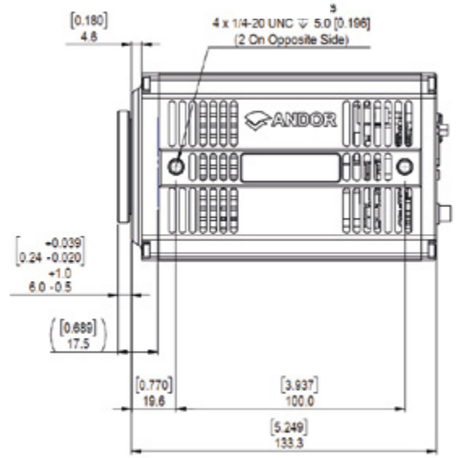
Custom Requirements

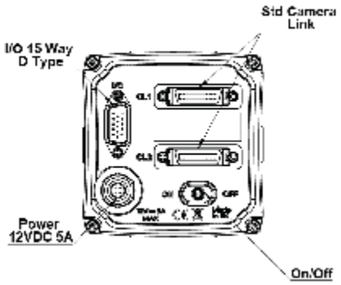
The Zyla can be tailored to your exact requirements:
If you require a non-standard product option, for example, a different lens mount or board level (no enclosure) please contact your local Andor OEM sales representative.

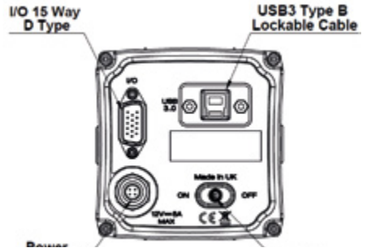
Product Drawings

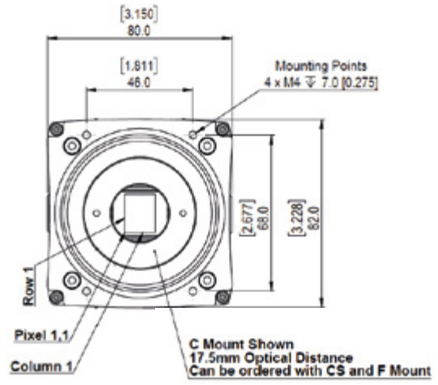
Third-angle projection

Dimensions in mm [inches]









Note: Please leave 70 mm minimum for the bend radius of the USB 3.0 cable.

Weight: 1 kg [2 lbs 3 oz]

Product drawings of the water cooled Zyla can be found at https://andor.oxinst.com/water-cooled-zyla

Connecting to the Zyla

Camera Control
Connector type: 3 meter Camera Link 10-tap connectors or USB 3.0. (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

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. See 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 local sales offices, please see: andor.oxinst.com/contact

Our regional headquarters are:

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China
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Items shipped with your camera
1x Power supply with mains cable
1x Quick Start Guide
1x CD containing Andor user guides
1x Individual system performance sheet

Recommended Computer Requirements:
- 2.68 GHz Quad Core
- 4GB RAM (increase RAM if to be used for continuous data spooling)

Hard Drive:
- Minimum 450 MB/s continuous write for USB 3.0 models
- Minimum 850 MB/s continuous write for Camera Link 10-tap models
- USB 3.0 Super Speed Host Controller capable of sustained rate of 450MB/s for USB 3.0 models
- PCI Express x4 or greater for USB 3.0 models
- PCI Express x8 or greater for Camera link 10-tap models
- Windows (8.1 or 10) or Linux

Footnotes
1. 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.
2. Quantum efficiency of the sensor at 20°C as supplied by the manufacturer.
3. Dark current measurement is taken as a median over the sensor area excluding any regions of blemishes.
4. Linearity is measured from a plot of Signal vs. Exposure Time over the full dynamic range.
5. 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.
6. 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.
7. '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.
8. Zyla USB 3.0 models should work with any modern USB 3.0 enabled PC/laptop (provided hard drives or RAM is sufficient to support data rates) as every USB 3.0 port should have its own host controller.
9. Upon request, Zyla 5.5 can be configured for operation up to +35°C, whilst maintaining 0°C sensor cooling. Enquire for further details.

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