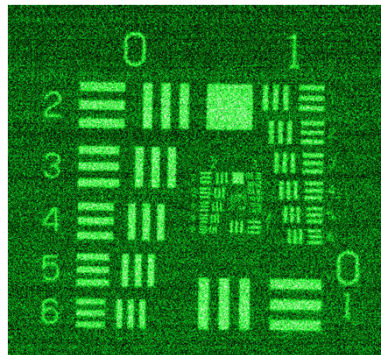


**Andor sCMOS**  
~1.0 e<sup>-</sup> read noise



**Interline CCD**  
5.5 e<sup>-</sup> read noise

### NEW Zyla 4.2 PLUS

- ✓ QE Boosted to 82%
- ✓ Industry fastest frame rates
- ✓ >99.8% Quantitative linearity



OEM Solutions

## Features and Benefits<sup>\*</sup>

- **NEW QE boosted up to 82%**  
Highest and broadest available photon capture efficiency across visible/NIR.
- **Compact and Light**  
Ideal for integration into space restrictive set-ups. Ideal for OEM.
- **~ 1 e<sup>-</sup> Read Noise**  
Noise floor down to 0.9e<sup>-</sup>. Lower detection limit than any CCD.
- **Industry fastest 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 PLUS) 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.
- **Dual-Gain Amplifiers**  
Extended dynamic range of up to 33,000:1
- **12-bit and 16-bit modes**  
12-bit for smaller file size and absolute fastest frame rates through USB 3.0; 16-bit for full dynamic range
- **NEW Better than 99.8% linearity**  
Unparalleled quantitative measurement accuracy across the full dynamic range
- **Dark Noise Suppression (DNS) technology**  
Extremely competitive low darkcurrent of 0.10 e<sup>-</sup>/pix/ sec with fan cooling. Maintains low noise advantage across range of exposure conditions.
- **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)<sup>\*10</sup>**  
Ideal for OEM integration into enclosed systems
- **Extensive FPGA on-head data processing**  
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.

## Scientific CMOS with down to 0.9 e<sup>-</sup> read noise for OEM applications (USB 3.0 or Camera Link)

Offering a unique blend of low noise, large field of view and high speed, the Andor Zyla sCMOS platform is ideally suited to a wide range of low light and high speed imaging applications. Loaded with FPGA intelligence, the Zyla sCMOS drives optimal performance and superior image quality from this exciting and innovative new technology development. Remarkably compact and light, and now available with the industry's highest performance USB 3.0 specifications, Zyla is available as an enclosed camera, board-level or private labelled component for flexible system integration.

Andor are an ideal partner as your OEM camera supplier; our quality systems, manufacturing environment and engineering team deliver the highest performance cameras to meet your business needs.

## Specifications Summary

Model	Zyla 5.5	Zyla 4.2 PLUS
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 size (W x H)	6.5 μm	
Pixel well depth (typical)	30,000 e <sup>-</sup>	
Readout speeds (MHz)	560 and 200	540 and 216
Read noise	1.2 e <sup>-</sup>	0.9 e <sup>-</sup>
Sensor operating temperature	0°C (up to 30°C ambient) <sup>*10</sup>	0°C (up to 27°C ambient)
Maximum frame rate	40 fps (USB 3.0) 100 fps (Camera Link)	53 fps (USB 3.0) 100 fps (Camera Link)
Interface options	USB 3.0 <sup>9</sup> Camera Link (10-tap)	USB 3.0 <sup>9</sup> Camera Link (10-tap)

## MODEL SPECIFIC SPECIFICATIONS<sup>\*1</sup>

Model	Zyla 5.5	Zyla 4.2 PLUS
<b>Sensor type</b>	Front Illuminated Scientific CMOS	Front Illuminated Scientific CMOS
<b>Active pixels (W x H)</b>	2560 x 2160 (5.5 Megapixel)	2048 x 2048 (4.2 Megapixel)
<b>Sensor size</b>	16.6 x 14.0 mm 21.8 mm diagonal	13.3 x 13.3 mm 18.8 mm diagonal
<b>Pixel readout rate (MHz)</b>	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)
<b>Read noise (e<sup>-</sup>) Median [rms] <sup>*2</sup></b>	<b>Rolling Shutter</b>	<b>Global Shutter</b>
	@ 200 MHz @ 560 MHz	1.2 [1.7] 1.45 [1.8]
<b>Maximum Quantum Efficiency <sup>*3</sup></b>	60%	82%
<b>Sensor Operating Temperature<sup>*</sup></b>		
<b>Air cooled</b>	0°C (up to 30°C ambient) <sup>*10</sup>	0°C (up to 27°C ambient)
<b>Water cooled</b>	-10°C	-10°C
<b>Dark current, e<sup>-</sup>/pixel/sec @ min temp <sup>*4</sup></b>		
<b>Air cooled</b>	0.10	0.10
<b>Water cooled</b>	0.019	0.019
<b>Readout modes</b>	Rolling Shutter and True Global Shutter (Snapshot)	Rolling Shutter and Global Clear <sup>*8</sup>
<b>Maximum dynamic range</b>	25,000:1	33,000:1
<b>Photon Response Non-Uniformity (PRNU)</b>	< 0.5%	< 0.1%
<b>Pre-defined Region of Interest</b>	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
<b>Data range</b>	12-bit and 16-bit	12-bit and 16-bit
<b>Interface options</b>	USB 3.0 <sup>*9</sup> Camera Link 10-tap	USB 3.0 <sup>*9</sup> Camera Link 10-tap

## GENERAL SPECIFICATIONS<sup>\*1</sup>

<b>Pixel size (W x H)</b>	6.5 µm
<b>Pixel well depth (e<sup>-</sup>)</b>	30,000
<b>Linearity (% , maximum) <sup>*5</sup></b>	Better than 99.8%
<b>MTF (Nyquist @ 555 nm)</b>	45%
<b>Pixel binning</b>	Hardware binning: 2 x 2, 3 x 3, 4 x 4, 8 x 8
<b>User defined ROI (granularity)</b>	Yes (1 pixel) <sup>**</sup>
<b>I/O</b>	External Trigger, Fire, Fire n, Fire All, Fire Any, Arm
<b>Trigger Modes</b>	Internal, External, External Start, External Exposure, Software Trigger
<b>Software Exposure Events<sup>*6</sup></b>	Start exposure - End exposure (row 1), Start exposure - End exposure (row n)
<b>Hardware timestamp accuracy</b>	25 ns
<b>Anti-blooming factor</b>	x 10,000

\* 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)<sup>\*7</sup>

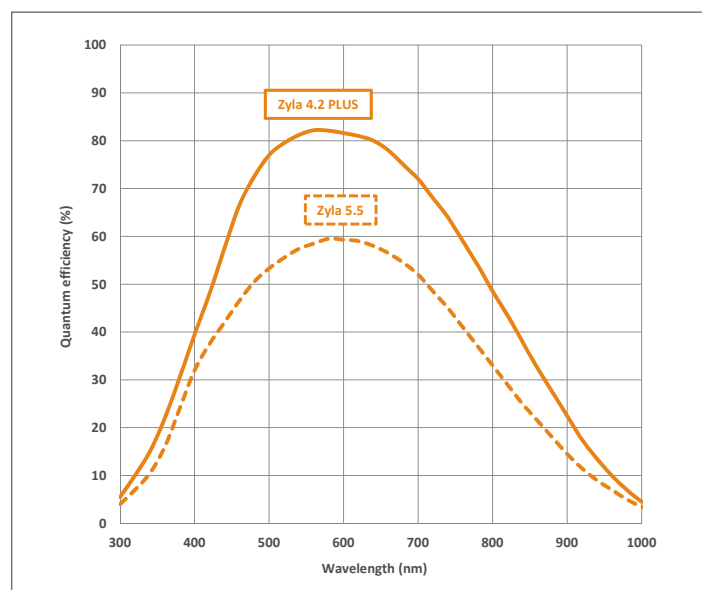
Array Size	Zyla 5.5 USB 3.0		Zyla 5.5 10-tap		Zyla 4.2 PLUS 10-tap	Zyla 4.2 PLUS USB 3.0
	Rolling Shutter	Global Shutter	Rolling Shutter	Global Shutter	Rolling Shutter	Rolling Shutter
2560 x 2160	40 (30)	40 (30)	100 (75)	49 (49)	-	-
2048 x 2048	53 (40)	52 (39)	105 (98)	52 (52)	101 (101)	53 (40)
1920 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)

## Customizable and Flexible

As a truly dedicated OEM platform, the Zyla can offer various levels of customization, for example:

- Cable connection flexibility
- Optical mount configurations
- Chassis mounting options
- Water cooling option
- Custom window options
- Board level or private labelled enclosure
- Alternative form factors
- Custom pixel blemish compensation
- Custom FPGA processing
- Flexible pricing structure scalable with volume requirements
- Specific QC / testing
- Lockable connectors

## Quantum Efficiency (QE) Curve<sup>\*8</sup>



## Andor - An OEM Leader

An industry leader in OEM supply with a wide customer base and exemplary track record, Andor has over the last 5 years sold cameras and detectors into 10 of the top 20 global industry leaders in the areas of life sciences, spectroscopic instruments, surface science instruments and X-Ray imaging.

Whether you are creating a brand new analytical device or incorporating new functionality into an existing configuration, you can depend on Andor's expertise in custom camera design and unparalleled engineering and sales support to offer efficient program scoping, prototyping and quality manufacture. Andor offers custom hardware or software modification, custom form-factors, private labelled enclosures, and adaptability to cost-sensitive, high volume manufacturing.



## First in Quality

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

## Have you found what you are looking for?

If you require adjustments to the mentioned mechanical, software or performance specifications please let our OEM sales team know, we can discuss the options for a bespoke product variant which suits your exact needs.

## CREATING THE OPTIMUM PRODUCT FOR YOU

### Step 1. Select the camera type

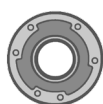


Camera Type

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

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

### Step 2. Select your accessories



Accessories

Optional Accessory	Code
CS-mount adapter	<b>ACC-MEC-05609</b>
F-mount adapter	<b>ACM-05574</b>
Auto extension tubes (set of 3) for C-mount	<b>OA-ECMT</b>
Auto extension tubes (set of 3) for Nikon F	<b>OA-ENAF</b>
Re-circulator for enhanced cooling performance (for water cooled models)	<b>XW-RECR</b>
7-way Multi I/O timing cable, offering Fire, External Trigger, Shutter and Arm	<b>ACC-ACZ-05612</b>
5 m Camera Link connector cable. Order x2 if using with Camera Link 10-tap models.	<b>ACC-ASE-02992</b>
10 m active Camera Link connector cable, includes power supply (for Camera Link 10-tap models).	<b>ACC-ASE-06962</b>
30 m fibre-optic extender solution (for Camera Link 10-tap models).	<b>ACC-ZYLFOX-10TAP-30M</b>
100 m fibre-optic extender solution (for Camera Link 10-tap models).	<b>ACC-ZYLFOX-10TAP-100</b>
15 m active USB 3.0 connector cable (power supply not required) (For USB 3.0 models).	<b>ACC-ASE-06887</b>
50 m fibre optic USB 3.0 extender solution includes power supply (For USB 3.0 models).	<b>ACC-ASE-08762</b>
100 m fibre optic USB 3.0 extender solution includes power supply (For USB 3.0 models).	<b>ACC-ASE-07860</b>
PC Workstation for up to 100 fps continuous spooling to hard drives, acquiring up to 120,000 12-bit full resolution images: Dell T7910XL, 2.6 GHz Eight Core, 8 GB RAM, 4 x 250GB SSD hard drive configured in RAID 0.	<b>WKST-1 WIN</b>
PC Workstation for up to 100 fps continuous spooling to RAM, acquiring up to 6,000 12-bit full resolution images: Dell T5810, 3.5 GHz Quad Core, 64 GB RAM.	<b>WKST-3 WIN</b>

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 (7, 8, 8.1 and 10) and Linux. Compatible with C/C++, LabView and Matlab.

**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.

**Andor Driver Licence (ANDOR-DRV-LIC)** Individual driver licence for Andor detectors and spectrographs. Required for integration into OEM bespoke product lines.

**Solis for Imaging** A 32-bit and fully 64-bit enabled application for Windows (7, 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.

### Step 4. Your custom requirements

Custom Requirements

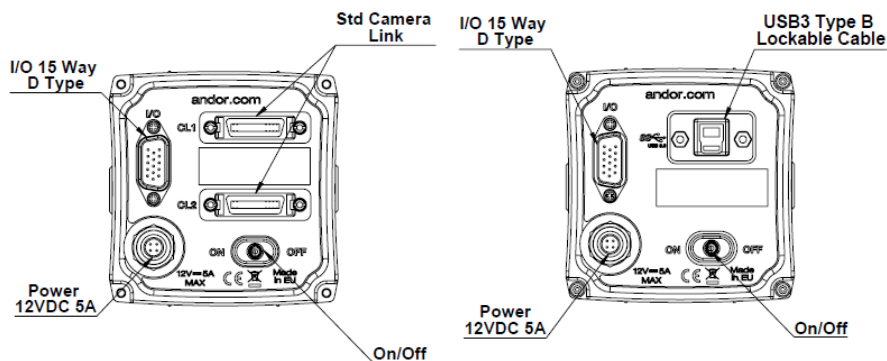
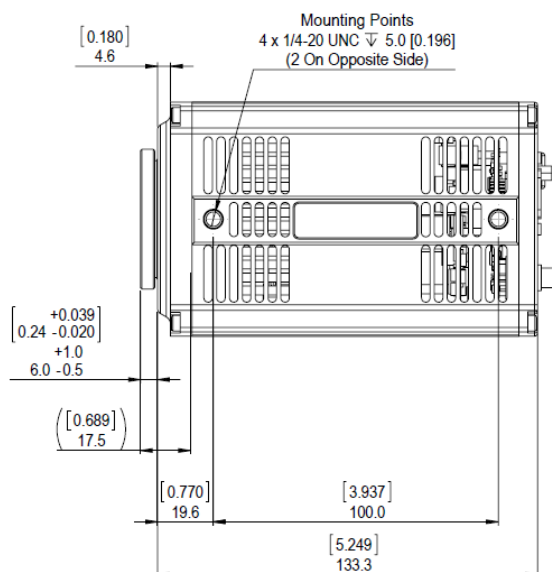
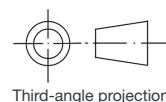
The Zyla can be tailored to your exact requirements:

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

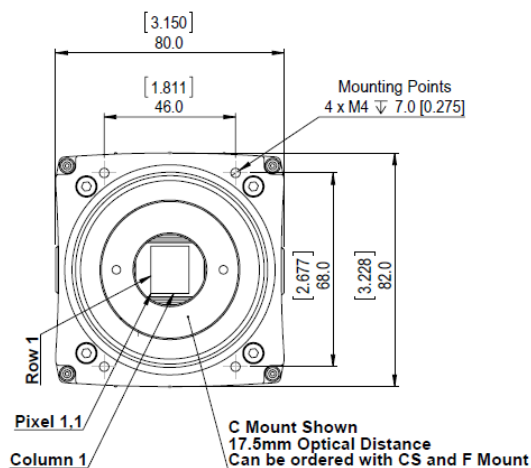
Dimensions in mm [inches]



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

**Weight:** 1,000 g [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 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

### Regulatory Compliance

- RoHS compliant
- EU EMC Directive: Non-enclosed version: this is a component not intended to be provided to the end-user as-is. This may require additional measures to ensure compliance and to protect against interaction with adjacent electronics when integrated. The enclosed version is compliant.
- 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: +12VDC  $\pm$  5% @ 5A
- Ripple: 200 mV peak-peak 0 - 20 MHz
- 100 - 240 VAC 50/60 Hz external power supply
- Power Consumption: 12V @ 5A Max, 12V @ 2.5A Nominal

## 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 regional sales offices, please see: [andor.com/contact](http://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) 6732 8968  
Fax +81 (3) 6732 8939

#### North America

Concord, 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 Power supply with mains cable
- 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 PLUS). 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.
9. 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.
10. Upon request, Zyla 5.5 can be configured for operation up to +35°C, whilst maintaining 0°C sensor cooling. Enquire for further details.



### 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 (7, 8, 8.1 or 10) or Linux

\* See technical note entitled: 'PC Recommendations for sCMOS'

\*\* Note, Andor supply PC workstations for Zyla, see page 4.

### Operating and Storage Conditions

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

### Power Requirements

- Please refer to page 5



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