

# C-BLUE One UV

## Ultraviolet Extended Global Shutter sCMOS Camera

### Key Specifications

- ✓ 2848 x 2848 pixels | 8.13 MP sCMOS
- ✓ 2.74  $\mu\text{m}$  pixel pitch
- ✓ 1.31 e- MED read noise
- ✓ 170 fps (8 bits) | 121 fps (12 bits)
- ✓ UV-Visible Optimized for 200 - 400 nm
- ✓ High Dynamic Range 80 dB | true 16 bits
- ✓ High speed interface options

### Key Applications

- ✓ Contamination detection
- ✓ Mineralogy
- ✓ Entomology
- ✓ Gas leak detection
- ✓ Non-destructive inspection
- ✓ Ultra-violet astronomy
- ✓ Hot plasma studies



# Introducing C-BLUE One UV



The C-BLUE One UV camera is an industrial-grade Ultraviolet-optimized scientific camera based on the latest generation of back illuminated CMOS sensors. The camera offers unprecedented performance to reach a significant quantum efficiency down in the UV range offering spectral sensitivity from 200 to 1000 nm.

Equipped with a high-performance monochrome CMOS global shutter sensor with a very high resolution of 8.1MP (2848 x 2848 pixels, 2.74 μm pitch), the camera is optimised for the 200-400 nm wavelength range with more than 50% quantum efficiency at 300 nm, and 30% at 220 nm.

C-BLUE One is a GigE Vision camera and GenICam compatible.

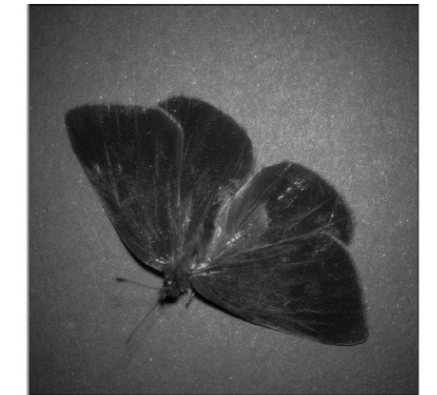
Please note when designing optical systems, it is crucial to consider the full optical path as many conventional optical materials are highly absorbent in the UV spectrum. Optics for UV imaging involve specialised materials and coatings.

C-BLUE One UV Common Features	
Monochrome global shutter CMOS	Silicon-based CMOS monochrome sensors with global shutter architecture.
Data interface	C-BLUE One UV has two high-throughput interfaces compatible with long reach cables: 10 GigE and CoaXPress. 10 GigE enables data transfer using the GigE Vision protocol and Ethernet cables. CoaXPress is optimized for real time operation. Two synchronization connectors enable peripheral device control.
Temperature management	C-BLUE One UV is the only camera offering high-end thermalization of the Sony Pregius™ sensors. This guarantees optimal noise performances and a stable position of the sensor. The integrated fan provides an air-cooled stabilization down to 0°C which can be completed by a cooling plate to further increase the temperature differential.
Camera body	The dimensions of the camera (154.3 mm x 76.2 mm x 64.1 mm and 1.1 kg) enable an easy integration into imaging and detection systems.
Lens mount	The camera has a CS-mount native interface and is provided with a C-mount adaptor.
ADC readout options	To optimize either bit depth or speed, both 8 bits and 12 bits modes are available.
Gain tuning	Capacitor gain can be switched between High gain and Low gain modes. In addition, 24 dB analog gain can be added, and up to 48 dB using digital gain.
Multi-windowing and Region of Interest (ROI)	Windowing mode allows to achieve faster image rate. A multiple region mode, illustrated below, further enhances the possible applications.

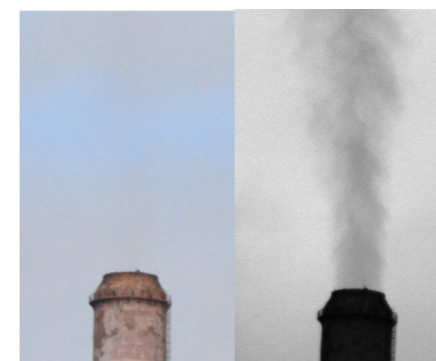
## Life Science / Entomology

Unlike humans, butterflies can perceive ultraviolet light, influencing their behaviour and ecology. By capturing UV reflectance patterns on butterfly wings, we unlock insights into their lives, from communication, mate selection, to environmental adaptation. Additionally, environmental conditions shape UV reflectance, highlighting the connection between butterflies and their habitats.

By delving into these nuances, we not only expand our knowledge of butterfly biology but also support conservation efforts by identifying quality habitats and assessing ecosystem health. UV imaging is a powerful tool for unravelling the mysteries of butterfly ecology and evolution, supporting scientific research and conservation initiatives.



Images of *Pieridae blanche* Left: visible light reflectance colour camera. Middle: Visible light reflectance C-BLUE One UV. Right: Ultraviolet light reflectance C-BLUE One UV.



Images of gas emissions. Left: Imaging in the visible range. Right: imaging between 305 and 315 nm with C-BLUE One UV.

## Gas Detection

UV imaging can be applied to monitor toxic emissions from industry. For example, Sulphur Dioxide, SO<sub>2</sub> a toxic gas causing acid rain, is transparent in the visible range but absorbs the UVB and can therefore be detected thanks to UV imaging under sunlight illumination.



# Technical Specifications

## Specifications

Sensor Specifications	C-BLUE One UV
Sensor type	Back Illuminated Scientific CMOS   Type 2/3 Monochrome CMOS
Active pixels (W x H)	2848 x 2848 (8.13 Megapixel)
Sensor size	2856 x 2912   16.6 x 14.0 mm   11.2 mm diagonal
Shutter architecture	Global shutter
Maximum Quantum Efficiency	> 70%
Interface options	CoaXPress 2.0 (CXP-12)   High speed SFP+ 10 GigE interface with Ethernet or Fibre GigE Vision GenICam compatible
Optical interface	C-Mount / CS-Mount

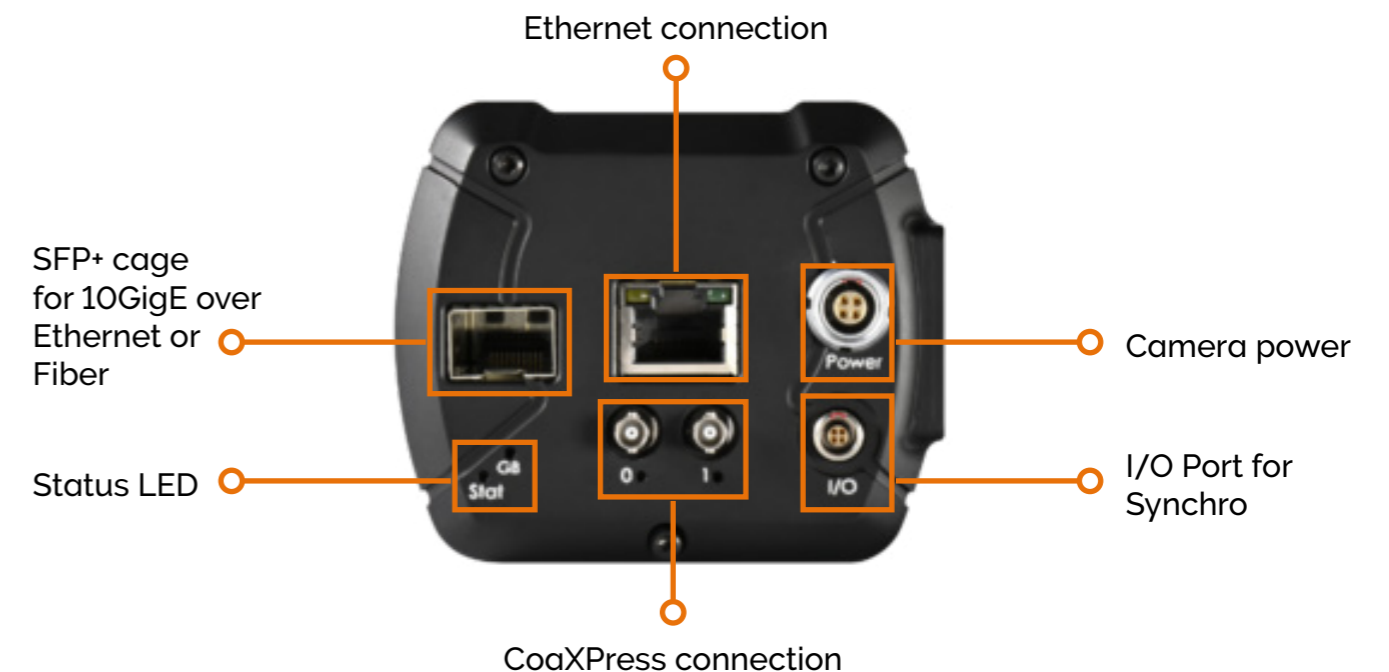
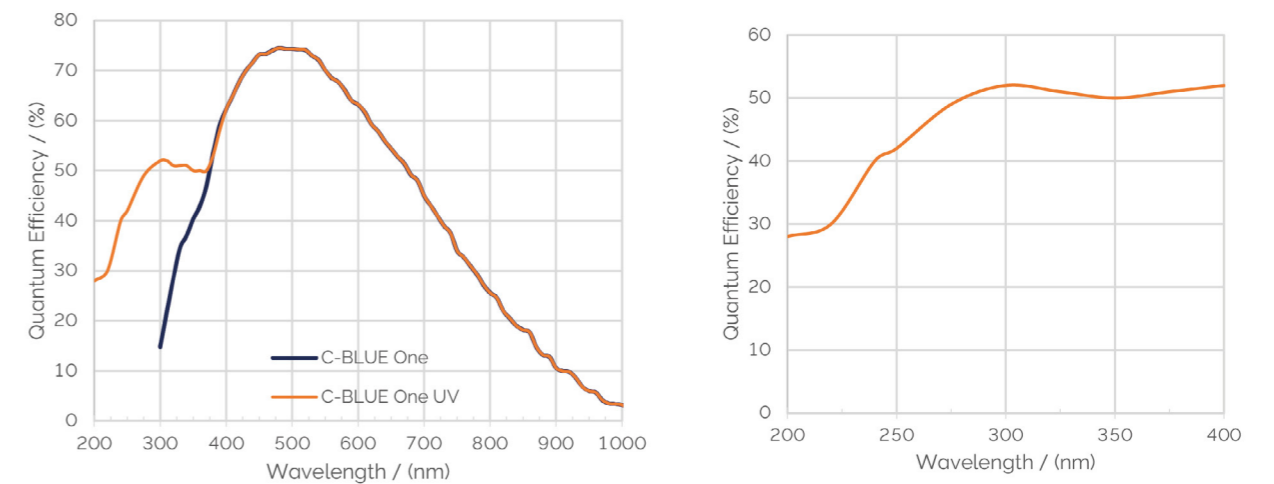
Camera Specifications	C-BLUE One UV	
Analog gain	0 to 24 dB	
Quantization A/D	8, 12 bits	
Quantization with HDR (High Dynamic Range)	16 bits	
Readout Noise (24 dB, @ 50µs)	1.31 e <sup>-</sup> <sub>MED</sub> (typical)   1.40 e <sup>-</sup> <sub>RMS</sub> (typical)	
Dark Current at 10°C sensor temperature	0.017 e <sup>-</sup> /p/s (typical)	
Full well capacity (0 dB)	9.2 ke <sup>-</sup>	
	CoaXPress	GigE Vision
Maximum speed Full Frame	170 fps (8 bit)	141 fps (8 bit)
	121 fps (12 bit)	72 fps (12 bit)   96 fps (12 bit packed)
	62 fps (16 bits (HDR))	60 fps (16 bits (HDR))
Maximum speed in 2x2 binning full frame	516 fps (8 bit)	To be measured (8 bit)
	392 fps (12 bit)	To be measured (12 bit)
	NA (16 bits (HDR))	NA (16 bits (HDR))
Minimum integration time	4.34 µs (8 bit)	4.72 µs (8 bit)
	5.15 µs (12 bit)	6.97 µs (12 bit)   5.84 µs (12 bit packed)
	5.15 µs (16 bits (HDR))	5.22 µs (16 bits (HDR))

Additional Features	C-BLUE One UV
Operating temperature	-10°C to 50°C Stabilization with ΔT* of 25°C between case and sensor (typ. 0°C for 25°C environment) Optional liquid cooling plate
Software	Graphical User Interface: First Light Vision Software Development Kit: (C, C++, C#, Python, MatLab) / LabVIEW / µManager

## Frame rate table

Lines	8 bits		12 bits		16 bits (HDR)		12 Packed (GigE Vision only)
	CXP	GigE	CXP	GigE	CXP	GigE	
16	1867	1867	1573	1534	1174	1146	1534
54	1597	1597	1307	1275	901	879	1275
256	1012	1012	779	674	466	455	760
1024	410	361	298	188	159	155	250
2848	170	141	121	72	62	60	96

## Quantum Efficiency (QE) Curve



# Creating The Optimum Product for You

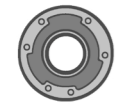
## Step 1. Select the camera type



Camera Type

Description	Code
C-BLUE One UV: 2848 x 2848 Monochrome CMOS camera, up to 170 FPS, <1.31 e-MED RON typ., CoaXPress/ GigE Vision 10GB Eth or Fiber interface	PAC-CB1-U81

## Step 2. Select an accessory



Accessories

Description	Order Code
Cooling pack	PAC-COO-200-000
Quick coupling set	ACC-QCS-CAM-001
Hydraulic cooling plate	ACC-HYD-CB1-000
Synchro cables 1 m	ACC-CAB-SYN-000
Synchro cables 3 m	ACC-CAB-SYN-001
Coax cables 10 m	ACC-CAB-CXP-000
Matrox Grabber CXP	ACC-GRA-CXP-000
Grabber kit 10 GB Ethernet	ACC-GRA-10G-ETH
Grabber kit 10 GB Fiber	ACC-GRA-10G-FIB

## Step 3. Software

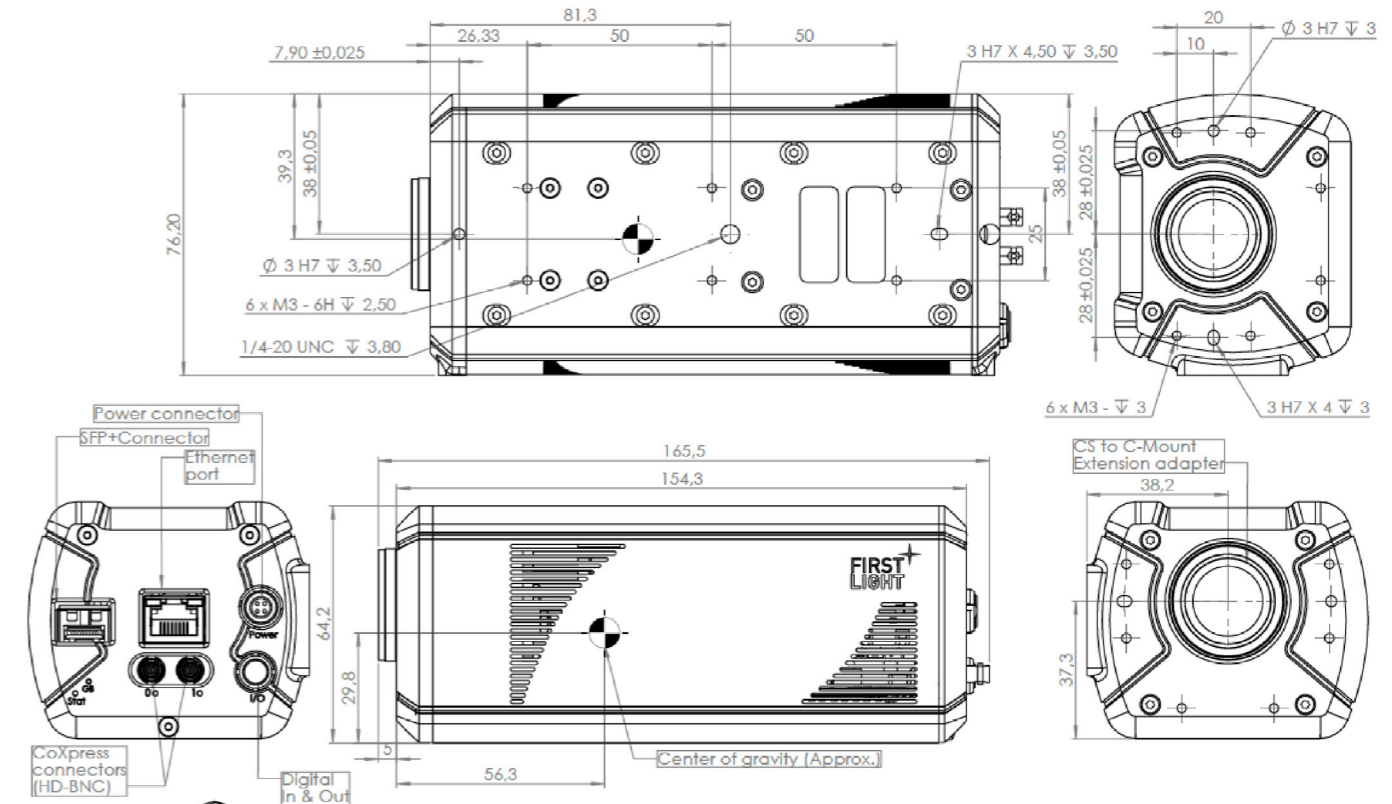


Software

Your product is provided with the following software options:  
 Graphical User Interface: First Light Vision  
 Software Development Kit: (C, C++, C#, Python, MatLab) / LabVIEW / µManager

# Product Drawings

Dimensions in mm (inches)  
 Weight 1.1 kg



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### Items shipped with your spectrograph:

- 1x Camera (model as ordered)
- 1x Power supply
- 1x Power supply cable
- 1x C-Mount adaptor
- 1x Quick start guide

Footnotes: Specifications are subject to change without notice

### Minimum Computer Requirements:

- RAM: 8 GB minimum
  - Processor: Intel® Core™ i5 or higher
  - Screen resolution: at least 1920 x 1080
- See [system requirements](#) for more information.

### Operating and Storage Conditions

- Operating Temperature: -10°C to 50°C
- Relative Humidity: (non-condensing)
- Storage Temperature: -10°C to 70°C

### Power Requirements

- 100 - 240 VAC 50 - 60 Hz
- Max. power consumption: 60 W