Libra 3412UC Global Shutter Color CMOS Camera, 12 MP, USB 3.0

Model Libra 3412UC · waveqvanta.com/products/libra-3412uc-cmos-camera

A 12 MP global shutter color camera with plug-and-play USB 3.0 for brightfield microscopy and pathology slide scanning.



The Libra 3412UC pairs a 4096 × 3072 global shutter color CMOS sensor with a USB 3.0 interface, so it connects directly to a standard microscope and computer without extra hardware. Auto white balance and AI-based color correction help reproduce stained tissue accurately, and the bundled software adds live stitching and depth-of-field fusion.

Key features

- Global shutter exposes all pixels simultaneously, avoiding motion blur and distortion during fast stage movement
- 4096 × 3072 resolution with 3.4 µm pixels, matched to optical systems below 40× magnification
- Up to 27 fps at full resolution in 8-bit mode and 18 fps in 12-bit mode over USB 3.0
- ISP auto white balance and AI-based color correction for faithful color in H&E-stained samples and teaching images
- Acquisition and analysis software with live image stitching and depth-of-field fusion
- Three gain modes with median readout noise down to 1.8 e^- (12-bit, Sensitive)
- USB-powered (below 4 W), passively cooled, 45 × 45 × 60 mm and ~162.5 g; IR-cut filter included

Specifications

Sensor Type	CMOS
Sensor	GMAX 3412
Color / Mono	Color (IR-cut filter included)
Resolution	4096 × 3072 (12 MP)
Pixel Size	3.4 µm × 3.4 µm
Effective Area	14.0 mm × 10.5 mm
Array Diagonal	17.4 mm (1.1")
Gain Mode	High Capacity, Balanced, Sensitive
Full-Well Capacity	12-bit: 9 ke^- High Capacity, 4.4 ke^- Balanced, 0.7 ke^- Sensitive
Readout Noise	12-bit median: 3.9 e^- High Capacity, 2.6 e^- Balanced, 1.8 e^- Sensitive
Frame Rate	27 fps @ 8-bit, 18 fps @ 12-bit (full resolution)
Shutter Type	Global
Exposure Time	1 µs – 10 s
Binning	1 × 1, 2 × 2, 4 × 4
ROI	Supported
White Balance	AI white balance supported
Image Correction	Defect pixel correction (DPC)
Cooling Method	Passive cooling
Bit Depth	8-bit, 12-bit

Data Interface	USB 3.0
Trigger	Hardware, software; Hirose 6-pin connector
Trigger Output	Exposure, Readout, Trigger Ready
Optical Interface	C-mount (customization available)
Power Supply	USB bus power
Power Consumption	Below 4 W
Dimensions	45 mm (H) × 45 mm (W) × 60 mm (L)
Weight	~162.5 g
Operating Environment	Operating 0 to 40 °C, 10–85% RH; storage −10 to 60 °C, 0–90% RH
Software / SDK Support	Acquisition and analysis software; SDK: C, C++, C#, Python
Operating System	Windows, Linux

Typical applications

- Pathology slide scanning
- Brightfield microscopy
- Fluorescence scanning
- Microscopy teaching
- Industrial inspection