

# Libra 3405C/3412C

The Libra 3405C and 3412C are global shutter color cameras developed by Tucsen for instrument integration. They utilize front-illuminated sCMOS technology, offering a broad spectral response (350 nm–1100 nm) and high sensitivity in the near-infrared range. Equipped with a global shutter and GigE interface, they deliver faster speeds for instruments, enhancing overall system performance.



Key Features	Benefits
High-Speed & Global Shutter	Ideal for high speed slide scanning.
High Resolution	3.4 μm pixel size is good for 20x – 40x objective resolution.
AI Color Correction <sup>[1]</sup>	Superior color quality for pathology application.
Enhanced NIR Sensitivity	For multichannel fluorescent imaging.
Cooling for Low Light	Provides uniform imaging background and clean fluorescence images.
10G GigE & Compact Design	Conducive to the integration of instrument systems.

## Typical Applications

- Slide Scanning
- Advanced Microscopy Imaging
- Industrial Inspection

## Noted Examples

[1] The AI Color Correction works on the camera itself, requiring no upgrades to the host configuration.

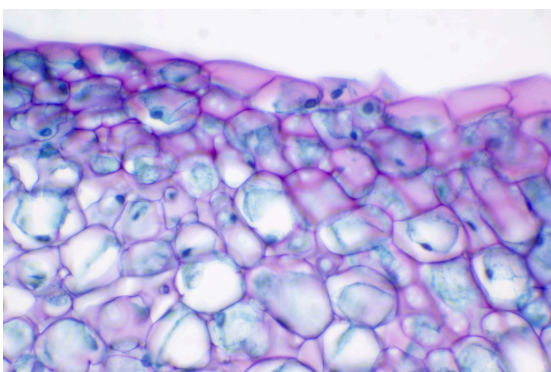
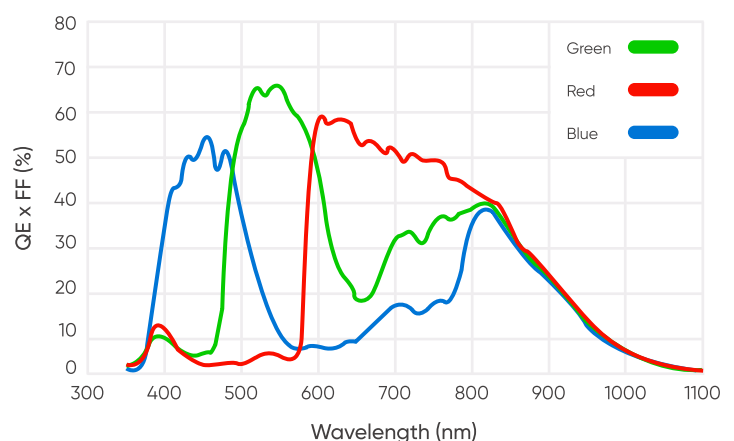
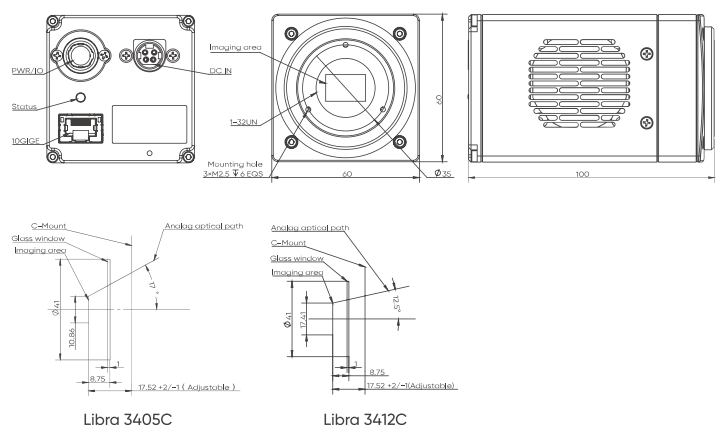


Figure 1: A 40x pathological photo taken by the AI Color Correction function, showing clear cellular details and distinct color gradations.

## Quantum Efficiency



### Dimensions (Unit: mm)



Model	Libra 3405C	Libra 3412C
Sensor Type	FSI CMOS	
Sensor Model	Gpixel GMAX 3405	Gpixel GMAX 3412
Color / Mono	Color	
Array Diagonal	10.9 mm (2/3")	17.4 mm (1.1")
Effective Area	8.3 mm x 7.0 mm	14.0mm x 10.5mm
Pixel Size	3.4 $\mu\text{m}$ $\times$ 3.4 $\mu\text{m}$	
Effective Resolution	2448 (H) x 2048 (V)	4096 (H) x 3072 (V)
Peak QE	Please refer to the quantum efficiency curve for details	
Gain Mode	High Capacity, Balanced, Sensitive	
	12 bit:	12 bit:
Full Well Wapacity	High Capacity:8.9 ke <sup>-</sup> ; Balanced:4.2 ke <sup>-</sup> ; Sensitive: 0.48 ke <sup>-</sup>	High Capacity:9 ke <sup>-</sup> ; Balanced:4.5 ke <sup>-</sup> ; Sensitive: 0.7 ke <sup>-</sup>
Frame Rate	12 bit@100fps;10 bit@163fps;8 bit@164fps	12 bit@64fps;10 bit@65fps;8 bit@98fps
	12 bit (Median):	12 bit (Median):
Readout Noise	3.7 e <sup>-</sup> @High Capacity; 2.3 e <sup>-</sup> @Balanced 1.4 e <sup>-</sup> @Sensitive	3.8 e <sup>-</sup> @High Capacity; 2.5 e <sup>-</sup> @Balanced 1.6 e <sup>-</sup> @Sensitive
Shutter Mode	Global Shutter	
Exposure Time	1 $\mu\text{s}$ ~ 10s	
AI White Blance	Support	
Image correction	DPC	
ROI	Support	
Binning (FPGA)	1x1 , 2x2 , 4x4	
Cooling Method	Air Cooling	
Cooling Temperature	Air cooling: 10°C@Room Temperature	
Dark Current	0.5e <sup>-</sup> /p/s @10°C	
Trigger Mode	Hardware, Software	
Output Trigger Signals	High, Low, ExposureOut, Readout, TriggerReady	
Trigger Interface	Hirose-12-Pin	
Data Interface	10G GigE	
Bit Depth	High Depth(12bit), Standard (10bit), Speed (8bit)	
Optical Interface	C-Mount	
Power	12 V/5A	
Power Consumption	30W	
Dimensions	60mm x 60mm x 100mm	
Camera Weight	~489g	
Camera Software	Samplepro/MosiacV3/Micromanager 2.0	
SDK	C / C++ / C# / Python	
Operating System	Windows / Linux	
Operating Environment	Working: Temp. 0~40°C, HUM 10~85% Storage: Temp. -10~60°C, HUM 0~85%	