FL 9BW / 9BW LT

The FL 9BW and 9BW LT are cooled CMOS cameras designed for long-exposure imaging. They not only incorporate the high sensitivity and low noise advantages of the latest sensor technologies but also leverage Tucsen's extensive experience in cooling chamber design and advanced image processing. These cameras can capture clean and uniform images with exposure times of up to 60 minutes.

Key Features	Benefits
Scientific Grade CMOS	92% peak QE, 0.9 e- readout noise and no glow.
< 0.0005 e-/p/s Dark Current	Equivalent to the cooled CCD for long exposure imaging.
16000 : 1 Dynamic Range	More than 4 times that of the CCD.
Pixel Correction Technology	High background quality ensures more accurate quantitative analysis.[1]
Flexible Binning Mode	Improving the sensitivity and dynamic range capability.
High Reliability Cooling Chamber	Cooled to -25℃@ 22℃, no condensation or other problems.
Compact Design	Conducive to instrument system integration.

Typical Applications

- Chemiluminescence
- Bioluminescence
- dPCR
- Fluorescence imaging

Noted Examples

[1] The FL 9BW has excellent background uniformity, as it has basically eliminated the bad factors such as amplifier grow and bad pixels.

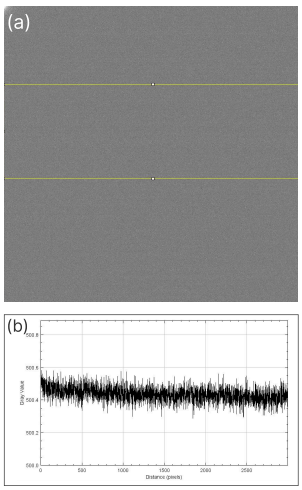
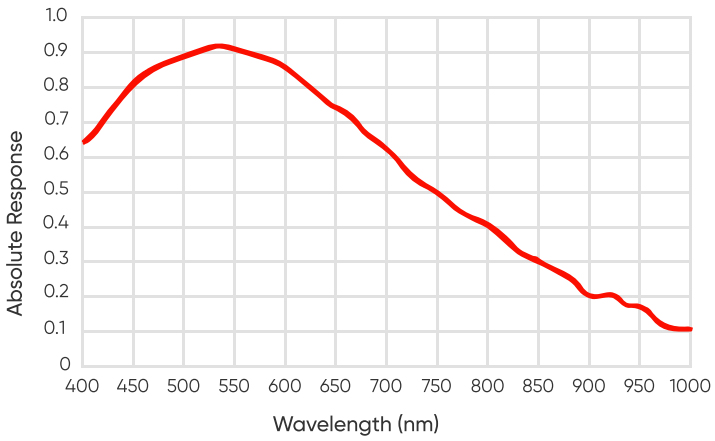
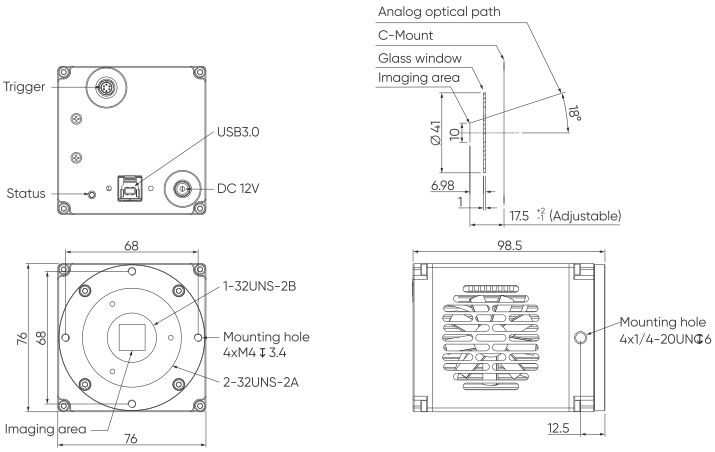


Figure (a) is the background image taken by FL 26BW with 600s exposure. Figure (b) is the grayscale intensity curve corresponding to the yellow region, showing excellent background uniformity.

Quantum Efficiency



Dimensions (Unit: mm)



Specifications

Model	FL 9BW		FL 9BW LT	
Sensor Type	BSI CMOS			
Sensor Model	SONY IMX533CLK-D			
Chrome	Mono			
Array Diagonal	15.96 mm (1")			
Effective area	23.4 mm x 15.6 mm			
Pixel Size	3.76 μm × 3.76 μm			
Resolution	3000 × 3000, 9 MP			
Peak QE	92%@540 nm			
Dark Current	< 0.0005 e-/p/s		< 0.0008 e-/p/s	
Gain Mode	Gain 0 HFWC	Gain 1 Balance	Gain 2 High Sensitivity 1	Gain 3 High Sensitivity 2
Full well capacity	47 ke-@bin 1	16 ke-@bin 1	8 ke-@bin 1	3 ke-@bin 1
Readout Mode	Standard, Low-Noise			
Readout Noise (Standard)	3.0 e-@Gain 0 0.95 e-@Gain 2	1.1 e-@Gain 1 0.8 e-@Gain 3	3.2 e-@Gain 0 1.1 e-@Gain 2	1.2 e-@Gain 1 1 e-@Gain 3
Readout Noise (LowNoise)	2.5 e-@Gain 0	1.0 e-@Gain 1	0.85 e-@Gain 2	0.75 e-@Gain 3
Frame Rate	19 fps@Standard Mode 12 fps@Low Noise Mode			
Shutter Mode	Rolling			
Exposure Time	15 μs~60 min			
Image Correction	DPC			
ROI	Support			
Binning	2 x 2, 3 x 3, 4 x 4, 6 x 6, 8 x 8, 12 x 12, 16 x 16, 24 x 24			
Cooling Method	Air			
Cooling Temp.	-25°C@Room Temperature (22°C)		Locked at 0°C	
Trigger Mode	Hardware, Software			
Trigger Output	Exposure Start, Global, Readout End, High Level, Low Level			
Trigger Interface	Hirose			
SDK	C, C++, C#, Python			
Data Interface	USB 3.0			
Software	Mosaic，SamplePro，LabVIEW，MATLAB，Micro-Manager 2.0			
Optical Interface	C-Mount / Customizable			
Bit Depth	14 bit, 16 bit			
Power Supply	12 V / 6 A			
Power Cons.	≤ 40 W			
Dimensions	76 mm x 76 mm x 98.5 mm			
Weight	835 g			
Operating System	Windows / Linux			
Operating Environment	Working: Temp. 0°C~45°C, HUM 10%~85% Storage: Temp. -10°C~60°C, HUM 0%~85%		Working: Temp. 0°C~45°C, HUM 10%~95% Storage: Temp. -10°C~60°C, HUM 0%~85%	

*Specifications in this manuat are subject to changes without prior notice.