FL 9BW Long-Exposure Cooled Mono CMOS Camera, 9 MP, 3000 × 3000

Model FL 9BW · waveqvanta.com/products/fl-9bw-cmos-camera

Compact cooled monochrome camera with a square 9 MP sensor for exposures of up to 60 minutes.



The FL 9BW is an air-cooled monochrome camera for long-exposure imaging, based on the Sony IMX533CLK-D back-illuminated CMOS sensor with a square 3000 × 3000 format. With the sensor cooled to -25 °C at 25 °C ambient and dark current below 0.0005 e^-/pixel/s, it records clean, uniform images with exposures of up to 60 minutes. A compact 76 mm housing and C-mount interface make it straightforward to build into imaging instruments.

Key features

- Sony IMX533CLK-D BSI CMOS sensor with 92% peak QE at 540 nm and readout noise down to 0.7 e^- (low-noise readout, Gain 3)
- Dark current below 0.0005 e^-/pixel/s with cooling to -25 °C at 25 °C ambient; the sealed chamber prevents condensation
- Exposure times from 15 µs to 60 min
- Four gain modes (full well from 48 ke^- to 3.1 ke^-) and a 16000:1 dynamic range
- Defect pixel correction for a clean, uniform background in quantitative work
- Binning from 2 × 2 up to 24 × 24
- 19 fps in standard mode or 12 fps in low-noise mode at full resolution over USB 3.0

Specifications

Sensor Type	BSI CMOS
Sensor	Sony IMX533CLK-D
Color / Mono	Mono
Peak QE	92% @ 540 nm
Resolution	3000 × 3000 (9 MP)
Pixel Size	3.76 × 3.76 µm
Effective Area	11.28 × 11.28 mm
Array Diagonal	15.96 mm (1")
Full-Well Capacity	48 / 16 / 7.8 / 3.1 ke^- (Gain 0 / 1 / 2 / 3, bin 1)
Readout Noise	2.5 / 1.0 / 0.85 / 0.7 e^- (Gain 0 / 1 / 2 / 3, low-noise readout)
Dynamic Range	16000:1
Frame Rate	19 fps (Standard mode), 12 fps (Low Noise mode)
Shutter Type	Rolling
Exposure Time	15 µs – 60 min
Binning	2 × 2, 3 × 3, 4 × 4, 6 × 6, 8 × 8, 12 × 12, 16 × 16, 24 × 24
ROI	Supported
Cooling Method	Air cooling
Cooling Temperature	-25 °C @ 25 °C ambient
Dark Current	< 0.0005 e^-/pixel/s

Image Correction	Defect pixel correction (DPC)
Bit Depth	14 / 16 bit
Data Interface	USB 3.0
Trigger	Hardware, software; outputs: Exposure Start, Global, Readout End, High, Low; Hirose 6-pin
Optical Interface	C-mount / customizable
Power Supply	12 V / 6 A
Power Consumption	≤ 46 W
Dimensions	76 × 76 × 98.5 mm (H × W × L)
Weight	835 g
Operating Environment	Working: 0–40 °C, 10–85% RH; storage: -10–60 °C, 0–85% RH
Operating System	Windows, Linux
Software / SDK Support	Acquisition and analysis software, LabVIEW, MATLAB, Micro-Manager 2.0
SDK	C / C++ / C# / Python

Typical applications

- Chemiluminescence imaging
- Bioluminescence imaging
- Digital PCR (dPCR)
- Fluorescence imaging
- Biochip readout