Dhyana 2100 Global-Shutter CMOS Camera, 5120 × 4096, 450 fps

Model Dhyana 2100 · waveqvanta.com/products/dhyana-2100-scmos-camera

A 21 MP global-shutter camera for capturing fast-moving scenes at full resolution.



The Dhyana 2100 combines a 5120 × 4096 global-shutter CMOS sensor (GSPRINT4521, 4.5 µm pixels) with eight CoaXPress-12 links to reach 450 fps at the full 21 MP resolution. Because all pixels are exposed at the same time, moving objects are recorded without rolling-shutter distortion. A fast 2 × 2 binning mode raises the rate to 975 fps at 12 bit, with larger effective pixels and a higher full well.

Key features

- 450 fps at full 5120 × 4096 resolution (8 bit, Full mode); 250 fps at 12 bit
- Global shutter for distortion-free images of fast-moving objects
- Fast Binning mode: up to 975 fps at 12 bit, with full well rising from 28 ke^- to 120 ke^-
- Full mode uses CXP-12 × 8; Base mode uses CXP-12 × 4 at up to 225 fps
- Air cooling to 25 °C below ambient or liquid cooling to 30 °C below coolant temperature
- M58 or F-mount optical interface, with custom mounts available

Specifications

Sensor Type	FSI CMOS
Sensor	GSPRINT4521
Color / Mono	Mono
Peak QE	63% @ 520 nm
Resolution	5120 × 4096
Pixel Size	4.5 µm × 4.5 µm
Effective Area	23.04 mm × 18.43 mm
Array Diagonal	29.5 mm
Full-Well Capacity	28 ke^- (12 bit, Gain 0); 120 ke^- (binned), typical
Readout Noise	3.5 e^- (12 bit, Gain 3), typical
Dynamic Range	68.8 dB (12 bit, Gain 2), typical
Frame Rate (Full Mode)	450 fps @ 8 bit; 300 fps @ 10 bit; 250 fps @ 12 bit
Frame Rate (Base Mode)	225 fps @ 8 bit; 150 fps @ 10 bit; 150 fps @ 12 bit
Frame Rate (Fast Binning)	975 fps @ 12 bit
Shutter Type	Global
Exposure Time	4 µs – 10 s
Binning	2 × 2, 4 × 4, 8 × 8
ROI	Supported
Cooling Method	Air, liquid
Cooling Temperature	Air: 25 °C below ambient; liquid: 30 °C below coolant temperature
DSNU / PRNU	2.0 e^- (12 bit, Gain 3) / 0.15% (Gain 0), 0.45% (Gain 3)
Bit Depth	8 bit, 10 bit, 12 bit

Data Interface	Full mode: CXP-12 × 8; Base mode: CXP-12 × 4
Trigger	Hardware, software; Hirose connector
Trigger Output	Exposure Start, Readout End
Optical Interface	M58, F-mount or custom
Power Supply	24 V / 6.67 A
Power Consumption	≤ 120 W
Dimensions	95 mm × 95 mm × 140 mm (without water-cooling connectors)
Weight	Under 1850 g
Operating Environment	Working 0–40 °C, 10–85% RH; storage 0–60 °C, 0–90% RH
Software / SDK Support	Sample acquisition software; C / C++ SDK; Windows, Linux

Typical applications

- Semiconductor wafer inspection
- FPD and SMT inspection
- High-speed aerial photography
- Voltage-sensitive imaging
- Cardiac imaging