Gemini 8KTDI LT Compact TDI sCMOS Line-Scan Camera, 500 kHz at 8K, CXP-12

Model Gemini 8KTDI LT · waveqvanta.com/products/gemini-8ktdi-lt-tdi-line-scan-camera

A compact, lightweight 8K TDI camera with a standard CXP interface for production-line inspection.



The Gemini 8KTDI LT brings the back-illuminated TDI sCMOS imaging of the Gemini 8KTDI into a smaller, lighter platform for scalable industrial inspection. It runs at 500 kHz at 8K over a CXP-12 × 4 interface and uses fan or passive cooling in place of combined air and water cooling. Visible and UV sensor versions are offered to suit different inspection tasks.

Key features

- Three models: G8KTDI LT-FAN-CXP (visible sensor, TEC + fan), G8KTDI LT-HS-CXP (visible sensor, passive cooling) and G8KTDI LT-UV-HS-CXP (UV sensor, passive cooling)
- Visible version: 300–1100 nm with 94.2% peak QE at 460 nm; UV version: 180–1100 nm with 65.8% QE at 266 nm
- Line rates of 500 kHz (8 bit), 410 kHz (10 bit) and 380 kHz (12 bit)
- 86 × 86 × 88 mm, 850 g and 35 W, compared with 120 × 120 × 144.5 mm, 3500 g and 72 W for the Gemini 8KTDI V2
- Standard CXP-12 × 4 interface, compatible with mainstream industrial vision equipment
- Pixel-level PRNU/DSNU correction and precise temperature control for quantitative defect detection
- Up to 256 TDI stages (P1) or 32 stages (P2); anti-blooming ≥ 50×

Specifications

Sensor Type	BSI sCMOS TDI
Sensor	GLT5008BSI VIS (FAN-CXP, HS-CXP); GLT5008BSI UV (UV-HS-CXP)
Color / Mono	Mono
Peak QE	94.2% @ 460 nm (VIS); 65.8% @ 266 nm (UV), typical
Spectral Range	300 nm to 1100 nm (VIS); 180 nm to 1100 nm (UV)
Resolution	P1: 8208 pixels × 256 stages; P2: 8208 pixels × 32 stages
Pixel Size	5 µm × 5 µm
Array Diagonal	41 mm
Full-Well Capacity	16.8 ke$^-$ (typical)
Readout Noise	7.4 e$^-$ @ 12 bit (typical)
Dynamic Range	67 dB @ 12 bit (typical)
Line Rate (TDI)	500 kHz @ 8 bit; 410 kHz @ 10 bit; 380 kHz @ 12 bit
TDI Stages	P1: 4, 32, 64, 128, 192, 224, 252, 256; P2: 2, 4, 8, 16, 24, 28, 30, 32
Operation Mode	TDI, area; scan direction forward, reverse or trigger-controlled
Binning	1 × 2, 2 × 2, 4 × 4, 8 × 8
ROI	Supported
Cooling Method	TEC + fan (FAN-CXP); passive cooling (HS-CXP, UV-HS-CXP)
Cooling Temperature	≤ 25°C @ 22°C (FAN-CXP)
Dark Current	2000 e$^-$/pixel/s @ 25°C (typical, corrected)

DSNU / PRNU	1.4 e^- / 0.05% @ 12 bit (typical, corrected)
Bit Depth	8 bit, 10 bit, 12 bit
Data Interface	CoaXPress (CXP-12 × 4)
Trigger	Trigger input, scan direction input; strobe output (Hirose 12)
Optical Interface	M58 × 0.75
Power Supply	12 V to 24 V DC
Power Consumption	35 W
Dimensions	FAN-CXP: 86 mm × 86 mm × 88 mm (H × W × L)
Weight	FAN-CXP: 850 g
Operating Environment	Working: 0°C to 40°C, 20–80% RH; storage: -20°C to 60°C; altitude up to 2000 m
Software / SDK	C/C++ SDK; Windows 10/11 (x64), Ubuntu 20.04/22.04 (x64), Euler OS (ARM64)

Typical applications

- Semiconductor inspection
- Chip packaging inspection
- Flat-panel display (FPD) inspection
- Lithium battery inspection
- Web inspection
- Biological fluorescence imaging and gene sequencing