

Gemini 8KTDI

The Gemini 8KTDI is a new-generation TDI camera developed by Tucsen to address the challenges of industrial inspection. The Gemini not only offers outstanding sensitivity in the UV range but also takes the lead in applying 100G CoF technology to TDI cameras, significantly improving line scan rates. Additionally, it features Tucsen's stable and reliable cooling and noise-reduction technology, providing more consistent and accurate data for inspections.



Key Features

Benefits

180-1100nm	Wide spectral response, especially with higher sensitivity in the ultraviolet range.
256 stages TDI	More TDI stages deliver higher SNR.
1 MHz@ 8K	Double the throughput of our previous generation TDI. ^[1]
100G CoF Interface	Reduces the need for multi-channel configurations, simplifying system integration.
Air & Liquid Cooling	Maintains low dark noise, minimizes vibration, and aids thermal stability. ^[2]

Typical Applications

- Semiconductor/Wafer Inspection
- Mask Inspection
- FPD Inspection
- Fluorescence Detection
- Gene Sequencing
- Spatial Omics

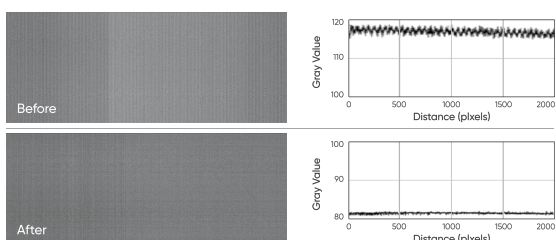
Noted Examples

[1] The Gemini 8KTDI has double the throughput of our previous generation TDI.

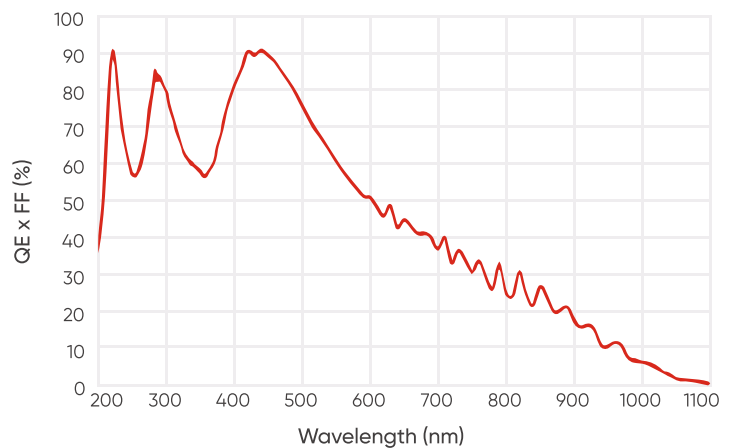
1 MHz@8 K **8208 Mpixel/s**

510 KHz@9 K **4590 Mpixel/s**

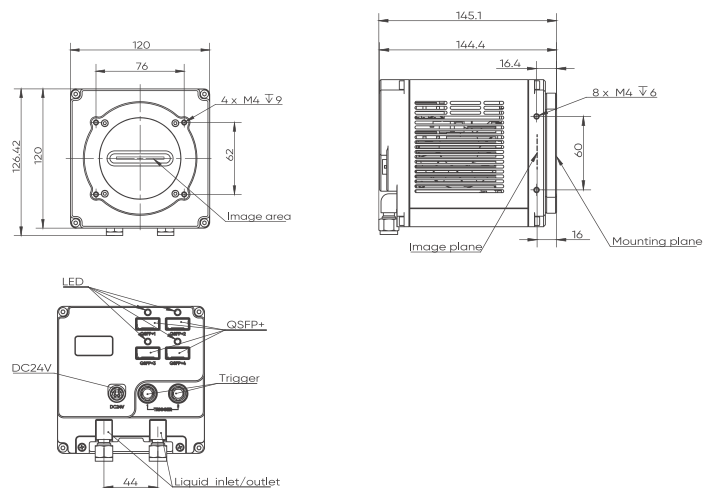
[2] Tucsen's advanced cooling technology creates a more uniform imaging background, enhancing detection accuracy.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Gemini 8KTDI
Sensor Type	BSI sCMOS TDI
Sensor Model	Gpixel GLT5008BSI_UV
Peak QE	≥ 63.9%@266 nm, ≥ 93.4%@440 nm
Spectral Range	180 nm - 1100 nm
Color / Mono	Mono
Array Diagonal	41 mm
Resolution	8208
Pixel Size	5 μm x 5 μm
Operation Mode	TDI, Area
TDI Stage	4, 32, 64, 128, 192, 224, 252, 256
Scan Direction	Forward, Reverse, Trigger Control
CTE	≥ 0.99996
Data Bit Depth	12 bit, 10 bit, 8 bit
Full-Well Capacity	≥ 15 ke-
Dynamic Range	≥ 66 dB@10 bit ADC
Max. Line Rate	1 MHz@8/10bit, 500 kHz@12bit
Readout Noise	14.3 e- @ 10 bit
Cooling Method	Air, Liquid
Max. Cooling	Air: 10°C@22°C Ambient, Liquid: 0 °C@22°C Liquid Temperature
Binning	1 x 2 (SENSOR BIN), 2 x 2, 4 x 4, 8 x 8 (FPGA BIN)
ROI	Support
Trigger Mode	Trigger Input, Scan Direction Input
Output Trigger Signals	Strobe out
Trigger Interface	Hirose
Timestamp Accuracy	8 ns
Gain	Analog Gain: x 1 ~ x 4, Digital Gain: x0 ~ x 16
Data Interface	QSFP+ / QSFP28
Optical Interface	M72x0.75 / User Customization
Power Supply	24 V / 6.67 A
Weight	< 3500 g
Dimensions	120 mm x 120 mm x 144.5 mm
Software	SamplePro
SDK	C, C++
Operating System	Windows 10 X 64/Windows 11 X 64, Ubuntu 20.04, 22.04
Operating Environment	Working: Temp. 0 °C~40 °C, Hum. 20%~80% Storage: Temp. -20 °C~60 °C, Hum. 20%~80% Working altitude: 0 ~ 2000 m