# Dhyana 9KTDI BSI TDI sCMOS Line-Scan Camera, 510 kHz at 9K, CXP-12

Model Dhyana 9KTDI · waveqvanta.com/products/dhyana-9ktdi-tdi-line-scan-camera

A BSI TDI line-scan camera for fast, low-light inspection from ultraviolet to near-infrared.




The Dhyana 9KTDI applies back-thinned sCMOS technology to time delay integration, with up to 256 TDI stages on a 9072-pixel line of 5 µm pixels. It reaches 510 kHz at 8 bit over a CoaXPress 2.0 (CXP-12 × 4) interface and responds from 180 nm to 1100 nm. Wafer inspection, FPD inspection and other precision scanning tasks are typical uses.

## Key features

- 82% QE at 550 nm, 51% at 355 nm and 38% at 266 nm
- Spectral response from 180 to 1100 nm for UV, visible and near-infrared imaging
- Selectable TDI stages from 4 to 256 for higher signal-to-noise ratio under limited light
- Line rates of 510 kHz (8 bit), 345 kHz (10 bit) and 299 kHz (12 bit)
- About 4590 Mpixel/s at 9K and 510 kHz, roughly 46× a back-illuminated TDI-CCD running 2K at 50 kHz (100 Mpixel/s)
- CoaXPress 2.0 (CXP-12 × 4) interface; M72 optical mount, customization available
- Air or liquid cooling in an 86 × 86 × 109 mm, 1100 g housing

## Specifications

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| **Sensor Type** | BSI sCMOS TDI |
| **Sensor** | GLT5009BSI |
| **Color / Mono** | Mono |
| **Peak QE** | 82% @ 550 nm; 51% @ 355 nm; 38% @ 266 nm; 38% @ 800 nm |
| **Spectral Range** | 180 nm to 1100 nm |
| **Resolution** | 9072 (H) × 256 (V) |
| **Pixel Size** | 5 µm × 5 µm |
| **Effective Area** | 45.36 mm × 1.28 mm |
| **Array Diagonal** | 45.4 mm |
| **Full-Well Capacity** | 10 ke$^-$ @ 10 bit and 12 bit (typical) |
| **Readout Noise** | 6.6 e$^-$ @ 10 bit; 6.2 e$^-$ @ 12 bit (typical) |
| **Dynamic Range** | 63 dB @ 10 bit; 66 dB @ 12 bit (typical) |
| **Line Rate (TDI)** | 510 kHz @ 8 bit; 345 kHz @ 10 bit; 299 kHz @ 12 bit |
| **TDI Stages** | 4, 8, 16, 32, 64, 96, 128, 160, 192, 224, 240, 248, 252, 256 |
| **Operation Mode** | TDI, area; scan direction forward, reverse or trigger-controlled |
| **Binning** | 1 × 2 (sensor); 2 × 2, 4 × 4, 8 × 8 (FPGA) |
| **ROI** | Supported |
| **Cooling Method** | Air cooling, liquid cooling |
| **Cooling Temperature** | 20°C below ambient (at 20°C); 35°C below water temperature (at 20°C) |
| **DSNU / PRNU** | 4 e$^-$ @ 10 bit and 12 bit / 0.3% (typical) |
| **Bit Depth** | 8 bit, 10 bit, 12 bit |

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| **Data Interface** | CoaXPress 2.0 (CXP-12 × 4) |
| **Trigger** | Trigger input, scan direction input; strobe output (Hirose HR10A-7R-4S) |
| **Optical Interface** | M72; customization available |
| **Power Supply** | 12 V / 8 A |
| **Power Consumption** | < 60 W |
| **Dimensions** | 86 mm × 86 mm × 109 mm (H × W × L) |
| **Weight** | 1100 g |
| **Operating Environment** | Working: 0°C to 40°C, 0–85% RH; storage: 0°C to 60°C, 0–90% RH |
| **Software / SDK** | C++ SDK (GenICam standard); Windows, Linux |

## Typical applications

- Semiconductor and wafer inspection
- Flat-panel display (FPD) inspection
- Fluorescence detection
- Spectral analysis