

# TDI board level camera C10000-A01



The C10000-A01 is a TDI camera. TDI technology is useful for a wide range of imaging applications which requires high speed and high sensitivity simultaneously which a typical line scan camera can not make an useful image. TDI is a special image acquisition method that has been used extensively in machine vision applications for industrial inspection. TDI imaging is appropriate for applications where it is desired to record a linear process over time, or where the aspect ratio of the object being imaged is significantly asymmetric. The camera is particularly useful for low light level scanning applications. Frame readout mode is available for easy focusing.

## FEATURES

- Single PC board module type camera
- High resolution / high sensitivity  
(Horizontal spatial resolution with 128(V) TDI stages)  
· 2048 (H) × 128 (V), 4 TAP
- Line rate up to 50 kHz
- High speed imaging with high-sensitivity and low noise
- Great spectral response for UV to NIR with back thinned CCD
- Dynamic range of 1600:1
- 12 bit / 8 bit selectable A/D converter
- Bidirectional scanning operation
- Frame readout mode for easy focusing

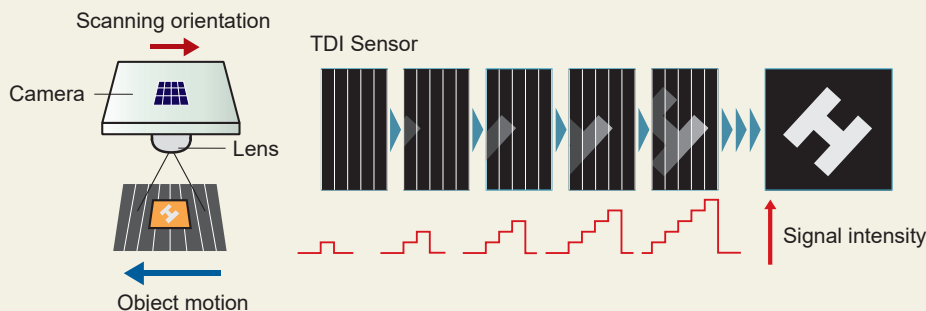
## APPLICATIONS

- Fluorescent imaging
- In-line inspection with low light illumination
- Scanning for a large size sample  
(e.g. LED flat panel)

## OPERATING PRINCIPLE OF TDI

### TDI (Time Delay Integration):

Time Delay Integration is a scanning technology in which a frame transfer device produces a continuous video image of a moving object by means of a stack of linear arrays aligned with and synchronized to the motion of the object to be imaged. In such a way that, as the image moves from one line to the next, the integrated charge moves along with it, providing higher resolution at lower light levels than is possible with a line-scan camera.



## SPECIFICATIONS

Type number	C10000-A01
Device structure	Back-thinned type
Effective number of pixels	2048 (H) × 128 (V)
Pixel size	12 μm (H) × 12 μm (V)
Effective area	24.58 mm (H) × 1.536 mm (V)
Lens mount	F-mount
Camera Link connector	Mini-Camera Link (SDR) × 1
Readout mode	TDI readout mode / Frame readout mode *1
TDI transfer direction	Bidirectional transfer
TDI output channel	4 TAP (512 × 128)
Anti-blooming	Lateral overflow drain (Supports up to 100 times saturation)
TDI pixel clock rate	30 MHz
TDI line rate	0.45 kHz to 50 kHz
TDI line rate control	Internal setting by serial command *2 / External trigger
Full-well capacity (Typ.)	80 000 electrons
Readout noise (rms Typ.)	50 electrons
Dynamic range	1600 : 1
Binning	2×2
Analog enhancement gain	1 time to 5 times (16 steps)
Digital output	12 bit / 8 bit *3
Interface	Camera Link base configuration
Camera control	Serial control in Camera Link
Camera output clock	60 MHz
Camera output channel	2 TAP (1024 × 128)
Power supply	DC +12 V*4
Power consumption	Approx. 13.2 W
Ambient operating temperature	0 °C to +40 °C
Ambient operating humidity	0% to 80 % (with no condensation)
Ambient storage temperature	-10 °C to +50 °C

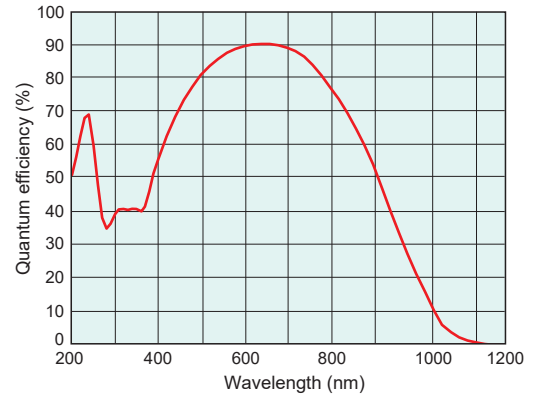
\*1: Frame readout mode is useful for easy focusing, but it is not suitable for measurement.

\*2: Internal TDI line rate is set by 33 ns step.

\*3: Selectable by serial command.

\*4: AC adapter and external trigger cable are not included.

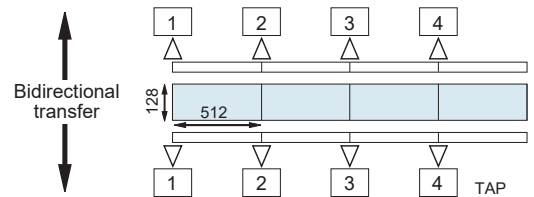
## SPECTRAL RESPONSE



\* This is typical, not guaranteed.

\* Without sapphire window. With the sapphire window, the spectral response is decreased due to the transmittance characteristics of the window.

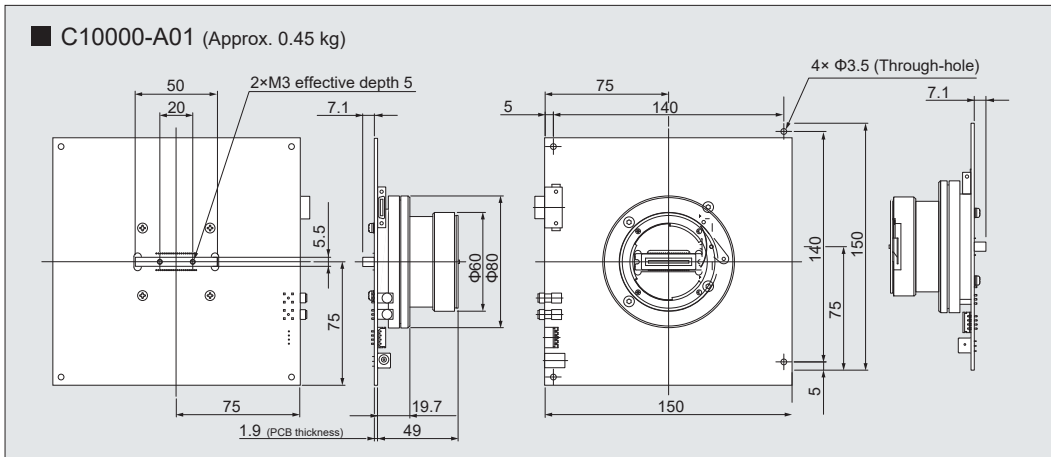
## TDI SENSOR STRUCTURE



## OPTIONS

- External trigger cable SMA-BNC 5 m A12106-05
- External trigger cable SMA-SMA 5 m A12107-05

## DIMENSIONAL OUTLINES (Unit : mm)



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Cat. No. SCAS0101E05  
AUG/2020 HPK  
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