Coming Product in 2009

Preliminary

# TDI Camera
# C10000-601,-701

## Time Delay Integration Camera

The C10000-601,-701 TDI camera is useful for a wide range of imaging applications requiring high speed operation with high sensitivity simultaneously. 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 subject being imaged is significantly asymmetric. TDI is particularly useful for low light level scanning applications for which a typical line scan camera can not make a useful image. Also, frame readout mode is available for easy focusing.

### FEATURES

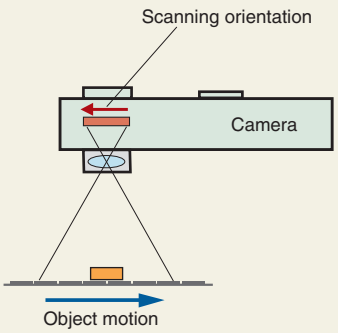
- **High resolution / high sensitivity**
  **(Horizontal spatial resolution with 128(V) TDI stages)**
  - 4096(H) × 128 (V) , 16 TAP or 8 TAP
- **Line rates up to 100 kHz**
  **(C10000-701, 16 TAP with 30 MHz pixel clock)**
- **High speed imaging combined with high sensitivity and low noise**
- **Great spectral response for UV-NIR with back thinned CCD**
- **100 % fill factor**
- **100× anti-blooming with lateral overflow drain**
- **Dynamic range of 800 : 1** (C10000-601,-701B)
- **12 bit / 8 bit selectable A/D converter** (C10000-601)
- **Bi-directional scanning operation**
- **Frame readout mode for easy focusing**
- **Internal real-time shading correction**

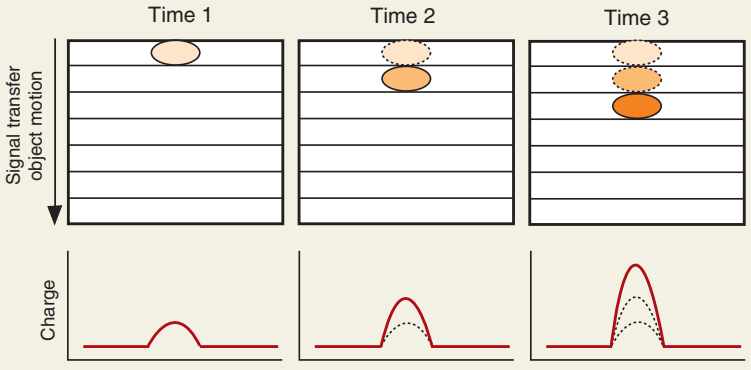
### APPLICATIONS

- **High speed imaging for low light applications i.e. fluorescence imaging**
- **Electronics manufacturing and inspection**
- **Semiconductor inspection**
- **High speed scanning for a large size sample i.e. flat panel displays**

### OPERATING PRINCIPLE OF TDI

**TDI** (Time Delay Integration):
Time Delay Integration is a technology of scanning 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.

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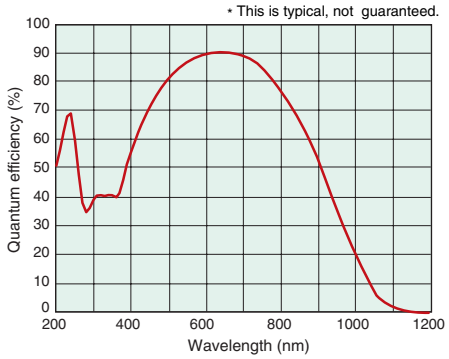
## SPECIFICATIONS

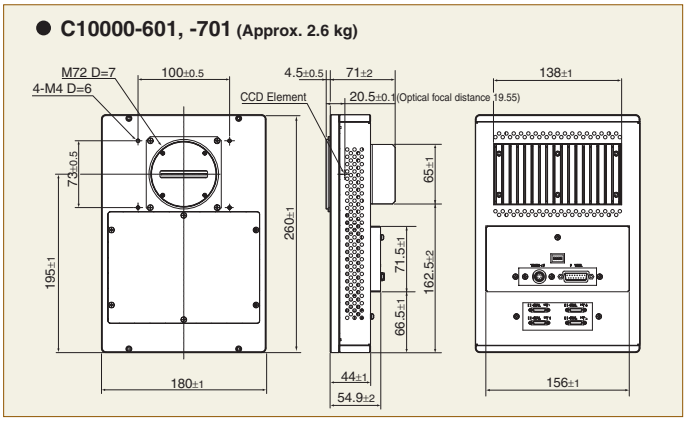
| Type number | C10000-601 | C10000-701A | C10000-701B |
|---|---|---|---|
| Pixel number | 4096 (H) × 128 (V) | | |
| Device structure | Back thinned type | | |
| Cell size | 12 µm(H) × 12 µm(V) | | |
| Effective area | 49.16 mm(H) × 1.536 mm(V) | | |
| Readout mode | TDI readout mode or frame readout mode*1 | | |
| TDI transfer direction | Bi direction | | |
| TDI output channel | 8 TAP (512 × 8) | 16 TAP (256 × 16) | |
| Anti-blooming | Lateral overflow drain (100×) | | |
| TDI pixel clock rate | 30 MHz | | |
| TDI line rate | 0.45 kHz to 50 kHz | 0.45 kHz to 100 kHz | |
| TDI line rate control | Internal setting by serial command*2 / External trigger | | |
| Full-well capacity (typ.) | 80 000 electrons | | |
| Readout noise (typ.) | 100 electrons r.m.s. *3 | | |
| Dynamic range (typ.) | 800 : 1 | 256 : 1 | 800 : 1 |
| Binning | 2 × 2 | | |
| Analog enhancement gain | 1 time to 5 times (16 steps) | | |
| A/D converter | 12 bit / 8 bit *4 | 8 bit | 12 bit |
| Image processing | Internal real-time shading correction / Background subtraction | | |
| Interface | Medium Configuration | Full Configration ×1 | Medium Configuration ×2 |
| Camera control | Serial control in Camera Link | | |
| Camera output clock | 60 MHz | | |
| Camera output channel | 4 TAP (1024 × 4) | 8 TAP (512 × 8) | |
| Camera Link connector | Mini-Camera Link (SDR) × 2 | Mini-Camera Link(SDR)× 2 | Mini-Camera Link(SDR)× 4 |
| Lens mount | M72, P=0.75 | | |
| Power / Power consumption | DC +12 V / 36 W | | |
| Ambient storage tenmperature | -10 ℃ to +50 ℃ | | |
| Ambient operating temperature | 0 ℃ to +40 ℃ | | |
| Ambient operating / storage humidity | 70 % max. (with no condensation) | | |

*1 Frame readout mode is useful for easy focusing, but it is not suitable for measurement. Please consult with our sales office for details.
*2 Internal TDI line rate is set by 33 ns step. *3 Provisional figure *4 Selectable by DIP switch.

## SPECTRAL RESPONSE

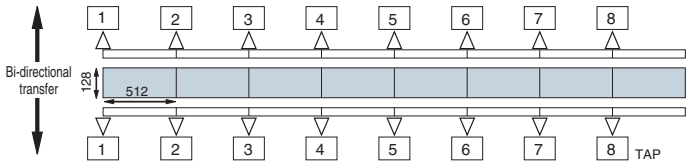



## DIMENSIONAL OUTLINES (Unit : mm)

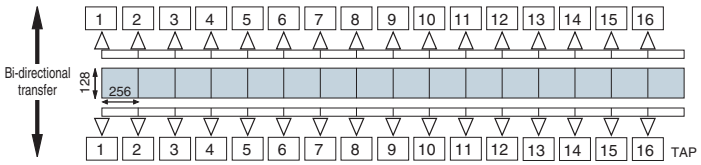



## TDI SENSOR STRUCTURES

* C10000-601 (4096×128, 8 TAP)




* C10000-701 (4096×128、16 TAP)



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Cat. No. SCAS0053E04
APR/2009 HPK
Created in Japan (PDF)