# SW-4000T-10GE
## Technical Datasheet

**Custom**

JAi®
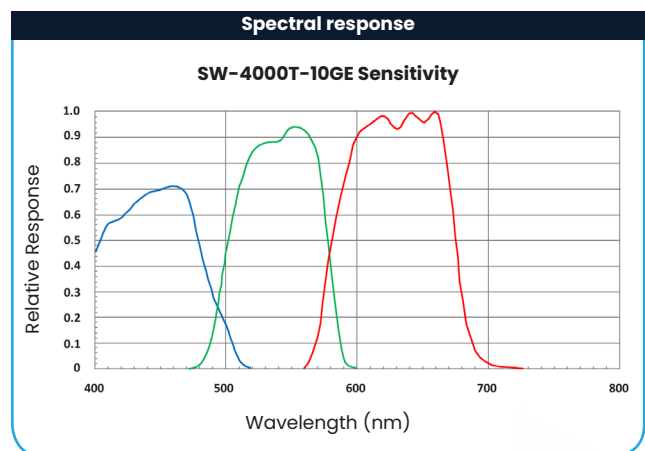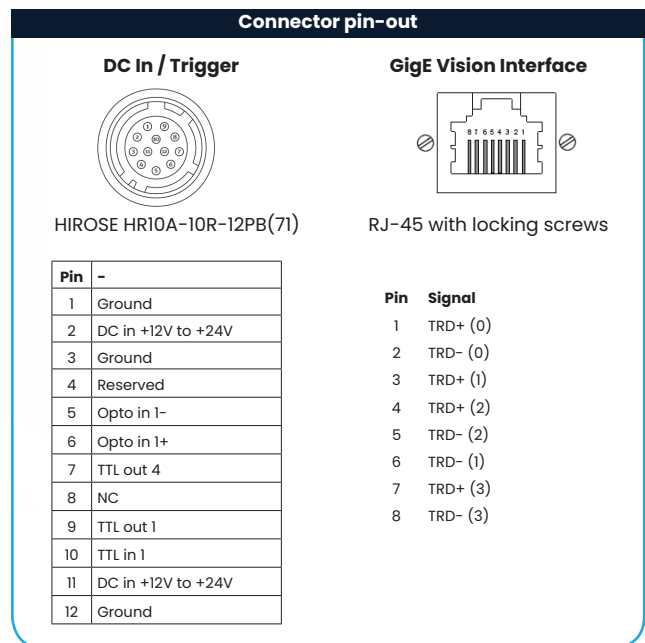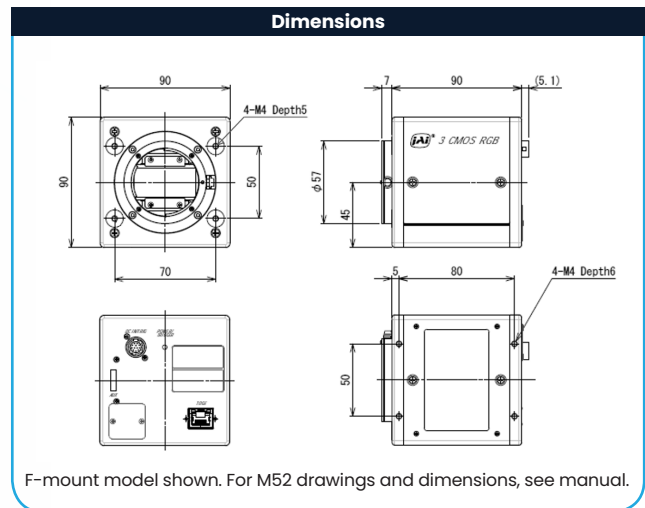*See the possibilities*



GiGE VISION
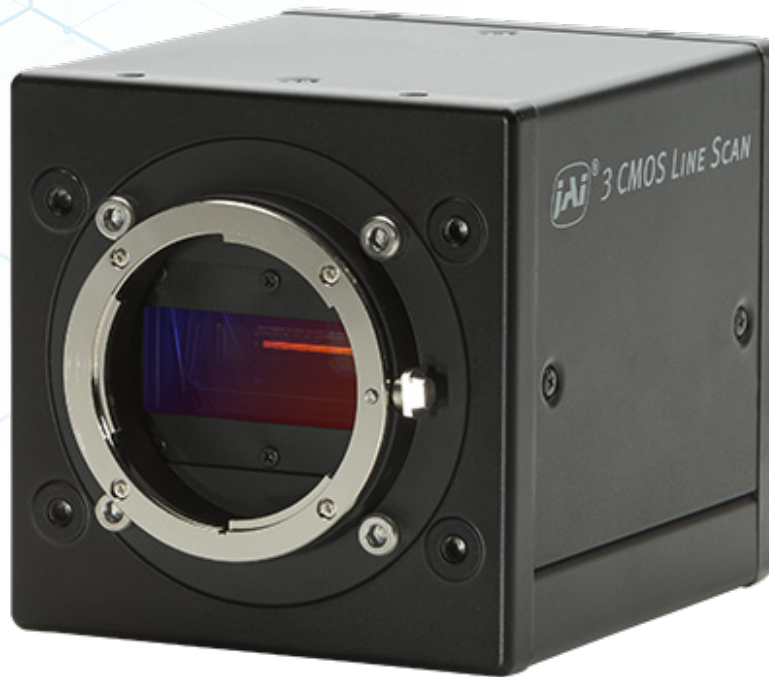
## Apex Series

JAI's Sweep Series includes both monochrome and trilinear color line scan cameras with line rates that are among the fastest available for their type and resolution.

The Sweep SW-4000TL trilinear models deliver outstanding color line scan images for applications that don't require the ultimate image precision provided by the Sweep+ Series.

## Specification Highlights

| | | | | |
|---|---|---|---|---|
| **SENSOR:** | Custom | | **SHUTTER:** | Global Shutter |
| **FORMAT:** | 30.72 mm | | **FRAME RATE:** | 97 kHz |
| **PIXEL SIZE:** | 7.5 x 7.5 μm / 25.0 x 25.0 μm | | **INTERFACE:** | 10 Gbps GigE Vision |
| **LENS MOUNT:** | F-Mount | | **RESOLUTION MP:** | N/A MP |
| **SPECTRUM:** | Color (Visible) | | **RESOLUTION WxH:** | 4098 x 1 px |

| Specifications | SW-4000T-10GE |
|---|---|
| Scanning system | 3 high-speed CMOS line sensors, prism-mounted |
| Active pixels | 3 x 4096 pixels (R, G, B) |
| Line rate | Up to 97 kHz (variable) Faster line rates possible with YUV compression |
| Sensor width | 30.72 mm |
| Pixel size | Mode A: 7.5 µm x 7.5 µm Mode B: 7.5 µm x 10.5 µm |
| Ethernet speeds | 10GBASE-T, 5GBASE-T, 2.5GBASE-T, 1000BASE-T Full backwards compatibility |
| Video output | RGB8, RGB10V1Packed, RGB10p32, YUV422_8_UVYV, YUV422_8 |
| Object illuminance (min.) | 220 lx @ 7800 K, Mode A (Gain 18 dB, 525 µs exp., 50% video, RGB8) |
| Responsivity | 123 DN/nJ/cm² (G channel, Mode A, 10-bit @ 550 nm, 0 dB gain) |
| S/N ratio | >55 dB on green, 10-bit with 0 dB gain |
| Inputs | Trigger (1 Opto In + 1 TTL via 12-pin, 2 TTL via 10-pin), Pulse Generator (4), NAND Out (2), Action (4) |
| Outputs | 2 TTL via 12-pin, 2 TTL via 10-pin |
| Gain | Analog Base Gain: 0 dB / 6 dB / 12 dB Digital Master: 0 to +30 dB, R/B: -7.96 to +12 dB Digital Individual: 0 to +36 dB |
| White balance | Manual/one-push auto by gain or exposure |
| Gamma | 0.45 to 1.0 (9 steps) or 257-point LUT |
| Image processing | PRNU/DSNU, black level, flat shading and color shading correction, chromatic aberration adjustment, horizontal mirroring |
| Color space conversion | RGB or RGBa8 to HSI, XYZ (CIE), sRGB, Adobe RGB, or User Custom RGB |
| Exposure modes | No shutter, timed, and trigger width control |
| Electronic shutter | 3 µs to 10.3 µs in 10 ns increments at fastest line rate. Exposure time can be longer at slower line rates. |
| Pulse width control | 1.8 µs to ~1 sec |
| Time synchronization | Support for Precision Time Protocol (IEEE 1588) |
| Lens mount | M52 mount or Nikon F-mount (46.5 mm flange back for both mounts) |
| Operating temp. (ambient) | -5ºC to +45ºC (20 to 80% non-condensing) |
| Storage temp. (ambient) | -25ºC to +60ºC (20 to 80% non condensing) |
| Vibration | 3G (20 Hz to 200 Hz, XYZ directions) |
| Shock | 50G |
| Regulations | CE (EN61000-6-2, EN61000-6-3) FCC Part 15 Class B, RoHS/WEEE |
| Power — 12-pin PoE+ | +10V to +25V DC. 13.7 W typical @ 12V 42V to 57V DC. 15.3 W typical @ 48V |
| Dimensions (H x W x L) | (without connector and lens mount protrusions) 90 mm x 90 mm x 90 mm |
| Weight | 830 g |
| **Ordering Information** | |
| SW-4000T-10GE-F SW-4000T-10GE-M52 | 3-CMOS prism line scan camera with F-mount 3-CMOS prism line scan camera with M52 mount |

## Dimensions



F-mount model shown. For M52 drawings and dimensions, see manual.

## Connector pin-out

### DC In / Trigger



HIROSE HR10A-10R-12PB(71)

| Pin | - |
|---|---|
| 1 | Ground |
| 2 | DC in +12V to +24V |
| 3 | Ground |
| 4 | Reserved |
| 5 | Opto in 1- |
| 6 | Opto in 1+ |
| 7 | TTL out 4 |
| 8 | NC |
| 9 | TTL out 1 |
| 10 | TTL in 1 |
| 11 | DC in +12V to +24V |
| 12 | Ground |

### GigE Vision Interface



RJ-45 with locking screws

| Pin | Signal |
|---|---|
| 1 | TRD+ (0) |
| 2 | TRD- (0) |
| 3 | TRD+ (1) |
| 4 | TRD+ (2) |
| 5 | TRD- (2) |
| 6 | TRD- (1) |
| 7 | TRD+ (3) |
| 8 | TRD- (3) |

## Spectral response

### SW-4000T-10GE Sensitivity

## Product Highlights

- World's first 3 x 4096 pixel prism-based 10GBASE-T line scan camera
- Max. line rate of 97 kHz for RGB8 output
- Prism technology for superior color quality and better color differentiation
- Backwards compatible to NBASE-T (5GBASE-T/2.5GBASE-T) and standard GigE (1000BASE-T)
- Optimized for applications with fixed and varying object speeds
- Newly developed "state of the art" CMOS sensors
- Selectable pixel size - 7.5 x 7.5 µm or 7.5 x 10.5 µm
- Supports vertical dual-line binning, 2x horizontal binning, or both
- Flat field correction and color shading correction
- HSI and XYZ color space conversion
- Supports direct connection to rotary encoders plus large variety of trigger options
- GigE Vision 2.0 interface with selectable YUV, 3 x 8-bit RGB, or 3 x 10-bit RGB output
- Excellent shock and vibration resistance

## Additional Product Images