SW-4000Q-SFP
Technical Datasheet

Custom

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See the possibilities

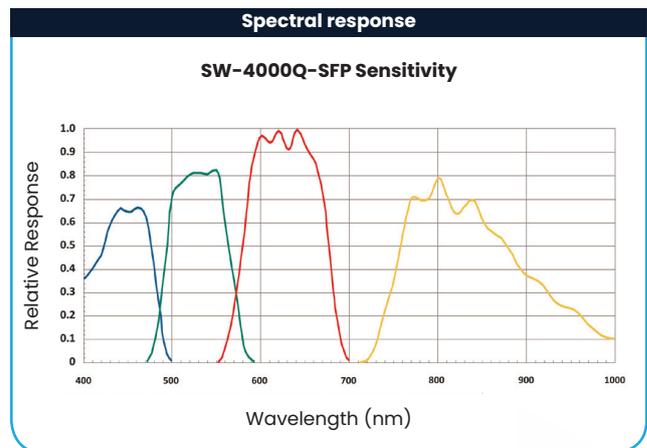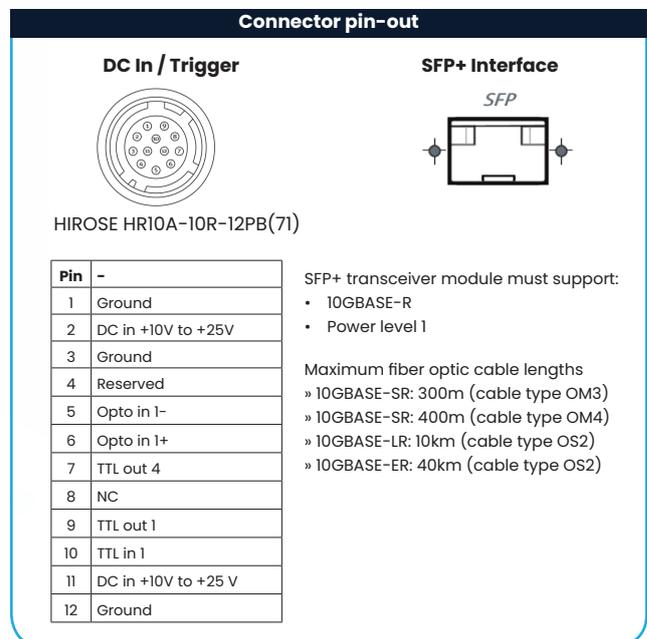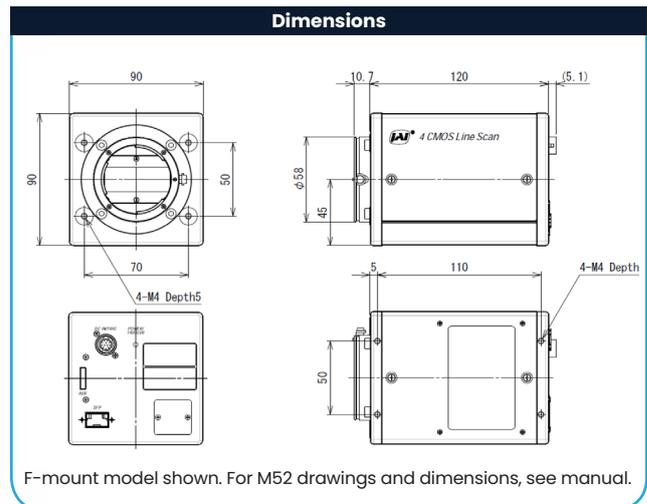**GigE VISION** ®

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:**	72 kHz
PIXEL SIZE:	7.5 x 7.5 µm / 25.0 x 25.0 µm		**INTERFACE:**	SFP+ over 10 Gigabit Ethernet
LENS MOUNT:	F-Mount		**RESOLUTION MP:**	N/A MP
SPECTRUM:	Multispectral (4-Bands R-G-B + NIR)		**RESOLUTION WxH:**	4097 x 1 px

Specifications	SW-4000Q-SFP
Scanning system	4 high-speed CMOS line sensors, prism-mounted
Active pixels	4 x 4096 pixels (R, G, B, NIR)
Line rate (full width)	Up to 72 kHz (variable) for 8-bit RGB + NIR 74 kHz 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-SR / 10GBASE-LR / 10GBASE-ER
Video output	Single stream: RGBa8 Two streams: RGB8, RGB10V1Packed, RGB10p32, YUV422_8_UVYV, YUV422_8 (visible) Mono8, Mono10Packed (NIR)
Object illuminance (min.)	300 lx @ 7800 K, Mode A (Gain 18 dB, 525 µs exp., 50% video, f/2.8)
Responsivity	RGB: 118 DN/nJ/cm² @ 550 nm (G channel) NIR: 64 DN/nJ/cm² @ 800 nm (Mode A, 10-bit, 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), User Out (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 +18 dB, R/B/NIR: -4 to 12 dB Digital Individual: 0 to +24 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 13889 µs in 1 µs increments at 72 kHz. 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. 17.4 W typical @ 12V Not supported.
Dimensions (H x W x L)	(without connector and lens mount protrusions) 90 mm x 90 mm x 120 mm
Weight	980 g

Ordering Information	
SW-4000Q-SFP-F SW-4000Q-SFP-M52	4-CMOS prism line scan camera with F-mount 4-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 +10V to +25V
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 +10V to +25 V
12	Ground

SFP+ Interface

SFP+ transceiver module must support:
- 10GBASE-R
- Power level 1

Maximum fiber optic cable lengths
» 10GBASE-SR: 300m (cable type OM3)
» 10GBASE-SR: 400m (cable type OM4)
» 10GBASE-LR: 10km (cable type OS2)
» 10GBASE-ER: 40km (cable type OS2)

Spectral response

SW-4000Q-SFP Sensitivity

Product Highlights

- 4 x 4096 pixel prism-based line scan camera
- Provides 10GBASE-R (fiber optic) output over SFP+ interface
- Max. line rate of 72 kHz for RGB8 + NIR dual-stream output
- Prism technology for superior color quality and alignment of visible + NIR channels
- 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 choice of single-stream or dual-stream output
- Output formats include 3 x 8-bit or 3 x 10-bit RGB, 8-bit YUV, and 8-bit/10-bit NIR
- Excellent shock and vibration resistance

Additional Product Images