

# LQ-401-CL

## Technical Datasheet

N/A



See the possibilities



## 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

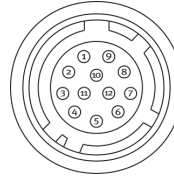
**SENSOR:** N/A  
**FORMAT:** 28.67 mm  
**PIXEL SIZE:** 7.0 x 7.0  $\mu$ m  
**LENS MOUNT:** F-Mount  
**SPECTRUM:** Multispectral  
(4-Bands R-G-B + NIR)

**SHUTTER:** Global Shutter  
**FRAME RATE:** 18 kHz  
**INTERFACE:** Camera Link  
**RESOLUTION MP:** N/A  
**RESOLUTION WxH:** 4096 x 1 px

Specifications		LQ-401 CL
Scanning system		Line sensor with internal clock
Pixel clock		84.00 MHz
Line rate	Standard	54.79µs (Full resolution/binning/internal trigger)
	Programmable	54.79µs-14.30ms, 11.9ns increments
Sensor		4 CMOS line sensors mounted on R/G/B/NIR beam splitter prism
Sensor scanning width		28.672 mm
Cell size		7 µm x 7 µm
Active pixels		4 x 4096 (h) 4 x 2048 (h) with 2:1 binning
Sensor sensitivity		Radiometric: 64nJ/cm <sup>2</sup>
Sensitivity		2800 Lux (7800K, gain=low, shutter=OFF, 100% video)
S/N ratio		55 dB on green with gain = 0 dB
Video output		4 x 8 bit in CL base configuration 4 x 10 bit in CL medium configuration
Gain		Master: 0 dB to +8 dB R/B: -4 dB to +6 dB Analog gain= Low (0dB) or High (+6dB)
Individual mode		R/G/B: -4 dB to +14 dB Analog gain= Low (0dB) or High (+6dB)
White balance		Manual, fixed or one-push Adjustable range 4000 K to 9000 K Fixed: 4000 K, 4600 K or 5600 K
Shading correction		Individual R/G/B/NIR flat or R/B/NIR to G
Flat-field correction		PRNU Correction: Built-in DSNU Correction: Built-in
Synchronization		Internal X-tal or external trigger
Trigger modes		No-shutter, shutter-select and pulse width control
Programmable exposure		9.52 µs to 14.2 msec. in 11.9 ns increments
Functions controlled by RS 232C or CL		Trigger modes, scan rate, exposure time, gain/black level, shading correction, flat-field correction, white balance, knee-function, diagnostics
Diagnostics		Test pattern generator. (Color bar, gray pattern and white) LED for power
Lens mount		M-52 mount. (Standard) Nikon F-mount. (Factory option)
Sensor alignment		Better than ±0.1 pixel (at center)
Operating temperature		-5°C to +45°C/20 – 80% non-condensing
Storage temp./humidity		-25°C to +60°C/20 – 80% non-condensing
Vibration		3G (20Hz to 200Hz, XYZ direction)
Shock		50G
Regulations		Emission: CE CISPR Pub. 22 (EN55022) Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHS
Power		12V DC to 24V DC ± 10%.
Dimensions (H x W x D)		90 mm x 90 mm x 120 mm (without connector and lens mount protrusion)
Weight		1050 g
Ordering Information		
LQ-401 CL-M52		4 CMOS RGB/NIR Line Scan Camera. P-mount (M52)
LQ-401 CL -F		4 CMOS RGB/NIR Line Scan Camera. F-mount

## Connection Pin-out

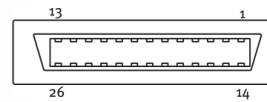
### DC In / Trigger



HIROSE HR10A-10R-12PB-71

Pin	-
1	Ground
2	+12V to +24V DC
3	Ground
4	Reserved
5	Ground
6	RXD RS 232C*
7	TXD RS 232C*
8	Ground
9	XEEN out
10	Trigger IN (TTL)*
11	DC in +12V to +24V
12	Ground

### Camera Link Interface



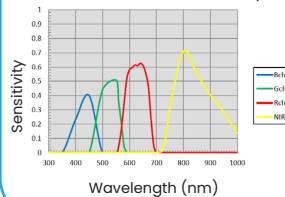
Pin	-	Signal	Function
1	14	GND	-
2	15	Xo-/Xo+	CL Data
3	16	X1-/X1+	CL Data
4	17	X2-/X2+	CL Data
5	18	Xclk-/Xclk+	CL Clk
6	19	X3-/X3+	CL Data
7	20	SerTC+/SerTC-	Serial in*
8	21	SerTFG-/SerTFG+	Serial out*
9	22	CC1-/CC1+	Trigger*
10	23	CC2-/CC2+	Reserved
11	24	CC3-/CC3+	Not used
12	25	CC4-/CC4+	Not used
13	26	GND	-

\* In Camera Link or 12 pin Hirose

Note:  
Camera Link base configuration shown. For medium configuration refer to Camera Link specifications or operation manual.

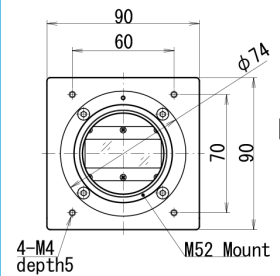
## Spectral Response

LQ-401CL CAMERA SENSITIVITY

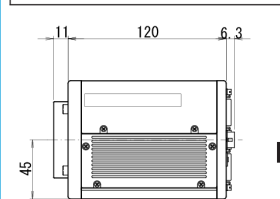


## Dimensions

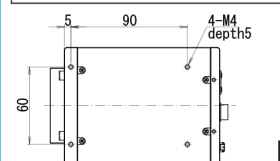
Front view



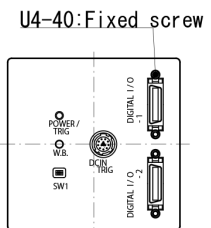
Side view



Bottom view



Rear view



## Product Highlights

- 4 CMOS line scan camera with Camera Link output
- Dichroic RGB/NIR beam splitter prism with 4 sensors
- 4 sensors with 4096 pixels,  $7\text{ }\mu\text{m} \times 7\text{ }\mu\text{m}$
- Low-noise operation (S/N: 55 dB) providing superior image quality
- 28.672 mm sensor scan width
- 4 x 8 bits or 4 x 10 bits output through Camera Link interface
- Line rate up to 18252 lines per second at 84 MHz pixel clock
- One-push auto white balance
- Flat field correction and color shading correction
- Knee and binning functions for extended dynamic range and sensitivity
- Sub-sampling and windowing readout
- Set-up and installation aid with built-in test generator
- Available with M52 mount (standard) or Nikon F-mount
- Short ASCII commands for set-up via RS 232C or Camera Link
- Setup by Windows software

## Additional Product Images



Company and product names mentioned in this datasheet are trademarks or registered trademarks of their respective owners.

JAI A-S and Machine Vision Direct, LLC Cannot be held responsible for any technical or typographical errors and reserves the right to make changes to products and documentation without prior notice