

**For Sales and Service** MachineVisionDirect.com +1 (800) 834-5588 Support@MachineVisionDirect.com











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.

SENSOR:	N/A	
FORMAT:	28.67 mm	
PIXEL SIZE:	14.0 x 14.0 µm	
LENS MOUNT:	F-Mount	
SPECTRUM:	Color (Visible)	

### **Specification Highlights**

SHUTTER: FRAME RATE: 30 kHz **INTERFACE: RESOLUTION MP:** N/A **RESOLUTION WxH:** 2048 x 1 px

**Global Shutter** Camera Link

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#### **For Sales and Service**

Dimensions

Front view (M52 mount)

4 ° × 6 depth3.5 (depth0.14)

# **Machine** VISION DIRECT

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SpecifiesInteract ColorScanning sytemUine sensor with internal clockPixel clocy86.00 MHzUine rateStandard22.91s foll resolution/bining/internal trigger)32.91s foll resolution/bining/internal trigger)Sensor3.CMOS line sensorsSensor sum9.86.72 mCell size14.0 (n) x14.0 (v) µmActive pixersor)8.adiometric 27n.1/cm²Sensitivity (sensor)8.adiometric 27n.1/cm²Sensitivity (sensor)8.adiometric 27n.1/cm²Sensitivity (sensor)57.48 on green with gain = 0.48Video utrut57.48 on green with gain = 0.48Video utrut24.bit (3x.8) in CL base configurationSolit (3x.10) in CL medium configurationGainMaster O dato +8 dBRef. setAnalog gain=Low (0dB) or High (+6dB) Master 0 db to +8 dBIndividual modeR/s/E -2 dB to +14 dBWhite balanceNalot Exact on any singShading currectionIndividual RGB flat or RB to GShading currectionIndividual RGB flat or RB to GShading currectionIndividual RGB flat or RB to GShading currectionSalger and size size and pulse width controlSiger modes, scan rate, exposure15.8 just 13.209 mec. In 12.5 is incrementsSiger modes, scan rate, exposure dimension16.9 context, shutter-select and pulse width controlSiger modes, scan rate, exposure dimension16.9 context, shutter-select and pulse width controlSiger modes, scan rate, exposure dimension16.9 context, shutter-select and pulse width controlSiger			
Pikel cloc-'     80.00 MHz       Line rate in rate     Standard Programmable     32.9µs (Full resolution/binning/internal trigger) 32.9µs to 18.844ms, ESns increments       Sensor script     ScMOS line sensors mounted on ROB beam splitter prism       Sensor script     8.602 MHz       Sensor script     8.602 MHz       Cell size     14.0 (h) x14.0 (v) µm       Active pixel     8.x024 (h) 3 x 1024 (h) with 21 binning       Sensitivity     Rediometric: 27n.Jcm <sup>2</sup> Sensitivity     Rodiometric: 27n.Jcm <sup>2</sup> Sensitivity:	Specifications	LT-200 CL	
Iten rate     Standard Programmable     329µs Full resolution/binning/internal trigger) 329µs to 18.844ms, 12.5ns increments       Sensor script     3 CMOS line sensors mounted on ROB beam splitter prism       Sensor script     14.0 (n) x 14.0 (v) µm       Active pixer     14.0 (n) x 14.0 (v) µm       Active pixer     3 x 1048 (h) 3 x 1024 (n) with 21 binning       Sensitivity (sensor)     Radiometric 27n.1/cm²       Sensitivity (sensor)     57 dB on green with gain = 0 dB       Sintaria     57 dB on green with gain = 0 dB       Video utput     57 dB on green with gain = 0 dB       Video utput     57 dB on green with gain = 0 dB       Notice of the AdB     Anolog gain= Low (odB) or High (+8dB) Master to B to +8 dB       Manual, fixed or one-push Adjustobie range 5000 K to 5000 K     Standing       Krie da Correction     Individual RGB flat or RB to G       Flat-field currection     Individual RGB flat or RB to G       Synchronizeron     Individual RGB flat or RB to G       Flat-field currection     Individual RGB flat or RB to G       Synchronizeron     Individual RGB flat or RB to G       Synchronizeron     Trigger modes, scan rate, exposure time, gain/black balans, incerements       Synchronizeron <td< td=""><td>Scanning system</td><td>Line sensor with internal clock</td></td<>	Scanning system	Line sensor with internal clock	
Programmable 32.9µs to 16.844ms, 12.5ns increments   Sensor 32.0µs to 16.844ms, 12.5ns increments   Sensor summa value 38.672 mm   Cell size 14.0 (h) x14.0 (J) µm   Active piers 8.800metric: 27n.JCm <sup>2</sup> Sensitivity (sensor) Radiometric: 27n.JCm <sup>2</sup> Sensitivity (sensor) Radiometric: 27n.JCm <sup>2</sup> Sensitivity (sensor) Radiometric: 27n.JCm <sup>2</sup> Sensitivity (sensor) 8.00 Lu (7800K, gain = low, shutter = OF, 6 = 0 dB, F28.100%, video)   S/N ratio 57 dB on green with gain = 0 dB   Video output 24 bit (3 x 8) in CL base configuration 30 bit (3 x 10) in CL medium configuration 30 bit (3 x 10) in CL medium configuration 30 bit (3 x 10) in CL medium configuration 30 bit (3 x 10) in CL medium configuration 30 bit (3 x 0) in CL medium configuration 30 bit (3 x 10) in CL medium configuration   Gain Kr.= 2 dB to +6 dB   Individual mode K/6.5: -2 dB to +14 dB   White ballow or exiting Manual, fixed or one-push Adjust bite range 5000 K fos000 K Fiseet 4000 K, 4600 K or 5600 K   Kree correcton Individual RGB flat or RB to 6   Flat-field correction Individual RGB flat or RB to 6   Synchronization Internal X-tal or external trigger   Trigger modes, scan rate, exposure time, gain/black level, shading correction, flat-field correction, white) balance, knee-function, flagonstics   Diognostics So6   B	Pixel clock	80.00 MHz	
Inconted on RGB beam splitter prismSensor scanning width26.672 mmCell size14.0 (h) x14.0 (v) µmActive pixels3 x2024 (h) x12 (h) with 2.1 binningSensitivity (sensor)Rodiometric 27n.J/cm³Sensitivity (standard)2600 Lux (7800K, gain = low, shutter = OFF, G = 0 dB, F28, 100% video)S/N ratio57 dB on green with gain = 0 dBVideo output2 bit (3 x 8) in CL base configuration 30 bit (3 x 10) in CL medium configurationGain.Ref. set Master trackingAnalog gain= Low (0dB) or High (+6dB) Master: 0 dB to +8 dB R, B: -2 dB to +4 dBWhite balanceIndividual R3 knee point and slopeShading correctionIndividual R8 flat or RB to GShading correctionInternal X-tal or external triggerTrigger modes25.8 us to 13209 msec. in 125 ns incrementsFurctions controlled by RS 222C or CLShaditar garmed, shaditar or, flat-field correction, flat-fie			
Cell size14.0 (h) x 14.0 (v) µmActive pixels3 x 2048 (h) 3 x 1024 (h) with 2.1 binningSensitivity (sensor)Radiometric: 27n.J/cm²Sensitivity (standard)2800 Lux (7800K, gain = low, shutter = OF, G = 0 dB, F28, 100%, video)S/N ratio57 dB on green with gain = 0 dBVideo output24 bit (3 x 8) in CL base configuration 30 bit (3 x 10) in CL medium configuration 30 bit (3 x 10) in CL medium configuration 30 bit (3 x 10) in CL medium configuration (Addit a configuration) 30 bit (3 x 10) in CL medium configurationGainAnalog gain = Low (0dB) or High (+6dB) Master trackingMaster trackingR/s/B: -2 dB to +14 dBWhite balanceManual, fixed or one-push Adjustable range 5000 K to 9000 K Fixed: 4000 K, 4600 K or 5600 KKnee correctionIndividual RGB flat or RB to GFlat-field correctionIndividual RGB flat or RB to GFlat-field correctionNo-shutter, seluter-select and pulse width controlSynchronizationInternal X-tal or external triggerTrigger modesNo-shutter, shutter-select and pulse width controlProgrammable exposureTrigger modes, scan rate, exposure time, gain/black bolance, knee-function, diagnosticsDiagnosticsTest pattern generator (Color bar, gray pattern and white). LED for powerLens mountM-52 mount. (Factory option)Sensor alignmentBetter than ±0.1 mmOperating temperature-5°C to +45°C/20 – 80% non-condensingStorage temp./humidity-25°C to +40°C/20 – 80% non-condensingVibration36 (20Hz to 20Hz, XY direction)Shock </td <td>Sensor</td> <td></td>	Sensor		
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Flat-field correctionTwo point pixel-to-pixel correctionSynchronizationInternal X-tal or external triggerTrigger modesNo-shutter, shutter-select and pulse width controlProgrammable exposure25.8µs to 13.209 msec. in 12.5 ns incrementsFunctions controlled by RS 232C or CLTrigger modes, scan rate, exposure time, gain/black level, shading correction, flat-field correction, white bolance, knee-function, diagnosticsDiagnosticsTest pattern generator (Color bar, gray pattern and white). LED for powerLens mountM-52 mount. (Standard) Nikon F-mount (Factory option)Sensor alignmentBetter than ±0.1 mmOperating temperature-5°C to +45°C/20 - 80% non-condensingVibration3G (20Hz to 200Hz, XYZ direction)Shock50GRegulationsEmission: CE CISPR Pub. 22 (EN55022) Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHSPower12V DC -10% to 24V DC +10% 450 mA (Typical) - 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gDrdering Information3 CMOS RGB Line Scan Camera. M52-mount (Standard) 3 CMOS RGB Line Scan Camera. F-mount	Knee correction	Individual RGB knee point and slope	
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Programmable exposure25.8µs to 13.209 msec. in 12.5 ns incrementsFunctions controlled by RS 232C or CLTrigger modes, scan rate, exposure time, gain/black level, shading correction, flat-field correction, white balance, knee-function, diagnosticsDiagnosticsTest pattern generator (Color bar, gray pattern and white). LED for powerLens mountM-52 mount. (Standard) Nikon F-mount. (Factory option)Sensor alignmentBetter than ±0.1 mmOperating temperature-5°C to +45°C/20 - 80% non-condensingVibration3G (20Hz to 200Hz, XYZ direction)Shock50GRegulationsEmission: CE CISPR Pub. 22 (EN55022) Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHsPower12V DC -10% to 24V DC +10% 450 mA (Typical) - 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gOrdering Information3 CMOS RGB Line Scan Camera. M52-mount (Standard) 3 CMOS RGB Line Scan Camera. F-mount	Synchronization	Internal X-tal or external trigger	
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Nikon F-mount. (Factory option)Sensor alignmentBetter than ±0.1 mmOperating temperature-5°C to +45°C/20 - 80% non-condensingStorage temp./humidity-25°C to +60°C/20 - 80% non-condensingVibration3G (20Hz to 200Hz, XYZ direction)Shock50GRegulationsEmission: CE CISPR Pub. 22 (EN55022) Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHSPower12V DC -10% to 24V DC +10% 450 mA (Typical) - 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gLT-200 CL-M523 CMOS RGB Line Scan Camera. M52-mount (Standard) 3 CMOS RGB Line Scan Camera. F-mount	Diagnostics		
Operating temperature-5°C to +45°C/20 - 80% non-condensingStorage temp./humidity-25°C to +60°C/20 - 80% non-condensingVibration3G (20Hz to 200Hz, XYZ direction)Shock50GRegulationsEmission: CE CISPR Pub. 22 (EN55022) Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHSPower12V DC -10% to 24V DC +10% 450 mA (Typical) - 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gLT-200 CL-M523 CMOS RGB Line Scan Camera. M52-mount (Standard) 3 CMOS RGB Line Scan Camera. F-mount	Lens mount		
Storage temp./humidity-25°C to +60°C/20 - 80% non-condensingVibration3G (20Hz to 200Hz, XYZ direction)Shock50GRegulationsEmission: CE CISPR Pub. 22 (EN55022) Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHSPower12V DC -10% to 24V DC +10% 450 mA (Typical) - 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gOrdering Information3 CMOS RGB Line Scan Camera. M52-mount (Standard) 3 CMOS RGB Line Scan Camera. F-mount	Sensor alignment	Better than ±0.1 mm	
Vibration3G (20Hz to 200Hz, XYZ direction)Shock50GRegulationsEmission: CE CISPR Pub. 22 (EN55022) Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHSPower12V DC -10% to 24V DC +10% 450 mA (Typical) - 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gOrdering Information1LT-200 CL-M523 CMOS RGB Line Scan Camera. M52-mount (Standard) 3 CMOS RGB Line Scan Camera. F-mount	Operating temperature	-5°C to +45°C/20 - 80% non-condensing	
Shock50GRegulationsEmission: CE CISPR Pub. 22 (EN55022) Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHSPower12V DC -10% to 24V DC +10% 450 mA (Typical) - 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gOrdering InformationIT-200 CL-M52LT-200 CL -F3 CMOS RGB Line Scan Camera. F-mount	Storage temp./humidity	-25°C to +60°C/20 – 80% non-condensing	
RegulationsEmission: CE CISPR Pub. 22 (EN55022) Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHSPower12V DC -10% to 24V DC +10% 450 mA (Typical) - 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gOrdering Information12V DC RGB Line Scan Camera. M52-mount (Standard) 3 CMOS RGB Line Scan Camera. F-mount	Vibration	3G (20Hz to 200Hz, XYZ direction)	
Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B RoHSPower12V DC -10% to 24V DC +10% 450 mA (Typical) - 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gOrdering InformationLT-200 CL-M523 CMOS RGB Line Scan Camera. M52-mount (Standard) 3 CMOS RGB Line Scan Camera. F-mount	Shock	50G	
450 mA (Typical) – 480 mA (Max.)Dimensions90 mm (H) x 90 mm (W) x 90 mm (D) (without connector and lens mount protrusion)Weight830 gOrdering InformationLT-200 CL-M523 CMOS RGB Line Scan Camera. M52-mount (Standard) 3 CMOS RGB Line Scan Camera. F-mount	Regulations	Immunity: CISPR Pub. 24 IEC61000-4-2 Conforming level 4 FCC Part15 Class B	
(without connector and lens mount protrusion)   Weight 830 g   Ordering Information   LT-200 CL-M52 3 CMOS RGB Line Scan Camera. M52-mount (Standard)   LT-200 CL -F 3 CMOS RGB Line Scan Camera. F-mount	Power		
Ordering Information       LT-200 CL-M52     3 CMOS RGB Line Scan Camera. M52-mount (Standard)       LT-200 CL -F     3 CMOS RGB Line Scan Camera. F-mount	Dimensions		
LT-200 CL-M52 3 CMOS RGB Line Scan Camera. M52-mount (Standard) LT-200 CL -F 3 CMOS RGB Line Scan Camera. F-mount	Weight	830 g	
M52-mount (Standard) LT-200 CL -F 3 CMOS RGB Line Scan Camera. F-mount	Ordering Information		
LT-200 CL -F 3 CMOS RGB Line Scan Camera. F-mount	LT-200 CL-M52		
	LT-200 CL -F	3 CMOS RGB Line Scan Camera. F-mount	



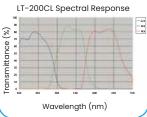
#### Camera Link Interface

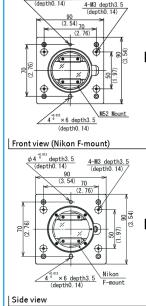
13 1				
	26		14	
Pin	-	Signal	Function	
1	14	GND	-	
2	15	Xo-/Xo+	CL Data	
3	16	X1-/X1+	CL Data	
4	17	X2-/X2+	CL Data	
5	18	Xclk-/Xclk+	CL Clk	
6	19	X3-/X3+	CL Data	
7	20	SerTC+/ SerTC-	Serial in*	
8	21	SerTFG-/ SerTFG+	Serial out*	
9	22	CCI-/CCI+	Trigger*	
10	23	CC2-/CC2+	Reserved	
11	24	CC3-/CC3+	Not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

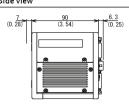
#### \*) In Camera Link or 12 pin Hirose Note:

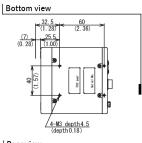
Camera Link base configuration shown. For medium configuration refer to Camera Link specifications or operation manual.

Spectral Response

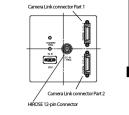








#### Rear view



# **Machine** VISION DIRECT

## **Product Highlights**

- 3 CMOS line scan camera with Camera Link output
- Dichroic RGB beam splitter prism with 3 sensors
- 3 sensors with 2048 pixels, 14.0 μm x 14.0 μm
- Low-noise operation (S/N: 57 dB) providing superior image quality
- 28.672 mm sensor scan width
- 3 x 8 bits or 3 x 10 bits output through Camera Link interface
- Line rate up to 30383 lines per second at 80 MHz pixel clock
- One-push auto white balance
- Flat field correction and color shading correction
- Knee and binning functions for extended dynamic range and sensivity
- 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 XP/Vista/Windows 7 software

### **Additional Product Images**



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