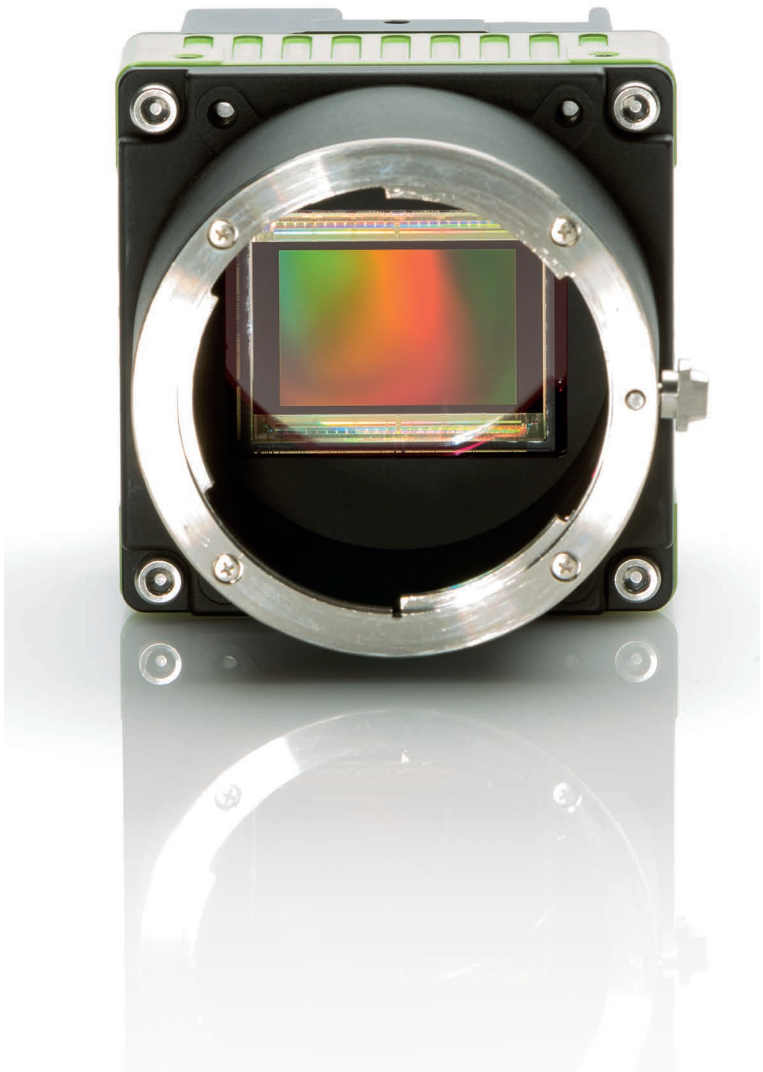
INNOVATIVE INDUSTRIAL CAMERA SOLUTIONS

● AREA SCAN ● LINE SCAN ● SINGLE-SENSOR ● MULTI-SENSOR



Camera Selection Guide 2020

Quality industrial cameras from JAI

No matter what vision business you're in, you must be reliable and deliver results. That calls for an industrial camera supplier with a long, proven track record of delivering cameras with innovative engineering, high-end quality, and long lasting operational reliability and durability.

Our industrial cameras and accessories are routinely expected to perform under the most demanding conditions - from high-speed production and inspection machinery to applications in life sciences, outdoor surveillance, aerospace, and scientific research.

Today, JAI cameras are running in applications and industries around the world, where vision technology is relied upon as an integral part of a production process, product, or service with the aim of improving quality and accuracy of products, lowering production line inspection costs, increasing production yields, creating higher efficiency in road traffic, or porviding the best color images for life sciences applications.

Common to all our customers is that they value the trademark characteristics of our products: proven technology, high reliability, consistent quality and superior image fidelity backed by JAI's long-term viability.

The JAI camera selection guide is also available as an on-line dynamic selection tool with filters and sorting capabilities. Please also visit www.jai.com to explore the easy-to-use on-line camera selection guide.

Strict quality assurance throughout the manufacturing process

Every electronic board mounted in a JAI camera undergoes thorough automated optical inspection, x-ray inspection and soldering inspection to ensure flawless electronics. During camera assembly, cameras are further submitted to aging tests, optical tests and a complete finish test including measurements and documentation against the EMVA 1288 standard.

A JAI camera for every vision need

JAI offers a broad range of cameras to suit almost every imaging need in industrial, medical, science and outdoor imaging, including traffic and sports/entertainment applications. You can choose from a wide range of single-imager cameras starting at very attractive price levels or - if your vision application needs the very best in color fidelity - you can choose from a broad selection of prism-based multi-imager area scan and line scan cameras. JAI has it all.

Designed to perform in tough environments

You can rely on a JAI camera! Rugged designs are able to withstand operating conditions with high vibration effects (up to 10G) and high shock occurrence (up to 80G), classifying JAI cameras among the very best in relation to industrial reliability and durability.

Low cost-of-ownership

Every detail in a JAI camera – electronics, mechanicals and software - is carefully engineered to ensure excellent product reliability and supreme image quality. As a result cameras from JAI offer high MTBF numbers, ensuring long lasting and trouble-free operation. For you, this means low cost of ownership for any JAI camera.

Pick your preferred interface

JAI offers a range of different industry standard interfaces, so you are able to choose the interface of your preference for each individual vision task. JAI offers cameras with USB3 Vision, GigE Vision, 10GigE Vision, SFP+, CoaXPress, Camera Link and Mini Camera Link interfaces.

Close support - when you need it

You can post an e-mail question to our on-line helpdesk (support@jai.com) at any time – day or night. JAI´s technical experts monitor incoming support questions round-the-clock and the first vacant support technician will take the case to help you solve your problem and get your project moving. Please also check out https://support.jai.com for FAQ's and more.

Area Scan Cameras

Line Scan Cameras

Camera selection charts

Go Series

Megapixel area scan cameras with small dimensions, high frame rates and cutting edge sensor technology.

JAI's Go Series delivers an exceptional blend of small size, high versatility, and excellent performance, all at an entry-level price, making them the perfect starting point for a wide range of machine vision applications.

The GO-5000 for example - packs a high performance 5-megapixel CMOS imager into a compact form factor that fits in your fingertips and weighs only 46 grams. Using a combination of ROI and binning capabilities, this tiny camera can become almost anything you want - from a superfast VGA camera (at nearly 450 fps) to a super sensitive camera using binning to create 10-micron, or even 20-micron effective pixel sizes.

Other Go Series models feature Sony's latest CMOS imager technology, providing exceptional low-noise characteristics for outstanding sensitivity and image quality.

All Go Series cameras are built for the real world, with robust housings and extensive shock (80G) and vibration (10G) testing to maximize their ability to withstand the rigors of industrial environments. Go Series cameras come with full 3-year warranties.

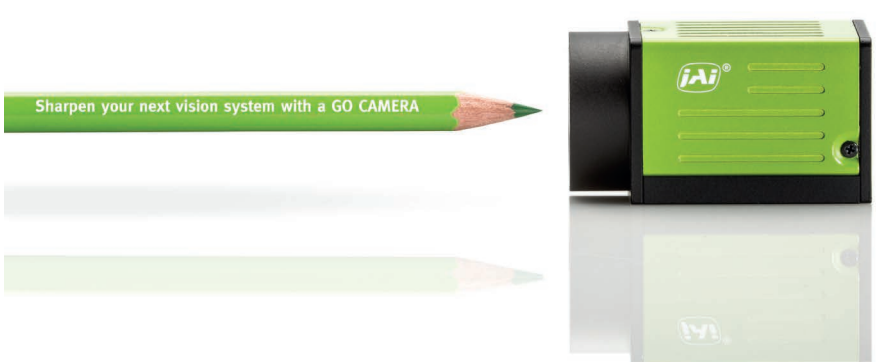
Go Series cameras offer many advantages, including:

- **Small size and weight:**
  Go Series cameras measure 29 x 29 x 41.5 mm (excluding lens mount) and weigh less than 50 grams, enabling them to fit into small spaces or into vehicles or other applications where weight and size is critical.

- **High frame rates:**
  High performance CMOS imager technology lets Go Series cameras run at frame rates as fast as 107 fps for 5 megapixel resolution or 165.5 fps for 2.35 megapixels.

- **High image quality:**
  CMOS technology, large pixels, global shutter, a built-in lookup table, multi-ROI, sequencer, and other advanced features help ensure image quality and operational flexibility beyond entry-level expectations.

- **Support for polarized imaging:**
  The Go Series features two models equipped with on-sensor polarizer grids to support applications which leverage polarization characteristics to improve contrast, reduce reflections, or analyze stress in transparent materials.



If you're facing a tough price/performance challenge give it a Go!

GLOBAL SHUTTER | VIBRATION 10G | SHOCK 80G | MTBF >200K HOURS | TEMP -5° / +45° | POWER 12V - 24V DC | 46 GRAMS | MULTI ROI | 3 YEARS WARRANTY

Small and robust industrial area scan cameras at a great price/performance point.

Check the table below for a list of all available Go Series cameras.

Model	Front View (Lens mount)	Resolution Megapixels (MP) (horizontal x vertical pixels)	Frame rate fps	Optical format/ Sensor tech.	Cell size (µm)	Data out-put (Bit)	Color/ Mono	Sensor name (Shutter type)	Interface
GO-5100-USB	(C-mount)	5 MP (2464 x 2056	74	2/3" CMOS	3.45 x 3.45	8/10/12	C/M	IMX250 (Global)	USB3 Vision (USB)
Polarized GO-5100MP-USB	(C-mount)	5 MP (2464 x 2056)	74	2/3" CMOS	3.45 x 3.45	8/10/12	Mono Polari-zed	IMX250MZR (Global)	USB3 Vision (USB)
GO-5100-PGE	(C-mount)	5 MP (2464 x 2056)	22.7	2/3" CMOS	3.45 x 3.45	8/10/12	C/M	IMX250 (Global)	GigE Vision (PGE)
Polarized GO-5100MP-PGE	(C-mount)	5 MP (2464 x 2056)	22.7	2/3" CMOS	3.45 x 3.45	8/10/12	Mono Polari-zed	IMX250MZR (Global)	GigE Vision (PGE) (Release May 2019)
GO-5101-PGE	(C-mount)	5 MP (2464 x 2056)	22.7	2/3" CMOS	3.45 x 3.45	8/10/12	C/M	IMX264 (Global)	GigE Vision (PGE)
GO-5101-PMCL	(C-mount)	5 MP (2464 x 2056)	35	2/3" CMOS	3.45 x 3.45	8/10/12	C/M	IMX264 (Global)	Power over Mini Camera Link Deca (PMCL)
GO-5000-PMCL	(C-mount)	5 MP (2560 x 2048)	107	1" CMOS	5.0 x 5.0	8/10/12	C/M	Lince5M (Global)	Power over Mini Camera Link (PMCL) Deca
GO-5000-USB	(C-mount)	5 MP (2560 x 2048)	62	1" CMOS	5.0 x 5.0	8/10/12	C/M	Lince5M (Global)	USB3 Vision (USB)
GO-5000-PGE	(C-mount)	5 MP (2560 x 2048)	22.3	1" CMOS	5.0 x 5.0	8/10/12	C/M	Lince5M (Global)	GigE Vision (PGE)
GO-2400-PMCL	(C-mount)	2.35 MP (1936 x 1216)	165.5	1/1.2" CMOS	5.86 x 5.86	8/10/12 RGB	C/M	IMX174 (Global)	Power over Mini Camera Link (PMCL) Deca
GO-2400-USB	(C-mount)	2.35 MP (1936 x 1216)	159	1/1.2" CMOS	5.86 x 5.86	8/10/12	C/M	IMX174 (Global)	USB3 Vision (USB)
GO-2400-PGE	(C-mount)	2.35 MP (1936 x 1216)	48	1/1.2" CMOS	5.86 x 5.86	8/10/12	C/M	IMX174 (Global)	GigE Vision (PGE)
GO-2401-PGE	(C-mount)	2.35 MP (1936 x 1216)	41	1/1.2" CMOS	5.86 x 5.86	8/10/12	C/M	IMX249 (Global)	GigE Vision (PGE)

Datasheets and manuals for each model with detailed specifications are available at www.jai.com

Interface types

GigE Vision (PGE)

Power over Mini Camera Link (PMCL)

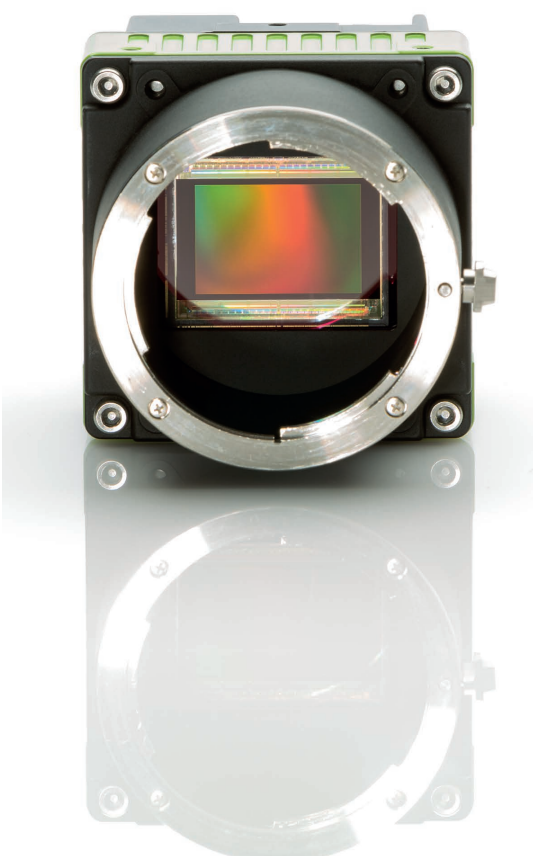
USB3 Vision (USB)

Spark Series

Advanced area scan cameras delivering high resolution, high frame rates, and high image quality.

JAI's Spark Series is the perfect choice for applications that demand high quality images with high resolution and the highest possible throughput. Spark Series cameras feature the latest CMOS imagers with resolutions up to 45 megapixels and speeds as much as 10 times faster than traditional CCD cameras.

With high sensitivity, industrial grade construction, and an attractive price point, it's easy to see why the Spark Series is an ideal solution for high performance vision applications.



Here are some of the advantages you get with JAI Spark cameras:

- **High throughput:**
  Spark Series cameras deliver outstanding megapixels-per-second performance, such as 45-megapixels at 52 fps, 12-megapixels at up to 189 fps and 5-megapixels at up to 253 fps. Using flexible ROI capabilities, even higher frame rates can be obtained.

- **Excellent image quality and unique features:**
  Despite their speed, Spark Series cameras feature advanced functions like single exposure high dynamic range (HDR), multi-region-of-interest, integrated auto-shutter/auto-gain exposure control (ALC), built-in iris control circuits, and efficient global shutters to ensure low noise, high quality images with high pixel uniformity and no shutter distortion.

- **Outstanding durability:**
  Whether outdoors, on vehicles, or in rugged factory environments, Spark Series cameras provide reliable performance under real-world conditions - with high shock and vibration ratings (80G/10G) and excellent temperature ratings, including models capable of operating from -45˚C to +70˚C.

The ultimate in megapixel-per-second performance

The Spark Series SP-45000-CXP4 can provide 8K TV resolution at 46-55 fps for 12-bit/10-bit output and over 65 fps for 8-bit.

The table below lists all available Spark Series cameras.

Model	Front View (Lens mount)	Resolution Megapixels (MP) (horizontal x vertical pixels)	Frame rate fps	Optical format/ Sensor tech.	Cell size (µm)	Data output (Bit)	Color/ Mono	Sensor name (Shutter type)	Interface
SP-45000-CXP4	(F-mount) [2]	45 MP (8192 x 5460)	52 fps	Super 35mm CMOS	3.2 x 3.2	8/10/12	C/M	XGS 45000 (Global)	CoaXPress 4-connector (CXP4)
SP-45001-CXP4	(F-mount) [2]	45 MP (8192 x 5460)	38 fps	Super 35mm CMOS	3.2 x 3.2	8/10/12	C/M	XGS 45000 (Global)	CoaXPress 4-connector (CXP4)
SP-20000-CXP2	(F-mount) [2)]	20 MP (5120 x 3840)	30 fps	41 mm CMOS	6.4 x 6.4	8/10/12 RGB	C/M	CMV20000 (Global)	CoaXPress 2-connector (CXP2)
SP-20000-PMCL	(F-mount) [2)]	20 MP (5120 x 3840)	30 fps	41 mm CMOS	6.4 x 6.4	8/10/12	C/M	CMV20000 (Global)	Power over Mini Camera Link (PMCL) Deca
SP-20000-USB	(F-mount) [2)]	20 MP (5120 x 3840)	16 fps	41 mm CMOS	6.4 x 6.4	8/10/12	C/M	CMV20000 (Global)	USB3 Vision (USB)
SP-12401-PGE	(C-mount)	12.4 MP (4112 x 3008)	9 fps	1.1"	3.45 x 3.45	8/10/12	C/M	IMX304 (Global)	GigE Vision (PGE)
SP-12401-USB	(C-mount)	12.4 MP (4112 x 3008)	23 fps	1.1"	3.45 x 3.45	8/10/12	C/M	IMX304 (Global)	USB3 Vision (USB)
SP-12400-PMCL	(C-mount)	12.4 MP (4112 x 3008)	64 fps	1.1"	3.45 x 3.45	8/10/12	C/M	IMX253 (Global)	Power over Mini Camera Link (PMCL) Deca
SP-12000-CXP4 [1)]	(F-mount)	12 MP (4096 x 3072)	189 fps	APS-C CMOS	5.5 x 5.5	8/10/12	C/M	CMV12000 (Global)	CoaXPress 4-connector (CXP4)
SP-5000-CXP4	(C-mount)	5 MP (2560 x 2048)	253 fps	1" CMOS	5.0 x 5.0	8/10/12	C/M	Lince5M (Global)	CoaXPress 4-connector (CXP4)
SP-5000-CXP2	(C-mount)	5 MP (2560 x 2048)	211 fps	1" CMOS	5.0 x 5.0	8/10/12 RGB	C/M	Lince5M (Global)	CoaXPress 2-connector (CXP2)
SP-5000-PMCL	(C-mount)	5 MP (2560 x 2048)	137 fps	1" CMOS	5.0 x 5.0	8/10/12	C/M	Lince5M (Global)	Power over Mini Camera Link (PMCL) Deca
SP-5000-USB	(C-mount)	5 MP (2560 x 2048)	62 fps	1" CMOS	5.0 x 5.0	8/10/12	C/M	Lince5M (Global)	USB3 Vision (USB)
SP-5000-GE2	(C-mount)	5 MP (2560 x 2048)	44 fps	1" CMOS	5.0 x 5.0	8/10/12 RGB/YUV	C/M	Lince5M (Global)	GigE Vision LAG(GE2)

1) The SP-12000-CXP4-XT model includes a cooling fan and extends the camera's operating temperature to +45°C.
2) Also available with M-42x1 mount.

Datasheets and manuals for each model with detailed specifications are available at www.jai.com

Interface types

GigE Vision LAG (GE2)

GigE Vision (PGE)

USB3 Vision (USB)

USB3 Vision (USB)

CoaXPress 2-connector (CXP2)

CoaXPress 4-connector (CXP4)

Power over Mini Camera Link (PMCL)

Power over Mini Camera Link (PMCL)

Apex Series

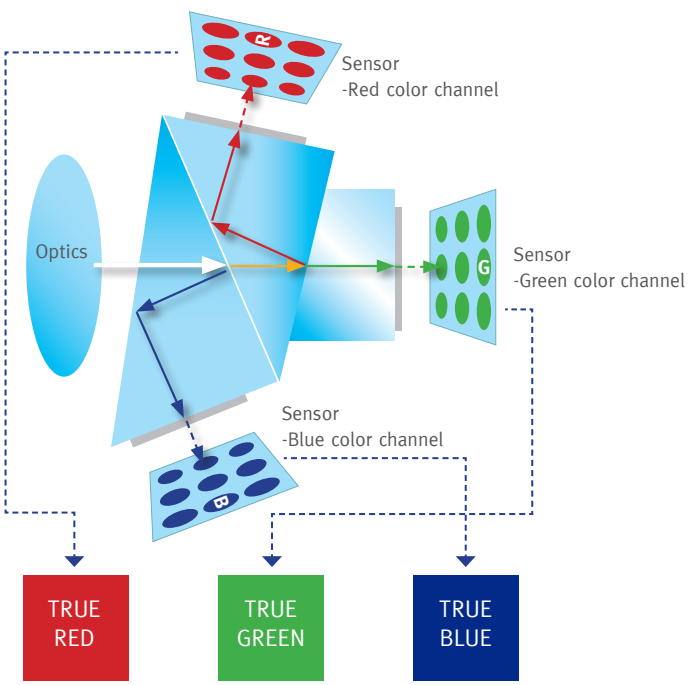
3-CMOS area scan cameras providing better color fidelity and spatial precision than traditional Bayer color cameras.

JAI's Apex Series is a range of 3-CMOS area scan cameras delivering advanced RGB color imaging that's ideal for demanding machine vision applications across a diverse range of industries.

Advanced prism technology separates the incoming light into red, green, and blue wavelengths, which are directed to three precisely-aligned image sensors.

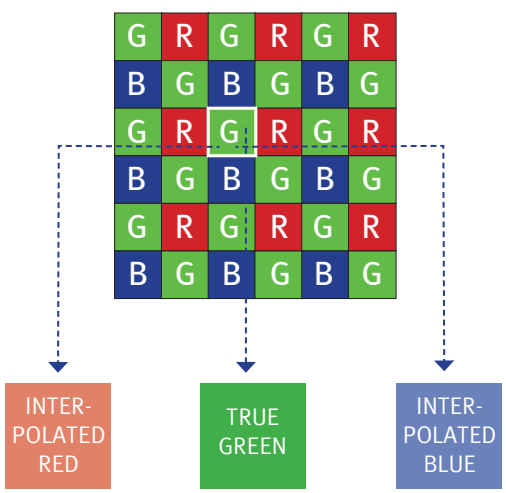
The Apex series provides:

- **Accurate colors:**
  More accurate per-pixel color values than those derived from Bayer color cameras with interpolation routines.
- **Steep spectral curves:**
  Steep spectral curves (less crosstalk) producing exceptionally accurate color image data.
- **Sharper details:**
  More precise spatial resolution, enabling more accurate edge detection and the ability to resolve smaller details on the inspected items.



PRISM-BASED IMAGING
Delivering TRUE colors!

In JAI's prism-based RGB cameras the incoming light is separated into red, green and blue wavelengths, which are directed to three precisely-aligned image sensors. The JAI RGB color imaging technique provides better color accuracy and spatial precision than traditional color cameras usIng the Bayer mosaic technique.



BAYER MOSAIC IMAGING
Delivering "only" INTERPOLATED colors!

With the Bayer technique, each pixel is filtered to capture only one of three colors. Therefore the data from each pixel cannot fully specify each of the red, green, and blue values on its own. To obtain a full-color image, the Bayer technique interpolate a set of complete red, green, and blue values for each pixel, making use of the surrounding pixels of the corresponding colors. This provides an estimation of the red, green and blue values for a particular pixel. However, the result of this interpolation technique is less color accuracy than with a prism-based camera.

Superior R-G-B color image data for the most demanding applications

Check the table below for a list af Apex Series Cameras.

Model	Front View (Lens mount)	Resolution Megapixels (MP) (horizontal x vertical pixels)	Frame rate fps	Optical format/ Sensor tech.	Cell size (µm)	Data output (Bit)	Color/ Mono	Sensor name (Shutter type)	Interface
AP-3200T-PMCL	(C-mount)	3 x 3.2 MP (2064 x 1544)	55	1/1.8" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX265 (Global)	Power over Mini Camera Link (PMCL) Deca
AP-3200T-USB	(C-mount)	3 x 3.2 MP (2064 x 1544)	38	1/1.8" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX265 (Global)	USB3 Vision (USB)
AP-3200T-USB-NF *	(C-mount)	3 x 3.2 MP (2064 x 1544)	38	1/1.8" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX265 (Global)	USB3 Vision (USB)
AP-3200T-PGE	(C-mount)	3 x 3.2 MP (2064 x 1544)	12	1/1.8" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX265 (Global)	GigE Vision (PGE)
AP-1600T-PMCL	(C-mount)	3 x 1.6 MP (1456 x 1088)	126	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX273 (Global)	Power over Mini Camera Link (PMCL) Deca
AP-1600T-USB	(C-mount)	3 x 1.6 MP (1456 x 1088)	79	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX273 (Global)	USB3 Vision (USB)
AP-1600T-USB-NF *	(C-mount)	3 x 1.6 MP (1456 x 1088)	79	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX273 (Global)	USB3 Vision (USB)
AP-1600T-PGE	(C-mount)	3 x 1.6 MP (1456 x 1088)	24	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX273 (Global)	GigE Vision (PGE)

* NF= No IR cut filter

Datasheets and manuals for each model with detailed specifications are available at www.jai.com

Interface types

USB3 Vision (USB)

Power over GigE Vision (PGE)

Power over Mini Camera Link (PMCL)

Apex Medical & Life Sciences Solutions

Superior dust suppression for maximum image quality

Compatible with Image-Pro & µManager image analysis software packages

The ultimate combination of color precision and dust-free image quality for medical and life sciences applications

JAI's Apex Series includes a set of high-performance prism color cameras specially designed to deliver unsurpassed image quality for medical and life sciences applications.

Like all Apex cameras, these models deliver color precision and color differentiation far exceeding what can be achieved by image optimization algorithms in Bayer cameras. They feature the latest in CMOS global shutter sensor technology for outstanding low-light sensitivity and excellent frame rates.

The Apex Medical and Life Sciences cameras are equipped with USB3 Vision interfaces for high throughput and easy integration. And they offer a range of unique features not found in "med" cameras from other manufacturers including built-in color space conversion, color binning options, and models with extended sensitivity in the near infrared spectrum.

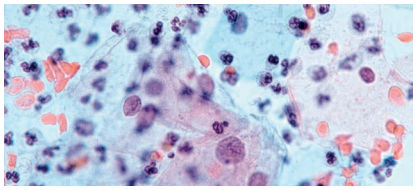
Most importantly, they provide the industry's highest level of protection against dust and other foreign object debris to ensure maximum image quality for microscopy applications and other life sciences vision systems.

A standard USB connection supports 38 fps for 3.2-megapixel models and up to 79 fps for 1.6-megapixel models providing ample performance for a wide range of medical and life sciences applications.

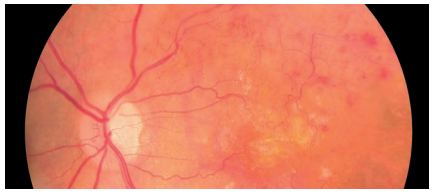
- **Unmatched color imaging capability:**
  With up to 3 x 3.2 megapixels of RGB resolution, the Apex Medical cameras can see details that are obscured by the interpolation algorithms of Bayer cameras. True color output enables critical color differentiation in digital pathology, ophthalmology, surgery, and other life sciences applications where absolute precision is required.

- **The industry's best dust protection:**
  JAI is the first in the industry to fully document its high standards for dust suppression in manufacturing and shipment. Building on the cleanroom procedures it has long used to assemble all prism cameras, JAI has added special coatings and external seals on lens mounts, internal seals between the electronics and the sensor compartment, and even more stringent cleanroom procedures to prevent dust on the prism, sensor, or elsewhere in the optical path. A rigorous inspection process using high-magnification telecentric lenses ensures that all Apex "LSX" models deliver the industry's highest level of dust suppression.

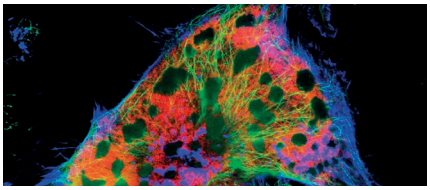
- **Compatibility with leading microscopy software:**
  For microscopy-based applications, JAI's Medical and Life Sciences cameras deliver outstanding image quality along with full integration to two of the industry's most widely-used packages: The Image-Pro image analysis platform from Media Cybernetics, and µManager, the world's preeminent open source, non-commercial solution. Both provide a broad range of functionality to capture, process, measure, analyze, and share microscopy images needed for a wide range of medical and life sciences applications.



Digital pathology
With supreme color reproduction, high spatial resolution and color enhancement tools, the Apex cameras are ideal for medical and life sciences systems used for tissue slice analysis, cell classification and more.



Ophthalmology
For ophthalmologists, looking at retina, optic nerve head, micro vessels etc., image accuracy and color precision are key factors in disease diagnostics and treatment. JAI Apex cameras do the job.



Fluorescence microscopy
In microscopy, fluorescent stains (fluorophores) are often added to make specific cell proteins and other organic compounds observable. JAI's prism cameras catch the subtlest color differences.

Endoscopy and surgical imaging
High resolution Apex cameras help to discern subtle color variations and fine details, enabling doctors and/or staff to more precisely differentiate tissue types.

Dermatology research
In modern dermatology research and diagnostics, digital imaging is becoming increasingly important. JAI´s Apex prism-based 3-CMOS cameras deliver the most accurate images of skin color nuances and pigments.

Medical quality inspection
Modern medicine demands the highest possible quality standards in everything from medicine to syringes, to catheters, to surgical tools. To inspect these products, high quality imaging systems are mandatory.

Model	Front View (Lens mount)	Resolution Megapixels (MP) (horizontal x vertical pixels)	Frame rate fps	Optical format/ Sensor tech.	Cell size (µm)	Data output (Bit)	Color/ Mono	Sensor name (Shutter type)	Interface
AP-3200T-USB-LSX	(C-mount)	3 x 3.2 MP (2064 x 1544)	38	1/1.8" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX265 (Global)	USB3 Vision (USB)
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AP-1600T-USB-LSX	(C-mount)	3 x 1.6 MP (1456 x 1088)	79	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX273 (Global)	USB3 Vision (USB)
AP-1600T-USB-NF-LSX	(C-mount)	3 x 1.6 MP (1456 x 1088)	79	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX273 (Global)	USB3 Vision (USB)
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AP-1600T-USB-NF-LS	(C-mount)	3 x 1.6 MP (1456 x 1088)	79	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX273 (Global)	USB3 Vision (USB)
AP-1600T-USB	(C-mount)	3 x 1.6 MP (1456 x 1088)	79	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX273 (Global)	USB3 Vision (USB)
AP-1600T-USB-NF	(C-mount)	3 x 1.6 MP (1456 x 1088)	79	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	R-G-B	IMX273 (Global)	USB3 Vision (USB)

Notes: NF = No IR-cut filter. LS = white housing, standard dust suppression. LSX = white housing, maximum dust suppression.

Now featuring Flex-Eye™ customization technology! Design the perfect multispectral configuration to fit your application

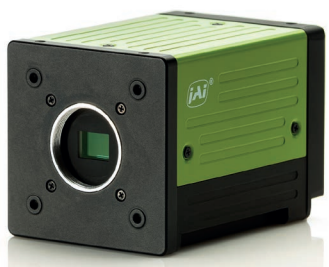
Fusion Series

Multi-sensor area scan cameras with unique capabilities for multispectral imaging.

JAI's Fusion Series of multispectral prism cameras provide simultaneous images of multiple wavebands through a single optical path. The cameras split incoming light into two or three separate sensors with precise pixel-to-pixel alignment regardless of motion or viewing angle.

Several standard models with predefined configurations of visible and near-infrared (NIR) wavebands are available. Or you can use JAI's innovative Flex-Eye technology to design your own configuration with two or three custom wavebands perfectly tailored to your system requirements.

Fusion Series cameras are ideal for life sciences or surgical applications using NIR fluorescence; for intelligent farming techniques such as NDVI/NDRE vegetation analysis or autonomous weed removal systems; for fruit, vegetable, and other types of food sorting or inspection; for electronics/PCB inspection; and much more.



Innovative solutions for multispectral imaging.

Visible image

NIR image
Foreign object

With Fusion Series and Flex-Eye you get:

- **Prism-based multispectral solution:**
  Standard or custom-designed configurations provide up to three wavebands and up to 3.2 megapixels per channel with perfect alignment between all wavebands, eliminating issues due to viewing angles, motion, or demosaicing

- **Custom-specified wavebands:**
  Using the Flex-Eye concept, custom-specified wavebands can be as narrow as 25 nm, located exactly where needed in the 405-1000 nm range (visible - NIR).

- **High performance multi-stream output:**
  Both standard and customized Fusion Series cameras feature high-speed 10GigE interfaces that automatically adapt to network speeds and provide simultaneous multi-stream output over a single cable to allow wavebands to be analyzed separately or combined on the host processor.

JAI's Fusion Series of multispectral area scan cameras perform simultaneous, separate imaging of visible and NIR light through a single lens. Standard and custom configurations can be used to inspect surface properties in visible wavebands, plus subsurface, fluorescence, or other non-visible characteristics in one or more NIR wavebands.


Visible image


NIR image

Visible image


NIR image


Visible image


NIR image

Fusion Series Standard Multispectral Cameras

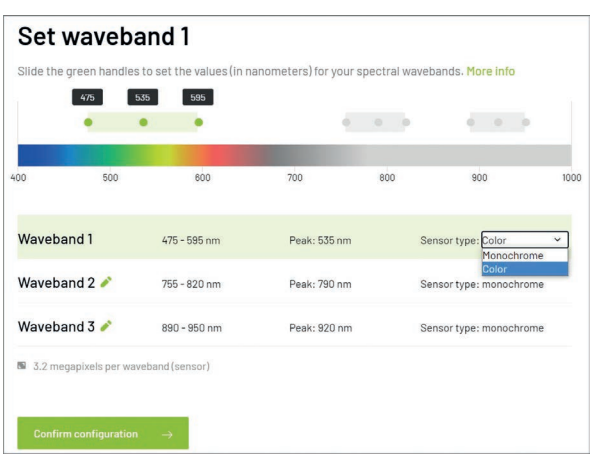
Model	Front View (Lens mount)	Resolution Megapixels (MP) (horizontal x vertical pixels)	Frame rate fps	Optical format/ Sensor tech.	Cell size (µm)	Data output (Bit)	Color/ Mono	Sensor name (Shutter type)	Interface
FS-3200T-10GE-NNC	(C-mount)	3.2 MP (2064 x 1544)	107 fps	1/1.8" 3-CMOS	3.45 x 3.45	8/10/12	C/NIR/ NIR	IMX265 (Global)	10GBASE-T GigE Vision (10GE)
FS-3200D-10GE	(C-mount)	3.2 MP (2064 x 1544)	123 fps	1/1.8" 2-CMOS	3.45 x 3.45	8/10/12	C/NIR	IMX265 (Global)	10GBASE-T GigE Vision (10GE)
FS-1600D-10GE	(C-mount)	1.6 MP (1456 x 1088)	226 fps	1/2.9" 2-CMOS	3.45 x 3.45	8/10/12	C/NIR	IMX273 (Global)	10GBASE-T GigE Vision (10GE)

Datasheets and manuals for each model with detailed specifications are available at www.jai.com

Flex-Eye Custom Multispectral "Base Models."

Model	Front View (Lens mount)	Resolution Megapixels (MP) (horizontal x vertical pixels)	Frame rate fps	Optical format/ Sensor tech.	Cell size (µm)	Data output (Bit)	Color/ Mono	Sensor name (Shutter type)	Interface
FSFE-3200T-10GE (Flex-Eye)	(C-mount)	3.2 MP (2064 x 1544)	107 fps	1/1.8" 3-CMOS	3.45 x 3.45	8/10/12	3 custom bands	IMX265 (Global)	10GBASE-T GigE Vision (10GE)
FSFE-3200D-10GE (Flex-Eye)	(C-mount)	3.2 MP (2064 x 1544)	123 fps	1/1.8" 2-CMOS	3.45 x 3.45	8/10/12	2 custom bands	IMX265 (Global)	10GBASE-T GigE Vision (10GE)
FSFE-1600T-10GE (Flex-Eye)	(C-mount)	1.6 MP (1456 x 1088)	213 fps	1/2.9" 3-CMOS	3.45 x 3.45	8/10/12	3 custom bands	IMX273 (Global)	10GBASE-T GigE Vision (10GE)
FSFE-1600D-10GE (Flex-Eye)	(C-mount)	1.6 MP (1456 x 1088)	226 fps	1/2.9" 2-CMOS	3.45 x 3.45	8/10/12	2 custom bands	IMX273 (Global)	10GBASE-T GigE Vision (10GE)

Datasheets and manuals for each Fusion Series Flex-Eye base model with detailed specifications are available at www.jai.com



For customized multispectral solutions, the Flex-Eye online configurator provides an easy, step-by-step process. The intuitive GUI with built-in validation rules enables users to quickly submit specifications that meet their unique requirements.

Interface

10GiGE VISION

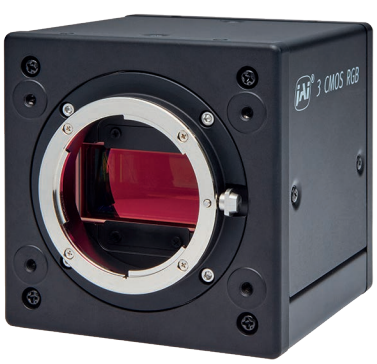
GigE Vision (GE)

Sweep+ Series

High performance prism-based color line scan cameras combining color precision, light sensitivity, fast line rates, ease of use and multispectral options.

JAI's Sweep+ Series uses advanced prism technology to provide the best possible performance, precision, and versatility for line scan cameras in web-based or continuous imaging applications. Multiple CCD (3-CCD and 4-CCD) or multiple CMOS (3-CMOS and 4-CMOS) line sensors are precisely-aligned to a common optical path providing solutions that are easier to set up, with higher color precision and less color degradation over time than tri-linear or quad-linear color cameras. With efficient manufacturing facilities and reliable and durable technology, these cameras are available at good price/performance points and offer low cost of ownership as well as supreme color line scan image quality.

Multi-Sensor precision color line scan cameras



The Sweep+ Series offers the industry's first prism-based 4K and 8K line scan cameras with fully backwards-compatible 10 GigE interfaces

This is what you get with the Sweep+ Series:

- **Better images in all inspection situations:**
  Eliminates parallax issues (no halo effects) and eliminates complex alignment procedures associated with off-angle viewing or inspection of cylindrical or wavy objects.

- **Lower configuration costs:**
  Lower setup costs due to faster configuration and a single optical plane that simplifies positioning and encoding tasks.

- **High speed with high sensitivity:**
  Advanced sensor technology and better light transmittance through the optical assembly reduces illumination requirements, for better performance at lower cost. High throughput options include the industry's first fully backwards-compatible 10 GigE interfaces, as well as models with SFP+ fiber interfaces. The backwards compatibility supports NBASE-T speeds (5Gbps and 2.5Gbps) and standard 1 GigE (1000BASE-T).

Advanced prism technology supports up to four separate sensors for precise R-G-B values and NIR imaging capabilities.The incoming light is split into 3 or 4 spectral bands (R, G, B) or (R, G, B + NIR) with perfect pixel-to-pixel alignment.

Prism-based color line scan cameras with 3-sensors (R-G-B)

Model	Front View (Lens mount)	Resolution (Pixels/line)	Line rate lps (kHz)	Sensor format	Cell size (µm)	Data output (Bit)	Color/ Mono	Interface	
SW-8000T-10GE	 (F-mount)  (M52 mount)	3-CMOS x 8192	45,000 (45 kHz)	30.72 mm 3-CMOS	3.75 x 5.78	8/10	R-G-B	 10GBASE-T GigE Vision (10GE)	Release August 2020
SW-8000T-SFP	 (F-mount)  (M52 mount)	3-CMOS x 8192	45,000 (45 kHz)	30.72 mm 3-CMOS	3.75 x 5.78	8/10	R-G-B	 Small Form Factor Pluggable (SFP+)	Release August 2020
SW-4000T-10GE	 (F-mount)  (M52 mount)	3-CMOS x 4096	97,000 (97 kHz)	30.72 mm (3-CMOS)	7.5 x 7.5 or 7.5 x 10.5	8/10	R-G-B	 10GBASE-T GigE Vision (10GE)	
SW-4000T-SFP	 (F-mount)  (M52 mount)	3-CMOS x 4096	97,000 (97 kHz)	30.72 mm (3-CMOS)	7.5 x 7.5 or 7.5 x 10.5	8/10	R-G-B	 Small Form Factor Pluggable (SFP+)	
SW-4000T-MCL	 (F-mount)  (M52 mount)	3-CMOS x 4096	68,212 (68 kHz)	30.72 mm 3-CMOS	7.5 x 7.5 or 7.5 x 10.5	8/10	R-G-B	 Mini Camera Link (MCL) Deca	
LT-400CL	 (F-mount)  (M 52 mount)	3-CMOS x 4096	16,180 (16 kHz)	28.67 mm 3 CMOS	7.0 x 7.0	8/10	R-G-B	 Camera Link (CL) (Base/medium)	
LT-200CL	 (F-mount)  (M52 mount)	3-CMOS x 2048	30,383 (30 kHz)	28.67 mm 3 CMOS	14.0 x 14.0	8/10	R-G-B	 Camera Link (CL) (Base/medium)	
SW-2001T-CL	 (F-mount)  (M52 mount)	3-CCD x 2048	19048	28.7 mm 3-CCD	14.0 x 14.0	8/10	R-G-B	 Camera Link (CL) (Base/Medium)	

Prism-based color line scan cameras with 4-sensors (R-G-B + NIR)

Model	Front View (Lens mount)	Resolution (Pixels/line)	Line rate lps (kHz)	Sensor format	Cell size (µm)	Data output (Bit)	Color/ Mono	Interface	
SW-8000Q-10GE	 (F-mount)  (M52 mount)	4-CMOS x 8192	36,000 (36 kHz)	30.72 mm 4-CMOS	3.75 x 5.78	8/10	R-G-B +NIR	 10GBASE-T GigE Vision (10GE)	
SW-8000Q-SFP	 (F-mount)  (M52 mount)	4-CMOS x 8192	36,000 (36 kHz)	30.72 mm 4-CMOS	3.75 x 5.78	8/10	R-G-B +NIR	 Small Form Factor Pluggable (SFP+)	
SW-4000Q-10GE	 (F-mount)  (M52 mount)	4-CMOS x 4096	72,000 (72 kHz)	30.72 mm (4-CMOS)	7.5 x 7.5 or 7.5 x 10.5	8/10	R-G-B +NIR	 10GBASE-T GigE Vision (10GE)	
SW-4000Q-SFP	 (F-mount)  (M52 mount)	4-CMOS x 4096	72,000 (72 kHz)	30.72 mm (4-CMOS)	7.5 x 7.5 or 7.5 x 10.5	8/10	R-G-B +NIR	 Small Form Factor Pluggable (SFP+)	
LQ-401-CL	 (F-mount)  (M52 mount)	4-CMOS x 4096	18,252 (18 kHz)	28.67 mm 4 CMOS	7.0 x 7.0	8/10	R-G-B + NIR	 Camera Link (CL) (Base/medium)	
LQ-201-CL	 (F-mount) (M52 mount)	4-CMOS x 2048	33,014 (33 kHz)	28.67 mm 4 CMOS	14.0 x 14.0	8/10	R-G-B + NIR	Camera Link (CL) (Base/medium)	
SW-2001Q-CL	(F-mount) (M52 mount)	4-CCD x 2048	19048	28.7 mm 4-CCD	14.0 x 14.0	8/10	R-G-B + NIR	Camera Link (CL) (Base/Medium)	

Datasheets and manuals for each model with detailed specifications are available at www.jai.com

Interface types

Camera Link (CL)

Mini Camera Link (MCL)

GigE Vision (GE)

Small Form Factor Pluggable (SFP+)

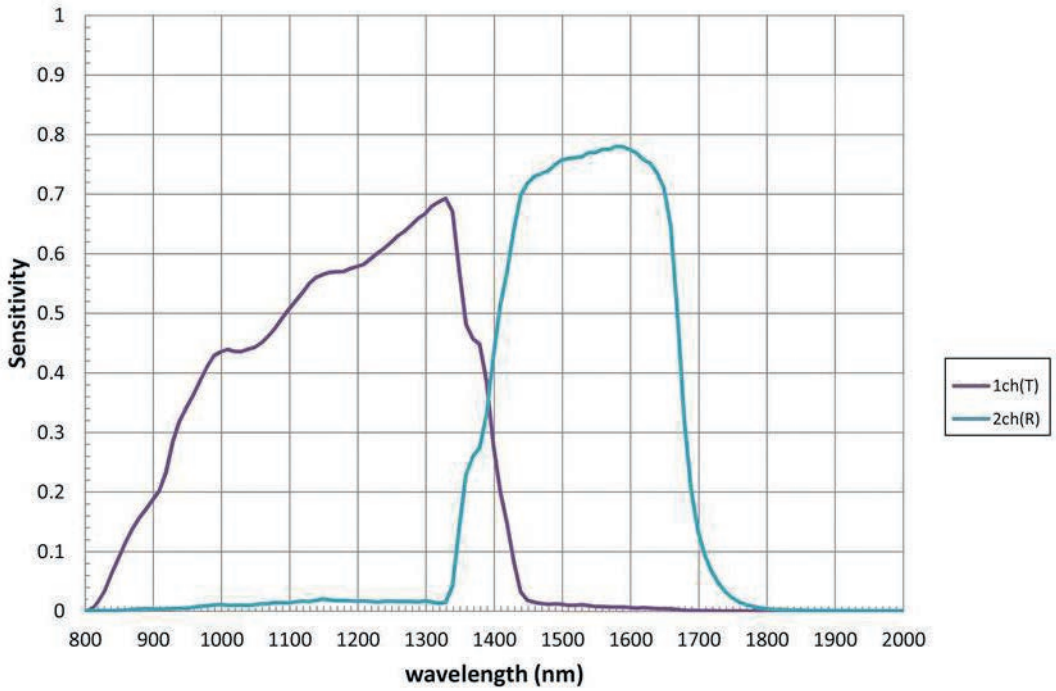
Wave Series

The Wave Series cameras are dual-band line scan cameras capable of sensing Short Wave InfraRed (SWIR) light. The cameras are based on Indium/ Gallium /Arsenide (InGaAs) sensor technology and JAI's prism line scan technology, making them capable of delivering dual-band imaging in the SWIR light spectrum (900 – 1700 nm).

Multi-imager camera technology is a JAI core competence and over the years JAI has delivered cameras covering RGB and NIR into various applications.

The new Wave Series camera brings dual-band imaging to the SWIR light spectrum to provide lots of extra "hidden" vision data. This capability can enhance current machine vision systems with imaging beyond what is possible when imaging the visible and/or the near infrared light spectrum. The Wave Series can open up a range of new applications in automated visual inspection.

Thanks to prism-based simultaneous image acquisition, it's possible to precisely align images in two different spectral bands even when objects are moving at high speeds. The WA-1000D-CL has a resolution of 2 x 1024 pixels and a maximum line frequency of 39 kHz.



WA-1000D-CL is capable of delivering dual-band imaging in the SWIR light spectrum (900 – 1700 nm)

Operation of the Wave Series camera is straightforward; no cooling is required and the data interface is standard Camera Link. The price level of the Wave Series line scan camera is lower than you may expect and the cost of ownership is comparable to a standard machine vision camera.

An advantage in SWIR is the variety of off-the-shelf optics available in comparison with MWIR cameras that require custom lenses and windows made of expensive materials.

Available Wave Series cameras:

Model	Front View (Lens mount)	Resolution (Pixels/line)	Line rate lps	Sensor format	Cell size (µm)	Data output (Bit)	Color/ Mono	Sensor name	Interface
WA-1000D-CL	(M 52-mount)	2-InGaAs x 1024	39230	25.6 mm	25 x 25	8/10/12	SWIR	-	Camera Link (CL) (Base/Medium)

Datasheets and manuals for each model with detailed specifications are available at www.jai.com

Interface types

Camera Link (CL)

Sweep Series

High performance monochrome and trilinear line scan cameras for a wide range of applications.

JAI's Sweep Series includes both monochrome and trilinear line scan cameras with line rates that are among the fastest available for their type and resolution. Utilizing custom-designed image sensors, these Sweep Series cameras offer outstanding image quality, advanced feature sets, and attractive pricing.

The SW-4000TL-PMCL model is a 4K trilinear model delivering outstanding color line scan performance for applications that don't require the ultimate precision provided by the prism technology in JAI's Sweep+ Series. It features a maximum line rate of 66 kHz for 24-bit RGB output, making it one of the fastest 3 x 4096 color line scan cameras on the market. And it offers advanced features like vertical and horizontal binning and built-in color space conversion not available on similar trilinear cameras.

The Sweep SW-4000M-PMCL and SW-8000M-PMCL are among the fastest monochrome line scan cameras in the industry. The SW-4000M-PMCL features 4096 pixels per line and is capable of running at up to 200,000 lines per second, while the SW-8000M-PMCL offers 8K resolution at up to a 100 kHz line rate. The SW-4000M-PMCL even includes a selectable quantum well size so users can adjust responsivity and dynamic range to suit their application.

Among the advantages offered by the Sweep Series are:

- **Ultra-fast scan rates:**
  Custom CMOS sensors deliver fast line rates to maximize the throughput of your vision systems.

- **Application flexibility:**
  Trilinear and monochrome models support a wide range of applications such as electronics component inspection, wafer inspection, raw material inspection (e.g., wood, food, minerals, etc.), sports imaging (finish line), print inspection (monochrome or color), waste management, and color web inspection of paper, plastic, textiles, and more.

- **Excellent value:**
  All models offer an excellent price/performance ratio, so you can stretch your camera budget further, getting more cameras for the same investment.

Trilinear color camera.
The sweep SW-4000TL-PMCL is also available with F-mount.

Monochrome Line scan cameras.
The Sweep SW-4000M-PMCL and SW-8000M-PMCL are also available with M42 x 1 lens mount.

Prism-based color line scan cameras with 4-sensors (R-G-B + NIR)

Model	Front View (Lens mount)	Resolution (Pixels/line)	Line rate lps (kHz)	Sensor format	Cell size (µm)	Data output (Bit)	Color/ Mono	Interface
SW-4000TL-10GE	 F-mount / M42 mount	4096 x 3px	65,963 (66 kHz	30.72 mm Trilinear CMOS	7.5 x 7.5	8/10	1x Trilinear color	 10 GigE Vision (10GE)
SW-4000TL-SFP	 F-mount / M42 mount	4096 x 3px	65,963 (66 kHz	30.72 mm Trilinear CMOS	7.5 x 7.5	8/10	1x Trilinear color	 Small Form Factor Pluggable (SFP+)
SW-4000TL-PMCL	 (M42 mount) [1]	4096 x 3px	65,963 (66 kHz)	30.72 mm Trilinear CMOS	7.5 x 7.5	8/10	1x Trilinear color	 Power over Mini Camera Link (PMCL) Base/Medium/Full/Deca
Sweep SW-4000M-PMCL	 (F-mount) [2]	4096	200,000 (200 kHz)	30.72 mm CMOS	7.5 x 7.5	8/10	M	 Power over Mini Camera Link (PMCL) Base/Medium/Full/Deca
Sweep SW-8000M-PMCL	 (F-mount) [2]	8192	100,000 (100 kHz)	30.72 mm CMOS	3.75 x 5.78	8/10	M	 Power over Mini Camera Link (PMCL) Base/Medium/Full/Deca

Datasheets and manuals for each model with detailed specifications are available at www.jai.com

1) Also available with F-mount.
2) Also available with M42 x 1 mount.

Interface types

Mini Camera Link (PMCL)

Power over Mini Camera Link (PMCL)

GigE Vision (10 GE)

Small Form Factor Pluggable (SFP+)

SDK and Control Tools

Standards-based software helps you operate, explore, and develop.

JAI provides a variety of free software tools to get you started or to take you all the way to a finished application. The eBUS SDK for JAI is a robust software package featuring a huge library of sample code to provide a quick-start platform for a wide range of development projects. The eBUS SDK for JAI complies fully with the GigE Vision®, USB3 Vision® and GENiCAM™ standards providing a clean, modular architecture with a single set of functions to simplify coding. Of course, JAI cameras are also compatible with a wide range of third-party software libraries capable of supporting the most complex machine vision applications.

For basic camera control, the eBUS Player for JAI allows users to control the parameters of GigE Vision and USB3 Vision cameras by providing access to their GenICam-compliant XML files. The player receives video and allows users to view streaming data and adjust device configuration settings to determine optimal settings for the vision system. For cameras equipped with Camera Link or CoaXPress interfaces, specialized control tool software is provided either by JAI or by frame grabber manufacturers, again by leveraging the standards-driven design of the cameras.

With JAI's software solutions you get:

- **Fast and easy setup:**
  The eBUS Player for JAI's graphical user interface allows the user to see and activate all the available features and functions of the connected GigE Vision or USB3 Vision cameras quickly and easily based on an XML file stored within the camera's firmware. By following a few simple steps in the manual, you can start streaming live video within minutes to verify basic operating parameters. Similar capabilities are provided through the specialized control tools for Camera Link and CoaXPress cameras.

- **Powerful functions and examples:**
  The SDK itself includes a wide range of image processing functions and libraries, as well as reference documentation and C++/C# sample code for the Visual Studio IDE. Also included is a filter driver for fast and efficient streaming of packet-based data.

- **Extensive third-party compatibility:**
  JAI's support of industry standards like GenICam, and GenTL provides compatibility with a wide range of popular third-party software tools and libraries for machine vision and/or scientific application development. Contact JAI regarding specific software compatibility questions.

The perfect software starting point

CAMERA SELECTION CHART: SINGLE - SENSOR AREA SCAN CAMERAS

Frames/ second	2.1 - 4.0 Megapixels	5.0 Megapixels	12.0 - 20 Megapixels	25.0 - 50.0 Megapixels
151-260*	GO-2400-PMCL 2.35 MP 165 FPS Page 5 GO-2400-USB 2.35 MP 160 FPS Page 5	SP-5000-CXP4 5 MP 253 FPS Page 7 SP-5000-CXP2 5 MP 211 FPS Page 7	SP-12000-CXP4 12 MP 189 FPS Page 7	
91-150		SP-5000-PMCL 5 MP 137 FPS Page 7 GO-5000-PMCL 5 MP 107 FPS Page 5		
71-90		GO-5100-USB 5 MP 74 FPS Page 5 GO-5100MP-USB 5 MP 74 FPS Page 5 Polarized GO-5100MP-PGE 5 MP 22 FPS Page 5 Polarized		
61-70		SP-5000-USB 5 MP 62 FPS Page 7 GO-5000-USB 5 MP 62 FPS Page 5	SP-12400-PMCL 12 MP 64 FPS Page 7	
51-60				SP-45000-CXP4 45 MP 52 FPS Page 7
41-50	GO-2400-PGE 2.35 MP 48 FPS Page 5	SP-5000-GE2 5 MP 44 FPS Page 7		
31-40	GO-2401-PGE 2.35 MP 33 FPS Page 5	GO-5101-PMCL 5 MP 35 FPS Page 5		SP-45001-CXP4 45 MP 38 FPS Page 7
21-30		GO-5100-PGE 5 MP 22 FPS Page 5 GO-5000-PGE 5 MP 22 FPS Page 5 GO-5101-PGE 5 MP 22 FPS Page 5	SP-20000-CXP2 20 MP 30 FPS Page 7 SP-20000-PMCL 20 MP 30 FPS Page 7 SP-12401-USB 12.4 MP 23 FPS Page 7	
10-20			SP-20000-USB 20 MP 16 FPS Page 7 SP-12401-PGE 12.4 MP 9 FPS Page 7	

*) Higher frames can be obtained using Region of Interest (ROI). ROI is available in selected models.
All JAI area scan cameras are available in color and monochrome versions.

CAMERA SELECTION CHART: MULTI-SENSOR AREA SCAN CAMERAS

Frames/ second	1.0 - 2.0 Megapixels	2.1 - 4.0 Megapixels
151-250	FS-1600D-10GE 2x1.6 MP 226 FPS  Page 13 FSFE-1600D-10GE 2x1.6 MP 226 FPS CUSTOM Page 13 FSFE-1600T-10GE 3x1.6 MP 213 FPS CUSTOM Page 13	
41-150	AP-1600T-PMCL 3x1.6 MP 126 FPS  Page 9 AP-1600T-USB 3x1.6 MP 78 FPS **Note 2  Page 9 AP-1600T-USB-LS 3x1.6 MP 79 FPS **Note 2  Page 11	AP-3200T-PMCL 3x3.2 MP 55 FPS  Page 9 FS-3200D-10GE 2x3.2 MP 123 FPS  Page 13 FSFE-3200D-10GE 2x3.2 MP 123 FPS CUSTOM Page 13 FS-3200T-10GE-NNC 3x3.2 MP 107 FPS  Page 13 FSFE-3200T-10GE 3x3.2 MP 107 FPS CUSTOM Page 13
31-40		AP-3200T-USB 3x3.2 MP 38 FPS *Note 1  Page 9 AP-3200T-USB-LS 3x3.2 MP 38 FPS *Note 1  Page 11
21-30	AP-1600T-PGE 3x1.6 MP 24 FPS  Page 9	
10-20		AP-3200T-PGE 3x3.2 MP 12 FPS  Page 9

*** Note 1: Model variants of AP-3200T-USB:**
AP-3200T-USB (Green housing)
AP-3200T-USB-LS (LS = White housing, standard dust suppression).
AP-3200T-USB-LSX (LSX = White housing, maximum dust suppression).
AP-3200T-USB-NF (NF = No IR-cut filter, green housing)
AP-3200T-USB-NF-LS (NF-LS = No IR-cut filter, white housing, standard dust suppression)
AP-3200T-USB-NF-LSX (NF-LSX = No IR-cut filter, white housing, maximum dust suppression)

**** Note 2: Model variants of AP-1600T-USB:**
AP-1600T-USB (Green housing)
AP-1600T-USB-LS (LS = White housing, standard dust suppression).
AP-1600T-USB-LSX (LSX = White housing, maximum dust suppression).
AP-1600T-USB-NF (NF = No IR-cut filter, green housing)
AP-1600T-USB-NF-LS (NF-LS = No IR-cut filter, white housing, standard dust suppression)
AP-1600T-USB-NF-LSX (NF-LSX = No IR-cut filter, white housing, maximum dust suppression)

 3-CMOS Red/Green/Blue

 3-CMOS: Bayer-NIR-NIR multispectral

CUSTOM 3-CMOS: Flex-Eye custom multispectral

 2-CMOS: Bayer-NIR multispectral

CUSTOM 2-CMOS: Flex-Eye custom multispectral

CAMERA SELECTION CHART: AREA SCAN CAMERAS - INTERFACE

	Models with USB3 Vision interface USB = USB3 Vision:	Models with GigE Vision interface 10GE = 10GBASE-T GigE Vision GE = GigE Vision GE2 = GigE Vision Link Aggregation PGE = Power over Ethernet/GigE Vision	Models with CoaXPress interface CXP = CoaXPress with 1-connector: CXP2 = CoaXPress with 2-connectors: CXP4 = CoaXPress with 4-connectors	Models with Camera Link interface CL = Camera Link MCL = Mini Camera Link PMCL = Power over Mini Camera Link
25.0 - 50.0 Megapixels			SP-45000-CXP4 45 MP 52 FPS Page 7 SP-45001-CXP4 45 MP 38 FPS Page 7	
12.0 - 20.0 Megapixels	SP-20000-USB 20 MP 16 FPS Page 7 SP-12401-USB 12.4 MP 23 FPS Page 7	SP-12401-PGE 12.4 MP 9 FPS Page 7	SP-12000-CPX4 12 MP 189 FPS Page 7 SP-20000-CXP2 20 MP 30 FPS Page 7	SP-20000-PMCL 20 MP 30 FPS Page 7 SP-12400-PMCL 12.4 MP 64 FPS Page 7
5.0 Megapixels	SP-5000-USB 5 MP 62 FPS Page 7 GO-5000-USB 5 MP 62 FPS Page 5 GO-5100-USB 5 MP 74 FPS Page 5 GO-5100MP-USB 5 MP 74 FPS Page 5	SP-5000-GE2 5 MP 44 FPS Page 7 GO-5100-PGE 5 MP 22 FPS Page 5 GO-5000-PGE 5 MP 22 FPS Page 5 GO-5100MP-PGE 5 MP 22 FPS Page 5 GO-5101-PGE 5 MP 22.7 FPS Page 5	SP-5000-CPX4 5 MP 253 FPS Page 7 SP-5000-CXP2 5 MP 211 FPS Page 7	SP-5000-PMCL 5 MP 137 FPS Page 7 GO-5000-PMCL 5 MP 107 FPS Page 5 GO-5101-PMCL 5 MP 35 FPS Page 5
2.1 - 4.0 Megapixels	GO-2400-USB 2.35 MP 160 FPS Page 5 AP-1600T-USB 3x1.6 MP 79 FPS P 9 AP-3200T-USB 3x3.2 MP 38 FPS P 9	AP-3200T-PGE 3x3.2 MP 12 FPS Page 9 GO-2400-PGE 2.35 MP 48 FPS Page 5 GO-2401-PGE 2.35 MP 33 FPS Page 5 AP-1600T-PGE 3x1.6 MP 24 FPS Page 9 FS-3200D-10GE 2x3.2 MP 123 FPS Page 13 FSFE-3200D-10GE 2x3.2 MP 123 FPS Page 13 FS-3200T-10GE-NNC 3x3.2 MP 107 FPS Page 13 FSFE-3200T-10GE 3x3.2 MP 107 FPS Page 13		AP-3200T-PMCL 3x3.2 MP 55 FPS Page 9 GO-2400-PMCL 2.35 MP 165 FPS Page 5 AP-1600T-PMCL 3x1.6 MP 126 FPS Page 9
1.0 - 2.0 Megapixels		FS-1600D-10GE 2x1.6 MP 226 FPS Page 13 FSFE-1600D-10GE 2x1.6 MP 226 FPS Page 13 FSFE-1600T-10GE 3x1.6 MP 213 FPS Page 13		
0.3 - 0.9 Megapixels				

3-CMOS Red/Green/Blue

3-CMOS: Bayer-NIR-NIR multispectral

3-CMOS: Flex-Eye custom multispectral

2-CMOS: Bayer-NIR multispectral

2-CMOS: Flex-Eye custom multispectral

CAMERA SELECTION CHART: LINE SCAN CAMERAS

Line Rate:	2048 pixels	4096 pixels	8192 pixels
200,000 (200 kHz)		SW-4000M-PMCL 1x4096 px  Page 19	
100,000 (100 kHz)			SW-8000M-PMCL 1x8192 px  Page 19
80,000 (80 kHz)		SW-4000T-10GE 3x4096 px  Page 15 SW-4000T-SFP+ 3x4096 px  Page 15	
70,922 (70 kHz)		SW-4000Q-10GE 4x4096 px  Page 15 SW-4000Q-SFP+ 4x4096 px  Page 15	
68,212 (68 kHz)		SW-4000T-MCL 3x4096 px  Page 15	
65,963 (66 kHz)		SW-4000TL-PMCL 3x4096 px  Page 19 SW-4000TL-10GE 3x4096 px  Page 19 SW-4000TL-SFP+ 3x4096 px  Page 19	
45,000 (45 kHz)			SW-8000T-10GE 3x8192 px  Page 15 SW-8000T-SFP 3x8192 px  Page 15
36,000 (36 kHz)			SW-8000Q-10GE 4x8192 px  Page 15 SW-8000Q-SFP 4x8192 px  Page 15
30,000-35,000 (30-35 kHz)	LQ-201-CL 4x2048 px  Page 15 LT-200-CL 3x2048 px  Page 15		
16,000-20,000 (16-20 kHz)	SW-2001Q-CL 4x2048 px  Page 15 SW-2001T-CL 3x2048 px  Page 15	LQ-401-CL 4x4096 px  Page 19 LT-400-CL 3x4096 px  Page 19	

 4-CCD or 4-CMOS: Red/Green/Blue + NIR

 3-CCD or 3-CMOS: Red/Green/Blue

 Color trilinear: Red/Green/Blue

 1-CMOS: Monochrome

INTERFACE, DATAOUT AND CABLE LENGTH

CoaXPress		
CXP = CoaXPress with one connector	CXP2 = CoaXPress with two connectors	CXP4 = CoaXPress with four connectors
In CXP-3 configuration Max interface throughput: 3.125 Gbit/s Effective data throughput: 312 MB/S Max cable length: 85 meters	**In CXP-3 configuration** Max interface throughput: 2 x 3.125 Gbit/s = 6.25 Gbit/s Effective data throughput: 625 MB/S Max cable length: 85 meters	**In CXP-3 configuration** Max interface throughput: 4 x 3.125 Gbit/s = 12.5 Gbit/s Effective data throughput: 1250 MB/S Max cable length: 85 meters
In CXP-6 configuration Max interface throughput: 6.25 Gbit/s Effective data throughput: 625 MB/S Max cable length: 35 meters	**In CXP-6 configuration** Max interface throughput: 2 x 6.25 Gbit/s = 12.5 Gbit/s Effective data throughput: 1250 MB/S Max cable length: 35 meters	**In CXP-6 configuration** Max interface throughput: 4 x 6.25 Gbit/s = 25 Gbit/s Effective data throughput: 2500 MB/S Max cable length: 35 meters

GiGE VISION		10 GiGE VISION	
GE = GigE Vision Interface	GE2 = GigE Vision Interface - Link Aggregation	PGE = Power Over Ethernet/GigE Vision	10 GE 10 GigE Vision interface
Max interface throughput: 1 Gbit/s Effective data throughput: 115 MB/S Max cable length: 100 meters	Max interface throughput: 2 Gbit/s Effective data throughput: 230 MB/S Max cable length: 100 meters	Max interface throughput: 1 Gbit/s Effective data throughput: 115 MB/S Max cable length: 100 meters	Max interface throughput: 10 Gbit/s Effective data throughput: 1150 MB/S Max cable length: 100 meters

CAMERA Link		mini CAMERA Link	
CL = Camera Link interface MCL = Mini Camera Link PMCL = Power Over Mini Camera Link (In Base configuration)	CL = Camera Link interface MCL = Mini Camera Link PMCL = Power Over Mini Camera Link (In Medium configuration)	CL = Camera Link interface MCL = Mini Camera Link PMCL = Power Over Mini Camera Link (In Full configuration)	CL = Camera Link interface MCL = Mini Camera Link PMCL = Power Over Mini Camera Link (In full 80-bit Deca configuration)
Max interface throughput: 2.0 Gbit/s Effective data throughput: 255 MB/S * Max cable length: 10 meters	Max interface throughput: 4.08 Gbit/s Effective data throughput: 510 MB/S* Max cable length: 10 meters	Max interface throughput: 5.44 Gbit/s Effective data throughput: 680 MB/S* Max cable length: 10 meters	Max interface throughput: 6.80 Gbit/s Effective data throughput: 850 MB/S* Max cable length: 7 meters

**) Depending on Sensor tap configuration.*

USB3 VISION
USB = USB3 Vision Interface
Max interface throughput: 5 Gbit/s Effective data throughput: 400 MB/S Max cable length 3 - 5 meters

The USB3 Vision interface also supports "power over the interface" as a standard capability. (Except where the power requirements of the camera exceeds the capacity of the interface. Consult the documentation for details.)

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Every day.

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