



## Prism-based 3-CMOS cameras for endoscopy and surgical imaging systems delivering images with supreme color accuracy, high resolution and high sensitivity.

In endoscopy surgery systems – used to look inside the human body and organs - the images generated by high resolution digital cameras must be able to reproduce even the subtlest color variations and details, helping doctors and/or staff to more precisely differentiate tissue types and identify small and fine structures (such as nerves and tiny vessels) with greater precision.

Also, surgical video capturing systems installed in, for example, surgical microscopes or mounted in the ceiling above open surgery tables, must capture images with a level of quality required for use in live external supervision from experts or as a general tool for documenting the particular operation and helping to develop better surgical procedures.

High quality video documentation can also be used to provide the best possible educational material for medical students in lecture theatres.

JAI's Apex Series consists of a range of high sensitivity 3-CMOS prism-based area scan cameras designed to deliver supreme color images in endoscopy and surgical imaging. They are an excellent choice for OEM integration into high-end medical imaging equipment.

Please turn page to read more about the Apex camera models.



*JAI Apex Series 3-CMOS area scan cameras are an excellent choice for OEM integration into endoscopy and surgical imaging systems. Turn page to learn more about the Apex cameras.*

# Apex Series: 3-CMOS prism-based area scan cameras for life sciences.

JAI's new Apex series cameras are low noise, high sensitivity prism R-G-B color area scan cameras with 3 x 3.2 megapixels resolution (AP-3200T-USB-LS) and 3 x 1.6 megapixel resolution (AP-1600T-USB-LS). They offer a rich feature set for supreme color imaging in various aspects of surgical imaging. The cameras are designed with a three-way prism that uses dichroic filters to separate the incoming light into red, green and blue wavelengths, which are directed to three precisely aligned CMOS sensors. The prism technique provides better R-G-B color accuracy, differentiation, and spatial precision than traditional color cameras based on the Bayer mosaic technique. The full color information provided in every pixel is ideal in demanding endoscopy imaging where supreme color discrimination (for detecting subtle color nuances) and spatial resolution are key factors.

## Supreme color differentiation:

Surgical imaging and endoscopy cameras must be able to reproduce even the subtlest color variations and details to differentiate tissue types and precisely identify small and fine structures. JAI's 3-CMOS prism camera technology provides better color separation than the interpolation/estimation of colors as found in cameras using Bayer color interpolation. Color differentiation is also increased due to the steeper spectral curves of the dichroic prism filters which results in smaller areas of "crosstalk" between color channels and thus, more certainty through the full light spectrum. These higher levels of color differentiation and dynamic range mean better performance in medical and life sciences applications.

## High sensitivity:

In most life science imaging applications it is essential that the camera can capture as much light as possible to produce bright images showing all details. While the filter matrix on a traditional Bayer camera blocks two-thirds of the wavelengths falling on each pixel, the JAI three-sensor prism cameras capture the full range of wavelengths on each pixel for better overall sensitivity.

In addition, the prism glass in JAI's microscopy cameras offers better light transmission properties than the polymer filters on a standard Bayer sensor. This further boosts the sensitivity and helps to produce bright images.

## Color Enhancer tool:

Apex Series cameras can be made to "boost" the intensity of a specific color when needed for specific applications. Six different primary/complementary colors (red, green, blue, cyan, magenta, yellow) are available for enhancement using a built-in

Color Enhancer function. Each color can be amplified up to 2 times its normal intensity to make certain items "stand out", such as the red color of blood vs. surrounding tissue.

## Edge Enhancer tool:

This image processing filter can identify the boundaries between contrasting colors and then increase the contrast in those areas, thereby improving edge sharpness and definition of small details.

## Highest levels of dust/FOD suppression:

All Apex LS models provide exceptional image quality for most medical and life sciences applications, but some applications call for an even higher grade of image clarity, and here the LSX models are recommended. The Apex LSX models are all pre-screened to offer minimal levels of image artifacts from dust/FODs, providing maximum image quality for the most demanding life sciences and microscopy applications.



## APEX SERIES:

- ✓ AP-3200T-USB-LS / LSX\*
- ✓ 3 x 3.2 MP CMOS
- ✓ 38 fps over USB3 Vision
- ✓ IMX265
- ✓ AP-1600T-USB-LS / LSX\*
- ✓ 3 x 1.6 MP CMOS
- ✓ 79 fps over USB3 Vision
- ✓ IMX273

*\*) Pre-screened "LSX" models offer minimal levels of image artifacts from dust/FODs*

**DOWNLOAD WHITE PAPER:**  
 Learn how using the unique advantages of 3-CMOS prism technology helps you to achieve superior image quality factors, such as real and full-color depth, improved color contrast, and better color differentiation.

## Camera technology from JAI

JAI offers a broad range of high quality industrial camera technology for integration into our customers' vision inspection systems, serving a wide range of industries such as life science, medical, pharmaceutical, semiconductor, automotive, food, sports/entertainment and more. Please contact JAI for a more detailed discussion of your camera needs for imaging in medical and life sciences applications and read more about JAI and our camera offerings on [www.jai.com](http://www.jai.com)



### Apex Series

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



### Go Series

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



### Spark Series

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



### Sweep Series

Monochrome & trilinear CMOS line scan cameras with high resolution, fast scan rates and high image quality.



### Sweep+ Series

Prism-based color line scan cameras combining highest color precision, fast line rates and multi-spectral options.



### Fusion Series

Dual-sensor area scan cameras with unique capabilities for specialized multi-spectral and HDR imaging applications.



### Wave Series

InGaAs dual-band line scan cameras capable of sensing Short Wave Infra-Red (SWIR) light. (900-1700 nm).

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See the possibilities

