



INFINITY DIGITAL MICROSCOPY CAMERAS

Produce crystal clear, vibrant images with Lumenera's INFINITY microscopy cameras. Our user friendly USB 3.0, USB 2.0 and HDMI cameras range in resolution from 1.4 to 32* megapixel and feature CMOS, CCD, High Definition (HD), low light CCD, large format, research-grade and pixel shifting technologies. As one of the most respected digital camera manufacturers in the scientific market, we install thousands of INFINITY cameras each year into life science, clinical and industrial applications. Lumenera provides high quality, scientific-grade cameras complete with feature rich software packages at the best price-to-performance ratio in the market.



* The INFINITYX digital camera's sub-pixel shifting technology provides variable resolution capture up to 32 megapixel.

Contact us to determine how you can benefit from Lumenera's high-quality, reliable products.



www.lumenera.com

Why Lumenera, Why INFINITY

Extensive Product Line

Life science researchers, clinical pathologists and industrial technicians count on our exceptional color reproduction, high quality microscopy cameras, complete with user friendly software packages. Select from Lumenera's cost-effective CMOS cameras, our HD camera with full 1080p60 preview, or our CCD solutions with high dynamic range and outstanding color fidelity.

Centralized Research Development & Manufacturing

Research, development and manufacturing are tightly controlled in one location ensuring the highest standard of quality from design to delivery. To ensure a timely product supply, Lumenera has established close, collaborative relationships with vendors and provides its own in-house manufacturing inspection and quality controls. As a testament to our high quality standards we continue to invest in research and development in order to maintain our reputation as a leading provider of high-performance digital imaging solutions. As a Lumenera customer you will benefit from our ongoing success and solid growth for years to come.

3rd Party Software Integration

Lumenera is integrated with leading software technology partners such as Media Cybernetics (Image Pro Premier), Molecular Devices (Metamorph), and National Instruments (LabVIEW) to name a few. For a full list of our microscopy software technology partners please visit our website:

<http://www.lumenera.com/partners/technology-partners.html>

Contact us regarding additional software packages.

Intuitive Software Package

Included with your camera purchase is INFINITY ANALYZE and INFINITY CAPTURE software. Together, the camera and software create a complete imaging solution for your application. Take advantage of features ranging from full camera control to advanced capabilities such as measurement, video recording, annotation and the pseudo-coloring of fluorescent images. INFINITY ANALYZE is translated into eight languages providing life science, clinical and industrial researchers native language support. Also included is a Mac camera driver and ImageJ plug-in for select INFINITY cameras.

Industry Leading Technical Assistance Center

Realize your vision needs through our Technical Assistance Center (TAC). Core competencies include microscopy, software development, color algorithms, opto-electronics, laser physics, remote sensing, sensor architecture and optics. Receive timely, accurate information from our skilled team.

Research-Grade Cameras

The research-grade designation is a result of the low noise electronics, high-grade components and Lumenera's unique thermal management techniques implemented inside the INFINITY camera. The end result is high quality images with extremely low noise and high dynamic range. Research-grade cameras are denoted with an R in the ordering part number.

Helpful Tools

INFINITY cameras are well known for their ease of set up and use. For immediate instruction on software features available, visit our popular step-by-step tutorials, as well as our FAQs and Knowledge Base at www.lumenera.com.

FLUORESCENCE SAMPLE TAKEN WITH INFINITY X-320

SAMPLE APPLICATIONS

Life Science & Clinical Applications

Genetics/Biology/Pathology



BPAA CELLS TAKEN WITH INFINITY3-1M



PARAMECIUM TAKEN WITH INFINITY1-2C

Stained Samples

To ensure proper identification and diagnosis of stained samples, precise color is required. Advanced Color Correction Matrices (CCMs) compensate for the visual imperfections caused by light sources and image sensors. To provide true-to-life color in a consistent and repeatable manner, Lumenera has designed proprietary CCMs. As a result, Lumenera is better able to define and contrast colors that are difficult to reproduce including hues of oranges, reds, pinks and yellows. These advanced techniques retune the image to be true to life.

Live Imaging

Combine INFINITY software with our high-speed USB 2.0 and USB 3.0 cameras for smooth, responsive live video preview, or to record brief video clips. Integration with popular 3rd party software is available.

Material Science—Quality Control

Metrology/Mineralogy/Metallurgy

Defect Analysis

Measurement and annotation are an important part of any quality control process. Obtain precise reproducible results through a variety of features found in INFINITY software such as simple calibration as well as extensive measurement options.



PCB SAMPLE TAKEN WITH INFINITY2-7CB



METALLIC SAMPLE TAKEN WITH INFINITY1-3C



FIBRE-OPTIC ILLUMINATION CABLE TAKEN WITH INFINITY3-3UR

Stereo and Macro Imaging

Samples with reflection, shadowing and low-light conditions commonly found in the QC environment can be quite difficult to image. Effectively deal with washed out or dark areas, bright spots or poorly lit samples with our high dynamic range INFINITY CCD cameras, whose high sensitivity allows for proper imaging. Perform depth of focus and spherical aberration correction with the Advanced Features Module (available as an accessory).

INFINITY Camera Selection

High to Moderate Illumination
10-bit Quantitative Analysis

Brightfield/Darkfield
DIC
Live Cell Imaging
Histology/Pathology/Cytology
Semiconductor Inspection
Metrology
Documentation and Archiving
Tumor Review Boards
Education

INFINITY1
INFINITY1-1M
INFINITY1-2
INFINITY1-3
INFINITY1-5
INFINITYHD
INFINITYlite

Moderate to Low Illumination
12 and 14-bit Quantitative Analysis

Brightfield/Darkfield
DIC
Live Cell Imaging
Histology/Pathology/Cytology
Semiconductor Inspection
Metrology
Documentation and Archiving

INFINITY2
INFINITY2-1R
INFINITY2-2
INFINITY2-3
INFINITY2-5
INFINITYX
INFINITYX-32

Moderate Light Fluorescence
Gel Documentation

High Sensitivity
12 and 14-bit Quantitative Analysis

Brightfield/Darkfield
DIC
Live Cell Imaging
Histology/Pathology/Cytology
Semiconductor Inspection
Metrology
Documentation and Archiving
Gel Documentation

INFINITY3
INFINITY3-1
INFINITY3-1UR
INFINITY3-3UR
INFINITY3-6UR
INFINITY3-1PF
INFINITY3-1URF
INFINITY3-3URF
INFINITY3-6URF

Low Light Fluorescence
Chemiluminescence
Bioluminescence
Flow Analysis
GFP, FISH, NIR, FRET

PRODUCT FEATURE: INFINITY3S-1UR

A best-in-class USB 3.0 microscopy camera based on Sony's new ICX825 1.4 megapixel CCD sensor



Lumenera's INFINITY3S-1UR is a high-speed, high sensitivity research-grade camera that incorporates Sony's remarkable ICX825 CCD sensor, which is 53% more sensitive than the popular ICX285 sensor. Sony has made several improvements on the ICX285 sensor design by including the EXview HAD CCD II™ structure with the ICX825 sensor to provide a much higher performance while maintaining the 6.45 x 6.45 μm pixel size.

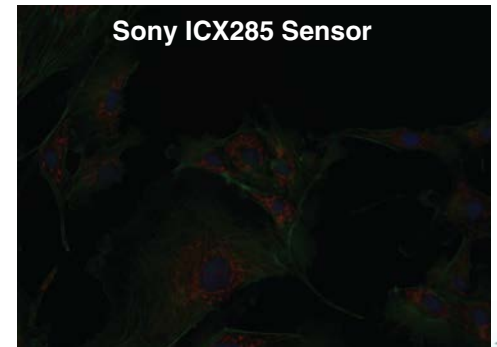
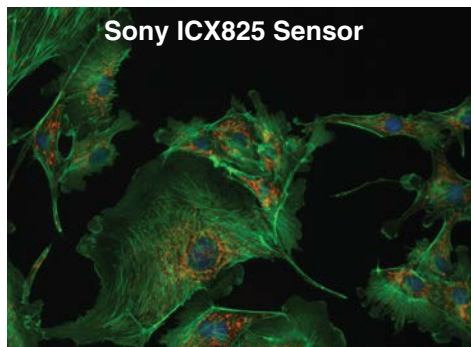
Lumenera pushed the new ICX825 sensor to provide the maximum performance possible by providing low read noise and low dark current with an uncooled design. For many standard fluorescence applications where very long exposures are not required, this camera provides astonishing low-noise results.

The published frame rate by Sony for the ICX825 CCD sensor is 45fps. Lumenera has designed the INFINITY3S-1UR to support a maximum frame rate of 60fps (mono) over a reliable USB 3.0 interface without sacrificing image quality.

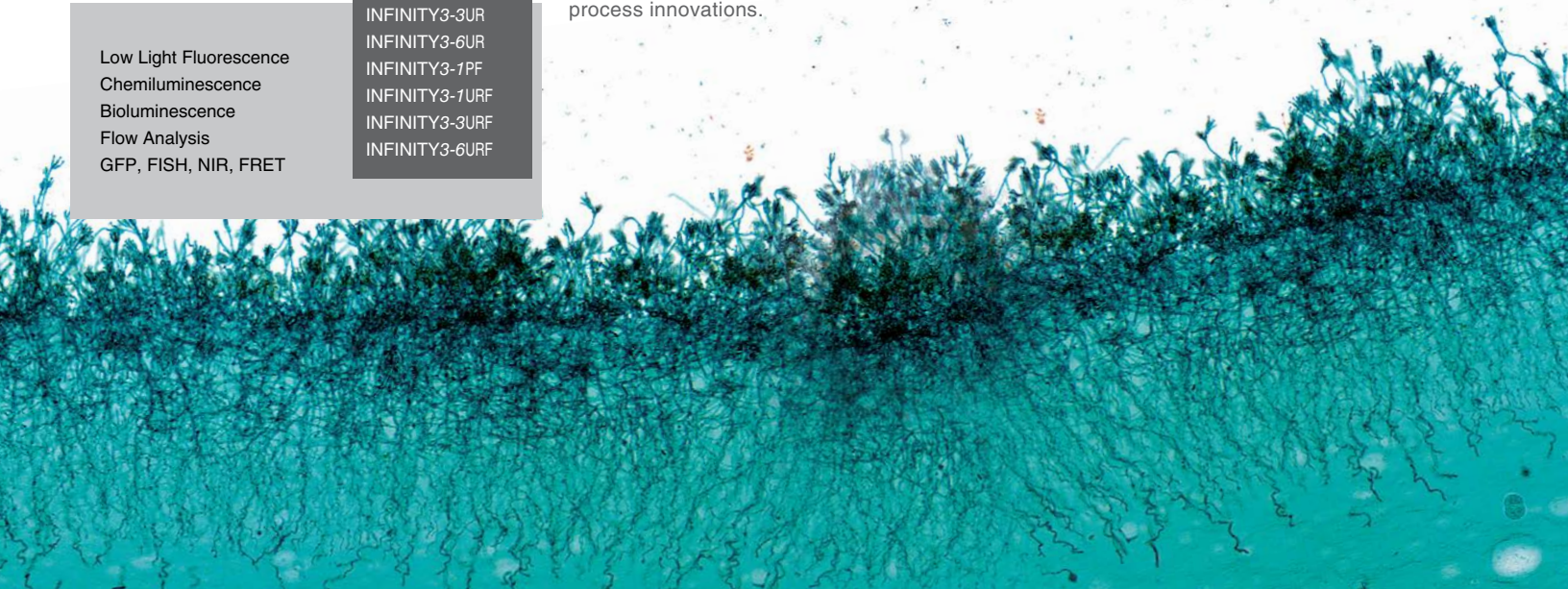
KEY PERFORMANCE IMPROVEMENTS FOR THE ICX825

- 6dB increase in dynamic range vs. ICX285
- 7dB improvement in QE at 850nm in the NIR range vs. ICX285
- Increased sensitivity thus reducing exposure time & reducing photo bleaching for fluorescence
- Increased frame rate of over 60fps vs. 30fps for the ICX285

HIGHER SENSITIVITY



The ICX825 sensor increases sensitivity by 3.7dB as a result of semiconductor technology and process innovations.





INFINITY1

CMOS Cameras for Photo Documentation and High-Speed Imaging

Highlights:

- 1, 2, 3 and 5 megapixel resolutions
- High frame rates
- High quality, cost-effective solution
- 8 or 10-bit output

The INFINITY1 series of CMOS USB 2.0 digital microscopy cameras, with resolutions as high as 5 megapixel, is specifically designed to be a cost-effective, versatile solution for a wide variety of microscopy photo documentation applications including life science, pathology, industrial inspection and geology.

Benefit from outstanding color, clarity and image detail. Easy-to-use and fast frame rates are achieved through the plug-and-play, low noise USB 2.0 data interface to maximize your workflow. Combine our powerful feature-rich software package, together with the INFINITY1 series of cameras to produce accurate, reproducible results.

Models:

- INFINITY 1-1M 1.1 MP CMOS Mono Camera
- INFINITY 1-2CB 2.0 MP CMOS Color Camera
- INFINITY 1-3C 3.1 MP CMOS Color Camera
- INFINITY 1-5C 5.0 MP CMOS Color Camera
- INFINITY 1-5M 5.0 MP CMOS Mono Camera

INFINITYlite

Low Cost CMOS Camera for Academic and Entry-Level Documentation

Highlights:

- 1.5 megapixel resolution
- Excellent color reproduction
- Live video preview and focus



The INFINITYlite is a low cost CMOS camera for archiving and documentation. With 1.5 megapixel resolution and excellent color reproduction, this entry-level camera is specifically designed for the education market as well as entry level microscopy applications. It is a compact, affordable scientific camera that delivers outstanding image quality and excellent value. Operates with INFINITY Capture Software.

Models:

- INFINITYliteB 1.5 MP CMOS Color Camera



INFINITY2

CCD Cameras for Challenging Lighting and Color Conditions, as well as Quantitative Analysis

Highlights:

- 1, 2, 3 and 5 megapixel resolutions
- Excellent light sensitivity
- Superior color reproduction
- 8, 12 or 14-bit output
- Research-grade camera with low dark current noise

Effortlessly capture challenging images of samples in complex lighting situations with the INFINITY2 CCD series. If precise color reproduction is critical, the exceptional quality of the INFINITY2's Sony sensor meets the requirements of the most demanding applications. The INFINITY2 series of cameras offer consistent results with resolutions as high as 5 megapixel, positioning them as an ideal solution for challenging photo documentation and quantitative analysis applications in high-end scientific, medical, ophthalmic and life science applications.

In addition to the features provided by this family of cameras, the INFINITY2-1R now offers reduced dark current noise, providing long exposures for research applications.

Models:

- INFINITY2-1RC 1.4 MP CCD Color Camera
- INFINITY2-1RM 1.4 MP CCD Mono Camera
- INFINITY2-2C 2.0 MP CCD Color Camera
- INFINITY2-2M 2.0 MP CCD Mono Camera
- INFINITY2-3C 3.3 MP CCD Color Camera
- INFINITY2-5C 5.0 MP CCD Color Camera
- INFINITY2-5M 5.0 MP CCD Mono Camera



INFINITY3

CCD Cameras for Low Light Conditions and Quantitative Analysis

Highlights:

- Ultra-sensitive Sony CCD 1.4, 2.8 and 6.0 megapixel sensor-based cameras
- Thermoelectric cooled and uncooled camera models
- Fast frame rates
- GPI/O provided standard on the INFINITY3-1, INFINITY3-3UR and INFINITY3-6UR models
- Research-grade camera with extremely high dynamic range

Camera models available in the INFINITY3 series:

The ultra-sensitive **INFINITY3S-1UR** incorporates Sony's new ICX825 CCD sensor, producing unmatched light sensitivity needed for challenging low light applications such as fluorescence and NIR imaging. Highlights include high QE, 6.45 x 6.45 µm pixels, high dynamic range, low noise, and an industry-leading 60 frames per second (fps).

Built on Sony's 6.0 megapixel EXview HAD II CCD sensor, the **INFINITY3-6UR** offers extremely high dynamic range (4.54 x 4.54 µm pixels). Lumenera has achieved a low 6.5 electron read noise, as well as high frames rates of 27 fps via a high-speed USB 3.0 interface. With 2x2 binning, there is a fourfold increase in sensitivity while providing a 1.5 megapixel (1376x1096) resolution.

The **INFINITY3-3UR** camera features a Sony ICX674 CCD sensor, offers 53 fps at full 2.8 megapixel resolution via a high-speed USB 3.0 interface. Designed for use in scientific and industrial applications requiring optimal color reproduction, extreme sensitivity, increased resolution and high speed.

The **INFINITY3-1** is thermoelectrically cooled to 25 °C below ambient and features a high signal to noise ratio, positioning it as an ideal solution for applications with extremely long integration times where reducing dark noise is a requirement.

Models:

Please see the table on the back of the brochure for a list of camera models available in the INFINITY3 series.



INFINITY X

Extremely High Resolution Pixel Shifting Camera

Highlights:

- 32 megapixel resolution for capturing fine detail
- 2 megapixel live preview
- CCD sensors provide application versatility
- 12-bit output for quantitative applications

The INFINITY X-32 digital camera's sub-pixel shifting technology provides variable resolution capture at 2, 8, 18 and 32 megapixel. High resolution, combined with the excellent sensitivity of a CCD, make this an excellent general camera for virtually any application. In addition to high resolution, pixel-shifting cameras have the added advantage of acquiring all three color channels for each pixel, ensuring the highest possible quality of color reproduction.

Models:

INFINITY X-32C 32 MP CCD Color Camera

INFINITY X-32M 32 MP CCD Mono Camera

INFINITY HD

1080p60 High Definition (HD) Camera, Direct Connect to HDMI Monitor

Highlights:

- 1080p60 HD camera
- Direct output to HDMI monitor
- 1/3" (16:9) CMOS 2 megapixel sensor
- 3 on-camera buttons for power, white balance and real-time, low latency capture

The INFINITY HD is a stand-alone, high definition camera offering full 1080p60 preview running at the required 60 fps needed for true high definition allowing for superb color reproduction and smooth sample manipulation without any lag. Images can be captured via USB 2.0 or video can be streamed live directly to an HDMI monitor (no need for a PC). Extremely fast response times quickly react to lighting changes in any life science, clinical or material application. INFINITY HD CAPTURE software required.

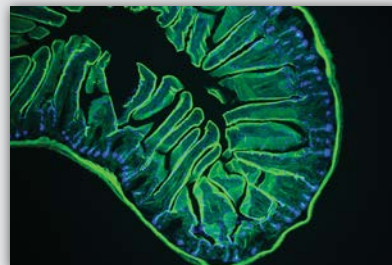
Models:

INFINITY HD 2 MP CMOS HD Color Camera

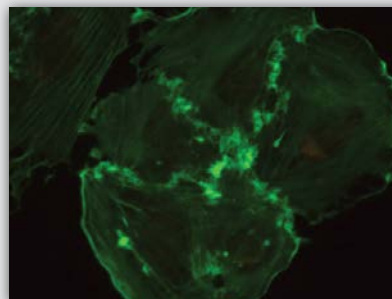
DID YOU KNOW?

Lumenera Offers a Complete Fluorescence Microscopy Solution with Advanced Image Analysis Software Included

The INFINITY3 series cameras have proven to excel in fluorescence - even under challenging conditions. Lumenera provides a complete fluorescence imaging solution, consisting of high-end scientific cameras and feature-rich software packages.



INFINITY3-1PFM
Mouse Intestine



INFINITY3-1PFM
Mouse Endothelioma in Green

INFINITY Software

Lumenera's INFINITY cameras* include INFINITY ANALYZE software at no extra charge, allowing complete camera control and advanced image acquisition and analysis.

INFINITY ANALYZE Features Include:

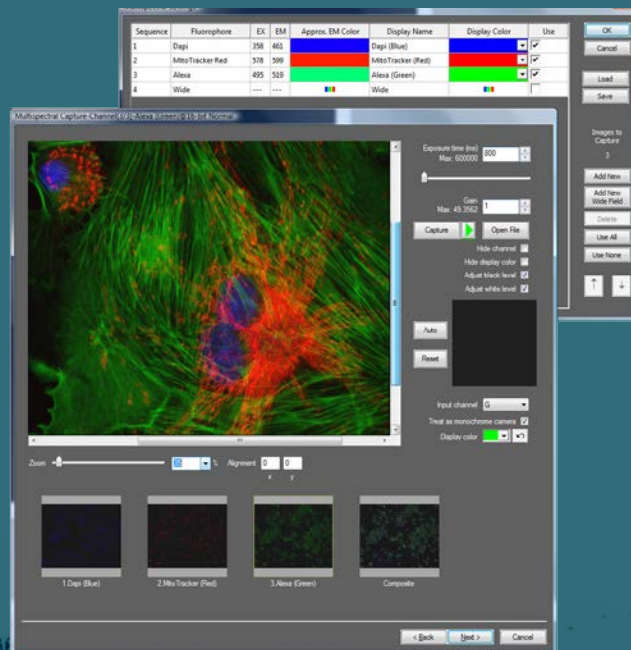
- Real time video preview
- Calibration measurement and annotation
- Archiving with search for date, author, description
- Fluorescent image composition including RGB Look-Up Tables (LUT)
- Single capture and time lapse
- Image stitching
- Automatic/manual exposure and white balance
- Hue, saturation, gain, contrast, brightness and gamma controls
- Advanced image processing
- Customize interface for specific applications
- Thumbnail worksheet
- Drag and drop measurement data to Microsoft Excel for analysis
- Save and restore camera settings
- Context sensitive help for all functions
- Optional focus enhancement
- Interactive color composition
- Available in 9 languages: English, Latin Spanish, Castilian Spanish, Italian, Russian, Japanese, Chinese, Korean and French
- Software compatible with Windows 10, 8, 7, XP, Vista, Mac OS X 10.7, 32 and 64-bit operating systems

An Advanced Features Model is available as an accessory to perform depth of focus and spherical aberration correction.

Also included is INFINITY CAPTURE, an intuitive user interface that contains all of the basic features needed to control the camera and capture images.

Easily integrate your INFINITY camera with 3rd party software applications through our TWAIN and DirectX/WDM interface (included) as well as 3rd party drivers for a variety of popular image analysis packages.

*Note: INFINITY HD comes with specialized INFINITY HD software and not INFINITY ANALYZE. INFINITY liteB comes with INFINITY CAPTURE.



Lumenera has worked extensively to develop a user-friendly **Multispectral Fluorescence Image Capture** and composition solution that enables users to perform rapid and accurate image capture and merging of multiple images with flexible pseudo-color assignment per channel.

Cat. # (Color/Mono)	Megapixel	Resolution	Sensor	C-Mount Coupler	Pixel Pitch	Frame Rate	Bit Depth	Read Noise	Binning/ Sub Sampling	Interface
INFINITY1										
INFINITY1-1 M	1.3	1280x1024	1/2" CMOS	0.5X	5.20	30	8 or 10	29 e-	N/A	USB 2.0
INFINITY1-2 CB	2.0	1600x1200	1/2" CMOS	0.5X	4.20	15	8 or 10	20 e-	N/Y	USB 2.0
INFINITY1-3 C	3.1	2048x1536	1/2" CMOS	0.5X	3.20	12	8 or 10	20 e-	N/Y	USB 2.0
INFINITY1-5 C or M	5.0	2592x1944	1/2.5" CMOS	0.5X	2.20	7	8 or 10	20 e-	N/Y	USB 2.0
INFINITY2										
INFINITY2-1R C or M	1.4	1392x1040	1/2" CCD	0.5X	4.65	30	8 or 14	8.5 e-	Y/Y	USB 2.0
INFINITY2-2 C or M	2.0	1616x1216	1/1.8" CCD	0.5X	4.40	12	8 or 12	12 e-	Y/Y	USB 2.0
INFINITY2-3 C	3.2	2080x1536	1/1.8" CCD	0.5X	3.45	5	8 or 12	12 e-	Y/Y	USB 2.0
INFINITY2-5 C or M	5.0	2448x2048	2/3" CCD	0.67X	3.45	9	8 or 12	12 e-	Y/Y	USB 2.0
INFINITY3										
INFINITY3-1 C or M	1.4	1392x1040	2/3" Cooled CCD	0.67X	6.45	15	8 or 12	8 e-	Y/Y	USB 2.0
INFINITY3-1UR C or M	1.4	1392x1040	2/3" CCD	0.67X	6.45	30	8 or 14	6 e-	Y/Y	USB 2.0
INFINITY3S-1UR C or M	1.4	1392x1040	2/3" CCD	0.67X	6.45	60	8 or 14	6 e-	Y/Y	USB 3.0
INFINITY3-3UR C or M	2.8	1936x1456	2/3" CCD	0.67X	4.54	53	8 or 14	6.2 e-	Y/Y	USB 3.0
INFINITY3-6UR C or M	6.0	2752x2192	1" CCD	1X	4.54	27	8 or 14	6.5 e-	Y/Y	USB 3.0
INFINITYX										
INFINITYX-32 C or M	32*	6464x4864	1/1.8" CCD	0.5X	4.40	12	8 or 12	12 e-	Y/Y	USB 2.0
INFINITYHD										
INFINITYHDC	2.0	1920x1080	1/3" CMOS	0.33, 0.4 or 0.5X	2.70	60	8	8.7 e-	N/A	HDMI
INFINITYlite										
INFINITYlite B C	1.5	1440x1080	1/2.5" CMOS	0.5X	4.20	10	8 or 10	53 e-	N/A	USB 2.0
INFINITY Product Bundles										
INFINITY3-1URF C or M	1.4	1392x1040	2/3" CCD	0.67X	6.45	30	8 or 14	6 e-	Y/Y	USB 2.0
INFINITY3-1PF C or M	1.4	1932x1040	2/3" Cooled CCD	0.67X	6.45	15	8 or 12	8 e-	Y/Y	USB 2.0
INFINITY3-3URF C or M	2.8	1936x1456	2/3" CCD	0.67X	4.54	53	8 or 14	6.2 e-	Y/Y	USB 3.0
INFINITY3-6URF C or M	6.0	2752x2192	1" CCD	1X	4.54	27	8 or 14	6.5e-	Y/Y	USB 3.0

INFINITY Camera Specifications

- Auto/Manual Exposure
- Manual White Balance
- 1 to 10x (or higher) Programmable Gain (varies by model)
- USB 2.0 High-Speed Interface (480 MB/s)
- USB 3.0 High-Speed Interface (5 Gbits/s)
- *Power:*
INFINITY *lite*, 1, 2 & 3-1UR: USB 2.0 Bus Power
INFINITY3S-1UR, INFINITY3-3UR, INFINITY3-6UR: External 5 V DC – 2 A
INFINITY3 Cooled/INFINITYX: External 5 V DC – 1 A
INFINITYHD: External 5 V DC – 500 mA
- *Operating Temp:* 0 to 50 °C
- *Operating Humidity:* 5 to 95 %, Non-condensing
- *Operating Systems:* Windows 8, 7, Vista, XP
Mac OS X 10.7, 32 and 64-bit.

INFINITY Advantage Packs

The INFINITY ADVANTAGE PACK (IAP) allows you to access software from any PC, unleashes additional software features, and provides peace of mind with advanced hardware replacement and a 5-year warranty for INFINITY cameras. For more details visit our website.

USB 3.0 and USB 2.0 Interface

Lumenera's INFINITY cameras feature either a USB 2.0 or USB 3.0 interface, offering an easy plug-and-play installation with computers, while providing more than enough throughput for its selected image sensors.

USB 3.0 Interface

The latest INFINITY3 series cameras use USB 3.0 technology at 5 Gb/s to deliver the fastest image transfer - even at its highest resolution. Image captures can be synchronized using either a hardware or software trigger. 128 MB of onboard memory for frame buffering ensures dependable and reliable image delivery at full frame rate and highest resolution even in the most demanding systems. Fully backward compatible with USB 2.0.

OEM Custom Camera Design

Lumenera's INFINITY camera hardware design and software features can be customized to meet your specific requirements, including OEM variations, to offer the following advantages:

- Improved Time-to-Market;
- Reduce Internal Development Costs
- Differentiate from the Competition

INFINITY Mac Software

Lumenera offers support for INFINITY camera users operating on a Mac platform. A Mac camera driver, ImageJ plug-in and the INFINITY ANALYZE for Mac application package are available for the following cameras:

- INFINITY 1-1M • INFINITY 1-2
- INFINITY 1-3 • INFINITY 1-5
- INFINITY 2-1R • INFINITY 2-2
- INFINITY 2-5 • INFINITY 3-1
- INFINITY 3-1UR • INFINITY 3-3UR
- INFINITY Fluorescence Series

Visit www.lumenera.com/support/downloads/microscopy-downloads.php to download the latest version.

* The INFINITYX-32 digital camera's sub-pixel shifting technology provides variable resolution capture up to 32 megapixel. The INFINITYX-32 is only available in select markets.

For more information e-mail
info@lumenera.com

www.lumenera.com

