INFINITY DIGITAL MICROSCOPY CAMERAS

Produce crystal clear, vibrant images with Lumenera's INFINITY microscopy cameras. Our user friendly USB 3, USB 2 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 and backed by an industry leading four-year warranty.

Lumenera corporation

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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.

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, 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. A version of the INFINITY application software is available for Mac, including an ImageJ plug-in (Mac support available for most 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 camera 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.

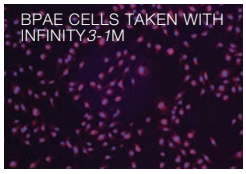
3rd Party Software Integration

Lumenera is integrated with leading software technology partners such as Media Cybernetics (Image Pro Premier), Molecular Devices (Metamorph), and National Instruments (MicroManager) to name a few. For a full list of our microscopy software technology partners please visit the Lumenera website or contact us regarding additional software packages.

SAMPLE APPLICATIONS

Life Science & Clinical Applications

Genetics/Biology/Pathology



Stained Samples

To ensure proper identification and diagnosis of stained samples, precise color is required. Lumenera's advanced Color Correction Matrices (CCMs) compensate for sensor response to the color output of various light sources. 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 ensure that the camera reproduces the colors as they appear in the oculars.

Live Imaging

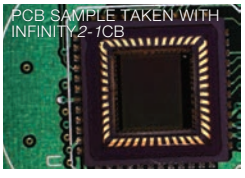
Combine INFINITY software with our high-speed USB 2 and USB 3 cameras for smooth, responsive live video preview, or to record brief video clips. Integration with popular 3rd party software is available.

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.



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

INFINITY*1* Series
INFINITY*5* Series
INFINITY*HD*
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

INFINITY*2* Series
INFINITY*5* Series
INFINITY*X*

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

INFINITY*3* Series
INFINITY*5* Series
INFINITY*EP*

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

Lumenera corporation

PRODUCT FEATURE: INFINITY3-6UR

A high resolution, large field of view, USB 3 CCD microscopy camera

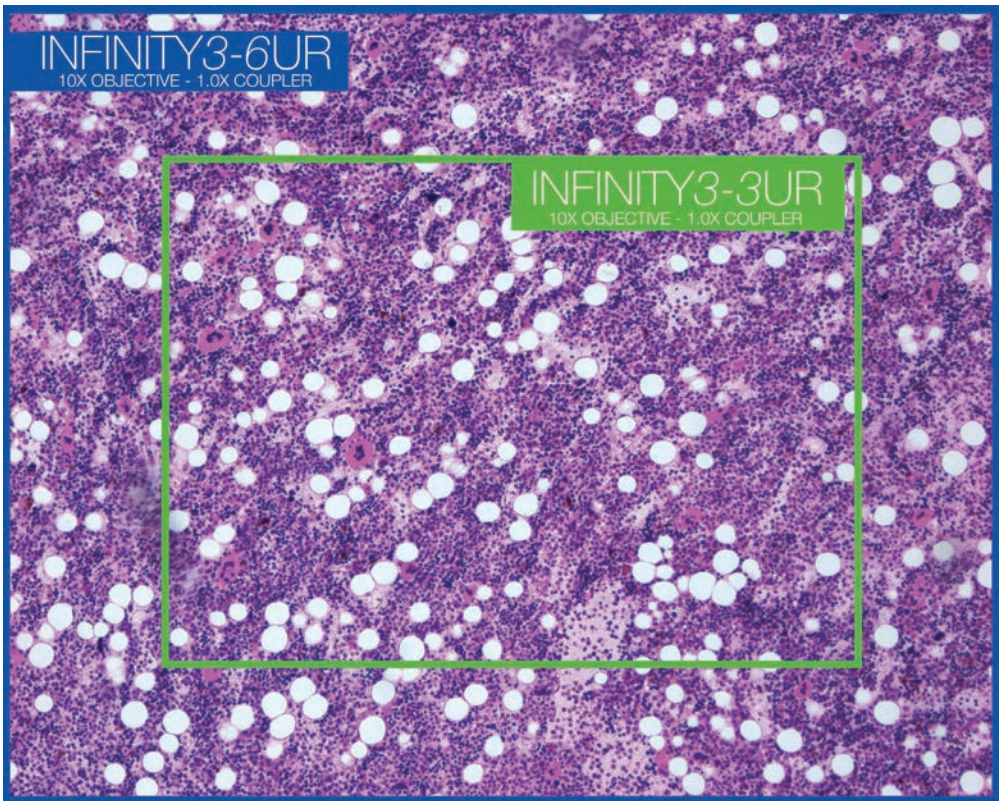
The INFINITY*3*-6UR is the ideal general purpose camera for most microscopy applications due to its 6MP resolution, excellent color reproduction, speed and light sensitivity needed for low-light applications. Built on Sony's EXview HAD II sensor technology, this camera offers extremely high dynamic range, 4.54 x 4.54 µm pixels and very low noise.

The INFINITY*3*-6UR is designed for use in a wide variety of scientific, life science, clinical and industrial applications requiring optimal color reproduction, extreme sensitivity, increased resolution and high speed.

PRODUCT HIGHLIGHTS

- **6.0 megapixel resolution (2752 x 2192) for outstanding image quality**
- **Industry leading Sony ICX694 CCD sensor with 1" optical format and high QE**
- **27 fps, lagless at full resolution**
- **High-speed USB 3 interface for fast image delivery and connectivity**
- **Excellent color reproduction capabilities**
- **High dynamic range and sensitvity for low light applications such as fluorescence and NIR imaging**

INFINITY3-6UR's Large Field of View



To maximize the sensitivity of the INFINITY*3-6*UR, Lumenera uses a 1" format Sony ICX694 sensor.

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INFINITY*1* Series

CMOS Cameras for Photo Documentation and High-Speed Imaging

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

The INFINITY*1* series of CMOS USB 2 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 data interface to maximize your workflow.

INFINITY*lite*

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.

INFINITY*2* Series

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

Highlights:
- 1, 2, 3 and 5 megapixel resolutions
- Excellent light sensitivity
- Superior color reproduction
- 8, 12 or 14-bit output

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.

INFINITY*X*

Extremely High Resolution Pixel Shifting Camera

Highlights:
- 2 megapixel live preview
- 32 megapixel resolution for capturing fine detail
- 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.

INFINITY*3* Series

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
- GPI/O provided standard on the INFINITY*3*-1, INFINITY*3*-3UR and INFINITY*3*-6UR models
- Research-grade camera with high dynamic range

Camera models available in the INFINITY3 series:

The ultra-sensitive INFINITY*3S*-1UR incorporates Sony's 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, and low noise.

Built on Sony's 6.0 megapixel EXview HAD II CCD sensor, the INFINITY*3*-6UR offers extremely high dynamic range as well as high frames rates of 27 fps via a high-speed USB 3 interface. With 2x2 binning, there is a fourfold increase in sensitivity while providing a 1.5 megapixel (1376x1096) resolution.

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

The INFINITY*3*-1 is thermoelectrically cooled to 25 ºC 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.

INFINITY*5* Series

High Performance Camera for a Wide Range of Applications – with Dual Output to HDMI and USB 3

Highlights:

- 3 and 5 megapixel resolutions
- High frame rates, sensitivity, and low noise
- Dual HDMI and USB 3 output
- Buttons for power, white balance, capture
- Compatible software: INFINITY CAPTURE, Micro-Manager, MetaMorph®

Lumenera's INFINITY5 series are high quality microscopy cameras with high speeds at high resolution. The INFINITY5 series are based on the Sony® Pregius™ global shutter CMOS sensor that rivals CMOS technology. With fast focusing at high frame rates, the INFINITY5 series perform in a wide range of applications. The dual output to HDMI and USB 3 provides flexibility for applications where knowledge sharing is critical.

INFINITY*EP*

High-Speed CMOS Camera for Electrophysiology

Highlights:

- 1.3 megapixel resolution
- Excellent near IR sensitivity and responsitivity
- Fast frame rates
- Ideal for electrophysiology and darkfield microscopy

Lumenera's INFINITY-*EP* digital camera is a cost-effective solution with excellent near IR sensitivity and responsivity. This camera produces crisp, incredibly low noise images while videos are delivered with zero lag. Lumenera's Advanced Thermal Management Technology (ATMT) eliminates dark current noise, providing high-contrast imaging to meet the challenging conditions of electrophysiology applications.

INFINITY*HD*

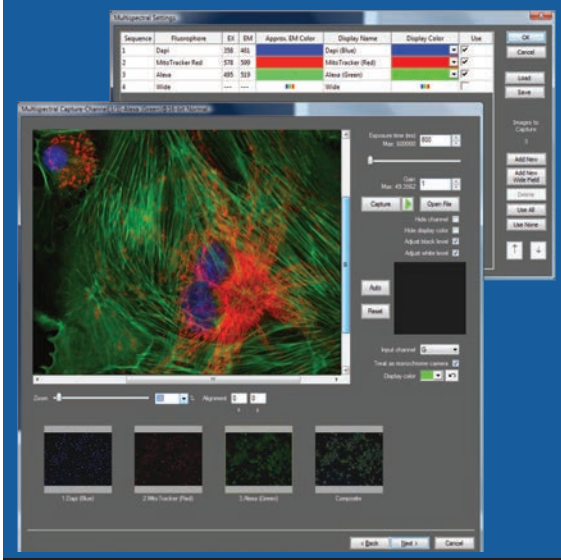
1080p60 High Definition (HD) Camera, Direct Connect to HDMI Monitor

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 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 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 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 and Mac OS*

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.

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 caputre and merging of multiple images with flexible pseudo-color assignment per channel.

Note: INFINITY*HD* comes with specialized INFINITY*HD* software and not INFINITY ANALYZE.
INFINITY*lite* comes with INFINITY CAPTURE. INFINITY*5* series supports INFINITY CAPTURE software only.

Cat. # (Color/Mono)	Megapixel	Resolution	Sensor	C-Mount Coupler	Pixel Pitch	Frame Rate	Bit Depth	Read Noise	Binning/ Sub Sam-pling	Interface
INFINITY*1*										
INFINITY*1–1* M	1.3	1280x1024	1/2" CMOS	0.5X	5.20	30	8 or 10	29 e-	N/A	USB 2.0
INFINITY*1–2* CB	2.0	1600x1200	1/2" CMOS	0.5X	4.20	15	8 or 10	20 e-	N/Y	USB 2.0
INFINITY*1–3* C	3.1	2048x1536	1/2" CMOS	0.5X	3.20	12	8 or 10	20 e-	N/Y	USB 2.0
INFINITY*1–5* 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
INFINITY*2*										
INFINITY*2–1*R 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
INFINITY*2–2* 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
INFINITY*2–3* C	3.2	2080x1536	1/1.8" CCD	0.5X	3.45	5	8 or 12	12 e-	Y/Y	USB 2.0
INFINITY*2–5* C or M	5.0	2448x2048	2/3" CCD	0.67X	3.45	9	8 or 12	12 e-	Y/Y	USB 2.0
INFINITY*3*										
INFINITY*3–1* 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
INFINITY*3–1*UR C or M	1.4	1392x1040	2/3" CCD	0.67X	6.45	30	8 or 14	6 e-	Y/Y	USB 2.0
INFINITY*3S-1*UR C or M	1.4	1392x1040	2/3" CCD	0.67X	6.45	60	8 or 14	6 e-	Y/Y	USB 3.1 Gen 1
INFINITY*3–3*UR C or M	2.8	1936x1456	2/3" CCD	0.67X	4.54	53	8 or 14	6.2 e-	Y/Y	USB 3.1 Gen 1
INFINITY*3–6*UR C or M	6.0	2752x2192	1" CCD	1X	4.54	27	8 or 14	6.5 e-	Y/Y	USB 3.1 Gen 1
INFINITY*5*										
INFINITY5-3 C or M	3.2	2064x1544	1/1.8" GS CMOS	0.5X	3.45	~120	8 or 12	~2.35 e-	Mono(Y/Y), Color(N/Y)	USB 3.1 Gen 1 and HDMI
INFINITY5-5 C or M	5.1	2464×2056	2/3" GS CMOS	0.6X	3.45	~75	8 or 12	~2.30 e-	Mono(Y/Y), Color(N/Y)	USB 3.1 Gen 1 and HDMI
INFINITY*EP*										
INFINITY*EP*	1.3	1280x1024	1/3" CMOS	0.35X	3.63	30	8 or 12	N/A	Y/Y	USB 2.0
INFINITY*X*										
INFINITY*X-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
INFINITY*HD*										
INFINITY*HD*	2.0	1920x1080	1/3" CMOS	0.33, 0.4 or 0.5X	2.70	60	8	8.7 e-	N/A	HDMI
INFINITY*lite*										
INFINITY*lite* 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										
INFINITY*3-1*URF C or M	1.4	1392x1040	2/3" CCD	0.67X	6.45	30	8 or 14	6 e-	Y/Y	USB 2.0
INFINITY*3-1*PF 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
INFINITY*3-3UR*F C or M	2.8	1936x1456	2/3" CCD	0.67X	4.54	53	8 or 14	6.2 e-	Y/Y	USB 3.1 Gen 1
INFINITY*3-6*URF C or M	6.0	2752x2192	1" CCD	1X	4.54	27	8 or 14	6.5 e-	Y/Y	USB 3.1 Gen 1

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 3.1 Gen 1 High-Speed Interface (5 Gbits/s)
- Power:
  INFINITY*lite*,*1, 2, 3*-1UR, *EP*:USB 2.0 Bus
  INFINITY*3S*-1UR,INFINITY*3*-3UR,
  INFINITY*3*-6UR: External 5 V DC – 2 A
  INFINITY*3* Cooled/INFINITY*X*: External 5 V DC–1 A
  INFINITY*HD*: External 5 V DC – 500 mA
- Operating Temp: 0 to 50 ºC
- Operating Humidity:5 to 95 %, Non condensing
- Operating Systems:Windows and Mac OS*

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 3.1 Gen 1 and USB 2.0 Interface

Lumenera's INFINITY cameras feature either a USB 2.0 or USB 3.1 Gen 1 interface, offering an easy plug-and-play installation with computers, while providing more than enough throughput for it's selected image sensors.

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 and CAPTURE for Mac application package are available.*

***See the camera data sheet for specific software compatibility details.**

Warranty effective for all INFINITY standard models sold after April 1, 2015.