USB 3.0, USB 2.0, Gigabit Ethernet

INDUSTRIAL & SCIENTIFIC CAMERAS

Satisfy your most demanding imaging application requirements with our wide range of high performance industrial and scientific cameras and custom imaging solutions. Choose from our many off-the shelf board-level and enclosed cameras, or contact us to discuss customizing our flexible products to meet your specific needs. Improve time-to-market, reduce development costs, ease your workload and benefit from our industry leading pre- and post-sales support and customer-centric business philosophy.

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

Lumenera® corporation

www.lumenera.com

WHY LUMENERA?

Reduce costs and shorten work cycles with our innovative high-quality solutions and stable, reliable products. Together our teams will collaborate to design the imaging solution tailor-made for your success.

"Selecting an imaging partner goes beyond the camera. It's about establishing a partnership with a camera manufacturer."
- Huw Leahy, President of Lumenera

LUMENERA BENEFITS

REDUCED TOTAL COST OF OWNERSHIP

Lumenera's customer-centric philosophy ensures that you have the ideal product for your application while supporting the integration and maintenance phases with diligence from our creative, enthusiastic and quality focused employees who go beyond just selling a camera.

CHOOSE YOUR INTERFACE

Lumenera cameras leverage the most popular interfaces to ensure that your images get from the camera to your computer using the method that makes the most sense for your application, none of which require a costly and complex frame grabber.

- USB 3.0 for high transfer speeds allowing for faster frame rates at a high resolution
- USB 2.0 to rely on the stability, ubiquity and ease of a plug-and-play interface
- GigE for an extremely long reach using low cost standard cables

Lumenera cameras feature a standard GPIO connector for external synchronization of lighting and peripheral device control.

FLEXIBLE CHOICES FOR YOUR APPLICATION

With more than 80 products and variants resulting in over 1,250 models available, the chances are that we have a product that meets your application needs. Variants include:

- Without IR Cut Filter Glass for active or passive Near IR light
- Without Sensor Cover Glass where the glass interferes with results
- Scientific-grade for tighter tolerance and superior image quality
- Packaging and board level options to fit within the space available

CHOOSE YOUR RESOLUTION

Lumenera offers a wide variety of cameras based on CCD and CMOS sensors, providing a wide range of resolutions to satisfy your imaging applications. Resolutions span from VGA to 29 megapixels using sensors from the most recognized and reputable sensor manufacturers.

ACCURATE COLOR REPRODUCTION

Capturing an image is one thing, but acquiring one that truly represents the physical subject is much more difficult. Lumenera cameras have customizable color formation matrices for high color accuracy and advanced demosaicing methods for truer reproduction. Excellent color / white balance functions ensure colors are represented correctly in captured images.

HIGH DYNAMIC RANGE

In many industrial and scientific applications there is a contrast in lighting composition but images need to be able to detail both bright and dark objects in the same frame. Lumenera cameras are highly sensitive to ensure details in nearly any lighting situation are captured.

MANUFACTURED IN NORTH AMERICA

Lumenera products are designed and manufactured at our headquarters in Ottawa, Canada. Our cameras are manufactured in the same location as our design engineers, allowing for improved development time and tight controls over our supply chain, quality and delivery.

SUPERIOR PRE- AND POST- SALES SUPPORT

Our Team is committed to fully supporting your imaging needs through design, development, integration, deployment and post-sales support. Our highly experienced professionals work closely with your Project Managers and Engineering Teams to best meet your application requirements, and assist with integration of our standard and custom imaging solutions.

CUSTOM DESIGNED CAMERAS

Specializing in custom camera development and manufacturing, our imaging engineers perform as an extension of your R&D team, relentlessly dedicated to the success of your next imaging project. Count on our mechanical, hardware, software and firmware design services, as well as our CMOS and CCD sensor expertise to deliver a seamless imaging solution.

Partner with Lumenera to tailor an imaging solution that best meets your unique application and budgetary requirements.

USB 3.0

USB 3.0 PERFORMANCE
IMAGING WITHOUT BOUNDARIES

Lumenera USB 3.0 cameras use the latest USB technology at 5 Gb/s to deliver the fastest image transfer - even at their highest resolution.

- Leveraging our 12+ years of experience with USB 2.0, Lumenera's USB 3.0 drivers are hardened and reliable unlike some competitors

- Does not require an expensive and complicated frame grabber

- Results in a simplified system and reduced total system cost

- USB 3.0 can reach lengths of up to 100m by using a fiber optic cable extender

All Lumenera USB 3.0 cameras include a 128 MB frame buffer for reliable image delivery in demanding situations. Unlike some competitive camera companies, Lumenera's buffer technology delivers all frames at full speed and maximum resolution without introducing latency.

VISION

VISION INDUSTRY CERTIFICATION
GigE Vision® & USB3 Vision™

Select Lumenera products have received GigE Vision® and USB3 Vision™ certification from the AIA.

Lumenera products that are compliant ensure true plug-and-play compatibility with vision software applications. Lumenera cameras provide customers with flexibility via the use of our proven and robust API and the option to use the GigE and USB3 Vision API.

USB 3.0 CAMERAS

SONY EXVIEW HAD II GLOBAL SHUTTER CCD

These cameras are ideal for applications where high resolution, sensitivity and low noise are critical, such as high resolution surveillance, traffic, tolling, ophthalmology, life sciences, high speed inspection, machine vision and NIR applications.

Lt365R
High-speed 2.8 MP 2/3" CCD
- 1936 x 1456 resolution
- Sony EXview HAD II ICX674 sensor
- 53 fps at full resolution

Lt965R
High Sensitivity 9.1 MP 1" CCD
- 3376 x 2704 resolution
- Sony EXview HAD II ICX814 sensor
- 19 fps at full resolution

Lt665R
High-speed 6.0 MP 1" CCD
- 2752 x 2192 resolution
- Sony EXview HAD II ICX694 sensor
- 27 fps at full resolution

Lt1265R
High Resolution 12 MP 1" CCD
- 4250 x 2838 resolution
- Sony Exview HAD II ICX834 sensor
- 15 fps at full resolution

QUAD TAP PERFORMANCE: Lumenera's advanced tap matching process ensures seamless images across large temperature and gain ranges.

GLOBAL SHUTTER CMOS

The Lt425 and Lt225 are ideally suited for applications that include traffic monitoring, automatic license/number plate recognition, high-speed inspection and motion control, slide scanning, laser profiling.

Lt225
2.2 MP 2/3" CMOS
- 2048 x 1088 resolution
- CMOSIS CMV2000 Rev3 sensor
- 170 fps at full resolution

Lt425
4.0 MP 1" CMOS
- 2048 x 2048 resolution
- CMOSIS CMV4000 Rev3 sensor
- 90 fps at full resolution

NEAR INFRA-RED (NIR) SENSITIVITY: Lumenera offers NIR sensitivity enhanced versions of the Lt225 and Lt425 cameras, that have higher quantum efficiency (QE) for wavelengths above 600 nm. Around 900 nm the QE is about doubled and increases from 8% to 16%.

LARGE FORMAT CAMERAS

These cameras are ideal for applications where high resolution is critical, such as: traffic monitoring, automated license plate recognition (ALPR), flat panel / solar panel inspection and UAV. These cameras have a fully Integrated Canon EF lens controller.

Lm11059 (USB 2.0)
11 MP 35mm CCD
- 4008 x 2672 resolution
- ON Semiconductor KAI-11002 sensor
- 4.3 fps at full resolution

Lg11059 (GigE)
11 MP 35mm CCD
- 4008 x 2672 resolution
- ON Semiconductor KAI-11002
- 5 fps at full resolution
- Simplified cabling and full camera control over a GigE network
- Integrated Canon EF lens controller

Lt16059H (USB 3.0)
16 MP 35 mm CCD
- 4896 x 3264 resolution
- ON Semiconductor KAI-16070
- 12 fps at full resolution

Ask us about GigE camera ordering options

Lt29059 (USB 3.0)
29 MP 35 mm CCD
- 6576 x 4384 resolution
- ON Semiconductor KAI-29050 sensor
- 6 fps at full resolution*

Did you know, the 'H' in our Lt16059H camera signifies higher performance via the use of the ON Semiconductor KAI-16070 sensor for higher dynamic range and sensitivity.

*Preliminary specs, subject to change.

CUSTOM CAMERAS

Lumenera was founded on creating custom products, providing quick prototyping and shortened time-to-market for your imaging solution. Sometimes using a camera that is available off-the-shelf causes more challenges, and can be more costly than getting a custom solution designed. Partner with Lumenera to tailor an imaging solution that best meets your unique application and budgetary requirements.

Lumenera manufacturers at our North American headquarters (located in Ottawa, Canada), the same location as our design engineers, allowing for faster prototyping and modifications. This also grants us superior supply chain management and quality control over the end product.

USB 2.0
PLUG-AND-PLAY SOLUTION

- Simple plug-and-play interface
- Available everywhere
- Delivers performance required for more imaging needs
- Does not require an expensive and complicated frame grabber
- Lumenera's USB 2.0 is compatible with USB 3.0 interface cards extending the lifetime of your implemented solution

Lumenera was one of the first companies to offer a USB 2.0 imaging solution giving us extensive experience in the design and support of the interface.

WHY US?

- **Choose the best architecture for your application**
- **Sensor + Image Processing + Digital Output**
- **Improve time to market with rapid prototyping**
- **Reduce development costs and risk**
- **Volume efficiencies to reach target price points**
- **Differentiate from your competitor**
- **Mechanical enclosure design to meet environmental requirements**
- **Manufacturing and quality controls you can count on for consistencies in color reproduction and product reliability**
- **Leverage our extensive experience with imaging**

SINGLE-BOARD CAMERAS*
- Variety of CMOS image sensors available from VGA, 1.3 and 3 megapixel options
- Mini-USB connector, and GPIO connections available
- C, CS, and M-12 lens mount options
- Enclosure available for certain models

Minimum order quantity may apply. Contact us for more details, or to discuss single-board camera options.

LUMENERA'S CUSTOMIZATION

Custom USB 3.0, USB 2.0 and GigE cameras can be adapted to fit your application requirements whether simple or complex.

Rely on **Lumenera's expertise** for timely modifications from hardware, software, firmware and drivers to complete made-to-spec solutions with alternate form factors such as private labeled enclosures, unique mechanicals and/or customized sensors.

Below are some examples of custom camera solutions we've created for our customers.

LUMENERA'S 'R' GRADE CAMERAS

You've seen the 'R' product code in some of our cameras. What does it mean?

The 'R' identifies that Lumenera's expert team has engineered the product to have substantialy **low read noise and dark current noise,** combined with increased frame rates.

These cameras feature **lower noise electronics,** high grade components, and Lumenera's **unique thermal management** technology.

The end result is **high quality** images with extremely low **noise** and **high dynamic range.**

USB 2.0 CAMERAS

WIDEST PORTFOLIO OF USB 2.0 CAMERAS IN THE INDUSTRY

Lumenera's USB 2.0 cameras leverage the simple plug-and-play interface that is available on almost every computer. Below is a selection of our most popular USB 2.0 cameras.

VGA 1/3" CMOS
- 640 x 480 resolution
- 60 fps at full resolution

Model # Lu070 & Lu075

1.3 MP 1/3" CMOS
- 1280 x 1024 resolution
- 30 fps at full resolution
- Color only

Model # Lw110 & Lw115

1.3 MP 1/2" CMOS
- 1280 x 1024 resolution
- 30 fps at full resolution

Model # Lu170 & Lu171 & Lu175

1.4 MP 2/3" Cooled CCD
- 1390 x 1040 resolution
- 15 fps at full resolution
- Low dark current noise

Model # Lw1160P-SCI

1.4 MP 2/3" CCD
- 1392 x 1040 resolution
- 30 fps at full resolution

Model # Lw160R & Lw165R

1.4 MP 1/2" CCD
- 1392 x 1040 resolution
- 30 fps at full resolution

Model # Lw130R & Lw135R

2.0 MP 1/1.8" CCD
- 1616 x 1216 resolution
- 12 fps at full resolution

Model # Lw230 & 235

2.0 MP 1/2" CMOS
- 1600 x 1200 resolution
- 10 fps at full resolution
- Color only

Model # Lu200 & Lu205

3.1 MP 1/2" CMOS
- 2048 x 1536 resolution
- 12 fps at full resolution
- Color only

Model # Lu370 & Lu371 & Lu375

5.0 MP 1/2.5" CMOS
- 2592 x 1944 resolution
- 7 fps at full resolution

Model # Lw570 & 575

5.0 MP 2/3" CCD
- 2448 x 2048 resolution
- 9 fps at full resolution

Model # Lw560 & Lw565
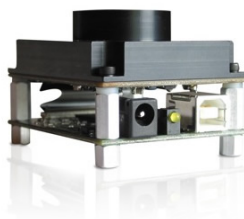
MORE CAMERAS ARE AVAILABLE ON OUR WEBSITE
WWW.LUMENERA.COM

SCIENTIFIC CAMERAS

Lumenera has extensive knowledge in manufacturing sophisticated scientific cameras that are used in microscopy and life sciences applications. Our unique knowledge and skills include; assembly procedures, calibration techniques, testing and quality control, all geared towards achieving exceptional performance and consistency.

Lumenera's scientific cameras are manufactured with a stringent quality control process that ensures camera-to-camera consistency. Our cameras deliver the high quality and reproducible image results that are critical to your application.
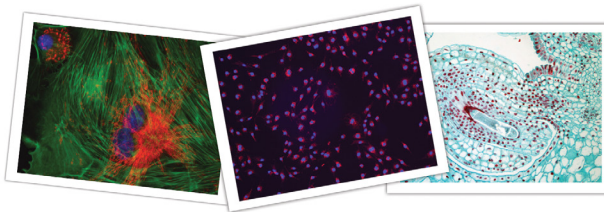
Lumenera cameras meet stringent FCC Class B and CE EMI certification requirements which are critical to obtaining FDA and other type approvals.

Most industrial cameras are available to order with a scientific option (-SCI), which includes microscopy-grade glass, ideal for collimated light source applications.

LU VS. LW
BUDGET VS. PERFORMANCE

Lumenera's Lu cameras are an extremely economical imaging system.

Lumenera's **Lw series** cameras provide more powerful image processing, faster throughput and increased on board FPGA and RAM:

- Lower power consumption and heat generation
- More power efficient with no need for external power supply (with the exception of the Lw1105X and Lw16059)
- Increased RAM – 32 MB vs 8 MB standard
- Larger FPGA for implementing all auto features/functions across all cameras

SAMPLE APPLICATIONS

Lumenera's cameras are used in thousands of industrial and scientific applications worldwide, including:

- Traffic Management
- UAV
- Optical Inspection
- Barcode
- Metrology
- Semiconductor
- Packaging
- Flat Panel Inspection
- Photo ID
- Biomechanics
- Robotics
- Pharmaceutical
- 3-D Imaging
- Automotive
- Material Handling
- Astro Imaging
- Food and Beverage
- Military
- Aerospace
- Document Reading
- Biometrics
- Ophthalmology
- OEM Microscopy
- Life Sciences
- Cell Counting
- Microplate Readers
- Gel Documentation
- Solar Panel Inspection

GIGE
GIGABIT ETHERNET
GOING THE DISTANCE

Lumenera's GigE cameras allow for fast transfer of data (1000 MB/s), using low cost standard cables over very long distances.

- Transfer images and control the cameras at distances beyond 100m
- Reduce system cost by using inexpensive, standard cables
- GigE is a widely adopted interface around the world, with Ethernet ports available on most computing and network devices

USB 3.0 CAMERAS

Model Number	Sensor Type	Resolution	Frame Rate*	Bit Depth	Pixel Pitch	Sensor	Shutter	Color/Mono	Lens Mount
Lt225	2/3" CMOS	2.2 MP (2048 x 1088)	170	8 or 12	5.5 µm	CMOSIS CMV2000 Rev3	Global	Color/Mono/NIR	C
Lt425	1" CMOS	4.0 MP (2048 x 2048)	90	8 or 12	5.5 µm	CMOSIS CMV4000 Rev3	Global	Color/Mono/NIR	C
Lt365R	2/3" CCD	2.8 MP (1936 x 1456)	53	8 or 14	4.54 µm	SONY ICX674	Global	Color/Mono	C
Lt665R	1" CCD	6.0 MP (2752 x 2192)	27	8 or 14	4.54 µm	SONY ICX694	Global	Color/Mono	C
Lt965R	1" CCD	9.1 MP (3376 x 2704)	19	8 or 14	3.69 µm	SONY ICX814	Global	Color/Mono	C
Lt1265R	1" CCD	12 MP (4250 x 2838)	15	8 or 14	3.1 µm	SONY ICX834	Global	Color/Mono	C
Lt16059H	35 mm CCD	16 MP (4864 x 3232)	12	8 or 14	7.4 µm	ON Semiconductor KAI-16070	Global	Color/Mono	Canon EF
Lt29059 *(Coming Soon)*	35 mm CCD	29 MP (6576 x 4384)	6	8 or 14	5.5 µm	ON Semiconductor KAI-29050	Global	Color/Mono	Canon EF

USB 2.0 CAMERAS

Model Number	Sensor Type	Resolution	Frame Rate*	Bit Depth	Pixel Pitch	Sensor	Shutter	Color/Mono	Lens Mount
Lu070 & Lu075	1/3" CCD	VGA (640 x 480)	60	8 or 12	7.4 µm	Sony ICX424	Global	Color or Mono	C or CS
Lm075	1/3" CCD	VGA (640 x 480)	60	8 or 12	7.4 µm	Sony ICX424	Global	Color or Mono	C or CS
Lm085	1/3" CMOS	VGA 752 x 480	60	8 or 10	6.0 µm	Micron MT9V032	Global	Color or Mono	C or CS
Lu100 & Lu101 & Lu105	1/2" CMOS	1.3 MP (1280 x 1024)	15	8 or 10	5.2 µm	Omnivision OV9620 (c)/ OV9121(m)	Rolling & Half Global	Mono	C, CS or M12
Lw110 & Lw115	1/3" CMOS	1.3 MP (1280 x 1024)	30	8 or 10	3.6 µm	Sony IMX035	Rolling	Color	C or CS
Lu130 & Lu135	1/2" CCD	1.4 MP (1392 x 1040)	15	8 or 12	4.65 µm	Sony ICX205	Global	Color or Mono	C or CS
Lm135	1/3" CMOS	1.4 MP (1392 x 1040)	15	8 or 12	4.65 µm	Sony ICX205	Global	Color or Mono	C or CS
Lw130R & Lw135R	1/2" CCD	1.4 MP (1392 x 1040)	30	8 or 14	4.65 µm	Sony HAD ICX205	Global	Color or Mono	C
Lw160R & Lw165R	2/3" CCD	1.4 MP (1392 x 1040)	30	8 or 14	6.45 µm	Sony ICX285	Global	Color or Mono	C or CS
Lw160P-SCI	2/3" Cooled CCD	1.4 MP (1390 x 1040)	15	8 or 12	6.45 µm	Sony ICX285	Global	Color and Mono	C
Lu160 & Lu165	2/3" CCD	1.4 MP (1392 x 1040)	15	8 or 12	6.45 µm	Sony ICX285	Global	Color or Mono	C or CS
Lm165	2/3" CCD	1.4 MP (1392 x 1040)	15	8 or 12	6.45 µm	Sony ICX285	Global	Color or Mono	C or CS
Lu170 & Lu171 & Lu175	1/2" CMOS	1.3 MP (1280 x 1024)	30	8 or 10	5.2 µm	Micron MT9M001	Rolling	Mono	C, CS or M12
Lu200B & Lu205B	1/2" CMOS	2.0 MP (1600 x 1200)	10	8 or 10	4.2 µm	SOI 268	Rolling & Half Global	Color	C or CS
Lw230 & Lw235	1/1.8" CCD	2.0 MP (1616 x 1216)	12	8 or 12	4.4 µm	Sony ICX274	Global	Color or Mono	C or CS
Lu370 & Lu371 & Lu375	1.2" CMOS	3.1 MP (2048 x 1536)	12	8 or 10	3.2 µm	Micron MT9T001	Rolling	Color	C, CS or M12
Lw560 & Lw565	2/3" CCD	5.0 MP (2448 x 2048)	9	8 or 14	3.5 µm	Sony ICX655	Global	Color or Mono	C or CS
Lw570 & Lw575	1/2.5" CMOS	5.0 MP (2592 x 1944)	7	8 or 12	2.2 µm	Micron MT9P031	Rolling & Half Global	Color or Mono	C or CS
Lm11059	35 mm CCD	11 MP (4008 x 2672)	4.3	8 or 14	9.0 µm	ON Semiconductor KAI-11002	Global	Color or Mono	Canon EF

GIGE CAMERAS

Model Number	Sensor Type	Resolution	Frame Rate*	Bit Depth	Pixel Pitch	Sensor	Shutter	Color/Mono	Lens Mount
Lg11059	35mm CCD	11 MP (4006 X 2672)	5	8 or 14	9.0 µm	Truesense KAI-11002	Global	Color/Mono	Canon EF

Ask us about GigE camera ordering options

Frame rate at full resolution.

3RD PARTY PARTNERS

Lumenera cameras are quickly integrated with support from partners, including but not limited to:

- Cognex
- MVTec – Halcon, ActiveTools
- National Instruments – LabVIEW, Vision Builder AI
- NorPix – StreamPix
- The MathWorks – MATLAB
- VISIONx Inc. – VisionGauge

For a full list of our software technology partners please visit our website:
www.lumenera.com/partners/technology_partners.php

Contact us regarding additional software packages.

CAMERA FEATURE SET

- Stable device drivers
- Interface options
  - Fast USB 3.0 (5 Gb/s),
  - Robust USB 2.0 (480 Mb/s),
  - Long reach GigE (1000 Mb/s)
- GPIOs - control of peripherals/synchronization of lighting
- Selectable 8, 10, 12 or 14-bit pixel data
- Color and monochrome options
- Universal SDK available
- Linux support for select platforms and cameras
- Software compatible with Windows10, 8, 7, XP at 32- and 64-bit
- DirectShow/DirectX compatible
- Adjustable lens mount
- FCC Class B, CE (enclosed cameras)
- Operate multiple cameras on one computer

ORDERING OPTIONS

-SCI
Scientific cameras which are manufactured with a higher grade glass and tested on a collimated light source.

WOCG
Without any cover glass on the camera sensor.

WOG
Without any glass within lens mount.

WOIR
For USB 3.0 Cameras:
AR/AR glass within lens mount.
For USB 2.0 & GigE Cameras:
Plain glass within lens mount.

7 Capella Court, Ottawa, ON, K2E 8A7
info@lumenera.com
Toll Free (North America): 1-866-636-4077
Direct: 1-613-736-4077

www.lumenera.com