Lt965R

9.1 Megapixel, High Sensitivity, CCD Camera with High-Speed USB 3.0

High Resolution, Low Noise CCD Imaging
The Lt965R is Lumenera's latest innovative, high performance USB 3.0 CCD camera based on the solid design of the Lt365R and Lt665R cameras. The Lt965R builds on leading edge ExView HAD II technology to deliver high sensitivity, low dark current and excellent anti-blooming characteristics. Low noise electronics ensure clear and sharp images rendering details with amazing accuracy. Superior responsiveness positions it as a good choice for Near-Infrared (NIR) imaging. This industrial-grade camera is ideally suited for a variety of applications including surveillance, traffic, tolling, high-speed inspection and machine vision. A scientific-grade variant is available for the most demanding life science applications such as ophthalmology and fluorescence. The Lt965R can also be customized to suit OEM designs.

High Quality Images at High Speed
The Lt965R was created for speed using the latest USB 3.0 technology to deliver the fastest image delivery possible from the Sony ICX814 sensor at its highest resolution. Image captures can be synchronized using either a hardware or software trigger. FPGA-enabled performance, complemented by 128 MB of onboard memory for frame buffering, ensure dependable and reliable image delivery even in the most demanding machine vision systems. Unlike some competitive cameras, the Lt965R buffer technology delivers all frames at full speed and max resolution without introducing latency.

Plug-and-Play with No Framegrabber
The compact, robust design of this camera, measuring 43 x 43 x 65 mm, allows for easy integration into tight spaces and systems. The locking USB 3.0 cabling and digital interface ensure a simple plug-and-play installation. No framegrabber is required. Simplified I/O cabling is provided through a locking Hirose connector supporting external power input along with 1 optically isolated output, 1 optically isolated input and 2 configurable I/O ports.

Maximize Camera Performance Within Your Own Application
The Lumenera Camera SDK provides a full suite of features and functions that allow you to maximize the camera's performance within your own vision application with minimal work. The SDK is compatible with all of our USB and GigE-based cameras. Microsoft DirectX/DirectShow, Windows API and .NET API interfaces are provided, allowing you the choice of application development environments from C/C++ to VB.NET or C#.NET.

Superior Technical Assistance Center
All Lumenera cameras are supported by an experienced team of pre-sales and technical support imaging experts widely acclaimed in the industry. We understand your imaging needs and are here to help you get the most out of your camera.

Features
- Industry leading Sony ExView HAD II sensor technology
- Fastest camera using the ICX814 sensor: 19 fps at full resolution on USB 3.0
- Color or monochrome CCD sensor with 1” optical format providing a resolution of 3376 x 2704 using 3.69 x 3.69 µm pixels
- High-Speed USB 3.0 interface for fastest image delivery and simplified connectivity
- Compact, robust form factor measuring 43 x 43 x 65 mm with 4 mounting points on all 4 sides and 1 tripod (1/4”-20) mount
- Locking industrial micro USB and Hirose GPI/O connector for power and control of peripherals and synchronization of lighting
- 4 GPI/O: 1 optically isolated output, 1 optically isolated input and 2 configurable I/O ports
- 128 MB RAM frame buffer
- Simplified cabling – video and full camera control over a single locking micro USB 3.0 cable
- Region of Interest (ROI) option to provide higher frame rates
- Selectable 8 or 14-bit pixel data
- Selectable tap readout to match sensor performance to your application
- Multiple data rates supported, each optimized for lowest noise performance
- FCC Class B, CE Certified
- DirectShow compatible
- Software compatible with Windows 8, 7, XP, Vista, 32 and 64-bit operating systems
- Complete Windows and Linux SDKs available
- Four (4) year warranty
Sensor Specifications
- Image Sensor: Sony ICX814, CCD, color, monochrome
- Optical Format: 1"
- Active Area: Diagonal 15.97 mm
- Pixel Size: 3.69 x 3.69 µm
- Resolution: 3376 x 2704 pixels
- Region of Interest Control: Any multiple of 16 x 16 (quad tap mode)

Camera Specifications
- Max Frame Rate: 19 fps at 3376 x 2704, 33 fps with 2x2 binning
- Bit Depth: 8 or 14-bit
- Binning Modes: 2 x 2, 4 x 4, 8 x 8 (3 x 3 mono only)
- Exposure Control: Manual and automatic control
- Exposure Range: 3 µs to 71 min (snapshot) 39 µs to 2.17 s (video)
- Gain Control: Manual and automatic control
- Gain Range: 0.5 to 37 x
- White Balance: Manual and automatic control
- Trigger Modes: Hardware and software triggerable

Camera Characteristics
- Sensitivity: Mono: 4.7 DN/(nJ/cm²), Color: 4.0 DN/(nJ/cm²) (Global and channel gains at unity)
- Dynamic Range: 65 dB
- Full Well Capacity: 12,000 e-
- Quantum Efficiency: 69% (Mono), 56% (Color)
- Read Noise: 6.8 e- (4 taps, 5.3 fps, 25 ºC ambient, 41 ºC internal)
- Dark Current Noise: <1 e-/s (at 22 ºC ambient, 41 ºC internal)

Mechanical Specifications
- Data Interface: USB 3.0, micro locking connector
- General Purpose I/O: Locking Hirose MXR-8R-8SA(71)
- Lens Mount: C-Mount
- Dimensions: 43 x 43 x 65 mm
- Mass: 175 g
- Operating Temperature: 0 to 50 ºC
- Storage Temperature: -30 to 70 ºC
- Operating Humidity: 5 to 95 %, non-condensing
- Shock / Vibration: 50 G shock / 5 G (2 to 200 Hz) vibration

Camera Software
- Operating Systems: Windows XP, Windows Vista, Windows 7, Windows 8, 32 and 64-bit operating systems
- Software Interfaces: DirectShow
- Power and Emissions
  - Power Consumption: 6.0 W
  - Power Requirement: USB Y cable or, La2000PK or La2000PIOK power kit to provide 5 V DC, 1.5 A, power through GPIO.
  - Emissions Compliances: FCC Class B, CE Certified
  - Hazardous Materials: RoHS, WEEE Compliant
  - Warranty: Four (4) year

Ordering Options
- Lt965RM: 9.1 MP Monochrome Camera
- Lt965RC: 9.1 MP Color Camera
- La2000PK: Power Supply via GPIO connector (power only)
- La2000PIOK: Power Supply with GPIO cable (leads + power)
- LuCAMSW-DVD: DVD with user application software, camera device drivers and documentation
- LuSDK: Software Developer’s Kit (Web Download)

Customization Options
- -SCI: Scientific grade
- -WOIR: Plain glass within lens mount

Recommended Applications
- UAV, Aerial Imaging
- Hyperspectral Imaging
- High Resolution Surveillance
- Machine Vision Inspection
- High Resolution Fluorescence Imaging
- Whole Slide Imaging
- Large Area Scan
- ITS (Intelligent traffic solutions)