THERE'S MORE TO SEE WITH

MEGAPIXEL SURVEILLANCE

CAMERAS

Lumenera corporation

INTELLIGENT CAMERAS

Be prepared – be proactive – take control!

Lumenera's new intelligent cameras greatly enhance the ability to detect potential threats and events in real-time, providing the opportunity for security personnel to interrupt a crime or attack while in progress. On board video analytics heighten the effectiveness of digital video surveillance by offering automated, real-time detection, tracking and analysis of objects of interest and identification of potential threats. Lumenera camera models offer 4-32X the image detail of analog video, providing automated detection of highly specific, pre-defined events, such as a person or vehicle entering a restricted zone, or a suspicious object left unattended in a public area.

Intelligent Camera Series

- User-friendly installation with LeCam Client application
- Automates and enhances the ability to detect potential threats
- Reduces loss of valuable assets and potentially saves lives
- Incorporates familiar features of the popular Le series cameras
- Future proof your investments with built-in video analytics capability

How it Works

A powerful Digital Signal Processor (DSP) within each camera provides the ability to distribute intelligence throughout the surveillance network. Lumenera has partnered with ObjectVideo to extend their powerful video analytics technology onto a DSP within each Lumenera camera, and is now the Worlds FIRST OV Ready camera integration partner.

Set-up and rule creation is user-friendly and easy via the intuitive software interface. New capabilities and features can be added to the cameras with software updates as they become available — providing for a future-proof system.

Enabling intelligence in the camera dramatically reduces overall system complexity and maintenance:

- Lowers implementation and life cycle costs as no backroom servers are required
- Improves system performance by optimizing network bandwidth and storage
- Reduces hardware footprint to better support space-constrained environments
- Provides the ability to selectively stream network video when required

Target Markets:

- Homeland Security
- Transportation
- Banking
- Education
- Retail
- Biometrics

Benefits:

- Reduce financial loss
- Minimize liability
- Proactive intervention
- Fewer false alarms
- Improve timeliness and decision making

Li045, Li165 and Li175

- 3 intelligent camera models including megapixel resolution
- Extreme low-light and fast-motion capabilities
- Power Over Ethernet (PoE)
- H.264 or MJPEG compression
- True day/night option
- NTSC analog out
- 2-way audio over IP
- Ultra-wide dynamic range (up to 120dB for Li045)
- Enabled with ObjectVideo video analytics

2 NEW INTELLIGENT CAMERA MODELS

Feature-Rich Video Content Analysis:

- Distinguish people, vehicles and inanimate objects
- Suspicious package not removed after preset time
- Object classification
- Digital tripwire
- Directional alarms
- Enter/exit event detection
- Camera tampering
- Object appears/disappears event detection
- Accurate people/vehicle counting
- Tailgating through controlled access
- People loitering
- Queue length monitoring
- Unexpected crowding in critical areas
- Vehicle moving at excessive speeds
- Object tracking
- Waterway monitoring for vessel size or speed

SUGGESTED APPLICATIONS

Li045, Li165, Li175 – VGA, 1.3 and 1.4 MP Intelligent Cameras

- Same capabilites as the Le045, Le165, Le175 plus…
- Low-light imaging with ambient light or active infrared
- Mission-critical surveillance for military, homeland, perimeter, border, prison, and airport security
- Monitoring of rapidly moving people, vehicles, trains, aircraft, etc.
- General purpose indoor and outdoor surveillance
- Monitoring city centers, college campuses, and public transportation
- Automated surveillance for timely response and prevention of operator fatigue
- Protection of major public and corporate infrastructure
- Scalable to large deployments using on-camera video content analysis

Le045 – VGA Resolution and Ultra-Wide Dynamic Range

- General purpose indoor and outdoor surveillance
- Monitoring city centers, college campuses, and public transportation
- Military, homeland, perimeter, and border surveillance
- Backlit scenes in airports, train and bus stations, commercial establishments, banks, hotels, etc.
- Deployments using wireless bridges

Le075 – VGA Resolution

- Monitoring of rapidly moving people, vehicles, trains, aircraft, etc.
- Monitoring city centers, college campuses, and public transportation
- Deployments using wireless bridges

Le165 – 1.4 MP Resolution and Unparalleled Performance

- Low-light imaging with ambient light or active infrared
- Mission-critical surveillance for military, homeland, perimeter, border, prison, and airport security
- Monitoring of rapidly moving people, vehicles, trains, aircraft, etc.

Le175, Le275 and Le375 – Cost-Effective 1.3, 1.9 and 3.1 MP Resolution

- General purpose indoor and outdoor surveillance
- Monitoring city centers, college campuses, and public transportation

Le259 – 2 MP 16:9 HD Format

- Monitoring of rapidly moving people, vehicles, trains, aircraft, etc.
- Surveillance of city centers, college campuses, city centers, roads, public transportation
- Long-range imaging using image-stabilized 35mm lenses
- Remote lens control over IP for low maintenance costs

Le575 – 5 MP for Wide-Area Surveillance

- Extremely wide-area, high-resolution surveillance of large construction projects, airports, borders, forest and other wild fires, pipe lines, factories, oil refineries, prisons, ports and marinas, city centers, college campuses
- Deployments limited to a small number of access/mounting points

Le11059 – 11 MP with Incredible Sensitivity

- Same capabilities as the Le575 plus…
- Long-range imaging using image-stabilized 35mm lenses
- Remote lens control over IP for low maintenance costs

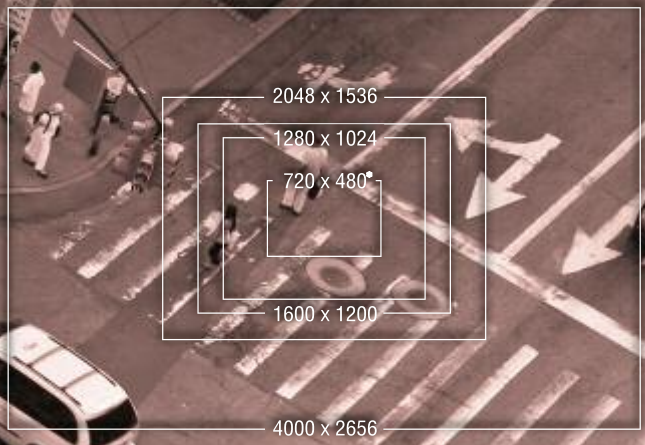
OEM CUSTOMIZATION

As an OEM customer you can now leverage the success of Lumenera's line of high-performance network cameras.

Our customization options for OEMs include hardware and software modifications, as well as custom enclosures, domes, etc. in offering the following:

- Improve your time to market for network or megapixel cameras
- Reduce development costs/risks
- Differentiate from your competition

For more information contact: customsales@lumenera.com

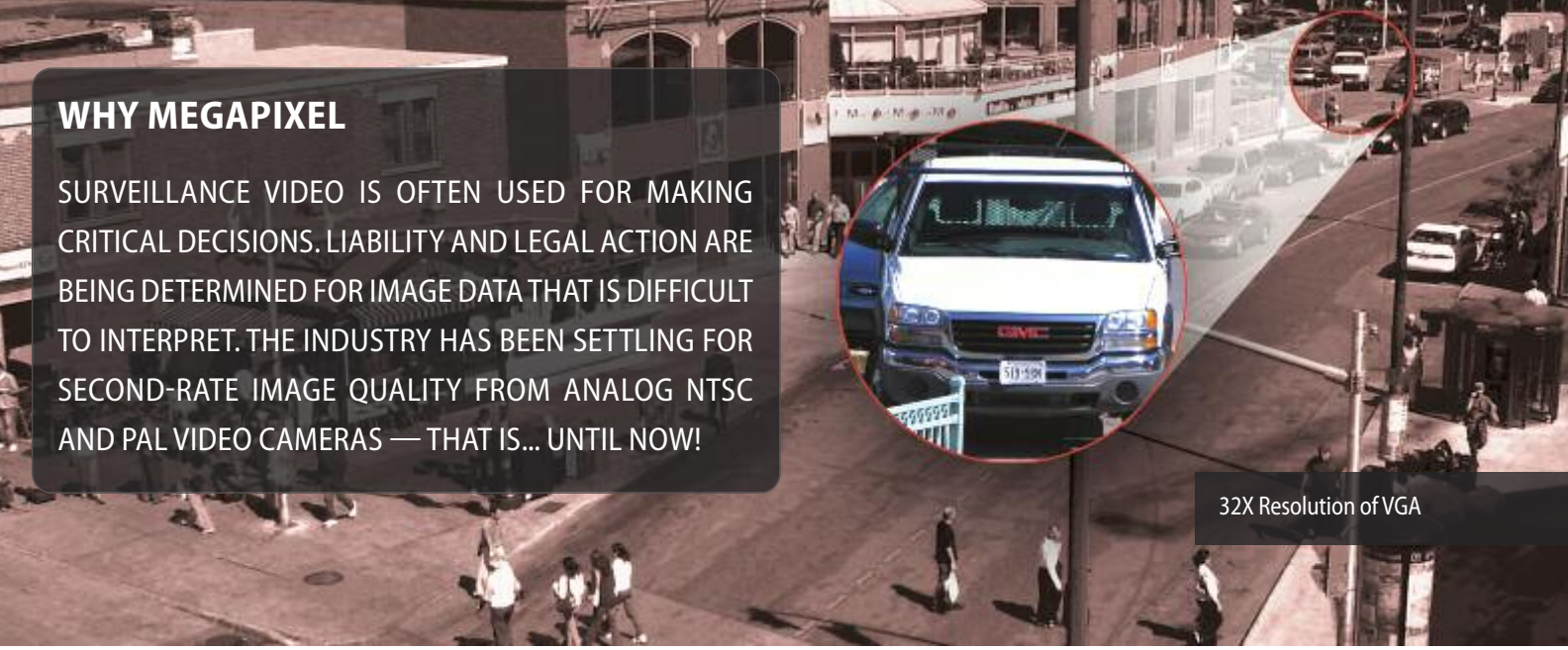


Resolution Comparison – Megapixel to Analog
* Resolution of high-end analog cameras

DVR/NVR SUPPORT

Lumenera cameras are quickly integrated into most digital or network video recorders. Support is currently provided by:

Artec Technologies	BroadWare Technologies	D3Data	Dallmeier	Genetec
Imron Corporation	Initsys	IP Video	JDS Digital Security Systems	JVC (VR-N900U NVR)
Lenel Systems International	LuxRiot	March Networks	Milestone Systems	Nuuo Inc.
On-Net Surveillance Systems	Petards	Pivot3	SAM Systems	Wavelet Technology



WHY MEGAPIXEL

SURVEILLANCE VIDEO IS OFTEN USED FOR MAKING CRITICAL DECISIONS. LIABILITY AND LEGAL ACTION ARE BEING DETERMINED FOR IMAGE DATA THAT IS DIFFICULT TO INTERPRET. THE INDUSTRY HAS BEEN SETTLING FOR SECOND-RATE IMAGE QUALITY FROM ANALOG NTSC AND PAL VIDEO CAMERAS — THAT IS... UNTIL NOW!

MEGAPIXEL... THE NEW ERA IN SECURITY VIDEO

The superior image quality of megapixel resolution represents the new era of security video. Megapixel and multi-megapixel sensors offer 4 to 32 times the image detail when compared to NTSC/PAL standards. 2600+ lines of resolution provide information-filled images with more clarity than ever seen before. Megapixel cameras are proven to provide better quality images in affording:

- new standards for legal evidence
- more valuable source for liability and loss prevention
- more accurate decision making, saving time while protecting human resources

Previously, with captured video being used to perform event analysis, there was little means to zoom into an image to view additional detail. Today, megapixel images provide the ability to perform 4 – 32X digital zoom with the additional pixel information available. Digital zoom can also be provided in live view minimizing the need for motorized optical zoom. Both are tremendous assets in analyzing security video.

Megapixel cameras help reduce camera counts. Given an equivalent level of image detail, a single multi-megapixel camera can replace several analog cameras scanning a large open area such as a traffic intersection, parking lot or storage facility. Installation and maintenance of a single camera greatly reduces overall system cost.

Superior quality video begins with high performance sensors. Progressive scan technology minimizes interlace video 'combing' effect of moving objects. CMOS sensors provide unique characteristics such as anti-blooming and selectable image cropping. Advanced CCD sensors offer extreme low-light capabilities and high dynamic range.

Designed over 50 years ago, analog video standards limit resolution to 720 x 576. Incompatibility between NTSC and PAL formats is yet another issue. Network camera internet protocol (IP) provides for unlimited resolution, choice of frame rate, and superior image quality through standard JPEG image formats.

The system architecture for network devices affords cost-effective and easy expansion. Depending on the application, one can choose from a variety of communication links. CAT5 twisted-pair is the lost-cost standard for distances up to 100 meters or 330'. The Power-over-Ethernet (PoE) capability of our new models usually means that only a single cable run to the camera is required. For additional flexibility, one may interface the camera with a variety of other transmission technologies. Ethernet-over-Coax adapters provide a solution when working with legacy CCTV cabling over intermediate distances. A growing number of wireless and optical fiber links provide a reach of several km/miles. Digital bidirectional communication means there is no need for separate control cables for camera updates, or running peripheral devices such as PTZ, lighting, etc.

IP FOR OUTSTANDING RESOLUTION AND IMAGE QUALITY

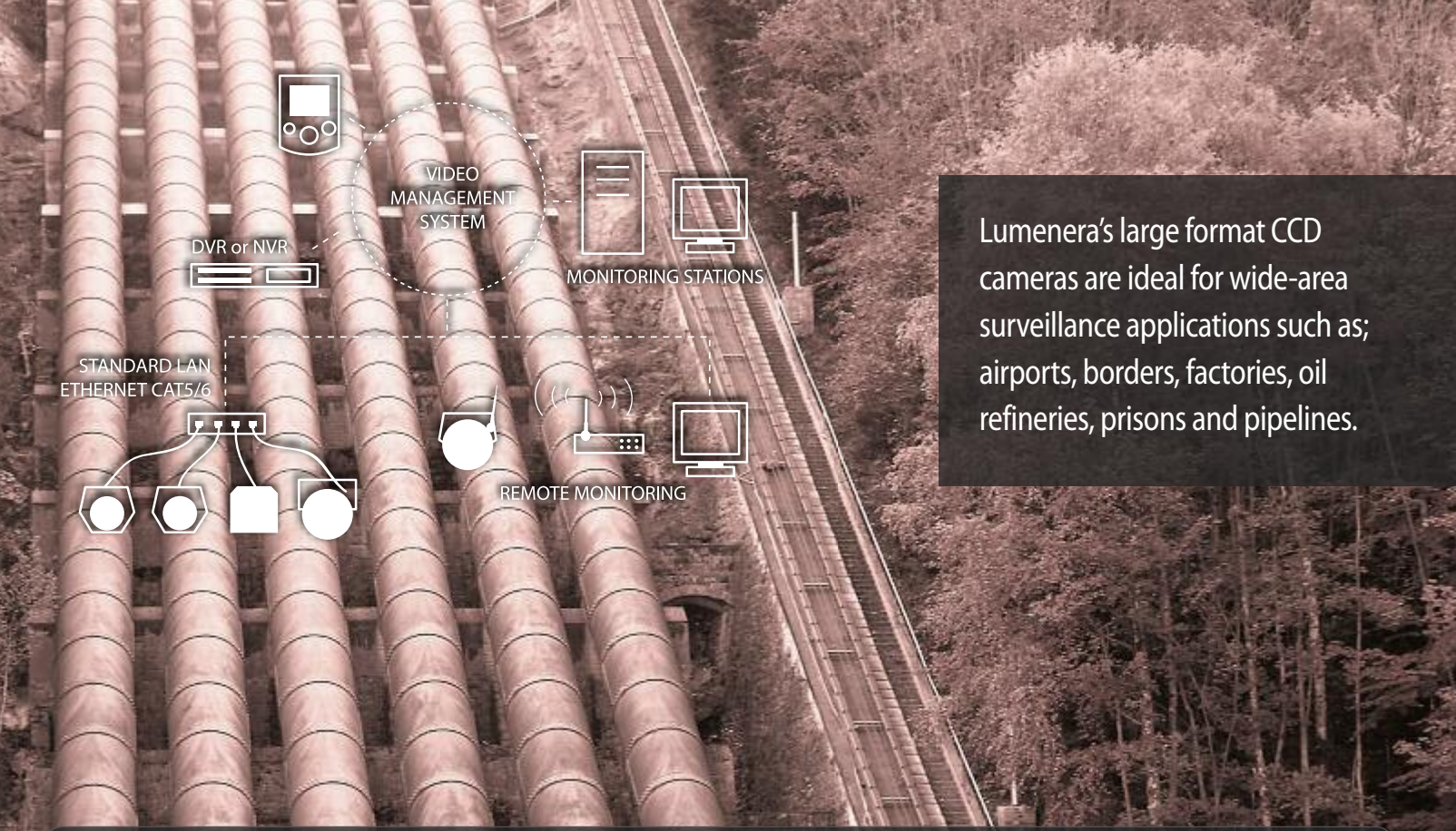
Lower overall costs can be achieved with a network solution. Standard servers, switches/routers, cabling and installation are proven to be more cost efficient — particularly when adding additional cameras to an existing networked system.

With billions of IP devices connected to commercial, corporate and government LAN and WAN networks — security devices of all types are naturally migrating to this technology. Tightly integrating access control, alarm panels, communications and security video is easier and less costly than ever before with the common standards of IP.

Actual images (x5 digital zoom) comparing analog versus Lumenera Le165 camera

Analog

Megapixel



Lumenera's large format CCD cameras are ideal for wide-area surveillance applications such as; airports, borders, factories, oil refineries, prisons and pipelines.

WHY LUMENERA

- Leading provider of high performance surveillance cameras
- Expertise in digital imaging
- Committed to innovation
- Unparalleled customer service and support
- Provider of custom, private labelled and OEM cameras around the world
- Easy-to-do business with

UNRIVALED IMAGE DETAIL — Better image quality is the result of additional pixels and progressive scan image sensors. Advanced digital image processing provides unrivaled color fidelity and image sharpness.

ADVANCED FEATURES — Standard features include adjustable motion detection, privacy zones, alarms, strobe synchronization, among others. Reliable internal self healing processes. On-board image buffer memory provides up to 1,000 pre-event images. DC iris and RS-232 port for control of peripheral PTZ systems are also standard.

IMAGE CROPPING AND CONTROL — Minimize bandwidth and storage requirements with software selectable region of interest. Aspect ratios of 4:3 are standard, but can be modified to 16:9, 1:1 or any desired combination of video height and width.

ON BOARD IMAGE PROCESSING — Lighting conditions present one of the greatest challenges in capturing quality images. Lumenera cameras include advanced on board image processing to address this. Advanced algorithms for auto exposure control (AEC), auto white balance (AWB), auto gain (AGC), and DC iris control provide intelligent self-sufficient operation over wide varying lighting conditions.

CHOOSE YOUR RESOLUTION — Lumenera offers a common platform with a choice of resolution from 0.3 through 11 megapixel. The Le165 camera model is the product of choice for homeland security, military and critical surveillance applications.

ADVANCED LOW-LIGHT PERFORMANCE — Critical surveillance applications must operate in the lowest of lighting conditions. For these applications, Lumenera offers NiteBrite™ for enhanced low light performance and a true day/night option with most camera models. A mechanical sliding window provides an IR-cut filter for accurate color rendition in daylight conditions — while a non-coated optical filter enhances night time performance, especially when combined with NIR illuminators. As an added benefit, all Lumenera camera sensors are uniquely sensitive to NIR lighting, with many models offering monochrome variants for X2 sensitivity versus the equivalent color sensor.

HIGH DYNAMIC RANGE — Poor image quality is often a result of contrast. Lumenera cameras use latest generation image sensors providing higher signal to noise and 10-bit image processing (30-bit color) in producing better facial and object detail as a result of high dynamic range — up to 120dB depending on the model.

FUTURE PROOF — A dedicated team of engineers are continuously developing new features to enhance the use, performance and compatibility of Lumenera network cameras. Software updates are available with simple upload to individual or multiple cameras via bulk upgrade tools.

A TECHNOLOGY PARTNER TO COUNT ON — Proven, reliable and cost effective solutions today. Software based platforms to provide cost effective upgrades (no forklift) as new capabilities are required. You can count on Lumenera as your partner with proven innovation and world class customer service.

SECURITY NETWORK CAMERAS — FEATURE COMPARISON MATRIX

Model	Megapixel	Resolution	Frame Rate at Full Resolution (MJPEG)	Optical Format	Sensitivity	Compression Type	Pixel Pitch	Sensor	Color / Mono	Lens Mount
INTELLIGENT CAMERA SERIES										
Li045	0.3	720 x 480	30 fps	1/3"	0.5 lux	MJPEG/H.264	7.0µm	CMOS	Color or Mono	CS*
NEW Li165	1.4	1376 x 1032	15 fps	2/3"	<0.01 lux	MJPEG/H.264	6.45µm	CCD	Color or Mono	CS*
NEW Li175	1.3	1280 x 1024	21 fps	1/2"	0.5 lux	MJPEG/H.264	5.2µm	CMOS	Color or Mono	CS*
ULTRA-WIDE DYNAMIC RANGE CAMERA SERIES										
Le045	0.3	720 x 480	30 fps	1/3"	0.5 lux	MJPEG/H.264	7.0µm	CMOS	Color or Mono	CS*
CMOS CAMERAS										
Le175	1.3	1280 x 1024	30 fps	1/2"	0.5 lux	MJPEG	5.2µm	CMOS	Color or Mono	CS*
Le275	1.9	1600 x 1200	20 fps	1/2"	1 lux	MJPEG	4.2µm	CMOS	Color	CS*
Le375	3.1	2048 x 1536	10 fps	1/2"	1.5 lux	MJPEG	3.2µm	CMOS	Color	CS*
NEW Le575	4.9	2560 x 1920	6 fps	1/2.5"	2 lux	MJPEG	2.2µm	CMOS	Color	CS*
STANDARD FORMAT CCD CAMERAS										
Le075	0.3	640 x 480	70 fps	1/3"	0.1 lux	MJPEG	7.4µm	CCD	Color or Mono	CS*
Le165	1.4	1376 x 1032	15 fps	2/3"	<0.01 lux	MJPEG	6.45µm	CCD	Color or Mono	CS*
LARGE FORMAT CCD CAMERAS										
Le259	2.0	1920 x 1080	15 fps	35mm	0.5 lux	MJPEG	7.4µm	CCD	Color or Mono	Canon EF
Le11059	10.6	4000 x 2656	3 fps	35mm	0.1 lux	MJPEG	9.0µm	CCD	Color or Mono	Canon EF
DAY/NIGHT CAMERAS										
Li045C-DN	0.3	720 x 480	30 fps	1/3"	0**lux	MJPEG/H.264	7.0µm	CMOS	Color	CS*
NEW Li165C-DN	1.4	1376 x 1032	15 fps	2/3"	0** lux	MJPEG/H.264	6.45µm	CCD	Color or Mono	CS*
NEW Li175C-DN	1.3	1280 x 1024	21 fps	1/2"	0** lux	MJPEG/H.264	5.2µm	CMOS	Color or Mono	CS*
Le045C-DN	0.3	720 x 480	30 fps	1/3"	0** lux	MJPEG/H.264	7.0µm	CMOS	Color	CS*
Le075C-DN	0.3	640 x 480	70 fps	1/3"	0** lux	MJPEG	7.4µm	CCD	Color	CS*
Le165C-DN	1.4	1376 x 1032	15 fps	2/3"	0** lux	MJPEG	6.45µm	CCD	Color	CS*
Le175C-DN	1.3	1280 x 1024	30 fps	1/2"	0** lux	MJPEG	5.2µm	CMOS	Color	CS*
Le275C-DN	1.9	1600 x 1200	20 fps	1/2"	0** lux	MJPEG	4.2µm	CMOS	Color	CS*
Le375C-DN	3.1	2048 x 1536	10 fps	1/2"	0** lux	MJPEG	3.2µm	CMOS	Color	CS*
NEW Le575C-DN	4.9	2560 x 1920	6 fps	1/2.5"	0** lux	MJPEG	2.2µm	CMOS	Color	CS*

*Optional C-Mount adapter available ** When combined with NIR illuminator

CAMERA FEATURE SET

- Gamma
- Contrast
- Saturation
- Brightness
- Sharpness
- Image Crop
- Privacy Map
- Time/Date
- Firmware Update
- Alarm I/O
- Min/Max JPEG File Size, Bandwidth Throttle
- Web Browser Viewer/Camera Setup
- Auto/Manual Exposure
- Auto/Manual Gain
- Continuous/Manual White Balance
- API/SDK available
- Motion Detection and Thresholds
- On-board memory buffer control
- Watchdog
- Serial Port Control
- Pre/Post Alarm Video Buffer
- Admin and User Passwords
- DC Iris

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