

# X64-CL GigE Lite™



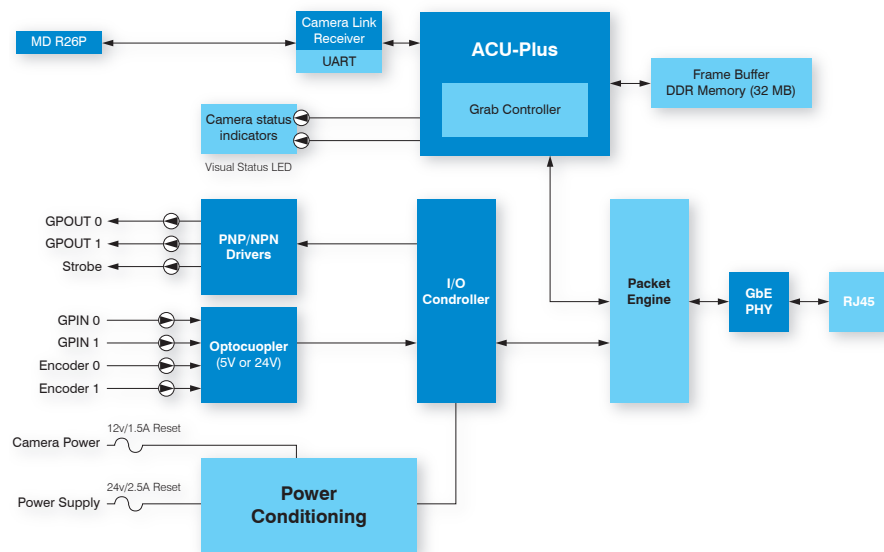
## Key Features

- Supports area and line scan Camera Link cameras
- Dedicated Gigabit Ethernet port for image transfer
- Flexible network topologies allow distributed processing and data centralization
- Supports field proven Trigger-to-Image Reliability framework
- Field proven software library and camera control tools
- Acquisition pixel clock rates up to 85 MHz

## Camera Link® to Gigabit Ethernet Connectivity

The X64-CL GigE Lite is a full featured frame grabber enclosed in stand-alone box that uses a standard gigabit Ethernet network connection to transfer captured images to the host computer.

The X64-CL GigE Lite preserves the investment in the existing camera equipment by leveraging the synergies of Camera Link and Ethernet technologies. The X64-CL GigE Lite is ideally suited for high performance machine vision applications where the host computer can't be located near the camera body and/or distributed processing is desired and/or data concentration is necessary. The X64-CL GigE Lite supports single Base Camera Link cameras and multiple tap configurations from both area and line scan cameras simultaneously. Camera controls such as external trigger input, shaft-encoder inputs, and general purpose input/outputs are localized on-board the X64-CL GigE Lite, while data is streamed continuously at rates of up to 1GB/s over point-to-point connections of 100 meters per network segment using inexpensive CAT-5 LAN cable.



X64-CL GigE Lite—Functional Block Diagram



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## Network Interface

The X64-CL GigE Lite utilizes industry standard Ethernet and UDP/IP protocols to deliver a flexible interconnect platform for machine vision applications. The X64-CL GigE Lite can be used to deliver innovative machine vision solutions involving various networking connection topologies. For example, it is possible to connect one Camera Link camera using the X64-CL GigE Lite and a network hub to more than one host computers at the same time. Similarly, multiple X64-CL GigE Lite units can be connected to a single host computer using a multi-port hub or a router. In addition, the X64-CL GigE Lite supports various networking protocols to permit fast and flexible network hookups.

## Software

### Image Acquisition and Control

The X64-CL GigE Lite is supported by DALSA's Sapera™ Essential software libraries for image acquisition and control. Supported by Microsoft .Net and Visual Studio 6.0 development environment, Sapera Essential applications can be developed using C++ classes, C DLL or ActiveX controls under Windows®2000, Windows®XP, and Windows XP Professional x64 platforms. An integral part of DALSA's stringent Trigger-to-Image Reliability technology framework, Sapera Essential is hardware independent in nature and supports the full suite of DALSA's hardware platforms.

### Sapera Essential Network Imaging Driver

Sapera Essential now features a Network Imaging Driver—a new component of Sapera Essential architecture that supports wide variety of network interface cards (NIC) and is responsible for constructing images from low level network data packets. Sapera Essential based machine vision applications can now use industry standard communication protocols to acquire, control and processing images with little load on the host CPU. Fully compliant with Sapera Essential API, the Sapera Essential network imaging driver makes porting existing applications to network environment easy and efficient. In addition to supporting multiple NIC's, the Sapera Essential also offers utilities to setup and configure compatible network devices.

### Serial Port

In addition to providing standard protocol support for communications, the Sapera Essential Network Imaging Driver also provides support for serial port over Ethernet link. This allows existing camera setup utilities to control and configure Camera Link cameras connected to the X64-CL GigE Lite. This virtual Sapera Essential communication port doesn't require any additional host resources like dedicated IO address or interrupt assignments.

### Camera Expert

Sapera Essential now extends its networking capabilities to CamExpert—a powerful and easy to use camera configuration utility. CamExpert features powerful camera configuration GUI that makes remote camera setup and configuration fast and effortless. CamExpert supports both area and line scan Camera

Link cameras. It also provides live display and pixel inspection tools for faster setup and diagnostics.

### Trigger-to-Image Reliability

The X64-CL GigE Lite has been built within DALSA's Trigger-to-Image Reliability technology framework. High-speed in-line machine vision applications require tight integration between the trigger, strobe, camera exposure and frame grabber acquisition to ensure data integrity. Trigger-to-Image Reliability leverages DALSA's hardware and software innovations to control, monitor and correct the image acquisition process from the time that an external trigger event occurs to the moment the data is received in the host computer memory, providing traceability when errors do occur and permitting recovery from those errors.

### Image Processing and Analysis

DALSA's Sapera™ Processing software library is a set of high performance C++ classes for image processing and analysis for machine vision applications. Sapera Processing library includes over 300 image processing functions and offers powerful pattern matching, optical character recognition, bar code and blob analysis tools.

### Input Lookup Tables (iLUTs)

The X64-CL GigE Lite features input lookup tables for Base and medium Camera Link monochrome and colour RGB cameras. The iLUTs are fully user programmable and are available for 8, 10 and 12-bit area and line scan cameras. The input lookup tables can be used for image thresholding, gamma correction or simply pixel format conversion, simplifying subsequent image processing steps.

## Simplified Setup and Operation

### Shaft-Encoder

The Quadrature shaft-encoder input, enables the X64-CL GigE Lite to acquire images from line scan cameras synchronously to the speed of the web. Higher quality images make processing more accurate and tolerant to motion artifacts.

### Digital Inputs and Outputs

The X64-CL GigE Lite features two optically-isolated digital input lines that can be configured either as an external trigger inputs or general purpose inputs. The X64-CL GigE Lite supports dedicated strobe control output for proper image synchronization. In addition, the X64-CL GigE Lite offers two digital outputs that can be configured via user application in either PNP or NPN mode—meeting wide variety of voltage and current requirements. The digital inputs and outputs of the X64-CL GigE Lite box provide predictable response to increase the quality of acquired images.

### Visual Status LED

The X64-CL GigE Lite further facilitates in-field diagnostics by utilizing visual status LEDs, mounted directly on the box. A dedicated status indicator LEDs indicates when the correct camera connection is made and when a grab is in progress. In addition, separate LEDs provide status of the network connection, shaft-encoder inputs and general purpose IO lines.

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## Specifications\*

Function	Description	Function	Description
Box Device	Camera Link Specifications Rev 1.10 compliant <a href="#">Ethernet 1000BaseT</a>	Power <i>Input</i> <i>Output</i>	Power-on-reset fused +24V DC input at 1.50A Power-on-reset fused +12V DC output at 1.50A
Acquisition	Supports single Base Camera Link area or line scan cameras <a href="#">Acquisition pixel clock rates up to 85MHz</a>	Software	Microsoft Windows 2000, Windows XP Professional <a href="#">Full support of DALSA's Sopera Essential and Sopera Processing software libraries</a> Application development using C++ DLLs and ActiveX controls with Microsoft Visual Studio <a href="#">Microsoft .Net Compatible</a>
Resolution	Horizontal Size (min/max): 8 byte/256K bytes Vertical Size (min/max): 1 line/infinite lines for line-scan cameras 1 line/16 million lines/frame for area-scan cameras Variable length frame size from 1 to 16 million lines for area-scan cameras <a href="#">32MB on-board frame buffer memory</a> Integrated advanced tap reversal engine allows independent tap formatting	Connectors	Camera Input: MDR-26 <a href="#">Power Input—Screwlock-Eurostyle 3-pin pluggable terminal block</a> Network—RJ45 <a href="#">Controls—Screwlock-Eurostyle 15-pin pluggable terminal block-5.08mm spacing</a>
Pixel Format and Tap configurations	Supports Camera Link tap configurations for 8, 10, or 12 bit mono, RGB cameras <a href="#">For Base cameras in any of the following combinations:</a> 3x8 bit/tap, 2x10 bit/tap, 2x12 bit/tap, 1x14 bit/tap, 1x16 bit/tap, & 1x24 bit/RGB	System Requirements	Intel Pentium 4 or equivalent with 64MB system memory <a href="#">GigaBit Ethernet (1000BaseT) compliant system</a> and 64MB system memory
Transfers	Real-time transfers to system memory: <b><a href="#">GigaBit Ethernet (1000BaseT)—1000MB/s</a></b> <a href="#">Intelligent Data-Transfer-Engine supports scatter-gather memory addressing</a> Reconstructs images from low-level network data packets with little CPU load	Dimensions	2x3x6(in.) or 5.23x7.77x15.39(cm)
Network	Ethernet IPv4, UDP, ARP, ICMP, DHCP, LLP and Persistent IP	Temperature	0°C (32°F) to 50°C (122°F) <a href="#">Relative Humidity: up to 90% (non-condensing)</a>
Input Lookup Tables		Markings	FCC Class B—Approved <a href="#">CE—Approved</a>
<i>Monochrome</i>	For each input one 256x8 bit, 1024x10 bit, 1024x8 bit, 4096x12 bit, 4096x10 bit or 4096x8 bit iLUTs/tap per camera input		
<i>Colour</i>	3x256x8-bit for Base RGB camera		
Controls	Comprehensive event notification includes end/frame/transfer <a href="#">TTL Strokes outputs</a> Serial communications port over IP link provide seamless interface to MS Windows applications <a href="#">Quadrature (AB) shaft-encoder inputs for external web synchronization</a> Two general purpose input—TTL / optically-isolated inputs 24VDC tolerant <b><a href="#">Can be configured as external trigger input(s)</a></b> Two general purpose output: NPN +5V @ 750mA or PNP +24V @ 350mA		