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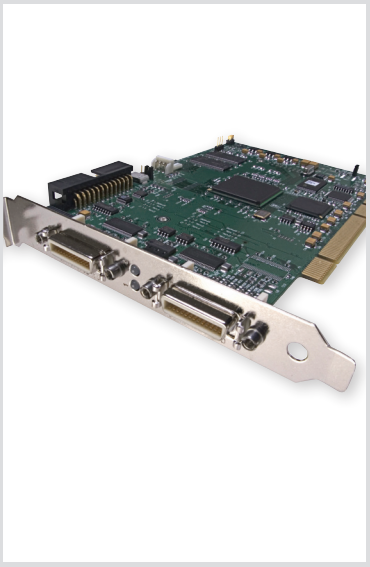
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Find the *Teledyne Dalsa / Coreco Imaging X64-CL iPro* at our website: ***Click HERE***

X64-CL iPro™



Key Features

- Simultaneous acquisition from two Base or one Medium Camera Link® cameras
- FPGA based processing including Bayer decoding and shading correction
- Supports acquisition for a wide range of cameras and formats
- Trigger-to-Image Reliability ensures secure image capture
- On-board Quadrature shaft-encoder input
- Acquisition pixel clock rates up to 85MHz
- Low-Cost/High Performance
- Teledyne DALSA Platform Development Advantage – Free Run-time Licensing[1]

TRIGGER-TO-IMAGE RELIABILITY

Fast, flexible, highly reliable image acquisition

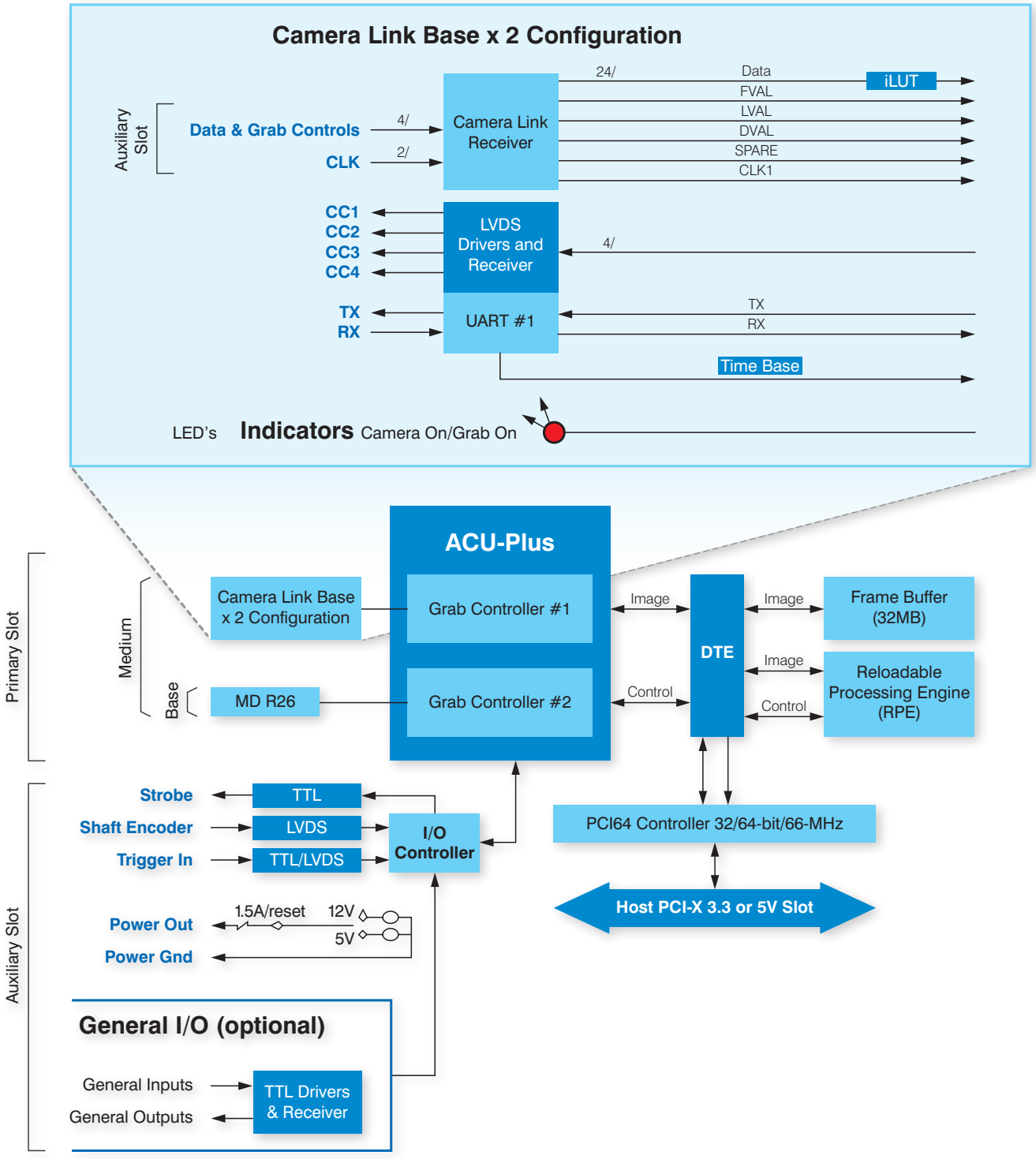
The X64-CL iPro is a highly versatile PCI frame grabber capable of acquiring images from two independent Base or one Medium Camera Link® cameras and performing image transfers at rates up to 528MB/s. Its low cost, combined with its ability to support multiple tap configurations from both area and line scan cameras simultaneously; in addition to its on-board FPGA based processing (including Bayer decoding and real-time shading correction) makes the X64-CL iPro an ideal solution for a wide variety cost-sensitive applications where flexibility, performance and reliability cannot be compromised.

Teledyne DALSA Platform Development Advantage - Free Run-Time Licensing
The Sapera Essential standard processing tool run-time license is offered at no additional charge when combined with the Teledyne DALSA frame grabbers. This software run-time license[1] includes access to over 400 image processing functions, area-based (normalized correlation based) template matching tool, blob analysis and lens correction tool.

[1] Some conditions and limitations apply, contact Teledyne DALSA sales for details.

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X64-CL iPro—Functional Block Diagram

X64-CL iPro™

Trigger-to-Image Reliability

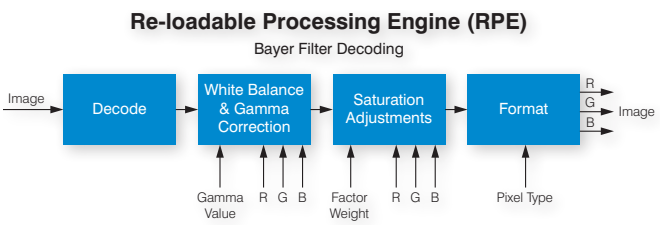
The X64-CL iPro has been built within Teledyne DALSA's Trigger-to-Image Reliability technology framework. High-speed in-line machine vision applications require tight integration between the trigger, strobe, camera exposure and frame grabber acquisition to ensure data integrity. Trigger-to-Image Reliability leverages Teledyne 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 sent to the PCI bus, providing traceability when errors do occur and permitting recovery from those errors.

Dual Camera Interface

The X64-CL iPro is able to acquire images from two independent Base Camera Link cameras or one Medium camera; capturing images from both area and line scan cameras (monochrome and RGB) simultaneously. Capable of acquisition rates up to 255MB/s per channel (510MB total),the X64-CL iPro makes image acquisition from the new generation of CMOS and multi-tap CCD cameras more efficient and cost effective. The X64-CL iPro supports fixed and variable size frames ranging up to 256KB horizontal pixels per line and up to 16 million vertical lines per frame for area scan cameras. One feature of particular interest to OEMs developing web-scanning applications is the X64-CL iPro's ability tosupport both infinite and variable frame lengths from line scan cameras, enabling 100 percent line capture as well as repeatable accuracy and faster execution times.

On-Board Processing Engine

As a part of its standard features set, the X64-CL iPro offers an FPGA based image processor called the Re-loadable Processing Engine (RPE). Fast and efficient, the RPE frees up the host CPU from performing tasks such as shading correction and Bayer decoding while delivering images that can be readily used by demanding vision applications without further pre-processing.

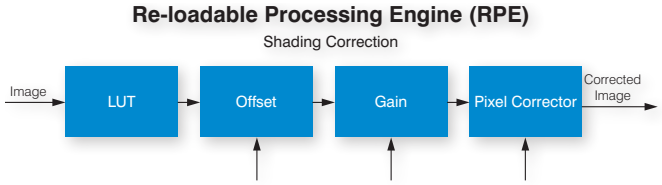


Hardware Bayer Decoding

Configured to decode Bayer Mosaic Filter images, the RPE supports Base and Medium cameras in a multitude of tap configurations. Designed with flexibility in mind, the X64-CL iPro can handle various Bayer patterns and provides control for gamma correction and white balance to produce accurate RGB images. To further facilitate the needs of high performance colour applications, the X64-CL iPro can capture and convert images from 8, 10, and 12-bit Bayer cameras.

Real-Time Shading Correction

To overcome the image artifacts caused by non-uniform illumination, non-uniform sensor response, dark current, and defective pixel elements, the X64-CL iPro can be configured to perform real-time shading correction. Capable of supporting Base and Medium configurations, the shading correction engine is user configurable and comes bundled with a calibration utility to generate gain and offset maps.



Input Lookup Tables (iLUTs)

The X64-CL iPro features input lookup tables for Base and Medium monochrome and RGB cameras. Available for 8, 10 and 12-bit area and line scan cameras, the iLUTs are dynamically loadable and are fully user programmable. The input lookup tables can be used for image thresholding, gamma correction or basic pixel format conversion, simplifying subsequent image processing steps.

Optimized Data-Transfer

Delivering fast and secure data transfers with zero CPU usage, the X64-CL iPro's Data Transfer Engine (DTE) features a high speed memory interface, multiple independent Direct Memory Access (DMA) controllers, and on-board tap descriptors.

The DTE also performs real-time input tap adjustments for direction (tap reversal/inversion), pixel overlap and under lap. This enables the DTE to deliver images that are ready for processing and liberating the host CPU for image analysis tasks. In addition, the DTE performs autonomous and robust image transfers to ensure data integrity during continuous image acquisition in non-real-time operating systems, such as Windows® XP and Windows® 2000.

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X64-CL iPro™

Simplified Set-up and Operation

Visual Status LED

The X64-CL iPro further facilitates ease-of-use by utilizing visual status LEDs, mounted on the card's bracket, to simplify system installation and setup. A status indicator LED provides visual feedback when the correct camera connection is made and when a grab is in progress. These visual indicators allow developers to instantly recognize if cabling has been correctly set up greatly facilitating the diagnostic process.

Trigger Input/Strobe Output

The X64-CL iPro features two trigger inputs along with two strobe control output signals, to synchronize image captures with external events.

Shaft Encoder

The Quadrature shaft-encoder input, enables the X64-CL iPro 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.

General Purpose I/Os

The X64-CL iPro offers optional opto-coupled input modules for demanding industrial environments. These interrupt-driven, general-purpose input and output controls allow X64-CL iPro boards to react to external inputs more rapidly and predictably to increase the quality of acquired images.

Serial Communications Ports

The X64-CL iPro features two independent on-board serial communication ports that provide integrated support for camera control and setup for machine vision applications. PC-independent in nature, this communication port can be used with off-the-shelf communication utilities such as HyperTerminal to control and configure Camera Link cameras with ease and without requiring additional external cabling.

Software Support

Image Acquisition and Control

The X64-iPro is supported by Teledyne DALSA's Sapera™ Essential software libraries for image acquisition and control. Compatible with Microsoft Visual Studio 6.0 and .NET development environments, Sapera Essential applications can be developed using C++ classes or ActiveX controls under Windows® 2000, and Windows® XP platforms. An integral part of Teledyne DALSA's stringent Trigger-to-Image Reliability technology framework, Sapera Essential is hardware independent and supports Teledyne DALSA's full range of imaging boards. In addition, Sapera Essential includes powerful diagnostics and setup utilities for application development, custom camera configurations and system deployment.

Image Processing and Analysis

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

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X64-CL iPro™

Specifications*

Function	Description
Board	Camera Link Specifications Rev 1.10 compliant Half length 64-bit PCI-X 66MHz compatible 5V and 3.3V slot ready
Acquisition	Supports two independent Base or one Medium Camera Link area or line scan cameras Acquisition pixel clock rates up to 85MHz
Resolution	Horizontal Size (min/max): 8 byte/256K bytes Vertical Size (min/max): 1 line/infinite lines for line-scan cameras 1 line/16million lines/frame for area-scan cameras Variable length frame size from 1 to 16 million lines for area-scan cameras 32MB onboard frame buffer memory Integrated advanced tap reversal engine allows independent tap formatting
Pixel Format and Tap configurations	Supports Camera Link tap configurations for 8, 10, or 12-bit mono, RGB and Bayer cameras: For one Medium or two Base cameras in any of the following combinations: 3x8-bit/tap, 2x10-bits/tap, 2x12-bit/tap, 1x14-bit/tap, 1x16-bits/tap, & 1x24-bit/RGB For Medium camera - 4x8-bit/tap, 4x10-bit/tap, 4x12-bit/tap, 1x30-bit/RGB, & 1x36-bit/tap[1]
Transfers	Real-time transfers to system memory: PCI-X bus: 64 bits @ 66MHz PCI-64 bus: 64 bits @ 66MHz PCI-32 bus: 32 bits @ 33MHz Intelligent Data-Transfer-Engine automatically loads scatter-gather and tap description tables from the host memory without CPU intervention
On-board Processing	
Bayer Mosaic Filter	Hardware Bayer Engine supports one 8, 10 or 12-bit Bayer camera input Bayer output format supports 8 or 10-bit RGB/pixel Zero host CPU utilization for Bayer conversion
Shading Correction	On the fly Flat-line and Flat-field correction with dead-pixel replacement Supports two independent monochrome cameras concurrently User programmable calibration gain/offset maps
Input Lookup Tables	
Monochrome	For each camera input one 256x8-bit, 1024x10-bit, 1024x8-bit, 4096x12-bit, 4096x10-bit or 4096x8-bit iLUTs
Colour	3x256x8-bit for Base Camera Link and 3x1024x10-bit or 3x4096x12-bit for Medium Camera Link RGB cameras

Function	Description
Controls	Comprehensive event notification includes end/frame/transfer Independent timing control logic for up to two Camera Link cameras Two independent TTL/LVDS trigger inputs programmable as active high or low (edge or level trigger) Two independent TTL Strobes outputs Two PC independent serial communications ports provide seamless interface to MS Windows applications Quadrature (AB) shaft-encoder inputs for external web synchronization
Options	Optional general purpose IO module supports: 8 inputs and 8 TTL outputs Inputs support TTL and 24V operations TTL outputs support PNP and NPN operations[2]
Power Output	Power-on-reset fused +12V/+5V DC output at 1.5A
Software	Microsoft Windows XP and Windows 2000 compliant Full support of Teledyne DALSA's Sapera programming package Microsoft Visual Studio 6.0 and .NET compatible C/C++ DLLs and ActiveX controls
System Requirements	PCI-X or PCI-32 compliant system and 64MB system memory
Dimensions	8.27" (21 cm) Length X 4.20" (10.7 cm) Height
Temperature	0 °C (32 °F) to 55 °C (131 °F) Relative Humidity: up to 95% (non-condensing)
Markings	FCC Class B- Approved CE - Approved

Notes:
1. Output pixel format limited to RGB30 only
2. Optional module requires separate PCI or PCIe slot

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Teledyne DALSA is an international leader in digital imaging and semiconductors and has its corporate offices in Waterloo, Ontario, Canada.

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