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Datasheet
LightBridge VCL

SMARTER IMAGING FOR BETTER LIVES
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LightBridge VCL

Product Profile of LightBridge VCL

Scalable, intelligent, external image processing device for highest requirements on image acquisition and preprocessing by optical data transfer and industrial standard

- External Frame Grabber with Camera Link interface (all configurations)
- Support of Camera Link Power Over / PoCL Safe Power
- Up to 60 meter optical connection to host PC, noise immunity, up 940 MB/s
- Plug & Play Real-Time Image and Signal processing
- Custom Programming with VisualApplets
- Compact and Fanless Housing, IP40 pending
- GPIO (5V - 24V opto-decoupled) for communication and synchronization with external devices
- Mounting options: Din rail and wall
- 100% compliant with Silicon Software SDK and GUI control and service tools
- Third-party imaging tool interface: Halcon, Common Vision Blox and others

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Technical Description

Programmable external image acquisition and image processing device, Camera Link interface with 2*SDR26, trigger interface, RS485 interface (scheduled), I/O interface, 2* Thunderbolt™ technology data interfaces, power interface. DIN rail mounting included. Available screw holes for DIN rail mounting, direct mounting. Optional accessories: power supply 12V, cables. Pre-licensed for VisualApplets (Base) and SmartApplets (Base). Documentation, SDK, supporting software tools, functional libraries with acquisition applets and drivers in delivery. Genuine compliance to VisualApplets FPGA programming environment.

Article Details

Product Name	LightBridge VCL
Match Code	LB-VCL
Article No.	160321
Category	V-Series (image acquisition board)

Device Features

Processor	Vision Processor
On Board Memory	2 GByte DDR3-RAM
Processor Board Interface	n/a
Data Forwarding	n/a
I/O Module Interfaces	Terminalblock

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Camera Interface

Standard	Camera Link 2.0, up to 85 MHz Pixel Clock, extended cable length
Configurations	CL-base, CL-dual base, CL-medium, CL-full, CL-deca (80bit)
Connectors	2* SDR26 (miniCL)
Cable Length	extended length
Power Output	PoCL SafePower, 4W/12V per cable
Camera Support	Area scan camera, line scan camera
Sensor Type	Grayscale sensor, CFA sensor (Bayer), RGB sensor
Sensor Resolution	64k*64k (area scan sensor, VisualApplets), 64k (line scan sensor, VisualApplets)
Bit Depth	8-16-bit (grayscale), 24-48-bit (color)
Data Bandwidth	850 MB/s
Test Environment	Camera Simulator

Controls and General Purpose I/Os

Trigger Board GPIO Interfaces	n/a
On-board GPIO Interface	4 opto-coupled inputs (4,5 V -28 V), optional 2 opto-coupled differential inputs (RS422); 4 opto-coupled outputs (4,5 – 28 V); Shaft encoder input, programmable rescaler, multiple-camera synchronization
On-board Front GPIO Interface	2 opto-coupled differential inputs (RS422) and 1 opto-coupled differential / single ended input; optional (conf.): 4 opto-coupled Inputs (4,5 V -28 V) with up to 1 MHz frequency□; 2 TTL outputs, up to 20 MHz frequency; shaft encoder input, programmable rescaler: multiple-camera synchronization; RS485 interface (PLC connection) scheduled
Synchronization and Control	Configurable Trigger System supporting several trigger modes (grabber controlled, external trigger, gated, software trigger) and shaft encoder functionality with backward compensation, Multi-Camera-Synchronization
GPIO Summary	4in/4out (max.), opto-coupled

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Host PC Interface

PC Bus Interface	Thunderbolt™ technology
PC Bus Interface Performance	up to 940 MB/s (sustainable)

Physical and Environmental Information

Dimensions	Aluminum case 120 Lx130 Wx55 H mm (4.72''x5.12''x2.17''), Direct screwing or top hat rail mounting
Approximate Weight	tbd
Power Consumption / Power Source	tbd
Operating Temperature	0 - 50°C (32°F - 131°F), fanless enclosure; pending
Storage Temperature	tbd
Relative Humidity	pending
MTBF	pending
Compliances	CE, RoHS, WEEE, REACH

Software

Software Drivers	Windows 7 / 8 (32-bit), Windows 7 / 8 (64-bit), Linux 32-bit, Linux 64-bit
Software Tools	microDisplay (Acquisition control and viewer), microDiagnostics (Service tool), GenICam Explorer (Camera configuration tool), SDK, Documentation, Device Drivers
Software API	Silicon Software SDK, .net interface
FPGA Programming	VisualApplets
BV Software Compatibility	Common Vision Blox, Halcon, others on request

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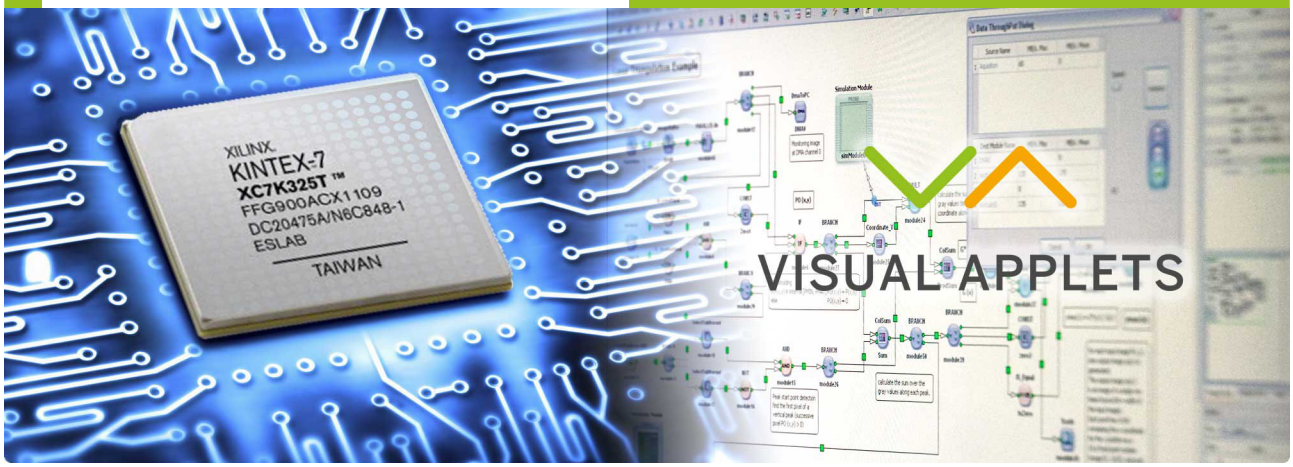

VisualApplets

Often, the goal of industrial image processing applications is to find 100% of all errors and to work in high resolution to identify even the smallest details, to acquire images in the shortest time possible, to detect defects and to forward the results. These tasks frequently require more computing power than a “standard system” can offer. There are solutions that begin the image processing right after the acquisition process but before the camera images are written to storage and taken over by the software.

The processors used in such solutions are designed for image processing. They process data with extremely high parallelism, thus guaranteeing the necessary data throughput. On all its frame grabbers, Silicon Software uses this FPGA technology. In the A-Series (frame grabbers with expanded image recording functions), we have already programmed important and valuable functions that can be activated via the configuration software. For V-Series models (programmable frame grabbers for individual image processing functions), we have released the FPGA for you, as our customer, for individual programming.

To ease your entry into hardware programming, we have developed software that enables you to graphically program FPGAs using data flow diagrams. This program is called VisualApplets.

VisualApplets makes it possible for you to write complex applications on your own, even after a short time, for the special processor. Even without hardware programming expertise. The program is geared toward both software programmers and application engineers. Program in the language of image processors without using hardware code. The simulation works with a rapid image output with which you can immediately check your algorithms and image processing steps.

We have built in many automatic correction functions and generators so that you can concentrate on your actual work. And should an error sneak in, you are immediately made aware of it in color, and solution approaches are offered to you.

An SDK output generates executable example code in C/C++, listing all the parameters (hardware register), in order to control the image processing application out of your software.

What does real time mean? By using FPGA technology, you have a deterministic relationship to the application that works after the start with a constant delay (latency) that is determined by the image processing algorithm. In most cases, this latency lies in the micrometer range.

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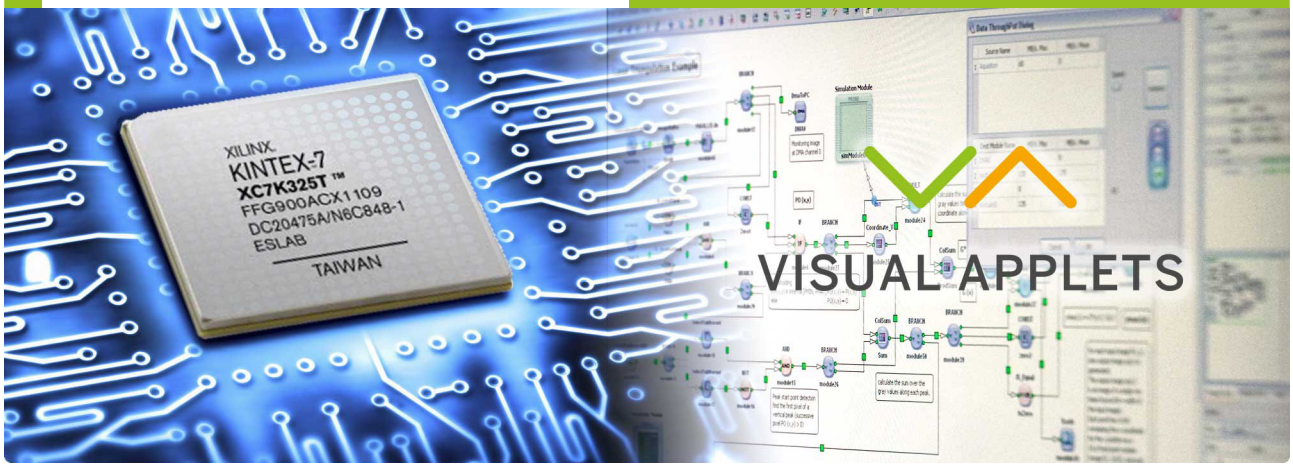

VisualApplets (ctd.)

VisualApplets simplifies image processing programming for you. You can fall back on libraries with over 200 operators. You can create your own libraries for commonly used image processing steps or import them from available hardware code (EDIF over VHDL/Verilog).

With VisualApplets, you acquire a powerful tool that offers you new ways forward for your system solution.

VisualApplets is available for Silicon Software V-Series frame grabbers, including VisualApplets-compatible cameras and imaging devices.

V-Series frame grabbers are already pre-licensed for use with VisualApplets in the basic version. VisualApplets offers several versions of its programming environment; additionally, you can license further operator libraries to expand the range of functions.

In 2006, VisualApplets was honored with the international Vision Award. It has been successfully used in the most diverse industrial applications, both using frame grabbers and in VisualApplets-compatible industrial cameras and image processing devices.

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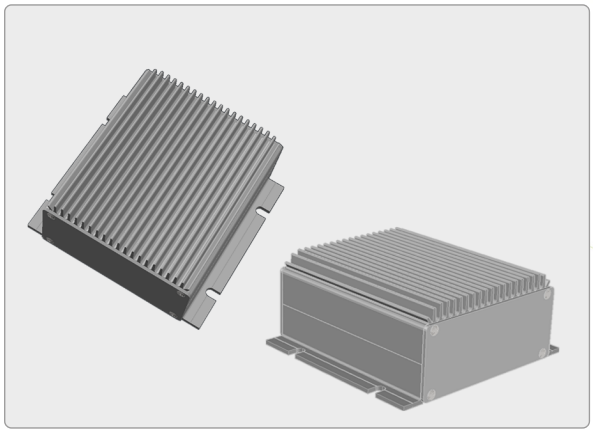
Technical Setup

Board/Housing Measurement



PRODUCT VARIATIONS

LightBridge ACL microEnable 5 marathon ACL
microEnable 5 marathon VCL

PRODUCT EXTENSIONS

No extensions available

ORDERING INFO

- LightBridge VCL,
  LB-VCL, Art No.: 160321

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