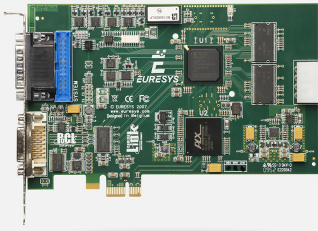


# Grablink Express

Frame grabber for one base-configuration PoCL Camera Link camera



## At a Glance

- For one Camera Link Base configuration camera
- Directly compatible with hundreds of Camera Link cameras available on the market
- Supports PoCL, Power over Camera Link
- PCIe x1 bus
- 32-MByte on board memory
- Feature-rich set of 9 digital IO lines

## Benefits

### Directly compatible with hundreds of Camera Link cameras available on the market

Check out our camera compatibility page (in the Support menu) to download the relevant CamFiles

### General purpose I/O lines

Compatible with a wide range of sensors and motion encoders.

### High-performance DMA (Direct Memory Access)

- Direct transfer into user-allocated memory
- Hardware scatter-gather support

### Flexible line-scan camera operation with the rate converter.

- The rate converter is a smart, programmable frequency multiplier/divider.
- Used with motion encoders and line-scan cameras, it allows the user to choose the aspect ratio of the pixels in the image.
- It provides a way to calibrate the acquisition chain to easily reach square (1:1 aspect ratio) pixels.

### Windows drivers available

## Applications

### Machine Vision for the Electronic Manufacturing Industry

- High speed image acquisition for AOI, 3D SPI, 3D lead/ball inspection machines.
- Very high resolution line-scan image acquisition for Flat Panel Display inspection and solar cell inspection

### Machine Vision for the General Manufacturing Industries

- High frame rate image acquisition for inspection machines
- Line-scan image acquisition for surface inspection machines

- Line-scan image acquisition for textile inspection

## Machine Vision for the Printing Industry

- High speed line-scan image acquisition for printing inspection machines

## Video Acquisition and Recording

- High-frame-rate video acquisition for motion analysis and recording

## Specifications

### Mechanical

Form Factor	PCI Express card
Format	Standard profile, half length, 1-lane PCI Express card
Cooling method	Air-cooling
Mounting	For insertion in a standard height, 1-lane or higher, PCI Express card slot
Connectors	<ul style="list-style-type: none"> <li>• 'CAMERA LINK' on bracket: <ul style="list-style-type: none"> <li>– 26-position Mini Delta Ribbon (MDR) socket</li> <li>– Camera Link connector</li> </ul> </li> <li>• 'SYSTEM' on bracket: <ul style="list-style-type: none"> <li>– 26-pin 3-row high-density male sub-D connector</li> <li>– I/O lines and power output</li> </ul> </li> <li>• 'SYSTEM' on PCB: <ul style="list-style-type: none"> <li>– 26-pin 2-row 0.1" pitch pin header with shrouding</li> <li>– I/O lines and power output</li> </ul> </li> <li>• 'CAMERA POWER INPUT' on module: <ul style="list-style-type: none"> <li>– 4-pin MOLEX power socket</li> <li>– 12 VDC power input for PoCL camera</li> </ul> </li> </ul>
Dimensions	L 168 mm x H 111 mm L 6.61 in x 4.37 in

### Host bus

Standard	PCI Express 1.0
Link width	1 lane
Link speed	2.5 GT/s (PCIe 1.0)
DMA	32-bit
Peak delivery bandwidth	256 MB/s
Effective (sustained) delivery bandwidth	180 MB/s (Host PC motherboard dependent)
Power consumption	Max. 5.35 W (500 mA @ +3.3V, 300 mA @ +12V), excluding I/O power output

### Camera / video inputs

Interface standard(s)	Camera Link
Connectors	1 Mini Delta Ribbon (MDR) Camera Link (CL)
Number of cameras	One Base camera
Line-scan cameras supported	Yes
Maximum aggregated camera data transfer rate	2.04 Gbit/s (255 MB/s)
Camera Link configuration	Base
Camera Link clock frequency	From 20 MHz up to 85 MHz
PoCL (Power over Camera Link)	One PoCL SafePower compliant controller with overload, over-voltage and short-circuit protections

Camera types	<ul style="list-style-type: none"> <li>• Gray-scale and color (RGB and Bayer) cameras</li> <li>• Area-scan and line-scan cameras</li> </ul>
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## Video delivery

Raw video format(s)	<ul style="list-style-type: none"> <li>• Monochrome formats: Y8, Y10, Y12, Y14, Y16</li> <li>• Packed RGB color formats: RGB24, RGB32</li> <li>• Planar RGB color formats: RGB24PL, RGB30PL, RGB36PL, RGB42PL, RGB48PL</li> <li>• Additional formats: BAYER8, BAYER10, BAYER12, BAYER14, BAYER16, RAW8, RAW10, RAW12, RAW14, RAW16</li> </ul>
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## On-board processing

On-board memory	32 MB (16 MB for image data)
Image data stream processing	<ul style="list-style-type: none"> <li>• Unpacking of 10-/12-/14-bit to 16-bit with selectable justification to LSb or MSb</li> </ul>

## General Purpose Inputs and Outputs

Number of lines	<p>9 I/O lines:</p> <ul style="list-style-type: none"> <li>• 4 TTL input/output lines (ENHANCED I/O)</li> <li>• 2 differential inputs (TRA1, TRA2)</li> <li>• 1 isolated output (STA)</li> <li>• 2 multimode input/output lines (ISOA1, ISOA2)</li> </ul>
Usage	<ul style="list-style-type: none"> <li>• Camera and image acquisition trigger</li> <li>• Light strobe trigger</li> <li>• Camera synchronization using motion encoder</li> <li>• General purpose IO</li> </ul>
Electrical specifications	<ul style="list-style-type: none"> <li>• ISOA1, ISOA2: Inputs or outputs, isolated up to 500 V: <ul style="list-style-type: none"> <li>– Input: compatible with TTL or 12V signals</li> <li>– Output: TTL, open-collector or open-emitter</li> </ul> </li> <li>• TRA1, TRA2: Inputs compatible with TTL, LVTTTL, differential LVDS, differential RS-422, differential RS-485 signals, protected against electrostatic discharge, with choke for the rejection of common-mode noise</li> <li>• STA: Opto-isolated outputs, compatible with signals up to 60V, with 3 <math>\mu</math>s fall time, isolated up to 500V</li> <li>• ENHANCED IO Inputs or outputs compatible with TTL signals, protected against electrostatic discharge, with high-frequency noise filter</li> </ul>
Filter control	<ul style="list-style-type: none"> <li>• Glitch removal filter available on input lines used as trigger sources:</li> <li>• Configurable with five time constants: <ul style="list-style-type: none"> <li>– 100 ns, 500 ns and 2.5 <math>\mu</math>s for trigger/ page trigger /page end trigger sources</li> <li>– 100 ns, 500 ns, 2.5 <math>\mu</math>s for line trigger source</li> </ul> </li> </ul>
Power output	<ul style="list-style-type: none"> <li>• Non-isolated +5V, 1A and +12V, 500 mA with self-resettable fuse protection</li> <li>• Isolated +5V 250 mA with electronic fuse protection</li> </ul>

## Software

Host PC Operating System	<ul style="list-style-type: none"> <li>• Microsoft Windows 10, 8.1, 7 for x86 (32-bit) and x86-64 (64-bit) processor architectures</li> <li>• Linux for x86 (32-bit) and x86-64 (64-bit) processor architectures</li> </ul> <p>Refer to release notes for details</p>
APIs	<ul style="list-style-type: none"> <li>• MultiCam 32- and 64-bit binary libraries (Windows and Linux), for ISO-compliant C/C++ compilers</li> </ul>

## Environmental conditions

Operating ambient air temperature	0 to +50 °C / +32 to +122 °F
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Operating ambient air humidity	10 to 90% RH non-condensing
Storage ambient air temperature	-20 to +70 °C / -4 to +158 °F
Storage ambient air humidity	10 to 90% RH non-condensing

## Certifications

Electromagnetic - EMC standards	<ul style="list-style-type: none"> <li>• European Council EMC Directive 2004/108/EC</li> <li>• United States FCC rule 47 CFR 15</li> </ul>
EMC - Emission	<ul style="list-style-type: none"> <li>• EN 55022:2010 Class B</li> <li>• FCC 47 Part 15 Class B</li> </ul>
EMC - Immunity	<ul style="list-style-type: none"> <li>• EN 55024:2010 Class B</li> <li>• EN 61000-4-2</li> <li>• EN 61000-4-3</li> <li>• EN 61000-4-4</li> <li>• EN 61000-4-6</li> </ul>
Flammability	PCB compliant with UL 94 V-0
RoHS	European Union Directive 2011/65/EU (ROHS2)
REACH	European Union Regulation 1907/2006
WEEE	Must be disposed of separately from normal household waste and must be recycled according to local regulations

## Ordering Information

Product code - Description	<ul style="list-style-type: none"> <li>• 1621 - Grablink Express</li> </ul>
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## AMERICA

### **Euresys Inc.**

27126-B Paseo Espada - Suite 704  
San Juan Capistrano, CA 92675 - United States

Phone: +1 949 743 0612

Email: sales.americas@euresys.com

## EMEA

### **Euresys SA**

Liège Science Park - Avenue du Pré Aily, 14  
4031 Angleur - Belgium

Phone: +32 4 367 72 88

Email: sales.europe@euresys.com

## EMEA

### **Sensor to Image GmbH**

Lechtorstrasse 20 -  
86956 Schongau - Germany

Phone: +49 8861 2369 0

Email: sales.europe@euresys.com

## ASIA

### **Euresys Pte. Ltd.**

750A Chai Chee Road - #07-15 Viva Business Park  
Singapore 469001 - Singapore

Phone: +65 6445 4800

Email: sales.asia@euresys.com

## CHINA

### **Euresys Shanghai Liaison Office**

Unit 802, Tower B, Greenland The Center - No.500 Yunjin Road, Xuhui District  
200232 Shanghai - China

Euresys上海联络处

上海市徐汇区云锦路500号绿地汇中心B座802室  
200232

Phone: +86 21 33686220

Email: sales.china@euresys.com

## JAPAN

### **Euresys Japan K.K.**

Expert Office Shinyokohama - Nisso Dai 18 Building, Shinyokohama 3-7-18  
Kouhoku-Ku, Yokohama-Shi 222-0033 - Japan

〒222-0033

神奈川県横浜市港北区新横浜3-7-18 日総第18ビル エキスパートオフィス新横浜

Phone: +81 45 594 7259

Email: sales.japan@euresys.com

More at [www.euresys.com](http://www.euresys.com)

