



EureCard™ GRABLINK™ series

High-speed digital Camera Link image acquisition boards

ADR
TECHNOLOGY

CAMERA
Link
REGISTERED PRODUCT



Compact PCI
form factor

GRABLINK Value™ – GRABLINK Avenue™ – GRABLINK Expert 2™
GRABLINK Value™ cPCI – GRABLINK Expert 2™ cPCI

*Patent pending

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EURESYS
Excellence in vision

EureCard™ GRABLINK™ series

The Grablink series is a range of **high-speed** PCI and cPCI frame grabbers for **line-scan or area-scan digital Camera Link cameras**. State-of-the-art cameras are easily connected with off-the-shelf Camera Link compliant cables. The Grablink series is ideal for industrial applications such as inspection of **high-speed moving objects, web inspection or high-resolution acquisition**.

The EureCard **Grablink Value** is a cost-effective board acquiring images from one camera in the Camera Link Base configuration. The **Grablink Avenue** is a high-performance **64-bit, 66 MHz PCI bus** board acquiring images from one camera in the Camera Link Base configuration. This new board includes a patented feature, ADR Technology™, allowing to facilitate line-scan acquisitions. The EureCard **Grablink Expert 2** is a high-performance 64-bit, 66 MHz PCI bus board acquiring images in two Base configurations or one Medium configuration. The Grablink Value and the Grablink Expert 2 are available in a Compact PCI version.

All Euresys frame grabbers offer an unprecedented **control over the memory allocation process** thanks to scatter-gather DMA transfers into user allocated memory. The Euresys boards come with the **MultiCam driver** available under **Windows and Linux**.

- **Support of line-scan or area-scan cameras in Base, dual Base or Medium Camera Link configurations**
- **Form factors: desktop PCI, 32-bit 33 MHz / 64-bit, 66 MHz bus
6U/4HP Compact PCI, 64-bit 66 MHz bus**
- **Acquisition: up to 24 bits / 48 bits at maximum 85 MHz**
- **On board memory: 8 / 16 / 32 Mbytes**
- **Asynchronous reset, exposure control and I/O lines (trigger & strobe)**
- **Camera Link serial line configurable as an additional PC COM port**
- **Multiple taps, tap reversal, tap multiplex, dynamic windowing**



GRABLINK™ series

Comparison chart

	GRABLINK Value	GRABLINK Value cPCI	GRABLINK Avenue	GRABLINK Expert 2	GRABLINK Expert 2 cPCI
Form factor	Desktop PCI	6U/4HP cPCI	Desktop PCI	Desktop PCI	6U/4HP cPCI
Bus	32-bit, 33 MHz	64-bit, 66 MHz	64-bit, 66 MHz	64-bit, 66 MHz	64-bit, 66 MHz
Camera Link configuration	Base	Base	Base	Base, dual-Base, Medium	Base, dual-Base, Medium
Gray scale	X	X	X	X	X
Color	X	X	X	X	X
Progressive scan	X	X	X	X	X
Max pixel-clock frequency	24 bits@60 MHz	24 bits@60 MHz	24 bits@85 MHz	48 bits@60 MHz	48 bits@60 MHz
Area scan	X	X	X	X	X
Line scan	X	X	X	X	X
ADR Technology™	-	-	X	-	-

Serial control of camera

The EureCard Grablink series supports the Camera Link pseudo **RS-232 serial line**. The application software can use the Camera Link API functions to control the camera. Alternatively, the serial line can be **configured as an additional PC COM port** ensuring interoperability with existing camera control software.

Bus mastering

All Euresys frame grabbers are **PCI bus mastering** agents that directly store the acquired images into the PC physical memory without CPU involvement. As a **unique feature**, the EureCard automatically recovers the **scatter-gather** virtual memory mapping to present the data as a regular bitmap image in a user allocated memory buffer.

Interfaced cameras

The Grablink series interfaces many different cameras. An up-to-date list is available on the **Interfacing Cameras** page on www.euresys.com.

*Patent pending



GRABLINK™ series, frame grabbers for line scan and area scan applications

Line scan applications

Camera modes: the EureCard Grablink series interfaces to **state-of-the-art Camera Link line scan cameras** with **line rate** and **exposure control**. Free running cameras are supported as well.

Continuous web scanning: the «web mode» allows inspecting a continuously moving surface without losing a line.

Successive object scanning: in «page mode», the Grablink acquires a set of consecutive lines constituting a 2D image. The acquisition starts when the object enters the camera field of view, as signaled by an external trigger.

Motion encoder: when the observed web or object moves at a variable speed, the frame grabber imposes a camera scanning rate derived from a motion encoder. **This guarantees a fixed pixel aspect ratio. Perfect square pixels** are achievable. A built-in rate converter of the Grablink boards defines any ratio between the camera scanning rate and the encoder pulse rate with 1/1000 resolution. Thus, an off-the-shelf encoder can serve several applications. The exposure control feature guarantees a **constant sensitivity** despite the speed variation.

ADR Technology*: In many applications, a **line-scan camera** has to be operated at a **constant cycling rate** in order to maintain a **constant sensitivity**. Grablink Avenue implements **ADR***, a **unique downweb resampling feature**, yielding a defined aspect ratio irrespective of web speed variations, even without an electronic shutter on the camera.



A built-in rate converter accommodates an off-the-shelf motion encoder to control the line acquisition process, enabling any **programmable aspect ratio, including perfect square pixels**. ADR* makes the most of the line-scan camera, as the sensitivity is not impaired by the shuttering.

For more information about ADR Technology, download the About ADR Technology flyer on our web site: www.euresys.com.

Area scan applications

Camera modes: features such as **asynchronous reset, exposure control, strobe lighting** often required in industrial applications are available on Grablink series. The synchronous mode is also supported.

Trigger and exposure control: an external signal can be sent to the frame grabber to trigger the acquisition. Grablink series is capable of consistently controlling the exposure time and the illumination.

Camera tap structure: for any tap structure, Grablink delivers a **re-ordered bitmap image** to the PC memory. **Tap-reversal** is supported. With the **multiplex tap** technique, several taps are interleaved over Camera Link as long as the combined data rate remains below the pixel clock frequency specified for the board.



*Patent pending



GRABLINK Value™



Cost effective digital acquisition

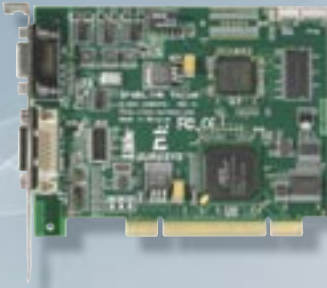
Base configuration

24 bits at 60 MHz

8-Mbyte on board memory

Form factors: desktop PCI, 32-bit 33 MHz bus

6U/4HP Compact PCI 64-bit 66 MHz bus



The **EureCard Grablink Value** is an affordable Camera Link frame grabber for **cost-effective industrial applications**. The Grablink Value is recommended for **single-camera systems**. It acquires images at a maximum camera speed of **60 MHz** over the data path towards the on board memory.

Support of the Base configuration

Fitted with **one Camera Link connector**, the EureCard Grablink Value supports the Base configuration of the Camera Link standard. The Grablink Value **supports various types of cameras**:

CAMERA COMPATIBILITY	Monochrome or Bayer		Color RGB
	single-tap	dual-tap	single-tap
Tap configuration	Base_1T8, Base_1T10, Base_1T12, Base_1T14, Base_1T16	Base_2T8, Base_2T10, Base_2T12	Base_1T24
Camera Link configuration Base	1 tap x (8-10-12-14-16 bits)	2 taps x (8-10-12 bits)	1 tap x (24 bits)

Form factors

The EureCard Grablink Value is available in two form factors. The **Grablink Value PCI** has a **32-bit 33 MHz PCI conventional bus**. The **Grablink Value cPCI** benefits from a **64-bit 66 MHz cPCI bus**. The Compact PCI board (cPCI) serves the purpose of the **industrial applications**. This particular form factor brings a **high resistance to shocks and vibrations** thanks to the **rugged packaging** and the **high-density pin-and-socket connection to the PC**. Besides, cPCI PCs offer many more slots - in the 33 MHz configuration up to eight slots are available-.

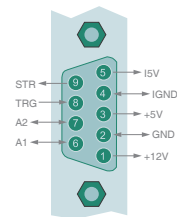


On board memory

The Grablink Value incorporates **8-Mbyte** on board memory. Used as a huge image FIFO, it is clocked at 80 MHz and provides a peak bandwidth of 320 Mbytes/s.

I/O lines

The EureCard Grablink Value is fitted with a **female DB9 connector**. It implements the **trigger and strobe** facilities offered by the MultiCam driver. System components such as motion encoders benefit from **isolated I/O lines and power supply**.



DB9 connector





GRABLINK Avenue™



Ultra-fast digital Camera Link acquisition

- Base configuration - up to 24 bits at 85 MHz-**
- Enhanced support of line-scan cameras, ADR Technology***
- Full support of area-scan cameras (asynchronous reset and exposure control)**
- 9 various external and internal I/O lines**
- 32-Mbyte on board memory**
- 64-bit, 66 MHz PCI bus, 3V/5V signaling**

The **EureCard Grablink Avenue** is an ultra-fast PCI frame grabber for **line-scan or area-scan digital Camera Link cameras**. Grablink Avenue is a high-performance **64-bit, 66 MHz PCI bus** board acquiring images from one camera in the Camera Link **Base configuration**. This board acquires the 24-bit data, with any tap structure, at the **maximum speed of 85 MHz** allowing to be interfaced to the fastest cameras.

With **line-scan cameras**, the Grablink Avenue guarantees a **constant sensitivity** of the image regardless of the web speed variation, thanks to **ADR***, a **unique patented downweb resampler**.

Support of the Base configuration

Fitted with **one Camera Link connector**, the Grablink Avenue supports the Base configuration of the Camera Link standard. Grablink Avenue **supports various types of cameras**.

CAMERA COMPATIBILITY		Monochrome or Bayer			Color RGB
		single-tap	dual-tap	quad-tap	single-tap
Tap configuration		Base_1T8, Base_1T10, Base_1T12, Base_1T14, Base_1T16	Base_2T8, Base_2T10, Base_2T12, Base_2T14B2, Base_2T16B2	Base_4T8B2	Base_1T24, Base_1T24B3, Base_1T30B2, Base_1T36B2, Base_1T36B3, Base_1T42B2, Base_1T42B3, Base_1T48B2, Base_1T48B3
Camera Link configuration	Base	1 tap x (8-10-12-14-16 bits)	2 taps x (8-10-12 bits)	-	1 tap x (24 bits)
	Extended Base*	-	2 taps x (14-16 bits)	4 taps x (8 bits)	1 tap x (24-30-36-42-48 bits)

*Multiplex tap

ADR Technology™* – Advanced Downweb Resampling



In many applications, a line-scan camera has to be operated at a constant cycling rate in order to maintain a constant sensitivity. Grablink Avenue implements ADR*, a unique downweb resampling feature, yielding a defined aspect ratio irrespective of web speed variations, even without an electronic shutter on the camera.

A built-in rate converter accommodates an off-the-shelf motion encoder to control the line acquisition process, enabling any programmable aspect ratio, including perfect square pixels. ADR* makes the most of the line-scan camera, as the sensitivity is not impaired by the shuttering. Download «About ADR Technology» flyer on www.euresys.com.

64-bit 66 MHz PCI bus

The **64-bit, 66 MHz PCI bus** of the Avenue is compatible with all the conventional PCI slots of a PC: from **32-bit, 33 MHz -5V-** to **64-bit, 66 MHz -3V-**. Download «PCI Variation Application Note» flyer on www.euresys.com.

In addition, **Direct Memory Access** for each camera connected and **PCI bus mastering** are offered.

Nine various external and internal I/O lines

The Grablink Avenue is fitted with a **male HD26 external connector** and a **26-pin internal header**. All nine I/O connections are available both from the outside of the PC enclosure or directly from the PCB. System components such as trigger, strobe or motion encoder benefit from different types of interface:

- One **opto-isolated output** for the safe control of external equipment
- Two **differential, including LVDS compatibility, input** lines for high-speed flexible control of the acquisition
- Two **isolated I/O lines and associated power supply** compatible with the other Grablink boards
- Four **enhanced TTL I/O lines** used, for instance, for interface with the user's application



*Patent pending

GRABLINK Expert 2™



High-performance digital acquisition

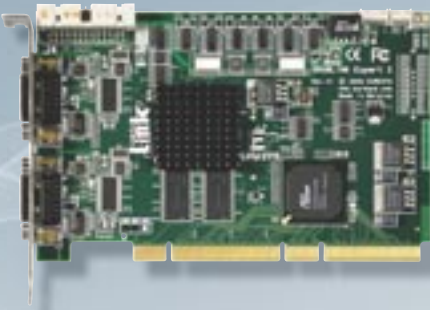
Dual Base or Medium configurations

48 bits at 60 MHz

16-Mbyte on board memory

Form factors: *desktop PCI 64-bit 66 MHz bus*

6U/4HP Compact PCI 64-bit 66 MHz bus



The **EureCard Grablink Expert 2** is a Camera Link frame grabber for **demanding industrial applications**. Supporting the **Base or Medium configurations**, it can be connected to **one or two cameras**. The Grablink Expert 2 is a **64-bit, 66 MHz PCI bus** frame grabber. Each camera delivers images at a maximum speed of 60 MHz over the data paths towards the on board memory.

Support of dual Base or Medium configurations

The Grablink Expert 2 is a Camera Link compatible frame grabber fitted with **two Camera Link connectors**. It acquires images simultaneously and independently from two line-scan or area-scan digital cameras in a **dual Base configuration**. The Grablink Expert 2 also supports one camera in the **Medium configuration**. It supports various types of cameras:

CAMERA COMPATIBILITY	Monochrome or Bayer			Color RGB	
	single-tap	dual-tap	quad-tap	single-tap	dual-tap
Tap configuration	Base_1T8, Base_1T10, Base_1T12, Base_1T14, Base_1T16	Base_2T8, Base_2T10, Base_2T12, Medium_2T14, Medium_2T16	Medium_4T8, Medium_4T10, Medium_4T12	Base_1T24, Medium_1T30, Medium_1T36, Medium_1T42, Medium_1T48	Medium_2T24
Camera Link configuration	Base	1 tap x (8-10-12-14-16 bits)	2 taps x (8-10-12 bits)	-	1 tap x (24 bits)
	Medium	-	2 taps x (14-16 bits)	4 taps x (8-10-12 bits)	1 tap x (30-36-42-48 bits) 2 tap x (24 bits)

Form factors

The EureCard Grablink Expert 2 is available in two form factors, PCI and cPCI. Both are designed for high-speed acquisition with a 64-bit, 66 MHz PCI bus. The Compact PCI board (cPCI) serves the purpose of the **industrial applications**. This particular form factor brings a **high resistance to shocks and vibrations** thanks to the **rugged packaging** and the **high-density pin-and-socket connection to the PC**. Besides, cPCI PCs offer many more slots - in the 33 MHz configuration up to eight slots are available-.

The **64-bit, 66 MHz PCI bus** of the Grablink Expert 2 is compatible with all the conventional PCI slots of a PC: from **32-bit, 33 MHz -5V-** to 64-bit, 66 MHz -3V-. For more information the «PCI Variation Application Note» is available on the download area (www.euresys.com).



On board memory

The Grablink Expert 2 incorporates a **16-Mbyte** on board memory. Clocked at 100 MHz, it provides a throughput of 800 Mbytes/s implementing a **huge FIFO for each camera**.

I/O lines

The Grablink Expert 2 PCI is delivered with an auxiliary I/O board implementing the trigger and strobe facilities. The bracket is fitted with two connectors. On the female DB9 connector, system components (such as a motion encoder) benefit from **isolated I/O lines and power supply**. **TTL trigger and strobe lines** are available on a female DB25 together with **16 fully programmable general-purpose I/O lines**. On the Grablink Expert 2 cPCI, the two I/O connectors, DB 25 and DB 9, are located directly on the front panel.

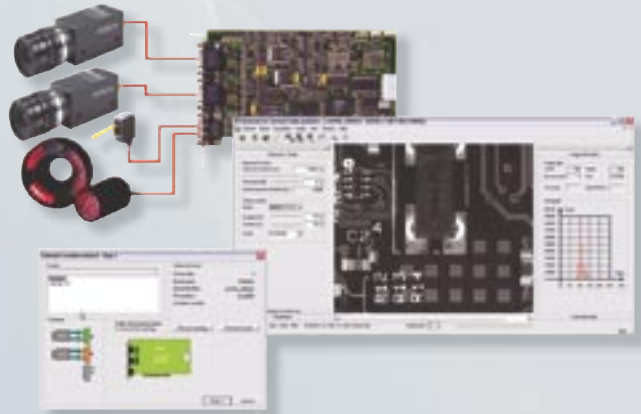


GRABLINK™ series software support

MultiCam™

The **MultiCam driver** enables the consistent control of several Euresys frame grabbers, using an arbitrary **number of cameras**, from **one or several software applications**. MultiCam allows defining **channels** linking cameras to buffers in the PC memory. The MultiCam channel **identifies all parameters** ruling the acquisition process from a camera. Every camera feature, such as its type, resolution or image format, is described and controlled through **simple parameters**, considerably easing the camera control task. For each channel-controlled camera, a set of dedicated parameters is created from a CAM file.

Euresys delivers pre-defined files for many popular cameras; still the user can customize his **CAM files**. MultiCam complies with most development environments. The native API is **standard C. ActiveX controls** enable the use of Visual Basic.



MultiCam™ for Windows and Linux



The MultiCam driver runs under Windows 2000, XP, XP Embedded, Server 2003 and Linux RedHat 8.0. It allows Euresys customers to combine the ease-of use of the MultiCam driver and the eVision software tools with the cost-effectiveness of Linux.

EasyMultiCam™

Offered as a part of the **eVision** tools suite, **EasyMultiCam** is a **set of powerful C++ and .NET classes** embedding the whole MultiCam functionality. The **object oriented** eVision functions define image containers suitable for **image processing and analysis**. Implementing the image capture code into a machine vision application is now straightforward.

Ordering Information

PRODUCT NAME

PRODUCT DESCRIPTION

PART NUMBER

Frame Grabbers

PRODUCT NAME	PRODUCT DESCRIPTION	PART NUMBER
EureCard GRABLINK Value	Digital 24-bit, 60 MHz Camera Link PCI frame grabber	1191
EureCard GRABLINK Value cPCI	Digital 24-bit, 60 MHz Camera Link cPCI frame grabber	1194
EureCard GRABLINK Avenue	Digital 24-bit, 85 MHz Camera Link PCI frame grabber	1198
EureCard GRABLINK Expert 2	Digital 48-bit, 60 MHz Camera Link PCI frame grabber	1197
EureCard GRABLINK Expert 2 cPCI	Digital 48-bit, 60 MHz Camera Link cPCI frame grabber	1196

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