PICOLO™ series

Euresys high-quality video capture boards

200/240 fps constantly available

PCI EXPRESS™

PICOLO Tymo™

PICOLO Alert™
PCI and PCI Express

PICOLO Diligent™
MPEG-4 compression

PICOLO™ series
PICOLO Junior 4™ – PICOLO™ – PICOLO Pro 2™ – PICOLO Pro 3™ – PICOLO Tymo™
PICOLO Tetra™ – PICOLO Alert™ – PICOLO Jet-X™ – PICOLO Diligent™

www.euresys.com
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EURESYS
Excellence in vision

PICOLO series, High-Quality Video Capture Boards

The Euresys Picolo boards are top-quality video acquisition boards compatible with standard cameras. They are dedicated to high-end applications in the fields of video surveillance and security, or entry-level applications in the field of machine vision.

These boards faithfully digitize the video signal provided, offering perfect image fidelity to make the most of the data provided by a camera.

The Euresys Picolo boards are at the leading edge of the technology: they offer ultra-performant features to empower security applications or industrial applications such as quality control and production monitoring.

Acquisition

- **Format**
  - *Color (PAL, NTSC)*
  - *Monochrome (CCIR, EIA)*

- **Full resolution images**
  - *Up to 640 x 480 (NTSC / EIA)*
  - *Up to 768 x 576 (PAL / CCIR)*

- **Full-frame** or **single-field** *images*

- **Image size**
  - *All sizes supported, high-quality hardware scaler*
  - *Built-in arbitrary cropping to a region of interest*

- **Real-time acquisition** *from one to four cameras*

- **Quick switching** *acquisition between up to 16 video sources*

Storage

- **Image format storage:** *all popular color formats such as RGB, YUV, planar or packed*

- **Direct capture** *of individual frames as well as video sequences to PC memory*

Compression

- **Picolo Jet-X**
  - *four on-board JPEG encoders*

- **Picolo Diligent**
  - *four MPEG-4 compression chips*
  - *Microsoft codec MP4S and DivX codec DX50*

Software

- Euresys **MultiCam drivers**

- Euresys dedicated **DirectShow filters**
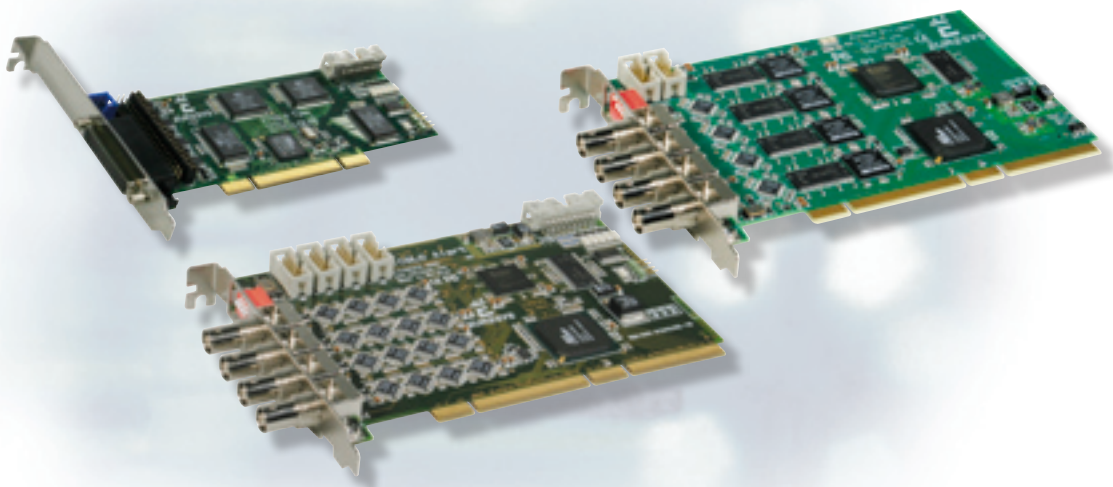
PICOLO series comparison chart

	PICOLO Junior 4	PICOLO	PICOLO Pro 2	PICOLO Pro 3	New PICOLO Tymo	PICOLO Tetra	New PICOLO Alert	PICOLO Jet-X	New PICOLO Diligent
Form factor	32-bit, 33 MHz PCI	32-bit, 33 MHz PCI	32-bit, 33 MHz PCI	32-bit, 33 MHz PCI	32-bit, 66 MHz PCI Low Profile compatible	64-bit, 66 MHz PCI	64-bit, 66 MHz PCI PCI Express x1	64-bit, 133 MHz PCI-X	64-bit, 66 MHz PCI
Video resolution	Square - Broadcast Qcif ⇨ Free	Square - Broadcast Qcif ⇨ Free	Square - Broadcast Qcif ⇨ Free	Square - Broadcast Qcif ⇨ Free	Square - Broadcast Qcif ⇨ Free	Square - Broadcast Qcif ⇨ Free	Square - Broadcast Qcif ⇨ Free	Square - Broadcast Qcif ⇨ Free	Square - Broadcast Qcif ⇨ Free
Video acquisition rate (fields per second)	Up to 50 / 60 fps	Up to 50 / 60 fps	Up to 50 / 60 fps	Up to 50 / 60 fps	Up to 200 / 240 fps	Up to 200 / 240 fps	200 / 240 fps constantly available	Up to 200 / 240 fps	200 / 240 fps constantly available
Nr. of real time cameras per board	1	1	1	1	4	4	4	4	4
Max. cameras per board	4	3	4	16	16	16	16	16	4
Video acquisition type	Real-time ⇨ Switching	Real-time ⇨ Switching	Real-time ⇨ Quick switching	Real-time ⇨ Quick switching	Real-time ⇨ Quick switching	Real-time ⇨ Quick switching	Real-time ⇨ FPGA digital switching	Real-time ⇨ Quick switching	Real-time
Euresys FPGA Technology	-	-	-	-	-	-	✓	-	✓
Hardware compression	-	-	-	-	-	-	-	JPEG - MJPEG	MPEG-4 Codecs: MP4S - DX50
Video connectors	BNC	BNC/S-Video/DB9	BNC	BNC	HD-44	BNC	BNC	BNC	BNC
Video output	-	-	-	-	1 selected with cascade input	4	-	4	1 selected with cascade input
Max I/O lines	0	4	13	20	9 professionals lines	13	9 professionals lines	13	-
Watchdog	-	-	-	✓	✓	✓	✓	✓	-
Size	120x90 mm 4,72x3,54 in	121x70 mm 4,76x2,76 in	121x85 mm 4,76x3,34 in	125x107 mm 4,92x4,21 in	168x64 mm 6,61x2,51 in	168x107 mm 6,61x4,21 in	PCI: 168x107 mm 6,61x4,21 in PCIe: 168x111 mm 6,61x4,37 in	265 x 117 mm 10,43 x 4,60 in	168 x 107 mm 6,61 x 4,21 in

Euresys Expansion Modules

MIO -I/O Module-	-	-	-	✓	-	✓	-	✓	-
VEB -Video Expansion Bracket-	-	-	-	-	-	3 for video in 1 for video out	3 for video in	3 for video in 1 for video out	1 for video out
Module Pro 3	-	-	-	✓	-	-	-	-	-

Software

DirectShow filter	✓	✓	✓	✓	✓	✓	✓	✓	✓
MultiCam driver	✓	✓	✓	✓	✓	✓	✓	✓	✓
VideoStorage 1.1	-	-	-	-	-	-	-	✓	✓
Starting kit	-	-	-	-	-	-	-	✓	-
eVision license support	-	✓	✓	✓	✓	✓	✓	✓	✓

PICOLO series general features

Acquisition – The Picolo boards acquire images that are **scalable**, before PCI transfer to the PC, to any smaller format down to 1/12. This process involves a sophisticated hardware device, performing an accurate interpolation in both directions, horizontal and vertical. The image buffer for a downscaled image is smaller, and its transfer requires less PCI bandwidth. Moreover, the image transfer can be restricted to a rectangular region of interest. All desirable adjustments can be applied to the images during the acquisition, such as video **contrast, brightness, color saturation** and **hue** (NTSC).

Synchronization – A **fully digital** technique is used to synchronize the digitizer operation on the incoming video signal. This ensures a stable and robust operation despite the varying video conditions. The Euresys video capture boards robustly support poor video signals issued by a low-end VCR. When using high-quality video surveillance cameras, the acquisition performance is exemplary, as demonstrated by a **jitter figure in the nanosecond range**.

Bitmap image formats – Before storing the acquired image into the destination memory buffer, a pixel format conversion takes place in real-time. Numerous color or monochrome formats are available such as packed RGB32, RGB24, RGB16, RGB15, YCrCb 4:2:2, YCrCb 4:1:1, Y8 or such as planar YCrCb 4:2:2, YCrCb 4:1:1, YCrCb 4:2:0, YCrCb 4:1:0, YCbCr 4:2:0, YCbCr 4:1:0. For a complete list, consult our web site.

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

Jumpers – The Picolo inputs feature a **removable 75-Ohm termination resistor** enabled by a jumper or a dip-switch (Picolo Tetra, VEB, Picolo Alert and Diligent).

New Compact And Cost-Effective Video Capture Board With 16 Inputs

PICOLO Tymo™

- **16 video-channels PAL / NTSC**
- **One compact HD-44 video connector and its corresponding internal header**
  - *Sixteen video inputs*
  - *Four S-Video inputs*
  - *One video output*
  - *One cascade video input*
- **Small form factor**
- **Watchdog and 9 professional I/O lines**
- **Universal PCI: 32-bit, 66 MHz, 3V / 5V**
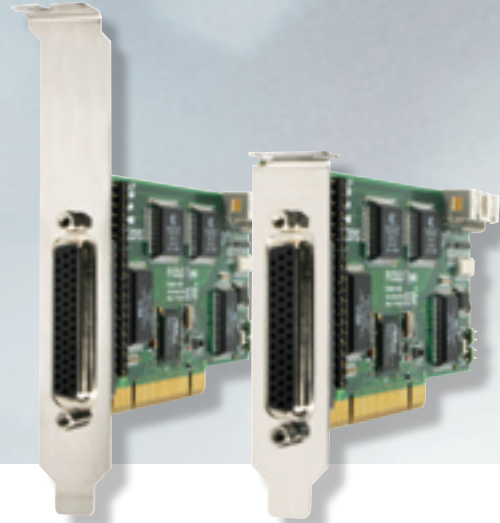
The Picolo Tymo is a **cost-effective** and **compact 16-camera** video capture board. Thanks to its four color video digitizers, the Picolo Tymo acquires four real-time image sequences in parallel from composite or S-Video cameras. This Picolo card benefits from a **small PCB size** and a 16-camera compact connector. The board is delivered with a choice of two different brackets -**regular or Low Profile**-. A video output and numerous general-purpose input / output lines are provided for easy system integration.

Small form factor

The Picolo Tymo PCB is no larger than 168 mm x 64 mm (6.61 in x 2.51 in). This small PCB size corresponds to the Low Profile form factor. Two brackets are delivered with allowing to install the board in either a low profile small standard PC or in a conventional larger PC. All video signals are available on one single compact standard connector.

One compact HD-44 video input connector

Sixteen composite video inputs, four chroma inputs, one video output and one cascade input are available on the bracket or internally through a header connector.

Four S-Video inputs - In applications using high-quality S-Video cameras, Picolo Tymo interfaces up to four such cameras allowing full resolution real-time acquisition on four channels. Picolo Tymo also supports a mix of composite and S-Video cameras as long as only one camera type is connected to a single digitizer.

One video output - To take advantage of standard video monitors often available in video surveillance systems, the Picolo Tymo is equipped with a composite video output.

One cascade video input - Through the use of its cascade video input, the Picolo Tymo is able to echo on its video output the signal available on any of the video inputs of any Picolo Tymo board in the system.

Camera connector
HD44F
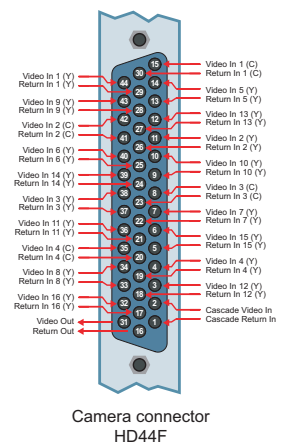
I/O and watchdog

The Picolo Tymo is equipped with nine Euresys professional I/O lines: four contact-closure inputs and five solid-state relay outputs. The board includes a full featured watchdog, which is backward compatible with Picolo Tetra.

32-bit, 66 MHz PCI bus, 3V and 5V compliant

The Picolo Tymo offers a 32-bit, 66 MHz, 3V and 5V compliant PCI bus. It allows to get the maximum out of its architecture and to operate multiple boards in parallel on a single PCI bus. The Tymo can be plugged in any PCI or PCI-X slot.

A New Generation Of Euresys FPGA-Based Video Capture Boards

PICOLO Alert™
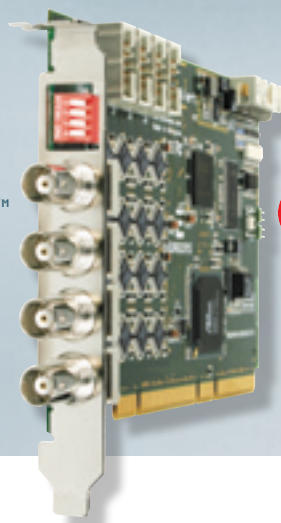
200/240 fps constantly available

PICOLO Diligent™

Euresys presents new Picolo boards making the difference in a DVR!

Equipped with the **video-surveillance FPGA technology from Euresys**, the Picolo Alert and the Picolo Diligent bring the video capture boards to an unrivalled level of **video-acquisition speed and image quality**. In addition, the Euresys unique video-surveillance FPGA approach allows each camera to feed two independent destinations. Therefore, **capture and preview functions** are simultaneously available for each camera. Both are fully configurable for acquisition rate, image resolution, cropping, scaling, contrast, brightness, saturation, storage format…

DirectShow users will naturally take advantage of these Picolo boards performances through a dedicated filter. All the standard DirectShow features, such as property pages or time stamping, are supported.

Euresys video-surveillance FPGA technology

- Controllable frame rate and acquisition parameters
Each video channel benefits from an **independently programmable frame rate**. The user is able to choose the applied frame rate according to the requirements of the application. A maximum of **four real-time channels** can run simultaneously. The image **acquisition is fully configurable** for image resolution, pixel size, cropping, scaling, contrast, brightness, saturation, storage format… The commonly used **size formats** are predefined: Qcif, Cif, Field and Frame, with square pixels or broadcast resolution.
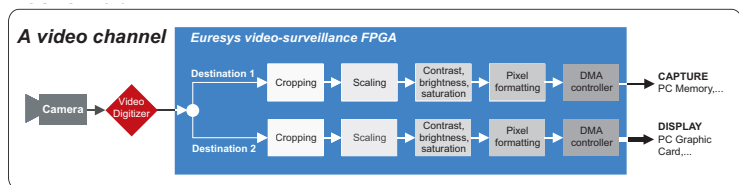
- Stable images regardless of video parity
Thanks to the Euresys video-surveillance FPGA, the new Picolo boards **process the acquired images on the fly** eliminating all issues related to the parity management without requiring any processing power from the PC.

- Two destinations per camera for simultaneous capture and preview functions
Each camera independently delivers data to two different memory locations in the PC, including the graphic card.

- Accurate time stamping

A video channel — Euresys video-surveillance FPGA
Camera → Video Digitizer
Destination 1: Cropping → Scaling → Contrast, brightness, saturation → Pixel formatting → DMA controller → CAPTURE PC Memory,…
Destination 2: Cropping → Scaling → Contrast, brightness, saturation → Pixel formatting → DMA controller → DISPLAY PC Graphic Card,…
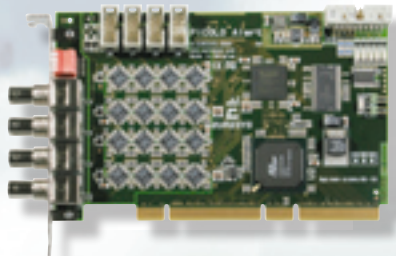
200/240 fps constantly available and non disruptive acquisition

This is not a peak value as the new Picolo boards provide a constant availability of **240 fps for NTSC** cameras or **200 fps for PAL cameras with any camera configuration**. The video-surveillance FPGA performs an **automatic removal of interlacing artefacts** in field mode. This architecture includes a **large frame store**. It allows an automatic and smooth regulation of the frame rate in case of a system overuse of the PCI bus. This frame store also ensures a non disruptive image delivery to the PC memory regardless of PCI bus latencies.

A natural match with the DirectShow API

PICOLO Alert™

Ultra-fast multiple-channel video capture board

- **Proprietary video-surveillance FPGA**
  - **Simultaneous capture and preview functions**
- **16 video inputs**
- **200 / 240 fps constantly available**
- **Form factors:**
  - **Universal PCI: 64 / 32 bits, 66 / 33 MHz, 3V / 5V**
  - **PCI Express x1**

The Picolo Alert is a **multiple-channel ultra-fast** video capture board. Equipped with the **Euresys video-surveillance FPGA**, the Picolo Alert is able to acquire images from up to **sixteen independent cameras** with a total digitizing power of **200 / 240 fps** constantly available. The user is free to share this digitizing power between the sixteen channels, according to the requirements of the application.

Sixteen video inputs and 200 / 240 fps constantly available

As a unique feature, the Alert offers the ability to share a total digitizing power of 200 / 240 fields per second (100 / 120 ips) among the sixteen video channels **without switching delay**. With the dedicated Euresys video-surveillance FPGA, this high acquisition rate is always fully available independently of the camera synchronization type.

NTSC cameras	4-camera configuration		16-camera configuration	
	/board	/camera	/board	/camera
Cif/s or Field/s	240	60	240	15
Image/s	120	30	120	7.5

PAL cameras	4-camera configuration		16-camera configuration	
	/board	/camera	/board	/camera
Cif/s or Field/s	200	50	200	12.5
Image/s	100	25	100	6.25

Form Factors

The Picolo Alert is available under two form factors, conventional PCI or PCI Express.

The **Picolo Alert PCI** offers a PCI bandwidth of 200 MByte/s enabling the most demanding applications. The high-bandwidth 64-bit, 66 MHz PCI bus of the Picolo Alert is compatible with all the conventional PCI slots of a PC: from 32-bit, 33 MHz -5V- to 64-bit, 66 MHz -3V-.
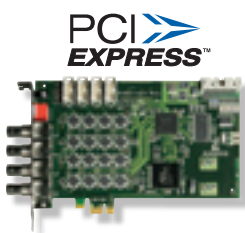
PCI EXPRESS™

PCI Express is a robust serial point-to-point interface offering high-speed bandwidth to each connected device.

The **Picolo Alert PCIe** is featured with a 1-lane (x1) PCI Express interface offering a large bandwidth of 2x180Mbytes/s. A 1-lane board is universal as it is compatible with all PCI Express connectors.

The «PCI Variation Application Note» and the "PCI Express Technology Note" are available on the Euresys web site -download area- for further information.

Connections for the 16 video inputs
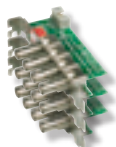
Four robust BNC connectors are provided on-board for the main video channels. The 12 additional inputs are to be connected internally.

For this purpose, Euresys offers Video Expansion Brackets (VEB) for 4 cameras. Alternatively, all 16 video sources can be connected internally via the four on-board headers.
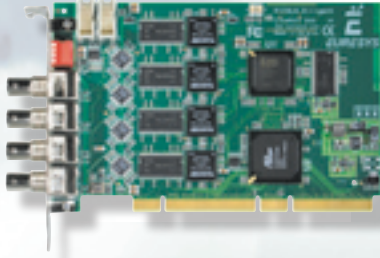
Professional I/O lines and configurable hardware watchdog

An internal 20-pin header offers 9 professional I/O lines to trigger the image capture, to strobe during the acquisition or to interface to alarm system.

- five solid-state relay outputs
- four contact-closure inputs
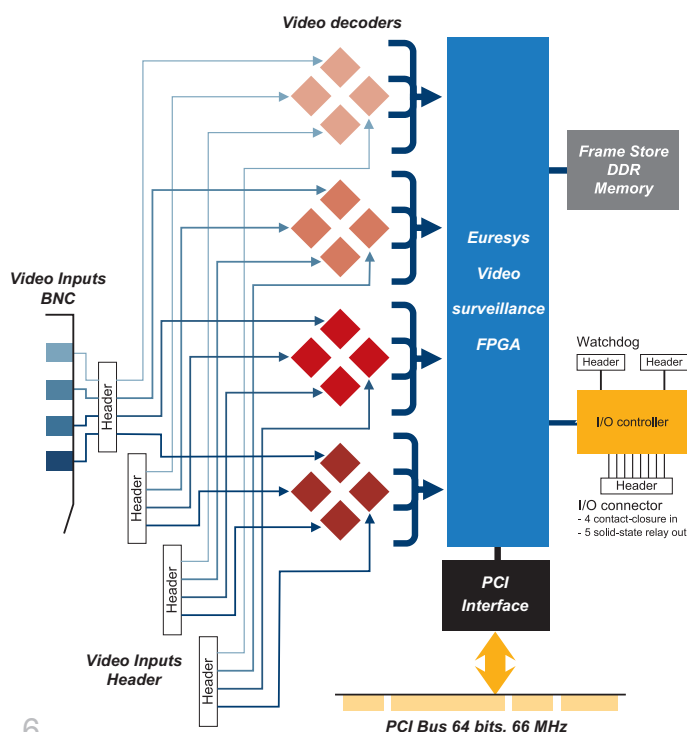
PICOLO Diligent™

Full D1 video capture and MPEG-4 compression board

- **Proprietary video-surveillance FPGA**
  - *Simultaneous full D1 preview and full D1 compressed capture*
- *4 video inputs*
- *Real-time MPEG-4 acquisition in full D1 format*
- *200 / 240 fps constantly available*
- *Universal PCI: 64 / 32 bits, 66 / 33 MHz, 3V / 5V*
- *One selected video output with cascading capability*

The Picolo Diligent is a **4-channel** video capture and **MPEG-4 compression** board. Equipped with the **Euresys video-surveillance FPGA**, the Picolo Diligent provides **in real-time four full D1 video streams** to the PC and, **simultaneously**, **four full D1 compressed video streams**.

Four video inputs and 200/240 fps constantly available

The Picolo Diligent is able to acquire images from up to **four independent cameras** and simultaneously transfer **the full D1 MPEG 4 streams** and the **full D1 uncompressed video images** at 25 / 30 frames per sec from all four cameras.

Real-time full D1 preview and simultaneous full D1 compressed capture

The Picolo Diligent is equipped with **four MPEG-4 compression chips**. The MPEG-4 compressed format issued is compatible with the **Microsoft codec MP4S** and the **DivX codec DX50**.

PCI bus and compatibility

The Picolo Diligent offers a PCI bandwidth of 200 MByte/s **enabling the most demanding applications**. The high bandwidth 64-bit, 66 MHz PCI bus of the Picolo Diligent is **compatible with all the conventional PCI slots** of a PC: from 32-bit, 33 MHz -5V- to 64-bit, 66 MHz -3V-.

The «PCI Variation Application Note» is available on the Euresys web site -download area- for further information.

Video inputs

The Picolo Diligent is equipped with four robust on boards **BNC connectors**. Alternatively, a four-video inputs header allows to **connect the cameras internally** the cameras.

Video output

A **video output** is available to display the different sources one at a time. The customer directs to an analog monitor one of the four video inputs or the fifth cascade input.
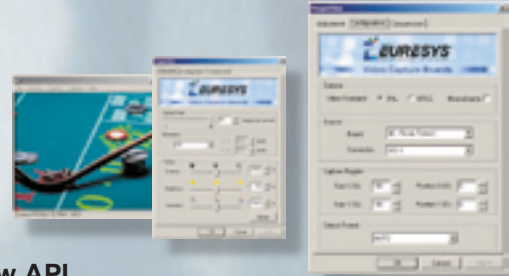
This cascade input allows to select a video source coming from other Picolo Diligent boards installed in the same system.
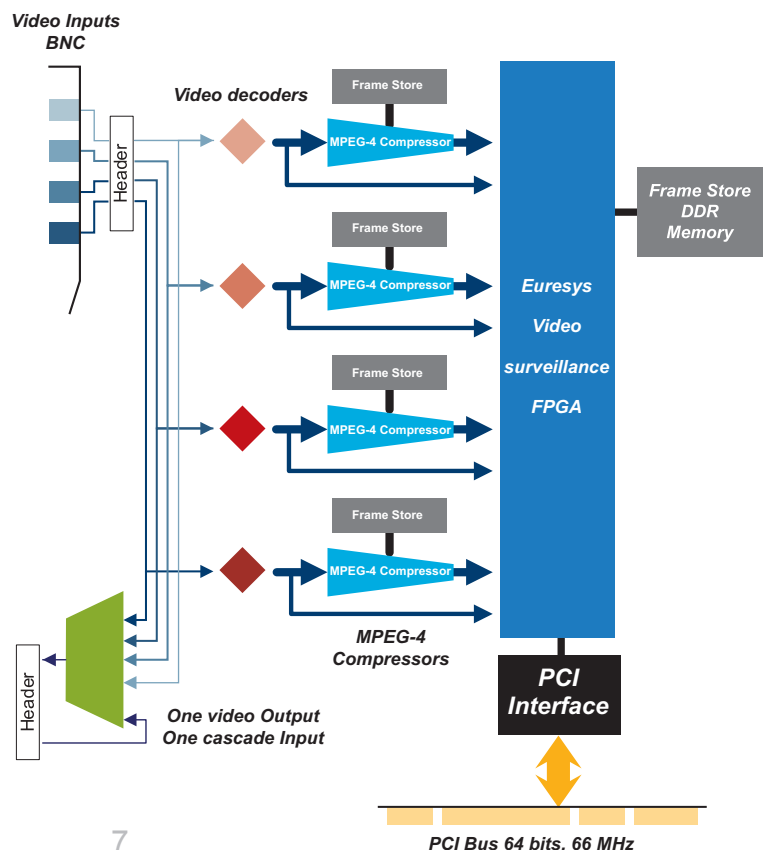
Software Support

Euresys DirectShow source filters

Euresys provides dedicated DirectShow source filters for rapid application development. All the standard DirectShow features, such as property pages or time stamping, are supported.

PICOLO Alert & Diligent, a natural match with the DirectShow API

Thanks to the Euresys FPGA technology, the design of the Picolo Alert and Diligent boards naturally matches the DirectShow API. The **double destination per video channel feature** is implemented directly from the video acquisition on the board. DirectShow users naturally benefit from it. The Picolo Diligent acquisition and compression board simultaneously provides four live full D1 video streams for display and four live full D1 compressed video streams for recording or broadcasting. **Time stamping** is performed on board, directly in the FPGA conferring to it a particularly high accuracy. This allows the perfect time localisation of events or images and a precise and smooth playback.
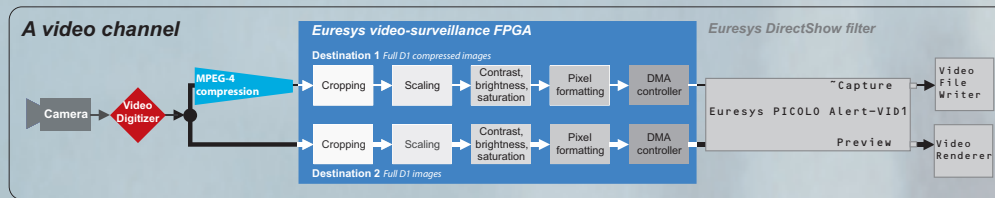
Euresys MultiCam™ drivers

MultiCam™ - MultiCam is the foundation driver that enables the consistent control of several Euresys capture boards, using an arbitrary number of cameras, from one or several software applications.

The MultiCam driver automatically manages cameras and capture boards to optimize the acquisition speed and the display refresh rate. MultiCam complies with most popular development environments and most programming languages. See on our web site for a complete compatibility chart: www.euresys.com.

MultiCam™ for Windows and Linux - The MultiCam driver runs under Windows 2000, XP, XP Embedded and 2003 server. MultiCam is available under Linux Suse 10, allowing Euresys customers to combine the ease of use of the MultiCam driver 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. Thanks to these tools, building an object oriented video-surveillance application is straightforward.

Ordering Information

PRODUCT NAME	PART NUMBER	PRODUCT NAME	PART NUMBER
Video Capture boards			
PICOLO Junior 4	1401	PICOLO Tetra	1303
PICOLO	1155	PICOLO Alert PCI	1305
PICOLO Pro 2	1157	PICOLO Alert PCIe	1641
PICOLO Pro 3	1158	PICOLO Diligent	1307
PICOLO Tymo	1402	PICOLO Jet-X	1302
Video & I/O Modules		**Starting kit**	
Module Pro 3	1201	Starting Kit Picolo Jet-X	2302
Video Expansion Bracket (Tetra & Alert)	1203		
MIO Module	1202		

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Your distributor

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