PICOLO™ series

High-quality video capture boards

PCI EXPRESS™

PICOLO Alert Compact PCIe™

NEW PICOLO Diligent Plus™

MPEG-4 on-board compression

NEW PICOLO V16 H.264™

H.264 on-board compression

PICOLO™ series

PICOLO™ – PICOLO Junior 4™ – PICOLO Pro 2™ – PICOLO Pro 3™ – PICOLO Tymo™ – PICOLO Tetra™
PICOLO Alert™ – PICOLO Alert PCIe™ – PICOLO Alert Compact™ – PICOLO Alert Compact PCIe™
PICOLO Diligent™ – PICOLO Diligent Plus™ – PICOLO V16 H.264™

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The PICOLO™ series Comparison Chart

Video acquisition boards

	PICOLO	PICOLO Junior 4	PICOLO Pro 2	PICOLO Pro 3	PICOLO Tymo	PICOLO Tetra	PICOLO Alert PICOLO Alert PCIe	PICOLO Alert Compact PICOLO Alert Compact PCIe
PCI interface(s)	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	64-bit, 66 MHz PCI	64-bit, 66 MHz PCI or PCI Express x1	64-bit, 66 MHz PCI or PCI Express x1
Video resolution	Square - Broadcast QCIF => Full D1	Square - Broadcast QCIF => Full D1	Square - Broadcast QCIF => Full D1	Square - Broadcast QCIF => Full D1	Square - Broadcast QCIF => Full D1	Square - Broadcast QCIF => Full D1	Square - Broadcast QCIF => Full D1	Square - Broadcast QCIF => Full D1
Video acquisition rate *fps= fields per second ips=images per second*	Up to 50/60 fps, up to 25/60 ips	Up to 50/60 fps, up to 25/60 ips	Up to 50/60 fps, up to 25/60 ips	Up to 50/60 fps, up to 25/60 ips	Up to 200/240 fps, up to 100/120 ips	Up to 200/240 fps, up to 100/120 ips	200/240 fps, up to 100/120 ips constantly available	200/240 fps, up to 100/120 ips constantly available
Nr. of real time cameras *per board*	1	1	1	1	4	4	4	4
Max. cameras *per board*	3	4	4	4 + 12*	16	16	16	16
S-Video inputs	1	-	-	-	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 => Digital switching Two simultaneous streams per camera	Real-time => Digital switching Two simultaneous streams per camera
Hardware compression	-	-	-	-	-	-	-	-
Video input connector *On the bracket* *Internally* *75-Ohm termination resistor*	*BNC/S-Video/DB9* - *Internal jumpers*	*4 BNC* - *Internal jumpers*	*4 BNC* - *Internal jumpers*	*4 BNC* *for 2 Modules Pro 3* *Internal jumpers*	*HD44F* *2 PH40M* *Internal jumpers*	*4 BNC* *3 PH10M* *Piano-switches*	*4 BNC* *4 PH10M* *Piano-switches*	*HD44F* - *Piano-switches*
Video output	-	-	-	-	1 selected with cascade input	4	-	-
Size	121 x 70 mm 4,76 x 2,76 in	120 x 90 mm 4,72 x 3,54 in	121 x 85 mm 4,76 x 3,34 in	125 x 107 mm 4,92 x 4,21 in	Low profile Half lenght	Full height Half lenght	Full height Half lenght	Full height Half lenght
Input Output Lines								
I/O connector(s) *On the bracket* *Internal*	DB9F -	- -	- PH16M	RJ45F PH10M *for MIO Link*	- PH20M	- PH16M, PH10M *for MIO Link*	- PH20M	- PH20M
Max I/O lines *On-board input lines* *On-board output lines* *On-board bidirectional lines*	4 - - *4 TTL*	-	13 - - *13 TTL*	5 + 40** - - *5 TTL*	9 professionals *4 contact-closure* *5 solid-state relay* -	13 + 40** - - *13 TTL*	9 professionals *4 contact-closure* *5 solid-state relay* -	9 professionals *4 contact-closure* *5 solid-state relay* -
Serial I/O port	-	-	-	1 RS485	-	-	-	-
Watchdog	-	-	-	✔	✔	✔	✔	✔
Modules and Accessories								
MIO *I/O Module*	-	-	-	✔	-	✔	-	-
VEB *Video Expansion Bracket*	-	-	-	-	-	3 for video in 1 for video out	3 for video in	-
Module Pro 3	-	-	-	✔	-	-	-	-
Spider cable *Connectors: HD44M - 16 BNC*	-	-	-	-	✔	-	-	✔
Drivers								
MultiCam *for Windows®* *for Linux*	✔ ✔	✔ ✔	✔ ✔	✔ ✔	✔ ✔	✔ ✔	✔ ✔	✔ ✔
Euresys DirectShow filters	✔	✔	✔	✔	✔	✔	✔	✔
Programming languages	C, C++, .NET classes and ActiveX controls							

*With 1 additional Module 12 Pro 3 or 3 additional Module Pro 3 **Up to 20 optically isolated Input lines and 20 relay output lines with 5 additional MIO modules

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Video acquisition and compression boards

	PICOLO Diligent	PICOLO Diligent Plus	NEW PICOLO V16 H.264
PCI interface(s)	64-bit, 66 MHz PCI	PCI Express x1	PCI Express x1
Video resolution	Broadcast QCIF => full D1	Broadcast QCIF => full D1	Broadcast (Raw image: 4CIF, CIF, QCIF) (Compressed image: 4CIF, CIF)
Video acquisition rate *fps= fields per second ips=images per second*	200/240 fps, 100/120 ips constantly available	200/240 fps, 100/120 ips constantly available	400/480 ips
Nr. of real time cameras *per board*	4	4	16
Max. cameras *per board*	4	4	16
S-Video inputs	-	-	-
Video acquisition type	Real-time, Simultaneous compressed and raw streams per camera	Real-time, Simultaneous compressed and raw streams per camera	Real-time, Simultaneous compressed and raw streams per camera
Hardware compression	MPEG-4 Part 2	MPEG-4 Part 2	H.264 (MPEG-4 Part 10): Base Profile (Level 3.1)
Video input connector *On the bracket* *Internally* *75-Ohm termination resistor*	*4 BNC* *Internal headers* *Piano-switches*	*4 BNC* *Internal headers* *Piano-switches*	*HD44F* *Internal headers* *Internal slides-switches*
Video output	1 selected with cascade capability	1 selected with cascade capability	1 selected with cascade capability
Size	Full height Half lenght	Full height Half lenght	Full height Half lenght
Audio			
Line-level analog audio input **Internal connector**	- -	- -	16 HH34M
Input Output Lines			
I/O connector(s) *On the bracket* *Internal*	- -	- PH20M	- HH34M, PH4M
Max I/O lines *On-board input lines* *On-board output lines* *On-board bidirectional lines*	-	9 professionals *4 contact-closure* *5 solid-state relay* -	32 professionals *16 contact-closure* *16 solid-state relay* -
Serial I/O port	-	-	-
Watchdog	-	✔	✔
Modules and Accessories			
MIO *I/O Module*	-	-	-
VEB *Video Expansion Bracket*	1 for video out	1 for video out	-
Module Pro 3	-	-	-
Spider cable *Connectors: HD44M - 16 BNC*	-	-	✔
Drivers			
MultiCam *for Windows®* *for Linux*	✔ ✔	✔ ✔	- -
Euresys DirectShow filters	✔	✔	Picolo V16 H.264 DirectShow driver
Programming languages	C, C++, .NET classes and ActiveX controls		C++

*With 1 additional Module 12 Pro 3 or 3 additional Module Pro 3 **Up to 20 optically isolated Input lines and 20 relay output lines with 5 additional MIO modules

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The PICOLO™ series

PICOLO™

PICOLO Junior 4™

PICOLO Pro 2™

PICOLO Pro 3™

PICOLO Tymo™

PICOLO Tetra™

PICOLO Alert™
PICOLO Alert PCIe™

PICOLO Alert Compact™
PICOLO Alert Compact PCIe™

PICOLO Diligent™
PICOLO Diligent Plus™

PICOLO V16 H.264™

Common Features

The Euresys Picolo boards are **top-quality video acquisition boards** compatible with standard PAL or NTSC 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 such as quality control and production monitoring. These boards faithfully digitize the video signal provided, offering **perfect image fidelity** to make the most of the data provided by a camera.

Acquisition

- ***Standards*** *Color (PAL, NTSC), monochrome (CCIR, EIA)*
- ***Image size***
  - *Broadcast resolution: up to 720 x 488 NTSC / EIA, 720 x 576 PAL / CCIR*
  - *Square pixels: up to 640 x 488 NTSC / EIA, 768 x 576 PAL / CCIR*
    The Picolo Diligent and V16 H.264 boards support only broadcast resolutions
  - *Frame, field, CIF, QCIF and custom image formats*
    In the broadcast resolution, the Picolo V16 H.264 supports for the raw image: 4CIF, CIF, QCIF
    for the compressed image: 4CIF, CIF
  - *Possible horizontal and vertical hardware scaler*
  - *Possible built-in arbitrary cropping to a rectangular Region Of Interest*
- ***Image adjustments*** *such as video contrast, brightness, color saturation and hue - NTSC only -*
- ***Wide range of boards with various possible number of camera***
  - *Real-time acquisition from one to 16 cameras*
  - *Quick acquisition switching for up to 16 cameras*

Storage

- ***Image format storage:*** *Numerous color or monochrome formats are available including all popular color formats such as RGB, YUV, planar or packed.*
  For a complete list, consult the Picolo series product page on www.euresys.com.
- ***Direct capture*** of individual frames as well as video sequences to PC memory

On-board Compression

- ***Picolo Diligent boards:*** *four MPEG-4 compression chips*
- ***Picolo V16 H.264:*** *H.264 real-time compression on 16 video inputs*

Synchronization

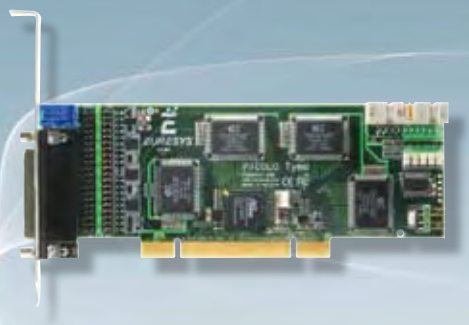
A fully digital technique is used to synchronize the digitizer operation on the incoming video signal. This ensures a **stable and robust operation** despite the varying video conditions. The Euresys video capture boards robustly support poor video signals issued by a low-end VCR. When using high-quality 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.

Bus Mastering

All Euresys 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.



PICOLO Tymo™

Compact and cost-effective video capture board with 16 inputs

***16 video inputs** - up to 200 / 240 fps*
One compact HD-44 video connector** plus the corresponding **internal header
***Form factor:** **Conventional PCI** 32-bit, 66 MHz, 3V or 5V signaling*
*Small PCB size with **regular and low profile brackets***

Fitted with four color video digitizers, the Picolo Tymo acquires four real-time image sequences in parallel from composite or S-Video cameras.

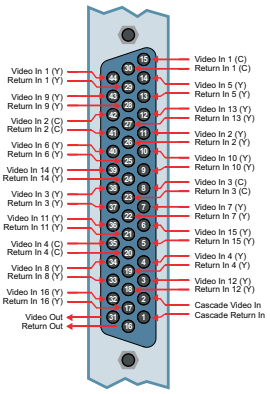
Single HD-44 video input connector for 16 video inputs

The choice of a single connector for multiple and various video inputs is cost-effective and allows customized and robust integrations.

Sixteen composite video inputs, 4 S-Video inputs among them
4 high-quality S-Video cameras can be connected for real-time acquisition with full resolution. A mix of composite and S-Video cameras can be connected as long as only one s-Video camera is connected to a single digitizer.

One video output to take advantage of standard video monitors often available in video surveillance systems.

One cascade video input to echo the signal available on any of the video inputs of any Picolo Tymo board in the system.



Camera connector
HD44F

9 professional I/O lines and a configurable hardware watchdog

On an internal 20-pin header:

4 professional input lines

- Contact-closure inputs that can be directly connected to:
  - Switches
  - Relays
  - Opto-coupled devices
  - 5V or TTL output
  - 12V or 24V output
- Providing a very high common-mode immunity

5 professional output lines

- Solid-state relay outputs that can be directly connected to:
  - Relays
  - Opto-coupled devices
  - TTL inputs with pull-up or pull-down resistor

Direct connection to various kinds of devices
Trigger, strobe, interface to alarm systems, …

Not sensitive to polarity

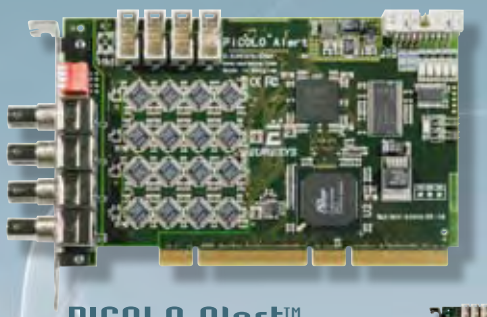
A **Spider Cable** equipped with an HD44M connector and 18 BNC is available separately on request for a straightforward evaluation of the board.

Software

MultiCam driver **for Microsoft Windows** 2000®, XP®, Server 2003® and Vista®
for Suse Linux Enterprise Server 10

Euresys dedicated **DirectShow filters**

Programming languages C, C++, .NET classes and ActiveX controls

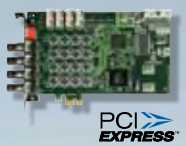


PICOLO Alert™ boards

Ultra-fast multiple-channel video capture boards

***16 video inputs** - 200 / 240 fps constantly available*
***Simultaneous capture and preview functions** - Proprietary video-surveillance FPGA -*
***Form factors:** **Conventional PCI** 64 bit, 66 MHz, 3V or 5V signaling*
***PCI Express** Full-height, half-length, x1*

PICOLO Alert™ PICOLO Alert PCIe™



Video input connectors

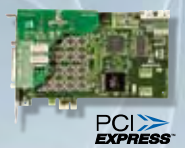
4 BNC on the board bracket

4 internal on-board headers

VEB -Video Expansion Brackets- compatible

- 12 additional inputs connected internally with 3 VEB
- 4 cameras connected on the board BNC connectors

PICOLO Alert Compact™ PICOLO Alert Compact PCIe™



One compact HD-44 video connector

On the bracket:

- 16 video inputs
- Compatible with the Picolo Tymo HD-44 connector
- A Spider Cable, equipped with an HD44M and BNC connectors, is available separately on request for a straightforward evaluation of the board.

Equipped with the Euresys video-surveillance FPGA, they are 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.

16 video inputs

200 / 240 fps constantly available

This is not a peak value! As a unique feature, the Alert boards offer 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.

PAL / NTSC cameras	4-camera configuration		16-camera configuration	
	/board	/camera	/board	/camera
Cif/s or Field/s	200 / 240	50 / 60	200 / 240	12.5 / 15
Image/s	100 / 120	25 / 30	100 / 120	6.25 / 7.5

- Automatic removal of interlacing artefacts in field mode

- **A large frame store** for 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.
- **Stable images regardless of video parity**: thanks to the Euresys video-surveillance FPGA, the Picolo Alert boards process the acquired images on the fly eliminating all issues related to the parity management without requiring any processing power from the PC.

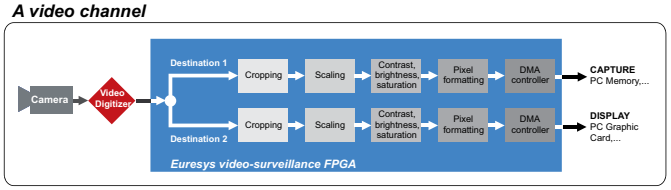
An independently programmable frame rate and acquisition parameters for each video input

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**.

Two simultaneous and independent video streams 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. Both are fully configurable for acquisition rate, image resolution, cropping, scaling, contrast, brightness, saturation, storage format…

A video channel

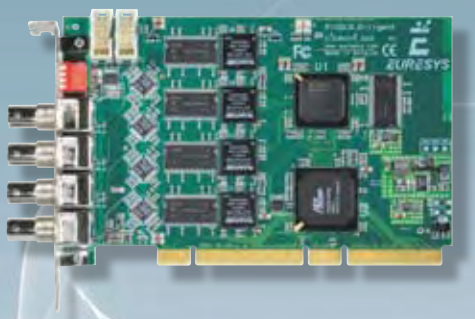


9 professional I/O lines and a configurable hardware watchdog *- identical to the Picolo Tymo -*

Software **MultiCam driver** **for Microsoft Windows** 2000®, XP®, Server 2003® and Vista®
for Suse Linux Enterprise Server 10

Euresys dedicated **DirectShow filters**

Programming languages C, C++, .NET classes and ActiveX controls



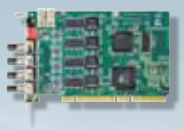
PICOLO Diligent™ boards

Full D1 video capture and MPEG-4 compression boards

***4 video inputs** - 200 / 240 fps constantly available*
***Simultaneous capture and preview functions** - Proprietary video-surveillance FPGA -*
***Compression:** Real-time **MPEG-4** acquisition in full D1 format*
***Image format:** broadcast resolution*
*One selected **video output** with cascading capability*

PICOLO Diligent™

Conventional PCI
64 / 32 bits, 66 / 33 MHz, 3V or 5V signaling -

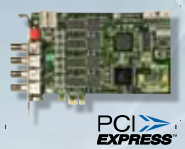


PICOLO Diligent Plus™

9 professional I/O lines
- identical to the Picolo Tymo -

Configurable hardware watchdog

***PCI Express** Full-height, half-length, x1*



The Picolo Diligent are 4-channel video capture and MPEG-4 compression boards. Equipped with the Euresys video-surveillance FPGA, the Diligent boards are 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.

4 real-time video inputs

MPEG-4 Part 2 on-board compression

The Picolo Diligent boards are equipped with four MPEG-4 compression chips. The MPEG-4 output format complies with the Single Profile @ Level3 and is compatible with the Microsoft® codec MP4S and the DivX codec DX50.

- Enhanced motion adaptive de-interlacing functions
- Programmable Group Of Pictures structures and sizes
- Advanced MPEG bit-rate control (CBR/VBR) from 1Kbps to 6 Mbps

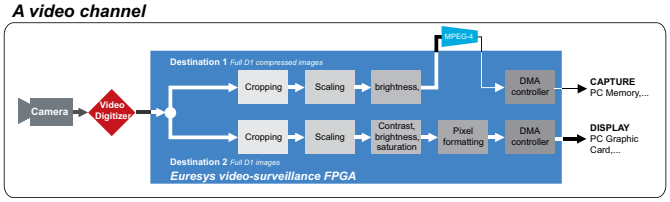
As the Picolo Alert boards, the Picolo Diligent features:

- Automatic removal of interlacing artefacts in field mode
- A large frame store
- Stable images regardless of video parity

An independently programmable frame rate and acquisition parameters for each video input

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 **broadcast resolution**.

Real-time full D1 preview and simultaneous full D1 compressed for recording or broadcasting



Video inputs connectors

On the bracket: four robust BNC connectors
Internally: a four-video inputs header

Video output

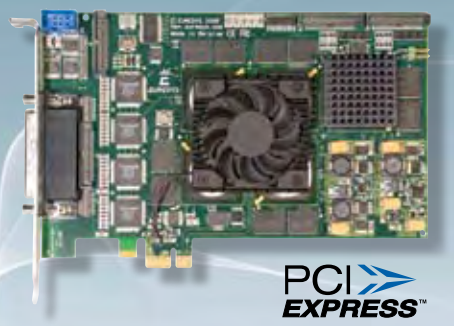
A video output is available to display the different sources one at a time. The customer directs to an analog monitor one of the four video inputs or the fifth cascade input. This cascade input allows to select a video source coming from other Picolo Diligent boards installed in the same system.

Software

MultiCam driver **for Microsoft Windows** 2000®, XP®, Server 2003® and Vista®
for Suse Linux Enterprise Server 10

Euresys dedicated **DirectShow filters**

Programming languages C, C++, .NET classes and ActiveX controls



PICOLO V16 H.264™

Capture and H.264 compression board for 16 video inputs with audio capability

16 video inputs PAL or NTSC
H.264 on-board compression, 400/480 ips at full resolution *(25/30 ips x 16)*
Precise time stamping
One selected video output *with cascade capability*
Form factor: PCI Express x1 *full-height, half-length*

H.264 ON-BOARD COMPRESSION

The Picolo V16 H.264 is an outstanding video capture board featuring real-time H.264 on board compression for 16 video channels with audio capability. Each video input delivers simultaneously a raw and compressed video stream. Both streams are independently configurable.

16 real-time video inputs

400/480 ips at full resolution (25/30 ips x 16)

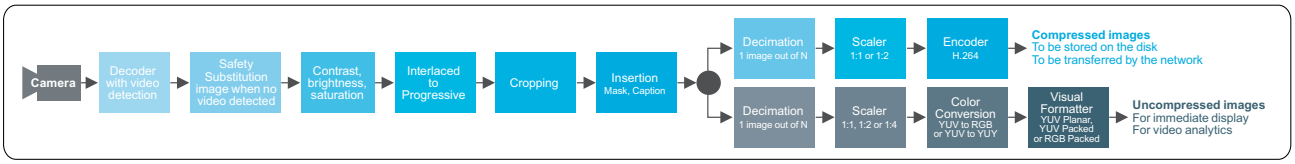
An independently programmable frame rate and acquisition parameters for each of the 16 video inputs
- Contrast, brightness and saturation controls available
- Video presence detection
- Overlay caption text and masking regions

H.264 on-board compression

- H.264 (MPEG-4 Part 10) Base Profile (Level 3.1)
- A compression standard offering high image quality on top of low bit rate and low storage requirement

Simultaneous and independent H.264 compressed and raw image transfer - subject to PC bus available bandwidth -

A video channel



Independently configurable functions on both streams

Compressed video stream configurations

Full **resolution** and full frame rate possible up to 2.0 Mbps per acquisition channel

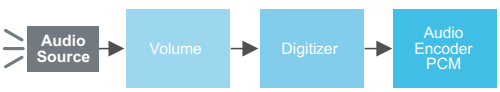
- Resolution settings: 4CIF: 704 x 576 (PAL) or 704 x 480 (NTSC)
  CIF: 352 x 288 (PAL) or 352 x 240 (NTSC)
- Configurable reduction of the **frame rate**
- Configurable **bit rate** control: CPQ - constant picture quality -
  CBR - constant bit rate -
  VBR - variable bit rate -

Raw video stream configurations

- **Cropping** control
- **Downscaling:** Resolution settings: 4CIF: 704 x 576 (PAL) or 704 x 480 (NTSC)
  CIF: 352 x 288 (PAL) or 352 x 240 (NTSC)
  QCIF: 176 x 144 (PAL) or 176 x 120 (NTSC)
- Configurable reduction of the **frame rate**
- Image **storage formats** available: Packed: RGB15, RGB16, RGB24, RGB32, YUV422, Y8
  Planar: YUV422PL

16 audio inputs

- Line-level audio signals
- Selectable sampling quality: 8 kHz
- Audio encoding
  - ✔ PCM (G.711): µ-law /A-law selectable companding
  - ✔ Bit rate: 64 kbps
- Audio-video synchronization supported by accurate time stamping of audio and video data
- Internal Audio connector
  - ✔ One 34-pin high-density header, 1.27 mm pitch



PICOLO V16 H.264™

32 professional I/O lines and watchdog capability

- 16 contact closure inputs
- 16 solid-state relay outputs
- 1 watchdog capability
- Internal I/O connectors
  - ✔ Two 34-pin high-density headers, 1.27 mm pitch
  - ✔ One 4-pin header “WATCHDOG” connector

Video connectors for Video In and Out

- One HD44 connector on the bracket
- 75-Ohm switchable termination resistors
- Internal pin header connectors
  - ✔ 1 “VIDEO IN”: 34-pin high-density header, 1.27 mm pitch
  - ✔ 1 “VIDEO OUTPUT & CASCADE”: 6-pin header

Software

DirectShow filters interfaces for Microsoft Windows XP®, XP Embedded®, Server 2003®, Vista® XP x64 Edition®, Server 2003 x64 Edition®, Vista 64®

Kernel streaming mini driver providing following filters:

- ➢ V16 H.264 Visual Source
- ➢ V16 H.264 Audio Encoder
- ➢ V16 H.264 Input Line
- ➢ V16 H.264 Output Line
- ➢ V16 H.264 Watchdog
- ➢ V16 H.264 Pass-Through Selector

Programming language C++

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1155	PICOLO
1401	PICOLO Junior 4
1157	PICOLO Pro 2
1158	PICOLO Pro 3
1402	PICOLO Tymo
1303	PICOLO Tetra
1305	PICOLO Alert
1641	PICOLO Alert PCIe

ORDER CODE	DESIGNATION
6001	PICOLO Alert Compact
6003	PICOLO Alert Compact PCIe
1307	PICOLO Diligent
6002	PICOLO Diligent Plus
1644	PICOLO V16 H.264
Video & I/O Modules	
1201	Pro 3 Module
1203	VEB
1202	MIO

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