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PICOLO H.264<sup>™</sup> series



PICOLO U4 H.264<sup>™</sup> - PICOLO U8 H.264<sup>™</sup> - PICOLO U16 H.264<sup>™</sup> PICOLO V16 H.264<sup>™</sup> - PICOLO U4 H.264 PCI-104<sup>™</sup> - PICOLO U4 H.264 PCI-104 RH<sup>™</sup>

### PICOLO U4 PICOLO V16 H 264<sup>™</sup> H 264<sup>™</sup>

16

PICOLO U4 H.264 **PCI-104**<sup>™</sup>





Easy-to-Integrate and High-Quality Video Capture and H.264 Compression Cards

# **PICOLO** H.264<sup>™</sup> series





# The PICOLO H.264" series





PICOLO U4 H.264 PCI-104 RH<sup>TM</sup>

**ыт4-26-416 Н.264**тм

MT**435.H 3IU 0103I** 

PICOLO U8 H.264TM

**PICOLO U4 H.264**TM



# The PICOLO H.264<sup>™</sup> series Comparison Chart

	NEW	NEW	NEW			
	PICOLO U4 H.264	PICOLO U8 H.264	PICOLO U16 H.264	PICOLO V16 H.264	PICOLO U4 H.264 PCI-104	
PCI interface(s)	PCI Express x1	PCI Express x1	PCI Express x1	PCI Express x1	PCI-104	
Video resolution	4 CIF, 2 CIF, CIF, QCIF	4 CIF, 2 CIF, CIF, QCIF	4 CIF, 2 CIF, CIF, QCIF	4 CIF, 2 CIF, CIF, QCIF	4 CIF, 2 CIF, CIF, QCIF	
Video acquisition rate fps= fields per second ips=images per second	100/120 ips	200/240 ips	400/480 ips	400/480 ips	100/120 ips	
Nr. of real time cameras per card	4	8	16	16	4	
Max. number of cameras per card	4	8	16	16	4	
Video acquisition type	Real-time	Real-time	Real-time	Real-time	Real-time	
Hardware compression	H.264 (MPEG-4 Part 10): Baseline Profile (Level 3)	H.264 (MPEG-4 Part 10): Baseline Profile (Level 3)	H.264 (MPEG-4 Part 10): Baseline Profile (Level 3)	H.264 (MPEG-4 Part 10): Baseline Profile (Level 3)	H.264 (MPEG-4 Part 10): Baseline Profile (Level 3)	
Simultaneous compressed and uncompressed video output streams per video input	2 compressed output streams 1 raw uncompressed stream	2 compressed output streams 1 raw uncompressed stream	2 compressed output streams 1 raw uncompressed stream	1 compressed output stream 1 raw uncompressed stream	1 compressed output stream 1 raw uncompressed stream	
Output image formats Monochrome: Y8 Color packed: RGB15, RGB16, RGB24, RGB32,YUV422 Color planar: YUV420PL	5 - 5	• - •	• - •	• •	• - •	
Video input connector						
On the bracket Internally 75-Ohm termination resistor	HD44F Internal headers Internal slides-switches	HD44F Internal headers Internal slides-switches	HD44F Internal headers Internal slides-switches	HD44F Internal headers Internal slides-switches	- PH14M Slides-switches	
Video output	1 selectable with cascade capability	1 selectable with cascade capability	1 selectable with cascade capability	1 selectable with cascade capability	1 selectable with cascade capability	
Size	Full height Half length	Full height Half length	Full height Half length	Full height Half length	PCI-104 compliant add-in module 96 x 90 mm (3.775 x 3.555 in)	
		A	udio			
Audio lines	4	8	16	16	4	
Audio formats						
8 kHz G.711 µ-law/A-law, 8 kHz 16-bit LPCM 16/22.05/44.1/48 kHz 16-bit LPCM	• •	• •	· · ·	<b>~</b>		
Internal connector	FTSH34M	FTSH34M	FTSH34M	FTSH34M	PH10M	
Input Output Lines						
I/O connector(s) On the bracket Internal	- FTSH34M (watchdog: PH4M)	- FTSH34M (watchdog: PH4M)	- FTSH34M (watchdog: PH4M)	- FTSH34M (watchdog: PH4M)	- PH20M	
Max I/O lines	8 professionals	16 professionals	32 professionals	32 professionals	8 professionals	
On-board input lines On-board output lines	4 contact-closure 4 solid-state relay	8 contact-closure 8 solid-state relay	16 contact-closure 16 solid-state relay	16 contact-closure 16 solid-state relay	4 contact-closure 4 solid-state relay	
Watchdog	~	✓ ·	~	~	~	
Connecting Accessories						
BNC or RCA Breakout Cable	~	~	~	<b>v</b>	With Adapters	
Adapters	FTSH34 to HD44F Adapter	FTSH34 to HD44F Adapter	FTSH34 to HD44F Adapter	FTSH34 to HD44F Adapter	Header 10 or 14 to HD44F Adapters, Audio/Video on DB25F Adapter for Picolo U4 H.264 PC-104	
Audio-on-Bracket Link for Picolo U4/U8 H.264	<u>ب</u>	~	-	-	-	
Drivers						
Drivers for Windows® 32-bit and 64-bit	DirectShow	DirectShow	DirectShow	DirectShow	DirectShow	
Drivers for Linux 32-bit and 64-bit	Virtual File System	Virtual File System	Virtual File System	Virtual File System	Virtual File System	

Connectors legend: PH= pin header, FTSH= half-pitch pin header, HD= high density, M= male, F= female

# **Common Features**

The Euresys Picolo H.264 cards are **top-quality video acquisition and H.264 compression cards** compatible with standard PAL or NTSC cameras. They are dedicated to high-end applications in the fields of video-surveillance and mobile **video-surveillance**. The Picolo H.264 series also targets entry-level applications in the field of machine vision such as **production monitoring** including in extreme industrial environments. The Picolo H.264 series **H.264 on-board compression**. This compression standard offers high image quality on top of low bit rate and low storage requirement.

Each video input simultaneously delivers two or **three independently configurable output streams:** one raw uncompressed stream and one or two H.264 compressed streams. The compressed streams may be recorded or transmitted while the uncompressed one is typically used for local display or video analytics. The Picolo H.264 cards feature one **audio** input line for each video input.

The Picolo H.264 cards **can be easily and quickly integrated into any video surveillance system.** They come along with simple and convenient Windows and Linux standard-based **drivers**. Various **connecting accessories are available** for straightforward integration and immediate evaluation of the cards. The cards are also compatible with **CamID**, **a framework and toolkit** for easy and flexible **video**, **audio and IO signals routing** throughout video surveillance systems. CamID simplifies the **design**, the **programming** and the **maintenance** of video surveillance applications.

### Acquisition

- Video standards: color (PAL/NTSC), monochrome (CCIR/EIA)
- Image size: 4CIF: 704 x 480 (NTSC/EIA), 704 x 576 (PAL/CCIR)
   2CIF, CIF and QCIF
- Wide range of cards with up to 16 video inputs at 25/30 fps
  - High interchangeability between the cards in an application
  - Independently programmable frame rate and acquisition parameters for each video input
    - Contrast, brightness and saturation controls available
    - Video presence and video standard detection
    - Overlay caption text: up to 2 lines of maximum 47 characters displayed as small rectangles on 4 pre-defined positions (corners) or anywhere in the active area (custom)
    - Privacy masking regions: up to 4 rectangular regions can be masked and colored in black
- Precise hardware-controlled time stamping
- One selectable video output with cascade capability

### **On-Board Compression**

- H.264 real-time compression on each video input
  - H.264 (MPEG-4 Part 10) Baseline Profile (Level 3)
  - High image quality on top of low bit rate and low storage requirement

### Output Streams

### • 2 or 3 independent and simultaneous destinations for each video channel

- One or two configurable H.264 compressed streams: Typical configuration: subject to the amount of instantaneously available encoding power for the considered video channel

- One high-fidelity, 4CIF format, full frame rate H.264 encoded stream e.g. for high-quality recording on hard disks
- One additional CIF format, half frame rate H.264 encoded stream only available on Picolo U4/U8/ U16 H.264 e.g. for transmission over networks with limited bandwidth including wireless networks
- One raw uncompressed stream e.g. for real-time display and video analytics subject to PCI bus available bandwidth



Overlay caption text



Privacy masking regions



### PICOLO H.264™ series

### Audio

### • Up to 16 line-level audio inputs

- Audio-video synchronization supported by an accurate hardware time stamping of audio and video data

### **Bus Mastering**

All Euresys cards are PCI bus mastering agents that directly store the acquired images into the PC physical memory without CPU involvement. The Euresys capture cards automatically recover the scatter-gather virtual memory mapping to present the data as a regular bitmap image in a user allocated memory buffer.

### Simple and Convenient Standard-Based Drivers

### • DirectShow Drivers for Windows® (32-bit and 64-bit)

- Kernel streaming mini driver providing the following filters:
- Board Audio Source Input Line Watchdog - Visual Source - Output Line - Pass -Through Selector

### • Virtual File System Drivers for Linux (32-bit and 64-bit)

**Memory-based file system driver** where each board appears as a file system populated with files organized as a directory tree and managed using standard file management functions of the **operating system**. The following board features are supported:

- Audio Inputs Output Lines
- Video Inputs Pass-Through Selector
- Input Lines Watchdog

Amymountpoint	Root directory (user-defined mount point)
😇 config.xml	Board configuration XML
💽 config.dtd	and corresponding DTD file
📻 exceptions.xml	Events issued in exceptional situations XML
🔄 exceptions.dtd	and corresponding DTD file
- 🗃 visual	Directory for visual capture function
- 🗃 audio	Directory for audio capture function
- 🗃 inputlines	Directory for general purpose inputs function
a outputlines	Directory for general purpose outputs function
- 😑 watchdog	Directory for watchdog function
- Passthroughselector	Directory for pass-through selector function

### Compatible with CamID

**CamID** is a system framework including a toolkit for easy and flexible video, audio and I/O signal assignation and routing throughout a video surveillance system. It strongly simplifies the **design and programming** of any surveillance applications on top of facilitating the maintenance. The Picolo H.264 cards and connecting accessories are available in the System



Interface CamID



### Connecting Accessories for Easy Integration and Immediate Evaluation of the Cards

- **Breakout Cables** with standard connectors. They can be connected directly to the connectors located on the card bracket. For internal connectors, an Adapter is required.
  - HD44M to BNC Breakout Cable for video (in, out and cascade) signals
- HD44M to RCA Breakout Cable for audio signals



- Adapters composed of a small Printed Circuit Board Assembly (PCBA) and a flatcable. They establish the connection between internal connectors and a bracket-mountable or chassis-mountable connector.
  - FTSH34 to HD44F Adapter for the Picolo U4, U8, U16 and V16 H.264 cards: it brings the video, the audio or the Professional I/O signals from internal connectors to an HD44F connector
  - Header 10 to HD44F Adapter and Header 14 to HD44F Adapter for the Picolo U4 H.264 PCI-104: they bring respectively the audio and video signals from internal connectors to a HD44F connector
  - Audio/Video on DB25F Adapter for Picolo U4 H.264 PCI-104: it brings the audio and video signals to a single DB25 connector



FTS34 to HD44F Adapter

Header 10 to HD44F Adapter

### • A Link interconnecting two internal connectors

Audio-on-Bracket Link for Picolo U4/U8 H.264: it connects the audio and video signals to the HD44 connector of the card bracket.



### PICOLO U4 H.264<sup>™</sup> - PICOLO U8 H.264<sup>™</sup> - PICOLO U16 H.264<sup>™</sup>



# PICOLO U4 H.264™



4 real-time PAL or NTSC video inputs H.264 on-board compression, 100/120 ips at full resolution (25/30 ips x 4) 4 high-quality audio inputs 8 professional I/O lines and watchdog capability One selectable video output with cascade capability Form factor: PCI Express x1 full-height, half-length

# PICOLO U8 H.264™

8 real-time PAL or NTSC video inputs H.264 on-board compression, 200/240 ips at full resolution (25/30 ips x 8) 8 high-quality audio inputs 16 professional I/O lines and watchdog capability One selectable video output with cascade capability Form factor: PCI Express x1 full-height, half-length





# PICOLO U16 H.264™

**16 real-time PAL or NTSC video inputs H.264 on-board compression, 400/480 ips at full resolution** (25/30 ips x 16) **16 high-quality audio inputs** 32 professional **I/O lines** and **watchdog** capability **One selectable video output** with cascade capability **Form factor: PCI Express x1** full-height, half-length

The Picolo U4 H.264, Picolo U8 H.264 and Picolo U16 H.264 are high-quality video capture cards featuring real-time H.264 on-board compression for 4, 8 or 16 video channels along with audio capability. These cards offer cost effective acquisition and compression delivering three independently configurable output streams for each video input: two compressed and one raw uncompressed stream.

# Real-Time Video Inputs with Independently Programmable Frame Rate and Acquisition Parameters

### H.264 On-Board Compression and Output Streams

## 3 simultaneous and independently configurable output streams for each video channel leading to video output streams

- Two independently configurable H.264 compressed streams
  - Resolution settings: 4 CIF, 2 CIF, CIF, QCIF
  - Configurable reduction of the frame rate
  - Configurable bit rate control:
    - CPQ constant picture quality -CBR - constant bit rate -
    - VBR variable bit rate -
  - Typical configuration
    - Subject to the amount of instantaneously available encoding power for the considered video channel
      - One high-fidelity, 4CIF format, full frame rate H.264 encoded stream
      - One CIF format, half frame rate H.264 encoded stream

- One raw uncompressed stream
- Subject to PCI bus available bandwidth
  - ✓ Resolution settings: 4CIF, 2CIF, CIF, QCIF
- Configurable reduction of the frame rate
- Image storage formats available: Monochrome: Y8 Color planar: YUV420PL





### PICOLO U4 H.264<sup>™</sup> - PICOLO U8 H.264<sup>™</sup> - PICOLO U16 H.264<sup>™</sup>

### **Audio Inputs**

- Line-level audio signals
- Selectable sampling rate: 8 kHz, 16 kHz, 22.05 kHz, 44.1 kHz, 48 kHz
- Audio encoding: V Linear PCM 16-bit
  - ✓ G.711 64-kbps µ-law/A-law
- 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



### Professional I/O Lines and Watchdog Capability

- 4, 8 or 16 contact closure inputs
- 4, 8 or 16 solid-state relay outputs
- Watchdog capability
- Internal I/O connectors
  - One or 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
  - A Breakout Cable equipped with HD44M and BNC connectors is available separately for an immediate evaluation of the card.
- 75-Ohm switchable termination resistors
- Internal pin header connectors
  - ✓ Video In: one 34-pin high-density header, 1.27 mm pitch
  - ✓ Video Cascade: one 6-pin header



### PICOLO V16 H.264™



# PICOLO V16 H.264™

 16 real-time PAL or NTSC video inputs

 H.264 on-board compression, 400/480 ips at full resolution (25/30 ips x 16)

 16 audio inputs

 32 professional I/O lines and watchdog capability

One selectable video output with cascade capability Form factor: PCI Express x1 full-height, half-length

The Picolo V16 H.264 is an outstanding video capture card featuring real-time H.264 on-board compression for 16 video channels with audio capability. Each video input simultaneously delivers a raw uncompressed and a compressed video stream. Both streams are independently and fully configurable offering a large choice of image formats, resolutions and frame rates.

# 16 Real-Time Video Inputs with Independently Programmable Frame Rate and Rcquisition Parameters

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

### H.264 On-Board Compression and Output Streams

Two simultaneous and independently configurable output streams for each video channel leading to 32 video output streams

### - Compressed stream configurations

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

- ✓ Resolution settings: 4 CIF, 2 CIF, CIF, QCIF
- Configurable reduction of the frame rate
- Configurable bit rate control:
  - CPQ constant picture quality -
  - CBR constant bit rate -
  - VBR variable bit rate -

### - Raw uncompressed stream configurations Subject to PCI bus available bandwidth

- ✓ Resolution settings: 4 CIF, 2 CIF, CIF, QCIF
- Configurable reduction of the frame rate
- Image storage formats available: Monochrome: Y8 Colorpacked:RGB15,RGB16,RGB24,RGB32, YUV422 Color planar: YUV420PL





### **16 Audio Inputs**

- Line-level audio signals
- Fixed sampling rate: 8 kHz
- Audio encoding: Linear PCM 16-bit and G.711 64-kbps  $\mu\text{-law}/\text{A-law}$
- 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



### Video Connectors for Video In and Out

- One HD44 connector on the bracket
  - A Spider Cable equipped with an HD44M connector and 18 BNC is available separately for immediate evaluation of the card.
- 75-Ohm switchable termination resistors
- Internal pin header connectors
  - Video In: one 34-pin high-density header, 1.27 mm pitch and Video Output & Cascade: one 6-pin header

### 32 Professional I/O Lines and Watchdog Capability

- 16 contact closure inputs
- 16 solid-state relay outputs
- Watchdog capability
- Internal I/O connectors:
  - One 4-pin header "WATCHDOG" connector



### PICOLO U4 H.264 PCI-104<sup>™</sup>



# PICOLO U4 H.264 PCI-104™ cards

4 real-time PAL or NTSC video inputs H.264 on-board compression, 100/120 ips at full resolution (25/30 ips x 4) 4 high-quality audio inputs 8 professional I/O lines and watchdog capability Ruggedized cards supporting EN50155, EN50155:2007 for Class 3 and EN61373 standards One pass-through video output with cascade capability Compact form factor: PCI-104 compliant

### PICOLO U4 H.264 PCI-104™



### PICOLO U4 H.264 PCI-104 RH™



This card does not feature a heat sink.

### Ruggedized cards for mobile video-surveillance applications.

The Picolo U4 H.264 PCI-104 is a ruggedized video capture card featuring real-time H.264 on-board compression for 4 video channels along with high-quality audio capabilities. Thanks to a high resistance to extreme temperatures, shocks, vibrations and humidity, the Picolo U4 H.264 PCI-104 is particularly well suited for embedded security systems for rail and road transportation, police vehicles equipment or any mobile or outdoor video-surveillance applications. The ruggedized characteristics of the card are also appropriate for video-surveillance systems installed in extreme industrial environments.

# 4 Real-Time Video Inputs with Independently Programmable Frame Rate and Rcquisition Parameters

### 100/120 ips at full resolution (25/30 ips x 4)

### H.264 On-Board Compression and Output Streams

# Two simultaneous and independently configurable output streams for each video channel leading to a total of 8 video streams

### - Compressed stream configurations

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

- Resolution settings: 4 CIF, 2 CIF, CIF, QCIF
- Configurable reduction of the frame rate
- ✓ Configurable bit rate control: CPQ, CBR, VBR

### - Raw uncompressed stream configurations

Subject to PCI bus available bandwidth

- ✓ Resolution settings: 4 CIF, 2 CIF, CIF, QCIF
- Configurable reduction of the frame rate
- Image storage formats available: Monochrome: Y8 Color planar: YUV420PL



### 4 High-Quality Audio Inputs

- Line-level audio signals
- Selectable sampling rate: 8 kHz, 16 kHz, 22.05 kHz, 44.1 kHz, 48 kHz
- Audio encoding: Linear PCM 16-bit
  - ✓ G.711 64-kbps µ-law/A-law
- Audio-video synchronization supported by accurate time stamping of audio and video data
- Audio connector: one 10-pin right angled header, 2.54 mm pitch



### PICOLO U4 H.264 PCI-104™

### **Ruggedized Card**

The Picolo U4 H.264 PCI-104 is designed and manufactured to support:

**Temperature range from -25°C to +85°C** (-13°F to 185°F) as specified by **EN50155** for Class T3 (minimum air flow  $\geq$  1m/s) electronic equipment used on rolling stock in railway applications.

- A temperature sensor measures the card temperature in the vicinity of the processor. The card temperature is reported to the application software through the API.
- A thermal protection safely turns off the processor and prevents irrecoverable card damage when the card temperature reaches the absolute limit (100°C 212°F).

### Sustained vibration and shocks

The Picolo U4 H.264 PCI-104 complies with the Category 1 Class B equipments as defined in **EN61373** and therefore can be mounted inside a case that is attached on the **vehicle frame**.

### **High humidity levels**

The card can operate in the relative humidity conditions specified by **EN50155:2007** for Class T3 (minimum air flow  $\geq$  1m/s) over the external temperature range of -25°C to +45°C (-13°F to 113°F):

- Relative humidity averaged over a year ≤ 75%
- Relative humidity during 30 consecutive days  $\leq$  90 %
- Condensation may not cause damage or malfunction

### 8 Professional I/O Lines and Watchdog Capability

- 4 contact closure inputs
- 4 solid-state relay outputs
- Watchdog capability
- I/O connectors: 20-pin right-angled header, 2.54 mm pitch

### **Video Connectors**

- Pin header video connector: 14-pin right-angled header, 2.54 mm pitch
- Internal 75-Ohm switchable termination resistors

### Compact Form Factor: PCI-104 Compliant

- Stack-through 120-pin 2mm pitch connector
- 32-bit PCI bus
- "Module slot" selector DIP switch: up to 4 PCI devices are allowed in the stack
- +5V power supply
- Universal add-in module for 3V/5V I/O signaling busses
- Power dissipation: less than 7W
- Standard size: 96 x 90 mm (3.775 x 3.555 in)







# Ordering Information

### ORDER CODE DESIGNATION

Video Capture and H.264 Compression Cards	
1645 PICOLO U4 H.264 1644 PICOLO V16 H.264	
1648 PICOLO U8 H.264 1646 PICOLO U4 H.264 PCI-104	
1649 PICOLO U16 H.264 1647 PICOLO U4 H.264 PCI-104 RH	I

### **CONNECTING ACCESSORIES**

The Picolo H.264 series includes the following Connecting Accessories:

### ORDER CODE DESIGNATION

<b>BNC Bre</b>	akout Cables					
	3126	HD44M to 18 BNC Breakout Cable				
	3127	HD44M to 10 BNC Breakout Cable				
	3128	HD44M to 6 BNC Breakout Cable				
RCA Bre	akout Cables					
	3129	HD44M to 16 RCA Breakout Cable				
	3130	HD44M to 8 RCA Breakout Cable				
	3131	HD44M to 4 RCA Breakout Cable				
Adapters	5					
	1651	Header 10 to HD44F Adapter				
	1652	Header 14 to HD44F Adapter				
	1650	FTSH34 to HD44F Adapter				
Link	3133	Audio/Video on DB25F Adapter for Picolo U4 H.264 PCI-104				
	3132	Audio-on-Bracket Link for Picolo U4/U8 H.264				

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