Picolo.net HD4

Four-input HD-SDI low-latency IP video encoder

At a Glance

- Stream video from 4 Full HD (1080p30) or HD (720p60) HD-SDI cameras over an IP network
- 83ms wire-to-wire latency when used with the Picolo.net LLD2 decoder
- ONVIF Profile S interface for interoperability with major Video Management Software
- High-quality H.264 encoder, up to 3 encoded streams per camera
- Optional audio modules

Benefits

Stream HD video from standard HD-SDI cameras over an IP network

- HD-SDI uses the same coaxial cables as analog and delivers high-definition digital video over at least 100 meters of standard RG59 cable
- HD-SDI is as easy to install and maintain as analog CCTV systems

83ms wire-to-wire latency between Picolo.net encoder and Picolo.net LLD2 decoder

In the video world, the time lag between the instant a frame is captured and the instant that frame is displayed is called glass-to-glass latency. Research has shown that an operator's ability to accurately perform precision manual tasks or surgical tasks decreases when glass-to-glass latency exceeds a 300 to 500 ms range.

Euresys can now reduce the glass-to-glass latency to less than 100ms in full HD, in specific conditions with a dedicated decoder. Euresys has recently developed a low latency video encoder, designed for remote control of industrial processes in critical or hazardous areas. With the Picolo.net encoder, operators will be able to control machines, cranes or robots from afar with an improved response time, thanks to the advanced technologies implemented to stream full HD video over an IP network.

High-quality H.264 encoder with up to three streams per camera

- H.264 is efficient: Up to 40 cameras can stream low-latency video over a Gigabit Ethernet network
- The highest quality HD video can be streamed, viewed, analyzed and stored anywhere on an IP network

ONVIF Profile S compliance for seamless VMS compatibility

- Exacq [exacqVision]
- Genetec [Omnicast and Security Centre]
- Milestone Systems [XProtect Corporate and Enterprise]
- OnSSI [Ocularis]
- Digifort
- AxxonSoft [Axxon Smart]
- Inaxsys
- Seetec

Easy-to-use local or remote device setup via web pages

Use a single network port for four cameras, reducing the number of network switches required

ith DG06 Technology Development Department support

Applications

LIFE SCIENCES & MEDICAL

High definition video streaming

Endoscopic techniques are less invasive and are becoming more frequent in operating rooms. The smaller incisions generate less pain and facilitate a quick recovery. Cameras and monitors are used by the surgeon to visualize the operative field. The surgeons are hence more dependent on real time images.

Nowadays, a recent operating room in a hospital will typically include 10 cameras and monitors. Every medical device can be connected to the IP network and displayed on one or several monitors, inside or outside the operating room. The images can be streamed to any rooms of the hospital, which allows collaboration with peer surgeons or pathologists. Students or other staff members do not need to be in the operating room and can be at a conference room location.

VIDEO MONITORING, SURVEILLANCE & SECURITY

High-definition low latency video streaming over IP for remote control

- Remote control of cranes. In container terminals, ship-to-shore cranes are controlled remotely. The operators are located in a control station hundreds of meters from the crane and really enjoy the comfortable and ergonomic working position. They are sitting in an armchair, triggering movements with a joystick and buttons and looking at monitors showing images from the cameras. Motion sickness is no more a problem. Remote control made it possible to increase the speed of the crane and to decrease the container loading cycle time.
- Remote control of drones. Drones can be equipped with high definition cameras for a more precise control and a more detailed inspection. The video streams can be encoded onboard and streamed over the Wi-Fi network to the ground station where they will be processed and archived.

High-definition low latency video streaming over IP

Example: Critical infrastructure
- Off-shore drilling platforms
- Oil, gas production, pipelines
- Petrochemical refineries
- Power plants
- Mining
- Factories / manufacturing plants
- Military

High-definition low latency video streaming over IP for factory surveillance

In a manufacturing workshop, up to 40 cameras and encoders can be connected to the local (specific) IP network. Any image stream can be displayed on any monitor connected to the network. An operator can monitor or control several machines at the same time.

The 2 MPixels camera and a powerful lens allow the operator to see the sharpest details of the scene. The comfort and the safety of the operator is improved as they can sit far away from the hazardous working area.

High-definition low latency video streaming over IP on oil rigs

Surveillance of critical infrastructure: Drilling is a hazardous operation and the presence of workers in the nearby should be avoided on the drilling floor, close to the turntable.

Tele-operated solutions allow to ensure the safety of operators in hazardous or isolated locations, like oil rigs. It is often hard to find people willing to work in such places and, in the future, one can also imagine unmanned platforms operated from the shore.

High-definition low latency video streaming over IP in mines

In open pit mines, unmanned trucks or excavators can be controlled safely from a remote location. The operators we can now benefit from the air conditioning and a reduced ambient noise. As a consequence, operator fatigue is reduced, with a direct influence on the reduction of errors and downtime in daily operations.

Surveillance of casinos

Video transmission for education, training

Video transmission for sports and events

Specifications

Mechanical

Form Factor	Stand alone device
Housing	Aluminum housing
Mounting	• Desktop • Wall mounting base plate included • DIN rail mount clip included
Dimensions	L 174 mm x H 53 mm x D 210 mm (Dimensions excluding cable connector plugs)
Weight	820 g, 1.81 lb 875 g, 1.93 lb with wall-mount accessory 890 g, 1.96 lb with DIN rail-mount accessory

Camera / video inputs

Connectors	INPUT 1 to INPUT 4: 4x BNC female connectors on the front panel
Formats and standards (HD)	• 720p (SMPTE 296M) • 1080p (SMPTE 274M) (progressive scan only)
Video inputs	4 HD-SDI (SMPTE 292M) / HDcctv 1.0
Native resolution	• 720p: 1280 x 720 • 1080p: 1920 x 1080
Frame rate	• 720p: 23.98, 24, 25, 29.97, 30, 50, 59.94, 60 fps • 1080p: 23.98, 24, 25, 29.97, 30 fps
Event reporting	Video signal presence and video format change detected
Video presence indicators	4 green LEDs on front panel
Number of cameras	4

Audio modules

Specification	• One or two optional audio modules can be fitted inside Picolo.net HD4 • Audio modules must be ordered with the Picolo.net and are factory installed • The specifications below apply to a single module

Audio inputs

Number of inputs	2
Type	Mono line-level analog input
Sampling rate	Fixed, 48 kHz
Audio format	• One single-channel audio stream per audio input • PCM G.711 ⊠-law, 64 kbps (8-bit @ 8 kHz)
Time stamping resolution	11.1 microseconds (90 kHz time clock)
Connectors	AUDIO INPUTS 1 to 4: 4 x TRS 3.5 mm jack socket connectors on the front panel

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On-board video codec

Video encoders	• H.264 (MPEG-4 Part 10) • Baseline, Main or High profile • 12 H.264 encoders per Picolo.net HD4 device • The cumulated encoding power cannot exceed the equivalent of 6 x 1080p30 video streams encoding
Number of streams	Up to 3 individually-configurable encoded streams per video input
Video stream control	Frame rate, resolution, bit rate
Bitrate	CBR, VBR
Video streams resolution	• 1920 x 1080, Full HD, native for 1080p sources • 1280 x 720, HD720, native for 720p sources • 960 x 540, qHD • 640 x 360, fits within a VGA display • 480 x 270 • 320 x 180, fits within a QVGA display • 320 x 240
MJPEG encoding performance	1 frame per second
Latency	• 83 ms wire to wire, with 1080p30 video (With Picolo.net LLD2 decoder. Time measured from encoder input to decoder output)

Streaming

Media transport protocol	RTP, RTCP
Media transport control protocol	RTSP for RTP streams, TCP for RTSP streams
RTP transport modalities	• RTP over UDP Unicast and over UDP Multicast • RTP interleaved in RTSP over HTTP • RTP Transport Media Types • RTP Payload Format for H.264 Video • RTP Payload Format for JPEG-compressed Video

Network

LAN interface	1 x Ethernet 10BASE-T/100BASE-TX/1000BASE-T, automatic speed negotiation
LAN connector	1 x RJ45 with link and activity LED indicators
Application layer protocols	DHCP, DNS, HTTP, HTTPS, NTP, RTCP, RTP, RTSP, TLS 1.0
Transport layer protocols	TCP, UDP
Internet layer protocols	IPv4, ICMP, IGMPv2
IP address allocation methods	DHCP, LLA, Static IP, TLS
Number of IP address/MAC address	1

User authentication and access policy

HTTP and RTSP authentication	Using the "HTTP Digest Authentication" mechanism
WS authentication	Using the WS-Security "Username Token" mechanism, with the "Password Digest" password type
Web pages	Through login/password dialog box
Access policy	ONVIF 2.2 default policy with four user levels: administrator, operator, user and anonymous

Encryption mechanisms

Web service	Messages encryption using TLS 1.0
HTTPS web pages	Access encryption using TLS 1.0

ONVIF or proprietary APIs

ONVIF Profile S 1.0	For interoperability with major Video Management Software
Proprietary web services	For advanced use
Maintenance client interface	To backup and restore configurations, to remotely reboot and upgrade the embedded firmware
Web pages	For easy installation, set up and testing

System integration

Alarm inputs	4 non-isolated polarity insensitive inputs for closing contacts or electronic sensor with CMOS digital outputs
Alarm inputs connectors	Removable plugs with push-in terminals
Relay outputs	4 potential-free normally open contacts
Relay outputs connectors	Removable plugs with push-in terminals
COM	1 bidirectional half-duplex RS-485 COM port for the control of up to 4 Pelco-D compliant PTZ cameras
COM connector	Removable plug with push-in terminals
Pan/Tilt/Zoom protocol	Pelco D
Watchdog	Yes

Electrical

Supply voltage	10 to 30 V DC, power supply via external unit
Power connector	Removable plugs with 2 push-in terminals
Power consumption	15 W typical
Power status	"Power OK" green LED on rear panel

Environmental conditions

Operating ambient air temperature	0 to +55 °C / +32 to +131 °F
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
Dissipated power	• At 25°C ambient temperature: 51 BTU/h, 15 W (measured with H.264 encoder at full workload) • At maximum operating ambient temperature: 58 BTU/h, 17 W (measured with H.264 encoder at full workload)

Certifications

Electromagnetic - EMC standards	• The European Council EMC Directive 2004/108/EC • The Unites States FCC rule 47 CFR 15
EMC - Emission	• EN 55022:2010 Class A • FCC 47 CFR 15 Class A
EMC - Immunity	• EN 61000-4-3 • EN 61000-4-4 • EN 61000-4-5 • EN 61000-4-6 • EN 61000-4-11
Flammability	PCB compliant with UL 94 V-0
RoHS	Compliant with the European Union Directive 2011/65/EU (ROHS2)
REACH	Compliant with the European Union Regulation No 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	1656 - Picolo.net HD4
Options	1670 - Audio Module option for Picolo.net HD4, HD8R
Optional accessories	• 1658 - Power Supply for Picolo.net HD4 • 1660 - Power Cable (EUR) for Power Supply 1658, 1659 • 1661 - Power Cable (US) for Power Supply 1658, 1659 • 1662 - Power Cable (UK) for Power Supply 1658, 1659

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