# Picolo.net HD8R

Eight-input HD-SDI rack-mount low-latency IP video encoder

## At a Glance

- Stream video from 8 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 | Short and long brackets included in order to fit all 19-in racks |
| Dimensions | L 433.20 mm x H 43.7 mm x D 203 mm without brackets<br>L 482.61 mm x H 43.7 mm x D 203 mm with brackets<br>(Dimensions excluding cable connector plugs) |
| Weight | 2.88 kg, 6.35 lb, without option modules and without brackets<br>Add 50 g, 0.11 lb, for long brackets<br>Add 100 g, 0.22 lb,for Cooling module option<br>Add 20 g, 0.044 lb, for each Audio Module option |

## Camera / video inputs

| | |
|---|---|
| Connectors | • MODULE A - INPUT1 to INPUT 4: 4x BNC female connectors on the rear panel<br>• MODULE B - INPUT1 to INPUT 4: 4x BNC female connectors on the rear panel |
| Formats and standards (HD) | • 720p (SMPTE 296M)<br>• 1080p (SMPTE 274M) (progressive scan only) |
| Video inputs | 2 x 4 HD-SDI (SMPTE 292M) / HDcctv 1.0 |
| Native resolution | • 720p: 1280 x 720<br>• 1080p: 1920 x 1080 |
| Frame rate | • 720p: 23.98, 24, 25, 29.97, 30, 50, 59.94, 60 fps<br>• 1080p: 23.98, 24, 25, 29.97, 30 fps |
| Event reporting | Video signal presence and video format change detected |
| Video presence indicators | 8 green LEDs on front panel |
| Number of cameras | 8 |

## Audio modules

| | |
|---|---|
| Specification | • Up to four optional audio modules can be fitted inside Picolo.net HD8R<br>• Audio modules must be ordered with the Picolo.net and are installed in factory<br>• The specifications below apply to one 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<br>• PCM G.711 μ-law, 64 kbps (8-bit @ 8 kHz) |
| Time stamping resolution | 11.1 microseconds (90 kHz time clock) |
| Connectors | • MODULE A - AUDIO INPUTS 1 to 4: 4 x TRS 3.5 mm jack socket connectors on the front panel<br>• MODULE B - 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)<br>• Baseline, Main or High profile<br>• 2 x 12 H.264 encoders per Picolo.net HD4 device<br>• The cumulated encoding power cannot exceed the equivalent of 12 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<br>• 1280 x 720, HD720, native for 720p sources<br>• 960 x 540, qHD<br>• 640 x 360, fits within a VGA display<br>• 480 x 270<br>• 320 x 180, fits within a QVGA display<br>• 320 x 240 |
| MJPEG encoding performance | 1 frame per second |
| Latency | • 83 ms wire to wire, with 1080p30 video<br>(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<br>• RTP interleaved in RTSP over HTTP<br>• RTP Transport Media Types<br>• RTP Payload Format for H.264 Video<br>• RTP Payload Format for JPEG-compressed Video |

## Network

| | |
|---|---|
| LAN interface | 2 x Ethernet 10BASE-T/100BASE-TX/1000BASE-T, automatic speed negotiation |
| LAN connector | 2 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 | 2 x 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 | 2 x 4 potential-free normally open contacts |
| Relay outputs connectors | Removable plugs with push-in terminals |
| COM | 2 bidirectional half-duplex RS-485 COM ports for the control of up to 8 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 | 2x removable plugs with 2 push-in terminals |
| Power consumption | 30 W typical |
| Power status | 2x "Power OK" green LEDs on rear panel |

## Environmental conditions

| | |
|---|---|
| Operating ambient air temperature | Without Cooling Module option:<br>• One device alone or at least 2 U gap between devices: 0 to +65 °C, +32 to +149 °F<br>• Stack of devices with at least 1 U space in-between: 0 to +55 °C, +32 to +131 °F<br>• Stack of 3 devices without space in-between: 0 to +45 °C, +32 to +113 °F<br>• Stack of any number of devices without space in-between: 0 to +35 °C, +32 to +95 °F<br>With Cooling Module option:<br>• Stack of devices with at least 1 U space in-between: 0 to +75 °C, +32 to +167 °F<br>• Stack of 3 devices without space in-between: 0 to +75 °C, +32 to +167 °F<br>• Stack of any number of devices without space in-between: 0 to +70 °C, +32 to +158 °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: 102 BTU/h, 30 W (measured with H.264 encoder at full workload)<br>• At maximum operating ambient temperature: 116 BTU/h, 34 W (measured with H.264 encoder at full workload) |

## Certifications

| | |
|---|---|
| Electromagnetic - EMC standards | • The European Council EMC Directive 2004/108/EC<br>• The Unites States FCC rule 47 CFR 15 |
| EMC - Emission | • EN 55022:2010 Class A<br>• FCC 47 CFR 15 Class A |
| EMC - Immunity | • EN 61000-4-3<br>• EN 61000-4-4<br>• EN 61000-4-5<br>• EN 61000-4-6<br>• 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 | 1680 - Picolo.net HD8R |
| Options | • 1670 - Audio Module option for Picolo.net HD4, HD8R<br>• 1681 - Cooling Module option for Picolo.net HD8R |
| Optional accessories | • 1659 - Power Supply for Picolo.net HD8R<br>• 1660 - Power Cable (EUR) for Power Supply 1658, 1659<br>• 1661 - Power Cable (US) for Power Supply 1658, 1659<br>• 1662 - Power Cable (UK) for Power Supply 1658, 1659 |

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