PC1656 Picolo.net HD4 Handbook

Firmware Version 7.4

Contents

About This Document

Document Scope

This document describes the specifications of the following products and product options:

Product Code	Product Designation
1656	Picolo.net HD4
1670	Audio Module option for Picolo.net HD4, HD8R

when they are operated with Firmware Version 7.4.

Revision History

Date	Document Version	Changes Description
2015-09-11	7.4	Handbook for Firmware version 7.4 ■ *H.264 Video Encoder Specification* on page 42: add Low Latency option ■ *Audio Input* on page 45: add 16-bit 48 kHz audio encoding ■ *SAP Support* on page 48: add support of Session Announcement Protocol ■ *PTZ Page* on page 93: add support of PTZ Presets
2013-07-22	6.3	Handbook for Firmware version 6.3 ■ Add temperature specification of HD8R ■ Add power consumption @max ambient T° of HD4/HD8R ■ Add weight specification of HD8R
2013-04-26	6.0	Handbook for Firmware version 6 ■ *Audio Output* on page 46 Add support of audio outputs

Description

Short Description

Picolo.net HD4 and Picolo.net HD8R

Picolo.net HD4 and Picolo.net HD8R are based upon the *HD4 encoder module*, a HD-SDI four-input multiple-stream IP video encoder.

Picolo.net HD4 is a desktop or wall-mount enclosure that packages **one instance** of the *HD4 encoder module*.

Picolo.net HD8R is a 19-inch 1U rack-mount enclosure that packages **two instances** of the *HD4 encoder module*.

Video Features

Picolo.net HD4 acquires high-definition video from up to four HD-SDI video sources.

720p and 1080p progressive-scan formats with a large set of frame rates for both 50Hz and 60Hz regions are supported. The format selection is automatic.

Picolo.net HD4 is fitted with a high performance H.264 encoder engine that is capable of delivering up to 12 encoded video streams simultaneously.

The H.264 encoder operates in the baseline, main, and high profiles. The bitrate is controlled using the CBR or the VBR methods.

The "Low Latency" option of the H.264 encoder enables a low-latency video transmission over an IP network. The lowest latency is effectively achieved when the encoded stream is decoded by Picolo.net LLD2 Decoder.

Picolo.net HD4 is also capable of delivering up to 4 MJPEG encoded video streams.

Audio Features

Picolo.net HD4 can optionally be fitted with one or two Audio Module option for Picolo.net HD4, HD8R.

Each audio module provides two analog audio input ports and two audio output ports through four 3.5mm TRS jack sockets located on the front panel.

The audio inputs accept line-level mono-channel audio signals. The audio input signals are converted into a G.711 μ-law 64 kbps low-quality digital audio stream or, optionally, into a 16-bit 48 kHz linear PCM high-quality audio stream.

The audio outputs deliver analog line-level mono-channel audio signals obtained by decoding a G.711 μ-law 64 kbps digital audio stream.

IO Features

Picolo.net HD4 provides the following I/O interfaces:

- 4 alarm input ports
- 4 isolated relay output ports
- 1 bidirectional half-duplex RS-485 COM port for the control of up to 4 Pelco-D compliant PTZ cameras

Picolo.net HD4 supports the following Pelco-D commands: Zoom Wide/Tele, Move Up/Down/Left/Right, Set/Clear/Go To Preset, Set Zoom Speed.

Network Features

Picolo.net HD4 provides a gigabit capable RJ-45 Ethernet port for connection to an IP network.

Streaming Features

Picolo.net HD4 uses the Real-time Transport Protocol - RTP - to stream audio, video and metadata over the IP network.
It supports the following RTP transport modalities:

- RTP over UDP Unicast
- RTP over UDP Multicast
- RTP interleaved in RTSP over HTTP

The streaming is controlled by means of the RTSP protocol. Each RTSP session may include:

- One encoded video stream from any of the Video Encoders
- One encoded audio stream from any of the Audio Encoders
- One metadata stream from any of the Event sources

Picolo.net HD4 supports the SAP – Session Announcement Protocol.

User Authentication and Access Policy

Picolo.net HD4 implements the following user authentication mechanisms to control the access to its resources:

- 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.

Picolo.net HD4 implements the default access policy recommended by the ONVIF 2.2 Core Specification. The policy implements four user levels: Administrator, Operator, User, and Anonymous.

Encryption

Picolo.net HD4 implements the following encryption mechanisms:

- Web Service messages encryption using TLS 1.0
- HTTPS Web Pages encrypted access using TLS 1.0

Compliance

Picolo.net HD4 is an encoder device complying with the version 1.0 of the ONVIF Profile S Specification.

Physical

Picolo.net HD4:

- Is packaged in an aluminum enclosure that can be installed on a desktop, on a wall using a baseplate, or on a DIN-rail using a clip-on baseplate.
- Is intended for indoor use exclusively.
- Is a fan-less device that supports ambient temperatures up to 55 °C or 131°F.

- Is 12V-24V DC powered.

Note. Pre-series products, SN00011 up to SN00070, are restricted for use with 12V DC supply!

Product Composition

The product without option is commercially referenced as follows:

- Product Code: **1656**
- Product Designation: **Picolo.net HD4**

Product Options

The following product options are available for Picolo.net HD4:

Product Code	Product Designation	Short Description and Usage Rule(s)
1670	Audio Module option for Picolo.net HD4, HD8R	Two line-level analog inputs and two line-level analog outputs. **Rules:** ■ 2 modules maximum ■ Firmware version 5 (or higher) for line-level audio input ■ Firmware version 6 (or higher) for audio output

Note. The options are installable at factory exclusively! Consequently, the product options must be ordered together with the product.

Product Accessories

The following accessories are available for Picolo.net HD4:

Product Code	Product Designation	Short Description
1658	Power Supply for Picolo.net SD2, HD4	Universal 110V-240V 50/60 Hz AC to 12V DC 40W Power Supply
1660	Power Cable (EUR) for Power Supply 1658, 1659	IEC C13 AC Power Cord with CEE 7/7 Plug - 1.8M
1661	Power Cable (US) for Power Supply 1658, 1659	IEC C13 AC Power Cord with US 3-pin Plug – 6ft
1662	Power Cable (UK) for Power Supply 1658, 1659	IEC C13 AC Power Cord with UK 3-pin Plug – 6ft

Deliverables

The product is delivered in a single carton box including the following items:

Quantity	Items
1	Picolo.net HD4 enclosure (possibly including product options)
1	Baseplate for wall or DIN-rail mounting
1	DIN-rail mounting clip with baseplate mounting screws
5	4-pin 3.5 mm pitch terminal plug with push-in spring cage contact
1	2-pin 5.08 mm pitch terminal plug with push-in spring cage contact
1	Enclosure grounding kit (BNC mountable Lock Washer + Screw)
1	Picolo.net HD4 Installation Guide

Product Labels

Product Identification Label

The Product Identification Label provides the identity of the product. It includes:

- The manufacturer identity: EURESYS
- The product code: 1656
- The product designation: Picolo.net HD4
- Standards logos and markings: ONVIF
- Safety logos and markings: CE, RoHS, WEEE
- Country of Origin marking: Made in EU

The Product Identification Label is affixed on:

- The bottom of the enclosure
- The carton box

Note. The Product Identification Label is identical for all instances of the same product.

Product Instance Identification Label

The Product Instance Identification Label identifies uniquely one particular instance of the product. It includes:

- The serial number. Example: *HD412345*
- The MAC address of the Ethernet interface. Example: 1F-23-45-5A-25-32

The Product Instance Identification Label is affixed on:

- The main board
- The bottom of the enclosure
- The carton box

Note. The Serial Number alone identifies uniquely an Euresys product.

Mechanical Specification

Product Pictures

Picolo.net HD4 Pictures

Picolo.net HD4 is a desktop or wall-mount enclosure that packages **one instance** of the *HD4 encoder module*.

The aluminum enclosure is gray-painted and terminated at both ends with two shock-protecting annular plastic caps. The front side holds the video connectors, the "Video Present" green LED indicators, and, optionally, the audio connectors. The top side is embossed with the Euresys logo. The rear side holds the power input, I/O, and LAN connectors together with the Power OK and LAN status LED indicators. Markings are printed on a black polycarbonate film applied on the rear and the front sides.

The following pictures show the Picolo.net HD4 ready to be installed on a Desktop:

Perspective view of the front side of Picolo.net HD4 without options

Perspective view of the front side of Picolo.net HD4 with 2 audio module options

Perspective view of the rear side of Picolo.net HD4

Dimensions and Weight

Picolo.net HD4 - Dimensions and Weight

Picolo.net HD4 Dimensions

Characteristic	Value [mm]	Value [inch]
Width	174	6.85
Height - Desktop or wall mount	53	2.09
Height - DIN-rail mount	64	2.52
Depth	210	8.27

Picolo.net HD4 Weight

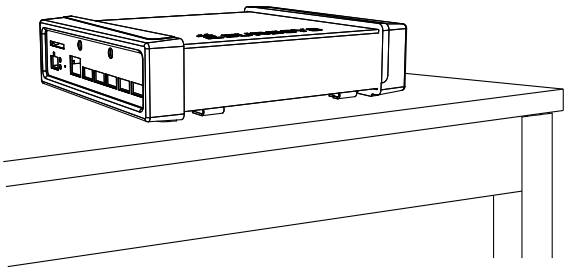
Characteristic	Value [g]	Value [lb]
Desktop (without options and mounting accessories)	820	1.81
Additional Weight for Wall mounting accessories	55	0.12
Additional Weight for DIN-rail mounting accessories	70	0.15
Additional Weight for each audio module option	20	0.044

Mounting Methods

The following mounting methods are available:

- **Desktop**: the product lays down on top of a horizontal flat surface such as a table.
- **Wall**: the product is hooked-up on a baseplate, itself screwed on a vertical flat surface such as a wall.
- **DIN-rail**: the product is hooked-up on a baseplate, itself clipsed on a DIN-rail.

Desktop Mount



Picolo.net HD4 "Desktop"

The out-of-the box product, namely the Picolo.net HD4 "Desktop", is ready for a desktop usage. The baseplate and the DIN-rail clip may be discarded.

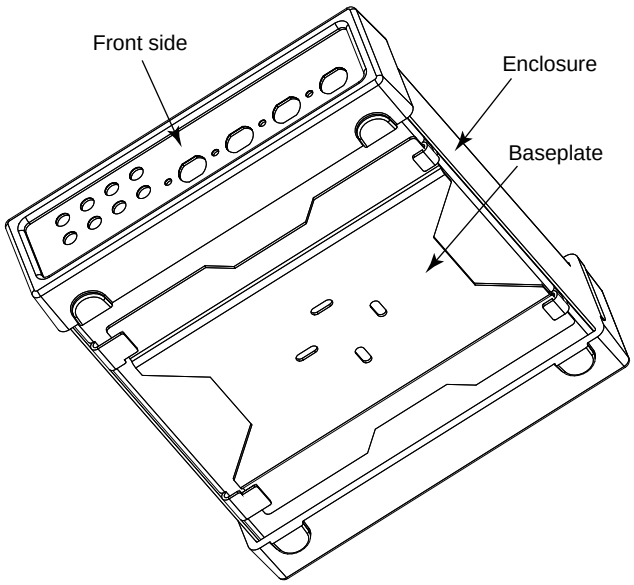
The enclosure is designed in such a way that its bottom side faces the table. The four embossings on the bottom side of the plastic caps act as anti-skid feet, and avoid direct contact between metallic parts and the table.

Wall Mount

The Picolo.net HD4 "Desktop" is used together with the baseplate. The DIN-rail clip may be discarded.

First of all, the baseplate has to be attached to the wall using appropriate fixation methods. Therefore it is equipped with four oblong openings allowing easy installation and alignment. The openings dimensions are 4 mm x 12 mm (0.16" x 0.47").

The enclosure is then hooked upon the baseplate by first inserting the long enclosure brackets, then the short brackets. The four embossings on the bottom side of the plastic caps act as anti-skid feet, and prevent any movement of the enclosure once hooked-up on the baseplate.



Picolo.net HD4 enclosure on baseplate assembly

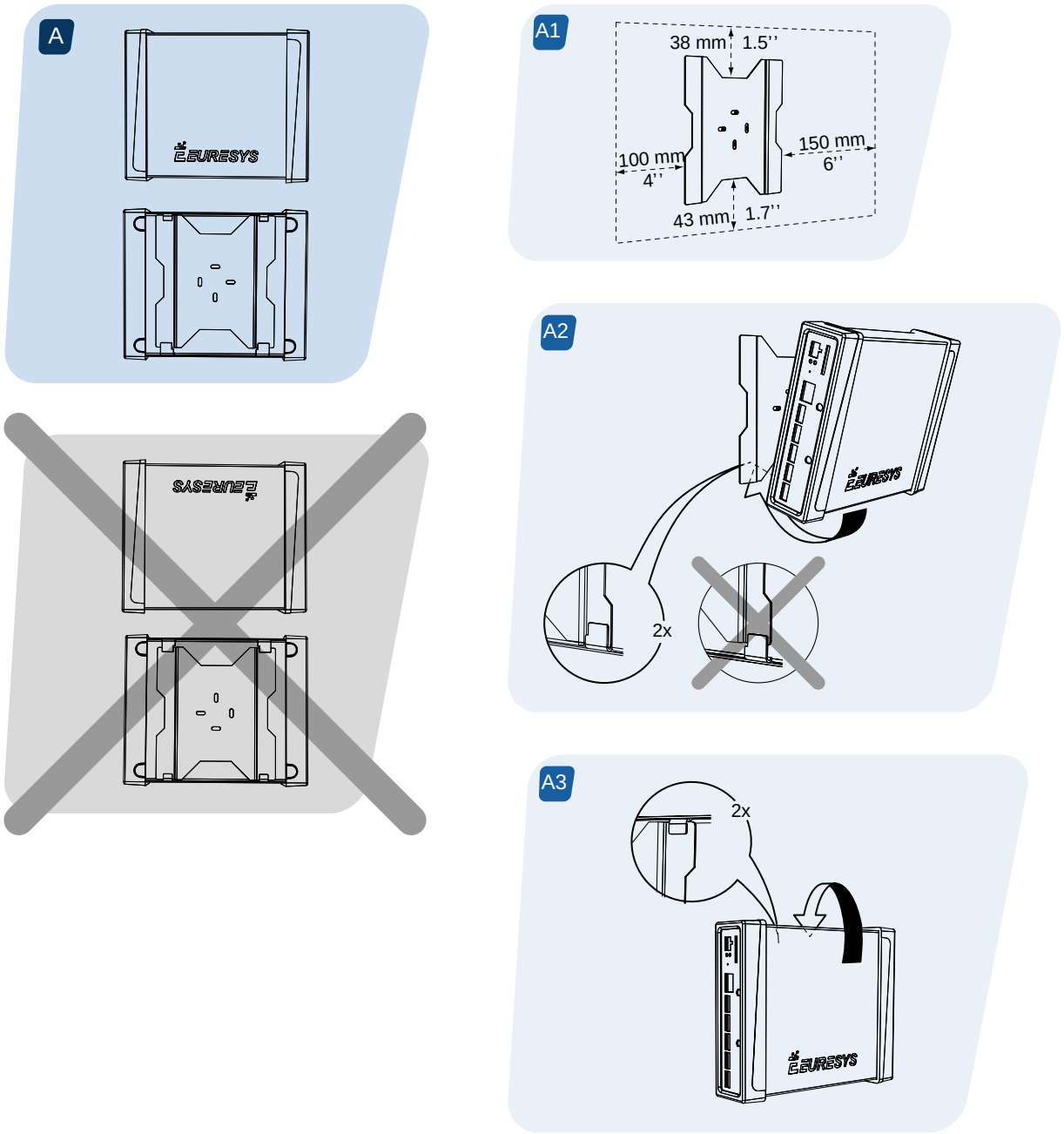
The enclosure and the baseplate are designed in such a way that the enclosure can be mounted on a vertical flat surface with three possible orientations:

- **Horizontal**: the BNC video connectors are facing rightwards and the Euresys logo is horizontal.
- **Vertical Downwards**: the BNC video connectors and the Euresys logo are oriented downwards.
- **Vertical Upwards**: the BNC video connectors and the Euresys logo are oriented upwards.

Note. BNC video connectors facing leftwards is not allowed.

Wall Mount - Horizontal Orientation

The following drawings summarize the installation instructions for the horizontal orientation:



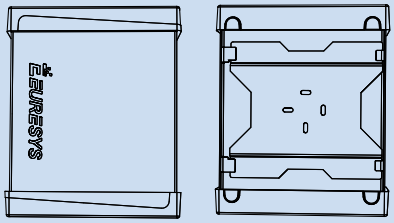
Wall mount - Horizontal

Note. The void area around the baseplate is required to allow easy installation and removal of the enclosure on the baseplate, and easy wiring on both the rear and front sides.

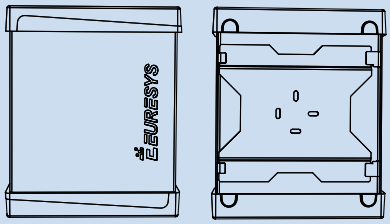
Wall Mount - Vertical Orientations

The following drawings summarize the installation instructions for both vertical orientations:

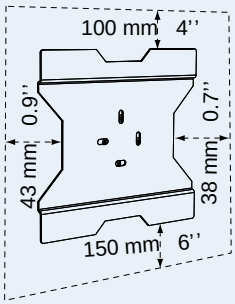
B



C



B1



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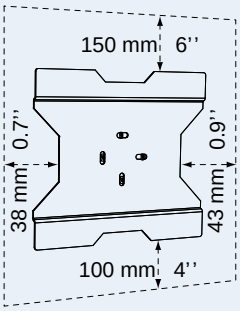
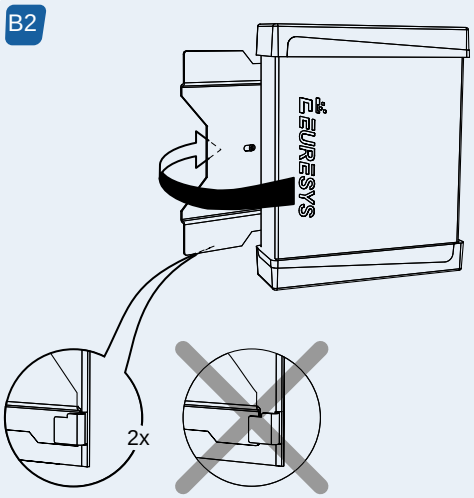
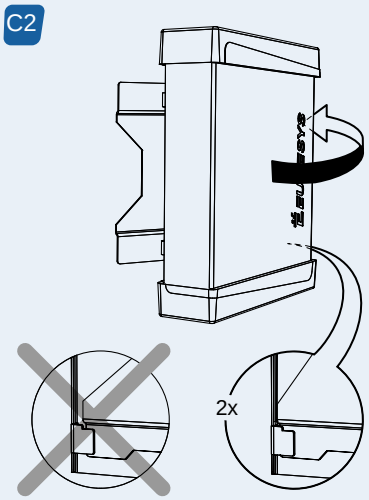


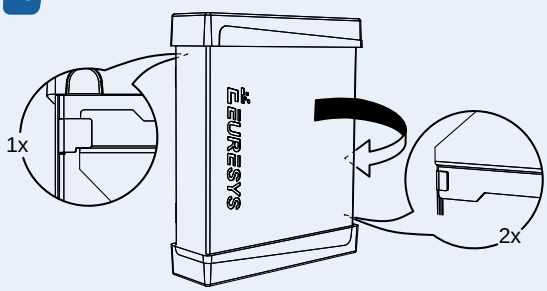
B2



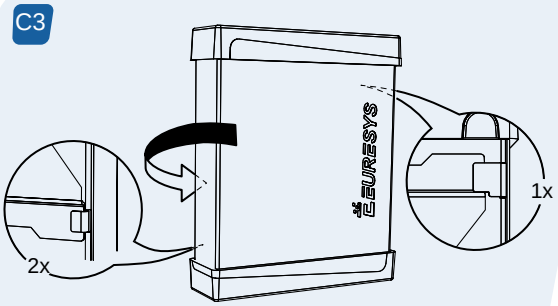
C2



B3



C3



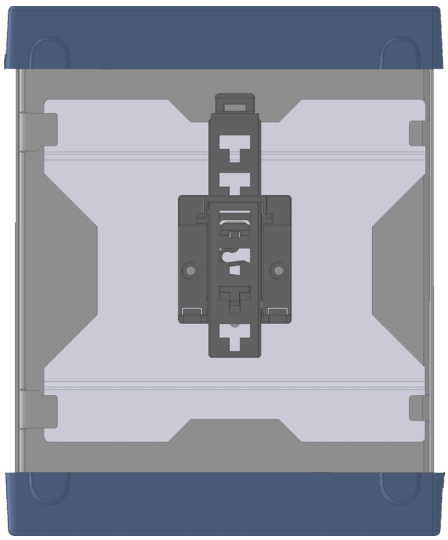
Wall mount - Vertical

Note. The void area around the baseplate is required to allow easy installation and removal of the enclosure on the baseplate, and easy wiring on both the rear and front sides.

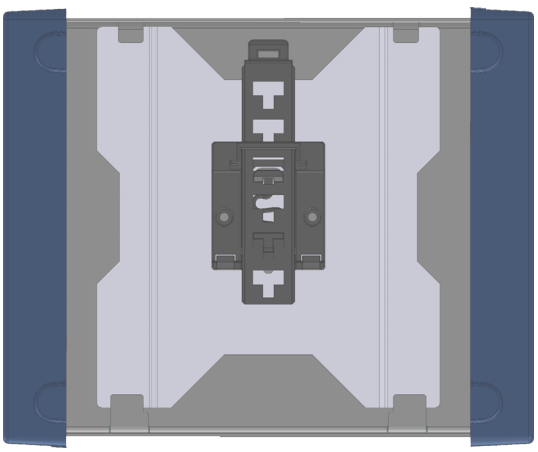
DIN-Rail Mount

To mount Picolo.net HD4 on a DIN rail, the DIN-rail clip must be installed on the back side of the baseplate, and the enclosure must be hooked-up on the baseplate like for the wall-mount usage.

Assuming that the DIN rail is always horizontal, the DIN-rail clip must be oriented according to the desired orientations for the BNC connectors.



DIN-rail clip orientation, for BNC video connectors facing upwards or downwards

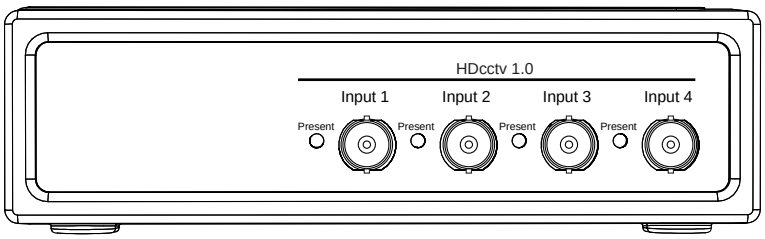


DIN-rail clip orientation, for BNC video connectors facing rightwards
(BNC video connectors facing leftwards is not allowed)

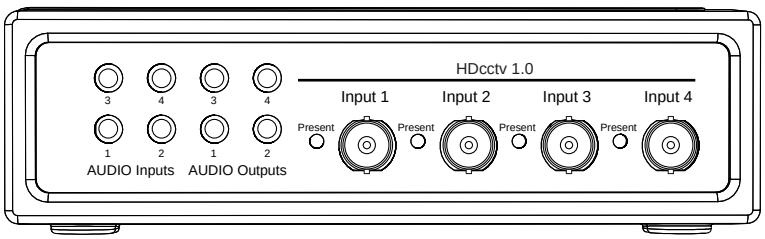
The DIN-rail clip is equipped with a lever that facilitates the removal from the DIN rail.

Connectors, Indicators and Switches

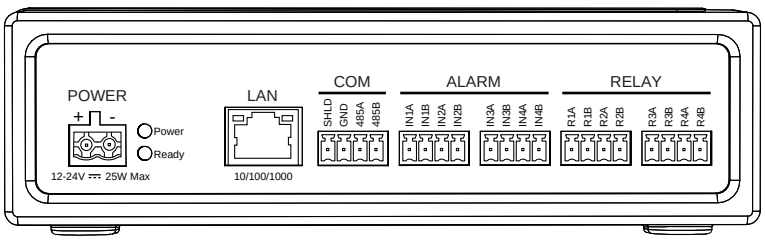
Connectors Location and Markings



Front panel of Picolo.net HD4



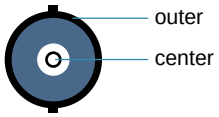
Front panel of Picolo.net HD4 with 2 Audio Module options



Rear panel of Picolo.net HD4

HD4 encoder module - Connectors Description

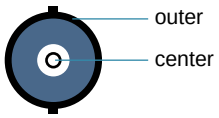
HD-SDI Input 1 Connector



2-pin female receptacle, right-angled PCB-mount, BNC connector

Pin	Signal	Usage
Center	HD-SDI IN1	HD-SDI Video Input 1
Outer	GND	Chassis ground

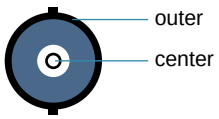
HD-SDI Input 2 Connector



2-pin female receptacle, right-angled PCB-mount, BNC connector

Pin	Signal	Usage
Center	HD-SDI IN2	HD-SDI Video Input 2
Outer	GND	Chassis ground

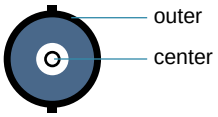
HD-SDI Input 3 Connector



2-pin female receptacle, right-angled PCB-mount, BNC connector

Pin	Signal	Usage
Center	HD-SDI IN3	HD-SDI Video Input 3
Outer	GND	Chassis ground

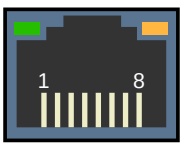
HD-SDI Input 4 Connector



2-pin female receptacle, right-angled PCB-mount, BNC connector

Pin	Signal	Usage
Center	HD-SDI IN4	HD-SDI Video Input 4
Outer	GND	Chassis ground

LAN Connector



8-pin RJ45 jack connector with 2 built-in LED indicators

Pin	Signal	Usage
1	TRP1+	Transmit/Receive Pair 1 +
2	TRP1-	Transmit/Receive Pair 1 -
3	TRP2+	Transmit/Receive Pair 2 +
4	TRP3+	Transmit/Receive Pair 3 +
5	TRP3-	Transmit/Receive Pair 3 -
6	TRP2-	Transmit/Receive Pair 2 -
7	TRP4+	Transmit/Receive Pair 4 +
8	TRP4-	Transmit/Receive Pair 4 -
Shell	GND	Chassis ground

COM Connector

4-pin 3.5mm pitch terminal socket

Pin	Signal	Usage
1	SHLD	Chassis ground
2	GND	Signal ground
3	485+	Transmit/Receive - Positive terminal
4	485-	Transmit/Receive - Negative terminal

ALARM I Connector

4-pin 3.5mm pitch terminal socket

Pin	Signal	Usage
1	IN1A	Alarm Input 1 - Terminal A
2	IN1B	Alarm Input 1 - Terminal B
3	IN2A	Alarm Input 2 - Terminal A
4	IN2B	Alarm Input 2 - Terminal B

ALARM II Connector

4-pin 3.5mm pitch terminal socket

Pin	Signal	Usage
1	IN3A	Alarm Input 3 - Terminal A
2	IN3B	Alarm Input 3 - Terminal B
3	IN4A	Alarm Input 4 - Terminal A
4	IN4B	Alarm Input 4 - Terminal B

RELAY I Connector

4-pin 3.5mm pitch terminal socket

Pin	Signal	Usage
1	R1A	Relay Output 1 - Terminal A
2	R1B	Relay Output 1 - Terminal B
3	R2A	Relay Output 2 - Terminal A
4	R2B	Relay Output 2 - Terminal B

RELAY II Connector

4-pin 3.5mm pitch terminal socket

Pin	Signal	Usage
1	R3A	Relay Output 3 - Terminal A
2	R3B	Relay Output 3 - Terminal B
3	R3A	Relay Output 4 - Terminal A
4	R3B	Relay Output 4 - Terminal B

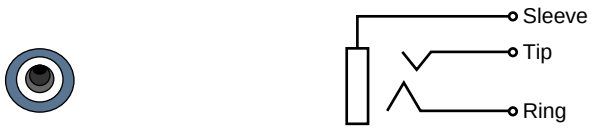
POWER Connector

2-pin 5mm pitch terminal socket

Pin	Signal	Usage
1	+	DC Power Input - Positive terminal
2	-	DC Power Input - Negative terminal

Audio Input 1 Connector

This connector is optional.

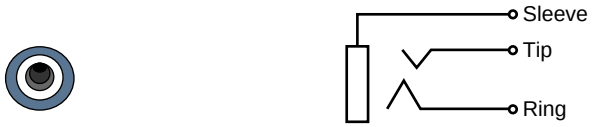


Black TRS 3.5mm jack socket connector

Pin	Signal	Usage
Ring	-	Unused
Tip	AUDIO IN1	Analog audio input 1
Sleeve	GND	Chassis ground

Audio Input 2 Connector

This connector is optional.

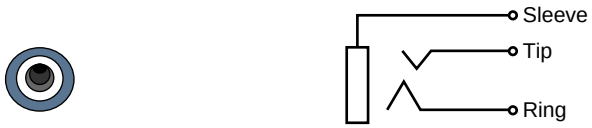


Black TRS 3.5mm jack socket connector

Pin	Signal	Usage
Ring	-	Unused
Tip	AUDIO IN2	Analog audio input 2
Sleeve	GND	Chassis ground

Audio Input 3 Connector

This connector is optional.

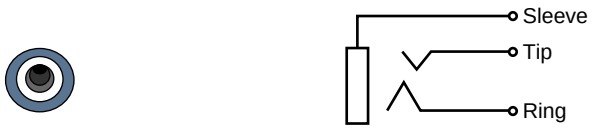


Black TRS 3.5mm jack socket connector

Pin	Signal	Usage
Ring	-	Unused
Tip	AUDIO IN3	Analog audio input 3
Sleeve	GND	Chassis ground

Audio Input 4 Connector

This connector is optional.

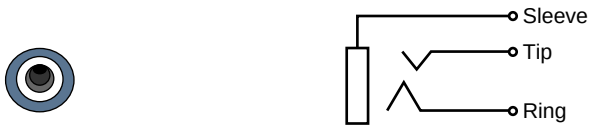


Black TRS 3.5mm jack socket connector

Pin	Signal	Usage
Ring	-	Unused
Tip	AUDIO IN4	Analog audio input 4
Sleeve	GND	Chassis ground

Audio Output 1 Connector

This connector is optional.

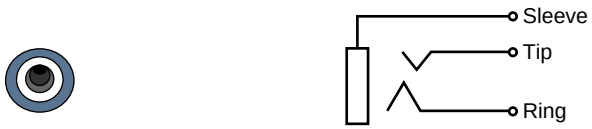


Black TRS 3.5mm jack socket connector

Pin	Signal	Usage
Ring	-	Unused
Tip	AUDIO OUT1	Analog audio output 1
Sleeve	GND	Chassis ground

Audio Output 2 Connector

This connector is optional.

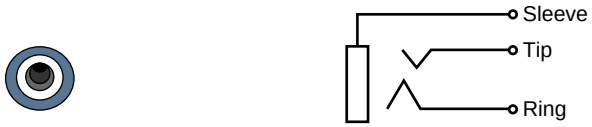


Black TRS 3.5mm jack socket connector

Pin	Signal	Usage
Ring	-	Unused
Tip	AUDIO OUT2	Analog audio output 2
Sleeve	GND	Chassis ground

Audio Output 3 Connector

This connector is optional.

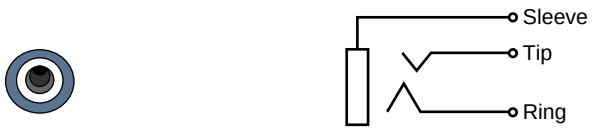


Black TRS 3.5mm jack socket connector

Pin	Signal	Usage
Ring	-	Unused
Tip	AUDIO OUT3	Analog audio output 3
Sleeve	GND	Chassis ground

Audio Output 4 Connector

This connector is optional.



Black TRS 3.5mm jack socket connector

Pin	Signal	Usage
Ring	-	Unused
Tip	AUDIO OUT4	Analog audio output 4
Sleeve	GND	Chassis ground

LED Indicators

Picolo.net HD4 provides the following LED indicators:

Location	Type and Colour	Marking	Function
Front panel	Circular green LED	Video Input 1 Present	HD-SDI signal status
Front panel	Circular green LED	Video Input 2 Present	HD-SDI signal status
Front panel	Circular green LED	Video Input 3 Present	HD-SDI signal status
Front panel	Circular green LED	Video Input 4 Present	HD-SDI signal status
Rear panel	Circular green LED	Power	Power status
Rear panel	Circular green LED	Ready	Device status
Rear panel - LAN connector	Rectangular green LED	*No marking*	Link activity
Rear panel - LAN connector	Rectangular amber LED	*No marking*	Link status

LED Indicators State Meanings

HD-SDI Signal Status LED State Meaning

LED State	Meaning
OFF	No or invalid HD-SDI signal
ON	Valid and supported HD-SDI signal
Blink 1Hz 90% ON time	Valid but unsupported HD-SDI signal

Power Status LED State Meaning

LED State	Meaning
OFF	No power
ON	Power OK

Device Status LED State Meaning

LED State	Meaning
OFF	Power OFF or Operating System kernel startup
Fast blink (10 Hz) 50% ON time	Operating System Kernel startup completed, system boot in progress
ON	System is Ready
Slow blink (1 Hz) 10% ON time	Firmware update in progress
Slow blink (1 Hz) 90% ON time	System error

LAN Link Activity LED State Meaning

LED State	Meaning
OFF	No activity on the link
Blink	Activity on the link

LAN Link Status LED State Meaning

LED State	Meaning
OFF	The link is not OK
Blink	The link is OK and operating at the lowest speed
ON	The link is OK and operating at the highest speed

Switches

Picolo.net HD4 provides the following switch:

Location	Type	Marking	Function
Front panel (near Power LED)	Recessed push-button	*No marking*	Device maintenance

Device Maintenance Switch Action Meaning

Switch Action	Meaning
Short push (200 ms < t < 3 s)	Reboot the device
Long push (t > 3 s)	Restore the device factory settings including network settings

Electrical Specification

Power Input

Picolo.net HD4 is powered from an external single voltage DC power source.

HD4 encoder module - **Operating characteristics**

Operating characteristics	Min.	Typ.	Max.	Unit
Voltage range (pre-series devices)	9.6		14.4	V
Voltage range (full-spec devices)	8		40	V
Power consumption – 25 °C ambient t°; H.264 encoder @full workload		15		W
Power consumption – Maximum operating ambient t°; H.264 encoder @full workload		17		W
Additional power consumption per audio module option				W
Additional power consumption for Cooling Module option for Picolo.net HD8R (applies to instance B of *HD4 encoder module* of Picolo.net HD8R)				W

Note. Pre-series products, SN00011 up to SN00070, are restricted for use with 12V DC supply!

Note. The input voltage range enables the usage of:

- Unregulated 12V DC +/- 20 % supply sources on all devices including pre-series devices.
- Unregulated 12V DC and 24V DC +/- 25 % supply source on full-spec devices.

Note. The Power input connector is labeled 12 V for pre-series devices and 12-24 V for full-spec devices.

HD4 encoder module - **Absolute maximum ratings**

Absolute maximum ratings	Min.	Typ.	Max.	Unit
Forward voltage			***TBD***	V
Reverse voltage			***TBD***	V

Note. The specification applies to the whole operating temperature range.

Note. Exceeding the above limits may irreversibly damage the product.

HD-SDI Inputs

Picolo.net HD4 has 4 identical HD-SDI compliant video inputs.

Operating characteristics

Operating characteristics	Min.	Typ.	Max.	Unit
Peak-to-peak signal amplitude (short cable)	720	800	950	mV
Serial data rate		1.485		Gbps
PLL loop filter bandwidth		1.5		MHz
Achievable cable length with Belden 1694 coaxial cable			100	m
Input impedance		75		Ω
Return loss measured over the 5MHz to 2.25GHz frequency range			-15	dB

Absolute maximum ratings

Absolute maximum ratings	Min.	Typ.	Max.	Unit
DC voltage	-2.0		+2.0	V

Note. Exceeding the above limits may irreversibly damage Picolo.net HD4. The usage of DC-coupled video sources outside the above mentioned limits is strictly prohibited.

Related Links
Functional Specification topic(s)
Video Source Specification on page 40
Software Specification topic(s)
ONVIF Media Service on page 60
The ONVIF media service provides functions to configure the streaming properties of the media streams.
Web Pages topic(s)
Configurations Page on page 77

COM I/O

Picolo.net HD4 has 1 bi-directional RS-485 compatible COM port.

Operating Characteristics

Operating characteristics

Operating characteristics	Min.	Typ.	Max.	Unit
Termination load impedance		120		Ω
Driver differential output voltage	1.5			V_{ptp}
Receiver common-mode voltage range	-7		+12	V
ESD voltage rating			15	kV

Condition: the RS-485 line is terminated at both ends with 120 ohms.

Absolute Maximum Ratings

Absolute maximum ratings

Absolute maximum ratings	Min.	Typ.	Max.	Unit
DC voltage	-8		+13	V
Driver output current			250	mA

Note. Exceeding the above limits may irreversibly damage Picolo.net HD4.

Related Links
Functional Specification topic(s)
System Integration Specifications on page 50
Software Specification topic(s)
ONVIF PTZ service on page 63
The PTZ service is used to control NVT pan tilt and zoom.

Proprietary PTZ service on page 64
The proprietary PTZ service extends the ONVIF PTZ service.

Web Pages topic(s)
PTZ Page on page 93

Alarm Inputs

Picolo.net HD4 has 4 identical Alarm Input ports.

Each of those digital non-isolated differential input ports exposes two pins named INxA and INxB respectively, where x is a number ranging from 1 to 4.

The ports are insensitive to the polarity and support the direct connection of the following types of devices:

- Potential-free contact closure (a.k.a. dry contacts)

- Fixed potential contact closure (one pin of the contact at a fixed potential)
- Digital Totem-Pole drivers operating at TTL, 3V CMOS, 5V CMOS, and 12V CMOS levels

Possible state values for **contact closure** devices:

OPEN

The contact is open.

LOW

The contact is closed.

Possible state values for **logical** devices:

OPEN

Logical device is in High-Z.

LOW

Logical device is driving LOW.

HIGH

Logical device is driving HIGH.

Related Links

Functional Specification topic(s)

System Integration Specifications on page 50

Software Specification topic(s)

ONVIF Device IO Service on page 66

The Device IO service offers commands to retrieve and configure the settings of physical inputs and outputs of a device.

Web Pages topic(s)

Digital Inputs & Relay Outputs Page on page 88

System Integration Specifications on page 50

Digital Inputs & Relay Outputs Page on page 88

ONVIF Device IO Service on page 66

The Device IO service offers commands to retrieve and configure the settings of physical inputs and outputs of a device.

Proprietary Device IO service on page 66

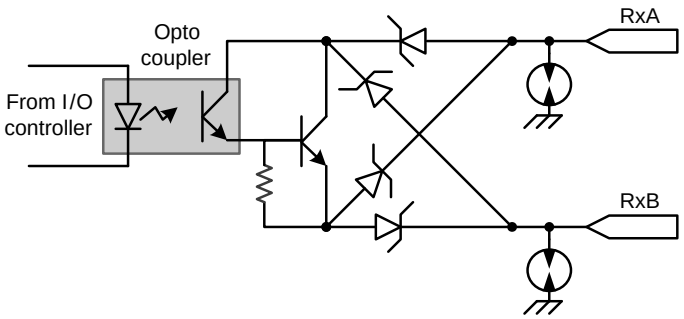
The proprietary Device IO service extends the ONVIF Device IO service.

Relay Outputs

Picolo.net HD4 has 4 identical Relay Output ports.

Each port has two pins named RxA and RxB respectively, where x is a number ranging from 1 to 4.

This output port emulates a potential-free and polarity-free solid-state contact. It is capable of switching both AC- and DC-powered resistive loads.



Relay Output port schematic

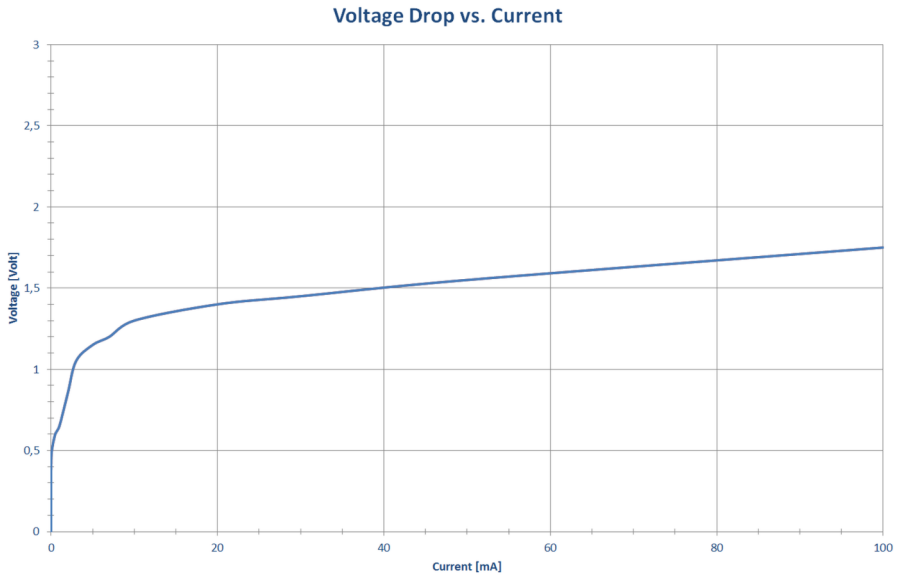
The contact remains in the OPEN state during the board initialization procedure.

In the CLOSED state, the output port exhibit a voltage drop across its pins. Typical voltage drops for current values of 1, 10 and 100 mA are shown in the following table:

Operating the relay output with load currents below 1 mA is not recommended since it exhibit a large equivalent resistance!

Operating Characteristics

Operating Characteristics	Condition	Min.	Typ.	Max.	Unit
Load Current - Recommended range	Ambient temperature up to 55 °C	1	10	100	mA
Voltage across pins	1 mA; 25 °C ambient temperature		0.65		V
	10 mA; 25 °C ambient temperature		1.3		V
	100 mA; 25 °C ambient temperature		1.75		V



Relay Output port U-I diagram

Absolute Maximum Ratings

Absolute Maximum Ratings	Test Condition	Min.	Typ.	Max.	Unit
Absolute maximum DC voltage	Contact open	-30		+30	V
Absolute maximum AC voltage	Contact open			21	V_{RMS}
Absolute maximum DC current	Contact closed	-100		+100	mA
Absolute maximum AC current	Contact closed			70	mA_{RMS}
Isolation voltage			500		V_{RMS}

Exceeding the absolute maximum ratings may irreversibly damage Picolo.net HD4.

Related Links
Functional Specification topic(s)
System Integration Specifications on page 50
Software Specification topic(s)
ONVIF Device IO Service on page 66
The Device IO service offers commands to retrieve and configure the settings of physical inputs and outputs of a device.

Web Pages topic(s)
Digital Inputs & Relay Outputs Page on page 88
System Integration Specifications on page 50
Digital Inputs & Relay Outputs Page on page 88
ONVIF Device IO Service on page 66
The Device IO service offers commands to retrieve and configure the settings of physical inputs and outputs of a device.

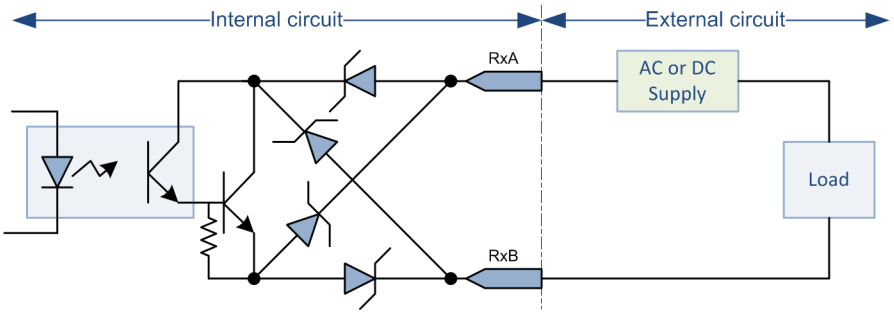
Proprietary Device IO service on page 66
The proprietary Device IO service extends the ONVIF Device IO service.

Using Relay Outputs

Circuit Diagram

The following drawing shows a diagram of an electrical circuit using one relay output. The left side shows the simplified electric diagram of the relay output port; the right side shows the elements of the external circuit:

- The power supply
- The load



Circuit Diagram

Power Supply

Operating the relay output circuit requires an external power source.

The power source can be either DC or AC since the relay output port is capable of switching current of both polarities. The recommended voltage rating ranges from 5V up to 24V for DC supply and from $5V_{RMS}$ up to $15V_{RMS}$ for AC supply.

Load

The load impedance must be essentially resistive.

If the load is capacitive, it is necessary to insert a series resistor to prevent against excessive currents when the relay output enters the CLOSED state.

If the load is inductive, it is necessary to insert a series resistor to prevent against excessive voltage spikes when the relay output changes of state.

The recommended current rating ranges from 1 mA to 100 mA for the whole operating temperature range.

As shown on the following table, the range of allowed load resistance values depends on the selected supply voltage and the load current limits.

Load Resistance Range vs. Supply voltage

Supply voltage	Load Resistance - Bottom Range @I = 100 mA	Load Resistance - Mid Range @I = 10 mA	Load Resistance - Top Range @I = 1 mA
5V DC or $5V_{RMS}$ AC	33 Ohms	370 Ohms	4.35 kOhms
12V DC or $12V_{RMS}$ AC	103 Ohms	1.07 kOhms	11.35 kOhms
15V DC or $15V_{RMS}$AC	133 Ohms	1.37 kOhms	14.35 kOhms
24VDC	223 Ohms	2.27 kOhms	23.35 kOhms

For instance, with a power supply of 12V DC or $12V_{RMS}$ AC , the load resistance must be higher than 103 Ohms and less than 11.35 kOhms.

Audio Inputs

Each Audio Module option for Picolo.net HD4, HD8R has 2 identical analog audio input ports.

Operating Characteristics

Operating characteristics	Min.	Typ.	Max.	Unit
Full-scale input voltage	1.35	1.4	1.5	V_{ptp}
Input impedance (@ 1 kHz)		20		kΩ
Sampling frequency		48		kHz

Absolute Maximum Ratings

Absolute maximum ratings	Min.	Typ.	Max.	Unit
DC voltage	-10		+10	V
Input signal level			2.0	V_{ptp}

Note. Exceeding the above limits may irreversibly damage Audio Module option for Picolo.net HD4, HD8R.

Related Links
Functional Specification topic(s)
Audio Input on page 45
Software Specification topic(s)
ONVIF Media Service on page 60
The ONVIF media service provides functions to configure the streaming properties of the media streams.
Web Pages topic(s)
Configurations Page on page 77

Audio Outputs

Each Audio Module option for Picolo.net HD4, HD8R has 2 identical analog audio output ports.

Operating Characteristics

Operating characteristics

Operating characteristics	Test condition	Min.	Typ.	Max.	Unit
Full-scale output voltage	10 kΩ load, min gain		0.97		V_{ptp}
	10 kΩ load, default gain	1.41	1.48	1.55	V_{ptp}
	10 kΩ load, max gain		2.79		V_{ptp}
Output impedance (@ 1 kHz)			470		Ω

Absolute Maximum Ratings

Absolute maximum ratings

Absolute maximum ratings	Min.	Typ.	Max.	Unit
DC voltage	-10		+10	V

Note. Exceeding the above limits may irreversibly damage Audio Module option for Picolo.net HD4, HD8R.

Related Links
Functional Specification topic(s)
Audio Output on page 46
Software Specification topic(s)
Proprietary Media Service on page 61
The proprietary media service extends the ONVIF media service.
Web Pages topic(s)
Audio Outputs Page on page 92

Environmental Specification

Operating Conditions

Picolo.net HD4

Requirements

Characteristic	Condition(s)	Min.	Max.	Unit
Ambient air temperature range	One device alone	0	55	°C
		32	131	°F
Ambient humidity range	Non-condensing	10	90	% RH

Dissipated power

Characteristic	Condition(s)	Typ.	Unit
Thermal value	25 °C ambient t°; H.264 encoder @full workload	51	BTU/h
		15	W
Thermal value	Maximum operating ambient t°; H.264 encoder @full workload	58	BTU/h
		17	W

Storage Conditions

The following requirements are applicable to Picolo.net HD4 during storage conditions when the product is not operating:

Requirement during storage conditions

Requirement during storage conditions	Min.	Max.	Unit
Temperature range	-20	+75	°C
	-4	+158	°F
Humidity range	10	90	% Relative Humidity non-condensing

Compliance

Electromagnetic

Picolo.net HD4 complies with:

- The European Council EMC Directive 2004/108/EC
- The Unites States FCC rule 47 CFR 15

It has been tested and found to comply with the following standards:

Radiated emission

Standard	Limit / Level
EN 55022	Class A
FCC 47 CFR 15 Sub-part A	Class A

Immunity

Standard	Description
EN 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4	Electrical fast transient/burst immunity test
EN 61000-4-5	Surge immunity test
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-11	Voltage dips, short interruptions and voltage variations immunity tests

RoHS

Picolo.net HD4 is manufactured according to the European Union RoHS 2011/65/EU Directive.

WEEE

According the European 2002/96/EC Directive, Picolo.net HD4 must be disposed of separately from normal household waste. It must be recycled according to the local regulations.

Functional Specification

Video Specifications

Video Processing Chain

The video processing chain of Picolo.net HD4 is composed of the following elements:

- 4 video sources
- 4 scalers
- 12 H.264 encoders

The video source implements an HD-SDI receiver capable of automatically identifying and decoding 720p and 1080p video signals at various frame rates. It delivers a full rate full resolution digital video stream to the source splitter.

The video splitter delivers up to 3 copies, possibly at a reduced frame rate, of the incoming digital video stream.

The scaler exclusively performs down-scaling of the video resolution.

The H.264 encoder performs the compression and delivers the encoded video stream.

Video Processing Capabilities

The capabilities of the video processing chain of Picolo.net HD4 are summarized as follows:

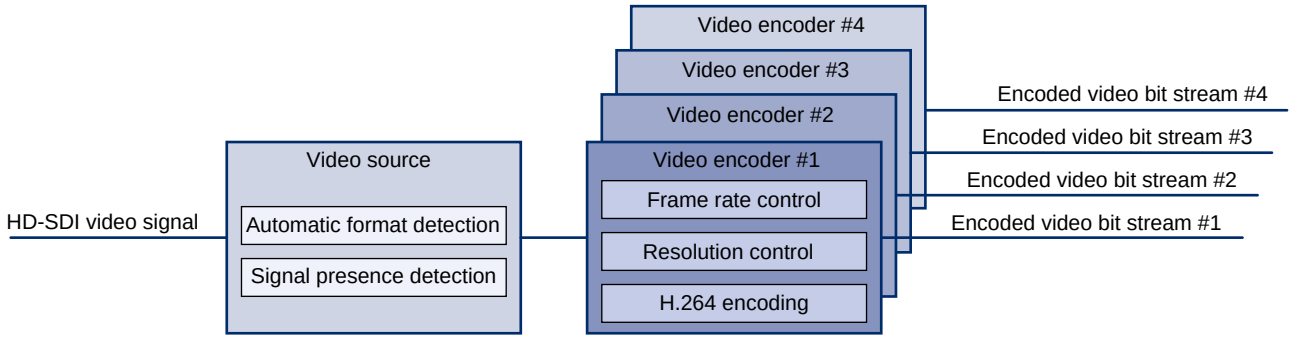
- Up to 3 H.264 video streams per camera can be generated.
- A total of up to 12 H.264 video streams can be generated per device.
- The frame rate of all video streams is configurable individually.
- The resolution of up to 4 video streams can be reduced.
- The cumulated encoding power cannot exceed the equivalent of encoding 6 x 1080p30 video streams.

Programming Model

The application software manages the video processing resources using one ONVIF Media Profile for each encoded video stream.

An ONVIF Media Profile associates one VideoSourceConfiguration and one VideoEncoderConfiguration.

The following simplified programming model applies to each video channel of Picolo.net HD4:



Programming model of a video channel

Video Source Specification

Picolo.net HD4 has 4 identical Video Sources.

Video Signal Requirement

The Video Source decodes the following high-definition video signals:

Video Signal Properties

Characteristics	Description
Number and type	4 x HD-SDI (SMPTE 292M)
Data rate [Gbit/s]	1.485 and 1.485/1.001
Video standards	720p (SMPTE 296M) and 1080p (SMPTE 274M) progressive scan only
Native resolution	720p: 1280 x 720 lines; 1080p: 1920 x 1080 lines
Standard selection	Automatic
LED indicator	Video Presence
Status/Event reporting	Video Presence, Detected standard

720p Frame Rates

720p Frame Rate [fps]	Data Rate [Gbit/s]
23.98	1.485/1.001
24	1.485
25	1.485
29.97	1.485/1.001
30	1.485
50	1.485
59.94	1.485/1.001
60	1.485

1080p Frame Rates

1080p Frame Rate [fps]	Data Rate [Gbit/s]
23.98	1.485/1.001
24	1.485
25	1.485
29.97	1.485/1.001
30	1.485

Note. Picolo.net HD4 does not support interlaced formats.

Video Format Selection

The video format is automatically detected.

The actual frame rate and the resolution are reported into the FrameRate and Resolution properties of the ONVIF VideoSource object.

Event Reporting

- Video Signal Presence
- Video Format Change Detected

Video Presence Detection

The presence of a valid Video Signal is reported by:

- The "Video Input Present" LED indicator
- Generation of "Signal" event

A video signal is considered as valid when all the following conditions are met:

- The signal timing complies with the above listed specification

- No CRC errors are detected by the SDI receiver

Related Links
Electrical Specification topic(s)
HD-SDI Inputs on page 29
Software Specification topic(s)
ONVIF Media Service on page 60
The ONVIF media service provides functions to configure the streaming properties of the media streams.
Web Pages topic(s)
Configurations Page on page 77

Video Encoder Specification

Encoding Method

The following video encoding methods are available:

- H.264
- JPEG

H.264 Video Encoder Specification

Resolution

The H.264 encoder delivers video in one of the following resolutions:

H.264 Encoding Resolution

Width	Height	Short Name	Image Aspect Ratio	Remark
1920	1080	Full HD	16:9	Native for 1080p sources
1280	720	HD720	16:9	Native for 720p sources
960	540	qHD	16:9	
640	360		16:9	Fits within a VGA display
480	270		16:9	
320	240	QVGA	4:3	*Available since version 4.x*
320	180		16:9	Fits within a QVGA display

The default resolution setting is the native video source resolution:

- 1920 (H) x 1080 (V) for 1080p sources
- 1280 (H) x 720 (V) for 720p sources

Profile

The H.264 encoder supports the following H.264 encoding profiles:

- H.264 Baseline profile
- H.264 Main profile
- H.264 High profile

The default encoding profile is the Baseline profile.

Rate Control - Frame Rate

The **EncodingInterval** and **FrameRateLimit** properties of the VideoEncoderConfiguration object determine the frame rate of the encoded video stream:

FrameRateLimit is an integer value expressed in frames per second [fps] specifying the upper limit of the frame rate of the encoded video stream.

The **FrameRateLimit** property:

- Is set, by default, to the actual frame rate of the video source.
- Can be set to any integer value up to the frame rate of the video source.

Note. For video sources having a non-integer frame rate value, the default and maximum value of FrameRateLimit is rounded up to the next integer value. For instance for 29.97 fps sources, FrameRateLimit is set to 30

Setting **FrameRateLimit** to 0 is equivalent to setting FrameRateLimit to its maximum value.

EncodingInterval specifies the interval between encoded frames. A value of 1 means that all frames are encoded; a value of 2 means that 1 frame out of 2 are effectively encoded. The **EncodingInterval** property:

- Is set, by default, to 1.
- Can be set to any integer value in the range [1, 150].

The frame rate of the encoded stream can be evaluated using the following formula:

Encoded Stream Frame Rate [fps] = ***FrameRateLimit / EncodingInterval***

Rate Control - Bit Rate

The target bit rate is specified in kbps by the **BitRateLimit** property of the VideoEncoderConfiguration object.

The **BitRateLimit** property:

- Is set, by default, to 4000 kbps.
- Can be set to any integer value up to 20000 kbps.

Note. Setting too low bit rates may result in lower fidelity, blocky or jerky video.

Picolo.net HD4 supports the following **bit rate control methods**:

- CBR (Constant Bit Rate)
- VBR (Variable Bit Rate)

The encoding quality is specified by the BitrateLimit property of the VideoEncoderConfiguration object.

Low Latency

The H.264 encoder features a Low Latency operation mode.

Using the Low Latency mode together with a Picolo.net LLD2 Decoder enables a low-latency video transmission over an IP network.

The Low Latency operation mode is disabled by default. It must be explicitly activated when it is required by the application.

GOP Size

The property GovLength specifies the total number of frames in a group of video pictures. Possible values are ranging from 1 to 300; the default setting is 100.

In the H.264 Baseline profile, a Group of video is composed of one I(or IDR)-frame followed by (Govlength-1) P frames.

In the H.264 Main and High profiles, a Group of video is composed of one I(or IDR)-frame followed by (Govlength-1) P or B frames.

Setting GovLength to 1 forces all pictures to be coded as I(or IDR)-frames.

JPEG Video Encoder Specification

Resolution

The JPEG encoder delivers images in one of the following resolutions:

JPEG Encoding Resolution

Width	Height	Short Name	Image Aspect Ratio	Remark
1920	1080	Full HD	16:9	Native for 1080p sources
1280	720	HD720	16:9	Native for 720p sources
960	540	qHD	16:9	
640	360		16:9	Fits within a VGA display
480	270		16:9	
320	240	QVGA	4:3	*Available since version 4.x*
320	180		16:9	Fits within a QVGA display

The default resolution setting is the native video source resolution:

- 1920 (H) x 1080 (V) for 1080p sources
- 1280 (H) x 720 (V) for 720p sources

Rate Control

The frame rate, bit rate and quality settings of MJPEG video encoders are ignored. The MJPEG video frame rate is low (typically around 1 fps) and mainly depends on the amount of active JPEG encoders and their configured resolutions.

Audio Specifications

Picolo.net HD4 can optionally be fitted with one or two Audio Module option for Picolo.net HD4, HD8R.
Each Audio Module option for Picolo.net HD4, HD8R provides the following capabilities:

- Streaming encoded digital audio captured from each of the two analog audio input ports
- Playback of a digital audio stream to each of the two analog audio output ports

Audio Input

Each audio input channel is composed of:

- The audio source interface that digitizes the analog audio signal
- The audio encoder that encodes the digital audio signal and performs the time-stamping

Source interface

Characteristics	Description
Type	Mono line-level analog input
Level control	Fixed
Sampling rate	Fixed: 48 kHz

Audio encoders

Characteristics	Description
Encoding standards	■ PCM G.711 µ-law @64 kbps(default) ■ Linear PCM 16-bit @48 kHz
Encoding standard selection	Using the ONVIF API
Time stamping resolution	11.1 microseconds (90 kHz time clock)
Audio streaming	One single-channel audio stream per audio input, individually configurable

Related Links
Electrical Specification topic(s)
Audio Inputs on page 34
Software Specification topic(s)
ONVIF Media Service on page 60
The ONVIF media service provides functions to configure the streaming properties of the media streams.
Web Pages topic(s)
Configurations Page on page 77

Audio Output

An audio output channel is composed of:

- An RTSP client capable of establishing an RTSP session with an RTSP server optionally using user/password authentication.
- An audio decoder that decodes the digital audio stream
- An output interface circuit that builds up the analog audio output signal

Audio decoder

Characteristics	Description
Audio playback	One single-channel audio stream per audio output
Encoding standard	PCM G.711 µ-law
Bit rate	64 kbps

Output interface

Characteristics	Description
Type	Mono line-level analog outputs

Event Signaling

A event is generated In case of a change in the audio output status.

The `PicoloAudioOutput` event message includes the following fields:

- The *Source* field contains the token name of the audio output port
- The first *Data* field reports the state of the audio output port
- The second *Data* field reports the URI of the audio stream

Audio Output States

State	Description
Connected	The Audio Output channel is connected to an RTSP server and fed by a valid audio stream.
Disconnected	The Audio Output channel is facing one or more of the following issues: ■ Incorrect UserName/Password for the RTSP server authentication ■ Unsupported audio encoding and/or bit rate ■ Unexpected interruption of the streaming ■ Network issues

Related Links

Electrical Specification topic(s)

Audio Outputs on page 35

Software Specification topic(s)

Proprietary Media Service on page 61

The proprietary media service extends the ONVIF media service.

Web Pages topic(s)

Audio Outputs Page on page 92

Streaming Specifications

Media Transport Protocols

Media Transport Protocol

Picolo.net HD4 uses the Real-Time Transport Protocol - RTP - norm for streaming media data over the network. In fact, the norm - RFC 3550 - describes two protocols:

- The RTP protocol itself.
- The Real-time Transport Control Protocol - RTCP.

The RTP protocol is a simple protocol which defines a standardized packet format for delivering audio and video over IP networks.

The RTCP protocol provides statistics and control information over the RTP stream.

RTP is used extensively in communication and entertainment systems that involve streaming media.

RTP can be declined in various flavors, depending on the following choices:

- The **transport modality** of the RTP stream over the network.
- The **type of media** transported by the RTP stream.

Media Transport Control Protocol

Picolo.net HD4 uses the Real-time Streaming Protocol - RTSP - as the control protocol for all the flavors of RTP streams.

RSTP is described by RFC 2326. It allows controlling another protocol (usually RTP), implementing commands such as Play (start a stream), Pause (pause a stream) and Describe (describe the streams controlled by the current RTSP session).

RTSP uses TCP as its transport protocol.

RTP Transport Modalities

Picolo.net HD4 implements the following modalities to transport the RTP stream over an IP network:

RTP over UDP Unicast

In this modality, the RTP stream is sent using the User Datagram Protocol - UDP - described in RFC 768.

The UDP protocol is a "fire and forget" protocol. The sender sends the data through the network and doesn't care whether that data arrives to the client or not. The data is never resent, and thus can be lost if a problem happens during the transport.

In the Unicast mode, the sender sends the data to a single receiver.

RTP over UDP MultiCast

This modality is almost identical to the "RTP over UDP Unicast" case. The only difference is that the data is sent to multiple receivers instead of a single one using UDP multicasting.

UDP multicasting uses the "IP multicast" technique described in RFC 1112.

In this technique, the sender sends the data to a special multicast address. The data is then sent by the routing protocols to receivers that previously informed the network that they are interested in the given multicast address. IP multicast is thus a subscription-based technique.

RTP interleaved in RTSP over HTTP

This modality is almost identical to the "RTP interleaved in RTSP over TCP" modality. The only difference is that instead of being directly sent on the TCP stream, the RTP and RTSP packets are first encapsulated in HTTP.

HTTP being a widely used protocol over the internet, encapsulating the data inside HTTP allows it to pass through firewalls.

Since HTTP is based on TCP, this modality can also be categorized as reliable.

RTP Transport Media Types

RTP can transport different media types, each coming with a corresponding sub-norm of RTP.

Picolo.net HD4 implements the following sub-norms of RTP:

RTP Payload Format for H.264 Video

The RFC 3984 describes the methodology used to encapsulate H264 (MPEG-4 Part 10) data in a RTP stream.

RTP Payload Format for JPEG-compressed Video

The RFC 2435 describes the methodology used to encapsulate JPEG-compressed Video data in a RTP stream.

SAP Support

Picolo.net HD4 supports the Session Announcement Protocol.

Permanent multicast streams enabled via the web interface are announced every 5 seconds through the SAP protocol (IETF RFC 2974) to other devices on the LAN.

Updating stream configuration (e.g. enabling/disabling audio or meta-data) only gets reflected in SAP messages after multicast is explicitly stopped and re-started on that stream.

Network Specifications

Network

Characteristics	Description
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

An IP address must be allocated to the LAN interface of Picolo.net HD4

The following IP address allocation methods are available:

- DHCP method: Automatic IPv4 address allocation using the Dynamic Host Configuration Protocol
- LLA method: Automatic IPv4 address allocation using the Link Local Address method a.k.a. ZeroConfig method
- Static IP method: Manual IPv4 address allocation

The DHCP Method

The **DHCP method** is an **automatic** IP address allocation method: the unique IP address is automatically assigned by a DHCP Server.

At Power On, providing that the "**DHCP method**" is **Enabled**, the device repeatedly attempts to contact the DHCP Server.

This method requires a correctly configured and running DHCP Server on the same network. More specifically:

- The DHCP Server must have sufficient IP addresses to deliver.
- When the DHCP Server uses MAC address filtering, it is mandatory to add the MAC address of the LAN interface to the list of enabled MAC addresses on the DHCP Server.

The **DHCP method** is **Enabled** for an out-of-the-box product or after completion of the "Restore Factory Settings" procedure.

If required, the **DHCP method** can be **Disabled** by changing the IP settings of the LAN interface.

The LLA Method

The **LLA method** is an **automatic** IP address allocation method that doesn't require a DHCP Server providing that all the peer device(s) are configured for LLA or ZeroConfig.

Note. LLA and ZeroConfig are widely supported by the Windows and Linux operating systems.

At Power On, providing that the "**LLA method**" is **Enabled**, the LAN interface negotiates with the peer device(s) a unique IP address in the 169.254.0.0/16 special block of IPv4 addresses reserved for that purpose.

The **LLA method** is **Enabled** for an out-of-the-box product or after completion of the "Restore Factory Settings" procedure.

LLA and DHCP share a common enable/disable setting.

The Static IP Method

With the **Static IP Method**, the IP address is assigned by the user.

The **Static IP method** is **Disabled** for an out-of-the-box product or after completion of the "Restore Factory Settings" procedure.

To manually assign a static IP address to the LAN interface, the user must:

- Establish a network session using any of the automatic IP address allocation method
- Gain access to the device Web Pages, and select the Device Network tab of the Management page
- Disable the automatic IP Address allocation by unchecking the "From DHCP" check-box in the IP Address panel
- Fill-in the IP and Subnet Mask fields with the appropriate value
- Apply the changes by clicking on the Apply button
- Reboot the device

TLS Protocol

Picolo.net HD4 implements the following TLS levels:

- TLS 1.0 as described by RFC 2246

The TLS protocol uses a hybrid encryption scheme, using a public-key algorithm to exchange securely between the server and the client a session key. That key is then used by a symmetric key algorithm to encrypt and decrypt the subsequent messages.

The combination of HTTP and TLS is more widely known as HTTPS.

System Integration Specifications

System integration

Characteristics	Description
Application Programming Interface	ONVIF Profile S + Proprietary web services
Alarm inputs	4 x non-isolated polarity insensitive inputs for closing contacts or electronic sensor with CMOS digital outputs
Alarm inputs connector	2 x removable plug with 4 push-in terminals
Relay outputs	4 x potential-free normally open contacts
Relay outputs connector	2 x removable plug with 4 push-in terminals
COM	1 x RS-485 bidirectional
COM connector	1 x removable plug with 4 push-in terminals
Pan/Tilt/Zoom protocol	Pelco D

Related Links
Electrical Specification topic(s)
Alarm Inputs on page 30
Relay Outputs on page 31
Software Specification topic(s)
ONVIF Device IO Service on page 66
The Device IO service offers commands to retrieve and configure the settings of physical inputs and outputs of a device.
Web Pages topic(s)
Digital Inputs & Relay Outputs Page on page 88
Electrical Specification topic(s)
COM I/O on page 29
Software Specification topic(s)
ONVIF PTZ service on page 63
The PTZ service is used to control NVT pan tilt and zoom.
Proprietary PTZ service on page 64
The proprietary PTZ service extends the ONVIF PTZ service.
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ONVIF Device IO Service on page 66
The Device IO service offers commands to retrieve and configure the settings of physical inputs and outputs of a device.
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The proprietary Device IO service extends the ONVIF Device IO service.
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The PTZ service is used to control NVT pan tilt and zoom.
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The proprietary PTZ service extends the ONVIF PTZ service.
PTZ Page on page 93

Watchdog Operation

Temperature Monitor

Picolo.net HD4 embeds a temperature sensor located inside the enclosure in the vicinity of the processor.
The temperature monitor circuit repeatedly measures the temperature and issues an alert when it exceeds 85 °C .
The measured temperature value is expressed in °C. It is available from:

- The device Web Pages: inside the Device Information panel of the Home Page.
- The Web Services: by means of the GetTemperature function of the Proprietary Device service.

- The Event Service: by means of the "Temperature" item in the "Temperature" topic of the "Device" topic set.

The temperature alert is reported with the Event Service by means of the Alert item in the "Temperature" topic of the "Device" topic set.

Note. When a temperature alert occurs, the user is invited to shut-down the device as soon as possible in order to prevent permanent damages.

Auto Setup Profiles

Picolo.net HD4 implements a procedure called "Auto Setup Profiles" both in the proprietary API and in the device web pages.

The Auto Setup Profiles procedure:

- Erases all existing ONVIF Media Profiles.
- Creates 1 ONVIF Media Profile for each currently connected camera.

It is executed:

- When the user requires it, either by pressing the corresponding button in the Media Profiles web page, or by calling the API function.
- At boot time, if there is no workable ONVIF Media Profile, the Auto Setup Profile procedure is executed for these cameras.

The generated ONVIF Media Profiles bind the corresponding Video Source object to a particular combination of Video Source Configuration, Video Encoder Configuration, and PTZ Configuration objects.

Note. Euresys reserves the rights to modify the composition of the collection and/or the settings of the configuration objects in future firmware upgrades.

Time and Date

Automatic Time and Date Synchronization Method

The automatic synchronization method keeps the device time and date in sync with the time and date of up to two NTP servers.

This method requires to have access to at least one NTP server on the network.

The IP address of the NTP servers can be:

- Obtained automatically using DHCP providing that the DHCP server on the network provides this service.
- Manually configured.

An out-of-the-box device, or a device after a "restore factory settings" procedure, is configured for:

- Automatic synchronization using NTP.
- Obtain automatically DNS addresses using DHCP.

Manual Time and Date Synchronization Method

When configured in the manual method, the device date and time must be manually restored after each power-up of the device.

Time Zones and Daylight Savings Time

Picolo.net HD4, supports time zone and daylight savings time settings. To configure the time zone, the user must provide the appropriate POSIX.1 TZ string describing the UTC offset and, when applicable, the daylight saving rule.

The Daylight Savings Time (DST) can be enabled or disabled on request.

Sample Time Zone rules

Rule in POSIX.1 TZ string format	Rule description
CET-1CEST,M3.5.0/2,M10.5.0/3	Applies to Central Europe including Belgium: ■ Local time: CET = UTC + 1 hour ■ Daylight Saving Time: CEST = CET + default DST offset of 1hour ■ DST starts on last Sunday of March at 02:00:00 CET ■ DST ends on last Sunday of October at 03:00:00 CEST
SGT-8	Applies to Singapore: ■ Local time: SGT = UTC + 8 hours ■ No DST
EST+5EDT,M3.2.0/2,M11.1.0/2	Applies to US Eastern Time Zone including New York City: ■ Local time: EST = UTC - 5 hours ■ Daylight Saving Time: EDT = EST + default DST offset of 1hour ■ DST starts on second Sunday of March at 02:00:00 EST ■ DST ends on first Sunday of November at 02:00:00 EDT

Note. For a description of the POSIX.1 TZ string syntax, refer to: *http://www.gnu.org/software/libc/manual/html_node/TZ-Variable.html*

Access Control

Access Policy

Picolo.net HD4 implements the default access policy that is recommended by the ONVIF 2.2 Core Specification.

The policy implements four user levels Administrator, Operator, User, and Anonymous.

Administrator, Operator, and Operator levels requires the user to be registered in the device user database and to authenticate before to gain access to protected device services. Non-authenticated users belongs to the Anonymous-level.

Anonymous-level users have only access to the services belonging to the following service class:

- "PRE_AUTH" class: a set of service functions not requiring user authentication, for instance: Device:GetCapabilities, Device:GetServices...

In addition to the access rights of Anonymous-level users, User-level have access to the following service classes:

- The "READ_SYSTEM" class: a set of service functions reading the system configuration from the device.
- The "READ_MEDIA" class; a set of service functions reading the media configuration data.

In addition to the access rights of User-level users, Operator-level have access to the following service class:

- The "ACTUATE" class: a set a service functions affecting the runtime behaviour.

An Administrator-level user has access to all function classes. It has an exclusive access to the following service classes:

- The "READ_SYSTEM_SECRET" class: a set of service functions reading confidential system configuration from the device.
- The "WRITE_SYSTEM" class: a set of service functions causing changes to the system configuration of the device.
- The "UNRECOVERABLE" class: a set of service functions causing unrecoverable changes to the system configuration of the device.

User Authentication

Picolo.net HD4 implements the following user authentication mechanisms to control the access to its resources:

- 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.

Enabling/disabling access control

Access control is automatically enabled when at least one Administrator-level user exists in the user database.

An out-of-box Picolo.net HD4 is delivered with an empty user database. The access control remains disabled until an Administrator-level user is created.

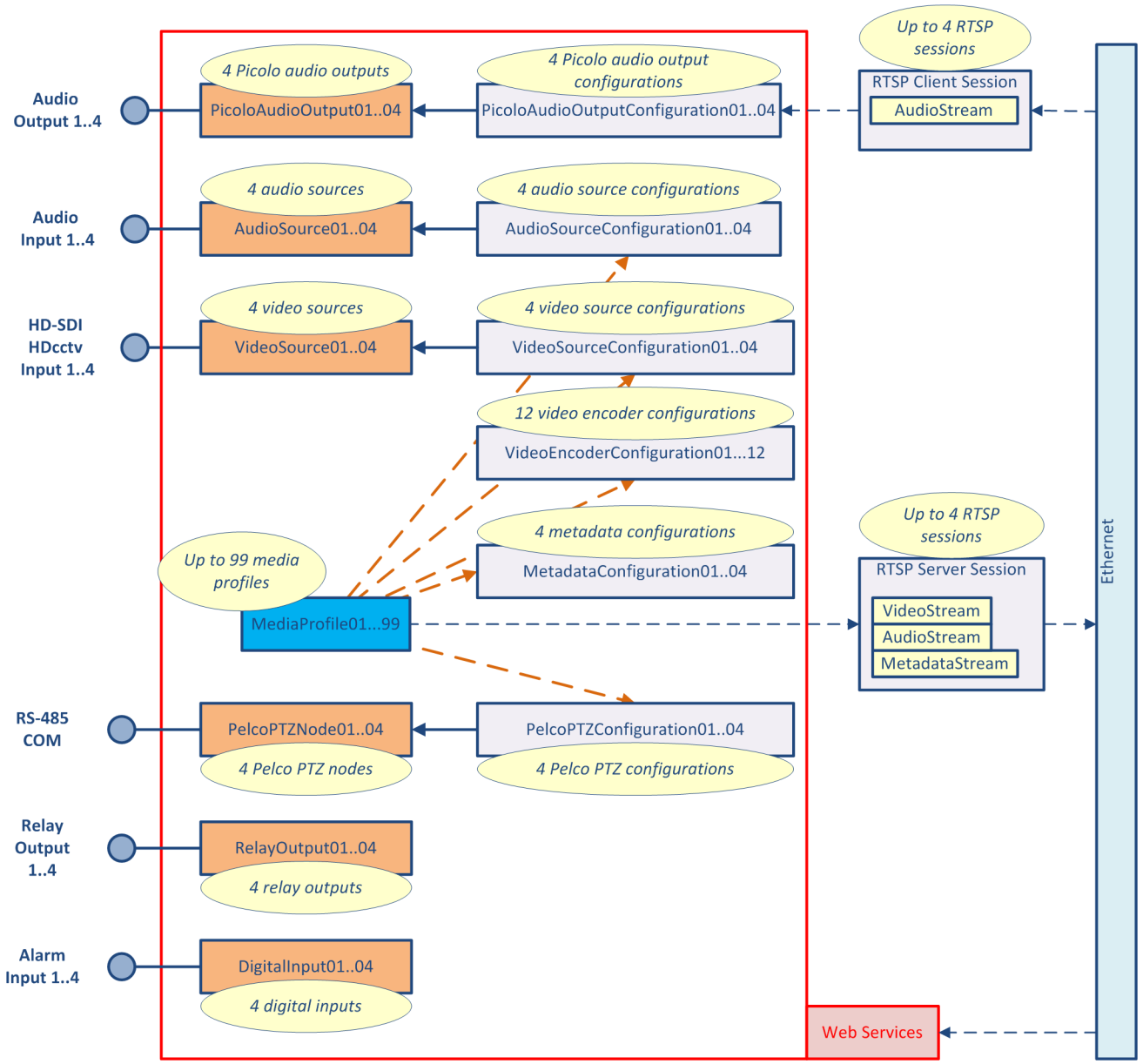
Access control can be disabled by deleting all the Administrator-level users of the user database.

Access control is also disabled after performing the "Reset to Factory Settings" procedure.

Software Specification

Software Components

***HD4 encoder module* - Components Overview**



Picolo.net HD4 is a Network Video Transmitter (NVT) device as defined by ONVIF.

ONVIF Media Profiles

The ONVIF Media Profile can be viewed as the object interconnecting the different types of configuration objects. Each one may contain configuration for:

- Up to one Video Source
- Up to one Video Stream
- Up to one Audio Stream
- Up to one Metadata Stream
- Up to one PTZ configuration

The user may create up to 99 ONVIF Media Profiles on Picolo.net HD4.

Video Configuration Objects

Picolo.net HD4 has:

- 4 VideoSource objects
- 4 VideoSourceConfiguration objects

There is one VideoSourceConfiguration object and one VideoSource object for each of the 4 physical HD-SDI inputs.

Each video source configuration is associated to the corresponding video source, e.g.: VideoSource01 is associated to VideoSourceConfiguration01. This association cannot be modified.

Video Encoder Configuration Objects

Picolo.net HD4 has 12 VideoEncoderConfiguration objects.

Each VideoEncoderConfiguration object can be associated to any of the VideoSourceConfiguration, providing that following rules are satisfied:

- Once a VideoEncoderConfiguration object is associated to a VideoSourceConfiguration object inside an ONVIF Media Profile, it cannot be associated to another VideoSourceConfiguration object.
- A VideoSourceConfiguration object can be associated to at most 3 VideoEncoderConfiguration objects.

Audio Inputs Configuration Objects

Picolo.net HD4 has:

- 4 AudioSource objects
- 4 AudioSourceConfiguration objects

Each AudioSource object is associated with one AudioSourceConfiguration object. The association cannot be modified.

Audio Encoder Configuration Objects

Picolo.net HD4 has 4 AudioEncoderConfiguration objects.

Each AudioEncoderConfiguration object is associated with one AudioSourceConfiguration object. The association cannot be modified.

Metadata Configuration Objects

Picolo.net HD4 has 4 MetadataConfiguration objects.

Picolo Audio Outputs Configuration Objects

Picolo.net HD4 has:

- 4 PicoloAudioOutput objects
- 4 PicoloAudioOutputConfiguration objects.

Each PicoloAudioOutput object is associated with one PicoloAudioOutputConfiguration object. The association cannot be modified.

PTZ Configuration Objects

Picolo.net HD4 has:

- 4 PTZNode objects
- 4 PTZConfiguration objects.

Each PTZNode object is associated with one PTZConfiguration object. The association cannot be modified. The PTZConfiguration allows to address any RS-485 target device attached on the RS-485 COM port of Picolo.net HD4.

Streaming

Video, audio, and metadata are streamed using the RTP protocol family as defined by ONVIF.

Prior to streaming video, audio, and/or metadata, an ONVIF Media Profile must be created and configured:

- To stream video, an ONVIF Media Profile must be associated to one VideoSourceConfiguration object and one VideoEncoderConfiguration object.
- To stream audio, an ONVIF Media Profile must be associated to one AudioSourceConfiguration object and one AudioEncoderConfiguration object.
- To stream metadata, an ONVIF Media Profile must be associated to one MetaDataConfiguration object.

An ONVIF Media Profile is associated to a unique stream URI. The URI remains valid as long as the ONVIF Media Profile exists. The bit stream can be delivered to one (or more) clients using one RTSP session per client.

The number of RTSP sessions is not explicitly limited. Practically, the limit is determined by the aggregate bandwidth over the Ethernet connection.

Client Interfaces

Picolo.net HD4 provides the following client interfaces:

Web Services

The "Web Services" client interface is a programmatic interface based on the W3C-standardized Web Services technology intended to be used by programmers of Video Management Software.

It provides the following categories of services:

- Configuration services
- Maintenance services

Note.

Web Pages

The "Web Pages" client interface is a graphical user interface based on the HTTP Web Server technology.
It is intended for:

- Out-of-the-box experience without programming
- Demonstration
- Diagnostic

Discovery Interface

This client interface allows a device to:

- Announce its presence in the network. So, applications are aware and can access the device.
- Scan the network for available devices. When an application starts, it knows what devices are there to be used.

RTSP Server

This client interface allows an application to query the device for available data streams and to control (start, stop, pause...) data streaming.

Web Services

ONVIF Web Services

The Web Services API provides the following ONVIF web services:

- ONVIF Device service
- ONVIF Media service
- ONVIF Event service
- ONVIF PTZ service
- ONVIF Device IO service

Proprietary Web Services

The Proprietary Web Services API complements the Web Services API. It supports settings and features not available in the ONVIF web services.
The Web Services API provides the following Proprietary web services:

- Proprietary Device service
- Proprietary Media service
- Proprietary PTZ service
- Proprietary IO service

WSDL and XSD files

The WSDL and XSD files specifying the Web Services API are available on the on-board web server.

The ONVIF `GetWsdlUrl` function returns the URL of the on-board folder holding all WSDL and XSD files for the device, namely: **http://[device_ip_address]/wsdl**

ONVIF Device Service

The ONVIF device service is the entry point to all other services provided by a device. It provides all the device management functions.

The ONVIF device service provides a collection of functions allowing the client to:

- Ask for the capabilities effectively provided by the device.
- To configure the network settings.
- To manage the system: get device info, backup, set/get date & time, firmware upgrade, ...
- Manage the device security configurations: access policy, user credentials, certificates, ...

ONVIF Device Service - Mandatory Network Capabilities

The ONVIF Device Service provides the following mandatory network capabilities for an NVT device. Namely:

- IPv4 with static IP configuration
- IPv4 with dynamic IP configuration (DHCP)

ONVIF Device Service - Mandatory Discovery Capabilities

The ONVIF Device Service provides the following mandatory discovery capabilities for an NVT device. Namely:

- Target Service role (WS-Discovery) on port 80
- Discoverable and non-discoverable modes
- Hello, Status changes, Probe and Resolve, and Bye Messages
- Scopes

ONVIF Device Service - Mandatory System Capabilities

The ONVIF Device Service provides the following mandatory system capabilities for an NVT device. Namely:

- List of supported ONVIF versions: 1.0 and 1.02
- System Support Information

ONVIF Device Service - Mandatory Security Capabilities

The ONVIF Device Service provides the following mandatory security capabilities for an NVT device. Namely:

- Access security policy: Administrator, Operator, User, Anonymous.
- Default access policy.

Proprietary Device Service

The proprietary device service extends the ONVIF Device service.

WSDL filename: `hd4DeviceProprietary.wsdl`

XML schema: `hd4DeviceProprietary.xsd`

The proprietary device service allows to:

- Get the internal temperature of the device.

GetTemperature operation

This operation allows to readout the internal temperature of the device.

The request message `GetTemperatureRequest` has no content.

The response message `GetTemperatureResponse` contains in the element <temperature> the numerical value of the temperature expressed in °C.

ONVIF Media Service

The ONVIF media service provides functions to configure the streaming properties of the media streams.

The ONVIF media service allows to:

- Configure ONVIF Media Profiles
- Configure video sources and video encoders
- Configure audio sources and audio encoders
- Configure metadata streams
- Request stream URI

ONVIF Media Service - Mandatory Codec Capabilities

The ONVIF Media Service provides the following mandatory codecs capabilities for an NVT device. Namely:

- JPEG video encoding - QVGA resolution
- G.711 µ-law audio encoding

The ONVIF Media Service provides the following optional codecs capabilities:

- JPEG video encoding - Other than QVGA resolution
- H.264 video encoding

ONVIF Media Service - Mandatory Streaming Capabilities

The ONVIF Media Service provides the following mandatory streaming capabilities for an NVT device. Namely:

- RTP / RTCP
- RTP over UDP - Unicast
- RTP interleaved in RTSP over HTTP
- RTP interleaved in RTSP over HTTPS
- RTP payloads for the formats supported by the device
- RTP metadata payload
- RTSP Port 554 as default session description using SDP
- RTSP Metadata Stream Description

Related Links
Electrical Specification topic(s)
HD-SDI Inputs on page 29
Functional Specification topic(s)
Video Source Specification on page 40

Web Pages topic(s)
Configurations Page on page 77
Electrical Specification topic(s)
Audio Inputs on page 34
Functional Specification topic(s)
Audio Input on page 45
Web Pages topic(s)
Configurations Page on page 77

Proprietary Media Service

The proprietary media service extends the ONVIF media service.
WSDL filename: `hd4MediaProprietary.wsdl`
XML schema: `hd4MediaProprietary.xsd`
The proprietary media service allows to:

- Perform the auto setup of ONVIF Media Profiles.
- Manage the audio outputs.

AutoSetup operation

This operation allows to trigger the ONVIF Media Profiles auto-setup procedure.
The request message `AutoSetupRequest` has no content.
The response message `AutoSetupResponse` has no content.

Get Picolo Audio Outputs operation

This operation allows to enumerate the audio output devices in the device.
The request message `GetPicoloAudioOutputsRequest` has no content.
The response message `GetPicoloAudioOutputs` contains:

- Zero or more `PicoloAudioOutputs` elements of type `PicoloAudioOutput`: one per available audio outputs in the device.

Get Picolo Audio Output Configuration operation

This operation allows to retrieve the configuration of an audio output port.
The request message `GetPicoloAudioOutputConfigurationRequest` contains:

- The token name of the audio output port in an XML data structure of type `string`

The response message `GetPicoloAudioOutputConfigurationResponse` contains:

- The configuration of the audio output port in an XML data structure of type `PicoloAudioOutputConfiguration`.

Set Picolo Audio Output Configuration operation

This operation allows to configure an audio output port.
The request message `SetPicoloAudioOutputConfigurationRequest` contains:

- The token name of the audio output port in an XML data structure of type `string`
- The configuration of the audio output port in an XML data structure of type `PicoloAudioOutputConfiguration`.

The response message `SetPicoloAudioOutputConfigurationResponse` has no content.

Note. The configurations are persistent. The audio outputs reconnect automatically during the boot of the device.

PicoloAudioOutput type

An extension of the `DeviceEntity` type, a base class for physical entities like inputs and outputs.

The element attribute @token contains the token name, a unique identifier referencing the audio output.

PicoloAudioOutputConfiguration type

This type is an extension of the `ConfigurationEntity` type composed of:

- Element <SourceURI> of type anyURI
- Optional element <UserName> of type string
- Optional element <Passwoord> of type string

The <SourceURI> element contains the URI of an RTSP audio stream. An empty `<SourceURI>` disables a currently configured PicoloAudioOutput.

The <UserName> and <Password> elements contain the credentials for authentication on the RTSP server.

PicoloAudioOutput event message

This event reports change of states related to the audio outputs:

- Invalid UserName/Password for RTSP authentication
- Stream issues
- Network issues

Related Links

Electrical Specification topic(s)

Audio Outputs on page 35

Functional Specification topic(s)

Audio Output on page 46

Web Pages topic(s)

Audio Outputs Page on page 92

ONVIF Event Service

The ONVIF event service provides functions to manage the events.

The ONVIF event service allows to:

- Find out what notifications a device support and what information they contain
- Poll the device to check for the occurrence of events using the Real-time Pull-Point Notification Interface
- To be notified by the device when selected events occur

ONVIF Event Service - Mandatory Capabilities

The ONVIF Event Service provides the following mandatory capabilities for an NVT device. Namely:

- Basic notification interface as specified in WS-BaseNotification and WS-Topics specifications
- Real-time Pull-Point Notification Interface
- Notification Streaming Interface

ONVIF PTZ service

The PTZ service is used to control NVT pan tilt and zoom.

ONVIF PTZ service

WSDL filename: `ptz.wsdl`
The PTZ service provides the functions to:

- Configure and control PTZ devices

ONVIF PTZ Service - Mandatory Capabilities

The ONVIF PTZ Service provides the following mandatory capabilities:

- Get PTZ node properties
- Get and set PTZ configurations
- Get PTZ configurations options
- Continuous pan/tilt/zoom movements
- Stop movement
- Get status

The ONVIF PTZ Service uses the following standard Pelco commands:

- Zoom Wide
- Zoom Tele
- Down
- Up
- Left
- Right

and the following extended Pelco commands:

- Set Preset
- Clear Preset
- Go To Preset
- Set Zoom Speed
- Recording PTZ presets

Related Links
Electrical Specification topic(s)
COM I/O on page 29
Functional Specification topic(s)
System Integration Specifications on page 50

Web Pages topic(s)

PTZ Page on page 93

Proprietary PTZ service

The proprietary PTZ service extends the ONVIF PTZ service.

WSDL filename: `hd4PTZProprietary.wsdl`

XML schema: `hd4PTZProprietary.xsd`

The proprietary PTZ service extends the ONVIF PTZ service to manage up to 4 PTZ cameras sharing the same COM IO port.

The proprietary PTZ service allows to:

- Set and get the serial port configuration of the COM IO device
- Set and get the address configuration of each PTZ node
- Get the address configurations of all the PTZ nodes

SetPelcoSerialPortConfiguration operation

This operation allows to configure the serial port.

The request message `SetPelcoSerialPortRequest` contains the configuration of the serial port device:

- The element <Speed> specifies the numerical value of the baud rate. Allowed values: 1200, 2400, 4800, 9600
- The element <DataBits> species the number of data bits. Allowed value range: [5:8]
- The element <Parity> specifies the parity bit. Allowed values: None, Even, Odd
- The element <StopBits> specifies the number of stop bits. Allowed values: 1, 2
- The element <FlowControl> specifies the method to control the data flow. Allowed values: None

The response message `SetPelcoSerialPortResponse` has no content.

GetPelcoSerialPortConfiguration operation

This operation allows to retrieve the configuration of the serial port.

The request message `GetPelcoSerialPortRequest` has no content.

The response message `GetPelcoSerialPortResponse`contains the actual configuration of the serial port device:

- The element <Speed> reports the numerical value of the baud rate.
- The element <DataBits> reports the number of data bits.
- The element <Parity> reports the absence (0), or the presence (1) of a parity bit.
- The element <StopBits> reports the number of stop bits.
- The element <FlowControl> reports the method to control the data flow.

SetPelcoNodeAddressConfiguration operation

This operation allows to set a PTZ node configuration.

The request message `SetPelcoNodeAddressConfigurationRequest` contains the configuration of the PTZ node in a XML data structure of type: `eur:PelcoNodeAddressConfiguration`.

The response message `SetPelcoNodeAddressConfigurationResponse` has no content.

GetPelcoNodeAddressConfiguration operation

This operation allows to retrieve a particular PTZ node configuration.

The request message `GetPelcoNodeAddressConfigurationRequest` specifies the token of the PTZ node configuration in a XML data structure of type `ConfigurationToken`

The response message `GetPelcoNodeAddressConfigurationResponse` returns the configuration of the PTZ node in a XML data structure of type: `eur:PelcoNodeAddressConfiguration`.

GetPelcoNodeAddressConfigurations operation

This operation allows to retrieve the PTZ node configurations.

The request message `GetPelcoNodeAddressConfigurationsRequest` has no content.

The response message `GetPelcoNodeAddressConfigurationsResponse` returns all the PTZ node configurations, each in a XML data structure of type: `eur:PelcoNodeAddressConfiguration`.

PelcoNodeAddressConfiguration type

This complex type is composed of:

- Root element: <Configuration>
- Root element attribute: @token
- Child element: <NodeToken> of type xs:string
- Child element: <Address> of type xs:unsignedByte

The attribute token is the unique identifier of the PTZ node assigned by the system.

The element <NodeToken> contains the token of the PTZ node configuration.

The element <Address> contains the numerical value of the physical address of the designated PTZ node. Allowed values range: [0:255]

ConfigurationToken type

This simple type is composed of:

- Root element: <ConfigurationToken> of type xs:string

The element <ConfigurationToken> contains the token of the PTZ node configuration.

The element <Address> contains the numerical value of the physical address of the designated PTZ node. Allowed values range: [0:255].

Related Links
Electrical Specification topic(s)
COM I/O on page 29
Functional Specification topic(s)
System Integration Specifications on page 50
Web Pages topic(s)
PTZ Page on page 93

ONVIF Device IO Service

The Device IO service offers commands to retrieve and configure the settings of physical inputs and outputs of a device.

WSDL filename: `deviceio.wsdl`

The device IO service provides the functions to retrieve and configure the physical inputs and outputs of a device. It allows to:

- Retrieve and configure the video sources.
- Retrieve and configure the audio sources.
- Retrieve and configure the audio outputs.
- Retrieve and configure the relay outputs.

ONVIF Device IO Service - Mandatory Capabilities

The ONVIF Device IO Service provides the following mandatory capabilities for an ONVIF 2.0 NVT device. Namely:

- Number of video sources: 4

Picolo.net HD4 supports the following Device IO features for relay outputs:

- DeviceIORelayOutputs
- DeviceIORelayOutputsMonostableClosed
- DeviceIORelayOutputsMonostableOpen
- DeviceIORelayOutputsMonostable
- DeviceIORelayOutputsBistableClosed
- DeviceIORelayOutputsBistableOpen
- DeviceIORelayOutputsBistable

Related Links
Electrical Specification topic(s)
Alarm Inputs on page 30
Relay Outputs on page 31
Functional Specification topic(s)
System Integration Specifications on page 50
Web Pages topic(s)
Digital Inputs & Relay Outputs Page on page 88

Proprietary Device IO service

The proprietary Device IO service extends the ONVIF Device IO service.

WSDL filename: `hd4IOProprietary.wsdl`

XML schema: `hd4IOProprietary.xsd`

The proprietary device IO service extends the ONVIF device IO service to manage up to 4 alarm inputs.

The proprietary device IO service allows to:

- Set and get the configuration of the alarm inputs
- Get the state of the alarm inputs

SetDigitalInputConfiguration operation

This operation allows to configure an alarm input port.
The request message `SetDigitalInputConfigurationRequest` contains:

- The token name of the alarm input port in an XML data structure of type `string`
- The configuration of the alarm input in an XML data structure of type `InputConfiguration`.

The response message `SetDigitalInputConfigurationResponse` has no content.

GetDigitalInputConfiguration operation

This operation allows to retrieve the configuration of an alarm input port.
The request message `GetDigitalInputConfigurationRequest` contains:

- The token name of the alarm input port in an XML data structure of type `string`

The response message `GetDigitalInputConfigurationResponse` contains:

- The configuration of the alarm input in an XML data structure of type `InputConfiguration`.

GetDigitalInputState operation

This operation allows to retrieve the state of an alarm input port.
The request message `GetDigitalInputStateRequest` contains the index of the alarm input port.

- The token name of the alarm input port in an XML data structure of type `string`

The response message `GetDigitalInputStateResponse` contains:

- The state of the alarm inputs in an XML data structure of type `State`.

State type

This type is composed of:

- Element <State> of type eur:InputStateEnum

The element <State> specifies the state of the alarm input port. Possible values are:

- **OPEN**: the alarm input port has detected an high-impedance. Possible causes are:result of an open contact or an unused port.
- **HIGH**: the alarm input port has detected a voltage above the voltage threshold.
- **LOW**: the alarm input port has detected a closed contact or a logical low level, namely a voltage below the voltage threshold.

InputConfiguration type

This type is composed of:

- Element <VoltageThreshold> of type eur:VoltageThresholdEnum.
- Element <TimingFilter> of type eur:TimingFilterEnum
- Element <EnableEvents> of type xs:boolean

The element <VoltageThreshold> specifies the voltage threshold of the alarm input port. Possible values are:

- **TTL**: The threshold voltage is 1.4 Volt . This is suitable for TTL devices,3 volt CMOS devices, or potential-free contacts.
- **5V CMOS**: The threshold voltage is 2.5 Volt. This is suitable for 5 volt CMOS devices.
- **12V**: The threshold voltage is 6 Volt. This is suitable for 12 volt or higher CMOS devices.

The element <TimingFilter> specifies the strength (time constant) of the noise filter of the alarm input port. Possible values are:

- **OFF**: the noise filter is set to a minimal strength.
- **10ms**: the noise filter is set to a medium strength. It filters out signal transients shorter than 10 milliseconds.
- **100ms**: the noise filter is set to a maximal strength. It filters out signal transients shorter than 100 milliseconds.

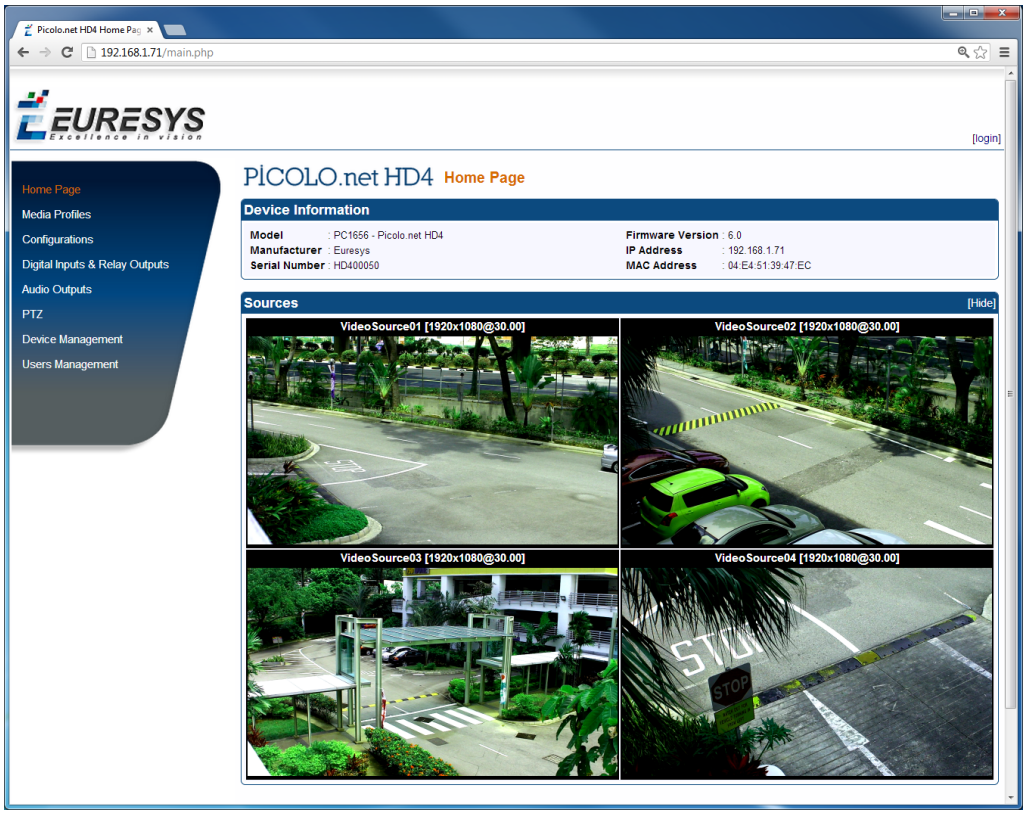
Related Links

System Integration Specifications on page 50
Alarm Inputs on page 30
Digital Inputs & Relay Outputs Page on page 88

Web Pages Description

Home Page

Picolo.net HD4 exposes a Web Server Home Page at the following URL: **http://[device_ip_address]/**. It appears as follows:

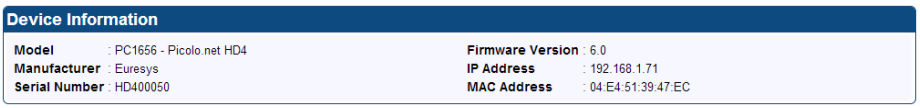


Web Server – Home Page

The Home Page provides:

- General information about the device in the Device Information panel.
- A mosaic display of all the video sources in the Sources panel.
- Navigation links to the main Web Server pages.

Device Information Panel

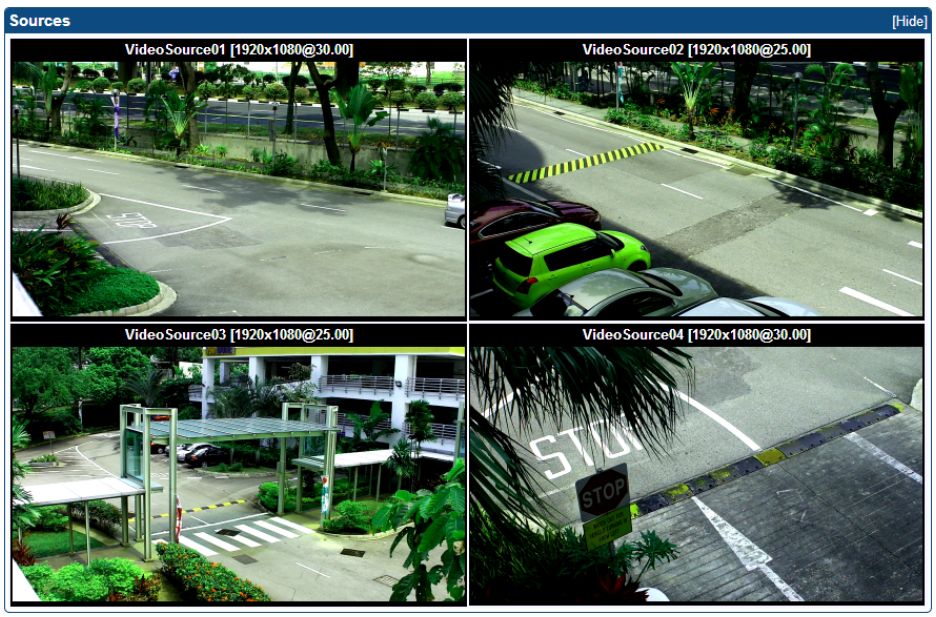


Device Information panel

The Device Information Panel provides the following device information:

Field name	Field Description
Model	Product code and product name of the device
Manufacturer	Manufacturer name of the device
Serial Number	Serial number of the device
Firmware Version	Major and minor version numbers of the firmware that is currently on the device.
IP Address	IPv4 address of the device currently assigned to the device
MAC Address	MAC Address of the LAN port of the device
Hostname	Host name currently assigned to the device

Sources Panel



Sources panel

The Sources Panel shows a mosaic of images from all the video sources of the device.
Each mosaic cell contains:

- A title composed of the name, the native resolution, and the native frame rate of the video source.
- A snapshot image providing that the source corresponding to that camera is referenced by a properly configured ONVIF Media Profile. If this condition is missing, the image is replaced by a black background overlayed by a crossed rectangle. If the source has no video, a blue image is displayed.

Clicking on the image brings the browser to the view/edit profile page for the profile that generated the snapshot.

Navigation Links

Navigation Links panel

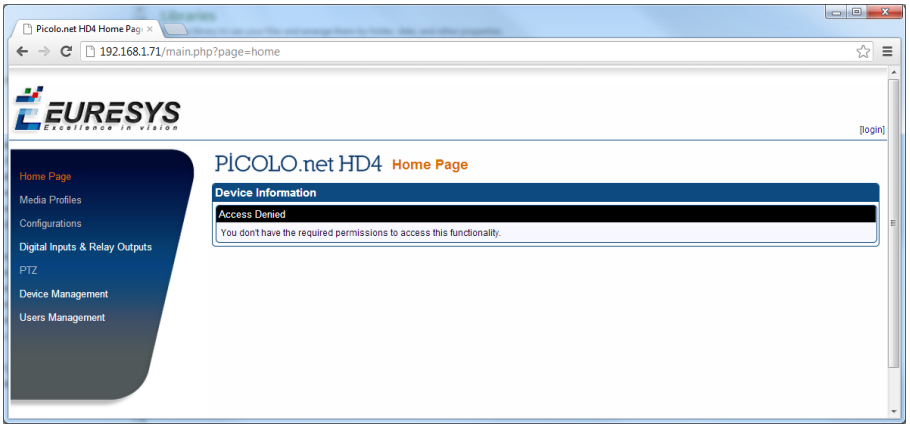
The panel on the left side provides navigation links giving a direct access to the main pages of the Web Server:

- Home Page
- Media Profiles
- Configurations
- Digital Inputs & Relay Outputs
- Audio Outputs
- PTZ
- Device Management
- Users Management

The navigation links panel is replicated on all the Web Server pages.

Home Page - Anonymous user

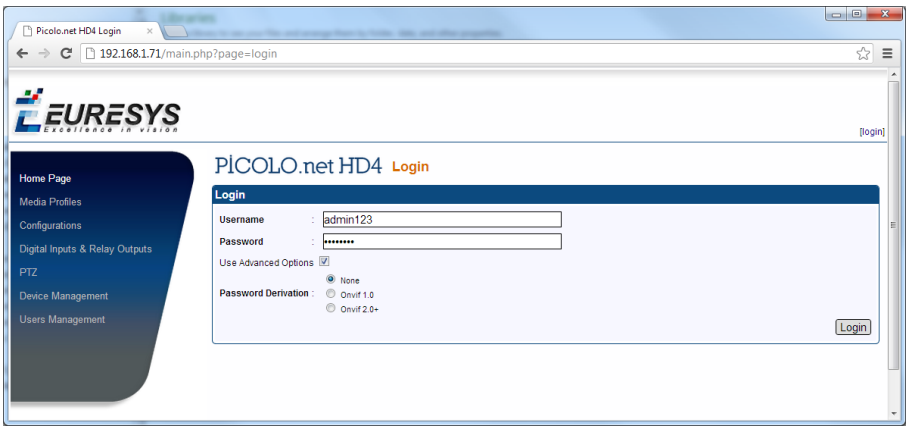
Once security is enabled, an anonymous user accessing the device Home page obtains the following page:



Home Page - Anonymous user

Clicking on the [login] link opens the Login page.

Login Page



Login Page

Login panel

Field name	Description
Username	User name
Password	User password
Use advanced options	Cross the checkbox if specific password derivations are required.

When Use Advanced Options checkbox is unchecked:

- The advanced options are not shown.
- There is no password derivation.

When Use Advanced Options checkbox is checked:

- The advanced options are shown.
- The user may specify a password derivation.

Media Profiles Page

The Media Profiles page are intended for the management of the media profiles.

Media Profiles Panel

Media Profiles panel

The upper area of the Media Profiles panel lists all the existing ONVIF Media Profiles. Each list item contains:

- A thumbnail image of the video source
- The name of the profile e.g. Profile01
- Between square brackets, a selection of profile properties including: name of the video source, resolution, frame rate, encoding method, bit rate, and rate control method of the encoded stream. A "-LL" suffix is appended when the Low Latency mode is enabled.
- A View/Edit button.
- A Delete button.

Clicking on the View/Edit button opens the Media Profile page allowing the user to view or edit the profile properties.

Clicking on the Delete button deletes the profile.

The lower right area of the Media Profiles panel contains two buttons:

- The Create New Profile button.
- The Auto Setup Profiles button.

Clicking on the Create New Profile button starts the profile creation procedure. First of all, the procedure opens a dialog box requiring the name of the new profile. Then it displays the Configurations page allowing the user to configure the ONVIF Media Profile.

Clicking on the Auto Setup Profiles button initiates the auto setup procedure. Before proceeding, a dialog box opens requiring to confirm the action.

Note. CAUTION: the auto setup procedure erases all the existing ONVIF Media Profiles.

Related Links

Media Profile Page on page 74
Configurations Page on page 77

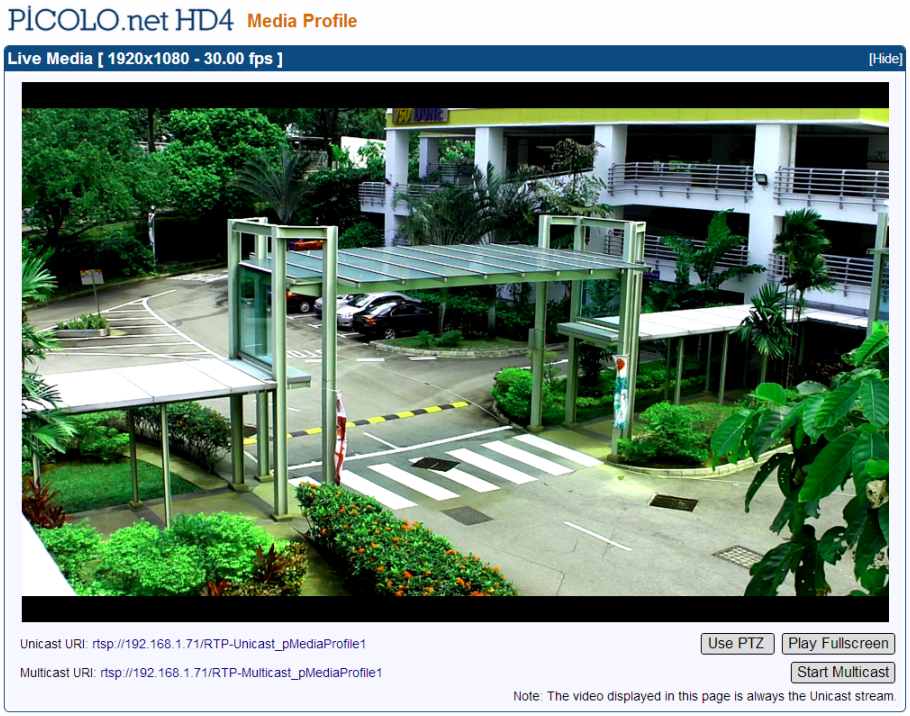
Media Profile Page

The Media Profile page of the Web Server is relative to a single ONVIF Media Profile. It allows the user to:

- View the encoded video stream in the Live Media panel
- View the properties of the components of an ONVIF Media Profile using the configuration panels
- Modify the composition of ONVIF Media Profiles using the Media Profile Configuration panels

The panels composing this page can be hidden or shown individually by clicking on the [Hide] or [Show] text. Initially, only the Live Media panel is shown.

Live Media Panels



Live Media panel without PTZ controls

The Live Media panel provides a live display of the video source unicast stream using the VLC plug-in of the Web Browser.

The panel title shows, between square brackets, the resolution and the frame rate of the encoded video stream.

In the bottom area, the panel provides:

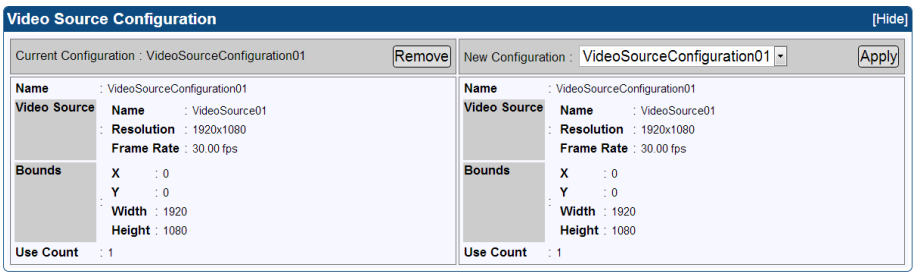
- The Unicast URL of the video stream
- The Multicast URL of the video stream
- The Use PTZ button
- The Play Fullscreen button allowing the user to display the live video on the entire screen
- The Start Multicast button

Clicking on the Play Fullscreen button enlarges the live video on the entire screen.
Clicking on the Use PTZ button adds PTZ controls on the right side of the image as shown on the following image:

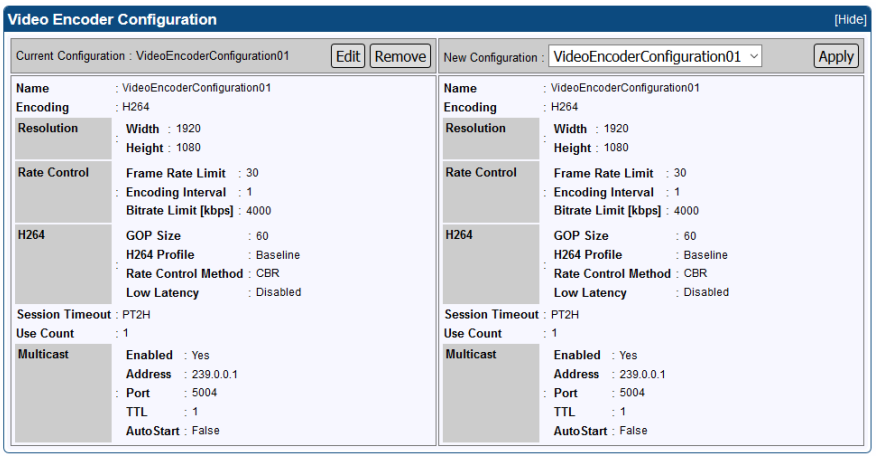
Live Media panel with PTZ controls

The Start Multicast button starts multicast streaming for the selected media profile. This is not necessary for clients that connect to the stream via the RTSP link provided. Multicast streaming will continue until explicitly stopped (even after a reboot of the device).

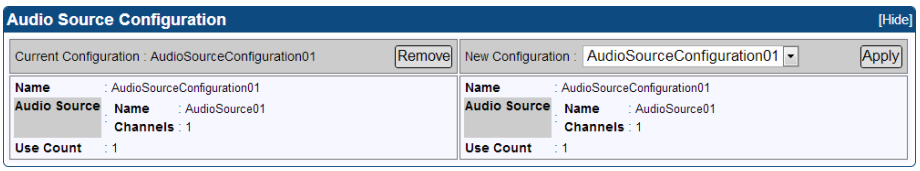
Media Profile Configuration Panels



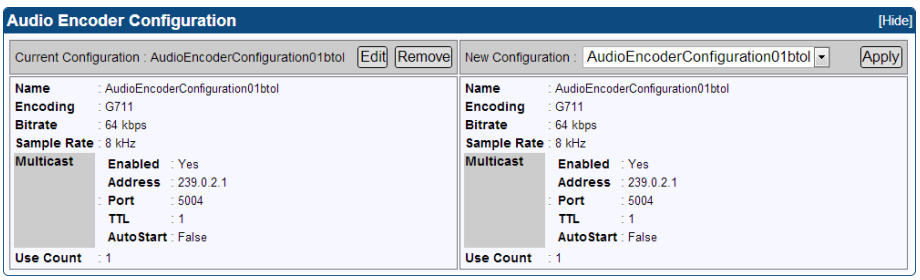
Media Profile Video Source Configuration panel



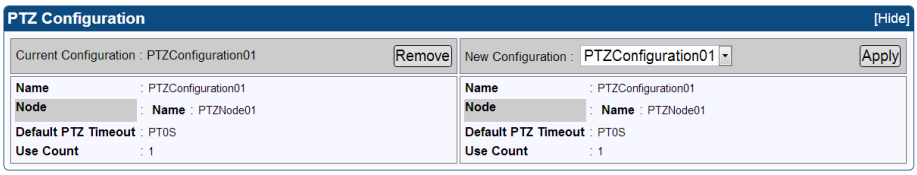
Media Profile Video Encoder Configuration panel



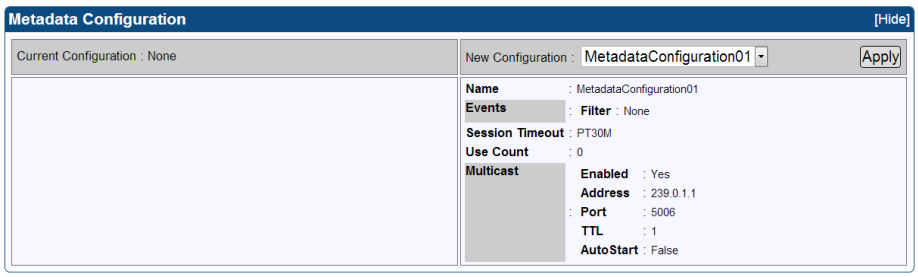
Audio Source Configuration panel



Audio Encoder Configuration panel



Media Profile PTZ Configuration panel



Media Profile Metadata Configuration panel

The configuration panels of the Media profile page allow to:

- View the composition of the profile and the characteristics their components
- Modify the composition of the profile by addition or deletion of components.

To facilitate the modification of existing ONVIF Media Profiles, each panel shows simultaneously for each component:

- On the left side: the characteristics of the configuration that is currently used by the ONVIF Media Profile
- On the right side: the characteristics of any selectable configuration

The upper left quadrant shows, providing that the component is currently used in the profile:

- The name of the current configuration
- A Remove button
- An Edit button (only on relevant panels)

Clicking on the Remove button removes the component from the profile.

Clicking on the Edit button opens the Configuration Edition panel of the component allowing the user to edit its properties.

The upper right quadrant shows:

- A drop-down box allowing the user to select a new configuration.
- An Apply button.

Clicking on the Apply Button applies the new configuration to the profile.

Related Links

Configurations Page on page 77

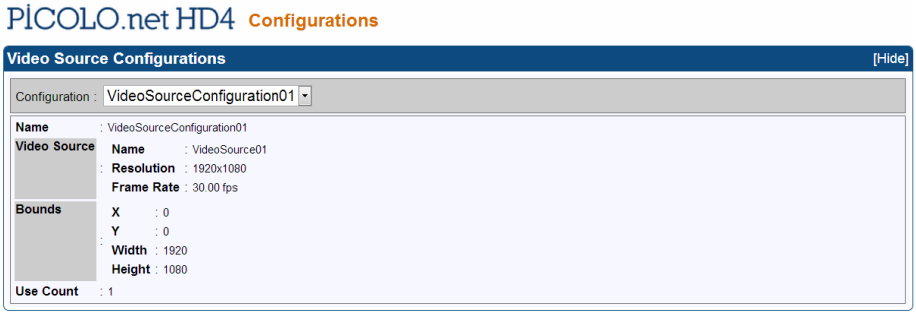
Configurations Page

The Configurations page allows the user to view or edit the configurations of the software objects.

It provides a panel for each component.

The panels composing this pane can be hidden or shown individually by clicking on the [Hide] or [Show] text.

Video Source Configurations panel



Video Source Configurations panel

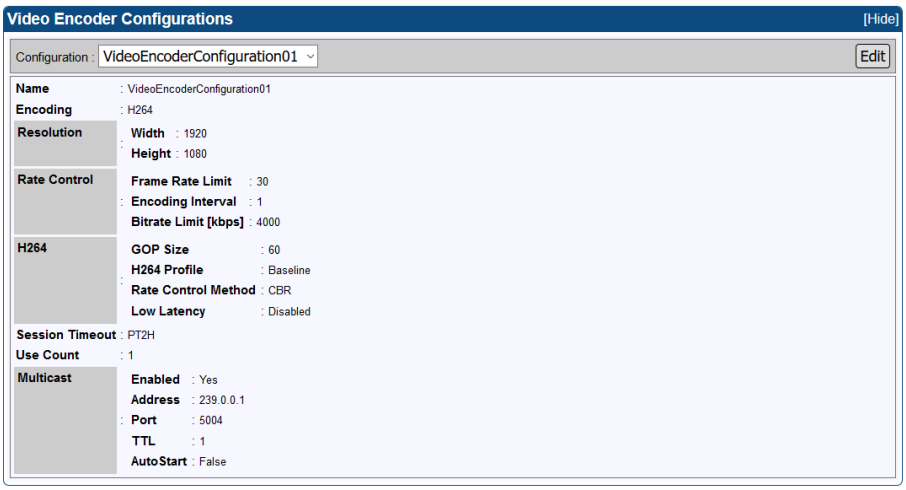
The drop-down box in the upper area allows to select one VideoSourceConfiguration object.
The lower area of the panel shows the properties of the selected object:

Field name	Description
Name	The name of the VideoSourceConfiguration object
Video Source - Name	The name of the video source
Video Source - Resolution	The resolution [H x V] of the video source, e.g. 1920x1080
Video Source - Frame Rate	The frame rate of the video source, expressed in fps, e.g. 25fps
Bounds - X, Y	The position offset of the acquired image relative to the camera active area
Bounds - Width	The number of columns of the acquired image
Bounds - Height	The number of lines of the acquired image
Use Count	The number of ONVIF Media Profiles using that VideoSourceConfiguration object

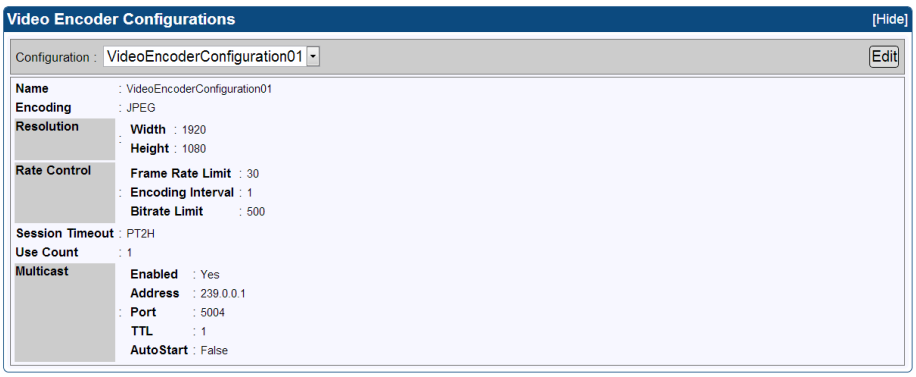
Note. None of the above properties is editable.

Video Encoder Configurations Panel

The drop-down box in the upper area allows to select one VideoEncoderConfiguration object.
Clicking the Edit button in the upper area of the panel opens the Video Encoder Configuration Edition page.
The layout of the Video Encoder Configurations Panel is specific to the video encoding method:



Video Encoder Configurations panel - H.264 encoding method



Video Encoder Configurations panel - JPEG

The lower area of the panels shows the properties of the selected object.

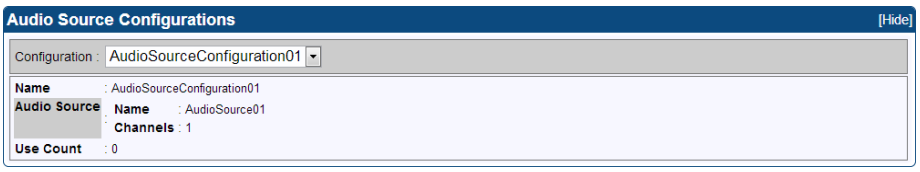
Video Encoder Configurations panels - Common properties

Field name	Description
Name	The token name of the VideoEncoderConfiguration object, e.g. VideoEncoderConfiguration01
Encoding	Used video codec.
Resolution - Width, Height	The image size of the encoded stream
Rate Control - Frame Rate Limit	Maximum output frame rate in fps.
Rate Control - Encoding Interval	Interval at which images are encoded and transmitted.
Rate Control - Bitrate Limit	The maximum output bit rate in kbps
Session Timeout	The RTSP session timeout. *The duration is expressed using the W3C lexical representation: PnYn MnDTnH nMnS*
Use Count	The number of ONVIF Media Profiles using that Video Encoder Configuration.
Multicast - Enabled	Indicates if the RTP multicast streaming of the encoded video is properly configured with a non-zero IP address and port number.
Multicast - Address	The IP address of the multicast group. *In IPv4, addresses 224.0.0.0 through 239.255.255.255 are designated as multicast addresses.*
Multicast - Port	The port number of the multicast group.
Multicast - TTL	The Time-To-Live of the multicast IP datagrams. *Usually 1 since the datagrams stops after the first router.*
Multicast - AutoStart	Indicates the persistence of multicast streaming. *When true, the multicast streaming starts automatically.*

Video Encoder Configurations panels - H.264 specific properties

Field name	Description
H264 - GOP Size	Group of Pictures (or Video frames) length.
H264 - H264 Profile	The H.264 profile: baseline, main or high.
H.264 - Rate Control Method	The rate control method of the H.264 method. Possible values: ■ VBR: Variable Bit Rate ■ CBR: Constant Bit Rate
Low Latency	Check the box to configure the low-latency encoding method.

Audio Source Configuration



Audio Source Configuration panel

The drop-down box in the upper area allows to select one AudioSourceConfiguration object.
The lower area of the panel shows the properties of the selected object:

Field name	Description
Name	The name of the AudioSourceConfiguration object
Audio Source - Name	The name of the audio source
Audio Source - Channels	The number of audio channels of the audio source
Use Count	The number of ONVIF Media Profiles using that AudioSourceConfiguration object.

Audio Encoder Configuration

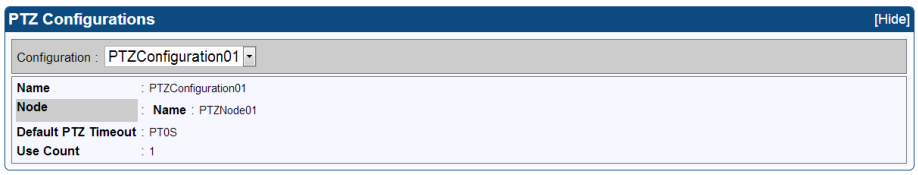
Audio Encoder Configuration panel

The drop-down box in the upper area allows to select one AudioEncoderConfiguration object.

The lower area of the panel shows the properties of the selected object:

Field name	Description
Name	The name of the AudioEncoderConfiguration object
Encoding	Used audio codec
Bitrate	The bit rate of the encoded audio stream
Sample Rate	The sampling rate of the encoded audio stream
Multicast - Enabled	Indicates if the RTP multicast streaming of the encoded video is properly configured with a non-zero IP address and port number.
Multicast - Address	The IP address of the multicast group. *In IPv4, addresses 224.0.0.0 through 239.255.255.255 are designated as multicast addresses.*
Multicast - Port	The port number of the multicast group.
Multicast - TTL	The Time-To-Live of the multicast IP datagrams. *Usually 1 since the datagrams stops after the first router.*
Multicast - AutoStart	Indicates the persistence of multicast streaming. *When true, the multicast streaming starts automatically.*
Use Count	The number of ONVIF Media Profiles using that AudioEncoderConfiguration object.

PTZ Configurations Panel



PTZ Configurations panel

The drop-down box in the upper area allows to select one PTZConfiguration object.
The lower area of the panel shows the properties of the selected object :

Field name	Description
Name	The name of the PTZConfiguration object
Node - Name	The name of the PTZ node, e.g. PTZNode01
Default PTZ Timeout	The default timeout value for the continuous movements. *The duration is expressed using the W3C lexical representation: PnYn MnDTnH nMnS* .
Use Count	The number of ONVIF Media Profiles using that PTZConfiguration object.

Note. None of the above properties is editable.

Metadata Configurations Panel

Metadata Configurations panel

The drop-down box in the upper area allows to select one MetadataConfiguration object.
Clicking the Edit button opens the Metadata Configuration Edition page.
The lower area of the panel shows the properties of the selected object:

Field name	Description
Name	The name of the MetadataConfiguration object
Events - Filter	List of filtered event items. *When empty: means that no events are filtered.*
Session Timeout	The RTSP session timeout. *The duration is expressed using the W3C lexical representation: PnYn MnDTnH nMnS*
Use Count	The number of ONVIF Media Profiles using that object
Multicast - Enabled	Indicates if the RTP multicast streaming of the metadata is properly configured with a non-zero IP address and port number.
Multicast - Address	The IP address of the multicast group. *In IPv4, addresses 224.0.0.0 through 239.255.255.255 are designated as multicast addresses.*
Multicast - Port	The port number of the multicast group.
Multicast - TTL	The Time-To-Live of the multicast IP datagrams. *Usually 1 since the datagrams stops after the first router.*
Multicast - AutoStart	Indicates the persistence of multicast streaming. *When true, the multicast streaming starts automatically.*

Related Links
Electrical Specification topic(s)
HD-SDI Inputs on page 29
Functional Specification topic(s)
Video Source Specification on page 40
Software Specification topic(s)
ONVIF Media Service on page 60
The ONVIF media service provides functions to configure the streaming properties of the media streams.
Electrical Specification topic(s)
Audio Inputs on page 34

Functional Specification topic(s)

Audio Input on page 45

Software Specification topic(s)

ONVIF Media Service on page 60

The ONVIF media service provides functions to configure the streaming properties of the media streams.

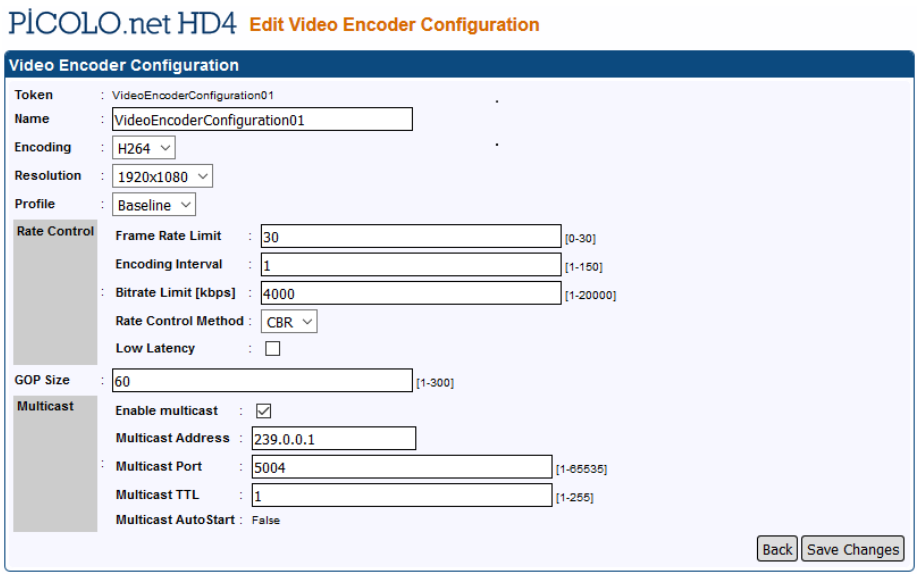
Edit Video Encoder Configuration Page on page 84
Edit Metadata Configuration Page on page 87

Edit Video Encoder Configuration Page

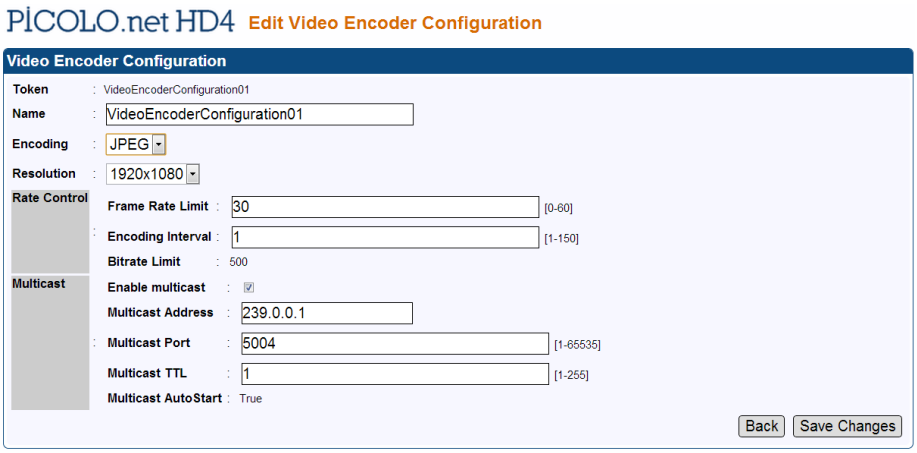
The Edit Video Encoder Configuration Page allows the edition of the properties of the Video Encoder Configuration object.

It shows a single panel: the Video Encoder Configuration panel.

The layout of the Video Encoder Configurations Panel is specific to the video encoding method:



Video Encoder Configuration Edition panel - H.264 encoding method



Video Encoder Configuration Edition panel - JPEG encoding method

Video Encoder Configurations panels - Common properties

Field name	Description
Token	The token name of the VideoEncoderConfiguration object, e.g. VideoEncoderConfiguration01. *This field cannot be edited.*
Name	A friendly name given to the configuration. *Default value = token name*
Encoding	Video encoding method: H.264 or JPEG
Resolution	The resolution of the encoded image, e.g. 1920x1080
Rate Control - Frame Rate Limit	The maximum output frame rate of the encoded stream, in fps. *If an EncodingInterval is provided, the resulting encoded frame rate will be reduced by the given factor.*
Rate Control - Encoding Interval	The interval at which images are encoded and transmitted. *A value of 1 means that every frame is encoded, a value of 2 means that every 2nd frame is encoded,...*
Rate Control - Bitrate Limit	The maximum output bit rate in kbps. *This field cannot be edited in case of JPEG encoding.*
Multicast - Enable multicast	Check the box to configure RTP multicast streaming.
Multicast - Multicast Address	The IP address of the multicast group. *In IPv4, addresses 224.0.0.0 through 239.255.255.255 are designated as multicast addresses.*
Multicast - Multicast Port	The port number of the multicast group.
Multicast - Multicast TTL	The Time-To-Live of the multicast IP datagrams. *Usually 1 since the datagrams stops after the first router.*
Multicast - Multicast AutoStart	Indicates the persistence of multicast streaming. *When true, the multicast streaming starts automatically. This field cannot be edited. This is enabled/disabled by clicking on the Start/ Stop Multicast button (in the Live Media Panel).*

Video Encoder Configurations panels - H.264 specific properties

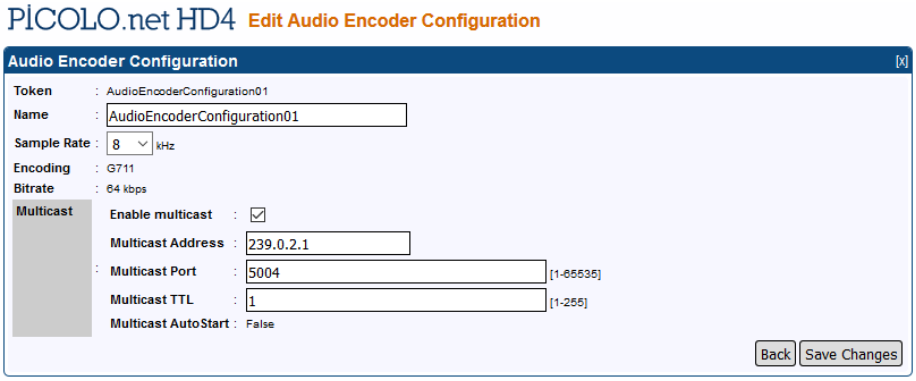
Field name	Description
GOP Size	Length of the Group of Pictures (or Video frames). *Determines typically the interval in which the I-Frames will be coded. An entry of 1 indicates I-Frames are continuously generated. An entry of 2 indicates that every 2nd image is an I-Frame, and 3 only every 3rd frame, etc. The frames in between are coded as P or B Frames.*
Profile	The H.264 encoder profiles: baseline, main, or high.
Rate Control - Rate Control Method	The rate control method of the H.264 encoder. Possible values: ■ VBR: Variable Bit Rate ■ CBR: Constant Bit Rate
Low Latency	Check the box to configure the low-latency encoding method.

Edit Audio Encoder Configuration Page

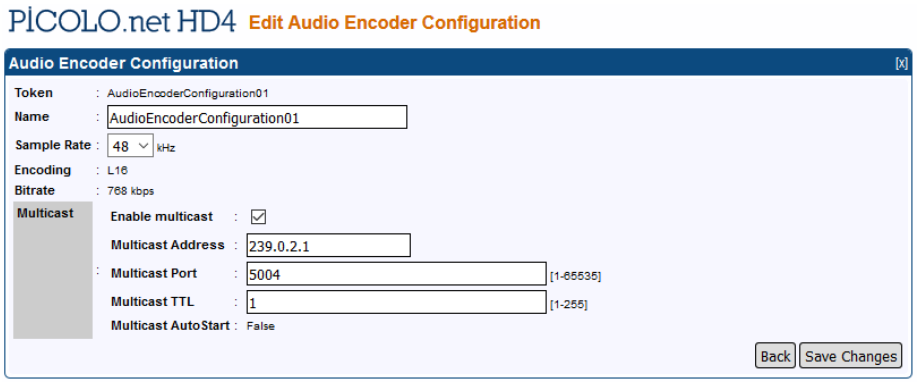
The Edit Audio Encoder Configuration Page allows the edition of the properties of the Audio Encoder Configuration object.

It shows a single panel: the Audio Encoder Configuration panel.

The layout of the Audio Encoder Configurations Panel is specific to the audio encoding method:



Audio Encoder Configuration Edition panel - G.711



Audio Encoder Configuration Edition panel - LPCM

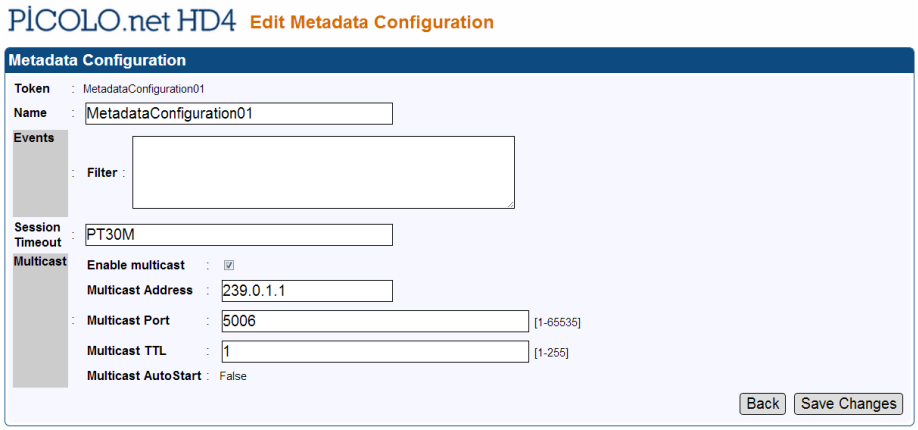
Audio Encoder Configurations panel

Field name	Description
Token	The token name of the AudioEncoderConfiguration object, e.g. AudioEncoderConfiguration01. *This field cannot be edited.*
Name	A friendly name given to the configuration. *Default value = token name*
Encoding	Audio encoding method. ■ *G711: G.711 µ-Law* ■ *L16: 16-bit linear PCM*
Bitrate	The bitrate of the encoded audio stream expressed in kilobits per second. ■ *64 kbps for the G.711 encoding method* ■ *768 kbps for the L16 encoding method*
Sample Rate	The sampling rate of the encoded audio stream expressed in kHz. ■ Select 8 kHz for the G.711 encoding method (Default setting) ■ Select 48 kHz for the L16 encoding method
Multicast - Enable multicast	Check the button to configure RTP multicast streaming.
Multicast - Multicast Address	The IP address of the multicast group. *In IPv4, addresses 224.0.0.0 through 239.255.255.255 are designated as multicast addresses.*
Multicast - Multicast Port	The port number of the multicast group.
Multicast - Multicast TTL	The Time-To-Live of the multicast IP datagrams. *Usually 1 since the datagrams stops after the first router.*
Multicast - Multicast AutoStart	Indicates the persistence of multicast streaming. *When true, the multicast streaming starts automatically. This field cannot be edited. This is enabled/disabled by clicking on the Start/ Stop Multicast button (in the Live Media Panel).*

Edit Metadata Configuration Page

The Edit Metadata Configuration Page allows the edition of the properties of the Metadata Configuration object.

It shows a single panel: the Metadata Configuration panel.



Metadata Configuration Edition panel

Metadata Configuration panel

Field name	Description
Token	The token name of the MetadataConfiguration object, e.g. MetdataConfiguration01. *This field cannot be edited.*
Name	A friendly name given to the configuration. *Default value = token name*
Events - Filter	List of filtered event items. *When empty: means that no events are filtered.*
Session Timeout	The RTSP session timeout. *The duration is expressed using the W3C lexical representation: PnYn MnDTnH nMnS*
Multicast - Enable multicast	Check the button to configure RTP multicast streaming.
Multicast - Multicast Address	The IP address of the multicast group. *In IPv4, addresses 224.0.0.0 through 239.255.255.255 are designated as multicast addresses.*
Multicast - Multicast Port	The port number of the multicast group.
Multicast - Multicast TTL	The Time-To-Live of the multicast IP datagrams. *Usually 1 since the datagrams stops after the first router.*
Multicast - Multicast AutoStart	Indicates the persistence of multicast streaming. *When true, the multicast streaming starts automatically. This field cannot be edited.*

Digital Inputs & Relay Outputs Page

The Digital Inputs & Relay Outputs page of the Web Server allows to view or edit the configuration of DigitalInput and RelayOutput objects.

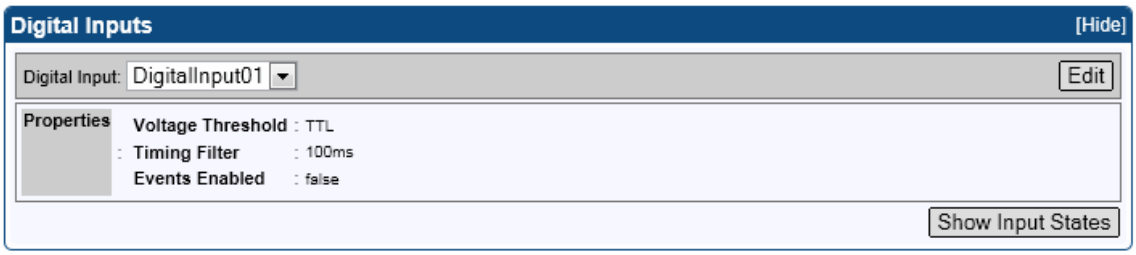
Each DigitalInput object represents one Alarm Input port.

Each RelayOutput object represents one Relay Output port.

The panels composing this pane can be hidden or shown individually by clicking on the [Hide] or [Show] text.

Digital Inputs Panel

The Digital Inputs panel allows the user to view the configuration of DigitalInput objects.



Digital Inputs panel

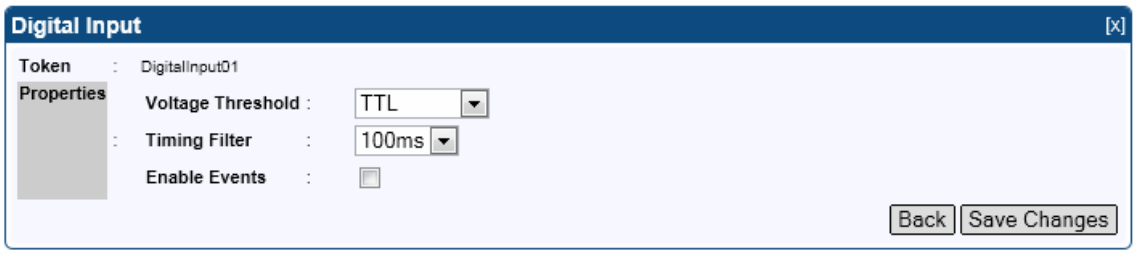
The drop-down box in the upper area allows to select one DigitalInput object.
The lower area of the panel shows the properties of the selected object:

Field name	Description
Voltage Threshold	Type (amplitude) of signal. Possible values are: ■ TTL => threshold voltage = 1.5 V ■ 5VCMOS => threshold voltage = 2.5 V ■ 12V => threshold voltage = 6V
Timing Filter	The strength (time constant) of the deglitching filter. Possible values are: ■ OFF => No filtering ■ 10ms => Weak filtering: filters out transients shorter than 10 milliseconds ■ 100ms =>Strongest filtering: filters out transients shorter than 100 milliseconds
Events Enabled	When true, any valid (= not filtered out) transition on the input produces an event.

Clicking on the Edit button opens the Digital Input Properties Edition page.
Clicking on the Show Input States button opens the Digital Input States page.

Digital Inputs Properties Edition page

The Digital Inputs Properties Edition page displays a single panel allowing the user to edit the properties of the Digital Input object.

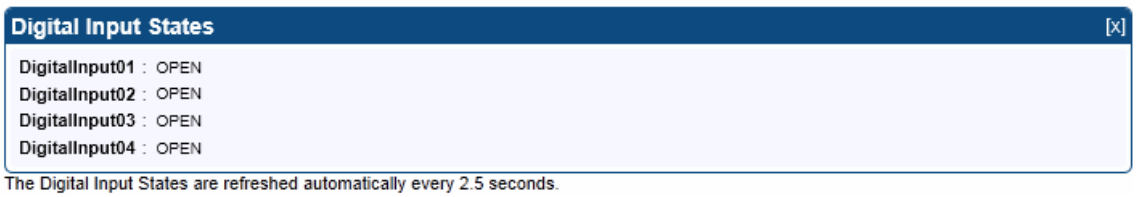


Digital Input Properties Edition panel

Checking the Enable Events check box enables the event generation for that input.

Digital Inputs States page

The Digital Inputs States page displays a single panel allowing the user to view the state of all DigitalInput objects.



Digital Inputs States panel

Possible state values for **contact closure** devices:

OPEN

The contact is open.

LOW

The contact is closed.

Possible state values for **logical** devices:

OPEN

Logical device is in High-Z.

LOW

Logical device is driving LOW.

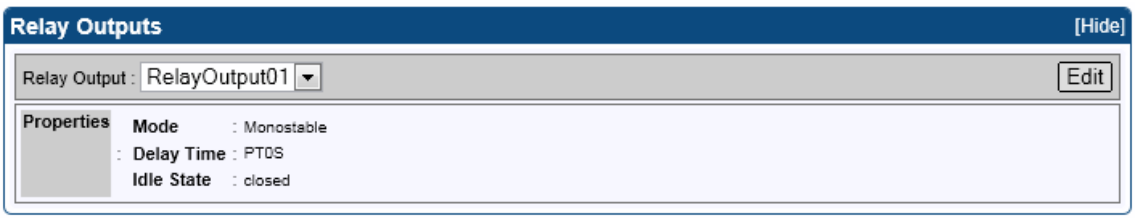
HIGH

Logical device is driving HIGH.

The Digital Inputs States panel is refreshed automatically.

Relay Outputs Panel

The Relay Outputs panel allows the user to view the configuration of the RelayOutput objects.



Relay Outputs panel

The upper area of the panel shows:

- A drop-down box allowing the user to select one RelayOutput object
- An Edit Button allowing the user to modify user-configurable settings

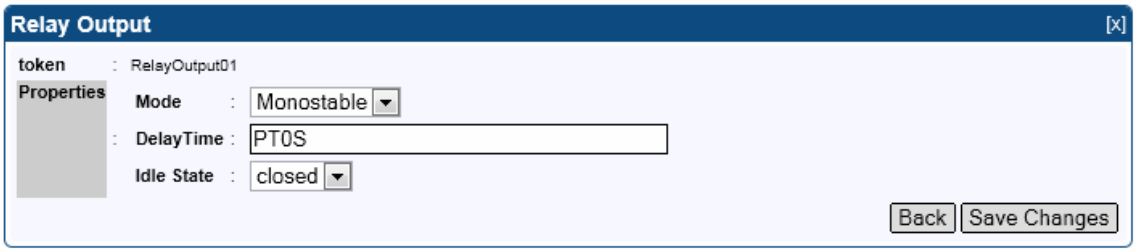
The lower area of the panel shows the properties of the selected object:

Field name	Description
Properties - Mode	The operating mode of the relay output. Possible values are: ■ Monostable => After setting the state, the relay returns to its idle state after the specified time. ■ Bistable => After setting the state, the relay remains in this state.
Properties - Delay Time	Specifies the time after which the relay returns to its idle state if it is in monostable mode. If the relay is set to bistable mode the value of the parameter shall be ignored. *The duration is expressed using the W3C lexical representation: PnYn MnDTnH nMnS*
Properties - Idle State	Position of the relay when the relay state is set to 'inactive' through the trigger command.. Possible values are: ■ Closed => The relay is closed. ■ Open=> The relay is open

Clicking on the Edit button opens the Relay Output Properties Edition page.

Relay Output Properties Edition page

The Relay Output Properties Edition page displays a single panel allowing the user to edit the properties of the Relay Output object.



Relay Output Properties Edition panel

Related Links

Electrical Specification topic(s)

Alarm Inputs on page 30

Relay Outputs on page 31

Functional Specification topic(s)

System Integration Specifications on page 50

Software Specification topic(s)

ONVIF Device IO Service on page 66

The Device IO service offers commands to retrieve and configure the settings of physical inputs and outputs of a device.

System Integration Specifications on page 50

Alarm Inputs on page 30

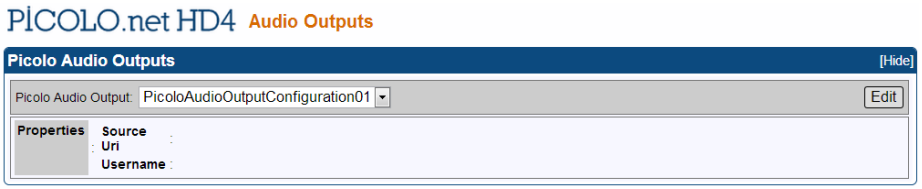
Relay Outputs on page 31

Audio Outputs Page

The Audio Outputs page of the Web Server allows to view or edit the configuration of Picolo Audio Outputs objects. Each object represents one Audio Output port.
The panel composing this pane can be hidden or shown individually by clicking on the [Hide] or [Show] text.

Picolo Audio Outputs Panel

The Picolo Audio Outputs panel allows the user to view the configuration of Picolo Audio Outputs.



Picolo Audio Outputs panel

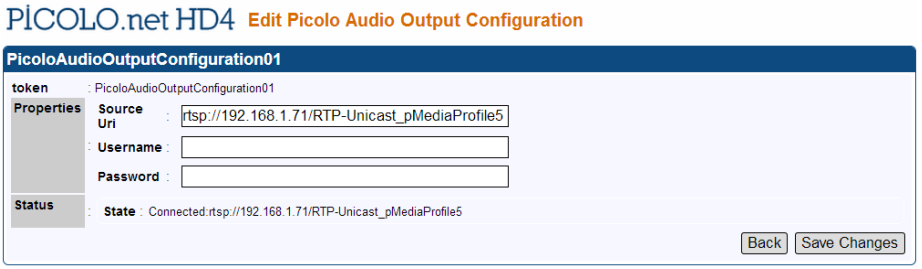
The drop-down box in the upper area allows to select one Picolo Audio Output object.
The lower area of the panel shows the properties of the selected object:

Field name	Description
Source URI	URI of an RTSP audio stream
Username	User name on the RTSP server

Clicking on the Edit button opens the Edit Picolo Audio Output Configuration page.

Edit Picolo Audio Output Configuration page

The Picolo Audio Output Configuration page displays a single panel allowing the user to edit the properties of a Picolo Audio Output object.



Edit Picolo Audio Output Configuration panel

Related Links
Electrical Specification topic(s)
Audio Outputs on page 35
Functional Specification topic(s)
Audio Output on page 46
Software Specification topic(s)
Proprietary Media Service on page 61
The proprietary media service extends the ONVIF media service.

PTZ Page

The PTZ Page allows to view or edit the configuration of the serial port and the PTZ nodes objects.

Serial Port Configuration panel

Serial Port Configuration panel

The Serial Port Configuration panel shows the properties of the serial port:

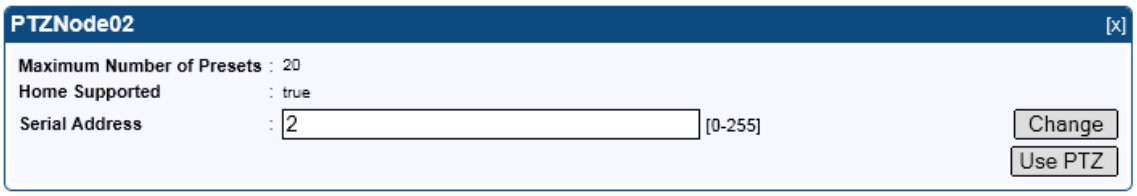
Field name	Description
Baud Rate	The baud rate of the RS-485 asynchronous port
Character Length	Number of bits per character
Parity Bit	Presence and polarity of the parity bit
Stop Bit	Number of stop bits

Clicking on the Edit button in the lower right area opens the Serial Port Configuration Edition page.

Serial Port Configuration Edition Page

The Serial Port Configuration Edition panel allows to modify the settings of the serial port used for PTZ. Clicking on the Save Changes button in the lower right area saves the settings.

PTZNodexx panels



PTZNode02 panel

The PTZNodexx panels show the properties of the corresponding PTZNode:

Field name	Description
Maximum Number of Presets	Indicates the maximum number of presets supported by the PTZ protocol. *20 for Pelco-D protocol.*
Home Supported	Indicates if the home command is supported by the PTZ protocol. *True for Pelco-D protocol.*
Serial Address	The address given to the PTZ node

Clicking on the "Change" button assigns the serial address to the PTZ node.

Clicking on the "Use PTZ" Button enables PTZ controls for this PTZ node.

The "Use PTZ" page features a new button for recording the current PTZ position as a preset in the camera. A third-party software is still required to update or delete such presets.

Related Links

Electrical Specification topic(s)

COM I/O on page 29

Functional Specification topic(s)

System Integration Specifications on page 50

Software Specification topic(s)

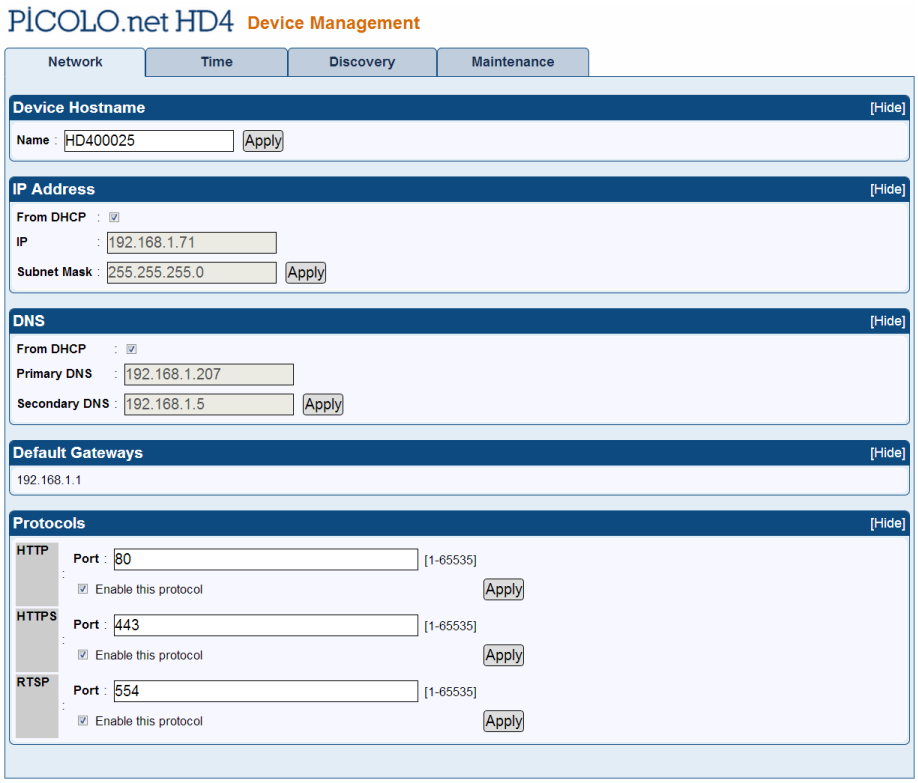
ONVIF PTZ service on page 63

The PTZ service is used to control NVT pan tilt and zoom.

Proprietary PTZ service on page 64

The proprietary PTZ service extends the ONVIF PTZ service.

Device Management Page - Network Tab



Device Management Network tab

The Network Tab of the Device Management Page allows to view or edit all the network related settings.

Device Host Name Panel

The Device Host Name panel allows to view and/or edit the device host name.
Clicking on the Apply button registers the change. It will be effective after a device reboot.

IP Address Panel

The IP Address panel allows to view and/or edit the following network properties:

- From DHCP: when checked, indicates that the IP address is obtained automatically using DHCP.
- IP: IP address assigned to the LAN interface of Picolo.net HD4.
- Subnet Mask: IP address subnet mask.

When the address is obtained from DHCP, the IP and Subnet Mask fields:

- Are greyed, indicating that these settings cannot be modified.
- Reflect the values assigned automatically by the DHCP server.

Clicking on the Apply button registers the change. It will be effective after a device reboot.

DNS Panel

The DNS panel allows to view and/or edit the following network properties:

- From DHCP: when checked, indicates that the addresses of the DNS servers are obtained automatically using DHCP.
- Primary DNS: IP address of the primary DNS server.
- Secondary DNS: IP address of the secondary DNS server.

When the addresses are obtained from DHCP, the Primary DNS and Secondary DNS fields:

- Are greyed, indicating that these settings cannot be modified.
- Reflect the values assigned automatically by the DHCP server.

Clicking on the Apply button applies registers the change. It will be effective after a device reboot.

Default Gateways Panel

The Default Gateways panel allows to view the default gateway IP address. When the IP address of the device is statically assigned, default gateways can be added, edited, or deleted.

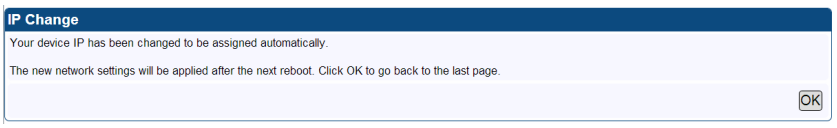
Protocols Panel

The Protocols panel allows the user to:

- Individually enable/disable the HTTP, HTTPS, and RTSP protocols
- Assign a port number to each protocol

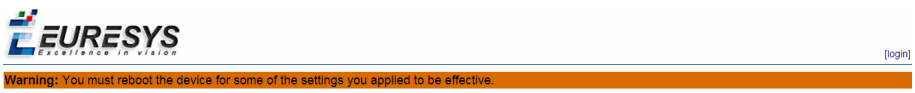
Applying changes

Some of the settings will be effective only after rebooting the device.
This is indicated by a message panel such as:



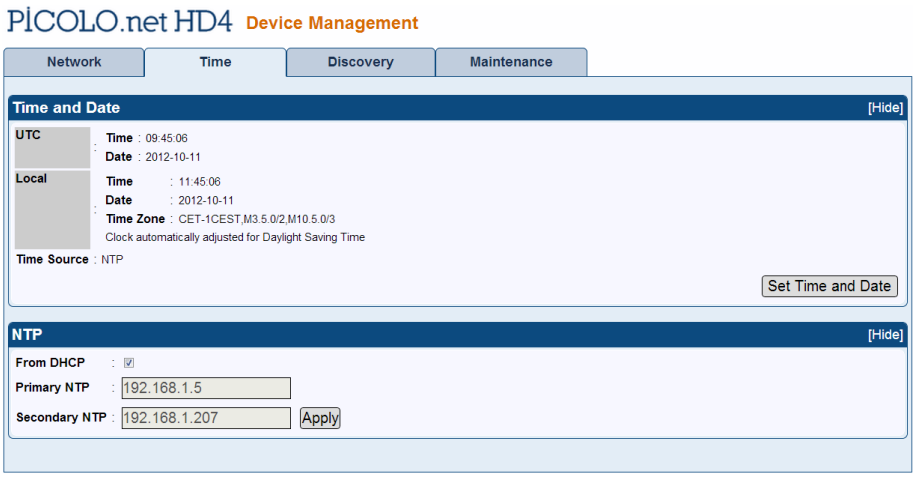
IP Change Panel

Clicking on the OK button returns to the last page. The following banner appears on top of it:



Must Reboot Banner

Device Management Page - Time Tab



Device Management Time tab

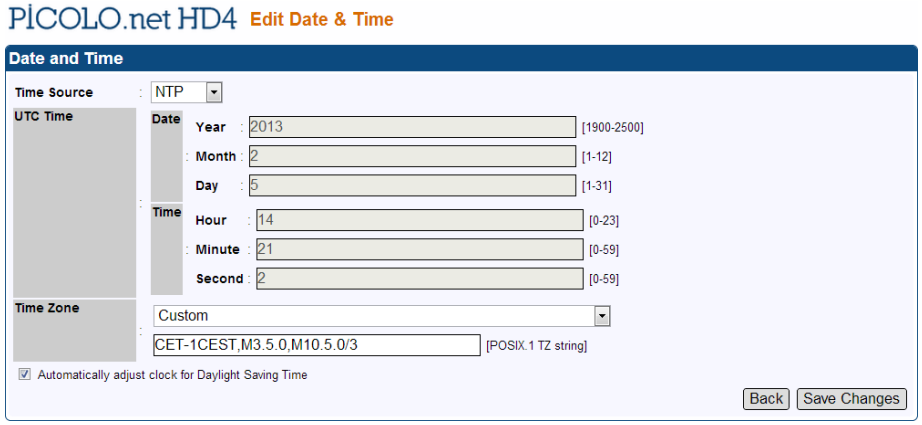
The Time Tab of the Device Management Page allows to view or edit all the time and date related settings.

Time and Date Panel

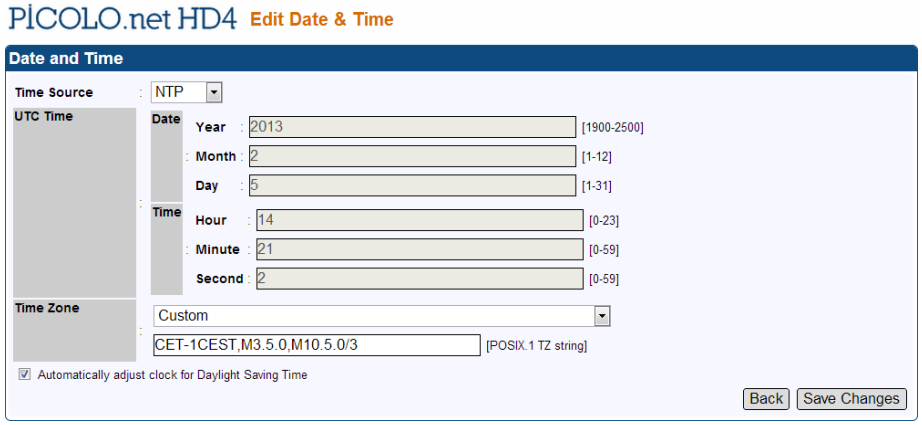
The Time and Date panel shows the following time and date settings:

Field name	Description
UTC - Time	The UTC (Coordinate Universal Time) time value. *Expressed in HH:MM:SS format.*
UTC - Date	The UTC (Coordinate Universal Time) date value. *Expressed in YYYY-MM-DD format.*
Local - Time	The local time value.*Expressed in HH:MM:SS format.*
Local - Date	The local date value. *Expressed in YYYY-MM-DD format.*
Local - Time Zone	The local time zone rule. *Expressed in POSIX.1 TZ string format.*
Local - *Phrase*	■ *Clock automatically adjusted for Daylight Saving Time.* indicates that the DST rule of the POSIX.1 TZ string is effectively considered by the Operating Systems. ■ *Clock not automatically adjusted for Daylight Saving Time.* indicates that the DST rule of the POSIX.1 TZ string is ignored by the Operating Systems.
Time Source	The source used for time and date synchronization.

Clicking on the Set Time and Date button opens the Date and Time Edition page.



Date and Time Edition panel



Date and Time Edition panel (Version 4)

The Date and Time Edition panel allows the user to modify all the time and date settings.

The Time Source drop-down box selects the source of the time synchronization. Possibles values are:

- NTP: selects the automatic synchronization method using NTP protocol.
- Manual: selects the manual synchronization method.

When manual synchronization method is selected, the 6 UTC time fields must be properly filled with the actual values of the UTC time.

The Time Zone field contains one drop-down box and one edit box.

The drop-down box provides a list of time zone sorted by increasing UTC offset values. Selecting an item automatically fills the edit box with the corresponding POSIX.1 TZ string.

Note. The validity of the TZ rules is not guaranteed. Indeed, TZ rules are subject to modification by civil authorities.

The edit-box specifies the time zone rule expressed in POSIX.1 TZ string format. An empty field means that the local time is equal to the UTC time.

The *Automatically adjust clock for Daylight Saving Time* check box controls the application of the DST (Daylight Savings Time) rule embedded in the time zone string.

- When checked, the device updates automatically the local time according to the DST rule.
- When unchecked, the device ignores the DST rule.

Clicking on the Apply button immediately applies the settings.

NTP Panel

The NTP panel allows the user to view and/or edit the following network properties:

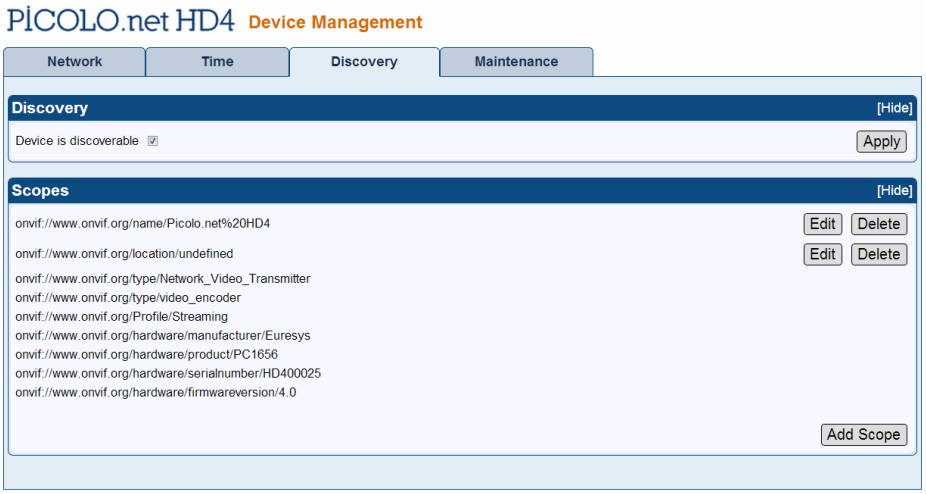
- From DHCP: when checked, indicates that the addresses of the NTP servers are obtained automatically using DHCP.
- Primary NTP: IP address or URL of the primary NTP server.
- Secondary NTP: IP address or URL of the secondary NTP server.

When the addresses are obtained from DHCP, the Primary NTP and Secondary NTP fields:

- Are greyed, indicating that these settings cannot be modified.
- Reflect the values assigned automatically by the DHCP server.

Clicking on the Apply button applies immediately the settings.

Device Management Page - Discovery Tab



Device Management Discovery tab

The Discovery Tab of the Device Management Page allows to view and edit all the device discovery settings.

Discovery Panel

The "Device is discoverable" check box controls the ability to discover the device on the network using the discovery functions of the ONVIF Device Web Service.

- When checked, the device is discoverable.
- When unchecked, the device don't reply to the discovery request messages.

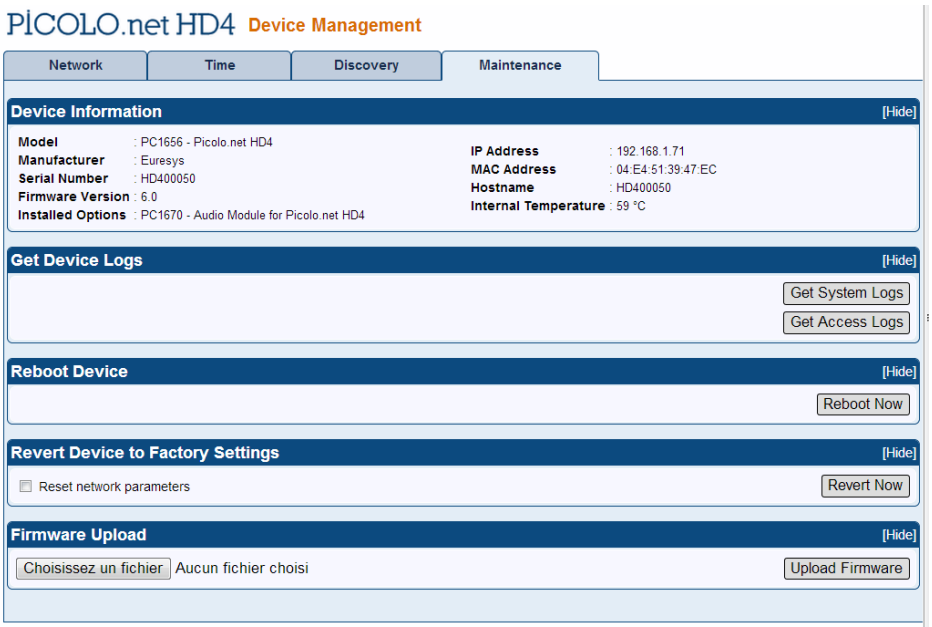
Clicking on the Apply button applies immediately the settings.

Scopes Panel

The Scopes Panel allows the view/edit/delete create ONVIF device scopes.

Clicking on an Edit button opens a dialog box allowing to modify the scope.
Clicking on a Delete button opens a dialog box allowing to delete the scope.
Clicking on the Add Scope opens a dialog box allowing to create a new scope.
For the user editable scopes it provides an Edit button and a Delete button.

Device Management Page - Maintenance Tab



Device Management Maintenance tab

The Maintenance Tab of the Device Management Page allows to perform maintenance tasks.

Device Information Panel

The Device Information Panel provides the following device information:

Field name	Field Description
Model	Product code and product name of the device
Manufacturer	Manufacturer name of the device
Serial Number	Serial number of the device
Firmware Version	Major and minor firmware version numbers of the device
Installed Options	Enumerated list of the options installed on the device. For each item: product code and product designation
IP Address	IPv4 address of the device currently assigned to the device
MAC Address	MAC Address of the LAN port of the device
Hostname	Host name currently assigned to the device
Temperature	Internal temperature of the device, expressed in °C

Get Device Logs Panel

The Get Device Logs panel allows to retrieve log files from the device.

Clicking on the Get Systems Logs button initiates the download of the `system.logs.tar.gz file` containing the system logs data.

Clicking on the Get Access Logs button initiates the download of the `access.logs.tar.gz file` containing the access logs data.

Note. In the log files, time is expressed in UTC time.

Reboot Device Panel

The Reboot Device panel allows to reboot the device.

Clicking on the Reboot Now button opens a dialog box allowing to initiate or cancel the task.

Revert Device to Factory Settings Panel

The Revert Device to Factory Settings panel allows to revert the device settings to their initial value at factory output.

Clicking on the Revert Now button opens a dialog box allowing to initiate or cancel the task.

The Reset network parameters checkbox controls the reverting of the network settings.

- When checked, the network related settings and the user database are also reverted.
- When unchecked, the network related settings and the user database are not reverted.

Firmware Upload Panel

The Firmware Upload panel allows to upload a firmware to the device.

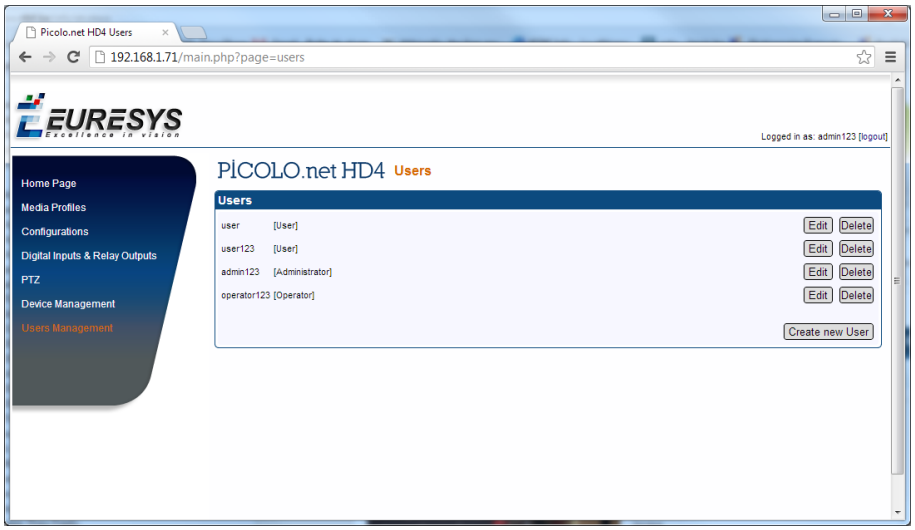
Clicking on the Browse button opens the file browser e.g. Windows Explorer allowing to select the firmware image file to upload.

Clicking on the Upload Firmware opens a dialog box allowing to initiate or cancel the task.

Users Management Page

The Users Management page allows to:

- Create and delete users
- View and edit user properties



Users Management Page

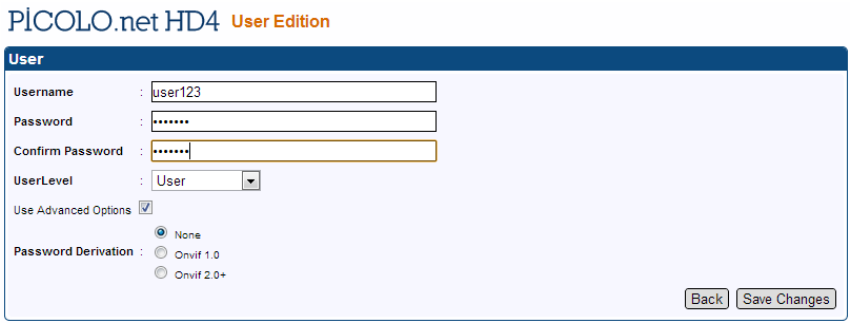
The Users panel displays the list of users. Each list item contains:

- User name
- User level between square brackets
- An Edit button
- A Delete button

Clicking the Delete button deletes the user.

Clicking the Edit button or the Create New User button opens the User Edition page.

User Edition page



User panel on the User Edition page

User Edition panel

Field name	Description
Username	User name
Password	User password
Confirm password	User password again
UserLevel	User access level. Possible values: ■ Administrator ■ Operator ■ User
Use Advanced Options	Enable/disable advanced options.

When Use Advanced Options checkbox is unchecked:

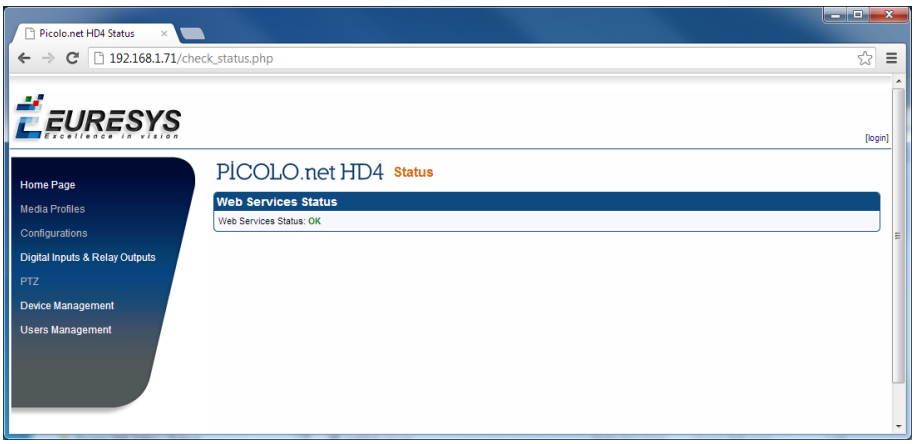
- The advanced options are not shown.
- There is no password derivation.

When Use Advanced Options checkbox is checked:

- The advanced options are shown.
- The user may specify a password derivation.

Hidden Pages

Check Status Page

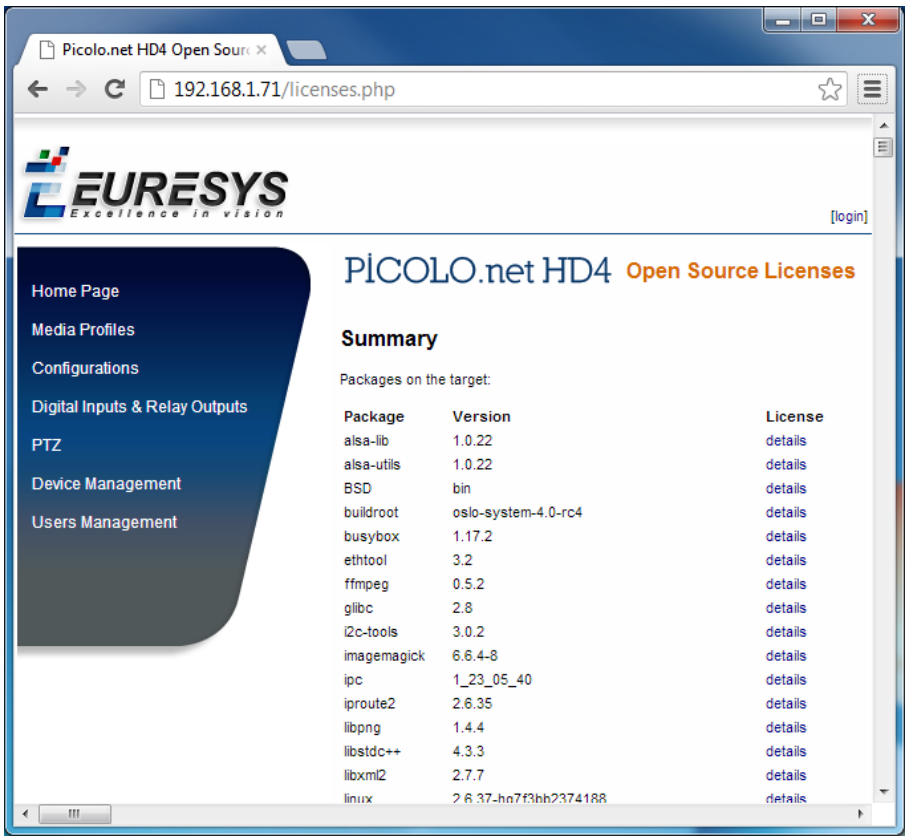


Check Status Page

Web Services Status panel

The Web Services Status field OK indicates that all the web services are up.

Open Source Licenses Page

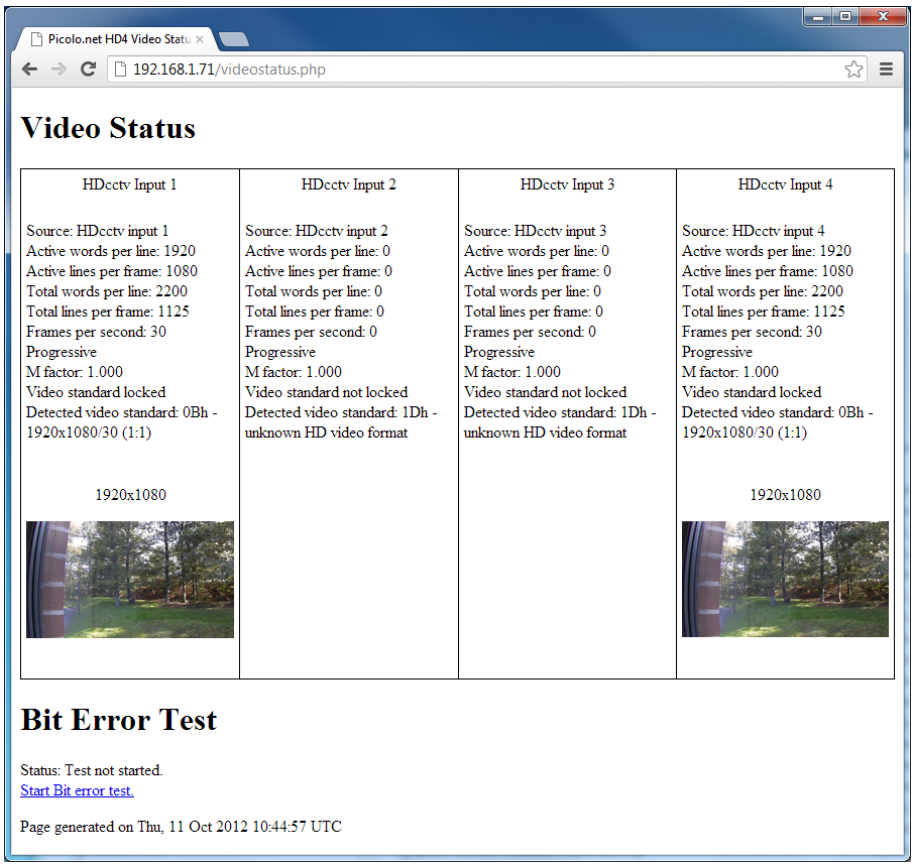


Open Source Licenses page

Open Source Licenses page

The Open Source Licenses page lists all the open-source licensed software components, their version, and provides a link to the license text.

Video Status Page



Video Status page

Video Status panel

The Video Status panel shows for each video input:

- The characteristics of the HD-SDI signal identified by the HD-SDI receiver device.
- A snapshot image for each encoded video stream.

Bit Error Test panel

The Bit Error Test panel allows to perform the Bit Error Test.
Clicking on the "Start Bit error test" initiates the BER measurement.
The test status is reported in the Status field.

Product Maintenance

Firmware Upgrade

The user can upgrade, re-install, or downgrade the embedded Firmware using one of the following methods:

- The "Firmware Upgrade" capability of the ONVIF API.
- The "Firmware Upload" panel available on the Device Management Page of the built-in Web Server.

Note. Uploading Firmware don't explicitly erase the existing user configurations settings.

Note. The product is shipped with the latest version of the Firmware that was available at the product manufacturing time.

Configuration Backup and Restore

The user can backup and restore the user-defined configurations using the ONVIF Backup/Restore capability.
The configuration backup data includes:

- Network settings
- ONVIF Media Profiles
- Video Source Configurations
- Encoder Configurations
- Metadata Configurations
- PTZ Configurations

The configuration backup data excludes user account settings:

- User name
- User passwords
- User level

Appendix

About ONVIF

First steps with ONVIF

To get familiar with ONVIF concepts, read:

- Chapter 4 - Overview of the core specifications: *http://www.onvif.org/specs/core/ONVIF-Core-Specification-v220.pdf*
- Chapter 4 - Media Profiles of the NVT media specifications: *http://www.onvif.org/specs/srv/media/ONVIF-Media-Service-Spec-v220.pdf*

ONVIF uses WEB SERVICES. For an introduction, read:

- *http://en.wikipedia.org/wiki/Web_services*
- *http://www.w3schools.com/webservices/default.asp*

ONVIF streams data over the network using RTSP and RTP. For an introduction, read:

- *http://en.wikipedia.org/wiki/Rtsp*
- *http://en.wikipedia.org/wiki/Real-time_Transport_Protocol*

ONVIF programmer's guide:

- *http://www.onvif.org/Portals/0/documents/WhitePapers/ONVIF_WG-APG-Application_Programmer%27s_Guide.pdf*

Online resources:

- ONVIF Device Manager is available for download from *http://sourceforge.net/projects/onvifdm/*

ONVIF Public Documents

Title	URL
ONVIF Web Site	*http://www.onvif.org/*
ONVIF Specification	*http://www.onvif.org/specs/DocMap.htm*
ONVIF NVT Specification	*http://www.onvif.org/specs/td/nvt/ONVIF-NVT-Definition-v210.pdf*
ONVIF Programmer's Guide	*http://www.onvif.org/Portals/0/documents/WhitePapers/ONVIF_WG-APG-Application_Programmer%27s_Guide.pdf*

Optional ONVIF Capabilities - Firmware version 7.4

This topic lists the ONVIF 1.02 optional Capabilities of Picolo.net HD4 with firmware version **7.4**.

Device Capabilities

Device/XAddr
http://192.168.1.216/onvif/device_service
Device/Network/IPFilter
false
Device/Network/ZeroConfiguration
false
Device/Network/IPVersion6
false
Device/Network/DynDNS
false
Device/System/DiscoveryResolve
true
Device/System/DiscoveryBye
false
Device/System/RemoteDiscovery
false
Device/System/SystemBackup
true
Device/System/SystemLogging
true
Device/System/FirmwareUpgrade
false
Device/System/SupportedVersions/Major
2
Device/System/SupportedVersions/Minor
30
Device/System/Extension/onv:HttpFirmwareUpgrade
true
Device/System/Extension/onv:HttpSystemBackup
false
Device/System/Extension/onv:HttpSystemLogging
false
Device/System/Extension/onv:HttpSupportInformation
false

Device/IO/InputConnectors
4
Device/IO/RelayOutputs
4
Device/Security/TLS1.1
false
Device/Security/TLS1.2
false
Device/Security/OnboardKeyGeneration
false
Device/Security/AccessPolicyConfig
false
Device/Security/X.509Token
false
Device/Security/SAMLToken
false
Device/Security/KerberosToken
false
Device/Security/RELToken
false
Device/Security/onv:Extension/onv:TLS1.0
true

Events Capabilities

Events/XAddr
http://192.168.1.216/onvif/event_service
Events/WSSubscriptionPolicySupport
false
Events/WSPullPointSupport
false
Events/WSPausableSubscriptionManagerInterfaceSupport
false

Media Capabilities

Media/XAddr
http://192.168.1.216/onvif/media_service
Media/StreamingCapabilities/RTPMulticast
true
Media/StreamingCapabilities/RTP_TCP
false
Media/StreamingCapabilities/RTP_RTSP_TCP
false

PTZ Capabilities

PTZ/XAddr
http://192.168.1.216/onvif/ptz_service

Extension Capabilities

Extension/onv:DeviceIO/onv:XAddr
http://192.168.1.216/onvif/deviceio_service
Extension/onv:DeviceIO/onv:VideoSources
4
Extension/onv:DeviceIO/onv:VideoOutputs
0
Extension/onv:DeviceIO/onv:AudioSources
2
Extension/onv:DeviceIO/onv:AudioOutputs
0
Extension/onv:DeviceIO/onv:RelayOutputs
4
Extension/onv:DeviceIO/onv:DigitalInputs
4

Detailed Access Policy - Firmware version 7.4

This topic applies to Picolo.net HD4 with firmware version **7.4**.
It provides, for each service function, the minimal user level required to gain access to that function.
Note. The list of functions is sorted alphabetically by function name and categorized by service name.

Device Service Functions

AddIPAddressFilter
Administrator
AddScopes
Administrator
CreateCertificate
Administrator
CreateDot1XConfiguration
Administrator
CreateUsers
Administrator
DeleteCertificates
Administrator

DeleteDot1XConfigurations
Administrator
DeleteUsers
Administrator
GetAccessPolicy
Administrator
GetCACertificates
User
GetCapabilities
Anonymous
GetCertificateInformation
User
GetCertificates
User
GetCertificatesStatus
User
GetClientCertificateMode
User
GetDNS
User
GetDPAddresses
User
GetDeviceInformation
User
GetDiscoveryMode
User
GetDot11Capabilities
User
GetDot11Status
User
GetDot1XConfiguration
User
GetDot1XConfigurations
User
GetDynamicDNS
User
GetEndpointReference
Anonymous
GetHostname
Anonymous
GetIPAddressFilter
User

GetNTP
User
GetNetworkDefaultGateway
User
GetNetworkInterfaces
User
GetNetworkProtocols
User
GetPkcs10Request
User
GetRelayOutputs
User
GetRemoteDiscoveryMode
User
GetRemoteUser
User
GetScopes
User
GetServiceCapabilities
Anonymous
GetServices
Anonymous
GetSystemBackup
Administrator
GetSystemDateAndTime
Anonymous
GetSystemLog
Administrator
GetSystemSupportInformation
User
GetSystemUris
User
GetUsers
Administrator
GetWsdlUrl
Anonymous
GetZeroConfiguration
User
LoadCACertificates
Administrator
LoadCertificateWithPrivateKey
Administrator

LoadCertificates
Administrator
RemoveIPAddressFilter
Administrator
RemoveScopes
Administrator
RestoreSystem
Administrator
ScanAvailableDot11Networks
User
SendAuxiliaryCommand
Operator
SetAccessPolicy
Administrator
SetCertificatesStatus
Administrator
SetClientCertificateMode
Administrator
SetDNS
Administrator
SetDPAddresses
Administrator
SetDiscoveryMode
Administrator
SetDot1XConfiguration
Administrator
SetDynamicDNS
Administrator
SetHostname
Administrator
SetHostnameFromDHCP
User
SetIPAddressFilter
Administrator
SetNTP
Administrator
SetNetworkDefaultGateway
Administrator
SetNetworkInterfaces
Administrator
SetNetworkProtocols
Administrator

SetRelayOutputSettings
Operator
SetRelayOutputState
Operator
SetRemoteDiscoveryMode
Administrator
SetRemoteUser
Administrator
SetScopes
Administrator
SetSystemDateAndTime
Administrator
SetSystemFactoryDefault
Administrator
SetUser
Administrator
SetZeroConfiguration
Administrator
StartFirmwareUpgrade
Administrator
StartSystemRestore
Administrator
SystemReboot
Operator
UpgradeSystemFirmware
Administrator

ProprietaryDevice Service Functions

GetInstalledOptions
User
GetTemperature
User

DeviceIO Service Functions

GetAudioOutputConfiguration
User
GetAudioOutputConfigurationOptions
User
GetAudioOutputs
User
GetAudioSourceConfiguration
User

GetAudioSourceConfigurationOptions
User
GetAudioSources
User
GetDigitalInputs
User
GetRelayOutputOptions
Anonymous
GetRelayOutputs
User
GetSerialPortConfiguration
User
GetSerialPortConfigurationOptions
User
GetSerialPorts
User
GetServiceCapabilities
Anonymous
GetVideoOutputConfiguration
User
GetVideoOutputConfigurationOptions
User
GetVideoOutputs
User
GetVideoSourceConfiguration
User
GetVideoSourceConfigurationOptions
User
GetVideoSources
User
SendReceiveSerialCommand
Operator
SetAudioOutputConfiguration
Operator
SetAudioSourceConfiguration
Operator
SetRelayOutputSettings
Operator
SetRelayOutputState
Operator
SetSerialPortConfiguration
Administrator

SetVideoOutputConfiguration
Operator
SetVideoSourceConfiguration
Operator

ProprietaryIO Service Functions

GetDigitalInputConfiguration
User
GetDigitalInputState
User
SetDigitalInputConfiguration
Administrator

Event Service Functions

CreatePullPointSubscription
User
GetCurrentMessage
User
GetCurrentMessage
User
GetEventProperties
User
GetServiceCapabilities
Anonymous
PullMessages
User
Renew
User
SetSynchronizationPoint
User
Subscribe
User
Unsubscribe
User

Media Service Functions

AddAudioDecoderConfiguration
Operator
AddAudioEncoderConfiguration
Operator
AddAudioOutputConfiguration
Operator

AddAudioSourceConfiguration
Operator
AddMetadataConfiguration
Operator
AddPTZConfiguration
Operator
AddVideoAnalyticsConfiguration
Operator
AddVideoEncoderConfiguration
Operator
AddVideoSourceConfiguration
Operator
CreateProfile
Operator
DeleteProfile
Operator
GetAudioDecoderConfiguration
User
GetAudioDecoderConfigurationOptions
User
GetAudioDecoderConfigurations
User
GetAudioEncoderConfiguration
User
GetAudioEncoderConfigurationOptions
User
GetAudioEncoderConfigurations
User
GetAudioOutputConfiguration
User
GetAudioOutputConfigurationOptions
User
GetAudioOutputConfigurations
User
GetAudioOutputs
User
GetAudioSourceConfiguration
User
GetAudioSourceConfigurationOptions
User
GetAudioSourceConfigurations
User

GetAudioSources
User
GetCompatibleAudioDecoderConfigurations
User
GetCompatibleAudioEncoderConfigurations
User
GetCompatibleAudioOutputConfigurations
User
GetCompatibleAudioSourceConfigurations
User
GetCompatibleMetadataConfigurations
User
GetCompatibleVideoAnalyticsConfigurations
User
GetCompatibleVideoEncoderConfigurations
User
GetCompatibleVideoSourceConfigurations
User
GetGuaranteedNumberOfVideoEncoderInstances
User
GetMetadataConfiguration
User
GetMetadataConfigurationOptions
User
GetMetadataConfigurations
User
GetProfile
User
GetProfiles
User
GetServiceCapabilities
Anonymous
GetSnapshotUri
User
GetStreamUri
User
GetVideoAnalyticsConfiguration
User
GetVideoAnalyticsConfigurations
User
GetVideoEncoderConfiguration
User

GetVideoEncoderConfigurationOptions
User
GetVideoEncoderConfigurations
User
GetVideoSourceConfiguration
User
GetVideoSourceConfigurationOptions
User
GetVideoSourceConfigurations
User
GetVideoSources
User
RemoveAudioDecoderConfiguration
Operator
RemoveAudioEncoderConfiguration
Operator
RemoveAudioOutputConfiguration
Operator
RemoveAudioSourceConfiguration
Operator
RemoveMetadataConfiguration
Operator
RemovePTZConfiguration
Operator
RemoveVideoAnalyticsConfiguration
Operator
RemoveVideoEncoderConfiguration
Operator
RemoveVideoSourceConfiguration
Operator
SetAudioDecoderConfiguration
User
SetAudioEncoderConfiguration
Operator
SetAudioOutputConfiguration
Operator
SetAudioSourceConfiguration
Operator
SetMetadataConfiguration
Operator
SetSynchronizationPoint
Operator

SetVideoAnalyticsConfiguration
Operator
SetVideoEncoderConfiguration
Operator
SetVideoSourceConfiguration
Operator
StartMulticastStreaming
Operator
StopMulticastStreaming
Operator

ProprietaryMedia Service Functions

AutoSetup
Operator
GetExtendedVideoEncoderConfiguration
User
GetExtendedVideoEncoderConfigurations
User
GetPicoloAudioOutputConfiguration
User
GetPicoloAudioOutputs
User
SetExtendedVideoEncoderConfiguration
Operator
SetPicoloAudioOutputConfiguration
Operator

PTZ Service Functions

AbsoluteMove
Operator
ContinuousMove
Operator
CreatePresetTour
Operator
GetConfiguration
User
GetConfigurationOptions
User
GetConfigurations
User
GetNode
User

GetNodes
User
GetPresetTour
User
GetPresetTourOptions
User
GetPresetTours
User
GetPresets
User
GetServiceCapabilities
Anonymous
GetStatus
User
GotoHomePosition
Operator
GotoPreset
Operator
ModifyPresetTour
Operator
OperatePresetTour
Operator
RelativeMove
Operator
RemovePreset
Operator
RemovePresetTour
Operator
SendAuxiliaryCommand
Operator
SetConfiguration
Operator
SetHomePosition
Operator
SetPreset
Operator
Stop
Operator

ProprietaryPTZ Service Functions

GetPelcoNodeAddressConfiguration
User

GetPelcoNodeAddressConfigurations

User

SetPelcoNodeAddressConfiguration

Administrator

Open Source Software

The firmware of Picolo.net HD4 uses Open Source software components.

The list of Open Source software components and their corresponding license text can be retrieved directly from the Embedded Web pages, at the following URL: **http://[device-ip-address]/licenses.php**

A package gathering all the source code of the Open Source development tools and open source components used in Picolo.net HD4 is available for download from a Euresys Web or FTP Server. The URL of the appropriate package is given in the above mentioned web page.

Precautions of Use

Damage caused by improper handling is not covered by the manufacturer warranty.

Risk of Electrical Shock

Do not operate the device with removed enclosure cover.

Use exclusively isolated DC power sources with the adequate voltage and power ratings.

Operate the device and its power supply only in a dry, weather-protected location.

Risk of Permanent Damage

Electronic devices can be damaged by electrostatic discharges.

Euresys devices are compliant with electrostatic discharges regulatory requirements. However, it is required to apply any general procedure aimed at reducing the risk associated to electrostatic discharge.

Risk of Malfunction Due to EMI

Electronic devices can be disturbed by electromagnetic interferences.

Euresys devices are compliant with electromagnetic susceptibility regulatory requirements. However, it is required to apply any general procedure aimed at reducing the risk associated to electromagnetic interferences.

Risks Due to Overheating

In case of inadequate cooling, the temperature of the device may become excessive, leading to a device malfunction, permanent damage, and risk of fire.

The device is designed for fan-less operation and natural air convection cooling. However, it is required to apply any general procedure aimed at facilitating the circulation of the air flow around the enclosure.

Risks Due to Poor Grounding Protection

Poor ground interconnection, ground loop or ground fault may induce unwanted voltage between equipments, causing excessive current in the interconnecting cables. This faulty situation can damage the electronic devices and its peripherals.

The computer and the camera can be located in distant areas with distinct ground connections.

The user must follow proper equipment grounding practices at all ends of the interconnecting cables. In addition, it is recommended to use cable assemblies with overall shield solidly connected to the conductive shell of all connectors. Besides the beneficial effect of cable shielding on electromagnetic compatibility, the shield connection can increase the protection level against grounding problems in temporarily absorbing unwanted faulty current.

Embedded Firmware Naming Conventions

Firmware

The Firmware version is uniquely identified by a **Firmware Version Name** composed of 2 decimal numeric fields separated by a dot:

- The **Major Firmware Version Number**: a decimal number starting at 1 and incrementing when features are added or improvements are made to the product.
- The **Minor Firmware Version Number**: a decimal number starting at 0 and incrementing when bugs or malfunctions are fixed.

Examples: **1.0**, **2.7**