

Piranha



H.264 Video With Metadata



Low latency multi-stream H.264 video encoding With Line 21 and KLV Metadata Support

The Piranha network video platform provides carrier grade low latency video compression for IP transport and incorporates full support for combined metadata applications such as ISR (Intelligence, Surveillance, Reconnaissance), UAV (Unmanned Airborne Vehicle), and KLV (Key-Length-Value) systems. The Piranha includes the performance, reliability, and flexibility of Haivision's acclaimed hai1000 series such as 180 millisecond end to end latency and advanced networking features including logical multicast and traffic shaping.



Designed around Haivision's MPEG-4 AVC H.264 core compression engine hardware (TRUE-H.264), the Piranha combines the performance, reliability, and feature set of the hai1000 with full support for metadata captured either from one of four serial port interfaces or extracted from the vertical blanking interval (line 21 or closed caption) data space of analog video transmission — or both!!! The Piranha then incorporates the data information in real-time within the private data space of the standard MPEG-2 Transport Stream.

H.264 with KLV Serial and Line 21 Closed Caption

The Piranha is ideal for deployments transitioning to more efficient and accurate video data systems. H.264 video compression affords over 50% reduction in bandwidth compared to historic MPEG-2 systems. Many users are as well looking to move from line 21 support over analog video to separate serial data injection as serial connections offer high data bandwidths and digital accuracy. The Piranha is unique in supporting both KLV data via a serial port and line 21 closed caption data from the video signal with H.264 video compression and video frame timestamping - one efficient high performance platform for data systems in transition.

Lowest Latency. With mission critical video transmission or when remote system control is required, reducing the latency between video capture and delivery is essential. Haivision's codec systems are integrated within the worlds leading telepresence suites where the lowest latency enables fluid communications and have been deployed for remote robotic surgery (telesurgery) where surgeons rely on the lowest latency to maintain hand-eye coordination. The Piranha delivers absolutely consistent performance at latency as low as 180 milliseconds end to end.

Advanced Video Encoding Features

The Piranha supports H.264 encoding of standard definition video in either analog format (composite/s-video) or digital format (SDI). The encoding resolution (Full-D1 or Half-D1), the video bitrate (150kbps to 5Mbps), and the frame rate (3 to 30 frames per second) are all independently adjustable to assure the optimal video quality for any bandwidth requirements. As with all Haivision technology, encoding adjustments are "on-the-fly" and take effect immediately.



METADATA HANDLING

4 Serial Ports - Line 21 Closed Caption Data - KLV or CoT on Serial
Up to 115.2 Kbps



VIDEO ENCODING

H.264 compression - 180 millisecond latency - 150 kbps to 5 Mbps
Fully adjustable parameters - Video frame timestamping



CONFIGURATIONS

1RU single encoder - 3RU up to 5 encoders
Analog or digital - Output port for monitoring/decoding



Advanced Serial Data Features

Accommodating up to 115.2 kbps of metadata, the Piranha has advanced capabilities for the translation of CoT (Cursor on Target) information (for UAV applications) into industry standard KLV format. Through the easy to use web interface or via the command line interface of the Piranha users can select either KLV or CoT style metadata as captured on any of the available 4 serial ports. Additionally, the PIRANHA can accommodate nested KLV information within time delay parameters.

Advanced Network Features. The PIRANHA incorporates the advanced networking features of its hai1000 heritage. The hai1000 has been deployed in the most rigorous LAN, WAN, and satellite environments. One of the more interesting network features is the ability for any encoder to transmit multiple network streams to various destinations all with unique IP wrappers (encapsulations). So each encoder may have up to 10 unique network destinations, each of which can be either multicast or unicast and can have one of a number of standard IP protocols supported including Direct RTP, UDP, Transport Stream, and even QuickTime and Flash compatibility. This affords significant deployment flexibility in that one system can feed a variety of infrastructures. Another significant network feature on the PIRANHA is traffic shaping. Any of the stream destinations can have traffic shaping enabled or disable. Traffic shaping creates an output stream adhering to exact bandwidth tolerances. With traffic shaping enabled, the streams from Haivision encoders adhere to exact total bit rate parameters — extremely significant for the most efficient use of valuable IP transport resources such as satellite.



PIRANHA Data Card Features. The PIRANHA data card on the PIRANHA 1060 or the PIRANHA 1020 supports 4 channels of serial data, either RS232 or RS422 selectable (unit ships standard with RS232 cable adaptor). The serial data bit rate supported is up to 115.2 kbps. Each encoder channel within a PIRANHA system can be assigned a serial data port source. Each serial data source can be designated as either raw KLV or CoT data types.

PIRANHA Configurations. The PIRANHA is available in two chassis formats. The PIRANHA 1020 is a 1RU single encoder system. The PIRANHA 1060 is a 3RU platform configurable with up to 5 encoders. In both systems each PIRANHA encoder card is as well equipped with an output port that can be used for baseband signal loop through or as a decoder for local stream validation or even for remote stream monitoring. Two PIRANHA encoder “blade” formats are available; and analog blade supporting composite and s-video and a digital blade that supports composite and SDI.

PIRANHA Control. The PIRANHA has an extensive command set to control the encoding and network parameters as well as for systems management and performance diagnostics. The command set is available through a convenient web interface available by “browsing” to the units IP address, or via command line interface over the IP or serial control ports. The PIRANHA as well supports simple network management protocol (SNMP) for advanced control systems. As well the entire product documentation is available “on board” through on-line help facilities available through the web interface.



Specifications

VIDEO ENCODING / DECODING

H.264 AVC (MPEG-4 part 10)

Resolution NTSC/PAL

Full-D1 720x480/576
Half-D1 352x480/576

Bit Rates

Encoder:
From 150 kbps to 6 Mbps
Decoder:
From 150 kbps to 5 Mbps

Rate Control:

Traffic Shaping

Latency (end to end)

From 180ms to 300ms

Compression Standard

H.264 AVC (MPEG-4 part 10)

ISO/IEC 14496-10

Baseline & Main Profiles

Level 3.0 and lower Intermediate Levels

I, IP, IBP, IBBP framing

Variable Group of Picture (GOP) size with

Intraframe

Insertion at scene cut

Support of CABAC & CAVLC

AUDIO ENCODING / DECODING

MPEG-4 AAC

Compression Standard

MPEG-4 AAC-LC

ISO/IEC 14496-3

Bit Rates

From 64 to 256 kbps

IP NETWORK INTERFACE

Standard

Ethernet 10/100 Bas-T, auto-detect,
Half/Full-duplex

Connector

RJ45

Networking Protocols

H.264 over RTP (RFC 3984)

Transport Stream over UDP / RTP

RTP / RTCP

Optional SIP protocol with INVITATION

MANAGEMENT INTERFACE

Standard

RS-232

RJ45 to RS-232 DB-9 Management Cable

Req'd.

Management

HTTP (web browser)

Command line over Telnet/RS-232

FTP/TFTP

4 PORT SERIAL DATA INTERFACE CARD

Standard

RS-232/RS-422

RS-232 up to 115.2 kbps

RS-422 up to 115.2 kbps

RJ45 Connectors

RJ45 to RS232 Adaptor Included

RJ45 to RS422 Adaptor Optional

Specifications

Key Length Value (KLV) or Cursor on Target

Metadata Multiplexing per MISB RP 0604

Synchronous Mode

KLV per SMPTE 336M

MISB EG0601.1

PIRANHA ANALOG ENCODER BLADE

Video Inputs/Outputs

S-Video 4-pin Mini-DIN

Composite 75Ω BNC

Audio Inputs/Outputs

4 analog audio channels

Balanced XLR connectors**

Unbalanced RCA connectors**

** DB15 breakout req'd, specify when ordering

PIRANHA DIGITAL ENCODER BLADE

Video Inputs/Outputs

Composite 75Ω BNC

SDI SMPTE — 259M-C 75Ω BNC

Audio Inputs/Outputs

4 analog audio channels

Balanced XLR connectors**

Unbalanced RCA connectors**

** DB15 breakout req'd, specify when ordering

Embedded Audio supported on SDI

PHYSICAL

PIRANHA 1020, 2 slot (1RU)

Temperature

0° to 50° C [32° to 122° F] operating
-40° to 70° C [-40° to 158° F] non-operating

Dimensions (H x W x D)

44 x 438 x 305 mm
1.75 x 17.25 x 12.0 in.

Power Requirements

110-240V AC; 125 W max

Weight

Approximately 4.5 kg [10 lbs]

Relative Humidity

Up to 95% without condensation

Certification

UL/CSA/CE, RoHS/WEEE

Compliance

EN 55022/55024;

FCC Part 15, Subpart B, Class A

Rackmount

19" included

PIRANHA 1060, 6 slot (3RU)

Temperature

0° to 50° C [32° to 122° F] operating
-40° to 70° C [-40° to 158° F] non-operating

Dimensions (H x W x D)

130 x 438 x 343 mm
5.125 x 17.25 x 13.5 in.

Power Requirements

110-240V AC or -48V DC; 200 W max

Weight

Approximately 9.1 kg [20 lbs] fully loaded

Relative Humidity

Up to 95% without condensation

Certification

UL/CSA/CE, RoHS/WEEE

Compliance

EN 55022/55024;

FCC Part 15, Subpart B, Class A

Rackmount

19" included

Ordering information (please obtain complete system quotations from Haivision or an authorized Haivision integration partner)

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|-------------------|---|
| S-1020-PIR-SD-EA | Piranha Standard Definition Analog H.264 Low Latency Encoder with Serial Port Data Channel, hai1020 1RU |
| S-1060-PIR-SD-2EA | Piranha Standard Definition 2 Encoder Analog H.264 Low Latency Encoder with Serial Port Data Channel, hai1060 3RU |
| S-1060-PIR-SD-2ED | Piranha Standard Definition 2 Encoder Analog/Digital H.264 Low Latency Encoder with Serial Port Data Channel, hai1060 3RU |
| B-PIR-HM4EDF | Piranha H.264 Analog Encode Blade with Decode – Line 21 Metadata, Composite and S-Video, 4 Channel Audio |
| B-PIR-HM4EDC | Piranha H.264 Analog/Digital Encode Blade with Decode – Line 21 Metadata, Composite and SDI, 4 Channel Audio |
| B-PIR-4SP | Piranha 4 Port Serial PMC Card, Special CoT data parsing and KLV Metadata integration. |
| F-PIR-1020 | Piranha 1020 - 2 Slot 1RU Chassis, Host and 4 port Serial Card, AC |
| F-PIR-1060 | Piranha 1060 - 6 Slot 3RU Chassis, Host and 4 port Serial Card, AC |