

## Low latency multi-stream H.264 video encoding with Line 21 and Serial Port 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 Variable) 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 KVL Serial and Line 21

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 data from the video signal with H.264 video compression - 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/Composite). The encoding resolution (SD or SIF), the video bitrate (150kbps to 5Mbps), and the frame rate (1 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.

### 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 **hai 1000** heritage. The **hai 1000** 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 disabled. 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

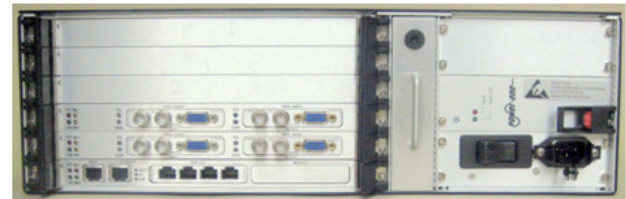
The **PIRANHA** data card on the **PIRANHA 1060** or the **PIRANHA 1020** supports 4 channels of serial data, either RS232 or RS422 selectable (unit ships standard with RS232 cable adaptor). The serial data bit rate supported is up to 115.2 kbps. Each encoder channel within a **PIRANHA** system can be 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 supporting composite and SDI (closed caption data on SDI pending development).



**PIRANHA 1020**  
Standard Analog Configuration



**PIRANHA 1060**  
Standard Dual Digital Configuration

### 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.

#### 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  
256 kbps to 6 Mbps  
Fully adjustable parameters

#### CONFIGURATIONS

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

## Specifications - *PIRANHA* systems

### DATA & VIDEO INTERFACES

#### IP Network Interface

##### Standard

Ethernet 10/100 Base-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

##### Signaling Protocols

INVITATION for SIP signaling interoperability with  
supported conferencing MCUs.

#### 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  
AMX/Crestron module provided

#### 4 Port Serial Data Interface Card

##### Standard

RS-232/RS-422  
RS-232 up to 115.2 kbps  
RS-422 up to 460.8 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  
KLV per SMPTE 336M

#### 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

### 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

##### Traffic Shaping

Constant (CBR)  
Variable (VBR)

##### Latency (end to end)

From 190ms 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, IBBP, IBBP framing  
Variable Group of Picture (GOP) size with Intra-  
frame 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

### 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 *PIRANHA* systems

(please obtain complete system quotations from HaiVision or an authorized HaiVision integration partner)

### CONFIGURED SYSTEMS

S-1020-PIR-SD-EA	PIRANHA Standard Definition Analog H.264 Low Latency Encoder with Serial Port Data Channel, hai1020 1U Format
S-1060-PIR-SD-2ED	PIRANHA Standard Definition 2 Encoder Analog/Digital H.264 Low Latency Encoder with Serial Port Data Channel, hai1060 3U Format

### SYSTEM COMPONENTS

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

### SYSTEM CABLES

CA-HM-2RCA2	Unbalanced, HD-15 DSUB to RCA, 2Channel, 2ft
CA-HM-4RCA2	Unbalanced, HD-15 DSUB to RCA, 4Channel, 2ft
CA-HM-2RCA10	Unbalanced, HD-15 DSUB to RCA, 2Channel, 10ft
CA-HM-4RCA10	Unbalanced, HD-15 DSUB to RCA, 4Channel, 10ft
CA-HM-2XM10	Balanced, HD-15 DSUB to XLR Male (OUTPUT), 2Channel, 10ft
CA-HM-2XF10	Balanced, HD-15 DSUB to XLR Female (INPUT), 2Channel, 10ft
C-MGMT	RJ45 to DB9 Serial Management Cable
C-PIR-RS232	PIRANHA RJ54 to DB9 RS-232 Serial Converter
C-PIR-RS422	PIRANHA RJ54 to DB9 RS-422 Serial Converter