

# Makito XH (Harsh) Installation Guide

## Makito XH Encoder/Decoder 2.3

This Installation Guide provides the steps required to install and configure the Makito XH (Harsh) Encoder (to stream to a compatible decoding device) and/or Decoder (to decode compatible video streams).

Please refer to the [Makito X Encoder User's Guide](#) or [Makito X Decoder User's Guide](#) for detailed configuration and operation information.

We recommend that you familiarize yourself with this guide before installing your encoder or decoder.

Use the following guidelines when unsafe conditions exist or when potentially hazardous voltages are present:

- Always use caution and common sense.
- To reduce the risk of electrical shock, do not operate equipment with the cover removed.
- Repairs must be performed by qualified service personnel only.

Improper handling and/or installation practices of sensitive equipment may VOID the warranty.

### ⚠ Caution

When handling components, or when setting switch options, always use an antistatic wrist strap connected to a grounded equipment frame or chassis. *If a wrist strap is not available, periodically touch an unpainted metal surface on the equipment.* Never use a conductive tool, such as a screwdriver or a paper clip, to set switches.

## Waste Electrical and Electronic Equipment (WEEE) Disposal



In accordance with the European Union (EU) WEEE Directive, Haivision products that fall within the scope of the WEEE, are labeled with the above symbol, and customers are encouraged to responsibly recycle their equipment at the time of disposal. Haivision also offers its customers the option of returning Haivision equipment to facilitate its environmentally sound disposal.

For more information, please visit our website at: <https://www.haivision.com/environment>.

## Makito XH Overview

The Makito XH (Harsh) is a semi-ruggedized, industrial version of the Makito X.

- The Makito XH encoder is available in single channel DVI input, and single and dual channel SDI input configurations.
- The Makito XH decoder is available in a dual SDI plus HDMI output configuration.

The Makito XH is designed for fan-less operation in harsh/hot environments, where it can survive exposure to a limited range of temperatures and other environmental factors (e.g. humidity, dust, etc).

The Makito XH is resistant to a limited amount of shock and vibration, and can tolerate variations in temperature (from 0 to 70 °C), humidity (5% to 95%, non-condensing), and air pressure (from 300 to 1015 kPa). In all other aspects (including video/audio encoding/decoding, streaming, management, network/serial port and metadata control) the Makito XH is identical to its non-ruggedized Makito X counterparts.

**Makito XH Encoder (#S-292E-X1H)**



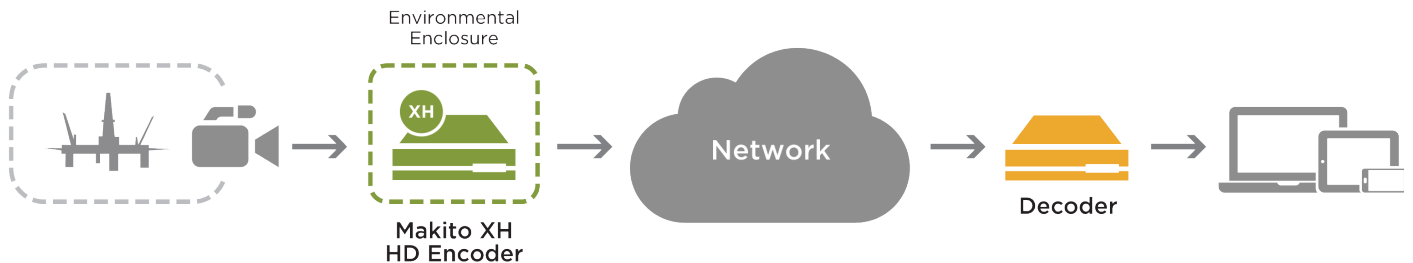
**Makito XH Decoder (#S-292D-X2H)**



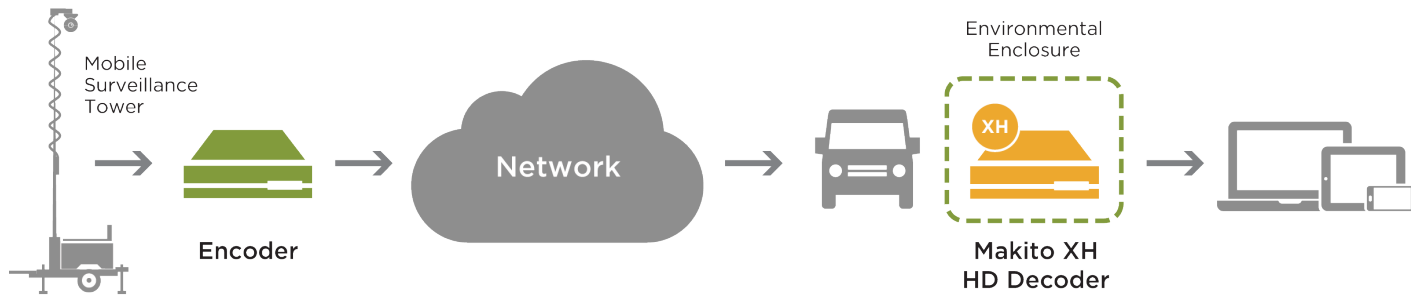
## Applications

The Makito XH is suited for ISR activities in remote locations, where it should be mounted within an environmental enclosure for additional protection.

Typical encoder applications include surveillance towers with security cameras that can feed an SDI signal to Makito XH units, which encode the video and stream it to a remote monitoring location.



Typical decoder applications include providing on-site decoding of video streams for border patrol operations, and fan-less decoding in noise-sensitive environments (e.g., a broadcast booth at a live sporting event).



## Before You Begin

1. Unpack the box and visually inspect the package contents for any evidence of shipping damage. See the *Important Notice* document in the box for a list of contents.
2. In addition to the contents of the Makito XH box, you may need to have the following items available:
  - Environmental enclosure
  - Four #8-32 screws or stainless steel, harsh-environment cable ties
  - Coaxial cabling with BNC connectors for audio/video sources, DVI cabling (DVI encoder), and/or HDMI cabling (decoder)
  - Cabling for analog audio sources (mini-DIN-8 connector)
  - Ethernet cable for a network connection
  - Ethernet cable for a serial connection (SDI encoder)
  - Sealant gel (e.g., X-Sealant Gel — <http://www.xmultiple.com/xwebsite-sealant.htm>)
  - A laptop with Web browser and Telnet client
3. (**Encoder**) In order to be able to view the output from the Makito XH Encoder, make sure you have a decoding device or video player (e.g., VLC) that supports the UDP Transport Stream format.
4. (**Decoder**) In order to be able to test the output from the Makito XH Decoder, make sure you have an encoding device or application that supports the UDP Transport Stream format.

### Note

If the device is to be installed in a remote location (e.g., on a utility pole, or on a mobile platform), we recommend that you follow the instructions in this Installation Guide to perform an initial setup in a "staging" environment, such as a lab or control center. Once the device has been set up and is demonstrated to be operating normally, you can then move it to the remote location.

### Caution

Before installing the device, please refer to the "Safety Guidelines" in the [Makito X Encoder User's Guide](#) or [Makito X Decoder User's Guide](#) . Only connect the unit to a compatible power source. If an electrical fault occurs, disconnect the unit and contact Haivision Technical Support. Never try to force the connections when setting up the system as this may damage the unit.

### Caution

**Hot surface. Avoid contact.** The chassis can achieve a surface temperature 95°C in poorly ventilated environments, and may cause personal injury if touched.

**ATTENTION Surface chaude. Eviter le contact.** Le châssis peut atteindre une température de surface de 95°C dans des environnements mal ventilés et peut causer des blessures en cas de contact.

### Warning

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

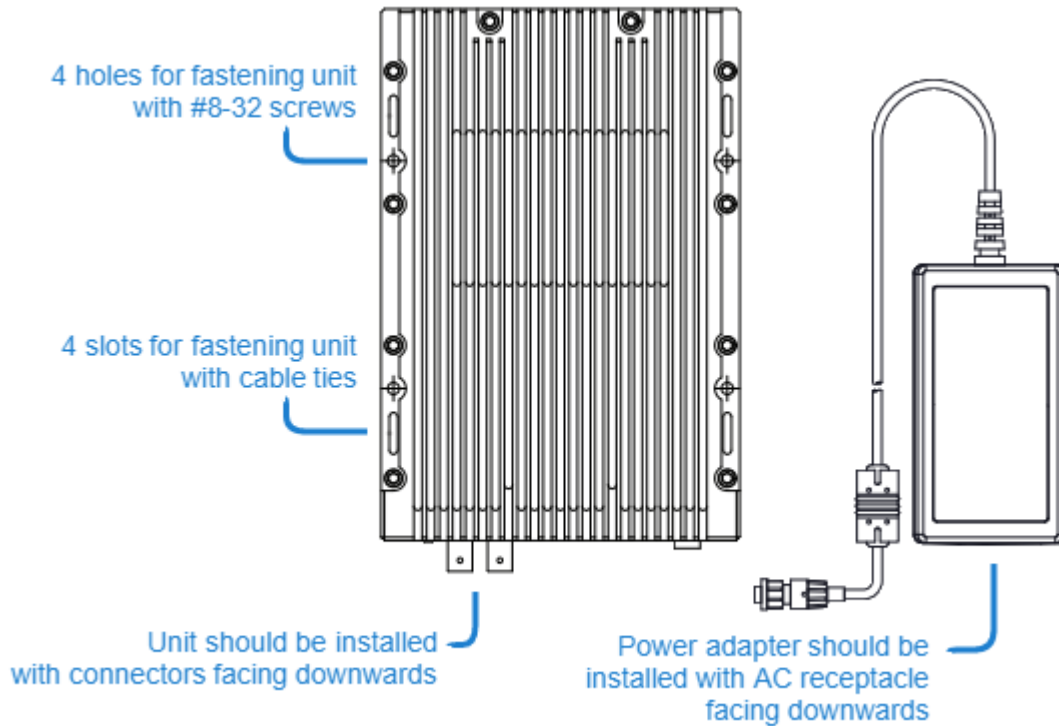
**AVERTISSEMENT** Ce produit est destiné à être installé dans une zone d'accès restreint. Les zones d'accès restreint sont protégées par un mécanisme spécifique, par une serrure et une clé, ou par tout autre dispositif de sécurité.

## Installing the Makito XH

1.

**⚠ Caution**

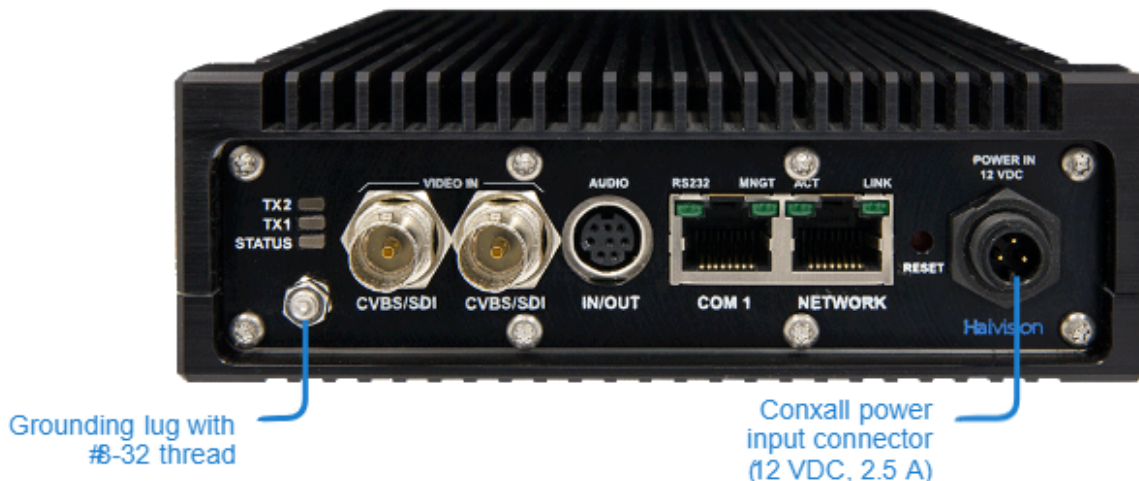
The surface temperature of the chassis can reach 95°C in poorly ventilated environments. We recommend that you fasten the appliance to a metal (cold) plate to increase heat dissipation.



**⚠ Caution**

The chassis and power adapter must be positioned with the connectors facing downwards to minimize the possibility of water penetration.

2. Fasten the appliance to its support base with four screws (size 8-32, or 6 mm). Alternatively, you can use stainless steel, harsh-environment cable ties, which can be passed through slots in the chassis.
3. Fasten a grounding wire (10 AWG minimum) to the grounding lug using the nut and lock washer provided (as shown in the following encoder example).



**⚠ Caution**  
 The chassis must be properly grounded in order to provide protection against lightning strikes and other power surges.

## Connecting the Makito XH to the Network and A/V Sources or Displays

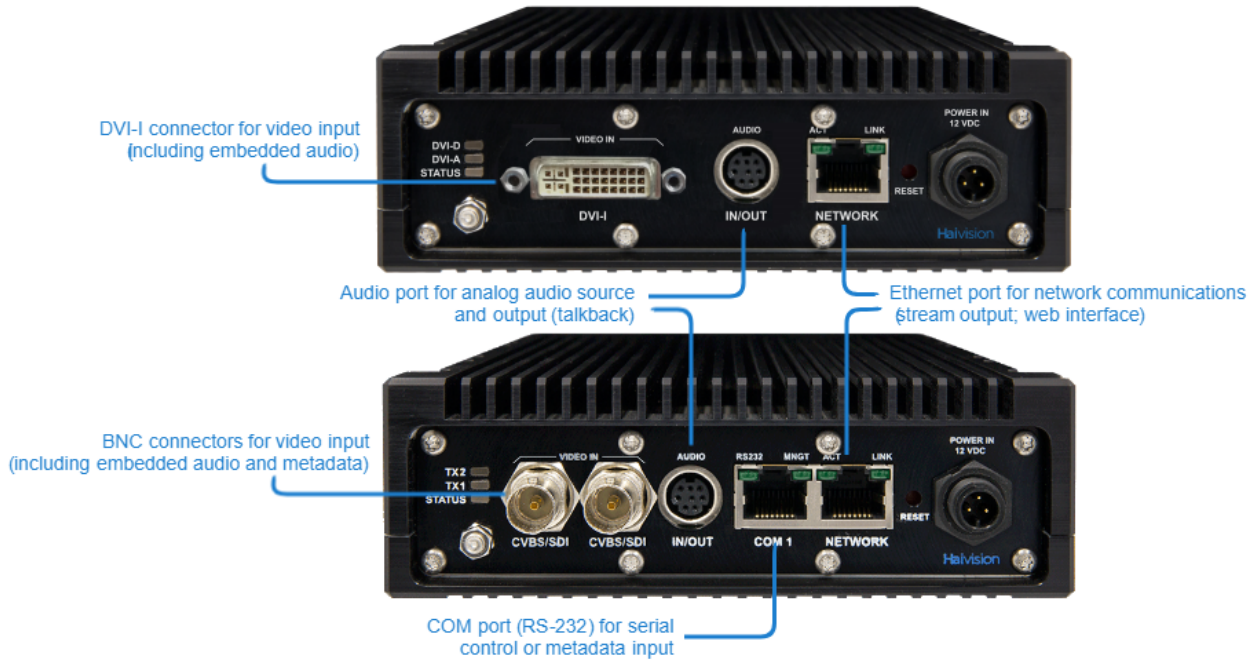
1. Connect video, audio, network and serial cables, referring to the figures below:

[Makito XH Encoder](#)

Makito XH Decoder

Makito XH Encoder

### Makito XH Encoder DVI Input

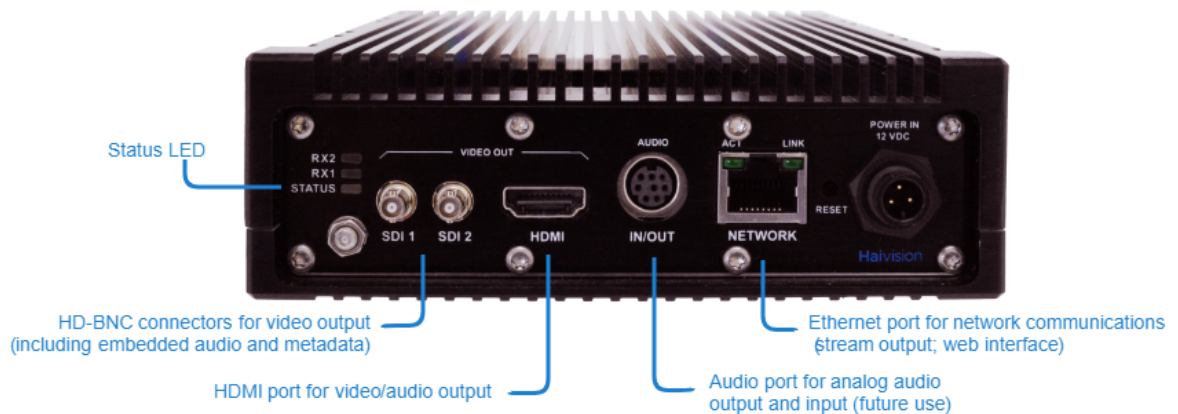


### Makito XH Encoder Dual SDI Input

Makito XH Encoder [Makito XH Decoder](#)

### Makito XH Decoder

### Makito XH Decoder Dual SDI Output



- Network:** Connect the Makito XH's Ethernet port to the IP network using a Type Cat 5E cable.

**⚠ Caution**

(SDI Encoder only) Take care not to plug the Ethernet cable from an Ethernet switch (especially a Power over Ethernet (PoE) switch) directly into the COM1 serial port as it may damage the encoder.

- (Optional for SDI Encoder) Serial Input:** Connect the Makito XH's COM1 port to a metadata source or to the serial port of a computer using a standard straight Ethernet cable (TIA-EIA 561). You may need to use the RS-232 DB9-to-RJ45 serial management adapter provided with the encoder.



**i Note**

The Reset button provides two options:

- If you press and hold the button for less than 4 seconds, the system resets and loads the last saved configuration. If no configuration was previously saved, the default settings prevail.
- If you press and hold the button for more than 4 seconds, the module performs a complete factory reset. It clears all of the previously configured settings, including IP, streams and encoder configurations.

- SDI Encoder Input:** Connect the Makito XH's SDI Video/Embedded Audio Input to your audio/video source(s) using the BNC connector(s) and coaxial cable(s).  
or  
**DVI Encoder Input:** Connect the Makito XH's DVI-I Video/Embedded Audio Input to your audio/video source(s) using a DVI-to-DVI or an HDMI-to-DVI cable.
- 3G-SDI Decoder Video Output with Embedded Audio:** Connect one or both of the decoder's SDI outputs to TV or display monitors, using the HD-BNC to BNC Adapter Cable(s) (included in the package for appliances).



or

**HDMI Decoder Video Output with Embedded Audio:** Connect the decoder's HDMI output to a TV or display monitor, using an HDMI connector (refer to the *Makito X Decoder User's Guide* for the HDMI connector pinouts).

**i Note**

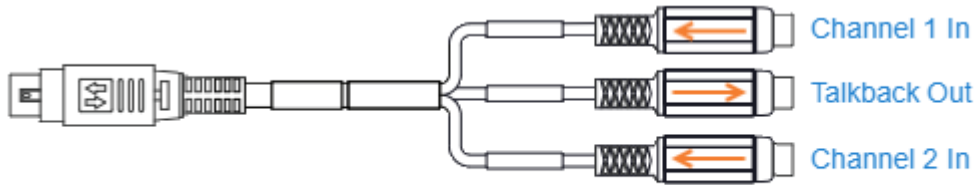
(Decoder only) By default, HDMI displays the SDI1 content. To monitor the SDI2 channel, see "Configuring the HDMI Video Display" (in the *Makito X Decoder User's Guide*).

- Analog Audio Input/Output:** Connect the Makito XH's mini-DIN-8 audio connector to your audio source or sound system/speakers, using the audio 8-pin Mini-DIN connector/ Audio cable/adaptor



provided with the Makito XH.

On the Makito XH Encoder, for unbalanced audio, use the 8-pin audio to 3-RCA female cable adapter (included in the package).



On the Makito XH Decoder, for unbalanced audio, use the 8-pin audio to 3-RCA female cable adapter (included in the package).



White - Channel 1 / Left Out  
 Red - Channel 2 / Right Out  
 Black - Talkback In

- A balanced audio cable adapter is available from Haivision upon request.
- Refer to the *Makito X Encoder or Decoder User's Guide* for the balanced/unbalanced audio pinouts.

**Note**

(Encoder only) The Makito XH supports Composite video as well as Analog audio formats. Selection between Analog (the default) and SDI audio can be done via the Web Interface. See [Configuring Audio Encoders](#) (in the [Makito X Encoder User's Guide](#) ).

**Tip**

On the Encoder, the Talkback channel may be used to provide loudspeaker voice alerts to ground personnel near surveillance towers, or for back-channel communications to pilots or drivers.

7. (Optional) Add a sealant gel around the Makito XH connectors in order to further protect them from water, humidity, sand and dust.

## Powering Up the Makito XH

**Warning**

When using the AC/DC power adapter, the power cord is the main disconnect device. Ensure that the socket-outlet is located/installed near the equipment and is easily accessible.

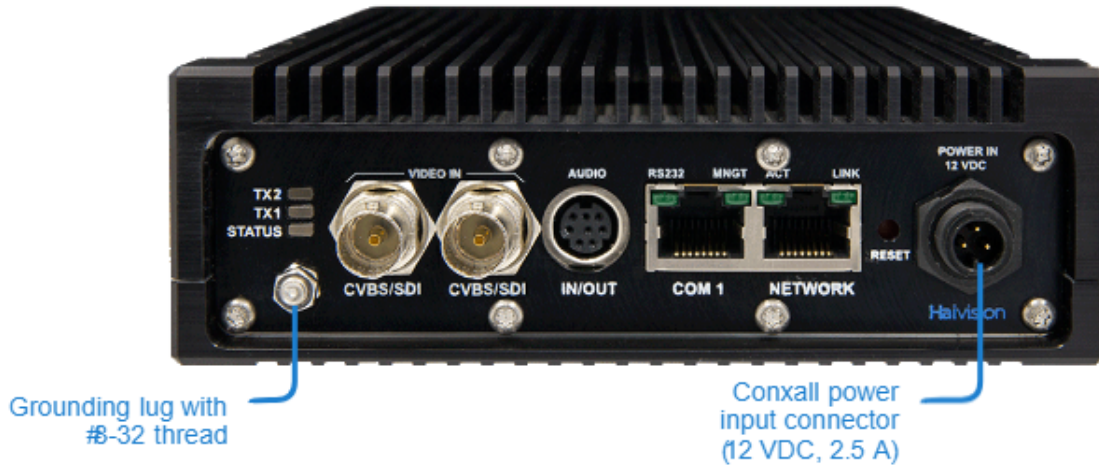
**ATTENTION** Quand on utilise l'adaptateur AC à DC, le cordon d'alimentation est utilisé comme interrupteur général. La prise de courant doit être située ou installée à proximité de l'équipement et être facile d'accès.

### **⚠ Caution**

To prevent damage to the encoder and/or power supply, be sure to connect the power supply to the chassis first and then to the AC source.

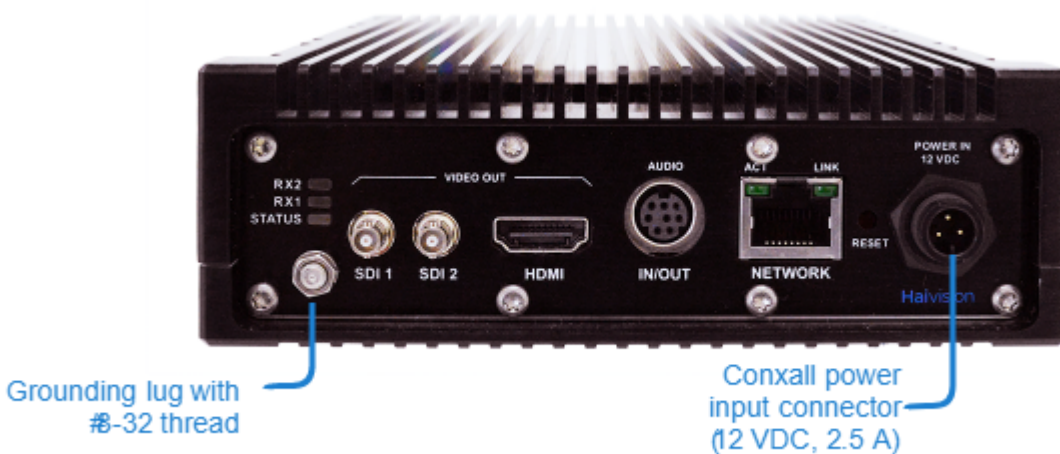
[Makito XH Encoder](#)    [Makito XH Decoder](#)

### Makito XH Encoder



[Makito XH Encoder](#)    [Makito XH Decoder](#)

### Makito XH Decoder



To power up the Makito XH:

1. Insert the 3-pin connector of the power cord into the power input jack at the rear of the unit. Make sure the connector is properly inserted and locked to avoid intermittent power problems.
2. Connect the power cord to the 12V power supply and plug the cord into an AC power source. The Status LED will start blinking green, indicating that the device is booting up.
3. Wait until the Status LED stays solid green, indicating that the Makito XH is ready for operation.

**Note**

While the Conxall power connector on the Makito XH is identical to those on the Makito X SDI appliances, the power supply (PSU) itself is different in order to support the increased temperature range. Refer to [Power Supply Characteristics](#) for details.

## Accessing the Web Interface

The following steps to access the Web Interface and configure the unit with a valid IP address apply equally for the Makito XH encoder and decoder.

1. Open a Web browser of your choice, such as Chrome, Firefox, Safari, or Internet Explorer.
2. Type the IP address for the encoder into the browser's address bar and press Enter.

The Makito X comes pre-configured with the following default settings:

IP Address	Subnet Mask	Gateway
10.5.1.2	255.255.0.0	10.5.0.1

**Note**

To access the Web interface, your computer must be in the same IP Address range (subnet). You may have to temporarily change your computer's IP Address to be in the same subnet as the encoder. Only then will you be able to access the encoder and change its IP address, and then afterwards change your computer's IP address back. For details, see [Configuring Network Settings](#) in the User's Guide.

3.

**Note**

The Makito X identity certificate and trusted root certificates may be managed from the Web interface (Certificates page) or using the CLI `certificate` command. See [Managing Certificates](#) in the User's Guide.

4. Sign in to the Makito X Web interface, using the default administrative username and password. Please refer to the *Important Notice* (postcard included in the box or available from the [Download Center](#) on the Haivision Support Portal) for the default sign-in credentials.

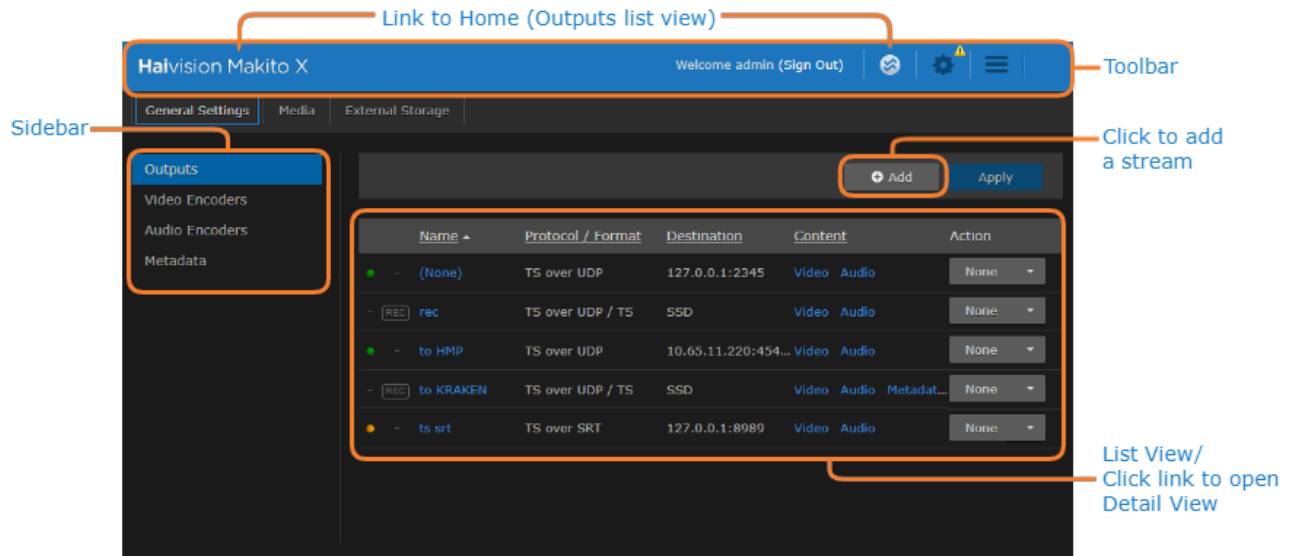
**Important**

Makito X Series devices ship from the factory with only the `admin` account enabled. For security reasons, the two default user accounts ( `user` and `operator` ) are locked at the factory as well as after a factory reset. An administrator must unlock them and change the passwords to use them for the first time.

**Tip**

For security purposes, be sure to change the default passwords! See [Changing Your Password](#) in the User's Guide.

The Web interface opens to the Outputs List View.



**Note**

While the Web interface is most commonly used to control the Makito XH, a Command Line Interface (CLI) is accessible via Telnet or SSH. For more information, please refer to [CLI Command Reference](#) (in the Makito X User's Guide).

The decoder Web interface opens to the Streams List View.

**Gliffy Macro Error**

Cannot find a diagram with these parameters:

- **Name:** MXD\_Interface\_Diagram\_Streams\_list\_view

Diagrams with the same name were found on the following pages:

Hover over the link to preview, click to set.

[Accessing the Web Interface](#)

[Accessing the Web Interface](#)

[Accessing the Web Interface](#)

[Accessing the Web Interface](#)

[Accessing the Web Interface](#)

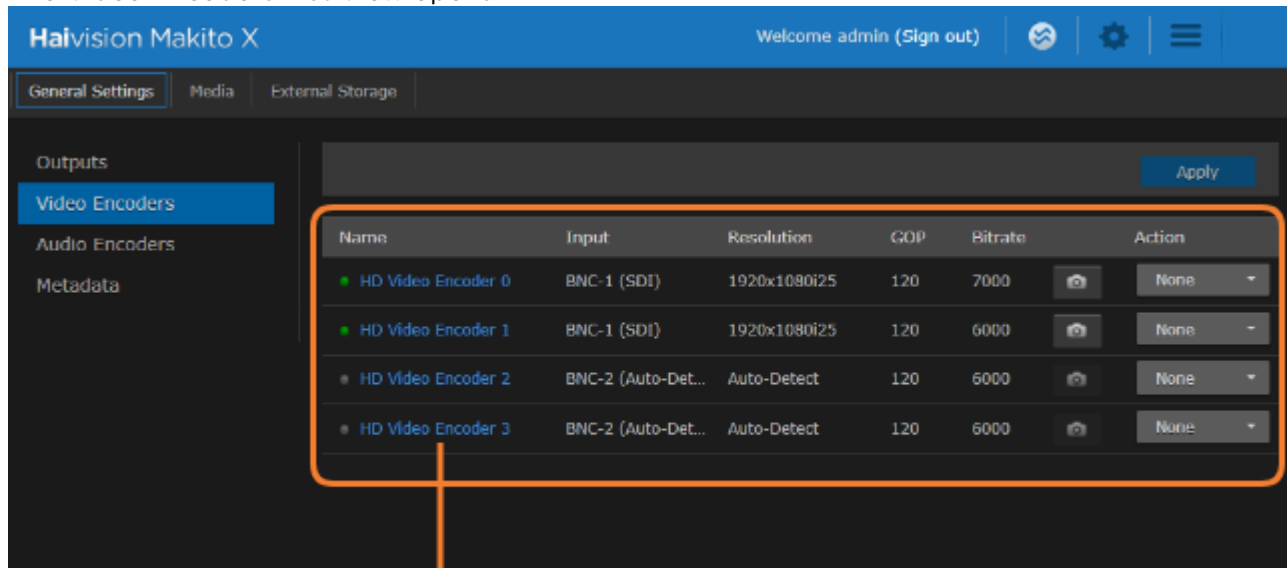
## Setting up a Test Stream (Makito X Encoder)

Setting up a test stream requires that you have an active video source connected to the Makito X Encoder. You will need to configure an encoding instance based on your video source, and then configure an output stream for that encoder. For detailed information, refer to [Configuring Video Encoders](#) and [Configuring Streaming Outputs](#) in the *Makito X Encoder User's Guide*.

To configure an encoding instance:

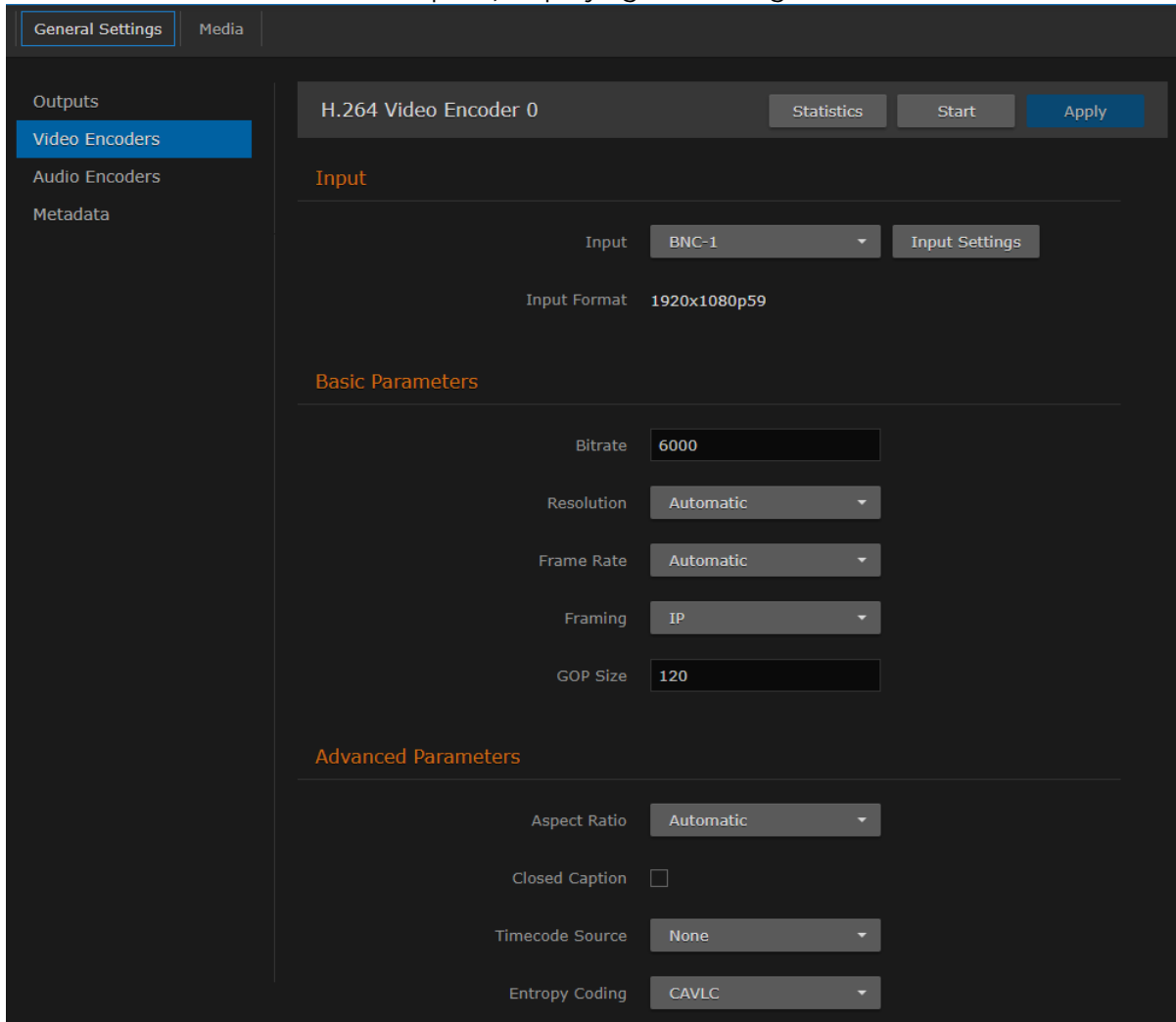
1. Sign in to the Makito X Encoder Web Interface.

- Click **Video Encoders** on the sidebar (under **General Settings**).  
The Video Encoders List View opens.



Click link to open Detail View

- Click a link in the table to select the encoder.  
The Video Encoder Detail View opens, displaying the settings for the selected video encoder.

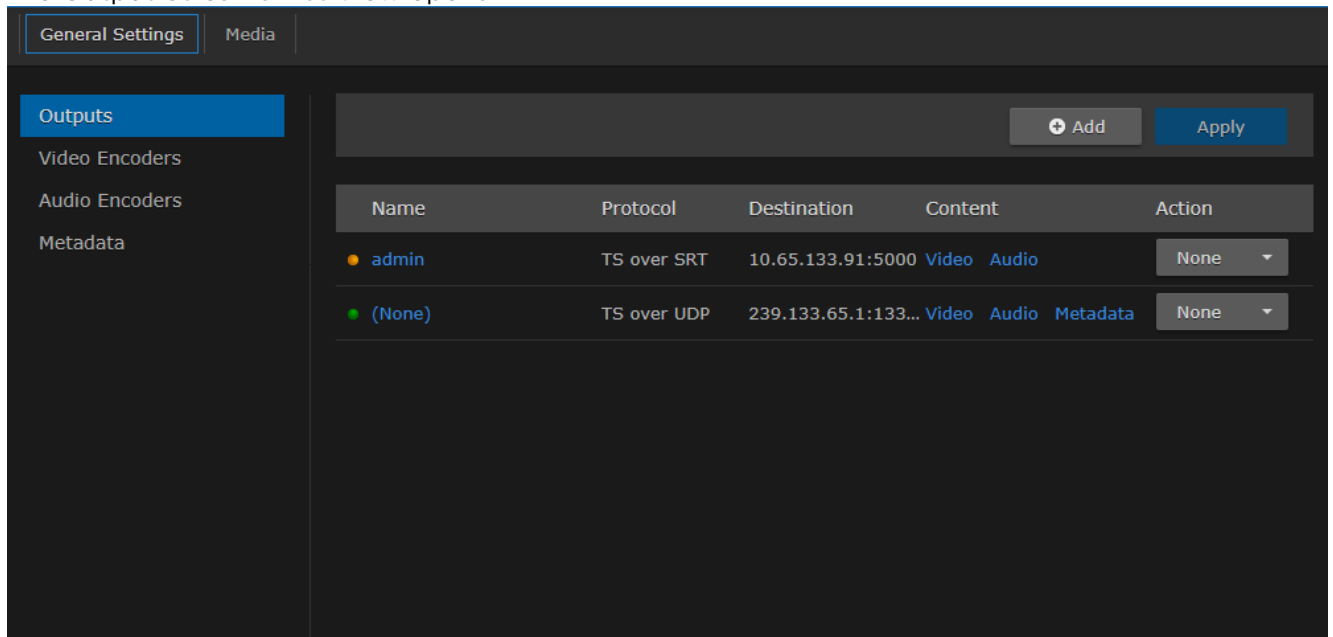


- To configure the encoder, select or enter the new value(s) in the appropriate fields (see [Configuring Video Encoders](#) in the User's Guide).
- Click **Start**, and then click **Apply**.

To configure an output stream:



1. Click **Outputs** on the sidebar.  
The Output Streams List View opens.



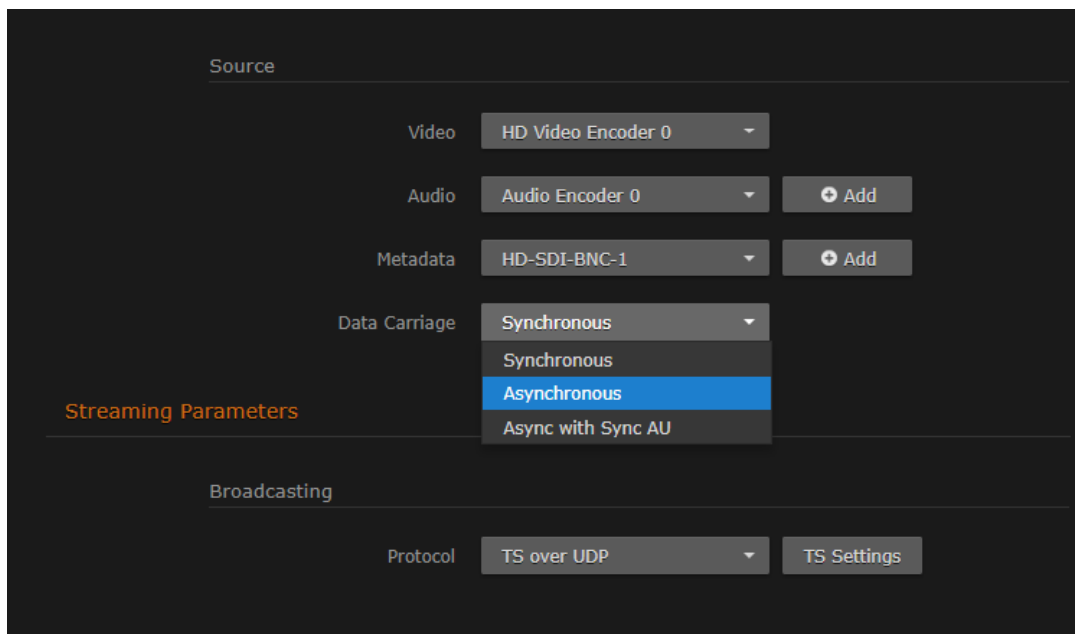
2. To add an output stream, click the **+ Add** button.  
The New Stream page opens.

3. Under Content, type a Name for the stream, and under Source, select the encoder you started in **step 4** (above).
4. Under Broadcasting, select **TS over UDP** for the Protocol.
5. Under Destination, type in a valid multicast Address (e.g., `239.192.2.3`) and Port number (e.g., `2000`).

**Note**

The Multicast address range is from `224.0.0.0` to `239.255.255.255`. Multicast addresses from `224.0.0.0` to `224.0.0.255` are reserved for multicast maintenance protocols and should not be used by streaming sessions. We recommend that you use a multicast address from the Organization-Local scope (`239.192.0.0/14`).

6. To add metadata to the stream, select the Metadata source, and (optionally) select the encapsulation type (Data Carriage).



7. To apply your changes and start streaming, click **Apply**.

**Note**

The changes will take effect immediately but will be lost after a reboot. For information on saving configuration settings, refer to [Saving and Loading Presets](#) in the *Makito X User's Guide*.

To view the test stream:

1. Make sure your decoding device (or software) supports MPEG Transport Stream format.
2. Turn the device on and connect it to a display (if applicable), or open your video player software (e.g., VLC).
3. Make sure you are on the same network segment as the encoder.
4. Tune your decoding device or software to the multicast address of the test stream coming from the encoder.

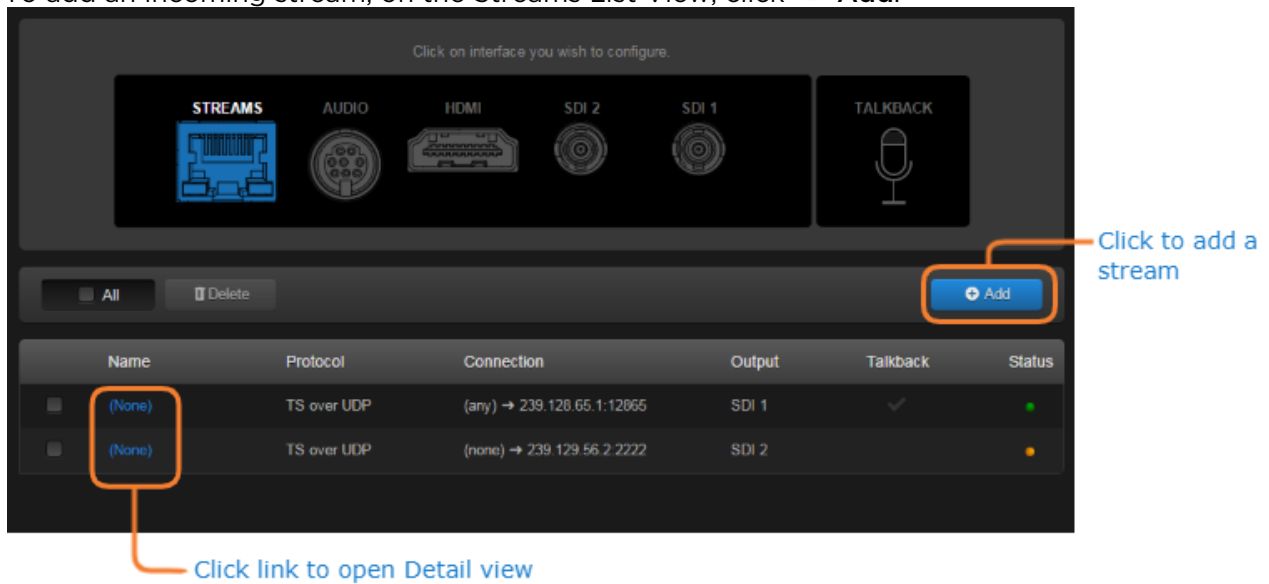
# Decoding and Viewing the Test Stream (Makito X Decoder)

**Note**

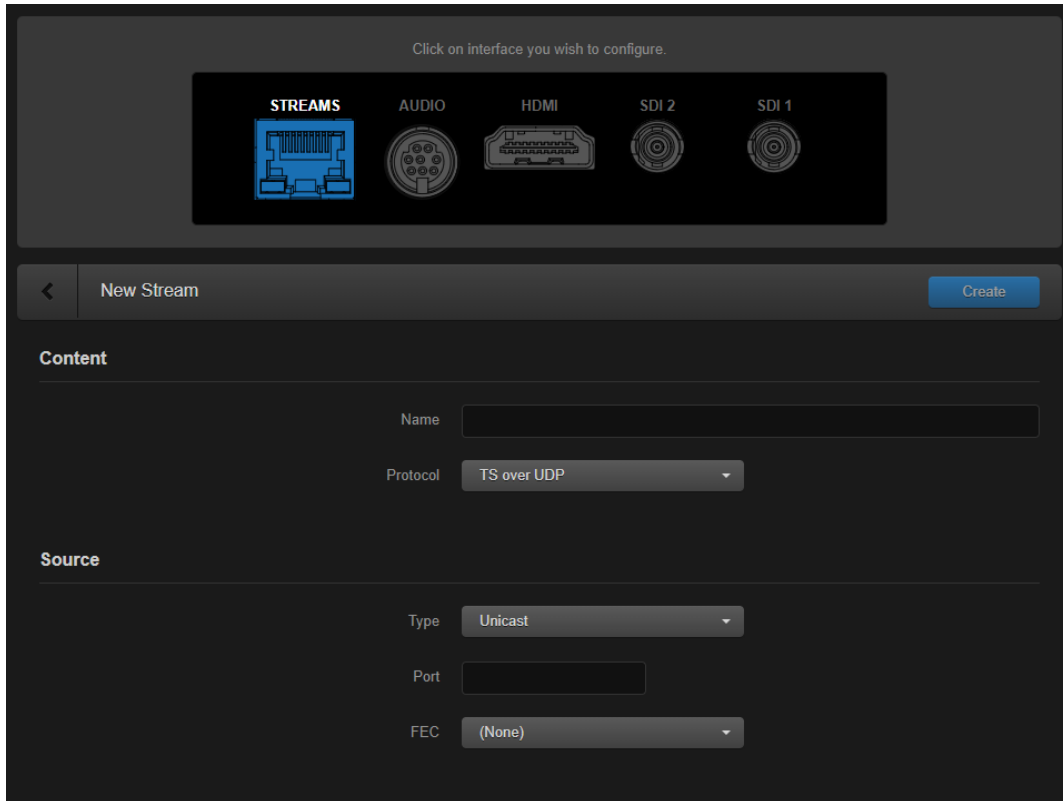
On the dual channel decoder, two streams are received and can be displayed on either SDI video port. Analog audio can be selected from embedded channels on either stream. Both Analog Audio and Embedded Digital Audio are active.

To decode the test stream:

1. Sign in to the Makito X Decoder Web Interface.
2. To add an incoming stream, on the Streams List View, click **+ Add**.



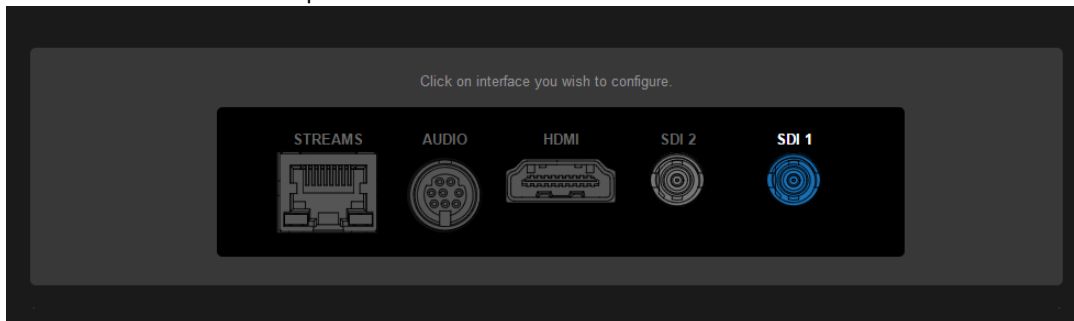
- On the New Stream page, under Content, type a name for the stream in the Name field and select **TS over UDP** for the Protocol.



- In the Source section, select **Unicast** and enter the appropriate **Port** number (from the encoder, see [Setting up a Test Stream](#)).

To configure the SDI decoder output:

- Click **SDI1** from the output interface bar.

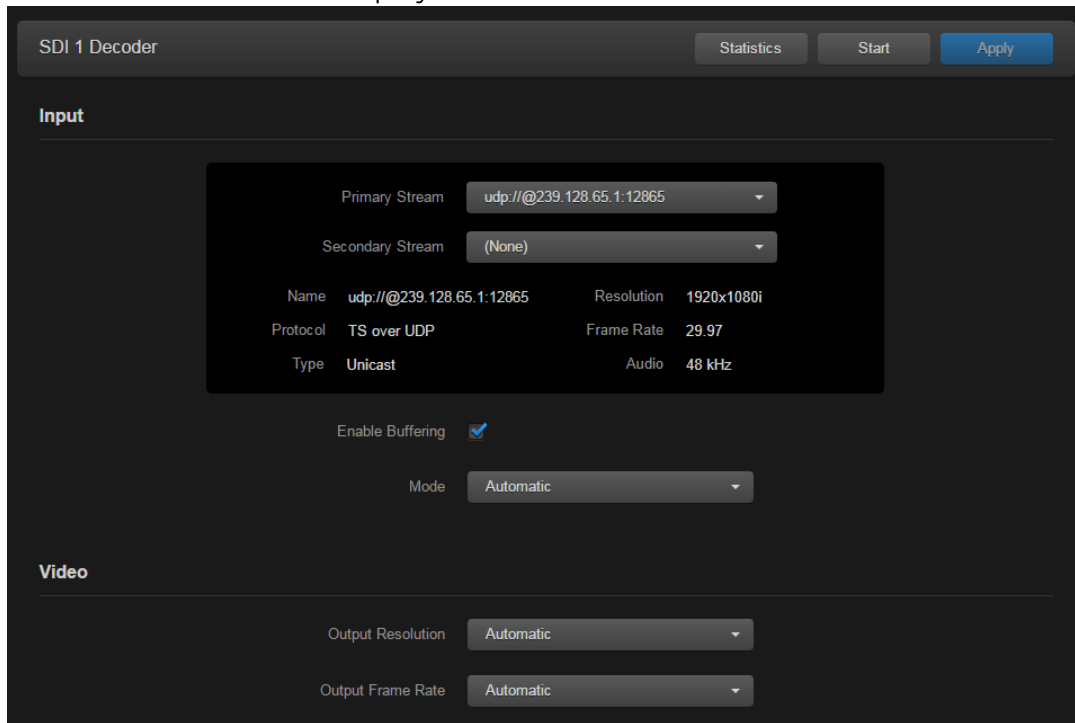


On the SDI1 and SDI2 Decoder pages, you can manage video decoding for the SDI1 and SDI2 ports. This includes binding the video output(s) to the stream(s) you have created and configuring properties such as the Output Resolution and Frame Rate.

**Note**

The Makito XH Decoder supports two independent video decoders that feed the two SDI interfaces. The HDMI port can be configured to mirror the same content that is seen on either SDI1 or SDI2. The decoder also can support the display of computer graphics content over the HDMI port.

- Under **Input**, select the Primary input stream from the drop-down list of the stream(s) you have created.  
The Name, Protocol, Type, incoming Resolution, Frame Rate, and Audio Sampling Rate for the selected stream now are displayed.

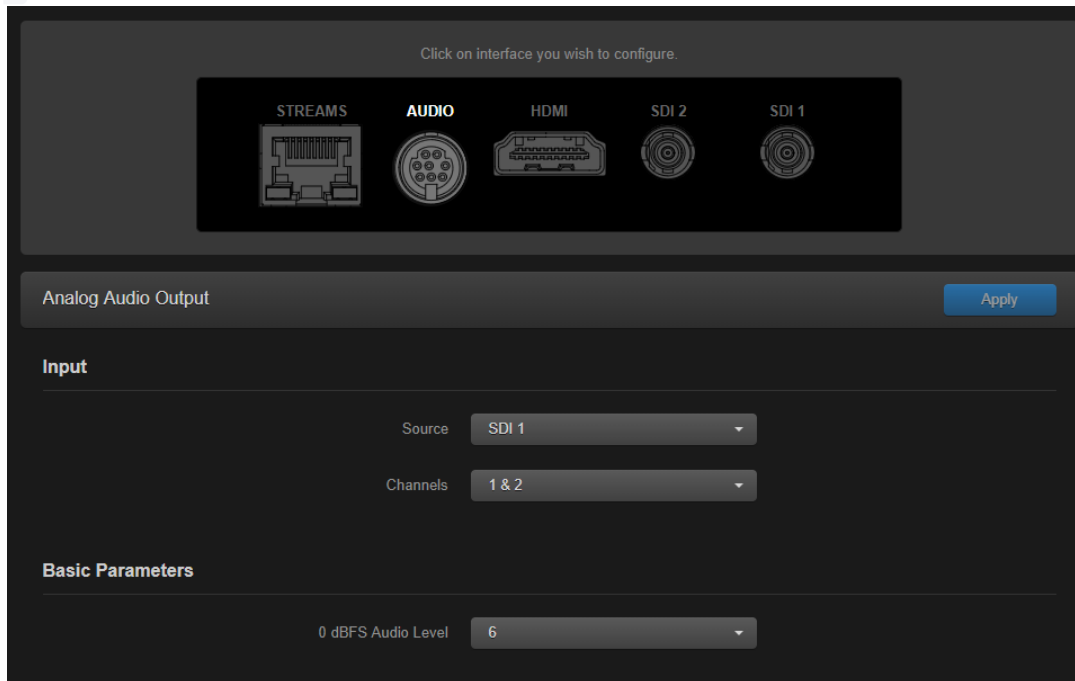


- If required, adjust the video settings. For details, see "SDI Decoder Settings" in the *Makito X Decoder User's Guide*.
- To apply your changes, click **Apply**.

To configure the analog audio output:

- Click **AUDIO** on the output interface navigation bar.

2. On the Audio Audio Output page, select the Input Source for the analog audio, either **SDI1** or **SDI2**.



3. Select the channel pairs for the output, either **1&2**, **3&4**, **5&6**, or **7&8**. For details, see [Analog Audio Settings](#) in the User's Guide.

**Note**

Channel pairs **9&10**, **11&12**, **13&14**, and **15&16** are also available when the decoder is a single channel variant.

4. To apply your changes, click **Apply**.  
Analog audio output is started or stopped depending on the status of the SDI1 or SDI2 video decoder.  
You should now be able to view the output of the Makito XH Decoder on the monitor or TV connected to SDI1.

# Makito XH Technical Specifications

## Physical Characteristics

The table below describes some basic characteristics of the Makito XH appliance. For complete specifications, please refer to the data sheet available from the Haivision Web site.

<b>Makito XH Encoder/Decoder</b>			
<b>Dimensions</b>	Chassis: 5.4" (13.72 cm) W x 8" (20.32 cm) D x 1.75" (4.45 cm) H	Storage Temperature	-10 °C to +7 °C
<b>Material</b>	Chassis: Aluminum 6061-T6 All materials are compliant with directive 2011/65/EU (RoHS2 / RoHS RECAST).	Working Temperature	0 °C to +70 °C, no derating
		Working Humidity	0 to 95% non-condensing
<b>Weight</b>	Approximately 4.0 lbs. (1.8 kg)	Pressure	300 to 1015 kPa
<b>Finish</b>	External: Black anodized, as per MIL-A-8625F, Type 2, Class 2 Internal: Chemical conversion as per MIL-DTL-5541F Type 2, Class 3	IP Rating	IP42

### **Caution**

We strongly recommend that you install the Makito XH and power adapter in an enclosure for protection against weather and other environmental stresses. The ambient temperature inside the enclosure should be between 0°C and 70°C, and the relative humidity between 5 and 95% (without condensation).

If you have specific questions regarding the suitability of the Makito XH in your operating environment, please contact Haivision Technical Support.

## Power Supply Characteristics

The table below details the minimum requirements for an adapter or battery to be used as a power source for the Makito XH. The power adapter provided by Haivision (P-292-XH-PS-AC) is subject to high quality standards, and meets or exceeds these minimum requirements in all respects.

<b>Nominal Output Voltage</b>	12 VDC	Maximum Output Ripple	100 mV
<b>Minimum Output Load</b>	1.7 A	Minimum Operational Temperature Range	0 °C to +70 °C
<b>Maximum Output Regulation</b>	+/- 5%	Minimum Operational Humidity Range	0 - 95% (non-condensing)



**⚠ Caution**

The use of a power adapter or battery that is not compliant with these specifications may cause irreparable damage to your Haivision appliance.

## Product Numbers

[Makito XH Encoder](#)   [Makito XH Decoder](#)   [PSU Power Cable](#)

Makito XH Encoder	
S-292E-X1H	Makito X Single channel SDI Encoder Appliance for Harsh Environments
S-292E-X2H	Makito X Dual channel SDI Encoder Appliance for Harsh Environments
S-292E-DVI-H	Makito X Single channel DVI Encoder Appliance for Harsh Environments
P-292-XH-PS-AC	Commercial AC to +12V DC / 30 watt PSU supporting 0 °C to 70 °C operation

[Makito XH Encoder](#)   [Makito XH Decoder](#)   [PSU Power Cable](#)

Makito XH Decoder	
S-292D-X1H	Makito X Single channel Decoder Appliance for Harsh Environments
S-292D-X2H	Makito X Dual channel Decoder Appliance for Harsh Environments
P-292-XH-PS-AC	Commercial AC to +12V DC / 30 watt PSU supporting 0 °C to 70 °C operation

[Makito XH Encoder](#)   [Makito XH Decoder](#)   [PSU Power Cable](#)

Power Supply Unit Power Cable	
16282-3SG-311	Conxall cable O.D. range: .09 - .14"
16282-3SG-315	Conxall cable O.D. range: .15 - .17"
16282-3SG-318	Conxall cable O.D. range: .18 - .20" (custom grommet required if cable O.D. is over .200")

## Power Supply Unit Pinouts

The pinouts for the power supply unit (PSU) provided with the Makito XH are as follows:

Dot indicates Pin #1



Rear View  
(solder side)



Front View  
(contact)

Pin #1: NC  
Pin #2: Common (GND)  
Pin #3: 12 VDC (+V)

## Terms of Service Agreement

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