

# Haivision

Mantaray™  
Set-Top Box  
Administrator's Guide v1.0.3

HVS-ID-AG-MANTA-103  
Issue 01

## Copyright

©2016 Haivision. All rights reserved.

Document Number: HVS-ID-AG-MANTA-103

Version Number: v1.0.3-01

This publication and the product it describes contain proprietary and confidential information. No part of this document may be copied, photocopied, reproduced, translated or reduced to any electronic or machine-readable format without prior written permission of Haivision. The information in this document is subject to change without notice. Haivision assumes no responsibility for any damages arising from the use of this document, including but not limited to, lost revenue, lost data, claims by third parties, or other damages.

If you have comments or suggestions concerning this guide, please contact:

Technical Publications Department  
Haivision  
4445 Garand  
Montréal, Québec, H4R 2H9 Canada

Telephone: 1-514-334-5445  
Toll-free (North America) 1-877-224-5445  
[infodev@haivision.com](mailto:infodev@haivision.com)

## Trademarks

The Haivision logo, Haivision, and certain other marks used herein are trademarks of Haivision. All other brand or product names identified in this document are trademarks or registered trademarks of their respective companies or organizations.

HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC.

## Safety Guidelines

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.

### Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. Electrostatic discharge occurs when a person whose body contains a static buildup touches a computer component.

The equipment contains static-sensitive devices that may be easily damaged, and proper handling and grounding is essential. Use ESD precautionary measures when installing systems or cards, and keep the parts and cards in antistatic packaging when not in use. If possible, use antistatic floorpads and workbench pads.

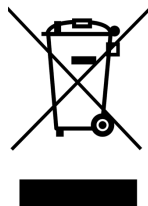
Improper handling and/or installation practices may VOID the warranty.



**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



This symbol on Haivision products or packaging means that the product should not be disposed of with general waste. It is your responsibility to dispose of your waste equipment by handing it over to a designated recycling collection point. The correct disposal of your end-of-life equipment will help prevent potential negative consequences to the environment and human health.

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: <http://www.haivision.com/environment>

---

# Table of Contents

<b>About This Guide</b> .....	6
About Haivision .....	7
Audience .....	7
Reliability of Information .....	7
Obtaining Documentation .....	7
Related Documents .....	8
Service Support .....	8
Document Conventions .....	8
<b>Introduction</b> .....	10
Product Overview .....	11
Mantaray Features .....	13
Mantaray-Furnace Integration .....	14
Front and Rear Panels .....	15
<b>Connecting Mantaray</b> .....	17
Package Contents .....	18
Safety First .....	18
Hardware Setup .....	19
LED Indicators (Front Panel) .....	21
Installing Batteries in Your Remote Control .....	22
<b>Initial Setup</b> .....	23
Joining Mantaray to a Furnace .....	24
Configuring Mantaray .....	26
On-screen Keyboard .....	26
Display Settings .....	27
Ethernet Settings .....	29
Server Setup .....	30
Time Settings .....	31
Information .....	33
Reset Factory Settings .....	34
Automatic Upgrades .....	35

Operating Mantaray ..... 36

- Using Your Remote Control ..... 37
  - Remote Control Buttons ..... 38
    - Unlocking the Video Button ..... 40
- Starting to Play Video ..... 41
- Using the Channel Guide ..... 44

Appendix A: Technical Specifications

- Video Decoding ..... 47
- Audio Decoding ..... 47
- Advanced Features ..... 48
- IP Networking ..... 48
- Management Interfaces ..... 49
- Physical Specifications ..... 49
- Regulatory/Compliance ..... 50

---

# About This Guide

Welcome to the Administrator's Guide for Haivision's Mantaray Set-Top Box (STB), Version 1.0.3. This guide provides an introduction to the features and describes how to set up and operate the set-top box.

## Topics In This Section

<a href="#">About Haivision</a> .....	7
<a href="#">Audience</a> .....	7
<a href="#">Reliability of Information</a> .....	7
<a href="#">Obtaining Documentation</a> .....	7
<a href="#">Related Documents</a> .....	8
<a href="#">Service Support</a> .....	8
<a href="#">Document Conventions</a> .....	8

## About Haivision

Haivision is a global leader in delivering advanced video networking, digital signage, and IP video distribution solutions. Haivision offers complete end-to-end technology for video, graphics, and metadata to help customers to build, manage, and distribute their media content to users throughout an organization or across the Internet. Haivision has specific expertise in the enterprise, education, medical/healthcare, and federal/military markets.

Haivision is based in Montreal and Chicago, with technical centers in Beaverton, Oregon; Austin, Texas; and Hamburg, Germany.

## Audience

This guide is directed towards qualified service personnel such as technicians and network system administrators involved in setting up and managing Mantaray set-top boxes in a Furnace environment.

## Reliability of Information

The information contained in this guide has been carefully checked and is believed to be entirely reliable. However, as Haivision improves the reliability, function, and design of its products, the possibility exists that this guide may not remain current.

If you require updated information, or any other Haivision product information, contact:

Haivision  
4445 Garand  
Montréal, Québec, H4R 2H9 Canada

Telephone: 1-514-334-5445  
Email: [infodev@haivision.com](mailto:infodev@haivision.com)

Or visit our website at: <http://www.haivision.com>

## Obtaining Documentation

You may download the latest software, Release Notes, Quick Start Guide, and other relevant documentation from our Download Center at:

<http://www.haivision.com/download-center/>



**NOTE** All customers may access the Download Center; however, a login is required. If you do not have a login, select the link to create an account.

---

## Related Documents

In addition to this guide, the following document(s) are also available through Haivision's Download Center (see link above):

- Mantaray Quick Start Guide
- Furnace Administration Guide
- Makito X User's Guide
- Makito X Decoder User's Guide
- Torpedo User's Guide

## Service Support

Haivision is committed to providing the service support and training needed to install, manage, and maintain your Haivision equipment.

For more information regarding service programs, training courses, or for assistance with your support requirements, contact Haivision Technical Support via our Support Portal on our website at: <http://www.haivision.com/support-portal-home>

## Document Conventions

The following document conventions are used throughout this guide.



**TIP** The light bulb symbol highlights suggestions or helpful hints.

---



**NOTE** Indicates a note, containing special instructions or information that may apply only in special cases.

---



**IMPORTANT** Indicates an emphasized note. It provides information that you should be particularly aware of in order to complete a task and that should not be disregarded. IMPORTANT is typically used to prevent loss of data.

---





**CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in damage to data or equipment, or minor to moderate injury. It may also be used to alert against unsafe practices.

---

---

# Introduction

This section provides a brief overview of Haivision’s Mantaray set-top box (STB), along with a description of the key features and main hardware components.

## Topics In This Section

- [Product Overview](#) ..... 11
- [Mantaray Features](#) ..... 13
- [Mantaray-Furnace Integration](#) ..... 14
- [Front and Rear Panels](#) ..... 15

## Product Overview

Mantaray is a next generation, low-cost, compact set-top box (STB) that delivers reliable, secure, high-definition (HD) video to displays from live and scheduled sources, for Furnace end-to-end IPTV systems. Mantaray may be used for both user and administrator controlled environments. Mantaray STBs can be centrally managed, are easy to provision, and never require manual updating.

Figure 1 Mantaray (Front View)



Figure 2 Mantaray (Back Panel View)



### Secure Video Streaming at Up to 1080p

Mantaray is a small form factor decoder appliance that employs standard encryption to deliver secure HD content to displays in a Haivision Furnace IPTV video system, at up to 1080p. Both digital or analog output is available from a single device.

### Central Management

The Furnace VF Mantaray Manager module centralizes remote management, including channel changes, volume control, rebooting and powering the unit on/off, and status updates (including current channel tuned, IP address, MAC address, and active status).

## Electronic Program Guide (EPG) and Local Remote Control

Mantaray comes with a remote control unit that is used to access and make selections in the STB Settings application, as well as navigate the electronic program guide, select channels, and control volume.



## Mantaray Features

Mantaray features and benefits include the following:

- 1080p high-definition video streaming: Display content at up to 1080p for a high-quality viewing experience
- Centrally controlled and managed: Allows easier and more efficient system administration
- Support for Furnace FEC and 128-bit encryption: Guarantees content protection
- HD/SD, digital/analog outputs: Manage HDMI, VGA, Composite (CVBS), or Component outputs all from a single device
- Support for Furnace EPG data
- Supplied remote control: Navigate EPG select channels and control volume
- Remote management capabilities (via Furnace Admin Web Portal> VF Mantaray Manager).
  - Set and activate the PIN code to be entered at startup
  - Set and activate the Admin PIN code to access the STB Settings application
  - Change channels
  - Adjust volume
  - Reboot and power on/off the unit
  - See the current state of the STB (current channel tuned, IP address, MAC address, and active status)
- Support for high bit rate DVB streams
- Support for Closed Captioning (608/708)
- IR Remote Control standard
- Automatic provisioning and upgrades provided over network

For additional details, please refer to [“Technical Specifications”](#) on page 46.

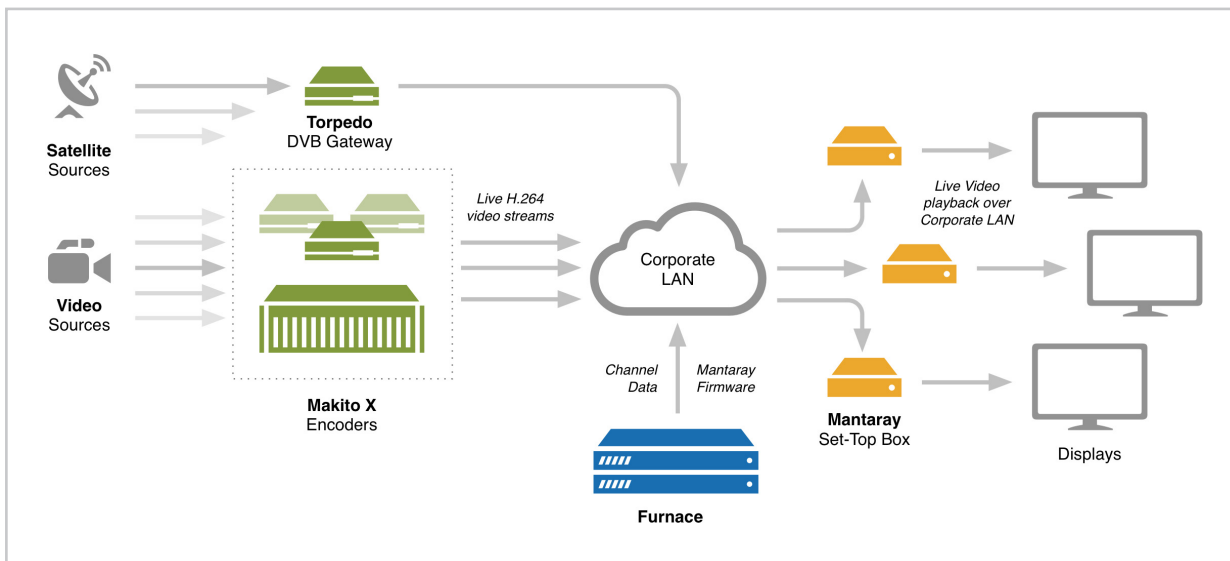
## Mantaray-Furnace Integration

Mantaray downloads system files and gets streams from the Furnace™ IP video system. Management is done via the Furnace Admin Web Portal (VF Mantaray Manager). Local control is via Infrared (IR) remote control.

Mantaray video sources include Makito™ X dual channel H.264 encoders, classic Makito HD encoders, and/or Torpedo™ DVB to IP Gateways.

The following diagram depicts the interoperability of various Haivision encoders and gateways with the Mantaray STB. Mantaray is able to display both the streaming media and associated EPG information.

Figure 3 Overview of Mantaray-Furnace Integration



For more information on Haivision network video products such as the Makito X, Makito, Torpedo, and Furnace, please see our website at: <http://www.haivision.com/>



**NOTE** Mantaray must be registered as a device in the Furnace domain. This is done from the Mantaray STB Settings application. For details, see [“Joining Mantaray to a Furnace”](#) on page 24.

## Front and Rear Panels

The following figures show the Mantaray interfaces, connectors, and LED status indicators.

Figure 4 Rear View

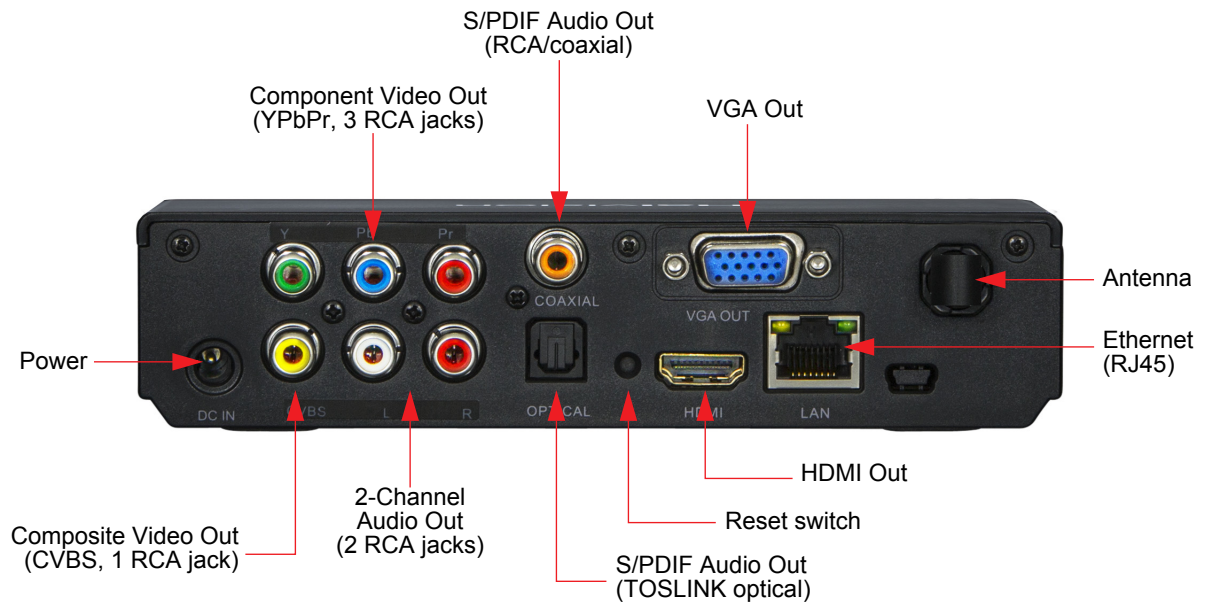
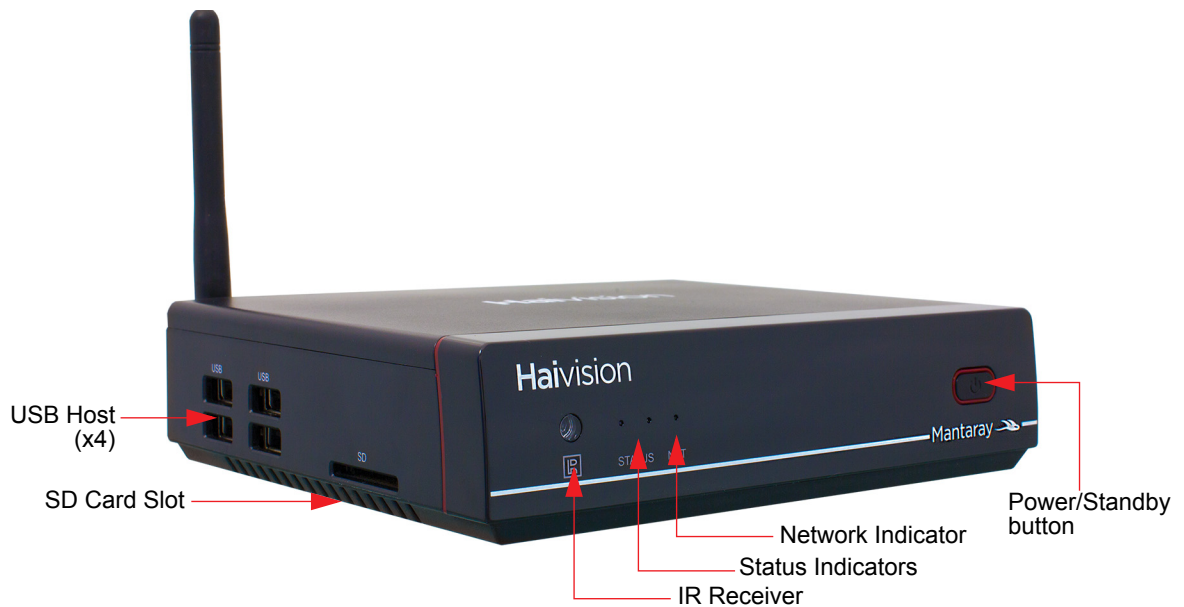


Figure 5 Side/Front View





**NOTE** When you press the Power button, it powers off the STB. Pressing and holding the button for 3 seconds will hard-power off the unit. Press another time to power it back on.

If the STB is joined to a Furnace server, it opens in full-screen mode to the default channel. If not joined to a Furnace server, or if the network is down, it opens to the Settings page.

---



---

# Connecting Mantaray

This section explains how to get started setting up and connecting Mantaray. It also includes the instructions for a factory reset.

## Topics In This Section

<a href="#">Package Contents</a> .....	18
<a href="#">Safety First</a> .....	18
<a href="#">Hardware Setup</a> .....	19
<a href="#">LED Indicators (Front Panel)</a> .....	21
<a href="#">Installing Batteries in Your Remote Control</a> .....	22

## Package Contents

The set-top box package includes the following components:

- 1 - Mantaray Set-Top Box
- 1 - Power supply unit and power cord
- 1 - HDMI cable
- 1 - Composite A/V cable
- 1 - Component A/V cable
- 1 - Infrared (IR) remote control (two AAA batteries included)
- 1 - WiFi antenna (attached)



**NOTE** A/V and Ethernet cables must be purchased separately.

---

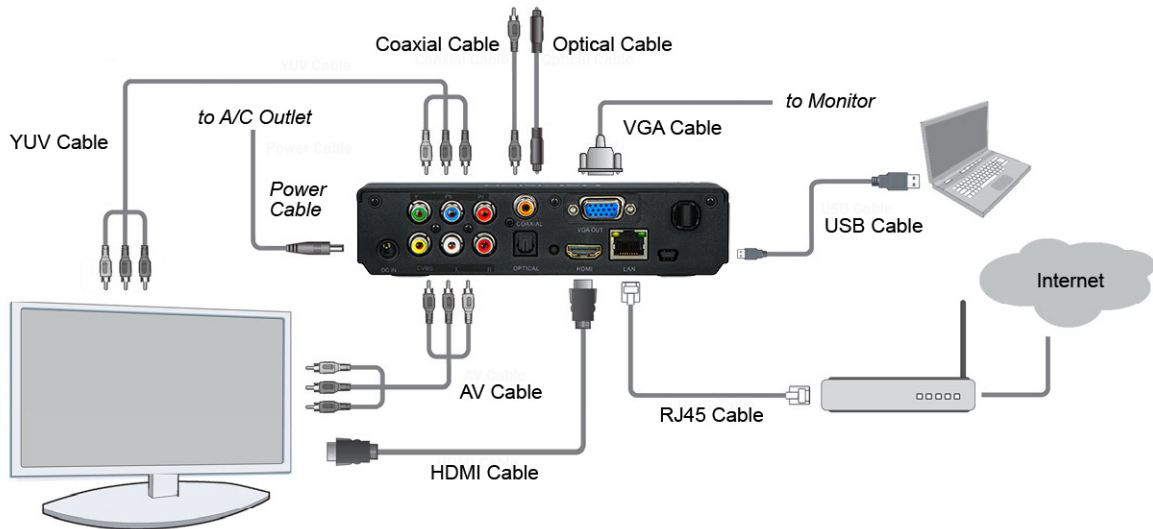
## Safety First

Please pay particular attention to the following points in order to help protect yourself and the set-top box:

- Refer to [“Safety Guidelines”](#) on page 3.
- The Mantaray is an indoor appliance and should be kept in a dry, dust free environment.
- To reduce the risk of fire or electric shock, keep this product away from exposed direct sunlight, open flames or heat, large amounts of moisture, dust, or sand.
- To reduce the risk of electric shock, DO NOT remove the cover (or back). DO NOT attempt to repair the product, this could lead to the risk of injury, damage to the product.
- There are no user-serviceable parts inside the unit. Opening the STB or making unauthorized changes will void the warranty.
- Only connect the unit to a compatible power source.
- If you experience any issues or problems, consult your local service provider or support organization.
- Never try to force the connections when setting up the system as this may damage the unit.

## Hardware Setup

Figure 6 Connection Diagram for Mantaray STB



## To connect the STB:

1. Place the Mantaray on a flat surface near the display, making sure nothing is blocking the signal from the remote control to the STB.
2. Connect the LAN port on the STB to the IP network using an Ethernet cable (type Cat 5 or higher).

This allows the unit to communicate with the Furnace server.

3. Referring to the above diagram, connect the video and audio output jacks to the monitor, using the appropriate connector:
  - **HDMI Digital Video+Audio:** Use an HDMI cable to connect the HDMI jack.
  - **VGA Analog Video+Baseband Audio:** Use a VGA cable to connect the VGA jack.
  - **Composite (CVBS) NTSC/PAL Analog Video+Baseband Audio:** Use a composite A/V cable to connect the Composite video (yellow RCA jack).
  - **Y,Pb,Pr Component Video+Baseband Audio:** Use a component cable to connect the Component (Y,Pb,Pr) jacks.

For Baseband audio, use an A/V cable to connect the audio (red/white RCA jacks) jacks.



**NOTE** Only one A/V source is active at a time.

---

4. Connect the power cable to the Mantaray, and then plug the power adapter into a wall socket. Use only the A/C power adapter provided with the unit.

Mantaray automatically starts when you connect the power cord to the STB.

## LED Indicators (Front Panel)

Mantaray has two LED indicators on the front panel: Status and Network.

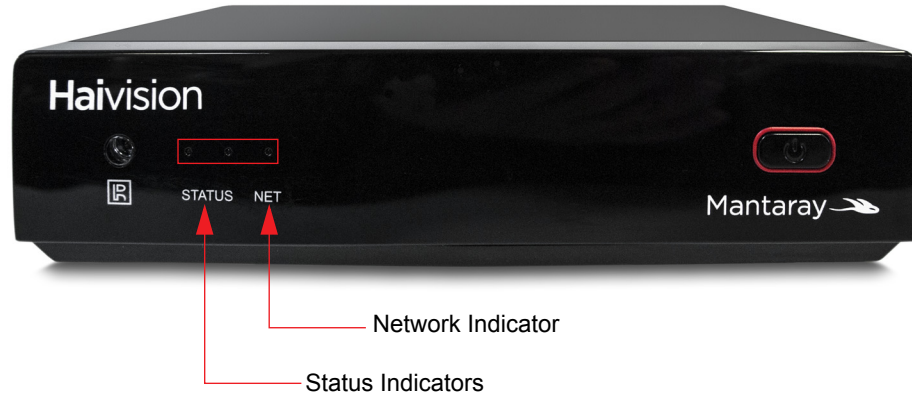


Table 1 LED Indicators

Function	Color	Description	Indication
STATUS	RED/ GREEN		No power or the STB is powered down (i.e., after the Power button has been held down for 3 seconds).
		RED Solid	STB is powering up.
		GREEN Solid	The STB is powered on and ready for remote input.
NETWORK	AMBER		No network connection.
		AMBER Blinking	Valid network connection.

## Installing Batteries in Your Remote Control

The remote control requires two AAA-size alkaline (1.5V) batteries.

To install or replace the batteries:

1. On the back of the remote, push down on the tab and lift off the cover.
2. Match the batteries to the + and - marks inside the battery case, and then insert the batteries.
3. Press the battery cover back into place.
4. Recycle or dispose of used batteries in accordance with your local environmental laws and guidelines.

---

# Initial Setup

This section explains how to join Mantaray to a Furnace and configure the Mantaray STB Settings application to begin viewing video.

## Topics In This Section

<a href="#">Joining Mantaray to a Furnace</a> .....	24
<a href="#">Configuring Mantaray</a> .....	26
<a href="#">On-screen Keyboard</a> .....	26
<a href="#">Display Settings</a> .....	27
<a href="#">Ethernet Settings</a> .....	29
<a href="#">Server Setup</a> .....	30
<a href="#">Time Settings</a> .....	31
<a href="#">Information</a> .....	33
<a href="#">Reset Factory Settings</a> .....	34
<a href="#">Automatic Upgrades</a> .....	35

## Joining Mantaray to a Furnace

The Mantaray Set-Top Box (STB) automatically provisions itself with an application from the network via the Furnace. Whenever power is applied to the STB, it remembers the last system it was provisioned with. In order for a Furnace server to provide guide data to Mantaray, the Mantaray must be registered as a device in the Furnace domain. This is done from the Mantaray.



**NOTE** Before proceeding, make sure that the STB is set up correctly and all necessary network and A/V connections are established (as described in [“Hardware Setup”](#) on page 19).

Also, Mantaray requires a Furnace lineup (that contains channels), which is then assigned to a Mantaray group. For information on Furnace lineups, see the Furnace Administration Guide.

---

### To join Mantaray to a Furnace:

1. If you haven't already done so, power on the Mantaray.
2. Turn on the TV or monitor to which it is connected.

Immediately after provisioning, Mantaray opens to the STB Settings application.



**TIP** If you do not see the STB Settings application on the screen connected to the STB, you can use the [Video](#) button on the remote control to toggle between output modes. For more information, see [“Using Your Remote Control”](#) on page 37.

3. If the STB has been configured with a locked screen (i.e., to require users to enter a PIN to unlock the STB whenever it is powered up or comes back out of standby mode), you will be prompted to enter your PIN.

Using the remote control, type in the PIN and press [OK](#).



**TIP** The PIN code is set by administrators from the Furnace Admin Web Portal. For more information, see your system administrator or the Furnace Administration Guide.

4. To set the date and time, press the Down Arrow on the remote control to scroll down to [Time](#).

You can either set the device local system time or provide an NTP address to use network time. Click [Save](#).





---

**IMPORTANT** By default the Mantaray's date and time is 1 Jan 1970. The correct date and time *must* be set before the Electronic Program Guide (EPG) will work.

---

5. If your network supports DHCP, you can skip to [Step #7](#). (DHCP is enabled by default.)

6. To specify the IP address or other network settings for the STB, press the Up Arrow on the remote control to scroll up to [Ethernet](#).

Select Static, fill in the required addresses, and click [Save](#). For details, see "[Ethernet Settings](#)" on page 29.

7. Use the remote control to scroll down to [Server Setup](#).

Enter the IP of the Furnace and the corresponding port number. Click [Save](#). For details, see "[Server Setup](#)" on page 30.

8. Wait until the STB application downloads and installs all necessary files from the Furnace server. If there is a new software version, it will reboot. This may take a minute.

When the STB display opens again, it tunes to the first channel and begins playing audio and video.

9. To display the Electronic Programming Guide, press the [EPG](#) button on the remote control. The content displayed is based on the Furnace lineup.



---

**TIP** Administrators can use the Furnace Admin Web Portal (Mantaray Manager) to manage Mantarays, either individually or in groups.

For example, you can edit device information, remove devices, and send control commands such as mute/unmute, reboot, set PIN/channel/volume, and power On/Off. For more information, see the Furnace Administration Guide.

---

## Configuring Mantaray

The STB Settings application allows you to configure settings such as the display resolution, Ethernet and server setup. It also includes a menu option to reset the unit to the default display, network and server settings.

To open as well as close the STB Settings application, press the **Settings** button (gear icon) on the remote control. The application opens to the **Display** page (or the last Settings page visited).

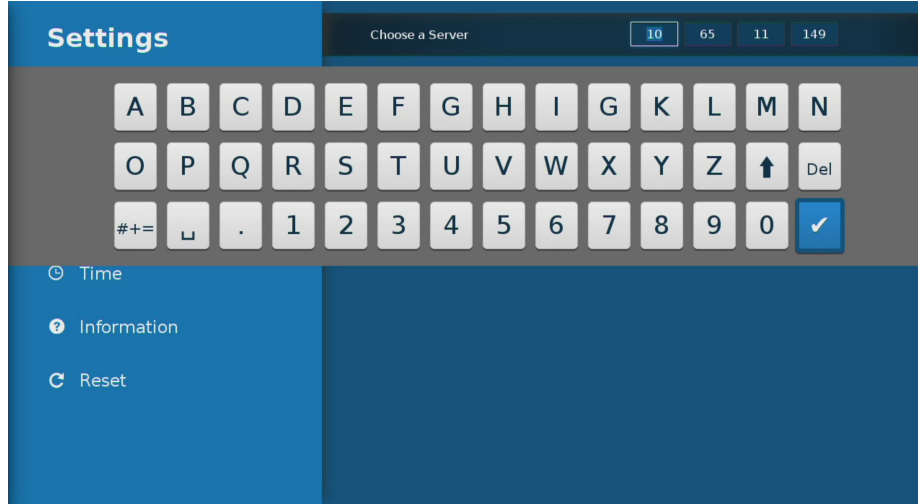


**NOTE** If Mantaray has been configured to require users to enter an Admin PIN to access the STB Settings application, you will be prompted to enter your PIN.



The PIN code is set by administrators from the Furnace Admin Web Portal. For more information, see your system administrator or the Furnace Administration Guide.

## On-screen Keyboard





The STB Settings application provides an on-screen keyboard that you can use to input numbers and letters when setting up the STB.



To bring up the on-screen keyboard:

- When the focus is on any text input, press **OK** on the remote control.  
Or you can press the  button.
- Clicking  (Done) closes the on-screen keyboard.

The following table lists the special function keys for the on-screen keyboard:

Special Key	Function
	<b>Up Arrow</b> Toggles between lower and upper case.
	<b>"# += " / "ABC"</b> Toggles between normal and special characters.
	<b>Delete</b> Deletes the last character.
	<b>Done</b> Closes the on-screen keyboard.

## Display Settings

On the Display Settings page, you can select the display resolution for the STB.

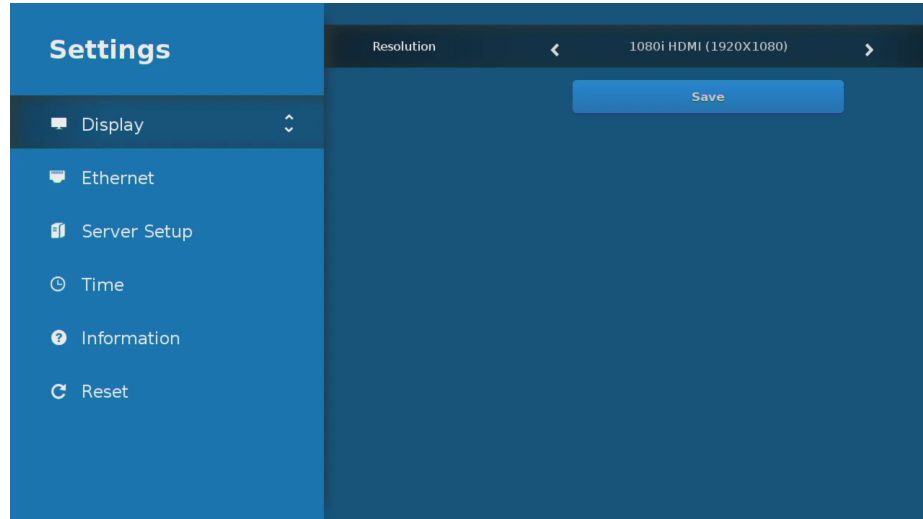


**NOTE** The selectable Resolutions include the output format (e.g., CVBS (Composite), HDMI, Component, or VGA) as well as the resolution.

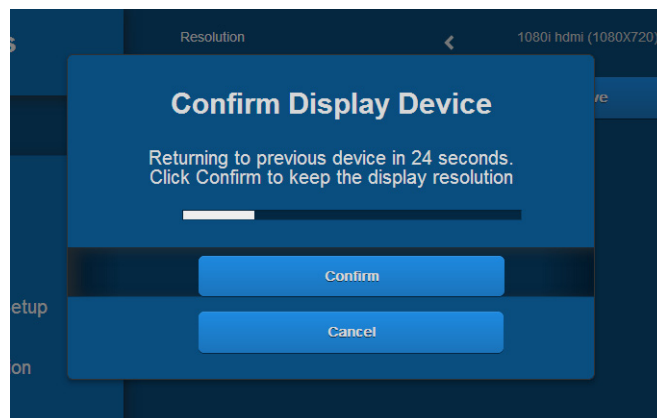
---

To change the display resolution:

1. Using the remote control, press the Left/Right arrows or **OK** button to scroll through the Resolution values.
2. When you reach the correct value, select **Save**.



Mantaray will test the new resolution and display a confirmation dialog:



3. To confirm the resolution change, select **Confirm**.

To cancel the resolution change, select **Cancel** (or wait 30 seconds). The display returns to its previous resolution setting.



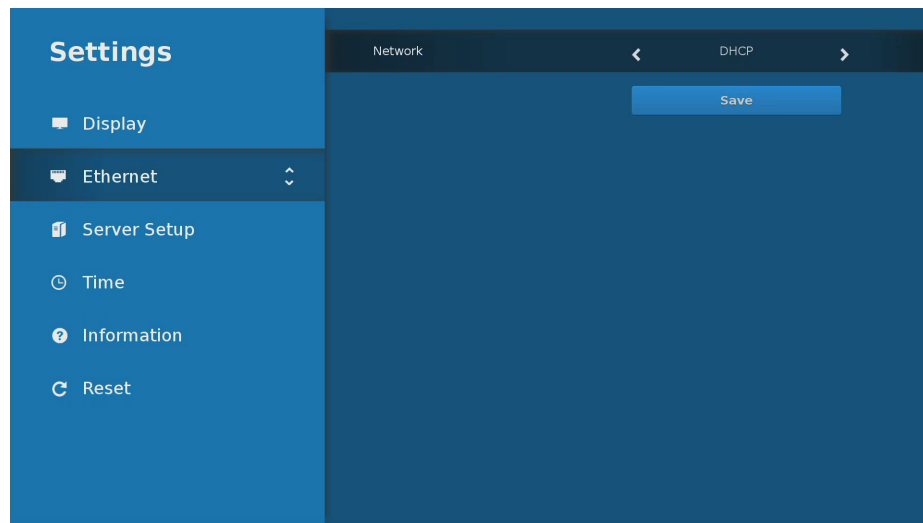
**NOTE** If a resolution is selected that is not supported by the display, the screen goes black for 30 seconds and then returns to its previous resolution.

## Ethernet Settings

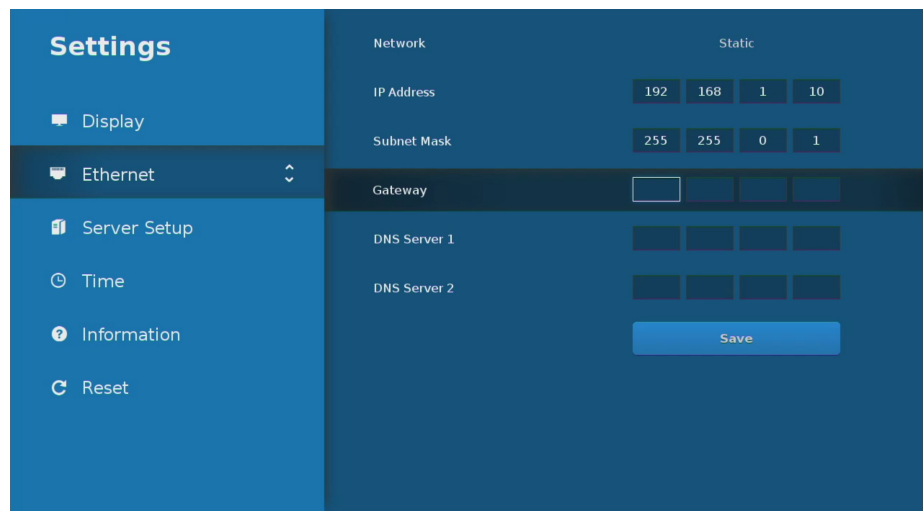
On the Ethernet settings page, you can specify the network settings for the STB. By default, Dynamic Host Configuration Protocol (DHCP) is enabled, which means that the STB will get an IP Address from a DHCP server on the network. When DHCP is disabled, you must manually enter an IP Address for the STB, as well as Netmask, Gateway, and DNS server address(es).

To configure the Ethernet settings:

1. Using the remote control, press the Down Arrow to scroll down to [Ethernet](#).



2. Press the Left/Right arrows or [OK](#) button to toggle between DHCP (default) and Static network mode.
3. If you select Static, fill in the additional network settings that are displayed.



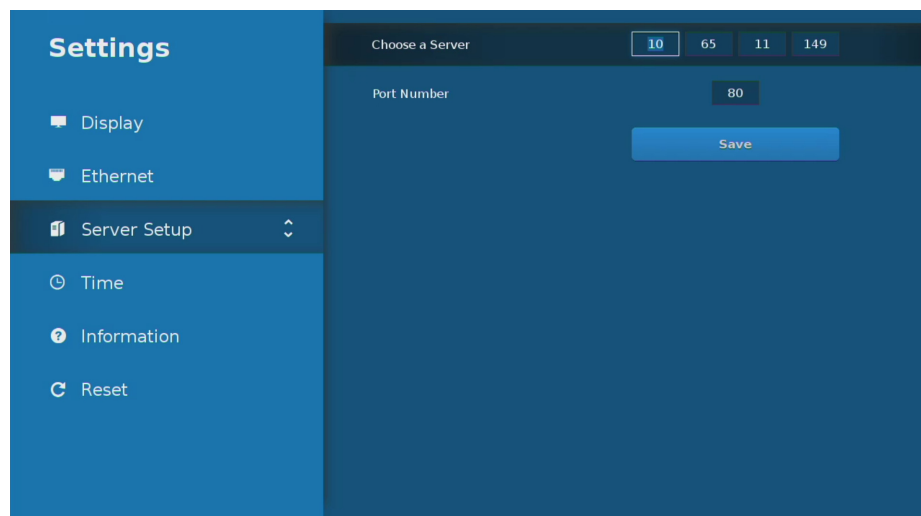
4. When you have finished, select [Save](#).

## Server Setup

On the Server Setup page, you can view and specify the IP address and port number of the Furnace server that will provide guide data to Mantaray.

To specify the Furnace server:

1. Using the remote control, press the Down Arrow to scroll down to [Server Setup](#).
2. Enter the Furnace IP address in the [Choose a Server](#) field and the corresponding port number in the [Port Number](#) field. For details on data entry, see [“On-screen Keyboard”](#) on page 26.



- All IP text inputs accept numeric values ranging 0-255.
  - Port input accepts numeric value ranging 1-65535.
3. When you have finished, select [Save](#).

## Time Settings

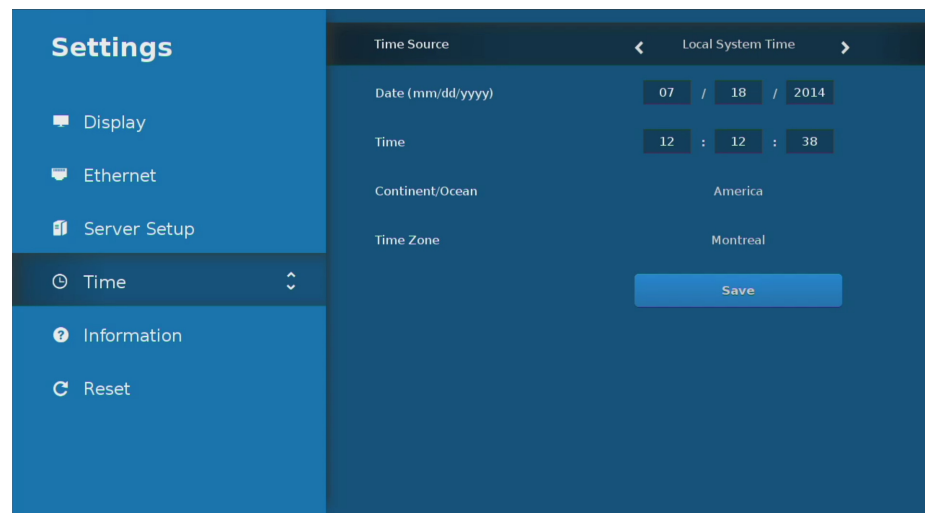
The Time settings page allows you to view and configure the time source, current time, and time zone for the STB. You can also configure Network Time Protocol (NTP) support to synchronize the STB clock with the selected time zone.



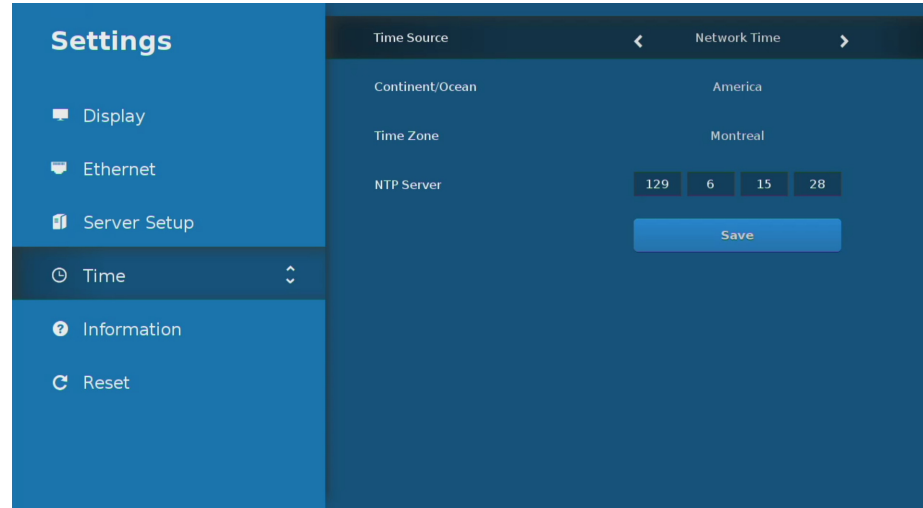
**IMPORTANT** By default the Mantaray's date and time is 1 Jan 1970. The correct date and time *must* be set before the Electronic Program Guide (EPG) will work.

To specify the Time settings:

1. Using the remote control, press the Down Arrow to scroll down to **Time**.



- To set up the device local system time, you need to input Date and Time numbers (as shown above).
- To use network time, you need to provide an NTP address (as shown below).



In either case, local system time or network time, you need to set up the time zone.

To set a time zone:

1. Select Continent/Ocean.
2. Then select a time zone within the area.



You also can set a time zone by setting Continent/Ocean as “none” and select a GMT number.

3. When you have finished, select [Save](#).

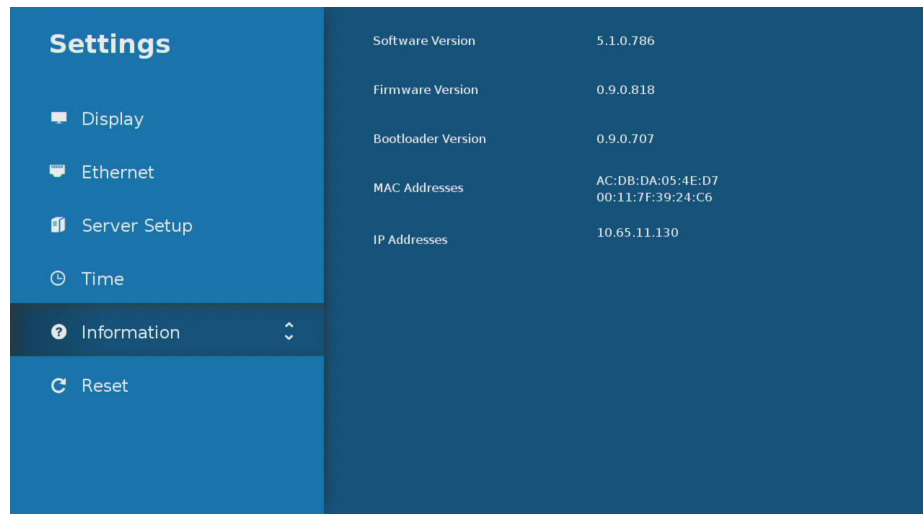


## Information

This page shows the current software version, firmware version, bootloader version, MAC addresses, and IP addresses for the STB.

To view system information for the STB:

1. Using the remote control, press the Down Arrow to scroll down to [Information](#).



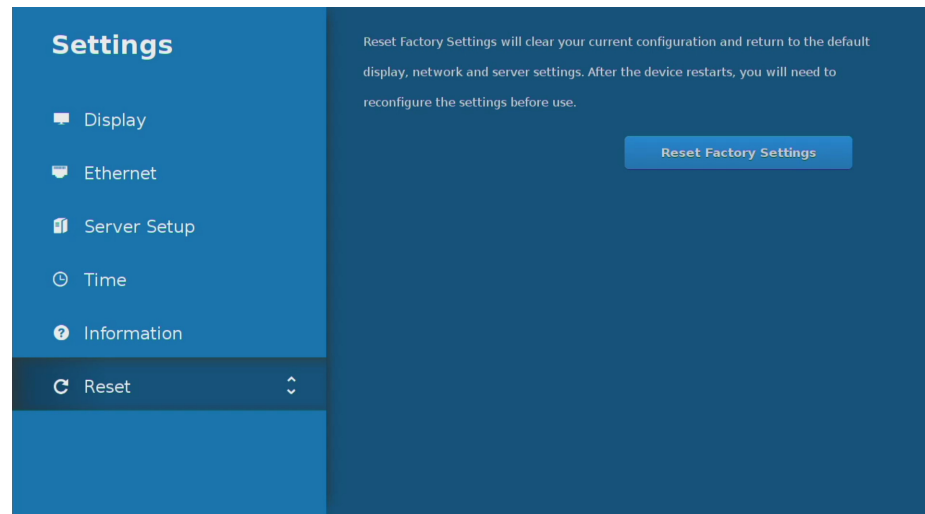
The Information page is read-only.

## Reset Factory Settings

The Reset Factory Settings page allows you to clear the current configuration and return to the default display, network and server settings.

To return the STB to factory settings:

1. Using the remote control, press the Down Arrow to scroll down to [Reset](#).



2. Click the Reset Factory Settings button.

The device will restart. You will need to reconfigure the Ethernet and Server settings before use.

## Automatic Upgrades

Firmware upgrades are delivered automatically to your Mantaray by the Furnace server to which it is connected.

When a Mantaray is configured to point to a Furnace server, it will poll the server at intervals of 60 seconds to check for firmware/application updates. If there is a new firmware/application available, the Furnace server will download the files to the Mantaray.

Once all necessary files have been downloaded, the Mantaray will reboot and the firmware update process will take place:

To determine if an update was successful, open the STB Settings application and verify the Firmware/Software version numbers on the Information page.

The upgrade preserves all your previous configuration.

---

# Operating Mantaray

This section provides information you need to know to get started viewing video on Mantaray.



**NOTE** The Ethernet input and audio and video outputs must already be connected (as described in [“Hardware Setup”](#) on page 19).

Also, the Mantaray must be part of a Furnace domain in order to receive guide data from the Furnace (see [“Joining Mantaray to a Furnace”](#) on page 24).

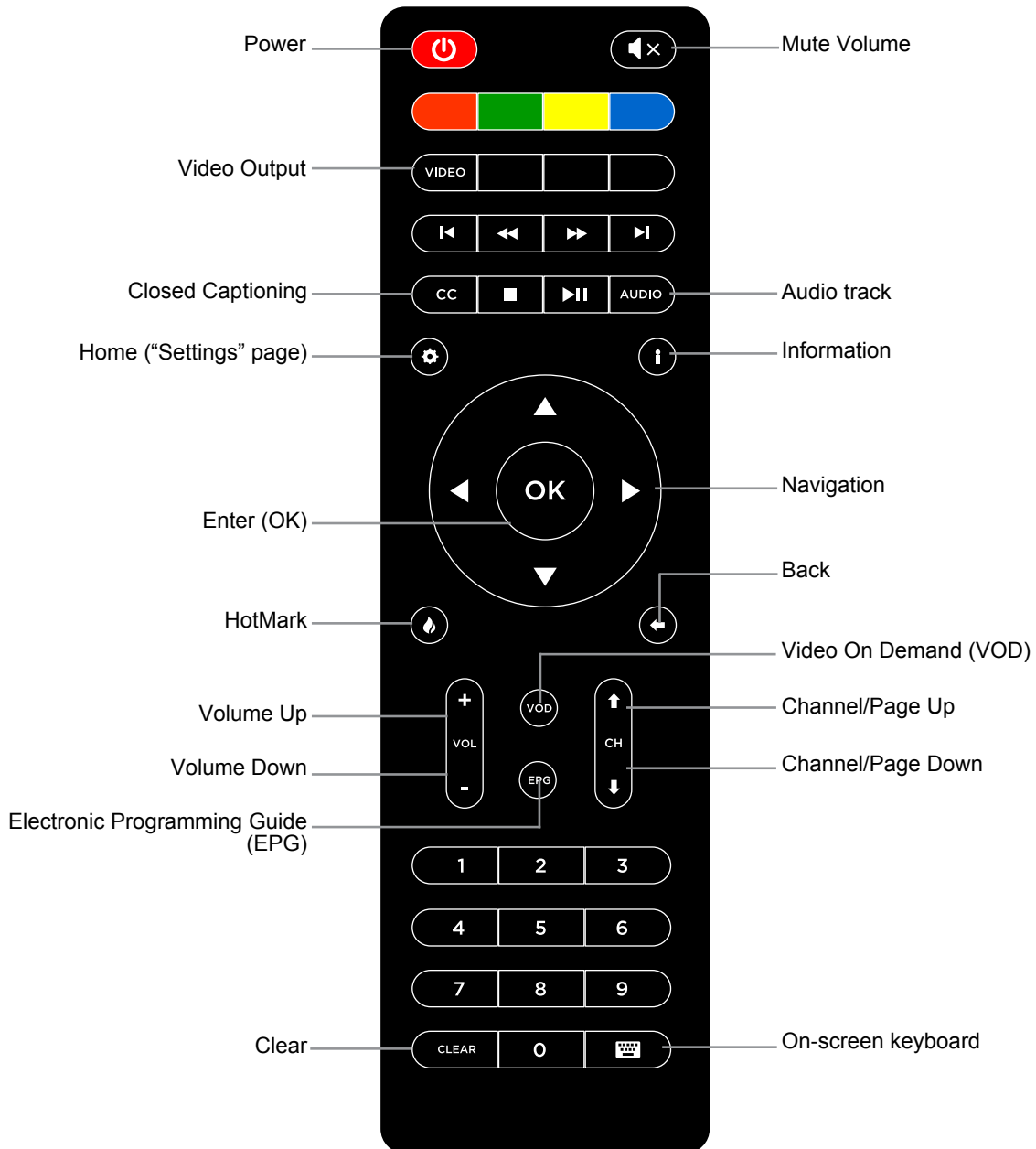
---

## Topics In This Section

<a href="#">Using Your Remote Control</a> .....	37
<a href="#">Remote Control Buttons</a> .....	38
<a href="#">Starting to Play Video</a> .....	41
<a href="#">Using the Channel Guide</a> .....	44

## Using Your Remote Control








This section describes the remote control buttons used to navigate the Electronic Program Guide (EPG), select channels, and control volume.













**NOTE** The [Video](#) button is locked once an STB application has been installed from the Furnace server. See ["Unlocking the Video Button"](#) on page 40.

## Remote Control Buttons

The following table lists the remote control buttons and their functions to navigate the EPG, select channels, and control volume, as well as make selections in the STB Settings application:

Button	Function
	<p><b>Power</b></p> <p>Toggles the STB between power on and off.</p>
	<p><b>Mute</b></p> <p>Mutes the volume. Press again to resume previous volume setting.</p>
	<p><b>Video Output</b></p> <p>Toggles through video output modes, for example, HDMI, VGA, Composite, and Component.</p> <p>This is useful during setup if you do not see the STB Settings application on the screen connected to the STB. Otherwise, to select the display resolution, see <a href="#">“Display Settings”</a> on page 27.</p> <p><b>IMPORTANT:</b> Once an STB application has been installed from the Furnace server, the Video button is locked. See <a href="#">“Unlocking the Video Button”</a> on page 40.</p>
	<p><b>Closed Captioning</b></p> <p>(Full-screen mode only) Enables/disables closed captioning (OFF or CC1-CC4).</p>
	<p><b>Audio Track</b></p> <p>Selects the audio track (Aud0-Aud7).</p>
	<p><b>Settings/Home</b></p> <p>Opens/closes the STB Settings application. For details, see <a href="#">“Configuring Mantaray”</a> on page 26.</p> <p><b>NOTE:</b> The Mantaray may have been configured to require users to enter an Admin PIN to access the STB Settings application. The Admin PIN code is set by administrators from the Furnace Admin Web Portal. For more information, see your system administrator or the Furnace Administration Guide.</p>
	<p>(Full-screen mode only) Displays current channel and program information.</p>

Button	Function
<b>Menu Navigation</b>	
	<p><b>Up/Down and Left/Right Arrows</b></p> <p>Navigates between controls (during setup) or between programs and channels in the guide.</p> <ul style="list-style-type: none"> <li>• Use Up / Down Arrows to navigate between menu items, as well as between rows within a page.</li> <li>• Use Right / Left Arrows to navigate between controls within the same row, as well as back.</li> </ul>
	<p><b>OK</b></p> <p>Selects an item. (During setup) Navigates from the sidebar menu to main page, as well as opens the on-screen keyboard for the highlighted field.</p>
	<p><b>HotMark</b></p> <p>Future use.</p>
	<p><b>Back</b></p> <p>Returns to previous channel. (During setup) Navigates back to the sidebar menu from a content page.</p>
<b>Channel Guide / Volume Controls</b>	
	<p><b>Volume Up and Down</b></p> <p>Raises or lowers the volume.</p>
	<p><b>Channel/ Page Up and Down</b></p> <p>Displays the previous or next channel, or page when viewing the on-screen guide.</p>
	<p><b>VOD</b></p> <p>Future use.</p>
	<p><b>EPG</b></p> <p>Toggles between full-screen mode and program data.</p>

Button	Function
	<b>Clear</b> (During setup) Clears a text field.
	<b>On-screen Keyboard</b> (During setup) Opens/closes the on-screen keyboard. See <a href="#">“On-screen Keyboard”</a> on page 26.

## Unlocking the Video Button

When Mantaray is running without a connected server and STB application, the [Video](#) button works normally, i.e., toggles through the video output modes.

However, once Mantaray has loaded an STB application from the Furnace server, the [Video](#) button is locked. This is designed to prevent users' from pressing it (for example, to browse videos) and inadvertently changing the video output to an unsupported resolution.

- To unlock (enable) the [Video](#) button, press the following key combination sequence on the remote: Blue, Yellow, Green, Red, Video.
- To lock the [Video](#) button again, press the Blue button.



## Starting to Play Video

Once Mantaray is connected and configured, you can begin using it to browse and view available content.

To operate the STB:

1. Turn on the Mantaray STB and the TV or monitor to which it is connected.

The STB tunes to the channel and begins to play audio and video.



**NOTE** If provisioning fails, contact your local service provider or help desk.

---

2. To change the channel, press the [EPG](#) button on the remote control. The channel guide will open. For details, see [“Using the Channel Guide”](#) on page 44
3. To select a program, press the Channel Up or Down button, or type in a channel number using the remote control keypad and press [OK](#). See [“Using Your Remote Control”](#) on page 37.

4. As you change channels, the channel number appears briefly in a band along the top of the screen.

When you press any of the volume controls (Mute, Up, or Down) on the remote control, a volume indicator appears along the bottom of the screen.



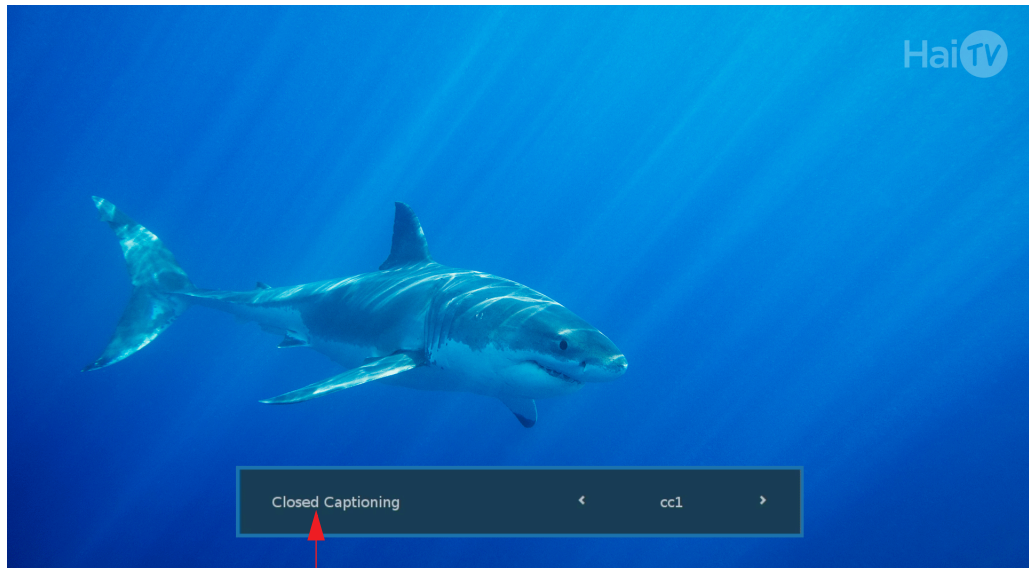
Currently tuned channel & program

Volume indicator



**NOTE** Since Mantaray is designed for the display of live video streams, transport controls on the remote control (such as Pause, Restart, and Fast Forward) are not enabled.

5. To display closed captioned text, press the CC button on the remote control and select the CC stream from the on-screen panel (Off or CC1-CC4).



Closed captioning stream selector

## Using the Channel Guide

1. On the Mantaray remote control, press the **EPG** button to display the Channel Guide.

Channel number and name (from EPG data)

Current time indicator

Currently selected program

Picture-in-Picture (PIP) of currently tuned channel

Channel list

Description of currently selected program

Channel	12:00 PM	12:30 PM	1:00 PM	1:30 PM
101 Live1	Swimming with Sharks 12:00 PM - 1:00 PM		Wolf 1:00 PM - 2:00 PM	
103 SART1HD	Julien Cottureau: Imagine Toi 11:00 AM - 1:00 PM		Cirque du Soleil: Ka Extreme 1:00 PM - 2:00 PM	
554 WESH	WESH 2 News at ... 12:00 PM - 12:30 PM	Derm Exclusive! 12:30 PM - 1:00 PM	Days of our Lives 1:00 PM - 2:00 PM	
555 DISN	Dog With a Blog 12:00 PM - 12:30 PM	Dog With a Blog 12:30 PM - 1:00 PM	Jessie 1:00 PM - 1:30 PM	Jessie 1:30 PM - 2:00 PM
556 QUEST	Salvage Hunters 12:00 PM - 1:00 PM		MythBusters 1:00 PM - 2:00 PM	

2. Use the Up and Down arrow buttons on the remote control to navigate through the channels, and the Left and Right buttons to step through the time slots.

A live preview (PIP) appears at the top right of the screen. As you continue to navigate the program guide, the PIP remains tuned to the currently selected channel.

When a program is highlighted, information about the program is displayed at the top of the screen.

3. Press **OK** to tune to the currently selected channel. Alternatively, use the Channel Up and Down buttons to tune to the channel on which a program is currently being displayed, and then press **OK**.
4. To exit the Channel Guide, press the **EPG** button.



---

**TIP** You can display channel and program information when viewing video in full-screen mode by pressing the **i** button on the remote control. The information band will then appear along the top of the display.

---

---

# APPENDIX A: Technical Specifications

This appendix lists the technical specifications for the Mantaray.

## Topics In This Appendix

<a href="#">Video Decoding</a> .....	47
<a href="#">Audio Decoding</a> .....	47
<a href="#">Advanced Features</a> .....	48
<a href="#">IP Networking</a> .....	48
<a href="#">Management Interfaces</a> .....	49
<a href="#">Physical Specifications</a> .....	49
<a href="#">Regulatory/Compliance</a> .....	50

## Video Decoding

VIDEO DECODING	
Compression Standards	MPEG-2
	MPEG-4 (H.264)
Video Resolutions	1920x1080p 30/29.97/25 Hz
	1920x1080i 60/59.94/50 Hz
	1280x720p 60/59.94/50 Hz
	720x480/576i 60/59.94/50 Hz
	720x480/576p 60/59.94/50 Hz
	(interlaced shown in fields per second)
Computer Resolutions	1280x1024 60 Hz
	1280x768 85/75/60 Hz
	1024x768 85/75/60 Hz
Video Bit Rates (bps)	SD video 500k to 20M
	HD video 500k to 20M
	Computer 800k to 9M

## Audio Decoding

AUDIO DECODING	
Compression Standards	MPEG 1 Layer II ISO/IEC 11172-3
	MPEG-2 AAC-LC ISO/IEC 13818-7
	MPEG-4 AAC-LC ISO/IEC 14496-3
Audio Channels	2 per video channel
Bit Rates	From 32 to 448 kbps per audio pair
Frequency Response	From 20 Hz to 22 kHz

## Advanced Features

EIA-608-B/NTSC Line 21 Closed Captioning
EIA-708-B/SDI Closed Captioning
Forward Error Correction (FEC) using Furnace format
AES Encryption 128-bit or 256-bit with Furnace systems or SRT

## IP Networking

IP NETWORKING	
Networking Protocols	Multicast Streaming
	MPEG Transport Stream over UDP
	FEC and 256-bit AES encryption support



## Management Interfaces

MANAGEMENT INTERFACES	
Management via IP using Furnace Portal Server	
Local control via Infrared Remote Control	
Video (Output)	Composite NTSC/PAL Analog
	Y, Pb, Pr Component Analog
	VGA Analog
	HDMI Digital
Audio (Output)	Unbalanced Stereo Analog Audio
	HDMI Embedded Digital Stereo Audio
Network	RJ45
	Ethernet 10/100/1000 Base-T, auto-detect, Half/Full-duplex
	Static IP/DHCP
Remote Control	Infrared Remote Included

## Physical Specifications

PHYSICAL SPECIFICATIONS	
Dimensions	39mm H x 161mm W x 131mm D (1.54"H x 6.34"W x 5.16" D)
Weight	1 lbs. (450g)
Power	12V/3A
Temperature	0° to 35° C [32° to 95° F] operating -40° to 70° C [-40° to 158° F] non-operating
Relative Humidity	Up to 95% without condensation

## Regulatory/Compliance

REGULATORY/COMPLIANCE	
EU Council Directives	EMC Directive - 2004/108/EC ROHS Directive - 2002/95/EC
EMC	EN 55022: 2010 (emissions), CLASS B EN 61000-3-2: 2006+A1:2009+A2:2009, CLASS B EN 61000-3-3: 2008 EN 55024:2010 (immunity) FCC part 15: 2009, subpart B, CLASS B ICES-003 Issue 4, Class B AS/ NZS3548
Safety	IEC60065:2001 (Seventh Edition) + A1:2005 + A2:2010, EN60065:2002 + A1:2006 + A11:2008 + A2:2010 + A12:2011

---

# Appendix B: Warranty Information

## Haivision One (1) Year Limited Warranty

Haivision warrants its hardware products against defects in materials and workmanship under normal use for a period of ONE (1) YEAR from the date of equipment shipment (“Warranty Period”). If a hardware defect arises and a valid claim is received within the Warranty Period, at its option and to the extent permitted by law, Haivision will either (1) repair the hardware defect at no charge, or (2) exchange the product with a product that is new or equivalent to new in performance and reliability and is at least functionally equivalent to the original product. A replacement product or part assumes the remaining warranty of the original product or ninety (90) days from the date of replacement or repair, whichever is longer. When a product or part is exchanged, any replacement item becomes your property and the replaced item becomes Haivision’s property.

### EXCLUSIONS AND LIMITATIONS

This Limited Warranty applies only to hardware products manufactured by or for Haivision that can be identified by the “Haivision” trademark, trade name, or logo affixed to them. The Limited Warranty does not apply to any non-Haivision hardware products or any software, even if packaged or sold with Haivision hardware. Manufacturers, suppliers, or publishers, other than Haivision, may provide their own warranties to the end user purchaser, but Haivision, in so far as permitted by law, provides their products “as is”.

Haivision does not warrant that the operation of the product will be uninterrupted or error-free. Haivision does not guarantee that any error or other non-conformance can or will be corrected or that the product will operate in all environments and with all systems and equipment. Haivision is not responsible for damage arising from failure to follow instructions relating to the product’s use.

This warranty does not apply:

- (a) to cosmetic damage, including but not limited to scratches, dents and broken plastic on ports;
- (b) to damage caused by accident, abuse, misuse, flood, fire, earthquake or other external causes;
- (c) to damage caused by operating the product outside the permitted or intended uses described by Haivision;
- (d) to a product or part that has been modified to alter functionality or capability without the written permission of Haivision; or
- (e) if any Haivision serial number has been removed or defaced.

TO THE EXTENT PERMITTED BY LAW, THIS WARRANTY AND REMEDIES PROVIDED ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, STATUTORY, EXPRESS OR IMPLIED. AS PERMITTED BY APPLICABLE LAW, HAIVISION SPECIFICALLY DISCLAIMS ANY AND ALL STATUTORY OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES AGAINST HIDDEN OR LATENT DEFECTS. IF HAIVISION CANNOT LAWFULLY DISCLAIM STATUTORY OR IMPLIED WARRANTIES THEN TO THE EXTENT PERMITTED BY LAW, ALL SUCH WARRANTIES SHALL BE LIMITED IN DURATION TO THE DURATION OF THIS EXPRESS WARRANTY AND TO REPAIR OR REPLACEMENT SERVICE AS DETERMINED BY HAIVISION IN ITS SOLE DISCRETION. No Haivision reseller, agent, or employee is authorized to make any modification,

extension, or addition to this warranty. If any term is held to be illegal or unenforceable, the legality or enforceability of the remaining terms shall not be affected or impaired.

EXCEPT AS PROVIDED IN THIS WARRANTY AND TO THE EXTENT PERMITTED BY LAW, HAIVISION IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY, INCLUDING BUT NOT LIMITED TO LOSS OF USE; LOSS OF REVENUE; LOSS OF ACTUAL OR ANTICIPATED PROFITS (INCLUDING LOSS OF PROFITS ON CONTRACTS); LOSS OF THE USE OF MONEY; LOSS OF ANTICIPATED SAVINGS; LOSS OF BUSINESS; LOSS OF OPPORTUNITY; LOSS OF GOODWILL; LOSS OF REPUTATION; LOSS OF, DAMAGE TO OR CORRUPTION OF DATA; OR ANY INDIRECT OR CONSEQUENTIAL LOSS OR DAMAGE HOWSOEVER CAUSED INCLUDING THE REPLACEMENT OF EQUIPMENT AND PROPERTY, ANY COSTS OF RECOVERING, PROGRAMMING, OR REPRODUCING ANY PROGRAM OR DATA STORED OR USED WITH HAIVISION PRODUCTS AND ANY FAILURE TO MAINTAIN THE CONFIDENTIALITY OF DATA STORED ON THE PRODUCT. THE FOREGOING LIMITATION SHALL NOT APPLY TO DEATH OR PERSONAL INJURY CLAIMS, OR ANY STATUTORY LIABILITY FOR INTENTIONAL AND GROSS NEGLIGENT ACTS AND/OR OMISSIONS.

## OBTAINING WARRANTY SERVICE

Before requesting warranty service, please refer to the documentation accompanying this hardware product and the Haivision Support Knowledge Base <http://haivision.com/support/knowledge-base>. If the product is still not functioning properly after making use of these resources, please contact your Authorized Reseller or Haivision at <http://support.haivision.com> using the information provided in the documentation. The Authorized Reseller or Haivision will help determine whether your product requires service and, if it does, will inform you how Haivision will provide it. You must assist in diagnosing issues with your product and follow Haivision's warranty processes.

Haivision may provide warranty service by providing a return material authorization ("RMA") to allow you to return the product in accordance with instructions provided by Haivision or Authorized Reseller. You are fully responsible for delivering the product to Haivision as instructed, and Haivision is responsible for returning the product if it is found to be defective. Your product or a replacement product will be returned to you configured as your product was when originally purchased, subject to applicable updates. Returned products which are found by Haivision to be not defective, out-of-warranty or otherwise ineligible for warranty service will be shipped back to you at your expense. All replaced products and parts, whether under warranty or not, become the property of Haivision. Haivision may require a completed pre-authorized form as security for the retail price of the replacement product. If you fail to return the replaced product as instructed, Haivision will invoice for the pre-authorized amount.

## APPLICABLE LAW

This Limited Warranty is governed by and construed under the laws of the Province of Quebec, Canada.

This Limited Hardware Warranty may be subject to Haivision's change at any time without prior notice.

## Software End User License Agreement

### READ BEFORE USING

THIS SOFTWARE END USER LICENSE AGREEMENT (“AGREEMENT”) IS FOR ANY OR ALL OF THE HAIVISION SOFTWARE PRODUCT(S) LICENSED, DOWNLOADED, INSTALLED AND/OR ACTIVATED BY YOU (“PRODUCT”). THE PRODUCT IS PROTECTED BY NATIONAL AND INTERNATIONAL COPYRIGHT LAWS AND TREATIES.

READ THE TERMS OF THE FOLLOWING AGREEMENT CAREFULLY. BY CLICKING THE ACCEPT BUTTON ON THIS AGREEMENT, OPENING THE SHRINKWRAP AROUND OR USING THE PRODUCT OR ANY PORTION THEREOF, OR BY USING OR DISTRIBUTING ANY VIDEO INFORMATION ENCODED BY, DECODED BY OR OTHERWISE MANIPULATED OR PASSED THROUGH THE PRODUCT, YOU CONFIRM YOUR ACCEPTANCE OF THIS AGREEMENT.

THIS AGREEMENT IS A LEGAL AGREEMENT BETWEEN YOU (A SINGLE CORPORATE ENTITY) AND HAIVISION. IF YOU DO NOT AGREE TO THESE TERMS, HAIVISION IS UNWILLING TO LICENSE THE PRODUCT TO YOU AND YOU ARE NOT AUTHORIZED TO INSTALL OR USE THE PRODUCT.

NOTWITHSTANDING SECTION [6.5](#) BELOW, THIS AGREEMENT ONLY GOVERNS THE PRODUCT(S) IF A SEPARATE SOFTWARE END USER LICENSE AGREEMENT HAS NOT BEEN SIGNED PRIOR TO THIS AGREEMENT FOR THE PRODUCT OR THE AGREEMENT IS NOT SUPERCEDED BY A SEPARATE SOFTWARE END USER LICENSE AGREEMENT FOR THE PRODUCT AT A LATER DATE.

### 1. DEFINITIONS

- 1.1. Entitlement.** The collective set of applicable documents (e.g., warranty, support and maintenance documents, data sheets, etc.) authorized by Haivision Network Video or its affiliate Haivision (collectively, “Haivision”) evidencing your obligation to pay associated fees (if any) for the license, associated Services, and the authorized scope of use of Product under this Agreement.
- 1.2. License Fee.** License Fee shall mean the consideration paid to Haivision for use of the Product. The License Fee is part or all of the price paid for the relevant Product.
- 1.3. Product.** Product shall mean the executable version of Haivision’s computer software, program or code, in object code format (specifically excluding source code), together with any related material including, but not limited to the hardware, Reference Manuals or database schemas provided for use in connection with the Product and including, without limitation, all Upgrades through the date of installation.
- 1.4. Reference Manuals.** Reference Manuals shall mean the most current version of the documentation for use in connection with the Product provided by Haivision to You.
- 1.5. Third-Party Content.** Services or materials, which are not proprietary to Haivision or may not be part of the materials of the company, entity or individual using the Product.
- 1.6. Updates.** Updates shall mean any periodic software releases, additions, fixes, and enhancements thereto, release notes for the Product and related Reference Manuals, (other than those defined elsewhere in this section as Upgrades) which have no value apart from their operation as part of the Product and which add minor new functions to the Product, but none so significant as to warrant classification as an Upgrade, which may be provided by Haivision to fix critical or non-critical problems in the Product on a scheduled, general release basis. Updates to the Product (“Version”) are denoted by number changes to the right of the decimal point for a version and revision number (for example, going from 2.0.0 to 2.1.0).

- 1.7. Upgrades.** Upgrades shall mean any modification to the Product made by Haivision, which are so significant, in Haivision's sole discretion, as to warrant their exclusion under the current license grant for the Product. Upgrades of Product are denoted by number changes to the left of the decimal point for a release number (for example, going from 2.0 to 3.0).
- 1.8. You (or Your).** The legal entity specified in the Entitlement, or for evaluation purposes, the entity performing the evaluation.

## 2. RIGHTS AND RESTRICTIONS

**2.1. License to Use.** Subject to the terms and conditions set forth herein and subject to the terms of your Entitlement, Haivision hereby grants to You a non-exclusive, personal, limited and nontransferable right and license to use the Product in accordance with the terms of this Agreement. This license is granted to You and not, by implication or otherwise, to any parent, subsidiary or affiliate of Yours without Haivision's specific prior written consent. This license is for the limited use of the Product by You for the purpose of creating, managing, distributing and viewing IP Video assets. This license does not grant any license for content whatsoever. All rights not expressly granted to You by this Agreement are reserved by Haivision.

### 2.2. Restrictions.

- (a) Reproduction.** You shall not copy, modify, distribute, use or allow access to any of the Product, except as explicitly permitted under this Agreement and only in the quantities designated in the Entitlement. However, You have the right to make copies of the Product solely for archival purposes, but only in quantities necessary and typical for your Organization. You shall not modify, adapt, translate, export, prepare derivative works from, decompile, reverse engineer, disassemble or otherwise attempt to derive source code, hardware designs or other proprietary information from the Product or any internal data files generated by the Product, or use the Product embedded in any third party hardware or software. You shall also not use the Product in an attempt to, or in conjunction with, any device, program or service designed to circumvent technological measures employed to control access to, or the rights in other work protected by copyright laws. You shall not remove, modify, replace or obscure Haivision's copyright and patent notices, trademarks or other proprietary rights notices affixed to or contained within any Product. No right is granted hereunder for any third party who obtains access to any Product through You to use the Product to perform services for third parties. Most sublicensing arrangements are prohibited under this Agreement. However, if You are a Reseller, You are permitted to sublicense the Product to single end-users under terms and conditions similar to the provisions of this Agreement; however, You are responsible and liable pursuant to the terms and conditions of this Agreement for Your sublicensees' actions and failures to take required actions with respect to the Product.
- (b) Ownership.** The Product is conditionally licensed and not sold. As between the parties, Haivision and/or its licensors owns and shall retain all right, title and interest in and to all of the Product, including all copyrights, patents, trade secret rights, trademarks and other intellectual property rights therein, and nothing in this Agreement shall be deemed to transfer to You any ownership or title to the Product. You agree that you will not remove, alter or otherwise obscure any proprietary rights notices appearing in the Product. All Haivision technical data and computer software is commercial in nature and developed solely at private expense.

## 3. TERM AND TERMINATION

- 3.1. Term.** The license and service term are set forth in your Entitlement(s). Additionally, this Agreement may be terminated without cause by You upon thirty (30) days written notice to Haivision.

- 3.2. Termination for Breach.** Your rights under this Agreement will terminate immediately without notice from Haivision if You materially breach this Agreement or take any action in derogation of Haivision’s rights to the Product. Haivision may terminate this Agreement should any Software become, or in Haivision’s reasonable opinion likely to become, the subject of a claim of intellectual property infringement or trade secret misappropriation.
- 3.3. Termination for Bankruptcy.** Haivision may terminate this Agreement, effective immediately, if You file, or have filed against You, a petition for voluntary or involuntary bankruptcy or pursuant to any other insolvency law, makes or seeks to make a general assignment for the benefit of its creditors or applies for, or consents to, the appointment of a trustee, receiver or custodian for a substantial part of its property.
- 3.4. Termination; Effect; Survival.** Upon the termination of this Agreement for any reason:
- (a) All license rights granted hereunder shall terminate;
  - (b) You shall immediately pay to Haivision all amounts due and outstanding as of the date of such termination or expiration; and
  - (c) You shall return to Haivision all Product and all Haivision Reference Manuals or certify that all such Product and Reference Manuals have been destroyed. Notwithstanding any termination of this Agreement, the following provisions of this Agreement shall survive for the relevant period of time set forth therein, if any: Sections [2.2](#), [4](#), [5](#) and [6](#).

## 4. REPRESENTATIONS, DISCLAIMER AND LIMITATION OF LIABILITY

- 4.1. Limited Warranty.** Haivision warrants that: (i) the Product will operate substantially in accordance with the Reference Manuals provided and (ii) any media on which the Product is provided will be free of material damage and defects in materials and workmanship under normal use for a term of ninety (90) days (the “Warranty Period”) after its delivery date. As Your sole and exclusive remedy for any breach of this warranty, Haivision will use its commercially reasonable efforts to correct any failure of the Product to operate substantially in accordance with the Reference Manuals which is not the result of any improper or unauthorized operation of the Product and that is timely reported by You to Haivision in writing within the Warranty Period, provided that in lieu of initiating commercially reasonable efforts to correct any such breach, Haivision may, in its absolute discretion, either: (i) replace the Product with other software or technology which substantially conforms to the Reference Manuals or (ii) refund to You a portion of the fee paid for the relevant Product, whereupon this Agreement shall terminate. This warranty shall immediately terminate if You or any third party makes or attempts to make any modification of any kind whatsoever to the Product, engages in any improper or unauthorized operation of the Product, including uses prohibited by the Entitlement or installs or uses the Product on or in connection with any hardware or software not specified in the Entitlement or product data sheets.
- 4.2. Warranty Disclaimers.** THE EXPRESS WARRANTIES SET FORTH IN SECTION [4.1](#) ABOVE IN RESPECT TO THE PRODUCT ARE IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, OR STATUTORY, REGARDING THE PRODUCT, OR ITS OPERATION, FUNCTIONALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT OF THIRD PARTY RIGHTS (ALL OF WHICH ARE DISCLAIMED). HAIVISION DOES NOT WARRANT THAT ANY OF THE PRODUCT(S) WILL MEET ALL OF YOUR NEEDS OR REQUIREMENTS, OR THAT THE USE OF ANY OF THE PRODUCT(S) WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT ALL ERRORS WILL BE DETECTED OR CORRECTED.
- 4.3. Liability Limitation.** IN NO EVENT SHALL HAIVISION OR ITS OFFICERS, EMPLOYEES, AGENTS, REPRESENTATIVES, OR MEMBERS, NOR ANYONE ELSE WHO HAS BEEN

INVOLVED IN THE CREATION, PRODUCTION OR DELIVERY OF THE PRODUCT, BE LIABLE TO YOU, YOUR CUSTOMERS OR TO ANY OTHER THIRD PARTY FOR CONSEQUENTIAL, INDIRECT, INCIDENTAL, PUNITIVE OR SPECIAL DAMAGES, LOST PROFITS, LOSS OF USE, INTERRUPTION OF BUSINESS OR FOR ANY DAMAGES FOR ANY BREACH OF THE TERMS OF THIS AGREEMENT OR FOR LOST OR CORRUPTED DATA ARISING FROM ANY CLAIM OR ACTION HEREUNDER, BASED ON CONTRACT, TORT OR OTHER LEGAL THEORY (INCLUDING NEGLIGENCE) AND WHETHER OR NOT SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. HAIVISION SHALL NOT BE LIABLE FOR DAMAGES FOR ANY CAUSE WHATSOEVER IN AN AMOUNT IN EXCESS OF THE FEE PAID TO HAIVISION BY YOU FOR THE RELEVANT PRODUCT.

## 5. INDEMNIFICATION

### 5.1. Indemnification by Haivision.

- (a) Haivision shall indemnify and hold You harmless against any and all actions, claims, losses, damages, liabilities, awards, costs and expenses (including reasonable attorneys' fees) ("Claims") arising out of (i) any accusation or purported violation of any third person's US and Canadian copyright, trademark, patent rights or trade secrets, proprietary information on account of Your use of the Product when used in accordance with the terms of this Agreement, or (ii) relating to or arising out of any negligence or willful misconduct on the part of Haivision or any breach by Haivision of the terms of this Agreement or any Maintenance and Support Agreement, or applicable law. You shall promptly notify Haivision in writing of any such Claim and promptly tender the control of the defense and settlement of any such Claim to Haivision. Haivision shall thereafter undertake the defense of any such Claim using counsel of its choice. You shall cooperate with Haivision, in defending or settling such Claim at the expense of Haivision; provided that Haivision shall not settle any Claim against You which would require the payment of money by You without the prior written consent of You, which consent shall not be unreasonably withheld. You shall have the right to consult and provide input into the defense with counsel of its choice at its own expense. Haivision shall not reimburse You for any expenses incurred by You without the prior written approval of Haivision, which approval shall not be unreasonably withheld.
- (b) If any Product is, or in the opinion of Haivision may become, the subject of any Claim for infringement, then Haivision may, or if it is adjudicatively determined that any of the Product infringes in the manner described above (except to the extent that any translation, modification, addition or deletion or combination by You is the sole source of such Claim), then Haivision shall, at its option, either (i) procure for You the right to continue use of the Product for the term hereof, (ii) replace or modify the Product with other suitable and reasonably equivalent products so that the Product becomes non-infringing, or (iii) terminate this Agreement and refund to You a portion of the fee paid for the relevant Product.
- (c) Haivision shall have no liability for: (i) the use of other than the then current release of the Product; (ii) the use of the Product other than as set forth in its accompanying documentation and as permitted herein; (iii) the modification of any of the Product by any party other than Haivision; or (iv) any infringement arising from the use of any Product by You after Haivision has issued a written notice to You requiring You to cease using such Product when Haivision exercises its option to terminate the License pursuant to Section 3.2 (collectively, "Exclusions"). SECTION 5.1 STATES HAIVISION'S ENTIRE OBLIGATION WITH RESPECT TO ANY CLAIM REGARDING THE INTELLECTUAL PROPERTY RIGHTS OF ANY THIRD PARTY.

- 5.2. Indemnification by You.** You shall indemnify and hold Haivision harmless against any and all Claims directly or indirectly arising out of, or in any manner whatsoever associated or connected with Your performance, purported performance or non-performance of your rights and obligations under this



Agreement, and against any and all Claims incurred by or on behalf of any of the foregoing in the investigation or defense of any and all such Claims.

## 6. OTHER PROVISIONS

- 6.1. Export and Other Restrictions.** This Agreement, and all Your rights and Your obligations under this Agreement, are subject to all applicable Canadian and U.S. Government laws and regulations relating to exports including, but not limited to, the U.S. Department of Commerce Export Administration Act and its associated Regulations and all administrative acts of the U.S. Government thereunder. In the event the Product or the Hardware is exported from the United States or re-exported from a foreign destination, You shall ensure that the distribution and export/re-export of the Product or the Hardware is in compliance with all laws, regulations, orders, or other restrictions of the U.S. Export Administration Act and its associated Regulations. You agree that neither you nor any of your Affiliates will export/re-export any Product, any hardware on which the Product is loaded or embedded, technical data, process, or service, directly or indirectly, to any country for which the Canadian government or United States government (or any agency thereof) requires an export license, other governmental approval, or letter of assurance, without first obtaining such license, approval or letter.
- 6.2. Content.** Your data and/or your use of the Product may not: (i) interfere in any manner with the functionality or proper working of the Product; (ii) stream any material that is copyrighted, protected by trade secret or otherwise subject to third party proprietary rights, including privacy and publicity rights, unless You are the owner of such rights or have permissions from the rightful owner to post the material; (iii) constitute, promote, facilitate or permit any illegal activities, including without limitation, activities that might be libelous or defamatory, invasive of privacy or publicity rights, abusive or otherwise malicious or harmful to any person or entity; (iv) distribute, share or facilitate unauthorized data, malware, viruses, Trojan horses, spyware, worms or other malicious or harmful distributions; or (v) otherwise violate, misappropriate or infringe the intellectual property, privacy, publicity, contractual or other proprietary rights of any third party.
- 6.3. Consent to Use Data.** You agree that Haivision may collect and use technical data and related information, including but not limited to technical information about Your device, system and application software and peripherals, that is gathered periodically to facilitate the provision of software updates, product support and other services to You (if any) related to the Product. Haivision may use this information, as long as it is in a form that does not personally identify You, to improve its products or to provide services or technologies to You.
- 6.4. Transfer and Assignment.** Haivision may assign, sublicense, or transfer this Agreement and/or any or all of its rights or obligations hereunder. You may not assign, transfer or delegate any of its rights or obligations hereunder (whether by operation of law or otherwise) without the prior written consent of Haivision. For purposes of the preceding sentence, and without limiting its generality, any merger, consolidation or reorganization involving You (regardless of whether You are a surviving or disappearing entity) will be deemed to be a transfer of rights, obligations or performance under this Agreement for which Haivision's prior written consent is not required. Any unauthorized assignment, transfer or delegation by You shall be null and void. This Agreement is binding upon and inures to the benefit of the parties hereto and their respective permitted successors and assigns.
- 6.5. Waiver and Amendment.** No modification, amendment or waiver of any provision of this Agreement shall be effective, unless in writing signed by both parties. No failure or delay by either party in exercising any right, power or remedy under this Agreement, except as specifically provided herein, shall operate as a waiver of any such right, power or remedy. Without limiting the foregoing, any additional legal terms and conditions submitted by You in any other documents, including but not limited to the Entitlement, shall be of no legal force or effect.

- 6.6. Enforcement by Third Party.** For any Product licensed by Haivision from other suppliers, the applicable supplier is a third party beneficiary of this Agreement with the right to enforce directly the obligations set forth in this Agreement against You.
- 6.7. Third Party Content.** Haivision is not responsible for examining or evaluating the data, accuracy, completeness, timeliness, validity, copyright compliance, legality, decency, quality or any other aspect of any Third Party Content. Haivision does not warrant or endorse and does not assume and will not have any liability or responsibility to You or any other person for any Third Party content. You agree that any Third Party Content may contain proprietary information and material that is protected by applicable intellectual property and other laws, including but not limited to copyright, and that you will not use such proprietary content, information or materials in any way whatsoever except for permitted uses of the Third Party Content.
- 6.8. Third Party Royalties.** Your further reuse, retransmission, rebroadcast, display or other distribution of your Third Party Content using the Product may require that you obtain a license from and / or pay royalties to the owners of certain third party audio and video formats. You are solely responsible for obtaining such licenses and paying such royalties.
- 6.9. Governing Law/Submission to Jurisdiction.** This Agreement shall be governed by and construed in accordance with the laws of the Province of Québec, Canada and the Laws of Canada applicable therein (excluding any conflict of laws rule or principle, foreign or domestic), exclusive of the U.N. Convention on the International Sale of Goods. You hereby consent to the jurisdiction of any provincial or federal court located within the Province of Quebec and waive any objection which You may have based on improper venue or forum non conveniens to the conduct of any proceeding in any such court.
- 6.10. Severability.** If any provision of this Agreement is held by a court of competent jurisdiction to be contrary to law, such provision shall be changed and interpreted so as to best accomplish the objectives of the original provision to the fullest extent allowed by law and the remaining provisions of this Agreement shall remain in full force and effect.
- 6.11. Force Majeure.** Neither party shall be liable to the other party for any failure or delay in performance to the extent that such delay or failure is caused by fire, flood, explosion, war, terrorism, embargo, government requirement, labor problems, export controls, failure of utilities, civil or military authority, act of God, act or omission of carriers or other similar causes beyond its control. If any such event of force majeure occurs, the party delayed or unable to perform shall give immediate notice to the other party, and the party affected by the other's delay or inability to perform may elect, at its sole discretion, to terminate this Agreement or resume performance once the condition ceases, with an option in the affected party to extend the period of this Agreement up to the length of time the condition endured. Unless written notice is given within 30 calendar days after the affected party is notified of the condition, the latter option shall be deemed selected. During an event of force majeure, the affected party shall exercise reasonable effort to mitigate the effect of the event of force majeure.
- 6.12. Entire Agreement.** This Agreement, together with the Entitlement and all other documents that are incorporated by reference herein, constitutes the sole and entire agreement between Haivision and You with respect to the subject matter contained herein, and supersedes all prior and contemporaneous understandings, agreements, representations and warranties, both written and oral, with respect to such subject matter.
- 6.13. Language.** The parties confirm that it is their wish that this Agreement, together with the Entitlement and any other documents relating hereto, have been and shall be drawn up in the English language only. Les parties confirment que c'est leur volonté expresse que ce contrat et tous documents y étant relative, y compris les bons de commande, le avis, les annexes, les autorisations, les pièces jointes et les amendements soient rédigés en langue anglaise seulement.

- 6.14. Headings Not Controlling.** The headings used in this Agreement are for reference purposes only and shall not be deemed a part of this Agreement.
- 6.15. US Government Rights.** Some Products are commercial computer software, as such, term is defined in 48 C.F.R. §2.101. Accordingly, if You, as the Licensee, is the US Government or any contractor therefor, You shall receive only those rights with respect to the Product and Reference Materials as are granted to all other end users under license, in accordance with:
- (a) 48 C.F.R. §227.7201 through 48 C.F.R. §227.7204, with respect to the Department of Defense and their contractors; or
  - (b) 48 C.F.R. §12.212, with respect to all other US Government licensees and their contractors.
- 6.16. Notices.** All notices, requests, consents, claims, demands, waivers and other communications hereunder shall be in writing and shall be deemed to have been given:
- (a) When delivered by hand (with written confirmation of receipt);
  - (b) When received by the addressee if sent by a nationally recognized overnight courier (receipt requested);
  - (c) On the date sent by facsimile (with confirmation of transmission) if sent during normal business hours of the recipient, and on the next business day if sent after normal business hours of the recipient; or
  - (d) On the third day after the date mailed, by certified or registered mail, return receipt requested, postage prepaid. Such communications must be sent to the respective parties at the addresses set forth on the Entitlement (or to such other address as may be designated by a party from time to time in accordance with this Section **6.16**).

If you have questions, please contact Haivision Systems Inc., at 4445 Garand, Montréal, Québec, H4R 2H9 Canada or [legal@haivision.com](mailto:legal@haivision.com).

