UMH160UIG

UHD Receiver Decoder

User Guide

Revision History

Date	Version	Description	Author
25/7/2022	1.0	First Draft	
8/12/2022	1.1	Add Management IP address settings and Cardless CAS feature	

This guide contains some symbols to call your attention.

 DANGER	The DANGER symbol calls your attention to a situation that, if ignored, may cause physical harm to the user.
 CAUTION	The CAUTION symbol calls your attention to a situation that, if ignored, may cause damage to Our product.
 NOTE	The NOTE symbol calls your attention to important information.
 TIP	The TIP symbol calls your attention to additional information that, if followed, can make procedures more efficient.
 Red Arrow	The Red Arrow symbols point to import details mention the context above or below an image.
 Blue Arrow	The Blue Arrow symbol indicates the motion path of an item in an operation step.
 Thick Arrow	The thick Arrow symbol calls your attention to a series of operation steps mentioned in the context.

This guide also contains the following text conventions.

Bold Italic	The bold Italic text indicates a button to click, an item in the drop-down menu to select, or a certain item in the UI.

Safety Instructions

- Read these instructions
- Keep these instructions
- Follow all instructions
- Heed all warnings
- Do not use this unit near water.
- Only use a dry cloth to clean chassis
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions
- This unit is grounded through the power cord grounding conductor. To avoid electrocution, do not remove the power cord before the outlet is switched off or unplugged. If the plug does not fit into your outlet, consult an electrician for replacement of the outlet.
- Route power cords and other cables so that they are not likely to be damaged.
- Only use attachments/accessories specified by the manufacturer.
- Do not wear hand jewelry or watch when troubleshooting high current circuits.
- Do not work on the system during periods of lightning.
- Refer all servicing to qualified service personnel. Servicing is required when this unit has been damaged in any way.
- **Damage Requiring Service**: Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - When the power-supply cord or plug is damaged.
    - If liquid has been spilled, or objects have fallen into the product.
    - If the product has been exposed to rain or water.
    - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of the controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
    - If the product has been damaged in any way.
    - The product exhibits a distinct change in performance.
- **Replacement Parts**: When replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer. Unauthorized part substitutions made may result in fire, electric shock or other hazards.

SAFETY PRECAUTIONS

There is always a danger present when using electronic equipment.

Unexpected high voltages can be present at unusual locations in defective equipment and signal distribution systems. Become familiar with the equipment that you are working with and observe the following safety precautions.

- Every precaution has been taken in the design of your UMH160UIG to ensure that it is as safe as possible. However, safe operation depends on you the operator.

- Always be sure your equipment is in good working order. Ensure that all points of connection are secure to the chassis and that protective covers are in place and secured with fasteners.

- Never work alone when working in hazardous conditions. Always have another person close by in case of an accident.

- Always refer to the manual for safe operation. If you have a question about the application or operation call Wellav for assistance.

- WARNING – To reduce the risk of fire or electrical shock never allow your equipment to be exposed to water, rain or high moisture environments. If exposed to a liquid, remove power safely (at the breaker) and send your equipment to be serviced by a qualified technician.

- To reduce the risk of shock the UMH160UIG must be connected to a mains socket outlet with a protective earthing connection.

- For the UMH160UIG the mains plug is the main disconnect and should remain readily accessible and operable at all times.
  The UMH160UIG is equipped with an internal system battery. The UMH160UIG must be sent to Wellav service for replacement of this battery.

- When installing the UMH160UIG utilizing the DC power supply, the power supply MUST be used in conjunction with an over-current protective device rated at 50V, 5A, type: Slow-blo, as part of battery-supply circuit.

- To reduce the risk of shock and damage to equipment, it is recommended that the chassis grounding screw located on the rear of the UMH160UIG– be connected to the installation's rack, the vehicle's chassis, the battery's negative terminal, and/or earth ground.

CAUTION – Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.

FCC Class A Information

The UMH160UIG has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

Shielded cables must be used with this unit to ensure compliance with the Class A FCC limits.

⚠Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Dolby Digital Information

This product has been manufactured under license from Dolby Laboratories. "Dolby Digital", "AC-3", and "Dolby Digital Plus" are licensed trademarks of Dolby Laboratories.

Table Of Contents

Preface

About This Manual

This manual provides introduction to users about how to operate the device correctly. The content includes introduction to product installation, product characteristics and product settings, etc. It is highly suggested that users should read this document before actually operating the device.

Intended Readers

This manual is suggested to be studied by the following readers:

- Technical Service Engineer
- Maintenance Engineer
- Test Engineer
- Sales Engineer

Symbol	Meaning
	There is highly potential danger. If it cannot be avoided, it will lead to the deaths or serious injury.
	There is medium or low potential danger. If it cannot be avoided, it will lead to medium or slight injury.
	There are potential risks. If ignore these texts, it may cause damage to the device, data loss, equipment performance reduce or unpredictable results.
	Tips that help you to solve problems or save your time.
	Remarks. Additional information to the text, in order to emphasize something.

Symbols Definition

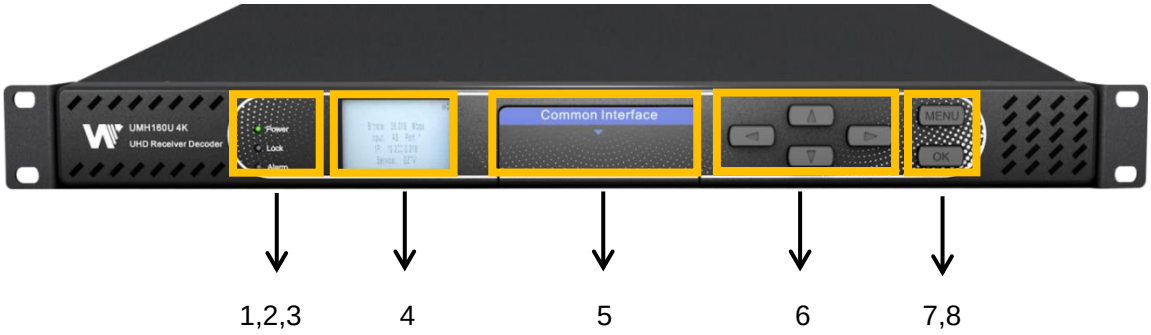
For the symbols that might appear in this document, the meanings they represent are as the following:

1. Overview

1. 1. Product Introduction

UMH160UIG is a powerful and cost-effective 4K receiver/decoder that supports MPEG-2/H.264/H.265/AVS+/AVS2 UHD/HD/SD video decoding and major audio decoding. With ample tuner input options and multiple input/output interfaces, it can achieve the RF signal reception, program descrambling, multiplexing, downscaling and decoding output. With IP-based stream processing and management interfaces, it is ideal to support advanced content distribution, 4K decoding, content remultiplexing, digital signal turnaround and transmission via an all-IP-headend system.

1. 2. Front Panel Overview



1. Power status indicator: This LED light is turned on when the IRD is power on.

2. Lock status indicator: This LED light is turned on when a channel is locked.

3. Alarm status indicator: This LED flickers when there is something abnormal.

4. LCD screen: This LCD screen can show the program and configuration information.

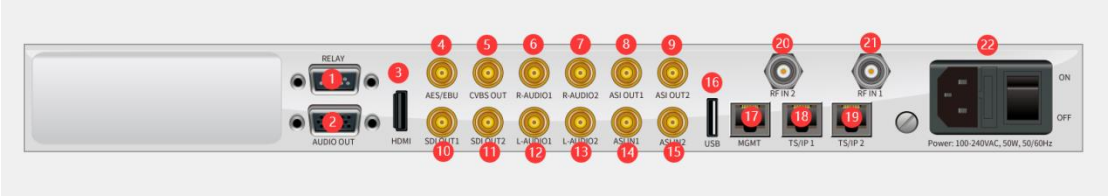
5. CI slots: There are two CI slots for various CAS CAM (PCMCIA) modules.

6. Up/Down/Left/Right buttons: To change channels, to adjust volumes and configure the IRD.

7. Menu button: To enter the menu and the quit function of the sub menus.

8. OK button: To confirm the operation in the setup.

1. 3. **Rear Panel Overview**



1	RELAY	2	AUDIO OUT
3	HDMI	4	AES/EBU
5	CVBS OUT	6	R-AUDIO1
7	R-AUDIO2	8	ASI OUT1
9	ASI OUT2	10	SDI OUT1
11	SDI OUT2	12	L-AUDIO1
13	L-AUDIO2	14	ASI IN1
15	ASI IN2	16	USB
17	MGMT	18	TS/IP 1
19	TS/IP 2	20	RF IN2
21	RF IN1	22	POWER SUPPLY

1. 4. **Cooling**

The UMH160UIG is cooled via forced induction through the front of the unit and exhausted through the vents in the rear of the chassis. The UMH160UIG is equipped with a temperature controlled status indicator. If the temperature inside the unit exceeds 60°C the red “Error” text will illuminate on the front panel and a description of the error will appear in the “Error List.

1. 5. **Rack Information**

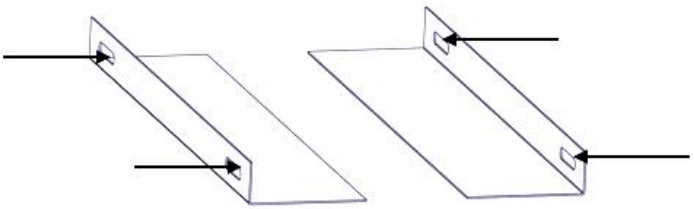
The UMH160UIG is intended to be mounted in a standard 19” rack. It occupies 1RU of rack space and the connections are all on the rear of the unit.

2. Installation

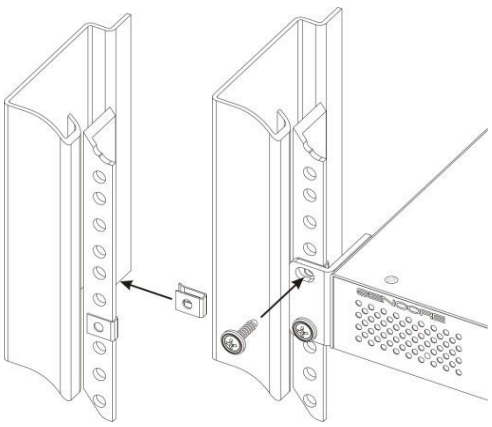
2. 1. Installation Procedure

The UMH160UIG is designed to be mounted in a standard 19” rack. It takes 1RU of rack space. To install it into a rack, please use the following steps:

1. Determine the desired position in the rack for the UMH160UIG. Make sure that the air intake on the top of the unit and the exhausts on the back of the unit will not be blocked.
2. Install the brackets at desired position if there’s no supporting plate in the rack.



3. Insert the rack mount clips into place over the mounting holes in the rack.
4. Slide the UMH160UIG into the position in the rack.
5. Secure the chassis to the rack by installing the four supplied screws through the front mounting holes and tightening.



2. 2. Preparation before Installation

Before installation, the installation personnel should read through and confirm the followings:

- Go through this user manual.

- Has the knowledge of digital television system.
- Has defined the sources, racks allocation, and set-up plan system wiring.
- Knows how to operate this unit and parameters configuration.
- Go through related engineering design documents about the system.

2. 3. AC Power Connection

Please only use the supplied 3-prong power connector or one with equal specifications. NEVER tamper with or remove the grounding pin. This could cause damage to UMH160UIG, personnel, or property. Make sure the power outlet is switched off before plug or unplug the power cable from the panel of UMH160UIG.

2. 4. DC Power Connection

The UMH160UIG with the DC chassis option is intended for use on 48V DC systems. A power cable is not included for this option. In order to apply power to the unit in this configuration, simply connect the screw terminals on rear of the unit to the rack's DC power rails.

Be sure that the power source and cable is used in conjunction with an over-current protective device rated at 50V, 5A, type: Slow-blo fuse as part of battery-supply circuit. Also, to reduce the risk of shock and damage to equipment, it is recommended that the chassis grounding screw (1.3) located on the rear of the UMH160UIG – be connected to the installation's rack, battery negative terminal, and/or earth ground.

2. 5. Checking Package and Accessories

- Base Unit x1
- Power cord x1
- Earth cord x1
- BNC cord x1
- BNC-RCA cord x2

2. 6. Maintenance

The UMH160UIG is virtually a maintenance-free piece of equipment. There are no user serviceable parts on the inside of the unit.

3. Operating the front panel

3. 1. UMH160UIG Front Panel Overview

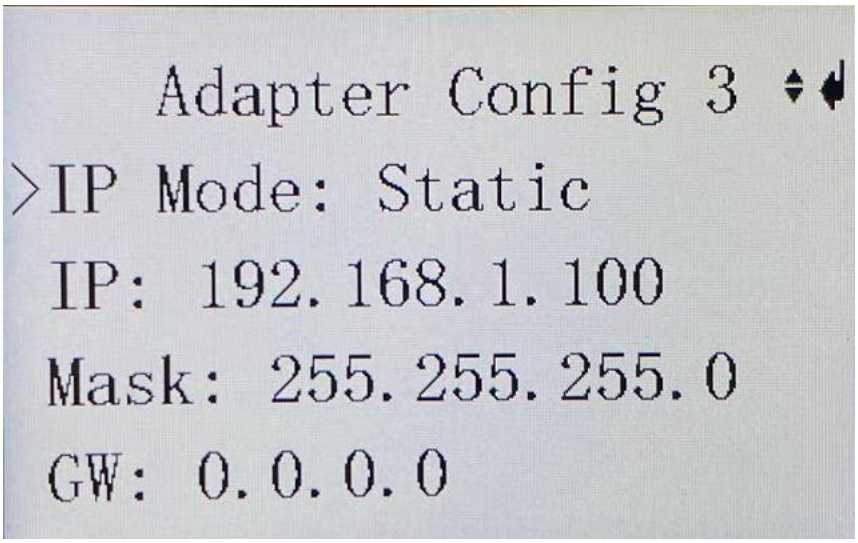
The UMH160UIG front panel allows the user to configure all settings that are present in the web interface using the buttons located on the front of the unit. The screen below is the idle screen of the UMH160UIG. This idle screen allows the user to view the incoming bitrate of the active input, which input is set to active, the management IP address of the unit and the service currently set to decode.

3. 2. UMH160UIG Network Setup via Front Panel

1. Bitrate of incoming stream displayed in Mbps.
2. Current active input.
3. IP address of management port.
4. Current decoded service.

The following figure shows a typical screen on the front panel. Several important features have been circled and noted below. These features are common to all screens and assist

when navigating, viewing and editing unit information. The MENU button allows the user to return to the home screen, cancel settings and go back a menu. In order to edit a selected parameter the OK button must be pressed. Once a parameter has been changed the OK button must be pressed again before the change takes effect on the unit.

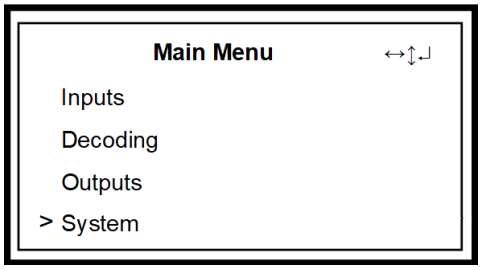


3. 3. UMH160UIG Management IP address via Front Panel

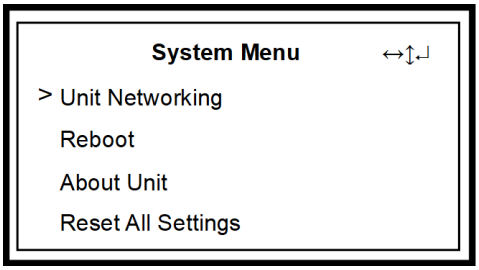
To setup the UMH160UIG with a **Static** IP address, use the following steps:

1. Press the OK button to “Main Manu”.

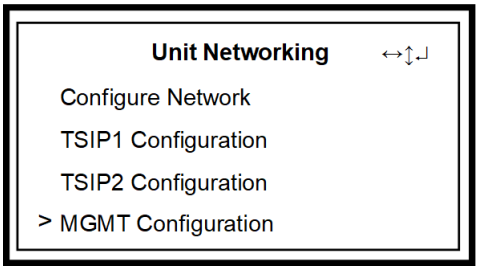
2. Use the ▲ and ▼ buttons to move the cursor to “System”



3. Use the ▲ and ▼ buttons to move the cursor to “Unit Networking”.

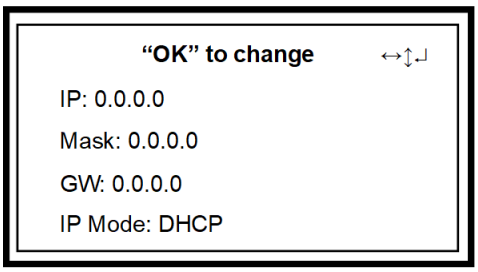


4. Use the ▲ and ▼ buttons to move the cursor to “MGMT configuration”



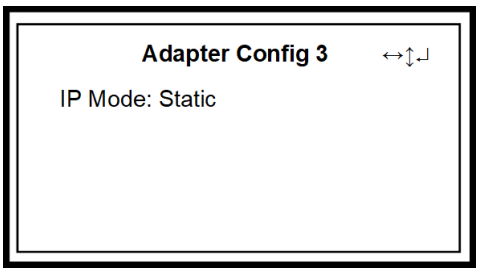
5. Press OK button to start the change mode.

6. Use the ▲ and ▼ buttons to move the cursor to “IP Mode”, press the OK button.



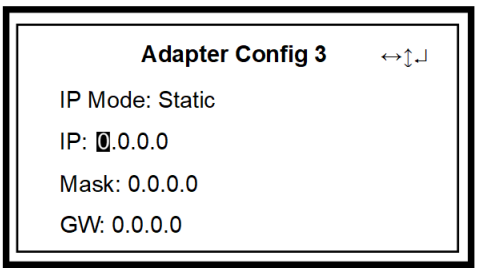
7. Press OK button to start the change mode

8. Use the ▲ or ▼ buttons to select “Static” and press OK button.



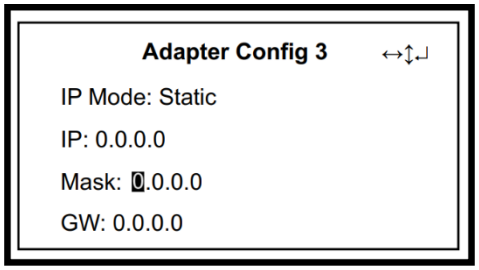
9. Use the ▼ buttons to move the cursor to “IP”, press OK button.

10. Use the ◄ and ► buttons to select the column to edit and use the ▲ and ▼ buttons to change the IP, then press the OK button.



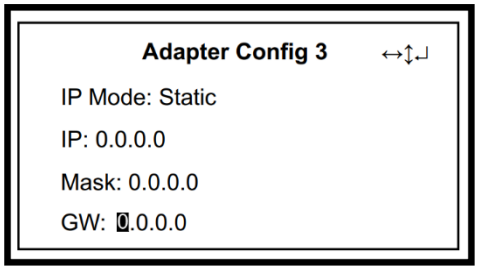
11. The cursor will now be on “Mask”.

12. Use the ◄ and ► buttons to select the column to edit and use the ▲ and ▼ buttons to change the Subnet Mask, then press the OK button.



13. The cursor will now be on “GW” which is gateway.

14. Use the ◄ and ► buttons to select the column to edit and use the ▲ and ▼ buttons to change the Gateway, then press the OK button.

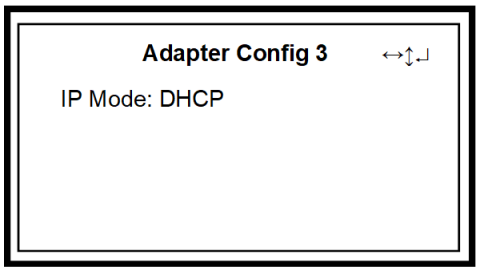


DHCP

The UMH160UIG can be configured to use DHCP to obtain an IP address/Subnet Mask/Gateway.

1. Use the ▲ and ▼ buttons to move the cursor to “IP Mode”, press the OK button.

2. Use the ▲ or ▼ buttons to select “DHCP” and press OK button to save the selection.



4. Operating the Web Interface

4. 1. UMH160UIG Web Interface Overview

4. 1. 1. Logging into the UMH160UIG Web Interface

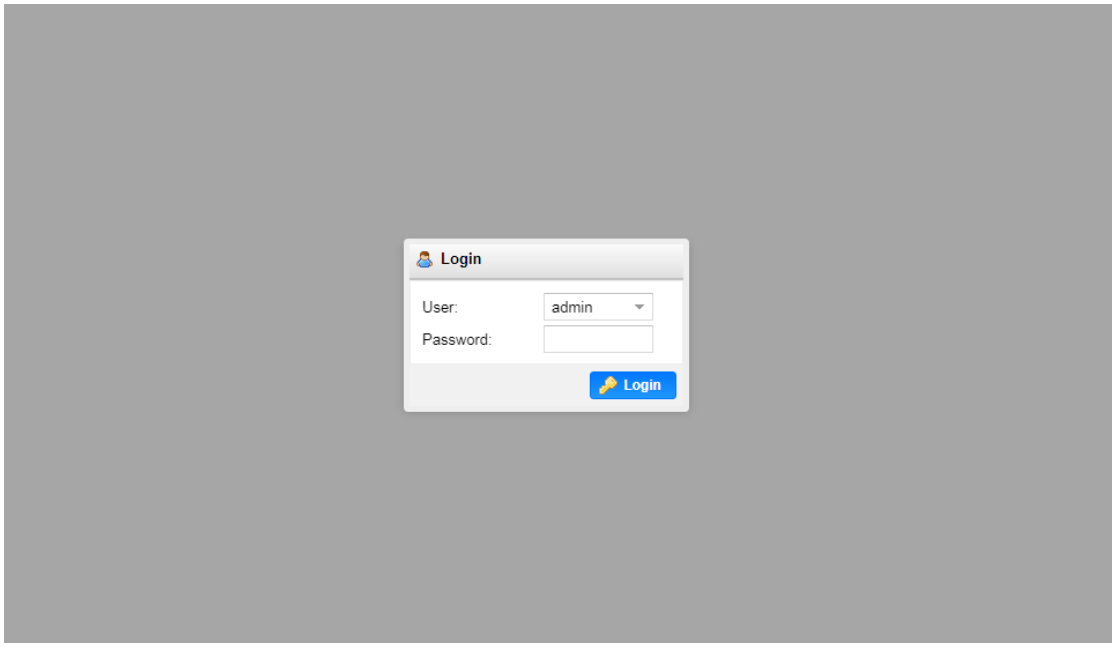
The user will need to login to the web interface. Press the login button in order to login to the web interface.

Default Credentials

IP address:10.0.0.74

Username: admin

Password: mpeg101



4. 1. 2. Hiding Unused Inputs

The UMH160UIG web interface allows the user to hide inactive inputs using the 

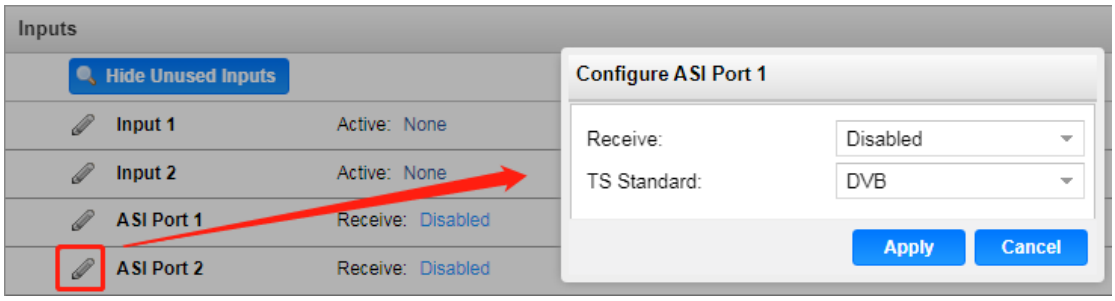
button or show all available inputs by click the 

button. Only the inputs configured as the Primary Input and Backup Input will be displayed when unused inputs are hidden.

4. 1. 3. Buttons and Status Indicators

When the  button is shown user configuration is available. Clicking this button will open

menus where settings can be changed by the user.



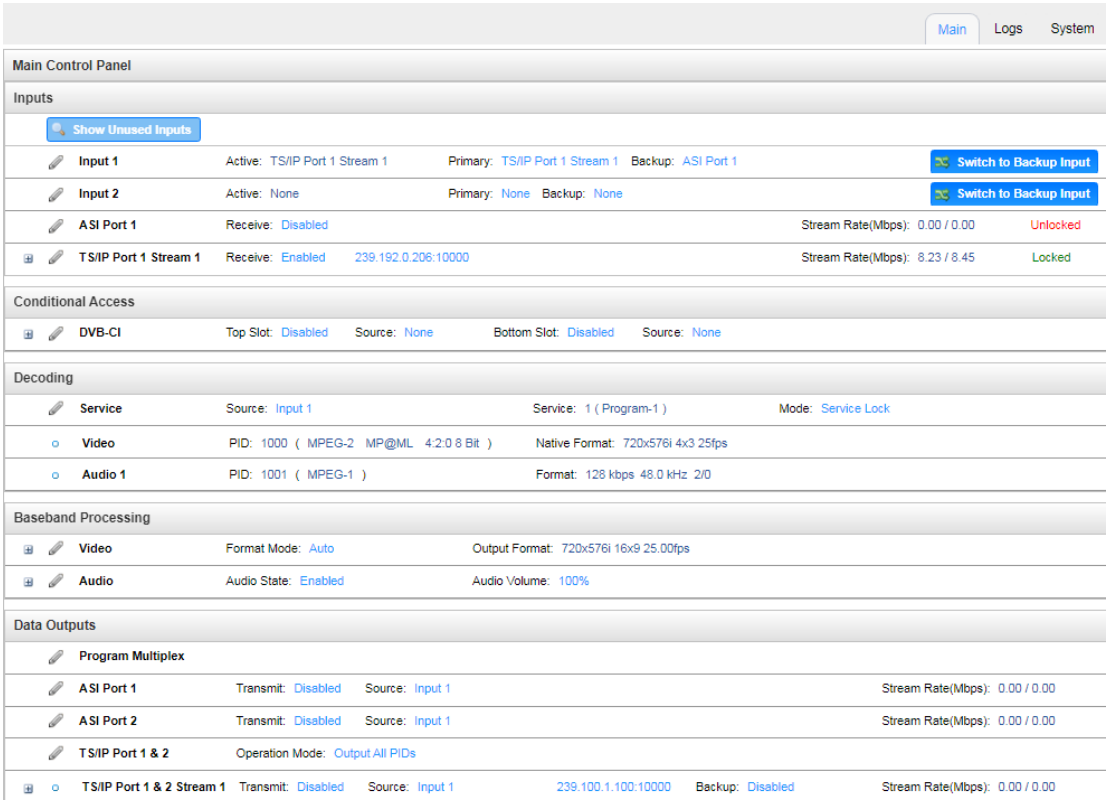
When the ⊞ icon is shown additional status information can be viewed. Click this button will expand the menu to display the additional status information.

Status in the UMH160UIG web interface is shown with LED status indicators:

Green LED	Status is good. No errors are present and function is operating normally.
Red LED	Status indicates function is affected by active error. To view the errors navigate to Alarms panel to view Active Errors
Gray LED	Status is inactive. Function is currently disabled or unavailable

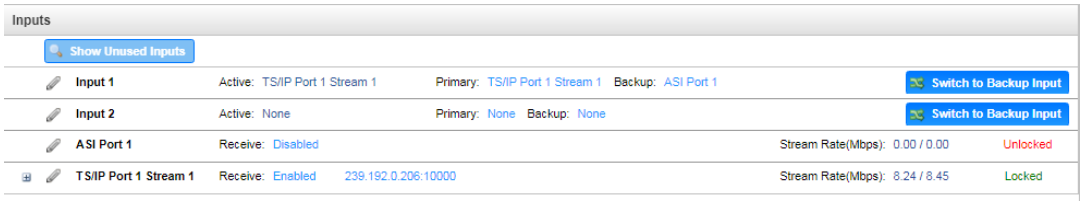
4. 2. **Main panel**

The Main panel of the UMH160UIG web interface is used to configure the unit to decode, de-encapsulate and demodulate. When configuring the UMH160UIG the user begins at the top of the menu and works down. The inputs are configured, then descrambling (if present), then service or PIDs are selected for decode, then outputs are configured. Pictured below is a fully populated unit with all options licensed.

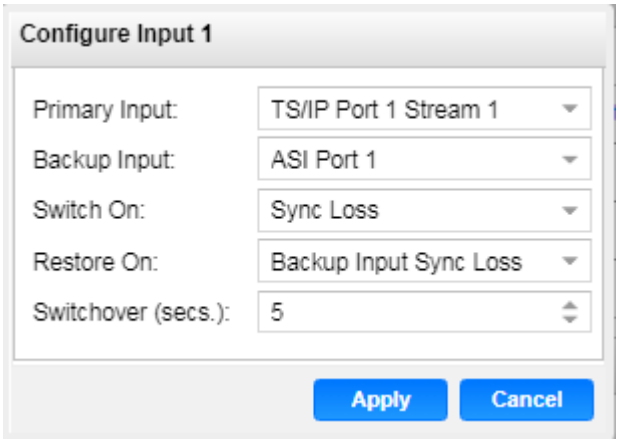


4.2.1. Configuring Active Inputs

This menu allows the user to configure a primary and backup input. In case there is an input failover the UMH160UIG is capable of detecting the failed state and switching to a secondary backup input in order to provide a continuous output. Which input is primary and backup, how the inputs switchover and restore and switchover timing is all user configurable. The user can force the UMH160UIG to switch between the Primary and Backup Inputs by clicking the Switch to button. To change the active input and failover settings click the button next to Input Selection:



Active Input Indicator



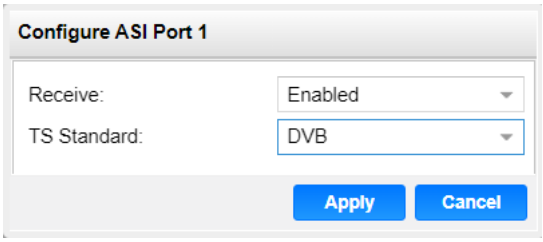
General options for Input 1 configuration

Setting	Range	Description
Primary Input	DVB-S2X Port1 DVB-S2X Port2 ASI Port1 ASI Port2 TS/IP Stream 1 TS/IP Stream 2 TS/IP Stream 3 TS/IP Stream 4 Network protocol	Used for both normal operation and input failover settings. During normal operation this input will be the active input. Note: Depending on the tuner module that is installed, the menu will change to reflect the applicable input type.
Backup Input	DVB-S2X Port1 DVB-S2X Port2 ASI Port1 ASI Port2 TS/IP Stream 1 TS/IP Stream 2 TS/IP Stream 3 TS/IP Stream 4 Network protocol	During failover operation this input will become the active input. The catalyst for what causes the unit to switch to this input is configured in the following setting. Note: Depending on the tuner module that is installed, the menu will change to reflect the applicable input type.

Switch On	Manual Only TS Sync Loss	Manual Only: the unit will not switch inputs automatically. The user must manually switch inputs. TS Sync Loss: the UMH160UIG will switch from the primary to the backup input if the primary stream loses synchronization for the duration of the Switchover Interval.
Restore On	Manual Only Primary Input Restored Backup Input Sync Loss	Manual Only: the unit will not restore to the primary input automatically. The user must manually switch inputs. Primary Input Restored: the UMH160UIG restores to primary when the Primary input regains transport stream synchronization. Backup Input Sync Loss: the unit will switch from back to primary when the backup stream loses synchronization for the duration of the Switchover interval.
Switchover(secs)	1-20 seconds	The time in seconds which Switch On or Restore On value must remain in the configured state before the UMH160UIG switches between the Primary Input and Backup Input or vice versa.

4.2.2. Configuring ASI Input

This menu allows the user to either Enable or Disable the ASI Input on the UMH160UIG. After ASI is enabled, the user need to select the corresponding TS standard, DVB or ATSC.

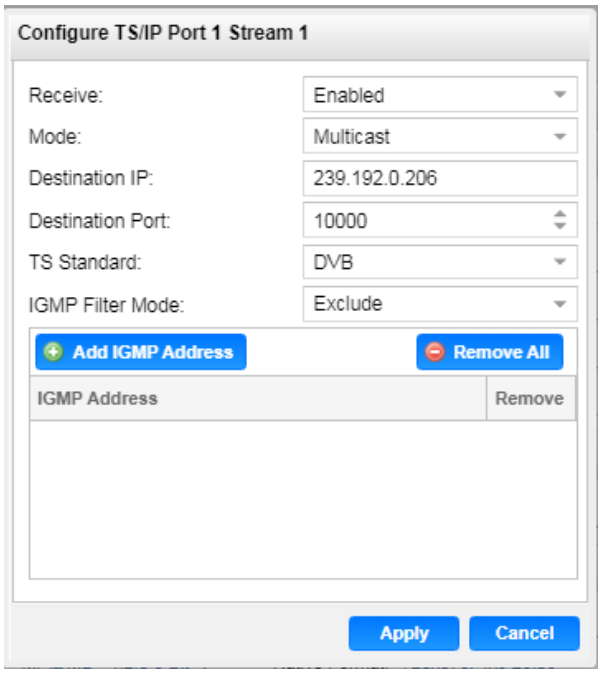


General options for ASI input

Setting	Range	Description
Receive	Enabled Disabled	This setting allows the user to enable or disable these input stream settings.
TS Standard	DVB ATSC	This setting allows the user to select the TS standard for input stream.

4.2.3. Configuring TS/IP Input

This menu allows the user to configure the TS/IP inputs. There are two ports that can be set to receive and/or transmit. This menu is for setting up the reception of TS/IP unicast or multicast transport streams. The menu for Stream 1 and 2 have the same settings. IGMPv2 is used to join/leave multicast streams by default if no IGMP Filter addresses are entered. If IGMP Filter Mode addresses are specified then IGMPv3 is used.



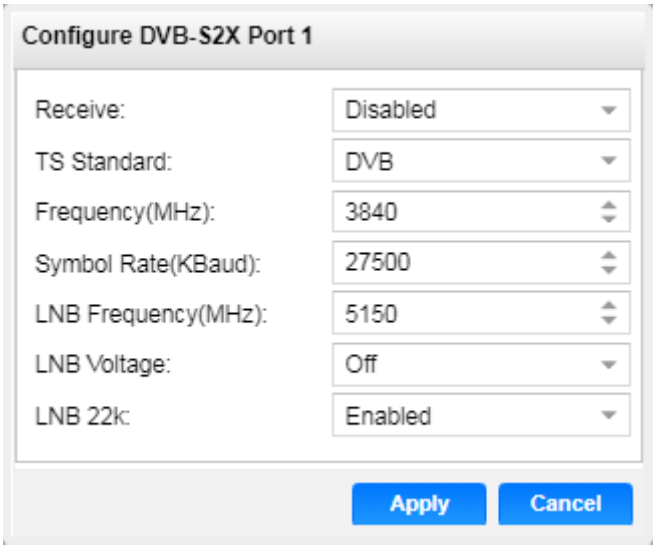
General options for TS/IP Input

Setting	Range	Description
Receive	Enabled Disabled	This setting allows the user to enable or disable these input stream settings.
Mode	Multicast Unicast	Multicast setting allows the unit to receive multicast streams. Multicast streams originate from the IP range 224.0.0.0 – 239.255.255.255. Unicast allows the unit to receive unicast streams. Unicast streams originate directly from a source device.
Destination IP	224.0.0.0 – 239.255.255.255	This setting is only available when receiving a multicast stream. This address is the IP address the source device is sending to.
Destination Port	0-65535	This is the UDP port the source device is sending to. This is the only setting required to receive a unicast stream.
TS Standard	DVB ATSC	This setting allows the user to select the TS standard for input stream.
IGMP filter Mode	Exclude Include	Used on networks supporting IGMPv3. If this setting is set to Exclude any streams originating from the user defined IP addresses will be rejected. If this setting is set to Include any streams originating from the user defined IP addresses will be received.

4.2.4. Configuring DVB-S/S2/S2X Input

If the DVB-S/S2/S2X tuner was selected as a factory installed option, the following menus and options will be available for configuration. This menu allows the user to configure the DVB-S/S2/S2X inputs. The tuner will automatically detect modulation and

symbol rate during signal acquisition. LNB Power configuration for this input card is configured in the DVB-S/S2/S2X menu.



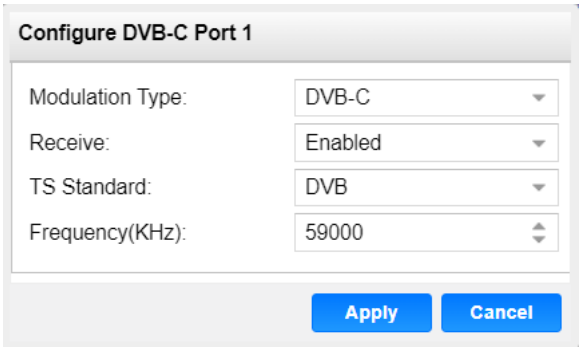
Configuration of DVB-S2X

Setting	Range	Description
Receive	Disabled Enabled	This setting allows the user to enable or disable this input stream.
TS Standard	DVB ATSC	This setting allows the user to select the TS standard for input stream.
Frequency(MHZ)	0-14500	This setting allows the user to enter the satellite frequency.
Symbol Rate(KBaud)	1000-45000	This setting allows the user to enter the symbol rate.
LNB Frequency(MHZ)	0-13550	The offset in MHz that the local oscillator is operating. Set to the LNB frequency when you want to enter the satellite frequency in Frequency field.

LNB Voltage	OFF 13V 18V	The UMH160UIG has the ability to provide the necessary voltage to power an LNB. Select the correct voltage to supply to the LNB.
LNB 22k	Enable Disable	Enabling or disabling the 22khz tone allows the UMH160UIG to trigger the LNB to switch polarities.

4.2.5. Configuring DVB-C Input

If the DVB-C tuner was selected as a factory installed option, the following menus and options will be available for configuration. This menu allows the user to configure the DVB-C inputs. This menu is for setting up the reception of DVB-C cable signal or DTMB signal.



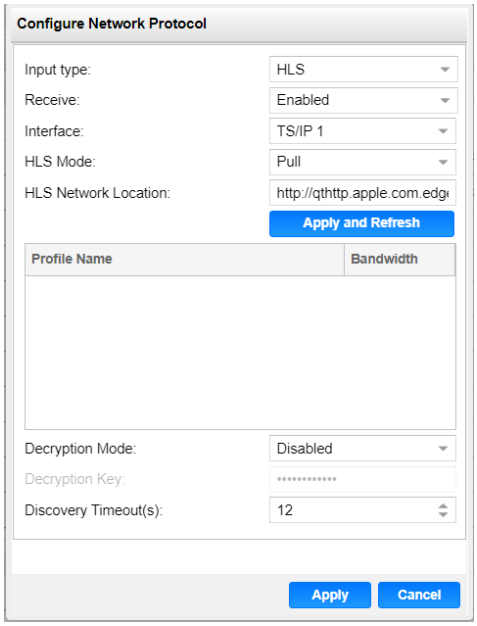
Setting	Range	Description
Modulation Type	DVB-C DTMB	This setting allows the user to choose between DTMB or DVB-C modulation schemes.
Receive	Disabled Enabled	This setting allows the user to enable or disable this input stream.
TS Standard	DVB ATSC	Defines the standard for the modulation input selected.
Frequency (KHz)	47000- 862000	This setting allows the user to enter the frequency of the input signal.

4. 2. 6. Configuring Network Protocol Input

This section describes how to configure Network Protocol input. Currently the UMH160UIG supports HLS input and SRT input.

Configuring HLS Input

This menu configures the HLS input for reception of HTTP/HTTPS streams. The HLS input may be configured to receive through a local or network location through the HLS mode setting.



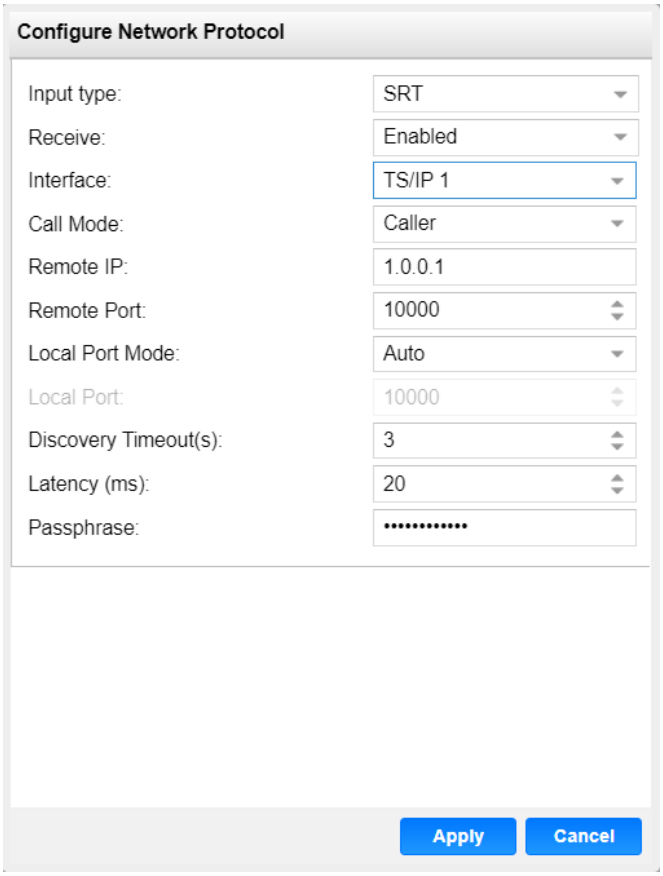
General options for HLS input

Setting	Range	Description
Receive	Disabled Enabled	This setting allows the user to enable or disable this input stream.
Interface	TS/IP 1 TS/IP 2	The physical connector on which to receive the HLS traffic.
HLS	Pull	Determines if the HLS receivers through a local or network location.

HLS Network Location	224.0.0.0- 239.255.255.255	Defines address of the HLS stream to be received.
Decryption Mode	Disabled AES128	Defines if a decryption of the received signal is needed, AES 128 standard.
Decryption Key	User Entry	Provides the key to allow signal processing if decryption is to be done.
Discovery Timeout	0(infinite) 1-100(seconds)	Defines the length of time to wait for the stream to be discovered.

Configuring SRT Input

This menu configures the reception of a SRT input. The SRT input can be configured to specify a caller, listener or rendezvous within the Call Mode selection drop down.

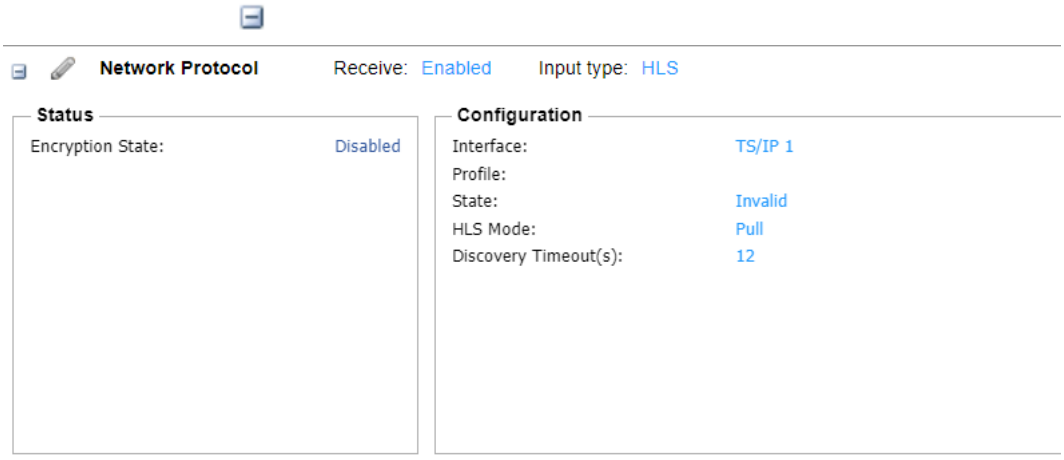


General options for SRT input

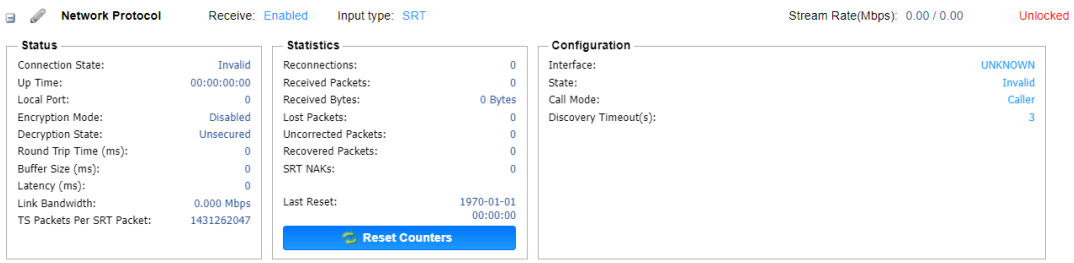
Setting	Range	Description
Receive	Disabled Enabled	This setting allows the user to enable or disable this input stream.
Interface	TS/IP 1 TS/IP 2	The physical connector on which to receive the HLS traffic.
Call Mode	Caller Listener Rendezvous	Defines the ‘handshake’ mechanism to be used when establishing connection.
Remote IP	224.0.0.0-239.255.255.255	Defines the IP address of the stream on the remote device.
Remote Port	0-65535	Defines the port of the stream on the remote device.
Local Port Mode	Auto Manual	In Auto Mode the local port number will be assigned. In Manual Mode the local port number will be defined by the user.
Local Port	1-65535	Defines local port number.
Discovery Timeout	0(infinite) 1-100(seconds)	Defines the length of time to wait for the stream to be discovered.
Latency	1-8000(ms)	Defines buffer size in milliseconds.
Passphrase	10-79(characters)	Defines encryption passphrase.

Click the ⊞ icon by the Network Protocol input to view information about the incoming IP

stream. Clicking the icon will hide the IP statistics.



HLS Input



SRT Input

4.2.7. Configuring DVB-CI Descrambling

This section describes how to configure DVB-CI descrambling in the UMH160UIG. First, the user will need to configure the CAM slots and descrambling mode. Once this is completed the user can configure which services or PIDs to descramble.

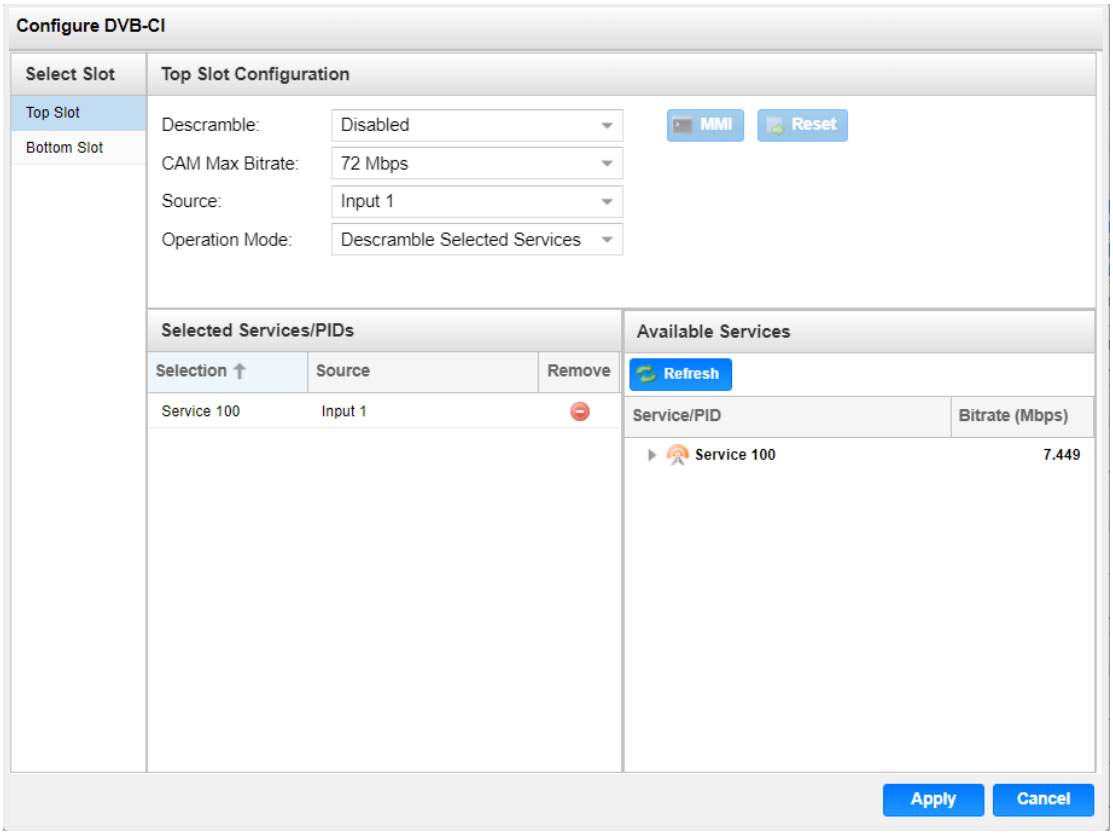
Configuring DVB-CI Slots

This menu allows the user to configure the DVB-CI slots in the UMH160UIG. The UMH160UIG has two DVB-CI slots, divided into top one and bottom one, where CAM Modules can be inserted. Both slots are individually configurable using the Bottom Slot and Top Slot tabs. CAM Modules can be reset manually using the Reset button. The MMI button opens the MMI (Man Machine Interface) for the CAM in the respective slot. MMI support is dependent on what is supported by the CAM.

Configuring Service Descrambling

This menu allows the user to select the service the UMH160UIG will descramble using the

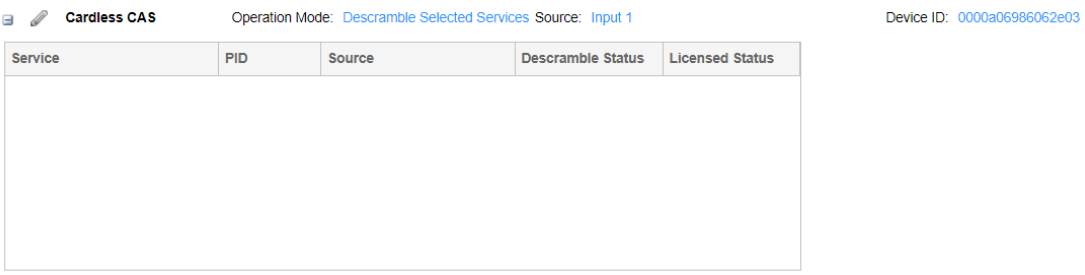
CAM modules and Smart Cards inserted into the DVB-CI slots. The drag and drop method can be used to drag services from the right column to the left column, The drop down menu next to each selected service allows the user to choose either the bottom or top slot to descramble the service. If in Descramble Selected Services mode, Services to descramble can be added manually by dragging the selected services from the right column to the left column. Clicking the Refresh button forces the UMH160UIG to rescan the transport stream for changes.



General options for DVB-CI descrambling

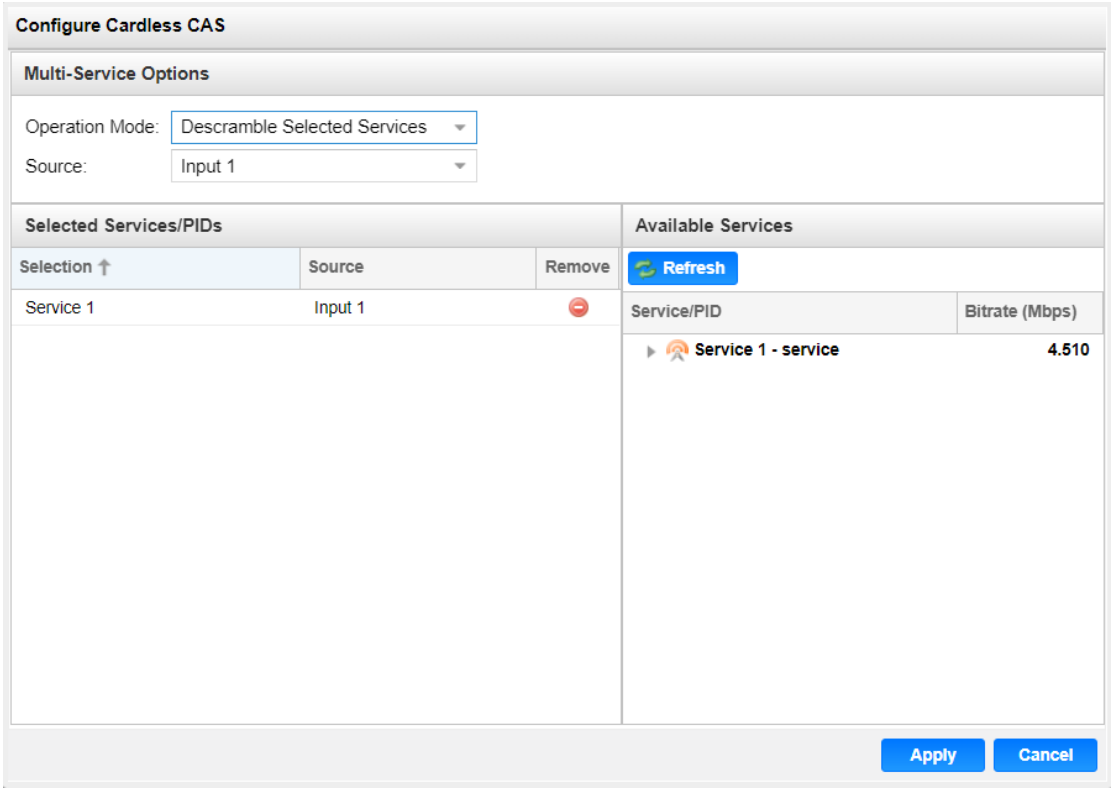
4. 2. 8. Configuring Cardless CAS Descrambling

This menu allows user to configure the Cardless CAS in the UMH160UIG. To use this feature, customer need to operate a complete CAS system. The Device ID at Cardless CAS is going to be the user device ID at the SMS system.



Configuring Service Descrambling

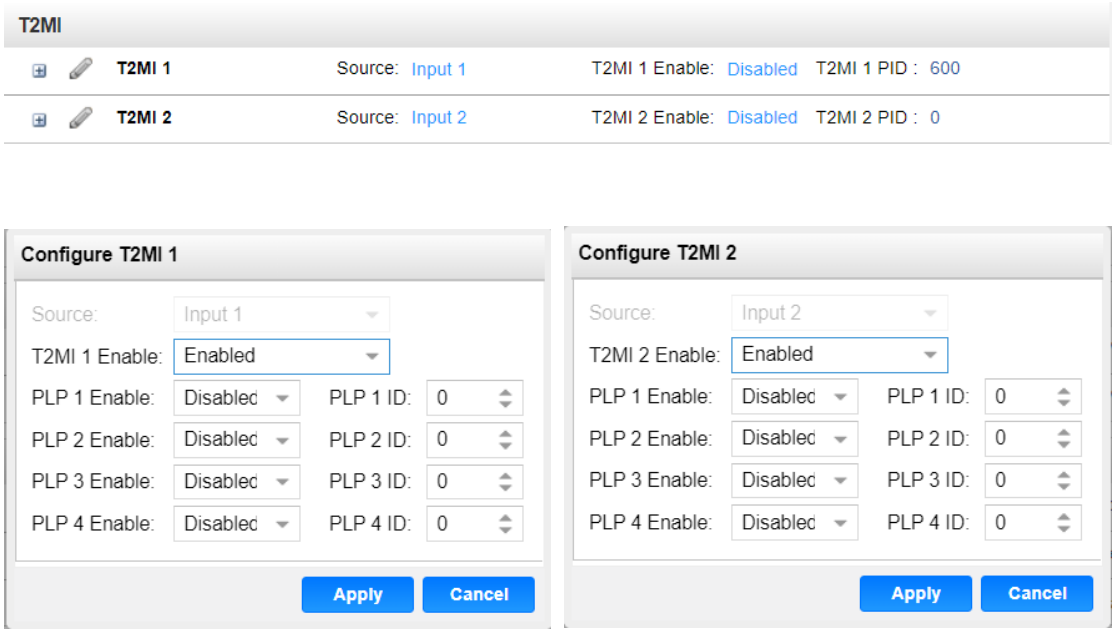
This menu allows the user to select the service the UMH160UIG will descramble using the CAS system. The drag and drop method can be used to drag services from the right column to the left column, The drop down menu next to each selected service allows the user to choose either the bottom or top slot to descramble the service. If in Descramble Selected Services mode, Services to descramble can be added manually by dragging the selected services from the right column to the left column. Clicking the Refresh button forces the UMH160UIG to rescan the transport stream for changes.



General options for Cardless CAS descrambling

4. 2. 9. **Configuring T2MI Decapsulation**

This menu allows the user to configure the T2MI Decapsulation for input stream. The T2MI 1 option corresponds to Input 1, while the T2MI 2 option corresponds to Input 2.



General options for T2MI decapsulation

Setting	Range	Description
T2MI 1/2 Enable	Disabled Enabled	This setting allows the user to enable or disable the T2MI decapsulation.
PLP 1 Enable	Disabled Enabled	This setting allows the user to enable or disable the Physical layer pipes 1.
PLP 1 ID	0-255	Defines the PLP 1 ID.
PLP 2 Enable	Disabled Enabled	This setting allows the user to enable or disable the Physical layer pipes 2.
PLP 2 ID	0-255	Defines the PLP 2 ID.
PLP 3 Enable	Disabled Enabled	This setting allows the user to enable or disable the Physical layer pipes 3.
PLP 3 ID	0-255	Defines the PLP 3 ID.

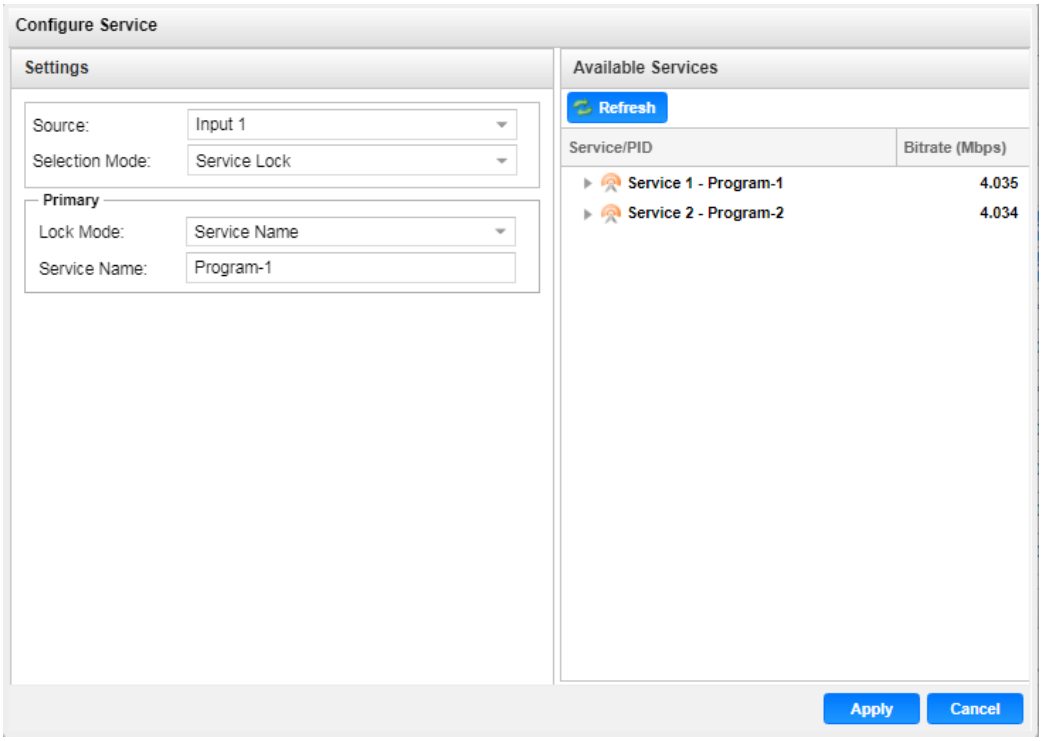
PLP 4 Enable	Disabled Enabled	This setting allows the user to enable or disable the Physical layer pipes 4.
PLP 4 ID	0-255	Defines the PLP 4 ID.

4. 2. 10. Configuring Service Selection

This menu allows the user to configure the PIDs or Service the UMH160UIG will decode. Depending on the Selection Mode that is set, the menu will change to reflect the applicable settings.

Service Lock

In Service Lock mode the UMH160UIG is set to decode a specified service number or service name. If the PIDs within the service change at any time, the UMH160UIG will continue to decode the service. The drag and drop method can be used to populate the Service Name or Service Number dialog boxes.

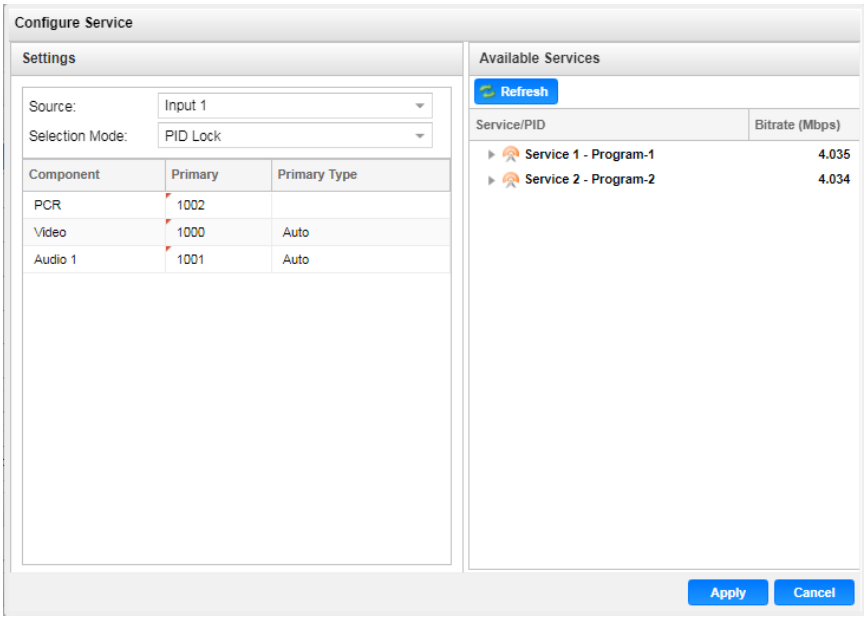


Service Lock Selection Menu

Setting	Range	Description
Source	Input1 Input2	Determines which input source to be decoded
Selection Mode	Service Lock PID Lock Auto Seek	Setting to Service Lock sets the unit to decode any PIDs associated with a service number or service name. Setting to PID Lock sets the unit to decode only the PIDs specified in the PID Lock Configuration matrix. Auto Seek mode will tune the unit to the first service listed in the PAT if a transport stream is present.
Lock Mode	Service Name Service Number	If set to Service Name the UMH160UIG will decode only services matching the name specified (SDT in DVB or TVCT in ATSC tables must be present in this mode). If set to Service Number, the UMH160UIG will decode only services matching the number specified.

PID Lock Mode

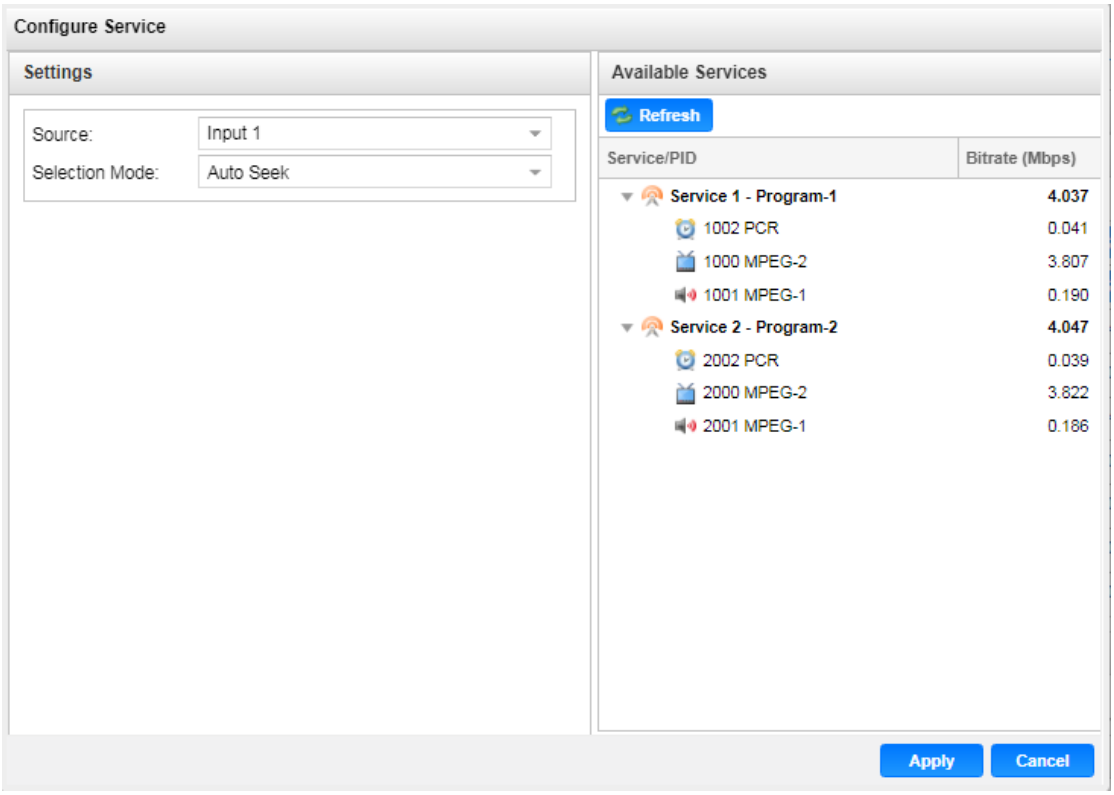
In PID Lock mode the UMH160UIG will only decode the PIDs specified by the user in the PID Lock Configuration matrix. The drag and drop method can be used to auto-populate the cells in the matrix.



PID Lock Selection Menu

Auto Seek Mode

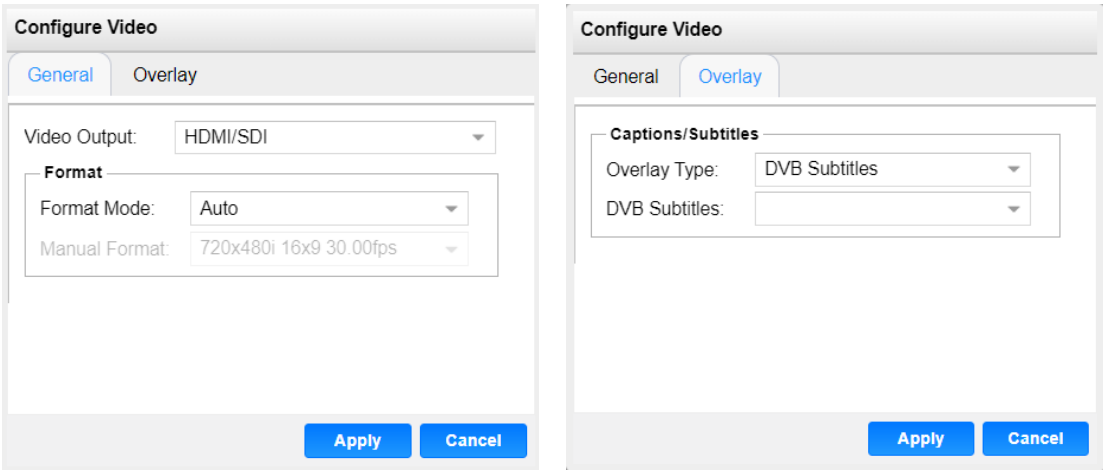
In Auto Seek mode the UMH160UIG will decode first service listed in the PAT. All PIDs will automatically be assigned and decoded. No other configurations are available in this mode. This mode should only be used to verify the UMH160UIG is receiving a valid signal and it able to decode. This mode is not recommended for a professional environment.



Auto seek selection menu

4. 2. 11. Configuring Video Services

This menu allows the user to configure the HDMI/SDI and Composite output formats of the UMH160UIG. Overlay function is configured in this menu as well.

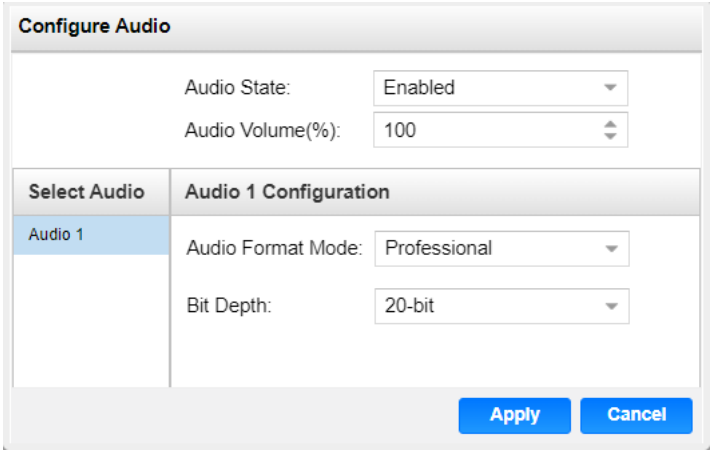


General and Overlay Options

Setting	Range	Description
Video Output	HDMI/SDI CVBS	Defines the video output interface.
Format Mode	Auto Manual	Setting to Auto the UMH160UIG will output video to match the incoming native video format. Setting to Manual the user can define the video format the UMH160UIG will output.
Manual Format		This setting is the video format the UMH160UIG will output.
Overlay Type	None DVB-Subtitles	Defines the Overlay Type. DVB Subtitles burns subtitles in video output.

4. 2. 12. Configuring Audio

This menu allows the user to configure the audio setting.



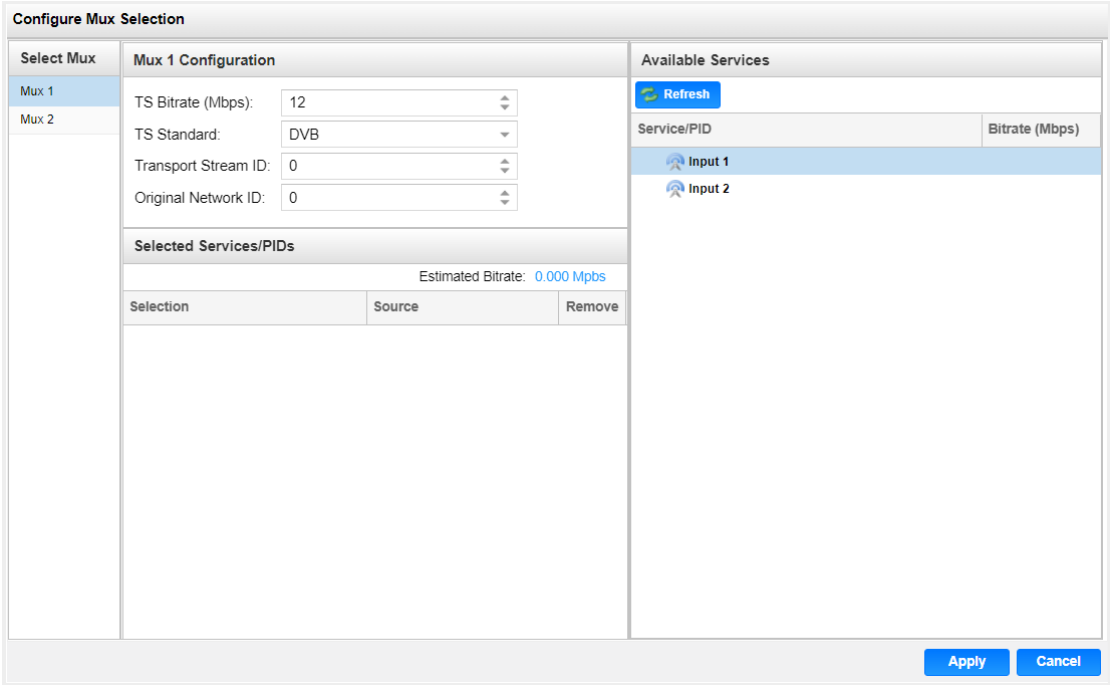
General options for Audio output

Setting	Range	Description
Audio State	Enabled Disabled	This setting allows the user to enable or disable audio output.

Audio Volume	0-100(%)	Defines the Volume of audio output
Audio Format Mode	Professional Consumer	This option selects the Dolby Digital format mode.
Bit Depth	20-bit 24-bit	This setting allows the AES bit-depth to be 20-bit or 24-bit

4. 2. 13. Configuring Program Multiplex

This menu allows the user to multiplex and output multiple programs they want. The user can create a new output TS by selecting and dragging one or more services from Input 1 and Input 2. The user can also configure a TS bitrate and stream information for each MUX stream. The menu for both MUX1 and MUX2 contain the same settings.

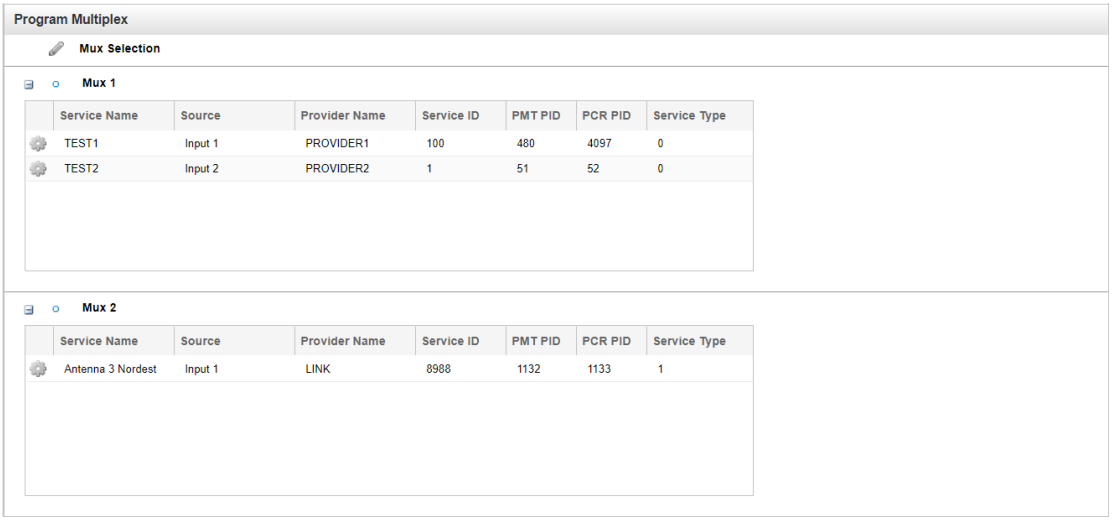


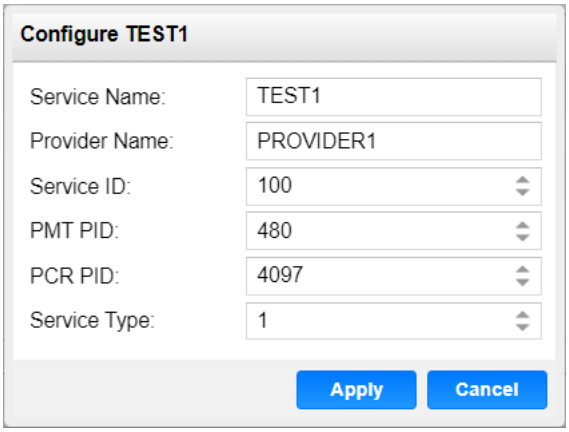
General options for program multiplex

Setting	Range	Description
Select MUX	Mux 1 Mux 2	Select which Mux to configure

TS Bitrate (Mbps)	0.25-160	Defines the TS Bitrate for the transport stream selected.
TS Standard	DVB ATSC	Defines the standard for the transport stream selected.
Transport Stream ID	0-65535	Defines the Transport Stream ID for the transport stream selected.
Original Network ID	0-65535	Defines the Original Network ID for the transport stream selected.

Click the icon by the Mux 1/2 to view information about the multiplexing services information. Click the button to edit the PSI table for the selected service. Clicking the icon will hide the information.



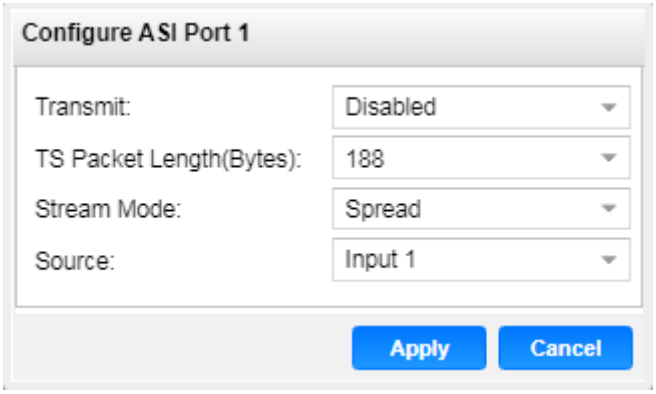


Configuring service information

Setting	Range	Description
Service Name	User Entry	Defines the Service Name for the service selected.
Provider Name	User Entry	Defines the Provider Name for the service selected.
Service ID	0-65535	Defines the Service ID for the service selected.
PMT PID	0-65535	Defines the PMT PID for the service selected.
PCR PID	0-65535	Defines the PCR PID for the service selected.
Service Type	0-255	Defines the service type for the service selected.

4. 2. 14. Configuring ASI Output

This menu allows the user to configure the ASI output of the UMH160UIG.

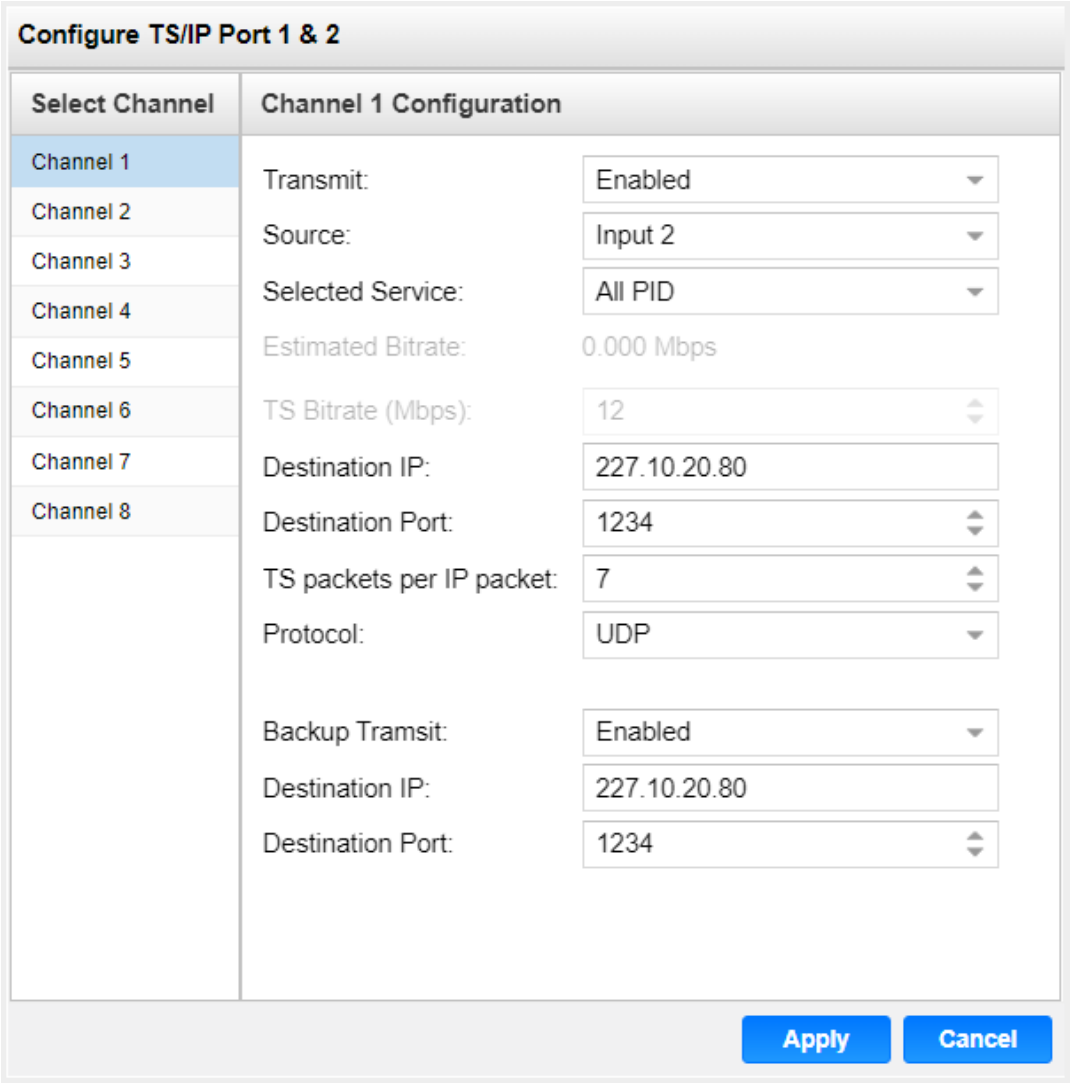


Configuring ASI Output

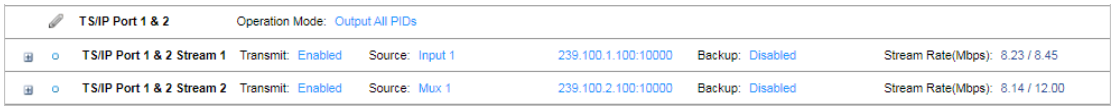
Setting	Range	Description
Transmit	Disabled Enabled	Enable or disable the ASI output port.
TS Packet Length(Bytes)	188 204	Defines the packet length of the output stream to be 188 or 204
Stream Mode	Spread Burst	Defines the stream mode to be Spread or Burst
Source	Input 1 Input 2 Mux 1 Mux 2	Input 1/2 will pass the incoming TS to the output without applying any BISS or DVB-CI decryption. Mux 1/2 will output the TS from program multiplex

4.2.15. Configuring TS/IP Output

This menu allows the user to configure the TS/IP outputs. Users can select all the programs they want to export or individual programs. The menu for Channel 1 through 8 will contain the same options.



Configuring TS/IP Output



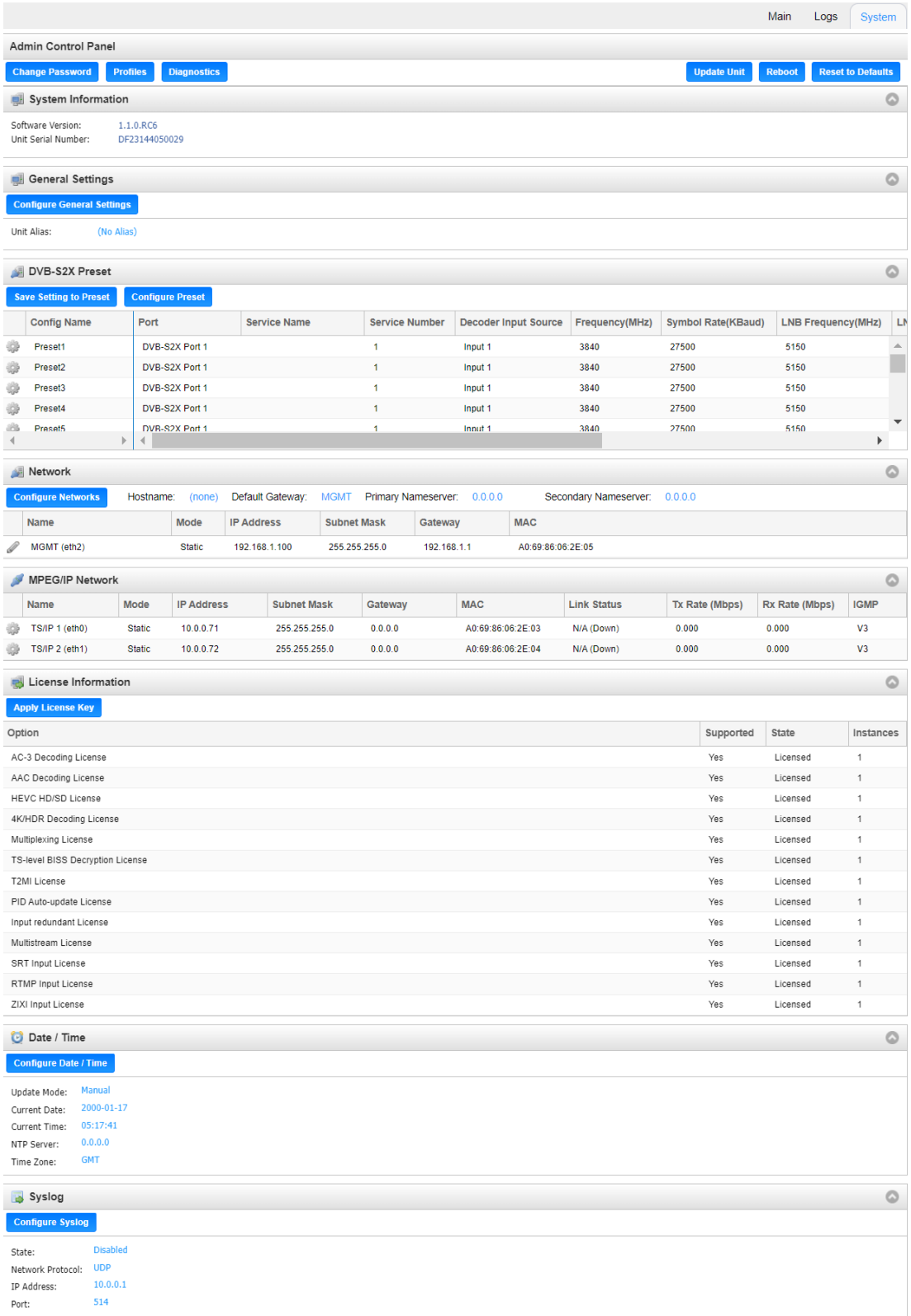
The output state of the two channels

Setting	Range	Description
Select Channel	Channel 1 to 8	Defines the IP output channel
Transmit	Enabled Disabled	Enable or disable the IP output channel.
Source	Input 1 Input 2 Mux 1 Mux 2	Input 1/2 will pass the incoming TS to the output without applying any BISS or DVB-CI decryption. Mux 1/2 will output the TS from program multiplex
Select Service	All PID Services X	Setting to All PID the UMH160UIG will output all the services in the selected source. Or the user can select a single service in the source to output.
Estimated Bitrate		The estimated bitrate of the selected service.
TS Bitrate	25 to 160	Defines the TS Bitrate for the transport stream selected.
Destination IP	0.0.0.0-255.255.255.255	When sending to a unicast address the destination IP address must match the receiving device's IP address. When sending a multicast to the address must be sent within the multicast IP range.
Destination Port	1025-65535	When sending to a unicast address, the destination port must match the receiving device's port. When sending a multicast, any port within the accepted range can be used.

TS Packets Per IP Packet	1-7	The number of TS packets that are contained with a single IP packet. Default is 7. Lowering this value below default increases network overhead.
Protocol	UDP RTP	Sets the Encapsulation to UDP or RTP.
Backup Transmit	Enabled Disabled	Enable or disable the backup IP output. Setting to Enabled, the transport stream will output via TS/IP port 2.
Destination IP	0.0.0.0-255.255.255.255	When sending to a unicast address the destination IP address must match the receiving device's IP address. When sending a multicast to the address must be sent within the multicast IP range.
Destination Port	1025-65535	When sending to a unicast address, the destination port must match the receiving device's port. When sending a multicast, any port within the accepted range can be used.

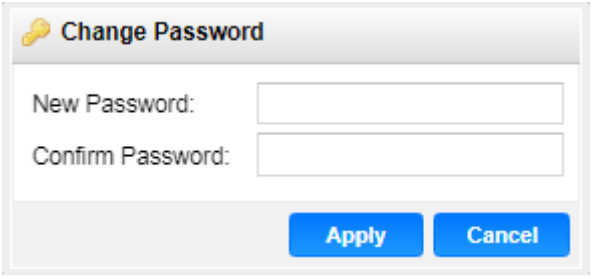
4. 3. **System Panel**

To access the System Panel, click on the System tab. This menu allows the user to control many aspects of the UMH160UIG.



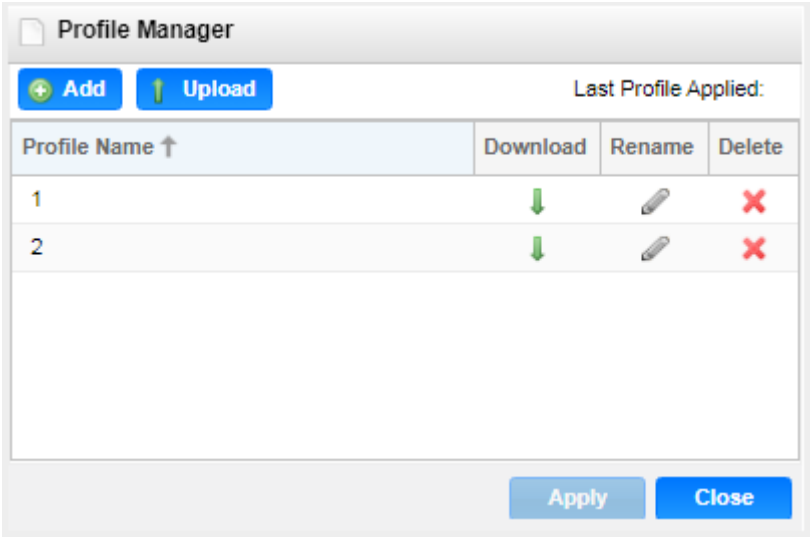
4.3.1. Changing Unit Password

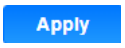
The UMH160UIG can be assigned an access password and the current access password can be changed. In order to make changes to passwords, click the Change Password button. A window will appear to enter the current password and new password.



4.3.2. Profiles

The UMH160UIG has the ability to save all configured settings to multiple profiles. Profiles can be saved locally, renamed and saved to external storage to be used on other UMH160UIGs. Profiles can be used to quickly and easily change the configuration of an UMH160UIG to suit different inputs and decoding requirements.

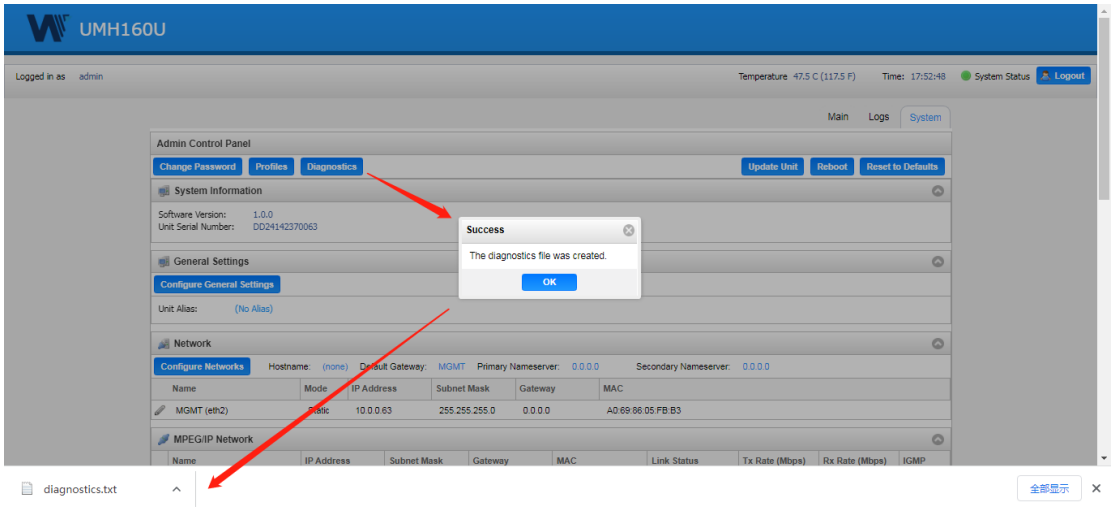


Add 	Adds a new profile from current settings. User must name profile before creation is complete.
Upload 	Allows the user to browse to external storage or workstation to upload profile to UMH160UIG
Download 	Select a profile from the drop down menu and click this button. The user will be prompted to select a directory to download the profile.
Rename 	Select a profile from the drop down menu and click this button. The user will be prompted for a new name for the profile.
Delete 	Select a profile from the drop down menu and click this button. The user will be prompted to confirm deletion of the profile.
Apply Profile 	Select a profile from the drop down menu and click this button. The UMH160UIG will apply all settings contained in the profile selected.

4.3.3. Diagnostics

The UHM160UIG provides the user the ability to take a snapshot of all current unit settings, reported values, active alarms, and the alarm and log file history. This snapshot will be downloaded as a .TXT format file that can be sent to Wellav for analysis.

Click the ‘Diagnostics’ button and a window will open showing the diagnostic file creation progress. This window is replaced with a download file window when file creation is complete. The user will be asked to ‘Open’ or ‘Save’ the file.

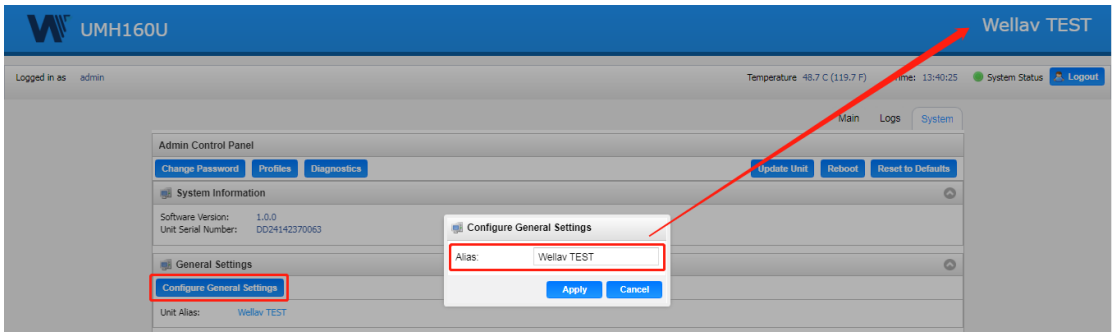


4. 3. 4. System Information

The user is able to check the software versions currently installed and the serial number of the unit.

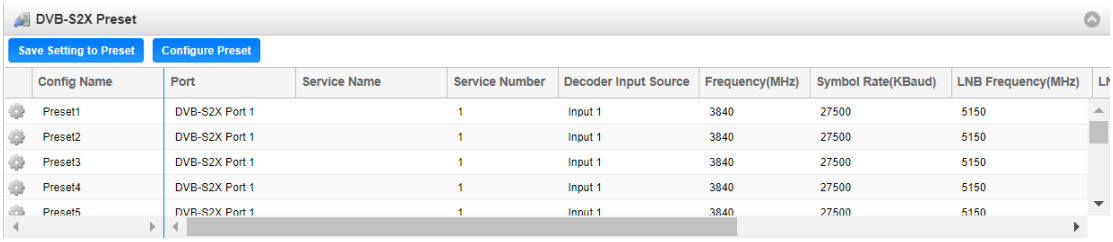
4. 3. 5. General Settings

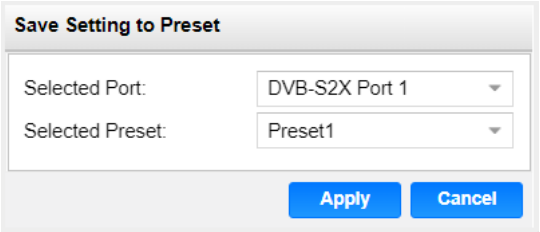
The UMH160UIG can be assigned an alias which is displayed in the upper right-hand corner of the web interface. The alias can help define which UMH160UIG the operator is currently logged into.



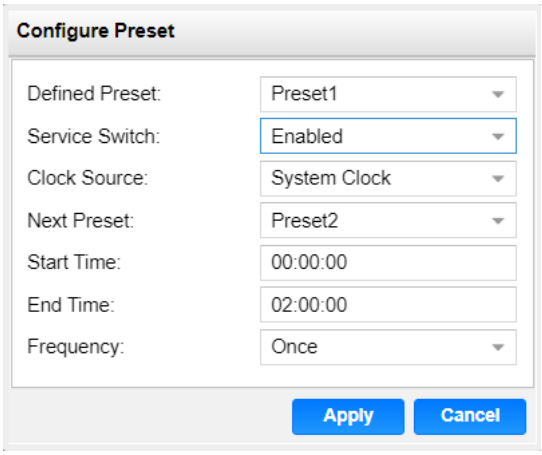
4. 3. 6. DVB-S2X Preset

If the DVB-S2X tuner module was installed, the following menus and options will be available for configuration. This menu allows the user to configure the preset parameters for DVB-S2X signal. Click **Save Setting to Preset** button to save your current setting to the preset selected. Click **Configure Preset** to configure the Preset switching conditions.



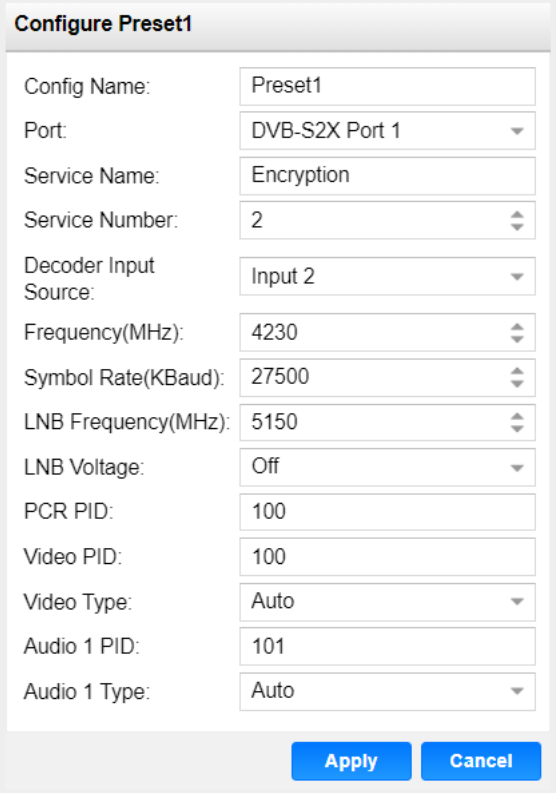


Setting	Range	Description
Select Port	DVB-S2X Port1 DVB-S2X Port2	Defines which port's configuration will be saved to the Preset.
Select Preset	Preset 1 to 20	Defines the Preset name the configuration will be saved to.



Setting	Range	Description
Defined Preset	Preset 1 to 20	Defines the current Preset name
Service Switch	Enabled Disabled	This setting allows the user to enable or disable the Service Switch.
Clock Source	System Clock Input 1 Input 2	Setting to System Clock the UMH160UIG will refer to its system time configured at Date/Time section. Setting to Input 1/2 the UMH160UIG will refer to the TOT/TDT table in the transport stream of Input 1/2.
Next Preset	Preset 1 to 20	Defines the next preset selected.
Start Time	00:00:00 to 23:59:59	Defines the start time of switching from the current preset to the next preset.
End Time	00:00:00 to 23:59:59	Defines the end time of switching from the current preset to the next preset.
Frequency	Once Every Day	Setting to Once the UMH160UIG will only perform the service switch once. Setting to Every Day the UMH160UIG will perform the service switch every day.

Click the  button to edit the configuration of the Preset selected. The menus for Preset 1 through Preset 20 all contain the same settings.

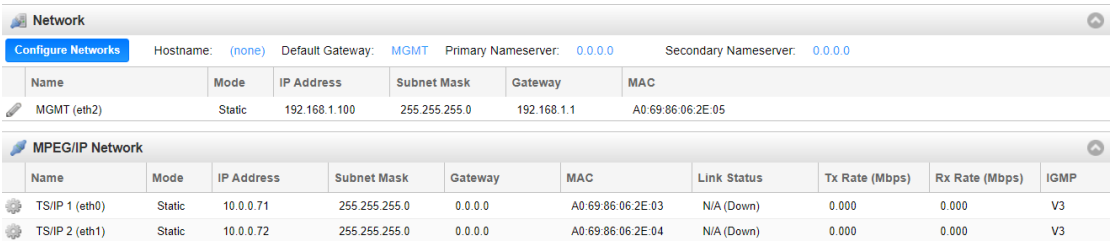


Setting	Range	Description
Config Name	User Entry	Set a name for the selected Preset
Port	DVB-S2X Port 1 DVB-S2X Port 2	Defines the DVB-S2X port the UMH160UIG will use to receive the signal.
Service Name	User Entry	This setting allows the user to enter the service name that UMH160UIG will decode.
Service Number	User Entry	This setting allows the user to enter the service number that UMH160UIG will decode. It should match the service number of the preset service.

Decoder Input Source	Input 1 Input 2	The setting allows the user to select the Decoder Input Source. The source should match the DVB-S2X port set in 'Port'.
Frequency (MHz)	0-14500	This setting allows the user to enter the satellite frequency.
Symbol Rate (KBaud)	1000-45000	This setting allows the user to enter the symbol rate.
LNB Frequency(MHz)	0-13550	The offset in MHz that the local oscillator is operating. Set to the LNB frequency when you want to enter the satellite frequency in Frequency field.
LNB Voltage	OFF 13V 18V	The UMH160UIG has the ability to provide the necessary voltage to power an LNB. Select the correct voltage to supply to the LNB.
PCR PID	0-8191	This setting allows the user to enter the PCR PID. It should match the PCR PID of the preset service.
Video PID	0-8191	This setting allows the user to enter the Video PID. It should match the Video PID of the preset service.
Video Type	Auto	The UMH160UIG will automatically detect the video type of the preset service.

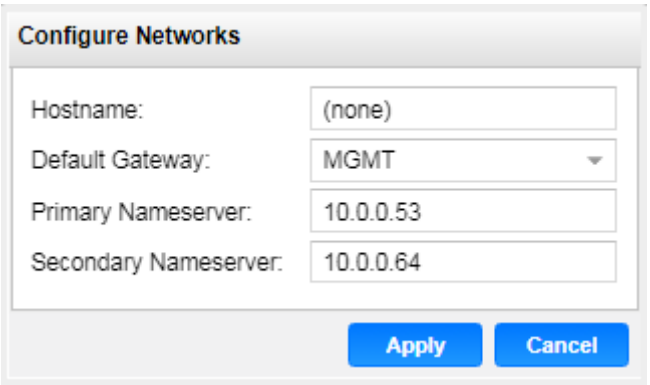
Audio 1 PID	0-8191	This setting allows the user to enter the Audio 1 PID. It should match the Audio 1 PID of the preset service.
Audio Type	Auto	The UMH160UIG will automatically detect the audio type of the preset service.

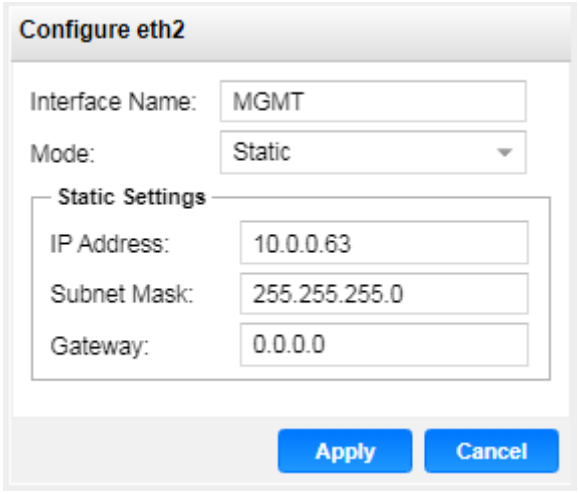
4. 3. 7. Unit Network Configuration



The management port of the UMH160UIG can be configured on the web interface. To make changes to the management port click, the  button under the Unit Network Configuration section. Domain name servers can be configured on the UMH160UIG clicking the Configure Networks button. IP address and web address entries are accepted as Nameserver addresses.

NOTE: Exercise extreme caution when performing changes to this menu as network communication can be lost with the UMH160UIG.



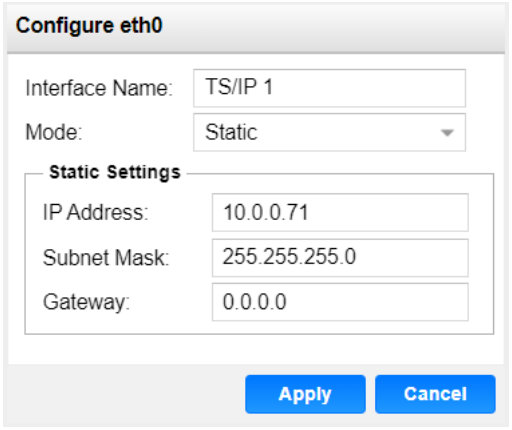


Setting	Range	Description
Hostname	User Entry	This setting allows the user to define an optional unit Hostname.
Mode	Static DHCP	Setting to DHCP will allow the network assign an IP address automatically to the UMH160UIG (if supported). Setting to Static allows the user to manually define all IP settings for the management port.
IP Address	1.0.0.0-126.0.0.0 128.0.0.0- 191.255.0.0 192.0.1.0- 223.255.255.0	This option is only available if Static Mode is set. This is the IP address assigned to the management port.
Subnet Mask	255.0.0.0 – 255.255.255.254	This option is only available if Static Mode is set. This is the Subnet Mask assigned to the management port.

Gateway	1.0.0.0-126.0.0.0 128.0.0.0- 191.255.0.0 192.0.1.0- 223.255.255.0	This option is only available if Static Mode is set. This is the Gateway address assigned to the management port.

MPEG/IP Network Configuration

This menu allows the user to configure the network for two data ports. Click the  button under the MPEG/IP Network Configuration next to the corresponding port. The settings for both ports are the same.



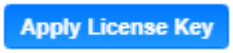
Setting	Range	Description
Interface Name	User Entry	This setting allows the user to define an interface name for the ethernet port selected.
Mode	Static DHCP	Setting to DHCP will allow the network assign an IP address automatically to the UMH160UIG (if supported). Setting to Static allows the user to manually define all IP settings for the management port.
IP Address	1.0.0.0- 126.0.0.0	This option is only available if Static Mode is set. This is the IP address assigned to the

	128.0.0.0-191.255.0.0 192.0.1.0-223.255.255.0	management port.
Subnet Mask	255.0.0.0 – 255.255.255.254	This option is only available if Static Mode is set. This is the Subnet Mask assigned to the management port.
Gateway	1.0.0.0-126.0.0.0 128.0.0.0-191.255.0.0 192.0.1.0-223.255.255.0	This option is only available if Static Mode is set. This is the Gateway address assigned to the management port.

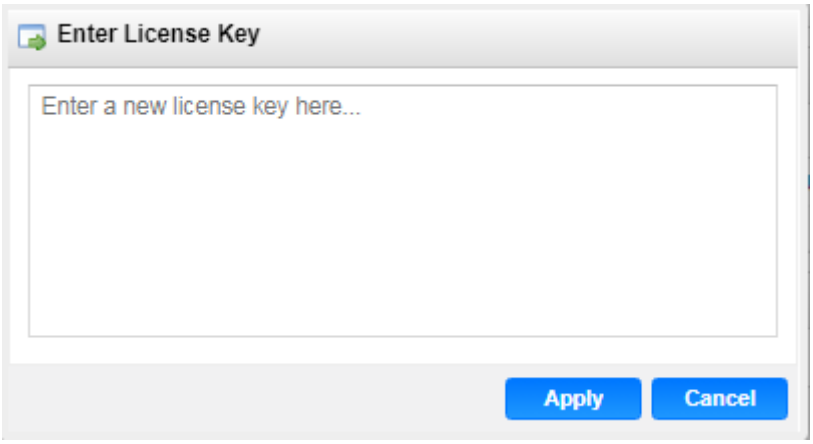
4.3.8. License Information

Certain features of the UMH160UIG require licenses in order to be functional. The interface displays all licenses available as well as the following status:

- License Locked or Unlocked
- License is Supported or Unsupported by the installed hardware

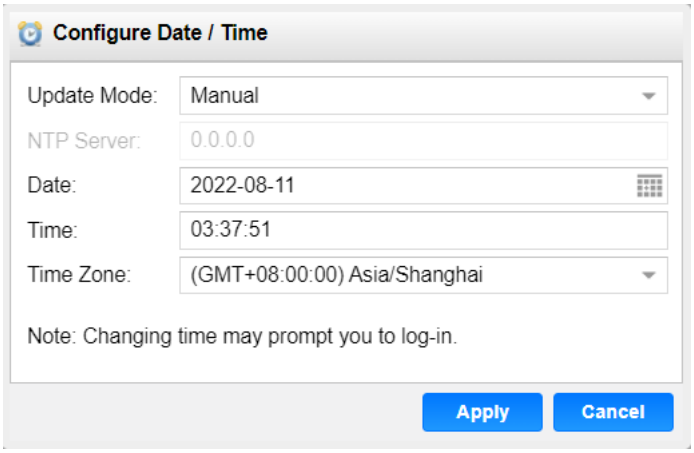
If licenses need to be applied to the UMH160UIG click 

button. The menu below will appear where the user can copy and paste the provided license key from Wellav.



4. 3. 9. Data/Time

The UMH160UIG can be set to synchronize with an NTP server or a manual date and time can be defined by the user. Click the Configure Date / Time button to configure the date and time. These values are used to timestamp entries in the Alarm and Event logs under the Reporting tab.

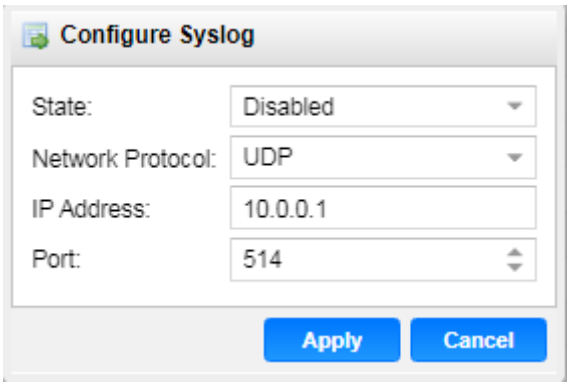


Setting	Range	Description
Update Mode	NTP Manual	Setting to NTP uses the local network's NTP server to synchronize date and time. Manual allows the user to define a data and time.
NTP Server	XXX.XXX.XXX.XXX Domain Name	This is the IP address or Domain Name of the local NTP Server on the network. This setting is only available if Update Mode is set to NTP.

Date	MM/DD/YYYY	This setting is the user defined date. A calendar widget can be used to select the date by clicking the button. This setting is only available if Update Mode is set to Manual.
Subnet Mask	255.0.0.0 – 255.255.255.254	This option is only available if Static Mode is set. This is the Subnet Mask assigned to the management port.
Time	00:00:00-23:59:59	This setting is the user defined time. The time is based on a 24 hour clock. This setting is only available if the Update Mode is set to Manual.

4.3.10. Syslog

The UMH160UIG can be configured to send error and event logs formatted in the syslog protocol to a remote user specified Syslog server. To configure the Syslog settings click the Configure Syslog button.



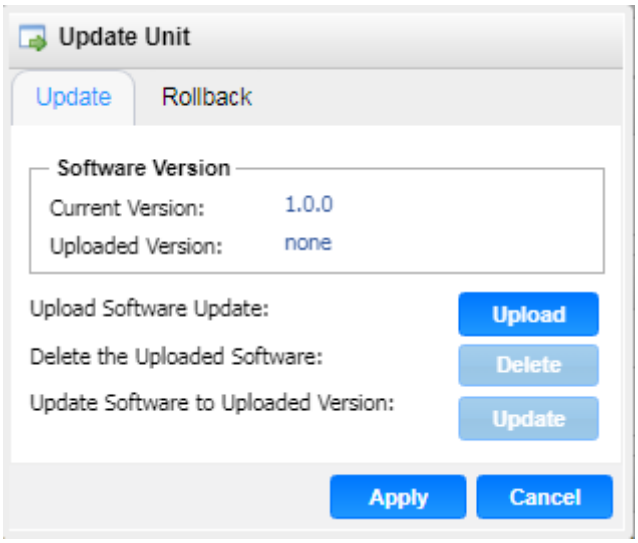
Action	Range	Description
State	Disabled Enabled	Enable or Disable sending messages to Syslog server.

Network Protocol	UDP TCP	Select which network protocol used to transmit to the Syslog server.
IP Address	Four decimal octets: XXX.XXX.XXX.XXX	IP of the Syslog server. 0.0.0.0 and 255.255.255.255 are not permitted.
Port	0 - 65535	Destination port of the Syslog server.

4. 3. 11. Updating the UMH160UIG

1.Applying software updates

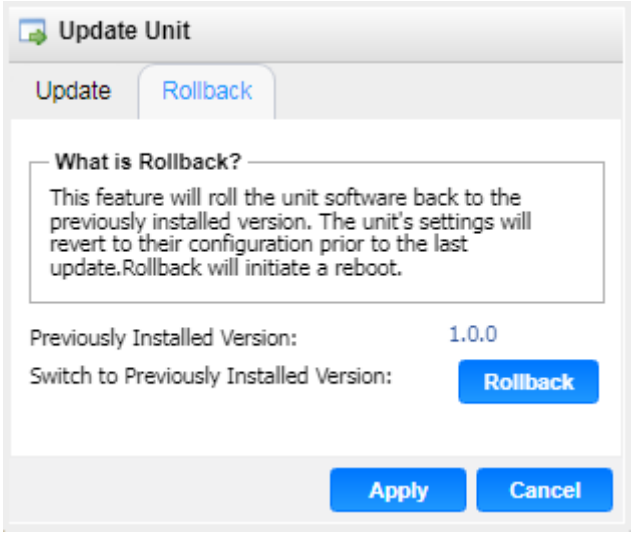
Updates to the UMH160UIG are performed through the web interface. A software update file is provided by Wellav and then uploaded to the unit. Once uploaded, the software update is applied to the unit. To upload software updates to the unit, click on the Update Unit button. The current version and uploaded version are displayed in the Software Versions section. The UMH160UIG will reboot after a software update is complete.



Action	Button	Description
Upload Software Update	Upload	To upload software updates to the UMH160UIG click this button. The user will be prompted to navigate to an update file. The file will then upload to the UMH160UIG. When complete the UMH160UIG with prompt the user to either apply the update or cancel.
Delete the Uploaded Software	Delete	Clicking this button prompts the user to confirm the deletion of the software update from the UMH160UIG. This will also clear the Uploaded Version status of the Software Versions section.
Update Software to Uploaded Version	Update	Clicking the button starts the software update process. The UMH160UIG will prompt the user to confirm the update. Click Yes to continue or No to cancel.

2.Rollback Software Updates

The UMH160UIG is capable of reverting back to a previous version of software using the Rollback feature. The UMH160UIG maintains two separate software images; one is the most current version of software with all current settings and the other is the previous version of software with all settings. To perform a rollback, click the Update Unit button and then click the Rollback tab. The UMH160UIG will reboot after the rollback process is complete.



4. 3. 12. Reboot Unit

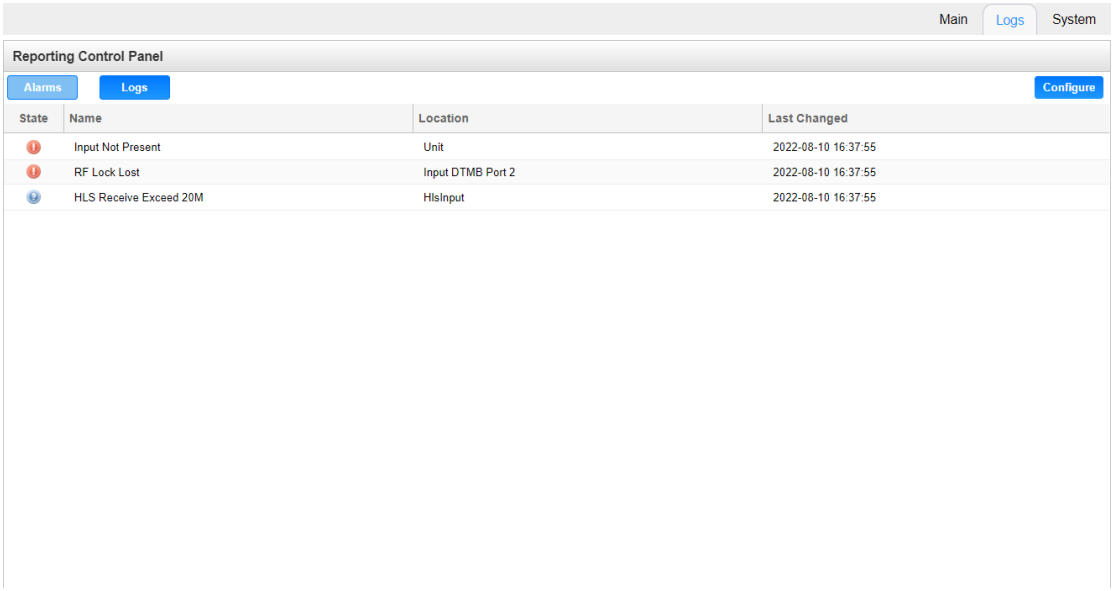
The UMH160UIG can be rebooted from the web interface. In order to perform a reboot, click the Reboot button. The UMH160UIG will prompt the user to confirm the reboot. Once the reboot is complete the login screen will appear allowing the web interface to be logged into.

4. 3. 13. Reset Defaults

The UMH160UIG settings can be reset to factory defaults. All settings will be returned to the factory defaults except the network management ports IP settings. All event logs will be cleared. To reset all settings to default, click the Reset to Defaults button. The UMH160UIG will prompt the user to confirm the reset.

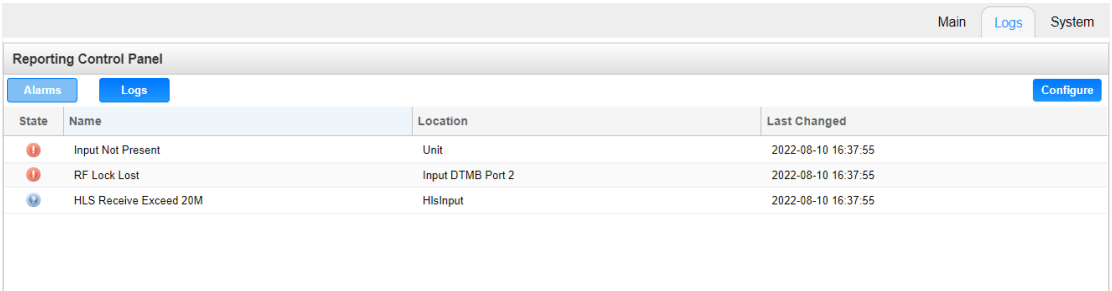
4. 4. Log Panel

The Logs tab in the UMH160UIG contains logs for active alarms currently affecting the unit and an event log. The active alarms are updated periodically in order to reflect the real-time state of the unit. Once an error is cleared it will be cleared from the active alarms window. The event log can be used to view alarm and event history. Both the active alarm and event logs can be configured to hide or change the behavior of alarms and events.



4. 4. 1. Active Alarms

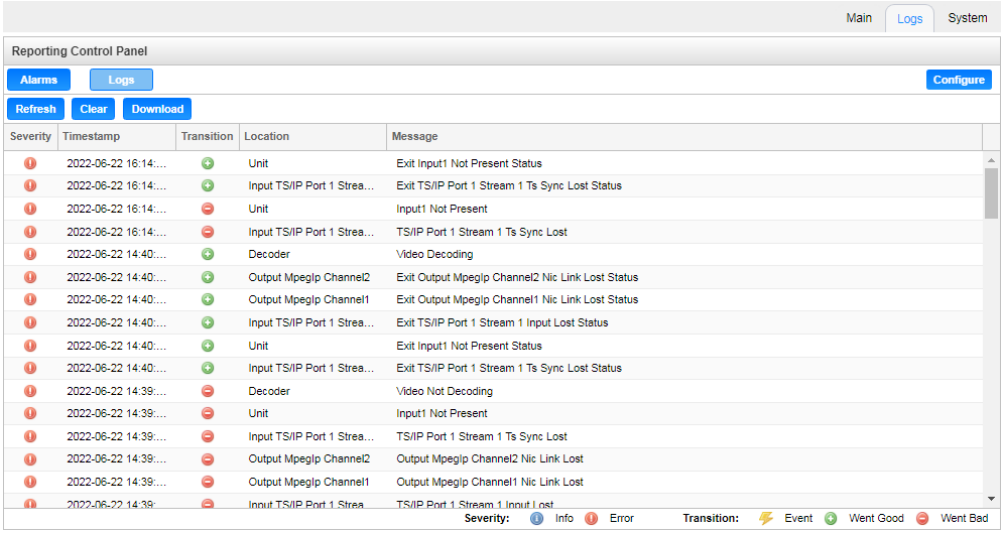
Clicking on the button displays the Active Alarms menu. This list displays all of the active alarms currently affecting the unit. There are four columns in the log that display different types of information.



Title	Description
State	This column displays the nature of the alarm. The icon means the log entry is informational and is not an error. The icon means the log entry is an active alarm.
Name	This column displays the description of the error. The function that is experiencing an error condition is described here.
Location	This column displays the hardware or function that is experiencing the active error.
Last Changed	This column displays the date and time the error was raised. This date and time correlate with the Date and Time settings configured before.

4.4.2. Event Logs

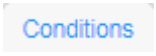
Clicking on the Logs button displays the Event Log menu. This list displays all of the events and alarms that have affected the unit. The UMH160UIG stores up to four days' worth of logs. If the unit is rebooted or powered off and on the event logs are cleared. The logs can be cleared manually by clicking the Clear button. The logs can be downloaded as a .tsv file and saved to an external location by clicking the Download button. There are five columns in the log that display different types of information.

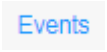


Title	Description
Severity	This column displays the nature of the alarm. The  icon means the log entry is informational and is not an error. The  icon means the log entry is an active alarm.
Timestamp	This column displays the date and time the error was raised or cleared. This date and time correlate with the Date and Time settings configured before.
Transition	This column displays when an alarm transition from a bad to good state. When an error is raised the  icon is displayed. When an error is cleared the  icon is displayed. When an event takes place the  icon is displayed.
Location	This column displays the hardware or function that experienced the alarm or event.
Message	This column displays the description of the error or event. The function or hardware that experienced the event or error is described here.

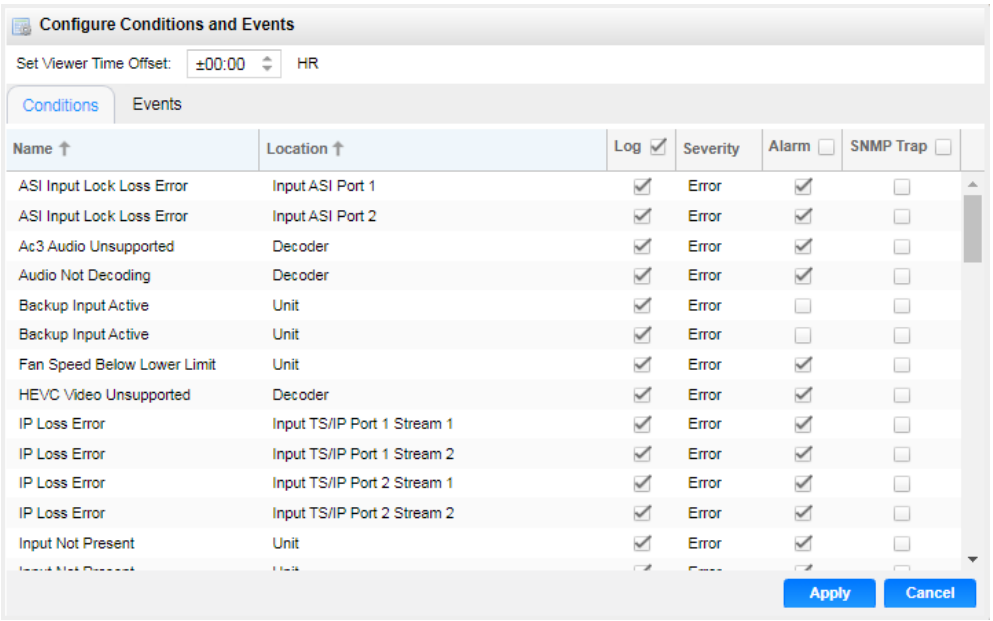
4.4.3. Configuring the Logs

The UMH160UIG allows the user to configure alarms and events. In order to configure these options, click the 

button. The 

tab allows the user to configure the alarms reported by the UMH160UIG. The 

tab allows the user to configure the events reported by the UMH160UIG. Each column and its function are described below. A user configured time offset can also be applied to allow viewing the logs in a local time zone.



Title	Description
Name	This column displays the name of the error or condition. This is informational data: no options can be set here.
Location	This column displays the hardware or function that the alarm or event applies to. This is informational data; no options can be set here.
Log	Checking the box in this column creates an entry in the event log in the case this error or event is raised. If this box is unchecked this error or event will be hidden and not logged if raised.
Severity	This column is only available in the Conditions tab This option allows the user to set the severity of the error to Info or Error. If Info is selected in the drop down box the icon will displayed in the event log. If Error is selected the icon will be displayed in the event log.
Alarm	This column is only available in the Conditions tab This option allows the user to enable or disable this alarm in the Active Alarms log. If checked the alarm will be displayed in the Active Alarms log if raised. If this box is unchecked this error will be hidden.

SNMP Trap	This column allows the user to send an SNMP Trap if this alarm is raised. If this box is checked an SNMP Trap is sent when this alarm is raised. If this box is unchecked an SNMP is not sent.

5. Appendices

5. 1. Acronyms and Glossary

8VSB: Vestigial sideband modulation with 8 discrete amplitude levels.

16VSB: Vestigial sideband modulation with 16 discrete amplitude levels.

AAC: Advanced Audio Coding

AC-3: Also known as Dolby Digital

AES: Audio Engineering Society

AFD: Active Format Descriptor

ASI: Asynchronous Serial Interface

ATSC: Advanced Television Systems Committee

AV: Audio Video

Bit Rate: The rate at which the compressed bit stream is delivered from the channel to the input of a decoder.

BNC: British Naval Connector

BPS: Bits per second.

CAM: Conditional Access Module

CAT: Conditional Access Table

CAT6: Category 6 – Cable standard for gigabit Ethernet

CC: Closed Caption

CI: Common Interface

CoP: Code of Practice

CRC: Cyclic Redundancy Check

CVCT: Cable Virtual Channel Table

dB: Decibel

DDPlus: Dolby Digital Plus

DHCP: Dynamic Host Configuration Protocol

DPI: Digital Program Insertion

DTVCC: Digital Television Closed Captioning

DVB: Digital Video Broadcasting

EBU: European Broadcasting Union

EIA: Electronic Industries Alliance

EIT: Event Information Table

EPG: Electronic Program Guide

ETM: Extended Text Message

ETT: Extended Text Table

Event: An event is defined as a collection of elementary streams with a common time base, an associated start time, and an associated end time.

FCC: Federal Communications Commission

FEC: Forward Error Correction

Field: For an interlaced video signal, a “field” is the assembly of alternate lines of a frame. Therefore, an interlaced frame is composed of two fields, a top field and a bottom field.

Frame: A frame contains lines of spatial information of a video signal. For progressive video, these lines contain samples starting from one time instant and continuing through successive lines to the bottom of the frame. For interlaced video a frame consists of two fields, a top field and a bottom field. One of these fields will commence one field later than the other.

HANC: Horizontal Ancillary

HD: High Definition

High level: A range of allowed picture parameters defined by the MPEG-2 video coding specification which corresponds to high definition television.

I/O: Input/Output

IP: Internet Protocol

Kbps: 1000 bit per second

LED: Light Emitting Diode

LNB: Low-Noise Block

MAC: Medium Access Control

Main level: A range of allowed picture parameters defined by the MPEG-2 video coding specification with maximum resolution equivalent to ITU-R Recommendation 601.

Main profile: A subset of the syntax of the MPEG-2 video coding specification that is expected to be supported over a large range of applications.

Mbps: 1,000,000 bits per second.

MER: Modulation Error Ratio

MGT: Master Guide Table

MIB: Management Information Base

MP@HL: Main profile at high level.

MP@ML: Main profile at main level.

MPEG: Refers to standards developed by the ISO/IEC JTC1/SC29 WG11, Moving Picture Experts Group. MPEG may also refer to the Group.

MPEG-2: Refers to ISO/IEC standards 13818-1 (Systems), 13818-2 (Video), 13818-3 (Audio), 13818-4

MPTS: Multiprogram Transport Stream

NTP: Networking Time Protocol

NTSC: National Television System Committee

OSD: On Screen Display

PAL: Phase-Alternating Line

PAT: Program Association Table

PCM: Pulse-Code Modulation

PCR: Program Clock Reference

PCM: Pulse-code Modulation

PID: Packet Identifier. A unique integer value used to associate elementary streams of a program in a single or multi-program transport stream.

PMT: Program Map Table

Profile: A defined subset of the syntax specified in the MPEG-2 video coding specification

Program specific information (PSI): PSI consists of normative data which is necessary for the demultiplexing of transport streams and the successful regeneration of programs.

Program: A program is a collection of program elements. Program elements may be

elementary streams. Program elements need not have any defined time base; those that do have a common time base and are intended for synchronized presentation.

PTS: Presentation Time Stamp

QAM: Quadrature Amplitude Modulation

QPSK: Quadrature Phase-Shift Keying

RDS: Receiver Decoder System

RF: Radio Frequency

RGBHV: Red, Green, Blue, Horizontal, Vertical

RO: Read Only

RPM: Revolutions Per Minute

RRT: Rating Region Table

RS-232: Recommended Standard. A standard for serial binary data interconnection.

RU: Rack Unit

RW: Read/Write

SD: Standard Definition

SDI: Serial Digital Interface

SFP: Small Form-Factor Pluggable

SI: System Information

SMPTE: Society of Motion Pictures and Television Engineers

SNMP: Simple Network Management Protocol

SPTS: Single Program Transport Stream

SSRC: Synchronization Source

STD input buffer: A first-in, first-out buffer at the input of a system target decoder for storage of compressed data from elementary streams before decoding.

STD: System Target Decoder. A hypothetical reference model of a decoding process used to describe the semantics of the Digital Television Standard multiplexed bit stream.

STT: System Time Table

TS: Transport Stream

TVCT: Terrestrial Virtual Channel Table

UTC: Coordinated Universal Time

VANC: Vertical Ancillary

VBI: Video Blanking Interval

VCT: Virtual Channel Table. Used in reference to either TVCT or CVCT.

XLR: Cannon “X” series connector, with a Latch, and Rubber around the contacts.

YPbPr: Component Red, Green, Blue

5. 2. Specifications

RF DVB-S/S2/S2X Input	
Input	RF (F-type), 75Ω
DVB-S/S2/S2X Input	QPSK, 8PSK, 16APSK, 32APSK, 64APSK
Symbol Rate	1~45 MSps (QPSK, 8PSK, 16APSK, 32APSK), 1-34MSps (64APSK)
Input Frequency	950~2150 MHz
Max Bit-rate	150Mbps
Signal Level	-65~-25 dBm
LNB Power	DC 13/18V@350mA
Control Tone	22K on/off
Roll-off Factors	0.35, 0.25, 0.20
Advanced Feature	16/32/64APSK CCM/VCM demodulation supported Multi-stream supported (single ISI) Roll-off factors:0.15, 0.10, 0.05
DVB-C Input	
Input	RF (F-type), 75Ω
Symbol Rate	1~6.952 MBauds
QAM Type	J.83 A/B/C
Input Frequency	48-862 MHz

Range	
Max Bit-rate	55Mbps
Signal Level	40~80 dBuV (64QAM) 44-100 dBuV (256QAM)
DVB-T Input	
Input	RF (F-type), 75Ω
Constellation	QPSK/16/64QAM
Bandwidth	6/7/8M
Input Frequency Range	48~862 MHz
Max Bitrate	31.67Mbps
Signal Level	-65~-25 dBm
Transmission Mode	2K, 8K
FEC Mode	1/2, 2/3, 3/4, 5/6, 7/8
Guard Interval	1/4, 1/8, 1/16, 1/32
DVB-T2 Input	
Input	RF (F-type), 75Ω
Constellation	QPSK/16/64/128/256QAM
Bandwidth	6/7/8M
Input Frequency Range	48~862 MHz
Max Bitrate	50.1Mbps
Transmission Mode	1K, 2K, 4K, 8K, 16K, 32K
FEC Mode	1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Guard Interval	1/4, 1/8, 1/16, 1/32, 1/128, 19/256, 19/128
ISDB-T/Tb Input	
Input	RF (F-type), 75Ω
Constellation	QPSK/16/64QAM
Bandwidth	6MHz

Input Frequency Range	48~862 MHz
Max Bitrate	23.42Mbps
Signal Level	-65~-10 dBm
Carriers Mode	2/4/8K
FEC Mode	1/2, 2/3, 3/4, 5/6, 7/8
Guard Interval	1/4, 1/8, 1/16, 1/32
8VSB Input	
Input	RF (F-type), 75Ω
Bandwidth	6MHz
Input Frequency Range	57~803 MHz (fixed frequency)
Sensitivity	-83~-8 dBm
Channel Plans	Broadcast
Max Bit-rate	19.39Mbps

TS/IP GbE IP	
Interface	2*GbE level RJ45 port
Speed	Up to 1000Mbps
Package Format	UDP/RTP/HLS/RTMP/SRT/ZIXI/RIST
Traffic Type	Unicast: (ARP) Multicast: V2, V3 (optional)
Number of Channels	2 x input & 2 x output
FEC	ProMPEG CoP3v2(1 x input & 1 x output)(Future)
TCP/IP Protocol	IPv4
IGMP	Version1, 2 & 3

DVB-ASI

Interface	4 BNC, 75Ω (2xASI input, 2xASI output)
Max Bitrate	150Mbps
Packet Type	188/204 bytes
Input Mode	Spread and burst
Output Mode	Spread
Supports MPEG-2/H.264/H.265/AVS+/AVS2 SD/HD/UHD stream bypass transmission	
Supports AC-3/E-AC-3 audio bypass transmission	

DVB De-scrambling	
DVB Common Interface	2 slots
Bitrate	Max. 150Mbps (Depending on processing capability of CAM module)
CAM Supported	NEOTION, SMIT, ASTON and other major CAMs
CAS Supported	CONAX, IRDETO, Novel-Super TV, CTI and other major CAS
BISS-1& BISS-E	Program level, Decoded Service only TS level (future licensed option)
Number of Services	Limited by CAM

Decoder Interface	
Composite Video Output	1xBNC, 75Ω PAL/NTSC
SD/HD-SDI Output	2xBNC, 75Ω
Digital Output	1xHDMI 2.0 connector
Analog Audio Outputs	4xBNC,75Ω unbalanced 2 pairs of analogue balanced audio output via 1x15 Pin

	D-sub (4xXLR Breakout Cable) (1 by default, 2 is a future option)
AES/EBU	2 pairs of digital unbalanced AES/EUB output via 1x15 Pin D-sub (2xBNC, Breakout Cable) (1 by default, 2 is a future option)

Video Decoding	
Video Profile/Levels	MPEG-2 SD 4:2:0 MP@ML
	MPEG-2 HD 4:2:0 MP@ML
	MPEG-4 AVC/H.264 SD MP@L3
	MPEG-4 AVC/H.264 HD MP@L4.1/HP@4.1
	AVS-P16/AVS+
	AVS2 P2 10 bit Profile @Level 8.2.60
	H.265/HEVC Main/Main10 profile@Level5.1 High-tier
Output Format	720x576i@25 720x480i@29.97,30 720x480p@50,59.94,60 1280x720p@50,59.94,60 1920x1080i@25,29.97,30 1920x1080p@25,30,50,59.94,60 3840x2160@25,30,50,60
Aspect Ratio Conversion	4:3 letterbox, 4:3 pan and scan, 16:9 letterbox, 16:9 pan and scan

Audio Decoding	
Number of Audio Services	1 by default, 2 is a future option
Audio Codecs Supported	MPEG1 Layer II
	Dolby Digital AC-3 (Optional)
	Dolby Digital Plus (E-AC3, optional)

	AAC-LC, HE-AAC, HE-AACv2(Optional)
SDI Embedded Audio Output	1 audio pair by default
Adjustable Volume Level	-63~0 dB

Transcoding（future） TS Transcoding	
Processing Channels	1 UHD programs
Input	
Video	H.264 (MPEG-4 part 10) or MPEG-2 or AVS+ or AVS2 or HEVC/H.265
Video Format	Up to 2160p60
Aspect Ratio	4:3, 16:9, auto
Audio	MPEG-1 Layer I/II
	Dolby Digital (AC-3)/Dolby Digital Plus(E-AC3) (optional)
	AAC (optional)
Audio Mode	Stereo, dual mono, single mono
Output	
Video	H.265/HEVC Main/Main10 profile@Level5.1 High-tier
Resolution	576i, 480i (BT.656)
	1080i50, 1080i60, 1080i59.94
	720P50, 720P60, 720P59.94
	1080p25, 1080p30, 1080p5994, 1080p60
	2160p25, 2160p30, 2160p50, 2160p60
Audio	MPEG-1 Layer I/II

	Dolby Digital AC-3 (optional)
	AAC (optional)
Subtitle and Audio	Pass-through
Bit-rate	MPEG-2 video: 2.0~15 Mbps (CBR & VBR)
	AVS+ video: 1.0~15 Mbps (CBR & VBR)
	H.264 Video: 1.0~20 Mbps (CBR & VBR)
	AVS2 Video: 2.0~40Mbps (CBR & VBR)
	H.265/HEVC Video: 2.0~40Mbps (CBR & VBR)
	Audio: 64~384 Kbps
Adjustable Volume	-63~0 dBm

Management	
Connector	RJ-45 10/100Mbps - auto negotiating
Protocols	HTTP HTTPS and SNMP
User Interfaces	Full control via web GUI Front panel
Automation Interfaces	Full status via SNMP Configurable SNMP traps
Firmware Updates	Via web GUI

Physical & Environment	
Power Supply	100~240 VAC 50/60Hz Dual AC (via a hardware upgrade, optional) Dual 36~72V DC (via a hardware upgrade, optional)
Size	1RU rack mount chassis
Dimension	483mm x 312mm x 44mm
Operating Temperature	0℃~50℃
Storage Temperature	-40℃~70℃
Relative Operating	＜ 95% (non-condensing)

Humidity	

Order Information	
Model	Description
UMH160UIG	H.264/MPEG-2 Receiver decoder, 1 x RF input, IP/ASI in/out, HLS in, SDI/HDMI/CVBS decoding, MPEG1L2, IP management

License	Description
16001	AC3 Decoding License
16002	AAC Decoding License
16003	HEVC HD/SD Decoding License
16004	4K/HDR Decoding License
16005	Multiplexing License
16006(Future)	TS-level BISS Decryption License
16007	T2MI License
16008(Future)	PID Auto-update License
16009	Input redundant License
16010(Future)	Multi-stream License
16011	SRT Input License
16012(Future)	RTMP Input License
16013(Future)	ZIXI Input License