Impulse 400D
4K UHD Receiver/Decoder

User Manual

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About Sencore

Sencore is an engineering leader in the development of high-quality signal transmission solutions for the broadcast, cable, satellite, IPTV, telecommunications, and professional audio/video markets. The company's world-class portfolio includes video delivery products, system monitoring and analysis solutions, and test and measurement equipment, all designed to support system interoperability and backed by best-in-class customer support. Sencore meets the rapidly changing needs of modern media by ensuring the efficient delivery of high-quality video from the source to the home. For more information, visit www.sencore.com.

Revision History

Date (MM/DD/YYYY)	Version	Description	Author
09/27/2022	1.0	First Draft	RAG

Safety Instructions

- Read these instructions
- Keep these instructions
- Heed all warnings
- Follow all instructions
- Do not use this apparatus near water
- Clean only with dry cloth
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
- To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
- The mains plug of the power supply cord shall remain readily operable.
- **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 dropped or 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 Sencore, or parts having the same operating characteristics as the original parts. 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 IMPULSE 400D 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 Sencore 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 IMPULSE 400D must be connected to a mains socket outlet with a protective earthing connection.
- For the IMPULSE 400D the mains plug is the main disconnect and should remain readily accessible and operable at all times.
  The IMPULSE 400D is equipped with an internal system battery. The IMPULSE 400D must be sent to Sencore service for replacement of this battery.
- When installing the IMPULSE 400D 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 IMPULSE 400D – 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 IMPULSE 400D 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.

Package Contents

The following is a list of the items that are included along with the IMPULSE 400D:

1. AC Power Cable
2. Datasheet.

Note: If any option cables were ordered with the IMPULSE 400D, they will be included in the box as well.

If any of these items were omitted from the packaging of the IMPULSE 400D please call 1-800-SENCORE to obtain a replacement. Manuals for Sencore products can be downloaded at www.sencore.com

1) AC Power Cable

2) Datasheet

Table of Contents

Section 1 Overview

Introduction

This section includes the following topics:

1.1 Product Introduction

The IMPULSE 400D 4K UHD Receiver/Decoder continues Sencore's long history of leadership in the receiver/decoder space. The product boasts a full complement of cutting-edge features, including 4:2:0 H.265 10bit decoding, and optional licensing added to include 4K/UHD decoding 2160p60 video support with 3G-SDI output. Additionally, the IMPULSE 400D has the ability of multiplexing, which allows the user to remultiplex the services from various inputs. This feature set makes the IMPULSE 400D the ideal choice for contribution reception or demanding distribution applications which require a future-proof set of specifications.

Every IMPULSE 400D ships with a full complement of basic inputs and outputs built-in, including ASI input and output, dual TS/IP input and output and dual SD/HD/3G-SDI outputs. The addition of a digital video output means that video monitoring is as easy as finding the nearest standard consumer television or PC monitor. In addition, available factory-configurable DVB-S2X/S2/T2/T/C, 8VSB and ISDB-T receiver modules make adapting the product to almost any use case easy.

The receiver also maintains Sencore's long tradition of ease of use, with a straight-forward web interface accessible via all major browsers and complete control of the unit via the front panel keypad, and is backed by Sencore's best-in-class staff of ProCare support engineers.

1.2 Front Panel Overview

The IMPULSE 400D can be controlled from the front panel using the LCD screen and buttons that are shown below. A detailed description of using the front panel can found in Section 3.1.

1. Power/Locked/Alarm Indicator
2. LCD screen
3. 2x DVB-CI Slots
4. Up, Down, Left, Right buttons
5. Menu and OK Buttons

1.3 Rear Panel Overview

The IMPULSE 400D comes with all of the hardware listed below.

1. Digital Unbalanced AES/EBU Output Connector
2. HDMI Output Connector
3. External Genlock Reference Input

4. Two SD/HD/3G-SDI Output Connectors (mirrored)
5. Four Analog Audio Output Connectors
6. Two ASI Output Connectors
7. Two ASI Input Connectors
8. RJ45 Management Port
9. Two RF Reception Connectors (Optional)
10. Two RJ45 Data Port
11. Chassis ground
12. Power Supply and Power Switch

1.4 Cooling

The IMPULSE 400D is cooled via forced induction through the front of the unit and exhausted through the vents in the rear of the chassis. The IMPULSE 400D 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 IMPULSE 400D 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.

Section 2 Installation

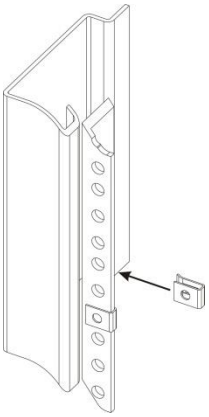
Introduction

This section includes the following topics:

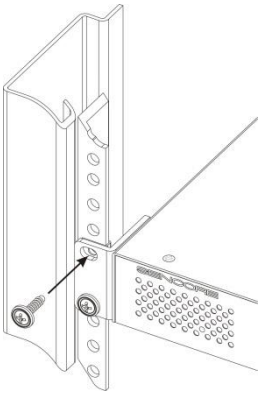
2.1 Rack Installation

To install the IMPULSE 400D into a rack use the following steps:

1. Determine the desired position in the rack for the IMPULSE 400D making sure that the air intake on the front of the unit and the exhausts on the sides of the unit will not be obstructed.
2. Insert the rack mount clips into place over the mounting holes in the rack.
3. Slide the IMPULSE 400D into position in the rack.



4. Secure the IMPULSE 400D to the rack by installing the four supplied screws through the front mounting holes and tightening.
5. If needed, secure a grounding wire use the grounding location on the rear panel of the IMPULSE 400D. See Section **Error! Reference source not found.** for g rounding location.



2.2 Power Connection

Using the proper power connections is vital to the safe operation of the IMPULSE 400D. Only use the supplied 3-prong power connector or one with equal specifications. NEVER tamper with or remove the 3rd – prong grounding pin. This could cause damage to the IMPULSE 400D, personnel, or property.

2.3 AC Power Connection

The IMPULSE 400D is intended for use on either 120V or 240V systems. The power supply will automatically detect the system it is connected to. To hook up the power use the following steps:

1. Locate the AC power cord that was included with the IMPULSE 400D.
2. Plug the female end of the power cord (end with no prongs) into the back of the unit.
3. Locate a protected outlet (usually inside of the rack) to plug the male end of the power cable into.

2.4 DC Power Connection (optional)

The IMPULSE 400D 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 IMPULSE 400D – be connected to the installation's rack, battery negative terminal, and/or earth ground.

2.5 Maintenance

The IMPSULE 400D is virtually a maintenance-free piece of equipment. There are no user serviceable parts on the inside of the unit

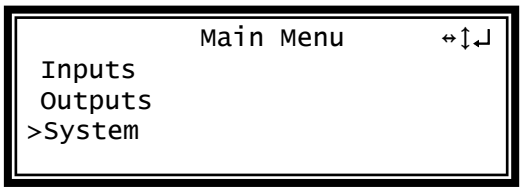
2.6 Network Setup via Front Panel

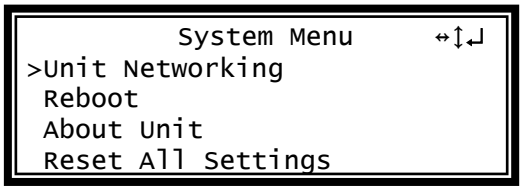
The IMPULSE 400D can be setup on a network connection to allow remote management and SNMP configuration. For these features to work, the network settings for the IMPSULE 400D must first be configured properly for the network it is connected to.

Static IP Address

To setup the IMPULSE 400D with a static IP address, use the following steps:

1. Press the OK button.
2. Use the ▲ and ▼ buttons to move the cursor to "System", then press the OK button.
3. Use the ▲ and ▼ buttons to move the cursor to "Unit Networking", then press the OK button.

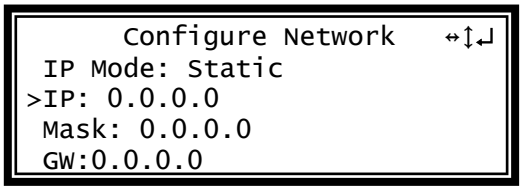




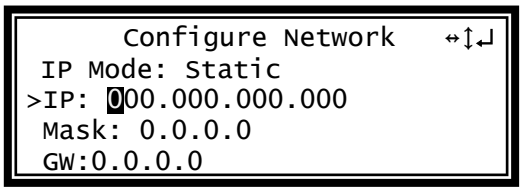
Note: The first menu displayed is status menu. In order to begin making changes to networking settings press the OK button.

IP Address/Subnet Mask/Gateway

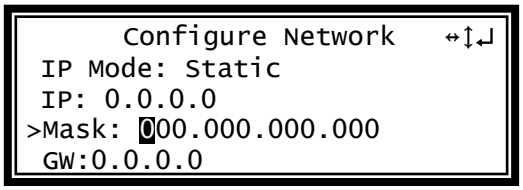
1. Use the ▲ and ▼ buttons to move the cursor to “IP”, then press the OK button.



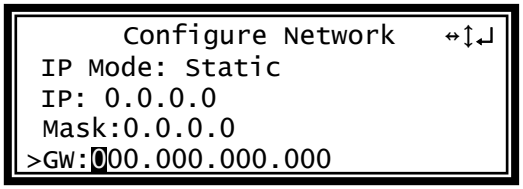
2. Use the ◄ and ► buttons to select the column to edit and use the ▲ and ▼ buttons to change the IP, then press the OK button to save the selection.



3. The cursor will now be on “Mask”.
4. 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 to save the selection.



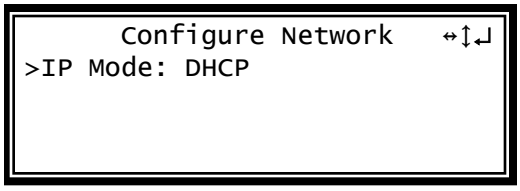
5. The cursor will now be on “Gateway”.
6. Use the ◄ and ► buttons to select the column to edit and use the ▲ and ▼ buttons to change the Gateway, then press the OK button to save the selection.



DHCP

The IMPULSE 400D can be configured to use DHCP to obtain an IP address/Subnet Mask/Gateway.

1. Use the ▲ and ▼ buttons to move the cursor to “DHCP:” then press the OK button.
2. Use the ▲ and ▼ buttons to change the selection to “Enabled” then press the OK button to save the selection.



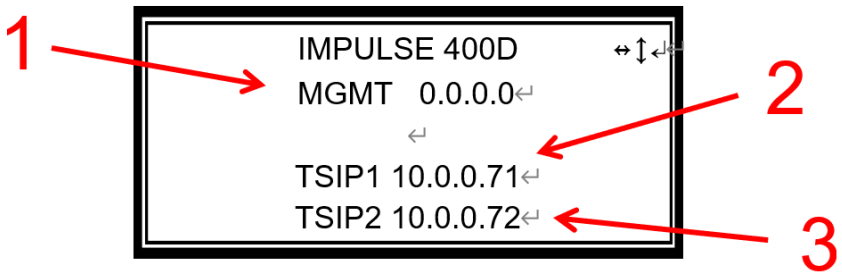
Section 3 Operating the Front Panel

Introduction

This section includes the following topics:

3.1 IMPULSE 400D Front Panel Overview

The IMPULSE 400D front panel allows the user to configure most major 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 IMPULSE 400D. This idle screen allows the user to view the management IP and TS/IP port 1&2 addresses.



1. IP address of management port, DHCP mode by default.
2. IP address of TS/IP port 1.
3. IP address of TS/IP port 2.

The following figure shows the set of buttons available on the front panel of the IMPULSE 400D. 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. The keys allow you to navigate through the menus right, left, up and down with each respective button.

Section 4 Operating the Web Interface

Introduction

This section includes the following topics:

4.1 IMPULSE 400D Web Interface Overview

4.1.1 Logging into the IMPULSE 400D Web Interface

To open the IMPULSE 400D web interface use one of the following supported browsers and navigate to the unit's IP address:

- Internet Explorer
- Firefox
- Google Chrome

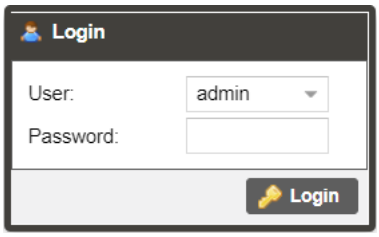
The user will need to login to the web interface. Press the 

button in order to login to the web interface.

Default Credentials

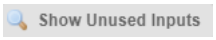
Username: admin

Password: mpeg101



4.1.2 Hiding Unused Inputs

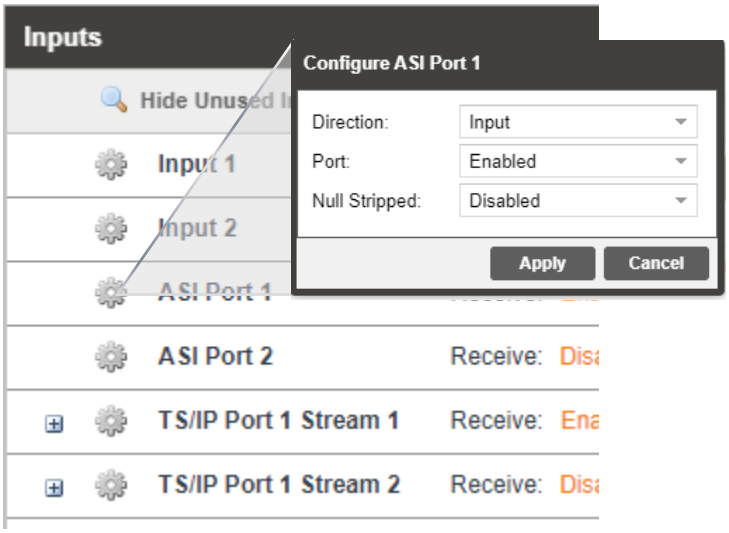
The IMPULSE 400D web interface allows the user to hide inactive inputs using the 

button or show all available inputs by click the 

button. Only the inputs configured as the Primary Input and Backup Input (see Section 4.2.1) will be displayed when unused inputs are hidden.

4.1.3 Buttons and Status Indicators

When the  icon is shown user configuration is available. Clicking this button will open menus where settings can be changed by the user.



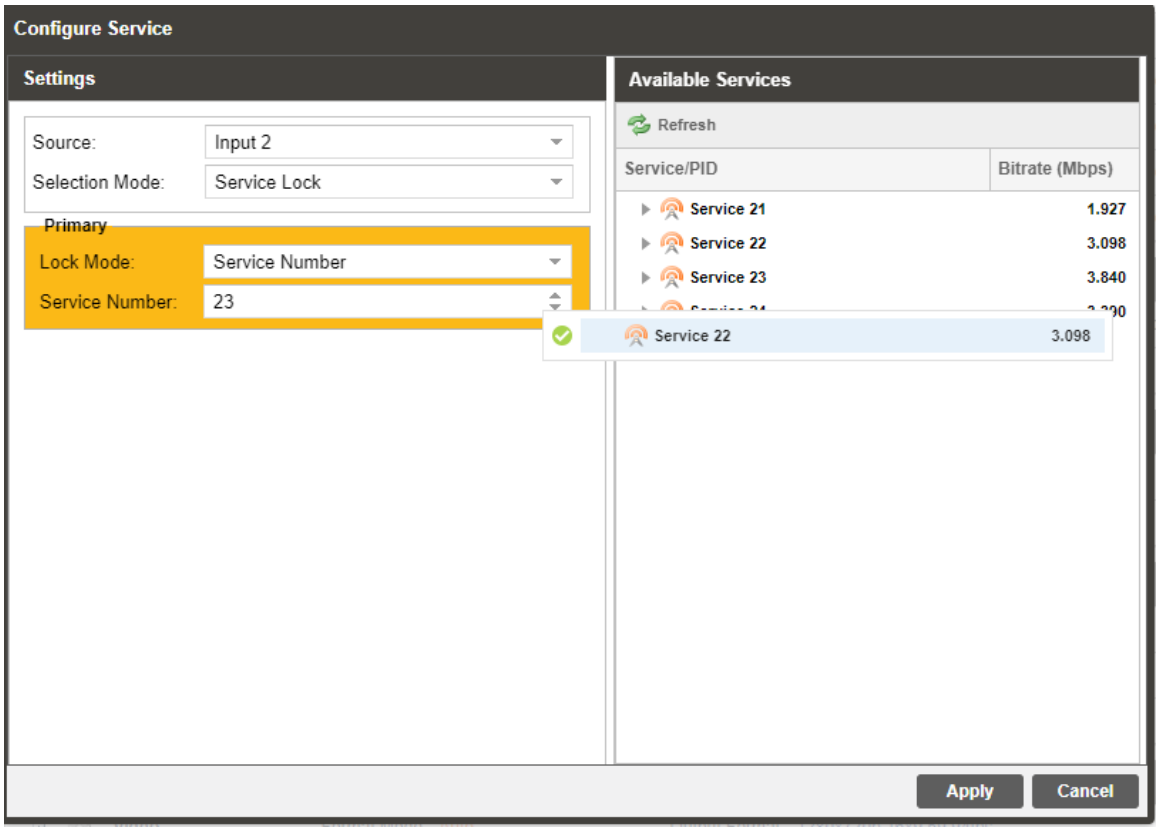
When the  icon is shown additional status information can be viewed. Click this button will expand the menu to display the additional status information. All text in status menus shown in **ORANGE** are user configurable settings. Text shown in **BLUE** is not user configurable and is strictly a status or value. To minimize the status windows again click the  icon.

Status in the IMPULSE 400D web interface is shown with Locked and Unlocked status indicators:

Green Locked	Locked	Status is good. No errors are present, and function is operating normally.
Red Unlocked	Unlocked	Status indicates function is affected by active error. To view the errors, navigate to Alarms panel to view Active Errors.

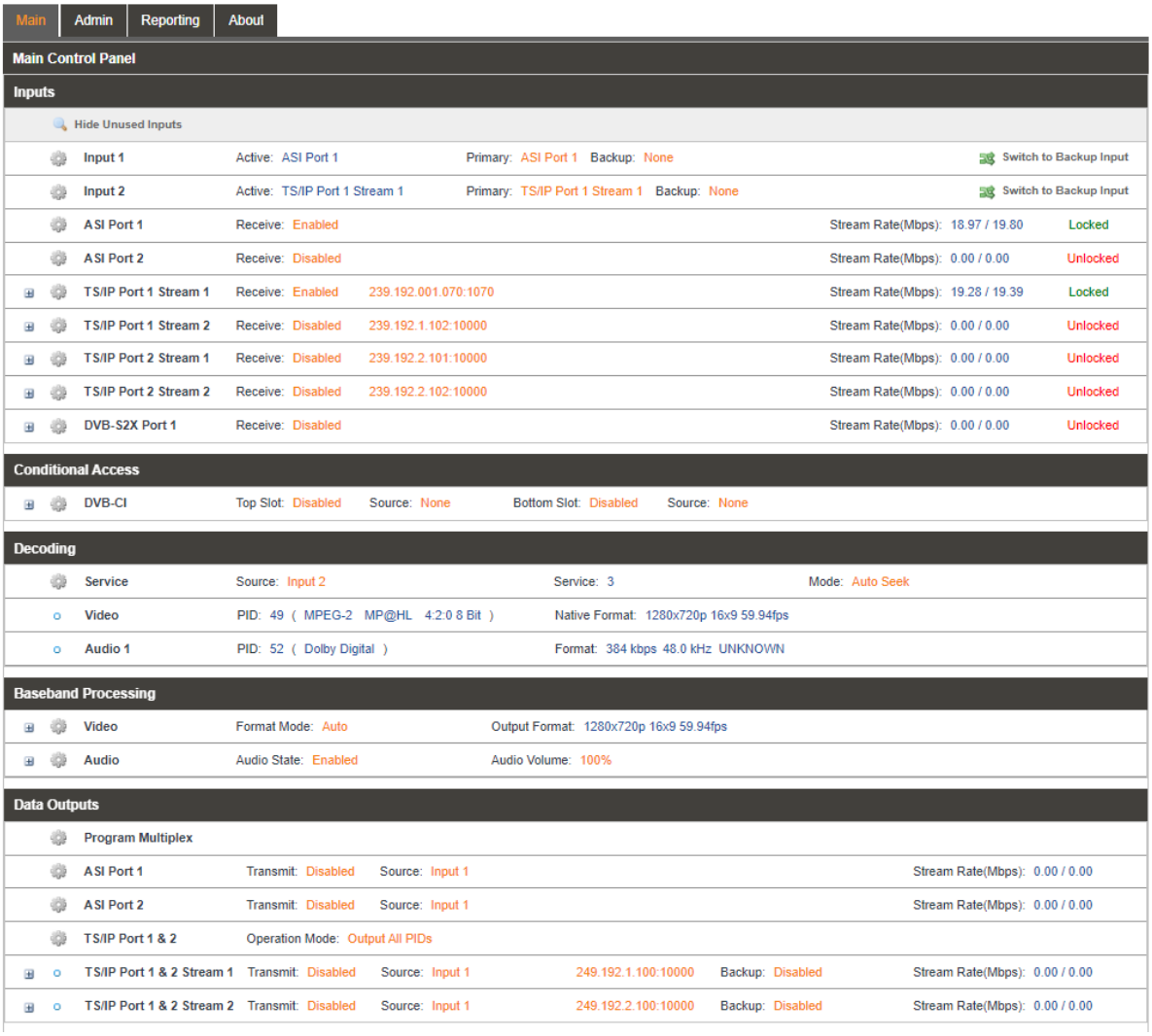
4.1.4 Drag and Drop Menus

Certain menus in the IMPULSE 400D allow the user to drag and drop items to auto populate fields. Conditional Access and Service Selection menus are some examples of menus that drag, and drop can be used. In the example below a service in the transport stream view on the right-hand side of the window is selected and dragged over to auto populate the PIDs in the service selection section.



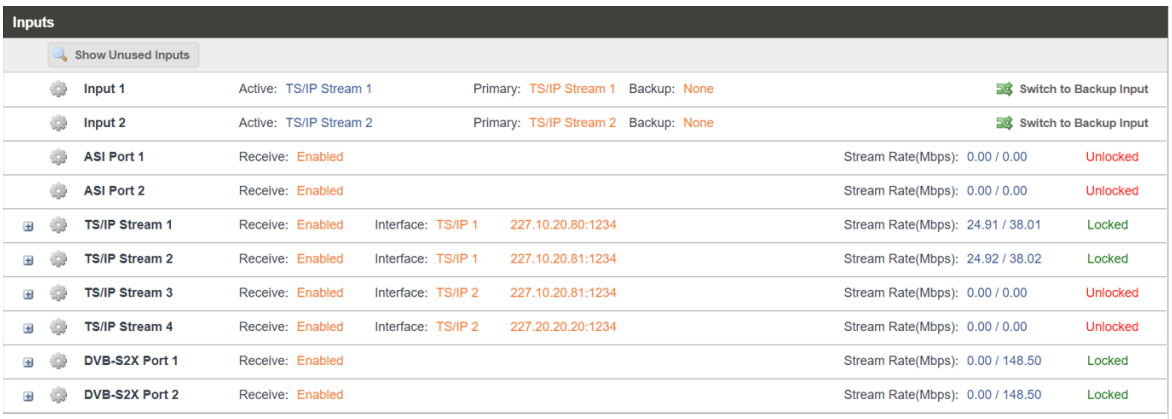
4.2 Main Panel

The Main panel of the IMPULSE 400D web interface is used to configure the unit to decode, de-encapsulate and demodulate. When configuring the IMPULSE 400D 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.

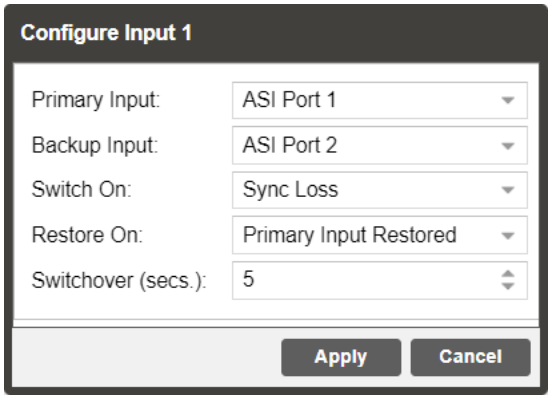


4.2.1 Configuring Active Inputs

This menu allows the user to configure a primary and backup input for both input 1 and input 2. However, input 1 and input 2 are set independently of each other. In case there is an input failover the IMPULSE 400D 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 IMPULSE 400D to switch between the Primary and Backup Inputs by clicking the Switch to Backup Input button. To change the active input and failover settings click the button next to Input Selection.



Active Input Indicator

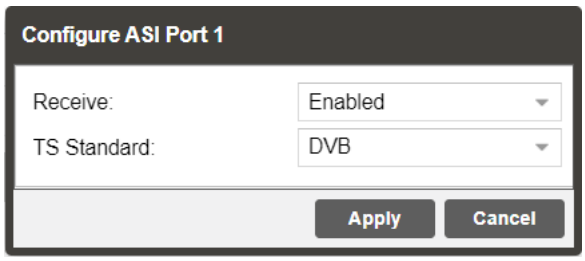


Active Input and Failover Configuration Menu

Setting	Range	Description
Primary Input	ASI Port X TS/IP Stream X DVB-S2X Port X DVB-T2/T/C Port X ISDB-T Port X Network protocol None	Used for both normal operation and input failover settings. During normal operation this input will be the active input.
Backup Input	ASI Port X TS/IP Stream X DVB-S2X Port X DVB-T2/T/C Port X ISDB-T Port X Network protocol None	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.
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 IMPULSE 400D 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 IMPULSE 400D restores to primary when the Primary input regains transport stream synchronization. Backup Input Sync Loss: the unit will switch from backup to primary when the backup stream losses synchronization for the duration of the Switchover Interval.
Switchover (seconds)	1-20 seconds	The time in seconds which Switch On or Restore On value must remain in the configured state before the IMPULSE 400D 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 IMPULSE 400D. This menu also allows the user to adjust the TS standard to accommodate the input.

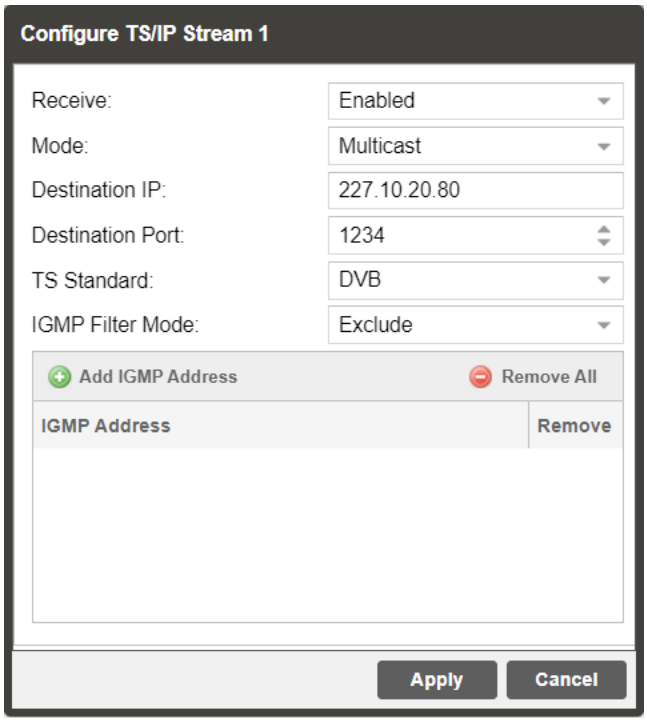


General options for ASI input

Setting	Range	Description
Receive	Enabled Disabled	This setting allows the user to enable or disable the ASI input to the IMPULSE 400D
TS Standard	DVB ATSC	Determines the TS standard for the input stream.

4.2.3 Configuring TS/IP Input

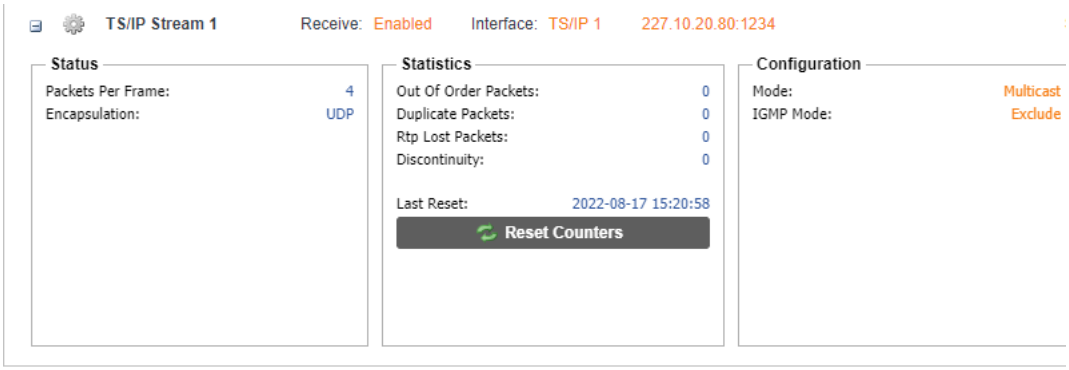
This menu allows the user to configure the TS/IP inputs. The IMPULSE 400D has two ports that can be set to receive and/or transmit. This menu is for setting up the reception of TS/IP unicast or multicast transport streams. The menu for TS/IP Stream 1 to 4 has the same settings. IGMPv2 is used to join/leave multicast streams by default if no IGMP Filter addresses are entered. If IGMP Filter Mode addresses are specified then IGMPv3 is used.



General and options for 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.

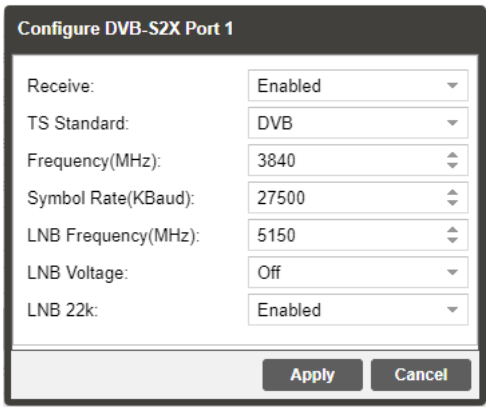
Destination Port	0 - 65535	This is the UDP port the source device is sending to. This is the only setting required to receive a unicast stream.
TS Standard	DVB ATSC	Determines the TS standard for the input stream.
IGMP Filter Mode	Exclude Include	Used on networks supporting IGMPv3. If this setting is 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 address will be received.



IP statistics menu

4.2.4 Configuring DVB-S/S2/S2X Input

If the DVB-S/S2/S2X input tuner module 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 menu for both demodulators has the same settings. The tuner will automatically detect modulation and symbol rate during signal acquisition. LNB Power configuration for this tuner is configured in the DVB-S/S2/S2X menu.

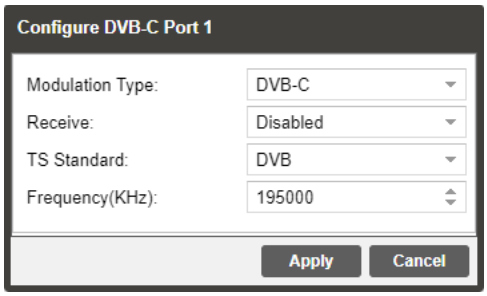


Configuration of DVB-S2X

Setting	Range	Description
Receive	Enabled Disabled	This setting allows the user to enable or disable this reception port.
TS Standard	DVB ATSC	Determines the TS standard for the input stream.
Frequency	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 satellite receive symbol rate.
LNB Frequency (MHz)	0 - 13550	The offset in MHz that the local oscillator is operating. This setting allows the LNB frequency to be set when the satellite frequency is needed in the frequency field.
LNB Voltage	OFF 13V 18V	The IMPULSE 400D 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 IMPULSE 400D to trigger the LNB to switch polarities.

4.2.5 Configuring DVB-C/DTMB Input

If the DVB-C input tuner module 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/DTMB input. This menu is for setting up the reception of DVB-C cable signals or DMTB signals.

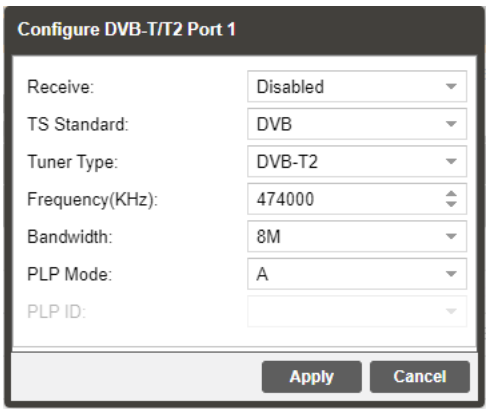


Configuration of DVB-C/DTMB

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 reception port.
TS Standard	DVB ATSC	Determines the TS standard for the input stream.
Frequency (KHz)	47000 – 862000	This setting allows the user to enter the frequency of the input signal.

4.2.6 Configuring DVB-T2 Input

If the DVB-T/T2 input tuner module was selected as a factory installed option, the following menus and options will be available for configuration. This menu allows the user to configure a DVB-T/T2 input.

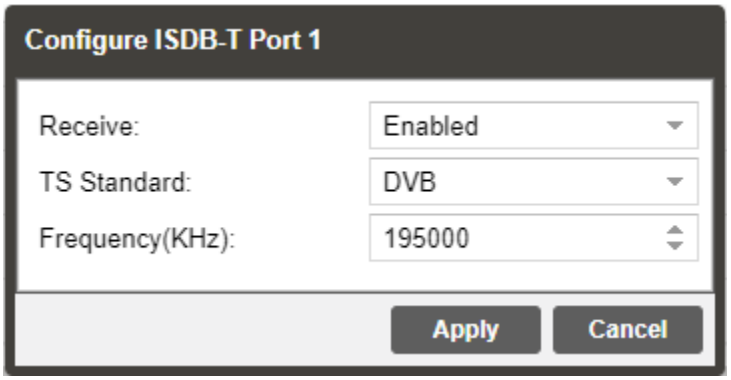


Configuration of DVB-T/T2

Setting	Range	Description
Receive	Enabled Disabled	This setting allows the user to enable or disable this reception port.
TS Standard	DVB ATSC	Determines the TS standard for the input stream.
Tuner Type	DVB-T DVB-T2	This setting allows the user to choose between DVB-T or DVB-T2 modulation schemes.
Frequency (KHz)	48000 - 862000	This setting allows the user to enter the frequency.
Bandwidth	6 MHz 7 MHz 8 MHz	This setting allows the user to select the bandwidth
PLP Mode	A B	This setting allows the user to select different profiles of DVB-T2 signal.
PLP ID	User Entry	This setting is only available when PLP Mode was set to B. The Unique PLP ID used to select a particular stream within the DVB-T2 input signal.

4.2.7 Configuring ISDB-T Input

If the ISDB-T input tuner module was selected as a factory installed option, the following menus and options will be available for configuration. This menu allows the user to configure an ISDB-T input.

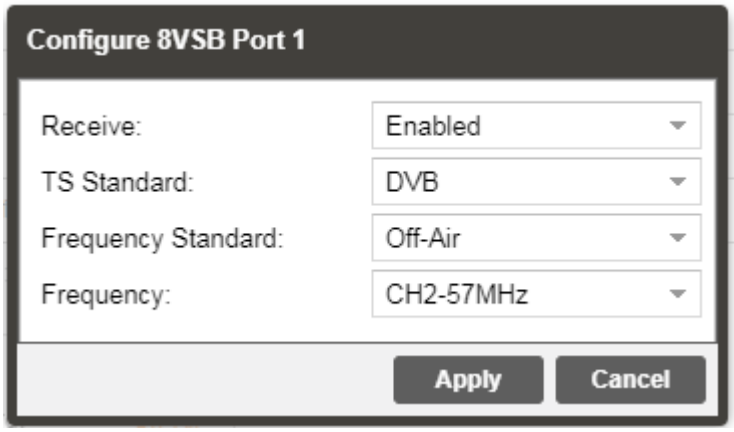


Configuration of ISDB-T

Setting	Range	Description
Receive	Enabled Disabled	This setting allows the user to enable or disable the reception port.
TS Standard	DVB ATSC	Determines the TS standard for the input stream.
Frequency (KHz)	47000 - 862000	This setting allows the user to enter the frequency.

4.2.8 Configuring 8VSB Input

If the 8VSB Input card 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 8VSB input. This menu is for setting up the reception of 8VSB off air signals.



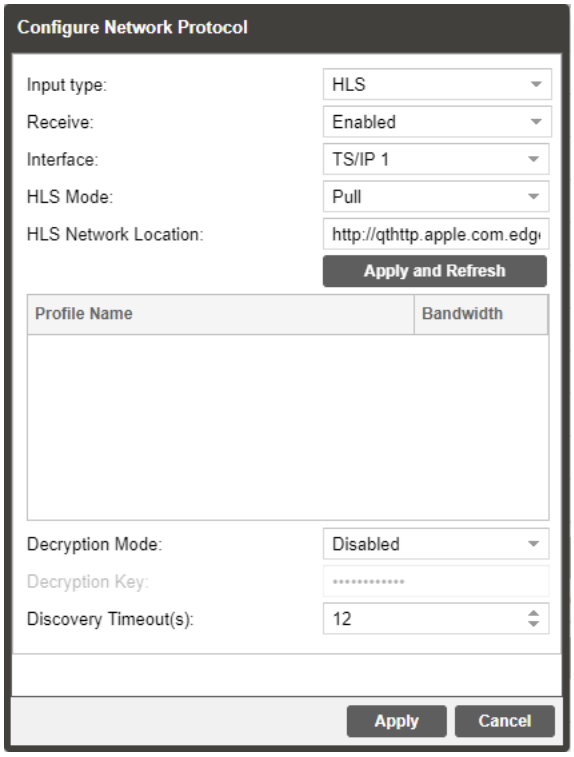
Setting	Range	Description
Receive	Enabled Disabled	This setting allows the user to enable or disable this reception port.
TS Standard	DVB ATSC	Determines the TS standard for the input stream.
Frequency Standard	Off Air	If *8 VSB* is the selected Mode, the only available option is *Off Air*.
Frequency	CH X – X MHz	This setting allows the user to tune to the correct frequency.

4.2.9 Configuring Network Protocol Input

This section describes how to configure Network Protocol input. Currently the IMPULSE 400D supports HLS input and SRT input.

4.2.9.1 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	Enabled Disabled	This setting allows the user to enable or disable this input stream setting.
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	User Entry	Defines address of the HLS stream to be received.
Profile Bandwidth	User Selected	After entering an HLS network location and clicking “Apply and Refresh” button, a list of available profiles will be displayed.
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 (Seconds)	use 0 for infinite	1 – 100,	Defines the length of time to wait for the stream to be discovered

4.2.9.2 Configuring SRT Input

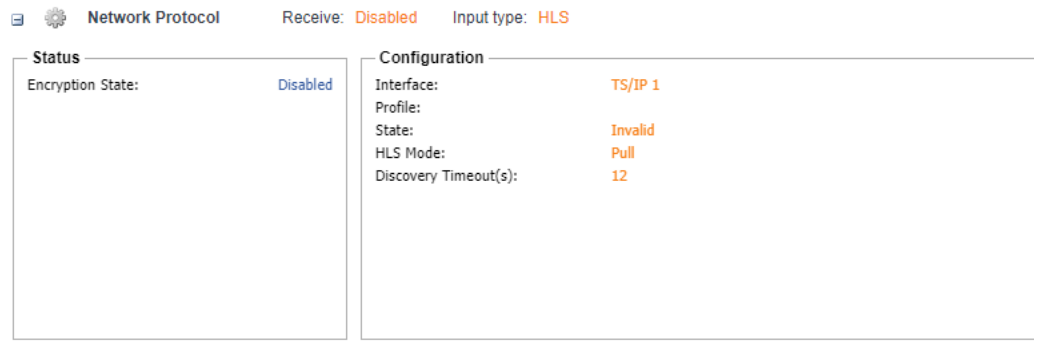
This menu configures the reception of a SRT input. The SRT input can be configured to configured to specify a caller, listener or rendezvous within the Call Mode selection drop down.

General options for SRT input

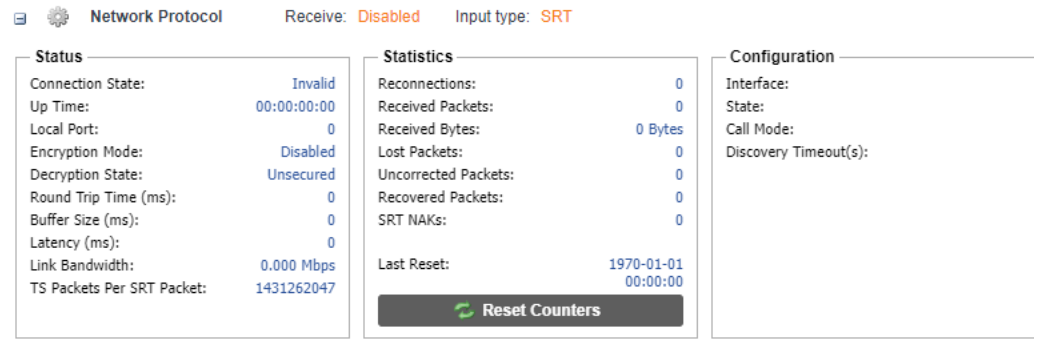
Setting	Range	Description
Receive	Enabled Disabled	This setting allows the user to enable or disable this input stream setting.
Interface	TS/IP 1 TS/IP 2	The physical connector on which to receive the SRT traffic.
Call Mode	Caller	Defines the “handshake” mechanism to be used when establishing connection.

	Listener Rendezvous	
Remote Host	xxx.xxx.xxx.xxx	Defines the IP address of the stream on the remote devices.
Remote Port	0 – 65535	Defines the port of the stream on the remote devices.
Local Port Mode	Auto Manual	In Auto mode, the local port number will be assigned automatically. In Manual mode, the local port number will be defined by the user.
Local Port	1 – 65535	Defines the local port number.
Discovery Timeout (Seconds)	1 – 100, use 0 for infinite	Defines the length of time to wait for the stream to be discovered
Latency (ms)	1 – 8000	Defines buffer size in milliseconds
Passphrase	10 – 79 characters	Defines the 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.



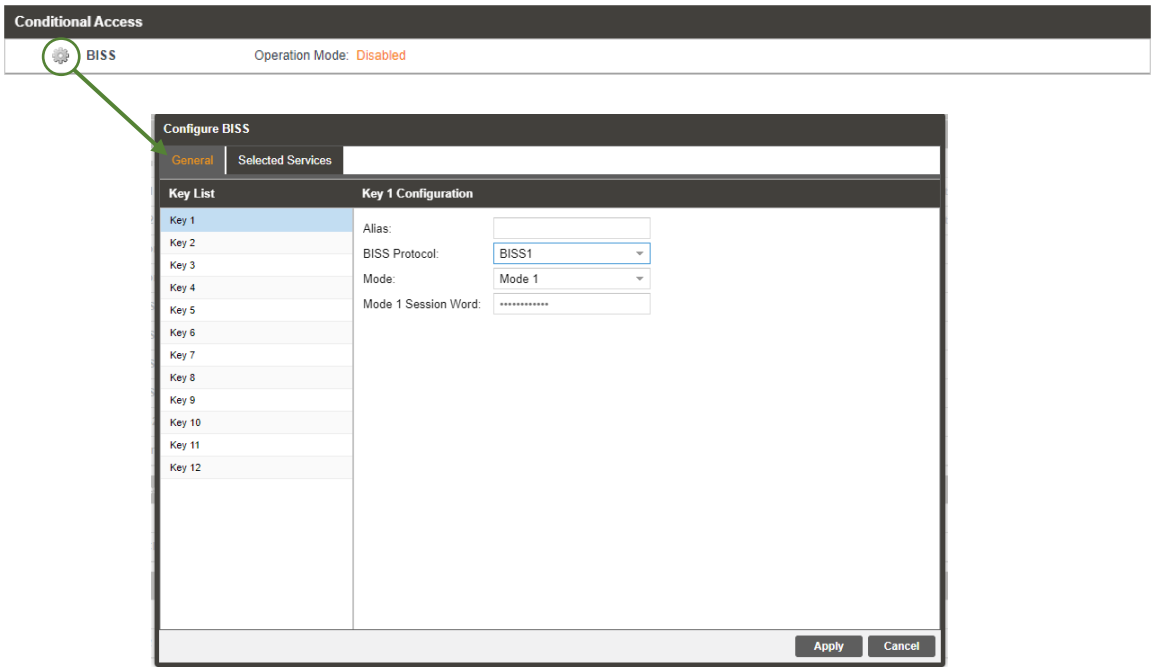
HLS Input



SRT Input

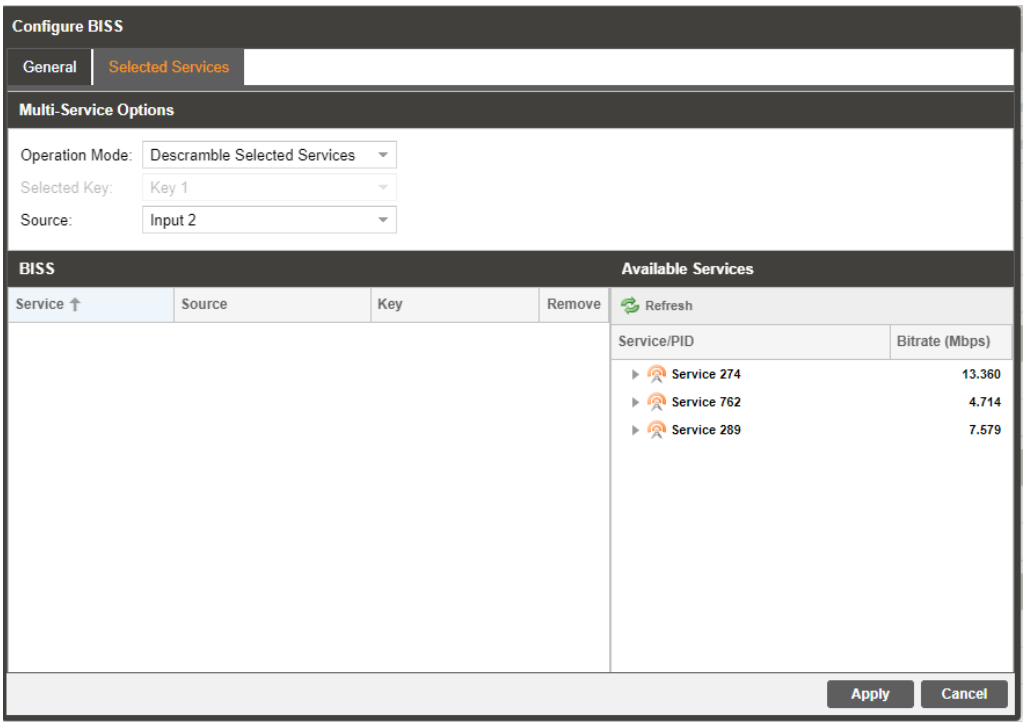
4.2.10 BISS 1 Descrambling

This menu allows the user to configure BISS descrambling. 12 unique BISS keys can be entered. Clicking on the gear icon allows the user to configure BISS 1.



Setting	Range	Description
Alias	Disabled Descramble Selected Services Descramble All PIDs	This setting allows the user to enable or disable the reception port.
BISS Protocol	BISS 1	Select which mode of BISS descrambling.
Mode	Mode 1 Mode E	This sets the mode of the BISS Key that has scrambled the transport stream.
Mode 1 Session Word	User Defined	If Mode 1 is selected the user enters the BISS session word here.
Mode E Session Word	User Defined	If Mode E is selected the user enters the BISS session word here.

The selected services menu allows the user to descramble only selected services within an input.



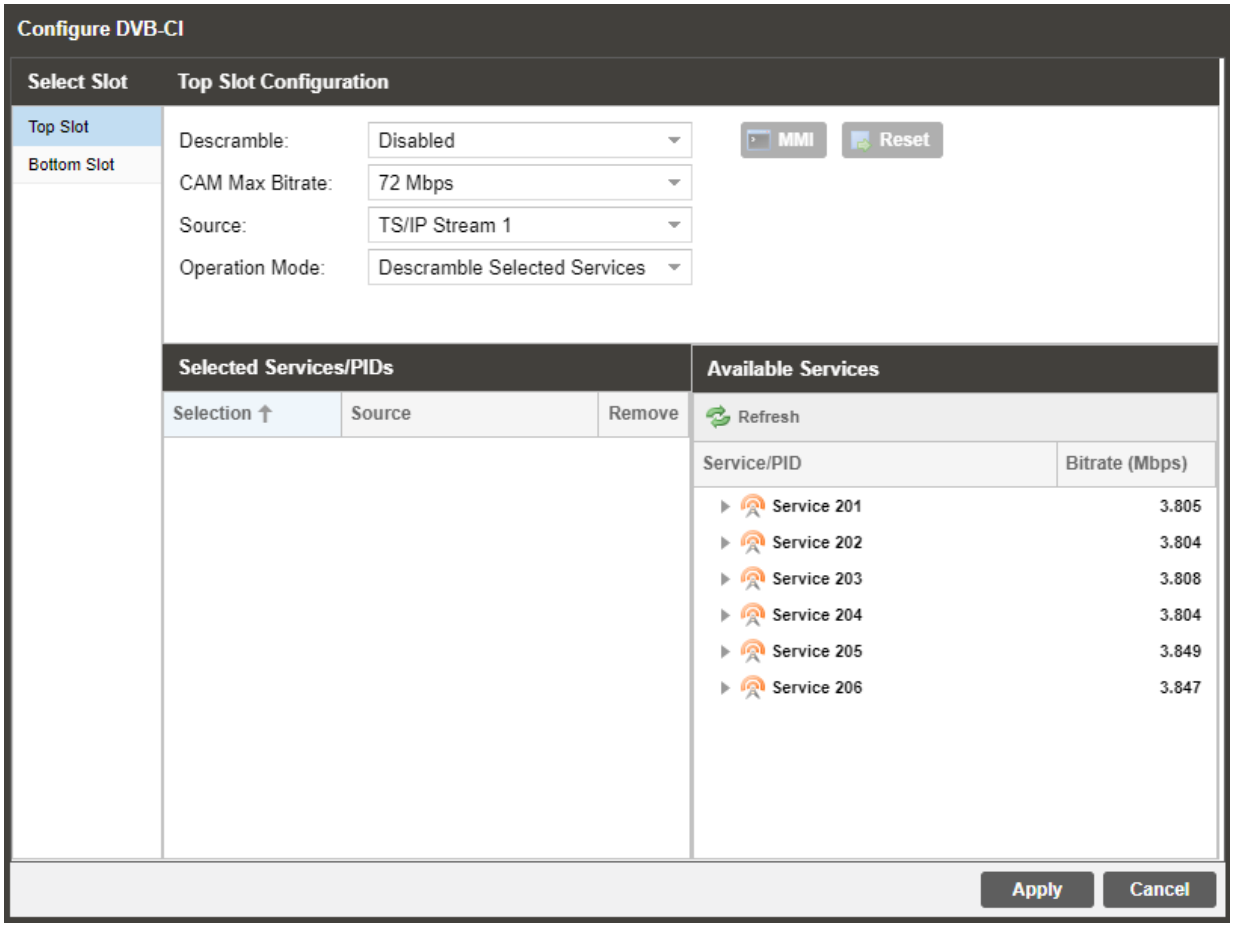
Setting	Range	Description
Operation Mode	Disabled Descramble Selected Services Descramble All PIDs	Setting to *Descramble Selected Services* sets the unit to decode individually selected services, or PIDs. *Descramble All PIDs* sets the unit to descramble all PIDs in selected services.
Selected Key	Key X	This setting allows the user to select the descrambling key.
Source	Input X ASI Port X DVB-S2X Port X Network Protocol TS/IP Stream X	This setting allows the user to enter the input source to be descrambled.

4.2.11 Configuring DVB-CI Descrambling

This section will describe how to configure DVB-CI descrambling in the IMPULSE 400D. First, the user will need to configure the CAM slots and descrambling mode. Once this is complete the user can configure which services or PIDs to descramble.

4.2.11.1 Configuring DVB-CI Slots

This menu allows the user configure the DVB-CI slots in the IMPULSE 400D. The IMPULSE 400D 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.



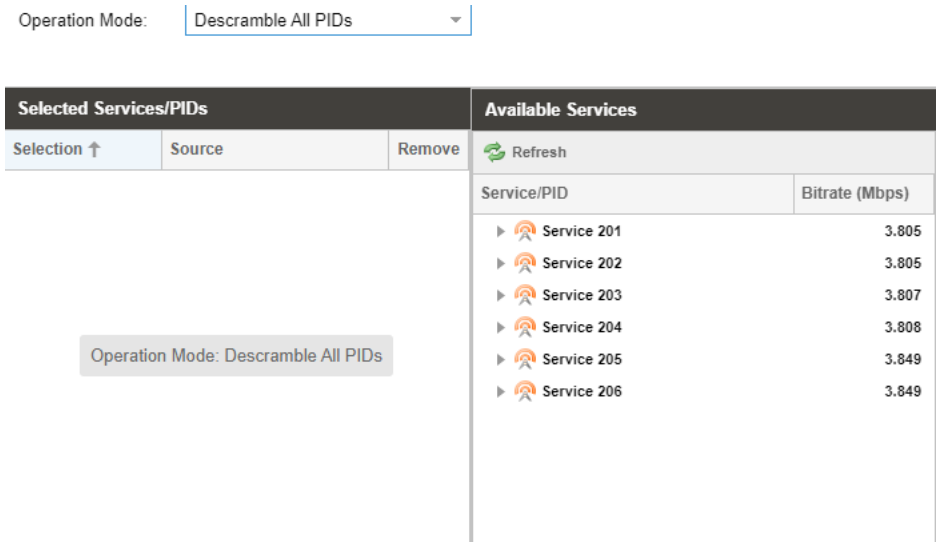
DVB-CI Descrambling Menu

Setting	Range	Description
Descramble	Disabled Enabled	This setting allows the user to enable or disable this input stream setting.
CAM Max Bitrate	X Mbps	This setting allows the user to select the required CAM maximum bitrate needed.

Source	Input X ASI Port X DVB-S2X Port X Network Protocol TS/IP Stream X	This setting allows the user to enter the input source to be descrambled.
Operation Mode	Descramble Selected Services Descramble All PIDs	Setting to *Descramble Selected Services* sets the unit to decode individually selected services, or PIDs. *Descramble All PIDs* sets the unit to descramble all PIDs in selected services.

4.2.11.2 Configuring Service Descrambling

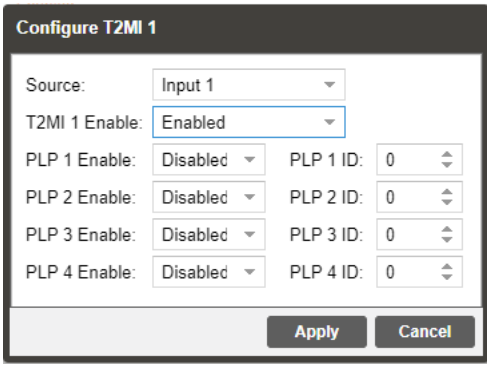
This menu allows the user to select the service the IMPULSE 400D will descramble using the CAM modules and Smart Cards inserted into the DVB-CI slots. The drag and drop method can be used to drag services from the right column to the left column. The drop-down menu next to each selected service allows 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. If in Descramble All PIDs mode, all the services in the selected source. Clicking the Refresh button forces the IMPULSE 400D to rescan the transport stream for changes.



General options for DVB-CI descrambling settings

4.2.12 Configuring T2MI Decapsulation

This menu allows the user to configure the T2MI Decapsulation for input stream.



General options for T2MI decapsulation

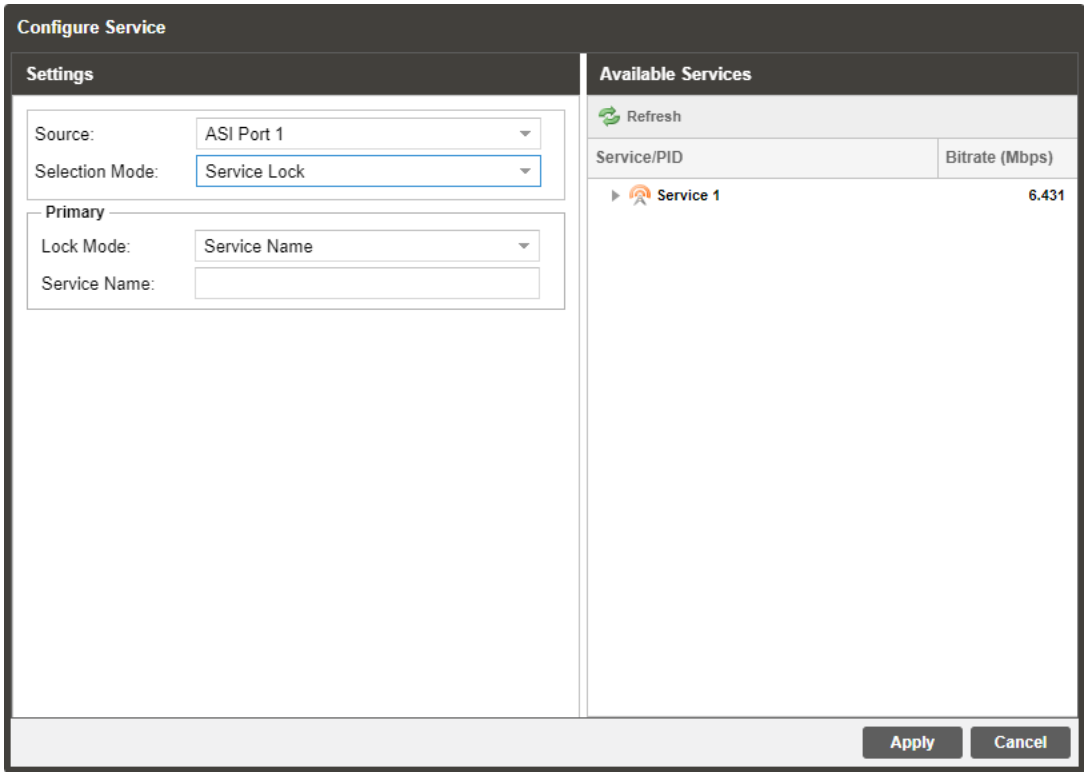
Setting	Range	Description
Source	Input X ASI Port X TS/IP Stream X DVB-S2X Port X DVB-T2/T/C Port X ISDB-T Port X	This setting allows the user to select the source to be de-capsulated.
T2MI X Enable	Disabled Enabled	This setting allows the user to enable or disable the T2MI decapsulation,
PLP X Enable	Disabled Enabled	This setting allows the user to enable or disable the Physical layer pipes X.
PLP X ID	0 – 255	Defines the PLP X ID.

4.2.13 Configuring Service Selection

This menu allows the user to configure the PIDs or Service the IMPULSE 400D 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 IMPULSE 400D is set to decode a specified service number or service name. If the PIDs within the service change at any time, the IMPULSE 400D will continue to decode the service. The drag and drop method can be used to populate the Service Name or Service Number dialog boxes.

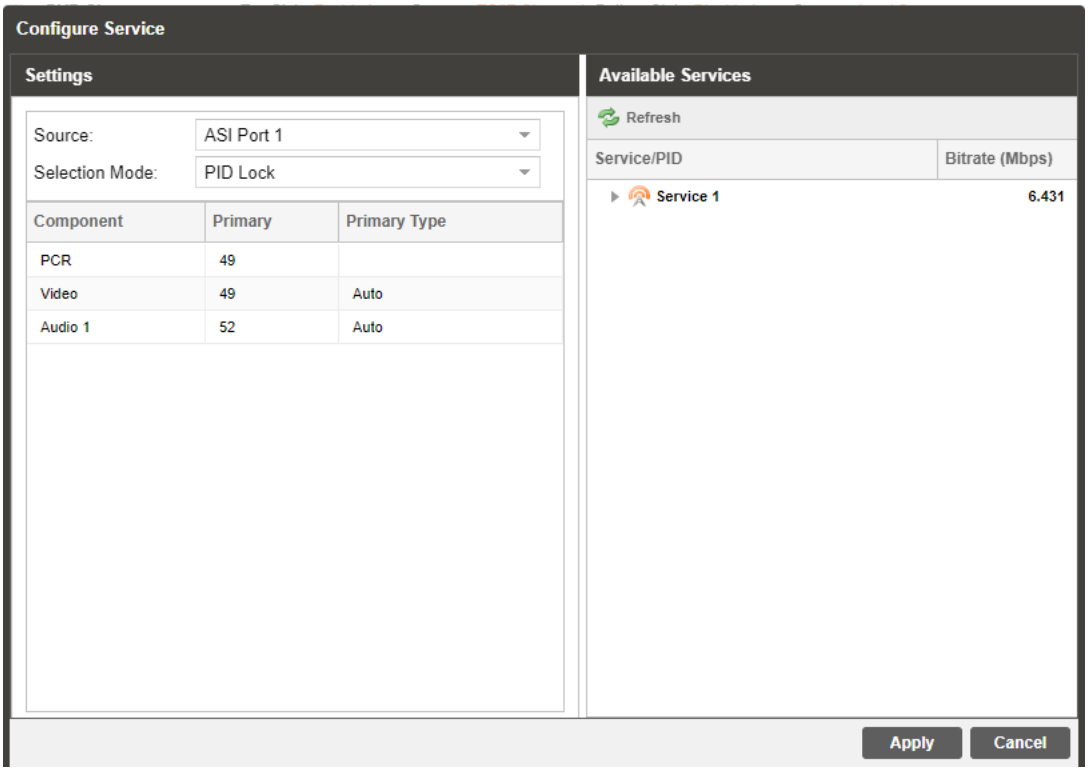


Service Lock Selection Menu

Setting	Range	Description
Source	None Input 1/2 ASI Port X TS/IP Stream X DVB-S2X Port X DVB-T2/T/C Port X ISDB-T Port X Network protocol Input X PLP X	This setting allows the user to select the source to decode.
Lock Mode	Service Name Service Number	If set to Service Name the IMPULSE 400D 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 IMPULSE 400D will decode only services matching the number specified.

PID Lock Mode

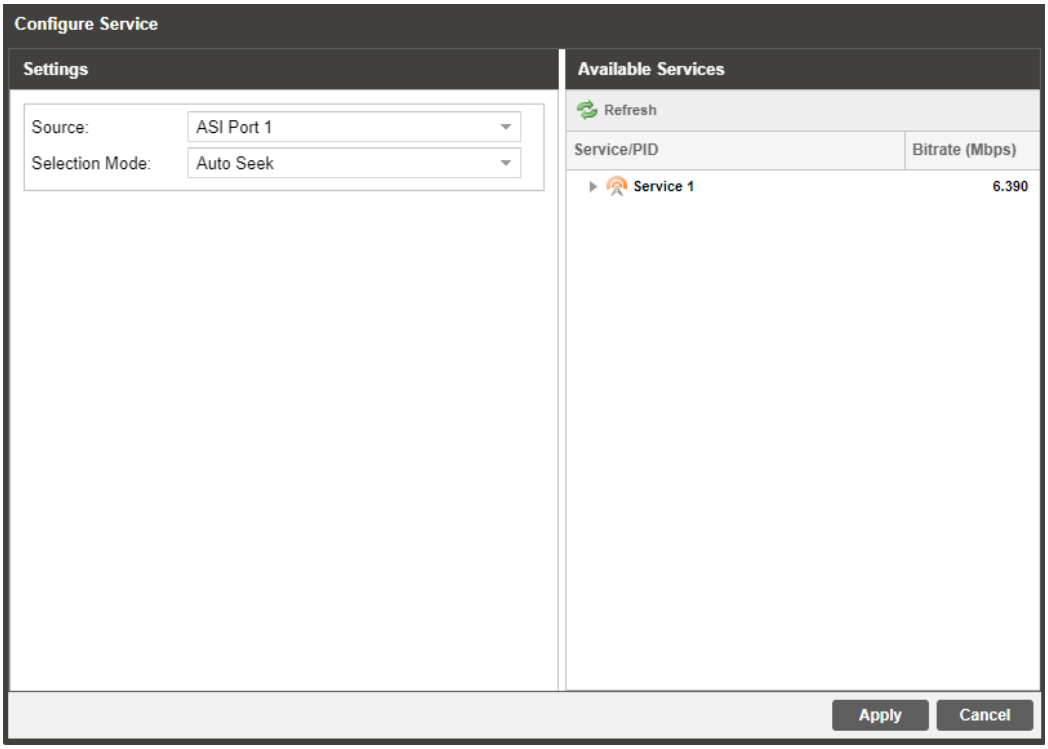
In PID Lock mode the IMPULSE 400D will only decode the PIDs specified by the user in the PID Lock Configuration matrix. The drag and drop method can be used to auto-populate the cells in the matrix. Stream types can be manually defined under the Primary Type. Individual cells under Primary column can be selected and PIDs can be typed in manually.



PID Lock Selection Menu

Auto Seek Mode

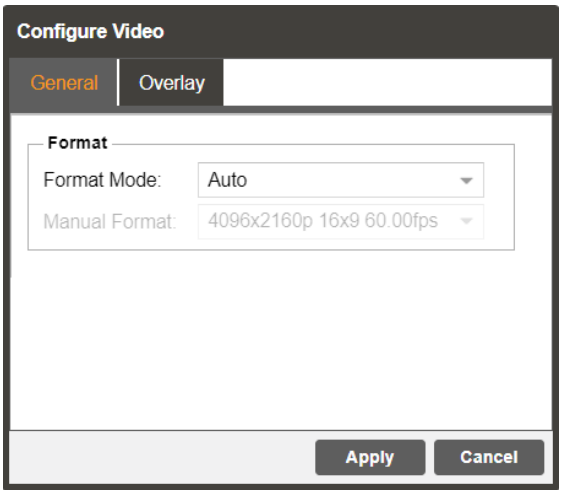
In Auto Seek mode the IMPULSE 400D will decode first service listed in the PAT. All PIDs will automatically be assigned and decoded. No other configurations are available in this mode. This mode should only be used to verify the IMPULSE 400D is receiving a valid signal and it is able to decode. This mode is not recommended for a professional environment.



Auto Seek Selection Menu

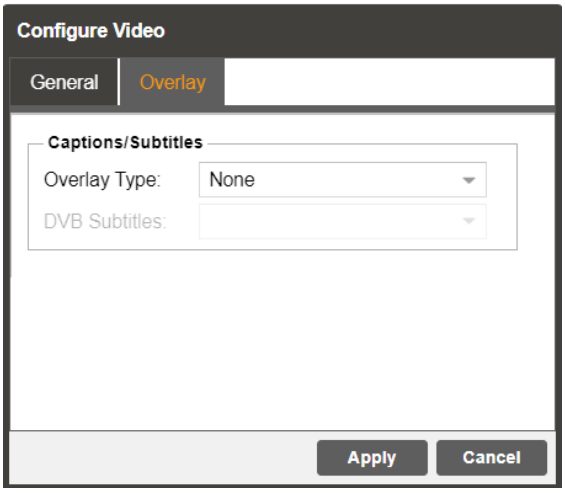
4.2.14 Configuring Video Services

This menu allows the user to configure the HDMI/SDI formats of the IMPULSE 400D. Overlay function is configured in this menu as well. To add the configure overlay settings click on the Overlay tab.



General Options

Setting	Range	Description
Format Mode	Auto Manual	Setting to *Auto* the IMPULSE 400D will output video to match the incoming native video format. Setting to *Manual* the user can define the video format the IMPULSE 400D will output.
Manual Format	Refer to Appendix C for supported formats.	This setting is the video format the IMPULSE 400D will output.

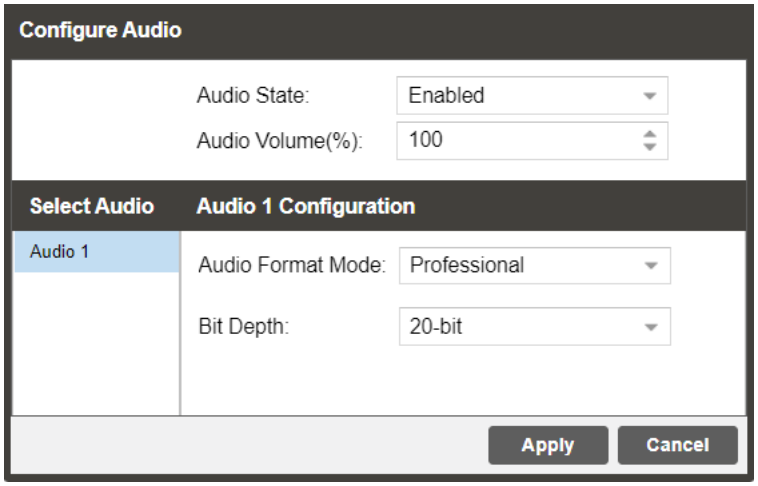


Overlay options

Setting	Range	Description
Overlay Type	None DVB-Subtitles	Defines the Overlay Type. DVB Subtitles burns subtitles in video output.

4.2.15 Configuring Audio

This menu allows the user to configure the audio setting

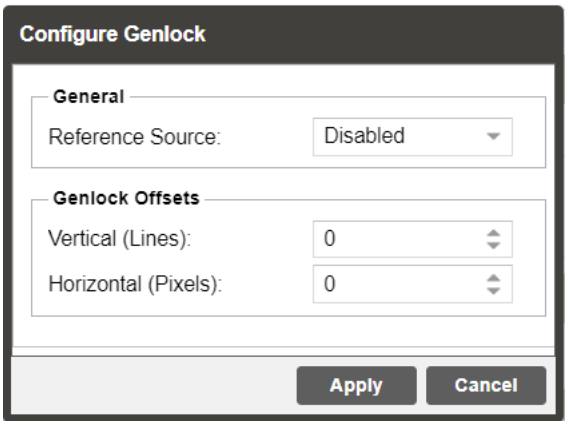


General options for Audio output

Setting	Range	Description
Audio State	Enabled Disabled	This setting allows the user to enable or disable the audio output.
Audio Volume (%)	0 – 100	Defines the audio output volume
Audio Format Mode	Professional Consumer	This option selects the Dolby Digital format mode.
Bit Depth	20-bit 24-bit	Defines the AES bit-depth to be 20-bit or 24-bit

4.2.16 Configuring Genlock

This menu allows the user to configure the genlock reference used by the IMPULSE 400D. The IMPULSE 400D can be configured to use an external user provided reference or disabled completely.



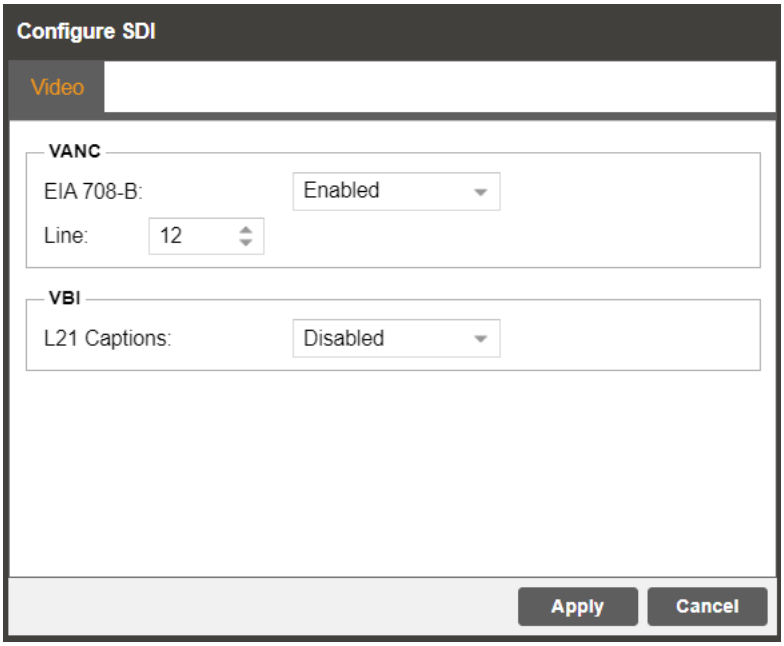
Genlock options

Setting	Range	Description
Reference Source	Disabled External	Setting to *Disabled* will synchronize video output to the PCR carried in the transport stream. Setting to *External* uses the user provided external genlock reference.
Vertical (Lines)	-312 - 312	Plus or minus half of the number of lines in the genlock reference.
Horizontal (Pixels)	-431 - 432	Plus or minus half of the number of pixels in the genlock reference.

Note: The Genlock reference connector if enabled requires external termination.

4.2.17 Configuring SDI Output Port

This menu allows the user to configure the EIA 708-B and L21 Captions in the SDI video output for port.

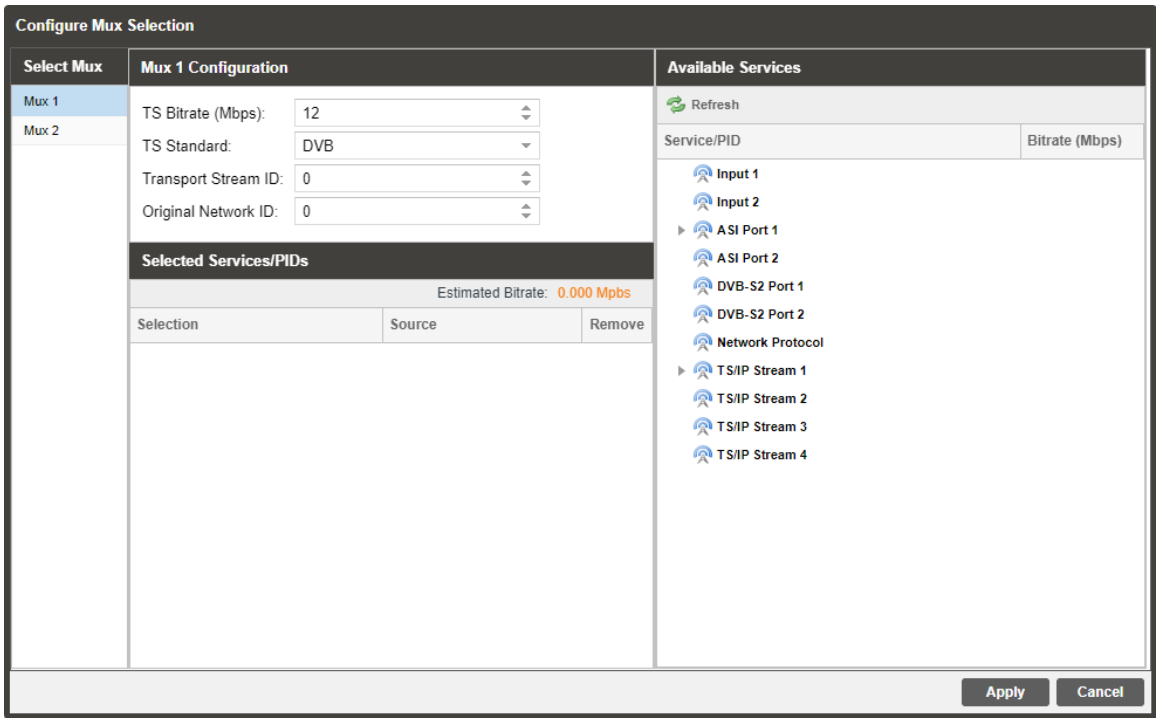


SDI auxiliary data output options

Setting	Range	Description
EIA 708-B	Enabled Disabled	Enable/Disable EIA 708-B Closed Caption embedding in the VANC.
Line	4 – 19	Choose one line between lines 4-19 to embed data.
L21 Captions	Enabled Disabled	Enable/Disable Line 21 Closed Caption embedding in the VBI. Closed Caption are output on line 21 in the VBI.

4.2.18 Configuring Program Multiplex

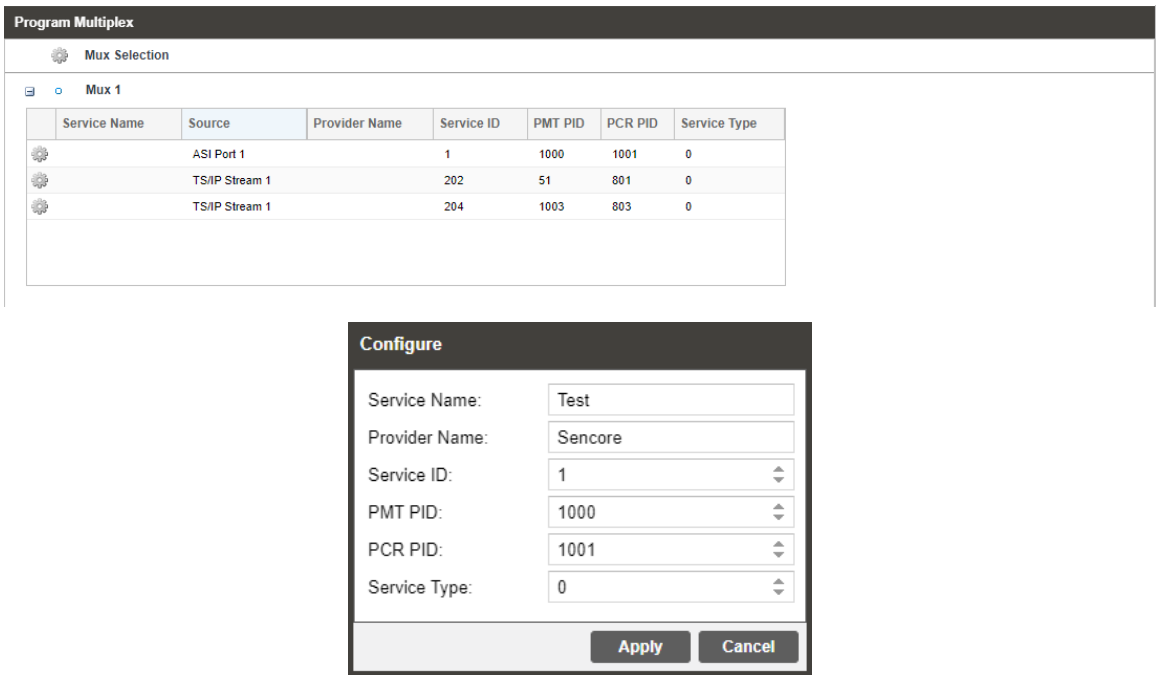
This menu allows the user to multiplex and output multiple programs. The user can create a new output TS by selecting and dragging one or more services from various sources. The user can also configure a TS bitrate and stream information for each MUX. The menus for both MUX1 and MUX2 contain the same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



General options for program multiplexing

Setting	Range	Description
Select MUX	Mux 1 Mux 2	This setting allows the user to choose which Mux channel will be configured.
TS Bitrate (Mbps)	.25 to 160	Configure the TS Bitrate for the transport stream selected.
TS Standard	DVB ATSC	Defines the TS 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 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.

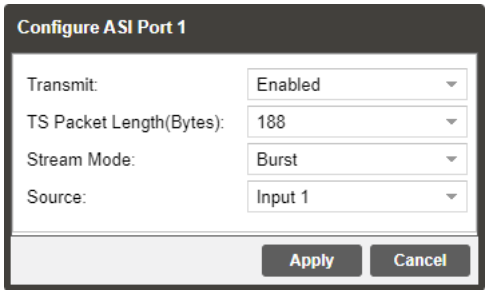


General options for service information setting

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.
Stream Type	0 - 255	Defines the Stream Type for the service selected.

4.2.19 Configuring ASI Output

This menu allows the user to configure the ASI output 1 and 2 of the IMPULSE 400D. The menus for both ASI Port 1 and ASI Port 2 contain the same settings.

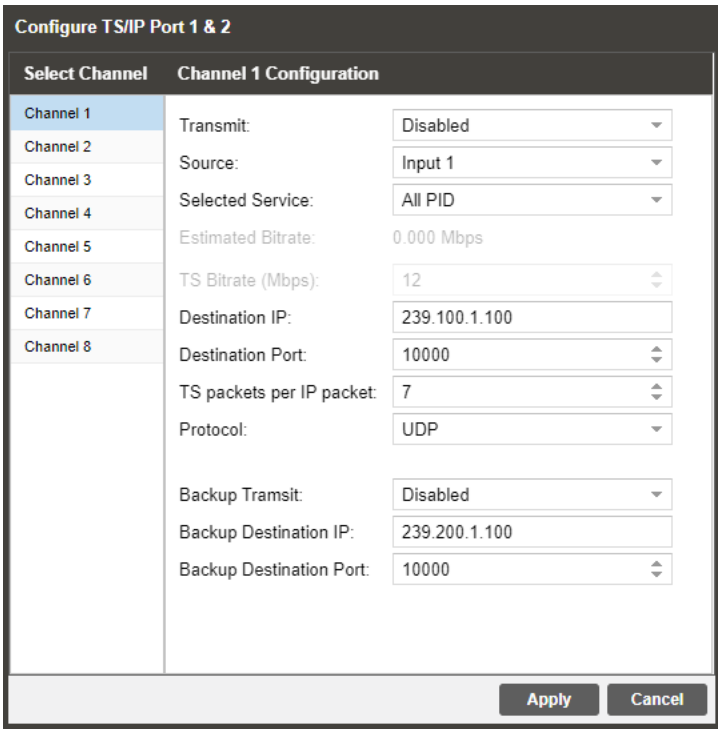


General options for ASI output setting

Setting	Range	Description
Transmit	Enabled Disabled	Enable or disable the ASI output.
TS Packet Length (Bytes)	188 204	Defines the packet length of the output stream.
Stream Mode	Spread Burst	Defines the output stream mode.
Source	Input X Mux X ASI Port X TS/IP Stream X DVB-S2X Port X DVB-T2/T/C Port X ISDB-T Port X Network protocol Input X PLP X	Defines which input TS to output.

4.2.20 Configuring TS/IP Output

This menu allows the user to configure the TS/IP outputs. The menu for Channel TS/IP stream 1 through TS/IP stream 8 contain the same settings.

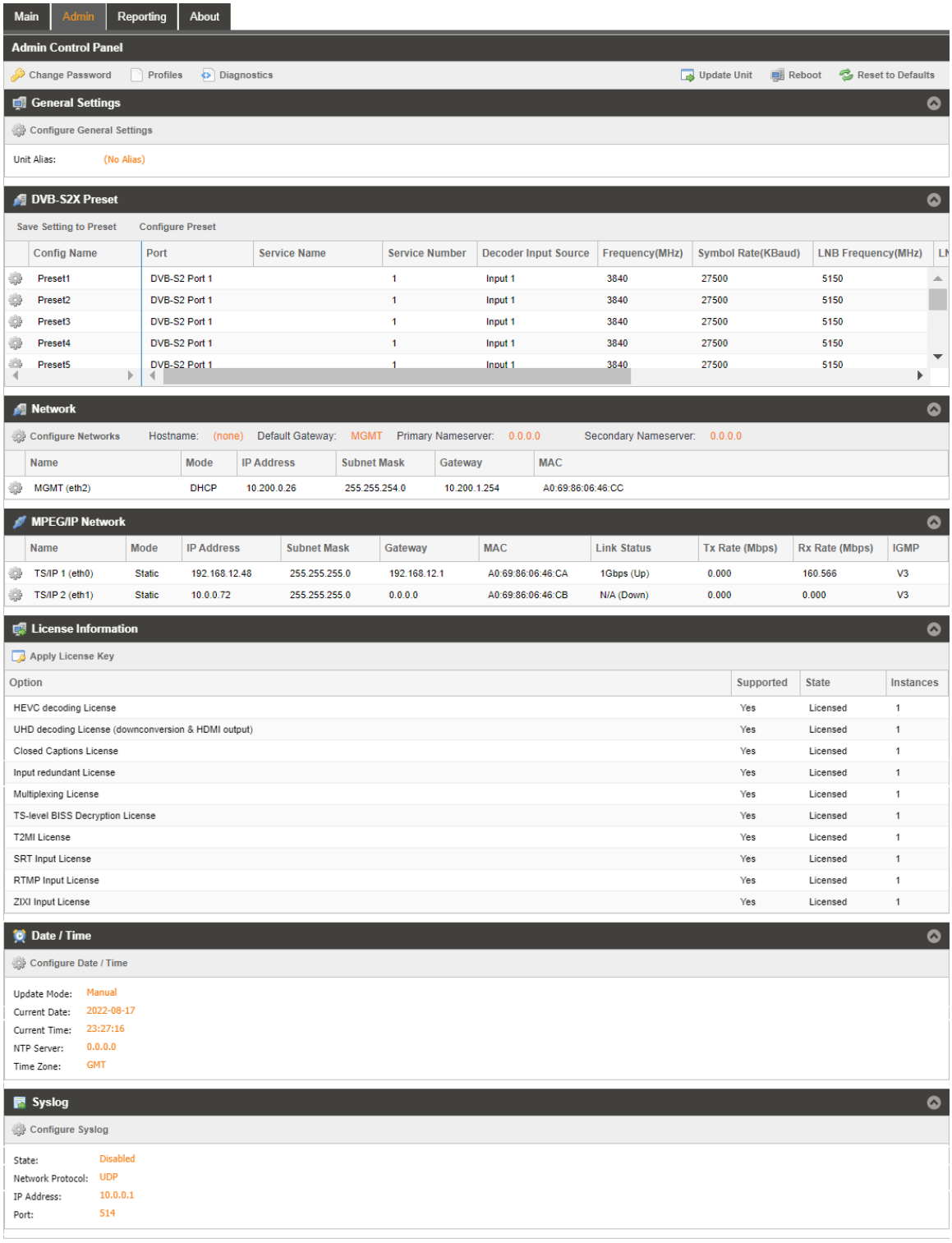


General options for TS/IP Output setting

Setting	Range	Description
Transmit	Enabled Disabled	Enable or disable the IP output channel selected.
Source	Input X Mux X ASI Port X TS/IP Stream X DVB-S2X Port X DVB-T2/T/C Port X ISDB-T Port X Network protocol Input X PLP X	Defines which TS to output
Selected Service	All PID Service X	Setting to *All PID* the IMPULSE 400D will output all the services in the selected source. Setting to *Service X* will select a single service from the input source to output.
TS Bitrate (Mbps)	0.25 - 160	Defines the TS Bitrate for the output stream selected.

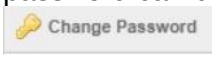
Destination IP	0.0.0.0–255.255.255.255	When sending to a unicast address, the destination IP address must match the receiving device's IP address. When sending a multicast, the address must be sent within the multicast IP range.
Destination Port	1025 - 65535	When sending to a unicast address, the destination port must match the receiving device's port. When sending a multicast, any port within the accepted range can be used, but it is good practice to always choose a port >1030 and an even number.
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	This setting allows the user to set a redundancy output. Setting to Enabled, the backup 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, 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, but it is good practice to always choose a port >1030 and an even number.

4.3 Admin Panel

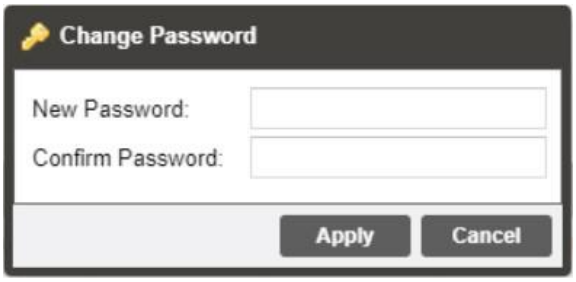


To access the Admin Control Panel, click on the Admin tab. This menu allows the user to control many aspects of the IMPULSE 400D.

4.3.1 Changing Unit Password

The IMPULSE 400D can be assigned an access password and the current access password can be changed. In order to make changes to passwords, click the 

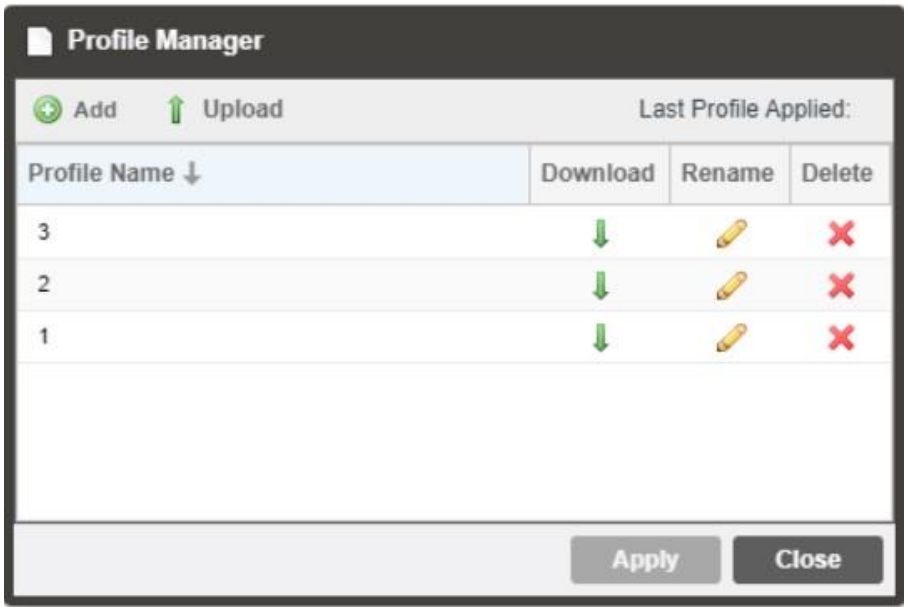
button. A window will appear to enter the current password and new password.



General options for Change Password

4.3.2 Profiles

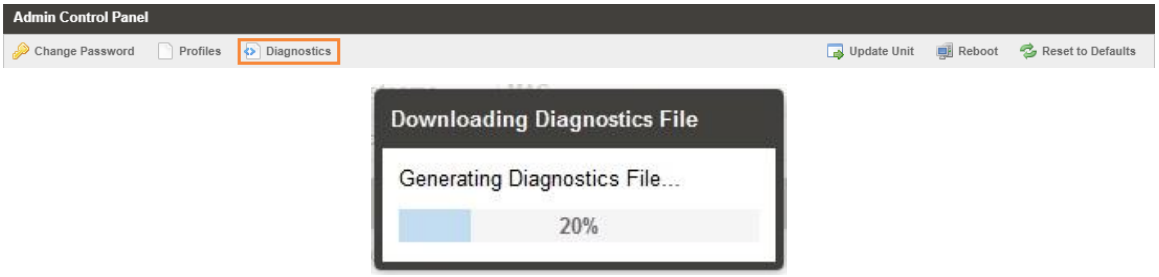
The IMPULSE 400D has the ability to save all configured settings to multiple profiles. Profiles can be saved locally, renamed and saved to external storage to be used on other IMPULSE 400Ds. Profiles can be used to quickly and easily change the configuration of an IMPUSLE 400D to suit different inputs and decoding requirements.



General options for Profile Manager

Action	Button	Description
Add New Profile	Add	Adds a new profile from current settings. User must name profile before creation is complete.
Upload Profile	Upload	Allows the user to browse to external storage or workstation to upload profile to IMPULSE 400D.
Apply Profile	Apply	Select a profile from the drop down menu and click this button. The IMPULSE 400D will apply all settings contained in the profile selected.
Rename Profile		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 Profile		Select a profile from the drop down menu and click this button. The user will be prompted to confirm deletion of the profile.
Download Profile		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.

4.3.3 Diagnostics



The IMPULSE 400D 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 .XML format file that can be sent to Procare at Sencore for analysis.

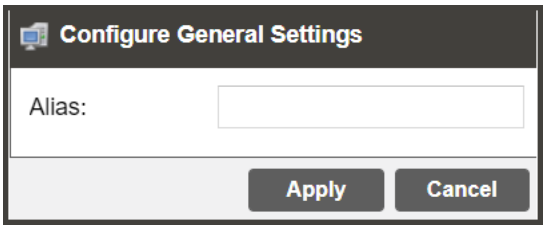
Click the ‘Diagnostics’ button and a window will open showing the diagnostic file creation progress.

This window is replaced with a download file window when file creation is complete.

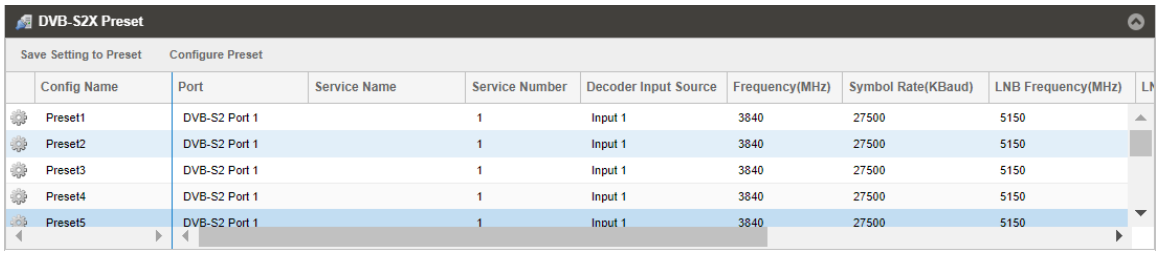
The user will be asked to ‘Open’ or ‘Save’ the file.

4.3.4 General Settings

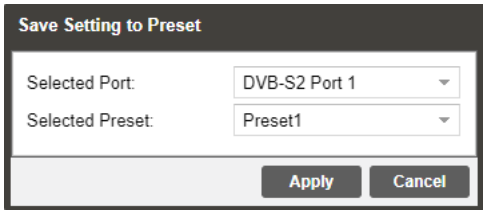
The IMPULSE 400D can be assigned an alias which is displayed in the upper right hand corner of the web interface. The alias can help define which IMPULSE 400D the operator is currently logged into. To edit the Unit Alias click on the Configure General Settings button.



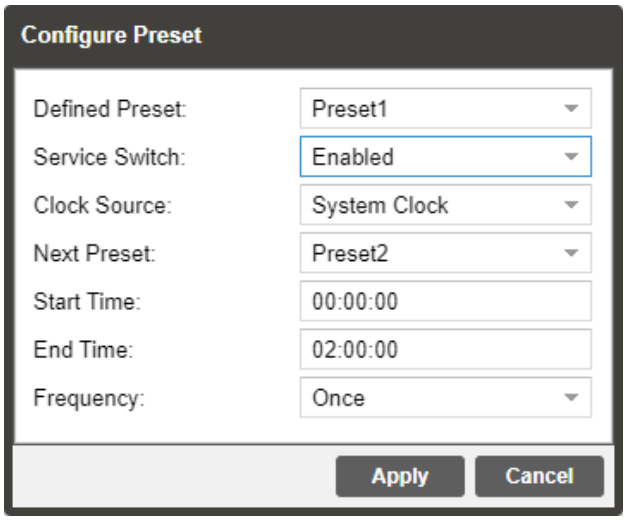
4.3.5 DVB-S2X Preset



If the DVB-S2/S2X input tuner module is installed, the following menus and options will be available for configuration. This menu allows the user to configure the preset settings for DVB-S2/S2X signal. Click on the Save Setting to Preset button to save your current setting to the preset selected. To configure the Preset switching conditions click on the Configure Preset button.



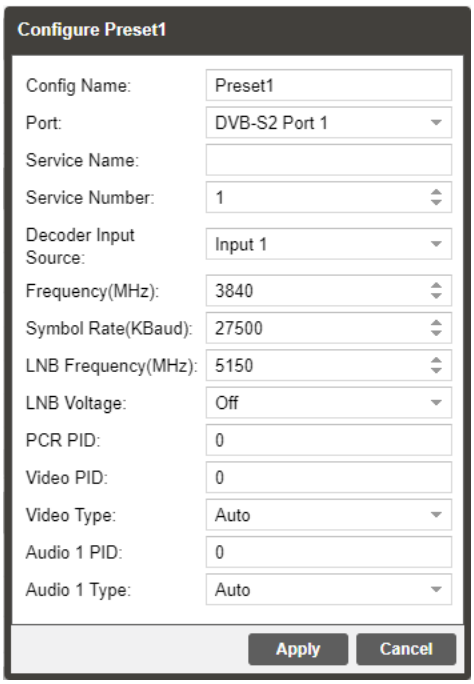
Setting	Range	Description
Select Port	DVB-S2 Port 1 DVB-S2 Port 2 DVB-S2X Port 1 DVB-S2X Port 2	This setting allows the user to save the configuration of the port selected.
Select Preset	Preset 1 to 20	Defines the Preset channel the configuration will be saved to.



Setting	Range	Description
Defined Preset	Preset 1 to 20	This setting allows the user to select the current Preset.
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 IMPULSE 400D will refer to its system time configured in Date/Time section. Setting to Input 1/2 the IMPULSE 400D will refer to the TOT/TDT present in Input 1/2.
Next Preset	Preset 1 to 20	This setting allows the user to select the next Preset.
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 IMPULSE 400D will only perform the service switch once. Setting to Every Day the IMPULSE 400D will perform the service switch every day.

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

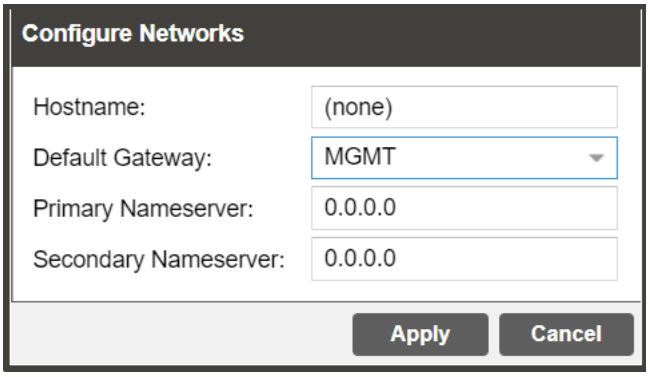


Setting	Range	Description
Config Name	User Entry	Set a name for the Preset selected.
Port	DVB-S2 Port 1 DVB-S2 Port 2 DVB-S2X Port 1 DVB-S2X Port 2	This setting allows the user to select which physical RF connector will be used to receive the signal.
Service Name	User Entry	This setting allows the user to enter the service name that IMPULSE 400D will decode.
Service Number	User Entry	It should be the same service number as the service set in Service Name field.

Decoder Input Source	Input X ASI Port X TS/IP Stream X DVB-S2X Port X DVB-T2/T/C Port X ISDB-T Port X Network protocol Input X PLP X	Defines the input source for the IMPULSE 400D
Frequency (MHz)	0 – 14500	Defines the satellite frequency of the port selected.
Symbol Rate (KBaud)	1000 – 45000	Defines the symbol rate of the port selected.
LNB Frequency (MHz)	0 – 13550	The offset in MHz that the local oscillator is operating.
LNB Voltage	OFF 13V 18V	The IMPULSE 400D has the ability to provide the necessary voltage to power a LNB. Select the correct voltage to supply to the LNB.
PCR PID	0 – 8191	The PCR PID should be the same PID as the service set in the Service Name field.
Video PID	0 – 8191	The video PID should be the same PID as the service set in the Service Name field.
Video Type	Auto	The IMPULSE 400D will automatically detect the video type of the decoding service,
Audio 1 PID	0 – 8191	The audio PID should be the same PID as the service set in the Service Name field.
Audio 1 Type	Auto	The IMPULSE 400D will automatically detect the audio type of the decoding service.

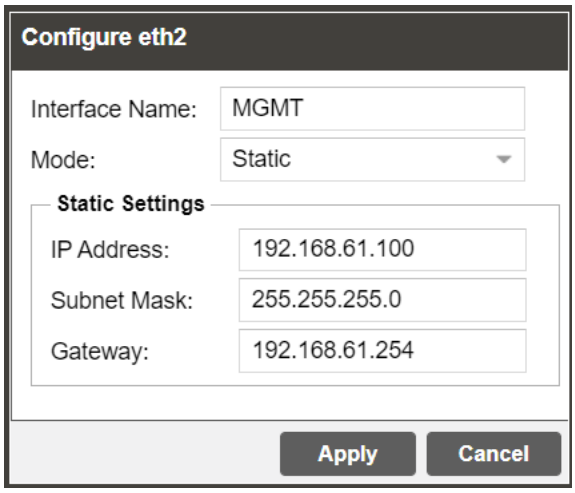
4.3.6 Unit Network Configuration

The management port of the IMPULSE 400D can be configured from the web interface. To make changes to the management port, click the ⚙ button under the Network section. Domain name servers can be configured on the IMPULSE 400D 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 IMPULSE 400D.

The IMPULSE 400D allows the user to configure the hostname and gateway under this menu.

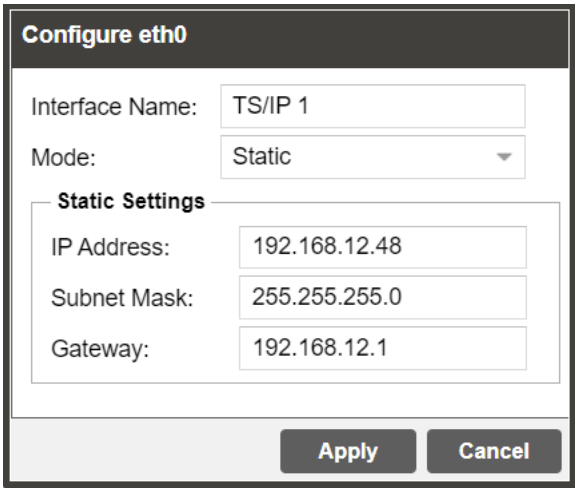


Setting	Range	Description
Interface Name	Valid characters: A through Z 0 through 9 - (hyphen)	This setting allows the user to define an optional unit Hostname.
Mode	DHCP Static	Setting to *DHCP* will allow the network assign an IP address automatically to the IMPULSE 400D (if supported). Setting to *Static* allows the user to manually define all TCP/IP settings for the management port.

IP	Four decimal octets: XXX.XXX.XXX.XXX	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	Four decimal octets: XXX.XXX.XXX.XXX	This option is only available if Static Mode is set. This is the Gateway address assigned to the management port.

4.3.7 MPEG/IP Network Configuration

This menu allows the user to configure the network settings for the two data ports. To configure the TCP/IP settings of the TS/IP ports click the button under the MPEG/IP Network section next to the corresponding port. The settings for both ports are the same.



Setting	Range	Description
Hostname	Valid characters: A through Z 0 through 9 - (hyphen)	This setting allows the user to define an optional unit Hostname.
Mode	DHCP Static	Setting to *DHCP* will allow the network assign an IP address automatically to the IMPULSE 400D (if supported). Setting to *Static* allows the user to manually define all TCP/IP settings for the management port.

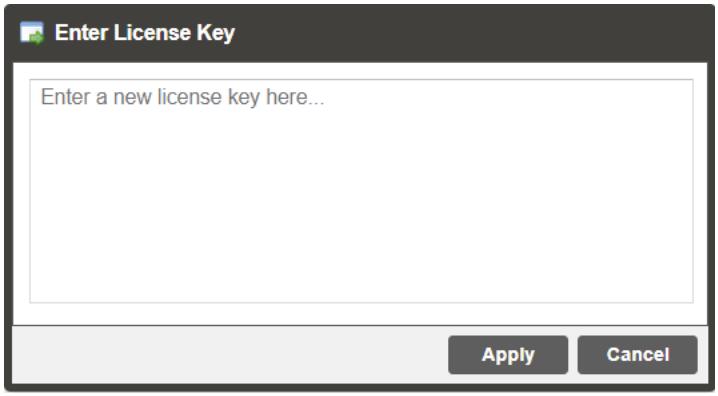
IP	Four decimal octets: XXX.XXX.XXX.XXX	This option is only available if Static Mode is set. This is the IP address assigned to the management port.
Subnet Mask	255.0.0.0 – 255.255.255.254	This option is only available if Static Mode is set. This is the Subnet Mask assigned to the management port.
Gateway	Four decimal octets: XXX.XXX.XXX.XXX	This option is only available if Static Mode is set. This is the Gateway address assigned to the management port.

4.3.8 Licensing

Certain features of the IMPULSE 400D require licenses in order to be functional. The interface displays all licenses available as well as the following status:

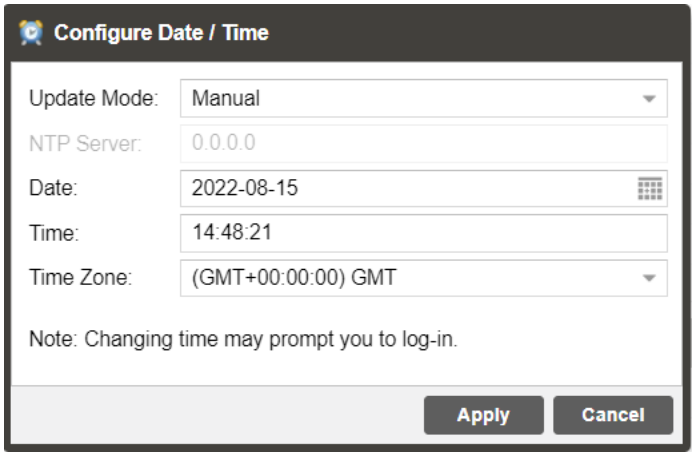
- License Locked or Unlocked
- License is Supported or Unsupported by the installed hardware

If licenses need to be applied to the IMPULSE 400D click Apply License Key button. The menu below will appear where the user can copy and paste the provided license key from Sencore.



4.3.9 Date/Time

The IMPULSE 400D 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.



General options for Date/Time

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 date and time.
NTP Server	Four decimal octets: 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 data by clicking the button. This setting is only available if Update Mode is set to Manual.
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 Configuring SNMP

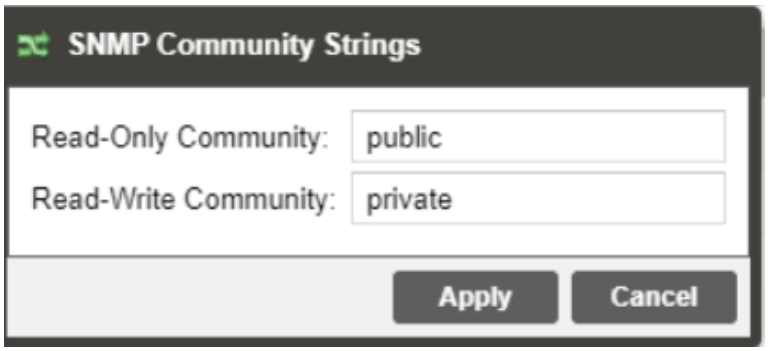
4.3.10.1 SNMP Communities

SNMP Communities define whether users have read-only or read-write SNMP rights. These two communities are given unique names. The default names for these communities are:

- Read –Only Community: public
- Read- Write Community: private

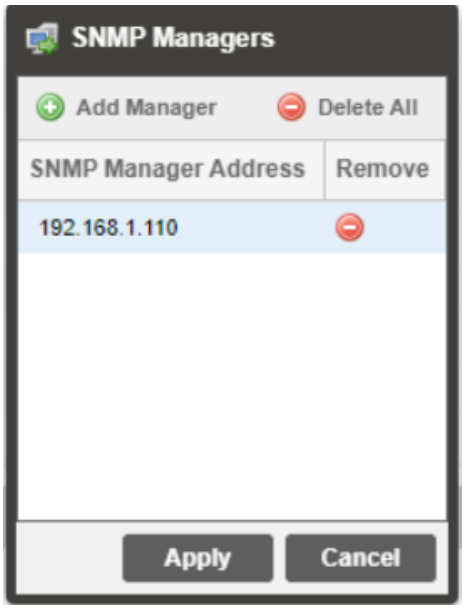
To modify the names of these communities, click on the 

button.



4.3.10.2 SNMP Trap Managers

The SNMP trap managers are recipients of SNMP traps sent from the IMPULSE 400D. The following menu allows the user to configure the recipient's IP addresses. To add and remove recipients of the SNMP traps click the Configure SNMP Communities button.



Action	Button	Description
Add Manager	Add Manager	Clicking this button prompts the user for the IP address of the SNMP trap manager.

Delete All	Delete All	Clicking this button prompts the user to confirm the deletion of all SNMP trap manager IP addresses. If the user confirms deletion all SNMP trap manager IP addresses will be removed.
Delete Single Entry		Highlight a single SNMP trap manager IP address and click this button to delete the entry. A prompt will appear confirming the deletion of IP address.

4.3.10.3 Download SNMP MIB Files

The IMPULSE 400D stores the SNMP MIB files for the currently installed version of software on the unit. These files can be downloaded directly from the IMPULSE 400D by clicking on the SNMP MIBs button. The screen below will appear where the files can be downloaded and saved off the unit.

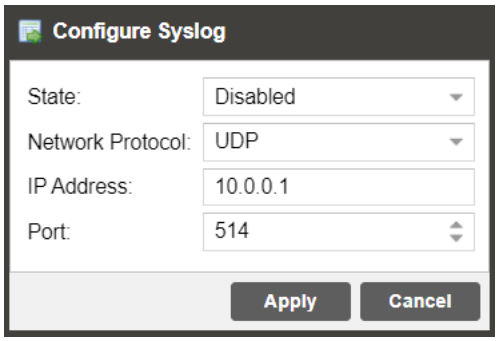
Index of /mibs/

Name	Last Modified	Size	Type
Parent Directory/		-	Directory
INET-ADDRESS-MIB.MIB	2022-Nov-02 08:05:12	16.3K	application/octet-stream
SENCORE-CSP-MIB.MIB	2022-Nov-02 07:51:08	102.4K	application/octet-stream
SENCORE-GLOBAL-REG.MIB	2022-Nov-02 07:51:08	2.3K	application/octet-stream
SENCORE-IMPULSE400D-MIB.mib	2022-Nov-02 07:51:02	167.9K	application/octet-stream
SENCORE-SCP2100-MIB.mib	2022-Nov-02 07:51:02	2.5K	application/octet-stream
SNMP-COMMUNITY-MIB.MIB	2022-Nov-02 08:05:16	15.1K	application/octet-stream
SNMP-FRAMEWORK-MIB.MIB	2022-Nov-02 08:05:17	21.8K	application/octet-stream
SNMP-MPD-MIB.MIB	2022-Nov-02 08:05:17	5.3K	application/octet-stream
SNMP-TARGET-MIB.MIB	2022-Nov-02 08:05:11	22.2K	application/octet-stream
SNMP-USER-BASED-SM-MIB.MIB	2022-Nov-02 08:05:17	38.2K	application/octet-stream
SNMP-VIEW-BASED-ACM-MIB.MIB	2022-Nov-02 08:05:16	33.3K	application/octet-stream
SNMPv2-MIB.MIB	2022-Nov-02 08:05:16	28.6K	application/octet-stream
SNMPv2-SMI.MIB	2022-Nov-02 08:05:10	8.7K	application/octet-stream
SNMPv2-TC.MIB	2022-Nov-02 08:05:10	37.1K	application/octet-stream

To Download: Right-Click, Save Link As or Save Target As

4.3.11 Syslog

The IMPULSE 400D 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.



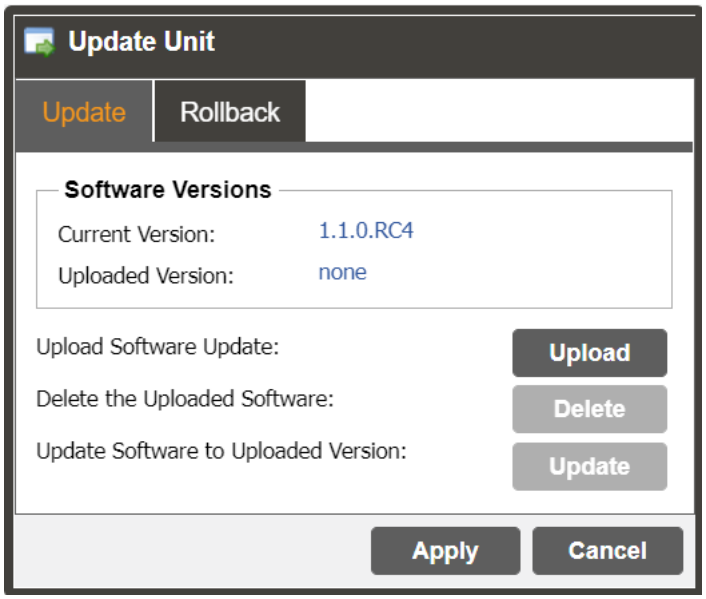
General options for Syslog configuration

Action	Range	Description
State	Enabled Disabled	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

4.3.12 Updating the IMPULSE 400D

4.3.12.1 Applying Software Updates

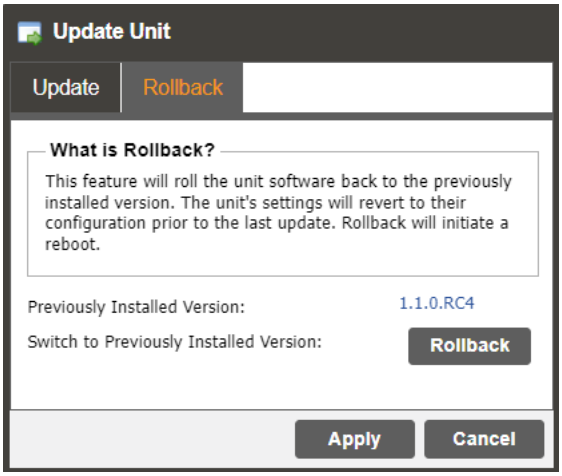
Updates to the IMPULSE 400D are performed through the web interface. A software update file is provided by Sencore and then uploaded to the unit. Once uploaded, the software update is applied to the unit. To upload software updates to the unit click on the Update Unit button. The current version and uploaded version are displayed in the Software Versions section. The IMPULSE 400D will reboot after a software update is complete.



Action	Button	Description
Upload Software Update	Upload	To upload software updates to the IMPULSE 400D click this button. The user will be prompted to navigate to an update file. The file will then upload to the IMPULSE 400D. When complete the IMPULSE 400D 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 IMPUSLE 400D. This will also clear the Uploaded Version status of the Software Version section.
Update Software to Uploaded Version	Apply	Clicking the button starts the software update process. The IMPULSE 400D will prompt the user to confirm the update. Click Yes to continue or No to cancel.

4.3.12.2 Rollback Software Updates

The IMPULSE 400D is capable of reverting back to a previous version of software using the Rollback feature. The IMPULSE 400D 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 IMPULSE 400D will reboot after the rollback process is complete.



Action	Button	Description
Rollback Software	Rollback	Clicking this button starts the Rollback process. The IMPULSE 400D will prompt the user to confirm the rollback or click cancel to stop the process.

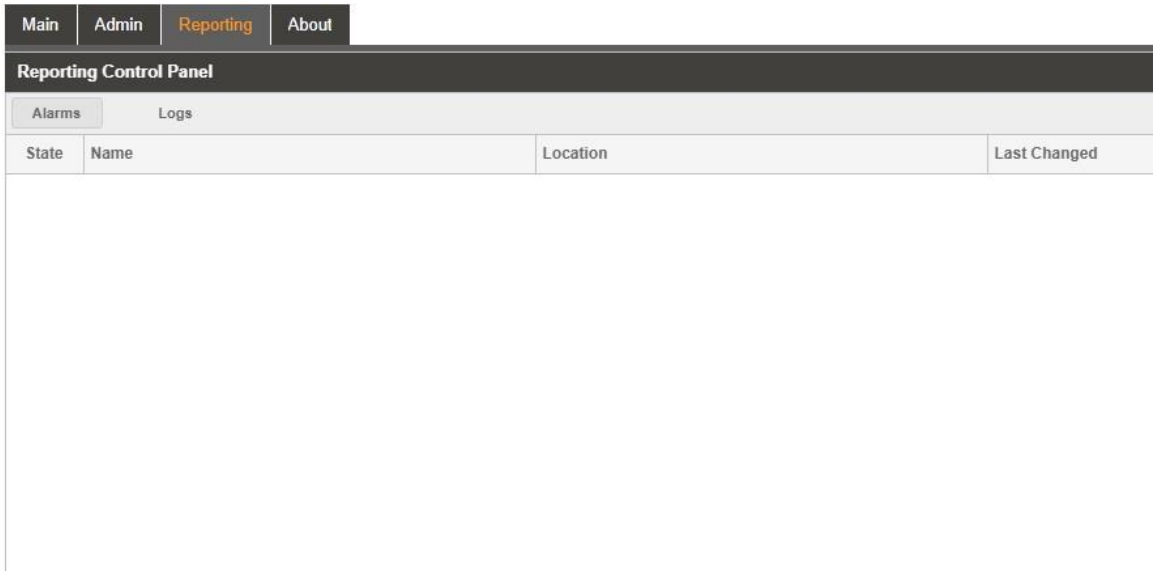
4.3.13 Reboot Unit

The IMPULSE 400D can be rebooted from the web interface. In order to perform a reboot click the Reboot button. The IMPULSE 400D 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.

4.3.14 Reset Defaults

The IMPULSE 400D settings can be reset to factory defaults. All settings will be returned to the factory defaults except the network management ports TCP/IP settings. All event logs will be cleared. To reset all settings to default click the Reset to Defaults button. The IMPULSE 400D will prompt the user to confirm the reset.

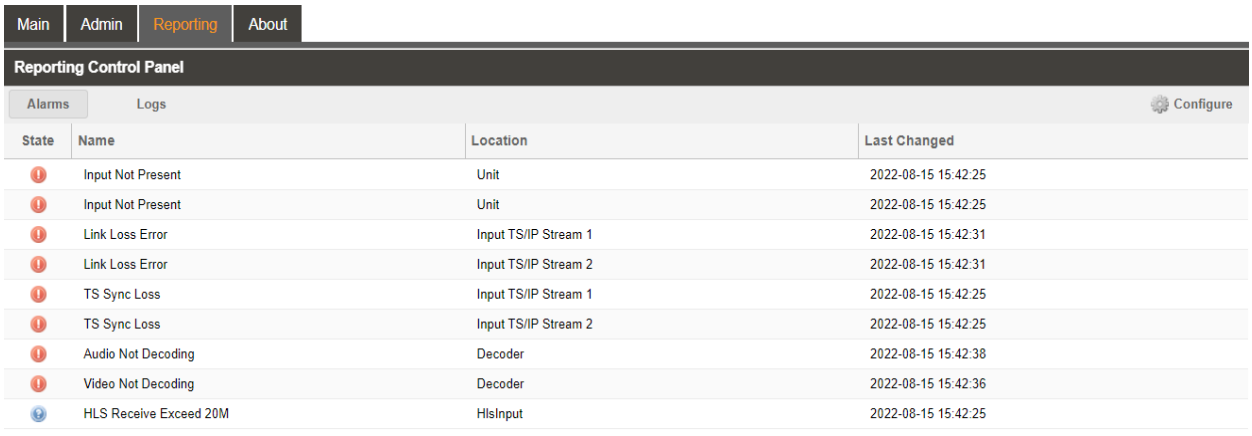
4.4 Reporting Panel



The Reporting tab in the IMPULSE 400D 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

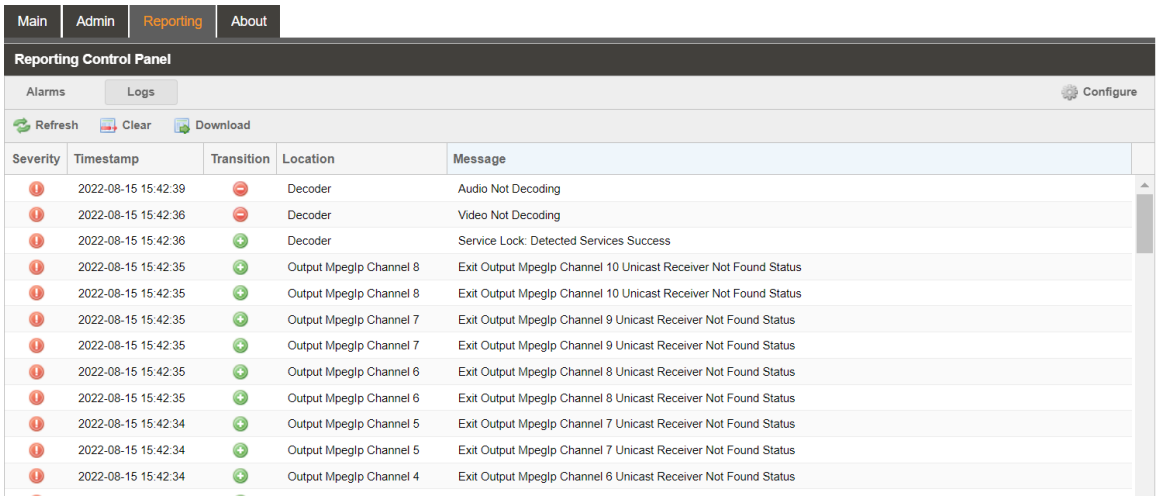
Clicking on the Alarms button displays the Active Alarms menu. This list displays all of the active alarms currently affecting the unit. There are four columns in the log that display different types of information.



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 correlates with the Date and Time settings configured in Section **Error! Reference source not found.**.

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 IMPULSE 400D 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.

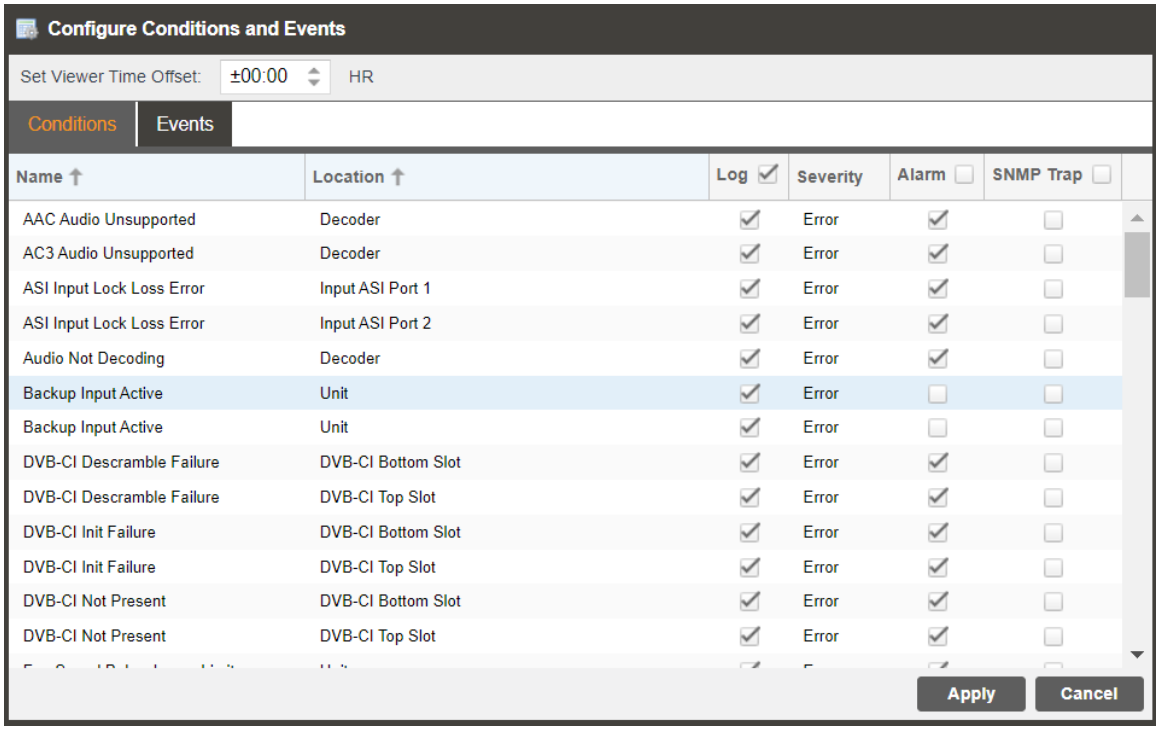


Title	Description
Severity	This column displays the nature of the alarm. The icon means the log entry is informational and is not an error. The icon means the log entry is an active alarm.

Timestamp	This column displays the date and time the error was raised or cleared. This date and time correlates with the Date and Time settings configured in Section **Error! Reference source not found.**.
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.
Message	This column displays the description of the error or event. The function or hardware that experienced the event or error is described here.
Location	This column displays the hardware or function that experienced the alarm or event.

4.4.3 Configuring the Logs

The IMPULSE 400D allows the user to configure alarms and events. Events and alarms can be hidden, set to send SNMP traps or close a relay when active. In order to configure these options click the Configure button while in the Logs section of the Reporting tab. The Conditions tab allows the user to configure the alarms reported by the IMPULSE 400D. The Events tab allows the user to configure the events reported by the IMPULSE 400D. 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.
Log 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.
Relay	This column allows the user to set a Relay closure if this alarm is raised. If this box is checked a Relay will be closed. If this box is unchecked a Relay will not be closed. See Appendix C for pinout.
Relay #	This column allows the user to select which of the three relays available on the IMPULSE 400D will be closed when the alarm is raised.
Relay Duration	This column is only available in the Events tab. This option allows the user to define the length of time in milliseconds the relay will be closed after the event is logged. This setting can be configured from 100-1000 milliseconds.

4.5 About Panel

Under the About tab, there are no user definable parameters but there is information about software versions currently installed, which licenses are installed, how to contact Sencore, and third-party software information.

Section 5 Appendices

Introduction

This section includes the following topics:

Appendix A – 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

Appendix B – Error and Event List

Error	Description
ASI Input Lock Loss Error	No ASI input has been detected by the ASI port for two seconds.
Audio Not Decoding	Audio is corrupted in incoming stream or format is not supported.
Auto Video Format Error	IMPULSE 400D is unable to determine the native incoming video in order to format output.
Backup Input Active Condition	Primary input is currently in a failed condition and the IMPULSE 400D has failed over to the Backup input.
DVB-CI Descramble Failure	CAM Module is not descrambling selected PIDs or services
DVB-CI Init Failure	The DVB-CI module initialization failed
DVB-CI Not Present	DVB-CI Descrambling is enabled but CAM Module is not installed.
Dropped Packet Error	The system has detected an instance of packets being dropped.
HLS Bitrate Exceed 20M Error	Total incoming transport stream bitrate has exceeded 20 Mbps.
HLS Receive Connection Error	They system encountered a connection error when receiving HLS transmission.
Fan Speed Below Lower Limit	Cooling fan in the IMPULSE 400D has failed.
Genlock Not Present	Genlock reference is enabled but not present.
IP Loss Error	No IP packets have been received by the TS/IP port for two seconds.
Input Not Present	The IMPULSE 400D has detected that the transport stream from the input is no longer present.
Incompatible Genlock Reference	External genlock reference is not compatible with output video format.
Link Loss Error	Physical IP link is not present on the TS/IP port.
MPEG/IP Transmit Unicast Receiver Not Found Error	The IMPULSE 400D cannot discover the destination for the unicast IP stream within 10 seconds after the initial ARP is sent.
No Services Detected	Service Lock service selection mode is enabled but no services are present in the active input transport stream.
NTP Server Unreachable	The system cannot connect to the configured NTP server.
NTP Updated	The NTP Date/Time was updated.
RF Lock Lost	Receiver carrier lock source is lost.
Service Not Found	Service Lock service selection mode is enabled but service defined by user is not present in the incoming stream.

SRT Bitrate Exceeded 20M Error	Total incoming transport stream bitrate has exceeded 20 Mbps.
SRT Receive Connection Error	The system encountered a connection error when receiving SRT transmission.
SRT Receive Decryption Error	The system has errors when trying to decrypt SRT signal.
SRT Receive Lost Packet Error	The system has detected lost packets in the received SRT signal.
SRT Skipped Packets Error	The system has detected skipped packets in the received SRT signal.
SRT Transmit Connection Error	The system has detected a connection error when transmitting SRT signal.
SRT Transmit NAK Received Error	The system has received a loss report from the receiver during the ARQ exchange and will retransmit packets.
Subsystem Network status is abnormal	The network communication with subsystem is abnormal.
Subsystem Startup Failed	The subsystem failed to start up.
Subsystem Upgrade Failed	An attempted software upgrade was unsuccessful.
Subsystem is upgrading	Subsystem is in the upgrade process.
Temperature Error	The IMPULSE 400D has detected that the internal temperature is 60 degrees Celsius or above.
TS Sync Loss	Transport stream sync for IP stream is not detected.
Video Not Decoding	The configured service or video PID to be decoded is not being successfully decoded by the IMPULSE 400D.

Appendix C – Specifications

System

Management	
Connector	RJ-45 10/100 Mbps – auto negotiation
Protocols	HTTP and SNMP
Physical & Environment	
Power Supply	100~240 VAC 50/60Hz
Size	1 RU rack mount chassis
Dimension	483mm x 312mm x 44mm
Operating Temperature	0° C ~ 50 ° C
Storage Temperature	-10° C ~ 70° C
Relative Operating Humidity	< 95% (non-condensing)

Decoding Features

Interface	
Genlock Input	1xBNC, Black Burst/Tri-level sync
SD/HD/3G-SDI Output	2xBNC, 75Ω
Digital Output	1xHDMI 2.0 connector
Analog Audio Outputs	4XBNC, 75Ω unbalanced
AES/EBU	2 pairs of digital unbalanced AES/EBU output via 1x 15 Pin D-sub (2xBNC Breakout Cable)
Video Decoding	
Video Profiles and Levels:	MPEG-2 SD 4:2:0 MP@ML– MPEG-2 HD 4:2:0 MP@ML H.264 SD MP@L3 H.264 HD MP@L4.1/HP@L4.1 H.265 Main/Main 10 profile@L5.1 High-tier AVS-P 16(AVS+) AVS2 P2 10-bit Profile @Level 8.2.60
Video Formats:	720x576i@25 720x480i@29.97, 30 720x480p@50, 59.94, 60 1280x720p@50, 59.94, 60 1920x1080i@25, 29,97, 30 1920x1080p@23.98, 24, 25, 29.97, 30, 50, 59.94, 60 3840x2160p@23.98, 24, 25, 29.97, 30, 50, 59.94, 60 4096x2160p@24, 25, 30,50, 60
Audio Decoding	
Number of Audio Pairs	1
Audio Codecs	Mpeg-1 Layer II Dolby Digital/AC-3 Dolby Digital Plus/E-AC3 AAC-LC, HE-AAC, HE-AACv2
SDI Embedded Audio Ouput	1
Adjustable Volume Level	-63~0 dB

Ancillary Data Support

SDI ANC Data:	Closed Captions (CEA/EIA-708)
SDI VBI Waveform:	Line 21 Captions (CEA/EIA-608)

DVB-CI Descrambling Module Option

Number of CAM Slots:	2
Bitrate	Max. 150Mbps (Depend on processing capability of CAM module)
CAM Supported	NEOTION, SMIT, ASTON and other major CAMs
CAM Usage:	Selectable, Enable/Disable
CAM Name Display:	Yes
Number of Services	Limited by CAM
BISS-1 & BISS-E:	Program level, Decoded service only TS level

ASI Input and Output Features

General –	
Connector:	4x BNC (2xASI input, 2xASI output)
Impedance:	75Ω
ASI Serial TS Input / Output –	
Maximum TS Rate:	150 Mb/s
Packet Sizes	Input:188 and 204 bytes Output: 188 bytes
Modes Supported –	
Input Mode:	Spread and Burst
Output Mode:	Spread

IP Input and Output Features

GbE IP –	
Interface:	2x GbE RJ-45 Ethernet Ports (Main and Backup)
Package Format:	UDP, RTP and RTP with extension headers
Traffic Type	Multicast and Unicast
FEC Receive:	Pro MPEG CoP3 SMPTE2022(input & output)
TCP/IP Protocol	IPv4
IGMP	Version 1, 2 & 3

DVB-S/S2/S2X Input

Input	RF (F-type), 75Ω
Constellation	QPSK, 8PSK, 16APSK, 32APSK, 64APSK
Symbol Rate	1~45 MSps
Input Frequency	950~2150 MHz
Max Bitrate	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, 0.15, 0.10, 0.05

DVB-T Input

Input	RF (F-type), 75Ω
Constellation	QPSK, 16QAM, 64QAM
Bandwidth	6/7/8 MHz
Input Frequency	48~862 MHz
Max Bitrate	31.67 Mbps
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, 16QAM, 64QAM, 256QAM
Bandwidth	6/7/8 MHz
Input Frequency	48~862 MHz
Max Bitrate	50.1 Mbps
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, 16QAM, 64QAM
Bandwidth	6 MHz
Input Frequency	48~862 MHz
Max Bitrate	23.42 Mbps
Signal Level	-65 ~ -10 dBm
Transmission Mode	2K, 4K, 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	6 MHz
Input Frequency	57~803 MHz (fixed frequency)
Channel Plans	Broadcast
Max Bitrate	19.39 Mbps
Signal Level	-83 ~ -8 dBm

Appendix D – Open Source Software

The IMPULSE 400D includes:

Package	Version	License	Copyright
Amibios dmi	75dce7b	GPL Version 2, June 1991	Claudio Matsuoka
BusyBox	1.20.1	GPL Version 2, June 1991	Erik Anderson, et. al.
Dropbear	2016.74	MIT-like	2002-2015 Matt Johnston, et. al (see license)
e2fsprogs	1.41.9	GPL Version 2, June 1991	Theodore Ts'o
ethtool	2.6.34	GPL Version 2, June 1991	David Miller, et. al.
FamFamFam Silk Icons	013	Creative Commons Attribution 2.5	Mark James
FastDB	3.71	MIT-like	Konstantin Knizhnik
FCGI	2.4.6	FastCGI	Open Market, Inc
FFmpeg	3.4.0	LGPL Version 2, February 1999	Fabrice Bellard
gptfdisk	1.0.3	GPL Version 2, June 1991	Johannes Erdfelt, Thomas Sailer, Brad Hards
grub	2.00	GPL Version 3, June 2007	
Lighttpd	1.4.30	BSD	2004, Jan Kneschke
Libpcap	1.8.1	BSD	1993, 1994, 1995, 1996 The regents of the University of California.
Linux	2.6.30	GPL Version 2, June 1991	Linus Torvalds, et. Al.
Log4cpp	1.0	LGPL Version 2.1, Feb 1999	Bastiaan Bakker
Monit	5.1.1	GPL Version	2010 Tildeslash

		3, 29 June 07	Ltd.
Net-SNMP	5.7.1	BSD	1989, 1991, 1992 by Carnegie Mellon Univsty.
NTP	4.2.4p7	NTP License	1992-2009 David L. Mills
OpenSSL	1.0.1c	BSD-Like	1998-2008 The OpenSSL Project, 1995-1998 Eric Young
OProfile	0.9.7	GPL Version 2, June 1991	John Levon, Philippe Elie, et. al
PCRE	8.30	BSD	1997-2012 University of Cambridge, 2007-2008
POPT	1.14	MIT	1998 Red Hat Software
pureftpd **qDecoder**	1.0.46 12.0.4	BSD BSD	Frank Denis 2000-2012 Seungyoung Kim
Samba	4.7.0	GPL Version 3, 29 June 07	Andrew Tidgell, et. al
SRT	1.3.2	MPLv2.0 License	2018 Haivision Systems Inc.
TCLAP	1.2.0	MIT	2003 Michael E Smoot
tzdata	2017b	Public domain, BSD 3-clause	Arthur David Olson
Zlib	1.2.7	Zlib/libpng License	1995-2005 Jean-Loup Gailly and Mark Adler

Appendix E – Warranty

Sencore One-Year Warranty

Sencore warrants this instrument against defects from any cause, except acts of God and abusive use, for a period of 1 (one) year from date of purchase. During this warranty period, Sencore will correct any covered defects without charge for parts, labor, or recalibration.

Appendix F – Support and Contact Information

Returning Products for Service or Calibration

The IMPULSE 400D is a delicate piece of equipment and needs to be serviced and repaired by Sencore. Periodically it is necessary to return a product for repair or calibration. In order to expedite this process please carefully read the instructions below.

RMA Number

Before any product can be returned for service or calibration, an RMA number must be obtained. In order to obtain a RMA number, use the following steps:

1. Contact the Sencore service department by going online to www.sencore.com and select Support.
2. Select Service and Repair from the options given.
3. Fill in the following required information:
    a. First & Last Name
    b. Company
    c. Email
    d. Phone Number
    e. Ship and Bill to Address
    f. Unit Model and Serial Numbers
4. A RMA number will be emailed you shortly after completing the form with return instructions.

Shipping the Product

Once an RMA number has been issued, the unit needs to be packaged and shipped back to Sencore. It's best to use the original box and packaging for the product but if this not available, check with the customer service representative for the proper packaging instructions.

Note: DO NOT return any power cables or accessories unless instructed to do so by the customer service representative.

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