DMG 7000
Digital Media Gateway Software

User Manual

Copyright

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	Version	Description	Author
6/21/2019	0.1	First Draft	TDH
7/12/19	0.2	Updated draft	TDH
7/29/19	0.3	Revised draft	TDH
8/22/19	1.0	Initial Release	TDH
1/23/20	1.1	Correct latency range error in Zixi receive and transmit tables	TDH
6/5/2020	1.2	v1.9.0 Feature Release	BCR

Safety Instructions

- Read and follow all instructions
- Keep this manual
- Heed all warnings
- 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 liquids 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 product 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 email ProCare@Sencore.com
- 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 power supply must be connected to a mains socket outlet with a protective earth ground connection.
- For the mains plug the main disconnect and should remain readily accessible and operable at all times.
- When utilizing DC power supply, the power supply MUST be used in conjunction with an over-current protective device rated at 50 V, 5 A, type: Slow-blow, as part of battery-supply circuit.
- To reduce the risk of shock and damage to equipment, it is recommended to ground the unit to the installation’s rack, the vehicle’s chassis, the battery’s negative terminal, and/or earth ground. 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.

⚠ **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.***

Package Contents

The following is a list of the items that are included in the shipping carton:

1. DMG 7000 Chassis
2. DMG 7000 Software
3. AC Power Cable
4. Quick Start Guide

If any of these items were omitted from the packaging please email ProCare@Sencore.com to obtain a replacement.

Table of Contents

Section 1 Overview

Introduction

This section includes the following topics:

1.1 Product Introduction

The new DMG 7000 Transport Stream Gateway utilizes the latest software-based platform from Sencore to deliver a highly flexible transport stream processor. It bridges the gap between unmanaged and managed networks with SRT/Zixi, HLS receive and MPEG/IP workflows.

The DMG 7000 provides bulletproof transport stream distribution over the internet using advanced encapsulation methods such as the SRT and Zixi protocols. The DMG 7000 product is a software-based solution; designed to run on a PC server chassis. Initial network configuration is done with keyboard, monitor, and mouse; however, once the IP is configured all operation and setup is via web-interface over a network.

The DMG 7000 maintains the long standing Sencore tradition of coupling ease of use, with a straight-forward web interface to give the user complete control of the unit and signals being processed.

To obtain the associated documentation from the server manufacturer or detailed information regarding front of chassis indicator lights email ProCare@Sencore.com

1.2 Front Panel Overview

There are three form factors for the DMG 7000. There are details below for each front panel. Note that connectors without highlighting and description are not used by the DMG 7000 and should not be connected.

The DMG 70010 Mini Unit

1. Power button
2. Status indicators for Power (PWR), Hard drive activity (SATA)
3. Two (2) USB 3.0 ports for keyboard and mouse connectivity

The DMG 70020 Field Unit

1. Power button
2. Reset button
3. Status indicators for Power ( ), Hard drive activity ( ), Management network activity ( ), video network activity ( ), and system status information ( ).

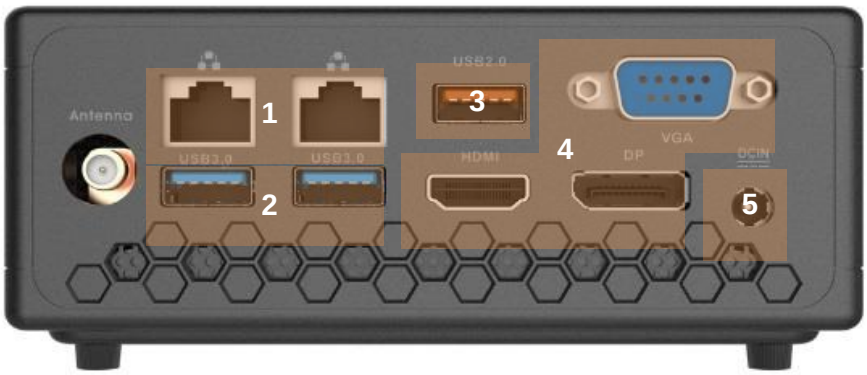
The DMG 70030 Headend unit

1. Power button
2. Reset button
3. Status indicators for Power, Hard drive activity, Management network activity, video network activity, and system status information.

1.3 Rear Panel Overview

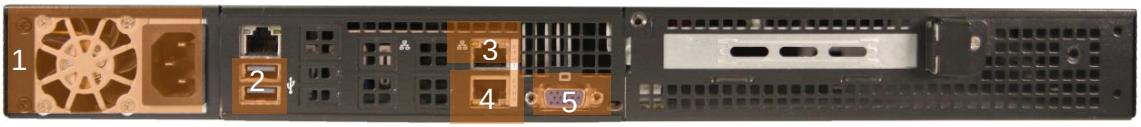
The DMG 7000 form factors back panels are described in the figures below. Note that connectors without highlighting and description are not used by the DMG 7000 and should not be connected.

The DMG 70010 Mini Unit



1. RJ45 Ethernet ports for management of MPEG/IP
2. Two (2) USB 3.0 ports
3. USB 2.0 port
4. System Video Output ports – (1) HDMI, (1) Display port and (1) VGA port
5. Power input port (19VDC)

The DMG 70020 Field Unit



1. Power supply (120/240 AC switching power supply)
2. USB ports (two) for keyboard and mouse connectivity
3. Eth0: One of two available RJ45 Ethernet ports for management or MPEG/IP
4. Eth1: One of two available RJ45 Ethernet ports for management or MPEG/IP
5. Local monitor output uses VGA (D-SUB) connector

The DMG 70030 Headend unit

1. Redundant Power supplies (two 120/240 AC switching power supply)
2. USB ports (two) for keyboard and mouse
3. Eth0: One of two available RJ45 Ethernet ports for management or MPEG/IP
4. Eth1: One of two available RJ45 Ethernet ports for management or MPEG/IP
5. Local monitor output uses VGA (D-SUB) connector

Section 2 Installation

Introduction

This section includes the following topics:

2.1 Installation

The DMG 7000 ‘mini/throw down’ unit can easily be deployed almost anyplace. The size is small enough that the unit can be placed on top of a desk, or a test equipment rack, or a shelf on a test bench.

The DMG 7000 ‘field’ and ‘head end’ units will have more processing power and thus require a little more space. Each of these systems can be installed into a rack system only requiring 1RU of space, and are lightweight enough to allow deployment to an alternate site with minimal effort.

2.2 Power Connection

The DMG 70010 Mini Unit will come with the necessary AC adaptor and power cord provided. To make the power connection, the user will

mate the power cord to the adaptor;

mate the adaptor to the DC power jack on the back of the DMG 7000 mini

then mate the power plug to a protected AC outlet

The DMG 70020 Field Unit has a single AC power connection provided on the chassis. To make the power connection, the user will

Locate the single AC power cord that is provided

Mate the female end into the DMG 7000 chassis

Mate the male end into a protected AC outlet

The DMG 70030 Headend unit will provide the user with a redundant AC power input. To make the power connection for this system, the user will

Locate the two (2) AC power cords that are provided

Mate the female ends into the two (2) open connections on the back of chassis

Mate the male ends of each AC power cord into separate protected AC outlets.

NOTE: Both AC connections should be active and complete or the system will sound an alarm indicating a power supply concern exists.

2.3 Maintenance

The DMG 7000 is a maintenance-free piece of equipment. There are no user serviceable parts on the inside of the unit. However, if the user has a need to pursue maintenance of any DMG 7000, please send an email request to one of our Sencore Pro Care members (ProCare@sencore.com) asking for the documentation of their specific platform.

This same contact should also be used to request a copy of the latest DMG 7000 software, release notes, or other documentation.

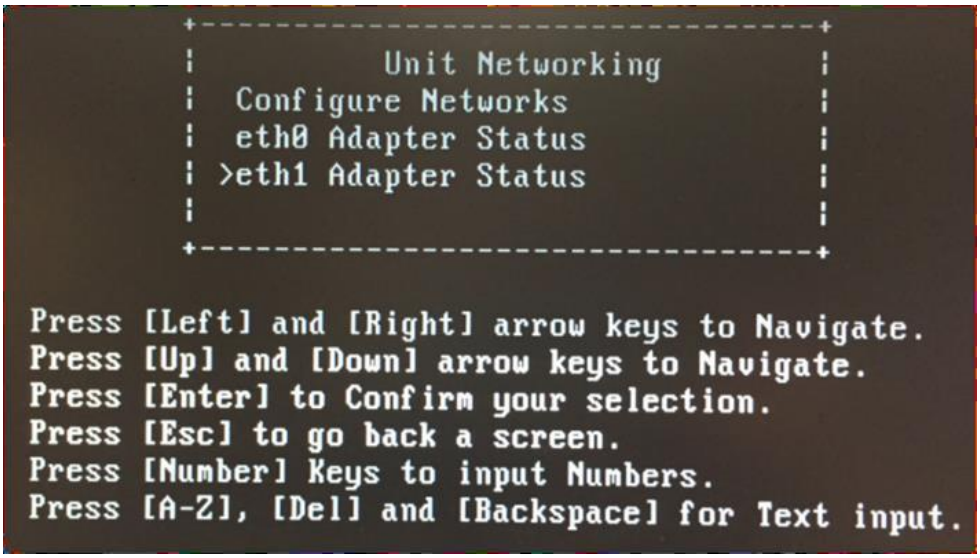
2.4 Network Setup via KVM

Connect the VGA (D-SUB) cable to a monitor and a USB keyboard.

The VGA will display the current Ethernet settings and provide a text-based menu to configure IP addressing, Subnet Mask, Gateway, and DNS settings.

Sencore recommends configuring the Eth0 port (Leftmost NIC when facing the rear of the unit) is set to a static IP for web-interface access. Ensure the user machine is also on the same network.

For additional information on initial network configuration menu see the Sencore DMG 7000 Quick-Guide documentation.


Unit Networking
Configure Networks
eth0 Adapter Status
>eth1 Adapter Status
Press [Left] and [Right] arrow keys to Navigate.
Press [Up] and [Down] arrow keys to Navigate.
Press [Enter] to Confirm your selection.
Press [Esc] to go back a screen.
Press [Number] Keys to input Numbers.
Press [A-Z], [Del] and [Backspace] for Text input.

Section 3 Web Interface Operation

Introduction

This section includes the following topics:

3.1 Logging into the DMG Web Interface

To open the DMG 7000 web interface use one of the following supported browsers and navigate to the unit's IP address:

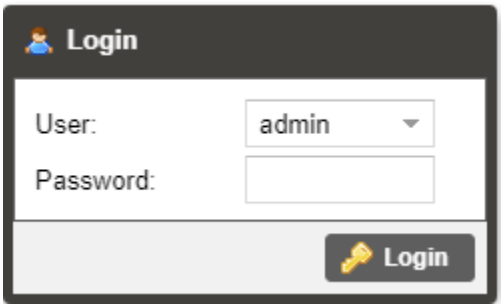
- Internet Explorer 11 & above
- Microsoft Edge 42 & above
- Firefox 77 & above
- Google Chrome 83 & above

The user will need to login to the web interface. By default the admin user account is available with "mpeg101" as the password. After entering the password, press the enter key or click the login button to login to the web interface.

Default Credentials

User: admin

Password: mpeg101



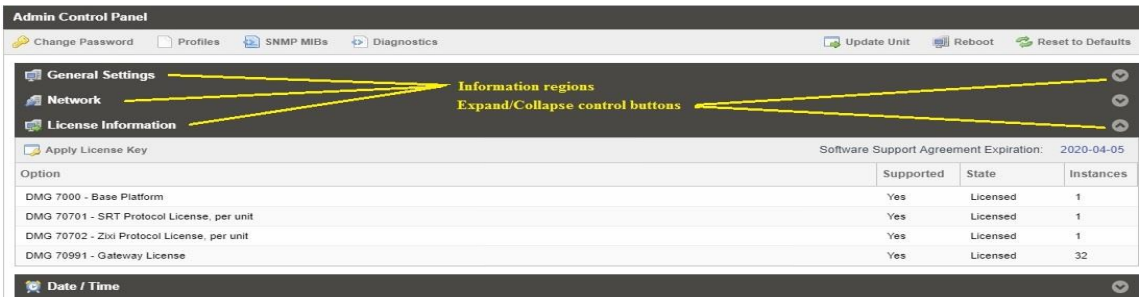
3.2 Control Panels

The web interface will provide complete control of unit configuration and process monitoring with four (4) separately defined control panels. Each control panel will be made up of unit features that are similar to each other to help the user easily locate the unit features they seek. The control panels are:

Gateway	This control panel is where the majority of the video stream processing configurations are managed.
Admin	This control panel is where unit hardware and administrative settings will be configured and monitored.
Reporting	This control panel is where alarms & logs are reported, configured and maintained.
About	This control panel is where unit software and hardware details are found.

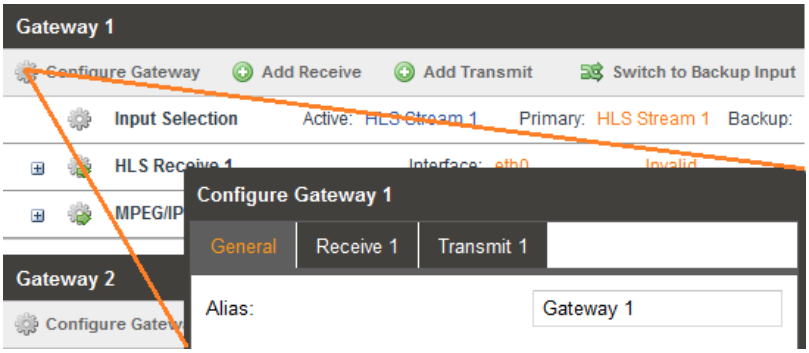
3.3 Title Ribbons

The “Gateway”, “Admin” and “About” control panels will group feature specific settings together under a title ribbon. Each ribbon presents an icon and description of settings that are offered. Each section can be expanded/collapsed with buttons at the right end as shown in the figure on the next page.

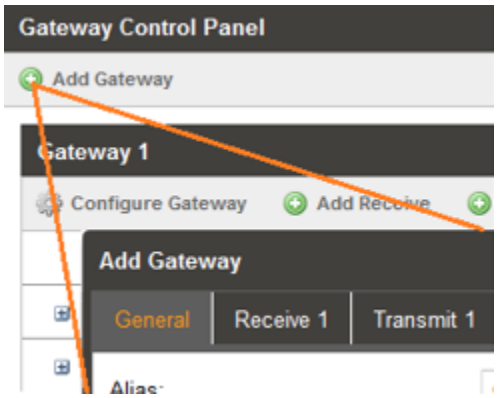


3.4 Buttons and Status Indicators

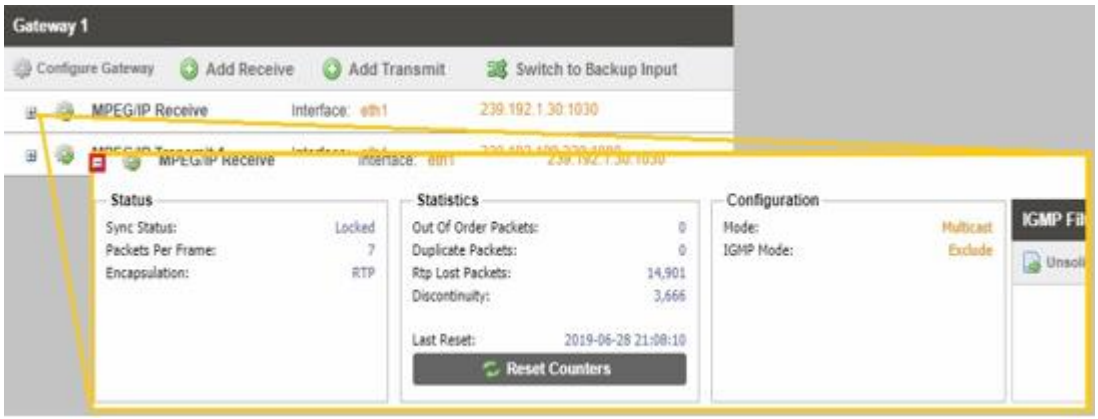
When the icon is shown user configuration is available. Clicking this button will open menus where settings can be changed by the user.



The green Add button will allow the user to add new gateways or transmit paths to existing gateways. Similar to the configuration cog show above.



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** report **status and details about the stream being processed**. Clicking the collapse icon ⊟ will close the details viewing window.



Status in the DMG 7000 web interface is shown with LED status indicators:

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

3.5 System Details with Global View

Some details are ‘global’ and can be viewed at all times when logged into the web client. These are displayed at the top of the page immediately under the model banner.

At the right (Logged in as: admin) is displayed the username currently accessing the web client.

Time (Time: 00:50:07) is the next detail as you move to the left and it displays the current system time. This is a user defined setting and configuration of it is located on the Admin tab. The time value will be applied to reported system and alarm conditions found on the Reporting tab and in the log files.

The next detail is CPU status (CPU: 2%) and is shown as a percentage. It reflects the amount of processing capacity that is currently being used.

Next is System Status (System Status) which reports the current status of the system. Green indicates the system operation is Good while Red indicates there is some detail about the system that is currently in Alarm condition. A Red condition prompts the user to seek further information about the Alarm condition by viewing the Reporting tab.

Finally, the Logout button (Logout) is provided and will allow the user to log out of the web client, returning them to the Login display page.

Section 4 Web Interface Control Panels

Introduction

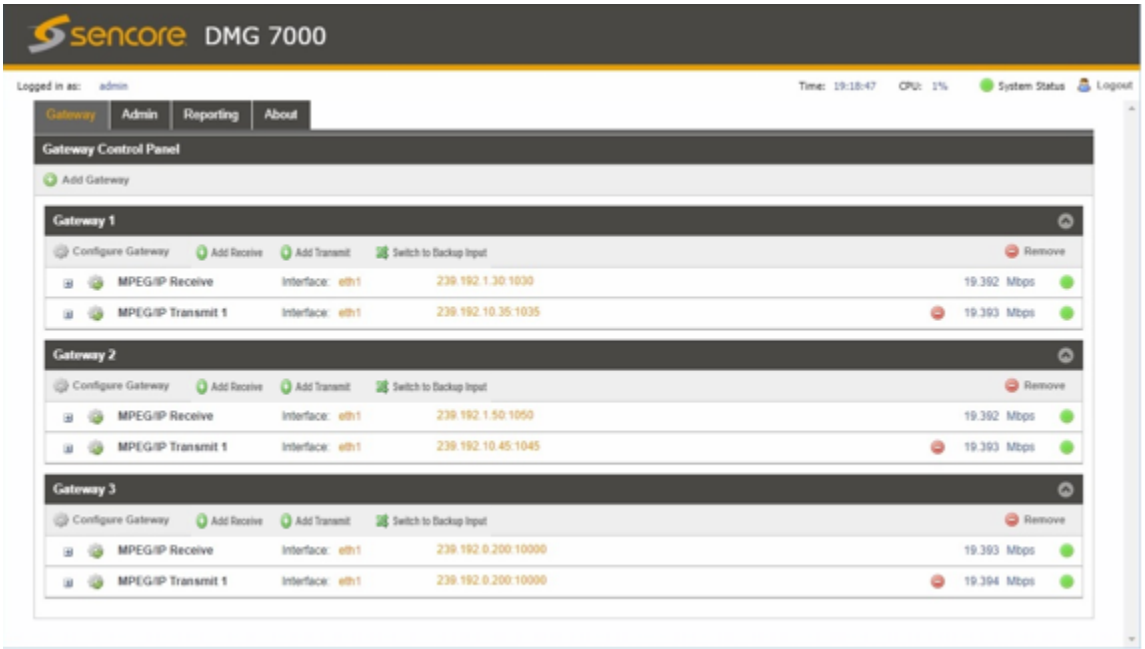
This section includes the following topics:

4.1 Gateway Control Panel

The Gateway control panel of the DMG 7000 web interface is used to configure the video processing details. This will include signal direction (transmit, receive or both), addresses to be received or delivered to and labeling of the gateways to help the user distinguish gateways from one another.

The number of available gateways will depend upon the physical DMG hardware as well as the license key that is applied. The chart below will show what an off the shelf unit will give the user, with a second column that will define the maximum number of gateway paths that can be attained with licensing.

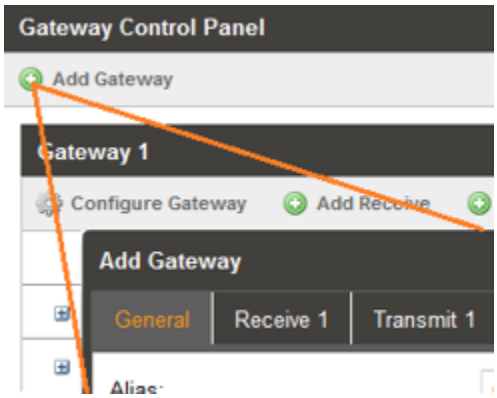
Hardware	Provided Gateways	Maximum Gateways (with license)
DMG 70010 (Mini)	1	5
DMG 70020 (Field)	8	14
DMG 70030 (Head end)	32	50



4.1.1 Adding a Gateway

To create a new or additional gateway, the user will click on the 

button in the upper left are of the page. This will open a configuration window and allow the user to define the ‘Alias’ or label for the gateway; the receive and/or transmit addresses



The configuration window that opens will provide the user with three tabs: General, Receive and Transmit.

The General tab will hold the name of the created gateway. By default, it will be “Gateway (numeric value)” beginning with 1 and incrementing with each additional gateway that is added. The use can change this by editing the text in the text entry box.

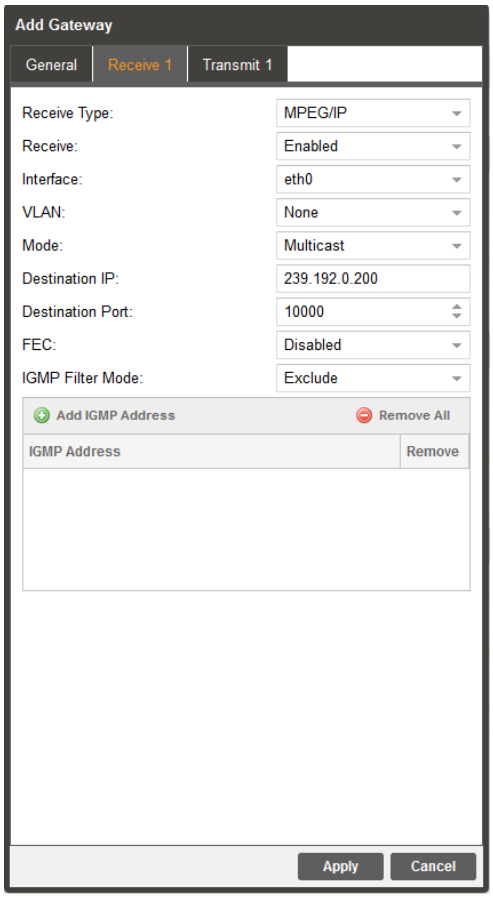
The Receive tab is where the user will define the details for the stream to be received and any IGMP filtering. The Transmit tab(s) will define the details for the stream(s) to be sent out of this gateway.

4.1.2 Gateway Receive

The DMG 7000 is capable of reception and/or transmission of different protocols. Based upon the type of protocol the user selects, the available configuration settings will adapt to provide the best fit. Two settings that are common to all protocols are “Receive”, which can be set to Enabled or Disabled, and “Interface” which can be set to Eth0 or Eth1 (options may change depending on the user defined interface name).

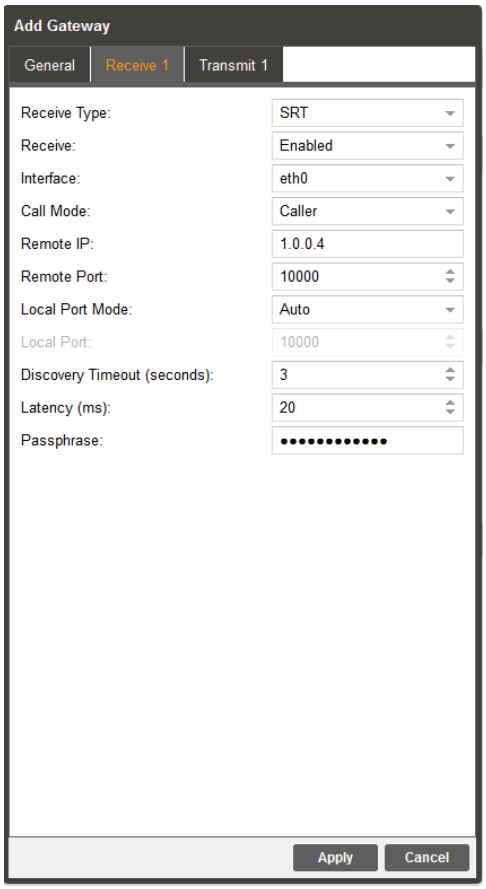
The available receive protocols are Zixi, SRT, MPEG/IP, Seamless RTP (SMPTE 2022-7 for Hitless Switching) and HLS

The tables below will show each receive protocol and the available configuration settings offered, along with a brief description.



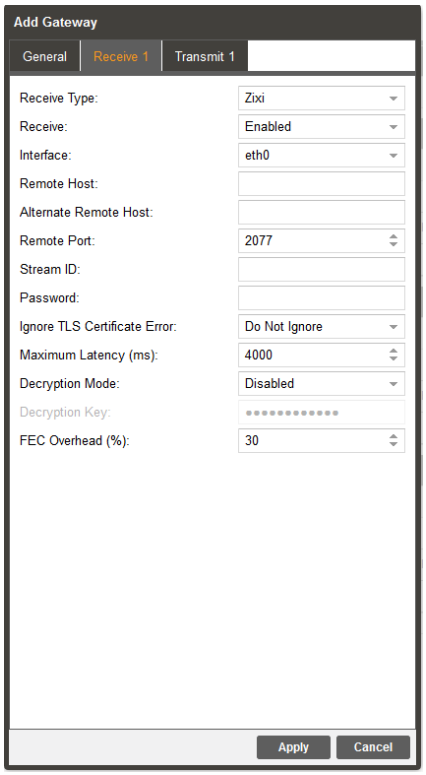
MPEG/IP Receive Settings

MPEG / IP (receive)		
Setting	**Available selections**	**Description**
VLAN	None, User Entry	Can set the receiving port to filter the MPEG/IP stream for VLAN tags as defined in section 4.2.9
Mode	Multicast, Unicast	Defines broadcast or point-to-point
Destination IP	xxx.xxx.xxx.xxx	Defines the address of the stream to be received
Destination Port	1 - 65535	Defines the port of the stream to be received
FEC	Enabled, Disabled	Sets the port to accept FEC on the incoming MPEG/IP stream
IGMP Filter	Include, Exclude	Defines filter to include or exclude addresses contained in IGMP list box
IGMP List Box	The list box will comprise the addresses entered by the user, and define the sources input signals can be accepted from (Include), or sources that input signals are not to be accepted from (Exclude).	



SRT Receive Settings

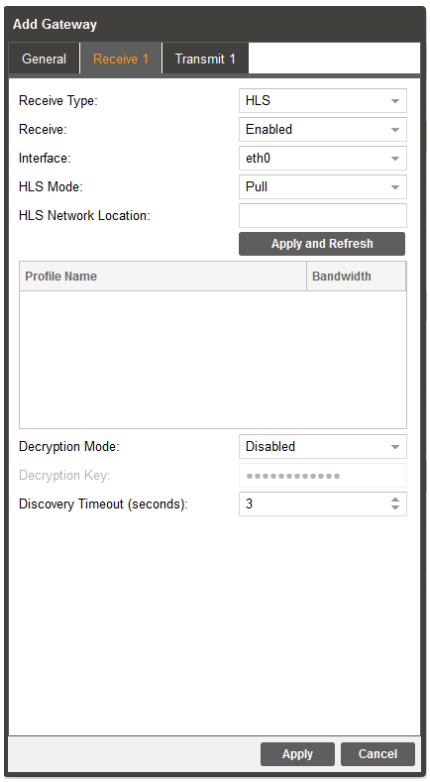
SRT (receive)		
Setting	**Available selections**	**Description**
Call Mode	Caller, Listener, Rendezvous	Defines the 'handshake' mechanism to be used when establishing connection
Remote IP	xxx.xxx.xxx.xxx	Defines the IP address of the stream on the remote device
Remote Port	1 – 65535	Defines the port of the stream on the remote device
Local Port Mode	Auto, Manual	In Auto Mode the local port number will be assigned In Manual Mode the local port number will be defined by the user
Local Port	1 – 65535	Defines 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
Passphrase	10 – 79 characters	Defines the encryption passphrase
Latency (ms)	1 - 8000	Defines buffer size in milliseconds



Zixi Receive Settings

Zixi (receive)		
Setting	**Available selections**	**Description**
Remote Host	xxx.xxx.xxx.xxx, or domain name	Defines the host of the remote broadcast using IP address or domain name
Alternate Remote Host	xxx.xxx.xxx.xxx, or domain name	Defines the alternate host of the remote broadcast using IP address or domain name
Remote Port	1 – 65535	Defines the port of the stream on the remote device
Stream ID	User entry	Defines the Zixi stream ID to be received
Password	User entry	Provides the password to allow specific Stream ID entered to be received
Ignore TLS Certificate Error	Do Not Ignore, Ignore	Defines whether to cease or continue processing if TLS Certificate Error is signaled
Maximum Latency	30 – 10,000	Defines the maximum latency or buffer size (in milliseconds)
Decryption Mode	Disabled, AES-128, AES-192, AES-256, Automatic	Defines if a decryption of the received signal is needed, which decryption standard to use, or if the DMG 7000 will automatically detect these.

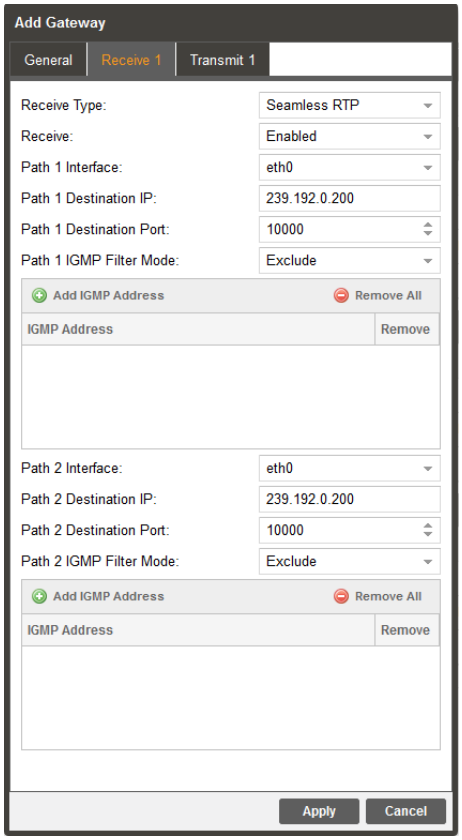
Decryption Key	User entry	Provides the key to allow signal processing if decryption is to be done.
FEC (Overhead %)	0 – 50	Defines the amount of processing overhead to be used to accommodate FEC



HLS Receive Settings

HLS (receive)		
Setting	**Available selections**	**Description**
HLS Mode	Push, Pull	Determines if the HLS receives 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”, 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)	1 – 100, use 0 for infinite	Defines the length of time to wait for the stream to be discovered

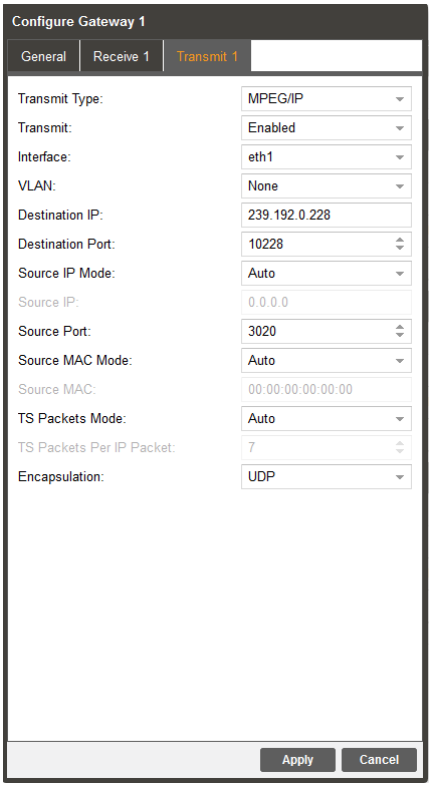


Seamless RTP Receive Settings

Seamless RTP – Hitless Switching (receive)		
Setting	**Available selections**	**Description**
Path 1 or 2 Destination IP	xxx.xxx.xxx.xxx	Defines the address of the first or second path to be received
Path 1 or 2 Destination Port	1 - 65535	Defines the port of the first or second path to be received
Path 1 or 2 IGMP Filter Mode	Include, Exclude	Defines filter to include or exclude addresses contained in IGMP list box
Path 1 or 2 IGMP List Box	The list box for each path will comprise the addresses entered by the user, and define the sources input signals can be accepted from (Include), or sources that input signals are not to be accepted from (Exclude)	

4.1.3 Gateway Transmit

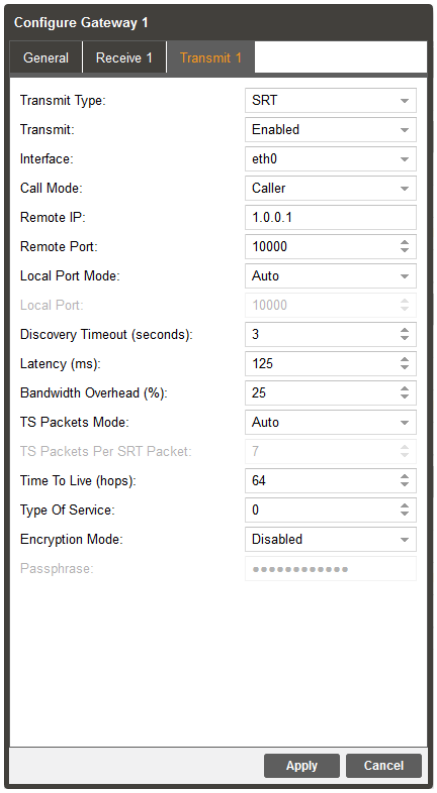
The DMG 7000 transmit feature is similar to the receive feature as based upon the type of protocol the user selects, the available configuration settings will adapt. There are also two settings common to all protocols; “Transmit”, which can be set to Enabled or Disabled, and “Interface” which can be set to Eth0 or Eth1 (options may change depending on interface name).
The tables below define the available settings and their purpose.



MPEG/IP Transmit Settings

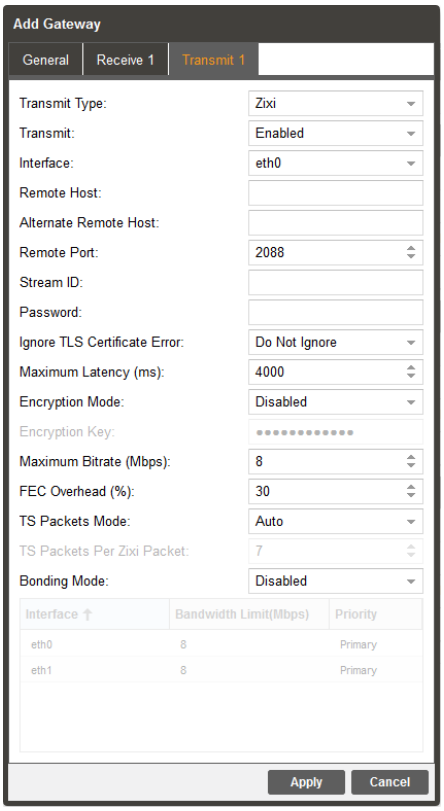
MPEG / IP (transmit)		
Setting	**Available selections**	**Description**
VLAN	None, User Entry	Can set the transmitting port to add VLAN tags to the MPEG/IP stream as defined in section 4.2.9
Destination IP	xxx.xxx.xxx.xxx	Defines the target IP address
Destination Port	1 – 65335	Defines the target IP port
Source IP Mode	Auto, Manual	In Auto mode In Manual mode
Source IP	xxx.xxx.xxx.xxx	Defines the source IP address to be assigned to the output stream
Source Port	1 – 65336	Defines the source IP port

Source MAC Mode	Auto, Manual	In Auto mode the MAC of the physical port will be defined in the output stream In Manual mode the user will define the MAC to be provided in the output stream
Source MAC	xx:xx:xx:xx:xx:xx	The user defined MAC for Manual mode
TS Packets Mode	Auto, Manual	In Auto mode the source will define the number of TS packets per IP packet In Manual mode the user will define the number of TS packets per IP packet
TS Packets per IP Packet	1 – 7	User defined value for Manual mode
Encapsulation	UDP, RTP	Defines the encapsulation mode of output



SRT Transmit Settings

SRT (transmit)		
Setting	**Available selections**	**Description**
Call Mode	Caller, Listener, Rendezvous	Defines the 'handshake' mechanism to be used when establishing connection
Remote IP	xxx.xxx.xxx.xxx	Defines the IP address of the stream on the remote device
Remote Port	1 - 65535	Defines the port of the stream on the remote device
Local Port Mode	Auto, Manual	In Auto Mode the local port number will be assigned In Manual Mode the local port number will be defined by the user
Local Port	1 – 65535	Defines 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
Passphrase	10 – 79 characters	Defines the encryption passphrase
Latency (ms)	1 – 8000	Defines buffer size in milliseconds
Bandwidth Overhead (%)	0 – 50	Defines the amount of bandwidth to allow for
TS Packets Mode	Auto, Manual	In Auto mode the source will define the number of TS packets per IP packet In Manual mode the user will define the number of TS packets per IP packet
TS Packets Per SRT Packet	1 - 7	User defined value for Manual mode
Time To Live (hops)	1 - 254	Defines number of network devices the transmission is allowed to pass through
Type Of Service	1 - 254	
Encryption Mode	Disabled, AES-128, AES-256	Defines if a decryption of the received signal is needed, which decryption standard to use



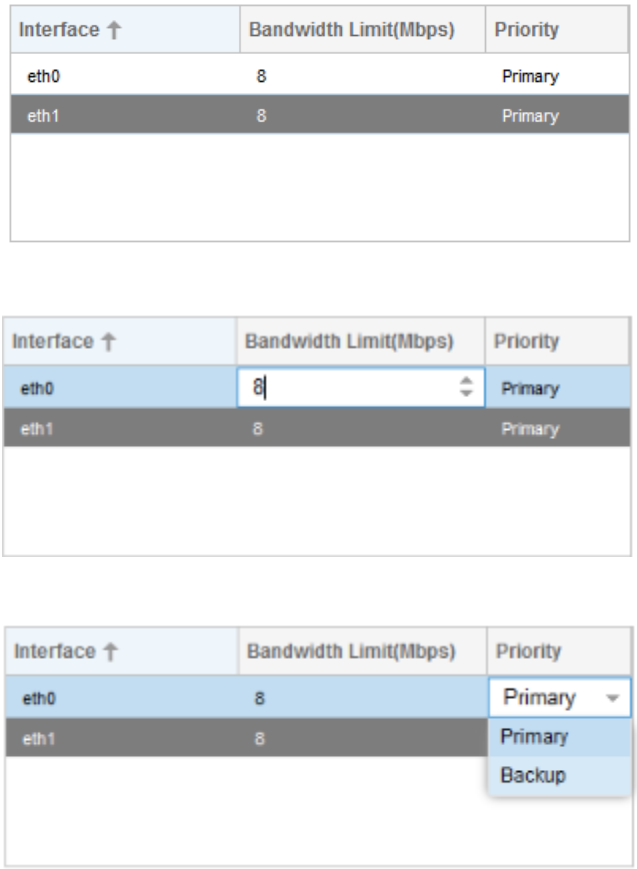
Zixi Transmit Settings

Zixi (transmit)		
Setting	**Available selections**	**Description**
Remote Host	xxx.xxx.xxx.xxx, or domain name	Defines the host of the remote broadcast using IP address or domain name
Alternate Remote Host	xxx.xxx.xxx.xxx, or domain name	Defines the alternate host of the remote broadcast using IP address or domain name
Remote Port	1 - 65535	Defines the port of the stream on the remote device
Stream ID	User entry	Defines the Zixi stream ID to be received
Password	User entry	Provides the password to allow specific Stream ID entered to be received
Ignore TLS Certificate Error	Do Not Ignore, Ignore	Defines whether to cease or continue processing if TLS Certificate Error is signaled
Maximum Latency (ms)	30 – 10,000	Defines the maximum latency or buffer size (in milliseconds)

Encryption Mode	Disabled, AES-128, AES-192, AES-256, Automatic	Defines if a decryption of the received signal is needed, which decryption standard to use, if the DMG 7000 will automatically detect these.
Encryption Key	User entry	Provides the key to allow signal processing if decryption is to be done.
Maximum Bitrate (Mbps)	0.001 – 2147.483	Defines the maximum IP bitrate of the Zixi transmission in Megabits per second
FEC (Overhead %)	0 – 50	Defines the amount of processing overhead to be used to allow FEC
TS Packets Mode	Auto and Manual	In Auto mode the source will define the number of TS packets per Zixi packet In Manual mode the user will define the number of TS packets per Zixi packet
TS Packets Per Zixi Packet	1 - 7	User defined value for Manual mode
Bonding Mode	Disabled, All interfaces, One interface, and Any interface	
Interface Bonding box	Available for One interface and Any interface modes	Allows user to define parameters and details about the port(s) when bonding

When the user chooses to bond the Zixi transmission and selects either “One Interface” or “Any Interface” mode, the Bonding Mode details box will be opened for editing.

If “One Interface” mode is selected, the user can then define the primary and back up ports as well as the maximum transmit bitrate for each port.



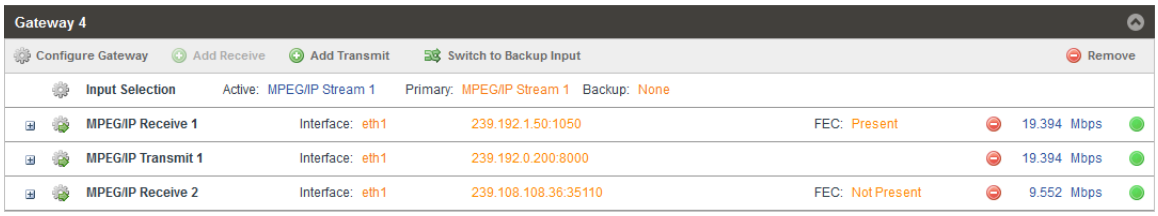
Interface Bonding Boxes

4.1.4 Additional Receive Instances

Each gateway on the DMG can be configured for multiple receive instances. To add an additional receive instance, click on the Add Receive button in the top left corner of the gateway section. The gateway configuration window will open with a new “Receive 2” tab, offering the same settings as the initial receive tab.

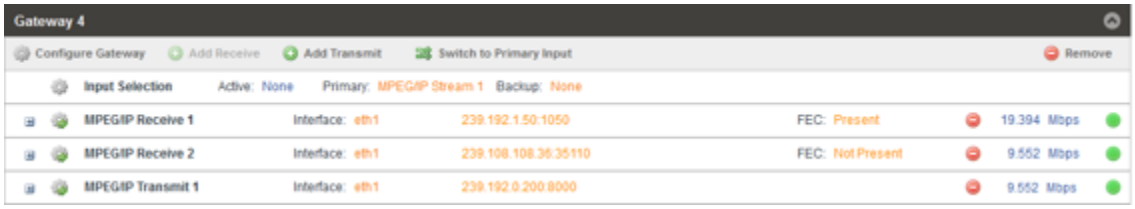
Removing a gateway from the configuration can be done by clicking on the Remove button located at the right side of the gateway ribbon. Any configured receive instance can also be removed by clicking on the red 19.394 Mbps button located within the receive row. When either of the red icons are clicked, the system will prompt the user with confirmation of intent to remove the item from the configuration.

Only one additional receive instance can be added, so the option becomes gray as shown below after the second path is added.



4.1.5 Switching to Backup Inputs

When multiple receive instances are configured as per section 4.1.4, only one of them can be assigned to the transmit instances. Clicking the Switch to Backup Input option under the gateway will prompt the user for confirmation of intent to change the receive instance assigning the transmit instances to source from receive instance 2. Clicking Switch to Primary Input will assign the transmit instances to return to sourcing from receive instance 1.

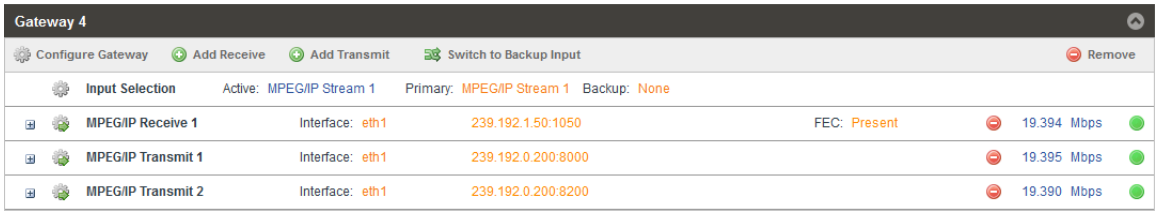


4.1.6 Additional Transmit Instances

The DMG 7000 will allow the user to configure a single gateway for multiple transmission paths. To add an additional transmission path, click on the Add Gateway Transmit button in the top left corner of the Gateway section. The gateway configuration window will open with an additional Transmit tab. The new tab will offer the same settings as the initial transmit tab.

Removing a gateway from the configuration can be done by clicking on the Remove button located at the right side of the gateway ribbon. Any configured transmit path can also be removed by clicking on the red 19.394 Mbps button located within the transmit row that the user wishes to remove. When either of the red icons are clicked, the system will prompt the user with confirmation of intent to remove the item from the configuration.

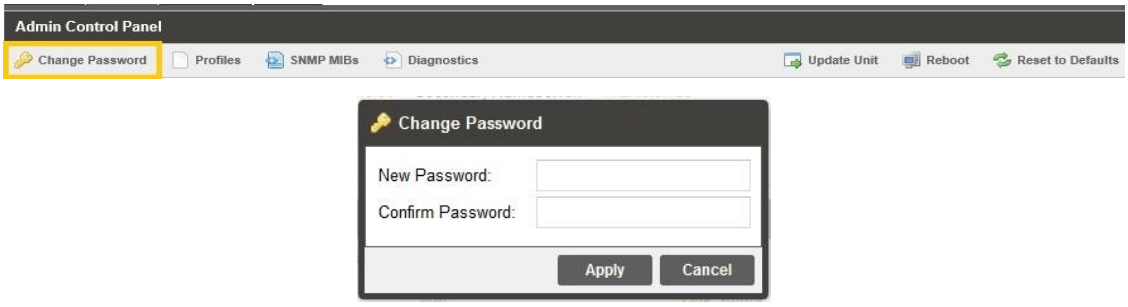
Which receive instance the transmit instances will source from is dependent on settings from sections 4.1.4 and 4.1.5.



4.2 Admin Control Panel

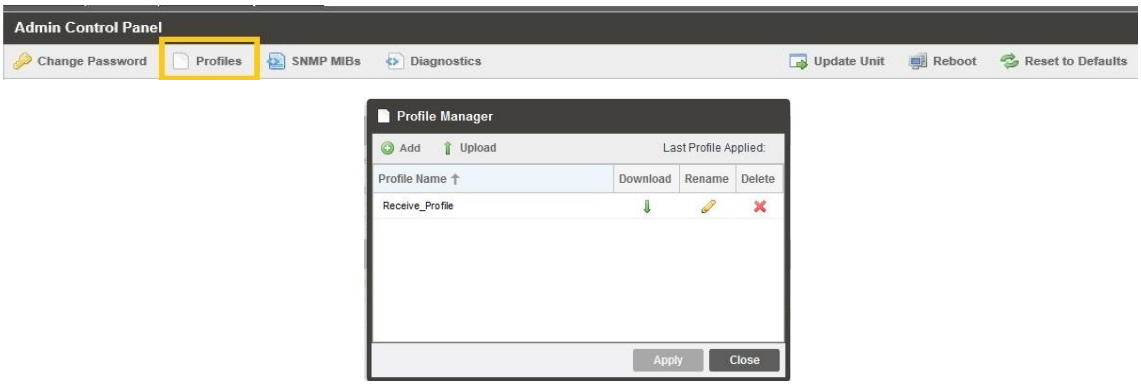
To access the Admin Control Panel, click on the Admin tab. This page will offer the user to control many global settings and maintenance tasks on the DMG 7000.

4.2.1 Changing Unit Password



The configuration button for this feature will be found under the Admin Control Panel title ribbon. This feature provides the DMG 7000 user management control of the web interface access password. In order to make changes to passwords, click the change password button. A window will appear to enter the current password and new password. Click “Apply” to save and exit.

4.2.2 Profiles



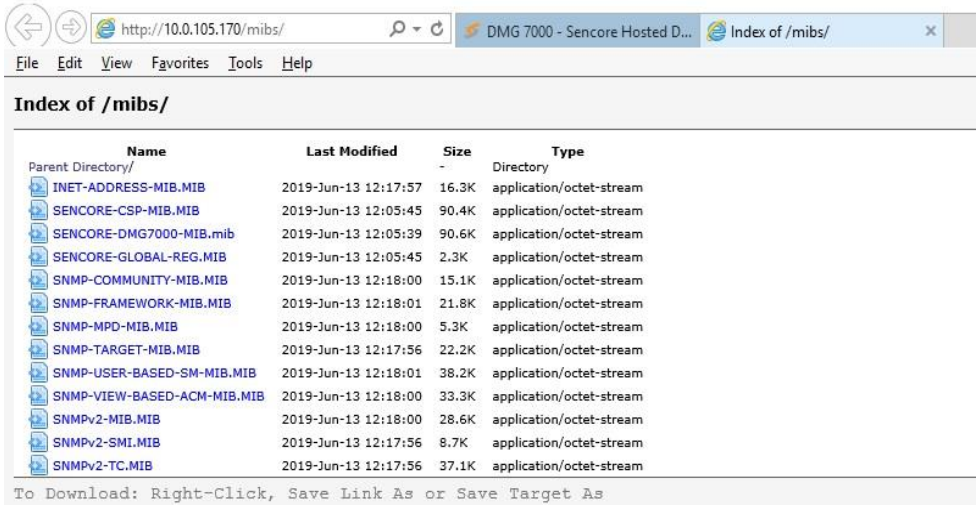
The DMG 7000 has the ability to save all configured settings to multiple profiles. Profiles can be saved locally, renamed and saved to external storage to be used on other DMG 7000. Profiles can be used to quickly and easily change the configuration of a DMG 7000 to suit different inputs and decoding requirements.

Add New Profile	Add	Used to create or add a new profile to the profile list
Upload Profile	Upload	Used to upload a profile to the DMFG7000 from the user pc
Apply Profile	Apply	Used to apply a profile selected from profile list to the DMG7000
Rename Profile		Used to edit the selected profile name
Delete Profile		Used to delete a profile from the profiles list
Download Profile		Used to download a profile selected from the list to the user pc

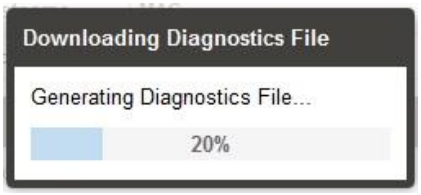
4.2.3 SNMP MIB files

The SNMP MIB files for the DMG 7000 can be obtained by clicking on the SNMP MIBs button at the top of the page.
This will open a new tab within the current web browser and give the user a list of all available MIB files.

Directions on how to save them to an external storage location are provided at the bottom of the list.



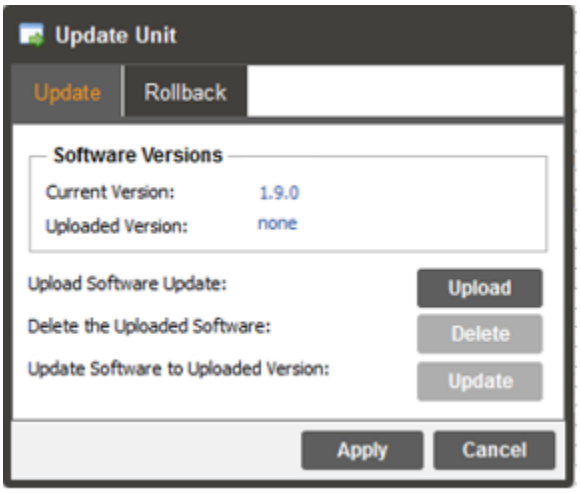
4.2.4 Diagnostics



The DMG 7000 provides the user the ability to take a snapshot of the ALL current unit settings, reported values, active alarms, and the alarm and log file history. This snapshot will be downloaded as an .XML format file that can be attached in an email or opened for viewing.
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.
Selecting the Save option will download the .XML file to the pc 'downloads' location.
The file can then be opened with a number of different software applications.

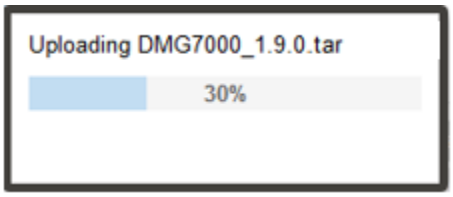
4.2.5 Updating the System Software

Updates to the DMG 7000 are performed through the web interface. A software update file is provided by Sencore and then uploaded to the unit. To request the latest software version or a copy of the release notes please send an email to ProCare@Sencore.com
The 'Update Unit' button is in the top right corner of the Admin control panel.
When opened this feature will allow the user to advance the software version the DMG 7000 operates on, or rollback the software version that the DMG 7000 operates on.



Applying software updates

1. Click Upload button and browse to the appropriate software file
2. A progress bar will show uploading status
3. Once the file is uploaded click on Yes when prompted to update
4. The DMG will reboot after a software update is complete.
5. The DMG 7000 will reboot after a software update is complete.



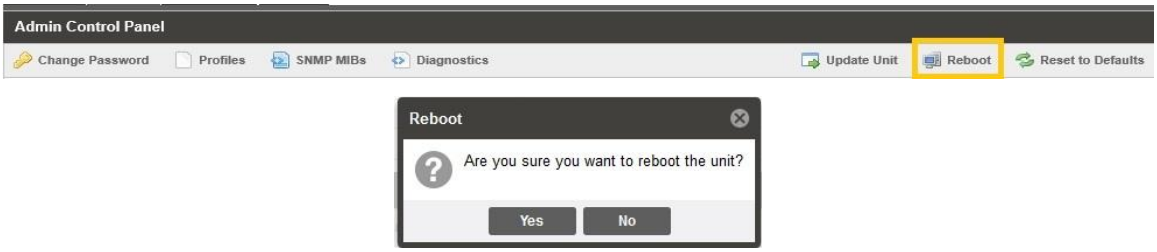
Upload Software Update	Upload	To upload software updates to the DMG 7000 click this button. The user will be prompted to navigate to an update file. The file will then upload to the DMG 7000. When complete the DMG 7000 with prompt the user to either apply the update or cancel
Delete the Uploaded Software	Delete	Clicking this button prompts the user to confirm the deletion of the software update from the DMG 7000. This will also clear the Uploaded Version status of the Software Versions section.

Update Software to Uploaded Version	Update	Clicking the button starts the software update process. The DMG 7000 will prompt the user to confirm the update. Click Yes to continue or No to cancel.

Rollback software updates

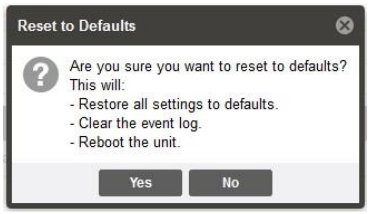
The DMG is capable of reverting back to a previous version of software using the Rollback feature. The DMG accomplishes this by maintaining two separate software images; one is the most current version of software with all current settings and the other is the previous version of software with all of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

4.2.6 Reboot the Unit



The DMG 7000 can be rebooted from the web interface Admin page. The 'Reboot' button is located in the top right corner of the Admin Control Panel. To perform a reboot, the user will click the reboot button. The system will prompt the user to confirm the reboot request. If confirmed, a status window with a progress bar will open be visible until the reboot is complete and the login window displayed.

4.2.7 Reset to Defaults

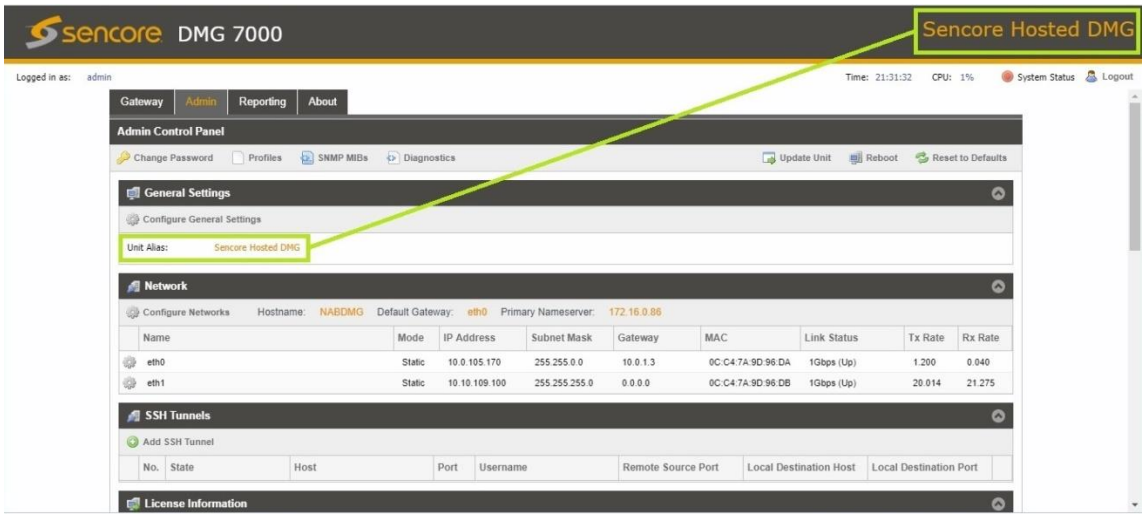


The DMG settings can be reset to factory defaults. All settings will be returned to the factory defaults **except** the network management ports TCP/IP settings. All event logs will be cleared. To reset all settings to default, click the Reset to Defaults button on the Admin page. The DMG will prompt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

4.2.8 Unit Alias

The configuration button for this feature is found under the General Settings title ribbon of the Admin control panel. The Unit Alias is a unique name or description the user can assign to the DMG 7000. The 'Alias' will be available on the unit web client and front panel.

When selected, the user will be provided a text entry box to enter the alias. The user will then click the Apply button to save the changes made. The web client and front panel will update immediately.



4.2.9 Configuring the Unit Networks and VLANs

System Network interface

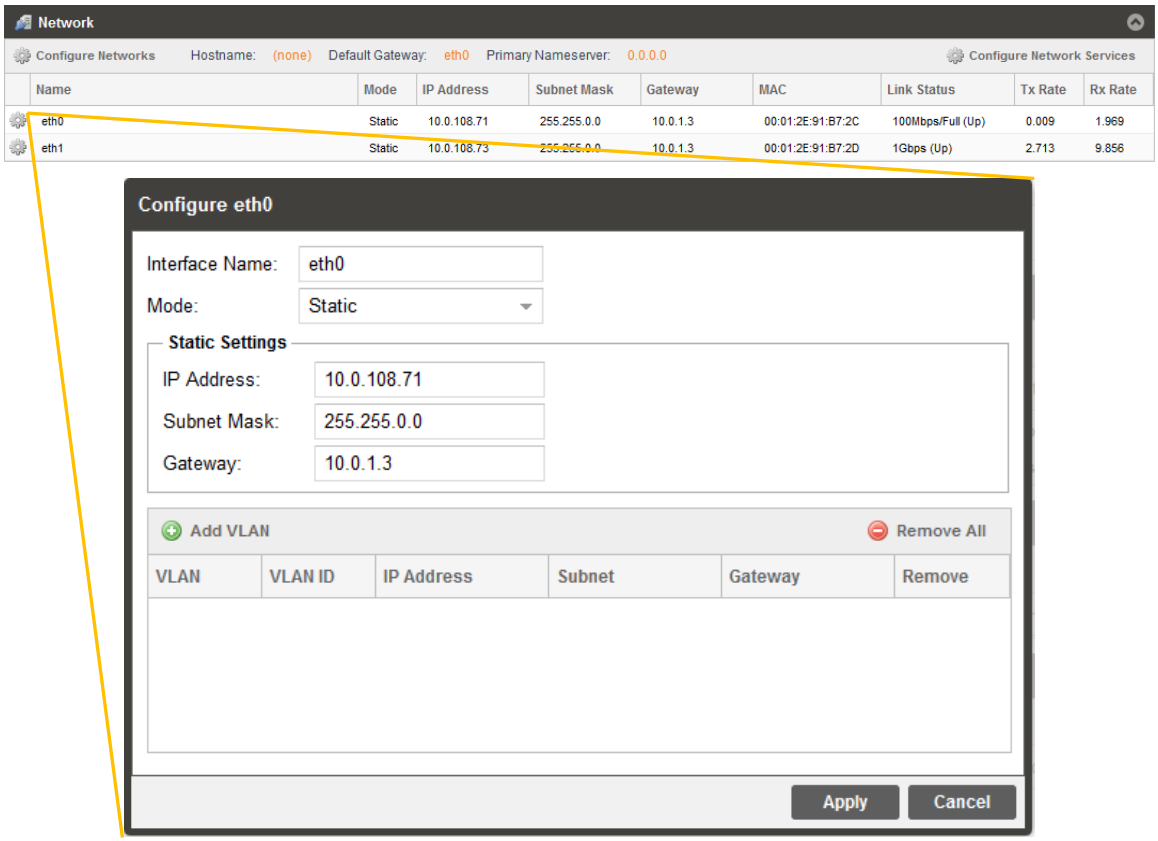
The DMG 7000 can be assigned a Hostname and DNS servers. To access this menu, click on the Configure Networks gear icon. Within the window that opens, the user can

assign a Hostname to the DMG 7000, define which physical port (Eth0 or Eth1) the Default Gateway will use [*The web-interface is accessible from the IP address of either Ethernet port; however, be sure to configure the two ports for separate subnets.],* and provide addresses for Primary and Secondary Nameservers.

Setting	Available Selections	Description
Hostname	Alphanumeric, no spaces allowed	Defines optional system name
Default Gateway	Eth0, Eth1	Defines which physical port gateway address is to be used
Primary Nameserver	xxx.xxx.xxx.xxx	IP address of Primary (DNS) nameserver
Secondary Nameserver	xxx.xxx.xxx.xxx	IP address of Secondary (DNS) nameserver

Management and Video/IP Ports

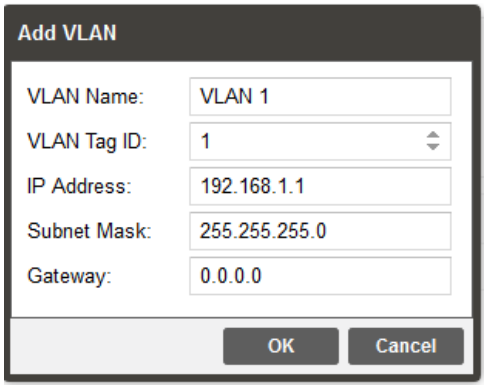
Each of the two physical NICs are identical in every way; either one can be configured for the management or Video/IP networks. As shown below, clicking the gear icon will open the settings for each NIC, including the name of the port, IP address and VLAN options. After finishing changes, click the apply button.



Setting	Available Selections	Description
Interface Name	User Entered (eth0 / eth1 by default)	User defined port names
Mode	DHCP, Static	DHCP allows network server to provide IP address Static requires the user to define the IP address to be used
IP Address	xxx.xxx.xxx.xxx	Static Mode IP address entry
Subnet Mask	xxx.xxx.xxx.xxx	Static Mode subnet mask entry
Gateway	xxx.xxx.xxx.xxx	Static Mode gateway entry

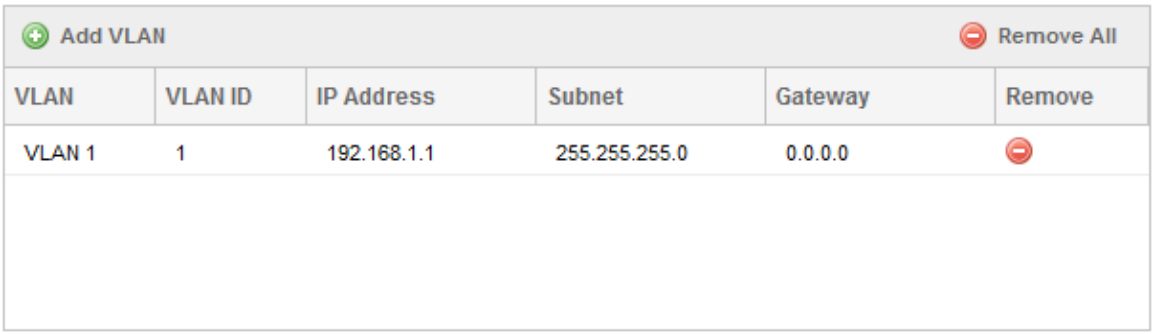
To add a VLAN to the NIC, click the 

icon to bring up the “Add VLAN” menu as shown on the next page.



Setting	Available Selections	Description
VLAN Name	User Entered	User defined VLAN names
VLAN Tag ID	1 – 4094	The VLAN Tag to be assigned to outgoing streams and filtered for incoming streams
IP Address	xxx.xxx.xxx.xxx	Static Mode IP address entry
Subnet Mask	xxx.xxx.xxx.xxx	Static Mode subnet mask entry
Gateway	xxx.xxx.xxx.xxx	Static Mode gateway entry

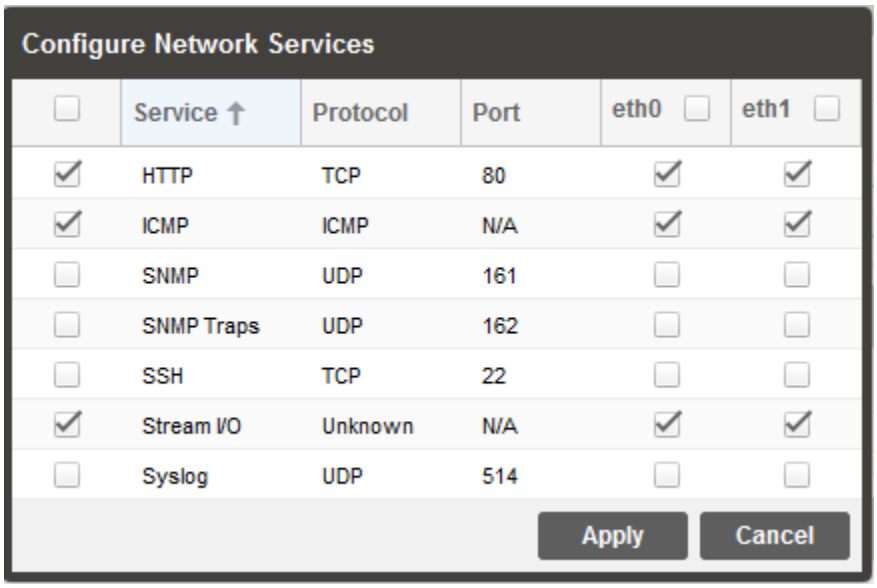
After clicking “OK” to finish configuring the newly created VLAN, it will appear on the VLAN list as seen in the figure below. To remove individual VLANs, click the red icon in the corresponding row. To remove all created VLANs, click the Remove All button.



Configuring Network Services

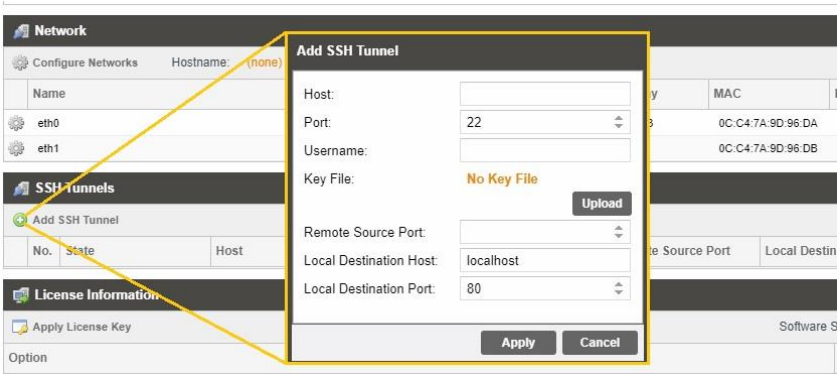
Both Physical NICs can have specific features enabled for functionality or disabled for security. To configure these settings, click on the Configure Network Services as indicated in the figure below.

The “Configure Network Services” menu will then be shown. These are the default settings that allow for web access, ICMP contact through pinging and general stream input and output traffic. To enable or disable further settings, click to check the leftmost box as well as the box corresponding to the physical NIC (eth0, eth1) in the row of the intended service.



Service	Protocol	Port	Description
HTTP	TCP	80	Allows access to the web interface via browser
ICMP	ICMP	N/A	Allows access to ICMP responses (such as pinging)
SNMP	UDP	161	Allows SNMP GET/SET commands
SNMP Traps	UDP	162	Enables SNMP traps to send upon system change
SSH	TCP	22	Allows for SSH access through port 22
Stream I/O	Unknown	N/A	Enables and disables all stream traffic for the physical interface (Zixi, MPEG/IP, SRT, HLS)
Syslog	UDP	514	Allows configuration of a syslog server for state triggered messages

4.2.10 SSH Tunnels



When using Zen Master to manage the DMG 7000, the SSH tunneling must be used. To complete a Zixi transmission, the signal path will flow from the source to the server (Zen Master) and then to the receiver. The server managing the signal path and flow also analyzes the stream flow and keeps the analytical data. If the user would like to check these statistics, they must use an SSH tunnel to connect with the server (Zen Master).

The SSH tunnel configuration window will allow the user to define the connection to the Zixi server by providing the required details in the Add SSH Tunnel window.

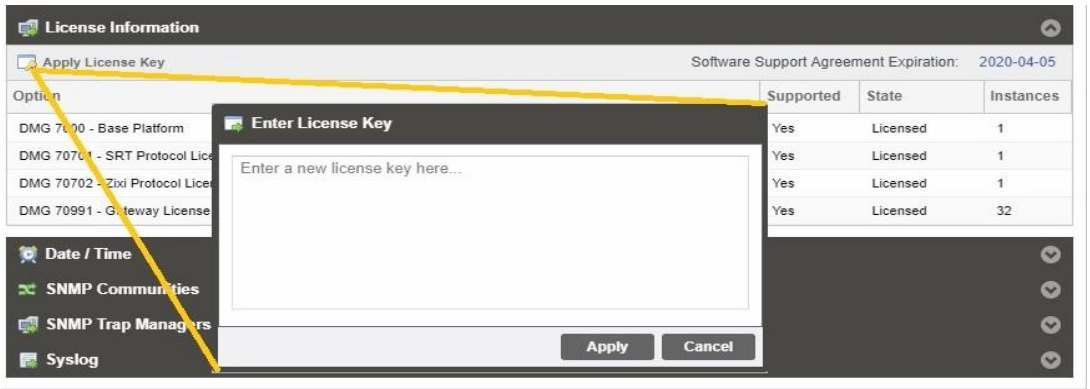
Setting	Description
Host:	The IP address or web link of the Zixi (Zen Master) server
Port:	The IP port of the Zixi (Zen Master) server
Username:	Account credential to log into Zixi (Zen Master) server
Key File:	User will click the “UPLOAD” button to select a hash key file used to open the secure connection to Zixi (Zen Master) server
Remote Source Port:	Remote port number the Zixi (Zen Master) server is using for SSH communication
Local Destination Host:	Address reporting to Zixi (Zen Master) server. Localhost is the default.
Local Destination Port:	The port that is accessible to the Zixi (Zen Master) server. Port 80 (DMG 7000 web client) is the default.

4.2.11 License Information

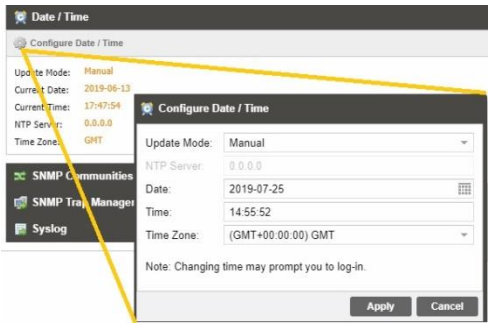
Certain features of the DMG 7000 require licenses in order to be functional. The interface displays all licenses available as well as the following status:

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

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



4.2.12 Setting Unit Time and Date



The DMG 7000 can be set to synchronize with an NTP server or a manual data and time can be defined by the user. Click the “Configure Date/Time” cog icon to begin. These values are used to timestamp entries in the Alarm and Event logs under the Reporting tab.

Setting	Available selections	Description
Update Mode	NTP or Manual	NTP = user provides IP address of NTP server to synchronize system date and time with. Manual = user will define system date and time.
NTP Server	XXX.XXX.XXX.XXX Domain Name	Defines IP Address or Domain Name of the server to be used when in NTP mode.
Date	YYYY/MM/DD	Manual mode setting format for the system date. Calendar widget can be used.

Time	00:00:00 – 24:00:00	Manual mode setting only - defines the system time. The time is based on a 24-hour clock.
Time Zone	-12:00:00 ~ +13:00:00	Applies a time offset to the value obtained from the NTP server

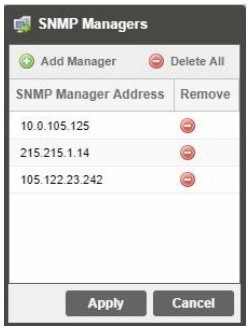
4.2.13 Configuring SNMP

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

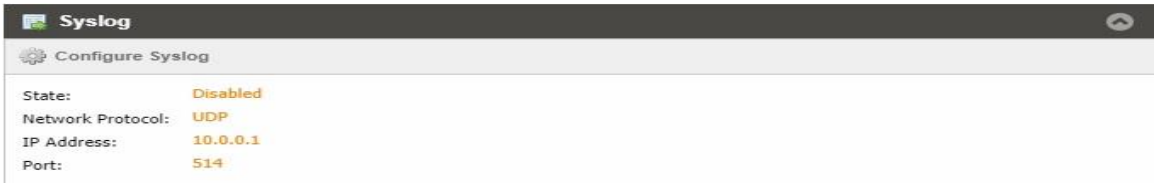
SNMP Trap Managers



The SNMP trap managers are recipients of SNMP traps sent from the DMG 7000. The following menu allows the user to configure the recipient's IP addresses by adding or deleting target addresses of an SNMP Manager Address list.

Add Manager	Add Manager	Adds IP address to SNMP Manager Address list
Delete All	Delete All	Clears SNMP Manager Address list
Delete Single Entry		Removes single address from SNMP Manager list

4.2.14 Syslog

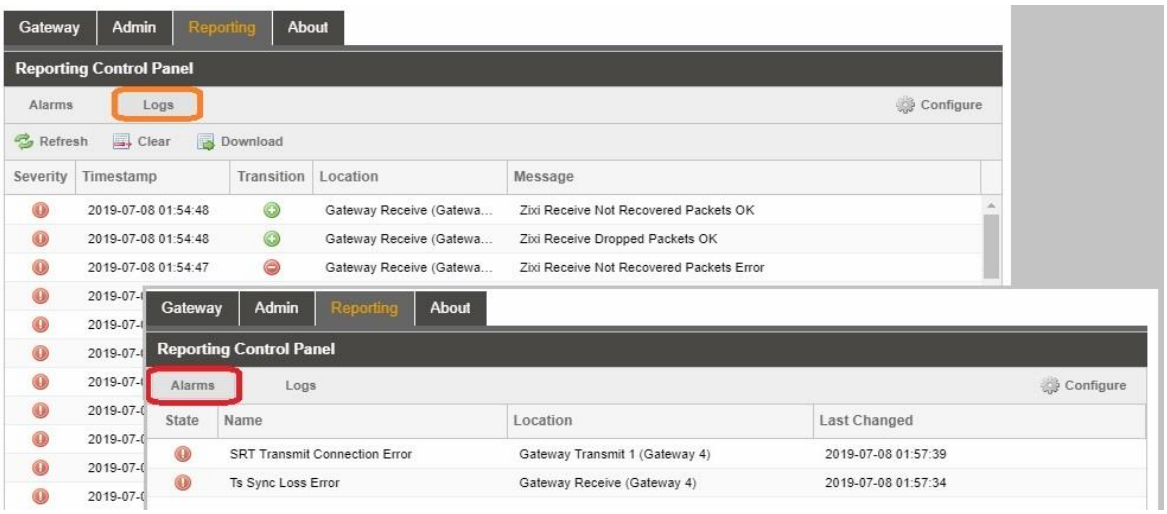


The DMG 7000 can be configured to send error and event logs formatted in the syslog protocol to a remote user specified Syslog server.

State	Enabled or Disabled	Enabled = send message; Disabled = do not send
Network Protocol	UDP or TCP	Defines the protocol used to send the messages
IP Address	XXX.XXX.XXX.XXX	Defines the IP address of the Syslog server.
Port	0 - 65535	Defines the port of the Syslog server

4.3 Reporting Control Panel

The Reporting control panel in the DMG 7000 will provide the user with a list of active alarms, as well as a means to log the detected events. Active alarms are constantly updated to reflect the real-time state of the unit.
Once an error is no longer detected, it will be cleared from the active alarms window.
The log files can be used to view alarm and event history. Both the active alarm and event logs can be configured for specific behavior based upon the user's needs.



4.3.1 Alarms

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

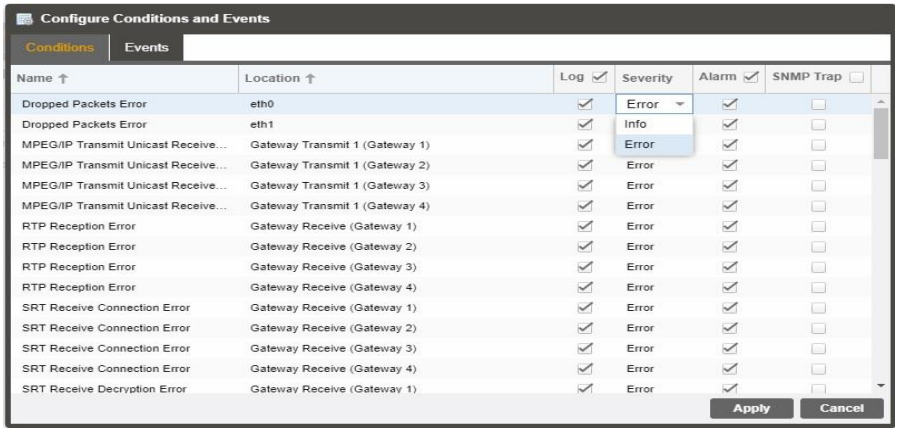
Alarms	
Column Name	**Description**
State	This area displays an icon that will signify the importance of the event The Info icon means the message is Informational and no error has been detected. The Error icon means the message is an Alarm and the unit status has been set to 'Error'.
Name	This column displays the description of the detected instance.
Location	This column displays the hardware or function that is experiencing the active error.
Last Changed	This column displays the data and time the error was raised. Timestamps here are determined with the Date and Time settings configured in Section 4.2.11.

4.3.2 Configuring the Alarms

The DMG 7000 monitoring points are divided into Conditions and Events and are managed separately. Configuration of these is done by clicking on the configuration cog in either the Alarms or Logs window.

Conditions

These instances are monitored within specific hardware and stream processing paths. How the DMG 7000 responds to the detection of the instance can be configured. Three 'checkbox' columns allow the user to define the system response. The checkbox at the top of the column can be used to enable or disable all instances in that column.



Logs	
Column Name	**Description**
Name	Defines the error message that will be provided if the instance is detected.
Location	This shows the user the specific hardware or stream processing path where the instance is detected.
Log	A checked box defines which instances will be recorded to the log file.
Severity	A dropdown box within the row allows the user to define the instance as an Error or Information event.
Alarm	A checked box defines which instances will raise an Alarm condition on the unit. This will cause the Error LED on the front of the unit and in the web client to illuminate.
SNMP Trap	A checked box defines which instances will trigger the DMG 7000 to send trap messages.

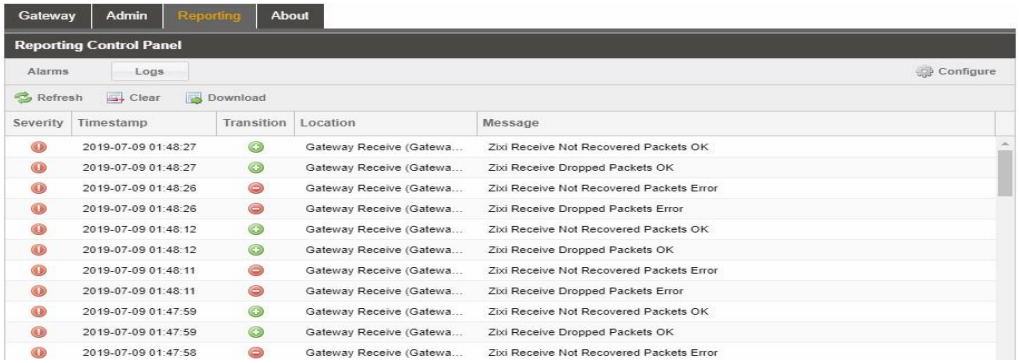
The APPLY button at the bottom of the window will commit the settings changes to the system, while the CANCEL button will ignore any settings changes and close the configuration window.

Events

These instances are global to the system because they will have an impact on all hardware and stream processing areas of the DMG 7000. These instances can only be configured to be recorded in the log file and/or to be sent as SNMP Trap messages.

Events	
Column Name	**Description**
Name	Defines the error message provided if the instance is detected.
Location	This will always be “Unit” since these instances are global
Log	A checked box defines which instances will be recorded to the log file.
SNMP Trap	A checked box defines which instances will trigger the DMG 7000 to send a trap message.

4.3.3 Event Logs



The Logs window provides the user a display of the log file and management tools to streamline the data returned. There are three buttons that will manage the log file.

Refresh	Refresh	Prompts the DMG 7000 to update the displayed logs.
Clear	Clear	Clears the log file
Download	Download	Exports the log file as a “.csv” extension file to the pc.

The log file itself is made up of five columns that explain each event, when it occurred, and the area of the system where the event was detected.

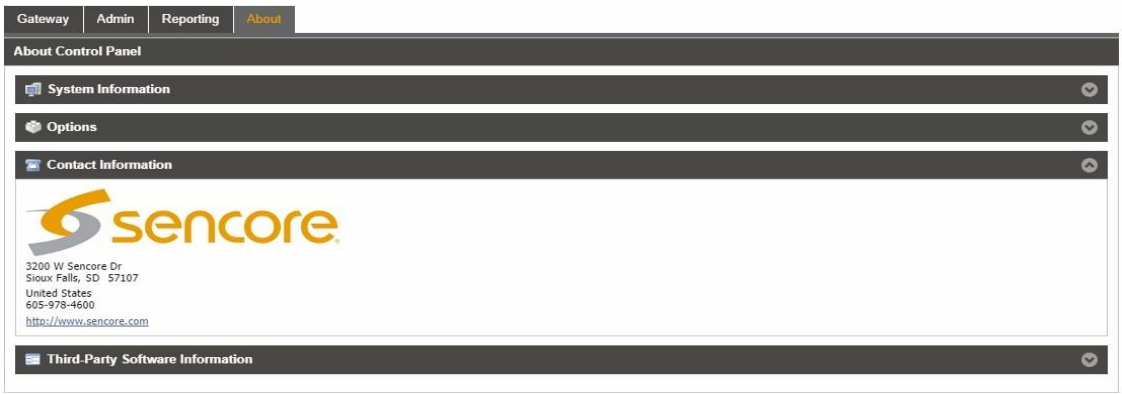
Column Name	Description
Severity	The Info icon means the message is Informational and no error has been detected. The Error icon means the message is an Alarm and the unit status has been set to 'Error'.
Timestamp	This is the DMG 7000 associated date and time of the instance. See Date/Time settings in Section 4.2.11.
Transition	The Went Bad icon means the instance entered into an Error state. The Went Good icon means the instance entered into a Clear state. The Event icon means a single point instance (such as NTP Time was updated) took place.
Location	Defines the hardware or function that experienced the alarm or event.
Message	This displays the description of the specific path that experienced the instance.

4.3.4 Configuring the Logs

Configuration of the logs will provide the user with the same configuration options as covered in section 4.3.2.

4.4 About Panel

Under the "About" panel, there is information about the current software version, hardware/software options, how to contact Sencore, and details on third party software being used.



4.4.1 System Information

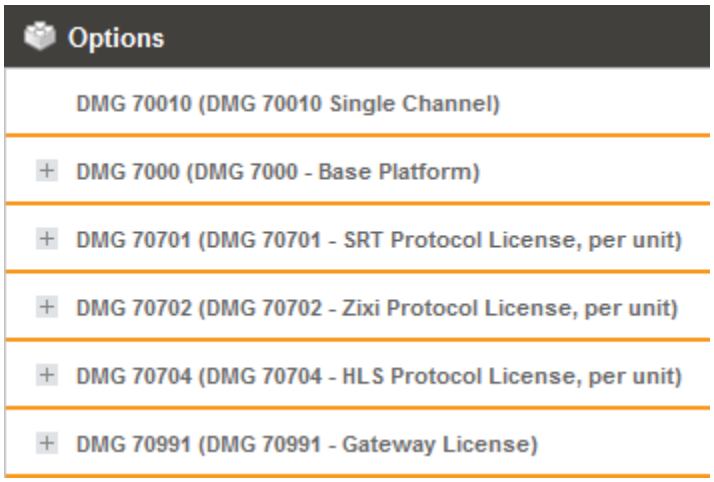
This area of the control panel gives the user the unit serial number and software version installed.

4.4.2 Contact Information

This area of the control panel gives the user the physical address, web address and phone number as methods of contact.

4.4.3 Options

This area will provide details about both hardware and software contents of the DMG 7000 platform.



4.4.4 Third Party Software Information

This area of the control panel can be expanded to show the third-party software used by the DMG 7000. For more details see Section 5 – Appendix D for a complete list.

Section 5 Appendices

Introduction

This section includes the following appendices:

Appendix A – Specifications

DMG 7000 – Minimum Requirements

For 100Mbps of throughput

CPU:	Intel Quad-Core 1.1Ghz, up to 2.4Ghz
RAM:	4GB DDR4 2400MHz
HDD:	32GB SSD

For 250Mbps of throughput

CPU:	Intel Xeon 4-core 2.2Ghz
RAM:	8GB DDR4 2400MHz
HDD:	32GB SSD

For 850Mbps of throughput

CPU:	Intel Xeon 6-core 3.6Ghz
RAM:	16GB DDR4 2400MHz
HDD:	32GB SSD

MPEG/IP Receive and Transmit

General –

Connector:	10/100/1000 auto negotiate Base-T RJ-45 Ethernet Port

Receive –

Input Format:	UDP, RTP and RTP with extension headers Multicast and Unicast CBR SMPTE 2022/CoP3 FEC SMPTE 2022-7 Hitless Switching
Multicast Filtering:	Filters based on IP address VLAN Tagging IDs
Buffer size:	1 - 4000 KB, or 1 – 4000ms
Bitrate Range:	.25 – 200 Mb/s
Packets/IP Frame:	1-7 MPEG Packets/IP Frame
IGMP Compatibility:	Version 2 and 3

Transmit –

Output Format:	UDP and RTP
Bitrate Range:	.25 – 200 Mb/s
Packets/IP Frame:	1-7 MPEG Packets/IP Frame

SRT Receive and Transmit

General –

Connector:	10/100/1000 auto negotiate Base-T RJ-45 Ethernet Port

Receive –

Protocol and IP Range:	UDP, Unicast
Negotiation Modes:	Caller, Listener, Rendezvous

Latency:	20-8000ms, user configurable
Bitrate Range:	0.25 – 50 Mbps
Decryption:	AES-128, AES-256 10-79 UTF-8 characters
Packets/IP Frame:	Auto detect
Transmit –	
Protocol and IP Range:	UDP, Unicast
Negotiation Modes:	Caller, Listener, Rendezvous
Latency:	20-8000ms, user configurable
Bandwidth Overhead:	0 – 50% of content bitrate
Bitrate Range:	0.25 – 50 Mbps
Encryption:	AES-128, AES-256 10-79 UTF-8 characters
Packets/IP Frame:	1-7 MPEG Packets/IP Frame

Zixi Transmit and Receive

General –	
Connector:	10/100/1000 auto negotiate Base-T RJ-45 Ethernet Port
Receive –	
Protocol and IP Range:	UDP, Unicast
Latency:	30-10000ms, user configurable
Bitrate Range:	1 – 50 Mb/s
FEC Overhead	0 – 50% of content bitrate
Decryption:	AES-128, AES-192, AES-256 10-79 UTF-8 characters
Packets/IP Frame:	Auto detect
Transmit –	
Protocol and IP Range:	UDP, Unicast
Mode:	Feeder to Broadcaster
Latency:	30-10000ms, user configurable
Bandwidth Overhead:	0 – 50% of content bitrate
Bitrate Range:	0.25 – 50 Mbps
Encryption:	AES-128, AES-256 10-79 UTF-8 characters
Packets/IP Frame:	1-7 MPEG Packets/IP Frame

HLS Receive

General –	
Connector:	10/100/1000 auto negotiate Base-T RJ-45 Ethernet Port
Receive –	
Protocol and IP Range:	HTTP, HTTPS, TCP, Unicast
Payload:	Chunked transport stream
Modes:	Pull, Push via WebDAV Push Mode supports up to 200GB or content

Profile Reception	Single profile selection
Bitrate Range:	0.25 – 50 Mbps
Decryption	AES-128
	10-79 UTF-8 characters
Packets/IP Frame:	1-7 MPEG Packets/IP Frame

Appendix B – Error and Event List

Events	Description
Date/Time Changed	The Date/Time setting of the system was changed
NTP Updated	The NTP Date/Time was updated
Software Update Failed	An attempted software update was unsuccessful
Software Update Succeeded	An attempted software update succeeded
Unit Booted	The system completed a boot process

Alarms	Description
Dropped Packet Error	The system has detected an instance of packets being dropped
MPEG/IP Transmit Unicast Receiver Not Found	The system was unable to detect the configured unicast receiver
RTP Reception Error	The system has detected an error in RTP reception
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 Packets Error	The system has detected lost packets in the received SRT signal
SRT Receive 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 Dropped Packets Error	The system has detected lost packets in the transmitted SRT signal
SRT Transmit NAK Received Error	
TS Sync Loss Error	The system has detected the loss of sync in the transport stream
Zixi Receive Connection Error	The system encountered a connection error when receiving Zixi transmission
Zixi Receive Decryption Error	The system has errors when trying to decrypt Zixi signal
Zixi Receive Dropped Packets Error	The system has detected dropped packets in the received Zixi signal
Zixi Receive Not Recovered Packets Error	The system is reporting that retransmitted packets were not recovered in the received Zixi signal
Zixi Transmit Connection Error	The system has detected an error when connecting to server to begin transmission
Zixi Transmit Dropped Packets Error	The receiving system is reporting that packets were dropped in the transmitted Zixi signal
Zixi Transmit Not Recovered Packets Error	The receiving system is reporting that retransmitted packets were not recovered in the transmitted Zixi signals

Appendix C – Internet Transport Protocol Explanation

This section is intended to provide example system deployments of the DMG 7000 with all supported protocols. Each protocol can be used in different ways to accomplish the goal of distributing content reliability over unmanaged networks and internet connections. Generally speaking, each of these protocols uses a form of packet retransmission allowing receiving devices to request missing or corrupt packets from the source device. FEC (Forward error correction) is also used as an additional layer of protection at the expense of additional bandwidth overhead. When distributing content over unprotected networks, encryption becomes extremely important. AES-128 and AES-256 encryption is supported by the DMG 7000 to ensure content remains protected when sent across these networks.

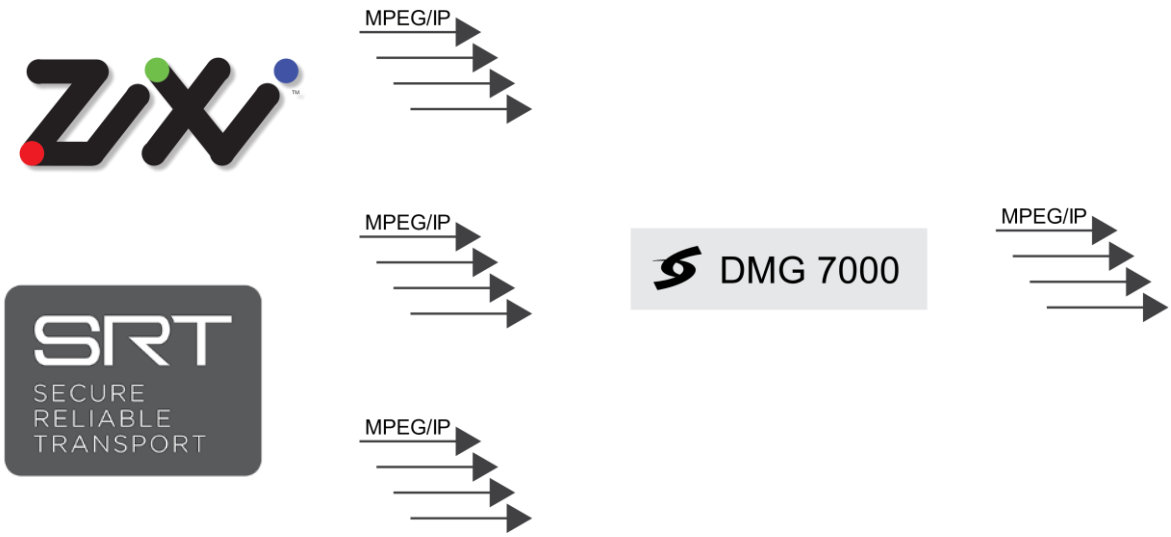
In this first system the Zixi protocol is being used to transmit an MPEG/IP source over-the-internet to multiple destinations. This should could be used as point-to-point as well. A few keys points are important to understand.

- Streams being transmitted from the DMG 7000 must be sent to a Zixi Broadcaster.
- Streams being received on the DMG 7000 must be received from a Zixi Broadcaster.

This architecture ensures the “first-mile” and “last-mile” of the streams path through the internet are as short as possible. The Zixi Broadcaster and ZEN Master control system allow streams being distributed over the internet to achieve high reliability. The Zixi Broadcaster is an appliance or cloud instance function that ingests Zixi streams and enables additional functions such as transcoding, monitoring and analysis. The ZEN Master control system orchestrates these functions and allows remote access to the DMG 7000 via SSH tunnels. These systems utilize cloud systems such as Amazon Web Services, Microsoft Azure or Google Cloud Platform. Access to a Broadcaster and ZEN Master system must be arranged through Zixi.

In this second system, the SRT protocol is being used for point-to-point transmission over the internet. The SRT protocol can be utilized without a central hub and transmit directly from a DMG 7000 to a receiving DMG 7000 over a consumer internet connection. Thanks to the DMG 7000’s ability to create multiple destinations from a single source one DMG 7000 can transmit to many end-points.

In this final example, the DMG 7000 is being used for signal acquisition from sources transmitted over an unmanaged network or internet connection. The goal of the DMG 7000 is to be protocol agnostic, allowing reception of MPEG/IP, SRT, Zixi and other protocols. This flexibility allows users to ingest streams sources from a variety of network architectures and turnaround these streams to MPEG/IP for use in typical broadcast networks.



Appendix D – Acronyms and Glossary

Acronym	Interpreted from
Bit Rate	The rate at which the compressed bit stream is delivered from the channel to the input of a decoder.
DHCP	Dynamic Host Configuration Protocol
DVB	Digital Video Broadcasting
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
I/O	Input/Output
IP	Internet Protocol
Kbps	1000 bit per second
LED	Light Emitting Diode
Mbps	1,000,000 bits per second.
MPEG	Refers to standards developed by the ISO/IEC JTC1/SC29 WG11, Moving Picture Experts Group. MPEG may also refer to the Group.
NTP	Networking Time Protocol
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.
RU	Rack Unit
SI	System Information
SMPTE	Society of Motion Pictures and Television Engineers
SNMP	Simple Network Management Protocol
TS	Transport Stream

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 DMG 7000 server 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 an RMA number, use the following steps.

Copy and paste, or enter the following link into a web browser:

http://www.sencore.com/procare-support/service-repair

Complete the on-line request form and click the Submit button at the bottom of the page

Once the RMA is generated it will be emailed to the address provided on the request. Shipping instructions will also be included.

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.

Appendix G – Open Source Software

The DMG 7000 includes:

Package	Version	License	Copyright
amibios dmi	75dce7b	GPL Version 2, June 1991	Claudio Matsuoka
BusyBox	1.24.2	GPL Version 2, June 1991	Erik Anderson, et.al.
dpdk	16.11	BSD	2010-2015 Intel Corporation
Dropbear	2016.74	MIT-like	2002-2015 Matt Johnston, et.al (see license)
e2fsprogs	1.43.4	GPL Version 2, June 1991	Theodore Ts'o
ethtool	4.13	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
gptfdisk	1.0.3	GPL Version 2 June 1991	Roderick W. Smith
grub	2.00	GPL Version 3.29 June 2007	1994-2011 Free Software Foundation, Inc.
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	4.4.20	GPL Version 2 June 1991	Linus Torvalds, et. Al.
Log4cpp	1.0	LGPL Version 2.1 February 1999	Bastiaan Bakker
Monit	5.1.1	GPL Version 3.29 June 2007	2010 Tildeslash Ltd.
Net-SNMP	5.7.1	BSD	1989, 1991, 1992 by Carnegie Mellon University, et.al (see license)
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
PCRE	8.30	BSD	1997-2012 University of Cambridge, et.al (see license)
POPT	1.16	MIT	1998 Red Hat Software
pureflpd	1.0.46	BSD	Frank Denis
qDecoder	12.0.4	BSD	2000-2012 Seungyoung Kim
samba	4.7.0	GPL Version 3.29 June 2007	Andrew Tridgell, et.al
Spawn-FCGI	1.6.3	BSD	Jan Kneschke, Stefan Bahler
srt	1.3.0	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

Sencore Inc.
3200 Sencore Drive
Sioux Falls, SD 57107 USA
www.sencore.com
1.605.978.4600