



**UCrypt<sup>®</sup>**  
Patent Pending

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## **UCrypt<sup>®</sup> Cable Gateways**

### **OPERATION MANUAL**

# General Guide Notes

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## Firmware Version

Some features described in this manual require the latest firmware to be installed on the hardware platform. Check with ATX Networks Technical Support for the latest release of firmware. The firmware version installed on your Device may be found in the UI on the System tab. At the time of publication of this manual the most current released firmware version is:

**Firmware Release**                      **3.2.33.2017.1107.1325**

## Organization of This Manual

This manual is generally organized based on the main interface tabs with individual chapters dedicated to describing the configurable features. Further chapters outline activities related to installation and the UI operation and configuration.

## Cross Reference Usage

Hyperlinks are used throughout the guide to assist the reader in finding related information if the reader is viewing the PDF file directly. Hyperlinks may be identified by their blue text. Most links are to related pages within the document, but some may reference outside documents if the reader needs that additional information. The Table of Contents is entirely hyperlinked and bookmarks are available but the bookmark feature must be turned on in your Reader application.

## Symbol Usage

Throughout the manual, some symbols are used to call the readers attention to an important point. The following symbols are in use:



***WARNING:*** This symbol usage will call the reader's attention to an important operation feature of the equipment which may be safety related or may cause a service outage.



***NOTE:*** This symbol indicates that there is helpful related information available in this note or elsewhere in the guide.

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# INITIAL STARTUP

## 1. Initial Startup

We provide a brief summary of the steps to get logged in to the Management Interface GUI. See the following chapters of the UCrypt Operation Manual for GUI configuration guidance.

### 1.1 Chapter Contents

- “Connecting to the Management Computer”
- “Factory Default IP Address”
- “Computer Requirements”
- “Configure Your Computer”
- “Use a Browser to Login”

### 1.2 Connecting to the Management Computer

The Management Interface for the Device is accessed on eth0 on the rear panel, Figure 1-1. The location of the port varies with hardware versions but the illustration shown is typical. Refer to the rear panel illustration for your model, see the Hardware Interface Manual.

If the equipment is to be connected to a local cable modem for remote configuration or monitoring, a standard Ethernet cable will be required for the connection to the modem. The modem will be connected in place of the Management Computer. In this case if a local computer is also required connect it to the Craft Port. The Craft Port (eth1) has a static IP address of 192.168.250.2.

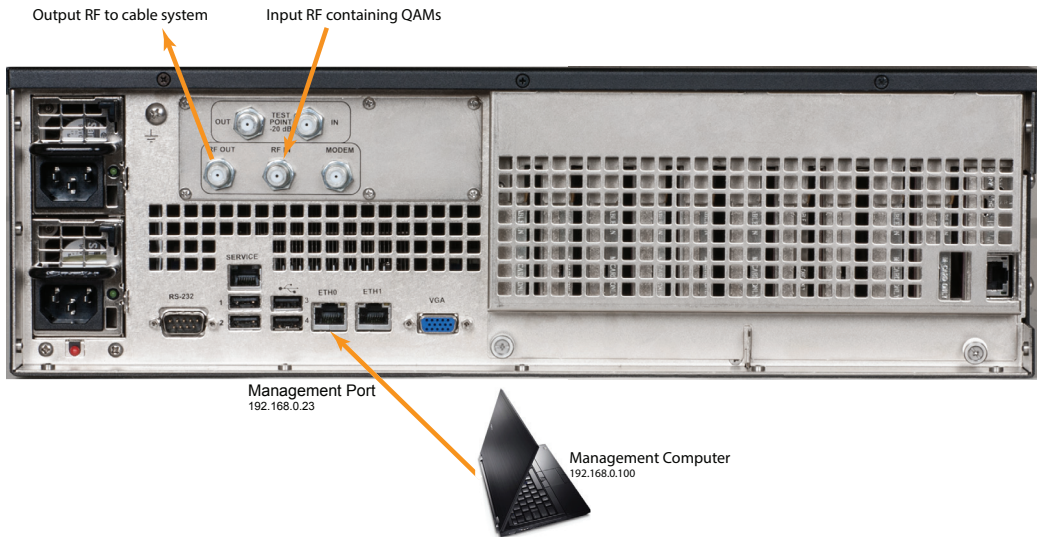


Figure 1-1: Connect Management Computer

### 1.3 Factory Default IP Address

The Management Interface is a secure web server and will require a locally connected PC to complete the configuration. The network port has been factory pre-configured with the following network settings.

Table 1.3a: Factory Default Static IP Addresses

Panel Label	Default Static IP Address	Purpose
eth0	192.168.0.23	Management GUI
eth1	192.168.250.2	Craft Interface access to Management GUI

## 1.4 Computer Requirements

The Management Computer must meet these minimum requirements.

- Computer running your choice of OS
- Ethernet Network port available
- Web browser for Management Interface

## 1.5 Configure Your Computer

Set your computer's wired network IP address and subnet to be on the same subnet as the UCrypt Device. For example use 192.168.0.50/24.

## 1.6 Use a Browser to Login

1. Open any browser and enter the Device factory default static IP address, **192.168.0.23**, see Figure 1-2.

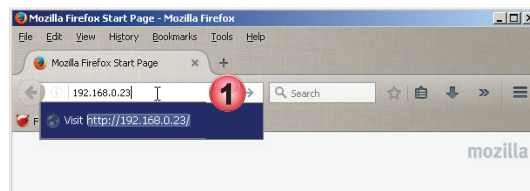


Figure 1-2: Enter IP Address 192.168.0.23

2. If this is the first time you have connected to this unit with this Management Computer, you may get a browser security warning, see Figure 1-3, however, depending on the browser you used, your message may look different than illustrated here. This warning is due to the UCrypt Device having a self signed security certificate. It is not a security threat but your browser identifies it as such due to the certificate being self signed. Click through to accept the warning. You may later add your own security certificate during configuration.

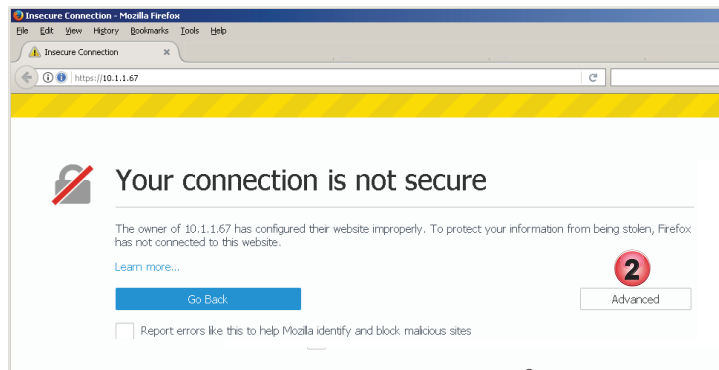


Figure 1-3: Warning For Firefox®

3. The login page is presented, Figure 1-4. Enter the Master **User Name** and **Password** from Table 1.6a.
4. Click **Login**.

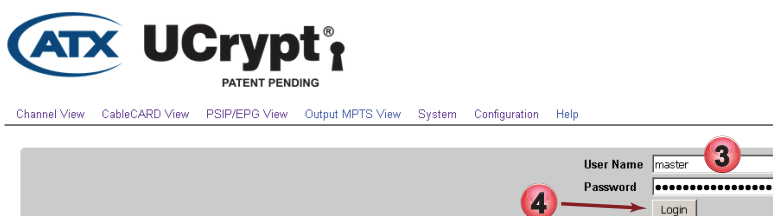


Figure 1-4: Login with Credentials

Table 1.6a: Factory Default User Names and Passwords

Account	Default Password	Modify Settings	Install Updates	Change Passwords	View Settings
master	atx_ucrypt_master_password	Yes	Yes	Yes	Yes
admin	atx_ucrypt_admin_password	Yes	No	No	Yes
user	atx_ucrypt_user_password	No	No	No	Yes

5. If this is the first time logging into this unit or this is a newly installed firmware version, you will receive a page prompting to accept the Product Software Licence. At the page bottom, click **Accept Licence**.

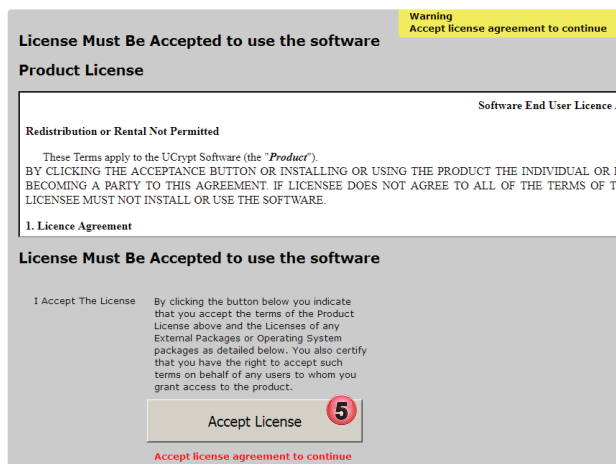


Figure 1-5: Accept Software Licensing Agreement

6. Following login, the Channel View page is presented, Figure 1-6. Your screen may differ slightly from the example depending on the model and whether the Device has previously applied configuration settings or if it is factory new.
7. If this is a new unit or a new firmware has been installed, you will receive a warning that the factory default passwords need to be changed. Click the **X** to temporarily dismiss this warning (See warning below).
8. Click **Change Password** to go directly to the User Password section to make the changes or if the passwords can be left at factory default, click **Disable Warning** (See warning below).



**PASSWORD WARNING:** ATX Networks strongly recommends that the factory default passwords be changed immediately upon Device initialization. The ability to dismiss or disable password warnings in the GUI are intended only for lab test environments with no internet connectivity to the Device.

Refer to other chapters of the UCrypt Operation Manual for configuration guidance.

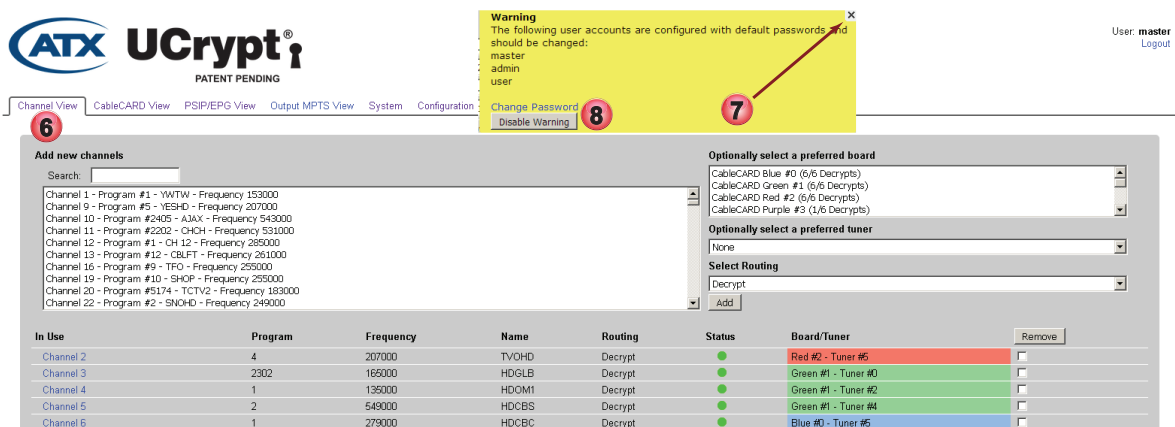


Figure 1-6: Channel View Page

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# QAM INPUT CONFIGURATION

## 2. QAM Input Configuration

This chapter applies only to Devices with QAM Input.

### 2.1 Chapter Contents

- “About Channel View”
- “Add VCT Channels to the Channel Lineup”
- “Channel View - Optional Functions”
- “Channels In Use”
- “Detailed Channel Properties”
- “Channel Insertion Tool”

### 2.2 About Channel View

This configuration page, Figure 2-1, provides an easy way to add programs to the channel lineup of QAM input type Devices. Some important features of the channels page are explained here.



**NOTE:** Out of the box, there are no channels defined for processing. In order to do this you may install a CableCARD to receive encrypted channel lineups or use un-encrypted channels to create your channel lineup. See “CableCARD™ Operations” on page 7-1 for information about activating a CableCARD on your Device.

1. Click the **Channel View** tab if it isn't already selected, Figure 2-1.
2. At least one CableCARD Device is required for channel map acquisition and it must indicate **Locked** in the OOB status section.
3. Once a channel map has been received, the channels will be displayed in the **Add New Channels** dialog box. These are the channels that may be selected for processing by the UCrypt Device.
4. Quickly find specific channels in the lineup by typing the name, source ID or frequency in the live search box.
5. Use the CableCARD controls to define a particular module for decryption or choose to pass a single selected channel

Channel View | CableCARD View | PSIP/EPG View | Output MPTS View | System | Configuration | Help | Logout

**1** Add new channels

Search:

**4**

Channel 4 - Program #1 - HDOM1 - Frequency 135000  
 Channel 5 - Program #2 - HDCBS - Frequency 549000  
 Channel 6 - Program #1 - HDCBC - Frequency 279000  
 Channel 7 - Program #3 - HDCTY - Frequency 135000  
 Channel 8 - Program #5 - HDCTV - Frequency 183000  
 Channel 9 - Program #6 - HD - Frequency 207000  
 Channel 10 - Program #2nd - AJAX - Frequency 543000  
 Channel 11 - Program #2202 - CHCH - Frequency 531000  
 Channel 12 - Program #1 - CH 12 - Frequency 265000  
 Channel 13 - Program #12 - CBLFT - Frequency 261000

**3**

**5** Optionally select a preferred board  
 CableCARD Blue #0 (3/6 Decrypts)  
 CableCARD Green #1 (0/6 Decrypts)  
 CableCARD Red #2 (0/6 Decrypts)  
 CableCARD Purple #3 (0/6 Decrypts)

Optionally select a preferred tuner  
 None

Select Routing  
 Decrypt

Add

In Use	Program	Frequency	Name	Routing	Status	Board/Tuner	Remove
Channel 1 / EAS	1	153000	YWTW	Decrypt		Blue #0 - Tuner #0	<input type="checkbox"/>
Channel 2	4	207000	TVOH	Decrypt		Blue #0 - Tuner #1	<input type="checkbox"/>
Channel 3	2302	165000	HDGLB	Decrypt		Blue #0 - Tuner #2	<input type="checkbox"/>

Total Channels In Use: 3  
 Channel Insertion Tool

**OOB Status**

Board	Status	Frequency	Board/Tuner	Identify
Board Blue #0	Inserted	Locked: 73.750 Mhz	CableCARD Setup	<input type="button" value="Identify"/>
Board Green #1	Inserted	Locked: 73.750 Mhz	CableCARD Setup	<input type="button" value="Identify"/>
Board Red #2	Inserted	Locked: 73.750 Mhz	CableCARD Setup	<input type="button" value="Identify"/>

At least one cablecard needs lock to acquire channel map.  
 CableCARD Pairing Information Summary

**2**

**9**

No Tuning Resolvers detected.

**7**

**8**

You have unsaved changes  
 Apply

Figure 2-1: Channel View Tab

without decryption. Only one channel may be added at a time when choosing a specific CableCARD. If not specified, or if multiple channels are selected, the next available CableCARD will be used.

- After being added to the channel lineup the programs are listed here in the **In Use** section with details about the program and the CableCARD it is decrypted on.
- Programs may be deleted individually or as a group; just check the box beside the target program(s) and click the **Remove** button.
- An individual CableCARD may be physically identified in the UCrypt chassis by clicking its **Identify** button, causing a blue light to flash momentarily on the card.
- After making any changes on this page, click the **Apply** button to cause the changes to be saved and come into effect. If there are unapplied changes the bar at the page bottom will be red as illustrated in Figure 2-1.

## 2.3 Add VCT Channels to the Channel Lineup

At least one CableCARD needs to be installed with its OOB carrier locked before an automatic channel map (VCT) will be available from which to add encrypted channels to the channel lineup. To add channels that are not in a VCT or there is no CableCARD installed and you are working with un-encrypted channels see “2.7 Channel Insertion Tool” on page 2-5.

### Procedure

This procedure explains how to add channels from a VCT to be processed by QAM input type UCrypt Devices.

- Click to select the **Channel View** tab if it isn't already selected, Figure 2-2.
- Select any programs that are to be added to the channel lineup. Use the keyboard Shift key or Ctrl key to select groups or individual programs. Selected programs will be highlighted in blue.
- Optionally, select a specific CableCARD board by clicking to select it. Once selected it will be highlighted in blue.
- Optionally select a specific tuner by clicking the drop down menu to select it.
- If programs are encrypted, select **Decrypt** or if they are in the clear, select **Passthrough**.
- Click the **Add** button.

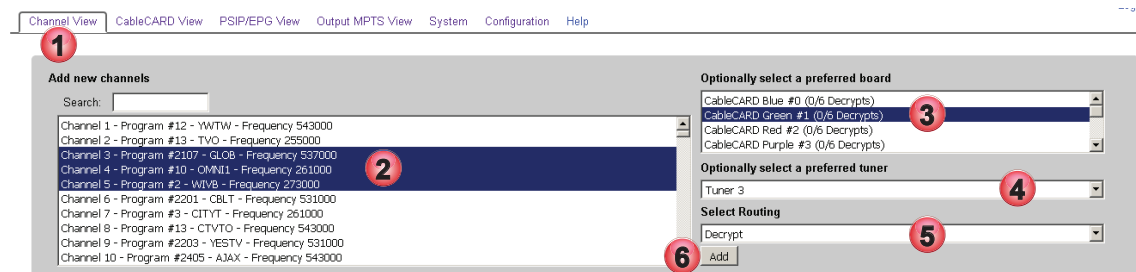


Figure 2-2: Add Programs

- Programs will be added to the **In Use** list, Figure 2-3.
- There is now an alert in red that there are unapplied changes. Click **Apply**.
  - Before you click Apply the changes can be discarded if necessary. Click the **Configuration** tab, then click **Revert**.

In Use	Program	Frequency	Name	Routing	Status	Board/Tuner	Remove
Channel 3 / EAS	2107	537000	GLOB	Decrypt		Green #1 - Tuner #3	<input type="checkbox"/>
Channel 4	10	261000	OMNI1	Decrypt		Blue #0 - Tuner #0	<input type="checkbox"/>
Channel 5	2	273000	WIVB	Decrypt		Blue #0 - Tuner #1	<input type="checkbox"/>
Total Channels In Use: 3							
<a href="#">Channel Insertion Tool</a>							
<b>OOB Status</b>							
Board Blue #0			Inserted	Locked 73.750 Mhz		CableCARD Setup	<a href="#">Identify</a>
Board Green #1			Inserted	Locked 73.750 Mhz		CableCARD Setup	<a href="#">Identify</a>
Board Red #2			Inserted	Locked 73.750 Mhz		CableCARD Setup	<a href="#">Identify</a>
At least one cablecard is required to lock to acquire channel map.							
<a href="#">CableCARD Pairing Instructions Summary</a>							
<b>No Tuning Resolvers detected.</b>							
You have unapplied changes							
<a href="#">Apply</a>							

Figure 2-3: Apply Program Changes

- After clicking Apply, programs are made available to the **PSIP/EPG View** tab and **Output MPTS View** tab.

## 2.4 Channel View - Optional Functions

There are optional channel handling features available when working with programs on the Channel View page, Figure 2-4.

The screenshot shows the 'Channel View' page with several optional features highlighted by red circles and numbers:

- 1**: Search bar for finding channels by EIA Channel, Program Number, or Frequency.
- 2**: List of channels with details like Program #, Name, and Frequency.
- 3**: Dropdown menu to optionally select a preferred board (CableCARD Blue #0, Green #1, Red #2, Purple #3).
- 4**: Dropdown menu to optionally select a preferred tuner (Tuner 3).
- 5**: Dropdown menu to select routing (Decrypt).

Figure 2-4: Optional Channel Handling Features

Table 2.4a: Optional Channel Handling (See Figure 2-4)

Figure 2-4	Feature	Description
1	Search	Search option speeds the process of locating desired programs in a very large channel map, allowing a search by EIA Channel, Program Number or Frequency. The search is done live by finding matches to the entered string. Alphanumeric characters, spaces and brackets will be searched and displayed as you type. Every entry that has a match found will be returned. Programs can then be selected and added. To clear the search criteria, delete the contents of the search box.
2	Optionally Select a Preferred Board	A specific program may be added to a specific CableCARD module. This is normally not necessary, except when CableCARD modules are first added to the system and it is desired to know if specific modules are authorized. In this case, one channel may be added to each module to ensure that the authorization process completed correctly. Select the desired module then click the <b>Add</b> button. If you do not select a specific module, the channels will be added to the first available module.
3	Optionally Select a Preferred Tuner	A specific program may be added to a specific tuner. This is normally not necessary, but the option is presented if required. Select from the drop down menu the desired tuner then click the <b>Add</b> button. If you do not select a specific tuner, the channels will be added to the first available tuner.
4	Select Routing	You may specify if the program needs to be decrypted or not. If a program is in the clear, that program may be passed through without using decryption resources. To pass a clear program, change the routing from Decrypt to Passthrough in the 'Select Routing' drop down menu, then click the <b>Add</b> button. If the program is encrypted, then choose 'Decrypt' in the drop down menu before clicking the <b>Add</b> button.



**WARNING:** The UCrypt Device does not support passthrough of encrypted programs which can cause undesired effects. For the same reason, clear programs should not be selected for **Decrypt**.

## 2.5 Channels In Use

Programs selected to be part of the channel lineup are listed in the **In Use** table below the **Add New Channels** window, see Figure 2-5. The table contents and a brief description are summarized in Table 2.5a. Status indicator is detailed in Table 2.5b. Click on the channel link to see the **Channel Details**, see "2.6 Detailed Channel Properties".

In Use	Program	Frequency	Name	Routing	Status	Board/Tuner	Remove
Channel 3 / <a href="#">Link</a>	210	261000	OMN11	Decrypt	●	Green #1 - Tuner #3	<input type="checkbox"/>
Channel 4	10	261000	OMN11	Decrypt	●	Blue #0 - Tuner #0	<input type="checkbox"/>
Channel 5	2	273000	WVVB	Decrypt	●	Blue #0 - Tuner #1	<input type="checkbox"/>

Figure 2-5: Channels in Use List

**Table 2.5a: Channel In Use Fields (See Figure 2-5)**

Field	Functional Description
In Use	This lists the cable channel number assigned to this program in the channel map (VCT) and is arranged in numerical order ascending. Any channels that have been assigned to either the tuner that will be used for tuning the Designated EAS Details Program or the output QAM that will be used to output the Designated EAS Details Program in the event of a force tune EAS alert are indicated with a bold EAS marking. The cable channel number is a hyperlink which takes the operator to a detailed summary of channel program properties.
Program	The MPEG program number assigned to this program.
Frequency	The QAM center frequency that this program is received on.
Name	The name assigned to this program in the channel map.
Routing	Indicates <b>Decrypt</b> if this program is assigned to a CableCARD module to be decrypted and <b>Passthrough</b> if it is selected for use at the output but is in the clear. Only clear programs may be passed through, otherwise they must be decrypted.
Status	Status dot is either Green or Yellow and indicates if the program is experiencing any problems according to errors tracked in the Alerts Settings page. See the following table for more detail.
Board/Tuner	Indicates the CableCARD module and tuner assigned to this program.
Remove	Tick the box and click <b>Remove</b> to delete any channels from the list.

**Table 2.5b: Channel Status Indicator (See Figure 2-5)**

Status Indicator Dot Condition	Meaning of Indicator
Green	There are no problems currently being detected on this program.
Yellow	At least one of the following problems is being detected on this program: <ul style="list-style-type: none"> <li>Entitlement Error</li> <li>Tuner Lost PCR Lock Error</li> <li>High Tuner Discontinuities/Minute Error</li> <li>Channel Lost Bitrate Error</li> </ul>

## 2.6 Detailed Channel Properties

Click the **Channel Name** link, see Figure 2-5, to view detailed properties. Details property page is shown in Figure 2-6 and explained in Table 2.6a.

Channel 3 - Program #2107 - GLOB

Scrambling Status	Resolution	Bitrate	Frequency	Modulation	Source Id
Encrypted	480i MPEG2	2.0 Mbps	537000 kHz	QAM256	4003

PSIP Name: GLOB PSIP Major #: 2 PSIP Minor #: 1 PSIP Present on Input: No

**Applied Configuration**

Board: Green #1 Decrypt CCI: 2 [CableCARD Setup](#)

Tuner: 3 [Tuner Diagnostics](#)

Signal Level: 7 dBmV Signal To Noise: 37 dB

Output: Ethernet #0 - Channel #0

Output Bitrate OK: Unknown

**Saved Configuration**

Board: Green #1 Decrypt

Tuner: 3 [Tuner Diagnostics](#)

Type	PID	Bandwidth	Output PID	Language Code
PAT	0x0000	0.0091 Mbps	0x0000	
PMT	0x0480	0.0090 Mbps	0x0030	
ECM	0x048d	0.0139 Mbps	Unknown	
Video-PCR	0x0481	1.5928 Mbps	0x0031	
Audio	0x0482 <input checked="" type="checkbox"/>	0.3650 Mbps	0x0032	eng
	0x0483 <input checked="" type="checkbox"/>		0x0033	enm

[Save](#) [Apply](#)

**Figure 2-6: Detailed Channel Properties**

**Table 2.6a: Detailed Channel Properties (See Figure 2-6)**

Field	Description
<b>Detailed Properties</b>	
Scrambling Status	Indicates whether the program is encrypted or not on the incoming cable feed.
Resolution	The vertical resolution of the received program.
Bitrate	The sampled Bitrate of the received program at the time of refresh in Mbps.
Frequency	The center frequency of the received QAM channel.
Modulation	The constellation size of the received QAM channel.
Source ID	The received program's assigned source ID.
PSIP Name	An alpha numeric string used for cable system channel identification and displayed to the user. Editable dialog allows changes from this page.
PSIP Major #	The major EIA channel number assigned. Editable dialog allows changes from this page.
PSIP Minor #	The minor EIA channel number assigned. Editable dialog allows changes from this page.
PSIP Present on Input	Indicates if PSIP is detected on the input signal.
<b>Applied Configuration</b>	
This dialog summarizes the applied decryption properties, such as assigned tuner number, CableCARD module host color, and approximate carrier signal level and approximate Signal to Noise Ratio (SNR) of the QAM carrier.	
<b>Saved Configuration</b>	
This dialog summarizes the properties that have been changed for this channel by the user but have not yet been applied. If no changes have been made this information will be the same as Applied Configuration.	
<b>PID Properties</b>	
Type	The type of tables and PIDs read from the stream.
PID	The PID number associated with the table or stream.
Bandwidth	The occupied bandwidth of the stream
Output PID	The output PID number.
Language Code	The language detected on an audio stream.
Audio PID	Detected audio PIDs are listed and may be deleted from the output by unticking the box then click Apply.
Save Button	Click to save changes. Not in effect until clicking <b>Apply</b> .
Apply Button	Click <b>Apply</b> to cause any changes made to come into effect.

## 2.7 Channel Insertion Tool

The **Channel Insertion Tool** link, Figure 2-7, is located on the **Channel View** tab and opens a separate configuration page shown in Figure 2-8.

In Use	Program	Frequency	Name	Routing	Status	Board/Tuner	<a href="#">Remove</a>
<a href="#">Channel 3 / EAS</a>	2107	537000	GLOB	Decrypt	<div></div>	Green #1 - Tuner #3	<input type="checkbox"/>
<a href="#">Channel 4</a>	10	261000	OMNI1	Decrypt	<div></div>	Blue #0 - Tuner #0	<input type="checkbox"/>
<a href="#">Channel 5</a>	2	273000	WVVB	Decrypt	<div></div>	Blue #0 - Tuner #1	<input type="checkbox"/>
Total Channels In Use: 3							
<a href="#">Channel Insertion Tool</a> <span>Click link to use Channel Insertion Tool</span>							
OOB Status							
<a href="#">Board Blue #0</a>		Inserted		Locked 73.750 Mhz		<a href="#">CableCARD Setup</a>	<a href="#">Identify</a>

*Figure 2-7: Channel Insertion Tool Link*

This page, Figure 2-8, allows a user to manually build a channel map entry for a program that does not exist on the VCT. This is especially useful for a locally generated program. Manually enter an MPEG program number, program properties and QAM frequency for the program.

### Procedure

This procedure describes manually adding a channel to the channel map using the Channel Insertion Tool, Figure 2-8.

1. You may start by using the Search tool to find a channel but this is not mandatory. If not using Search, skip to step number 3. To search, enter the criteria such as channel name or any identification, i.e. CNBC. The uppermost dialog window displays all channels found in the channel map as received on the OOB carrier using the entered criteria, if any. This is the same search function provided on the Channel View page and is not used directly to insert a new channel map entry.

2. Results are displayed in the search results window.
3. Select a specific tuner to use in reading the transport stream of a system QAM carrier, enter the known center frequency of the QAM carrier in kHz that this tuner will search on and the constellation of the search channel (64QAM or 256QAM).
- All available tuners are listed along with their status. If a tuner is in use it will have a statement (**In Use**) beside the tuner number. If the tuner is available it will be listed along with the color of the CableCARD module it is associated with. If there is no free tuner available, there will be a service outage on the program associated with the tuner while the discovery process completes.
4. Click **Tune** to start the search process using the selected criteria.
- Clicking **Tune** causes the transport stream PAT and PMT tables to be read to find the MPEG program streams which are then listed in the dialog below the Tune button.
5. Select the program to be inserted into the channel map
6. Alternately, if a program number, channel number and source ID are already known, they may be entered manually without the need to tune the incoming QAM channel. All entered parameters will be associated and stored persistently with the added program in the local UCrypt Device channel map. The Channel Name and EIA Channel Number are those that the program will be known by in the Channel Map once they are inserted then you will find the specified channel listed in the Channel Map.
7. To make these new settings part of the working configuration, click the **Apply** button. Until you click Apply, you will have a red banner along the bottom of the screen.
8. You may remove added channels by ticking the box for those channels then click the **Remove** button.

**Insert new channels**

Warning: Use of this tool could cause service interruptions because it uses a tuner to determine which programs are present.

Search existing channels:

Channel 1 - Program #12 - YWTW - Frequency 543000  
 Channel 2 - Program #13 - TVO - Frequency 255000  
 Channel 6 - Program #2201 - CBLT - Frequency 531000  
 Channel 7 - Program #3 - CITYT - Frequency 261000  
 Channel 8 - Program #13 - CTV - Frequency 543000  
 Channel 9 - Program #2203 - YES - Frequency 531000  
 Channel 10 - Program #2405 - AJAX - Frequency 543000  
 Channel 11 - Program #2202 - CHCH - Frequency 531000  
 Channel 12 - Program #2401 - CH 12 - Frequency 265000  
 Channel 13 - Program #12 - CBLFT - Frequency 261000

Select Tuner To Use: (In Use) Tuner #0 on Blue #0

Enter Frequency: 99000 kHz

Modulation: QAM256

Tune

Select Program Number:

Or Manually Enter Program Number:

Channel Name: Name Channel Number: 2

Source Id: 0

Insert

Remove inserted channels:

Channel Number	Name	Program #	Frequency	Source ID	Remove
2222	New Channel	2	99000	10002	<input type="checkbox"/>

Figure 2-8: Channel Insertion Tool Page

## ETHERNET INPUT CONFIGURATION

### 3. Ethernet Input Configuration

This chapter applies only to Devices with IP Input.

This configuration page allows the operator to specify the incoming IP multicast streams that contain the programs that will be processed by the Device. The interface allows the operator to specify whether a program will be Pro:Idiom encrypted, passed through in the clear or not processed.

#### 3.1 Chapter Contents

- “About Input Ethernet View”
- “Input Ethernet Configuration”
- “Add Programs to Input Ethernet Channels”

#### 3.2 About Input Ethernet View

1. Click the **Input Ethernet View** tab to find this page, Figure 3-1.
2. Tabs to select the **Physical Input Ethernet Port** being configured. The list of channels is then confined to the selected port. Selecting the **All** tab displays all channels from all 3 interfaces which may be a very long list.
3. The input **Channels** representing the input streams which may be SPTS or MPTS.
4. Buttons to **Add Channels** to or **Remove Channels** from the input channels list. Pre-configured with eight but any number may be added up to the Bitrate limit of about **620 Mb/s**. Added channels appear at the bottom of the list. Channels deleted are removed from the bottom of the list also.
5. The entry dialogs for the input stream multicast or unicast address **IP** and **Port**.
6. Define a Source Specific Multicast (SSM) if there are more than one stream multicast on the specified IP address.
7. Button to **Detect Programs** on the specific channel of the associated Ethernet interface. Affects no other channels.
8. Button to **Detect Programs** on all channels of all Ethernet interfaces. Creates a longer outage on all channels as all Ethernet interfaces are polled.
9. The detected programs on the specified input multicast address, here displaying the 2 programs on an MPTS.
10. Routing control to **Filter** (drop), **Passthrough to Output**, or **Encrypt** the detected program. Bitrates are not displayed for streams that are filtered (dropped). The Encryption choice appears only on Devices built with support for Pro:Idiom.
11. Dialog to enter a **Label** per program that will be used in the generation of PSIP and the EPG.
12. The current aggregate **Bitrate** of programs on this Ethernet Interface. Bitrate limit is about **620 Mb/s**. Update with page refresh.

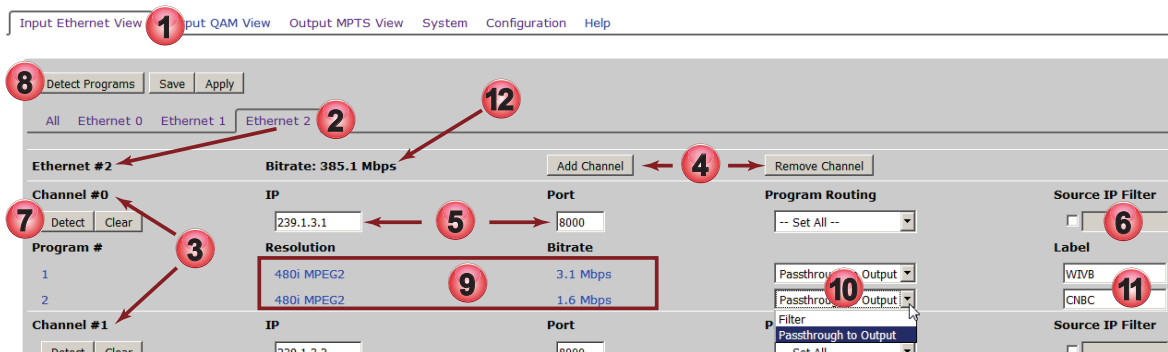


Figure 3-1: Input Ethernet Page

### 3.3 Input Ethernet Configuration

**Table 3.3a: Input Ethernet Configuration (See Figure 3-1)**

Control/Heading	Object	Description
Detect Programs	Button - Page Top	After the IP address and Port is entered in a channel, the Device must read the transport stream tables to determine the programs available. The entered addresses must be saved first, so click <b>Save</b> then use the <b>Detect Programs</b> button at the top of the page to read all PMT tables for all channels or the <b>Detect</b> Button with each channel to read just that one channel.
Save	Button - Page Top	<p>This button saves the entered IP addresses/Port numbers as well as the Encrypt/Passthrough setting for each program to the <b>Saved Configuration</b>. Saving is not service affecting, whereas, applying the changes will result in service disruption.</p> <p>When there are configuration changes that have been saved but not yet applied, a red banner will announce this, shown in Figure 3-2. The banner remains until you click apply or revert the changes.</p> <p>If changes are saved and subsequently it is desired to not apply these changes it is possible to discard them. Navigate to the <b>Configuration</b> tab and click the <b>Revert</b> button. This will discard the changes and copy the Applied configuration over the Saved configuration restoring the UCrypt to the condition before any changes were made. The red banner is removed and no changes are made. This is not service affecting. See <a href="#">“Reset Channel Configuration” on page 12-3</a> for more details on Reverting the configuration.</p>
Apply	Button - Page Top	This will re-initialize the unit and make the new, saved changes part of the working configuration.
Bitrate	Heading	Shows the current aggregate bitrate of the specific Ethernet interface. Updated with a page refresh.
Add Channel	Button	Adds one Ethernet channel at the bottom of the existing list of channels of the associated physical input port. There is one Add Channel button per Ethernet Port.
Remove Channel	Button	Removes one Ethernet channel at the bottom of the existing list of channels of the associated physical input port. This button removes the last added channel from the bottom of the list. You cannot remove a specific channel; the last one added is first to be removed. There is one Remove Channel button per Ethernet Port.
Channel #X	Title	This is the input Ethernet channel defined most commonly with a Multicast address.
Detect	Button	Tunes to the IP address and port entered on this channel and reads the PMT table, presenting the results. This button detects programs only on the specific channel it is assigned to and is provided to avoid the long delay while all input program streams are read on all physical interfaces if there are many streams. The Device does not dynamically read the PSI tables over time. Use of this button is service affecting to the channel.
Clear	Button	If the IP address/Port number are changed in a specific channel, or if the program lineup within the stream changes as reported by the PAT and PMT tables, the system must be instructed to “forget” the previous programs and re-read the new program tables. The tables are read only once and the system assumes that no changes will take place. After clearing the programs, click <b>Detect</b> again to read the new table data.
IP	Title	This is the IP address, usually multicast but also may be unicast.
Port	Title	The port number associated with the IP Address.
Program Routing	Dropdown Menu	<p>Easily set all channels in a multiplex to the same settings:</p> <p><b>Filter</b> - This is the default setting and causes the program to be ignored or dropped. The program does not pass to the output of the UCrypt.</p> <p><b>To Pro:Idiom Encryptor</b> - Passes the program to the encryption engine, appearing for assignment on the <b>Output MPTS View</b> tab.</p> <p><b>Passthrough to Output</b> - Allows the program to pass in the clear and the program appears for assignment on the <b>Output MPTS View</b> tab. The passed through program does not consume encryption resources.</p>
Filter by Source IP	Tick Box/Dialog	If there are identical multicast IP address available on a network, the desired IP stream may be selected by entering the source IP address of the desired stream. This will prevent all other source streams from being detected on this channel. Essentially this causes the system to discriminate between the available identical stream addresses and select the one from the desired source. Also known as SSM.

You have unapplied changes  
Save Apply

Figure 3-2:

#### 3.3.1 Input Bitrate Limit

The Ethernet ports are each limited to being able to ‘listen’ to 620 Mbps of traffic which is reported in the GUI, Figure 3-3, and includes total traffic on all multicast addresses entered regardless of whether programs are selected for use. Please stay within this limit which is 16 multiplexes of 38.8 Mb/s. There is no requirement to use more than one physical interface until the data rate limit on the first port is reached although any or all ports may be utilized as desired.



Figure 3-3: Input Bit Rate Display

#### 3.3.2 In-the-Clear Input Streams only

All incoming multicast streams must be in the clear. No encryption of any type will be detected or handled.

### 3.4 Add Programs to Input Ethernet Channels

Connect the UCrypt Device to a source of IP streams. In this example we assume Ethernet #0 is connected and Channel #0 will be used.

#### Procedure

This procedure explains how to add programs to the Input Ethernet channels.

1. Click the **Input Ethernet View** tab if it isn't already selected, Figure 3-4.
2. Click the **Ethernet 0** tab and find the **Ethernet #0 Channel #0** location.
3. Enter the desired multicast address under **IP** and the port number under **Port**. This may also be a unicast IP and port.
4. If there might be more than one IP multicast at this address, tick the box **Source IP Filter** and enter the source IP address of the correct source of the multicast.
5. Click **Save** to save the changes or new IP addresses.
6. Click **Detect** to read the PMT table on the specified stream. You may also click the button **Detect Programs** which reads the PMT tables on all streams of all interfaces; this takes longer and causes an outage on other channels. You may need to refresh your browser tab to see the detected streams.

Figure 3-4: Enter IP Address and Port for Eth0 Ch0

7. Programs listed in the PMT tables of the transport stream will appear in the list, Figure 3-5, but without the Resolution or Bitrate. The bit rates of these programs are unknown at this point as they need to be passed through to the output to be measured. It is assumed you already know what the programs are and knowing the bit rate is not required at this point. All programs will initially have **Program Routing** set to **Filter** thus will not be measured.
8. For each desired program, set its **Program Routing** to **Passthrough to Output** (or **To Pro:Idiom Encryptor** if that is one of your options). Leave others set at **Filter**, causing them to be dropped.
9. Enter a **Label** for each desired program which will appear in PSIP tables and the EPG display.
10. When all changes are finished on all required programs, click **Apply**.

Figure 3-5: Input Programs Detected



**NOTE:** *The Device will not recognize the resolution of the programs or the bitrate of incoming detected programs until the configuration is applied. It is assumed that the operator knows the bitrate and resolution of the programs in the beginning so this should not be an issue. This was viewed as a helpful feature but not as a substitute for a transport stream analyzer. If it is necessary to see the resolution and bitrate of the detected incoming programs before assigning to output IP streams simply click **Apply** on the Input Ethernet page.*



**NOTE:** *Clicking the Detect Programs button at the top of the page is service affecting to all of the input streams while the streams are being read. Reading the streams may take up to 15 seconds. Clicking the Detect Programs button of any specific multicast address only affects the service on that multiplex.*

# QAM OUTPUT CONFIGURATION

## 4. QAM Output Configuration

This chapter applies only to Devices with QAM Output.

### 4.1 About Output QAM View

1. Click **Output QAM View** tab to open this page, Figure 4-1.
2. Configure the base output channel of the installed QAM modulator modules. The UCrypt supports STD, IRC and HRC channel frequency plans and a constellation of 256QAM.
  - QAM modulators within each module are arranged in 2 banks of 4 adjacent 6 MHz spaced channels.
  - Each bank's range may be defined by setting the center frequency of the lowest frequency channel in the bank. There may be no overlapping channels in the final channel plan.
  - If a particular QAM channel is not required in any available bank of 4, it may be muted merely by not assigning programs to it and there will be no RF output from that modulator.
3. After making frequency changes, click **Apply** to make the changed effective. Clicking Save will save the changes made here so you continue with more Device changes before applying.

**ATX UCrypt®**  
PATENT PENDING

Input Ethernet View **Output QAM** 1 PSIP/EPG View Output MPTS View System Configuration Help

DQAM Number	Center Frequency	Major	Modulation	Status
<b>MQAM_8CH Unit#0 (Diagnostics)</b>				
Operational	519000 KHz	73	QAM256	Enabled <b>EAS</b>
Serial: MQ141700452	525000 KHz	74	QAM256	Enabled
Firmware: 2.0-0.17-1.0	531000 KHz	75	QAM256	Enabled
MAC: 40:D8:55:12:25:E7	537000 KHz	76	QAM256	Enabled
Temperature: 66 degr.C	543000 KHz	77	QAM256	Enabled
<a href="#">Link to DQAM Diagnostics page</a>	549000 KHz	78	QAM256	Enabled
	555000 KHz	79	QAM256	Enabled
	561000 KHz	80	QAM256	Enabled
<b>MQAM_8CH Unit#1 (Diagnostics)</b>				
Operational	567000 KHz	81	QAM256	Enabled
Serial: MQ141700450	573000 KHz	82	QAM256	Enabled
Firmware: 2.0-0.17-1.0	579000 KHz	83	QAM256	Enabled
MAC: 40:D8:55:12:25:E5	585000 KHz	84	QAM256	Enabled
Temperature: 69 degr.C	591000 KHz	85	QAM256	Enabled
	597000 KHz	86	QAM256	Enabled
	603000 KHz	87	QAM256	Enabled
	609000 KHz	88	QAM256	Enabled

Save Apply 3

Figure 4-1: Configure Output QAM

Table 4.1a: QAM Configuration Page (See Figure 4-1)

Page Heading	Description
DQAM Number	When installed, the physical QAM modules will appear as <b>DQ800-B Unit#x</b> , <b>MQAM_8CU Unit#x</b> or similar notation. These are the Output QAM Modulator modules, each of which creates 8 RF channels
Center Frequency	The center frequencies of the groups of internal modulators are listed next to the frequency of the lowest channel in the group which is the only one that may be specified in the dialog box. STD, HRC and IRC channel plans are supported, enter the full desired frequency to the nearest kHz.
Major	This is the EIA channel number of the QAM modulator RF carrier output. This is calculated and displayed based on the entry of the lowest center frequency of the associated modulator group.
Modulation	This specifies the QAM constellation and only 256QAM is implemented. It is the operator's responsibility to ensure the total bitrate of all programs assigned to each individual output QAM will never exceed the maximum bitrate allowed for the QAM constellation.
Status	This illustrates the activation status of each QAM channel in the group. If there has been at least one program added to the QAM modulator, (see "SPTS/MPTS Output Configuration") the modulator will automatically be enabled. If no program is assigned to the modulator, then the modulator will be disabled with no RF output.  If the modulator is associated with an EAS Force Tune Event then EAS will be shown in the status line. This is illustrated in Figure 4-1. This would indicate that when a force tune event is commanded, this modulator will be the target QAM that TV's will tune to receive the EAS Details program.

## 4.2 DQAM Diagnostics

1. Access the page by clicking the **Output QAM View** tab then click the specific DQAM module link **Output QAM View > MQAM\_8CH Unit#x (Diagnostics)** see Figure 4-1. The hyperlink leads to the DQAM module diagnostics page illustrated here, Figure 4-2.
2. Technical information about the DQAM module is listed.
3. Diagnostics information may be viewed live with constantly changing data on this page updated every 5 seconds showing the changed data in yellow highlight.
4. the **Power Cycle DQAM** button will cycle the power off then back on for this DQAM. In the image shown in Figure 4-2, it would be DQAM #0. Each DQAM module may be power cycled from it's own diagnostics page. This would be performed in an attempt to restart a module which is not responding or has stopped it's output. A symptom in this case would be that the bitrate of the channels may have dropped to zero. Using this potentially avoids restarting the whole system.
5. The **Toggle Channel** button will do a soft restart on only the DQAM channel selected with the drop down selection menu. If a single channel has stopped it's output stream this is usually indicated when the channel bitrate has dropped to zero; use this tool to restart this channel. Using this feature potentially avoids restarting the whole system.
6. Although it is possible to upgrade DQAM firmware from this page, this feature will almost never be used as DQAM firmware is updated through system firmware updates. This may be used for unusual issues only. Also available from this page is an ability to power cycle the DQAM module. This may be necessary under some conditions but usually at the recommendation of ATX Networks technical support group only. See "11.6 Firmware" on page 11-4 for system firmware upgrades.

Channel View CableCARD View **Output QAM View** PSIP/EPG View Output MPTS View System Configuration

**DQ801-B Unit#0**

Operational  
Serial: 0012004475  
Firmware: 2.22  
Hw Rev: 00  
MAC: 00:1E:17:00:0A:E8  
RF Level/Channel: 0.75 dBmW (49.45 dBmV)  
Temperature: 51 degr.C

**Diagnostics**

Bitrate: 38812447	Restarts/Minute: 0	Delay: 4635.26us
Bitrate: 38813645	Restarts/Minute: 0	Delay: 4991.46us
Bitrate: 38812469	Restarts/Minute: 0	Delay: 4784.67us
Bitrate: 38812457	Restarts/Minute: 0	Delay: 4926.15us
Bitrate: 38812457	Restarts/Minute: 0	Delay: 5216.20us
Bitrate: 38812438	Restarts/Minute: 0	Delay: 4695.78us
Bitrate: 38812450	Restarts/Minute: 0	Delay: 4788.28us
Bitrate: 38812441	Restarts/Minute: 0	Delay: 4932.30us

Refreshed every 5 seconds

**Firmware upgrade** Browse... File selected. Upgrade

DQAM firmware upgrade takes about 5 minutes to complete.  
Status: Not started

**Diagnostic Utilities** Power Cycle Dqam

0 Toggle Channel

Figure 4-2: DQAM Diagnostics Page

# SPTS/MPTS OUTPUT CONFIGURATION

## 5. SPTS/MPTS Output Configuration

This page is where selected programs are assigned to RF Output QAMs for QAM output Devices and output multiplexes for IP output Devices. Programs selected on either the **Channel View** or **Ethernet Input View** tabs will appear in the **Available Programs** list on this page. Depending on your model of Device the output configuration page may be called **Output View** or **Output MPTS View**.

### Output View

This is the page to configure SPTS output streams. SPTS output is the only option for the following Devices:

- SQIP Device with Simulcrypt only capabilities.
- XQIP Devices with Simulcrypt or Fixed Key encryption selected.

### Output MPTS View

This is the page to configure MPTS multiplexes. You may also use the Output MPTS page to create SPTS outputs.

- All IP Output Devices with no encryption selected.
- All QAM Output Devices.



**WARNING:** When re-multiplexing programs from different input channel sources, you must take into account the variable Bitrate nature of MPEG programs. Sufficient headroom must be maintained in each output multiplex used for QAM to allow for this.

### 5.1 Chapter Contents

- “Pro:I Encryption Limitations”
- “Output MPTS View - QAM Output”
- “Output MPTS View - MPTS IP Output”
- “Output View - SPTS IP Output with Simulcrypt”
- “Output View - SPTS IP Output with Fixed Key”
- “Add Programs to Output Multiplex”
- “Remove Programs from Output Multiplex”
- “Multiplexing Considerations for QAM”
- “Auto Assign”
- “Auto Assign from Input”
- “Assign x Programs per Output”

### 5.2 Pro:I Encryption Limitations

For Devices that include Pro:I encryption capabilities, Figure 5-1, the number of programs that may be encrypted depends on following factors. Encryption is by output multiplex.

Product Type	
Product Type:	GigE to GigE ProI
SKU Type:	24 ProI SPTS IP Outputs
FACE Attached:	False

Figure 5-1: Product Type Section

- Encryption capacity is ordered in blocks of 8 multiplexes. Your model may have up to 24 multiplex capacity. On the **System** page, see **Product Type** section for the capability of your unit.
- In an SPTS multiplex, there will be only one program encrypted. In an MPTS multiplex, multiple programs will be encrypted up to an aggregate total of 38.8 Mb/s. The number of programs that may be encrypted, therefore, depends directly on the number of programs in the multiplex.

### 5.3 Output MPTS View - QAM Output

#### Applies to models with QAM Output

1. Click the **Output MPTS View** tab on your QAM output type Device to find this page, Figure 5-2.
2. The list of channels that have been added to the Device from the **Channel View** or **Input Ethernet View** tabs. This list is showing the channels that have not yet been assigned to output multiplexes.
3. The groups of QAM **Output Multiplexes** and the displayed list of multiplexes may be abbreviated by clicking any of the individual outputs.
4. The individual output EIA channels of the QAM output modules.
5. Tick boxes to select individual programs for moves in or out of multiplexes. Select one or more channels at one time.
6. Arrow controls to move individual or multiple programs in and out of multiplexes.
7. Controls to assist in the bulk assignment of programs to output multiplexes.
8. The **Apply** button must be clicked after any changes on this page to make the changes become effective. If changes are made but you don't want to apply them just yet, click the **Save** button to save them to apply later.

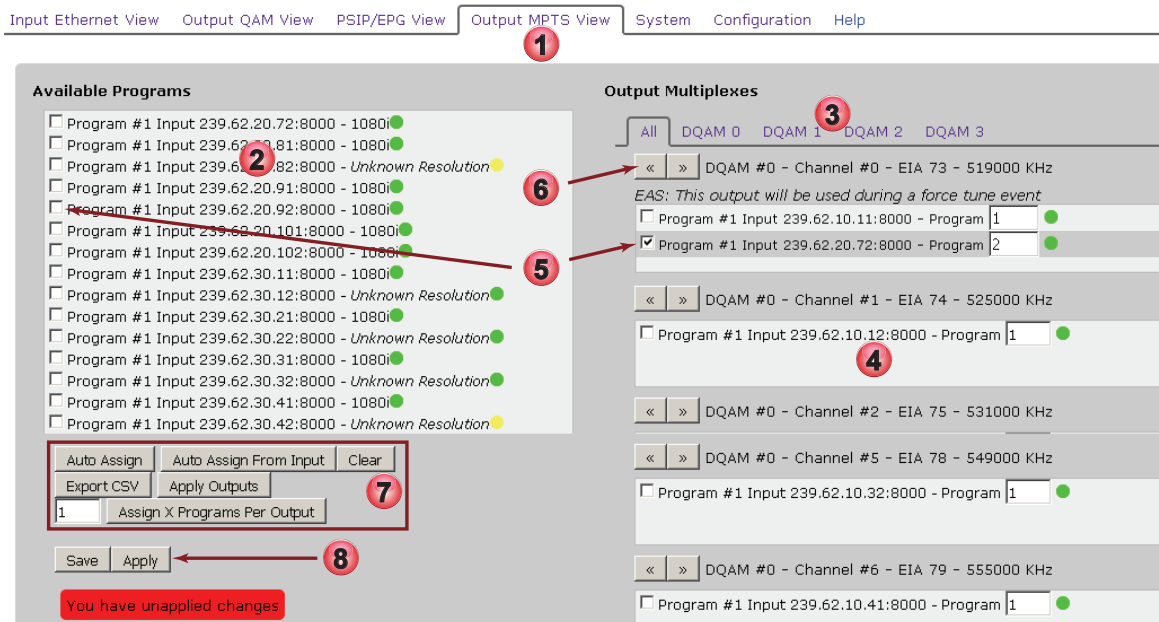


Figure 5-2: Output MPTS View - QAM Outputs

## 5.4 Output MPTS View - MPTS IP Output

While MPTS outputs are the default mode, you may use the Output MPTS page to create SPTS outputs by inserting only one program per MUX and reducing the bitrate to an appropriate value.

1. Click the **Output MPTS View** tab on your IP output type Device to find this page, Figure 5-3.
2. The list of channels that have been added to the Device from the **Channel View** or **Input Ethernet View** tabs. This list is showing the channels that have not yet been assigned to output multiplexes.
3. The physical rear panel output Ethernet ports represent groups of **Output Multiplexes**. The default view is all outputs. The displayed list of output multiplexes may be abbreviated by clicking any of the individual outputs.
4. The individual output EIA channels in the case of QAM output Device or individual output multicast addresses in the case of IP output Device.
5. Assign the IP multicast or unicast address and port as well as set the multiplex bitrate and disable null stuffing which is on by default.
6. Tick boxes to select individual programs for moves in or out of multiplexes. Select one or more channels.
7. Arrow controls to move individual or groups of programs in and out of multiplexes.
8. Controls to assist in the bulk assignment of programs to output multiplexes.
9. The **Apply** button must be clicked after any changes on this page to make the changes become effective. If changes are made but you don't want to apply them just yet, click the **Save** button to save them to apply later.

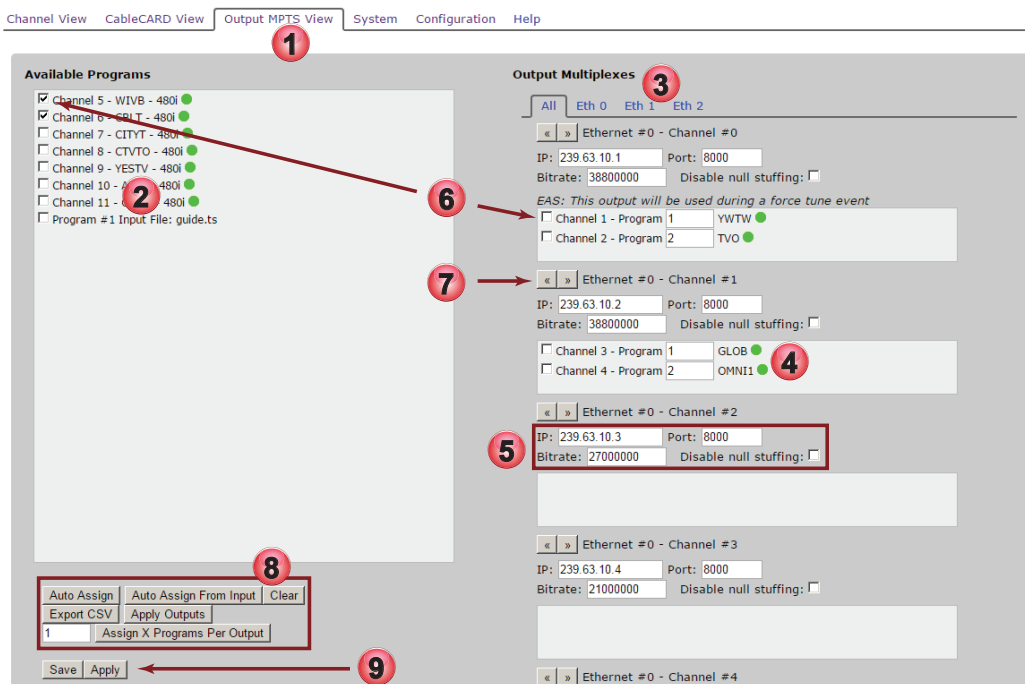


Figure 5-3: Output MPTS View - IP Outputs

## 5.5 Output View - SPTS IP Output with Simulcrypt

Applies to SQIP and XQIP with Simulcrypt Encryption selected only

1. Click the **Output View** tab on your SQIP (or XQIP with Simulcrypt selected) Device to find this page, Figure 5-4.
2. The list of channels that have been added to the Device from the **Channel View** or **Input Ethernet View** tabs. This list is showing the channels that have not yet been assigned to output multiplexes.
3. The **Output Multiplexes** grouped by the physical Ethernet output ports on the Device. Default view is all outputs. The displayed list of output multiplexes may be abbreviated by clicking any of the individual Ethernet output selector buttons.
4. The individual output SPTS unicast or multicast addresses and maximum stream bitrate.
5. Tick boxes to select individual programs for moves in or out of multiplexes. Select one channel per multiplex.
6. Arrow controls to move individual programs in and out of multiplexes.
7. Null stuffing is on by default, tick to disable null stuffing per multiplex.
8. Simulcrypt configuration parameters.
9. Controls to assist in the bulk assignment/clearing of programs and applying changes to output multiplexes.
10. The **Apply** button must be clicked after any changes on this page to make the changes become effective. If changes are made but you don't want to apply them just yet, click the **Save** button to save them to apply later.

Channel View CableCARD View **1** Output View System Configuration Help

**Available Programs**

- ☒ Channel 5 - 480i
- ☒ Channel 6 - 480i
- ☒ Channel 7 - CITY - 480i
- ☒ Channel 8 - CTVTO - 480i
- ☐ Program #1 Input File: guide.ts

**Output Multiplexes**

All Eth 0 Eth 1 Eth 2

	IP	Port	Bitrate	Disable null stuffing	Simulcrypt Profile	ECM PID	ECMG ACS
« Ethernet #0 - Channel #0 EAS: This output will be used during a force tune event	239.63.10.1	8000	20000000	<input type="checkbox"/>	Default (No Encryption)	0	0x 00000000
Channel 1 - Program 12 YWTW					Packets 34532	0	Test ECMG
« Ethernet #0 - Channel #1	239.63.10.2	8000	20000000	<input type="checkbox"/>	Default (No Encryption)	0	0x 00000000
Channel 2 - Program 13 TVO					Packets 31927	0	Test ECMG
« Ethernet #0 - Channel #2	239.63.10.3	8000	20000000	<input type="checkbox"/>	Default (No Encryption)	0	0x 00000000
Channel 3 - Program 2107 GLOB					Packets 28765	0	Test ECMG
« Ethernet #0 - Channel #3	239.63.10.4	8000	20000000	<input type="checkbox"/>	Default (No Encryption)	0	0x 00000000
Channel 4 - Program 10 OMNI1					Packets 38137	0	Test ECMG
» Ethernet #0 - Channel #4	239.60.10.5	8000	20000000	<input type="checkbox"/>	Default (No Encryption)	0	0x 00000000
» Ethernet #0 - Channel #5	239.60.10.6	8000	20000000	<input type="checkbox"/>	Default (No Encryption)	0	0x 00000000
» Ethernet #0 - Channel #6	239.60.10.7	8000	20000000	<input type="checkbox"/>	Default (No Encryption)	0	0x 00000000
» Ethernet #0 - Channel #7	239.60.10.8	8000	20000000	<input type="checkbox"/>	Default (No Encryption)	0	0x 00000000
» Ethernet #0 - Channel #8	239.60.10.9	8000	20000000	<input type="checkbox"/>	Default (No Encryption)	0	0x 00000000

Auto Assign Clear  
Export CSV Apply Outputs

Save Apply

Figure 5-4: Output View - IP Output With Simulcrypt

## 5.6 Output View - SPTS IP Output with Fixed Key

Applies to SQIP and XQIP with Fixed Key Encryption selected

1. Click the **Output View** tab on your SQIP (or XQIP with Fixed Key selected) Device to find this page, Figure 5-4.
2. The list of channels that have been added to the Device from the **Channel View** or **Input Ethernet View** tabs. This list is showing the channels that have not yet been assigned to output multiplexes.
3. The **Output Multiplexes** grouped by the physical Ethernet output ports on the Device. The default view is all outputs. The displayed list of output multiplexes may be abbreviated by clicking any of the individual Ethernet output selector buttons.
4. The individual output SPTS unicast or multicast addresses and maximum stream bitrate.
5. Tick boxes to select individual programs for moves in or out of multiplexes. Select one channel per multiplex.
6. Arrow controls to move individual programs in and out of multiplexes.
7. Null stuffing is on by default, tick to disable null stuffing per multiplex.
8. Fixed Key Profile Selection.
9. Controls to assist in the bulk assignment/clearing of programs and applying changes to output multiplexes.
10. The **Apply** button must be clicked after any changes on this page to make the changes become effective. If changes are made but you don't want to apply them just yet, click the **Save** button to save them to apply later.

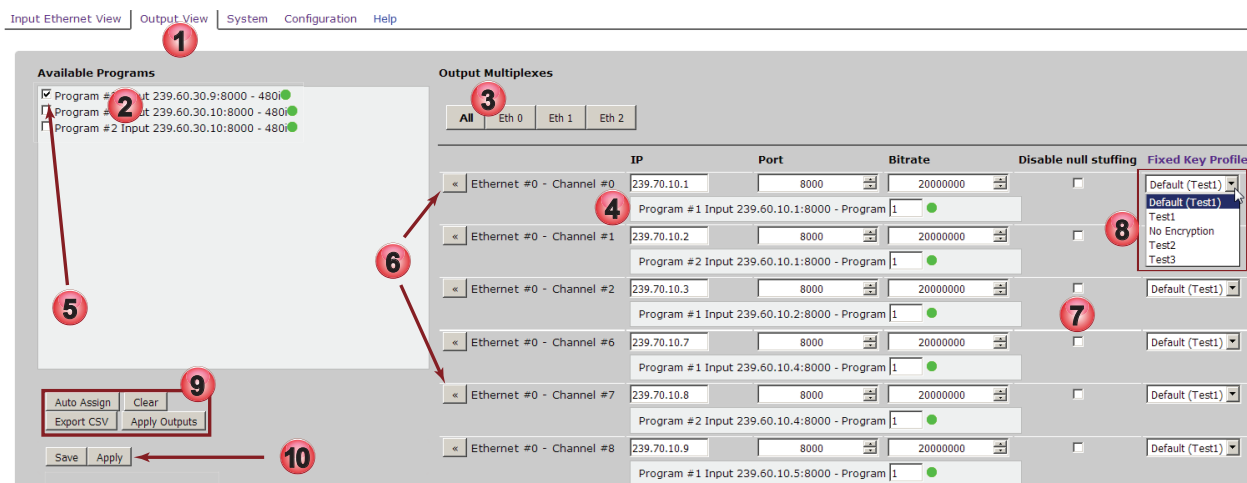


Figure 5-5: Output View - IP Output With Fixed Key Encryption

## 5.7 Add Programs to Output Multiplex

Programs selected for processing on the Channel View or Input Ethernet View pages or added with the Channel Insertion Tool will automatically be added to any available MUXs that exist at that time so it may not be necessary to add them manually. If required MUXs do not exist at the time programs are added, then programs may later be manually added to any available output multiplexes. If too many programs are manually added to a multiplex, the system may begin to exhibit a Multiplex Dropping Error. For more information about this see [“Multiplex Dropping Error” on page 10-15](#).

### Procedure

This procedure explains how to manually add a program to an output multiplex.

1. Click the **Output MPTS View** tab (or **Output View** tab for Simulcrypt), if it is not already selected, Figure 5-6.
2. Channels previously added to the Device are in the **Available Programs** list.
3. Select the **Tick Box** for the program(s) that will be added to a single multiplex with a single click; the check box becomes ticked. For Simulcrypt, only a single program may be added to a multiplex.

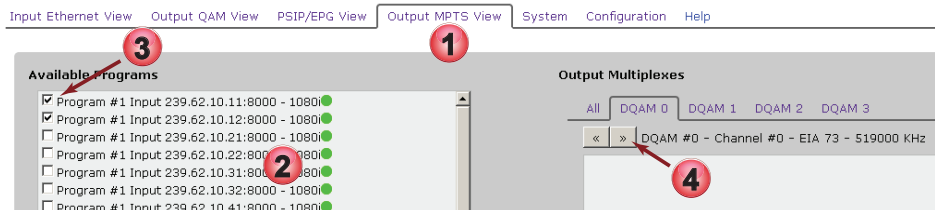


Figure 5-6: Select Programs to Add to MUX

4. When all required programs are selected for a single multiplex, click the **Right Double Arrow** button beside the multiplex name. (Simulcrypt has a single button that changes from right to left as appropriate).
5. The programs are moved to the multiplex list as shown in Figure 5-7.

Repeat steps 3 and 4 for each additional set of programs for all other multiplexes. Multiple moves in and out of different multiplexes may be performed before proceeding to the next step of applying the changes.

6. Edit program numbers for each program if required.
7. When finished with all additions, at the page bottom click the **Apply** or **Apply Outputs** button.

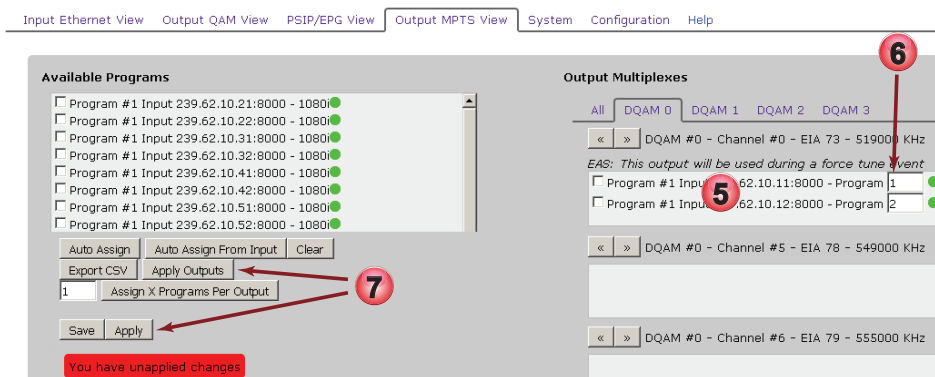


Figure 5-7: Programs Added to MUX

## 5.8 Remove Programs from Output Multiplex

This procedure assumes programs have previously been assigned to an output MUX and are listed below each multiplex and applies equally to SPTS and MPTS multiplexes.

### Procedure

This procedure explains how to manually remove a program from an output multiplex.

1. Click the **Output MPTS View** tab (or **Output View** tab for Simulcrypt) if it is not already selected, Figure 5-8.
2. Select the **Tick Box** for the program(s) that will be removed from a multiplex with a single click; the check box becomes ticked.
3. When all programs to be removed from a single MUX are selected for the multiplex, click the **Left Double Arrow** button beside the multiplex name. (Simulcrypt has a single button that changes from right to left as appropriate)

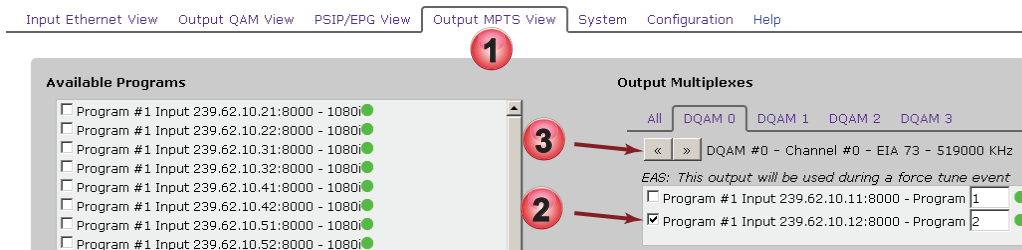


Figure 5-8: Select Programs to Remove From MUX

4. The programs are moved back to the **Available Programs** list, Figure 5-9.
- Repeat steps 3 and 4 for all programs to be removed for each multiplex. Multiple moves in and out of multiplexes may be performed before proceeding to the next step of applying the changes.
5. When finished with all changes, at the page bottom click the **Apply** or **Apply Outputs** button.

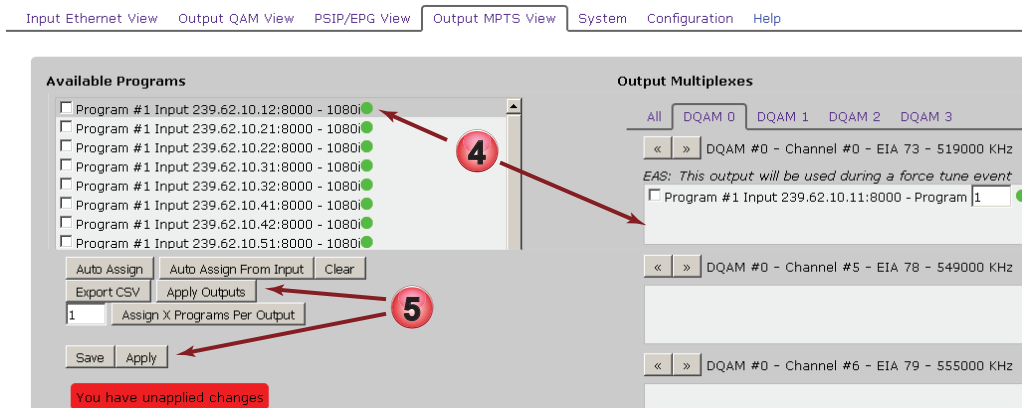


Figure 5-9: Programs Removed From MUX

## 5.9 Multiplexing Considerations for QAM

There are several factors to take into consideration when assigning channels to QAM multiplexes.

- Cable TV programs are VBR but the data rate of the QAM is fixed at 38.81070 Mb/s for 2 HD or 9 SD programs.
- Most SD programs are normally limited in Bitrate to about 4 Mb/s but can exceed this.
- Most HD programs are normally limited in Bitrate to about 18.1 Mb/s but can exceed this.

The UCrypt system software uses algorithms to automatically assign programs to output multiplexes, saving the labour to do this manually. Since it is rarely important exactly which program is carried on a specific QAM channel, this is usually safe to use. However the equipment uses the HD and SD programs bitrate listed above to judge how many programs to place in any QAM and it is up to the Cable Service Provider to review this criteria to determine if the QAM gets packed at the correct capacity.

## 5.10 Auto Assign

The task of assigning programs to output multiplexes can be left to the UCrypt Device which has a built in auto-assign capability. This function works slightly differently depending on the model and we attempt to show the main differences here.

### 5.10.1 IP Output with Simulcrypt and Fixed Key

If you have an SQIP Device or XQIP with Simulcrypt or Fixed Key encryption is active, only one program can be assigned to each individual multiplex. In this case, clicking the auto Assign button will assign one program per SPTS multiplex.

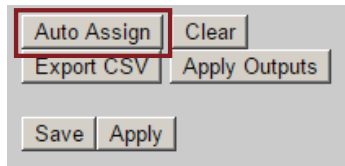


Figure 5-10: Auto Assign w/Encryption

### 5.10.2 QAM and IP Output Devices

The operation of an IP output Device is the same as a QAM output Device in the assignment of programs to multiplexes if the IP multiplex is set to 38.8 Mb/s. For IP multiplex bit rates other than 38.8 Mb/s, the assignment of channels will be proportional to the bitrate available and as such, half the available bit rate in the multiplex will result in about half the channels being assigned.

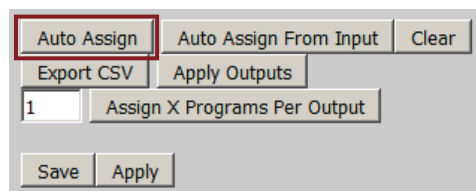


Figure 5-11: Auto Assign - QAM

For 38.8 Mb/sec IP multiplexes and QAM output Devices, this function follows simple rules which assume 18.1 Mbps for HD programs (720 & 1080 res) and 4 Mbps for SD programs (480 res). It then packs output QAM or IP multiplexes to their limit according to these assumptions. If these assumptions are incorrect, the operator is responsible to ensure there will always be sufficient headroom in each output QAM.

This eliminates the manual effort of assigning a large channel contingent to outputs. Checking the result for errors may be easier than manually assigning the lineup.

The **Auto Assign** function will assign programs to QAM and IP multiplexes as follows:

1. Programs are assigned in ascending order based on their virtual channel number in the Available Programs list.
2. HD programs are assigned 2 to a 38.8 Mb/sec multiplex.
3. SD programs are assigned 9 to a 38.8 Mb/sec multiplex.
4. Programs are assigned beginning with the first available output channel on DQAM #0, then the second, etc.

In the case of IP output, the assignment starts with the first available multiplex.

5. SD programs and HD programs are usually not assigned to the same multiplex unless available space is becoming limited then SD and HD programs will be mixed.
6. If a multiplex is not filled on the first pass due to encountering an HD program while filling an SD QAM, the software algorithm will backfill the SD QAM with the next SD program encountered.

### Procedure

It is important to note that the UCrypt system software uses detected program resolution to determine bitrate allowances but can only detect the program resolution **after** the program is assigned to an output QAM and the apply button is clicked.

1. Select all programs for passthrough or decryption first on the **Channel View** tab.
2. The selected programs will appear in the **Available Programs** list on the **Output MPTS View** tab. Click the **Auto Assign** button to assign all the programs to output multiplexes.
3. Click **Apply**. The programs will be assigned 2 into each multiplex because the unit does not yet know the resolution and therefore the bitrate allowance of each program. The firmware assumes these are HD programs. After the apply button is pressed and the equipment adopts the new configuration, it now knows the resolution of the programs.
4. Click **Clear**. All programs are cleared from the output QAM multiplexes into the **Available Programs** list.
5. Click **Auto Assign** again. This time, the system knows the resolution and therefore the bitrate allowance for each program and assigns the programs according to their real needs.
6. Click **Apply** again to finalize the assignment of programs to the output MUXs.
7. If more new programs are subsequently added from the Channel View tab, this process will need to be repeated. This action may result in programs being assigned differently to the output MUXs since the Virtual Channel Number is used in order, ascending, to execute the assignment process.

## 5.11 Auto Assign from Input

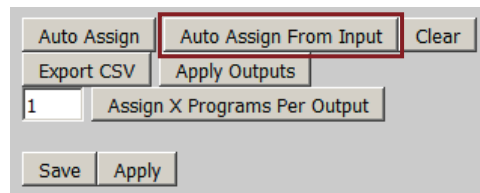


Figure 5-12: Auto Assign From Input

The **Auto Assign From Input** button maps all **Available Programs** to output multiplexes as they appear on input multiplexes.

### Auto Assign for QAM Application

Auto Assign will function the same for QAM output Devices and IP Devices with multiplex size set to 38.8 Mb/s. For example, if four programs are received on the same QAM and are selected for processing, the **Auto Assign From Input** function will allocate them on a single QAM for output. This alleviates the need to provide further bitrate headroom as the programs were configured this way at the Headend.

This is also very safe to use but we stress that if programs are moved about on the cable system QAMs with the moves reflected in the channel map, the equipment will be forced to keep the programs together on the original output QAM as there is no capability to advise downstream TVs of changes in output channel mapping. The worst case scenario is where there are 3 HD programs being used in a QAM and one of the incoming programs moves to a different QAM, possibly with only 2 HDs on the new QAM. The result is that the moved program is now no longer grouped with the other programs on the incoming QAM as it was before the move and the data rate for the output QAM will most likely be exceeded.

Keeping the programs together on the output QAM is the only option to avoid the problem of TVs not being able to find programs that moved with their input QAM but this introduces the problem of the group of output channels not having been originally multiplexed together at the headend, therefore the possibility exists for the programs to momentarily peak above the Bitrate limit of the output QAM. This can cause program breakup due to data losses during the momentary peak condition.

### QAM Assignment Recommendation

If programs move around often on the cable plant QAM channels, use **Auto Assign** to map programs or manually limit a max of 2 HD programs and 6-9 SD programs per output QAM. This results in possibly less channel capacity per QAM but provides for the inevitable moves and Bitrate conflicts. If the channel map is constant and programs will not likely be moved on the cable plant, use of the **Auto Assign From Input** is safe because assigning whole input QAMs to output QAMs achieves more

program capacity per channel.

## 5.12 Assign x Programs per Output

This control, which is not available for Simulcrypt or Fixed Key encryption, Figure 5-13, allows a specified number of programs to be assigned in order of their appearance in the VCT to all available output multiplexes. Usually the output multiplexes would

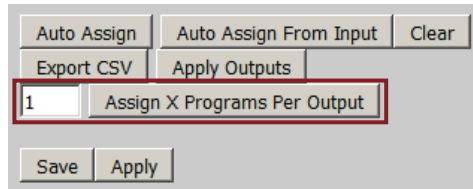


Figure 5-13: Configuration Controls

be clear of programs before using this control; click **Clear** to clear the multiplexes. To assign programs, first enter the number then click the **Assign X Programs Per Output** button. The specified number of programs will be added to all available output multiplexes.

## 5.13 Configuration Controls

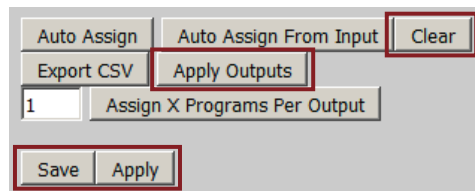


Figure 5-14: Configuration Controls

### 5.13.1 Clear

This button, Figure 5-14, clears all programs previously assigned to output multiplexes and all programs appear back in the Available Channels list. This allows the operator to rearrange the output program lineup more easily if there are many programs to be moved.

The action to remove or clear programs does not take effect on the working configuration of the system until after the **Apply** button is clicked although the removed or cleared programs appear in the Available Programs list. The UCrypt continues to run on its applied configuration and the operator may reassign programs as required without applying after a Clear is performed.

### 5.13.2 Save

This button, Figure 5-14, saves changes so that the operator may move between configuration tabs to perform more extensive configuration changes without incurring unnecessary service interruptions. Saving changes allows the operator to see effect of changes in the page displays of some of the configuration tabs. The Save button changes the saved configuration and is a temporary configuration apart from the working configuration.

The saved changes may be discarded without service interruption by navigating to the **Configuration** tab and clicking the **Revert** button.

### 5.13.3 Apply

If you have any changes that you have saved and wish to apply them, it is not necessary to do so from this page. You can use any **Apply** button anywhere on the Management Interface; they all perform the same function. Every time you click the **Apply** button, the system first performs a **Verify** operation to check for problems and conflicts in your configuration. This action is service affecting.

### 5.13.4 Apply Outputs

The **Apply Outputs** button, Figure 5-14, can apply changes to the output program arrangement on the output multiplexes if these are the only changes made. This action takes about 5 seconds and results in a loss of service for this period. This takes place much faster than using the **Apply** button, which takes about 20 seconds. This button can only apply changes to parameters on this page and will not apply changes made elsewhere.

## 5.14 Export CSV

This function, Figure 5-15, exports a file which contains a list of all of the programs that have been assigned to output multiplexes along with details of the assignments. The exact list of parameters varies depending on the model of UCrypt Device. The format of the data is Comma Separated Values (CSV). This data may be copied, saved and imported into a text editor or opened by a spreadsheet program.

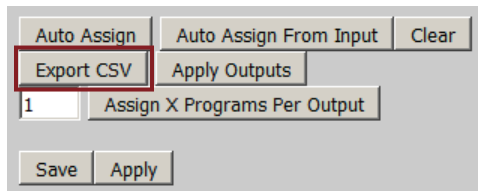


Figure 5-15: Export CSV

If your browser opens the file instead of saving it, you can copy the text then paste the data to a text editor. Save the file as a .txt file if you will view it in a text editor or save as a .csv file if you want to import it to a spreadsheet program.

The file contains headers which are explained in Table 5.14a.

**Table 5.14a: Table Describing .CSV File Headings**

Heading	Applies to	Details
Channel Name	QAM Input Models	The name assigned to this program in the channel map (VCT).
Input Channel Number	QAM Input Models	The cable channel number assigned to this program in the VCT.
Program Number	QAM Input Models	The MPEG program number assigned to this program in the VCT.
Input Board	QAM Input Models	The CableCARD module host color and number.
Input Tuner	QAM Input Models	The tuner number utilized on the CableCARD module host.
Input Frequency	QAM Input Models	The EIA channel center frequency this program is received on in kHz.
Output Major Number	QAM Output Models	The EIA channel number of the output QAM containing this program.
Output Minor Number	QAM Output Models	The MPEG program number assigned to this program in the output QAM.
Status	All Models	The decryption status of the programs, either encrypt, decrypt, passthrough or clear.
Input IP	IP Input Models	The IP address of the stream that has been subscribed to.
Input Port	IP Input Models	The IP port associated with the IP input address.
Input Program Number	IP Input Models	The MPEG program number associated with the IP input stream.
Output IP	IP Output Models	The IP address of the output SPTS or MPTS stream.
Output Port	IP Output Models	The IP port associated with the IP input address.
Output Program Number	IP Output Models	The MPEG program number associated with the IP output stream.

A sample csv file for a QAM Input model is provided in Table 5.14b:

**Table 5.14b: Sample CSV Output**

Channel Name	Input Channel Number	Program Number	Input Board	Input Tuner	Input Frequency	Output Major Number	Output Minor Number	Status
NY1	1	468	Green #1 (#1)	3	435000	31	1	Passthrough
WCBS	2	502	Purple #3 (#3)	2	753000	30	1	Passthrough
WNBC	4	504	Purple #3 (#3)	2	753000	30	2	Passthrough
WWORHD	709	1	Red #2 (#2)	5	465000	30	5	Passthrough
FXHD	710	201	Blue #0 (#0)	4	357000	47	1	Decrypt
WPIXHD	711	3	Green #1 (#1)	1	447000	41	2	Passthrough
TLCHD	752	80	Green #1 (#1)	5	405000	50	2	Decrypt

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# ANALOG OUTPUT CONFIGURATION

## 6. Analog Output Configuration

This chapter applies only to Devices with Analog Output.

The Output View page, Figure 6-1, allows the bulk or individual assignment of selected programs to analog output channels. Before the Output View page can be configured, all required incoming programs must first be made available on the **Channel View** page. For guidance on selecting programs, see section “2.3 Add VCT Channels to the Channel Lineup” on page 2-2. Once programs have been selected for decryption or passthrough, they will appear in the **Available Programs** list.

### 6.1 About Output View

1. Click the **Output View** tab to find this page, Figure 6-1.
2. Available programs to add to the analog output channels are listed here. These come from the Channels View tab.
3. Controls to move individual programs in or out of specific output channel assignments.
4. Controls to assign all programs to channels or clear all programs from channel assignments in bulk.
5. Channels that have been previously added to analog output channels.
6. Controls to select specific groups of analog output channels. The output numbers refer to the physical output modulator module channels and not the EIA analog channels.
7. Access the Quick Settings Tool Bar to make bulk changes to the channel lineup properties.
8. Effect bulk changes to the sequence of channels in the lineup.
9. Controls effect bulk changes to channel audio and subtitle languages, program volume and aspect ratio. Once an entry is made, clicking the **Check Mark** applies the change to all channels in the view while the **X** will clear the entries.
10. Click inside any dialog box to directly add, delete or edit the contents for individual channel changes. Outlined in green while editing, turns red if an invalid entry is made.
11. Select the analog channel plan from the menu. Currently only North America NTSC plans are supported.
12. Click to Save changes made on this page or Apply changes to the working configuration of the Device.

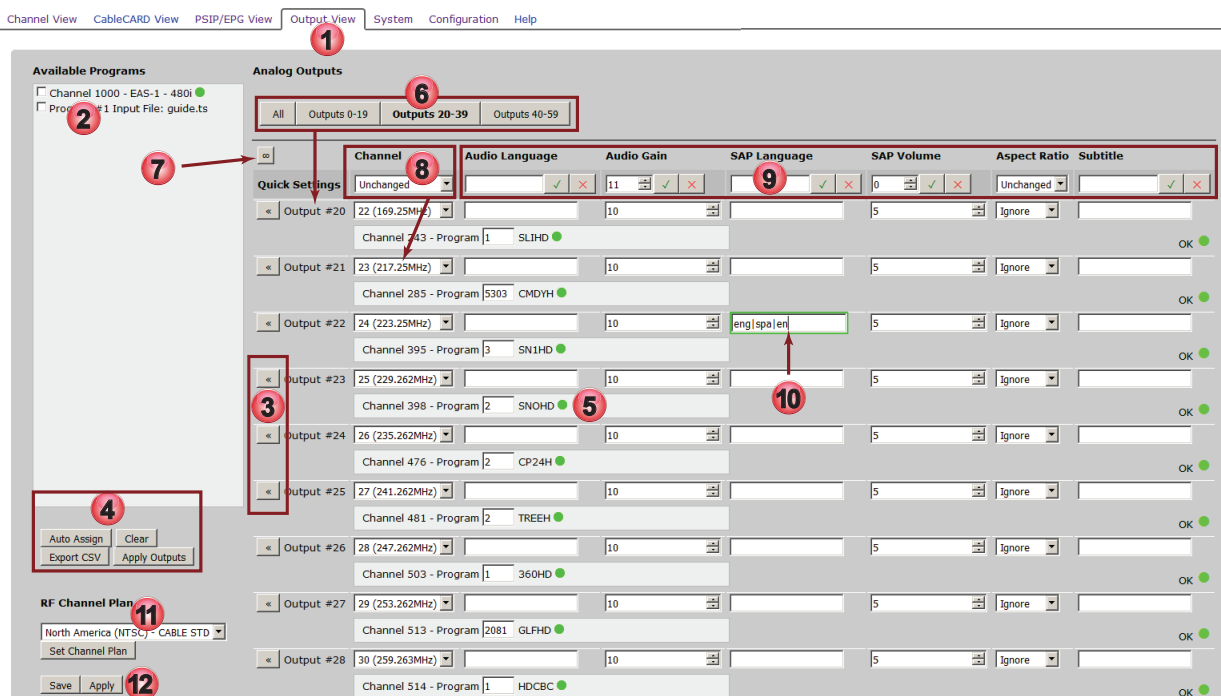


Figure 6-1: Output View Page

## 6.2 Automatically Assign Programs

With a single click all programs listed in the **Available Programs** list, Figure 6-2, may be assigned to output channels beginning with the first channel in the current view and in the order the program is listed in the VCT. Once assigned, it is still possible to change the output channel lineup to suit using the drop down selection menu on each channel.

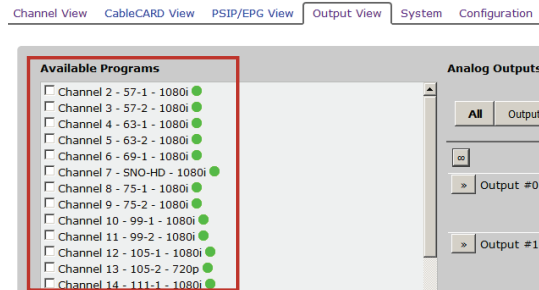


Figure 6-2: Available Programs

### Procedure

This procedure outlines the steps to automatically assign programs to the output channels.

1. Click the **Output View** tab if it isn't already selected, Figure 6-3.
2. Note that there are programs listed in the **Available Programs** list. In your case there may be more or less channels.
  - The list of Available Programs was previously configured on the **Channel View** page.
3. Select the analog output channels that will have programs assigned. In this example we selected **All** but you can select smaller sub groups of **Outputs 0-19**, **Outputs 20-39** or **Outputs 40-59** also.
4. There are currently no programs assigned to any of the analog channels in Figure 6-3. The information boxes are not yet populated with program details. You can select a different group of channels by selecting the appropriate Analog Outputs group buttons ( ).
5. If there were programs already assigned, those programs may be cleared back to the **Available Programs** list by clicking **Clear**.
6. To assign the programs, click the **Auto Assign** button.

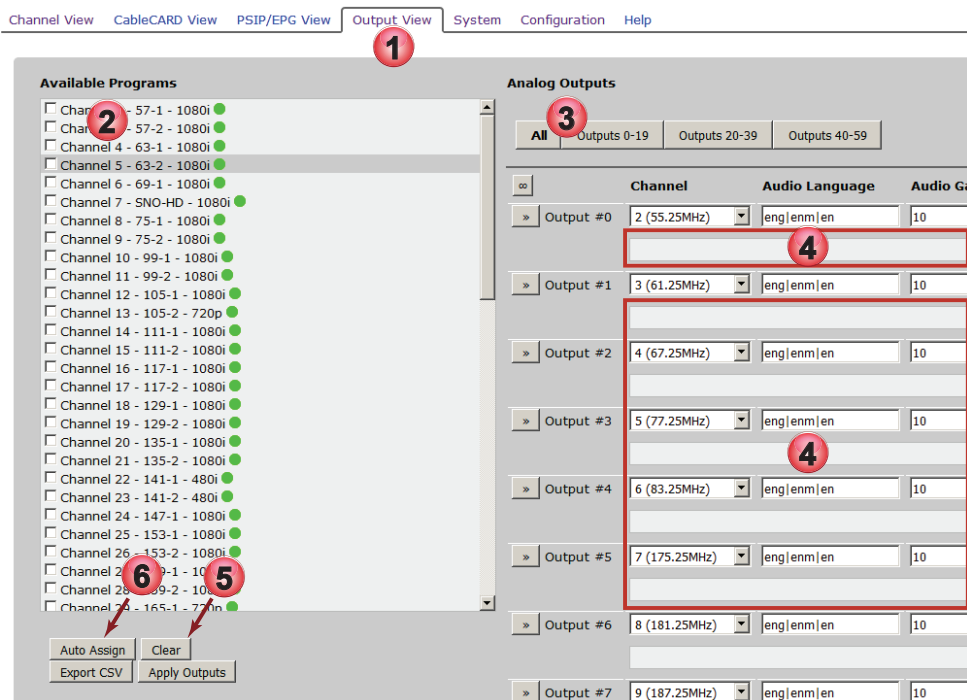


Figure 6-3: Programs Not Assigned

7. All available programs in the list are assigned to analog channels in the order they were listed, Figure 6-4. If there was a **guide.ts** file created earlier it will not be assigned automatically.
8. An alert is posted that changes made are unapplied.
  - Click **Save** to save changes before leaving this page and continue with other configurations. Not service affecting.
  - Click **Apply** to apply the changes made so far. This action is service affecting.
9. If you had previously created a **Guide Channel**, the guide must be assigned manually on the desired channel, see “6.3 Manually Assign Programs”.
10. It is possible to change channel number assignments using the drop down menu of channels on each individual channel. If you make a duplicate selection both affected channels will turn red until you clear the duplication.
  - Analog channels with no program assigned will be muted on the RF output of the Device.
11. Click the **Save** button to save changes made on this page and allow more changes to be made on other pages or click **Apply** to make changes to the working configuration of the Device effective.

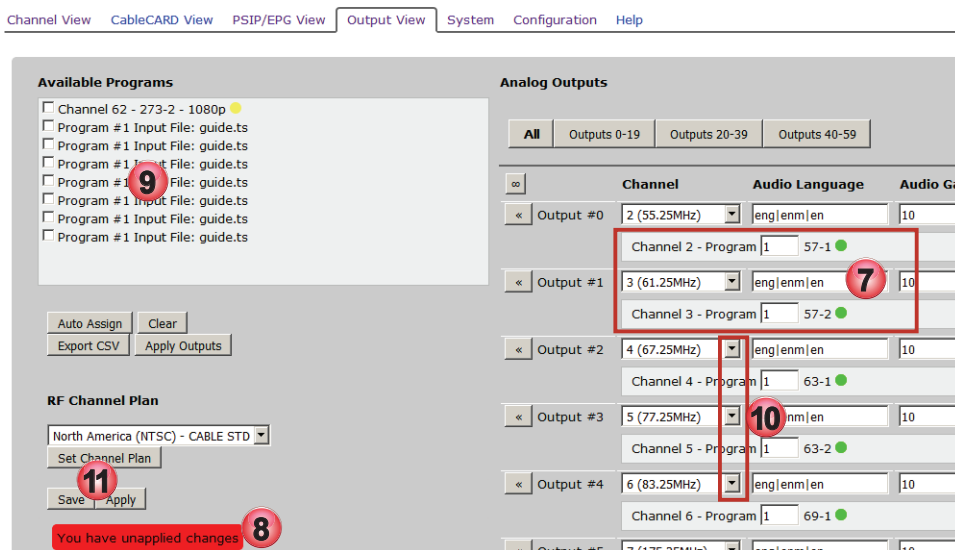


Figure 6-4: Programs Assigned

### 6.3 Manually Assign Programs

Programs in the **Available Programs** list may be assigned in any order and to any output channel if a specific channel lineup is required. This is done one program at a time.

1. Click to select the **Output View** tab if it isn't already selected, Figure 6-5.
2. Notice that there are **Available Programs** in the list. There may be more or less on your machine.
  - The list of **Available Programs** was previously configured on the **Channel View** page.
3. In this demo there are currently no programs assigned to any of the analog channels. The information boxes are not yet populated with program details. In your Device there may already be some assignments.

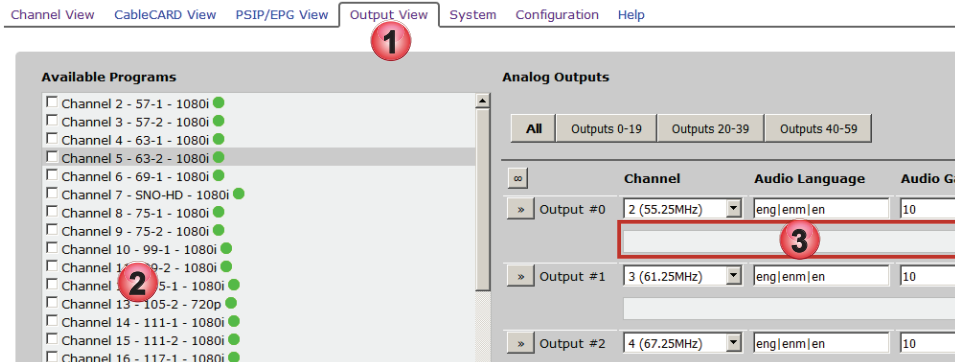


Figure 6-5: Programs Not Yet Assigned

4. Click one **Tick Box** to select any single program to be assigned, Figure 6-6.
5. Click the **Right Arrow** control to move the selected program to the desired analog channel.
  - Repeat steps 4 and 5 to assign each available program to create the desired channel lineup.
  - Once a program is added to a channel, the right arrow on that channel changes to a left arrow which then removes the program from the channel when clicked again.

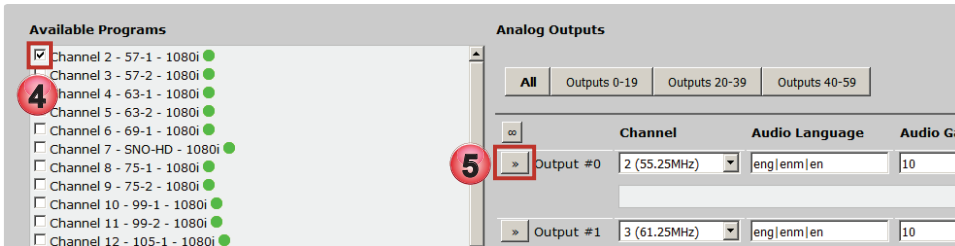


Figure 6-6: Select and Assign a Program

6. The assigned program is moved from the list to the channel's information box, Figure 6-7.

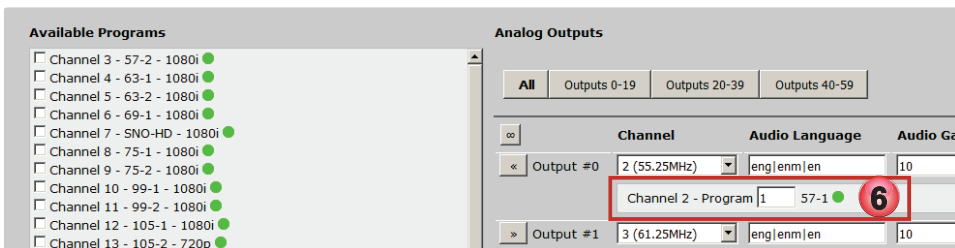


Figure 6-7: Selected Program Assigned

7. Continue to assign all available programs in any order, Figure 6-8.
8. Click **Save** to save changes before leaving this page and continue with other configurations. An alert is posted that changes are unapplied. Not service affecting.
  - Alternately, click **Apply** to apply the changes made so far. This action is service affecting.
  - Analog channels with no program assigned will be muted on the RF output.

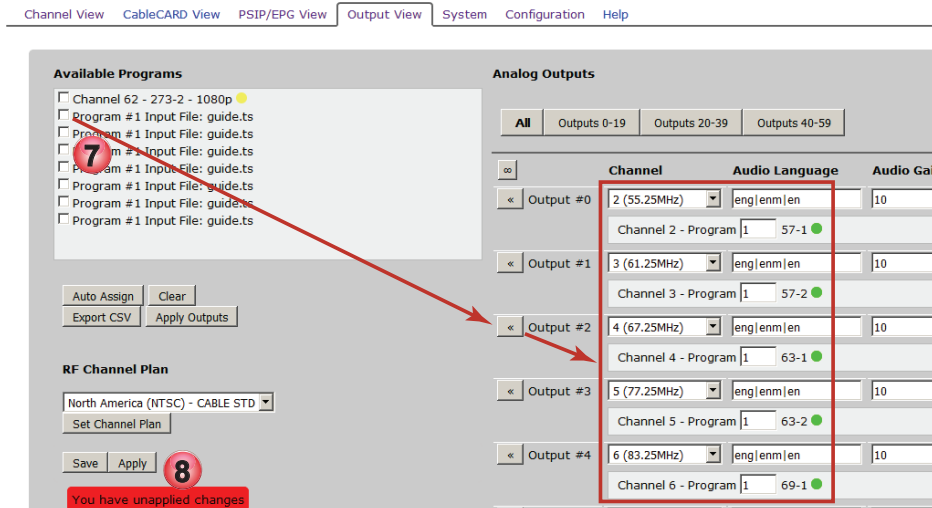



Figure 6-8: Add Channels in any Order

## 6.4 Quick Settings Tool Bar

It is possible to customize the settings of each program in the analog channel lineup to suit the specific requirements determined by program format, audio channels available, Closed Caption display, etc. These changes may be made per channel or can be done in one step if all or most channels will have the same settings.

1. Click the **Quick Settings** link  (the infinity symbol) in the Header bar, Figure 6-9.

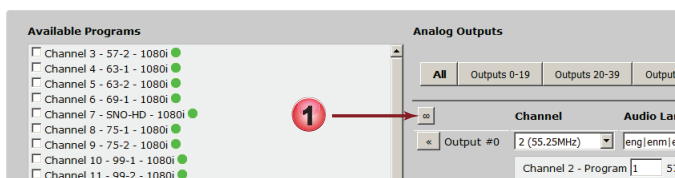


Figure 6-9: Quick Settings Access

2. A new row of controls opens, Figure 6-10, accessing bulk configuration change features, see Table 6.4a.
3. If a channel selection is made in the **Channel** dialog then settings changes will affect only programs/channels in the current view beginning with the channel specified. In this example we show the channel group **Outputs 20-39**.

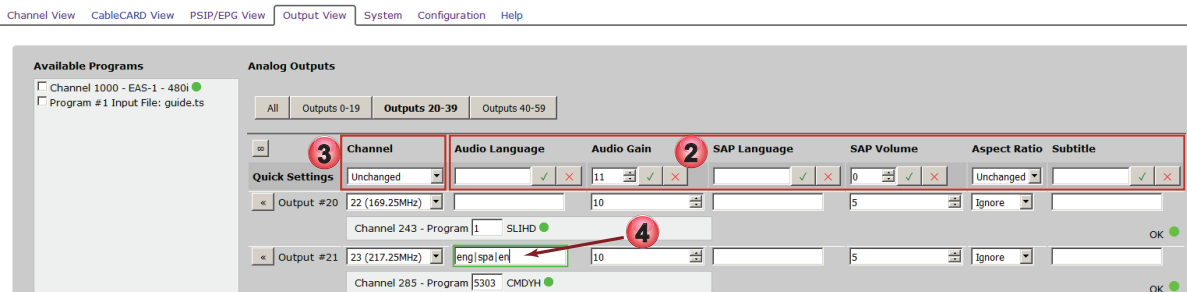


Figure 6-10: Quick Bulk Channel Settings

4. Each individual program/analog channel may also have its settings customized by clicking inside each dialog box. The box turns green while editing and red if a wrong value is entered, Figure 6-10.

**Table 6.4a: Quick Settings Tool Bar Summary (See Figure 6-10)**

Control	Options	Effect
Channel	Menu Dropdown	Used to set the beginning EIA channel of the sequence of the Output Channels in the current view of output channels. Change the current view of output channels by clicking the Analog Outputs selector buttons; <b>All</b> , <b>Outputs 0-19</b> , <b>Outputs 20-39</b> or <b>Outputs 40-59</b> .
Audio Language	ISO6392 language code or PID number	Enter the language codes or PIDs (Base 10) in order of preference separated with   symbols. Affects PSI tables labeling only, does not create new language programs that previously did not exist. Must click the Check Mark to apply to all channels in the current view. Click the Red X to clear the values in the view.
Audio Gain (Volume)	Settings between +12dB and -100 dB.	A setting of 0 is no change; above 0 = amplification, below 0 = attenuation; -100 mutes the audio output. Must click the Check Mark to apply to all channels in the current view. Click the Red X to clear the values in the view.
SAP Language	ISO6392 language code or PID number	If present, enter the language codes or PIDs (Base 10) in order of preference separated with   symbols. Affects PSI tables labeling only, does not create new language programs that previously did not exist. Must click the Check Mark to apply to all channels in the current view. Click the Red X to clear the values in the view.
SAP Volume (Gain)	Settings between +12dB and -100 dB.	A setting of 0 is no change; above 0 = amplification, below 0 = attenuation; -100 mutes the audio output. Must click the Check Mark to apply to all channels in the current view. Click the Red X to clear the values in the view.
Aspect Ratio	Not set, AFD(Auto) Automatic frame detection), Letterbox, Center-Cut	<b>Ignore</b> ignores aspect ratio of the video. On 16:9 display, a 4:3 image appears vertically distorted. On a 4:3 display, a 16:9 image appears vertically distorted. This is the default setting. <b>AFD(Auto)</b> is for televisions with automatic ratio detection. Television switches between 4:3 and 16:9 with full content is displayed for both. <b>Letterbox</b> for televisions with no aspect ratio switching, where the full 16:9 screen is required. In this mode, 4:3 content fits the screen correctly, and any 16:9 content is displayed with black bars above and below.
Subtitle	ISO6392 language code or PID number	If Closed Caption is present, places text into VBI or disables processing of CC entirely. Enter the language codes or PIDs (Base 10) in order of preference separated with   symbols. Affects PSI tables labeling only, does not create new language programs that previously did not exist. Must click the Check Mark to apply to all channels in the current view.

# CABLECARD™ OPERATIONS

## 7. CableCARD™ Operations

This chapter applies only to Devices with QAM Input.

This chapter explains the installation and activation of CableCARD modules. The main page, **CableCARD View**, provides access links to all CableCARD configuration and tuner diagnostics.

### 7.1 Chapter Contents

- “About CableCARD™ View”
- “Program Filtering”
- “The CableCARD™ Module”
- “Generic Short Guide to Activating a Module”
- “Activating Motorola Modules”
- “Activating Cisco® Modules”

### 7.2 About CableCARD™ View

This view, shown in Figure 10-1 is accessed by clicking the **CableCARD View** tab. From here you may customize CableCARD module resources. This view displays the status of selected programs only after the program is assigned to an output QAM and the configuration is applied.

1. Click **CableCARD View** tab to find this page.
2. The list of programs that were added to the Device from the **Channel View** page.
3. The tuner is tuned to the multiplex at 273 MHz and detected QAM type is shown.
4. The **Set Frequency** control will change the tuner to another frequency if you enter it in the **Multiplex** dialog. The programs that exist in the new multiplex will be displayed but filter setting for all is ‘Filter’. Programs will be added to the machine when the filter setting is changed to decrypt or passthrough.
5. The filter setting of all multiplex programs may be set at one time with the **Set All** dropdown menu (then Apply).
6. The entire multiplex may be removed by ticking the **Remove** box (then Apply).

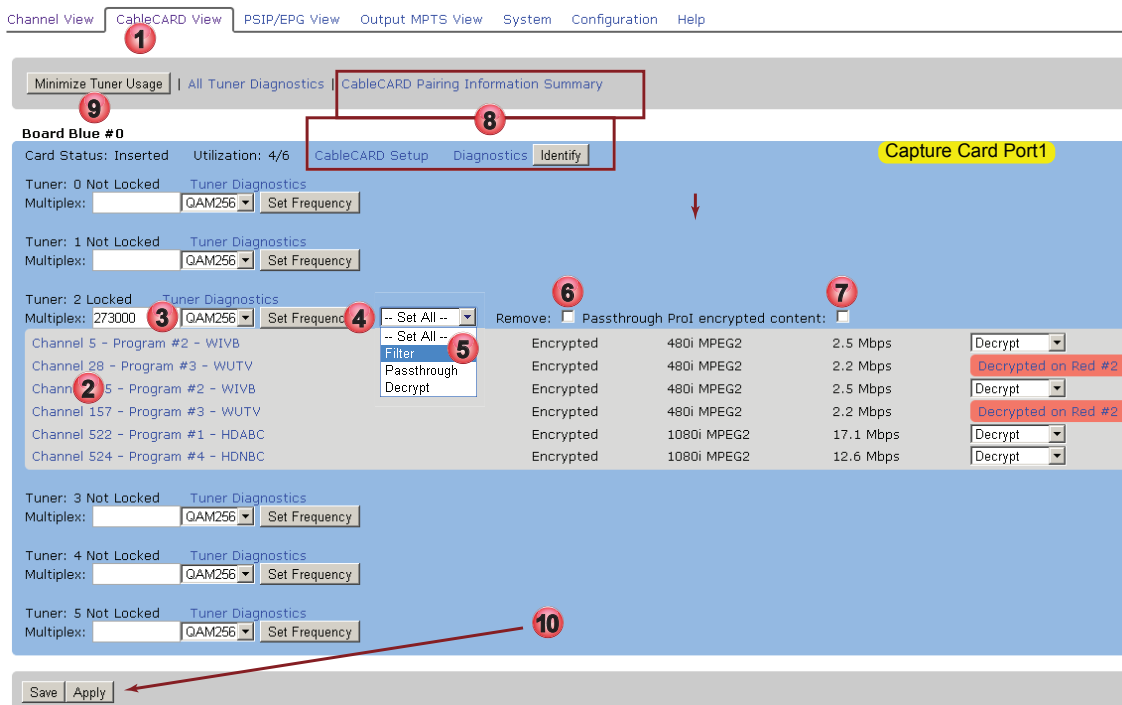


Figure 7-1: About CableCARD® View

7. Click this box to pass Pro:Idiom content through to the output if it exists on the input.
8. CableCARD setup, pairing information and diagnostics are accessed here on these three links. CableCARDS may be physically identified on their associated tuner card with a blinking light by clicking the **Identify** button.
9. Sometimes the tuners are not deployed efficiently depending on the order in which programs are added and multiple tuners end up being used for a single input multiplex. When tuner count becomes critical, use the **Minimize Tuner Usage** button to re-deploy the tuners based on multiplex frequency and possibly free up a tuner or more.
10. After any changes on this page, click the **Apply** button. The **Save** button is for saving changes made if you need to leave this page before applying the changes, otherwise changes will be lost.

## 7.3 Program Filtering

Program filtering is the process of selecting encrypted programs for decryption by a CableCARD module or passthrough of un-encrypted programs to the Device output stages.

There are initially two choices, **Passthrough** and **Decrypt**, for channels added to the Device on the Channel View page, Figure 7-2.

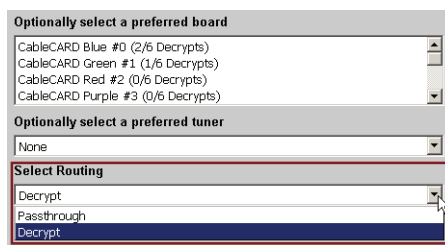


Figure 7-2: Program Filtering - Channels Page

Once the channel is added filtering can be changed from the **CableCARD View** page as shown in Figure 7-3.

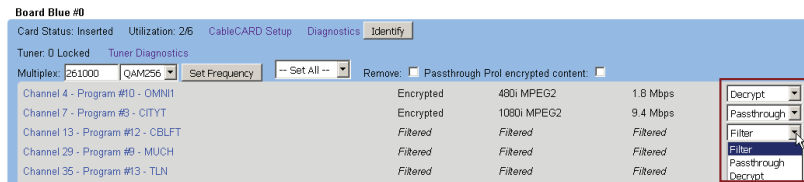


Figure 7-3: Program Filtering - CableCARD® View

### 7.3.1 Encrypted Programs

Incoming encrypted programs may be specified to be decrypted or filtered but may not be passed through in an encrypted state. Do not choose **Passthrough** for an encrypted program.

### 7.3.2 In the Clear Programs

Programs received in the clear may be selected for filter or passthrough but **must not** be specified to be decrypted. This will cause unexpected results from the CableCARD™ module and is not supported.

### 7.3.3 Filter Parameters

The exact meanings of filter parameters:

- **Filter**  
Means the program will be dropped from the multiplex and is not available for output. If already added to the **Channels In Use** list, choosing this will delete the program from the list.
- **Passthrough**  
Only applies to programs received in the clear and means the program will be available for output.
- **Decrypt**  
Only applies to incoming programs that are encrypted and means the program will be decrypted and available for output.

## 7.4 The CableCARD™ Module

A CableCARD module is installed into a host slot receptacle located on the rear panel or behind the front panel, depending on the model. Multichannel CableCARD modules (M-Cards) from the following manufacturers are supported:

1. Cisco
2. Motorola
3. NDS

### 7.4.1 Hot Swappable

CableCARD modules are hot swappable, so they may be inserted or removed at any time without turning the unit off.



**WARNING:** Great care should be taken with the insertion of a CableCARD module to not forcibly insert the card - it should slide in and seat easily. Forcing the card into the slot is likely to result in bent pins in the PCMCIA (also referred to as PC Card) host interface which will prevent proper operation of the UCrypt equipment.

### 7.4.2 Host Slot/CableCARD™ Pairing

During configuration, each CableCARD module will be paired with its host slot and this information recorded in the Cable Service Provider's Billing System. Similar to the CableCARD module, the host slot has a unique ID number, like a serial number. The card, once paired with its host slot, will only work there. After configuration, the CableCARD module installed in a specific host slot will need to remain in that slot because the pairing has been done based on the ID number of that host slot. Moving CableCARD modules between slots after configuration will render the configuration invalid and the pairing operation will need to be redone for the new slot.

### 7.4.3 Module Status Indicators

The LED's on the rear panel adjacent to the CableCARD host receptacles on the version 1.0 hardware indicate the status of each inserted CableCARD module. The blue and white LEDs illuminate to show a number of possible conditions. On all versions above 1.0, the status lights are located adjacent to the host slot on the tuner card. When the unit is powered up or a CableCARD module is plugged in, the white lights illuminate. As the system boots, the blue lights flash to indicate the boot sequence has begun. Once the cards are finished booting they are a solid blue color. If there is a hardware problem detected on a CableCARD module the white LED will be illuminated.

Table 7.4a: CableCARD Module Status Lights

Light	Means
Blue flashing	Normal condition during boot sequence.
Blue steady	Normal condition following boot sequence. Indicates CableCARD hardware ready.
No Lights lit	No CableCARD module plugged in or not recognized.

### 7.4.4 Tuner OOB Status

The OOB Status area at the bottom of the **Channel View** tab, Figure 7-4, shows the status of installed CableCARD modules. When a CableCARD Device is inserted into a slot, the status should show 'Inserted' and the CableCARD module should lock into the appropriate OOB carrier for the system and show 'Locked'.

<b>OOB Status</b>		
Board Blue #0	Inserted	Locked: 75.250 Mhz
Board Green #1	Inserted	Locked: 75.250 Mhz
Board Red #2	Inserted	Locked: 75.250 Mhz
Board Purple #3	Inserted	Locked: 75.250 Mhz
At least one cablecard needs lock to acquire channel map		
<a href="#">CableCARD Pairing Information Summary</a>		
		<a href="#">CableCARD Setup</a>
		<a href="#">CableCARD Setup</a>
		<a href="#">CableCARD Setup</a>
		<a href="#">CableCARD Setup</a>

Figure 7-4: OOB Status

### 7.4.5 Tuner Diagnostics

The **All Tuner Diagnostics** page, Figure 7-5, summarizes the properties of all available tuners on all active CableCARD modules while the **Tuner Diagnostics** page displays only a single tuner. Both pages contain the same basic information. Each CableCARD module host receptacle has six integrated tuners and each tuner is displayed on a separate line in a table format. A brief description of the data is outlined in Table 7.4b.

Board	Tuner	Frequency	Modulation	Carrier Lock	PCR Lock	Signal Level	SNR	Discontinuities/Minute
Blue #0	0	261000	QAM256	yes	yes	8 dBmv	37 dB	0
Blue #0	1	273000	QAM256	yes	yes	7 dBmv	37 dB	0
Blue #0	2	Not Set	Not Set	no	no	-	-	0
Blue #0	3	Not Set	Not Set	no	no	-	-	0
Blue #0	4	Not Set	Not Set	no	no	-	-	0
Blue #0	5	Not Set	Not Set	no	no	-	-	0

Board	Tuner	Frequency	Modulation	Carrier Lock	PCR Lock	Signal Level	SNR	Discontinuities/Minute
Green #1	0	Not Set	Not Set	no	no	-	-	0
Green #1	1	Not Set	Not Set	no	no	-	-	0
Green #1	2	Not Set	Not Set	no	no	-	-	0
Green #1	3	537000	QAM256	yes	yes	7 dBmv	38 dB	0
Green #1	4	Not Set	Not Set	no	no	-	-	0
Green #1	5	Not Set	Not Set	no	no	-	-	0

Figure 7-5: All Tuners Diagnostics Page

Table 7.4b: All Tuner Diagnostics Page (See Figure 7-5)

Tuner Diagnostics Heading	Description of Contents
Board	The assigned CableCARD module host number and slot color it is plugged into. Each bank of 6 tuners hosts one module and is colored Blue, Green, Red etc..
Tuner	The tuner number on the module host board.
Frequency	The center frequency that the specific tuner is set to.
Modulation	The constellation size of the QAM on each specific tuner.
Carrier Lock	The tuner has locked to the QAM carrier.
PCR Lock	The tuner has locked on to the tuned program PCR.
Signal Level	The approximate signal level of the QAM carrier on each specific tuner.
SNR	The approximate Signal to Noise of the carrier on the tuner (See details below).
Discontinuities/Minute	The Discontinuities/Minute at the current time in the current minute. This number should normally be Zero. Anomalies on the cable plant may cause this number to climb and this can be used for troubleshooting problems. The value is not persistent and refreshes every minute.

### 7.4.6 Notes about RF Levels

Ensure that the RF level as reported by each individual tuner is between -5 and +10 dBmV. This reported value DOES NOT correspond to the RF level at the RF input port as there are several loss stages internally within the equipment before the signal reaches each individual tuner. An Input level of between +5 to +10 dBmV per digital channel should result in the tuners seeing a level within their tuning range (-5 to +10 dBmV). If necessary due to level variation on the Cable system, the input level should be adjusted so that all tuners show between -5 and +10 dBmV on this page. The SNR as reported by the tuner should be >32 dBmV. This is an SNR measurement at the demodulator and not an MER measurement for the QAM itself so this value will not be the same as an MER measurement with a field meter.

If a tuner has no input signal and therefore has not acquired PCR lock, the reported SNR will display 21 dB despite there being no input signal. This is a default minimum value below which the system cannot measure, so it is unable to discern if there is a signal present or not. If the PCR lock cannot be acquired even when there is an input signal present, the same 21 dB will be displayed. In these two cases the displayed measurement is not real.

## 7.5 Generic Short Guide to Activating a Module

The illustration in Figure 7-6 attempts to capture the bare essential steps to activating a module. The process is generic for all makes of modules. Detailed step by step instructions to follow are given for both Motorola and Cisco cards.

### Procedure

First, plug modules into the Host Slots on the Ucrypt Device and allow the modules some time to boot and configure themselves. They may need to automatically download new firmware.

1. Click the **Channel View** tab see Figure 7-6.
2. Check under **OOB Status** that the OOB carrier is locked on at least one module. If the OOB is not locked click **CableCARD View** then click the **Diagnostics** link for each card for information about the process.
3. Click **CableCARD Pairing Information Summary** link at the bottom of the page which opens a pairing info window.
4. Give the **CableCARD ID** and **Host ID** pairing information to your Service Provider. Allow sufficient time for this information to be entered and transmitted.
5. Click the **CableCARD Setup** link. A new window opens displaying the live steps as the card is authorized.
6. When finished, the Card Authorization must say **Validated**.

**ATX UCrypt®**  
PATENT PENDING

User: **master**  
Unit Address: **1-501 Clements Road W**  
Customer Account Number: **R12345**  
Customer Contact: **Lab Manager**  
Phone Number: **1-800-428-6068**  
Logout

Channel View | CableCARD View | PSIP/EPG View | Output MPTS View | System | Configuration | Help

**1**

**Add new channels**

Search:

Channel 2 - Program #13 - TVO - Frequency 255000  
Channel 3 - Program #2107 - GLOB - Frequency 537000  
Channel 4 - Program #10 - OMNI1 - Frequency 261000  
Channel 5 - Program #2 - WIVB - Frequency 273000  
Channel 6 - Program #2201 - CBLT - Frequency 531000  
Channel 7 - Program #3 - CITYT - Frequency 261000  
Channel 9 - Program #2203 - YESTV - Frequency 531000  
Channel 11 - Program #2202 - CHCH - Frequency 531000  
Channel 12 - Program #2401 - CH 12 - Frequency 285000  
Channel 13 - Program #12 - CBLFT - Frequency 261000

**Optionally select a preferred board**

CableCARD Blue #0 (2/6 Decrypts)  
CableCARD Green #1 (0/6 Decrypts)  
CableCARD Red #2 (0/6 Decrypts)  
CableCARD Purple #3 (0/6 Decrypts)

**Optionally select a preferred tuner**

None

**Select Routing**

Decrypt

Add

In Use	Program	Frequency	Name	Routing	Status	Board/Tuner	Remove
Channel 1	12	543000	YWTW	Decrypt	●	Blue #0 - Tuner #0	<input type="checkbox"/>
Channel 8	13	543000	CTVTO	Decrypt	●	Blue #0 - Tuner #0	<input type="checkbox"/>
Channel 10	2405	543000	AJAX	Passthrough	●	Blue #0 - Tuner #0	<input type="checkbox"/>

Total Channels In Use: 3  
Channel Insertion Tool

**OOB Status**

Board	Status	Lock	Setup	Identify
Board Blue #0	Inserted	Locked: 73.750 Mhz	CableCARD Setup	Identify
Board Green #1	Inserted	Locked: 73.750 Mhz	CableCARD Setup	Identify
Board Red #2	Inserted	Locked: 73.750 Mhz	CableCARD Setup	Identify

At least one cablecard needs lock to acquire channel man

**3** CableCARD Pairing Information Summary

No Tuning Resolvers detected.

Apply

**CableCARD Board Blue #0**

CableCARD ID: 0-011-674-024-226  
Host ID: 0-610-000-210-779  
Serial Number: PKGXCLBFZ  
MAC Address: 44:E0:8E:FA:5B:86  
HUB ID: 7  
Firmware Version: PKEY1.5.2\_F.p.3001  
OOB: Locked  
Authorization: Validated, validation message is received,

**4**

**CableCARD Board Blue #0**

**CableCARD Setup Steps**

Step 1: CableCARD Inserted (Done)  
Step 2: Acquire OOB Lock (Done)  
Step 3: Receiving messages from headend (Done, count: 60066)  
Step 4: Use Cisco CableCARD/Host ID Screen to provide headend with required activation info  
Step 5: CableCARD is bound to host (Done)  
Step 6: CableCARD is validated (Done)  
Step 7: Test whether streaming an encrypted channel works  
Complete

**CableCARD Diagnostic Info**

Item	Value
Status	Inserted
Manufacturer	Scientific-Atlanta (0001)
Card Version	1
Card Authorization	Validated, validation message is received, authenticated, and the IDs match those in the current binding
Card Message	

**5** CableCARD Setup

**6**

Figure 7-6: Quick Guide to Module Authorization

## 7.6 Activating Motorola Modules

### 7.6.1 Motorola Module Validation & Authorization



**FYI:** VERY IMPORTANT NOTES follow on Activating a Motorola Module:

1. Ensure that your Billing System Administrator is aware that the host Device type to be selected for the account is as a one-way host. If two-way host is selected, the provisioning process will not complete properly.
2. After the initial validation message and INIT are received, the module reboots. Observe the module blue status light on the rear panel flashing indicating a reboot. Once this is complete, the head end message counter in step 3 on the setup page resets and starts counting up again. This can take up to a minute. Wait until the card has rebooted and the counter begins to increment again before sending the DHCT HIT with appropriate entitlement information. If the HIT is sent while the card is rebooting, the card will not receive the message and will not be able to receive its entitlement message to decrypt any programming.
3. From the 'CableCARD View' page, Click on **CableCARD Setup** to view the validation process and when validated, you may proceed to select a program from the channel map on the 'Channel View' tab and select a program on the validated Device (Blue, Green, Red, etc) to decrypt the program.
4. When a channel from the channel map is selected for decryption and all changes have been applied, if the Device is properly authorized you will see the message 'CableCARD is authorized to decrypt channel' on the Setup page (see Figure 7-8). You can then proceed to validate additional CableCARD Devices or continue with adding more programs to this validated module.
5. If the 'CableCARD Setup' page does not display 'CableCARD is authorized to decrypt channel' at this point in the process, you can check the Device specific 'Conditional Access Details' page by clicking **Conditional Access** (See 'Hyperlinks to Diagnostic Tools' in Figure 7-8) to access the **Active Programs** page. If you have added just one channel to the module, you will have one active program (Program Index 0). The 'Val' field should contain a 'V'. If it does not, the Device is not validated. The 'Auth' field should contain 'S' or 'FWK'. If the module is activated, but not subscribed to this channel, you will see Auth:N, see Figure 7-8. If it displays anything else (such as ? or MP), the card did not successfully complete the INIT process and/or did not successfully received the HIT and the process needs to be repeated. An MP error is often caused by an incomplete INIT process due to the DAC being incorrectly configured to think that the card belongs to a two-way host.

### 7.6.2 Motorola Module Setup Step by Step

These detailed steps are taken by each module when it is inserted into a Host slot. This process is shown on the UCrypt unit Management Interface when you follow the Hyperlink **CableCARD Setup** from the **CableCARD View** page.

#### Procedure

This procedure covers the authorization steps for a Motorola CableCARD Module which occur after it is plugged in to a Host slot.

1. Click the **CableCARD View** tab, Figure 7-7.
2. Click the **CableCARD Setup** link. (It is not strictly necessary to use this link. All CableCARD setup links lead to the same page). These detailed steps are taken by each module when it is inserted into a Host slot.

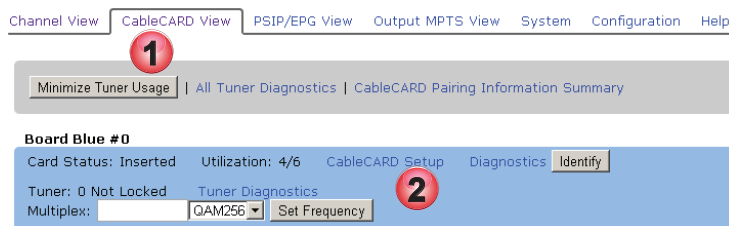


Figure 7-7: Motorola Module Authorization

The CableCARD module follows the setup steps detailed below and shown in Figure 7-8.

**Step 1: CableCARD Inserted**

When 'Done' it means that:

The equipment has detected the insertion of a module on the associated Tuner/Host board.

**Step 2: Acquire OOB Lock**

When 'Done' it means that:

The OOB tuner on the associated tuner/host board has acquired lock. This is the OOB lock for only this host board. Each module has an independent OOB tuner which must all acquire lock independently.

**Step 3: Receiving messages from headend**

When 'Done' (with a numerical message count) it means that:

The OOB tuner has begun receiving messages from the headend on the OOB Carrier. Prior to achieving OOB lock, this message will say **"No Messages received from Headend yet"**. The state of receiving messages must be achieved before an attempt is made to validate the module as it indicates that the communications channel for receiving entitlement messages is now established. The count displays the number of messages the module has received from the cable headend on the OOB (out of band) frequency. If you exit this screen and then come back to it, the count value should increase. If this value is zero or stays static when you exit and then return to the page, the module is not communicating with the headend.

**Step 4: Use CableCARD Pairing to provide headend with required activation info**

This refers to the need to obtain the unique CableCARD ID and Host ID numbers from the management interface and pass this information to the Billing System administration. This information technically does not need to be sent to the headend. Click on the hyperlink to open the page with all of the module pairing information.

**Step 5: Headend has turned on service to the CableCARD**

When 'Done' it means that:

The CableCARD module and Host port have been successfully paired in the billing system and a message indicating this has been received for this Device. This requires that the CableCARD ID and Host ID have previously been entered correctly in the billing system and further that the numbers match at the Device. The module is not yet validated at this point. Alternately, the message may read **"CableCARD is not bound to Host"**

**Step 6: CableCARD is Validated**

When 'Done' it means that:

The module is validated, and authenticated, a validation message has been received, the pairing information is correct and matches the current binding in the billing system. Alternatively the message may read **"CableCARD has not received Validation signal"**

**Step 7: Added encrypted channel to (Blue, Red etc) board**

When 'Done' it means that:

A program has been successfully decrypted using the module entitlement. Alternately the message may read **"Test whether streaming or encrypted channel works"** which would prompt you to try to decrypt a program on this module. This message is only displayed for the first channel decrypted, illustrating that the module entitlement is in working order.

**Step 8: CableCARD module is authorized to decrypt Channel xxx**

When 'Done' it means that:

The specified channel has been successfully decrypted using entitlement of the module. This message is displayed when a program or channel has been assigned to the module and decryption is working.

Channel View CableCARD View Output QAM View PSIP/EPG View Output MPTS View System Configuration Help

### CableCARD Board Blue #0

#### CableCARD Setup Steps

Step 1: CableCARD Inserted (Done)  
 Step 2: Acquire OOB Lock (Done)  
 Step 3: Receiving messages from headend (Done, count: 226820)  
 Step 4: Use CableCARD(tm) Pairing to provide headend with required activation info  
 Step 5: Headend has turned on service to CableCARD (Done)  
 Step 6: CableCARD is validated (Done)  
 Step 7: Added encrypted channel to Board Blue (Done)  
 Step 8: CableCARD is authorized to decrypt Channel 200 (Done)  
 Complete

Setup steps followed by each CableCARD when inserted. This is outlined in detail in the chapter ACTIVATING CableCARDS

#### CableCARD Diagnostic Info

Status	Inserted
Manufacturer	Motorola (0000)
Card Version	613
Card Authorization	Validated, validation message is received, auth current binding
Card Message	
OOB	Locked
Profile	6 MPTS Streams
Applications	Conditional Access CableCARD(tm) Status Network Setup CableCARD(tm) Pairing DSG Interactive Info

Diagnostics help to identify problems when authorizing CableCARDS

Hyperlinks to the Diagnostic tools shown here

Con:Yes means Headend has turned on service to the CableCARD

This V Indicates card is validated

This S Indicates card is authorized

FYI: This hyperlink is an alternate location of CableCARD pairing info

#### Network Setup

OOB Mode: OOB GTC:  
 OOB  
 2-Way Established:  
 Unknown  
 OOB LKC: 72.750  
 OOB Status: IDLE

EMM PID: 1 0x1503  
 Messages: 232663

VCTID: 26 VCT Rcvd:  
 42788

DSG/DOCSIS Screen in OOB Mode

#### Interactive (Aloha) Info

IP Address: 0.0.0.0  
 UPM Address: 0x000000  
 DSP ID: 0x0000  
 USP ID: 0x0000  
 DSP: Unconfigured  
 USP: No Message To Send  
 Signon Status: Unknown  
 Ack timeout: 0 msec  
 Cell Abort count: 0 (max = 0)  
 MAC Abort count: 0 (max = 0)

#### CableCARD ID

CableCARD ID: 000-015-815-113-4  
 Host ID: 061-000-000-064-2  
 Data: 153-712-415-46

UnitAddress: 000-00158-15113-051  
 Card S/N: MA0903CARL02  
 eCM MAC: -----  
 Host MAC: 00:22:2C:70:00:40  
 Host Type: 1-Way RF only

#### CableCARD(tm) Status

Manufacturer: Motorola  
 FW Version: 02.65, --, 03.25  
 HW Version: 0469927002  
 Unit Address: 0x0000F151C9  
 000-00158-15113-051  
 Download Status  
 left: 0 last: 999999 rate: 0  
 State: Wait To Start  
 News:  
 EMM Provider ID: 1

Out of Band Channel Mode: OOB  
 Last Known Carrier: 72.750

#### Conditional Access

Unit Address: 000-00158-15113-051  
 Encryption: DES  
 Con: Yes EBCP: Yes Val: V 0x00  
 ActivePrg: 0 <1> 2 3

PMTCMD: D Prg: 00002 ECM: 0x0431  
 LTSID: 005 TSIndex: 1  
 SvcID: 0x00E064 Svc: 1 Enc: ENC  
 CP: Disabled CA Reply: 0x01 N  
 Auth: S CCl: 0x00 S Epoch: 0x4E

Component PDS in Hex:

Figure 7-8: Motorola Module Setup &amp; Diagnostics Pages

## 7.7 Activating Cisco® Modules

### 7.7.1 Cisco® Module Validation and Authorization



**FYI:** VERY IMPORTANT NOTES on Activating a Cisco Module:

1. Ensure that your Billing System Administrator is clearly aware that the host Device type to be selected for the account is as a “one-way host”. If two-way host is selected, the provisioning process will not complete properly.
2. After sending the pairing information and DHCT HIT to the module, if the ‘CableCARD Setup’ page shows the ‘Card Authorization’ as ‘Not Authorized’ or some similar message, the card may require a DHCT REFRESH in order for full provisioning to be completed.
3. Click the **CableCARD View** tab then **CableCARD Setup** link to view the status of the module validation. When validated, you may proceed to select a program from the channel map on the ‘Channel View’ tab and select the validated module (blue, green, red, etc) to decrypt the program.
4. If the added channels are decrypted without issue, you can then continue to validate additional modules, or if all cards are validated continue with the other equipment setup.
5. When a channel from the channel map is selected for decryption and all changes have been applied, if the CableCARD Device is properly authorized you will see the message ‘CableCARD is authorized to decrypt Channel xxx (Done)’ on the ‘CableCARD Setup Steps’ page (see “[Motorola Module Setup Step by Step](#)” on page 7-6). You can then proceed to validate additional modules or continue with adding more programs to this validated module.
6. To verify that a CableCARD Device is properly validated, check the Device specific ‘Conditional Access Details’ page by clicking **Cisco CableCARD CA Screen** from the ‘CableCARD Setup’ page. The ‘Status’ field near the top of the screen should display ‘Ready’, see Figure 7-9. If this field indicates ‘Not Staged’, the pairing or validation process did not complete properly.

Channel View **CableCARD View** Output QAM View PSIP/EPG View Output MPTS View System Configuration Help

Minimize Tuner Usage All Tuner Diagnostics CableCARD Pairing Information Summary

**Board Blue #0**

Card Status: Inserted Utilization: 5/6 **CableCARD Setup** Diagnostics

Tuner: 0 Locked Tuner Diagnostics

Multiplex: 117000 QAM256 Set Frequency Set All Remove: ☐

Channel 587 Program #16 - YTVHD Filtered Filtered Filtered Filter

Channel CableCARD Board Blue #0

Channel

**CableCARD Setup Steps**

Step 1: CableCARD Inserted (Done)

Step 2: Acquire OOB Lock (Done)

Step 3: Receiving messages from headend (Done, count: 1016)

Step 4: Use [Cisco CableCARD/Host ID Screen](#) to provide headend with required activation info

Step 5: CableCARD is bound to host (Done)

Step 6: CableCARD is validated (Done)

Step 7: Test whether streaming an encrypted channel works

Complete

**CableCARD Diagnostic Info**

Status	Inserted
Manufacturer	Scientific-Atlanta (0001)
Card Version	1
Card Authorization	Validated, validation message is received, authentic in the current binding
Card Message	CP Sync Received
Card CP Status	Locked
OOB	6 MPTS Streams
Profile	6 MPTS Streams
Applications	<a href="#">Cisco CableCARD CA Screen</a> <a href="#">Cisco CableCARD/Host ID Screen</a> <a href="#">Cisco CableCARD IP Service</a> <a href="#">Cisco CableCARD DAVIC Info</a> <a href="#">Cisco CableCARD CP Info</a> <a href="#">Cisco CableCARD Diag Screen</a> <a href="#">Cisco CableCARD ASD Info</a> <a href="#">Cisco CableCARD DSG Info</a>

**Cisco CableCARD(tm) Conditional Access Details**

System Id: 0x0F00

Status: Ready

Internal Secure Micro Serial No: 02:06:00:6C:F2:2A

Secure Micro Software Ver: 3.14

CA Time: Tue Aug 21 2012, 7:41:00 PM GMT

Time GBAM: 1009

App GBAM: 0

Purchase GBAM: 0

EMMs Processed: 0

[More CA Details](#)

Figure 7-9: Verify Cisco Module Validation

## 7.7.2 Cisco® Module Setup Step by Step

These detailed steps are taken by each module when it is inserted into a Host slot. This process is shown on the UCrypt unit Management Interface when you follow the Hyperlink **CableCARD Setup** from the **CableCARD View** page.

### Procedure

This procedure covers the authorization steps for a Motorola CableCARD Module which occur after it is plugged in to a Host slot.

1. Click the **CableCARD View** tab, Figure 7-10.
2. Click the **CableCARD Setup** link. (It is not strictly necessary to use this link. All CableCARD Setup links lead to the same page). These detailed steps are taken by each module when it is inserted into a Host slot.

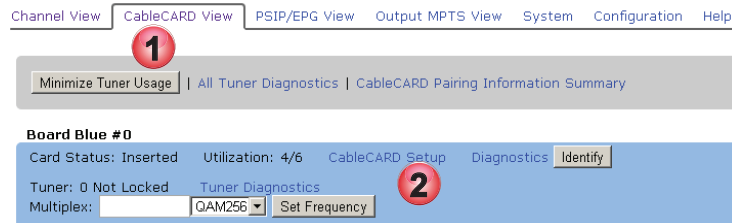


Figure 7-10: Motorola Module Authorization

The CableCARD module follows the setup steps detailed below and shown in Figure 7-11.

### Step 1: CableCARD Inserted

When 'Done' it means that:

The equipment has detected the insertion of a module on the associated Tuner/Host board.

### Step 2: Acquire OOB Lock

When 'Done' it means that:

The OOB tuner on the associated tuner/host board has acquired lock. This is the OOB lock for only this host board. Each module has an independent OOB tuner which must all acquire lock independently. Alternately, the message may read **"Acquire OOB Lock (Not Locked. Check Cables.)"** indicating that the OOB tuner has not found and locked to the OOB carrier.

### Step 3: Receiving messages from headend

When 'Done' (with a numerical message count) means that:

The OOB tuner has begun receiving messages from the headend on the OOB Carrier. Prior to achieving OOB lock, this will indicate **"No Messages received from Headend yet"**. This state must be achieved before an attempt is made to validate the module as it indicates that the communications channel for receiving entitlement messages is now established. The count displays the number of messages the module has received from the cable headend on the OOB (out of band) frequency. If you exit this screen and then come back to it, the count value should increase. If this value is zero or stays static when you exit and then return to the page, the module is not communicating with the headend.

### Step 4: Use Cisco CableCARD/Host ID Screen to provide headend with required activation info

Refers to the need to obtain the unique CableCARD ID and Host ID numbers from the UCrypt management interface and pass this information to the Billing System administration. This information technically does not need to be sent to the headend; this is a reference to the billing department. Click on the hyperlink to open the page with all of the CableCARD ID and Host ID pairing information.

### Step 5: CableCARD is bound to Host

When 'Done' it means that:

The module and Host port have been successfully paired in the billing system and a message indicating this has been received for this Device. This requires that the CableCARD ID and Host ID have been entered correctly in the billing system and further that the numbers match at the UCrypt system. The module is not yet validated at this point. Alternately, the message may read **"CableCARD is not bound to Host"**

### Step 6: CableCARD is Validated

When 'Done' it means that:

The module is validated, authenticated, a validation message has been received, the pairing information is correct and matches the current binding in the billing system. Alternatively the message may read **"CableCARD has not received Validation signal"**

**Step 7: Test whether streaming an encrypted channel works**

When 'Done' it means that:

A program has been successfully decrypted using the module entitlement. Alternately the message may read **"Test whether streaming or encrypted channel works"** which would prompt you to try to decrypt a program on this module. This message is only displayed for the first channel decrypted, illustrating that the module entitlement is in working order.

**Step 8: CableCARD is authorized to decrypt Channel xxx**

When 'Done' it means that:

The specified channel has been successfully decrypted on the module. This message is displayed when a program or channel has been assigned to the module and decryption is working.

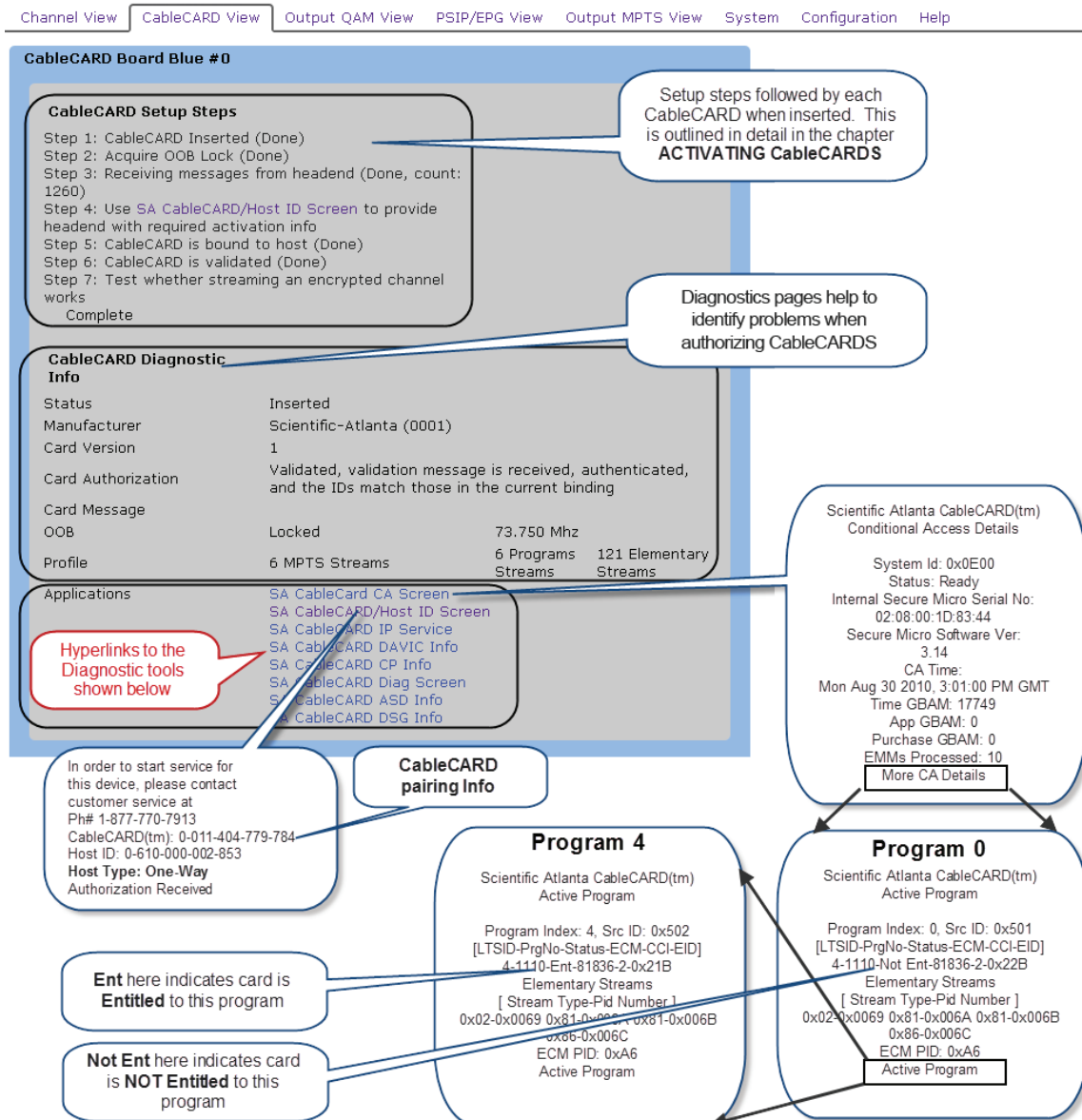


Figure 7-11: Cisco Module Setup & Diagnostics Pages

### 7.7.3 Verification of Cisco® Entitlement

To verify that the CableCARD Device is authorized to decrypt specific programs, check the Device specific 'Conditional Access Details' page by clicking **Cisco CableCARD CA Screen** from the 'CableCARD Setup' page. Click **More CA Details** and then **Active Program** to open the 'Active Programs' page (see Figure 7-12).

If you have added just one channel to the module, you will have one active program (Program Index 0). The third line below

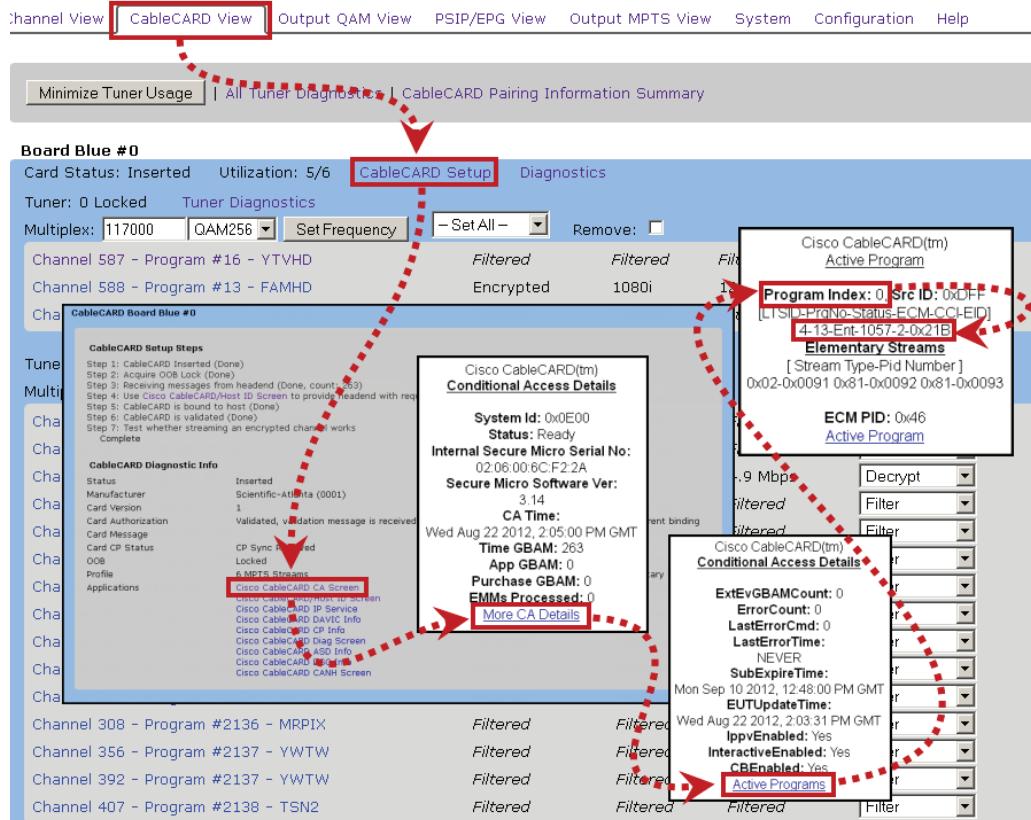


Figure 7-12: Verify Cisco Module Program Entitlement

the title bar should display 'X-XX-Ent-XXX...' or a similar message indicating 'entitlement'. If it shows 'X-XX-Not Ent-XXX...', the card did not successfully complete the provisioning process, see "Figure 7-11: Cisco Module Setup & Diagnostics Pages" on page 7-11 for details on the pages presented.

For either of the above errors, the card may need a DHCT REFRESH and/or DHCT HIT sent to it, or may require deletion of all Device and host information from the DNCS and then repetition of the addition and provisioning processes.

# PSIP & EPG CONFIGURATION

## 8. PSIP & EPG Configuration

All UCrypt Devices include a configurable line card style EPG channel and associated PSIP generation. Properties with UCrypt Devices installed will often require an EPG to provide the end user with guidance for tuning to available programs. The integrated EPG provides a configuration page with full flexibility to design the lineup as you need.



**NOTE:** Before configuring the PSIP and EPG page, you need to assign all added channels to an output (either QAM, IP or Analog, depending on the model you are working with) in order for the configuration to complete successfully.

### 8.1 Chapter Contents

- “About PSIP & EPG”
- “Create an EPG Channel with PSIP”
- “About the PSIP/EPG Configuration Page”
- “PSIP/EPG Configuration”
- “File Program”
- “PSIP/EPG Configuration Controls”
- “Settings”
- “Additional EPG Channels”
- “Logo Uploads”
- “EPG Generation”

### 8.2 About PSIP & EPG

The PSIP (Program and System Information Protocol) is created by the UCrypt Device using the program information then the PSIP tables are transmitted with the programs on the output channels. PSIP enabled TV display equipment reads the tables when tuned to a channel and allows seamless tuning to the desired program using the ‘virtual’ channel lineup numbers and displays the channel’s ‘Name’ that you may define. The TVs must either auto-tune RF channels or they may be programmed with the lineup. During tuning/programming, the PSIP tables are read and remembered by the TV.

An EPG(Electronic Program Guide) channel can be created to provide customers with the property virtual channel lineup, displaying the channel ‘name’ and its virtual channel for tuning. The EPG has the ability to have a custom background graphic and branding logo uploaded and is ultimately displayed on a virtual channel of the operator’s choosing. TVs may be programmed to automatically tune to this guide channel on power-up.

#### 8.2.1 Differences between Device Types

QAM input and Ethernet input channels appear slightly differently on the PSIP/EPG View page, see Figure 8-1, but all other functionality is similar.

Channel	Name	PSIP/EPG Name	PSIP Major # EPG Virtual Channel #	PSIP Minor #	Use Input PSIP	Input PSIP	Output Assigned
2	TVCHD	TVCHD	23	1	<input type="checkbox"/>		Yes
3	HDGLB	HDGLB	10	1	<input type="checkbox"/>		Yes
4	HDOM1	HDOM1	14	1	<input type="checkbox"/>		Yes

Typical of QAM Input Device

Channel	Name	PSIP/EPG Name	PSIP Major # EPG Virtual Channel #	PSIP Minor #	Use Input PSIP	Input PSIP	Output Assigned
239.62.10.11:8000 Program 1					<input type="checkbox"/>		Yes
239.62.10.12:8000 Program 1					<input type="checkbox"/>		Yes
239.62.10.21:8000 Program 1					<input type="checkbox"/>		Yes

Typical of IP Input Device

Figure 8-1: Difference Between Device Input Types

## 8.3 Create an EPG Channel with PSIP

### Procedure

This procedure explains the basic steps to creation of the EPG channel with PSIP table generation. Before preparing the EPG, the Channel View page must first be configured to create the channel lineup. Our example is illustrated on a Q2A model but the procedure is similar on all models. Your model may show different names for channels and different input or output types.

1. Click the **PSIP/EPG View** tab if it isn't already selected, Figure 8-2.
2. All channels that have been previously configured to be processed on the Channel View page will be listed under the heading "Name" in ascending order based on the VCT (Virtual Channel Table) channel number.

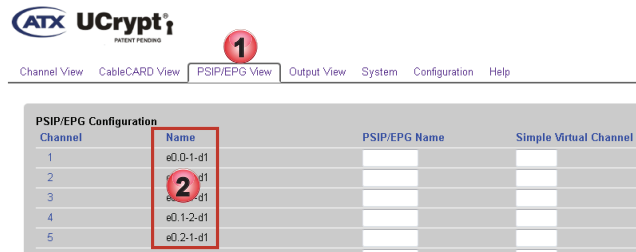


Figure 8-2: List from Channel View Page

3. Be sure that the EPG/PSIP Generation Mode is set to its default value of **Normal**, Figure 8-3, (the only valid choice for the QAM to Analog machine. Other settings are for other Device Types) and tick **Enable PSIP Generation**.
4. Be sure that **Use Fields from PSIP/EPG Table** is ticked and **EPG Page Duration** is set to the required page dwell time (If there are multiple EPG pages, this is the amount of time that each page is displayed).
5. Click the button **AutoAssign** to have names from the cable system channel map automatically entered in numeric order starting with EIA channel 2, Figure 8-3.
6. Click **Apply**.

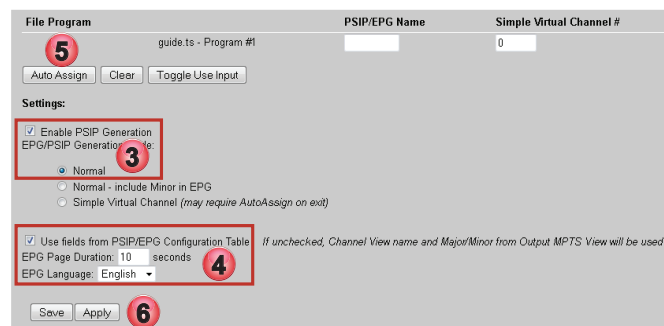


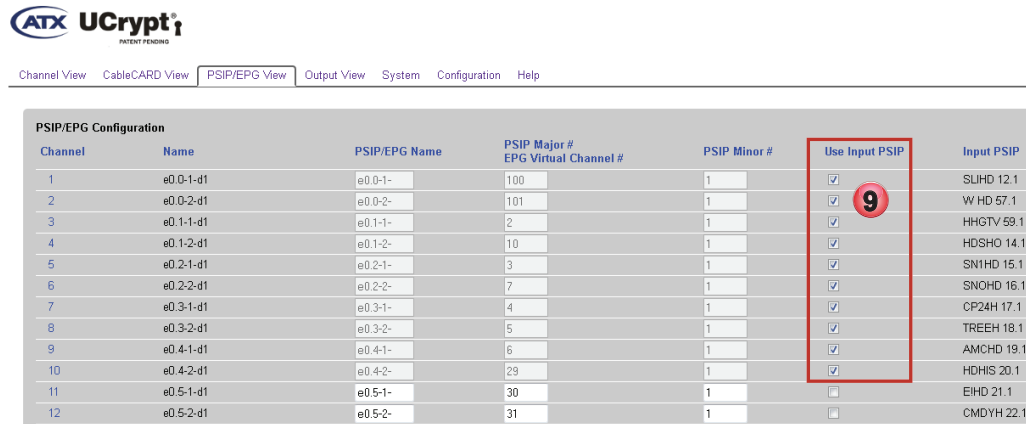
Figure 8-3: Select Normal EPG Mode

7. Virtual Channels are assigned starting with channel 2 and names are assigned based on the VCT, Figure 8-4.
8. You may edit any of the PSIP/EPG Names, or the PSIP Major (The EIA channel number). Always enter '1' for PSIP Minor. After any or all changes are made, click **Apply** again (repeat step 6 above).

Channel	Name	PSIP/EPG Name	PSIP Major # EPG Virtual Channel #	PSIP Minor #
1	e0.0-1-d1	e0.0-1-	2	1
2	e0.0-2-d1	e0.0-2-	3	1
3	e0.1-1-d1	e0.1-1-	4	1
4	e0.1-2-d1	e0.1-2-	5	1
5	e0.2-1-d1	e0.2-1-	6	1
6	e0.2-2-d1	e0.2-2-	7	1
7	e0.3-1-d1	e0.3-1-	8	1
8	e0.3-2-d1	e0.3-2-	9	1
9	e0.4-1-d1	e0.4-1-	10	1
10	e0.4-2-d1	e0.4-2-	11	1

Figure 8-4: Auto-assign Channels

9. If input PSIP is present and is to be used to create the output PSIP, tick the box **Use Input PSIP** in each channel configuration row, Figure 8-5. In this case any Names and Major/Minor numbers entered for the channels on this page are ignored and will be greyed out. The Tick box selections can be toggled on or off with the button **Toggle Use Input**.
- If the **Use Input PSIP** option is activated then the EIA RF analog channel assignment on the Output View page **must** match the channel specified in the input VCT (Virtual Channel table) or else channel tuning will not work correctly. For example if the VCT says a channel is on 15.1 then that program must be assigned to EIA channel 15. Minor channel numbers are ignored and a default of 1 is used.
10. Click **Apply** after making changes (repeat step 6 above).



Channel	Name	PSIP/EPG Name	PSIP Major # EPG Virtual Channel #	PSIP Minor #	Use Input PSIP	Input PSIP
1	e0.0-1-d1	e0.0-1-	100	1	<input checked="" type="checkbox"/>	SUHD 12.1
2	e0.0-2-d1	e0.0-2-	101	1	<input checked="" type="checkbox"/>	W HD 57.1
3	e0.1-1-d1	e0.1-1-	2	1	<input checked="" type="checkbox"/>	HHGTV 59.1
4	e0.1-2-d1	e0.1-2-	10	1	<input checked="" type="checkbox"/>	HDSHO 14.1
5	e0.2-1-d1	e0.2-1-	3	1	<input checked="" type="checkbox"/>	SN1HD 15.1
6	e0.2-2-d1	e0.2-2-	7	1	<input checked="" type="checkbox"/>	SN0HD 16.1
7	e0.3-1-d1	e0.3-1-	4	1	<input checked="" type="checkbox"/>	CP24H 17.1
8	e0.3-2-d1	e0.3-2-	5	1	<input checked="" type="checkbox"/>	TREEH 18.1
9	e0.4-1-d1	e0.4-1-	6	1	<input checked="" type="checkbox"/>	AMCHD 19.1
10	e0.4-2-d1	e0.4-2-	29	1	<input checked="" type="checkbox"/>	HDHIS 20.1
11	e0.5-1-d1	e0.5-1-	30	1	<input type="checkbox"/>	EIHD 21.1
12	e0.5-2-d1	e0.5-2-	31	1	<input type="checkbox"/>	CMDYH 22.1

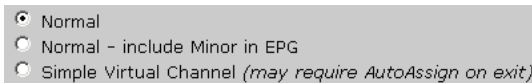
Figure 8-5: Use Input PSIP

## 8.4 About the PSIP/EPG Configuration Page

This section describes functionality of all the controls and data presented on this page broken down by major category.

### 8.4.1 PSIP/EPG Configuration

This section allows the operator to define the generated EPG program names and channel numbering. The columns may be sorted based on the alpha-numeric order of the column data by clicking the light blue header titles. Clicking repeatedly will sort in ascending then descending numerical and alphabetical order. The headings on the page change depending on the EPG Mode choice, Figure 8-6, **Normal** generation shown in Figure 8-7 or **Simple Generation** shown in Figure 8-8.



☒ Normal  
☐ Normal - include Minor in EPG  
☐ Simple Virtual Channel (may require AutoAssign on exit)

Figure 8-6: PSIP/EPG Generation Mode

PSIP/EPG Configuration							
Channel	Name	PSIP/EPG Name	PSIP Major # EPG Virtual Channel #	PSIP Minor #	Use Input PSIP	Input PSIP	Output Assigned
1	YWTW	YWTW	2	1	<input type="checkbox"/>		Yes

Figure 8-7: PSIP/EPG Configuration - Normal Generation

PSIP/EPG Configuration						
Channel	Name	PSIP/EPG Name	Simple Virtual Channel #	Use Input PSIP	Input PSIP	Output Assigned
1	YWTW	YWTW	2	<input type="checkbox"/>		Yes

Figure 8-8: PSIP/EPG Configuration - Simple Generation

Table 8.4a: PSIP/EPG Configuration Table (See Figure 8-7 &amp; Figure 8-8)

Headings	Description
Channel	This is the program's channel number from the cable TV system channel map which is also seen in 'Channel View', 'CableCARD View' and 'Output View' tabs. Clicking the <b>Channel</b> link opens a detailed page for that channel just as in the 'Channel View' tab.

Headings	Description
Name	This is the name of the program found in the cable TV system channel map, the VCT. This is predefined at the cable TV headend and cannot be changed, however the EPG allows a new name to be created for use only at the property where the UCrypt Device is installed.
PSIP/EPG Name	This is where a new name for the program may be created. Any letters, numbers or symbols that may be typed are valid however only a maximum of 7 may be used in the EPG display.
PSIP Major #/EPG Virtual Channel #	This heading appears in 'Normal EPG/PSIP Generation Mode' (the default and only valid mode for Q2A), Figure 8-7. This number will be displayed in the created program guide and transmitted in the PSIP tables and also will be the channel number a customer enters in the TV remote control to tune to this program.
Simple Virtual Channel	This heading appears in 'Simple EPG/PSIP Generation Mode', Figure 8-8. This number will be displayed in the created program guide and transmitted in the PSIP tables and also will be the channel number a customer enters in the TV remote control to tune to this program.
PSIP Minor #	Used to define the minor EIA number in some Devices or applications. This is not used in the Q2A model and must be left set to 1.
Use Input PSIP	Ticking this box allows the use of the PSIP received on the input channel map, if any. If the 'Use Input PSIP' option is activated then the EIA RF analog channel assignment on the Output View page <b>must</b> match the channel specified in the input VCT (Virtual Channel table) or else channel tuning will not work correctly. For example if the VCT says a channel is on 15.1 then that program must be assigned to EIA channel 15. Minor channel numbers are ignored and a default of 1 is used.
Input PSIP	If there is input PSIP information, it will be read from the cable system channel map and displayed in this column. Tick to select the use of Input PSIP if it exists. If there is no Input PSIP, this column will be greyed out.
Output Assigned	Indicates that the program has been assigned to an output on the machine. This is done on the Output MPTS page. This column is not relevant to the Q2A model.

## 8.4.2 File Program

The stream containing the EPG information may be defined in this section. It is called 'File Program' since it is created, saved and played as a video file. Once created, the EPG is streamed, or in other words, continuously played in a loop and will appear as a program to be added to an output channel in a similar manner to all other programs on the output.

File Program	PSIP/EPG Name	PSIP Major #	PSIP Minor #
guide.ts - Program #1	GUIDE	121	1

Figure 8-9: File Program Section - Normal

Table 8.4b: PSIP/EPG Configuration Controls (See Figure 8-9)

Headings	Description
PSIP/EPG Name	This is the name of the stream or program and may be up to 7 characters. The Name will appear in the EPG and also on PSIP enabled TV displays as a 'Call Sign' with the other channel names.
PSIP Major #	This heading appears in 'Normal' 'EPG/PSIP Generation Mode' (the default and only valid mode for Q2A). This number will be displayed in the created program guide and transmitted in the PSIP tables and also will be the channel number a customer enters in the TV remote control to tune to this program.
PSIP Minor	Used to define the minor EIA number in some Devices or applications. Not used in Q2A model, leave set to 1.

## 8.4.3 PSIP/EPG Configuration Controls

File Program	PSIP/EPG Name	PSIP Major #	PSIP Minor #	
guide.ts - Program #1	guide	100	1	Yes
<input type="button" value="Auto Assign"/> <input type="button" value="Clear"/> <input type="button" value="Toggle Use Input"/>				

Figure 8-10: PSIP/EPG Configuration Controls

Table 8.4c: PSIP/EPG Configuration Controls (See Figure 8-10)

Control	Description
Auto Assign	This control assigns a virtual channel number starting with channel #2 to all programs that have been added in the 'Channel View' tab. The channel order generated will be in the numerical order of the channel in the system channel map. It will use and assign the channel name from the cable system channel map which may be later edited.
Clear	This clears all assigned names and channel numbers that have been entered in the EPG lineup. This does not take effect until the 'Apply' button is clicked.

Control	Description
Toggle Use Input	This toggles the 'Use Input PSIP' check boxes to the opposite setting so all boxes checked will be turned off. Clicking again will toggle boxes back on again. Has no effect if there is no input PSIP.

## 8.4.4 Settings

EPG and PSIP generation is enabled here, Figure 8-11, and display properties of the PSIP/EPG may be defined here. See Table 8.4d for guidance on control operation.

**Settings:**

☒ Enable PSIP Generation  
 EPG/PSIP Generation Mode:

- ☒ Normal
- ☐ Normal - include Minor in EPG
- ☐ Simple Virtual Channel (may require AutoAssign on exit)

☒ Use fields from PSIP/EPG Configuration Table *If unchecked, Channel View name and Major/Minor from Output MPTS View will be used*

EPG Page Duration:  seconds

EPG Language:

Figure 8-11: Settings Section

Table 8.4d: PSIP/EPG Settings Configuration (See Figure 8-11)

Control	Description																																																																
Enable PSIP Generation	Checking this box enables the generation of PSIP tables based on the entries on this page. PSIP tables will then be sent with each channel on the output.																																																																
EPG/PSIP Generation Mode	This selection defines how the channel numbering will be done in the generated EPG.																																																																
Normal	<p>When the EPG guide is generated it will <u>only display the major number</u> (i.e. 2 ESPN, 3 ABC, 4 NBC, 5 TSN, 6 HGTV) and the customer will tune via major number, PSIP includes Major ONLY. The configuration page for <b>Normal</b> Mode is shown in Figure 8-12. This is the most commonly used mode</p> <table><caption>PSIP/EPG Configuration</caption><thead><tr><th>Channel</th><th>Name</th><th>PSIP/EPG Name</th><th>PSIP Major # EPG Virtual Channel #</th><th>PSIP Minor #</th><th>Use Input PSIP</th><th>Input PSIP</th><th>Output Assigned</th></tr></thead><tbody><tr><td>121</td><td>777-1</td><td>aset1</td><td>1</td><td>1</td><td><input type="checkbox"/></td><td>HDCTV 41.1</td><td>Yes</td></tr><tr><td>122</td><td>777-2</td><td>sdfsd1</td><td>2</td><td>2</td><td><input type="checkbox"/></td><td>HDOM1 42.1</td><td>Yes</td></tr><tr><td>123</td><td>141-1</td><td>sdf1</td><td>3</td><td>3</td><td><input type="checkbox"/></td><td>HDABC 43.1</td><td>Yes</td></tr><tr><td>124</td><td>57-1</td><td>sdf1</td><td>4</td><td>4</td><td><input type="checkbox"/></td><td>CNNHD 51.1</td><td>Yes</td></tr><tr><td>125</td><td>57-2</td><td>astest1</td><td>5</td><td>5</td><td><input type="checkbox"/></td><td>HDHIS 52.1</td><td>Yes</td></tr><tr><td colspan="2"><b>File Program</b></td><td><b>PSIP/EPG Name</b></td><td colspan="2"><b>PSIP Major #</b></td><td colspan="2"><b>PSIP Minor #</b></td><td></td></tr><tr><td colspan="2">guide.ts - Program #1</td><td>guide</td><td>10</td><td>10</td><td colspan="2"></td><td>Yes</td></tr></tbody></table> <p>Figure 8-12: Normal EPG</p>	Channel	Name	PSIP/EPG Name	PSIP Major # EPG Virtual Channel #	PSIP Minor #	Use Input PSIP	Input PSIP	Output Assigned	121	777-1	aset1	1	1	<input type="checkbox"/>	HDCTV 41.1	Yes	122	777-2	sdfsd1	2	2	<input type="checkbox"/>	HDOM1 42.1	Yes	123	141-1	sdf1	3	3	<input type="checkbox"/>	HDABC 43.1	Yes	124	57-1	sdf1	4	4	<input type="checkbox"/>	CNNHD 51.1	Yes	125	57-2	astest1	5	5	<input type="checkbox"/>	HDHIS 52.1	Yes	<b>File Program</b>		<b>PSIP/EPG Name</b>	<b>PSIP Major #</b>		<b>PSIP Minor #</b>			guide.ts - Program #1		guide	10	10			Yes
Channel	Name	PSIP/EPG Name	PSIP Major # EPG Virtual Channel #	PSIP Minor #	Use Input PSIP	Input PSIP	Output Assigned																																																										
121	777-1	aset1	1	1	<input type="checkbox"/>	HDCTV 41.1	Yes																																																										
122	777-2	sdfsd1	2	2	<input type="checkbox"/>	HDOM1 42.1	Yes																																																										
123	141-1	sdf1	3	3	<input type="checkbox"/>	HDABC 43.1	Yes																																																										
124	57-1	sdf1	4	4	<input type="checkbox"/>	CNNHD 51.1	Yes																																																										
125	57-2	astest1	5	5	<input type="checkbox"/>	HDHIS 52.1	Yes																																																										
<b>File Program</b>		<b>PSIP/EPG Name</b>	<b>PSIP Major #</b>		<b>PSIP Minor #</b>																																																												
guide.ts - Program #1		guide	10	10			Yes																																																										
Normal - Include Minor in EPG	Includes the EIA Minor number in the EPG Guide display. Not applicable to the Q2A model.																																																																
Simple Virtual Channel	Generates EIA Major numbers only, does not generate EIA minor numbers. Not applicable to the Q2A model.																																																																
Use Fields From PSIP/EPG Configuration Table	Checking this box enables the use of the name and program number entries made on this page. If unchecked, the program name from the 'Channel View' tab and EIA channel from 'Output View' tab will be used instead of the entries on this configuration page.																																																																
EPG Page Duration:	The number of seconds of dwell for each page in the EPG. When tuned to the EPG channel, the page, if there is more than one, will update to the next page in the sequence in this number of seconds.																																																																
EPG Language:	The language of the EPG may be specified to be English or French.																																																																
Save	Click <b>Save</b> to save changes made on this page. Saved changes must be applied to become effective. Changes saved but not applied may be reverted using the <b>Revert</b> button on the Configuration tab.																																																																
Apply	Click <b>Apply</b> to make changes become effective.																																																																

Figure 8-12: Normal EPG

### 8.4.5 Additional EPG Channels

This allows multiple external programs (channels) to be added to the EPG/PSIP, Figure 8-13. This would be used, for example, to add a local channel like a lobby camera that is created external to the UCrypt Device and added to the channels available to a customer where this channel needs to appear in the EPG display. More lines for additional programs may be added by clicking the **Add External Program** button then fill in the name and channel. Enter the Name and enter the EIA channel number under Major. Enter 1 for Minor channel number. You will need to apply the settings before they will take effect.

Name	Major #	Minor #
<input type="text"/>	<input type="text"/>	<input type="text"/>

Figure 8-13: Additional EPG Channels

### 8.4.6 Logo Uploads

It is possible to upload logos and branding graphics from this section, Figure 8-14. A graphics editing program may be required to edit the size and type of file if the available graphics files are not compliant. Incorrect file types will be rejected by the upload tool. Incorrect size graphics will be re-sized to fit the space allotted. An example of uploaded logos is shown in Figure 8-15 where the logo simply says **LOGO HERE** for illustrative purposes. The same file was uploaded to both the left and right side.

**Custom Logo (Left):**  
   Must be a PNG image size 200px by 150px.

**Custom Logo (Right):**  
   Must be a PNG image size 200px by 150px.

**Custom Background:**  
   Must be a JPG image size 1280px by 720px.

Figure 8-14: Uploading Custom Graphics

#### Custom Logo (Left and Right):

Must be a PNG file; image size allowed on the background is 200 x 150 Pixels. Allows a logo file to be uploaded which will be positioned in the top corners of the EPG display as shown in Figure 8-15. The area dedicated to the logo is 200 pixels x 150 pixels. If the file uploaded is not exactly these dimensions, the image will be resized maintaining the original file aspect proportions, to fit into the specified area.

#### Custom Background:

Must be a JPG file, image size 1280 by 720 pixels. Allows a graphic file to be uploaded which will be the background image of the EPG display. The area dedicated to the background is 1280 pixels horizontally x 720 pixels vertically. If the file uploaded is not exactly these dimensions, the image will be resized maintaining the original file aspect proportions, to fit into the specified area and this may result in some unoccupied space either on the top and bottom or the sides.

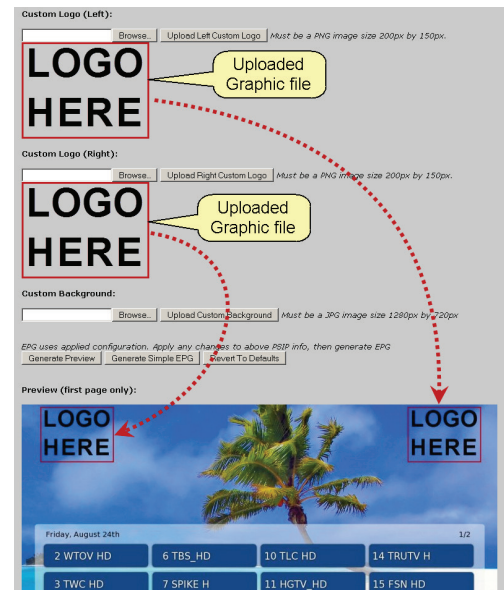


Figure 8-15: Position of Uploaded Logos

### 8.4.7 EPG Generation

This section, Figure 8-16, controls the generation of the EPG but also allows a preview of the EPG before producing the EPG file and PSIP tables. Click **Apply** when finished making changes.

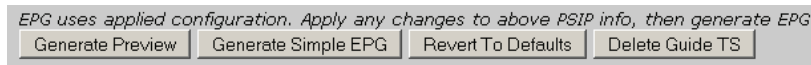


Figure 8-16: EPG Generation Controls

Table 8.4e: EPG Generation Controls (See Figure 8-16)

Control	Description
Generate Preview Button	This button starts a process of reading the PSIP/EPG information, either from the table on this page or from the incoming channel map and Output View then a preview of the resulting EPG is generated but the displayed sample EPG is not updated until the <b>Apply</b> button is clicked.
Generate Simple EPG Button	This generates the EPG file and names it 'guide.ts'. The result is the creation of a 'program' that is available on the 'Output View' page. This program must be added to an output channel just like any other program to be sent to the end user. The created program is actually a video file that streams continuously in a loop on the assigned channel.
Revert to Defaults Button	This allows the uploaded guide graphics to be erased.
Delete Guide TS Button	This deletes the 'guide.ts' file from the UCrypt Device and will remove the program from it's assigned output channel.
Preview (First Page Only)	This is a preview (Figure 8-17) of the guide based on any uploaded graphics files which allows any errors to be found before the file is implemented. Primarily this is used to verify that the graphics appear on the screen as expected, since only the first page is shown. An area 1280 x 720 pixels is displayed. If the graphics file was not exactly this number of pixels in size, some white area will be showing on the sides or top and bottom to illustrate this error. A graphic of exactly the correct proportions will leave no white area showing on the grey background of the UCrypt Device output display.

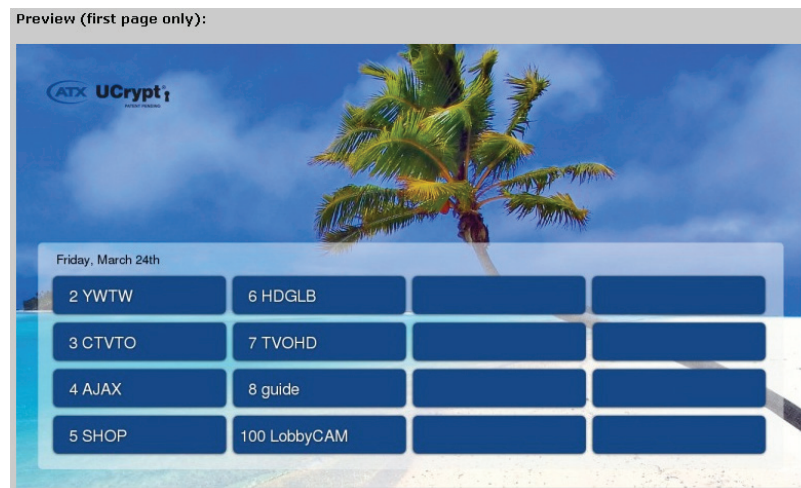


Figure 8-17: Preview of First Page of EPG

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# EMERGENCY ALERT SYSTEM

## 9. Emergency Alert System

Mandated by the FCC, the Emergency Alert System (EAS) in the United States disseminates emergency warnings of pressing local, regional, or national importance over a variety of networks and it is a requirement of all associated carrier equipment to support the EAS system to the greatest extent possible. The UCrypt system software provides support of EAS signaling standards through thoughtful design and implementation. This section describes the implementation of EAS support in the QAM to QAM model.

### 9.1 Chapter Contents

- [“Support for SCTE 18”](#)
- [“External EAS Generator Connection”](#)
- [“EAS Compatibility & Compliance”](#)
- [“IP Input EAS Configuration”](#)
- [“QAM Input EAS Configuration”](#)
- [“Creating the EAS Details Channel”](#)
- [“More Information about EAS”](#)

### 9.2 Support for SCTE 18

The software system has been engineered with extensive support for SCTE 18 which allows it to work effectively with compliant and non-compliant TVs, enabling the Cable Service Provider to comply with FCC mandates. The reception of emergency alert messages by the UCrypt Device is done in accordance with Figure 1 Emergency Alert Message Example Processing Flow Diagram of the SCTE 18 standard. See the [SCTE 18 Standard](#) for details.

#### 9.2.1 Features in Support of SCTE 18:

- The system is equipped with test features to help the operator to determine if the EAS system has been implemented properly or if TVs are SCTE 18 compatible or not which are described in detail below. For test purposes, the UCrypt system generates its own internal text message which cannot be changed.
- For QAM input Devices, EAS alerts sent within the QAM carrier (in-band) are received and processed by a single tuner automatically selected during system configuration and indicated by the EAS designator.
- There is support for the use of channels designated as “hidden” within the VCT.
- There is support for text and video alert types. Audio only alerts are not supported.
- An e-mail alert will be sent to a designated e-mail address indicating the occurrence and duration of a detected and processed alert message if the ‘Send Alerts’ feature is enabled on the ‘System>Alerts’ configuration page and an alert e-mail address as well as internet connectivity have been configured.

### 9.3 External EAS Generator Connection

Most models accept input from an external EAS generator. This will be helpful at locations such as large commercial and Campus installations that traditionally did not need specific EAS generators but benefit from the ability to provide targeted EAS information. Models with external EAS generator input capabilities have a dedicated EAS Ethernet input port provided on the rear panel. Refer to the Hardware Interface manual for the location of the Ethernet input port.

### 9.4 EAS Compatibility & Compliance

There is support for EAS text messages on SCTE 18 Compliant and Non Compliant TVs. The choice of compatibility is defined by the operator through a drop down dialog on the EAS Configuration page. Those two options and the resulting actions are explained in the following table. Full SCTE 18 compatibility requires the creation of a ‘Details Channel’ as outlined in [“9.8 Creating the EAS Details Channel”](#) on page 9-7 for force tune events.

**Table 9.4a: Summary of SCTE 18 Compliance**

SCTE 18 Mode	Action for SCTE 18 Text Message Event
SCTE 18 Compliant	<ul style="list-style-type: none"> <li>UCrypt Device detects the SCTE 18 text message over OOB, Inband or external EAS input port.</li> <li>Replicates the text message in-band on all active output programs on all active output channels passing the text message on in-band to TVs that are tuned to any program on any of the active output channels.</li> <li>TVs are then responsible to internally display the text message.</li> </ul>
SCTE 18 Non-Compliant	<ul style="list-style-type: none"> <li>UCrypt Device detects the SCTE 18 text message over OOB, Inband or external EAS input port</li> <li>Unit tunes to the program as defined in the <b>Details Source Channel Settings</b> fields which must correspond to the location on the plant where the Cable Service Provider will have a program with the EAS text alert already encoded into the program stream available for tuning. See <a href="#">"9.8 Creating the EAS Details Channel"</a> on page 9-7 for details.</li> <li>Unit replicates this program across all active output programs on all active output channels.</li> <li>TVs tuned to any output channel get the contents of the encoded background plus the text message by default.</li> <li>NOTE: In this scenario, the program that was being watched by the user is interrupted for the duration of the alert in order to supply the text message - i.e. it is not embedded over each individual stream like it is in an STB environment.</li> </ul>
	Action for SCTE 18 Force Tune Event
Both Compliant and Non-Compliant TVs	<ul style="list-style-type: none"> <li>UCrypt Device detects SCTE 18 force tune message over OOB, Inband or external EAS input port.</li> <li>Unit tunes to the Details Channel defined in the <b>Details Source Channel Settings</b> fields.</li> <li>Unit replicates this program across all active output programs on all active output QAMs.</li> <li>TVs tuned to any program on any output channel get the Details Channel by default.</li> </ul>

## 9.5 IP Input EAS Configuration

The IP input type Device configuration settings on the **EAS** page are shown in Figure 9-1 and detailed in Table 9.5a.

**Emergency Alert System (SCTE18)**

Please refer to the installation and operation manual for the UCrypt (linked to under 'Help') for a more detailed explanation of the settings below and the EAS handling setup and capability of the UCrypt.

**EAS Settings**

EAS Enabled: ☒ EAS Processing Enabled When this setting is enabled the UCrypt will react to incoming EAS messages

EAS Inband Passthrough: ☒ Inband Passthrough Enabled When this setting is enabled EAS messages will be inserted on the output of the UCrypt

**EAS Message Source Settings**

Dedicated EAS Source: Multicast IP:  This is the multicast address on which the EAS generator will send out EAS messages. This address will be subscribed to on the secondary configuration port. It will be watched for any EAS messages sent to this destination.

Port:

Filter by source IP:

Max alert length: 15 Minutes UCrypt will re-tune to video content at the expiration of this timer, even if the EAS alert has remaining time. This timer will be reset each time a copy of the EAS message is received. Used to prevent the UCrypt from remaining on the details channel indefinitely in the event an EAS with a long Alert Message Time is erroneously sent.

**Details (Force Tune) Source Channel Settings**

Details channel: Multicast IP:  Video content on this multicast will be subscribed to during an EAS event requiring a force tune or if the 'Low Priority Message Handling' setting is set to 'SCTE 18 non-compliant mode'. Only Ethernet input port 0 will be used to subscribe to this multicast so the multicast must be available to that physical port on the UCrypt.

Port:

Filter by source IP:

Program #:

**Low Priority (Text Only) EAS Message Handling Settings**

TV capability: SCTE 18 Compliant Selecting 'SCTE 18 Compliant' setting will cause the UCrypt to pass along low priority EAS messages in-band for SCTE 18 compliant TVs to display the message contents over the current programming (i.e. perform a crawl). Selecting 'SCTE 18 Non-Compliant' setting will cause the UCrypt to tune to the details channel specified above in the event of a low priority EAS message and replicate its contents over all active output programs in order to display an encoded version of EAS Text message on TVs not capable of handling in-band SCTE 18 messages and performing crawls.

**EAS Handling Tests**

Test High Priority (Force Tune) EAS:  Generates an EAS message internally to simulate a force tune to specified details channel for 1 minute and replicates content across all output programs.

Test Low Priority (Text) EAS:  Simulates a received low priority EAS message. UCrypt will react accordingly depending on the 'Low priority EAS Message handling' setting above (i.e. send along inband message in 'SCTE 18 compliant mode' or tune and replicate details channel in 'SCTE 18 non-compliant' mode).

**Network Settings for Secondary Configuration Port**

Interface:  IP/Prefix (CIDR format) settings for the secondary configuration port used to receive EAS messages sent by the EAS generator.

Settings: IP/Prefix: 192.168.103.2/2

Enable DHCP Client: ☐

MAC Address: 00:22:2C:00:6F:79

Link Speed: Not Connected

*Figure 9-1: EAS Page for IP Input Devices*

**Table 9.5a: IP Input EAS Configuration Settings (See Figure 9-1)**

Field	Value	Description
<b>EAS Settings</b>		
EAS Enabled	Tick Box	When this setting is enabled the UCrypt will react to incoming EAS messages.
EAS Inband Passthrough:	Tick Box	When this setting is enabled EAS messages will be inserted on the output of the UCrypt.
<b>EAS Message Source Settings</b>		
Dedicated EAS Source Multicast IP & port	IP Address	This is the multicast address on which the EAS generator will send out EAS messages. This address will be subscribed to on the secondary configuration port. It will be watched for any EAS messages sent to this destination.
Filter by source IP	Tick Box & IP Address	Tick this box to only accept EAS messages from this source IP address.
Max alert length:	Integer	Duration of alert message over-riding the SCTE 18 "max_alert_length" field in the EAS message. UCrypt will re-tune to video content at the expiration of this timer, even if the EAS alert has remaining time. This timer will be reset each time a copy of the EAS message is received. Used to prevent the UCrypt from remaining on the details channel indefinitely in the event an EAS with a long Alert Message Time is erroneously sent.
<b>Details (Force Tune) Source Channel Settings</b>		
Details channel Multicast IP, port & program number	IP Address, port and MPEG program #	Video content on this multicast will be subscribed to during an EAS event requiring a force tune or if the 'Low Priority Message Handling' setting is set to 'SCTE 18 non-compliant mode'. Only Ethernet input port 0 will be used to subscribe to this multicast so the multicast must be available to that physical port on the UCrypt.
Filter by source IP	Tick Box & IP Address	Tick this box to only accept EAS messages from this source IP address.
<b>Low Priority (Text Only) EAS Message Handling Settings</b>		
TV Capability	Dropdown menu	Selecting 'SCTE 18 Compliant' setting will cause the UCrypt to pass along low priority EAS messages in-band for SCTE 18 compliant TVs to display the message contents over the current programming (i.e. perform a crawl). Selecting 'SCTE 18 Non-Compliant' setting will cause the UCrypt to tune to the details channel specified above in the event of a low priority EAS message and replicate its contents over all active output programs in order to display an encoded version of EAS Text message on TVs not capable of handling in-band SCTE 18 messages and performing crawls.
Filter by source IP	Tick Box & IP Address	Tick this box to only accept EAS messages from this source IP address.
Preferred Source	Dropdown Menu	Select the preferred source of EAS messaging which determines the message source that takes precedence if overlapping messages arrive at the same time. i) <b>Inband</b> - EAS messages are read from inband PSI tables and OOB carrier but the inband PSI tables take precedence if present. ii) <b>OOB</b> (Out of Band) - EAS messages are read from inband PSI tables and OOB carrier but the OOB messages take precedence if present. iii) <b>OOB Only</b> - EAS messages are read from the OOB carrier only; inband messages are ignored if present.
<b>EAS Handling Tests</b>		
Test High Priority (Force Tune) EAS	Button	Generates an EAS message internally to simulate a force tune to specified details channel for 1 minute and replicates content across all output programs.
Test Low Priority (Text) EAS:	Button	Simulates a received low priority EAS message. UCrypt will react accordingly depending on the 'Low priority EAS Message handling' setting above (i.e. send along inband message in 'SCTE 18 compliant mode' or tune and replicate details channel in 'SCTE 18 non-compliant' mode).
<b>Network Settings for Secondary Configuration Port</b>		
Interface	Dropdown Menu	Choice of any one of the three MPEG input streaming ports for the secondary configuration port used to receive EAS messages sent by the EAS generator.
Settings	IP Address	IP/Prefix (CIDR format) settings for the secondary configuration port.
Enable DHCP Client	Tick Box	Enable DHCP for the secondary configuration port.
Set Network	Button	Saves the network settings in the secondary EAS settings section.

## 9.6 QAM Input EAS Configuration

The QAM input type Device configuration settings on the **EAS** page are shown in Figure 9-2 and detailed in Table 9.6a.

**Emergency Alert System (SCTE18)**

Please refer to the installation and operation manual for the UCrypt (linked to under 'Help') for a more detailed explanation of the settings below and the EAS handling setup and capability of the UCrypt.

**EAS Settings**

EAS Enabled: ☒ EAS Processing Enabled When this setting is enabled the UCrypt will react to incoming EAS messages

EAS Inband Passthrough: ☒ Inband Passthrough Enabled When this setting is enabled EAS messages will be inserted on the output of the UCrypt

**EAS Message Source Settings**

Preferred source:    
 Max alert length:  Minutes   
 UCrypt will re-tune to video content at the expiration of this timer, even if the EAS alert has remaining time. This timer will be reset each time a copy of the EAS message is received. Used to prevent the UCrypt from remaining on the details channel indefinitely in the event an EAS with a long Alert Message Time is erroneously sent.

**Details Source Channel Settings**

Details channel:   
 Frequency:  kHz   
 Modulation:    
 Program #:    
 Video content at this location on the input feed to the UCrypt will be tuned during an EAS event if the 'Low Priority Message Handling' setting is set to 'SCTE 18 non-compliant' mode. Typically this would be the location on the plant at which an encoded output of a 'crawl capable' set top box is inserted.

**Low Priority (Text Only) EAS Message Handling Settings**

TV capability:    
 Selecting 'SCTE 18 Compliant' setting will cause the UCrypt to pass along low priority EAS messages in-band for SCITE 18 compliant TVs to display the message contents over the current programming (i.e. perform a crawl). Selecting 'SCITE 18 Non-Compliant' setting will cause the UCrypt to tune to the details channel specified above in the event of a low priority EAS message and replicate its contents over all active output programs in order to display an encoded version of EAS Text message on TVs not capable of handling in-band SCITE 18 messages and performing crawls.

**EAS Handling Tests**

Test High Priority (Force Tune)   
 EAS:    
 Source Id:    
 Generates an EAS message internally to simulate a force tune to the specified Source ID for 1 minute and replicates content across all output programs. The program with the specified Source ID must be present & valid in the acquired VCT (on 'Channel View' page), be present on the input feed to the UCrypt and be unencrypted.

Test Low Priority (Text) EAS:    
 Simulates a received low priority EAS message. UCrypt will react accordingly depending on the 'Low priority EAS Message handling' setting above (i.e. send along inband message in 'SCITE 18 compliant mode' or tune and replicate details channel in 'SCITE 18 non-compliant' mode).

Figure 9-2: EAS Page for QAM Input Devices

Table 9.6a: QAM Input EAS Configuration Settings (See Figure 9-2)

Field	Value	Description
<b>EAS Settings</b>		
EAS Enabled	Tick Box	When this setting is enabled the UCrypt will react to incoming EAS messages.
EAS Inband Passthrough	Tick Box	When this setting is enabled EAS messages will be inserted on the output of the UCrypt.
<b>EAS Message Source Settings</b>		
Preferred Source	Dropdown Menu	Select the preferred source of EAS messaging which determines the message source that takes precedence if overlapping messages arrive at the same time. i) <b>Inband</b> - EAS messages are read from inband PSI tables and OOB carrier but the inband PSI tables take precedence if present. ii) <b>OOB</b> (Out of Band) - EAS messages are read from inband PSI tables and OOB carrier but the OOB messages take precedence if present. iii) <b>OOB Only</b> - EAS messages are read from the OOB carrier only; inband messages are ignored if present.
Max Alert Length	Integer	Duration of alert message over-riding the SCITE 18 "max_alert_length" field in the EAS message. UCrypt will re-tune to video content at the expiration of this timer, even if the EAS alert has remaining time. This timer will be reset each time a copy of the EAS message is received. Used to prevent the UCrypt from remaining on the details channel indefinitely in the event an EAS with a long Alert Message Time is erroneously sent.
<b>Details Source Channel Settings</b>		
Video content at this location on the input feed to the UCrypt Device will be tuned to during: A low priority event if the 'Low Priority EAS Message Handling' setting is set to 'SCITE 18 non-compliant' mode. A high priority EAS force tune event. Typically this would be the channel on the plant at which an encoded output of a 'crawl capable' set top box is inserted. Alternately, the operator may chose to define a regional network channel as the Details Channel since they would need to comply to the EAS requirements and have a text crawl on their programming. The UCrypt Device will then replicate the channel's contents over all active output programs on all active output multiplexes in order to display the EAS text message on the TVs. If the operator chooses to create a channel, this channel needs to be made available on the cable plant at the RF input and specified in the following configuration settings. See <a href="#">"9.8 Creating the EAS Details Channel"</a> on page 9-7 for further details.		
Frequency	Integer	Enter the frequency of the QAM channel containing the EAS Details Channel.
Modulation	Dropdown Menu	Chose the constellation size of the QAM containing the EAS Details Channel. i) QAM64 ii) QAM256
Program #	Integer	The MPEG program number of the EAS Details Channel.

Field	Value	Description
<b>Low Priority (Text Only) EAS Message Handling Settings</b> The UCrypt Device is capable of passing text messages to compliant TVs in-band if it can be verified that all TVs on the property are indeed compliant. This is the best solution only if there is a 100% assurance of compliancy. If TVs are not compliant, the Device will, upon receipt of a text message alert, tune to the created channel specified in the Details Channel fields and replicate this channel across all active output programs on all active output QAMs. <b>SCTE 18 Compliant</b> Selecting 'SCTE 18 Compliant' will cause the UCrypt system to pass along low priority EAS messages in-band for SCTE 18 compliant TVs to display the message contents over the current programming (i.e. perform a crawl) <b>SCTE 18 Non-Compliant</b> Selecting 'SCTE 18 Non-Compliant' will cause the UCrypt system to tune to the Channel specified in the Details Channel fields on the System>EAS Settings configuration page in the event of a low priority EAS message and replicate its contents over all active output programs in order to display an encoded version of EAS Text message on TVs not capable of handling in-band SCTE 18 messages and performing crawls.		
TV Capability	Dropdown menu	Selecting 'SCTE 18 Compliant' setting will cause the UCrypt to pass along low priority EAS messages in-band for SCTE 18 compliant TVs to display the message contents over the current programming (i.e. perform a crawl). Selecting 'SCTE 18 Non-Compliant' setting will cause the UCrypt to tune to the details channel specified above in the event of a low priority EAS message and replicate its contents over all active output programs in order to display an encoded version of EAS Text message on TVs not capable of handling in-band SCTE 18 messages and performing crawls.
<b>EAS Handling Tests</b>		
Test High Priority (Force Tune) EAS	Button	Generates an EAS message internally to simulate a force tune to the specified Source ID for 1 minute and replicates content across all output programs.
Source ID	Integer	The program with the specified Source ID must be present & valid in the acquired VCT (on 'Channel View' page), be present on the input feed to the UCrypt and be unencrypted.
Test Low Priority (Text) EAS:	Button	Simulates a received low priority EAS message. UCrypt will tune and replicate contents of the details channel specified above over all output programs.
Save EAS Settings	Button	Saves the changed settings. This is not service affecting.

## 9.7 EAS Handling Tests

Figure 9-3: EAS Handling Tests

### 9.7.1 Test High Priority (Force Tune) EAS:

The 'Test High Priority' button causes the UCrypt system to act just like it would if a real alert were received, except for the receipt of the actual message by the OOB tuner. The unit generates an EAS message internally to simulate a force tune to the specified Source ID for 2 minutes and replicates the specified Source ID content across all active output programs on all active output QAMs. The program with the specified Source ID must be present & valid in the acquired VCT (on 'Channel View' page), be present on the input feed to the equipment and be un-encrypted.



**WARNING:** This action is service affecting to the RF output.

To use this, enter the Source ID of an EAS Details Channel (or any program you wish to use to test) and click the **Test High Priority EAS** button to initiate a force tune. The specified source ID is used for test only and is not used in actual live EAS messaging.

### 9.7.2 Test Low Priority (Text) EAS:

The 'Test Low Priority' button acts in one of two different ways depending on if 'SCTE 18 Compliant' or 'SCTE 18 Non-compliant' mode is set. It causes the UCrypt Device to act just like it would if a real alert were received, except for the receipt of the actual message. Pressing this button simulates a real EAS message being received and the results depend on other configuration settings as described below.

### 9.7.3 Test Result

Depending on the setting of 'TV Compatibility', the result will be:

1. SCTE 18 Compliant  
SCTE 18 compliant TVs will receive an in-band text message and will display a text message internally generated by the UCrypt system for 2 minutes.
2. SCTE 18 Non-Compliant  
The Device tunes to the channel specified by the settings of the **Details Channel** configuration fields, specifying a program which contains a text crawl. The unit replicates this program across all active output programs on all active output channels. TVs tuned to any program on any output channel receive the specified Details Channel with the embedded text message. See ["9.8 Creating the EAS Details Channel" on page 9-7](#) for details on making the details channel available.

### 9.7.4 Important Notes to EAS Text Testing:

1. It is not necessary to actually have an EAS Details Channel available for this test. Any valid non-encrypted (in the clear) program can be specified in the Details Channel configuration settings for testing the feature.
2. When the test is started, all programs passing through the equipment will carry the 'Details Channel' and as a result, there is a service outage on all channels for the duration of the test.
3. The EAS Details Channel is a program encoded at the headend which consists of a background program of the operators choice with the EAS text crawl superimposed. This program must be available on the cable system, be un-encrypted and its location is specified by the Details Channel fields on the configuration settings page. For more details about this, see ["9.8 Creating the EAS Details Channel" on page 9-7](#) The UCrypt Device cannot create this program.
4. An alternate method to provide a Details Channel: the operator may chose to define a regional network channel as the Details Channel since they would need to comply to the EAS requirements and have a text crawl on their programming.

This is a convenient way to test for SCTE 18 compliance of TVs. If compatibility configuration is set to **Compliant**, and the internally generated text message is displayed on the TV, then the TV is SCTE 18 compliant. If no message is displayed it is not compliant.

## 9.8 Creating the EAS Details Channel

### 9.8.1 The Problem

There will be hospitality properties encountered where the TVs or STB to be fed by the UCrypt Device are not SCTE 18 compliant. Support for EAS Text messages and EAS Force Tune events to these Non compliant TVs may be provided with a single setup that may be used across all installations. The fundamental issue is providing the Non SCTE 18 TVs with the text crawl and force tuning to the Details Channel when required. While you may already be carrying the required Details Channel with SCTE 18 EAS messaging, the non compliant TV or STB does not respond to SCTE 18 messages. A new approach is required to support the non compliant equipment. This involves the creation of an external SCTE 18 setup to handle force tuning and text message creation.

### 9.8.2 The Challenge

The UCrypt Device has embedded features to replicate the Details Channel across all programs on all channel outputs when alerts are received but does not have capability to create the Text Crawl on output programs as this requires an MPEG2 encoder. Therefore, a Details Channel program must be created externally and made available to every UCrypt Device so the required program arrives already MPEG2 encoded in a QAM RF channel or IP multicast that will be tuned by the Device. There is an easy and inexpensive solution to this issue, described next.

### 9.8.3 The Solution

It is suggested that the following equipment be assembled to create the required Details Channel and the resulting signal be made available on the distribution network or at the headend where the UCrypt Device is installed:

- An SCTE 18 compliant cable TV STB.
- An inexpensive MPEG encoder with QAM RF output as well as IP output such as the ATX Networks DVIS or Nano.

The “always on” STB will be fed with the cable network signals as usual. Since the set top box would be subject to any EAS alerts, it would display, at its video output, any EAS Text Alert or EAS Force Tune content when EAS alerts are received on it's OOB carrier. The STB video output would feed the MPEG2 video encoder which would be configured to have a QAM RF channel or IP multicast output stream as its output. With the MPEG2 encoder's output available to the UCrypt Device input, the system could tune to the set top box channel when required, during EAS alert events. The RF channel frequency and program number or multicast IP address of the Details Channel source is specified by entering the information in the Details Channel fields on the EAS configuration page in the sections for QAM input and IP input Devices illustrated in Figure 9-4.

**EAS Message Source Settings**

Dedicated EAS Source:

Multicast IP:

Port:

Filter by source IP: ☐

**Details Source Channel Settings**

Details channel:

Frequency:  kHz

Modulation:

Program #:

Settings for IP Input Devices

Settings for QAM Input Devices

Figure 9-4: Details Channel Fields

### 9.8.4 Drawings of Proposed Setup

Drawing showing how this would be configured are provided in section “9.9.1 QAM Input Details Channel Simplified Schematic” on page 9-8 and section “9.9.2 IP Input Details Channel Simplified Schematic” on page 9-9. Differences exist in the EAS generator input type for various UCrypt Devices. Use Ethernet or USB appropriate to your model. The QAM to Analog model does not support EAS generator input.

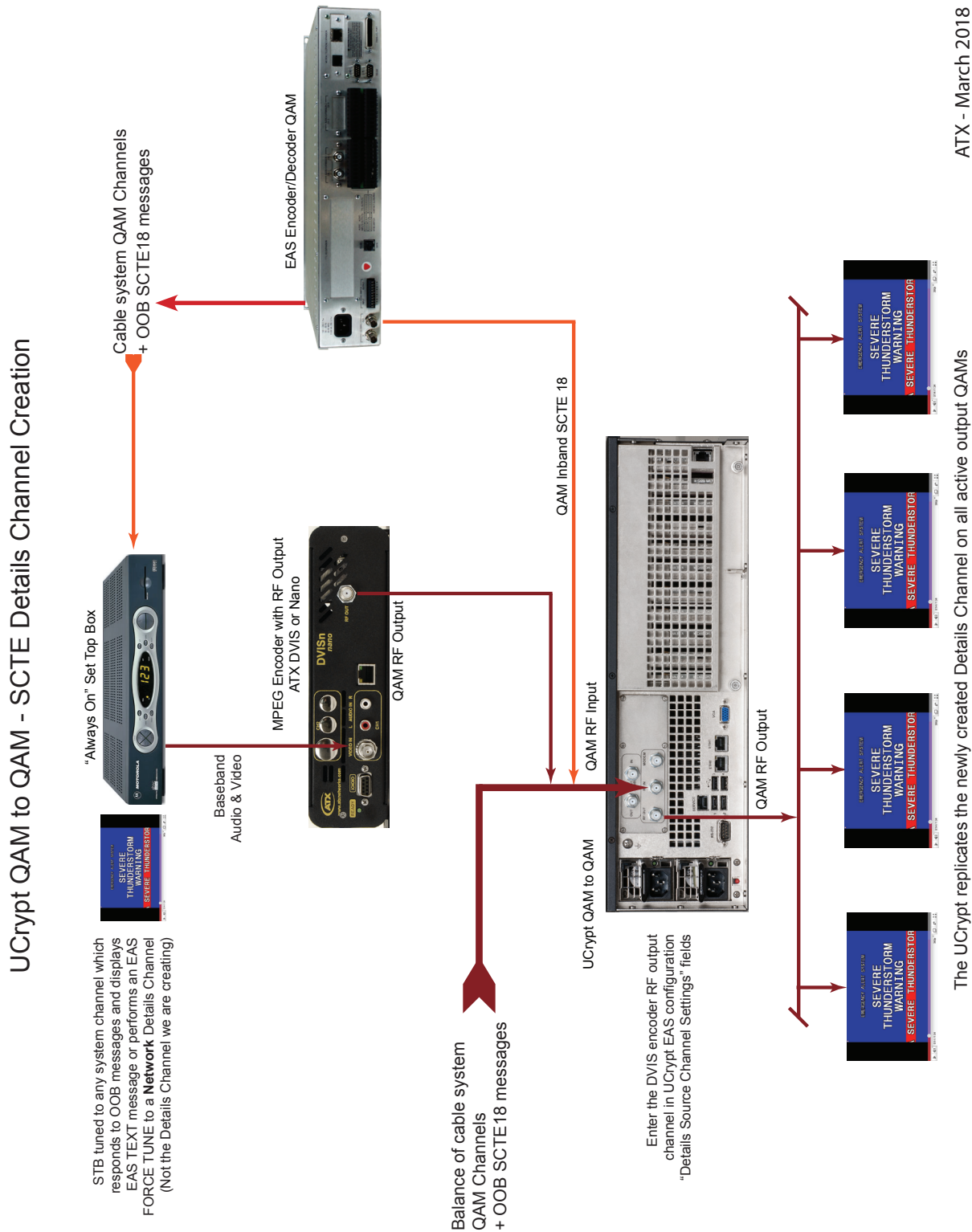
## 9.9 More Information about EAS

More information about the Emergency Alert System is available from the following sources:

- [FCC CFR 2009 Title 47 Part 11 EAS](#)
- [SCTE 18 2007 Standard](#)

### 9.9.1 QAM Input Details Channel Simplified Schematic

See the descriptions on the drawing for more details.



The UCrypt replicates the newly created Details Channel on all active output QAMs

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# ALERTS

## 10. Alerts

The specific metrics that are monitored and reported via Alerts allow insight into functionality that would otherwise be difficult to analyze. The following is information to allow the user to better understand the significance of the reported errors or events, called Alerts. Not all alerts are an indication of a failure; some Alerts are informational only and require no specific action.

### 10.1 Chapter Contents

- “Temperature Error”
- “Fan Error”
- “EAS Event”
- “Channel Map Update Exception”
- “CableCARD™ Module Entitlement Error”
- “Tuner Lost PCR Lock Error”
- “Lost OOB Lock Error”
- “High Tuner Discontinuities/Minute Error”
- “Program Lost Bitrate Error”
- “Multiplex Dropping Error”
- “Output QAM Lost Bitrate Error”
- “SDV Lost Resolve Error”
- “Tuning Resolver Lost Lock Error”
- “Power Supply Failure”
- “Plant Maintenance Exception”
- “Tuner Board Configured But Not Detected”

Each alert is logged in the system log with time and date stamps which may be retrieved from the **System>Logging>ViewLog** link or the **System>Alerts>Alert Settings>ViewLog** link. Clicking these links opens a log page which may be reviewed and a copy taken if desired by highlighting the text and copying it to a text editor. Each Alert Event will be explored and explained in detail. In the log, Alerts are labeled ‘Alert’. Other entries are for information only and are not part of the alerts messaging system.

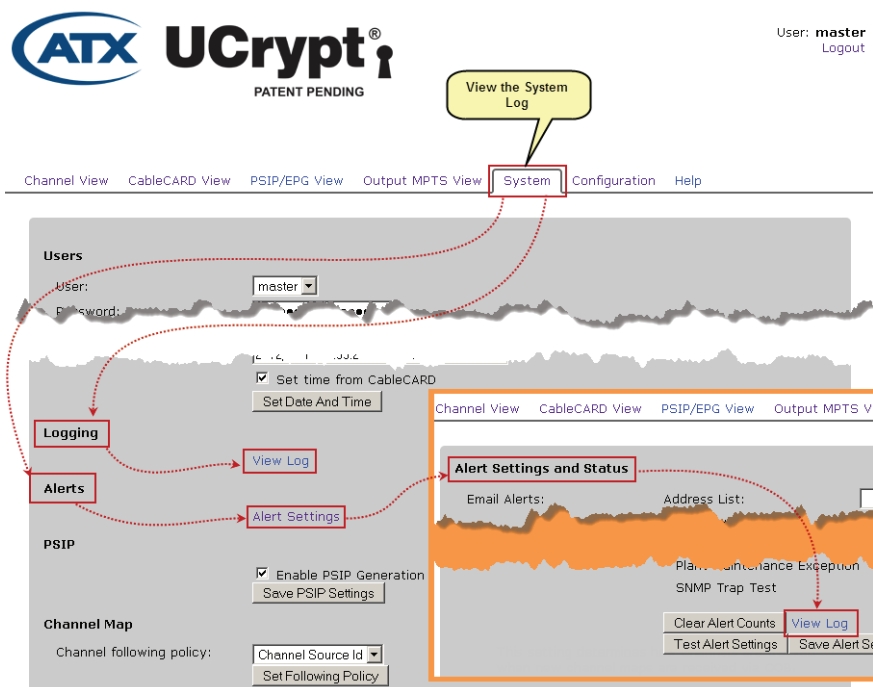


Figure 10-1: View Alerts in System Log

## 10.2 Temperature Error

### 10.2.1 Refers to

**The internal operating temperature of the UCrypt CPU Cores.** The Mainboard CPU(s) contain thermistor probes that monitor the temperature of the cores. The alert threshold is at a core temperature of 167°F (75°C) which reflects an ambient air temperature surrounding the UCrypt of about 107°F (42°C). Due to normal variabilities, these specified temperatures might be slightly different.

### 10.2.2 Repetition of Alert

Alert is sent only once per event, that is, if the temperature rises above the threshold and stays there, no further alerts will be sent. If the temperature drops below the threshold then raises again above the threshold, the alert is resent when the temperature again exceeds the threshold.

### 10.2.3 Customer Symptoms

No symptom directly as a result of this error. At extreme temperature for extended time, customer may lose all programming from affected equipment as the equipment shuts down as a result of temperature failure.

### 10.2.4 Urgency

Critical.

### 10.2.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

This alert is generated when the ambient air temperature is nearing the critical level where the equipment may fail due to inability to keep the CPU cool enough. The UCrypt is designed to operate to published specifications at temperatures between +32°F and +122°F (0°C and 50°C). At elevated temperatures, the UCrypt will continue to operate but the lifetime of the equipment is likely to be reduced. This alert is warning that the UCrypt is operating at temperatures higher that it is specified to operate at.

If this alert is received multiple times over several days it may indicate a recurring temperature problem in the room where the equipment is installed. Knowledge of the ambient conditions of the installation will help to judge if physically attending to the UCrypt immediately is justified.

#### An Internal Issue

This alert could be generated when external UCrypt cooling fans have failed. If this is the case, there will be fan failure alerts as well. Under normal room temperature ambient conditions of about 72°F (22°C). The UCrypt can operate with up to 2 failed fans but if ambient temperatures are elevated, all fans will be needed.

### 10.2.6 Typical Alert Message

Alert Temperature Error: 4 sensors have detected conditions that exceed their thresholds. The following readings are available:		
Sensor	Value	Threshold
Alert: Core 0	73	70
Alert: Core 2	73	70
Alert: Core 4	73	70
Alert: Core 6	73	70

Figure 10-2: Typical Temperature Alert

### 10.2.7 Probable Causes

1. External equipment fans have failed (check for fan errors on 'System' view page under 'Health').
2. External ambient air temperature is above 122°F (50°C).

### 10.2.8 Next Steps

1. Check for Fan Errors on 'System' view page under 'Health' (See also next section: Fan Errors). If fans have failed then this may explain the high temperature error. The UCrypt is capable of normal operation with only 2 of the 4 installed fans active under normal room temperature ambient conditions. If ambient temperature around the UCrypt

is under 122°F (50°C), then just replacing the fans should correct the problem.

2. If fans have not failed, then check the ambient room temperature where the equipment is installed. If ambient temperature around the UCrypt is over about 122°F (50°C), then try to solve the problem of high ambient room temperature.
3. Install additional cooling if the room temperature above 122°F (50°C) persists.
4. If none of the above conditions exist and the error persists, proceed to step 5.
5. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.3 Fan Error

### 10.3.1 Refers to

**The failure of external cooling fans of the UCrypt.** The UCrypt contains four fans installed on the front panel to assure that the internal temperature is maintained at a level that will allow a long service life under almost all site conditions that could reasonably be encountered. The UCrypt is designed to continue to work efficiently with up to 2 failed fans under normal room temperature ambient conditions.

### 10.3.2 Repetition of Alert

Alert is sent only once per event, that is, if a fan fails, an alert is sent, but no further notification is generated. Each fan is monitored and reported on independently. When a fan is replaced, the alarm condition for that fan is automatically reset, then the UCrypt will again send a failure alert if/when that specific fan fails again.

### 10.3.3 Customer Symptoms

No symptom directly as a result of this error.

At extreme, all fans failed for extended time, customer may lose all programming from affected UCrypt Devices as equipment shuts down as a result of temperature failure (see Temperature Error).

### 10.3.4 Urgency

Low.

### 10.3.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

This alert is not caused by outside influences.

#### An Internal Issue

This alert is generated when an external UCrypt cooling fan is detected to have failed. Only one notification will be sent per failed fan.

#### Typical Alert Message

Alert Fan Error: 4 sensors have detected conditions that exceed their thresholds.

The following readings are available:

Sensor	Value	Threshold
Alert: Front fan 0	Failure	
Alert: Front fan 1	Failure	
Alert: Front fan 2	Failure	
Alert: Front fan 3	Failure	

### 10.3.6 Probable Causes

1. A UCrypt external cooling fan has failed.

### 10.3.7 Next Steps

1. Check for how many fans are in failure mode. If this is the first failed fan, no immediate action need be taken. The equipment should operate normally with only 2 of 4 installed fans active under normal room temperature ambient conditions. If ambient temperature around the UCrypt is expected to remain under 80°F (27°C), then just replace the fan on the next site visit.
2. If 2 fans have failed and the ambient room temperature will remain below 80°F (27°C), then the fans should be replaced as soon as possible but this should not require an immediate visit.
3. If more than 2 fans have failed and the ambient room temperature could exceed 80°F (27°C), then the fans should be replaced as soon as possible.
4. The urgency may be further judged by the occurrence of a Temperature Error alert. If multiple fans have failed and there is a temperature alert, the replacement of fans should be attended to as soon as possible to avoid the equipment failing catastrophically.
5. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.4 EAS Event

### 10.4.1 Refers to

**Reception of an event related to the Emergency Alert System (EAS).** Each EAS event will be reported as an alert without details as to the specific nature of the EAS event. An official test of the EAS system will be reported with the same alert as a real EAS event. Channel details in the typical message below refer to the Details Channel.

### 10.4.2 Repetition of Alert

Alert is sent only once per EAS event. No further notification is generated.

### 10.4.3 Customer Symptoms

Customer experiences loss of regular programming for duration of EAS event. Customer may receive substitute programming consisting of force tune Details Channel or text message for the duration of the event.

### 10.4.4 Urgency

Informational purposes only.

### 10.4.5 Cases Where Alert is Likely a Result of:

#### **Outside influence or normal operation**

This alert is generated when the EAS event is received via the OOB carrier or Inband if applicable. Expect this alert to be sent with every test of the EAS system.

#### **An Internal Issue**

There are no internal issues that will cause this alert.

### 10.4.6 Typical Alert Message

Alert EAS Event: Emergency Alert System activated. Event ID: 1

Alert Message:"(null)"

Channel details being received on – Frequency 645000, Modulation QAM256, Program: 33857

Channel details being retransmitted on – Major: 82, Minor: 33857

This EAS force tune will last 2 seconds

This EAS event will last for 15 minutes

### 10.4.7 Probable Causes

1. An EAS event message has been received.

### 10.4.8 Next Steps

1. There is no need for any action to be taken for this alert. The alert is informational only.

## 10.5 Channel Map Update Exception

### 10.5.1 Refers to

**The inability of the UCrypt to accommodate a program move as required by a channel map update.** The Channel Map is also known as the Virtual Channel Table and is transmitted by the Cable Service Provider on the OOB carrier to inform the system STBs of the current location of each program carried on the cable system. This relates the “Cable Channel” to the EIA QAM channel and MPEG program number (the EIA Major and Minor Channel Numbers) of each service. The Channel Map is sent from time to time to reflect the moving of programs to different QAM channels etc. This alert will be set if there are no available tuners to acquire a QAM channel if the QAM channel was not previously being received. This will be a very rare event most likely to happen on a UCrypt where all available tuners must be used to process the desired programs and at least one tuner is processing multiple programs.

### 10.5.2 Repetition of Alert

Alert is sent once when a ‘program follow’ is not able to be accommodated. No further notification is generated until the issue is rectified and another instance of ‘failure to follow’ a program due to insufficient resources occurs again.

### 10.5.3 Customer Symptoms

Customer experiences loss of the program affected by the alert as there is no available tuner for the program. All remaining programming is unaffected.

### 10.5.4 Urgency

Critical.

### 10.5.5 Cases Where Alert is Likely a Result of:

#### **Outside influence or normal operation**

This alert is generated when the Channel Map Update is received and there are not enough tuners to receive the required number of QAM channels. This further indicates that a previously tuned and received program was lost due to insufficient tuner resources.

#### **An Internal Issue**

This alert is not generated by any internal issues or conditions other than the lack of sufficient installed tuners.

### 10.5.6 Probable Causes

1. During initial configuration, all available tuners were required to tune the desired lineup and now an additional unavailable tuner is required to continue to deliver the same lineup.

### 10.5.7 Next Steps

1. Analyze the occurrence of this alert with respect to the program specified as being affected and the changes in the most recent Channel Map Update (channel map update info will need to be acquired internally from system channel map administrators).
2. Have the channel that caused the error replaced back into a multiplex contained on one of the QAMs already tuned by the UCrypt in question.
3. Drop the affected channel from the lineup.
4. Upgrade the number of QAM tuners if the UCrypt in question has less than 60 tuners or 10 tuner boards installed.
5. For assistance with upgrading hardware contact ATX Networks Technical Support.

## 10.6 CableCARD™ Module Entitlement Error

### 10.6.1 Refers to

**A specific program on a specific CableCARD module does not possess an entitlement enabling it to be decrypted.** Entitlement is necessary for a CableCARD module to decrypt programming therefore a loss of entitlement will result in a loss of that program on the UCrypt output. Each program must be authorized by the Cable Service Provider's billing system allowing it to be decrypted on a specific CableCARD/host slot pair. The Host is the physical slot that the CableCARD module is inserted into and the "slot" or "Host" itself has a unique identification number. The ID number from the Host and the ID number from the CableCARD are "paired" in the billing system. CableCARD modules may not be moved between UCrypt Devices without re-pairing.

### 10.6.2 Repetition of Alert

This message is sent only once when it is determined that a specific CableCARD module no longer possesses entitlement to decrypt the associated program. If the card re-acquires entitlement, then loses it again, another alert is sent.

### 10.6.3 Customer Symptoms

Customer experiences loss of all encrypted programming on affected CableCARD module(s) for the duration that the error condition exists. All programming that arrives at the UCrypt in the clear as well as all programming on unaffected CableCARD modules is processed normally.

### 10.6.4 Urgency

Medium to Critical.

### 10.6.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

An occurrence of a CableCARD module losing entitlement with no outside influence is rare, though it may be possible. Usually the card re-acquires entitlement by itself and requires no action. A permanent loss of entitlement on a particular program most likely indicates an error in the billing system configuration and/or pairing process for that specific CableCARD module.

#### An Internal Issue

This alert is not generated by any internal issues or conditions.

### 10.6.6 Typical Alert Message

Alert CableCARD Entitlement Error:

Channel 952 has lost entitlement on CableCARD board 3

### 10.6.7 Probable Causes

1. The CableCARD module has not been properly validated & authorized in the Cable Service Provider's Billing System.
2. The correct package with the program at issue has not been sent in the form of a 'hit' to the CableCARD module.
3. A previously paired CableCARD module has been removed from the billing system.
4. A previously authorized service has been changed or deleted in the billing system.
5. The CableCARD module's entitlement has expired prior to the card receiving an entitlement renewal message.
6. If entitlement has been restored since the alert, there was a temporary loss of entitlement by the CableCARD which either rectified itself or required an automatic re-start of the CableCARD by the UCrypt equipment to rectify.

### 10.6.8 Next Steps

1. Check if the problem has corrected itself by checking 'status' of program in question on 'Channel View' page.
2. This problem may correct itself the next time entitlement messages are distributed on the network. The CableCARD entitlement per program normally expires after a time and is refreshed automatically. If the CableCARD module ID and Host ID are not setup correctly in the billing system there is a possibility the refresh does not happen as expected or required. There may be other issues that could potentially cause this within the billing system.
3. If this problem has not corrected itself, contact the Cable Service Provider's administration to ensure that the CableCARD/host slot pair are properly recorded in the billing system. Find the CableCARD module and Host ID numbers by following hyperlinks:
  - a) Cisco: CableCARD View>CableCARD Setup>Cisco CableCARD/Host ID screen
  - b) Motorola: CableCARD View>CableCARD Setup>CableCARD Pairing

Report the CableCARD module and Host ID numbers to your administrator.

4. Pay particular attention to the 'DATA' field in Cisco/SA environments as this field changes over time, but must be re-entered with the correct current data if a card is being re-validated or re-hit.
5. Have the administrator resend (Hit) the entitlement message to the CableCARD module.
6. Repeated problems with the same CableCARD may indicate a problem deeper within the DAC/DNCS which cannot be resolved by access at the billing system level. In this case, the assistance of a DAC/DNCS administrator may be necessary to completely remove the CableCARD module and host IDs from the DAC/DNCS inventory and re-enter it from scratch.
7. There is a problem with the physical CableCARD module and replacement may be necessary.

## 10.7 Tuner Lost PCR Lock Error

### 10.7.1 Refers to

The loss of Program Clock Reference on a specific multiplex or QAM channel. PCR is required to process programs so it is necessary to maintain PCR lock at all times.

### 10.7.2 Repetition of Alert

This alert is sent once per event, so if PCR lock is lost and is reacquired, the alert will be sent again if/when it loses lock again. If lock is not reacquired, the Alert will not be sent again.

### 10.7.3 Customer Symptoms

Customer experiences loss of all programs on the affected tuner for the duration that the error condition exists.

### 10.7.4 Urgency

Medium to High.

### 10.7.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

It would be expected that during certain operations such as plant maintenance when disrupting a tuned QAM or an RF outage, the PCR lock would be lost. A loss due to a factor similar to this does not require any action as the UCrypt will regain lock when the QAM is properly restored. It could be considered normal to lose PCR lock occasionally if this does not reoccur repeatedly. The occasional loss does not require any attention.

#### An Internal Issue

Repeated occurrences of loss of PCR lock will require attention to determine the cause, which can be either internal or external to the UCrypt.

### 10.7.6 Typical Alert Message

Alert Tuner Lost PCR Lock Error: The following tuners have lost PCR lock

Tuner 0, Board 0

Tuner 1, Board 0

Tuner 2, Board 0

Tuner 4, Board 0

Tuner 5, Board 0

### 10.7.7 Probable Causes

1. The subject QAM was not available on the cable system at the time of the error.
2. Plant distortions make it difficult for the UCrypt tuner to maintain lock on the subject QAM.
3. Plant maintenance has been occurring at the time of the error.
4. An internal service affecting operation within the UCrypt (such as hitting apply or reboot) was performed just prior to the alert.
5. Hardware tuner in the UCrypt equipment is failing.

### 10.7.8 Next Steps

1. Check if the program has corrected itself by checking 'status' of the program on 'Channel View' page and checking for indication of persisting PCR lock error message on 'CableCARD View' page.
2. Check if there was an 'apply' or 'reboot' performed just prior to the error message in the logs. If so, this is normal operation.
3. Consider if there was plant maintenance happening during the subject time period. Plant outages will cause this problem. Were there other alerts that occurred at the same time or were there many or all tuners affected at the same time indicating plant as the source.
4. Analyze if only one tuner board was affected or if all tuners were affected. If all were affected, the likelihood is that there was an external influence such as an outage or an internal operation such as a UCrypt system 'apply' or 'reboot' which causes this message to appear while the tuners are unlocked in the midst of the operation (which is normal and as per design).
5. Analyze if the signal levels at the UCrypt are in spec and if all QAM channels are flat in response.

6. If a single tuner is always affected in a similar way, and recurring alerts are reported over several days, this may indicate an external problem, so measure signal levels and MER to determine system performance ahead of the UCrypt on the affected channel.
7. If plant distortions and signal level problems have been eliminated, the UCrypt hardware tuner is likely failing.
8. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.8 Lost OOB Lock Error

### 10.8.1 Refers to

The **UCrypt** has lost reception on the specified **OOB carrier**. There is an OOB carrier tuner on each CableCARD module / host slot port installed in the UCrypt. Your UCrypt may have between 1 and 10 OOB tuners installed depending on the ordered configuration.

### 10.8.2 Repetition of Alert

This alert is sent only once each time a specific OOB carrier losses lock. No further alert will be sent until the OOB carrier locks again in the tuner and then again loses lock.

### 10.8.3 Customer Symptoms

No symptom directly as a result of this error.

Extended duration of this error could result in customer experiencing loss of all programs on the associated CableCARD module as the module eventually loses its entitlement.

### 10.8.4 Urgency

Medium.

### 10.8.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

If all tuners lose lock simultaneously this is almost certainly an indication of OOB impairment on the plant as it's extremely improbable that all individual OOB tuners would experience hardware failures at the exact same time. This is usually caused by plant maintenance activities.

#### An Internal Issue

If just a single tuner board is losing OOB lock repeatedly, this is an indication of a potential hardware issue with that board since any impairment to the OOB on the plant side should affect all tuners equally.

### 10.8.6 Typical Alert Message

Alert Lost OOB Lock Error: The following CableCARD modules have lost OOB lock

Board 0

Board 1

### 10.8.7 Probable Causes

1. The subject OOB carrier was not available on the cable system at the time of the error.
2. Plant distortions make it difficult for the UCrypt tuner to maintain lock on the subject OOB Carrier.
3. Plant maintenance had been occurring at the time of the error.
4. Hardware tuner internal to the UCrypt equipment is failing.

### 10.8.8 Next Steps

1. Determine if multiple OOB carriers lose lock at the same time. Multiple loses at a time indicate external causes such as maintenance activities.
2. Note if the loss of lock occurs during maintenance windows indicating external causes.
3. Note if other alerts trigger at almost the same time, again indicating external causes.
4. A single loss on a specific tuner very occasionally or rarely may be considered normal.
5. Recurring losses of lock over time on a specific tuner may indicate a hardware problem especially if other tuners in the UCrypt equipment operate normally.
6. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.9 High Tuner Discontinuities/Minute Error

### 10.9.1 Refers to

**MPEG level packet loss at a specific QAM tuner (Tuner #0 to #5) on a specific Host card (Card #0 to #9).** This is the packet loss related to a QAM multiplex and not a specific program within the multiplex. There may be bit error correction in the system but this problem is reporting uncorrectable bit errors resulting in packet loss as this is measured post error correction. This should be always zero under the best circumstances but some uncorrectable errors may still occur but are not visible in the picture up to about 500/minute, therefore the UCrypt will only begin to send alerts where the discontinuities exceed 200/minute.

### 10.9.2 Repetition of Alert

The UCrypt will send an alert each time there are more than 200 discontinuities recorded on a specific QAM in a one minute time frame.

### 10.9.3 Customer Symptoms

Customer experiences noticeable artifacts and/or other impairments starting at an error level of about 500 discontinuities/min, with impairments escalating with higher levels of discontinuities up to and including loss of all programs on the affected tuner for the most severe conditions for the duration that the error condition exists. The resulting customer experience will be both random and variable depending on the conditions causing the error and it is not possible to quantify them further.

### 10.9.4 Urgency

Low to High.

### 10.9.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

If the number of discontinuities is low (a few hundred per minute) and infrequently reported, this is considered normal as just about all cable plants experience some brief moments of signal impairment for a multitude of reasons. If the discontinuities are above 500/minute and occur frequently and across many QAM tuners, urgent attention is indicated as there are likely system problems with the level and/or signal quality hitting the input to the equipment. If the discontinuities are above 500/minute and occur frequently on a single QAM tuner only, this typically indicates either a problem with the level and/or signal quality on the particular QAM frequency at the UCrypt input.

#### An Internal Issue

If the discontinuities are above 500/minute and occur frequently on a single QAM tuner only, it may indicate a potential hardware issue with that particular tuner.

### 10.9.6 Typical Alert Message

2012-08-10 alert 14:24:50	Alert High Tuner Discontinuities/Minute Error: The following tuners have high discontinuity rates Tuner 0, Board 2: 2657 Discontinuities/Minute Tuner 1, Board 2: 6555 Discontinuities/Minute Tuner 3, Board 2: 4175 Discontinuities/Minute Tuner 5, Board 2: 5619 Discontinuities/Minute
------------------------------	---

Figure 10-3: Typical High Tuner Discontinuities Alert

### 10.9.7 Probable Causes

1. Input RF levels are either not set to the UCrypt's ideal operating range, certain QAM levels are unbalanced on the plant or the SNR or MER of the QAM signal is below the threshold the equipment can handle without errors.
2. Plant maintenance had been occurring at the time of the error.
3. Hardware tuner internal to the UCrypt is failing.

### 10.9.8 Next Steps

1. Check if the program has corrected itself by checking 'status' of the program on 'Channel View' page.
2. Analyze the log to determine if there have been multiple tuners sending alerts at about the same time. If multiple tuners are reporting problems especially if they reside on different host boards, this indicates a problem external to the UCrypt.

3. Analyze the log to determine if the errors are occurring at times when plant or headend maintenance may be occurring.
4. Check the 'All Tuner Diagnostics' page on the UCrypt GUI and ensure all tuned frequencies are showing signal levels between 0 and +15 dBmV and SNRs greater than 32 dB.
5. If symptoms point to external causes, then measurement of plant carrier levels and MER may be required.
6. If a single tuner persistently reports errors or tuners on a single CableCARD module or tuners on a single tuner board are persistently in error and the RF signal level and MER on the QAM in question have been confirmed to be within spec at the UCrypt input, this could indicate a failing tuner board internal to the UCrypt equipment.
7. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.10 Program Lost Bitrate Error

### 10.10.1 Refers to

**Lack of presence of MPEG video packets for the program in question.** This error is reporting on a single program in a QAM and is not indicating the failure of the QAM as a whole.

### 10.10.2 Repetition of Alert

This alert is sent at every occurrence of the detection of a bitrate that is lost. If the stream is reacquired, then the alert is sent again upon the next bit rate loss detection.

### 10.10.3 Customer Symptoms

Customer experiences loss of program reported by the error for the duration that the error condition exists.

### 10.10.4 Urgency

Medium to High.

### 10.10.5 Cases Where Alert is Likely a Result of:

#### **Outside influence or normal operation**

To have an occasional but rare alert of lost bitrate could be considered normal as there are many possible causes, many of them cable system related, or may happen as a result of an effected UCrypt operation such as an 'apply' or reboot and does not require any attention if the UCrypt is able to recover from the problem by itself. It may be a program was taken out of service momentarily at the headend. A repeated alert of this nature should be cause to investigate why a single program is consistently losing bitrate.

#### **An Internal Issue**

If a program is consistently losing bitrate and/or fails to re-acquire bit rate when it can be verified the same program is in fact operating properly on the plant, this may be an indication of either a UCrypt software or hardware based issue.

### 10.10.6 Typical Alert Message

Alert Program Lost Bitrate Error: The following programs have problems

Program 1009 has zero bitrate

### 10.10.7 Probable Causes

1. If the error is seen immediately following an 'apply' or 'reboot' this is considered normal and is not an issue.
2. The UCrypt software failed to re-acquire the program video stream after an outage condition.
3. The program was unavailable (or is still not available) on the cable system plant at the time of the error.
4. There is a hardware failure of the tuner or demodulator in question.

### 10.10.8 Next Steps

1. Investigate if bitrate on the program in question has been re-acquired by the UCrypt typically indicated by the program status returning to 'green' on the 'Channel View' page. Also check the video bitrate on the program specific details page. If it has not been re-acquired, an 'Apply' or a 'reboot' may be necessary in order to re-acquire.
2. Investigate why the subject program was not available and/or is still not available on the cable system plant at the time of the error.
3. If an apply or reboot fixed a case where the UCrypt failed to re-acquire the bitrate on its own, contact an ATX support representative in order to diagnose the root cause of the recovery failure.
4. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.11 Multiplex Dropping Error

### 10.11.1 Refers to

The aggregate bit rate of the specific QAM is exceeding 38.8 Mb/s or the internal multiplexer is failing to properly process all packets as it should. Each program that is assigned to a multiplex is variable bit rate and the sum total of all the assigned programs is likely exceeding, from time to time, the bit rate limit of the affected QAM. This may happen when several programs are taken from various QAMs and multiplexed together on another QAM and there has not been sufficient headroom left to accommodate the variable bit rate nature of the programs. The UCrypt does not rate shape programs so the operator must ensure that too many programs are not placed in any single output QAM.

### 10.11.2 Repetition of Alert

This alert is sent each time that it is detected that the bit rate for the specific QAM has exceeded the 38.8 Mb/s limit. If the bit rate then falls below 38.8 Mb/s the alert will be sent next time that the bit rate again exceeds 38.8 Mb/s.

### 10.11.3 Customer Symptoms

Customer experiences flickering, artifacts and/or other impairments on all programs on the affected multiplex for the duration that the error condition exists with the degree of impairments escalating with the severity of the condition. The resulting effects will be both random and variable depending on the conditions causing the error and it is not possible to quantify them further.

### 10.11.4 Urgency

Medium.

### 10.11.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

If this alert is received repeatedly, it indicates that the variable bit rate nature of the programs assigned to a QAM are peaking above 38.8 Mb/s under some content conditions and a brief outage or picture breakup is occurring on all programs on that QAM at the time of the peak rate. The programs on the affected QAM must be spread out over more QAMs. The total aggregate bit rate on the affected QAM must be reduced.

#### An Internal Issue

Read the paragraph above as this is the most likely cause. If it is absolutely clear that the multiplex specified in the alert is not being oversubscribed (i.e. it only has a single program assigned to the output MPTS or has 2 HD's that the operator knows for sure are together are not exceeding 38.8 Mb/s) then the error is likely indicating a temporary failure by the multiplexer to properly process all packets as it should. This is a rare but possible internal UCrypt cause.

### 10.11.6 Typical Alert Message

Alert Multiplex Dropping Error: The following output multiplexes are dropping data:

0.0, 0.2, 0.3, 0.5, 0.7, 1.2

This may be because there are too many programs configured on it, or some other unexpected condition.

Note: The alert notation of x.x shown above as 0.3, 1.2 and similar numbers is referring to the QAM module and channel number on that module where the QAM module is 0, 1, 2 or 3 and the second number is the incrementally assigned 'channel' number on that QAM module (0 through 7) - i.e. 1.2 means the multiplex affected is the one assigned to the 3rd channel (labeled as Ch 2 since they start at 0) on QAM module 1.

### 10.11.7 Probable Causes

1. There are too many programs assigned to the affected QAM and the aggregate bit rate of the programs exceeds 38.8 Mb/s occasionally or frequently.
2. Internal UCrypt multiplexer error.

### 10.11.8 Next Steps

1. Analyze the number of programs and the maximum possible aggregate bite rate of those programs that are assigned to the specific troubled QAM and attempt to calculate if only a single program or more are required to be removed from this multiplex then start removing programs until this alert no longer occurs.
2. Analyze the log for the consistency of the alert over time. It is possible that a single error may occur and may not necessarily indicate a serious problem requiring attention.
3. It is possible for this error to be an indication of an internal software failing. First eliminate the possibility of too many programs in the QAM.
4. If an immediate resolution to the issue is necessary, a reboot of the UCrypt should be attempted.

5. If it is determined that the problem is NOT too many programs in a QAM, or if a reboot as per step 4 rectified the condition, proceed to step 6.
6. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.12 Output QAM Lost Bitrate Error

### 10.12.1 Refers to

**QAM Modulator stops modulating at 38.8 Mb/s.** The bit stream from the internal multiplexer to the QAM modulator has failed. This error indicates that the modulator has failed to acquire the bit stream properly.

### 10.12.2 Repetition of Alert

This alert is sent each time it is detected that a QAM has stopped modulating the 38.8 Mb/s stream. If the stream again starts modulating and fails again, the alert is sent again.

### 10.12.3 Customer Symptoms

Customer experiences loss of all programs on the affected QAM for the duration that the error condition exists.

### 10.12.4 Urgency

Low - High.

### 10.12.5 Cases where Alert is likely a result of:

#### **Outside influence or normal operation**

If only a rare occurrence of an output QAM losing bit rate is reported, this could happen due to programs losing bit rate during plant maintenance or other operations, or may happen as a result of an effected UCrypt system operation such as an 'apply' or reboot and does not require any attention if the UCrypt is able to recover from the problem by itself.

#### **An Internal Issue**

If this alert is sent frequently over a period of hours or days it is usually an indication of internal hardware/software issues within the Device and requires urgent attention.

### 10.12.6 Typical Alert Message

Alert Output QAM Lost Bit rate Error: The following output QAM's reported zero bit rate:

DQAM #0 Channel #2

DQAM #0 Channel #3

DQAM #0 Channel #5

### 10.12.7 Probable Causes

1. Plant conditions or an effected UCrypt operation (apply, reboot) have caused a QAM modulator channel to lose its input stream momentarily.
2. The QAM modulator within the UCrypt is failing.

### 10.12.8 Next Steps

1. If the QAM loses bit rate very occasionally but the UCrypt recovers from the problem without outside help, this may be ignored, especially if the reoccurrence is very rare.
2. This alert, received frequently, may be an indication that there is an internal failure in the UCrypt.
3. If an immediate resolution to the issue is necessary, a reboot of the UCrypt should be attempted. If the reboot fixes the condition contact ATX Networks support to diagnose the root cause of the problem.
4. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.13 Output QAM Channel Restarting Error

### 10.13.1 Refers to

**PCR accuracy is abnormal at the output of the UCrypt program multiplexer.** When PCR accuracy is intolerable, the QAM modulator restarts or re-acquires lock. This alert is sent at a threshold of 3 restarts per minute.

### 10.13.2 Repetition of Alert

This alert is sent every time that the threshold of the alert is exceeded in a one minute period.

### 10.13.3 Customer Symptoms

Customer experiences a very brief flicker impairment on all programs on the affected QAM at the time that the error condition occurs. The impairment is so brief that it sometimes may only be noticed if there are very many restarts per minute.

### 10.13.4 Urgency

Low - High.

### 10.13.5 Cases Where Alert is Likely a Result of:

#### **Outside influence or normal operation**

If only a rare occurrence of an output QAM restarting is reported, this could be considered normal and does not require any attention if the UCrypt is able to recover from the problem by itself.

#### **An Internal Issue**

Repeated occurrences of an output QAM restarting, is usually indicative of excessive variation in PCR accuracy in the multiplexed output stream being sent to the QAM modulator channel in question.

### 10.13.6 Typical Alert Message

Alert Output QAM Channel Restarting Error: The following output QAM's are restarting often:

DQAM #0 Channel #1 Restarts/Minute: 9

DQAM #0 Channel #5 Restarts/Minute: 6

DQAM #0 Channel #6 Restarts/Minute: 7

### 10.13.7 Probable Causes

1. Maintenance at the single program level (i.e. not broadband RF system maintenance) at the headend or intentionally effected UCrypt operation such as programming changes.
2. Excessive variation in PCR accuracy in the multiplexed output stream being sent to the QAM modulator channel in question indicating internal issues.
3. The output QAM modulator module internal to the UCrypt is failing.

### 10.13.8 Next Steps

1. If the QAM restarts very occasionally but the UCrypt recovers from the problem without outside help, this may be ignored, especially if the reoccurrence is rare and restarts are very low (well under 5 per minute).
2. This alert, received frequently, could more likely be indicating an internal UCrypt software issue especially if many restarts are being reported over a period of time.
3. If an immediate resolution to the issue is necessary, a reboot of the UCrypt should be attempted. If the reboot fixes the condition contact ATX Networks support to diagnose the root cause of the problem.
4. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.14 SDV Lost Resolve Error

### 10.14.1 Refers to

TA tried to determine the frequency of the channel but it received an error message

### 10.14.2 Repetition of Alert

Every time it occurs

### 10.14.3 Customer Symptoms

The channel will be missing from the output

### 10.14.4 Urgency

Medium->High

### 10.14.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

TA losing lock, provisioning issue, session manager not sending information back to TA

#### An Internal Issue

There are more SDV programs configured than the number of TA tuners

### 10.14.6 Typical Alert Message

SDV Lost Resolve Error

### 10.14.7 Probable Causes

1. Provisioning issue,
2. Session manager did not send information to the TA
3. Require another TA

### 10.14.8 Next Steps

1. Verify the TA is properly provisioned
2. Check the configuration on the UCrypt Device; the number of SDV programs should be equal to or less than the number of TA tuners. Add additional TA if required.
3. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.15 Tuning Resolver Lost Lock Error

### 10.15.1 Refers to

TA lost lock to the Data carousel

### 10.15.2 Repetition of Alert

Every time it occurs

### 10.15.3 Customer Symptoms

- No issue immediately
- Extended outage may cause programs to be drop to black

### 10.15.4 Urgency

Medium

### 10.15.5 Cases Where Alert is Likely a Result of:

**Outside influence or normal operation**

Issue in the RF signal

**An Internal Issue**

None

### 10.15.6 Typical Alert Message

Alert Tuning Resolver Lost Lock Error: Tuning Resolver 3:2 left Ready state. Status is now 'Check Signal'

### 10.15.7 Probable Causes

1. Signal Issue
2. Plant maintenance had been occurring at the time of the error.
3. Plant distortions make it difficult for the TA to maintain lock on the data carousel
4. Hardware issue on the TA

### 10.15.8 Next Steps

1. Note if the loss of lock occurs during maintenance windows indicating external cause
2. A single loss on a TA very occasionally or rarely may be considered normal
3. Recurring losses of lock over time on a specific tuner may indicate a hardware problem
4. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.16 Power Supply Failure

### 10.16.1 Refers to

**Failure of one of the two redundant power supply modules.** This failure could be caused also by the lack of AC input to one power supply if they are fed from redundant power sources.

### 10.16.2 Repetition of Alert

This alert is sent only once, when detected.

### 10.16.3 Customer Symptoms

Customer experiences no change to normal operation.

### 10.16.4 Urgency

Low - High.

### 10.16.5 Cases Where Alert is Likely a Result of:

#### **Outside influence or normal operation**

This alert may be caused by the lack of AC input to the affected power supply if the AC feeds are setup with redundancy, but cannot be caused by any normal operation of the equipment.

#### **An Internal Issue**

This alert may be triggered by the failure of an internal power supply. A site visit is required to resolve the cause.

### 10.16.6 Typical Alert Message

Alert Power Supply Failure.

### 10.16.7 Probable Causes

1. Internal redundant power supply failure.
2. No AC power in supply circuit.
3. AC power cord for power supply has been removed or unplugged.

### 10.16.8 Next Steps

1. Check AC power cord to power supplies.
2. Check for presence of AC power at supply receptacle.
3. Exchange failed power supply module.
4. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.17 Plant Maintenance Exception

### 10.17.1 Refers to

**The scheduled check of programs that are either missing or are not decrypting.** On the System page under the 'Power' section, the Device may be configured to do a "Scheduled Outage Check". If this feature has been configured, then this alert refers to a missing or improperly decrypted program. For setup details, see ["8.4.6 Scheduled Outage Check" on page 18-21](#).

### 10.17.2 Repetition of Alert

This alert is sent every time that a program is detected to be missing or not properly decrypted when tested according to the defined schedule.

### 10.17.3 Customer Symptoms

Customer will be aware of the missing or improperly decrypted program that is being reported and the intention is to restore this program through the scheduled maintenance reboot process.

### 10.17.4 Urgency

Low - High.

### 10.17.5 Cases Where Alert is Likely a Result of:

#### **Outside influence or normal operation**

If only a rare occurrence of a missing channel is reported, this could be considered normal and does not require any attention if the Device is able to recover from the problem by itself. This may be an indication of problems at the originators site, the broadcaster of the program.

#### **An Internal Issue**

Repeated occurrences of a missing channel, could be the result of internal hardware that is failing or firmware related issue. ATX support group should be notified for further analysis.

### 10.17.6 Typical Alert Message

Alert Plant Maintenance Exception: The following channels had problems:  
(2000 - Bloom)

### 10.17.7 Probable Causes

1. Plant Maintenance was occurring at the time of the Alert
2. Headend Maintenance was being done on that program at the time of Alert.
3. The CableCARD lost decryption authorization for the program and did not recover.
4. Internal hardware or firmware related issue. Contact ATX Support for further analysis.

### 10.17.8 Next Steps

1. If the program is reported missing very occasionally but the UCrypt recovers from the problem without outside help, this may be ignored, especially if the reoccurrence is rare and frequency of reports are very low.
2. This alert, received frequently, could more likely be indicating an internal UCrypt software issue especially if many channels are reported missing over a period of time.
3. If an immediate resolution to the issue is necessary, a reboot of the UCrypt should be attempted. If the reboot fixes the condition contact ATX Networks support to diagnose the root cause of the problem.
4. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.18 DQAM Configured But Not Detected

### 10.18.1 Refers to

UCrypt Device configuration has program assigned to a DQAM but the DQAM has not been detected.

### 10.18.2 Repetition of Alert

Only once

### 10.18.3 Customer Symptoms

All programs assigned will be missing

### 10.18.4 Urgency

High

### 10.18.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

If this alert is accompanied by other alerts, analyze the sum total of the alerts to determine a possible outside cause as there may be some common problem which cannot be predicted here. This alert would not normally be expected.

#### An Internal issue

Possible over heating of the DQAM, or DQAM, not powering up.  
Bad internal network connection, bad internal slot, or a f/w issue.

### 10.18.6 Typical Alert Message

Alert DQAM Configured But Not Detected: DQAM 1 configured but not detected

### 10.18.7 Probable Causes

1. Dead or failing DQAM module.

### 10.18.8 Next Steps

1. Power Cycle unit.
2. Ensure fans are all functional
3. Ensure ambient air temperature is within specification.
4. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

## 10.19 Tuner Board Configured But Not Detected

### 10.19.1 Refers to

Programs known to be assigned to tuner boards will be missing from the output.

### 10.19.2 Repetition of Alert

Only once.

### 10.19.3 Customer Symptoms

Missing programs.

### 10.19.4 Urgency

High

### 10.19.5 Cases Where Alert is Likely a Result of:

#### Outside influence or normal operation

If this alert is accompanied by other alerts, analyze the sum total of the alerts to determine a possible outside cause as there may be some common problem which cannot be predicted here. This alert would not normally be expected. The UCrypt may be installed in a dirty environment whereby the slots of the motherboard have become dirty and connections to tuner boards are failing.

#### An Internal Issue

Dirty PCIe slot, bad PCIe slot, f/w issue, internal overheating.

### 10.19.6 Typical Alert Message

Alert Tuner Board Configured But Not Detected: Tuner Board 7 configured but not detected.

### 10.19.7 Probable Causes

1. Dirty unit, defective PCIe slot contacts
2. Failing tuner board

### 10.19.8 Next Steps

1. Power Cycle unit.
2. Ensure fans are all functional
3. Ensure ambient air temperature is within specification.
4. For assistance with troubleshooting suspected hardware or software issues contact ATX Networks Technical Support.

# SYSTEM

## 11. System

Global Device settings are made on the System tab.

### 11.1 Chapter Contents

- “Users”
- “Power”
- “Serial Number”
- “Unit Info”
- “Firmware”
- “Network”
- “Encryption”
- “Fixed Key Encryption Profiles”
- “Fixed Key Decryption”
- “Health”
- “Time”
- “Logging”
- “Alerts”
- “Support for SNMP Deployment”
- “PSIP”
- “Channel Map”
- “Emergency Alert System (SCTE18)”
- “Simulcrypt Encryption”
- “PID/PSI Filtering”
- “Capture Input & Output”
- “Product Type”

### 11.2 Users

This is where the Master User will set passwords for all users, Figure 11-1. See Table 11.2a for factory default passwords for each user account. User privileges may not be changed. If default passwords are not changed from factory default, a warning will appear on all pages, Figure 11-2. The warning may be dismissed by clicking the **X** top right or disable the warning with the button.

Figure 11-1: Users Section

Figure 11-2: Password Warning

Table 11.2a: Default User Account Privileges (See Figure 11-1)

Account	Default Password	Install Updates	Set Passwords	Modify Settings
master	atx_ucrypt_master_password	Yes	Yes	Yes
admin	atx_ucrypt_admin_password	No	No	Yes
user	atx_ucrypt_user_password	No	No	No

### 11.2.1 TACACS+ Authentication

TACACS+ authentication is supported, see Figure 11-1.

Figure 11-3: TACACS+ Settings

To use this feature, tick the **Enable TACACS+ Authentication** box and complete the form with values for your network. When finished, click the **Save Authentication Settings** button.

The authentication settings and connectivity to the TACACS+ server may be tested by entering a test user and password, then click the **Test Authentication Settings** button.

### 11.3 Power

Power options, Figure 11-4, allow flexible management of the system if it becomes necessary to power cycle or re-boot the Device in circumstances when the user is remotely located without the need to physically visit the equipment. Some control buttons have attached descriptive text but an expanded explanation is offered here in Table 11.3a.

Figure 11-4: Power Section

Table 11.3a: Power Section Configuration Settings (See Figure 11-4)

Field	Value	Description
Reboot	Button	Causes the machine to perform a warm reboot immediately.
Power Cycle	Button	Powers down the Device immediately. Device remains off for 30 seconds before rebooting, performing a cold power off reboot. Total outage of about 2 minutes.
Shutdown	Button	Schedule a shutdown to occur in <b>60 seconds</b> . Power off the Device until it is manually power cycled. This takes a unit out of service until field personnel arrive for a power recycle. May be used if an errant configuration is causing unintended channel outages and must be removed from service.
Cancel Shutdown	Button	Cancel pending shutdown or reboot if a shutdown was scheduled and it is decided to not to allow follow through. This button immediately cancels the pending action.
Reset Video	Button	Reset Video Streaming Process. May be used to attempt to restart the streaming if it has stopped without applying a reboot which is an action that imposes a longer outage.

Field	Value	Description
Scheduled Reboot	Pop up config.	The Device may be configured to perform a reboot at the time specified in the dialog box. Click into the dialog to configure the time with the pop up time selection menu.
Enable Scheduled Reboot	Checkbox	Tick the <b>Enable Scheduled Reboot</b> box to cause the unit to reboot at the time specified in 'Scheduled Reboot'.
Recurring	Checkbox	Tick <b>Recurring</b> box to cause the reboot every day at the specified time.
Days Between	Integer	If 'Recurring' is ticked, then the number of days between the recurring reboot may be specified. The default is 1 day.
Scheduled Outage Check	Pop up config.	Enabling this feature will cause the system to check for any channels that are not present that should be present. If any are found the system will reboot at the time specified. Click into the dialog to configure the time with the pop up time selection menu.
Enable Scheduled Outage Check	Checkbox	Tick the <b>Enable Scheduled Outage Check</b> box to cause a check at the time specified in 'Scheduled Outage Check'.
Save Reboot Settings	Button	It is necessary to save the changes to the <b>Power</b> settings that were made. Failing to save the settings will result in the changes being discarded when navigating away from the System page.
System Uptime	Integer	This is for information only and shows the running time since the last reboot or power cycle.
Video Enable	Checkbox	Tick the <b>Enable Video Output</b> checkbox to cause the suspension of all output from this Device. This is an easy way to effect a machine wide temporary service suspension without having to make any changes to the configuration. Only Admin and Master users can make this change.
Save Video Enable	Button	Click the <b>Save Video Enable</b> button to save the Video Enable configuration change. Only Admin and Master users can save this change.



**WARNING:** Use of **Shutdown** will require physically cycling the power at the remote unit. It does not restart on it's own.

## 11.4 Serial Number

Serial Number section, Figure 11-5, lists the serial numbers of each installed module and the system itself for record keeping, reference and warranty purposes. CableCARD and MQAM serial numbers are a link to the diagnostics information for those hardware items.

Serial Number	
System:	170309451
Hard Drive:	PHDV65020317150MGN
License Present:	Yes
License Valid:	Yes
Blue #0:	00-70-b3-d5-00-70-62-7d
Green #1:	00-70-b3-d5-00-70-62-7b
Red #2:	00-70-b3-d5-00-70-62-7c
Purple #3:	00-70-b3-d5-00-70-62-40
Yellow #4:	00-70-b3-d5-00-70-62-3d
Aqua #5:	00-70-b3-d5-00-70-61-19
Grey #6:	00-70-b3-d5-00-70-62-41
Gold #7:	00-70-b3-d5-00-70-62-3f
Teal #8:	00-70-b3-d5-00-70-61-16
Orange #9:	00-70-b3-d5-00-70-61-17
MQAM_8CH Unit#0:	MQ165204175
MQAM_8CH Unit#1:	MQ165204219
MQAM_8CH Unit#2:	MQ165204169

Figure 11-5: Serial Number Section

Table 11.4a: Serial Number Section (See Figure 11-5)

Field	Description
System	The serial number of the Device hardware.
Hard Drive	The serial number of the installed hard drive.
Licence Present	Reports on the presence of the firmware licence displaying 'Yes' if a licence has been issued.
Licence Valid	This reports on the validity of the firmware licence displaying 'Yes' if a licence has been validated.
Blue, Green, Etc #0 to #9	MAC Address of the tuner boards each identified by it's unique color. There may be up to 10 of these installed depending on the model of Device.
DQAM_8CH Unit#0 to #3	MAC Address of the installed DQAM Modulators the number of which may be from 1 to 4 if installed. There are no DQAM modulators in Q2IP, Q2A and IP2IP models.

11.5 Unit Info

This information space is provided to allow the operator to more precisely define specifics about the location, account, contact and phone number, Figure 11-6. This information is not used by the system software but is always displayed on the top right corner of the web page. This section may be left blank if not required. Headings cannot be changed. There is no practical limit to the number of alpha numeric characters that may be entered.

Unit Info

Unit Address:

1-501 Clements Road W

Customer Account Number:

R12345

Customer Contact:

Lab Manager

Phone Number:

1-800-428-6068

Save Unit Info

Figure 11-6: Unit Info Section

Table 11.5a: Unit Info Section Settings (See Figure 11-6)

Field	Value	Description
Unit Address	String	The address where the system is installed.
Customer Account Number	String	The customer's account number.
Customer Contact	String	The contact at the customer's premises.
Phone Number	String	The customer's phone number.
Save Unit Info	Button	Any changes must be saved.

11.6 Firmware

This section, Figure 11-7, presents a summary of the installed versions of firmware on each installed tuner board as well as the system firmware version. Each tuner board module firmware version number is a link to the diagnostics information.

Firmware

System Version:

3.2.15.2017.803.2121

Update:

Browse...

No file selected.

Upload

Only master user can apply updates

[License Agreement](#)

Blue #0 Version:

[17.6.1.137, 7421](#)

Green #1 Version:

[17.6.1.137, 7421](#)

Red #2 Version:

[17.6.1.137, 7421](#)

Purple #3 Version:

[17.6.1.137, 7421](#)

Yellow #4 Version:

[17.6.1.137, 7421](#)

Aqua #5 Version:

[17.6.1.137, 7421](#)

Grey #6 Version:

[17.6.1.137, 7421](#)

Gold #7 Version:

[17.6.1.137, 7421](#)

Teal #8 Version:

[17.6.1.137, 7421](#)

Orange #9 Version:

[17.6.1.137, 7421](#)

Figure 11-7: Firmware Section

This is also the location where the system firmware may be updated when required. The update file must reside on a Management Computer local drive or on a local area network drive which is accessible. Click the **Browse** button to navigate to the location of the update file. Click the **Upload** button to start the update process. Firmware update files are provided on request by ATX Networks. You may sign up on the support web site to be notified about new releases.

## 11.7 Network

The network section, Figure 11-8, allows configuration of all necessary network parameters to install the equipment on a public or private network.



**WARNING:** Ensure that the management interface is configured for a different IP network than the input & output interfaces to avoid (but not limited to) loss of communications with access to the web interface and multicast traffic being redirected to the management interface instead of the output interface



**NOTE:** As this section applies to all UCrypt Devices, the Network settings available on your machine will depend on the model of Device. We provide Figure 11-8 as an example only.

If this unit is to be remotely monitored and controlled, it will be necessary to change the default address settings according to your network requirements. If the web interface is to be accessed only by a locally connected Management Computer and will not be on a network with other network Devices, it may be acceptable to leave default network settings as supplied.

### 11.7.1 Changing the Management IP Address

When all required changes have been made in this section, click **Set Network** to save the settings then click **Apply** to cause saved changes to be applied to the Device working configuration. This is service affecting. If the IP address of the system has been changed, the system will restart the network process and the unit will redirect to the new IP address, closing the current browser session.



**NOTE:** If you lost access to the device after changing the network settings, then open a new browser session using the new IP address.

**Network**

Configuration:

IP Address: 10.1.1.95

Netmask: 255.255.252.0

Gateway: 10.1.0.1

Restrict Access by IP/Prefix List: 192.168.0.0 (Comma Separated)

Upload Restricted Access IP/Prefix List:  No file chosen

Restricted Access by IP/Prefix enabled: ☐

DNS Server: 8.8.8.8

DNS Search Domain:

DHCP client mode enabled: ☐

DHCP Hostname: tests

DHCP Static Fallback Lease: ☒

HTTP Port: 80

HTTPS Port: 443

MAC Address: 00:25:90:DA:F0:86

Link: 1000Mb/s

Output Interface	IP/Prefix	DHCP	MAC Address	Link	Mb/s In	Mb/s Out
GbE 0	192.168.150.2/24	<input type="checkbox"/>	00:22:2C:00:69:DE	1000Mb/s	0.00	398.27
GbE 1	192.168.151.2/24	<input type="checkbox"/>	00:22:2C:00:69:DF	1000Mb/s	0.00	398.26
GbE 2	192.168.152.2/24	<input type="checkbox"/>	00:22:2C:00:69:E0	1000Mb/s	0.00	439.10

MPEG Output TTL: 10

MPEG Output Type Of Service (TOS): 0

Only master/administrator user can set network settings

Figure 11-8: Network Section

Table 11.7a: Network Section Configuration Settings (See Figure 11-8)

Field	Value	Applies to	Description
IP Address	IP Address	All	The IP address assigned to this unit.
Netmask	IP Address	All	Set according to the portion of the IP address range required.
Gateway	IP Address	All	The local router address that provides network access to the unit.

Field	Value	Applies to	Description
Restrict Access by IP/Prefix List	IP Address	All	Specify network(s) allowed access. If left blank all networks may access.
Upload Restricted Access IP/Prefix List	IP Address	All	If many address are allowed, then upload a simple text file without any formatting containing the list of addresses, comma delimited, no returns.
Restricted Access by IP/Prefix enabled	Tickbox	All	Enables the feature that restricts access to the addresses in the defined access list.
DNS Server	IP Address or URL	All	If Email alerts are configured on the Alerts page, a DNS server address needs to be specified to resolve the Email addresses. Also required if any URL is entered.
DNS Search Domain	String	All	The local DNS search domain address if required by your Email server. DNS search domain value is for automatically appending additional domain information to e-mail addresses and may be required for some e-mail servers. Leave blank unless you know that a DNS search domain is required.
DHCP client mode enabled	Tickbox	All	This enables the internal DHCP client allowing acquisition of a dynamic IP address. Commonly used when connected to a cable modem.
DHCP Hostname	String	All	The DHCP hostname if required by your DHCP configuration. The default is 'ucrypt'. This name is sent in default alerts.
DHCP Static Fallback Lease	Tickbox	All	When a DHCP address has not been obtained by the management port it will fall back to 192.168.0.23
HTTP Port	Integer	All	This setting defines the HTTP redirect port as the software only supports secure web server connections. If an attempt is made to connect by entering 192.168.0.23, the user is redirected automatically to the secure server HTTPS://192.168.0.23. The standard port for HTTP connections is port 80 and is assumed if no port is specified i.e. 192.168.0.23 and 192.168.0.23:80 mean the same thing to a browser. The redirect port may be specified if port 80 is not appropriate as may be the case behind a firewall.
HTTPS Port	Integer	All	Accessing the equipment remotely by secure connection requires the web server to be presented on a defined port on the IP address assigned. The default and standard HTTPS port is 443 and in this case the port number does not have to be specified in the address, i.e. HTTPS://192.168.0.23 and HTTPS://192.168.0.23:443 mean the same thing to a browser.
MAC Address		All	The Media Access Control Protocol address factory hard coded into the network port to uniquely identify this network card. May be required by your IT department if they manage DHCP server reserved addresses.
Link Speed		All	The link speed negotiated with the Device connected to the management port.
Input Interface GbE 0 IP/Prefix	IP Address	IP Input Models	The IP address of the MPEG Input streaming port 0 labeled GbE0. Address in CDIR notation. xxx.xxx.xxx.xxx/xx
Input Interface GbE 1 IP/Prefix	IP Address	IP Input Models	The IP address of the MPEG Input streaming port 1 labeled GbE1. Address in CDIR notation. xxx.xxx.xxx.xxx/xx
Input Interface GbE 2 IP/Prefix	IP Address	IP Input Models	The IP address of the MPEG Input streaming port 2 labeled GbE2. Address in CDIR notation. xxx.xxx.xxx.xxx/xx
Output Interface GbE 0 IP/Prefix	IP Address	IP Output Models	The IP address of the MPEG Output streaming port 0 labeled GbE0. Address in CDIR notation. xxx.xxx.xxx.xxx/xx
Output Interface GbE 1 IP/Prefix	IP Address	IP Output Models	The IP address of the MPEG Output streaming port 1 labeled GbE1. Address in CDIR notation. xxx.xxx.xxx.xxx/xx
Output Interface GbE 2 IP/Prefix	IP Address	IP Output Models	The IP address of the MPEG Output streaming port 2 labeled GbE2. Address in CDIR notation. xxx.xxx.xxx.xxx/xx
MPEG Output TTL	Integer	IP Output Models	Specify the Time To Live for MPEG output streams.
MPEG Output Type of Service (TOS)	Integer	IP Output Models	Optionally, specify the IPv4 TOS or DSCP (Differentiated Services Code Point) setting in decimal notation or leave blank if you don't use DiffServ.
Set Network	Button	All	After all changes required have been made to network settings, click the <b>Set Network</b> button to save the settings.

## 11.7.2 Restricted IP Addresses

UCrypt Devices with Ethernet Input and/or Output capability have some restrictions on user assigned IP Addresses to avoid conflict with internally assigned ranges according to Table 11.7b. Please avoid using these private IP network ranges anywhere within noted UCrypt Devices.

**Table 11.7b: Restricted IP Addresses**

Start Address	End Address	Applies to
192.168.100.000	192.168.100.255	QAM Output Models
192.168.101.000	192.168.101.255	QAM Output Models
192.168.102.000	192.168.102.255	QAM Output Models
192.168.103.000	192.168.103.255	QAM Output Models
192.168.200.000	192.168.200.255	QAM Input Models
192.168.201.000	192.168.201.255	QAM Input Models
192.168.202.000	192.168.202.255	QAM Input Models
192.168.203.000	192.168.203.255	QAM Input Models
192.168.204.000	192.168.204.255	QAM Input Models
192.168.205.000	192.168.205.255	QAM Input Models
192.168.206.000	192.168.206.255	QAM Input Models
192.168.207.000	192.168.207.255	QAM Input Models
192.168.208.000	192.168.208.255	QAM Input Models
192.168.209.000	192.168.209.255	QAM Input Models
192.168.210.000	192.168.210.255	QAM Input Models
192.168.211.000	192.168.211.255	QAM Input Models

## 11.8 Encryption

### Applies only to XQIP Models

This section is visible only if your Device supports both Pro:I and Simulcrypt encryption such as XQIP Devices which are able to specify the encryption type using AES-128 Fixed Key, Pro:Idiom or Verimatrix (Simulcrypt) or None with a drop down menu choice, Figure 11-9. After changing encryption type, enter the **Master User** password then click the **Set Encryption Type** button to take the changes live.

The screenshot shows a web interface for configuring encryption. The title is "Encryption". Below it, the label "Encryption Type:" is followed by a dropdown menu. The dropdown menu has four options: "None", "Pro:I" (which is highlighted in blue), "Simulcrypt", and "Fixed Key". To the right of the dropdown menu is a text input field with the placeholder text "Pro:I". Below the input field is a button labeled "Set Encryption Type". To the right of the button is a label "Enter master user password to change encryption type".

*Figure 11-9: Encryption Section*

## 11.9 Fixed Key Encryption Profiles

Models that support Fixed Key Encryption have a **Fixed Key Profiles** link, Figure 11-10. Click the link to configure the profiles.



Figure 11-10: Fixed Key Encryption Section

This link points to the page used to create or modify profiles, Figure 11-11, which may be configured with multiple encryption profiles. Use Table 11.9a for configuration guidance. The created profiles will appear as choices to select for each output channel on the Device **Output View** page.

Figure 11-11: Fixed Key Encryption Profiles Form

Table 11.9a: Fixed Key Encryption Profiles (See Figure 11-11)

Field	Value	Action / Description
Profile Name	String	The name you provide to the created profile. A meaningful name will help to avoid confusion and errors.
Cypher Mode	Drop Down Menu	Select the required encryption Mode: <ul style="list-style-type: none"> <li>Electronic Codebook (AES-128- ECB-T)</li> <li>Cypher Block Chaining (AES-128- CBC-T)</li> <li>None (Disabled).</li> </ul>
Select Key	Drop Down Menu	Specifies which encoding key to use for encryption; Even or Odd. Once selected, only the selected key, odd or even, for this profile needs to have the 32 digit key number and IV entered.
Key (even)	String	32 Hexadecimal Digits defining the even 128-bit decryption key for the TS encoding.
IV (even)	String	32 Hexadecimal Digits defining the even initialization vector (IV) for CBC fixed-key TS encoding.
Key (odd)	String	32 Hexadecimal Digits defining the odd 128-bit decryption key for the TS encoding.
IV (odd)	String	32 Hexadecimal Digits defining the odd initialization vector (IV) for CBC fixed-key TS encoding.
Encrypt Audio	Tick Box	Select to enable encryption of audio streams. If not selected, audio will be in the clear.
Scrambling %	Integer	Enter a value between 0 and 100 representing the depth of encryption. Very low values may not provide adequate security while very high values increase the Device processor load.
Create New	Link	Use this link to begin to create a new profile. After completing the profile form, click the <b>Create New</b> button to create the new profile and display it in the list. You will need to click Apply to finish creating the entry.
Create New	Button	This button is visible only when a new profile is being created. After completing the profile form, click the <b>Create New</b> button to create the new profile and display it in the list. You will need to click Apply to finish creating the entry.
Save Changes	Button	This button is visible only when a new profile is being created. Click to save any configuration changes without applying them. This is not service affecting and allows navigating to other pages without losing the changes.

Field	Value	Action / Description
Save as new profile	Button	This button is visible only when a new profile is being created. Saves the open profile to be saved as a new profile.
Choose File	Button	To import a Decryption Profile file, first click the <b>Choose File</b> button and browse to the file using the file explorer window that opens.
Import CSV/JSON	Button	After selecting the Decryption Profile file, click to import the file to the Device.
Export CSV	Button	Exports all of the Decryption Profiles to a CSV file.
Export JSON	Button	Exports all of the Decryption Profiles to a JSON file.
Delete Profile	Button	Deletes the currently highlighted Decryption Profile.
Apply	Button	Causes saved changes to be applied to the Device working configuration. This is service affecting.

### 11.9.1 Encryption Profiles Export

When exporting a JSON or CSV Encryption Profiles file, all existing profiles are exported into a single file. It is possible to create your own CSV or JSON profiles file to deploy across many Devices but it may be best to first create a profile on the Device then export it to use an example for syntax when defining your file parameters. Example files are shown below for both CSV and JSON file formats opened in Notepad++ which is capable of opening and saving both file formats.

#### JSON File Export

Screen capture of example file below:

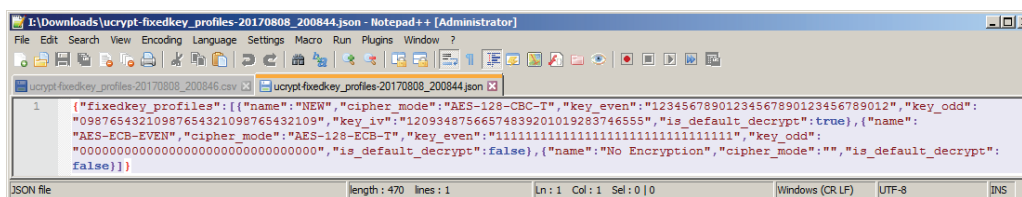


Figure 11-12: JSON File Export

The following is the text of the JSON file shown above:

```
{
  "fixedkey_profiles": [
    {
      "name": "NEW",
      "cipher_mode": "AES-128-CBC-T",
      "key_even": "12345678901234567890123456789012",
      "key_odd": "09876543210987654321098765432109",
      "key_iv": "12093487566574839201019283746555",
      "is_default_decrypt": true
    },
    {
      "name": "AES-ECB-EVEN",
      "cipher_mode": "AES-128-ECB-T",
      "key_even": "11111111111111111111111111111111",
      "key_odd": "00000000000000000000000000000000",
      "is_default_decrypt": false
    },
    {
      "name": "No Encryption",
      "cipher_mode": "",
      "is_default_decrypt": false
    }
  ]
}
```

#### CSV File Export

Note that for creating the CSV file format within a text editor, if there is a space in the Name that you assign to the profile, the name must be enclosed in double quotes. The default profile is indicated by a 1 in the 'is\_default\_decrypt' column. Separate line for the headers and for each profile.

Screen capture of example below:

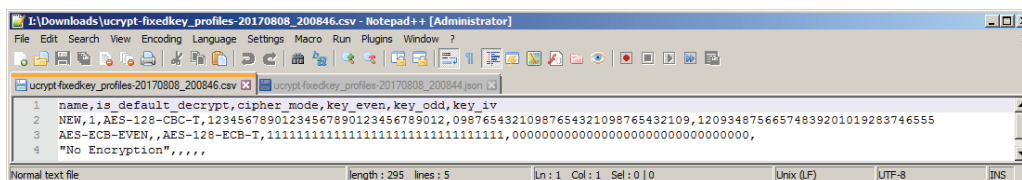


Figure 11-13: CSV File Export

The following is the text of the CSV file shown above:

```
name,is_default_decrypt,cipher_mode,key_even,key_odd,key_iv
NEW,1,AES-128-CBC-T,12345678901234567890123456789012,0987654321098765432109,12093487566574839201019283746555
AES-ECB-EVEN,,AES-128-ECB-T,11111111111111111111111111111111,00000000000000000000000000000000,
"No Encryption",,,,,,
```

## 11.10 Fixed Key Decryption

Models that support Fixed Key Decryption have a **Fixed Key Profiles** link, Figure 11-14. Click the link to configure the profiles



Figure 11-14: Fixed Key Decryption Section

The link points to the page used to create or modify profiles, which may be configured with multiple Fixed Key Profiles, see Figure 11-15 and use Table 11.10a for guidance.

Figure 11-15: Fixed Key Decryption Profiles Form

Table 11.10a: Fixed Key Decryption Profiles (See Figure 11-15)

Field	Value	Action / Description
Profile Name	String	The name you provide to the created profile. A meaningful name will help to avoid confusion and errors.
Cypher Mode	Drop Down Menu	Select the required encryption Mode: <ul style="list-style-type: none"> <li>Electronic Codebook (AES-128- ECB-T)</li> <li>Cypher Block Chaining (AES-128- CBC-T)</li> <li>None (Disabled).</li> </ul>
Key (even)	String	32 Hexadecimal Digits defining the even 128-bit decryption key.
Key (odd)	String	32 Hexadecimal Digits defining the odd 128-bit decryption key.
IV	String	32 Hexadecimal Digits defining the initialization vector (IV) for CBC fixed-key.
Create New	Link	Use this link to begin to create a new profile. After completing the profile form, click the <b>Create New</b> button to create the new profile and display it in the list. You will need to click Apply to finish creating the entry.
Create New	Button	This button is visible only when a new profile is being created. After completing the profile form, click the <b>Create New</b> button to create the new profile and display it in the list. You will need to click Apply to finish creating the entry.
Save Changes	Button	This button is visible only when a new profile is being created. Click to save any configuration changes without applying them. This is not service affecting and allows navigating to other pages without losing the changes.
Save as new profile	Button	This button is visible only when a new profile is being created. Saves the open profile to be saved as a new profile.
Choose File	Button	To import a Decryption Profile file, first click the Choose File button and browse to the file using the file explorer window that opens.
Import CSV/JSON	Button	After selecting the Decryption Profile file, click to import the file to the Device.
Export CSV	Button	Exports all of the Decryption Profiles to a single CSV file.
Export JSON	Button	Exports all of the Decryption Profiles to a single JSON file.
Delete Profile	Button	Deletes the currently highlighted Decryption Profile.
Apply	Button	Causes changes to be saved and applied to the Device working configuration. This is service affecting.

### 11.10.1 Decryption Profiles Export

Encryption and Decryption profiles are the same. See “11.9.1 Encryption Profiles Export” on page 11-9.

### 11.11 Health

The system has been provided with some basic diagnostic features that help to keep it in good “Health” by monitoring internal functions and which in turn can be used by the ATX support team in diagnosing internal problems, Figure 11-16. The system also monitors itself and reports on cooling issues like the temperature of CPU cores and fans.

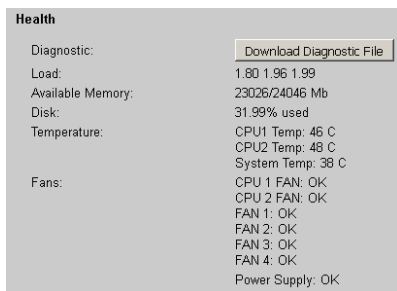


Figure 11-16: Health Section

Table 11.11a: Health Section Details (See Figure 11-16)

Field	Description
Diagnostic	This section provides some diagnostic information for troubleshooting problems which could occur due to unanticipated conditions. Facilities are available to download a file which can be used by ATX Networks Engineers to help resolve issues that occur in the field.  If requested by your ATX Support Engineer, download the diagnostic file to the management computer by clicking the button provided. A period of about 30 seconds is required for the equipment to compile the file, at which time your browser will present you with a dialog prompting you to save the file. Save the file to a local drive. The file can vary in size and could be large depending on configuration. E-mail this file to your ATX Support Engineer directly. The format of the file is not meant to be end user readable.
Load:	This summarizes the underlying Linux software system CPU load showing the <u>average</u> load over time: 1 MINUTE 5 MINUTES 15 MINUTES.
Available Memory:	This summarizes the system RAM memory ratio: FREE RAM / AVAILABLE RAM.
Disk:	Reports on the amount of space used on the internal hard drive. Do not allow this to approach 100%.
Temperature:	The CPU cores (the number of which depends on the model of your Device) are monitored for temperature and displayed in degrees Celsius (°C). The values shown on this page are not constantly updated in real time, they are updated only when the page is refreshed with the F5 key or CTL+F5. Core temperatures should not exceed +70° C which is the threshold for setting the temperature alarm alert if configured. If these temperatures are constantly in a range close to the threshold, try to ensure the installation environment is kept cooler. For more details, see “Alerts” on page 11-13 & “Temperature Error” on page 10-2.
Fans	There are a number of cooling fans monitored depending on the Device model. The status of each fan is illustrated here by indicating the assessed condition of the fans which will be OK or Failure. If a fan is reported to be failed, the fan should be changed as soon as practical. Fans may be removed from the front panel simply by removing four Phillips screws and a power plug and this may be done while the unit is in service. Fan errors are automatically cleared after replacement.
Power Supply	This reports on the condition of the single or dual power supply installed. Reports OK or Failure.

## 11.12 Time

The system uses time to keep records of alerts, logs and for automatic operations such as reboot schedules. The time may be taken from an installed CableCARD module or may be entered manually.

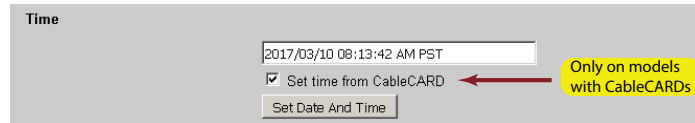


Figure 11-17: Time Section

### 11.12.1 Time Dialog box

Manually adjusting the time is done by first unticking the box **Set Time from CableCARD** if there is one on your model, then clicking the time dialog box which opens an adjustment matrix as shown in Figure 11-18. The process is intuitive; just click the boxes for the time and date and time zone then click **Set Date And Time** button.

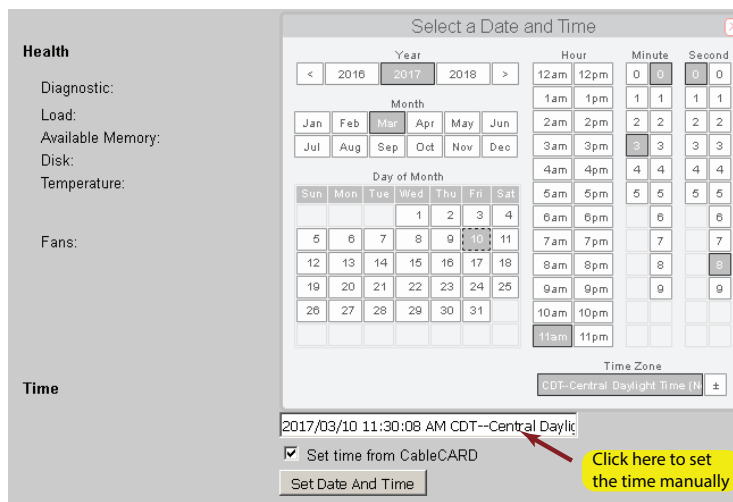


Figure 11-18: Adjusting the Time Matrix

### 11.12.2 Set Time From CableCARD™

If your model has a CableCARD installed, Tick this box to have the time set based on the time code on the encryption system, or un-tick if the time needs to be set manually.

## 11.13 Logging

The system will log critical and informational processes that may be important for troubleshooting and that text log is accessible from the **View Log** link, Figure 11-19. It may be copied from your browser by highlighting it and saved for reference.

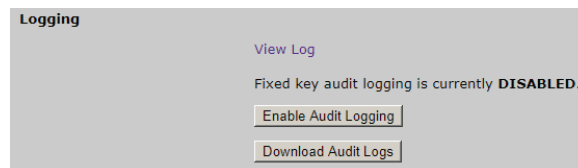
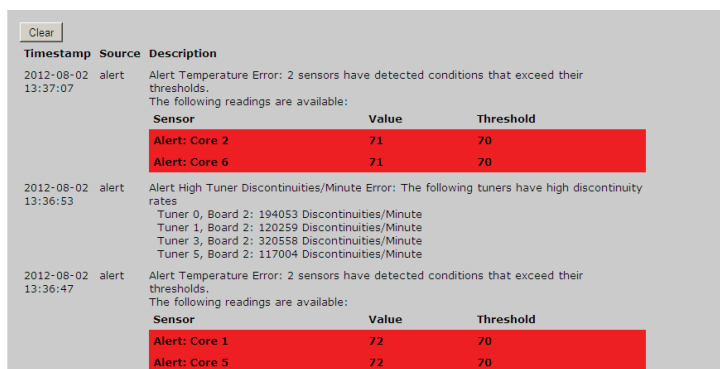


Figure 11-19: Logging Section

### 11.13.1 View Log

The format of the log when opened, Figure 11-20, is designed to be informative to the field personnel. Usually the log will be referred to when a problem has arisen and support personnel are troubleshooting. A copy of the file may be taken by copying the text to the clipboard. Open a text editor and paste the text. Save as a .txt file. If requesting support from ATX Networks Support Engineers, you may be asked to send a copy of this log to the engineer. From time to time, if there have been no issues with the equipment, it is acceptable to clear the log. The clear button can be found at the top of the log screen.



Timestamp	Source	Description									
2012-08-02 13:37:07	alert	Alert Temperature Error: 2 sensors have detected conditions that exceed their thresholds. The following readings are available: <table border="1"> <thead> <tr> <th>Sensor</th> <th>Value</th> <th>Threshold</th> </tr> </thead> <tbody> <tr> <td>Alert: Core 2</td> <td>71</td> <td>70</td> </tr> <tr> <td>Alert: Core 6</td> <td>71</td> <td>70</td> </tr> </tbody> </table>	Sensor	Value	Threshold	Alert: Core 2	71	70	Alert: Core 6	71	70
Sensor	Value	Threshold									
Alert: Core 2	71	70									
Alert: Core 6	71	70									
2012-08-02 13:36:53	alert	Alert High Tuner Discontinuities/Minute Error: The following tuners have high discontinuity rates Tuner 0, Board 2: 194053 Discontinuities/Minute Tuner 1, Board 2: 120259 Discontinuities/Minute Tuner 3, Board 2: 320558 Discontinuities/Minute Tuner 5, Board 2: 117004 Discontinuities/Minute									
2012-08-02 13:36:47	alert	Alert Temperature Error: 2 sensors have detected conditions that exceed their thresholds. The following readings are available: <table border="1"> <thead> <tr> <th>Sensor</th> <th>Value</th> <th>Threshold</th> </tr> </thead> <tbody> <tr> <td>Alert: Core 1</td> <td>72</td> <td>70</td> </tr> <tr> <td>Alert: Core 5</td> <td>72</td> <td>70</td> </tr> </tbody> </table>	Sensor	Value	Threshold	Alert: Core 1	72	70	Alert: Core 5	72	70
Sensor	Value	Threshold									
Alert: Core 1	72	70									
Alert: Core 5	72	70									

Figure 11-20: Sample Log Output

### 11.13.2 Enable Audit Logging

Click the **Enable Audit Logging** button, Figure 11-19, to enable the creation of Fixed Key Decryption audit logs which may be used to troubleshoot decryption problems, address issues with profiles or trace changes made to the profiles.

### 11.13.3 Download Audit logs

The audit logs are consolidated into a zip file and saved in .json file format which may be opened with Notepad++. Click the **Download Audit Logs** button, Figure 11-19, to save the logs to your browser's download folder.

## 11.14 Alerts

In the 'Alerts' section, clicking the **Alert Settings** link opens the **Alert Settings and Status** page, see Figure 11-22.



Figure 11-21: Alerts Section

### 11.14.1 Email Alert Settings and Status

All Devices can provide email alerts from a number of detected error events. The email configuration is done in the **Email Alerts** section, Figure 11-22. Each alert may be enabled individually by clicking the associated **Alert Enables** check box, Figure 11-25. After configuration changes, click the **Save Alert Settings** button, see Figure 11-25.

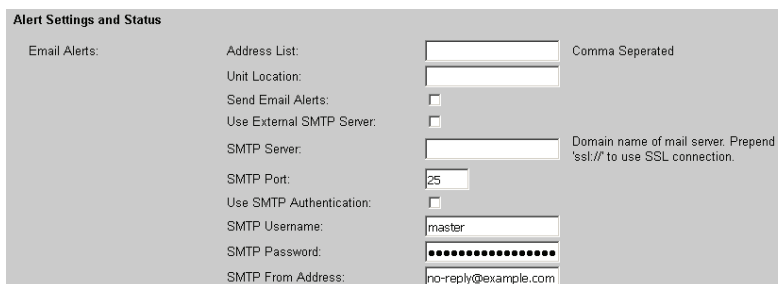


Figure 11-22: Email Alerts Section



**FYI:** For more details about Alerts, see also "Alerts" on page 10-1

**Table 11.14a: Email Alerts Configuration (See Figure 11-22)**

Field	Value	Description
Address List	Email Address	The list of email addresses that will receive the alerts from this unit. Multiple addresses need to be comma separated.
Unit Location	String	Text describing the unit so the recipient knows which unit has sent the alert. This may be a street address or client name.
Send Email Alerts	Tickbox	Enable the alerts to be sent to a recipient email address.
Use External SMTP Server	Tickbox	Use an external mail server. Un-tick to use the internal UCrypt Device mail server.
SMTP Server	String	Domain name of external mail server. Server names requiring TLS connections may be entered directly, i.e. <b>smtp.gmail.com</b> . Prepend 'ssl://' to use SSL connection.
SMTP Port	Integer	Port number to be used to send mail to the external mail server, usually 25 or 587.
Use SMTP Authentication	Tickbox	Enables SMTP authentication then fill in the SMTP Username and Password.
SMTP Username	String	Username for SMTP authentication.
SMTP Password	String	Password for SMTP authentication.
SMTP From Address	Email Address	The email address used to identify the 'sender'. Since the UCrypt Device itself does not have an email address, this will be how you identify the Device that sent the email. May be required by the SMTP mail server but may not be required to be a real email address.

### 11.14.2 Activating Email Alerts

These notifications are sent to the Email addresses entered in the address list. Internet access is required as are valid DNS Server and Gateway addresses. See ["Network" on page 11-5](#) for more details.

To activate Email alerts:

- Enter a single Email address in the 'Address List' dialog box. Multiple addresses are supported when separated by commas. Later removal of addresses is done by editing the persistent list of addresses.
- Enter the physical location for identification. This text will be sent with the notification and is also shown on the Management Computer screen below logged in User.
- Click the **Send Email Alerts** check box.
- Click the **Save Alert Settings** button at the page bottom.
- Click the **Test Alert Settings** button at the page bottom.
- If the test message is not received, check the network configuration. A valid Gateway and DNS Server may be missing or Internet access may not be available.

### 11.14.3 SNMP Alerts

Sending SNMP traps to a single remote SNMP Management Console is supported, Figure 11-23. The SNMP manager will require the UCrypt Device MIB to be compiled into its MIB database. The MIB is stored on the hard drive and is accessible by following the **MIB** hyperlink, Figure 11-23. Right click the link and select "Save Link As" then save the MIB file to your computer drive. This file will need to be compiled into the MIB database of the SNMP manager.

Figure 11-23: SNMP Alerts Section

### SNMP Alerts Configuration (See Figure 11-23)

Field	Value	Description
Address	IP Address	Enter the IP address of the SNMP manager computer. Only one address is supported.
SNMP Alert Community	String	The default Alert Community is 'public' and this must match the setting of the SNMP manager. It may be changed here if required.
SNMP Read Community	String	The read community must be set the same on the UCrypt Device software and Management software. This is set to <b>ucrypt_snmp_community</b> .

SNMP Write Community	String	The read community must be set on the Management software in order to write to the UCrypt Device. This is set to <b>ucrypt_write_snmp_community</b> .
SNMP Protocol Version		For information only, the SNMP version is v2c.
Send SNMP Alerts	Tickbox	Ticking this box activates the sending of alerts.
Persistent Interval	Integer	The number of minutes entered here keeps the alert persistent for the amount of time specified. This prevents the alerts from being re-transmitted repeatedly if the alert conditions becomes triggered on and off in a short time.

### 11.14.4 Remote Syslog Logging

This feature, Figure 11-24 forwards syslogs to a remote server. Click the button **Save Alert Settings** if changes are made to this section.

Figure 11-24: Remote Syslog Logging Section

Table 11.14b: Remote Syslog Logging Configuration (See Figure 11-24)

Field	Value	Description
Enable	Tickbox	Ticking this box activates the sending of syslogs to the specified syslog server.
IP	IP Address	Enter the IP address of the remote syslog server. Only one address is supported.
Port	Integer	The port number associated with the IP address of the remote syslog server.
Protocol	Dropdown Menu	The default and recommended protocol is UDP but TCP may be selected.

### 11.14.5 Alert Enables

This is the section where optional alerts may be enabled for sending, Figure 11-25. Configuration is explained in Table 11.14c and the actual alerts is explained in Table 11.14d. While Figure 11-25 and Table 11.14d list all possible alerts for all UCrypt models, some models will have only a subset of this list of alerts.

Figure 11-25: Alert Enables Section

Table 11.14c: Alert Enables (See Figure 11-25)

Field	Description
Name	This is the name given to the alert.
Count	This column tracks the number of time this alert was detected since the alerts were last reset.
Active	This column allows the alert to be activated and will send an alert by Email and SNMP. Tick to activate.
Persistent	Ticking this column keeps the alert persistent for the time specified in the <b>Persistent Interval</b> box, see Figure 11-23. This prevents the alert from being re-transmitted repeatedly if the alert condition becomes triggered on and off in a short time.



**FYI:** Alerts are explained in detail in the Alerts Chapter, “Alerts” on page 10-1.

**Table 11.14d: System Alerts (See Figure 11-25)**

Event Name	Condition Detected
Temperature Error	The internal temperature of the CPU core has exceeded the limit temperature. This usually indicates the ambient air temperature is too high.
Fan Error	A fan failure has been detected.
EAS Event	There has been an EAS event detected.
Channel Map Update Exception	An instance where the system is not able to accommodate a program move as reported via a channel map update due to insufficient remaining tuners.
CableCARD™ Entitlement Error	A failure in the Entitlement of a program on a CableCARD module has been detected. A program selected for decryption possibly currently lacks entitlement on a module.
Tuner Lost PCR Lock Error	A tuner has lost PCR (Program Clock Reference) lock on an MPEG program.
Lost OOB Lock Error	The OOB carrier tuner has lost its lock on the carrier.
High Tuner Discontinuities/Minute Error	Abnormally high discontinuities/Minute in the MPEG transport stream detected on a tuner.
Program Lost Bitrate Error	A single Program has no associated video or audio bitrate.
SDV Lost Resolve Error	The Tuning Resolver is no longer resolving its channel plan.
Tuning Resolver Lost Lock Error	The Tuning Resolver has lost tuning lock.
Power Supply Failure	One of the two available power supply modules has failed or lost AC input power.
Plant Maintenance Exception	If Scheduled Outage Check was enabled, this alert will list any program(s) that were detected as not working or not decrypting.
Tuner Board Configured But Not Detected	If a tuner board has been configured but due to a possible hardware failure, the tuner is no longer detected, this alert will be expressed.
System Booted	Detects system reboots.
SNMP Trap Test	Tick to enable a test of the SNMP traps sender without sending all selected traps.

### 11.14.6 Configuring SNMP Alerts

To set up the system to send SNMP traps do the following:

1. Download and save the MIB file from the Management Interface.
2. Compile the MIB into the SNMP Manager database.
3. Enter a single IP address in the Address dialog box. Multiple IP addresses are not supported.
4. Enter the **SNMP Alert Community** if it is not the default “public”.
5. Click the **Send SNMP Alerts** check box.
6. Click the **Save Alert Settings** button at the page bottom
7. Click the **Test Alert Settings** button at the page bottom
8. If the test message is not received, check the network configuration. A valid Gateway may be missing or Internet access may not be available.

### 11.14.7 Clear Alert Counts

The software increments a register every time it detects an event in the alerts list. This number is displayed in the Management Interface beside the alert name. After a time, the units may accumulate a large number of alerts in its registers and it will be desirable to reset that count to zero. Click the **Clear Alert Counts** button to zero all the alert counters.

## 11.15 Support for SNMP Deployment

### SNMP Walks

SNMP walks may be performed on branch nodes of the MIB. In order to perform walks, you must first ensure that the read community for the SNMP agent is set to ucrypt\_snmp\_community in your MIB browser. Download the MIB from the UCrypt Device **Alert Settings** page and compile it into your MIB browser. Assuming that a graphical browser is used, the entire MIB structure should now be visible. Select and perform walks on branch nodes of the UCrypt Device MIB. Walks cannot be performed on the MIB itself as the MIB tree is access controlled all the way down to the UCrypt Device MIB.

## SNMP Writes

There are two functions that allow SNMP writes. (A value of 1 should be written to perform the reboot and restarts):

- Reboot System
- Powercycle System.

## General Arrangement of MIB

### System

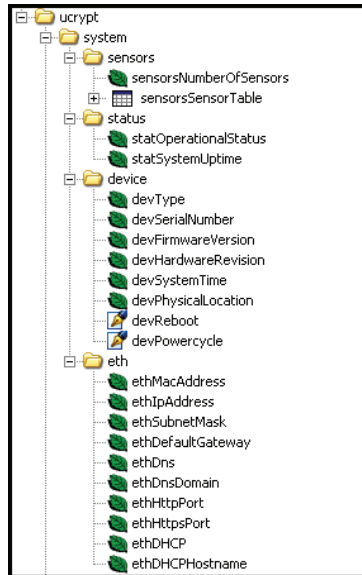


Figure 11-26: MIB - System Section

### Channels

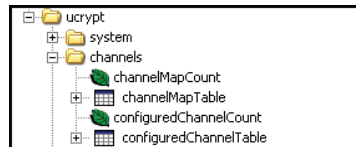


Figure 11-27: MIB - Channels Section

### Boards

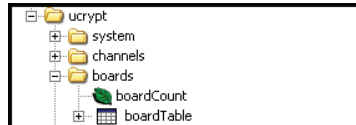


Figure 11-28: MIB - Boards Section

### Tuners



Figure 11-29: MIB - Tuners Section

Traps



Figure 11-30: MIB - Traps Section

Outputs

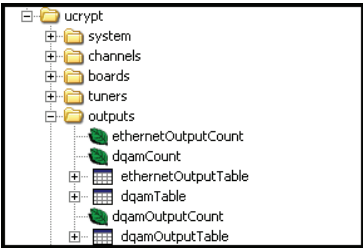


Figure 11-31: MIB - Outputs Section

11.16 PSIP

This section, Figure 11-32, enables the generation of PSIP tables. Configuration is done on the PSIP/EPG tab which appears after enabling it here, see “[PSIP & EPG Configuration](#)” on page 8-1. To enable PSIP/EPG generator, click the box and then **Save PSIP Settings** button.

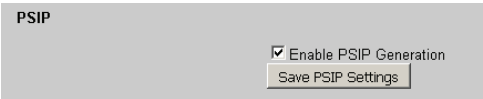


Figure 11-32: PSIP Section

## 11.17 Channel Map

Channel Maps, which are also known as Virtual Channel Tables (VCT), are sent by the Cable Services Provider to inform the system set top boxes or compatible Devices where to tune to receive the desired program when making channel changes. The map is transmitted periodically on the Out Of Band (OOB) carrier which is generally located in the low band region of the cable spectrum. The exact location of the OOB carrier may vary between systems and operators but is automatically detected by the OOB tuner. The OOB tuners of the UCrypt Device are co-located with the QAM tuners and one is provided for each active CableCARD module. The status of OOB tuners is indicated on the bottom of the 'Channel View' tab.

### 11.17.1 Channel Following Policy

Some Cable Service Providers make frequent program location changes within the channel map. Programs are moved to different QAM channels and these changes are reflected in an updated channel map. Ordinarily, this does not cause a problem to customers as their digital set top box receives the updated map and then can easily discover the location of the moved program on a different QAM carrier with its new cable channel number or name.

The UCrypt Device must also recognize these changes and then find and deliver the desired program if it was moved from its previously known position. The system is able to continuously monitor the channel map for changes and automatically adjust the tuned location of the desired program however it must be informed which VCT parameter will always be held constant in the event of a change. This is done by choosing the appropriate policy from the drop down menu box, Figure 11-33.

By selecting the constant parameter from the drop down menu, the operator informs the unit to pay attention to this value and tune to the correct QAM carrier and program number to find the desired content. All changes in the channel map occurring after setting the value, will be followed according to the selection.

Figure 11-33: Channel Map Section

Table 11.17a: Channel Map Configuration (See Figure 11-33)

Field	Value	Action / Description
Channel Following Policy	Dropdown Menu	i) The <b>Channel Number</b> is constant and will be tracked and followed. ii) The <b>Channel Name</b> is constant and will be tracked and followed. iii) The <b>Channel Source ID</b> is constant and will be tracked and followed.
Set Following Policy	Button	Sets the Channel Following Policy chosen above.
CableCARD to receive channel map	Dropdown Menu	Selection options are 'All' or any individual installed card, all listed separately. This sets the card from which channel maps are received. Selecting 'All' will merge all maps from all cards.
Set Channel Map CableCARD	Button	Causes the map selection to be applied.
SDV Channel Map - Automatically merge map	Tick Box	This setting determines how SDV channel maps are merged into the main system channel list. If checked, all channels received from the Tuning Resolvers will be automatically merged. If not checked, only the user specified channels will be merged in.
Save SDV Channel Map Settings	Button	Causes the <b>Automatically Merge Map</b> tick box choice to be applied
View SDV Channel Map	Link	Opens a new page, Figure 11-34, to display the SDV channels. Nothing is displayed until a tuning resolver is installed and configured.

Figure 11-34: SDV Channel Map

## 11.18 Emergency Alert System (SCTE18)

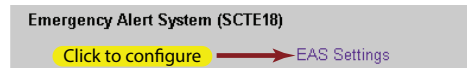


Figure 11-35: Emergency Alert Section

Emergency Alert System (EAS) in the United States disseminates emergency warnings of pressing local, regional, or national importance over a variety of networks and it is a requirement of all associated carrier equipment to support the EAS system to the greatest extent possible. The Emergency Alert System configuration page is accessed here, Figure 11-35, click the **EAS Settings** link.



**FYI:** Configuration of the EAS features is described fully in chapter “Emergency Alert System” on page 9-1.

## 11.19 Simulcrypt Encryption

### Applies only to SQIP and XQIP Models

These models support the DVB Simulcrypt Architecture with an integrated Entitlement Control Message Generator (ECMG) which may be configured and multiple ECMG profiles created. If this feature exists on your Device, this section on the System page will exist as shown in Figure 11-36. Click either link to view or change configuration.

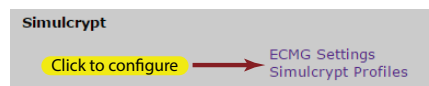


Figure 11-36: Simulcrypt Section

Figure 11-37: Simulcrypt Profiles

Table 11.19a: Simulcrypt Profile Settings (See Figure 11-37)

Field	Value	Action / Description
Profile Name	String	The name given to the created profile. A meaningful name will help to avoid confusion and errors.
Default	Tick Box	This tick box indicates if this profile was set as the system default profile when created.
Scrambler Algorithm	Drop Down Menu	Choices of encryption include Electronic Codebook (ECB1 and ECB2) and Cypher Block Chaining (CBC1) or Encryption Disabled.
Encrypt Audio	Tick Box	If ticked, the program audio stream is encrypted as well as the program video stream.
Crypto Period	Integer	Number of seconds that a particular Control Word (CW) is being used by the scrambler.
Scrambling Percent	Integer	Valid entries between 1 and 100 determine the depth of the encryption; higher percent means content is more deeply encrypted and thus less viewable.
Create New	Button	This button is visible only when a new profile is being created. After completing the profile form, click <b>Create New</b> to create the new profile and display it in the list. You will need to click Apply to finish creating the entry.

Field	Value	Action / Description
Save Changes	Button	Click to save any configuration changes without applying them. This is not service affecting and allows navigating to other pages without losing the changes.
Save as new profile	Button	Saves the open profile to be saved as a new profile.
Delete Profile	Button	Click to delete the current profile.
Apply	Button	Causes changes to be saved and applied to the Device working configuration. This is service affecting.

Figure 11-38: ECMG Profiles

Table 11.19b: ECMG Profile Settings (See Figure 11-38)

Field	Value	Action / Description
Profile Name	String	The name given to the created profile. A meaningful name will help to avoid confusion and errors.
Default	Tick Box	This tick box indicates if this profile was set as the system default profile.
Interface	Drop Down Menu	Defines the interface that the the ECMG will communicate on. Choices are Management and MPEG output interfaces 0, 1 or 2.
IP Address	IP Address	The IP address of the ECMG.
Port	Integer	The port number associated with the ECMG.
CA System ID	Integer	The CA System number assigned to the ECMG.
Create New	Button	This button is visible only when a new profile is being created. After completing the profile form, click <b>Create New</b> to create the new profile and display it in the list. You will need to click Apply to finish creating the entry.
Save Changes	Button	Click to save any configuration changes without applying them. This is not service affecting and allows navigating to other pages without losing the changes.
Save as new profile	Button	Saves the open profile as a new profile with the same name and settings..
Delete Profile	Button	Click to delete the current profile. The default profile may not be deleted until another profile is first made the default.
Apply	Button	Causes changes to be saved and applied to the Device working configuration. This is service affecting.

11.20 PID/PSI Filtering

Some specific functionality is provided to filter PIDs and was created to limit the number of PIDs being presented to the CableCARD modules. If you don't know exactly why you are selecting these options, you likely don't need to. Contact ATX Networks for details. There are three options, Figure 11-39 and Table 11.20a.

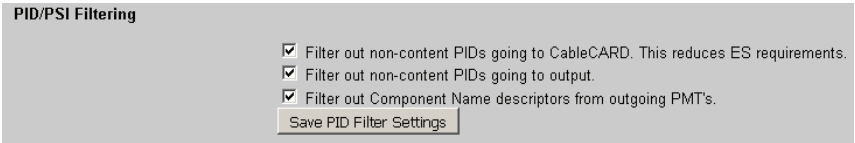


Figure 11-39: PID Filtering Section

Table 11.20a: PID/PSI Filtering Configuration (See Figure 11-39)

Field	Value	Action / Description
Filter out non-content PIDs going to CableCARD module. This reduces ES requirements	Tick Box	Ticking this box will remove or not allow any PIDs containing non audio/video data to be passed to the modules. Some CableCARD module firmware limited the number of PIDs that could be processed; this works around this limitation, if present. The net effect is to allow the elementary streams for the service to pass unimpeded.
Filter out non-content PIDs going to output	Tick Box	Ticking this box will remove or not allow any PID containing data to be passed to the output multiplex or QAM. Some hotel systems wish to receive only the relevant elementary streams so this option limits the number of PIDs that will be passed to the hotel operator. The net effect is to allow the elementary streams for the service to pass unimpeded to the output.
Filter out Component Name descriptors from outgoing PMT's.	Tick Box	This selection is intended to save bandwidth and prevent the PMT from being larger than 1 packet.
Save PID Filter Settings	Button	Causes the <b>PID/PSI Filtering</b> tick box choices to be applied


Click the button **Save PID Filter Settings**  to save the changes made. This is not service affecting. The changes, however do not come into effect until the **Apply** button is clicked on any other page, see Figure 11-40; there is no Apply button on the System page.



Figure 11-40: Apply Required

11.21 Capture Input & Output

**Applies to all models (QAM to Analog may capture input only)**

The system provides a utility for capturing video streams for analysis, access it by clicking the link **Capture Input/Output**, Figure 11-41. The capture will be for the entire channel multiplex, not an individual program within the channel. Since the root cause of many problems that arise are caused by stream issues, this allows the operator to capture a stream without the need for test equipment which is often not available at the time it is needed. The resulting video file may be several hundred megabytes and this will be indicated in the captured file name. The available storage space for video files on the system's hard drive is several hundred gigabytes but do not retain files after they are no longer needed. Storing too many video files may affect Device performance.



Figure 11-41: Stream Capture Section

Clicking the link opens a new page, Figure 11-42, for configuring stream/file capture. The input and output capture Devices that you find there will depend on the model of the UCrypt Device. QAM input units will list tuner boards while IP input units will list Ethernet channels. Output choices will correspondingly show the style of output available, either DQAM, EIA or Ethernet channels. Our example here is representative only. You will possibly find different choices available on your equipment.

The screenshot shows a web-based configuration page titled "Capture Input/Output Video:". It contains two main sections for configuration. The first section, "Capture Input:", has a dropdown menu for "Capture Input:" set to "Input Ethernet #0 Channel #0", a "Progress:" indicator showing "Not started", and a "Start Input Capture" button. The second section, "Capture Output:", has a dropdown menu for "Capture Output:" set to "DQAM #0 - Channel #0 - EIA 73 - 519000 KHz", a "Progress:" indicator showing "Not started", and a "Start Output Capture" button. Below these is a "Captures:" section showing "No captures yet" and three buttons: "Download Selected", "Send Selected to FTP", and "Delete Selected". An "FTP Upload progress:" indicator shows "Not started". The "Settings:" section includes fields for "Capture Length:" (set to 30 seconds, with a note "Max 900."), "FTP Server/Port:", "Path:" (set to "/pub"), "Username:" (set to "anonymous"), and "Password:". A "Save Settings" button is at the bottom.

Figure 11-42: Stream Capture Page

Table 11.21a: Capture Input/Output Video Configuration (See Figure 11-42)

Field	Value	Action / Description
Capture Input	Dropdown Menu	The menu lists the active tuner boards for the purpose of capturing the video stream. After selecting the correct tuner, click the <b>Start Input Capture</b> button. Progress will be reported next to the button
Capture Output	Dropdown Menu	The menu lists the active output MPTS channels for the purpose of capturing the video stream. After selecting the correct output multiplex channel, click the <b>Start Output Capture</b> button.
Captures	List	When a capture is initiated, the file is named with a naming convention as follows: input/output_interface #_tuner #_yyyymmdd_hhmm.ts file size Mb This naming format differs slightly between models depending on interfaces. See Figure 11-43 for capture files examples.
Download Selected	Button	If the file is to be saved to the local computer, select the file (you may only select a single file at a time) for action by ticking the radio button for the file(s) then click <b>Download Selected</b> . A file manager window will open where the target directory may be selected.
Send Selected to FTP	Button	To initiate an FTP file transfer to the specified server, select the files to be transferred by clicking the radio buttons on the files then click <b>Send Selected to FTP</b> . The server address and login must first be saved.
Delete Selected	Button	To delete files, select from the list with the radio button then click <b>Delete Selected</b> .
Capture Length	Integer	This determines the length of capture in seconds. The maximum for any single capture is 15 minutes.
FTP Server/Port	IP Address	The system has an integrated FTP client which can send captured files to an FTP server streamlining the transmission of files to ATX technical support. the addresses may be entered in the following formats: <ul style="list-style-type: none"> <li>IP address without port number: i.e. 192.168.100.10 (Port 21 default).</li> <li>IP address + port number: i.e. 192.168.100.10:2121</li> <li>URL resolvable by a name server: i.e. 'corp.ftp.com'</li> <li>URL resolvable by a name server + port number: i.e. 'corp.ftp.com:2121'</li> </ul>
Path	String	This is the path of the directory on the FTP server where the file will be uploaded. This directory must exist on the target server; it will not be created if it does not exist. If left blank, the file will be sent to the root directory of the server. No spaces in the path name. Example format: /video_files/UCrypt/upload
Username	String	The username required to log into the FTP server for authentication purposes. The username 'anonymous' may be used if the server is configured for that.
Password	String	The password of the username for authentication purposes if required by the FTP server.
Save Settings	Button	Click to save any changed settings.

:

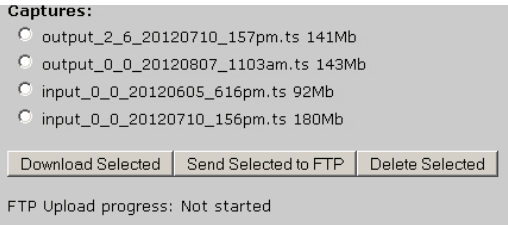


Figure 11-43: Captured Video Files List

11.22 Product Type

A description of the capabilities of the UCrypt Device, Figure 11-44.

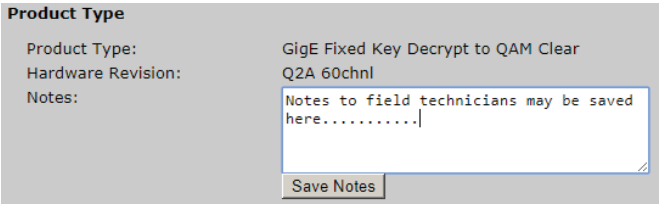


Figure 11-44: Product Type

11.22.1 Product Type

This section is for information only and displays the functional version of the UCrypt Device (QAM to Analog, QAM to GigE, etc) and options installed such as encryption. The illustrated product in Figure 11-44 is only an example and will differ from what you see on your product.

11.22.2 Hardware Revision

This section describes the actual hardware that the Device uses.

11.22.3 Notes:

This is a "Notepad" available for user text notes about this UCrypt Device, Figure 11-44. Any textual information may be saved, perhaps to inform system technicians of particulars about this site or the Device itself. There is no limit to the size of the storage available. The equivalent of more than several pages of text may be saved. Click **Save Notes** if you add or delete any text in the dialog.

# CONFIGURATION

## 12. Configuration

This page, Figure 12-1, is common to all Device models, and contains many global controls and utilities for manipulation of channel configurations.

### 12.1 Chapter Contents

- “About Configuration Tab”
- “Support for Two Simultaneous Configurations”
- “Modify Channel Configuration”
- “Import Channel Configuration”
- “Export Configuration”
- “Reset Channel Configuration”
- “Configuration Backups”

### 12.2 About Configuration Tab

1. Click the **Configuration** tab to find this page, Figure 12-1.
2. Use this section to **Verify** configuration changes saved and **Apply** the changes saved on any page of the UI. This Apply button has the same function as any other Apply button in the UI.
3. Use this section to **Import** a channel configuration saved to your PC. May be used for mass deployment of a commonly used configuration.
4. Use this to **Export** a channel configuration for backup to your PC. May be used for saving a commonly used configuration for mass deployment.
5. Here you may **Clear** channel configurations, **Revert** saved changes to the applied configuration and clear SDV channel added to the channel map.
6. This section allows managing configuration backups.

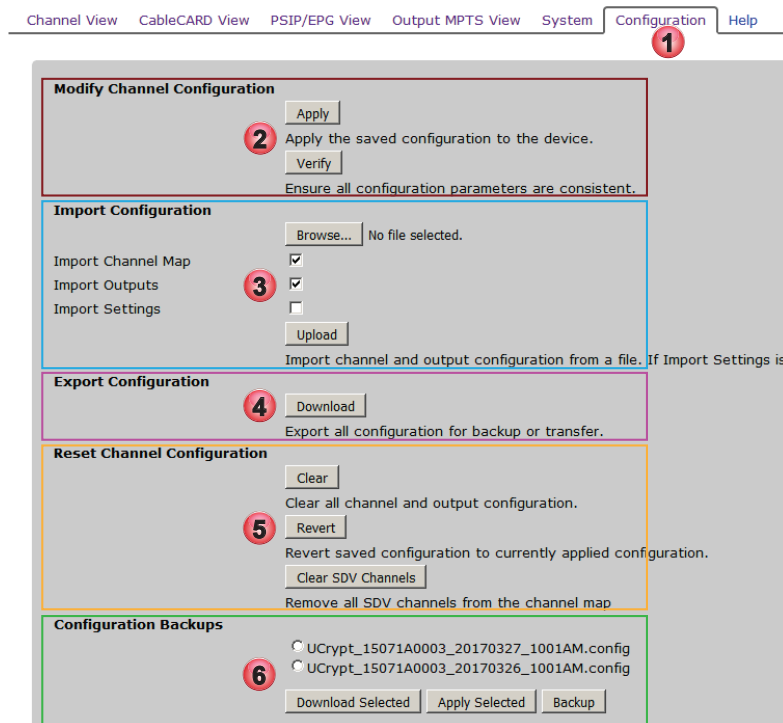


Figure 12-1: Configuration Tab

## 12.3 Support for Two Simultaneous Configurations

UCrypt Devices support two simultaneous configurations; **Saved** and **Applied** configurations. During configuration, while changes are being made, the saved configuration and the applied configuration differ by the changes that have been made and saved since last clicking **Apply**. After the Apply button is clicked, the saved configuration and the applied configuration are identical.

### 12.3.1 Saved Configuration

This can be thought of as a work in progress and any changes can be made in the configuration without affecting how the system is currently “working”. This saved configuration can be discarded at any time without affecting the “working” configuration by clicking the **Revert** button on this page or you can click **Apply** button to make it the new “working” configuration. The system is designed to accommodate dynamic changes to the channel configuration, meaning that you may work on configuration changes to an in-service Device without disrupting the services currently provided to customers.

When the operator makes changes on any configuration page that are deemed correct and are required to be saved, before leaving the page it is necessary to click the **Save** button provided on that page. If you navigate to another page without clicking **Save**, the changes you made on that page are lost.

### 12.3.2 Applied Configuration

This is the “working” configuration that the unit is currently using to provide the desired services to the output since the last time the **Apply** button was clicked. A verification is done automatically when you click **Apply** and any errors will be noted before the configuration is processed by the equipment. The operator will need to accept the errors before proceeding.



**WARNING:** Applying changes is service affecting. Expect the system to be unavailable for up to 20 seconds as it re-initializes with the new configuration.

## 12.4 Modify Channel Configuration

This section allows the saved configuration to be Verified and Applied.

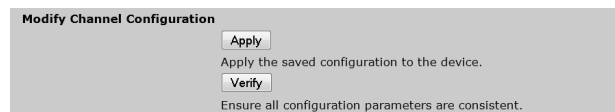


Figure 12-2: Modify Channel Configuration



**WARNING:** Applying changes is service affecting. Expect the system to be unavailable for up to 20 seconds as it re-initializes with the new configuration.

Table 12.4a: Modify Channel Configuration (See Figure 12-2)

Field	Function	Description
Apply	Button	Click to apply any configuration changes made to settings anywhere on the UI. Every time you click the <b>Apply</b> button, the system first performs a <b>Verify</b> operation to check for problems and conflicts in your configuration. If you have any changes that you have saved and wish to apply them, it is not particularly necessary to do so from this page. You can use any <b>Apply</b> button anywhere on the Management Interface; they all perform the same function.
Verify	Button	Click to verify any configuration changes made to settings anywhere on the UI. If you wish to verify that your saved configuration is acceptable, with no errors or conflicts, you can click the <b>Verify</b> button. This will perform the same verify operation that occurs automatically when <b>Apply</b> is clicked but this does not apply the configuration.

## 12.5 Import Channel Configuration

The Import Channel Configuration function, Figure 12-3, allows importing of a previously exported configuration. By default, the Channel Map and configured Outputs and Settings will be imported from the file.

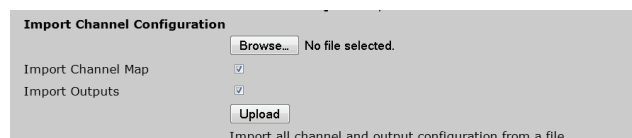
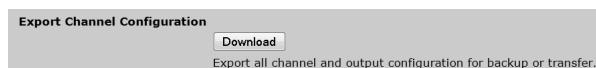


Figure 12-3: Import Channel Configuration

**Table 12.5a: Import Channel Configuration (See Figure 12-3)**

Field	Value	Description
Browse	Button	Before uploading of the file can begin, you must click Browse button and point to the desired file. When the file has been selected, the file and folder path will be displayed in the dialog.
Import Channel Map	Tick Box	If Import Channel Map is deselected, the equipment attempts to find channels in the current channel map that match those in the imported configuration. Channels that cannot be matched are discarded.
Import Outputs	Tick Box	If the Import Outputs is deselected, the equipment does not assign outputs for the selected channels.
Import Settings	Tick Box	If the Import Settings is deselected, the global settings of the UCrypt machine will not be imported.
Upload	Button	Clicking the Upload button will begin the upload of the selected configuration file. The configuration will be applied upon completion of the upload. There will be a service interruption of about 20 seconds if the system is currently in service.

## 12.6 Export Configuration

*Figure 12-4: Export Configuration*

The Export Channel Configuration feature, Figure 12-4, closely related to the **Import Channel Configuration** feature, exports the Device channel configuration to your PC hard drive. When the **Download** button is clicked, the file will be presented to your browser for download. It is possible that your browser security settings will block the download and you may have to accept the download file before it will begin. The file, which is not human readable, will be downloaded to the browser managed downloads folder. The downloaded file will be named with a unique name of Device serial number plus the date and time. This is the same function as **Backup**, see “[12.8 Configuration Backups](#)” on page 12-4, with the exception that this file is saved to your PC.

## 12.7 Reset Channel Configuration

*Figure 12-5: Reset Channel Configuration***Table 12.7a: Reset Channel Configuration (See Figure 12-5)**

Control	Function	Description
Clear	Button	The <b>Clear</b> button provides the ability to completely clear the configuration and return the unit to a factory programming configuration. This deselects all channels, and disables all outputs. If the <b>Clear</b> button is clicked, the <b>Saved</b> and <b>Applied</b> configurations are cleared. You will receive a prompt that there are configuration changes that have not been applied. You must click the Apply button at the top of the page to apply the cleared configuration. If the <b>Clear</b> button is clicked in error or you decide to abandon changes made that have not yet been applied, the <b>Revert</b> button can be used to discard the “changes” made to the saved configuration.
Revert	Button	In the process of changing the configuration of a unit, the changes from one or several views may have been saved before being applied. If it is decided that saved changes are in error, or are not needed or wanted for any reason, the saved changes may be discarded with the <b>Revert</b> button which clears the saved configuration then copies the applied configuration to the saved configuration. The net result is that no changes are made to the system and the saved and applied configurations are identical.  It is important to understand that saved changes that are not applied are persistent. If changes are made and not applied, they will remain in memory indefinitely until either being applied or until the Revert button is clicked. You will be reminded that there are unapplied changes by a red banner along the bottom of configuration pages.  Clicking the Revert button is not a service affecting action.
Clear SDV Channels	Button	This button is used for clearing Switched Digital Channels from the Channel Map if any were previously added.

12.8 Configuration Backups

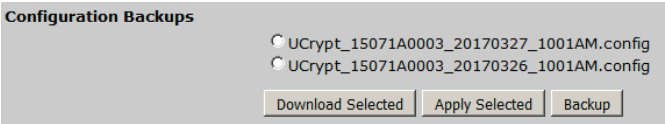


Figure 12-6: Configuration Backups

The Configuration Backups function, Figure 12-6, automatically backs up the machine every day with the entire state of all the machine settings in a single file for easy restoration. A copy may be saved off the machine for archival purposes. This backup function is similar to **Import** and **Export Download** with the exception that this backup is saved to the machine hard drive and backups are restored from the machine drive. The UCrypt machine manages the backups, deleting them after saving a specific number of them.

Table 12.8a: Configuration Backups (See Figure 12-6)

Field	Function	Description
Download Selected	Button	First use the radio buttons to select a backup file(s) to be downloaded to your PC, then click the button <b>Download Selected</b> to save a copy of the file to your PC.
Apply Selected	Button	First use the radio buttons to select a backup files to be restored, then click the button <b>Apply Selected</b> to restore the configuration file to the machine..
Backup	Button	Click this button to cause an immediate backup to be created.

## SWITCHED DIGITAL VIDEO

### 13. Switched Digital Video (SDV)

This chapter applies only to Devices with QAM Input.

#### 13.8.1 What is SDV?

Switched Digital Video (SDV) is a technology that allows Cable Service Providers to expand the number of programming channels available to subscribers. They do that by sending certain channels to a fiber node only when the channels are requested by a subscriber. When the subscriber tunes away from that channel and nobody else on that fiber node requests it the channel is removed thus freeing up valuable bandwidth to that node. If the channel is not required at a node, it isn't sent. This allows a large group of channels that are in lower demand to share the limited bandwidth available.

#### 13.8.2 How Does it Work?

The request to send a channel to a node is done by a customer's STB when normal tuning is performed. The STB sends a message upstream to the headend requesting the program on an SDV channel, then it is advised by the headend where to tune to the correct frequency to receive it. This process does not work when a receiving Device such as a UCrypt unit with CableCARD modules is used to receive and decrypt a program. The CableCARD module is a one-way Device, referred to as a Unidirectional Digital Cable Product (UDCP) which is unable to send requests for channels upstream to the headend. In the absence of two way capability, tuning requests are made by a 'Tuning Resolver' (TR). A Tuning Resolver is sometimes referred to as a Tuning Adapter.

#### 13.8.3 What is a Tuning Resolver?

The Tuning Resolver (TR) is a Device specified by CableLabs to take the place of a STB for two way communications with the headend in situations where a CableCARD module is deployed. The UCrypt Device supports and has been tested with TR from Cisco and Motorola. Figure 13-1 shows some typical units. The TR interfaces with the UCrypt software through a USB cable and provides a VCT (Virtual Channel Table) or Channel Map, identifying the channels which will be requested via SDV. Those channels that will be decrypted are added to the normal VCT and are used when specifying which program is required



Figure 13-1: Typical Tuning Resolvers

to be decrypted and where to tune it.

#### 13.8.4 More Information

The CableLabs specification for tuning resolvers is available here:

<https://apps.cablelabs.com/specification/opencable-tuning-resolver-interface-specification>.

## 13.1 Obtain the Tuning Resolver Address

This section assumes the Tuning Resolver is already connected. In order to get the Tuning Resolver authorized, the unit address will need to be sent to the Cable Service Provider's authorization department since the resolver is authorized similarly to a STB. To assist in this, the system polls the connected TR and brings the address to the 'Channel View' page, see Figure 13-2.

### Procedure

Start by applying power the Tuning Resolver and connect the USB cable to the rear panel, ensuring the correct RF signal level is presented to the TR.

1. Click the **Channel View** tab if it isn't already selected, Figure 13-2.
2. Be sure that at least one of the OOB carriers are locked.
3. The Tuning Resolver is automatically recognized by the system, and after a brief time, it's presence is reported, see Figure 13-2. The address needed to authorize it will be listed beside it.

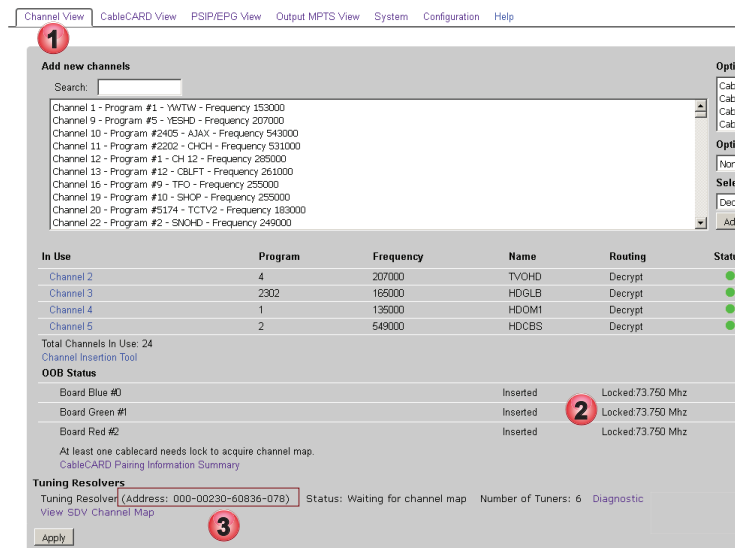


Figure 13-2: Tuning Resolver Recognized

## 13.2 Authorize the Tuning Resolver

### Procedure

This procedure shows how to find the Tuning Resolver address and may not be necessary if the address is presented as outlined in "14.2 Connecting the Tuning Resolver" on page 14-3.

1. Click the **Channel View** tab if it isn't already selected, Figure 13-3.
2. The Tuning Resolver, previously connected, is reported at the page bottom.
3. Beside the Tuning Resolver, click the link **Diagnostic**.

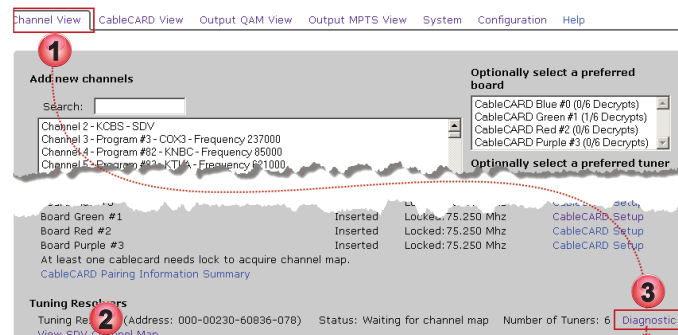


Figure 13-3: Access Tuning Resolver Diagnostic Page

4. A new window opens, Figure 13-4. The information on this page is pulled from the Tuning Resolver and displayed as a status page.
5. Click the link **Diagnostic Menu**.
6. The Tuning Resolver opens a web page and displays a menu. Click **General Status**. (This may differ depending on the connected Tuning Resolver).
7. Read the Unit Address. Pass this information to the Cable Service Provider's authorization department.

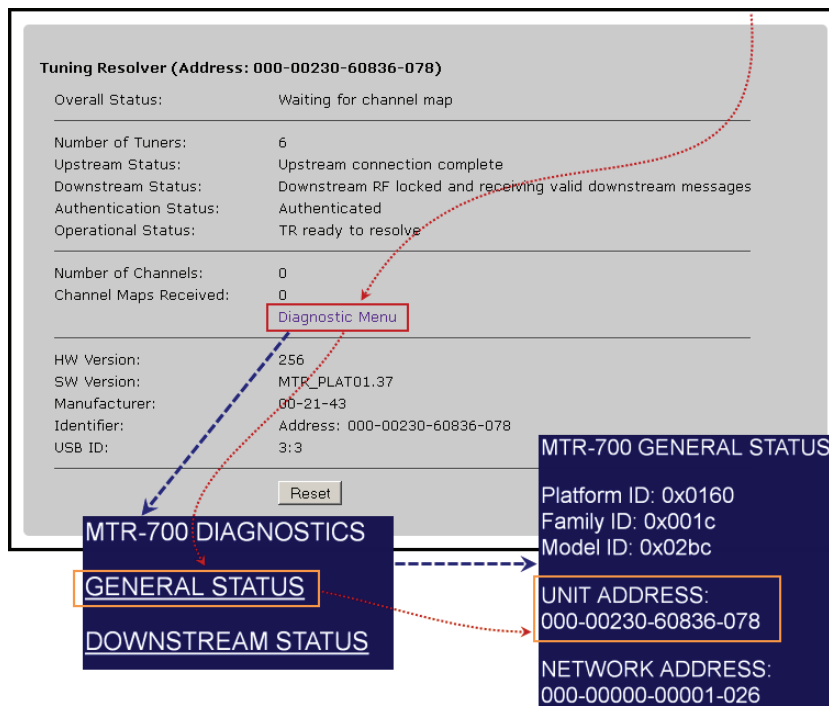


Figure 13-4: Obtain Tuning Resolver Address

8. Given some time to authorize the Tuning Resolver, click the **Main Menu** of the TR and click **Switched Digital Video Status**.
9. A new menu opens, Figure 13-5, which shows the Status as 'Active'.

```

MTR-700 SWITCHED DIGITAL VIDEO STATUS
STATUS: Active
PRI SVR: 174.077.240.126:22410
SEC SVR: 000.000.000.000:22410
DSC SVR: 001.001.001.001:22410
MODE: FREQ
MOT EXT: CACHE SIZE=0
CONFIG: VER: 224 QAMS: 6
CHANNELS: Sw-266
CAROUSEL: VER: 18 CNT: 95
LAST ERR: 00/00/00 00:00:00
LAST ERR CODE: NONE
SERVICE GROUP: 126
QOB CONFIG MSG: 9999 MIN, ACTIVE CHAN
LIST MSG: 0 MIN

REFRESH
MAIN MENU

```

Figure 13-5: Tuning Resolver Active

### 13.3 SDV Channel Map Configuration

If there are SDV channel maps, it is convenient to merge the maps with the regular channel maps.

#### 13.3.1 Merger the SDV Maps

##### Procedure

1. Click the **System** tab if it isn't already selected.
2. Scroll to the **SDV Channel Map** section, Figure 13-6.
3. Tick the box **Automatically merge map**. This setting determines how SDV channel maps are merged into the main system channel map. If checked, all channels received from the Tuning Resolvers will be automatically merged.
4. Click **Save SDV Channel Map Settings**.

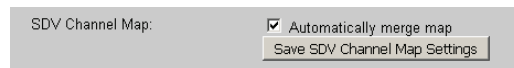


Figure 13-6: Merge SDV Maps

### 13.4 Clearing SDV Channels from VCT

During the setup of a Tuning Resolver, a number of channels or possibly all channels, were added to the Channel Map (VCT - Virtual Channel table). Those channels may need to be removed for a number of reasons.

##### Procedure

This procedure explains how to clear SDV channels from the VCT.

1. Click the **Configuration** tab if it isn't already selected, Figure 13-7.
2. In the section Reset Channel Configuration, click the **Clear SDV Channels** button.

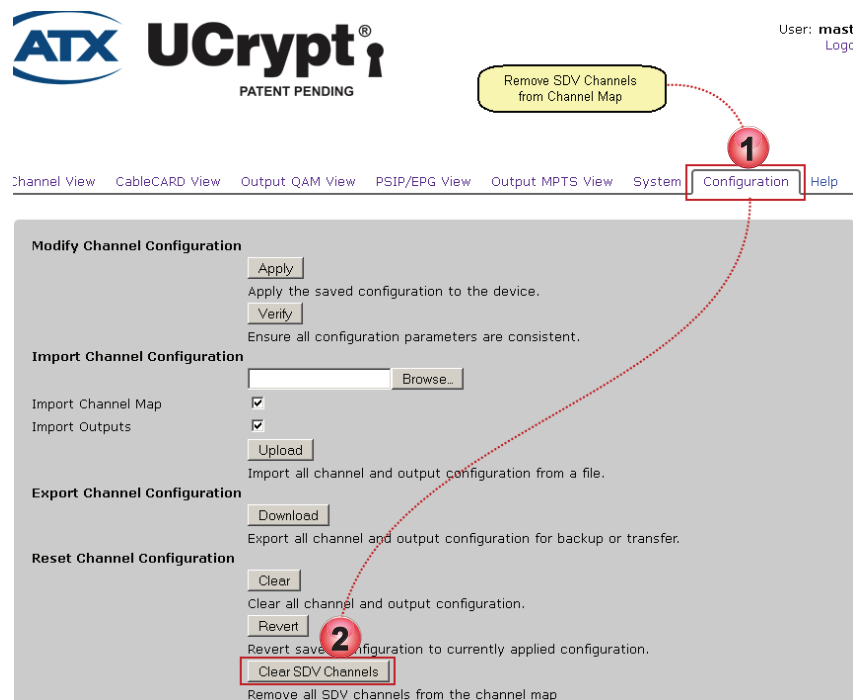


Figure 13-7: Clear SDV Channels From Channel Map

### 13.4.1 Add SDV Channels

SDV channels may be manually added from the SDV channel map.

#### Procedure

This procedure explains how to add channels to the VCT from the SDV channel map.

1. Click the **Channel View** tab if it isn't already selected, Figure 13-8.
2. Ensure that the 'Status' of the installed Tuning Resolver (TR) reports **Ready**. This indicates the TR is recognized and is ready to receive the channel map, once authorized.
3. Below the list of Tuning Resolvers, click the link **View SDV Channel Map**. A new page opens showing the Channel Map received from the TR. This is the same channel map that the UCrypt unit tuners receive but less specific information is passed from the TR.
4. Using the Search dialog, enter the Call Sign letters or channel number of the program to be added to the channel map. The search will find all channels that match the entered criteria. Alternately, scroll the list.
5. Highlight the channel(s) required by clicking them
6. Click **Enable Selected SDV Channels**.
7. The channels are added to the channel map and are listed below the search window.

When finished adding SDV channels to the channel map, click the **Channel View** tab to add those SDV programs to the CableCARD modules. This is done in the same manner as all regular broadcast programs.

The figure shows two screenshots of the ATX UCrypt web interface. The left screenshot is the 'Add new channels' page, and the right screenshot is the 'Available SDV channels' page. Red boxes and numbers 1 through 7 indicate the steps for adding SDV channels. A yellow callout bubble says 'Channel is added' next to the 'Channel 1063' entry in the 'Available SDV channels' table.

**Available SDV channels**

Number	Name	Disable
Channel 1022	TWCHD	<input type="checkbox"/>
Channel 1026	WGN	<input type="checkbox"/>
Channel 1032	NEWS	<input type="checkbox"/>
Channel 1042	BRVHD	<input type="checkbox"/>
Channel 1044	TruTV	<input type="checkbox"/>
Channel 1063	SFCHD	<input type="checkbox"/>

Total SDV Channels Enabled: 6  
SDV Automatic Channel Map Merging: Disabled

Figure 13-8: Add SDV Channels to Channel Map

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# TROUBLESHOOTING

## 14. Troubleshooting

### 14.1 Chapter Contents

- [“Required Test Equipment”](#)
- [“Initial Assessment”](#)
- [“Premises & RF Troubleshooting”](#)
- [“Internal Troubleshooting”](#)
- [“Other Troubleshooting”](#)

### 14.2 Required Test Equipment

In order to troubleshoot any potential UCrypt Device related issue, it is highly recommended to have ALL of the following equipment available in order to quickly and properly diagnose the root cause of any problem.

1. A Management Computer and Ethernet cable for connecting to the problem Device and viewing the Management Interface.
2. Remote connectivity to the unit if support from an ATX Networks support engineer is required.
3. A digital field meter for QAM level, MER and BER measurement.
4. An MPEG analyzer for viewing QAM based MPEG stream PSI information (and for potentially viewing video content if not Pro:Idiom encrypted).
5. A clear QAM TV (for clear QAM versions) or Pro:Idiom enabled TV (for Pro:Idiom enabled versions) in the same room as the equipment fed DIRECTLY from the output test point through appropriate attenuators.
6. Appropriate communication cable, PC based application or programming controller for Pro:Idiom enabled TV set virtual channel map troubleshooting and verification.
7. A set top box that can be connected to the input test point and the test TV for input program presence and quality verification.

### 14.3 Initial Assessment

For any reported outages or problems with a program being generated by the system at an installation premises, the following steps should be followed in order to isolate the potential cause of the issue:

1. Login to the Management Interface. This can be done by direct connection to the unit, see [“1.2 Connecting to the Management Computer” on page 1-1](#), or remotely if the equipment is setup for remote access. Remote access prior to physically visiting the premises can determine whether a physical visit is necessary.
2. On the Channel View tab, note the color of the STATUS DOT for each program, see [“2. QAM Input Configuration” on page 2-1](#).
3. If the status dot for all programs is GREEN proceed to [“14.4 Premises & RF Troubleshooting” on page 14-1](#).
4. If the status dot for one or more programs is YELLOW proceed to [“14.5 Internal Troubleshooting” on page 14-3](#).

### 14.4 Premises & RF Troubleshooting

#### 14.4.1 No Video for a Particular Program on ALL Premise TVs

1. Log in and select **Output MPTS View**. Record the output EIA channel numbers and MPEG Program numbers for all output programs. The Export CSV button at the bottom of the Output MPTS view page can be used to obtain a copy of the list of all programs and their locations at the output.
2. Connect a digital field meter to the Output Test Point. Check the signal level and MER for the QAM carrier on each EIA channel as noted in step 1. The level at the 20 dB down test point should be between 15 and 20 dBmV and MER should be >36 dBmV.



**FYI:** A 15 to 20 dBmV level on OUTPUT TEST POINT corresponds to 35 to 40 dBmV on the RF OUT port.

3. If the levels or MER on valid output EIA channels at the OUTPUT TEST POINT are not as described above, contact an ATX Networks support engineer.
4. Connect an MPEG analyzer to the Output Test Point to view QAM based MPEG stream PSI information (and for potentially viewing video content if not Pro:Idiom encrypted).



**FYI:** *If necessary, be sure to insert additional padding on the connection from the test point. Tune the MPEG analyzer to each output EIA channel as noted in step 1. Ensure the presence of each MPEG program number for each corresponding EIA channel. Ensure a valid (non zero) bit rate is present for each program. For each program that is not Pro:Idiom encrypted, verify video presence and/or quality using the MPEG analyzer.*

5. If you do not see any programs noted in step 1 but all programs show a green status dot on the Channel View tab, call an ATX Networks support engineer.
6. Connect a Pro:Idiom enabled TV to the Output Test Point (You will probably require an extra 20 dB of padding on this connection). Using the appropriate communication cable and laptop application or using the on screen TV menu with a master controller, verify that the TV channel map as entered on the TV corresponds exactly to the EIA channels and MPEG program numbers as noted in step 1 for each program generated (refer to the manual for the specific TV being used and/or contact the appropriate support representative from the TV manufacturer if more information relating to TV functionality is required). Carefully perform this step as it is easy to enter an incorrect EIA channel number or MPEG program number in a long TV virtual channel map. Correct any virtual program map entries that are incorrect. Verify the presence of all programs on the TV connected to the output.
7. If results from the previous tests are OK, but no channels are being received by the TV, this is most likely an issue with the TV. Re-loading the channel map can sometimes rectify this situation. If you are dealing with Pro:Idiom encryption, trying to tune any available clear programs using a digital TV with a regular clear QAM tuner will further indicate if the problem resides with the specific TV or possibly the Pro:Idiom insert card. Removing the Pro:Idiom insert card and replacing it with a clear QAM tuner card may also be an option.

#### 14.4.2 No Video for a Particular Channel or on all Channels on Specific Premise TVs

If only specific premise TVs are exhibiting problems on some or multiple channels, but other premise TVs do not exhibit any issues with these channels, then is it very unlikely that it is a problem with the UCrypt Device. This symptom is most likely a problem with the transmission of signal to the room or the TV in the room where the problems are being experienced.

Some things to check if there are problems in specific rooms, but above steps do not help resolution of problems:

1. Check the RF level at the TV – it should be within range of the tuner for that particular TV (refer to the TV specifications for exact tuner level requirements, but probably 0 to +10 dBmV will suffice). If the RF level is insufficient, you may need to troubleshoot the level somewhere in the premises distribution network.
2. Check the MER at the TV – ideally it should be >36 dBmV. If the MER at the TV in question is much lower than the measured MER for that EIA channel at the equipment output test point, check the premises distribution network for any potential causes (taps, connectors, levels feeding amps, etc.).
3. Check the channel map of the TV with issues. Using the appropriate communication cable and laptop application or using the on screen TV menu with a master controller, verify that the TV channel map as entered on the TV corresponds exactly to the EIA channel number and MPEG program number as generated by the UCrypt (refer to the manual for the specific TV being used and/or call the appropriate support representative from the TV manufacturer if more information relating to TV functionality is required). Carefully perform this step as it is easy to enter an incorrect EIA channel number or MPEG program number in a long TV virtual channel map. Correct any virtual program map entries that are incorrect.
4. Check the TV itself. Re-loading the channel map can sometimes rectify a problem with the TV even if the channel map is correct. If you are dealing with a TV with a Pro:Idiom insert card, removing the Pro:Idiom insert card and tuning and clear QAM channels with the original clear QAM insert card will further indicate if the problem resides with the TV or the Pro:Idiom insert card. Tuning to the various EIA channels and ensuring presence of clear QAM programs with an MPEG analyzer is a very good way to ensure signal and content is present at the room and therefore isolate the issue to the TV. Trying an alternate or clear QAM TV in the same location is also a good test to isolate the problem to a specific TV. If the above troubleshooting steps appear to be indicating that the problem has to do with the TV, contact the appropriate support representative from the TV manufacturer for further information on how to troubleshoot the TV.

## 14.5 Internal Troubleshooting

If the initial assessment shows that status dot on the 'Channel View' page is yellow for one or more programs, this indicates a potential problem with the program due to issues with CableCARD module entitlement, input RF, presence of program on plant feed and/or receipt of program PSI information from the cable TV plant feed.

Ensure that the latest version of the system firmware is installed. If it is not, contact ATX Networks support and update the system firmware. Obtain ATX update procedure **ANW1429 UCrypt Firmware Update Instructions** for complete update guidance.

The following sections describe various error conditions that may appear for specific programs being processed by the unit, why the error condition has occurred and steps to take to resolve the issue.

### 14.5.1 CableCARD™ Related Error Conditions

Log in, select **CableCARD View** and scroll down to the corresponding CableCARD board and tuner for the program in question. If there is an error message showing **CableCARD not Authorized** or **CableCARD not Entitled**, check the 'Conditional Access' page to verify which part of the CableCARD module provisioning process is missing (card authorization or program entitlement).

#### Resolution:

Repeat any necessary CableCARD module authorization steps and/or re-send a hit or refresh to the CableCARD module to rectify the issue appropriately, see ["7.6 Activating Motorola Modules" on page 7-6](#) or ["7.7 Activating Cisco® Modules" on page 7-9](#) for details on CableCARD module provisioning steps. Verify that CableCARD Devices are entered and associated properly with a valid account in the billing system (and not just DAC/DNCS) so that automatic billing system rectification does not cause de-authorization or de-entitlement of CableCARD Devices.

### 14.5.2 Input RF Signal Related Error Message

Log in, select **CableCARD View** and scroll down to the corresponding CableCARD board and tuner for the program in question. If there is a yellow bar across the top of the tuner box with the description **'Tuner not locked'**, check the input level and MER of the QAM at the input test point. The RF level at the input test point should be in the range of -15 to -10 dBmV (or +5 to +10 dBmV on the actual input feed). MER should be >35 dBmV. Select the **Tuner Diagnostics** hyperlink for the tuner in question to ensure the RF level as reported by the tuner shows between -5 and +10 dBmV (Note that this reported value does not correspond to the RF level at the input as there are several loss and gain stages internally within the equipment before the RF signal reaches the tuner). The input level should be adjusted so that all tuners show between -5 and +10 dBmV as reported by the tuners. The SNR as reported by the tuner should be >32 dB (Note that this is an SNR measurement at the demodulator and not an MER measurement for the QAM itself so this value will not be the same as an MER measurement with a field meter). For an overall summary of signal level and SNR reported by all the tuners, select the **All Tuner Diagnostics** hyperlink at the bottom of the CableCARD View tab.



**FYI:** If you have checked RF signal level and MER directly at the UCrypt input for the QAM frequency in question and they are within specification but the error message persists, ensure you have remote login connectivity to the unit and call an ATX Networks support engineer with the IP address and login information.

### 14.5.3 MPEG Stream Information Related Error Message

Log in, select **CableCARD View** and scroll down to the corresponding CableCARD board and tuner for the program in question.

1. If a message **Failed to find program in PAT** or **Failed to add program – PMT not found** appears below the program in question, this indicates a problem with the PSI information in the QAM for that program.

#### Resolution:

Check for the presence of the incoming channel with an MPEG analyzer or STB off the input feed test point. If the program is present on the input stream, and on the EIA channel and MPEG number shown in 'Program Details' view, further investigation of the actual PAT and PMT being sent out on this QAM may be necessary to determine the cause of the issue.

2. If a message **Failed to add program – timed out** appears below the program in question, this indicates a problem with receipt of PSI information for this program. This condition could be a result of any number of external or internal causes (tuner lock problems at time of 'Apply', PSI information not present in the stream, or an error from the CableCARD module while passing the stream to the UCrypt system, etc.).

#### Resolution:

Check for the presence and/or location of the incoming channel with an MPEG analyzer or STB off the input feed test

point. If the program is present on the input stream, and on the EIA and MPEG number shown in Program Details view, ensure you have remote login connectivity to the equipment and call an ATX support engineer and provide them with IP address and login information so that a technician can diagnose and log the nature of the error. Once this is done, steps to potentially resolve this condition include the following:

- a) Select **Refresh** on the Program Details page.
- b) Select **Apply** on the CableCARD View page.
- c) Reboot or power cycle the unit.

#### 14.5.4 Internal CableCARD™ Communication Error

If **Unknown** appears under either the bitrate or resolution or **CableCARD technical error** appears for the program in question, this may indicate an internal CableCARD module communication error.

##### Resolution:

Ensure that the latest version of the system firmware is installed. If it is not, contact ATX Networks support and update the system firmware. Obtain ATX update procedure **ANW1429 UCrypt Firmware Update Instructions** for complete update guidance.

If the firmware upgrade does not resolve the issue, this may be an internal error. Ensure you have remote login connectivity to the equipment and contact an ATX Networks support engineer and provide them with IP address and login information so that a technician can diagnose and log the nature of the error. Once this is done, steps to potentially resolve this condition include the following:

1. Select **Refresh** on the Program Details page.
2. Select **Apply** on the CableCARD View page.
3. Reboot or power cycle the unit.

#### 14.5.5 Internal QAM Module Error

Select the **Output QAM View>QAM Diagnostics** page for the output QAM module associated with the problem program in question. If there has been a high number of restarts for the output QAM outputting the program in question this may indicate an internal QAM module error.

##### Resolution:

Ensure that the QAM module firmware is the latest version. If it is not, contact ATX Networks support and update the system firmware. Obtain ATX update procedure **ANW1429 UCrypt Firmware Update Instructions** for the complete update guidance.

If the firmware upgrade does not resolve the issue, this is an internal error. Ensure you have remote login connectivity to the equipment and contact an ATX Networks support engineer and provide them with IP address and login information so that a technician can diagnose and log the nature of the error. Once this is done, steps to potentially resolve this condition include the following:

1. Select **Restart** on the DQAM.
2. Reboot or power cycle the unit.

### 14.6 Other Troubleshooting

#### 14.6.1 Unit Does Not Power Up

If the system does not power up follow the steps below:

1. Ensure the power toggle button on the power supply at the rear is in the 'On' position. If a software based shutdown command was sent to the Device from the Management Interface, the power switch must be set to the 'Off' position for a minimum of 30 seconds to allow for proper circuit discharge and then set back to 'On' position to begin powering up the system again.
2. Check that the power cable is firmly plugged in at both ends. If possible, try an alternate power cable.
3. Check to make sure the outlet the equipment is plugged into is live and carrying mains power.

#### 14.6.2 No Connectivity to the UCrypt® Unit

If you experiencing issues connecting to the Management Interface follow the steps below:

1. Ensure that at least one LED on the Ethernet adapter on both the host computer and the Management Interface port is lit. If there are no link lights on either Ethernet adapter, there is a problem with either the Ethernet adapter of the host computer, the Ethernet adapter of the UCrypt Device or the Ethernet cable being used to connect the two Devices. Plug the host computer into another Device to ensure its Ethernet interface is working. Also try a different

Ethernet cable that is confirmed to be working with the host computer and another Device. If the host computer can connect to another Device using the same Ethernet cable as was used to attempt to connect to the UCrypt port, but there are still no link lights when the connection is made, contact an ATX Networks support engineer.

2. If the link lights are present, but you cannot establish the Management Interface connectivity, ensure all steps were followed exactly as described in “1. Initial Startup” on page 1-1. If the unit has been assigned a static IP address that is different from the original default IP of 192.168.0.23, you must ensure that the Management Computer subnet is the same as the subnet assigned to the unit in order to establish a direct connection. For information about re-setting your subnet, see “1. Initial Startup” on page 1-1. If there is still no connection using a web browser, try sending a network ping to the UCrypt management port on its assigned IP address. If the ping is successful, then network connectivity is present, so the issue is most likely with the browser or some other settings on the Management Computer. Ensure that the correct address is typed into the URL/address field of the browser. Also try using an alternate browser.
3. If you receive a warning on the browser web page that the site you are trying to connect to is potentially unsafe, this is normal as the UCrypt Device software may not currently have a signed & registered Security Certificate that many web browsers look for from web servers. Select the option to ignore this warning and continue to the Management Interface.
4. If none of the above steps are successful, access the Craft interface on the back of the equipment. You may have to remove a screw holding the panel over this interface. The static IP address of the Craft Interface is 192.168.250.2. Follow the steps described in “1. Initial Startup” on page 1-1, however use subnet mask 255.255.0.0 in order to communicate with the auxiliary port. Open a browser and enter **https://192.168.250.2** while connected to the Craft Interface. If the Management Interface does not open, try pinging the interface on this address. If all of the above steps fail, contact an ATX Networks support engineer.

### 14.6.3 Intermittent Connectivity &/or Management Interface Access to the UCrypt®

If you experience intermittent connectivity to the UCrypt GUI follow the steps below:

1. Shut down and restart the browser being used to access the unit. If this does not help, reboot the Management Computer and try accessing the unit with the browser again. Manually clear all cached information from the browser to ensure the issues are not related to caching of information by the browser. If all of these measures do not help, try using an alternate browser.
2. If the unit is experiencing intermittent connectivity while connected remotely, try logging in directly on site. If the intermittent connectivity is not present while connected directly but is present while connected remotely, check the network being used to provide remote connectivity for any possible issues.
3. If all of the above steps fail, please ensure you have remote login connectivity and contact an ATX Networks support engineer and provide them with IP address and login information so that a technician can diagnose and log the nature of the problem.

### 14.6.4 OOB Signal Not Locking

If you are experiencing issues with the CableCARD boards locking into the OOB signal from the plant, follow the steps below:

1. Ensure the presence of the QPSK OOB carrier at the input test point. Check the signal level of the QPSK OOB carrier – it needs to be <15 dBmV for the OOB signal to lock.
2. If the location of the OOB carrier on the plant is at 72.5 MHz and there is an analog channel present on EIA channel 4 on the plant, the OOB tuners may have difficulty locking due to the close proximity of the audio carrier from the analog channel 4 program to the OOB carrier. If this is the case, contact an ATX Networks support engineer for more information about outboard filters that can be used to rectify this issue.
3. If all of the above steps do not rectify the issue, ensure you have remote login connectivity to the equipment and contact an ATX Networks support engineer and provide them with IP address and login information.

### 14.6.5 CableCARD™/Tuner Board Does Not Appear on GUI

If an entire CableCARD/tuner board has disappeared from the CableCARD View page in the GUI, this may be due to an internal system error.

#### Resolution:

Ensure that the latest version of the system firmware is installed. If it is not, contact ATX Networks support and update the system firmware. Obtain ATX update procedure **ANW1429 UCrypt Firmware Update Instructions** for complete update guidance.

If the firmware upgrade does not resolve the issue, this is an internal error. Ensure you have remote login connectivity to the equipment and contact an ATX Networks support engineer and provide them with IP address and login information so that a technician can diagnose and log the nature of the error. Once this is done, steps to potentially resolve this condition include

the following:

1. Reboot or power cycle the unit.

#### 14.6.6 QAM Module Does Not Appear on GUI

If an entire QAM module has disappeared from the Output QAM View page in the GUI, this may be due to an internal system error.

##### **Resolution:**

Ensure that the latest version of the system firmware is installed. If it is not, contact ATX Networks support and update the system firmware. Obtain ATX update procedure **ANW1429 UCrypt Firmware Update Instructions** for complete update guidance.

If the firmware upgrade does not resolve the issue, this is an internal error. Ensure you have remote login connectivity to the equipment and contact an ATX Networks support engineer and provide them with IP address and login information so that a technician can diagnose and log the nature of the error. Once this is done, steps to potentially resolve this condition include the following:

1. Reboot or power cycle the unit.

## SERVICE & SUPPORT

### 15. Service & Support

#### 15.1 Contact ATX Networks

Please contact ATX Technical Support for assistance with any ATX products. Please contact ATX to obtain a valid RMA number for any ATX products that require service and are in or out-of-warranty before returning a failed module to ATX.

##### TECHNICAL SUPPORT

Tel: 289.204.7800 – press 1  
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only  
Email: [support@atx.com](mailto:support@atx.com)

##### SALES ASSISTANCE

Tel: 289.204.7800 – press 2  
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only  
Email: [insidesales@atx.com](mailto:insidesales@atx.com)

##### FOR HELP WITH AN EXISTING ORDER

Tel: 289.204.7800 – press 3  
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only  
Email: [orders@atx.com](mailto:orders@atx.com)  
Web: [www.atx.com](http://www.atx.com)

#### 15.2 Warranty Information

All of ATX Networks' products have a 1-year warranty that covers manufacturer's defects or failures.



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