DVIS
Patent Pending

DVISm
Patent Pending

DVIS/DVISm - Digital Video Insertion System & Mini Digital Video Insertion System

INSTALLATION & OPERATION MANUAL

General Guide Notes

Manual Release Date: July 16 2018

Firmware Version

Some features described in this manual require the latest firmware to be installed on the DVIS Device platform. Check with ATX Networks technical support or the related support web site for your model for the latest release of firmware. The firmware version installed may be found on the 'Maintenance' tab of the GUI. At the time of publication of this manual the most current released firmware version is:

System	**4.23-3.21-10.56**
GUI	**6.0.4.6**
DV1HDA Card	**1.3.0**
DVGIGE Card	**7.15-0.0**

Organization of This Manual

This manual is generally organized based on the tabbed GUI with an individual chapter dedicated to describing the configurable features of each tab. Further chapters outline activities related to the DVIS Device operation such as installation, troubleshooting, etc.

FYI: *In this guide, reference to DVIS infers DVIS and DVISm unless the model is specifically stated.*

Cross Reference Hyperlink Usage

Hyperlinks are used liberally throughout the guide to assist the reader in finding related information if the reader is viewing the Adobe PDF file directly. Hyperlinks may be identified by their blue text. Most links are to related pages within the document, but some 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 an operation that may cause a service outage.*

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

TABLE OF CONTENTS

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SAFETY INSTRUCTIONS

1. Safety Instructions

WARNING! FAILURE TO FOLLOW THE SAFETY PRECAUTIONS LISTED BELOW MAY RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY. PLEASE READ AND COMPLY WITH THE FOLLOWING:

1.1 General Safety Instructions

SAFETY GROUND: The connection to earth of the supplementary grounding conductor shall be in compliance with the appropriate rules for terminating bonding jumpers in Part V of Article 250 of the National Electrical Code, ANSI/NFPA 70, and Section 10 of Part I of the Canadian Electrical Code, Part I, CSA C22.1.

WATER AND MOISTURE: Care should be taken to prevent entry of splashed or dripping water, other liquids, and physical objects through enclosure openings.

DAMAGE: Do not operate the device if damage to any components is suspected.

POWER SOURCES: Only connect the unit to a power supply of the type and capacity specified in the operating instructions or as marked on the device.

NOTE: (a) For 115 VAC operation, use the power cord supplied for operation from a 115 VAC source.

(b) For 230 VAC operation, use the power cord supplied for operation from a 230 VAC source.

GROUNDING OR POLARIZATION: Electrical grounding and polarization means must not be defeated.

POWER CORD PROTECTION: Route power supply cord to prevent damage by external objects. Pay particular attention to the exit point from the device and plug.

FUSING: This device is equipped with a fused receptacle, replace the fuse only with the same type. Refer to replacement text on the unit for correct fuse type. It is recommended that the duplex wall receptacle be current limited to 15 A maximum.

NOTE: (a) Replace fuse in units operating on 115 VAC supply by fuse rated 3.0 A, 250 V, slo blo.

(b) Replace fuse in units operating on 230 VAC supply by fuse rated 1.5 A, 250 V, slo blo.

CAUTION: For continued protection against the risk of fire, replace only with the same type and rating of fuse.

POWER SUPPLY REMOVAL: Disconnect power (AC or DC) from the equipment before removing it for replacement or service. This is accomplished by unplugging the power cord from the power outlet.

BATTERY REMOVAL AND REPLACEMENT: Replace the battery with Panasonic or Sony Part No. CR2032 or exact replacement only.

CAUTION: Use of a different battery type may present a risk of fire or explosion.

BATTERY DISPOSAL: Recycle or dispose of batteries in accordance with the battery manufacturer's instructions and local/national disposal and recycling regulations. Please call 1-800-8-BATTERY or go to the website at www.call2recycle.org for information on recycling or disposing of your used battery.

SERVICE: Do not attempt to service the device beyond procedures provided the operating instructions. All other servicing should be referred to qualified service personnel.

MODIFICATIONS: Modifications should not be made to the device or any of its components for applications other than those specified in the operating instructions.

SAFETY CODES AND REGULATIONS: The device should be installed and operated in compliance with all applicable local safety by-laws, codes and regulations.

POWER SUPPLY CORD PROTECTION: Care must be taken during installation to route or arrange the power supply cord to prevent and avoid the possibility of damage to the cord.

POWER SUPPLY CORD ROUTING: The power supply cord shall not be attached to the building surface, nor run through walls, ceilings, floors and similar openings in the building structure.

EQUIPMENT NOTICE: Use in Norway and Sweden:

Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing - and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, per EN 60728-11: a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.).

Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.

1.2 Laser Safety

This equipment may contain or be connected to an infrared laser source that transmits intensity-modulated light and emits invisible radiation.

WARNING: *Avoid Personal Injury. The laser light source on this equipment or the fiber cables connected to this equipment emit invisible laser radiation. Avoid direct exposure to the laser light source.*

WARNING: *Viewing the laser output (if a transmitter) or fiber cable with optical instruments may pose an eye hazard.*

WARNING:*This equipment may only be installed, operated and serviced by authorized personnel trained in the safe handling and operation of fiber optic cables and laser sources.*

- Do not apply power to this equipment if the fiber is unmated or unterminated.
- Do not look into an activated fiber with optical instruments such as magnifiers, or microscopes.

1.3 Laser Warning Labels

This equipment may contain or be connected to other equipment containing Class 1M laser sources. The following labels adhered to each product will indicate the type of laser source utilized along with general laser radiation labels.

SYSTEM DESCRIPTION

2. System Description

DVIS series products are cost effective and space efficient encoding, multiplexing and transmission platforms ideal for local digital channel insertion applications. Several SD/HD baseband programs can be directly encoded/multiplexed and output in QAM or IP format, eliminating the need for combining several units for multiple program encoding. Models exist with two and five card slots, accepting various combinations of available cards. HTTP based GUI allows easy set-up and control without the need for proprietary software installation. Remote access and SNMP monitoring are available via integrated RJ45 Ethernet interface.

In this chapter we introduce the key features and describe the attributes that make the DVIS Device a powerful addition to any digital cable TV network.

2.1 Chapter Contents

2.2 Models Covered by this Guide

There are two models in the series; both have QAM output by default, but each has different channel capacity.

FYI: *In this guide, reference to DVIS infers DVIS and DVISm unless the model is specifically stated.*

2.2.1 DVIS

This model has up to 10 channels of SD MPEG-2 encoding or 5 channels of HD/SD MPEG-2/H.264. The output is a single QAM. GbE IP output is available but number of encoded channels is reduced for IP output, as one card slot is used for the IP output card. This is a popular model in applications where up to 10SD/5HD channels of cost effective video are required in commercial sites such as MDUs, stadiums, hospitals and other health care facilities where in-house educational channels are implemented.

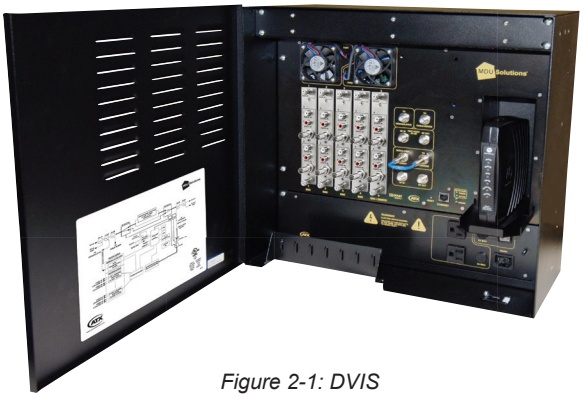

Figure 2-1: DVIS

Distinguishing Features:

- 5 card slots for encoders or I/O cards. (Not all slots can be used for all card types.)
- Up to 10 integrated SD MPEG-2 encoded programs using dual encoder cards.
- Up to 5 integrated SD/HD MPEG-2/H.264 encoded programs.

2.2.2 DVISm

This is the Mini model with up to 4 channels of HD/SD MPEG-2/H.264. The output is single QAM. GbE IP output is available but the number of encoded channels is reduced for IP output, as one card slot is used for the IP output card. This is a popular model in applications where up to 4SD/2HD channels are required in commercial sites such as MDUs, stadiums, hospitals and other health care facilities where in-house educational channels are implemented.

Distinguishing Features:

- 2 card slots for encoders or I/O cards.
- Up to 4 integrated SD MPEG-2 encoded programs using dual encoder cards.
- Up to 2 integrated SD/HD MPEG-2/H.264 programs encoded.

Figure 2-2: DVISm

2.3 The Digital Audio/Video Insertion System (DVIS)

DVIS Device series products are network-edge local content encoding devices for digital video networks. They encode local baseband analog content into a digital format within a property provisioned with IP or QAM digital only TVs, STBs or DTAs where analog spectrum is not available or where digital content is needed in addition to analog content.

Target applications include:

- Cost-effective encoding, multiplexing & transmission (QAM and/or IP).
- Digital simulcast or digital delivery of PEG (Public, Educational, Government).
- Hub site specific programming.
- Security or surveillance camera feeds (MDUs, retirement homes).
- Text/character generator or local information channel (hotels, conference centers, gated communities).
- Distribution of 'in-house' or private channels throughout a property (e.g., sports stadiums, network studios).

All deployments of digital signals in a modern cable TV system are presented with challenges which did not exist in the former analog deployments. Specific challenges are faced when MDUs and institutions within the cable plant require locally inserted content which must be received by the installed base of cable TV set top boxes (STB). The DVIS Device can be used in these properties to encode local analog video cameras, message boards, instructional and advertising channels into HD/SD MPEG-2/H.264 streams. The resulting stream content may be inserted into a blank EIA channel or may perform digital drop and insert into pre-existing clear or encrypted QAM carriers. The flexible architecture of the product makes it an ideal candidate for any number of programs that an MDU or similar property is likely to require.

2.4 Key Features

2.4.1 Flexible Digital Program Insertion

Designed for deployment in both RF and IP environments, the DVIS system is capable of inserting digital programs into an EIA RF channel where there is no pre-existing carrier or it may be used with an integrated channel deletion filter and any EIA channel may be effectively removed making way for a new QAM created by the DVIS Device. The integrated QAM modulator may be set to any frequency between 54 and 870 MHz (extended range 15 - 975 MHz with some restrictions) in 1 kHz steps and fully supports STD, IRC and HRC channel plans. For IP distribution/insertion installations, Ethernet transport streams may be created as either unicast or multicast, MPTS/SPTS with any address within the valid IPv4 address and port range.

2.4.2 Support for SD/HD MPEG-2/H.264 Encoding

The DVIS and DVISm platforms accommodate plug-in SD or HD video encoders, including an HD encoder with HDMI input. Single channel HD plug-in cards and single and dual channel SD encoder cards are available to encode with MPEG-2 or H.264 profiles. Both SD and HD programs may be mixed on any output multiplex (IP or QAM).

2.4.3 Gigabit Ethernet Output

The DVIS systems may be provisioned with an optional gigabit Ethernet output card. The Ethernet card has 2 electrical Ethernet ports (RJ45) as well as 2 SFP ports into which may be installed singlemode or multimode fiber optic SFPs for reliable trunk connection to distribution switches. A variety of SFP interface types such as single mode and multimode fiber are supported and may be installed as required by system architecture. The Ethernet output may be provisioned to be the sole output of the unit or simultaneous RF and Ethernet are supported. IP output streams may be provisioned with VLAN tagging and Pro-MPEG FEC. If configured with IP output only(RF Disabled), then the IP programs may be all SPTS streams.

2.4.4 Fiber Optic Output

Installation of this available module adds fiber output capabilities to the DVIS platforms allowing insertion of forward path channels directly into RFoG and FTTH networks. With +10dBm optical output power, SC/APC interface and available for ITU channels 16 thru 46 this optional module upgrades DVIS to the latest distribution technology.

2.4.5 Integrated Add/Drop Multiplexing

Both DVIS platforms have integral transport stream multiplexers which creates a new QAM or IP multiplex or alternately may be used in a QAM add/drop application along with an optional plug-in demodulator card to insert programs into an existing QAM, clear or encrypted, replacing only the programs that are desired. If the program that is dropped was encrypted, the replacement program stream will be in the clear. The add/drop application utilizes the QAM demodulator to analyze the MPEG stream and selectively insert or “drop and insert” local programs in a flexible manner.

2.4.6 Remote Monitoring Via SNMP

The product fully supports Simple Network Management Protocol (SNMP) which allows the monitoring of the built in alarm points by a remote SNMP management console. The available DVIS Device MIB may be compiled into the remote Management Console to provide notification of the triggering of alarms either across a private network or the internet if available. Upon triggering of a predefined alarm, a trap is automatically sent by the equipment to a listening SNMP management console.

2.4.7 Flexible Transport Stream Re-Multiplexing

Flexibility is provided in configuring the re-multiplexed transport stream in an add/drop application. The inserted program may be assigned any valid PID or MPEG program number and the encoder may be set to any of a wide range of valid CBR video and audio encoding rates. A built in MPEG-2 stream analyzer (demodulator card required for this feature) for incoming MPEG programs assists in making the correct selections for replacing programs easy and intuitive. MPEG tables PAT and PMT along with all PID values are automatically generated to ensure that downstream STB can reliably tune the inserted multiplex and minimum craft experience is required to implement a system. Dynamic PID monitoring avoids outages due to program table updates.

2.4.8 Scalable Architecture is Field Upgradable

Encoder cards which accommodate one or two channels of SD MPEG-2 or one channel of HD/SD MPEG-2/H.264 encoding may be installed as required so the system may be grown as needs grow. Hot swappable cards make upgrading the DVIS encoder capability faster while keeping outages to a minimum. The RF Demodulator card may be installed in any available slot as future requirements dictate even if the initial installation did not originally include it. IP output capabilities may also be added when required by installing a Gigabit Ethernet card in slot 2 (DVISm) or 5 (DVIS).

2.4.9 Mass Deployment and Backup with Configuration Export

The DVIS platforms allow the operator to export the programmed configuration as a file. The exported file may be used for backup and archive purposes or to allow fast and easy deployment of multiple DVIS units with similar configuration thus saving the time to manually program each unit before deployment.

NOTE: *Care has to be taken not to overwrite the existing DVIS Device IP address when loading exported settings to remote units. This is avoided with factory default settings but may happen with user configured settings.*

2.4.10 IPv4 and IPv6 Support

With the latest available firmware installed, all DVIS platforms support legacy IPv4 and IPv6 IP addressing to allow access from private networks or from across the internet.

2.4.11 TACACS+ Authentication

For security against internet intrusion, the DVIS Device forces assignment of a username and password which may be changed at any time. However, for added security and easier user management, TACACS+ support may be enabled

2.4.12 Optional Channel Deletion Filter

In applications where all cable plant channels have pre-existing QAM carriers, the units may be configured with an optional channel deletion filter which allows the removal of any EIA channel and all of it’s RF content with minimal adjacent channel affect, allowing a new QAM channel to be inserted.

2.4.13 Powerful GUI

Management and configuration of the DVIS system is through a built-in web server which presents the configuration pages in

an intuitive tabbed format. Access to the GUI may be configured to allow remotely connecting across any private network or over the Internet if a connection is made available, usually with a DOCSIS Cable Modem.

2.4.14 MDU Application Secure Enclosure

The DVIS platform is constructed in a durable and lockable enclosure designed for the typical MDU wall mount installation environment. Integral cooling fans allow the equipment to be installed and operate in a wide range of uncontrolled environmental conditions where room cooling is not available. All controls and modules are securely inside the cabinet and there is room inside the cabinet for most cable modems to be securely installed where remote management is required.

2.4.15 Integrated RF Management

Integrated RF management is an engineered feature provided with the DVIS series simplifying deployment with a minimum of time and craft. All combiners and splitting required for all functionality are internally configured and clearly labeled and accessible.

2.4.16 Automatic RF Bypass in Power Outage

The DVIS Device has been thoughtfully provided with an RF bypass feature. A power outage to the equipment causes the internal RF bypass switches to activate and restore the original cable system QAM channel to the affected premises. This prevents customers receiving a blank channel during outages.

2.5 Simplified Block Diagrams

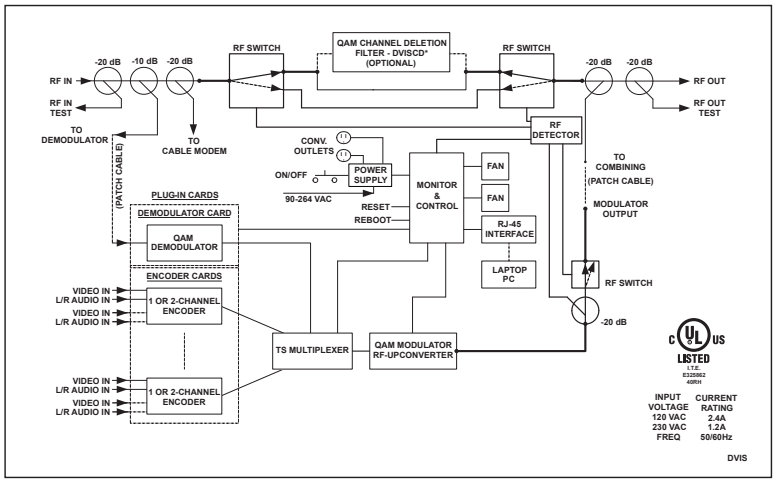

Figure 2-3: Simplified Block Diagram - DVIS

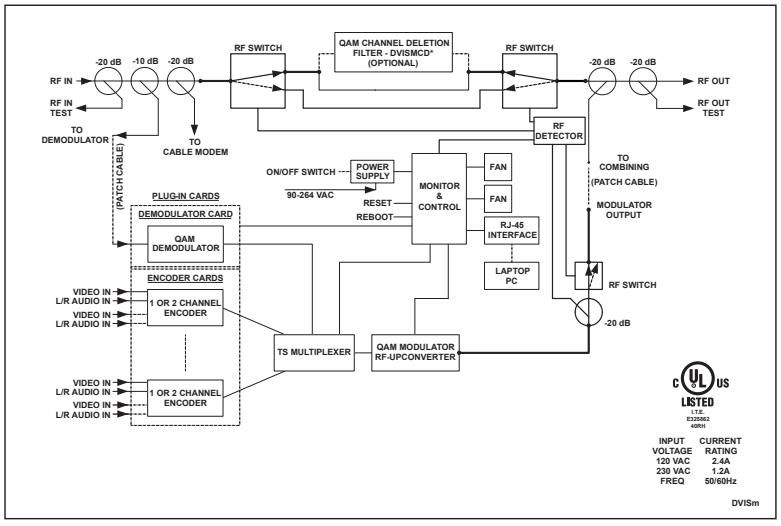

Figure 2-4: Simplified Block Diagram - DVISm

2.6 Available Encoder Cards

2.6.1 DV1CE & DV1CEM

Single Channel SD Analog Input Encoder

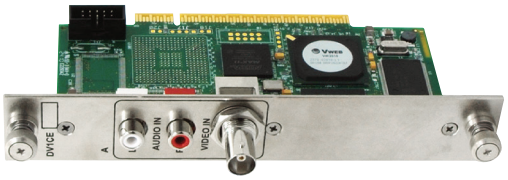

Figure 2-5: Analog SD Encoder

2.6.2 DV2CE & DV2CEM

Dual Channel SD Analog Input Encoder

Figure 2-6: Dual Channel Analog SD Encoder

2.6.3 DV1HDA

Single Channel HD Component/VGA Input Encoder

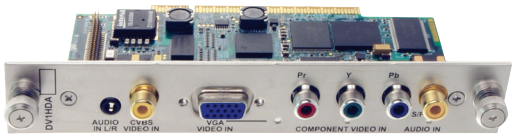

Figure 2-7: Component/VGA HD/SD Encoder

2.6.4 DV1HDMI

Single Channel HD HDMI® Input Encoder

Figure 2-8: HDMI® HD Encoder

2.7 Available Input/Output Cards

2.7.1 DV2DA Dual Output Distribution Amplifier

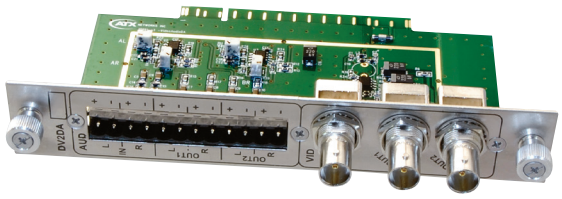

Figure 2-9: Dual Output A/V Distribution Amplifier

2.7.2 DVDMQMB QAM Modulator

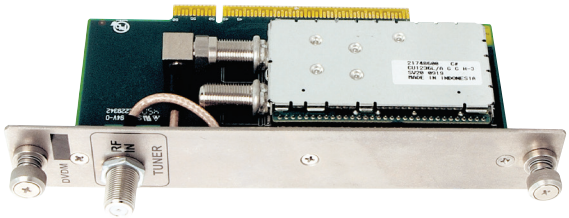

Figure 2-10: QAM Demodulator

2.7.3 DVGIGE Gigabit Ethernet Card

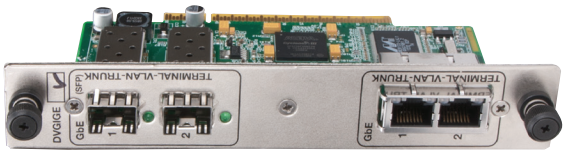

Figure 2-11: Gigabit Ethernet Output Card

FIELD APPLICATIONS

3. Field Applications

In this chapter we illustrate some of the common field applications for the DVIS systems. This listing is not exhaustive and does not show every combination of channel or program encoding/insertion.

FYI: *In this guide, reference to DVIS infers DVIS and DVISm unless the model is specifically stated.*

3.1 Chapter Contents

3.2 Analog Channel Insertion vs Digital Channel Insertion

In the past, in order to insert a local channel into an MDU, an entire cable channel would be deleted with a channel deletion filter and the entire existing channel would be lost, Figure 3-1.

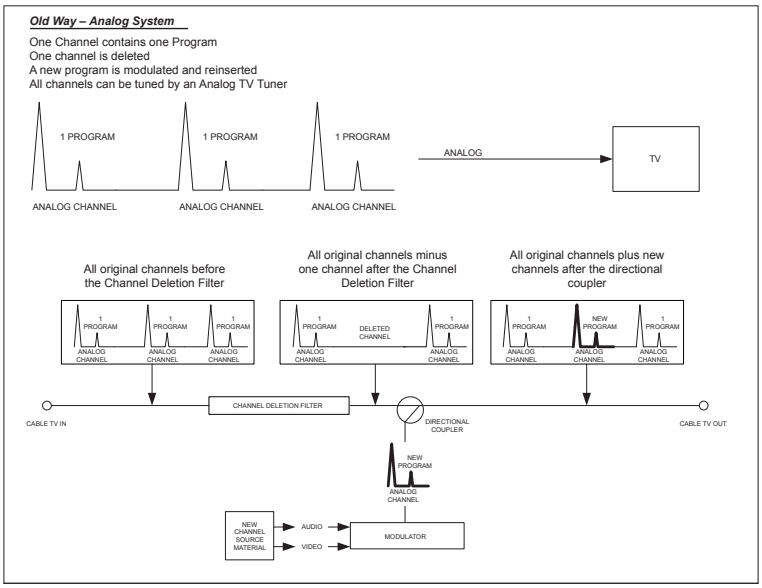

Figure 3-1: Analog Channel Insertion vs Digital Channel Insertion

Now it is possible with the DVIS system to delete only a single program (or multiple programs) from an existing QAM channel and replace that program with locally encoded content, see Figure 3-2. In this case the QAM channel is still deleted with a channel deletion filter or it is possible to insert the QAM carrier into spectrum space left intentionally blank without the use of a channel deletion filter.

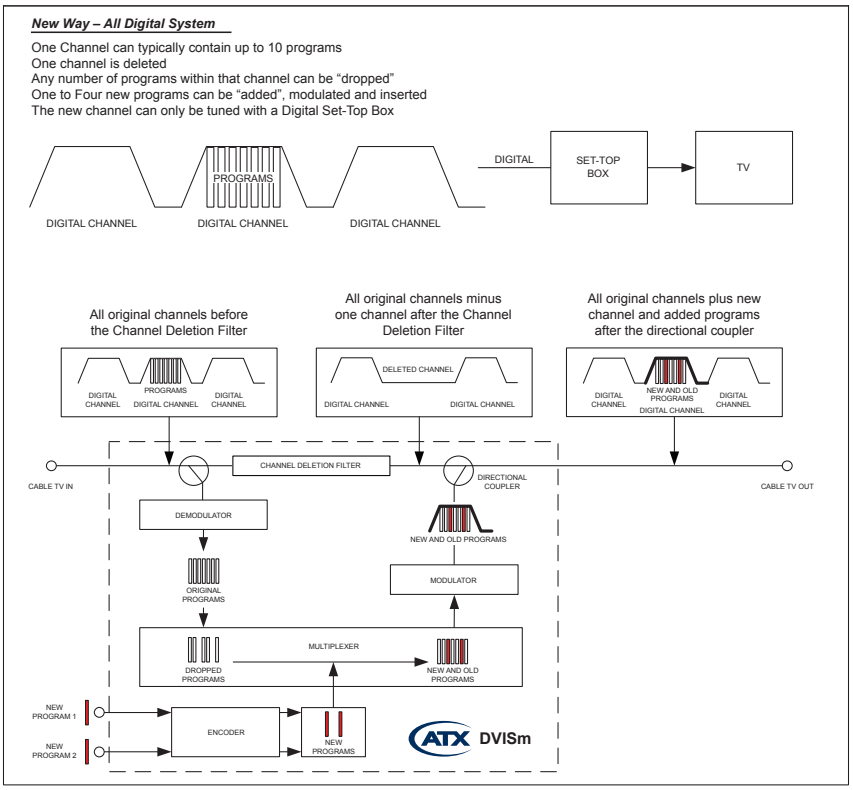

Figure 3-2: QAM Program Drop & Insert

3.3 RF QAM Insertion

The simplest configuration is to create a new QAM at the MDU them insert it into spectrum that contains no other channel. This scenario dose not require any pre-filtering.

3.3.1 RF QAM Insertion Into Empty Channel

DVIS series products can be used to insert local programming into the cable system where there is empty spectrum (no

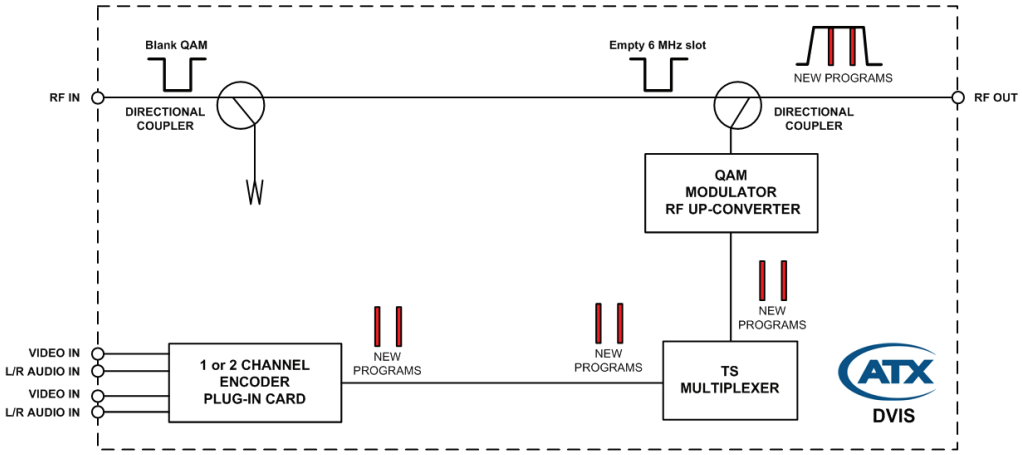

Figure 3-3: Insertion Into Blank Channel or at Band Edge

QAM or analog channel), see Figure 3-3. This can be spectrum in the middle of other channels or above the HFC plant end frequency (at the “band edge”). In these scenarios, a channel is allocated on the system where no carrier is sent from the headend and every property in the system where the DVIS Device is installed may insert a QAM without the use of a channel deletion filter. When RF spectrum is available for this application and/or there are a large number of insertion systems installed, the cost of a channel deletion filter may be saved at every property.

3.3.2 RF QAM Insertion at Band Edge

There are two main scenarios for this deployment:

- Regular 870 MHz plant has some empty channels remaining unused just below 870 MHz. The new QAM channel is inserted on one of these empty channels.
- Plant is built to 750 MHz so at least 100 MHz of plant is available with empty channels. The new QAM is inserted in this upper band above the 750 MHz plant.

In each case, some extra loss may be incurred through passives that are near or past their usable bandwidth but in such a case, only a very few passives are affecting the new QAM channel and the output may be increased slightly to compensate if required, Figure 3-3.

3.3.3 RF QAM Insertion Into Deleted Channel

This application is intended for clear or encrypted QAM channels that have programming that is able to be sacrificed or for QAM channels that are designed for this program insertion feature. Encrypted programs will be replaced with an ‘in the clear’ program. Using the optional channel deletion filter, the target channel may be effectively removed to make space for the inserted channel. In this case, Figure 3-4, adjacent system channels are minimally affected through the “Brick Wall” channel dropping filter technology.

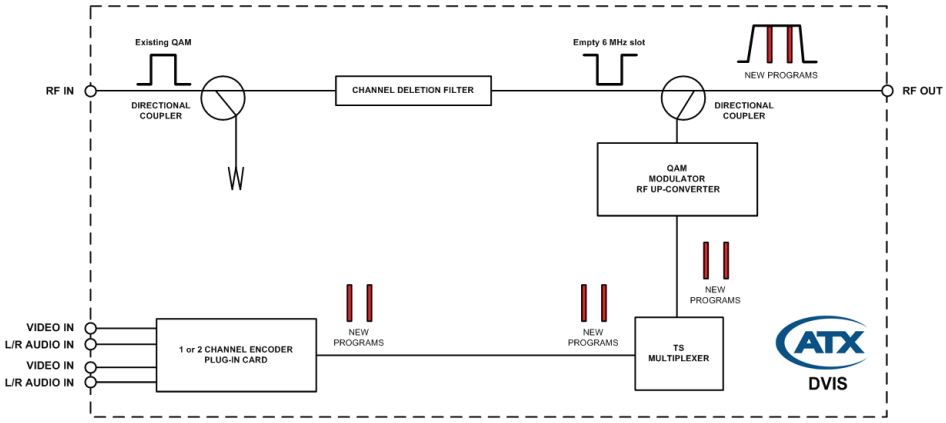

Figure 3-4: Insertion into Locally Deleted QAM

The equipment can be used to insert local programming into an EIA channel where the cable system carries a channel but providing customers with the programming on that channel is discretionary. In this scenario, a system EIA channel is deleted using an optional channel deletion filter with very good adjacent channel performance and deep rejection of the intended deletion channel. This filter is available from ATX Networks and is an integral part of the design of the units. In this case, they will create a totally new QAM channel and insert it into the blank spectrum following the output of the filter.

3.3.4 RF QAM Local Program Add/Drop

The DVIS system can be used to insert local programming into the actual data stream of a QAM by dropping specific programs from an existing QAM channel and replacing them with local content, Figure 3-5. This application requires an optional DEMOD Card and Channel Deletion Filter. In this application, the original system EIA channel is filtered out and a new QAM channel inserted in it's place, however, before deletion the incoming QAM channel is demodulated and de-multiplexed. This allows insertion of local content in a more granular manner, right at the program level. Any incoming programs may be selected to be deleted, even an encrypted program, and in their place, SD or HD programs may be inserted. Replaced programs will be 'in the clear'.This has the benefit of retaining programs in the QAM that must remain and using the deleted program space to provide the local content to the property. Only content payload is manipulated (dropped/replaced/added). All other data/tables from incoming QAM is passed through without any affect.

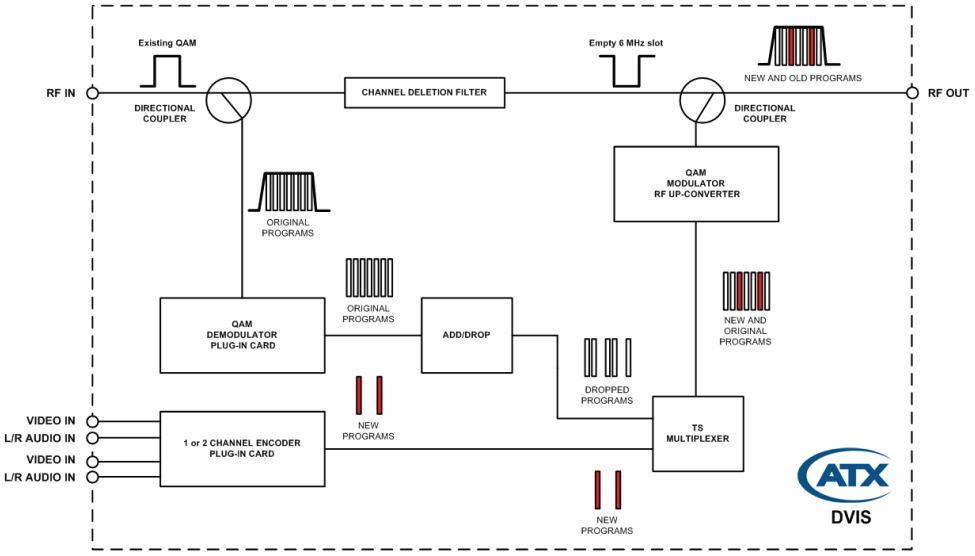

Figure 3-5: Local Add/Drop of Programs in a QAM

3.4 IP Video Insertion Application

3.4.1 IP Insertion - MDU

This application uses encoding capability with IP output to insert programming into an IPTV property for distribution, Figure 3-6. The DVIS platform with GbE output card may be used to insert IP video content directly to a network switch for transmission on the plant in a hotel or other hospitality environment or transported via Edge QAM and optical for remote delivery.

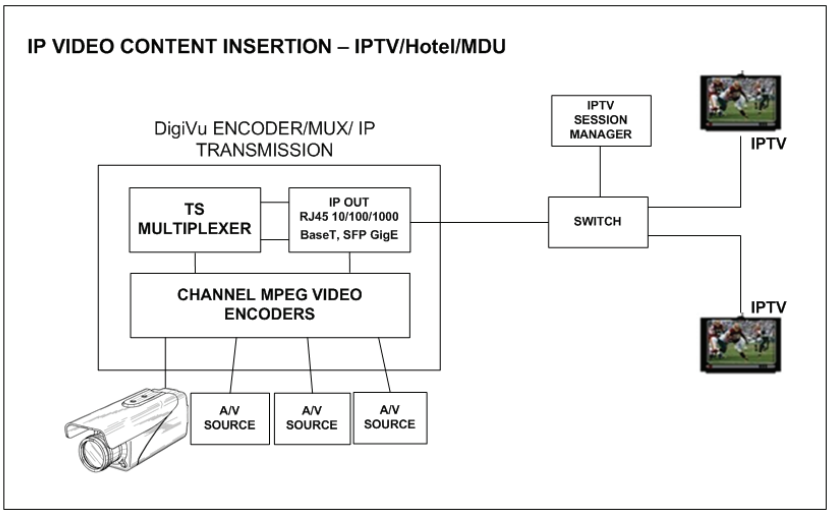

Figure 3-6: IP Insertion for an MDU

3.4.2 IP Insertion - Optical Transport

This application uses encoding capability with IP output to insert programming into an IPTV network for distribution at a hub, Figure 3-7. The DVIS platform with GbE output card may be used to insert IP video content directly to a network switch for transmission on the plant in a hotel or other hospitality environment or transported via Edge QAM and optical for remote delivery.

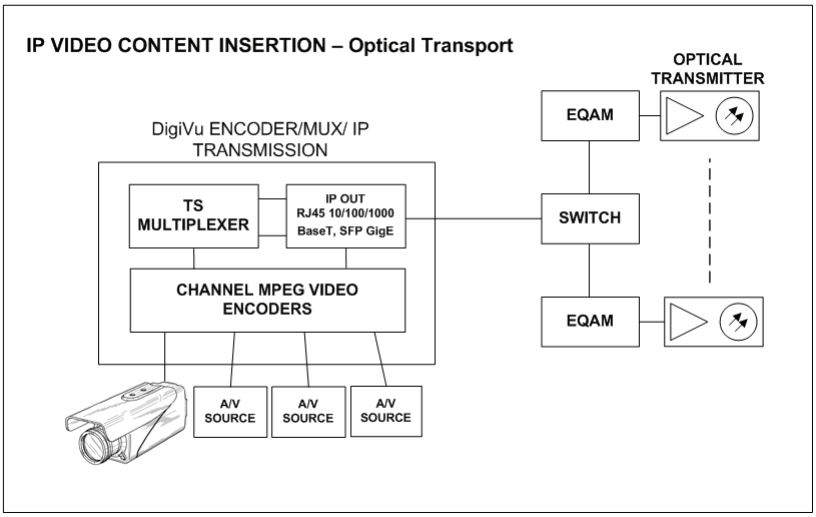

Figure 3-7: IP Video Insertion to Optical Transport

3.4.3 Local Content Back Haul Over IP

DVIS systems may be used for IP back haul where there is a source of video at a point in the plant such as a remote studio or special program origination location and the video is needed at a hub for reinsertion into the plant. There are two main applications as illustrated in Figure 3-8.

1. Fiber Back Haul

   This provides guaranteed signal quality, link speed and bandwidth. In this case, a single mode SFP installed in the GigE Module may be used to transport the IP stream on the fiber.

2. DOCSIS Modem Back Haul

   Not always possible to guarantee link speed and bandwidth which could vary, therefore encoded signal quality must be lower due to lower upstream bandwidth. In this case a DOCSIS modem with high rate upload speed is used to transmit the video over IP to the hub, where it is re-inserted.

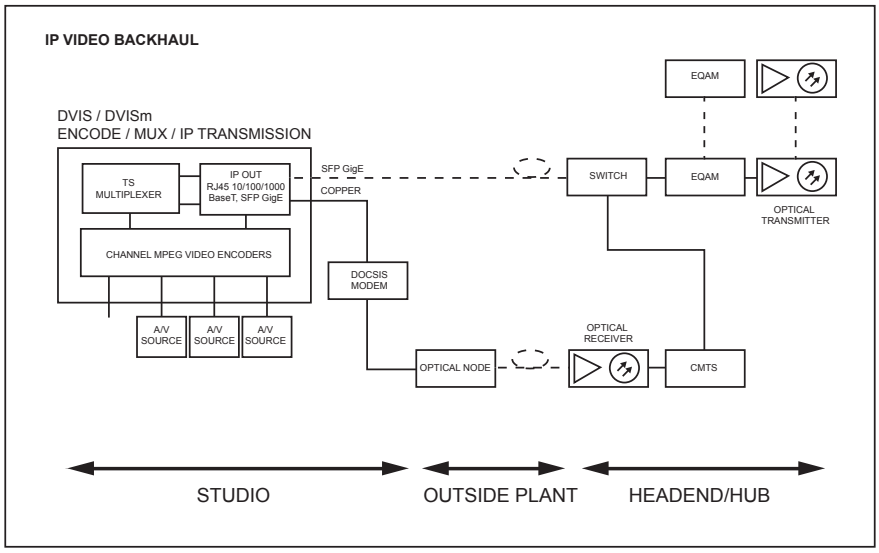

Figure 3-8: Local Content Back Haul over IP

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INSTALLATION

4. Installation

This chapter outlines the most important aspects of the installation and summarizes the site considerations that the installer must take into account when choosing a location for the unit.

FYI: *In this guide, reference to DVIS infers DVIS and DVISm unless the model is specifically stated.*

4.1 Chapter Contents

4.2 Recommended Installation Environment

Carefully unpack the equipment from the shipping box. If the box or equipment is damaged, notify the freight company to make a damage claim. If you suspect that there is a problem with the equipment that may preclude safe operation, do not install or operate it.

The DVIS cabinet may be mounted in a variety of positions as required by site conditions although the intention was that the cabinet be installed with the cable entry at the bottom and fans at the top.

NOTE: *This equipment is intended for installation in a RESTRICTED ACCESS LOCATION only. Not for use in a computer room as defined in the Standard for Protection of Electronic Computer/ Data Processing Equipment, ANSI/NFPA 75. This equipment is intended for use in a fixed position and should be installed securely before operation is undertaken.*

4.3 Equipment Safety Grounding

It is imperative that the cabinet be connected to a permanent building ground in a manner that will ensure that the exposed metal parts are constantly connected to ground even when the power cord may be disconnected temporarily. A grounding lug is provided on the front panel to conveniently effect such a connection. The following guidelines are provided to clarify the requirements for the installation to meet UL, CUL and CB standards. The use of the words "Ground" and "Earth" as well as "Grounding" and "Earthing" may be used interchangeably and in this context, have the same meaning.

Figure 4-1: Safety Ground Lug

4.3.1 Connection to Earth

The supplementary equipment grounding conductor is to be installed between the back panel ground connector and earth, that is, in addition to the equipment ground conductor in the power supply cord.

4.3.2 Conductor Size

The supplementary equipment grounding conductor may not be smaller in size than the branch-circuit supply conductors or a minimum #14 AWG. The supplementary equipment grounding conductor is to be connected at the back panel terminal provided, and connected to earth in a manner that will retain the earth connection when the power supply cord is unplugged. The connection to earth of the supplementary grounding conductor shall be in compliance with the appropriate rules for

terminating bonding jumpers in Part V of Article 250 of the National Electrical Code, ANSI/NFPA 70, and Section 10 of Part I of the Canadian Electrical Code, Part I, CSA C22.1.

4.3.3 Conductor Termination

Termination of the supplementary equipment grounding conductor may be made to building steel, to a metal electrical raceway system, or to any grounded item that is permanently and reliably connected to the electrical service equipment earth.

4.3.4 Conductor Type

Bare, covered or insulated grounding conductors are acceptable. A covered or insulated grounding conductor shall have a continuous outer finish that is either green, or green with one or more yellow stripes.

4.4 RF Cable Sheath Grounding

4.4.1 Requirement to Ground the Coaxial Cable Sheath

In addition to the supplementary ground to the equipment, it is also required to ground the sheath of the RF coaxial cable at it's point of entrance to the building. If the cabinet is installed at a location removed from the point of coaxial cable entrance, it is the installer's responsibility to ensure that the grounding of the sheath has already been performed in accordance with electrical code directives.

4.4.2 Size of Grounding Conductor

The size of grounding conductor and the manner of attachment to the coaxial cable should be in accordance with the national electrical safety regulations in effect in the country in which the installation is located.

4.4.3 Minimize Coaxial Cable Sheath Currents

Care should be taken when grounding the coaxial cable sheath to ensure that circulating currents are minimized to prevent interference on the RF signal. This ground loop condition may be minimized by connecting the coaxial cable sheath grounding conductor to the same building ground point as the cabinet safety ground conductor attachment.

4.5 Mounting

4.5.1 Panel Mounting

The cabinet is intended to be mounted flat against the backboard only. Be sure to provide sufficient area. The outside dimensions are:

DVIS 17"H x 17.5"W x 8.75"D (43.18H x 44.45W x 22.23D cm)

DVISm 13.5"H x 14.5"W x 8.75"D (34.29H x 36.83W x 22.23D cm)

A reasonable amount of space will be required all around the cabinet. The equipment is designed with fan forced cooling, so be sure to avoid blocking airflow and mount in such a manner to provide a source of ambient cool air at the bottom air intake grill. Consider also that the site technician will need access the front of the unit for service, maintenance and configuration when determining the best mounting location. Wood screws required to mount the cabinet to a backboard are not supplied.

4.5.2 Panel Mounting Precautions

FYI: *See* "Equipment Safety Grounding" on page 4-1 *for more detailed information on the safety ground*

1. Elevated Operating Ambient:

   If installed in a closed environment that may exceed room ambient temperature, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature specified (50°C).

2. Reduced Air Flow:

   Installation should allow at least 2" spacing around the equipment to ensure that airflow required for proper operation is not compromised.

3. Mechanical Loading:

   Mounting of the equipment should be according to the installation instructions so that a hazardous condition is not created due to improper mechanical loading. Do not use the DVIS Device cabinet to mechanically support other equipment.

4. Circuit Overloading:

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuit will have on over-current protection and supply wiring. Consider equipment nameplate ratings when addressing this concern.

5. Reliable Earthing:

   The cabinet must be connected to a reliable ground or earth connection with an adequately sized copper conductor.

4.5.3 Using the Installation Template

Each shipped DVIS Device is provided with a full size template to assist with installation. The unit is mounted on a backboard panel using keyhole slots in the cabinet rear panel but some of the mounting slots are inaccessible inside the unit so the template simplifies installing the mounting screws in the correct locations. If you do not have a template either call ATX Customer "Contact ATX Networks" on page 4-3 and request one or download from the ATX website (atxnetworks.com) in the Resources & Support Section, User Documents sub-section.

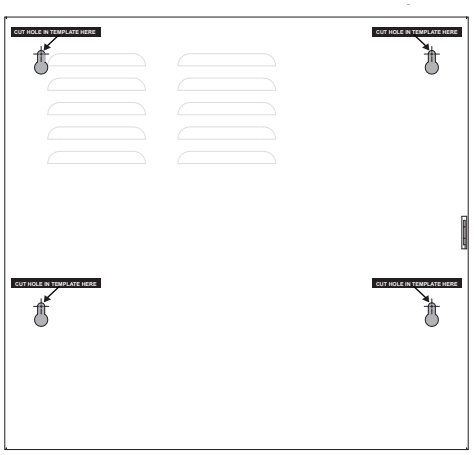

Figure 4-2: Example Mounting Template - Not to Scale

If you don't have the ability to print these full size, a workable template may be made with a large sheet of paper or cardboard. Place the paper or cardboard on the rear of the cabinet and punch holes through at the keyhole locations. This may take a bit of trial and error but will result in a most satisfactory template. Only two of the four holes are inaccessible, so only two screw locations need be measured. The last two screws may be installed from inside the cabinet with the filter panel removed.

1. Choose a mounting location that allows minimum 5 cm (2 in.) of clearance around the unit in order for proper venting and space for cables.
2. Tape the template to the mounting surface in the exact location the unit is to be mounted.
3. Pre-drill mounting holes at the marked locations on the mounting surface. (this step may be skipped if installing on a wood backboard)
4. In the holes, install mounting fasteners capable of supporting 50 lb. Maximum fastener size is #10 pan head screw and they must not protrude more than 0.5 cm (0.2 in.) into the DVIS Device housing.
5. Tighten the screws until the gap under the screw head is just slightly less than the thickness of the sheet metal cabinet.
6. Open the unit and remove the channel deletion filter slot panel and filter if installed.
7. Line up the key holes on the rear of the unit with the fasteners on the mounting surface, push the unit against the mounting surface so that the fasteners protrude through the key holes, and slide the unit downward until the fasteners are located at the top of the key holes.

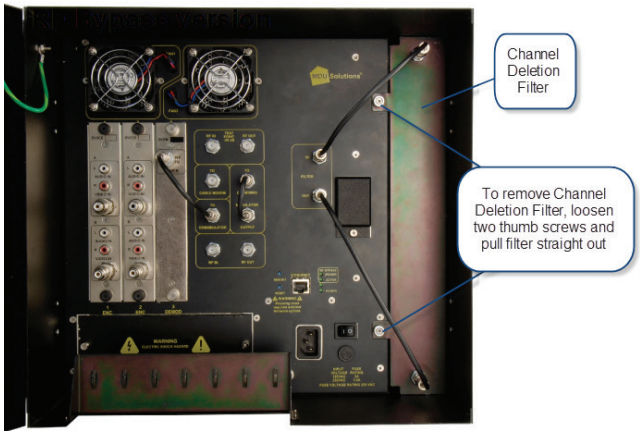

Figure 4-3: Removal of Channel Deletion Filter to Access Mounting Slots

8. Tighten the fasteners in the accessible key holes to firmly secure the unit.
9. Replace the filter slot panel and filter.

4.6 Environment Considerations

4.6.1 Ambient Temperature

The cabinet must be installed in a room where the ambient air temperature does not exceed +122°F (+50°C). This is a maximum temperature that must not be exceeded but the preferred temperature range is one where people feel most comfortable.

4.6.2 Non-condensing Environment

The environment must be non-condensing. This means that a relative humidity of less than 95% must be maintained. Lower humidity is better and the preferred humidity range is one where people feel most comfortable.

4.6.3 Fan Control

The equipment is designed to operate to specification in an ambient room temperature of 0°C to +50°C (+32°F to +122°F). Sufficient airflow through the unit must be maintained regardless of the mounting location. It is imperative that other equipment or materials of any type do not block free airflow around the cabinet. There are no internal air filters so there is no need to provide ongoing maintenance of filters.

4.7 Provisioning Electrical Power

4.7.1 Power Cord Protection

Measures must be taken during installation to route or arrange the power supply cord to prevent physical damage to the cord and to avoid the possibility of future damage occurring. The power supply cord shall be installed and routed such that, throughout it's length, the cord and it's points of connection are not strained in any way.

4.7.2 Power Cord Attachment

The power supply cord shall not be attached to the building surface, bundled with audio, video or RF coaxial cables, nor run through walls, ceilings, floors and similar openings in the building structure.

4.7.3 Provision of Electrical Power Outlet

An electrical power outlet of appropriate type and rating shall be provided near the location where the cabinet is installed such that the provided power supply cord may be routed in an appropriate manner, without the use of extension cords, between the receptacle and the cabinet. Alternately, the cabinet shall be installed in close proximity to an existing electrical outlet such that the requirements of this paragraph are achieved.

4.7.4 IEC Power Input Cord

The power input receptacle is a standard IEC connector similar to that commonly used on computers and monitors. The power cord provided is dependant on the shipping address of the equipment. If shipped in North America a cord with a NEMA 5-15 grounded plug for 115 VAC is provided. If it is necessary to operate the equipment on 230 VAC, the installer must obtain an IEC cord with a NEMA 6-15 grounded plug for use in North America. This may be obtained from ATX Networks or locally. If shipped outside of North America, the equipment will be shipped with an IEC cord set appropriate for the locale.

4.7.5 Input Power Requirements

When installing equipment, it is the responsibility of the installer to determine that sufficient capacity is available in the electrical circuit feeding the unit to avoid overloading the supply circuit. Each model will require power according to it's specifications to be supplied from a properly grounded outlet. The installer should determine that the power outlet, its wiring and receptacle is in compliance with the local electrical codes.

4.7.6 Input Power

The input power requirement is constant over the range of input voltages. At higher input voltages, the current consumption is lower than it is at lower voltages where the input current is higher.

4.7.7 Input Voltage Range

The equipment is supplied with an autosensing switching type power supply which can operate on input voltages from 90 VAC to 264 VAC. There is no need to configure the power supply to operate on any voltage within this range.

4.7.8 Fusing

The internal power supply is protected from over current conditions with a slow blow fuse. Replace with similar type and rating to avoid over-current circuit damage. The following table describes the fuse if replacement ever becomes necessary.

Table 4.7a: Fuse Replacement Criteria

Input Voltage	Applies to	Fuse application	Type	Ampere rating	Fuse size
115 VAC	DVIS & DVISm	AC IN	Slow Blow	3	5 x 20 mm glass tube
230 VAC	DVIS & DVISm	AC IN	Slow Blow	1.5	5 x 20 mm glass tube
115 VAC	DVIS	Receptacle	Slow Blow	3	5 x 20 mm glass tube
230 VAC	DVIS	Receptacle	Slow Blow	1.5	5 x 20 mm glass tube
115 VAC	DVIS & DVISm	Internal Power Supply	Fast Blow	4	5 x 20 mm glass tube
230 VAC	DVIS & DVISm	Internal Power Supply	Fast Blow	4	5 x 20 mm glass tube

4.8 RF Cabling

RF cabling to the cabinet should be either RG6/u or RG59/u style double or triple shield coaxial cable of a type UL approved for Cable TV applications. Connectors should be **very lightly** wrench tightened according to Cable Service Provider's company policy.

NOTE: *Final connection of the RF output to the distribution network should only be completed when the installer has completed configuration. An incompatible configuration, if it was installed or configured elsewhere, may create a situation where output RF Levels are incompatible with the premises. This may result in unintended service outages.*

4.8.1 RF Port Connectors

The DVIS system has been designed to need a minimum of external combiners or couplers. In most instances no external combiners will be required except for applications that were not anticipated. Figure 4-4 illustrates the connector panel. A "Simplified Block Diagram - DVIS" on page 2-4 may be referenced for details of interconnections. All connectors are 75 Ω "F" Type female connectors.

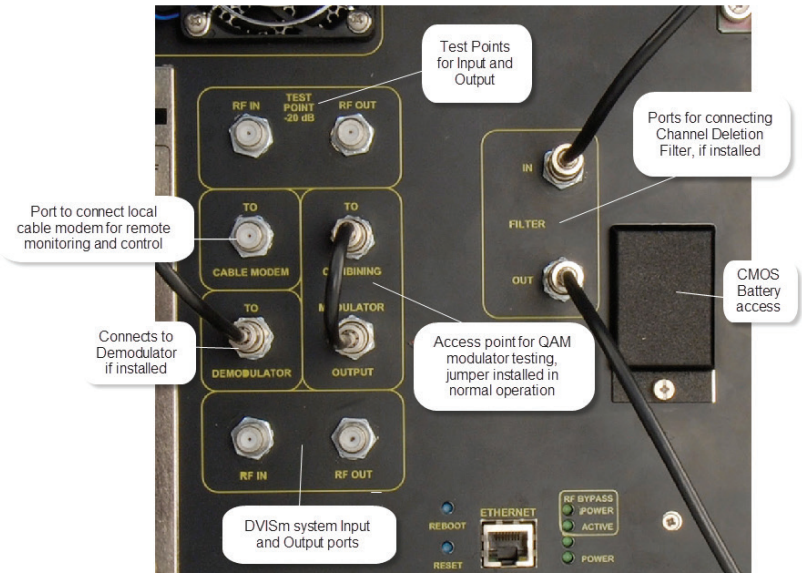

Figure 4-4: Integrated RF Management Ports

4.8.2 Integrated RF Management Ports

The following ports have been provided for connecting to internal and external elements.

Table 4.8a: Management Ports Description (See Figure 4-4)

Port	Description
RF In	This is the RF Input. Observe that the correct level of RF carriers is applied. See "4.8.3 RF Input Levels".
Test Points -20dB	Two -20dB test points are provided, one each on the input and output of the unit.
To Demodulator	If there is a demodulator installed, connect the RF port on the demodulator to this connector. There is a factory installed external 10dB attenuator between this port and the demodulator input to reduce the input level to the demodulator. Internally there is a 10dB coupler feeding this port. Total loss to this point is about 21dB including the external attenuator. The attenuator may be removed in the field if the input signal levels are lowered by 10dB or it may be replaced with an attenuator of appropriate value depending on available input levels. The required short jumper cable is provided with the demodulator.
To Cable Modem	For convenience, this connector is provided to feed a local cable modem for remote monitoring, configuration and control. The full sized DVIS Device is large enough to provide a shelf for the cable modem. The DVISm model provides the connection but there may not be room inside the cabinet for the modem itself. Loss to this point is about 23dB.
Modulator Output	There is an opportunity to directly access the QAM modulator output before combining for special applications. Usually there is a short jumper between this point and the "To Combining" port. RF output from the QAM modulator at this port without internal attenuation applied is about +57dBmV. Refer to the "Simplified Block Diagrams" on page 2-4 for details if this needs to be accessed.

Port	Description
To Combining	This is the port to which the QAM modulator output is normally connected with a short jumper cable. This access point is provided for convenience. Refer to the "Simplified Block Diagrams" on page 2-4 for details if this port needs to be accessed for special applications.
RF Output	This port is the final output; the original incoming channels with the newly inserted channel included. This is the reference point for setting the QAM modulator output (or use the test point) so the level is flat with the adjacent channels. RF output level may be as much as 10dB lower here than that presented at the input port.

4.8.3 RF Input Levels

NOTE: *There is a factory installed external 10dB attenuator on the demodulator input port designed to reduce the input level presented to the demodulator. This may be removed in the field if input levels below those specified will be presented to the RF input.*

The input signal level presented to the RF input fitting must be in the range of +30 to +35dBmV per digital carrier as measured with a digital field meter in order to present sufficient RF level to the demodulator. This RF input level will result in an input level to the demod of approximately +4 to +14dBmV. If local conditions dictate that a higher or lower signal level is available, the installer must install appropriate external attenuation or may remove the demodulator attenuator to ensure the input specification is met. External RF attenuators and couplers that may be necessary depend on site conditions and are not supplied.

4.8.4 RF Output Levels

The RF output level from the QAM modulator is 57.5dB but only presents a maximum of 35.5dBmV at the unit's output connection due to internal combining losses. The equipment provides an internal adjustable attenuator of up to 26dB in 1dB steps to reduce this level to match incoming RF levels. Try to adjust the modulator output to closely match adjacent channels on the unit's output.

4.8.5 Terminating Unused RF Ports

It is recommended that any unused RF ports be terminated with quality 75 Ω terminators to preserve the integrity of the return loss of installed components.

4.8.6 Local Cable Modem

If there is to be a local cable modem to provide remote access for management, connect the cable modem RF input to the product's RF port provided for this purpose. See "4.8.2 Integrated RF Management Ports" on page 4-5 for further details.

4.8.7 Channel Deletion Filter (Optional)

If the application requires a channel deletion filter, this is ordered separately and installed in the cabinet slot provided, see Figure 4-5. Connections are made to the front panel ports provided for this purpose and clearly labeled. If no filter is installed in the cabinet, there will be a short coaxial jumper cable installed between the filter input and output connections.

Figure 4-5: Optional Channel Deletion Filter

4.8.8 RF Output Level

The RF output connector is 75 Ω "F" Type female. The output level from the QAM modulator is +57.5 +/- 1.5dBmV. The GUI provides an internal adjustable attenuator of up to 26dB in 1dB steps to reduce this level to match application specific RF levels. Try to adjust the modulator output QAM level to closely match adjacent channels on the final system combining network.

4.9 Audio & Video Connections

4.9.1 Video Cable Recommendation

It is recommended to utilize double shielded 75 Ω coaxial cables with RCA connectors or adapters for video signals. UL approved coaxial cables that are in general use in Cable TV systems are satisfactory. Observe fire and smoke rating of cables and the installation environment to ensure compliance with all local codes. Cables shall be routed and connectors and adapters attached such that terminal connections are not strained.

Table 4.9a: Encoder Input/Output Connector Interfaces

Device Model Number	Video Input	Analog Audio Input	Digital Audio Input
DV1CE/DV2CE	BNC-F (2 for DV2CE)	RCA-F x 2 (4 for DV2CE) Unbalanced Stereo	
DV1HDA - Component Input	RCA-F x 3(RGB/YPrPb)	TRS 3.5mm-F Unbalanced Stereo	RCA-F (S/PIDF)
- VGA Input	DE-15	TRS 3.5mm-F Unbalanced Stereo	
- CVBS (This input for Closed Caption only)	RCA-F		
DV1HDMI	HDMI-F	TRS 3.5mm-F Unbalanced Stereo	HDMI-F
-CVBS CC	RCA-F		

4.9.2 TRS (Tip/Ring/Sleeve) Audio Connections

The audio connection for the HDMI Encoder unbalanced stereo analog input is made with 3.5 MM (1/8") TRS (Tip/Ring/Sleeve) plugs, the connection of which is illustrated in Figure 4-6. The installer may find that using available adapter cables to RCA, BNC or screw terminals similar to that shown in Figure 4-7 and Figure 4-8 will make interfacing easier.

Figure 4-6: 3.5 MM TRS Connections

Figure 4-7: 3.5 MM TRS to BNC

Figure 4-8: 3.5 MM TRS to Terminals

4.9.3 Video Input Levels

Analog Video Input level is expected to be 1 volt P-P although a higher and lower signal voltage may be tolerated by adjusting the video level control in the GUI. See "Brightness" on page 6-7 for a possible work around for low level video.

4.9.4 Audio Cable Recommendation

It is recommended to utilize double or triple shielded 75 Ω coaxial cables with RCA connectors or adapters for audio signals. UL approved coaxial cables that are in general use in Cable TV systems will usually be satisfactory. Observe fire and smoke rating of cables and the installation environment to ensure compliance with all local codes. Cables shall be routed and connectors and adapters attached such that terminal connections are not strained.

4.9.5 Audio Input Impedance & Level

The audio input is high impedance unbalanced. Be sure to match the audio source to the audio connection. Usually double or triple shielded 75 Ω coaxial cables may be used with satisfactory results. If balanced audio is encountered it is often possible to obtain good results by using only the + side of the feed.

4.10 Ethernet Network

4.10.1 Ethernet Port

A front panel Ethernet network port is provided to allow local and remote access to the equipment over the internet or a private intranet.

Information about use of the Ethernet port may be found at:

Setting port IP addresses "Network Settings" on page 9-5

"Connecting to the Management Computer" on page 5-2

"Connecting to a Local Cable Modem" on page 5-4

The Ethernet port is similar to a PC Ethernet port and will require a crossover cable to connect to a PC. Connection to a

router or switch may be made with a standard straight through cable. Port speed is 10/100 Base-T and will auto negotiate the connection based on the fastest common speed of the DVIS Device and connected equipment.

4.10.2 Ethernet Cable Type

Connect DVIS to:	Router or Switch	Computer
Cable Type	Straight Through	Crossover

Cat5e or Cat6 cables recommended. A crossover cable is supplied with every DVIS unit.

4.11 Installing Modules

For information on removing or installing modules, see “15. Module Field Replacement” on page 15-1

4.12 Cable Management Bar

The cable management bar may be used to organize and provide strain relief to cables entering the cabinet. Be careful to not over tighten cable ties to avoid distorting the coaxial cables which could result in return loss discontinuities.

4.12.1 Moving the Cable Management Bar

The cable management bar can be mounted to the exterior of the cabinet to facilitate removal of the power supply. To mount the cable bar below the unit:

1. Remove the four pan head Phillips screws from the under side of the cabinet bottom panel.
2. Remove the cable bar, see Figure 4-9.
3. Position the cable bar facing downwards underneath the unit.
4. Fasten the cable bar into place on the cabinet bottom panel using the four screws, see Figure 4-10.

Figure 4-9: Cable Management Bar Removed

Figure 4-10: Cable Management Bar Inverted Outward

4.12.2 Power Supply Access

As shipped, the cable management bar blocks access to the power supply. This is not an issue unless, in the unlikely event, the power supply needs to be changed. It is up to the installer as to which position of the cable bar best suits the installation.

THE MANAGEMENT GUI

5. The Management GUI

In this chapter we discuss the requirements for the computer required to manage the system, how to connect to access the Management GUI. We also discuss the connection of a cable modem to allow remote access.

5.1 Chapter Contents

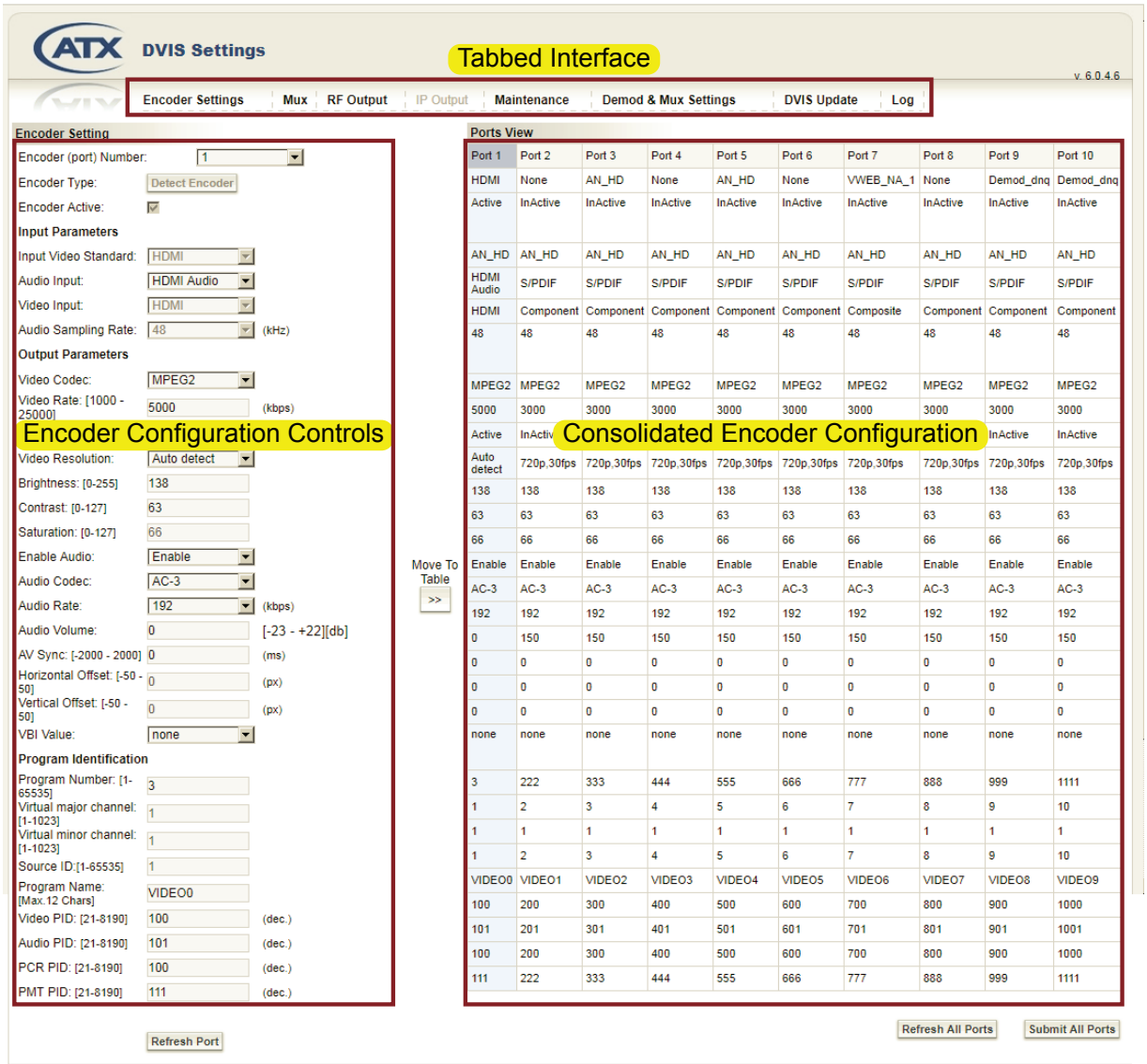

Figure 5-1: The Management GUI

5.2 Configuration Pages

5.2.1 Summary of Page Functionality

A brief outline and description of the GUI main configuration tabs follows.

Table 5.2a: GUI Configuration Tabs

Tab Name	Page Properties
"Encoder Settings"	Displays the HD/SD MPEG-2/H.264 Encoder configurable settings and the Ports View which is the complete list of installed modules and their stored configuration.
"Mux"	Displays the configurable settings affecting the output multiplex for RF or Ethernet, activation of the Ethernet output card and settings affecting legacy STB.
"RF Output"	Displays the configurable settings affecting the QAM output type and frequency and RF output level.
"IP Output"	Displays configurable settings affecting the Gigabit Ethernet card IP output type, IP source and destination addressing including VLAN and FEC. Only active with GbE card installed
"Maintenance"	Displays configurable settings for the GUI Ethernet network, cooling status and facilitates exporting configurations for backup and mass deployment.
"Demod & Mux Settings"	Displays configurable settings affecting the demod input frequency and all add/drop configuration and MPEG stream analyzer controls. Only active with demod card installed.
"DVIS Update"	Facilitates importing of firmware updates as well as import of a previously exported configuration file.
Log	Used for troubleshooting by ATX Networks support engineers.

5.3 Minimum Computer Requirements

The computer used to access the configuration settings is referred to as the **Management Computer**. It is recommended that the Management Computer meet the minimum requirements listed below.

5.3.1 Recommended Computer

- Computer with any OS.
- Wired Ethernet Network Port.
- Web browser.

5.4 Connecting to the Management Computer

The DVIS Device cabinet is provided with a 10/100 Base-T Ethernet network port on the front panel, shown in Figure 5-2. This port is for connecting to the GUI for initial configuration and ongoing monitoring and maintenance.

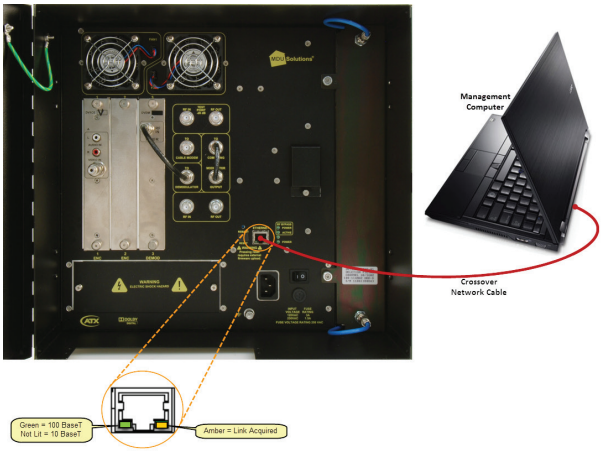

Figure 5-2: Management Computer Connected

If the equipment is to be connected to a local cable modem for remote configuration or monitoring, a standard Cat5e or better

type cable will be required for the connection to the modem. The cable required for connection to the cable modem is normally supplied with the modem.

5.5 Connecting to the GUI Using IPv4

FYI: By factory default only the IPv4 address is set.

Configuration requires a laptop or desktop PC with an available Ethernet network port (the Management Computer). If connecting directly to the unit, the Management Computer must be set to operate on the same subnet as the DVIS Device for access to the GUI.

The following procedures are for a default IPv4 IP address setting on the DVIS Device of 192.168.0.23.

FYI: *If you are using a different Operating System or the network address has been changed from default, adjust to suit the address or software you are using.*

1. Connect the Management Computer's Ethernet adapter to the device Ethernet port using a Cat5e cable.
2. Open a web browser and enter **192.168.0.23/site** in the address field, Figure 5-3.

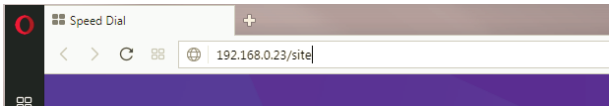

Figure 5-3: Open Browser at 192.168.0.23

3. The window shown in Figure 5-4 opens or similar depending on browser, requesting the username and password.

Username	Password
atx	atx

5. Once logged in you receive the default DVIS Device Settings page, shown in Figure 5-5.:

Figure 5-4: Login Dialog

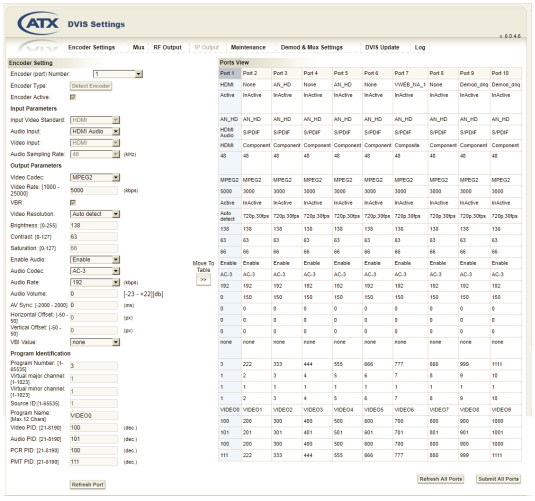

Figure 5-5: Default DVIS Page

5.6 Setup IPv6 Address

1. If an IPv6 address is required for your application, click the **Maintennance** tab of the GUI, Figure 5-6.

Figure 5-6: Use Maintenance Tab for IPv6 Setup

2. In the IPv6 Network Settings section, click the tick box if IPv6 DHCP is required, else leave unticked, Figure 5-7.

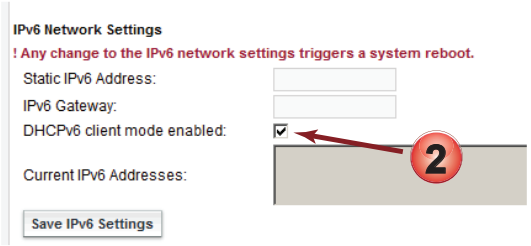

Figure 5-7: Tick Box for IPv6 DHCP

3. Enter the static IPv6 address and gateway, Figure 5-8.
4. Click **Save IPv6 Settings** Button. Confirm that you wish to change IPv6 settings. The Device will reboot.

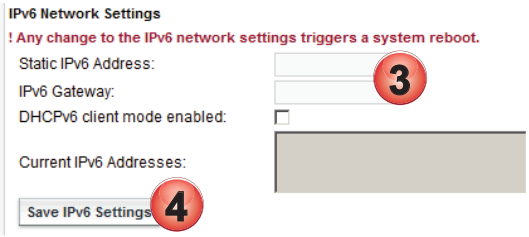

Figure 5-8: Enter IPv6 Address

5. After the reboot, reconnect with the GUI on either the IPv4 or IPv6 address. Be sure to append **/site** to either address.

5.7 Connecting to a Local Cable Modem

The following procedure allows remote management using a cable modem for internet connectivity.

5.7.1 Install and Connect the Modem

1. Connect the cable modem RF input to a source of cable TV RF signals of the appropriate level.
2. Verify that the modem completes registration to the DOCSIS carriers (LED indication). If the cable modem does not lock into the DOCSIS carriers, verify that the signal at the RF input port is sufficient.

5.7.2 Log into the GUI

It is first necessary to connect the Management Computer directly through a network cable to the Ethernet management port and configure the IP address for remote management. See “Connecting to the GUI Using IPv4” on page 5-3 for details on logging into the GUI.

In order to connect to the units remotely you need the IP address that the network port has been set to. Depending on the method of setting the IP address, acquire the address in the following ways:

Dynamic IP Address Acquired via Cable Modem

In order to reconnect to the GUI after it is connected to a cable modem, it is necessary to determine the IP address the unit has acquired from the DHCP server. There are two ways to achieve this:

- Get it from the DHCP Server:

  Log into the appropriate billing system interface and access the account associated with the cable modem being used. The account can typically be found by searching according to cable modem MAC address, which is labeled on the modem. Once you can access the cable modem account, verify that a client with the MAC address is connected. Record the IP address assigned to the DVIS unit MAC address in the cable modem client table.

- Get it from the Cable Modem:

  Log into the cable modem interface if it is accessible. Each cable modem has a built-in web server to allow troubleshooting and this interface will display the acquired IP address.

FYI: *In some systems, the time for the billing or modem management system to update with the most recent cable modem client table information may take a few minutes to a few hours. If you have alternative means to find out the IP address assigned to the client with the DVIS MAC address more rapidly, you can save time as the DVIS Device is available for remote access as soon as the new IP address is acquired, regardless of whether the billing or modem management system has this information.*

Once you have the assigned public IP address of the DVIS Device:

1. Open a web browser and in the address bar enter **http://xxx.xxx.xxx.xxx/site** replacing the x's with the IP address of the unit.
2. When the login screen appears, enter the Username and Password for the unit.

Username	Password
atx	atx

3. Upon validation of the login and password, the GUI opens and displays the 'DVIS Settings' page. The unit is ready to be managed remotely.

Static IP Address Assigned

Logging in with a static public static IP address is the same as using the default factory IP except that you are connecting through a public or private network.

1. Login to a computer with internet access. If you are using the same computer that was used for direct connection to the unit, remember to restore the computer's network settings to the appropriate values (the settings used prior to changes made for connection to the DVIS Device or other settings, as appropriate).
2. Open a new browser window to establish a fresh internet session entering the static IP address of the Device in the address window.
3. You should be presented with the following screen on the left, prompting you to log in:

Figure 5-9: Enter Username & Password

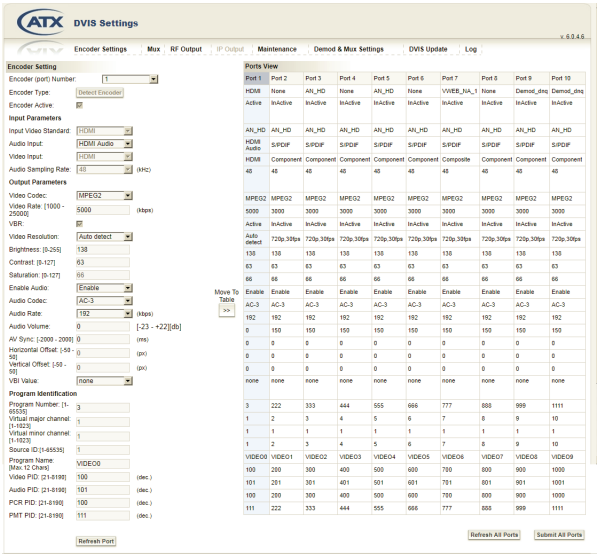

Figure 5-10: Default Screen when Logged In

When the login screen, above left, appears prompting you to log in, enter the factory default **atx** as User Name and **atx** as Password for the Device(or the correct user and password if they have been previously changed. When the login username and password are successfully entered, the default screen, above right, will be presented.

5.8 Resetting the Username and Password

If the Username or Password have been changed and subsequently forgotten, a firmware reset file is available which can workaround this problem without loss of programmed configuration. Contact ATX Networks technical support for assistance. When you have received the appropriate file from technical support, then see "14.9 Username & Password Reset Process" on page 14-8 for the file installation process.

ENCODER SETTINGS

6. Encoder Settings

In this chapter we detail the configuration controls which are used to adjust settings to achieve the encoder performance that is required. All GUI settings are discussed along with limits and some suggestions as to what values are most applicable and why. With the selection of some encoder types it will be seen that some parameters are greyed out, meaning that these parameters are either not relevant or are preset.

FYI: *In this guide, reference to DVIS infers DVIS and DVISm unless the model is specifically stated.*

6.1 Chapter Contents

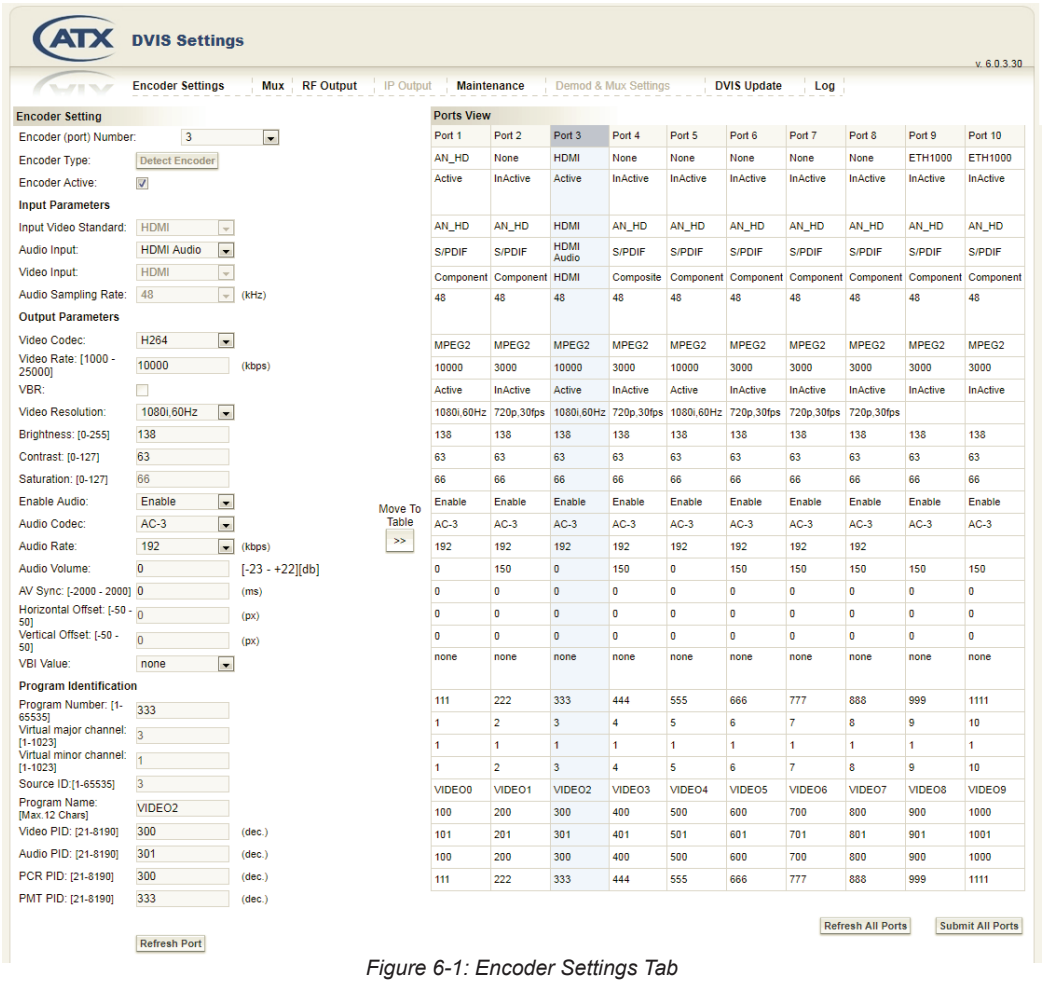

Figure 6-1: Encoder Settings Tab

6.2 SD Encoder Cards

The selection of encoder card is principally based on functionality required (one channel or 2 channel). The type of encoder that is plugged in will be detected and reported in the GUI. The options presented to be configured will be adjusted to only those available to the specific installed encoder.

Table 6.2a: SD Encoder Cards

Model	Description
DV1CE DV2CE	Available as single and dual channel encoder card. This is the currently shipping ATSC SD MPEG-2 encoder with support for a wide array of video resolutions and AC-3 audio bit rates. There is support for ATSC closed captioning which may be turned on or off as required.
DV1CEM DV2CEM	Available as single and dual channel encoder card. This is the currently shipping ETSI SD MPEG-2 encoder with support for a wide array of video resolutions and MPEG-1 audio bit rates. Support for ETSI closed captioning is not yet implemented so changing this setting has not effect.
NXP	Available as single and dual channel encoder card. This is the legacy SD MPEG-2 encoder model for both ETSI (European standard) and ATSC (North American standard). It is no longer available for purchase but may be encountered in existing installations. This encoder supported fewer video resolutions and audio bit rates than the current VWEB encoder. It also did not support Closed Captioning.

6.3 HD Encoder Cards

There are 2 HD single channel encoders distinguished by their hardware input interface capabilities. The type of encoder that is plugged in will be detected and reported in the GUI. The options presented to be configured will be adjusted to only those available to the specific installed encoder.

Table 6.3a: HD Encoder Cards

Model	Description
DV1HDA	This single program HD encoder supports both MPEG-2 or H.264 encoding (configurable) with 15 pin female VGA connector, RGB component input on RCA female connectors. Closed Captioning is supported but CC does not pass over the component or VGA interfaces. Instead, CC captioning must be input using the CVBS female RCA connector. The Video Resolution of this card must be set to match the input source.
DV1HDMI	This single program HD only encoder supports both MPEG-2 or H.264 encoding (configurable) with standard HDMI female connector. Closed Captioning is supported but CC does not pass over the HDMI interface. Instead, CC captioning must be input using the CVBS CC female RCA connector. Digital audio may be passed over the HDMI but alternately unbalanced Stereo audio may be input through the 3.5MM TRS connector.

The following table outlines the multiplexing capabilities for HD encoded programs per QAM channel or IP multiplex. The ability to output 5 HD programs per QAM depends on encoding format and bit rate and may be limited to less programs per QAM with a high encoder bit rate setting.

Table 6.3b: Programs Encoded per Platform

Platform	QAM Output	IP Output
DVIS	5 HD Programs	4 HD Programs
DVISm	3 HD Programs	2 HD Program

6.3.1 TRS Audio Connections

The audio connection for the HDMI Encoder unbalanced stereo analog input is made with 3.5 MM (1/8”) TRS (Tip/Ring/Sleeve) plugs, the connection of which is illustrated in Figure 4-6. The installer may find that using available adapter cables to RCA, BNC or screw terminals similar to that shown in Figure 4-7 and Figure 4-8 will make interfacing easier.

Figure 6-2: 3.5 MM TRS Connections

Figure 6-3: 3.5 MM TRS to BNC

Figure 6-4: 3.5 MM TRS to Terminals

6.4 Input & Output Cards

There are other cards available that may be used for some specialty applications. The cards are briefly described below.

Table 6.4a: Input & Output Cards

Card Model	Type	Description
DVDMQMB	QAM Demodulator	This card must be used if an add/drop configuration is required. May be installed in any card slot except #1.
DVGIGE	Gigabit Ethernet Output	This card is used in applications where Ethernet output of the DVIS Device is required and is supported only in specific slots. The recommended slot to use is always the highest available which will usually be slot #2 in the DVISm model and slot #5 in the DVIS model.

NOTE: *The Distribution Amplifier DV2DA do not appear in the GUI and are not affected by any firmware or upgrades. These cards are supported in any slot and only derive power from the mainboard connection.*

6.5 Port Numbering Convention

6.5.1 DVIS Model

Each DVIS physical encoder slot is assigned a pair of port numbers in the GUI and there can be up to two encoders per installed card. The first physical slot is assigned ports 1 & 2, the second slot is assigned ports 3 & 4 etc. If an encoder card has only one encoder installed, the port that would have been occupied by the second encoder is reported in the GUI as “None”.

6.5.2 DVISm Model

The DVISm unit is slightly different; since there are only 3 physical slots, ports 7 through 10 will be reported in the GUI as “None”. If a DVGIGE card is installed, it should always be installed in Slot 3.

The following table illustrates the relationship between slots and ports for both models:

Table 6.5a: Port Numbering Convention

Port Number in GUI	Physical Card Slot DVIS		Physical Card Slot DVISm	
	Single Encoder	Dual Encoder	Single Encoder	Dual Encoder
Port 1	Slot 1	Slot 1 – Input A	Slot 1	Slot 1 – Input A
Port 2		Slot 1 – Input B		Slot 1 – Input B
Port 3	Slot 2	Slot 2 – Input A	Slot 2	Slot 2 – Input A
Port 4		Slot 2 – Input B		Slot 2 – Input B
Port 5	Slot 3	Slot 3 – Input A	Slot 3	Slot 3 – Input A
Port 6		Slot 3 – Input B		Slot 3 – Input B
Port 7	Slot 4	Slot 4 – Input A	Ports 7-10 show up in GUI but there are no physical associated slots.	
Port 8		Slot 4 – Input B		
Port 9	Slot 5	Slot 5 - Input A		
Port 10		Slot 5 - Input B		

6.6 Encoder Configuration Quick Guide

6.6.1 Quick Guide to Encoder Configuration:

Refer to Figure 6-5 for clarification of this procedure.

1. Select the encoder port number that represents the encoder that is desired to be configured from the drop down box labeled ‘Encoder (port) Number:’
2. Make any adjustments required for the selected encoder in each of the dialogs or drop downs in the left column.
3. Click **Move to Table.** This stores the changes for the selected encoder but does not apply the settings.
4. Repeat from step 2 for each encoder requiring configuration.
5. When all encoders have been configured as needed, click **Submit All Ports** to apply all of the settings changes simultaneously.

NOTE: *Clicking ‘Submit All Ports’ is service affecting.*

NOTE: *When operating in Add & Drop Mode, a number of encoder settings on this screen are greyed out as they are set elsewhere. See* “Demod & Mux Settings” on page 10-4.

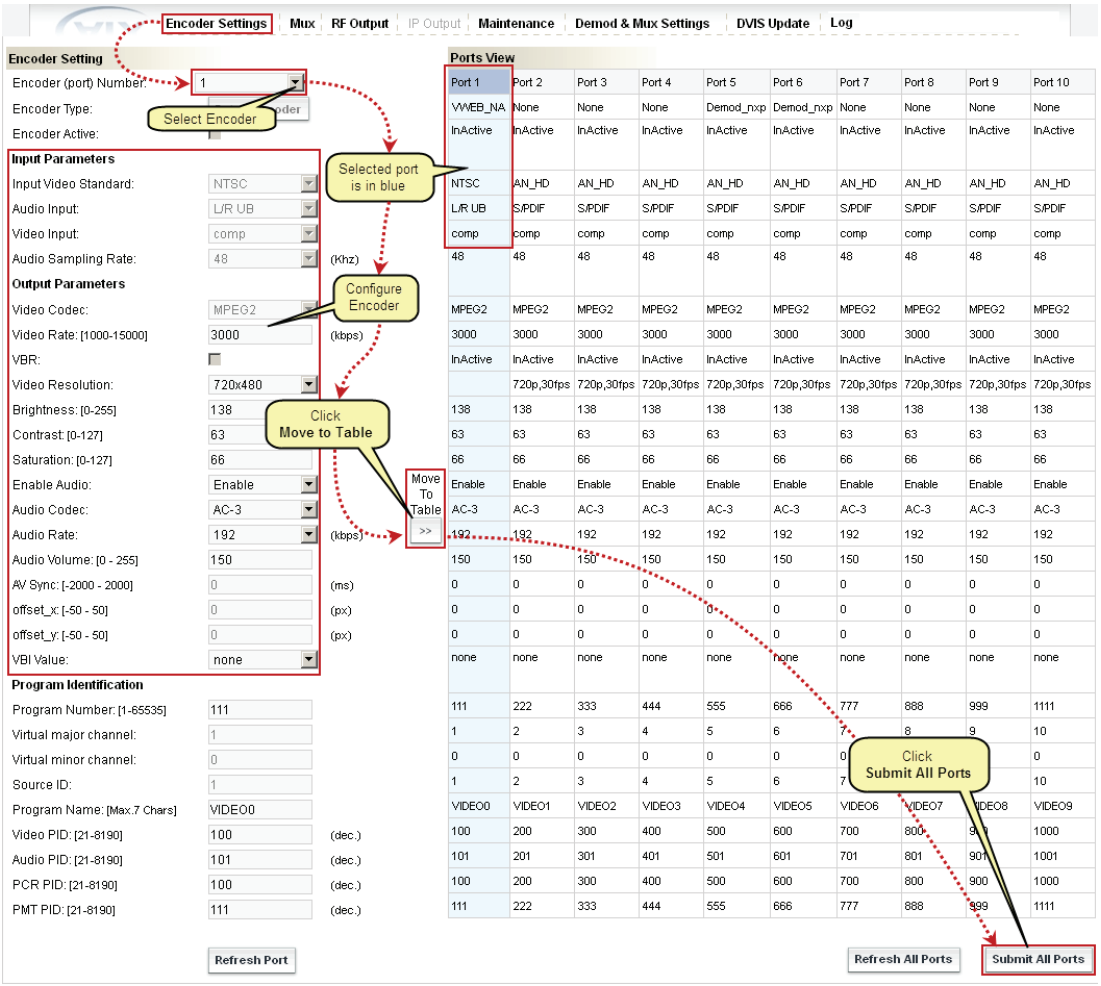

Figure 6-5: Quick Guide to Encoder Configuration

6.7 Encoder Setting Section

This section displays the configuration of all of the installed cards and allows adjusting some parameters. If other types of cards are installed, such as a demod or gigabit Ethernet card, they will be reported under the heading “Encoder Type” but are not configurable on this page. The **Encoder Number** control is used to select the encoder that is desired to change the settings for, then as each encoder is selected by way of the drop down dialog box, the appropriate encoder port is highlighted in the **Ports View**.

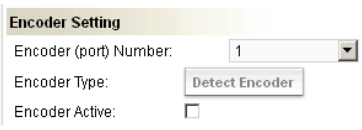

Figure 6-6: Encoder Setting

Table 6.7a: Encoder Settings (See Figure 6-6)

Setting	Description
Encoder (port) Number	Select the encoder port number from the drop down box representing the encoder that you wish to adjust the settings for. The applicable/selected column becomes highlighted in Ports View.
Encoder Type	In the ‘Ports View’ section the type of encoder installed is indicated. The types of SD encoders that may be encountered here were discussed in “SD Encoder Cards” on page 6-2 as well as the type of HD encoder in “HD Encoder Cards” on page 6-2. If another type of card is installed this will also be identified. These cards were briefly discussed in section “Input & Output Cards” on page 6-3. Disregard the configuration reported for all cards except encoders. The possible card types that may be reported here are:
Detect Encoder (Control)	• Slot Previously Empty: If an encoder slot was previously empty and a new encoder card was hot plugged into the slot, the GUI must be made aware of the change as it will not take any action without instruction. Click the **Detect Encoder** button to force a detection of the encoder card just installed. The control will be greyed out on any encoder selected that has already been detected. • Slot Previously Occupied If an encoder slot was previously occupied and a different card was hot plugged into the slot the DVIS Device must be made aware of it but the control is greyed out. In this case, click the **Refresh All Ports** button at the bottom of the GUI page to force the unit to detect the encoder card just installed. The control will be remain greyed out on any encoder selected that has already been detected.
Encoder Active:	This check box lets you switch each encoder on and off. On the right side of the page in the Ports View display, encoders are shown as active or inactive.

Table 6.7b: Encoder Type Summary (See Figure 6-5)

Card Type Reported	Capability
VWEB_NA	(NTSC Video SD MPEG-2, AC-3 audio)
VWEB_NA_1	(NTSC Video SD MPEG-2, AC-3 audio)
VWEB_EU	(PAL Video SD MPEG-2, MPEG-1 L2 audio)
VWEB_EU_1	(PAL Video SD MPEG-2, MPEG-1 L2 audio)
NXP	(Legacy NTSC/PAL Video MPEG-2 w/AC-3 & MPEG-1 audio)
ETH1000	(GigE Output Card)
AN_HD	(HD/SD MPEG-2/H.264 encoding)
HDMI	(HD MPEG-2/H.264 encoding)
Demod_nxp	(Legacy QAM Demod Card)
Demod_dnq	(QAM Demod Card)

6.8 Input Parameters Section

This group of settings are for configuration of any input variables on some encoders, such as Video Input on the HD Component/VGA encoder. Some of these parameters are preset depending on the encoder card and in this case, is for information only.

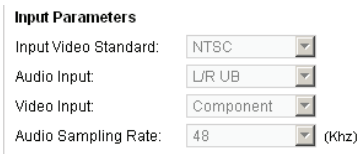

Figure 6-7: Input Parameters

Table 6.8a: Input Parameters (See Figure 6-7)

Setting	Description
Input Video Standard	Automatically selected as NTSC or PAL as appropriate for the SD encoder card installed. If an HD encoder is installed, this displays AN_HD or HDMI depending on installed card.
Audio Input	Allows selection between input types if more than one is available for the selected card. **- HD Component/VGA encoder:** Input types are L/R UB (Unbalanced) or S/PDIF (supports AC-3). **- HDMI encoder:** Input types are HDMI Audio or L/R UB (Unbalanced). **- SD encoder:** Input type is L/R UB (Unbalanced).
Video Input	Allows selection between input types if more than one is available for the selected card. **- HD Component/VGA encoder:** Input types are VGA or Component. **- HDMI encoder:** Input type is HDMI. **- SD Encoder:** Input type is Composite.
Audio Sampling Rate	This value is preset at 48 kHz and is the number of samples per second (in kHz) taken from an analog signal to make a digital signal.

6.9 Output Parameters Section

This group of configuration settings affect the video and audio program stream properties.

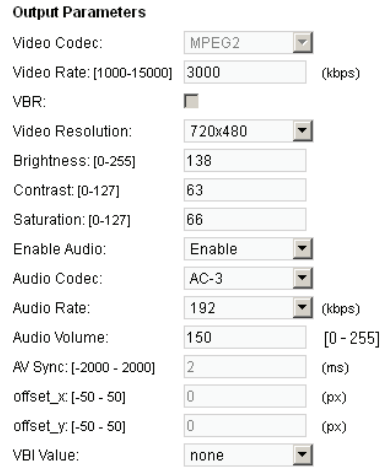

Figure 6-8: Output Parameters

Table 6.9a: Output Parameters Description (See Figure 6-8)

Setting	Description
Video Codec	For encoder cards with more than one type of encoding profile, this allows selection of the required profile. For both HD encoder cards the profile types are MPEG-2 and H.264. For the SD encoders, the profile is MPEG-2 for ATSC and ETSI.
Video Rate [1000-25000]	When the unit is operating in Add & Drop Mode, this setting is greyed out as it is set in the configuration view "Demod & Mux Settings" on page 10-4 The video program elementary stream bit rate is entered in kbps and must be between 1000 and 8000 for SD programs, between 1000 and 25000 for H.264 HD programs and between 1000 and 20000 for MPEG-2 HD programs. Increasing the bit rate increases the resulting picture quality but consumes more bandwidth. The entered value must be balanced against the number of other programs in the output MUX and the total amount of room within the MUX for each program. Although the HD Video Rate is able to be set as low as 1000 kbps, this low bit rate will not result in suitable quality and is only intended for the 480p and 576p resolutions that this HD card supports. Suitable quality for HD programs will be obtained at a bit rate of 6000 kbps or higher.
VBR	Preset, not configurable.

Setting	Description
Video Resolution	Video resolution refers to the number of discrete picture elements (pixels) in each horizontal line and the number of displayed horizontal lines in the picture. (e.g. 720 pixels per line x 480 lines). The available video resolution settings depend on the type of encoder installed. Higher picture resolutions require a higher video bit rate for the same picture quality and conversely, a lower resolution picture can be encoded with a lower bit rate. Depending on the quality required and the resolution of the source video, such as a lobby camera, lowering the resolution and bit rate may be used and more channels may be added in available bandwidth. For SD encoder cards: The Video Resolution setting determines the output resolution. For HD encoder cards: For HD encoding resolutions, the HDMI card auto-detects input Video Resolution however the Video Resolution setting must be manually set to match the input resolution for both HD Encoder Cards.
Brightness [0-255]	This dialog allows modification of the video signal to increase or decrease brightness. There are 256 levels available (0-255) The default value is preset at 138. This setting should not normally require changing.
Contrast [0-127]	This dialog allows modification of the video signal to increase or decrease picture contrast. There are 128 levels available (0-127) The default value is preset at 63. This setting should not normally require changing.
Saturation [0-127]	This dialog allows modification of the video signal to increase or decrease color saturation. There are 128 levels available (0-127) The default value is preset at 66. This setting should not normally require changing. For HD this is not applicable.
Enable Audio	The audio codec may be disabled if the specific application of the DVIS Device does not require an audio program such as a lobby camera. Disabling the audio codec will result in silence at the receiving TV. Use the drop down box to select the required setting. The default is Enable.
Audio Codec	This setting is automatically set to the value appropriate for the detected card. A codec converts an audio baseband signal to a specific streaming audio format. The AC-3 codec supported is 2.0 (two channel stereo). The supported audio codec depends on the encoder card installed.
Audio Rate	This drop down displays the audio bit rate options available for each installed encoder. This is the data rate at which an audio signal is encoded. Each encoder supports commonly used bit rates which range from 192 - 384 kbps. The recommended audio rate is 192 kbps for stereo audio.
Audio Volume	This control influences the volume level of the incoming baseband audio signal into the encoder card of 23dB to +22dB. This value typically does not need to be changed from it's default value but some guidance is provided if audio volume is not satisfactory with standard settings. SD Encoder: The scale is 0 - 255 with the default setting of 150. The value represents a relative volume output and is not an absolute level. If the volume as heard on a TV or other receiving device is too high or too low, increase the value to increase the output volume or decrease the value to decrease the output volume. Be careful to not increase the volume excessively as the encoding of extreme high volumes will cause instability. HD Encoder: The scale is in dB with a default setting of 0dB. The value represents a relative volume output and is not an absolute level. If the volume as heard on a TV or other receiving device is too low, increase the setting to a positive number to increase the output volume. An increase of 10dB will double the output volume. Be careful to not increase the volume excessively as the encoding of extreme high volumes will cause instability.
AV Sync	This adjusts audio/video lip-sync up to +/- 2000 ms if program audio is not in synchronization with the video. With each adjustment of this value, click **Add to Table** then **Submit all Ports** for the value to become effective, see Figure 6-5 for guidance. If needed, the correct value is found by trial and error.
Offset_X	This setting allows the adjustment of the horizontal position of VGA input signals only. With each adjustment of this value, click **Add to Table** then **Submit all Ports** for the value to become effective, see Figure 6-5 for guidance. The picture may be shifted by +/- 50 pixels.
Offset_Y	This setting allows the adjustment of the vertical position of VGA input signals only. With each adjustment of this value, click **Add to Table** then **Submit all Ports** for the value to become effective, see Figure 6-5 for guidance. The picture may be shifted by +/- 50 pixels.
VBI Value	This dropdown configuration menu enables ATSC Closed Caption (CC) support in the Vertical Blanking Interval (VBI). Only appropriate settings will be available in the drop down. The video encoders do not create a closed caption, they capture existing closed captions on incoming video and convert them to a digital format. CVBS Video containing the desired CC data is presented on the CVBS connector. • ATSC_CC: Enables capturing CC data for ATSC (In Cards DV1CE, DV2CE, DV1HDA, DV1HDMI). • ETSI_CC: Enables capturing of CC data for the ETSI (not currently implemented). • NONE: Disables the closed caption function.

6.10 Program Identification

This section allows configuration of the program specific settings of the transport stream. The PID values may often be left at their default values. The 'Program Number' must be set appropriately. The remaining parameters may or may not need to be set as it is application specific.

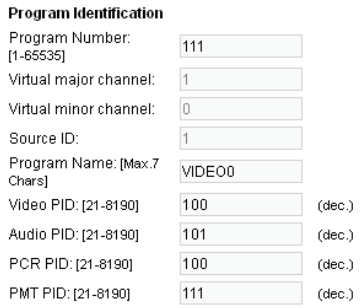

Figure 6-9: Program Identification

Table 6.10a: Program Identification Settings (See Figure 6-9)

Setting	Description
Program Number [1-65535]	This is the MPEG-2 Program Number that identifies a program from others within a multiplex and is used to allow selection and decoding at the receiving device. It is a unique number that is assigned to each program within a multiplex and may require setting according to the system channel map. The decoding device may display this program number for program selection.
Virtual Major Channel:	For a program in a QAM channel, this is the major channel which is often also the EIA channel. *- For virtual Major/Minor channels to be detected and acted upon by an appropriate end user device, it is required to enable the 'PSIP' feature on the MUX tab. See* "7.4 DVB® SI Settings" on page 7-2 *to enable this feature.* *- This parameter is only detected or used by end user devices that support PSIP tables.*
Virtual Minor Channel:	For a program in a QAM channel, this is the program number within the previously defined Major channel. This is the program number within the multiplex. *FYI: For virtual Major/Minor channels to be detected and acted upon by an appropriate end user device, it is required to enable the 'PSIP' feature on the MUX tab. See* "7.4 DVB® SI Settings" on page 7-2 *to enable this feature. FYI: This parameter is only detected or used by end user devices that support PSIP tables.*
Source ID:	A source ID may be assigned here if the DVIS Device application required it. This is not mandatory.
Program Name [Max. 12 Chars]	The name (up to 12 characters) assigned to a program may be entered here. To enable, it is required to select the DVB-SI option on MUX page. This name may or may not be supported in the end customer decoding device. *For Program Name to be detected and acted upon by an appropriate end user device, it is required to enable the DVB-SI feature on the MUX tab. See* "7.4 DVB® SI Settings" on page 7-2 *to enable this feature.*
Video PID: [21-8190]	The video PID is a decimal number that uniquely identifies a video transport stream in an MPEG-2 transport stream so that it can be filtered and routed appropriately. This value often does not need to be changed from it's default value as it is automatically reported in the PMT table.
Audio PID: [21-8190]	The audio PID is a decimal number that uniquely identifies an audio transport stream in an MPEG-2 transport stream so that it can be filtered and routed appropriately. This value often does not need to be changed from it's default value as it is automatically reported in the PMT table.
PCR PID: [21-8190]	The PCR (Program Clock Reference) PID is a decimal number that uniquely identifies the time base for synchronization of individual frames or fields of the video stream and their associated audio. This value often does not need to be changed from it's default value as it is automatically reported in the transport stream. Typically it always takes the same value as the video PID.
PMT PID: [21-8190]	The PMT (Program Map Table) PID is a decimal number that uniquely identifies a PMT table in an MPEG-2 transport stream. The PMT contains a data structure specifying which PIDs carry the video, audio and data stream that collectively constitute the broadcast program. This value often does not need to be changed from it's default value as it is automatically reported in the PAT table.

6.11 Platform Control Buttons

Control buttons to refresh the display or apply changes.

Figure 6-10: Control Buttons

Table 6.11a: Platform Controls (See Figure 6-7)

Control	Description
Refresh	This control reads the DVIS stored settings and refreshes the page with the values. This also will read the encoder card types installed and populate the display with the discovered types. This is useful when an encoder card type has been changed or a new encoder card installed.
Submit	This control applies all of the changes made on the 'RF Output' tab and makes the changes part of the working configuration of the DVIS system. If changes have been made click **Submit** button before navigating away from the page, to avoid all changes being lost. This attribute may be used to throw away changes made if you change your mind. NOTE: This is a service affecting operation

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MUX

7. Mux Tab - Configuration

In this chapter we detail the multiplexer controls for the specific installation environment. All settings are discussed along with limits and some suggestions as to what values are most applicable and why. If there is a Gigabit Ethernet output card installed, this is the page where the Ethernet output is enabled. The Ethernet and RF outputs may be flexibly set to either RF, Ethernet, or both simultaneous output types. While the Ethernet output is enabled here, it is not configured on this page. See "IP Output" on page 12-1 for Ethernet configuration.

FYI: *In this guide, reference to DVIS infers DVIS and DVISm unless the model is specifically stated.*

7.1 Chapter Contents

Figure 7-1: Mux Configuration Tab

7.2 Mux Settings

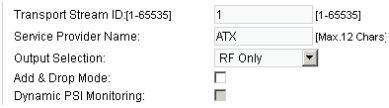

Figure 7-2: MUX Settings

Table 7.2a: Mux Settings (See Figure 7-2)

Setting	Description
Transport Stream ID: [1-65535]	A Transport Stream ID is a unique number describing the transport stream. The default value is 1 and supported values are 1 - 65535.
Service Provider Name:	An optional entry used to identify the provider of the service. This may or may not be supported or displayed by the end customer decoder device.

Setting	Description
Output Selection:	This check box selects which outputs are active. Ethernet may not be activated if there is no Ethernet output card installed in slot 2 or 5. IF SPTS IP output is desired, the only mode this is supported under is 'Ethernet Only'. The supported selections are: RF Only Ethernet only RF & Ethernet FYI: The Ethernet output is enabled here but is configured on the "IP Output" tab. See "IP Output" on page 12-1 for further details.
Add & Drop Mode:	This check box selects whether the 'Demod & Mux Settings' tab is enabled. The 'Demod & Mux Settings' are required if a demodulator is installed. After activation see "Demod & Mux Settings" on page 10-1. After checking the box click Submit button to apply the change.
Dynamic PSI Monitoring:	Selects whether Dynamic PSI (Program Specific Information) monitoring is enabled. This will instruct the unit to monitor the incoming PSI tables for changes and reanalyze the stream when they occur. This feature is active in add/drop mode only.

7.3 Legacy STB Settings

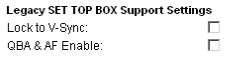

Figure 7-3: Legacy STB Settings

Table 7.3a: Legacy Set Top Box Settings (See Figure 7-3)

Setting	Description
Lock to V-Sync:	The default setting is 'Lock to Internal Sync'; the check box is not selected. Issues with vertical sync quality will usually manifest as constant or occasional vertical rolling of the image. The quality of the baseband vertical sync signal can be impacted by a number of factors including source quality, cable length, connectors and the presence of distribution amps. Using the internally generated timing signals is usually the most reliable method of sync recovery but in some circumstances better results maybe achieved by using the external baseband sync signal if vertical rolling is experienced. In this case click the selection box. This setting is not directly related to legacy STBs.
QBA & AF Enable:	Selects whether QBA and AF are enabled. Necessary only for some legacy set top boxes. Default; the check box is not selected.

7.4 DVB® SI Settings

These settings are not always required to be used for typical operation. They provide additional features if required by system operator.

Figure 7-4: DVB® SI Settings Section

Table 7.4a: DVB® SI Settings (See Figure 7-4)

Setting	Description
DVB-SI/ PSIP:	This setting is a drop down menu with preset options. None DVB-SI This selection enables support for passing/updating the SDT (Service Description Table) and NIT (Network Information Table) tables through the multiplexer in a drop & insert application as well as creation of SDT/NIT tables in encoding mode. It may be necessary in some installations to enable these tables to be received by the end user when tuned to the DVIS programs. In add/drop applications the SDT/NIT tables must be existing in the incoming QAM. If the tables do not exist, do not attempt to enable this feature. PSIP This selection enables insertion of Virtual Channel information as per PSIP standard, see "6.10 Program Identification" on page 6-8.
Network ID: [1-65535]	This is the Network ID as listed in NIT.
No Video Slide Enable	This **'No Video'** feature allows a slide to be shown to the viewer on a channel that loses video input to the encoder card. There is a pre-configured default slide, Figure 7-5, but a custom slide may also be uploaded to the system. **If Checked:** On loss of video to an encoder, the DVIS displays a built-in or custom slide graphic on the program output of encoders. One slide will display on all active encoders. **If Not Checked:** On loss of video to an encoder, the DVIS will have no output program to display. Depending on end display equipment it may show up as a black or blue screen or some default screen from end display device.
Built-in Slide	The default built-in slide provided displays a message indicating that a video source is not detected and advises that the video source and cables should be checked. This feature is useful to avoid blank channels in the lineup when local video sources fail. It indicates that the DVIS is functioning and RF output is present indicating that other customer premise equipment should be checked first. In some situations this may help prevent unnecessary service calls for the DVIS platform. Once this feature is enabled by ticking the box, a menu is activated which allows selection of either the default slide or a custom slide.

Setting	Description
Custom Slides	Custom SD slides should first be created using our online 'Video Loop Creation Tool' available in the Resources & Support > Calculators & Utilities sub-section at atxnetworks.com. This is the same tool for all DVIS and DigiVu products. Once the slide is created, it has to be exported (saved on local PC) and then uploaded into the DVIS using the **Upload Slide** button, see Figure 7-1. Click the **Submit** button to save and apply the image slide settings.

NOTE: *The Slide Enable feature is only available for use with SD encoder cards DV1CE, DV2CE, DV1CEM & DV2CEM. This will not work with either of the current HD encoder cards.*

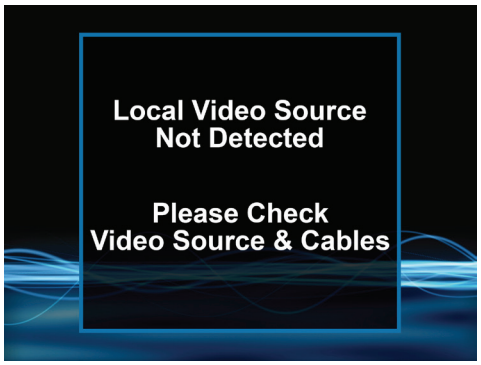

Figure 7-5: Default 'No Video' Slide

7.5 Platform Control Buttons

Control buttons to refresh the display or apply changes.

Figure 7-6: Platform Control Buttons

Table 7.5a: Platform Controls (See Figure 7-2)

Control	Description
Refresh	This control reads the DVIS stored settings and refreshes the page with the values. This also will read the encoder card types installed and populate the display with the discovered types. This is useful when an encoder card type has been changed or a new encoder card installed.
Submit	This control applies all of the changes made on the 'RF Output' tab and makes the changes part of the working configuration of the DVIS system. If changes have been made click **Submit** button before navigating away from the page, to avoid all changes being lost. This attribute may be used to throw away changes made if you change your mind. NOTE: This is a service affecting operation

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RF OUTPUT

8. RF Output

In this chapter we discuss the RF output configuration. This is the page from which all QAM RF output settings are changed or configured. Reference to DVIS infers the discussion applies to DVIS and DVISm unless specifically stated.

FYI: *In this guide, reference to DVIS infers DVIS and DVISm unless the model is specifically stated.*

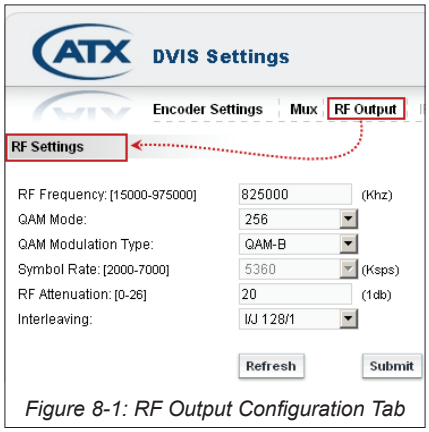

Figure 8-1: RF Output Configuration Tab

8.1 RF Output Settings

Settings affecting the QAM RF output of the DVIS are configured on this page. QAM output settings and operation is based on ITU-T Recommendation J.83 standards.

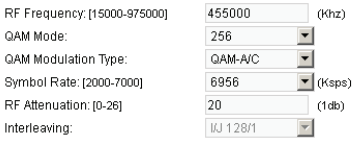

Figure 8-2: RF Output Section

Table 8.1a: RF Output Settings (See Figure 8-2)

Setting	Description
RF Frequency	Enter the required QAM output channel center frequency here in Khz without any decimals or commas. This supports STD, IRC and HRC channel plans. The limits of tuning are 15000 kHz to 975000 kHz.
QAM Mode	Select the appropriate QAM constellation. The available selection is dependant on the selected QAM modulation type as outlined here. **North America - QAM-B**: 64 & 256 QAM **Europe/Japan - QAM A/C**: 16, 32, 64, 128 & 256 QAM
QAM Modulation Type	The type of QAM modulation is selected here and is dependant mostly on locale. In general, the following applies: QAM-B is defined in ITU-T standard J.83 Annex B for use in North America and other territories following same standard. QAM A/C is defined in ITU-T standard J.83 Annex A and J.83 Annex C for general use in Europe, Japan and other territories following same standard.

<table>
<tr><th>Setting</th><th>Description</th></tr>
<tr><td>Symbol Rate</td><td>The values presented as preset options depend on the QAM modulation type selected. QAM-B has two predefined values, but QAM-A/C allows a user defined setting along with some common predefined values. All DVIS models support symbol rates between 2000 and 7000 Kilo symbols per second (ksps).
<table>
<tr><th colspan="3">Default Values of Symbols/Sec for each QAM Type</th></tr>
<tr><th colspan="2">QAM-B</th><th>QAM-A/C</th></tr>
<tr><td rowspan="4">5360 ksps</td><td rowspan="4">256 QAM</td><td>User Defined</td></tr>
<tr><td>2608 ksps</td></tr>
<tr><td>3478 ksps</td></tr>
<tr><td>4347 ksps</td></tr>
<tr><td rowspan="4">5056 ksps</td><td rowspan="4">64 QAM</td><td>5217 ksps</td></tr>
<tr><td>6086 ksps</td></tr>
<tr><td>6956 ksps</td></tr>
</table></td></tr>
<tr><td>RF Attenuation</td><td>The DVIS internal RF output attenuator will lower the QAM RF output level by up to 26dB in 1dB steps. The output level of the QAM carrier is +57.5dB +/- 1.5dB with this attenuator set at 0dB.</td></tr>
<tr><td>Interleaving</td><td>This setting is only available for the QAM-B mode. The interleaving may be adjusted if required, though it will not normally require changing from the default value of ‘I/J 128/1’. Supported values listed here are defined by the standard:
I/J 64/2, I/J 32/4, I/J 16/8, I/J 8/16, I/J 128/1, I/J 128/2, I/J 128/3, I/J 128/4, I/J 128/5, I/J 128/6, I/J 128/7, I/J 128/8</td></tr>
</table>

NOTE: *Uniform RF performance (as per published spec) is available between 30 MHz and 960 MHz. The areas close to lowest/highest tunable range fall in the roll-off of the operating range and RF parameters (for instance MER) are starting to degrade in these two border areas. Depending on desired application this might or might not be acceptable. It should be tested under such application to obtain relevant data about suitability.*

FYI: *The interleaving in QAM-A/C is fixed in the standard to 1/J 12/17 and is therefore not listed in the GUI.*

8.2 Platform Controls

Control buttons to refresh the display or apply changes.

Figure 8-3: Platform Control Buttons

Table 8.2a: Platform Controls (See Figure 8-3)

Control	Description
Refresh	This control reads the DVIS stored settings and refreshes the page with the values. This also will read the encoder card types installed and populate the display with the discovered types. This is useful when an encoder card type has been changed or a new encoder card installed.
Submit	This control applies all of the changes made on the ‘RF Output’ tab and makes the changes part of the working configuration of the DVIS system. If changes have been made click **Submit** button before navigating away from the page, to avoid all changes being lost. This attribute may be used to throw away changes made if you change your mind. NOTE: This is a service affecting operation

MAINTENANCE

9. Maintenance

Access the Device Network Configuration, passwords and usernames and TACACS+ settings from this page.

9.1 Chapter Contents

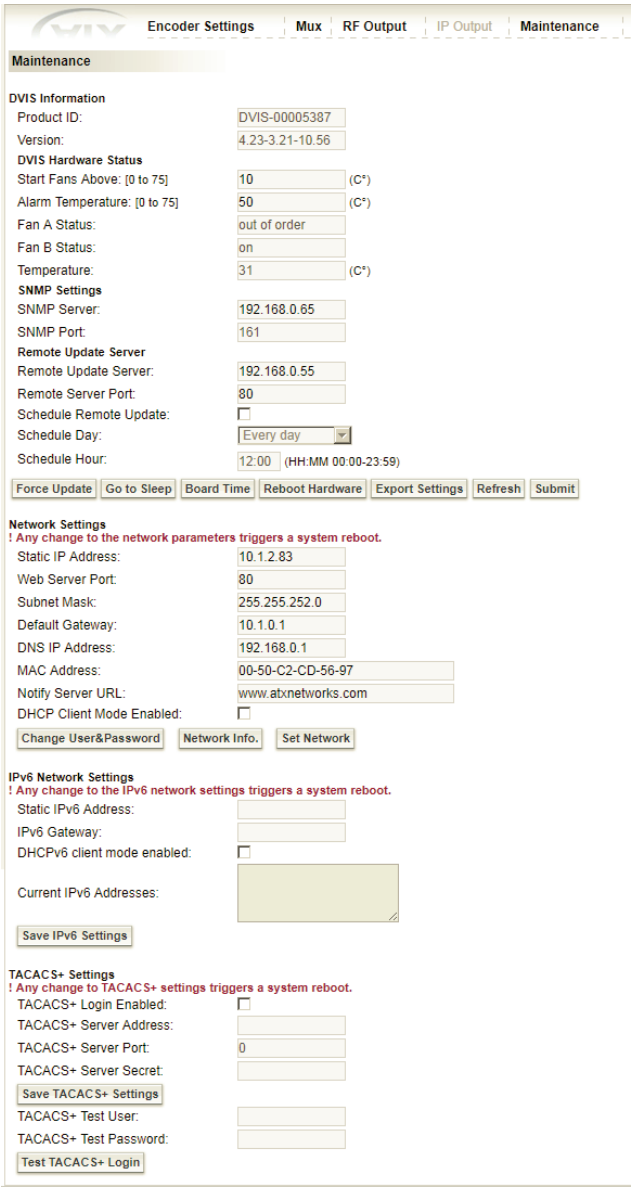

Figure 9-1: Maintenance Tab

9.2 DVIS Information

This section provides serial number and firmware installed. Availability of firmware for your DVIS may be checked at the ATX Networks support sites.

Figure 9-2: DVIS Information Section

Table 9.2a: DVIS Information Section (See Figure 9-2)

Item	Description
Product ID	This is the hardware serial number.
Version	The system firmware version installed in the DVIS. This is the version to check if new firmware is required or recommended. (Ignore the version number on the top right corner of the GUI display. That number is indicating the version of the GUI, not of the DVIS system.) The numbers displayed here directly relate to the firmware version that will be posted to the ATX Networks support site.

9.3 DVIS Hardware Status

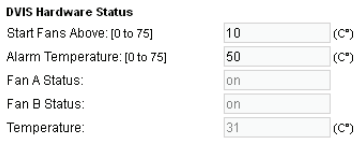

Figure 9-3: DVIS Hardware Status

Table 9.3a: DVIS Hardware Status Settings (See Figure 9-3)

Setting	Description
Start Fans Above: [0 to 75]	Temperature at which the fans begin operating. This may be set manually to any temperature between 0-75 °C though the default value of 10 °C is recommended.
Alarm Temperature: [0 to 75]	Temperature at which an alarm is initiated. This may be manually set to any temperature between 0-75 °C. This is the temperature at which an SNMP trap is sent to the SNMP manager, if installed and configured.
Fan A Status	Shows whether the fan is On, Off, or Out of Order (indicating fan failure).
Fan B Status	Shows whether the fan is On, Off, or Out of Order (indicating fan failure).
Temperature	Current internal temperature of the unit (°C).

NOTE: *Setting this temperature artificially low is not recommended. When the DVIS equipment internal temperature reaches this limit, internal power is switched to a lower power mode and the unit will remain in this mode to prevent damage to the hardware until the temperature drops below the set level. This is intended to avert a major hardware failure due to excess heat buildup.*

9.4 SNMP Settings

All DVIS support sending SNMP traps to a remote SNMP manager. This lets TCP/IP-based network management clients exchange information about the configuration and status of nodes. A MIB is required to be compiled into the remote manager in order for it to understand the SNMP traps.

Figure 9-4: SNMP Settings Section

Table 9.4a: SNMP Settings (See Figure 9-4)

SNMP Server:	This is the IP address of the remote Management Console which is the computer that will receive traps sent by the DVIS and is the computer with SNMP software installed. This is the system which will receive the SNMP traps. Only one SNMP manager may be specified.
SNMP Port:	By default, the DVIS assigns port 161 for sending and receiving requests. This is the default and commonly used port for SNMP messaging. SNMP uses UDP (User Datagram Protocol).
SNMP MIB	If you want to implement SNMP monitoring you will need the SNMP MIB. Get this by requesting it from ATX Networks technical support at the numbers listed in “Contact ATX Networks” on page 17-1.

9.4.1 SNMP MIB

The DVIS MIB may be browsed with an SNMP Manager once it is compiled into the manager. The following values may be received by SNMP:

- "RPM measured on Fan 1"
- "RPM measured on Fan 2"
- "Channel x Video Status" (Up to 10 channels reported)

9.4.2 Traps Reported by SNMP

- Temperature beyond Threshold (MAJOR)
- Fan Failure (MAJOR)
- Video Status changed channel x (MAJOR) (Up to 10 channels reported)

9.5 Remote Update Server:

Feature not currently implemented.

Remote Server Port: Feature not currently implemented.

Schedule Remote Update: Feature not currently implemented.

Schedule Day: Feature not currently implemented.

Schedule Hour: Feature not currently implemented.

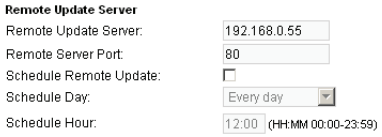

Figure 9-5: Remote Update Server

9.5.1 Platform Control Buttons

Figure 9-6: Maintenance Control Buttons

Table 9.5a: Platform Control Buttons (See Figure 9-6)

Control	Description
Force Update	Feature not currently implemented.
Go to Sleep	This control causes the DVIS to go into a low power mode which reduces the internal temperature buildup.(Service Affecting)
Board Time	This control allows the real time and date to be set so that time stamps on the logs will reflect real time. This only needs to be set once as the realtime backup battery installed in the DVIS equipment will keep the clock running during any power outages.
Reboot Hardware	This control performs a soft reboot of the hardware from a remote location to help troubleshoot some symptoms.
Export Settings	This control allows the operator to export the programmed configuration as a file. The exported file may be used for backup and archive purposes or to allow fast and easy deployment of multiple DVIS with similar configuration. The file may be imported to any number of units requiring similar settings, thus saving the time to manually program each unit before deployment. The process of exporting the configuration file is shown in Figure 9-8.
Refresh	This control reads the DVIS' stored settings and refreshes the page with the values. This also will read the encoder card types installed and populate the display with the discovered types. This is useful when an encoder card type has been changed or a new encoder card installed. This is not a service affecting operation.
Submit	This control applies all of the changes made on the 'Maintenance' tab (except for 'Network Settings' which are applied separately) and makes the changes part of the working configuration of the DVIS system. If changes have been made click Submit button before navigating away from the page, to avoid all changes being lost. This attribute may be used to throw away changes made if you change your mind.

9.6 Import Settings

Importing a settings file is done with the same upload utility used for upgrading firmware. For information on importing a settings file, see "14.6 Firmware Upgrade Process" on page 14-3.

9.6.1 Import/Export Firmware Versions Must Match

Because different firmware versions might contain different features and therefore different fields for setting parameters, export and upload will only work reliably and correctly if the originating and receiving DVIS are running the same firmware version. There will be potential problems if originating and receiving device don't have same feature set and it will not be known by the device how to configure settings.

9.6.2 Export Settings Selection

The DVIS platform provides several choices for the granularity of the amount of data to be saved when settings are exported. To start the settings export process, click the **Export Settings** button.

When the export settings dialog is opened, see Figure 9-7, a number of choices are provided to allow just the required data to be exported. One may be tempted to just select 'All Settings' as this may intuitively seem the best choice but carefully consider the circumstances of the machine receiving the data. If it intended to use the data as a backup which will be restored to the same DVIS in the same network, this is the best choice. If the receiving DVIS is another machine in another location, the choice of data exported must be made with careful consideration. An explanation of the data that will be exported with each selection is outlined here:

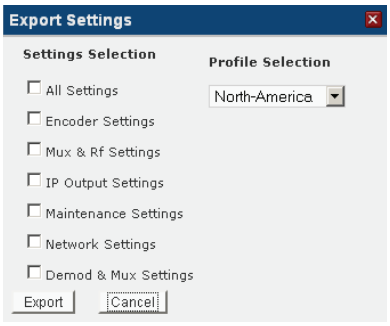

Figure 9-7: Settings Selection

Table 9.6a: Export Settings (See Figure 9-7)

Setting	*Description*
All Settings	All settings of the entire DVIS platform will be exported. Perfect for a backup database. *WARNING: If a remote re-configuration of a DVIS (the target DVIS) is performed while connected through an IP network, the 'All Settings' check box has to be unchecked. Otherwise, the exported 'Network Settings' of the source DVIS (the source of the exported file) will load into the target DVIS and those settings will be incorrect unless the target and the source DVIS are the same machine. Every remotely accessible device has unique 'Network Settings' which will be overwritten if we check this box. The result will be that internet access to the remote DVIS is lost and someone has to visit it locally to reset the Network Settings appropriately for network access.*
Encoder Settings	All settings from 'Encoder Settings' page get exported and later loaded in the other DVIS.
MUX and RF Settings	All settings from 'MUX and RF Output' pages get exported and later loaded in the other DVIS.
IP Output Settings	All settings from 'IP Output' page get exported and later loaded in the other DVIS.
Maintenance Settings	All settings from 'Maintenance' page other than Network settings get exported and later loaded in the other DVIS.
Network Settings	All settings from 'Network Settings' section on the Maintenance page get exported and later loaded in the other DVIS.
Demod and MUX Settings	All settings from the 'Demod and MUX Settings' page get exported and later loaded in other DVIS.

NOTE: *Because the '*Demod and MUX Settings' *page uses data from an incoming QAM in a specific QAM RF distribution network, exporting and loading these parameters only makes sense if the 'receiving' DVIS operates in the exact same QAM RF network. Otherwise in a different QAM RF network this export settings file won't work because the QAM channels, programs, frequencies, etc. could be different, therefore incorrect values will be loaded.*

NOTE: *In order to generate settings in the 'Demod & MUX Settings' page it is required to connect the DVIS to the QAM RF network to collect data as required for the Demod & MUX page. Parameters in all other GUI pages are generated directly in DVIS, but parameters in the Demod & MUX Settings page are a combination of real-life received/analyzed data and modification performed by the DVIS. It is important to note that the Demod & MUX page data always and only can be created in the system in question and cannot be generated in a lab/office located elsewhere.*

9.6.3 Quick Guide to Export Settings

The screen capture construction in Figure 9-8 may be used to clarify these instructions.

1. Click the **Maintenance** tab.
2. Click **Export Settings** button.
3. A window opens allowing the selection of the dataset to be exported from this DVIS. After selection click **Export**.
4. A new window will open with a web-link to download the settings file.
5. Click this hyper-link.
6. Another new window opens with a prompt to act on the file, (it's format depends on the browser used and it's version) asking to open or save this file.
7. Save this file in a known location on the PC. You may accept the offered file name or change it in any way you want to personalize it to identify the DVIS it is saved from. Without renaming, every DVIS export file will be named identically.
8. This file can be used later to be uploaded into a DVIS through the DVIS update page, in same way as new firmware would be loaded. The execution of such uploaded file happens in same way as when firmware files get uploaded, and after that process is done the receiving DVIS will have same parameter settings as originating DVIS.

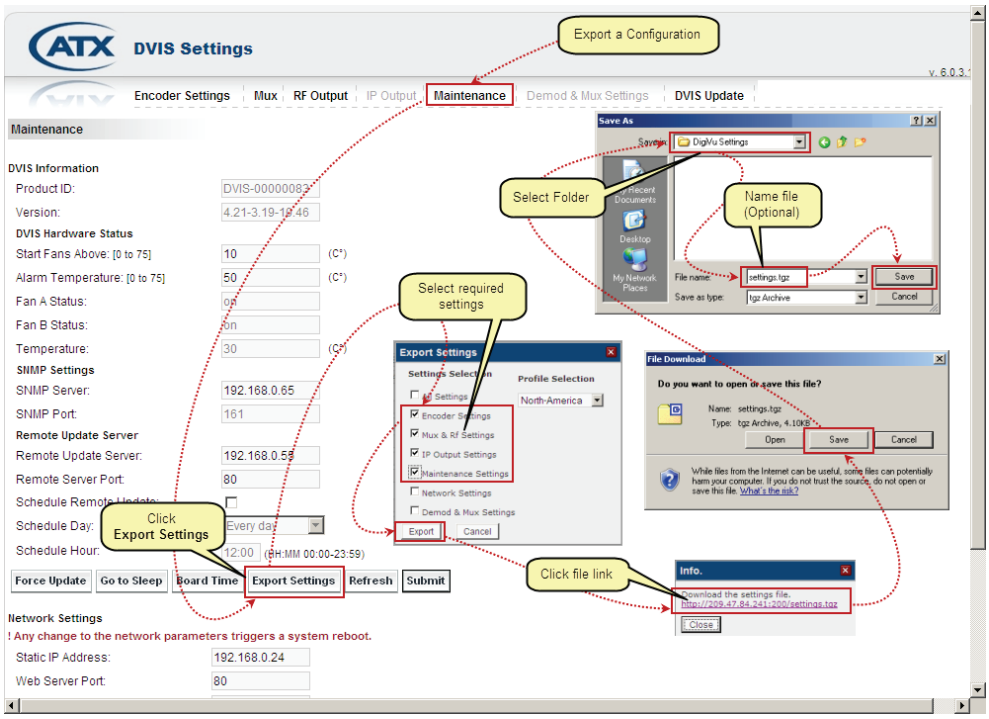

Figure 9-8: Export Settings Procedure Illustrated

9.7 Network Settings

This section defines the Network address settings for the Management GUI. The configuration of the Gigabit Ethernet card is detailed in "IP Output" on page 12-1.

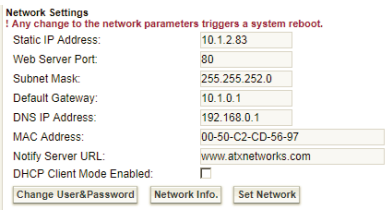

Figure 9-9: Network Settings Section

NOTE: *Any change to network parameters triggers a reboot when applying the changes with the 'Set Network' button.*

Table 9.7a: Network Settings (See Figure 9-9)

Setting	Description
Static IP Address	This is the address that you may assign to allow access to the Device on your network. The default factory address is 192.168.0.23. If DHCP Client Mode is enabled, this value is greyed out.
Web Server Port	This is the TCP/IP port that is used to remotely access the DVIS. The default value is port 80 which is the well known port for HTTP protocol web servers and is the default value used by a web browser if no port is specified. For additional security or to allow the product to work properly behind some firewall configurations, the port used for access may need to be changed. If the port is changed to 8000, for example, the product would then be accessed by a web browser with the following address notation: http://xxx.xxx.xxx.xxx:8000 where the actual public IP address replaces the x's.
Subnet Mask	A subnet mask must be set to define what part of the network address is applicable to the subnet that the DVIS exists on. This should be set according to the overall network design. The default value of 255.255.255.0 will work fine with the default private network address of 192.168.0.23
Default Gateway	This is the address of a router that the product is connected to and is installed between the unit and access to the internet or intranet. If there is no router or internet access this value is irrelevant.
DNS IP Address	DNS (Domain Name System) servers translate human-readable domain names into machine-readable IP addresses and the reverse. For remote access a DNS IP address must be entered. Cannot be ignored for remote access! This address must be entered, though it may be any IP address including an address that is not specifically a DNS server. A Google DNS Address that may be used is 8.8.8.8
MAC Address	A MAC (Media Access Control) address is a unique identifier assigned to network adapters or network interface cards (NICs) by the manufacturer to uniquely identify them on a LAN. It is used to identify the DVIS on the network to a DHCP server and to other computers. It is hard coded into the DVIS at the factory and cannot be changed. For example, the MAC address is used by a cable modem to acquire an IP address in DHCP mode.
Notify Server URL	This feature is not yet implemented.
DHCP Client Mode Enabled	DHCP (Dynamic Host Configuration Protocol) automates assigning an IP address to the management access port. DHCP is commonly used with cable modems so likely DHCP Client Mode will need to be enabled if a cable modem will be connected to the management port for remotely accessing the DVIS.

9.7.1 Network Control Buttons

Buttons are provided to allow changing the platform username and password, obtain more network information and save any network changes made, Figure 9-10.

Figure 9-10: Network Control Buttons

Change Username and Password

Click **Change User&Password** button, Figure 9-10, to change the platform username or password from default values, Figure 9-11. After changes are entered, click the **Send** button.

Figure 9-11: Change User/Password

Network Info.

Click **Network Info** button, Figure 9-10, to obtain more detailed information about the network connections, Figure 9-12. Note that 'eth0' is the physical Ethernet connection on the front panel and 'lo' is the local loopback connection.

Figure 9-12: Network Info.

Set Network

Click **Set Network** button, Figure 9-10, to save any changes made to Network settings. This will trigger a Device reboot.

9.7.2 Default IPv4 Address:

The default IPv4 address settings are outlined in the following table. There is no IPv6 default address.

Table 9.7b: Default IPv4 Address Settings

IP Address	192.168.0.23
Subnet Mask	255.255.255.0
Web Server Port	80
Gateway	192.168.0.1
DNS IP Address	Not Defined

NOTE: *Once DHCP is enabled and an IP address is assigned you will need to externally determine what the IP address was set to in order to access the DVIS again through the Ethernet port. Further, you may need to set your computer to the corresponding subnet if you are directly connected to the DVIS on the network. Your Network Administrator may be able to help with this.*

9.8 IPv6 Network Settings

Use of IPv6 network addresses is supported only on the latest Device firmware version available. Please check the ATX Networks support site for the latest firmware for your product or contact ATX Networks Technical Support.

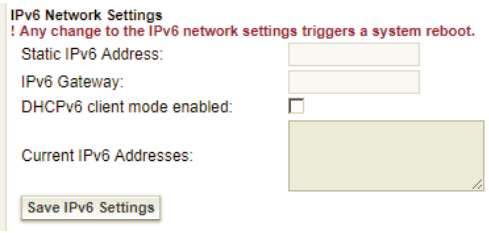

Figure 9-13: IPv6 Network Settings

Table 9.8a: IPv6 Network Settings (See Figure 9-13)

Setting	Description
Static IPv6 Address	This is the address that you may assign to allow access to the Device on your IPv6 network. A default factory address is not set. If DHCPv6 Client Mode is enabled, this value is greyed out.
IPv6 Gateway	This is the address of an IPv6 capable router that the Device is connected to and is installed between the unit and access to the internet or intranet.
Current IPv6 Addresses	These are IPv6 addresses that have been assigned to this Device through DHCP.
DHCP Client Mode Enabled	DHCP (Dynamic Host Configuration Protocol) automates assigning an IP address to the management access port. Tick this box to enable the IPv6 DHCP client then click **Save IPv6 Settings**.
Save IPv6 Settings	Click this button to save any changes made to IPv6 settings. This will trigger a Device reboot. If this address was changed and you use the IPv6 address to connect to the management GUI, you will need to log in again using the new IPv6 address.

9.9 TACACS+ Settings

Terminal Access Controller Access-Control System (TACACS, usually pronounced like tack-axe) refers to a family of related protocols handling remote authentication and related services for networked access control through a centralized server(Wikipedia). Use of TACACS+ for user access to infrastructure like DVIS allows more fine grained control of user permissions.

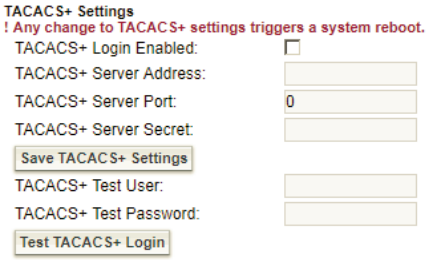

Figure 9-14: TACACS+ Settings

Table 9.9a: TACACS+ Settings (See Figure 9-14)

Setting	Description
TACACS+ Login Enabled	Tick this box to enable using TACACS+ for user authentication. Once ticked, normal user authentication by username and password is disabled.
TACACS+ Server Address	This is the IP address of a TACACS+ Authentication Server.
TACACS+ Server Port	This is the port associated with the TACACS+ Server IP Address above.
TACACS+ Server Secret	This is the shared secret(password) used to authenticate using the TACACS+ Server. If the secret contains spaces, enclose the whole secret within quotes.
Save TACACS+ Settings Button	Click this button to save any changes made to TACACS+ settings.
TACACS+ Test User	Setting up a 'Test User' within the TACACS+ Server can make testing the configuration and connectivity of each configured Device easier without having to use a real users name and password which can compromise security for that user. After setting up a Test User in the TACACS+ Server, enter that test users name here. The Test User credentials will not be saved within the Device and will need to be re-entered for subsequent tests.
TACACS+ Test Password	After setting up a Test User in the TACACS+ Server, enter that test users password here. The Test User password will not be saved within the Device and will need to be re-entered for subsequent tests.
Test TACACS+ Login	Click this button to test the TACACS+ authentication using the 'Test User' settings.

9.10 Network Control Buttons

These controls provide network related functions.

Figure 9-15: Network Control Buttons

9.10.1 Change User & Password

Click the **Change User&Password** button to allow the user name and password to be modified. After changing the settings, click Send to apply the new settings. The DVIS GUI will close and you will be requested to log in under the new credentials.

For security purposes, the DVIS has a Username and Password which must be entered for access to the GUI. The username and passwords may be changed through the dialog that opens with this control. After changing the username and/or password, click Set Network and the DVIS will be rebooted in order for the changes to become effective. After the reboot, the new username and password must be used. The username and password may not be set to null (No entry or blank).The DVIS system provides for a single system user and password who is allowed to modify all settings. For multiple user access with unique passwords, see TACACS+ features.

Figure 9-16: Change Username and Password

9.10.2 Network Info

The **Network Info** button opens an information window that summarizes Ethernet network information such as IP address (even DHCP assigned), packets received and transmitted, the link status, data collisions and the number of RX and TX bytes. This is for information only. An example is shown in Figure 9-17.

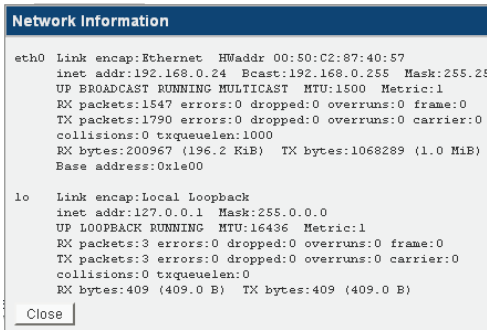

Figure 9-17: Network Information Window

9.10.3 Set Network

NOTE: *Clicking the **Set Network** button will cause the Device to reboot.*

If any parameter in the 'Network Settings' section has been changed, they need to be saved and applied to the Device in order to take effect. This is done by clicking the **Set Network** button, Figure 9-15 which applies the network configuration changes. A platform reboot will always take place.

NOTE: *If the network addresses have been changed, then the platform will reboot and you will need to open a new browser session with the new address entered in your browser.*

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DEMOD & MUX SETTINGS

10. Demod & Mux Settings

In this chapter we detail the controls which are used to operate the Demodulator and Multiplexer to achieve the results that are required in an Add/Drop application. For Add/Drop applications, all add/drop settings are discussed along with limits and some suggestions as to what values are most applicable.

FYI: *In this guide, reference to DVIS infers DVIS and DVISm unless the model is specifically stated.*

FYI: *The 'Demod and Mux' tab will be activated only if a demod card is installed. If there is no demod installed, this tab will be greyed out in the GUI.*

FYI: *The DVIS platform can only accommodate one DEMOD card.*

10.1 Chapter Contents

10.2 Quick Guide to Demod & Mux Configuration

10.2.1 Activate the Demod & Mux Settings Tab

If the 'Demod & Mux Settings' tab is greyed out it will need to be activated on the 'Mux' tab. Open the Mux tab and tick the 'Add & Drop Mode' box, then click **Submit** button, see Figure 10-1.

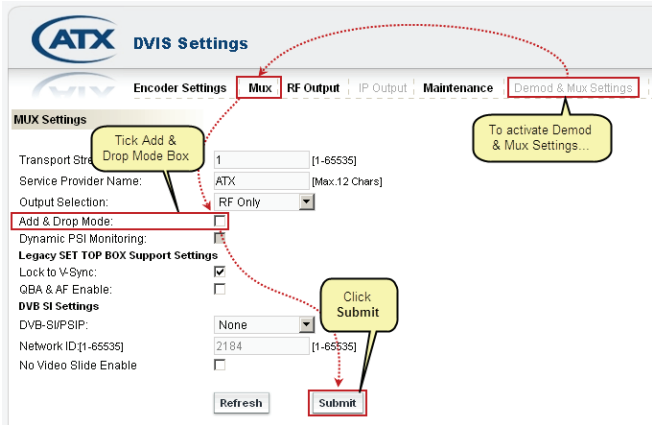

Figure 10-1: Activate Add/Drop Mode on the Mux Tab

NOTE: *Clicking 'Submit' is a service affecting operation.*

10.2.2 Quick Guide to Tuning the Demodulator

Refer to Figure 10-2 for clarification of this process.

1. Open the 'Demod & Mux Settings' tab.
2. Depending on the QAM Demodulator type (Qam -B ATSC vs QAM A/C, ETSI), the symbol rate may need to be set first. For QAM-B the setting is automatic, for QAM A/C obtain the symbol rate from the cable system operator.
3. Click **Demodulator Settings** button.
4. Set QAM type, QAM Mode and Channel Center Frequency. These values will be copied into 'Demod Settings' when tuning is finished.
5. Click the **Tune** button**.** The tuning process will take some time. If the QAM can be tuned, the indicators, which are initially red, will turn green. The tuner is also determining signal quality during this time.
6. When lights have turned green and 'BER' (Bit Error Rate) value is populated (allow some time for BER data collection), click the **Apply & Close** button.
7. Click the **Analyze** button. The analyze info window opens for about 1 minute then displays 'Completed'.
8. The **PID Display Tree** is populated with the detected streams and their MPEG properties.

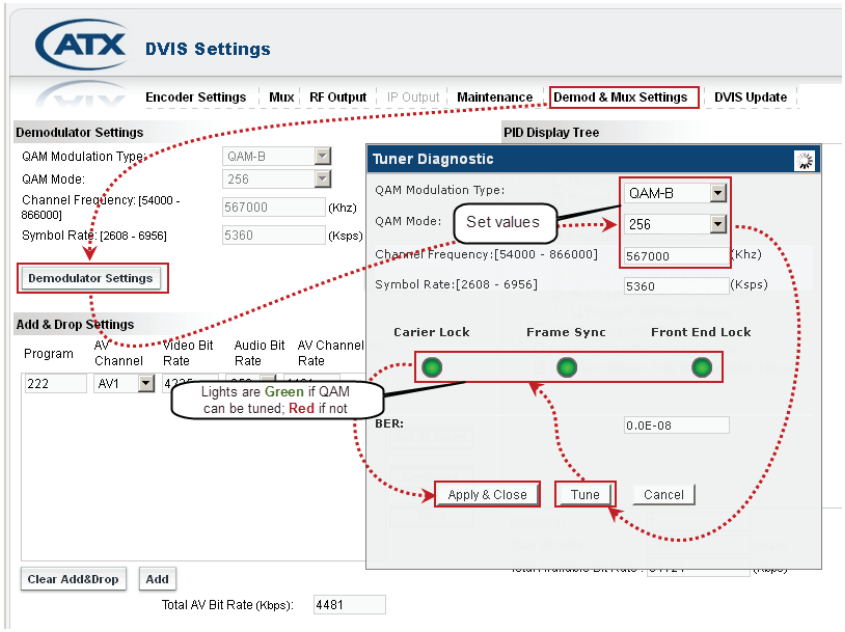

Figure 10-2: Tune the Demodulator

10.2.3 Quick Guide to Drop and Add a Program

Refer to Figure 10-3 for clarification of this procedure.

1. Left click the program to be dropped in the 'PID Display Tree' in order to highlight it
2. Right click that program and a drop down menu appears (Active, Drop).
3. Click **Drop.** A replacement program is populated in the Add & Drop Settings window area with same program number as the dropped program, The dropped program is greyed out.
4. In the 'Add & Drop Settings' section select the 'AV Channel' (the DVIS encoder port that is physically connected to local baseband source) to be inserted; AV1 or AV2 etc. (Initially the drop downs for 'AV Channel' will show 'None').
5. Click **Set Bit Rates.** DVIS will analyze the incoming stream and attempt to assign the highest bit rate to each added AV Channel that the available space will allow.

FYI: *The bitrate computed in step 5 will be assigned to each program in 'AV Channel Bit Rate' column. Since the algorithm is assigning all available bitrate headroom, it might happen that these values are extremely high and need adjustment downward. To do so, click into the field with assigned 'Video Bit Rate' and enter an appropriate bitrate number (this number depends on several factor). Do this for all available 'AV Channels'.*

6. The assigned bitrate for each encoder may be adjusted downward if necessary.
7. Select "Audio Bit Rate" for every available AV Channel. The recommended setting is 192 kbps.
8. Click **Configure** button. The settings are saved to the DVIS configuration.
9. Click **Start** button. This starts the multiplexer add/drop process.

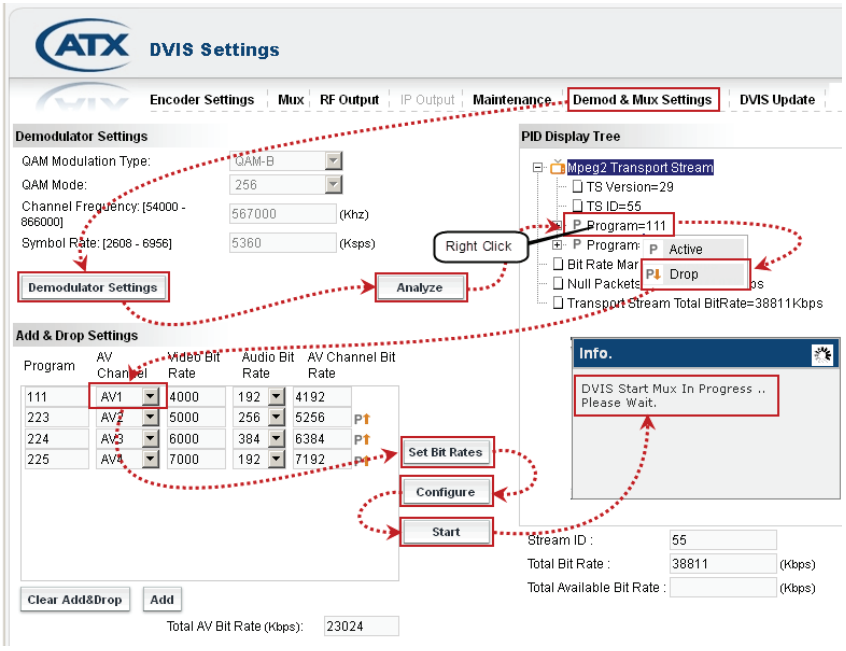

Figure 10-3: Add or Drop a Program

NOTE: *Clicking* 'Start' *is a service affecting operation*

10.3 Demod & Mux Settings

The following is a description of the 'Demod & Mux Settings' configuration page. The page is divided into 3 main sections as shown in Figure 10-4:

- Demodulator Settings
- Add & Drop Settings
- PID Display Tree

Each of these screen sections are described next.

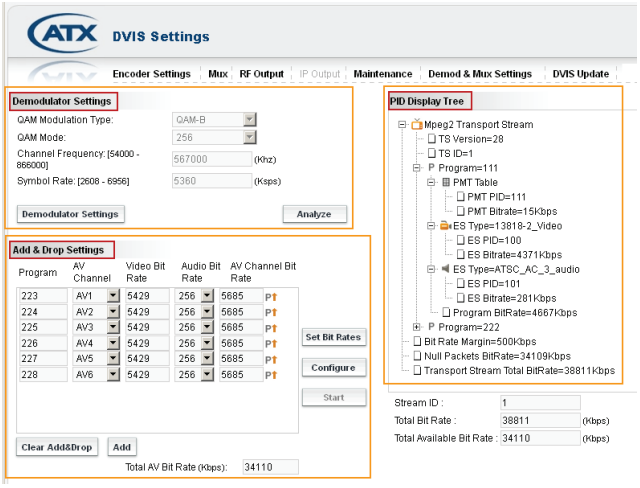

Figure 10-4: Demod and Mux Settings Configuration Page

10.4 Demodulator Settings

This area displays the parameters of the QAM demodulator. These values are adjustable in the 'Tuner Diagnostic' dialog that opens when you click the **Demodulator Settings** button, discussed below.

Figure 10-5: Demodulator Settings

Table 10.4a: Demodulator Settings (See Figure 10-5)

Setting	Description
QAM Modulation Type	This is the type of QAM standard that the Demod will use and is determined mostly by locale and the Demod Card installed (two versions are available); generally QAM B for North America and QAM A/C for Europe (and appropriate territories following standards from North America/Europe/Japan).
QAM Mode	Depending on the QAM Type selected above, the QAM mode is preset to a few possible values. For QAM-B available options are 64 QAM and 256 QAM. For QAM-A/C available options are 16QAM, 32QAM, 64QAM, 128QAM and 256QAM.
Channel Frequency: [54000 - 866000]	This is the center frequency of the EIA/RF/CCIR channel to be demodulated. The possible values are 47000 kHz to 897000 kHz. Do not enter any commas or other punctuation marks.
Symbol Rate: [2608 - 6956]	The symbol rate of the QAM channel. For QAM-B for selected QAM mode there is only one valid symbol rate which is automatically entered. For QAM-A/C, several possible symbol rates are preset and there is a possibility to enter a user defined number as well.
BER	This is the measured Bit Error Rate (or Bit Error Ratio) on the tuned QAM channel. This value should be very low, preferably 0.0E-08, indicating a quality signal. If the BER is worse than 1.0E-06 an investigation into transmission problems on the cable system should be undertaken.
Demodulator Settings Button	This control opens the Tuner Diagnostics window that permits changing the relevant configuration and verifying the successful tuning of the specified QAM. The screen capture construction in "Quick Guide to Tuning the Demodulator" on page 10-2 outlines the process. The window contains three indicators which are red by default when the window opens. Opening the Tuner Diagnostics window will always initially display the three indicators as red, even when the tuner is currently properly tuned and locked. This screen must be refreshed every time it is opened by clicking the Tune button. If the QAM demodulator cannot tune and lock on the carrier, the indicator lights remain red, however, upon successful tuning and locking of sync, all three of the lights should be green and in a few moments the BER (Bit Error rate) is measured and populated. The action of clicking the Tune button is not service affecting unless the QAM parameters have been changed since the window was opened.
Tune - Control	After entering or selecting the values in the dialog, click the **Tune** control. This causes the tuner to attempt to find the carrier detect frame sync and lock on the frequency. Successful tuning results in the three indicators lighting green and the tuner then attempts to evaluate the bit error rate of the channel. The BER is posted in a few moments if successful.
Apply and Close	When the lights are all green and the BER is posted, click **Apply & Close** to apply and save the settings and close the window. The 4 set parameters will be copied into the "Demodulator Setting" section.

Figure 10-6: Demodulator Settings Buttons

10.4.1 Add & Drop Settings

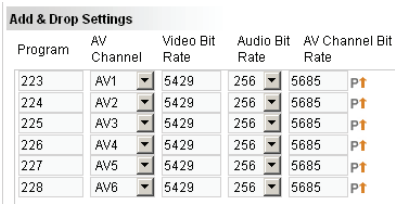

Figure 10-7: Add & Drop Settings Section

This section displays the local encoder settings in the 'Add & Drop' mode only. This is where local encoder video and audio encoding bit rates and program numbers are set when the add/drop mode is activated. If the Add/Drop mode is not being used, encoder parameters are set on the 'Encoder Settings' page. In Add/Drop mode, some parameters can still be set in 'Encoder Settings' page, but the ones which are restricted are greyed out. Programs will automatically be added in this window when an incoming program is dropped in the 'PID Display Tree'. Other local encoder channels may be added into an incoming QAM (if enough bitrate is available) from this window as required without dropping every program from incoming QAM. Configuring local programs will force the use of the automatic bit rate configurator, the 'Set Bit Rates' button, but the bit rate assigned to an encoder could exceed the output capability of the used encoder card (for example for SD it's 8000 kbps). If this happens, change the bit rate manually to a lower value. This can happen because the algorithm assigns all available bitrate in a QAM, and if the QAM is 'empty' the available bitrate is high.

Table 10.4b: Add & Drop Settings (See Figure 10-7)

Setting	Description
Program	This is the MPEG program number assigned to the program. This may be changed to any number as required by your system. If a program is being dropped, the program number assigned to the inserted program is the number of the dropped program. The program number assigned here will show up in 'Encoder Settings' page as greyed out numbers (in appropriate port view).
AV Channel	This is the number of the local encoder port. On the 'Encoder Settings' page,in the 'Ports View' section, this same encoder is referred to as a 'Port Number'. See "6.5 Port Numbering Convention" on page 6-3 for the port numbering. By default this value is set to 'None' which represents the program being dropped from the incoming QAM without replacement.
Video Bit Rate	The bit rate assigned to the local encoder after clicking the Set Bit Rates button. This value depends on the installed encoder card. If the bit rate configurator automatically assigns a bit rate that exceeds max allowed bitrate, manually set it to less. A higher bit rate equates to higher quality video transmission but setting a high bit rate will not improve low quality video presented to the encoder input.
Audio Bit Rate	This is the bit rate of the audio program. Depending on the encoder card installed, default values will be available to be chosen as required by your system. Recommended setting is 192 kbps.
AV Channel Bit Rate	This is the aggregate bit rate for the overall program including the individual encoded video and the audio streams.
Total AV Bit Rate (kbps)	This is the aggregate total bit rate of all of the programs added in the 'Add & Drop Settings' section. The total includes the video and the audio encoder bit rates. This value may equal but must not exceed the value of 'Total Available Bit Rate' displayed below the 'PID Display Tree' section.

10.5 Add & Drop Settings Buttons

A description of the functionality of the control buttons of the 'Add & Drop Settings' feature.

Figure 10-8: Add & Drop Settings Buttons

Table 10.5a: Add & Drop Settings Buttons (See Figure 10-8)

Setting	Description
Clear Add & Drop Button	If there are any programs entered into the program list, this button clears all entries. The added programs may also be removed one at a time by right clicking the programs and select Remove when prompted. For programs that are dropped from the 'PID Tree', they may be added once again only from the 'PID Tree' section.
Add Button	This enters new programs in the list that have no relationship with the incoming QAM; i.e. are not replacements for dropped incoming programs, just newly added programs to the QAM. Programs are entered with default audio bit rates which may be changed. The video bit rate will be calculated so do not enter the desired video bit rate until after clicking the Set Bit Rate button.
Set Bit Rates Button	This control automatically calculates the video bit rate of each added program based on the bandwidth available. This is determined by measuring the transport stream null stuffing, if any, and the bit rate made available by any dropped programs. It then subtracts the audio bit rates that were specified by the added programs plus some stream headroom, and divides the remainder by the number of added programs. The result is automatically entered as the 'Video Bit Rate'. Each individual video bit rate may be changed at this point but do not allow the aggregate bit rate to exceed the 'Total Available Bit Rate' specified in the display under the 'PID Display Tree'. This is not service affecting.  *Figure 10-9: Set Bit Rates*
Configure Button	This control saves the specified settings for the added programs to the DVIS multiplexer. This is not service affecting.
Start - Control	This reads the settings saved with the 'Configure' control and applies the settings to the multiplexer. Clicking 'Start' is a service affecting operation

10.5.1 Observing Mux Bitrate

The MUX bitrate may be observed while on the MUX page, see Figure 10-10.

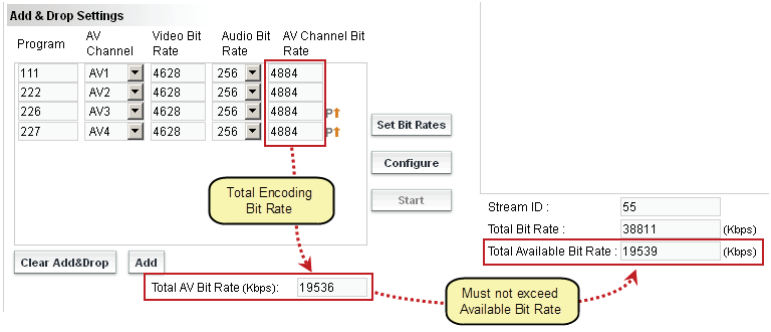

Figure 10-10: Observe MUX Bitrate

10.6 Add/Drop Programs

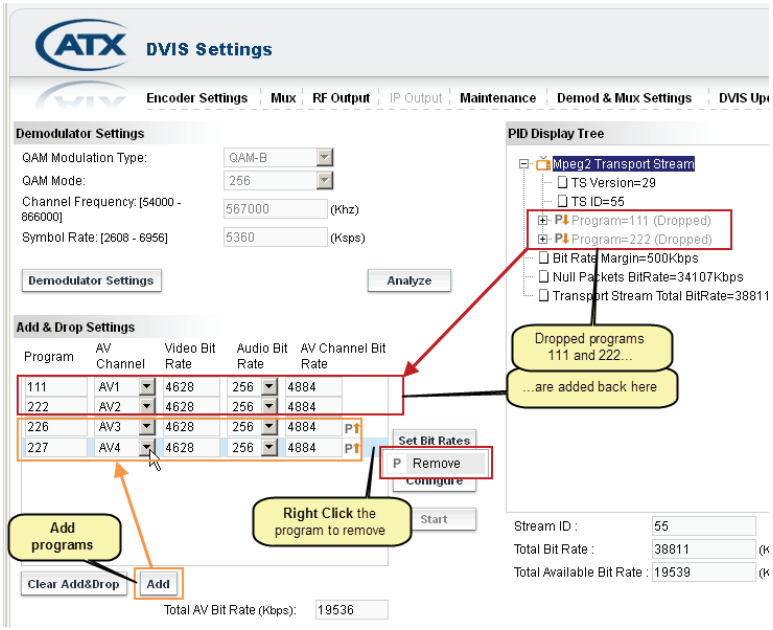

Figure 10-11: Adding and Dropping Programs

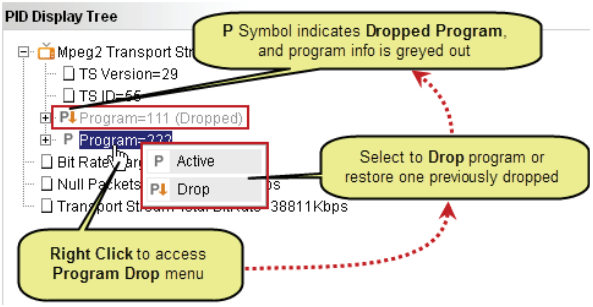

Figure 10-12: Drop or Restore a Program

10.7 PID Display Tree

The 'PID Display Tree' is an MPEG stream analyzer display of the incoming programs detected in the received QAM transport stream PAT and PMT tables. See Figure 10-12 for an example of the PID tree display. Only programs listed in the transport stream

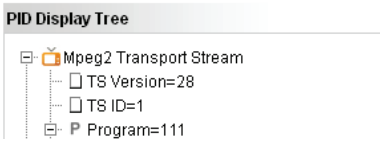

Figure 10-13: PID Display Tree Section

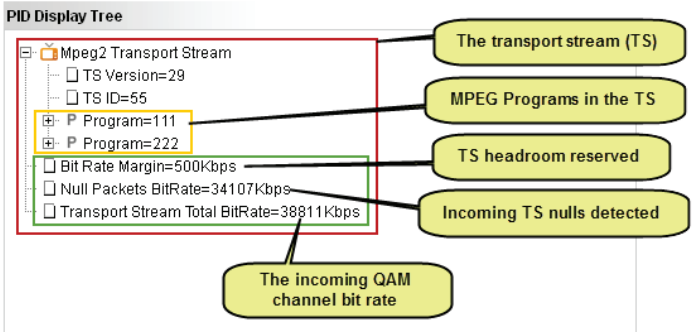

Figure 10-14: TS Components in PID Display Tree

tables will be displayed. This display makes selecting and dropping the correct program easier. Clicking on the + signs opens the stream parameters for closer inspection of individual PIDs and detected bit rates. Bit rates are read over a short period of time and are a snap shot of the stream and are valid only at the time of analysis; if they subsequently change the display is not updated.

10.7.1 MPEG-2 Transport Stream Components

The MPEG-2 Transport Stream displayed in the PID Display Tree is the QAM transport stream as demodulated by the demod card. It comprises the following components described next, see also Figure 10-15.

Table 10.7a: MPEG TS Stream Components (See Figure 10-14)

Component	Description
TS Version	Each time the stream analyzer function is used, this number increments. It does not relate to anything about the stream itself.
TS ID	This is the ID number assigned to the transport stream at it origin. This would be assigned to the stream multiplex before being modulated to the source QAM channel.
Bit Rate Margin	This is the margin or headroom detected in the incoming stream. This allows some small change in the aggregate bit rate of all of the TS programs without exceeding the QAM channel maximum bit rate.
Null Packets Bit Rate	The transport stream may not contain all MPEG stream data. If the analyzer detects null stuffing, it displays the data rate of the nulls here.
Transport Stream Total Bitrate	This is the bit rate of the QAM channel. In the case illustrated above, a QAM-B 256 QAM channel with a data rate of 38811 kbps.

10.7.2 Program Components

Each program listed in the stream PAT and PMT tables will be displayed along with their assigned MPEG program number. Each program is further broken down into it's components, see Figure 10-15.

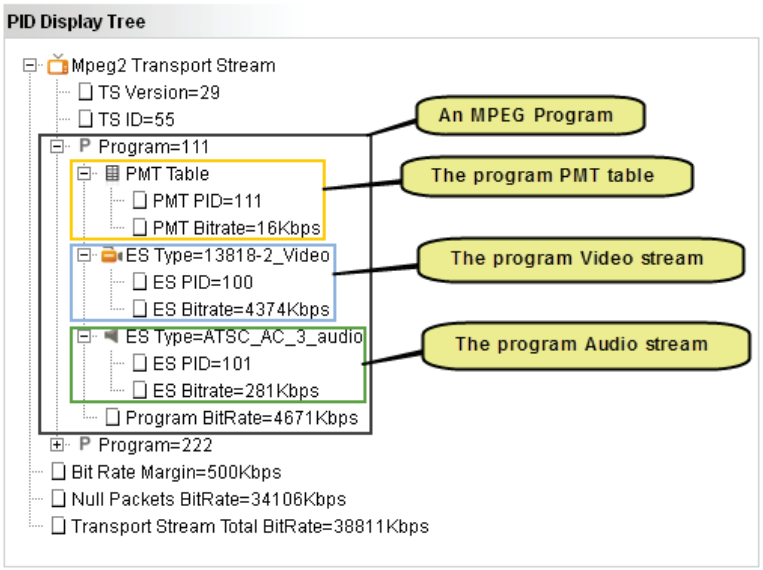

Figure 10-15: Showing Program Components in PID Display Tree

Table 10.7b: MPEG Program Components (See Figure 10-15)

Component	Description
PMT Table	The table that announces the PID assigned to each individual elementary stream; the Audio and Video streams. The PMT table is contained within it's own data stream with a PID assigned • PMT PID: The PID assigned to the PMT table. This cannot be changed. • PMT Bit rate: The bit rate of the PMT table. Information only.

Component	Description
ES Type=13818-2 Video	The stream analyzer will determine the video stream type and display it here. In this example the stream is detected as 13818-2 Video. The number 13818-2 is the standard that defines MPEG-2 video. If your system carries different video, this will reflect the video detected. ES means Elementary Stream. Each program stream is comprised of one or more elementary streams. • ES PID: The PID assigned to the Video Elementary Stream. • ES Bit Rate: The bit rate of the Video Elementary Stream in kbps. In the illustrations, the actual bit rate displayed is the total of the payload data rate specified by the standard plus header packets
ES Type=ATSC_AC_3 Audio	The stream analyzer will determine the audio stream type and display it here. In the example illustrated the stream is detected as AC-3 Audio. If your system carries different audio, such as MPEG-1, the analyzer will reflect the audio stream type detected. ES means Elementary Stream. Each program is comprised of one or more elementary streams. • ES PID: The PID assigned to the Audio Elementary Stream. • ES Bit Rate: The bit rate of the Audio Elementary Stream in kbps. In the illustrations, the actual bit rate displayed is the total of the payload data rate specified by the standard plus header packets.

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RF BYPASS OPERATION

11. RF Bypass Operation

An RF bypass feature is integral to the hardware and is designed to react to a power outage or to the unlikely occurrence of the failure of the internal QAM modulator. See “Simplified Block Diagrams” on page 2-4 for a drawing showing the RF Bypass switches. The operation of the bypass ensures that the MDU or other facility will continue to receive the cable system QAM channel content despite hardware or power failure. RF switches are installed on either side of the channel deletion filter which allow the filter to be switched from the active RF path if required. There is a switch on the output of the QAM modulator as well which removes the QAM RF output from the combiner network. The RF switches are all fail-safe and have a power off rest state, which is the bypass state. The QAM modulator switch terminates the modulator RF output in the bypass state. All 3 switches always act together.

11.1 RF Bypass Operation

An RF switch controller monitors the RF output level of the built-in QAM modulator and controls the state of the bypass switches.

There are 3 conditions where RF bypass will occur:

- In the event of an internal QAM modulator failure, where the RF output level drops below a pre-determined threshold.
- In the event of the loss of 115/230 VAC power or a failure of the internal power supply module.
- During unit power-up (for 90 Seconds).

The RF bypass will, during a power failure or detected QAM modulator output failure:

- Bypass the channel dropping filter from the input RF path restoring the original QAM channel from the cable plant.
- Terminate the built in QAM modulator within the DVISm unit.

11.2 Power-up/Power Restoration

When power is first applied or restored following an outage, the RF switches will be in the bypass state and the bypass controller will not restore the normal state of the switches for 90 seconds while the unit boots up. When the boot up cycle is complete, the controller will restore the QAM channel deletion filter to the active RF path along with the internally generated QAM carrier.

11.3 Front Panel Indicators

Indicators are provided on the front panel to illustrate the state of the bypass switches highlighted with clear labeling.

11.3.1 Power

Indicates that power is applied to the RF switch controller.

11.3.2 Active

Indicates when the bypass switches are in the bypass state, and will illuminate under the following conditions:

- QAM modulator RF output has dropped below the preset threshold.
- During unit power-up (for 90 Seconds)

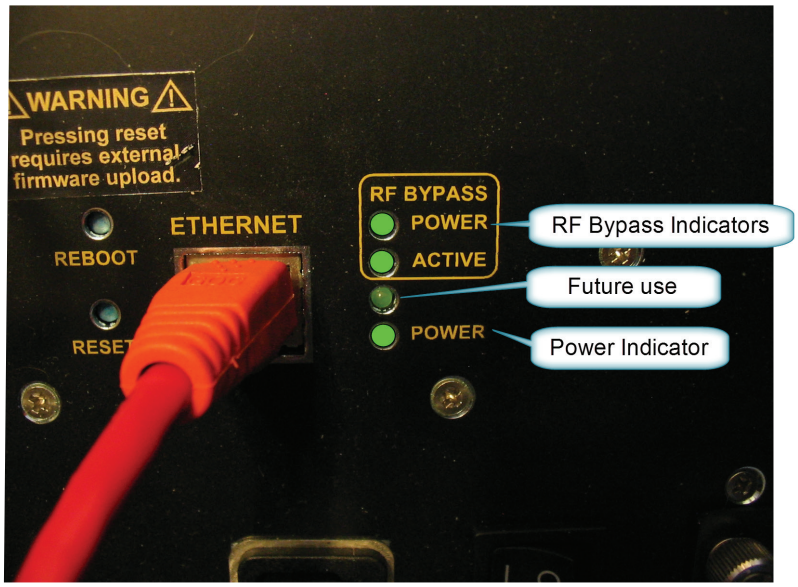

Figure 11-1: Front Panel RF Bypass Indicators

IP OUTPUT

12. IP Output

This chapter is about the configuration of the Gigabit Ethernet (GbE) card shown in Figure 12-1. The GbE option supports transmission by multicast or unicast of the multiplex created by the encoders. The DVIS platform can simultaneously create a QAM and IP output with programming duplicated on both. In this case the IP output will be a single multiplex of the created programs, an MPTS. If the DVIS is configured for IP output only, then SPTS multiplexes may be created for each program. In IP output only mode the user can select either SPTS or MPTS transmission, but not a mixture of both. See “12.13 Stream Settings” on page 12-8 to activate the SPTS feature.

FYI: *Activation of the ‘IP Output’ tab requires that an IP Card be installed. If there is one installed check in the “Encoder Settings” on page 6-1 to see that the IP Card is detected. The ‘IP Output’ tab must also be activated on the ‘Mux’ tab. See “Mux” on page 7-1.*

FYI: *In this guide, reference to DVIS infers DVIS and DVISm unless the model is specifically stated.*

12.1 Chapter Contents

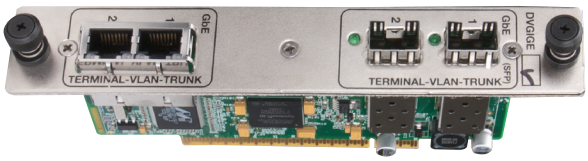

Figure 12-1: GbE Output Module

12.2 Enabling the IP Output Tab

NOTE: *The Ethernet card is supported in slots 2(DVISm) and 5(DVIS) only.*

If the GbE card has just been inserted and the GUI IP Output tab is greyed out, the Ethernet functionality must first be activated. That is done on the 'Mux' tab; see "Mux Settings" on page 12-1. The procedure is shown in Figure 12-2. The DVIS can produce Ethernet only or RF only outputs or both simultaneously; features that are also activated on the 'Mux' tab.

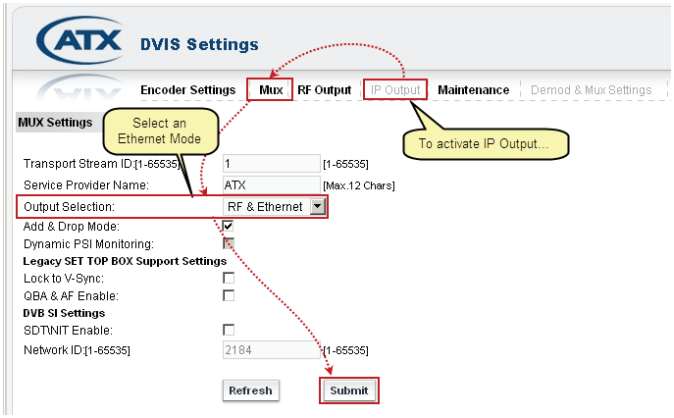

Figure 12-2: Activate the IP Output Tab

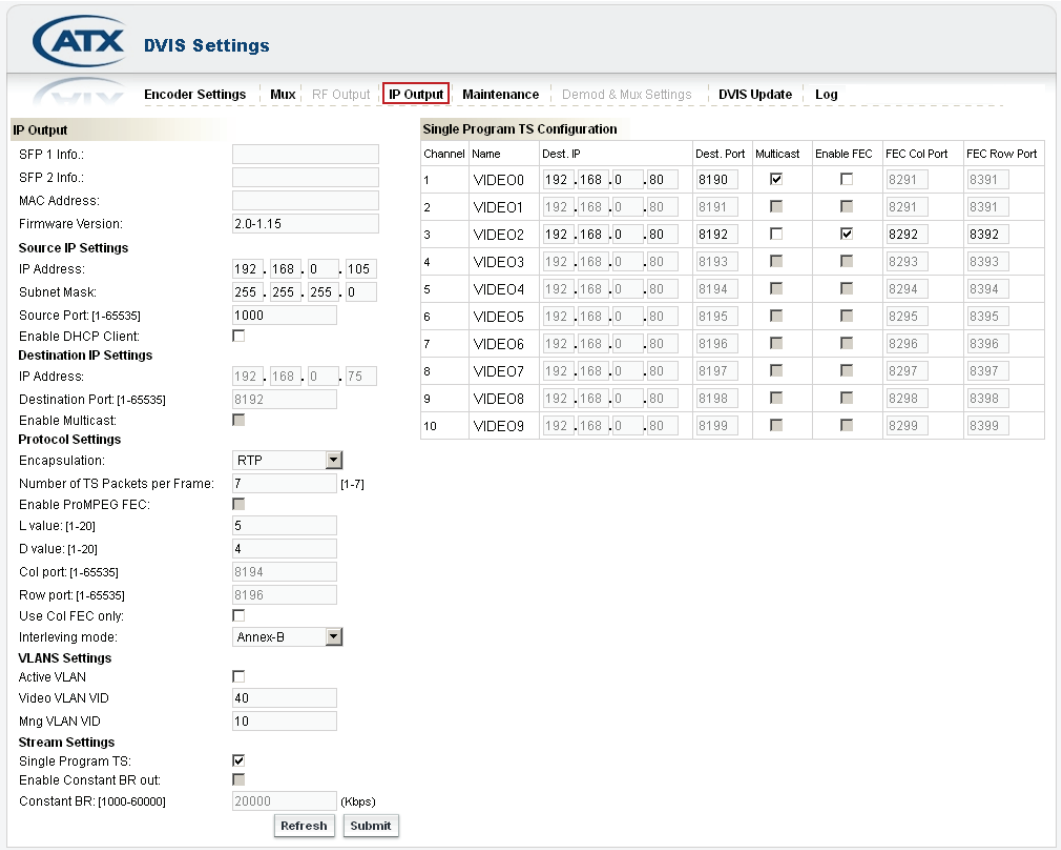

Figure 12-3: IP Output Tab

12.3 Support for VLAN Tagging

The Ethernet Output card supports the automatic creation of two VLANs or Virtual Local Area Networks. This feature may be used to allow both routing the streaming of the output video and access to the GUI on two separate virtual networks as if there were two separately wired physical networks installed. In VLAN tagging, the broadcast domain is extended across the VLAN as if the devices in the group were all locally connected together. VLANs also extend the DHCP server requests across the same virtual network if DHCP is used to assign network addresses. In this way the GUI and streaming IP output may be assigned addresses independently from two separate pools or DHCP servers.

Without the use of VLANs, the GUI port may be connected to any of the GbE ports since the four GbE ports are configured as an IP switch, and any other GbE port may be connected to a local switch or access network such as a cable modem. In this manner a single path to the central headend may be used to carry both management and streaming video. The disadvantage of this method is that at the central headend consolidation switch, and depending on the type of switch, the streams may all appear on the destination device port such that a management computer may have streaming video from many DVIS devices routed to it and conversely, the video receiving device may experience undesired management traffic.

By using VLANs, the video and management access streams, while arriving together, are separated at the destination switch into two distinct VLAN groups, each routed to a specific physical port defined by the VLAN. In this way all streaming video will be routed to the video receiving device, like a CherryPicker and the management access will be routed to the management computer(s). In this way only traffic intended for a receiving device will receive it. Since broadcast domains are extended over VLANs, all of the features of a broadcast domain are extended across the VLAN as well. See “VLAN Settings” on page 12-6 for specific details on this.

12.4 Gigabit Ethernet Card Fundamentals

12.4.1 SFP Support

The card supports two SFP modules (Small Form-Factor Pluggable) allowing single mode and multi-mode optical modules to interface to the GbE ports providing long range and secure interfaces to switches, routers and remote sites. Many types and manufacturers of SFP have been tested with good results but because of the vast offering of various SFP modules, it is not possible to test all of them. It remains up to the customer to verify that his SFP will work as expected.

12.4.2 Integrated Switch

The Gigabit Ethernet card integrates a GbE switch on board allowing the card to transmit simultaneously from up to 4 Ethernet ports; 2 copper RJ45 type ports and 2 SFP ports. SFP Modules must be purchased separately and so far, SFP modules that are incompatible have not been identified.

12.4.3 Protocol Support

The card supports DHCP, ICMP and ARP protocols as well as VLAN tagging. Before unicast transmission is started the card will first attempt to find the destination MAC address of the receiving side (when using unicast transmission) using ARP protocol. When the MAC address is found, transmission begins.

12.5 Quick Guide to the Gigabit Ethernet Card

If more information is required, see the detailed configuration descriptions following this quick guide.

1. Insert the Gigabit Ethernet card into slot 2 (DVISm) or 5 (DVIS).
2. Open the ‘Mux’ tab and change the ‘Output Selection’ to either ‘Ethernet Only’ or to ‘RF & Ethernet’.
3. Verify insertion and detection of the card on the ‘Encoder Settings’ tab – Card is detected as ‘ETH1000’.
4. Open the IP Output tab and configure the Gigabit Ethernet Card with the following parameters as required:

- Source IP Settings:
  - IP Address – The IP address of the Ethernet Card physical interface. Only one required for all 4 ports.
  - Subnet Mask – Identifies the subnet of the IP address specified above.
  - Source Port – Source port that will be specified when sending the TS data.
  - Enable DHCP Client – When selected, the Gigabit Ethernet Card will obtain a dynamic IP address (Source address) from a DHCP server and use this address for all Ethernet transmissions. A source port is not obtained from a DHCP server.
- Destination IP Settings:
  - IP Address – The IP address that the Gigabit Ethernet Card transmits to.
  - Destination Port – The virtual destination port that is used for the TS data transmission.

- Enable Multicast – When selected, the Gigabit Ethernet Card will not attempt to find the destination IP address with ARP before transmission begins.

- Protocol Settings:
  - Encapsulation – The encapsulation type that is used for the TS data transmission.
  - Number of TS Packets Per Frame – how many TS packets will be used in each Ethernet frame.
  - Enable Pro-MPEG FEC – enables the Pro MPEG forward error correction.
  - L Value, D Value – FEC Parameters.
  - Col Port – port number to use for transmission of FEC column data.
  - Row Port – port number to use for transmission of FEC row data.
  - Use Col FEC Only – use only Column FEC for the FEC.
  - Interleaving Mode – which interleaving mode to use for the FEC.

5. Click the **Submit** button.

12.6 IP Output Configuration

Figure 12-4: IP Output Configuration

Table 12.6a: IP Output Configuration (See Figure 12-4)

Setting	Description
SFP 1 Info	This is where the GUI will report if there is an SFP installed in SFP Slot 1. If there is no SFP it will say “Not Connected”.
SFP 2 Info	This is where the GUI will report if there is an SFP installed in SFP Slot 2. If there is no SFP it will say “Not Connected”.
MAC Address	A MAC (Media Access Control) address is a unique identifier assigned to network adapters or network interface cards (NICs) by the manufacturer to uniquely identify them on a LAN. It is used to identify the GbE Card on the network to a DHCP server and to other computers. It is hard coded into the GbE Card at the factory and cannot be changed. This is the Mac Address for all four output ports, collectively, of the Gigabit Ethernet Card. If DHCP is used, this is the address to use for a reservation in the DHCP server for the video output device.
Firmware Version	The firmware version installed on the Gigabit Ethernet card - for information only.

12.7 Source IP Settings

This section sets the physical IP address configuration for the SFP and Electrical Ethernet ports. All ports are replicated in an integrated switch, so there is only one IP address assigned to all of the physical ports collectively.

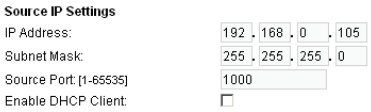

Figure 12-5: Source IP Settings Section

Table 12.7a: Source IP Settings (See Figure 12-5)

Setting	Description
IP Address	A static IP address may be specified here that is assigned to the Ethernet ports, collectively. Only one address may be assigned and this will be the source address that is reported in the resulting unicast or multicast streams.
Subnet Mask	If a static IP address is assigned, enter the subnet mask for the entered network address.
Source Port [1-65535]	This is the source port number that may be assigned to the Ethernet ports, collectively. Only one port may be assigned and this will be the Source Port that is reported in the resulting unicast or multicast streams.
Enable DHCP Client	The Ethernet card supports DHCP Client Mode on the Gigabit ports separately from the unit’s management port. This option enables the DHCP client on the Gigabit Card Ethernet ports only. Only a single address will be requested from the DHCP server. The source port will still need to be assigned even if DHCP client is enabled since DHCP will not assign a port number. When DHCP client is enabled, the IP address that is reported in the greyed out IP address and subnet settings above do not reflect the actual IP address obtained. If that information is required, the DHCP server should be consulted, looking for the address that was assigned to the MAC address shown above.

12.8 Destination IP Settings

This section sets the IP address that is assigned to the outgoing IP stream when working in MPTS mode. There will be only one multiplex created and only one address may be assigned. This address will be used across all of the output Ethernet ports as the four ports are on an integrated switch.

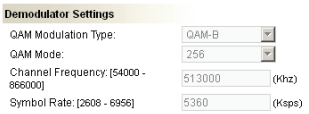

Figure 12-6: Destination IP Settings

Table 12.8a: Destination IP Settings (See Figure 12-6)

Setting	Description
IP Address:	This is the IP address that is assigned to the output unicast or multicast MPTS stream and will be reported in the resulting MPTS stream as the Destination IP Address.
Destination Port: [1-65535]	This is the port number that is assigned to the output unicast or multicast MPTS stream and will be reported in the resulting MPTS stream as the Destination Port Number.
Enable Multicast:	This check box enables the use of multicast as an output. The Ethernet card does not use the actual assigned destination IP address range to determine if unicast or multicast transmission is desired. In other words, merely assigning a multicast address in the range 224.0.0.0 through 239.255.255.255 will not cause the output to be multicast. **If this check box is unticked:** ARP protocol will be used to find and establish a unicast connection to the computer or receiving device with the destination IP address. The stream will be unicast to the destination address specified. If the address of the destination specified is not found, the transmission will default to multicast. **If this box is ticked:** The Ethernet interface will not need to find the destination IP address before beginning transmission. It will assume that there are multiple receivers of the stream. The stream will be multicast to the address specified.

12.9 Protocol Settings

In this section, some configuration settings for the IP protocol may be changed.

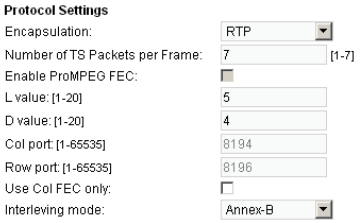

Figure 12-7: Protocol Settings Section

Table 12.9a: Protocol Settings (See Figure 12-7)

Encapsulation:	Defines the type of IP encapsulation to be used for IP transmission. UDP User Datagram Protocol is a connectionless protocol (as opposed to TCP) and is commonly used to send audio and video over Ethernet. There is no ordering of the data enforced and data arriving late is ignored. RTP Some routers support RTP (Real-time Data Protocol) and will pass data sent under this protocol with priority.
Number of TS Packets per Frame:	Here the number of MPEG packets that are encapsulated into each IP packet may be defined. The default and maximum value is seven. Encapsulating more MPEG packets in each IP packet reduces overhead but there is more MPEG data loss with each lost IP packet. Assigning less MPEG packets per IP packet increases overhead but results in a possibly more robust stream. Seven is most commonly used.
Enable Pro-MPEG FEC:	The DVIS supports transmission with Pro-MPEG FEC protocol defined by Pro-MPEG COP#3. For more information on configuring Pro-MPEG FEC see the Pro-MPEG FEC documentation at http://www.Pro-MPEG.org/
L value: [1-20]	Pro-MPEG FEC Values
D value: [1-20]	Pro-MPEG FEC Values
Col port: [1-65535]	Port number to use for transmission of FEC column data.
Row port: [1-65535]	Port number to use for transmission of FEC row data.
Use Col FEC only:	Use only Column FEC for the Pro-MPEG FEC
Interleaving Mode:	Configures which interleaving mode to use for FEC

12.10 VLAN Settings

Figure 12-8: VLANS Settings Section

The GbE output card supports automatic creation of 2 VLANs when this feature is activated. See "12.3 Support for VLAN Tagging" on page 12-3 for further information about the VLAN Tagging option. The Figure 12-9 summarizes the operation of the DVIS implementation of VLANs to assist in understanding and configuring the feature.

Table 12.10a: VLAN Settiongs (See Figure 12-8)

Setting	Description
Active VLAN	This activates the use of VLANs for transport stream transmission and accessing the GUI over the Gigabit Ethernet card ports.
Video VLAN VID	This is the Video VLAN ID
Mng VLAN VID	This is the GUI VLAN ID

12.11 GbE Port Numbering

Physical ports on the Gigabit Ethernet card, Figure 12-10 each have a number assigned for purposes of configuring VLANs as shown in Figure 12-9 and described here:

Figure 12-10: GbE Card Port Numbering

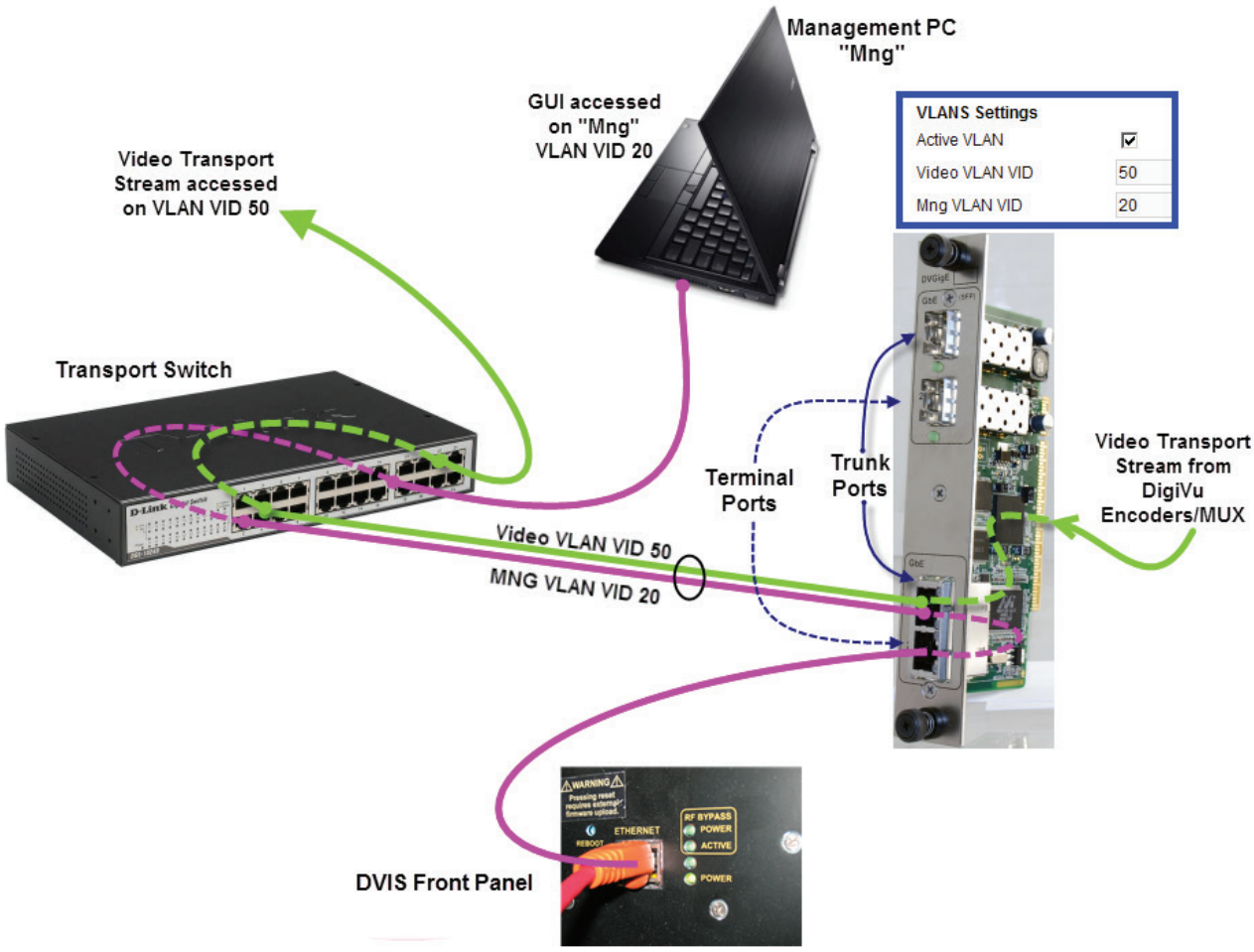

Figure 12-9: VLAN Setup and Operation

1. Trunk Ports are both labeled #1 on the front panel.

   Trunk ports will receive/transmit only tagged Ethernet packets which will be routed to their destination according to their assigned VID. There is one each electrical and SFP (Small Form-Factor Pluggable) port which are identical functionally and interchangeable depending on the type of interface required.

2. Terminal Ports are both labeled #2 on the front panel.

   Terminal ports are connected to a device (such as the management port) that does not support VLAN tagging but needs to be routed on a management VLAN. There is one each electrical and SFP port but the RJ45 port is typically used in this case.

12.12 Two VLANs Automatically Created

Enabling the VLAN option automatically creates 2 VLANs over which the streaming video and the management of the DVIS device may be accessed over a single physical connection but kept separate at the destination switch.

1. Video LAN

   The GbE video multiplex exists on this virtual LAN (it is connected to the switch through an internal port and the card connector). This means that the MUX output is connected to an internal switch in the GigE Card. MUX output then flows to both physical trunk ports; the ports labeled #1. These ports reside on the internal GbE switch so either may be used as the trunk output.

2. Management LAN

   Both physical Ports #2 of the GbE card are configured on this Virtual LAN. Either of these ports connect to the Management Ethernet port through a straight wired Cat5e cable however typically only the RJ45 electrical port is used. These ports are mutually exclusive so only one or the other may be used.

12.12.1 Quick Guide to VLAN Setup

a) Set up a remote external switch with VLAN support and VLANs enabled for the GUI and streaming video.

b) On the DVIS 'IP Output' tab select the **Active VLAN** check box.

c) Set the VLAN VID for Mng (GUI) and Video VLAN VID to the same VIDs used on the external switch.

d) Click **Submit**.

e) Connect the management IP port from DVIS front panel to RJ45 GbE Port 2 on the GbE card using a short straight through Cat5e cable.

f) Connect one of the trunk ports labeled #1 (depends whether you use copper or SFP) to a Trunk port on the external switch.

g) Connect a Management PC to the 'Mng' management port at the remote external switch and login to the GUI making sure both the PC and DVIS reside on the same subnet.

h) Connect another PC or the receiving device to the defined video port at the external switch and set it up to capture the video over IP as was configured at the 'IP Output' tab.

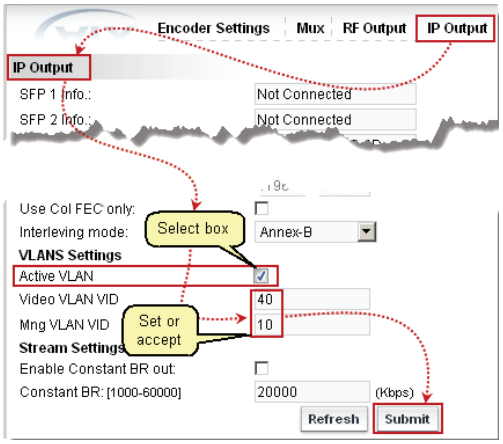

Figure 12-11: Activate and Configure VLAN

12.13 Stream Settings

Configuration of enabling and configuring SPTS is described in Figure 12-13 and Table 12.13a.

Figure 12-12: Stream Settings Section

Table 12.13a: Stream Settings (See Figure 12-12)

Setting	Description
Single Program TS:	This feature allows the creation of Single Program Transport Streams (SPTS) from the IP output rather than all the programs being distributed in a single MPTS multiplex with a single IP address. This is available only when the Ethernet output alone is active (setting on the Mux tab). See "Output Selection:" on page 7-2 to select "Ethernet Only". The configuration of the addresses, defining the address as multicast and enabling FEC is done in a table available on this IP Output tab. Only encoders that have been activated on the Encoder Settings tab will be available to configure(see "Encoder Settings" on page 6-1).
Enable Constant BR Out:	Configures the multiplexer to output a constant bit stream at a defined data rate without regard to the actual payload data rate. This may be defined if a STB or other receiving device requires a bit stream at a defined rate. If the payload is less than the number defined here, null packets will be used to stuff the IP data stream to the defined output rate. *NOTE: This only works in MPTS mode.*
Constant BR: [1000-60000]	This is the CBR bit rate of the transport stream on the Ethernet network if a constant rate is desirable. Defining a bit rate higher than the payload will result in null stuffing of the transport stream to the bit rate specified here. *NOTE: This only works in MPTS mode.*

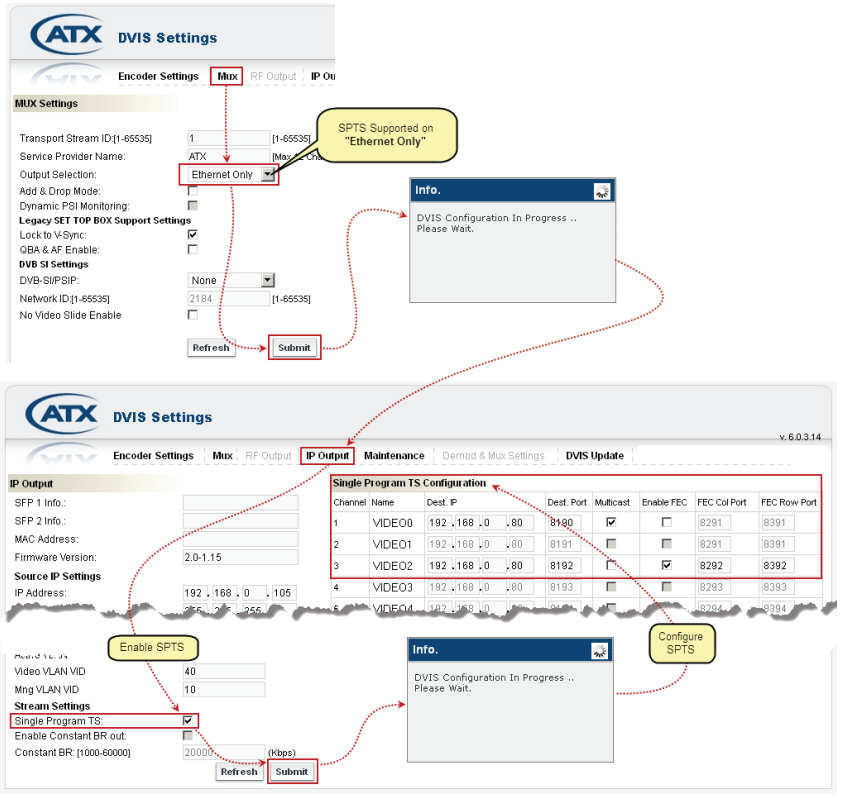

Figure 12-13: Enable and Configure SPTS Feature

12.14 Platform Control Buttons

Control buttons to refresh the display or apply changes.

Figure 12-14: Platform Control Buttons

Table 12.14a: Platform Controls (See Figure 12-4)

Control	Description
Refresh	This control reads the DVIS stored settings and refreshes the page with the values. This also will read the encoder card types installed and populate the display with the discovered types. This is useful when an encoder card type has been changed or a new encoder card installed.
Submit	This control applies all of the changes made on the 'RF Output' tab and makes the changes part of the working configuration of the DVIS system. If changes have been made click **Submit** button before navigating away from the page, to avoid all changes being lost. This attribute may be used to throw away changes made if you change your mind. NOTE: This is a service affecting operation

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FIRMWARE UPDATE & RECOVERY

13. Firmware Update & Recovery

In this chapter we explain the firmware upgrade process and where to get firmware files. We also discuss the procedure for recovering to a previous firmware version or resetting the username & password if it is ever necessary.

NOTE: *The Distribution Amplifier DV2DA do not appear in the GUI and are not affected by any firmware or upgrades.*

New system firmware for the DVIS platform is provided in an archive file format of .tgz in a zip container and will be made available from time to time. It is not necessary to un-compress the tgz package as the DVIS has built-in facilities to accept the file in tgz format. The tgz file is provided from ATX Networks support in a zip format, so it will be necessary to un-zip the file downloaded first. The name of the zip file and the tgz file inside will be the same except for the extension and both will be named with the firmware version number. If you require a program to unzip the file, an open source file archiver may be obtained for free at the http://www.7-zip.org/download.html site.

13.1 Chapter Contents

13.2 Types of Firmware Files

A brief description of the files that may be obtained.

13.2.1 System Upgrade/Recovery File

This is a file that is used to bring the DVIS up to the latest firmware revision and is referred to as a firmware upgrade. This file may be used even if the equipment has a very old version of firmware installed as it completely replaces all files on the DVIS platform and works with any previously installed version. This file can also be used to reinstall the latest firmware revision on an already upgraded device if there is suspicion that the firmware might not be working as expected and this application of the same file would be referred to as a system recovery. This is the most commonly installed file type and is installed in the same manner regardless of the end requirement. The following attributes apply to this file type:

- Can be used to upgrade any firmware version or when existing version is unknown.
- Fully replaces existing firmware.
- Suitable only when unit is physically available (cannot be applied remotely).
- Used to recover network parameters, login credentials or after mis-configuration.
- IP parameters and login passwords are reset to factory default.
- Requires full re-configuration of all channel parameters.

13.2.2 Remote Upgrade

This file type may be applied to the equipment even if it is remotely located. This firmware may be installed over a limited range of previous firmware so check the support site for qualifying existing versions.

- Usable for minor firmware changes. Check the support site for qualifying existing versions.
- Suitable when the unit is remotely located.
- IP parameters and login credentials are not changed.
- Channel parameters are not changed.

13.2.3 Username and Password Reset File

It is possible to reset a lost username and password without losing the programmed configuration. A special file is available to reset the username and password back to factory defaults (username: atx, password: atx). This file must be requested from ATX Networks technical support.

13.3 Identifying Current Firmware Version

The currently installed firmware version is displayed in the DVIS Device GUI under the 'Maintenance' tab, as shown in Figure 14-1.

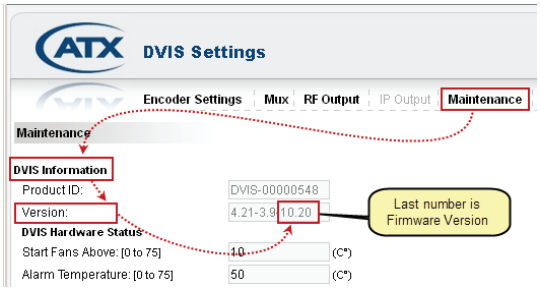

Figure 13-1: Identify the Current Firmware Version

13.4 Exporting a Configuration

The DVIS Device has the ability to export the programmed configuration as a file, which could be kept as a backup or used for mass deployment of a common configuration. It is suggested to export the configuration prior to upgrading firmware but the exported settings may not be used to restore after a firmware upgrade since system settings may be incompatible between firmware versions. The settings file may only be restored with the same version firmware as the unit from which it originates. Making this backup is not service affecting and it is recommended that the settings be exported and saved whenever the system configuration changes. The settings file is exported from the 'Maintenance' tab. Figure 14-2 illustrates what to do.

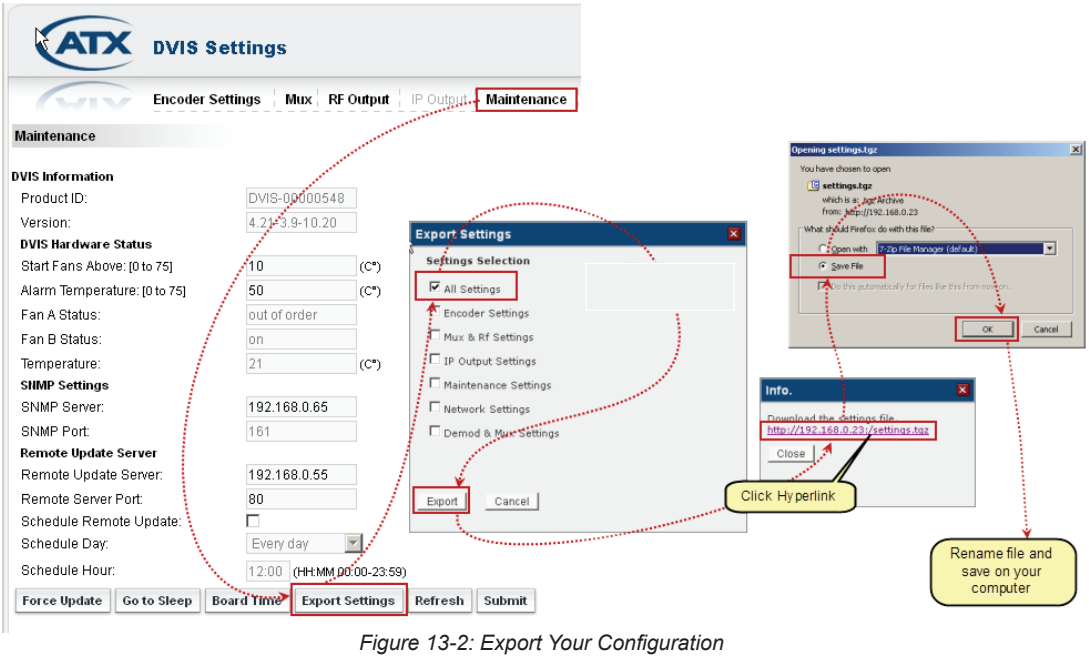

Figure 13-2: Export Your Configuration

NOTE: *If a firmware upgrade is undertaken, it will not be possible to use an exported configuration made as a backup since features introduced in the newer firmware will render the backup file from a previous firmware version incompatible. A backup taken will only be of use on a DVIS Device with a firmware version the same as the version from which it is taken, ie. if the firmware is ever reverted back to the original version.* ***Only use exported configuration files on a Device of identical firmware version.***

13.5 Where to Obtain Firmware Files

Firmware upgrade files are released by ATX Networks periodically to add features or to address potential issues with released firmware operation. The firmware files, when released, will be available from ATX Technical Support.

If further information is required during any phase of the firmware upgrade, or you have concerns or questions about the firmware or it's applicability to your device, contact ATX Networks Digital Video Support.

13.6 Firmware Upgrade Process

The following firmware upgrade process is the general format that will be followed. Each firmware upgrade may have specific criteria that will need to be adhered to and those criteria will be posted with the upgrade.

FYI: *This manual does not contain specific up to date information for each release. Please read the instructions posted with each firmware release on the support web site.*

NOTE: *With the exception of applying the remote upgrade file and password reset file, applying system upgrade files will cause the loss of programmed settings. Record the configuration so it may be re-programmed before applying a system upgrade/recovery file.*

13.6.1 Save Firmware File to Management Computer

Save the upgrade file in a convenient location on the Management Computer. The upgrade file is named with the same name as the version of the upgrade although it may be contained in a zip wrapper. Extract the firmware file within the zip archive and save it in a convenient location on the Management Computer. This recovery file is in **.tgz** format and is itself an archive format. It should not be modified in any way or extracted further, though it may be renamed.

13.6.2 Direct Connect Management Computer to DVIS

If connecting to your device directly through a cable, set the computer that you will use for the upgrade to the same subnet as the DVIS in order to access the GUI. For example, if the network address for the unit is set to the factory default setting of 192.168.0.23 set the Management Computer to an address between 192.168.0.24 and 192.168.0.255

For connecting to your remote device through the Internet use the usual procedure for your situation. This setting cannot be specified here due to field variability.

13.6.3 Upload Firmware

1. Select the 'DVIS Update' tab. The 'Update DVIS Version' page will appear.
2. Click **Browse**, navigate to the folder on your computer where you saved the .tgz file and click **Open**. The file name and location appear in the selection box.
3. Click **Update** to begin uploading the file to the DVIS. See Figure 14-3.

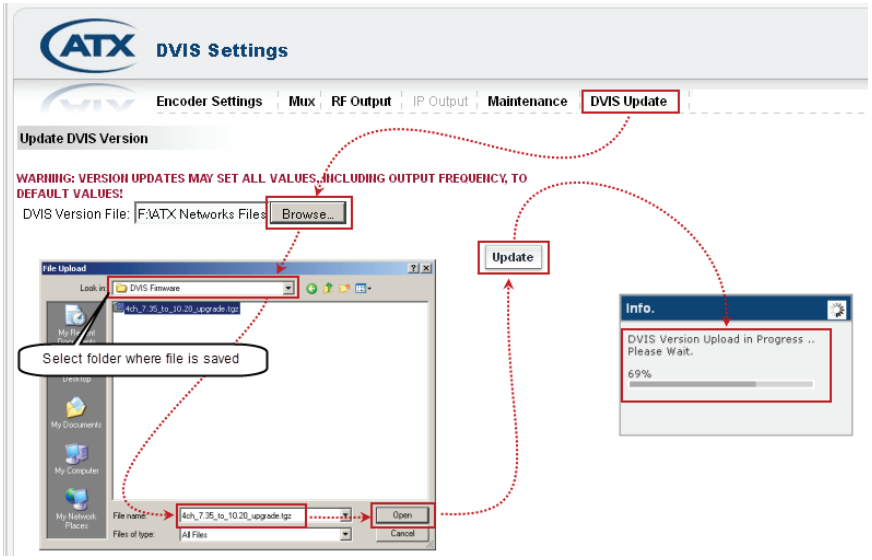

Figure 13-3: Upload Firmware

4. A progress bar indicates the percentage file upload completion (0 to 100%).
5. When file upload is complete the unit will present the 'Upload Done' page, shown in Figure 14-4.
6. When the upload has finished, file installation begins automatically. The amount of time required for the firmware file installation may vary depending on factors such as link speed and type and size of upgrade file.
7. Close the browser window.
8. When installation has completed, the unit reboots (indicated when the fans shut off for a few seconds and then restart).

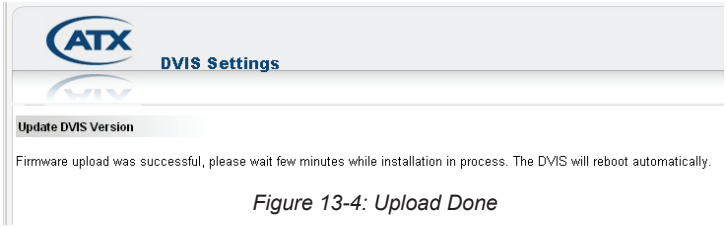

Figure 13-4: Upload Done

9. Wait 2 minutes after the fan restarts for the reboot to complete.
10. Open Internet Explorer and enter 'http://192.168.0.23/site' in the URL field. When the login screen appears, enter **atx** for both the Username and Password. The DVIS 'Encoder Settings' page appears.

Figure 13-5: Login

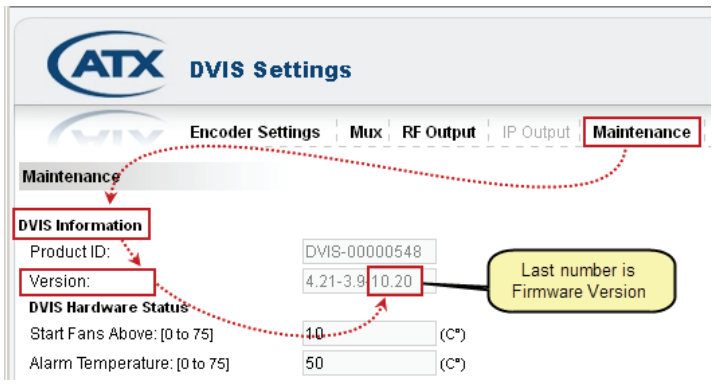

Figure 13-6: Check New Firmware Version

11. Select the ‘Maintenance’ tab and verify that ‘Version Number’ is the same as the number in the name of the firmware upgrade file.
12. If the installed firmware version agrees with the name of the file, the firmware upgrade is complete.

13.7 System Recovery Process

NOTE: *Do not depress the ‘RESET’ button unless you have the appropriate firmware file available. This will cause your DVIS to wait indefinitely until the firmware is uploaded. There is no cancel button for recovery mode and once recovery mode has begun, the appropriate firmware file has to be uploaded to complete the recovery process.*

13.7.1 Introduction

NOTE: *All programmed settings will be lost. Record the configuration so it may be re-programmed before applying the system recovery file.*

System recovery is intended to restore the system in case it is suspected that internal files have become corrupted and that the GUI has become unresponsive. The Recovery Mode/Status is reached by pressing and holding, for several seconds, the ‘Reset Button’ until the fans stop running. The button is located on the front panel of the DVIS beside the Management IP port and is covered from the factory by a small adhesive dot to prevent inadvertent use. One fan will start running again while the other will remain idle. In recovery mode, the IP address setting of the Management IP port always reverts to 192.168.0.23 regardless of previously configured IP settings before recovery. Now the appropriate firmware file has to be uploaded, typically the latest firmware version upgrade file. Check the details posted on the appropriate ATX Support site, see “Where to Obtain Firmware Files” on page 13-2, for the current firmware versions.

NOTE: *By default the DVIS IP address will be reset to 192.168.0.23 so it will be necessary to configure a computer on the same subnet to allow uploading the file, using an address between 192.168.0.24 and 192.168.0.255.*

13.7.2 Obtain and Save Firmware Upgrade

Obtain the appropriate recovery firmware file and save it in a known location on the Management Computer. This file is in **.zip** format and its name contains the version code for this upgrade.

Extract the firmware file within the zip archive and save it in a known location on the Management Computer. This file is in **.tgz** format and is itself an archive format. It should not be modified in any way or extracted further.

13.7.3 Set Management PC Subnet

You will need to connect to your device directly through a cable, so set the computer that you will use for the upgrade to the same subnet as the DVIS in order to access the GUI. The network address for the DVIS unit will be reset to the factory default setting of 192.168.0.23 so configure the computer to an address between 192.168.0.24 and 192.168.0.255.

13.7.4 Reset the DVIS

NOTE: *Do not depress the ‘RESET’ button unless you have the appropriate firmware file available. This will cause your DVIS to wait indefinitely until the firmware is uploaded. There is no cancel button for recovery mode and once recovery mode has begun, the appropriate firmware file has to be uploaded to complete the recovery process.*

Using a pen or similar small pointed object, press and hold the ‘RESET’ button on the front panel of the DVIS for several seconds to place the unit in RESET/RECOVERY mode. You can recognise the condition when both fans stop operating, then after a few seconds they restart (this assumes that the fans were running). Wait about 1 minute more for the DVIS to restart.

NOTE: *In Recovery Mode, the DVIS Management IP port reverts to 192.168.0.23.*

13.7.5 Connect to GUI

1. Open an Internet Explorer browser window and enter **http://192.168.0.23/site** in the address field.
2. When the login screen appears, enter **atx** for both the Username and Password, see Figure 14-7.
3. Upon validation of the login and password, the 'DVIS Recovery' page appears, see Figure 14-8.

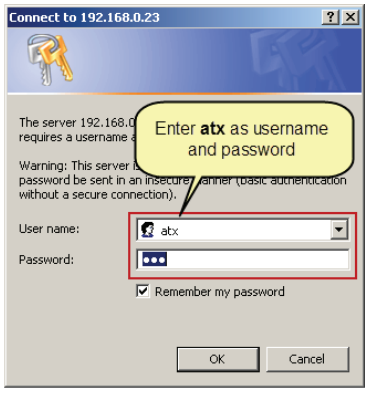

Figure 13-7: Login

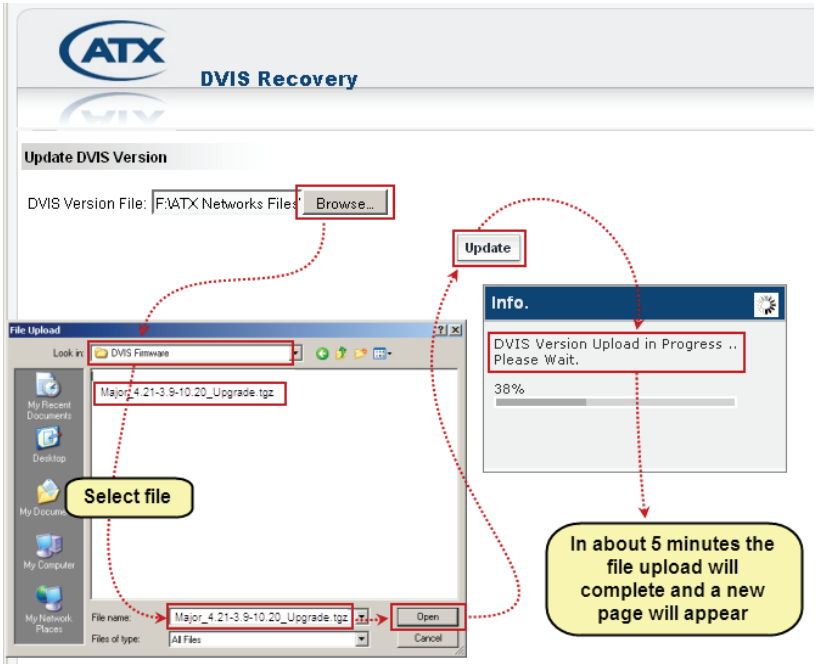

Figure 13-8: Restore System Firmware

13.7.6 Upload Firmware

1. Click **Browse**, see Figure 14-8, navigate to the location of the saved files and select the file. The file name and location appear in the selection box.
2. Click **Update** to begin uploading the file to the unit. A progress bar indicates the percentage completion (0 to 100%). When the upload is finished, the Upload Done page appears in the web browser as shown in Figure 14-9 and file installation on the DVIS begins automatically.
3. Close the web browser.
4. When installation has completed (which can take several minutes), the unit reboots (indicated when the fan shuts off for a few seconds and then restarts). After a few seconds the second fan restarts.
5. Wait an additional 90 seconds, reopen the web browser and enter **http://192.168.0.23/site** in the address field. When the login screen appears, enter **atx** for both the Username and Password, see Figure 14-10. The 'DVIS Encoder Settings' page appears.
6. Click **Maintenance** and verify that 'Version' is the same as the name of the upgrade file, see Figure 14-11.

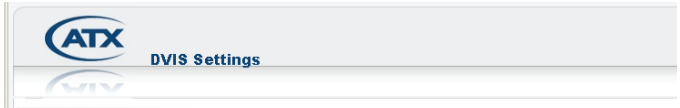

Figure 13-9: Upload Done

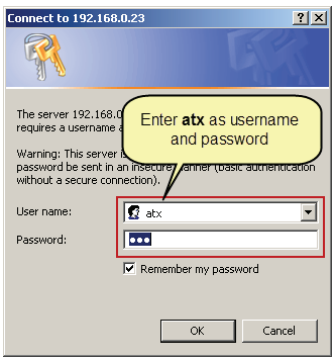

Figure 13-10: Login

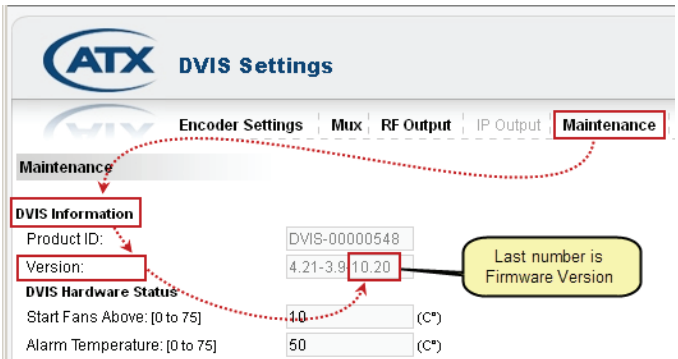

Figure 13-11: Check Firmware Version

13.8 Restore a Configuration Export

If you saved an exported file or are performing a mass deployment of a number of DVIS with identical configurations and installed firmware, you can restore the saved configuration from the exported file. The file is in tgz format and would have been named **settings.tgz** if you accepted the name that the DVIS suggested when exported.

NOTE: *Only install exported configuration files on DVIS units with identical firmware version as the unit from which the configuration file originated.*

Restore an exported file in the same manner as a firmware upgrade from the 'DVIS Update' tab. See Figure 14-12.

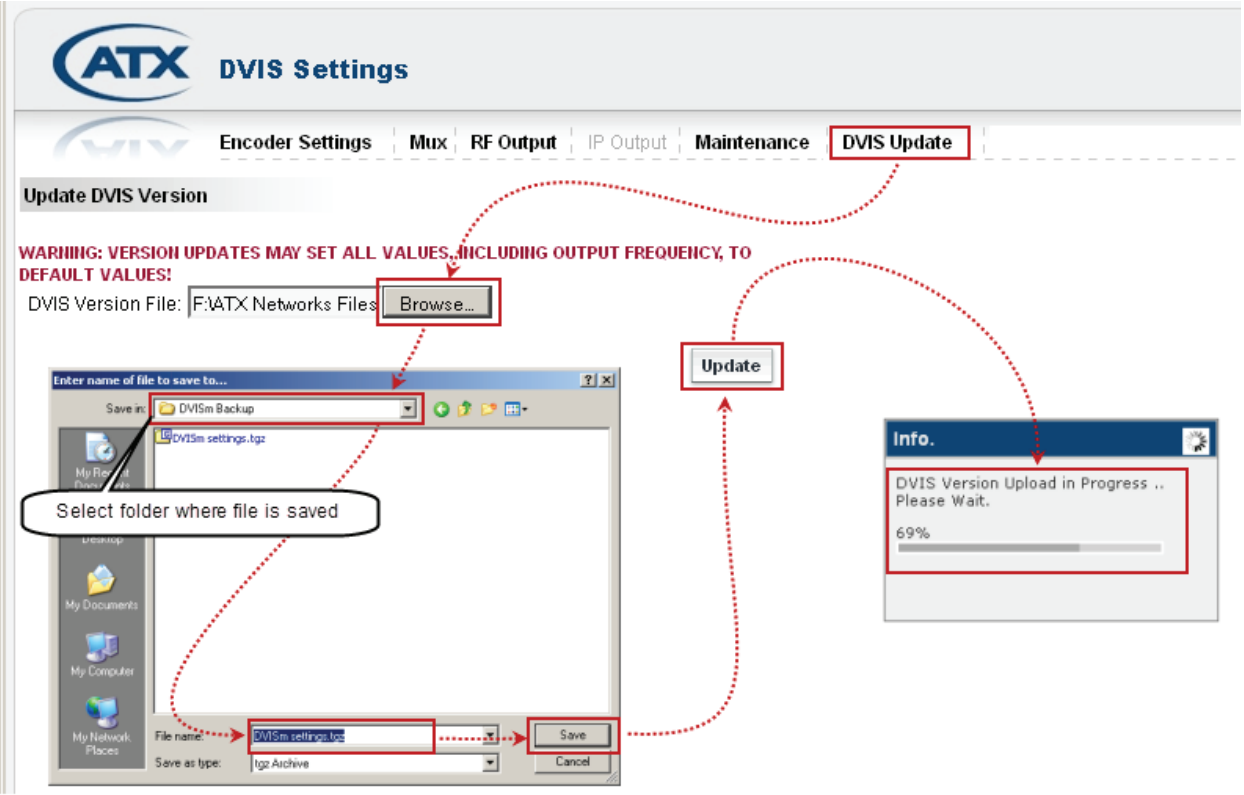

Figure 13-12: Restore an Exported Configuration

1. Select the 'DVIS Update' tab. The 'Update DVIS Version' page will appear.
2. Click **Browse**, navigate to the folder on your computer where you saved the **settings.tgz** file (or whatever name you may have given it) and click **Open**. The file name and location appear in the selection box.
3. Click **Update** to begin uploading the file to the DVIS. A progress bar indicates the percentage file upload completion (0 to 100%).
4. When file upload is complete the DVIS will present the 'Upload Done' page, as shown in Figure 14-13.
5. When the upload has finished, file installation begins automatically.
6. Close the browser.
7. When file installation has completed (which can take about 1 minute), the unit reboots (indicated when the fans shut off for a few seconds and then restart).
8. Wait 2 minutes after the fan restarts for the reboot to complete.

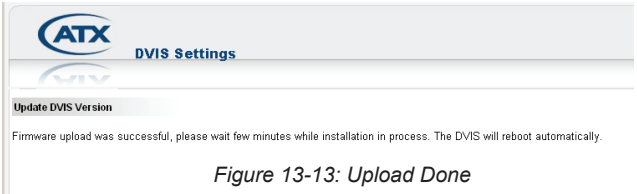

Figure 13-13: Upload Done

9. Open Internet Explorer and enter one of the following in the browser URL field as appropriate:
   a) Enter **http://192.168.0.23/site** if the exported IP address was set to the default IP address setting.

b) Enter the IP address of the DVIS that was saved in the exported file.

c) Enter the original IP address of the target DVIS receiving the file if 'Network Settings' was not part of the restoration file.

10. When the login screen appears, enter one of the following in the browser URL field as appropriate:
    a) Enter **atx** for both the username and password if the default DVIS settings had been restored.
    b) Enter the username and password of the DVIS that was saved in the exported file.
    c) Enter the original username and password of the target DVIS receiving the file if 'Network Settings' was not part of the restoration file.
11. The DVIS 'Encoder Settings' page appears.
12. Configuration settings defined by the **settings.tgz** file have been restored.

13.9 Username & Password Reset Process

NOTE: *Do not depress the 'RESET' button unless you have the appropriate firmware file available. This will cause your DVIS to wait indefinitely until the firmware is uploaded. There is no cancel button for RESET mode and once begun, the appropriate firmware file has to be uploaded to complete the process.*

NOTE: *The password reset file may be obtained from ATX Networks technical support group.*

13.9.1 Introduction

The Username/Password reset process is intended to restore the DVIS factory username and passwords in case it is has been changed then lost or forgotten. After this process, the login credentials will be returned to factory settings but all other settings will be unchanged. The password recovery mode is reached by pressing and holding, the 'RESET' button for several seconds, until the fans stop running. The button is located on the front panel of the DVIS beside the Management IP port and is covered from the factory by a small adhesive dot to prevent inadvertent use. One fan will start running again while the other will remain idle. In reset mode, the IP address setting of the Management IP port always reverts to 192.168.0.23 regardless of previously configured IP settings before reset, then using the factory default IP address, the appropriate firmware file is uploaded.

NOTE: *By default the DVIS IP address will be reset to 192.168.0.23 so it will be necessary to configure a computer on the same subnet to allow uploading the file, using an address between 192.168.0.24 and 192.168.0.255.*

13.9.2 Obtain and Save Password Reset File

Obtain the appropriate recovery firmware file from ATX Networks and save it in a known location on the Management Computer. This file is in **.zip** format and the version you are given will depend on the firmware version installed on your equipment. Extract the firmware file within the zip archive and save it in a known location. This file is in **.tgz** format and is itself an archive format. It should not be modified in any way or extracted further.

13.9.3 Set Management PC Subnet

During this process, the network address for the DVIS unit will be reset to the factory default setting of 192.168.0.23 so you will need to connect to your DVIS directly through a crossover Ethernet cable. Set the computer that you will use for the recovery to the same subnet as the DVIS in order to access the GUI, configuring the computer to an address between 192.168.0.24 and 192.168.0.255.

13.9.4 Reset the DVIS

NOTE: *Do not depress the 'RESET' button unless you have the Password Reset firmware file available. This will cause your DVIS to wait indefinitely until the firmware is uploaded. There is no cancel button for recovery mode and once recovery mode has begun, the appropriate firmware file has to be uploaded to complete the process.*

Using a pen or similar small pointed object, press and hold the 'RESET' on the front panel of the DVIS for approximately 5 to 10 seconds to place the unit in RESET mode. You can recognise the condition when both fans stop operating, then after a few seconds they restart (this assumes that the fans were running before reset). Wait about 1 minute for the DVIS to restart.

NOTE: *In Reset Mode, the DVIS Management IP port reverts to 192.168.0.23.*

13.9.5 Connect to GUI

1. Open an Internet Explorer browser window and enter **http://192.168.0.23/site** in the address field.
2. When the login screen appears, enter **atx** for both the Username and Password, see Figure 14-14.
3. Upon validation of the login and password, the 'DVIS Recovery' page appears.

13.9.6 Upload Password Reset Firmware

1. Click **Browse**, navigate to the location of the saved files and select the file. The file name and location appear in the selection box, see Figure 14-15.

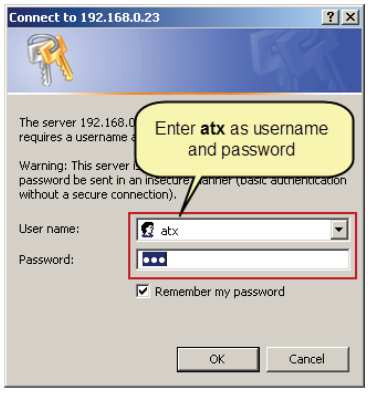

Figure 13-14: Login

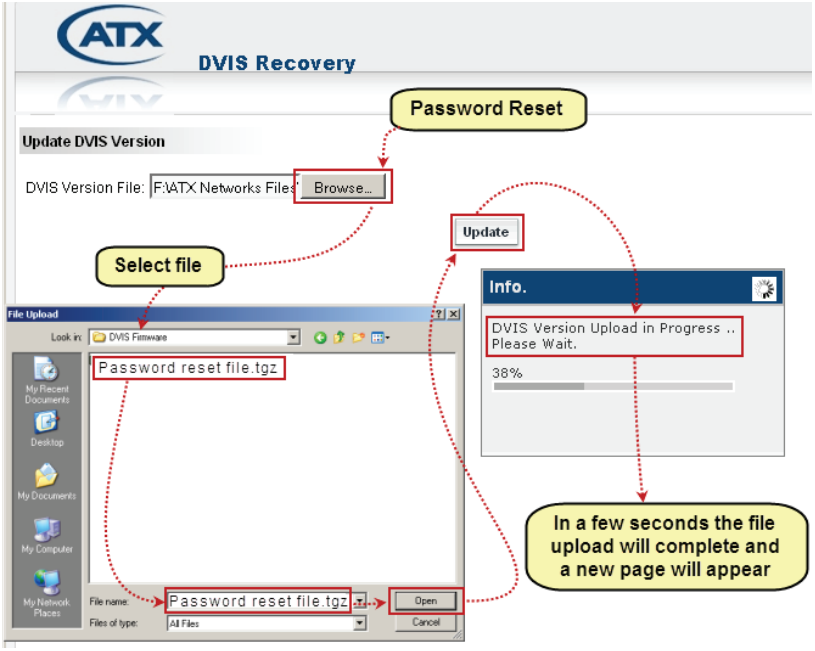

Figure 13-15: Upload Password Reset Firmware

2. Click **Update** to begin uploading the file to the unit. A progress bar indicates the percentage completion (0 to 100%) but it happens very fast so it is easy to miss. When the upload is finished, the 'Upload Done' page appears in the web browser as shown in Figure 14-16 and file installation begins automatically.
3. Close the web browser.
4. When installation has completed (which can take several minutes), the unit reboots (indicated when the fans shut off for a few seconds and then restart).
5. Wait an additional 90 seconds, reopen the web

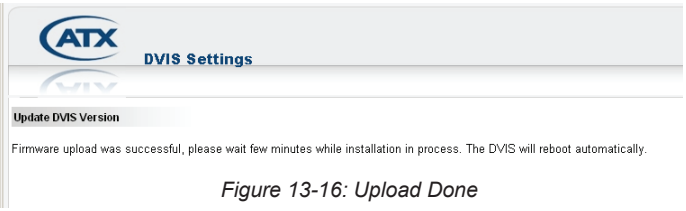

Figure 13-16: Upload Done

browser and enter **http://192.168.0.23/site** or the original IP address in the address field. If the IP address was other than the factory set address, the original will be restored. When the login screen appears, enter **atx** for both the Username and Password, see Figure 14-17. The 'DVIS Encoder Settings' page appears, see Figure 14-18.

Figure 13-17: Login

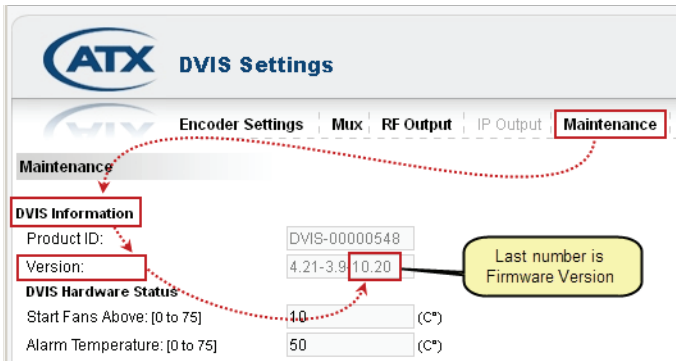

Figure 13-18: Check Firmware Version

6. Click **Maintenance** from the menu bar and verify that 'Version' has not changed.
7. Change the username and password to whatever is required by your system. For details on doing that, see "9.10.1 Change User & Password" on page 9-8.

MODULE FIELD REPLACEMENT

14. Module Field Replacement

14.1 Field Replacement of CMOS Battery

The DVISm model has a CMOS backup battery access door on the front panel. This battery maintains continuity of the clock on the DVIS device main board in the event of power outages. The CMOS battery is Lithium and has an expected life of 20+ years under normal system operation. Replace this battery with a 3 volt CR 2032 or exact replacement type.

If your DVIS device does not have a CMOS access door and the battery requires replacement, contact ATX Networks technical Support.

14.2 Field Replacement of Cooling Fans

14.2.1 Remove Fan

1. Disconnect the fan connector.
2. Using a Phillips screwdriver, remove the four screws holding the fan in place.

14.2.2 Replace Fan

1. Hold the fan in position, insert the four retaining screws and tighten using a Phillips screwdriver.
2. Insert the connector into the adjacent receptacle.

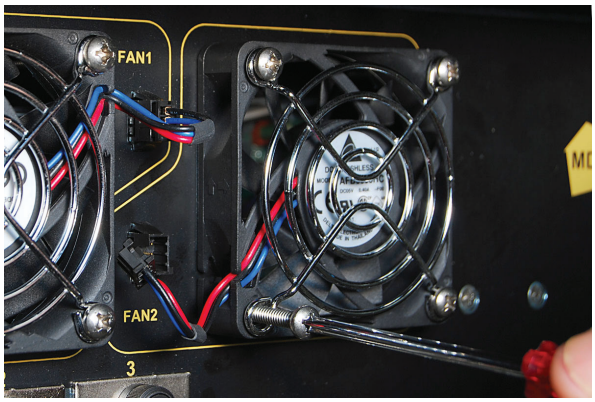

Figure 14-1: Disconnect and Remove Cooling Fan

14.3 Field Replacement of Channel Deletion Filter

14.3.1 Filter Removal

To remove the QAM Channel Deletion filter from the DVIS unit:

1. Open the DVIS cabinet and unscrew the two thumb screws securing the filter on the right front side of the front panel.
2. Disconnect the cables from the two connectors at the top and bottom of the filter.
3. Slide the filter out of the slot.

14.3.2 Filter Insertion

To install a QAM Channel Deletion filter in the DVIS Device:

1. Slide the filter into the filter slot.
2. Connect the cables to the two F connectors at the top and bottom of the filter.
3. Tighten the two thumb screws securing the filter on the right front side of the unit and close the DVIS unit.

If you have a filter with blue cables coming from beneath the front panel, ensure that the cables are positioned in the top and bottom notches of the filter housing and not pinched under the filter panel.

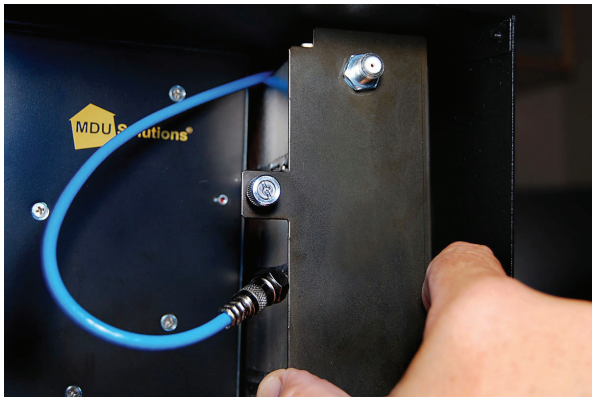

Figure 14-2: Remove Channel Deletion Filter

14.4 Field Replacement of Modules

All accessory cards are installed in the same manner, in a slot numbered from the left side The first slots are labeled ENC meaning Encoder, which is legacy labeling as now there are more than encoder cards available and new firmware supports cards in multiple slots as illustrated in the chart below. See the card support table below for correct card insertion. Be careful to align the circuit board of the card with the yellow paint indication above the card when re-inserting the cards.

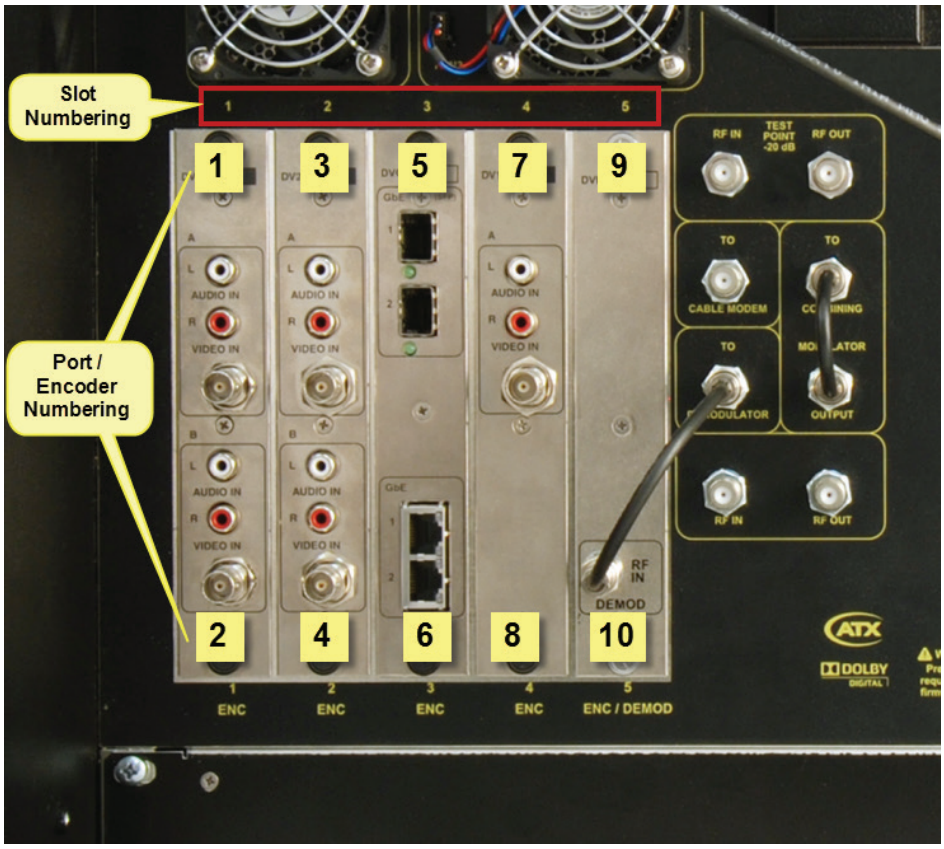

Figure 14-3: DVIS Front Panel

DVIS & DVISm Card Support		
Card Type	**DVIS Supports in Slots**	**DVISm Supports in Slots**
Single Channel Encoder	1, 2, 3, 4,5	1, 2
Dual Channel Encoder	1, 2, 3, 4,5	1, 2
Demodulator	5	3
Gigabit Ethernet	3, 5	3
Distribution Amplifier Card	1,2,3,4,5	1,2,3

NOTE: *The Distribution Amplifier DV2DA do not appear in the GUI and are not affected by any firmware or upgrades. These cards are supported in any slot and only derive power from the mainboard connection.*

NOTE: *Please power down the DVIS platform before replacing any plug in cards.*

14.4.1 Card Removal

1. Disconnect any cables attached to the card.
2. Loosen the thumbscrews at the top and bottom of the card.
3. Gently slide the card out of the slot.

14.4.2 Card Insertion

1. Align the card edges with the yellow guidelines above and below the card slot.
2. Gently slide the card into the slot until the rear edge of the card is seated in the connector at the back of the card slot.
3. Tighten the thumbscrews at the top and bottom of the card.

Figure 14-4: Release Screw and Gently Pull Card Out

Figure 14-5: To Replace - Align Card with Yellow Card Slot Marker

14.5 Field Replacement of Power Supply

Warning: *Ensure that the unit is shut off and power cord disconnected before removing the power supply to prevent a shock hazard.*

14.5.1 Power Supply Removal

1. Using a Phillips screwdriver, loosen the two retaining screws holding the power supply in place, see Figure 15-6.
2. Gently slide the power supply out far enough to allow access to the connectors to the supply and disconnect the two pin AC input connector and ground spade connector at the right side of the supply,see Figure 15-7.
3. Lift the supply and disconnect the six pin DC output connector at the left side, see Figure 15-8.

14.5.2 Install Power Supply

1. Connect the six pin connector at the left side of the supply.
2. Connect the two pin connector and spade lug at the right side of the supply.
3. Insert the top edges of the supply into the slots at the top edge of the opening and slide the power supply into the unit, see Figure 15-9.
4. Using a Phillips screwdriver, tighten the two retaining screws holding the power supply in place.

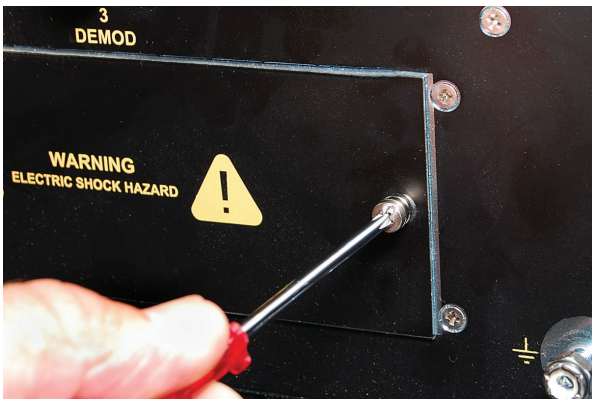

Figure 14-6: Loosen and Remove Screws

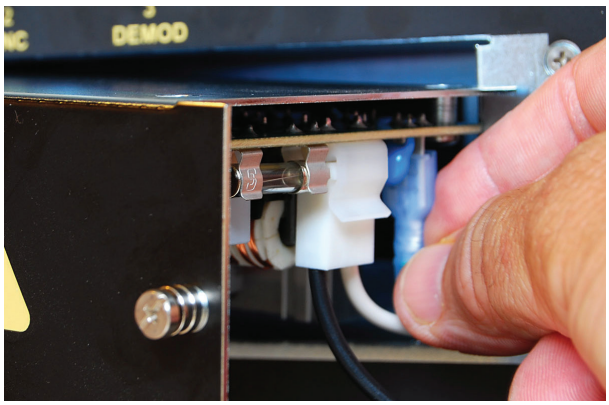

Figure 14-7: Remove AC Input Connector and Ground Spade

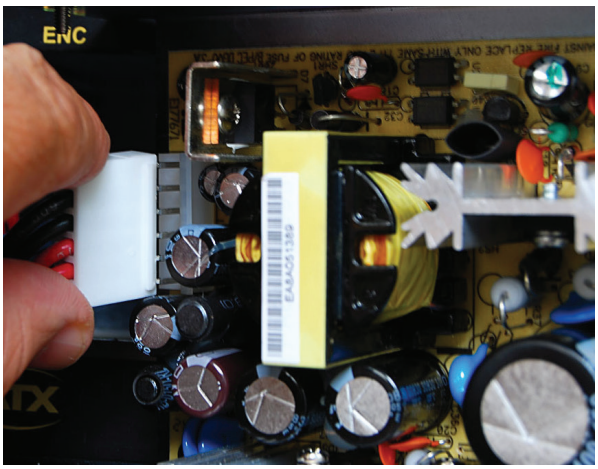

Figure 14-8: Remove DC Output Connector

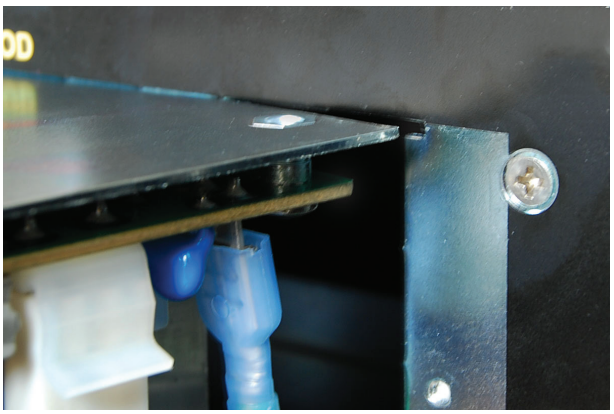

Figure 14-9: Align the Power Supply with the Slot

TROUBLESHOOTING

15. Troubleshooting

This chapter lists the error codes that may be given by the DVIS under some circumstances. These codes may be used to better understand the problem that was encountered and to help the ATX support engineer to assist in troubleshooting the equipment problem.

15.1 Error Codes

The following chart displays the Error Codes that may appear in the GUI web browser.

Error code	Operation	Error description
404	HTTP	Cannot load page as requested
500	HTTP	Unknown HTTP request
502	HTTP	Unknown POST request
503	Configuration	Unknown A/V port
504	Configuration	Cannot access shared memory
506	Configuration	Cannot open configuration file
507	TS Analyze	NO input TS in demodulator
508	TS Analyze	Cannot find PAT (PID 0)
509	TS Analyze	Cannot find TS information
		HTTP/1.0 200 _001 - System Is Configured For Add & Drop But There Is No Demod Card Present

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SERVICE & SUPPORT

16. Service & Support

16.1 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

SALES ASSISTANCE

Tel: 289.204.7800 – press 2
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only
Email: 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
Web: www.atx.com

16.2 Warranty Information

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

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9001:15
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Rev. 01/20 (ANW0967)

ATX Networks
Tel: 289.204.7800 | Toll-Free: 866.YOUR.ATX (866.968.7289) | support@atx.com