DVISn
Patent Pending

IP Video Series

DVISn - Nano-sized Digital Video Insertion System IP Output

INSTALLATION & OPERATION MANUAL

General Guide Notes

Firmware Version

Some features described in this manual require the latest firmware to be installed on the DVISn devices. Check with ATX Networks technical support or the support web site for DVISn for the latest release of firmware. The firmware installed on your device may be found on the Management Interface near the top of the page, see "Figure 6-1: Locating the Current Firmware Version" on page 6-1 for help locating your version. At the time of publication of this manual the most current released firmware version is:

Hardware Version 1   **Firmware Version 1.12**

Hardware Version 2   **Firmware Version 2.8**

Organization of This Manual

This manual is generally organized based on the Management Interface with chapters dedicated to describing the configurable features. Further chapters outline activities related to the operation such as safety, installation, firmware update etc.

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

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

TABLE OF CONTENTS

SAFETY

1.   Safety

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

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 120 VAC operation, use the power cord supplied for operation from a 120 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 fuse, replace the fuse only with the same type. Refer to replacement text on the unit for correct fuse type.

> **NOTE**:   (a) Replace fuse in units operating on 120 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.**

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 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.

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SYSTEM DESCRIPTION

2.   System Description

2.1   In This Chapter

2.2   Introduction

In this chapter we introduce the key features of the ATX Networks Nano-sized Digital Video Insertion System (DVISn) IP Output and describe some attributes that make this product a desirable addition to any IP based digital TV network.

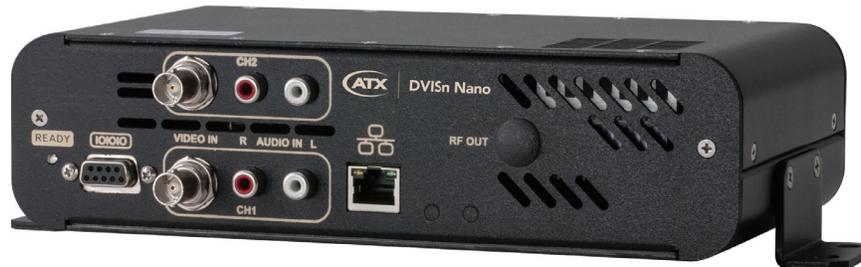### 2.3   The DVISn Digital Video Insertion System - IP Output

Figure 2-1: Dual Channel Configuration (DVNANO2IP)

The DVISn product is a network-edge local content insertion device for IP Based digital video networks which encodes local baseband analog content into a digital format within a property provisioned with IPTVs (IP Based Televisions), or IPSTBs (IP Based Set Top Boxes)

Target applications include:

- 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)

Deployments of digital signals in an IP based TV system is presented with a challenge of cost effectively providing small distribution networks with locally generated content which must be received by the installed base of IPTVs and IPSTBs. The DVISn product can be used in these properties to cost effectively encode local analog video cameras, message boards, instructional and advertising channels into multicast IP MPEG-2 streams and insert the content into a local network switch. The flexible architecture of the two channel model makes it an ideal candidate for any number of programs that an MDU or similar property is likely to require. Any number of units may be employed to provide the required channel capacity.

2.4   Key Features

For full features and specifications see "Specifications" on page 7-1.

2.4.1   Flexible MPEG-2 Digital Program Insertion

Designed for deployment in IP environments, the DVISn is available in on or two channel models capable of inserting up to

digital programs into a local switch for IP insertion installations. Ethernet transport streams may be created as either UDP or RTP, unicast or multicast with any address within the valid IPv4 address and port range. The two integral MPEG-2 encoders may be set independently to a CBR video encoding bit rate between 1 and 4 Mbps while audio encoding rates may be individually set to 192 or 256 kbps. Encoders support both PAL and NTSC standards and can be individually be set to a range of preset video resolutions valid for the chosen format standard.

2.4.2 Fast Ethernet Output

The DVISn unit is provisioned with a single electrical fast ethernet output port with link presence and activity indicators. IP streaming and the Management interface are accessed on the same port.

2.4.3 Flexible Transport Stream Multiplexing

The encoded program elementary streams may be assigned any valid PID or MPEG program number and the MPEG tables.

2.4.4 Automatically Generated PSI/SI Tables

PAT and PMT along with all of their PID values are automatically generated to ensure that downstream IPTVs and IPSTBs can reliably tune the inserted streams and minimum craft experience is required to implement a system.

2.4.5 IPv4 Network Address Support

The DVISn product uses IPv4 IP addressing and maybe configured with any valid IPv4 address to allow access from private networks. The unit may be configured to use an existing DHCP server for assignment of the Management Port IP address.

2.4.6 Web Based Management Interface

Management and configuration of the DVISn product is through a built-in web server which presents the configuration page in an intuitive interface. Access to the Management Interface may be configured with IP addresses which may allow remotely connecting across any network. The default Management Interface web IP port number may be changed if required to any port within the range of valid IPv4 port numbers to improve security or work with firewalls.

2.4.7 Compact Form Factor

The DVISn product is built in a compact housing which will fit in virtually any space and is easily installed on a panel board or may be used in an office or headend environment.

2.4.8 Low Power Consumption

The DVISn product consumes a frugal 25 watts of power at 115 and 230 VAC.

2.4.9 Internal Cooling

DVISn equipment is provided with automatically controlled internal fan for cooling for use in a wide variety of installation environments.

2.4.10 Easy Firmware Update

With built in facilities for firmware updates, the DVISn product can take advantage of technology advancements and new features which can be integrated with firmware changes.

2.5 Front Panel

2.5.1 Single Program Encoder Model

Figure 2-2: Single Channel Configuration (DVNANO1IP)

2.5.2   Dual Program Encoder Model

Figure 2-3: Dual Channel Configuration (DVNANO2IP)

2.6   Rear Panel

Figure 2-4: Common Rear Panel for Both Models

2.7   Simplified Block Diagram
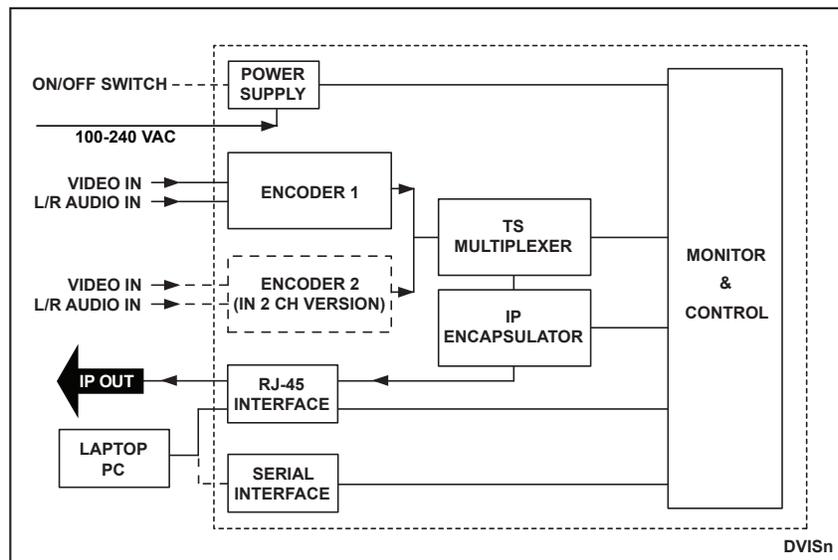
Figure 2-5: Simplified Block Diagram

2.8 Available Hardware

More information on available hardware options and accessories may be obtained from ATX Networks Customer service. See "Contact ATX Networks" on page 8-1 for contact phone numbers. Please refer to "Specifications" on page 7-1 for detailed information on the DVISn system and options.

2.8.1 Ordering Information

Part Number	Description
DVNANO1IP	Single Channel Encoder Nano Digital A/V Insertion Unit - IP Output
DVNANO2IP	Dual Channel Encoder Nano Digital A/V Insertion Unit - IP Output
DNFAN	Replacement/Spare Fan for DVISn

INSTALLATION

3. Installation

3.1 In This Chapter

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

- "Recommended Installation Environment"
- "In This Chapter"
- "Mounting"
- "Airflow and Cooling"
- "Electrical Power"
- "In This Chapter"
- "Ethernet Network"
- "Connecting the DVISn to the Distribution Network"

3.2 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 chassis may be mounted in a variety of positions as required by site conditions. It's small size also allows it to be used in a number of applications.

⚠️ *NOTE:* *This equipment is intended for installation in a RESTRICTED ACCESS LOCATION only.*

NOTE: *Not for use in a computer room as defined in the Standard for Protection of Electronic Computer/Data Processing Equipment, ANSI/NFPA 75.*

NOTE: *This equipment is intended for use in a fixed position and should be installed securely before operation is undertaken.*

3.3 Equipment Safety Grounding

It is imperative that the chassis 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 rear 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 3-1: Safety Ground on Rear Panel

3.3.1 Connection to Earth

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

3.3.2 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 rear 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.

3.3.3 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.

3.3.4 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.

3.4 Mounting

3.4.1 Panel Mounting

The chassis is intended to be mounted flat against the backboard only so be sure to provide sufficient area. The dimensions of the unit are:

2.3"H x 8.8"W x 4.8"D (5.84cmH x 22.35cmW x 12.19cmD)

A reasonable amount of space will be required in front of and behind unit. The equipment is designed with fan forced cooling which exhausts to the rear of the unit, so be sure to avoid blocking airflow at the front of the unit and mount in such a manner to provide a source of ambient cool air at the front and top air intakes of the unit. Consider also that the site technician will need access to the front of the unit for accessing connections, maintenance and configuration when determining the best location for this equipment. Wood screws required to mount the equipment to a backboard are not supplied.

3.4.2 Precautions

- 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).

- Reduced Air Flow:

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

- 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 unit to mechanically support other equipment.

- 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.

- Reliable Earthing:

  See "Equipment Safety Grounding" on page 3-1 for more detailed information on the safety ground.

3.5 Airflow and Cooling

3.5.1 Ambient Temperature

The equipment 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.

3.5.2 Non-Condensing Environment

The equipment must be installed in an environment that is 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.

3.5.3 Fan Cooling

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 at the front panel, top or fan output.

3.6   Electrical Power

3.6.1   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.

3.6.2   Power Cord Attachment

The unit 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.

3.6.3   Provision of Electrical Power Outlet

An electrical power outlet of appropriate type and rating shall be provided near the location where the DVISn unit 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.

3.6.4   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 with product shipped within North American is a NEMA 5-15 grounded plug for 115 VAC. If it is necessary to operate the device 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 appropriate IEC cord set for the locale is included.

3.6.5   Input Power Requirements

When installing the product, it is the responsibility of the installer to determine that sufficient capacity is available in the electrical circuit feeding the device to avoid overloading the supply circuit. Each model will require power 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.

3.6.6   Input Power

The input power requirement is constant at 25 Watts over the range of input voltages. At higher input voltage, the current consumption is lower than it is at lower voltage where the input current is higher.

3.6.7   Input Voltage Range

The equipment is designed with an autosensing switching type power supply which can operate on a 115 VAC and 230 VAC. There is no need to configure the power supply to operate on any voltage within this range.

3.6.8   Fusing

The 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.

Fuse Replacement Criteria				
Input Voltage	Fuse application	Fuse Type	Ampere rating	Fuse size
115/230 VAC	AC IN	Slow Blow	3	5 x 20 mm glass tube

3.7   Audio & Video Connections

Recommendations are made on the type of cables and adapters to use when connection the equipment into the network. It should be ensured that the type of cable is suitable for the installation environment, especially taking note of flame spread and smoke ratings for cable installed in plenums.

3.7.1 Video Cable Recommendation

It is recommended to utilize double or triple 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 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 such that terminal connections are not strained. Use the least number of adapters possible, avoiding their use if at all possible, by using the correct cable end fitting. If cable TV style cable and F fittings are used, an F to BNC adapter may be required if a crimp-on BNC is not available for the cable type used.

3.7.2 Video Port Connectors

The MPEG encoders are provided with a BNC connector for video input. For convenience a BNC to RCA adapter is provided on each video input port as this is a common requirement in many installations.

3.7.3 Video Input Levels

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 Management interface. See "Brightness: [0-255]" on page 5-3 for a possible work around for low level video.

3.7.4 Audio Cable Recommendation

It is recommended to utilize double or triple shielded 75 Ω coaxial cables with RCA connectors or adapters for audio signals or alternately audio cable specifically constructed and terminated for use with 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 such that terminal connections are not strained.

3.7.5 Audio Port Connectors

The Audio connectors provided are RCA type. Many adapter types are available to convert these RCA connections to the type that may be encountered at a property. Use good quality shielded cable for all audio applications.

3.7.6 Audio Input Impedance & Level

The audio input is high impedance unbalanced. Be sure to match the audio source to the audio connection. If balanced audio is encountered it is often possible to obtain good results by using only the + side of the feed.

3.8 Ethernet Network

3.8.1 Ethernet Port

An Ethernet network port is provided to allow local and remote access to the unit over a private intranet.

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

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

"Connecting the DVISn to the Management Computer" on page 4-2.

The Ethernet port is DTE, 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 connected equipment.

3.8.2 Ethernet Cable Type

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

Cables of high quality meeting Cat5e standards are recommended.

3.9 Connecting the DVISn to the Distribution Network

The same ethernet port used for configuration is also the output port for video streaming. It is usual to connect this port to a network switch or router. A straight through Cat5e Ethernet cable may be used as illustrated in Figure 3-2.
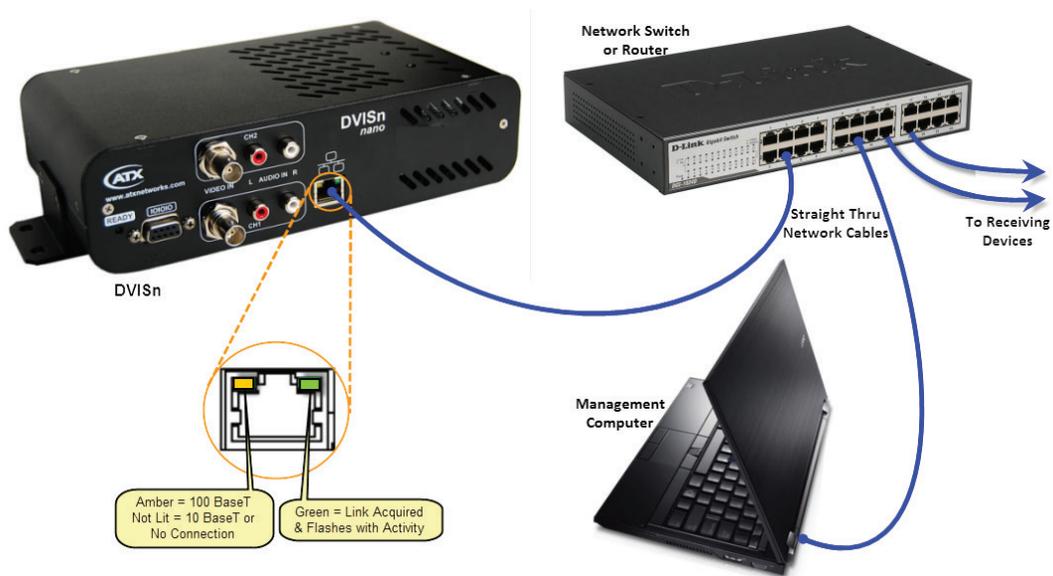

Figure 3-2: Connecting to the Distribution Network

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MANAGEMENT INTERFACE

4. Management Interface

4.1 In This Chapter

In this chapter we discuss the requirements for the computer required to manage the DVISn system, how to connect to allow access to the Management Interface and how to configure your computer if you are unfamiliar with that.

- • "Configuration Page"
- • "Minimum Computer Requirements"
- • "Connecting the DVISn to the Management Computer"
- • "Starting the Management Interface"
- • "Factory Default IP Address Settings"

4.2 Configuration Page

The product has been provided with many configurable settings which allow customizing to meet the needs of the installation environment. Access to the configuration screen, referred to as the **Management Interface**, is via an integrated web server so a web browser may be used to view and change settings. The Management Interface may be accessed remotely over any private intranet if such access is made available.

For details on configuration of encoders see "Configuration Page" on page 5-1.

4.2.1 Page Navigation With a Pointing Device

On the view of each page you will note much of the background is light grey. Within each page there are white background dialog boxes which are the editable fields. These fields take the form of editable dialogs, tick boxes and drop down lists. Simply place your cursor with a left mouse click inside the dialog box and enter a value if there is not one, edit an existing value or select a drop down pre-configured value.

4.2.2 Page Navigation Without a Pointing Device

If you have no mouse or pointing device you may navigate with the <Tab> key. Pressing the <Tab> key will present a highlight on the screen surrounding the currently selected element. Only elements that are hyperlinks or editable fields will become selected. The selection starts at the top of the page and proceeds to the remaining settings. A dark highlight or dotted outline will indicate which element is selected. If the selected element is a multi-item dialog, the <Up Arrow> and <Down Arrow> will allow selection of the desired item. Drop down boxes work the same with the Arrow keys scrolling through the item list. Once the correct setting is obtained with the arrow keys, continue to tab down the page. When on a highlighted item, it is possible to scroll back up the page of selections with the <Shift>+<Tab> keys.

While it is possible to do your configuration in this manner, it is not recommended except in a situation where the Management Computer's pointing device has failed.

4.3 Minimum Computer Requirements

The computer used to access the DVISn configuration settings is referred to as the 'Management Computer'. It is recommended that the Management Computer meet the minimum requirements listed below. ATX Networks does not endorse the use of any specific operating system software however the listed combination of software has been thoroughly tested with the products and is known to work without issue. The operator is free to utilize whatever software combination is desired, however the responsibility to ensure correct operation of the alternate software is his/hers alone.

> ⚠️ **NOTE:** *The extensive use of java script in the DVISn Management interface may cause web browsers other than Internet Explorer® to incorrectly or incompletely display web pages.*

MDU Solutions® – DVISn - Nano-sized Digital Video Insertion System IP Output – Installation & Operation Manual
ATX *Confidential & Proprietary*

4-1

4.3.1   Recommended Computer

- Computer running Windows® or other OS
- Ethernet Network port available
- Internet Explorer web browser
- Adobe® Reader® for reading this manual

4.3.2   Web Browsers Supported

- Microsoft® Internet Explorer
- Mozilla Firefox®
- Google Chrome®

The system may be accessed with multiple brands of web browser software. ATX Networks does not endorse the use of any specific brand of web browser and the user is free to use a preferred browser.

Mozilla Firefox and Microsoft Internet Explorer have been thoroughly tested with the DVISn product. As with any software, it is recommended that the latest version of your choice of browser be used.

4.4   Connecting the DVISn to the Management Computer

The DVISn unit is provided with a 10/100 Base-T Ethernet network port on the front panel for connecting to the Management Interface for initial configuration and ongoing monitoring and maintenance.
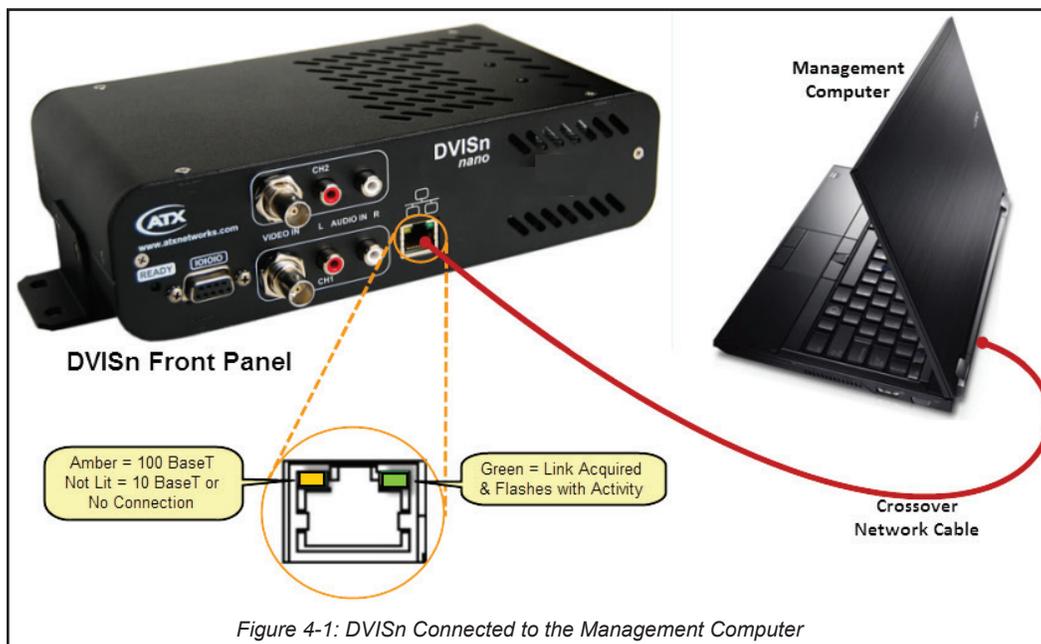
Figure 4-1: DVISn Connected to the Management Computer

The Management Ethernet network port on the DVISn is DTE, similar to a PC Ethernet port. A crossover Ethernet cable, provided with the unit on shipment, will be required to connect the unit to the Management Computer unless the computer has an auto sensing Network Interface Card (NIC).

The network port will automatically negotiate a speed of 10 or 100 Mb/s depending on the capabilities of the management Computer NIC. If the Ethernet output is connected to a switch or router, it will negotiate a speed compatible with the external device. An LED next to the Ethernet port will illuminate when a link is negotiated.

> ⚠ **NOTE:**   *If connectivity problems between the PC network port and the DVISn occur, (Ethernet link light does not illuminate) check to be sure that you are using a known good network cable.*

If the DVISn is to be connected to a local network switch for remote configuration or monitoring, a standard Cat5e type straight through cable will be required for the connection to the switch.

4.5 Starting the Management Interface

Configuration of the unit requires a laptop or desktop PC running Microsoft Windows or other OS with an available Ethernet network port (the Management Computer). If connecting directly, the Management Computer must be set to operate on the same subnet as the DVISn Ethernet port for access to the Management Interface.

The following procedures are for Microsoft Windows XP and a default IP address setting on the DVISn unit of 192.168.0.23

> ⚠️ **NOTE:** *If you are using a different Operating System or the network address on the DVISn has been changed from default, adjust the procedures to suit the address or software you are using.*
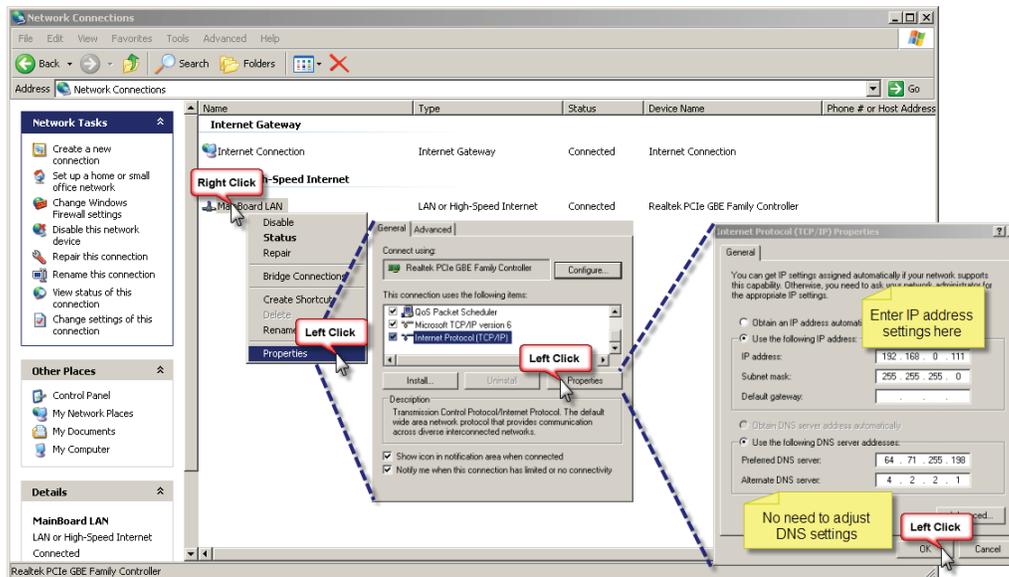
Figure 4-2: Setting the Management Computer IP Address

1. Connect the Management Computer's Ethernet adapter to the DVISn Ethernet port using a Cat5e cable. Link lights should illuminate indicating that the cable connection is correct and working.

2. Set the Management Computer's Ethernet interface to a static IP address on the 192.168.0.x subnet, as described below:

> ⚠️ **NOTE:** *If the Management Computer currently has network settings that will need to be used again after the DVISn is configured, this would be a good time to makes note of the current settings if you don't already know them, so the network adapter may be readily returned to these values again.*

   a) From the Control Panel, open **Network Connections** and select the connection associated with the wired Ethernet adapter to be used for connecting to the DVISn (e.g., Local Area Connection).

   b) Right click on the connection then select **Properties**.

   c) Select **Internet Protocol (TCP/IP)** and click **Properties**.

   d) Click the selection box beside **Use the following IP address**.

   e) In the **IP address** field, enter 192.168.0.x (where x represents any number from 1-253 except 23).

   f) Click in the **Subnet mask** field and the subnet 255.255.255.0 is automatically entered.

   g) Click **OK** and then **OK** again in the previous window.

3. On the Management Computer, open a web browser and enter **192.168.0.23** in the address field.

4. You should get the following window. There is no username or password.:

See "Configuration Page" on page 5-1 for further configuration details.

4.6 Connecting Remotely

In order to connect to the DVISn unit remotely you need the IP address that its network port has been set to. Depending on the method of setting the IP address, acquire the address in the following ways. If you know the address skip to **Static IP Address Assigned** below.

4.6.1 Dynamic IP Address Acquired

In order to reconnect to the Management Interface after it has obtained an IP address from a DHCP server, it is necessary to determine the IP address the unit has acquired. You may need to have your network administrator help with this if you don't have DHCP server access. Log into the appropriate DHCP server and access the DHCP assignments. The address can typically be found by searching according to DVISn MAC address, which is labeled at the top of the configuration page as shown here. Once you access the IP address assignments, verify that a client with the MAC address of the unit is listed as connected in the client table. Record the IP address assigned to the DVISn MAC address.

DVISn MAC Address on Configuration Page

Once you have the assigned public IP address of the DVISn Ethernet port:

1. Open an Internet Explorer web browser and enter the IP address of the unit in the URL address window.
2. The Management Interface opens and displays the configuration screen. The unit is ready to be managed remotely.

4.6.2 Static IP Address Assigned

1. Login to a computer with the private network access. If you are using the same computer that was used for direct connection to the equipment, remember to restore the computer's network settings to the appropriate values (the settings used prior to changes made for connection to the unit).
2. Open a new Internet Explorer browser window to establish a fresh internet session entering the IP address of the DVISn unit in the URL address window.

4.7 Factory Default IP Address Settings

The Management Interface for the DVISn is web based and will require a locally connected computer to complete the configuration. The network port through which access to the web server is available has been factory pre-configured with the following network settings. By default, the IP address mode is static IP; DHCP is disabled, allowing access to the Management Interface on the default IP Address. Changes to this address are effected at the bottom of the DVISn 'Settings' page. See "Network Settings" on page 5-5.

Factory Default IP Addresses	
IP Address	192.168.0.23
Web Server Port	80
Subnet Mask	255.255.255.0
Default Gateway	192.168.0.1
DNS IP Address	192.168.0.1

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CONFIGURATION

5. Configuration

5.1 In This Chapter

In this chapter we detail the configuration controls which are used to adjust settings to achieve the performance that is required. All settings are discussed along with limits and some suggestions as to what values are most applicable.

- "IP Output Parameters"
- "Encoders"
- "Output Parameters"
- "Program Identification"
- "Submit Output Controls"

5.2 Configuration Page

This is the configuration page which displays all possible settings and the current applied parameters. Each section is described separately, in order.

Figure 5-1: Configuration Page

MDU Solutions® – DVISn - Nano-sized Digital Video Insertion System IP Output – Installation & Operation Manual
ATX *Confidential & Proprietary*

5-1

5.3 IP Output Parameters

5.3.1 Destination IP

This is the multicast (or unicast if required) IP address, or in other words, the address to which the receiving device will subscribe to receive the transmission. All valid IPv4 addresses are supported.

Figure 5-2: IP Output Parameters Section

5.3.2 Destination Port

This is the TCP/UDP port that is associated with the IP address defined above to provide a complete address specification to which the receiving device will subscribe in order to receive the transmission. All valid port numbers are supported but well known port numbers should be avoided if possible.

5.3.3 Source Port

This is the port that is associated with the sending device. All valid port numbers are supported but well known port numbers should be avoided if possible.

5.3.4 Protocol

Specify either UDP or RTP with the drop down menu.

UDP

UDP (User Datagram Protocol) is the usual protocol used with multicast transmission and is the recommended protocol.

RTP

RTP (Real Time Protocol) may be used to improve reliability of message delivery if network routers support this protocol.

5.3.5 Multicast

This check box determines whether the DVISn unit will try using ARP (Address Resolution Protocol) to establish a connection with the receiving device or if it will transmit in a broadcast type mode. If the destination address physically exists on the network, **do not** check this box, while if the destination address is not a physical device on the network, check this box. With the box checked, transmission will be in a broadcast/multicast mode and will not care if the destination address exists.

5.4 Encoders

5.4.1 General

These controls are used to select the encoder that will be active and to define the transmission standard to be used; NTSC or PAL. The DVISn accepts video signals that conform to NTSC or PAL standards depending on the specific encoder setting.

Figure 5-3: Encoders Section

5.4.2 Encoder (port) Number

This relates to the physical encoder. The Video Input ports on the housing are labeled Ch1 and Ch2 which correspond to directly to Encoder port 1 and Encoder port 2 in the interface.

5.4.3 Input Video Standard

Both encoders must be set to the same standard with the drop down menu.

- NTSC

  Adheres to ATSC Standard. This is the default setting.
- PAL

  Adheres to ETSI Standard.

5.4.4 Encoder Active

This check box lets you switch each encoder on and off. Your DVISn may only have 1 encoder installed if it is the single channel model.

5.5   Output Parameters

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

Figure 5-4: Output Parameters Section

5.5.1   MPEG-2 Video Rate: [1000-8000]

The video program elementary stream bit rate is entered in kbps and must be between 1000 and 4000. This setting may be adjusted based on the quality of the resulting picture that is required. Increasing the bit rate increases the resulting picture quality but consumes more bandwidth. The entered value must be balanced between the required picture quality and available bandwidth. In most cases, use the highest setting that the network bandwidth will allow.

5.5.2   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 input video standard selected. See "Specifications" on page 7-1 for available video resolutions supported. 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.

5.5.3   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 120, about the middle of the available range. This setting should not normally require changing but could be modified to compensate for video cameras which suffer from low picture brightness.

5.5.4   Contrast: [0-255]

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 50, about the middle of the available range. This setting should not normally require changing but could be modified to improve picture quality of extra bright camera installation locations.

5.5.5   Saturation: [0-255]

This dialog allows modification of the video signal to increase or decrease colour saturation. There are 128 levels available (0-127) The default value is preset at 50, about the middle of the available range. This setting should not normally require changing but could be used in conjunction with the brightness and contrast control to markedly improve picture quality in some installations.

5.5.6   Audio Codec:

This setting is automatically set to the value appropriate for the selected profile. A codec converts an audio baseband signal to a specific streaming audio format.

- For ASTC:

    AC-3 codec is specified by ATSC standards. Note that while the AC-3 standard supports surround sound, the DVISn encoder for AC-3 supports 2.0 stereo only.

- For ETSI:

    MPEG-1 Audio Layer II supports 2.0 stereo only.

5.5.7   Audio Rate: 256 & 192

This drop down displays the audio bit rate options available for each installed encoder. Sampling rate at which an audio signal is encoded. The higher the bit rate, the better the sound quality. Each encoder supports a range of commonly used bit rates. See "Specifications" on page 7-1 for detailed information on bit rates supported.

5.6 Program Identification

This section allows configuration of the program specific settings of the MPEG program streams. The PID values may often be left at their default values as these are mostly transparent to the end user and can usually be almost any value. The Program Number is the most likely value that may need adjustment if programs within a Mux have to be assigned a specific MPEG Program number for decoding.

Figure 5-5: Program Identification Section

5.6.1 Program Number: [1-65535]

This is the MPEG Program Number that identifies a program from others within a multiplex and is often 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.

5.6.2 Video PID: [21-8190]

The video PID (Packet Identifier) is a decimal number that uniquely identifies a video transport stream in an MPTS (multi-program 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.

5.6.3 Audio PID: [21-8190]

The audio PID (Packet Identifier) is a decimal number that uniquely identifies an audio transport stream in an MPTS (multi-program 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.

5.6.4 PCR PID: [21-8190]

The PCR (Program Clock Reference) PID (Packet Identifier) 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.

5.6.5 PMT PID: [21-8190]

The PMT (Program Map Table) PID (Packet Identifier) is a decimal number that uniquely identifies a PMT table in an MPTS (multi-program 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.

5.6.6 Lock to V-Sync

The default setting is "Lock to Internal Sync"; the check box is un-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.

5.7 Submit Output Controls

5.7.1 Refresh

This control reads the system 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.

Figure 5-6: Submit Output Controls

5.7.2 Submit

This control submits changes to the system to implement the parameters specified.

NOTE: *This is a service affecting operation*

5.8 Network Settings

5.8.1 Static IP Address

This is the IP address assigned to the physical ethernet port used for both configuration and streaming output. This should be set to a value appropriate for the local network. The default value is 192.168.0.23

Figure 5-7: Network Settings

5.8.2 Web Server Port: [1-65535]

This value defines the virtual port used for the configuration web server. The default value is the well known web server port 80 and this may be changed if required for your network requirements. If you do not require a different value, leave this set as Port 80.

5.8.3 Subnet Mask

This value defines the subnet portion of the static IP address entered above.

5.8.4 Default Gateway

If there is a router on the network that will serve as a gateway to the destination of the streaming video, DHCP server or DNS server, enter the IP address of the router here.

5.8.5 DNS IP Address

If there is a DNS server available, enter the IP address here. Connection to the internet or access to the local DNS server would be required for this to be effective. This is only required if a URL needs to be resolved.

5.8.6 DHCP Client Mode Enabled

If the unit should get its IP address parameters from a DHCP server, select this tick box. In this case, the unit will obtain its IP address from the DHCP server.

5.8.7 Set Network

Click this button when all network settings have been entered to commit the changes.

⚠️ **NOTE:** *If the IP address was changed or DHCP was selected for the first time, you will need to log in again with a new browser session using the changed IP address. If DHCP was used, you will need to determine from the DHCP server which IP address was assigned.*

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FIRMWARE UPDATE & RECOVERY

6.   Firmware Update

6.1   In This Chapter

In this chapter we explain the firmware update process, where to get firmware files and how to perform the update.

- •   "Firmware Update Process"
- •   "Identify Currently Installed Firmware Version"
- •   "Backing Up Your Configuration"
- •   "Where to Obtain Firmware Files"
- •   "Firmware Update"

6.2   Firmware Update Process

New system firmware is provided in a zip archive file format and will be made available on the ATX Networks support site for the product. See "Where to Obtain Firmware Files" on page 6-3 to obtain the firmware. Since the file is provided in a zip format, it will be necessary to un-zip the file first. Once unzipped, it is not necessary to un-compress the tgz package since the device has built-in facilities to accept the file in tgz format. 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 do not have a program to uncompress the .zip archive, you may obtain a free open source program at http://www.7-zip.org/ where 7zip is available for free. Download the program here.

6.3   Identify Currently Installed Firmware Version

The currently installed firmware version is displayed in the DVISn Management Interface, as shown here. Each firmware update will be posted on the ATX support site along with the range of prerequisite installed firmware that it is applicable to. This is where to check your installed version to verify it is a qualifies to accept the posted update.

Figure 6-1: Locating the Current Firmware Version

6.4 Backing Up Your Configuration

Most firmware updates will affect the programmed configuration of the DVISn unit, and as with any software update, it is recommended to make a backup before starting. There are basically three methods available to Windows users, outlined next:

6.4.1 Open a Second Browser Window

This method works with all browsers

One recommended procedure is to open a second web browser session with the DVISn unit and to leave it open throughout the update process. The open web browser will retain the original configuration page which may then be referred to in restoring any settings that may have changed.

6.4.2 Save the Web Page

This method works with Firefox® 4.0+

Alternately, you may save the web page from within the browser for a more permanent record of the settings. The screen shot construction below illustrates what to do.
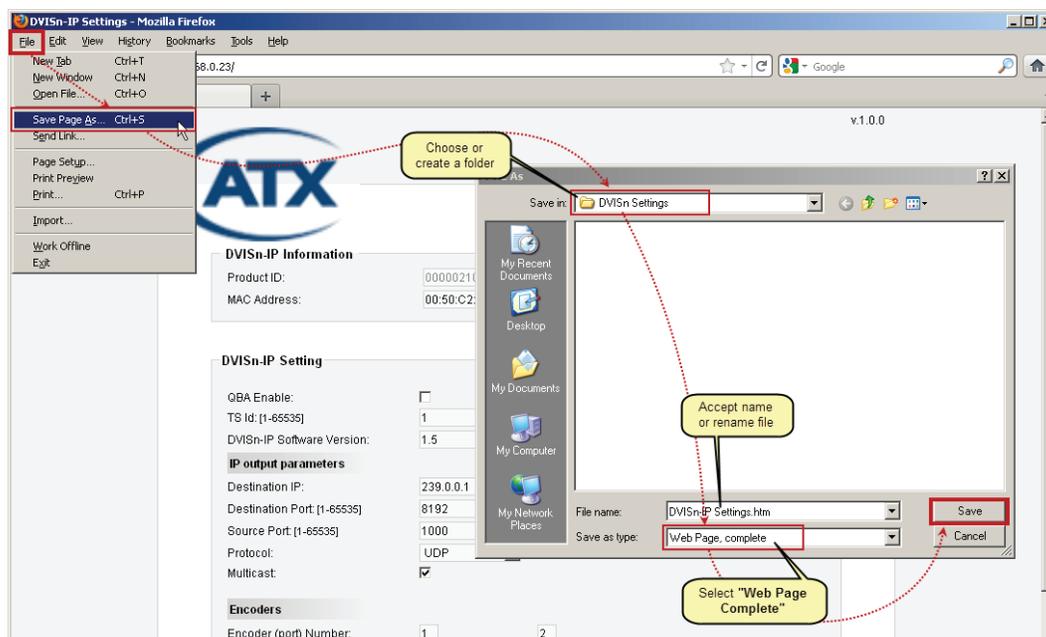

Figure 6-2: Save the Web Page for Backup

To recall the settings, just open the file you saved and view it in the Firefox browser. This may be used to archive the DVISn product settings for many units.

6.4.3 Take a Screen Capture

This method works will all browsers

If you have software to save a screen capture, this method is also useful. To use this method, select the browser as the active window, just single clicking the title bar if necessary. Press the keys ALT + PRINT SCREEN together; this will copy the browser window to the Windows clipboard. Next, paste the clipboard into a word processor such as WORD® or WORDPAD. You may also use a graphics program such as PAINT®. This method may require you to take more than one capture, scrolling the browser window down each time to capture the entire configuration page. The multiple images for one or more DVISn units may be saved in a single file within the program you have used to collect them.

6.5 Where to Obtain Firmware Files

Updated firmware 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 always be posted to the ATX website (atxnetworks.com) in the Resource & Support section, Software Downloads sub-section. Along with the firmware file you will find specific instructions on updating the firmware. The instructions given in this guide are general in nature and cannot be guaranteed to be applicable to every firmware release, so always refer to the instructions for the latest procedures specific to the posted firmware release.

If further information is required during any phase of the firmware update, or you have concerns or questions about the firmware or it's applicability to your unit, contact ATX Networks Digital Video Support. See "Contact ATX Networks" on page 8-1 for contact information.

6.6 Firmware Update

The following firmware update process is the general format that will be followed. Each firmware update may have specific criteria that will need to be adhered to and those criteria will be posted with the update. If at any time you have questions about, or require assistance with this update, please contact ATX Networks Technical Support; see "Contact ATX Networks" on page 8-1 for contact numbers.

> ⚠️ **NOTE:** *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.*

6.6.1 Save Firmware Update to Management Computer

The firmware update file, when available, is on the ATX website (atxnetworks.com) in the Resource & Support section, Software Downloads sub-section. Save the firmware update file in a convenient location on the Management Computer. The actual update file is in .tgz format and is named with the same name as the version of the update although it may be contained in a zip wrapper.

6.6.2 Connect Management Computer to DVISn

Set the computer that you will use for the update to the same subnet as the DVISn Ethernet port in order to access the DVISn Management Interface. For example, if the network address for the unit is set to the factory default setting of 192.168.0.23 and you are using a Windows based computer then set the computer to an address between 192.168.0.24 and 192.168.0.255

If you do not know how to set the Management Computer to the same subnet as the DVISn Ethernet port, see "Management Interface" on page 4-1 for a tutorial on setting the IP address.

6.6.3 Upload Firmware

1. In the DVISn - IP Version Update section, click **Browse**. The 'File Upload' dialog will appear.

2. 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 **Open**, then **Update** to begin uploading the file.

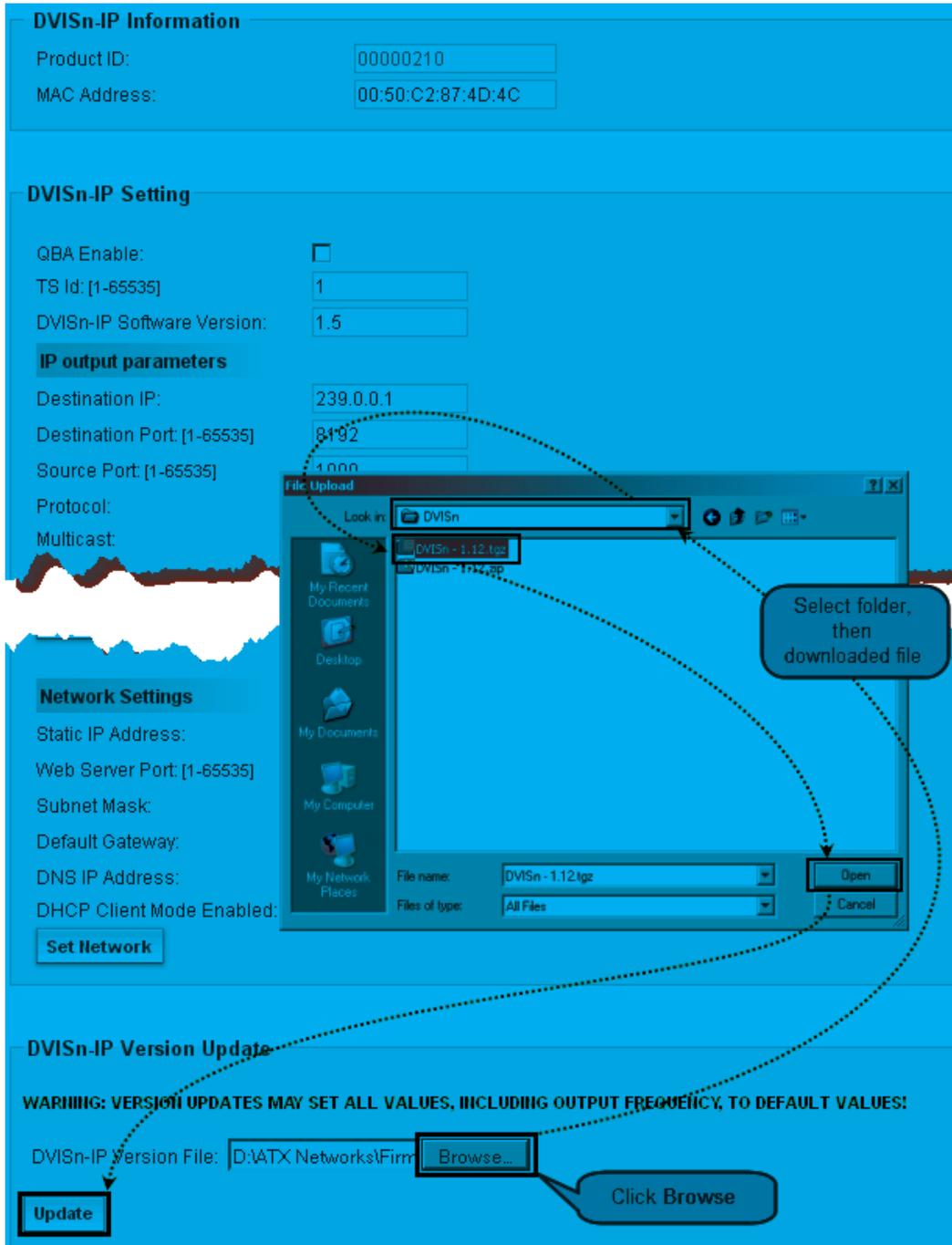4. A progress bar indicates the percentage file upload completion (0 to 100%).

Figure 6-3: Upload Firmware

5. When file upload is complete the unit will present the **Upload Done** Screen, shown below.
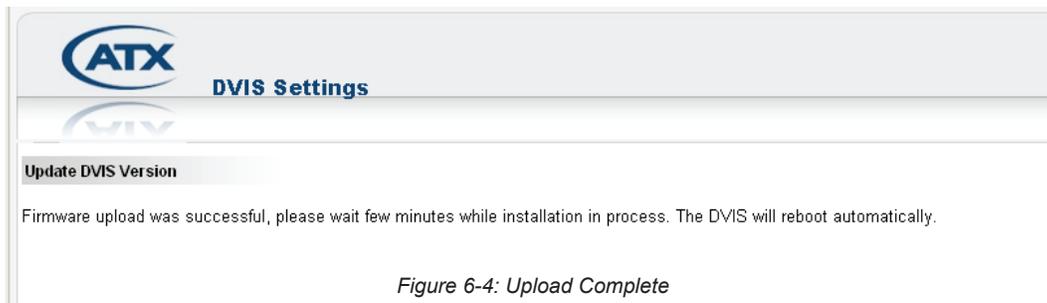

Figure 6-4: Upload Complete

6. When the upload has finished, file installation begins automatically.
7. Close the browser.
8. When installation has completed (which can take up to 10 minutes), the equipment reboots (indicated when the fans shut off for a few seconds and then restart).
9. Wait 5 minutes after the fan restarts for the reboot to complete.
10. Open Internet Explorer and enter **http://192.168.0.23** in the address field.
11. The DVISn IP Settings screen appears.
12. Look in the first section of the DVISn IP Settings and verify that Version number is the same as the number in the name of the firmware update file.
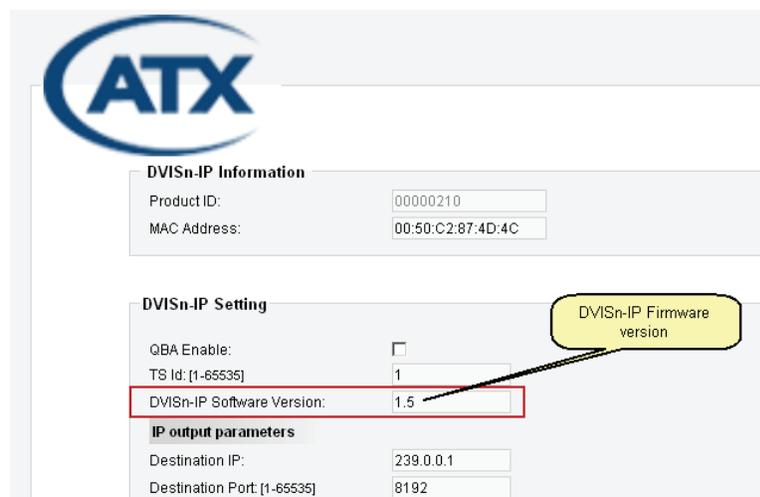

Figure 6-5: Check New Firmware Version

13. If the installed firmware version agrees with the name of the file, the firmware update is complete

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SPECIFICATIONS

7. Specifications

7.1 Specifications

PLATFORM	
CHASSIS OVERVIEW	
DIMENSIONS	2.3"H x 8.8"W x 4.8"D (5.84H x 22.35W x 12.19D cm), Wall Mount
WEIGHT	2.2 lbs (1.0 kg)
ENCODED PROGRAMS	1 or 2 Programs into 1 IP Output
POWER SUPPLY	IEC Connector / 110-220 VAC, 50/60Hz
POWER CONSUMPTION	25W Max.
DEVICE MANAGEMENT	HTTP over Ethernet Network Interface (RJ45); 10/100 Mbps
OPERATING TEMPERATURE	0°C to +50°C (+32°F to +122°F)
HUMIDITY	0-95% (without condensation)
TS MULTIPLEXER	
PACKET SIZE	188 Bytes
TS SUPPORT	QBA, AF
PROGRAM NUMBER & TS NUMBER	User Settable (Program #: 1-65535; TS ID: 1-65535)
PSI / SI INFORMATION TABLE	PAT, PMT, SDT, NIT
SETTABLE PIDs	PMT, PCR (0x0021-0x1FFE; dec. 33-8190)
IP OUTPUT	
TRANSPORT LAYER	UDP, RTP
STREAMING PROTOCOL	Multicast, Unicast
ENCAPSULATION	7 TS Packets per Ethernet Frame
TRANSMISSION	SPTS (1 Program), MPTS (2 Programs)
IP OUT INTERFACE	1x RJ45 (10/100 Mbps)
ENCODER VIDEO SPECIFICATIONS	
INPUT	CVBS, NTSC/PAL
INPUT INTERFACE	1x BNC, 75 Ω (x2 on Dual Channel Version)
ENCODING FORMAT	MPEG-2, 4:2:0, MP@ML

PLATFORM (cont'd)	
ENCODER VIDEO SPECIFICATIONS (cont'd)	
ENCODING BIT RATE TYPE	CBR/VBR
VIDEO ADJUSTMENTS	Brightness, Contrast, Saturation
VIDEO PROCESSING	TBC
SUPPORTED RESOLUTIONS	704, 544, 528, 480, 352 x480 720, 704, 544, 528, 480, 352 x576
FRAME RATE	29.97, 25 fps
VIDEO ENCODING BIT RATE	1000-8000 kbps
GOP STRUCTURE	IBBP - length 15
VIDEO PID SETTING	0x0021-0x1FFE; dec. 33-8190
ENCODER AUDIO SPECIFICATIONS	
INPUT	Analog Unbalanced
INPUT INTERFACE	RCA (L/R) (x2 on Dual Channel Version)
ENCODING FORMAT[1]	Dolby® Digital AC-3[1], MPEG-1 Layer II
SAMPLING RATE	48 kHz
ENCODING BIT RATES	192 & 256 kbps
AUDIO PID SETTINGS	0x0021-0x1FFE; dec. 33-8190

NOTE:
(1) Dolby is a registered trademark of Dolby Laboratories. Manufactured under license from Dolby Laboratories.

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SERVICE & SUPPORT

8.   Service & Support

8.1   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

8.2   Warranty Information

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

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

www.atx.com