

**AvediaStream Encoders**  
Standard and High Definition  
MPEG Encoders



**Exterity Encoder**  
**AvediaStream e2110**  
**Administrator's Guide V1.0**

## **Notices**

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## **Products Covered By This Guide**

- AvediaStream e2110 (avstr-e2110)

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## **Safety Notices**

Before installing and operating these products, please read the safety information in this manual.

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## Important Safety Instructions

There are no instructions specifically for service personnel in this document. There are no user serviceable parts inside any Exterity product. To prevent electric shock or fire hazard, do not remove cover. Refer service to qualified service personnel.

This chapter contains important safety information. If you are unsure about any of the information in the section, please contact Exterity.



The lightning flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage " within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

### USA and Canada

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the instructions contained in this manual.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.

12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
16. To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
17. The mains plug of the power supply cord shall remain readily operable.

**WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

## EU and Others

Do not proceed beyond a **WARNING** notice until you have understood the hazardous conditions and have taken appropriate steps.

### Safety Information

**WARNING:** There are no user serviceable parts inside any Exterity product. To prevent electric shock or fire hazard, do not remove cover. Refer service to qualified service personnel.

**WARNING:** For 230/240 volt operation, be sure to use a harmonised grounded 3 conductor cord, rated 6 Amp minimum. Use a suitable cord for connection to the equipment and terminating in an IEC approved plug.

This equipment relies upon a safety earth for operation, ensure that you always use a power cord with appropriate earth and that the inlet to which is inserted also has the appropriate earth. If in any doubt about the earth provision in your building consult a qualified electrician

**WARNING:** Use only the dedicated power supply or cord supplied for your device.

**WARNING:** The Exterity products use ventilation holes for cooling. None of the ventilation holes should be blocked. Keep all materials at least 5cm away from all the ventilation holes.

**WARNING:** Do not expose the product to any rain or moisture.

**WARNING:** Do not use the product near a naked flame e.g. a candle.

**WARNING:** The operating conditions of the product should be 0°C-40°C with a Relative Humidity of 5 – 95%. The product should not be operated outside of these conditions.

There are no user-serviceable parts inside these products. Any servicing, adjustment, maintenance, or repair must only be performed by service-trained personnel.



---

## About this Manual

### Summary

This manual explains how to set up, use and manage the Exterity AvediaStream e2110 Encoder (the “encoder”).

### Scope

This edition of the manual refers to version 1.0.x of the encoder firmware for the AvediaStream e2110.

### Audience

This manual is intended for use by systems integrators or systems administrators who are installing and setting up Exterity products. The manual assumes that readers are familiar with installing and configuring network-based products.

### Associated documentation

This manual should be used in conjunction with the manuals listed in Table 1.

Manual	Reference Number
AvediaStream Installation Guide	1300-0018-0001
IPTV Manager Administrator's Guide	1300-0011-0001

**Table 1 Associated Documentation**

### Terms and definitions

The following terms and definitions are used in this document:

**Composite video** – A type of analogue video signal where the luminance, chrominance and sync signals are all carried on a single cable. This is often referred to as CVBS.

**DHCP** – Dynamic Host Configuration Protocol, a protocol used to allocate IP addresses to devices on an IP network.

**IGMP** – Internet Group Management Protocol, a protocol used to manage multicast traffic on an IP network.

**IP** – Internet Protocol, a protocol used for communicating data across a network using the Internet Protocol Suite, also referred to as TCP/IP.

**MPEG** – A family of compression methodologies for audio and video.

**MPEG Transport Stream** – a communications protocol enabling multiplexing of digital audio, video and data which is specified in MPEG-2 Part 1, Systems (ISO/IEC standard 13818-1).

**RGB** – A type of component analogue video signal consisting of three signals - red, green, and blue - carried on three separate cables.

**RGBS** – A specific type of RGB where the video sync signal is carried on a fourth cable.

**RTP** – Real-time Transport Protocol, a protocol used to carry real time data on an IP network.

**SAP** – Session Announcement Protocol, a protocol used to advertise the presence of multicast sessions on an IP network.

**S-Video** – an analogue video signal that carries video data as two separate signals: luminance and chrominance. Also known as Y/C.

**TFTP** – Trivial File Transfer Protocol, a simple file transfer protocol used on IP networks.

**UDP** – User Datagram Protocol, a transport protocol in the TCP/IP suite, providing a connectionless transport mechanism with low overhead.

## How this manual is organised

This manual is organised as follows:

### **Section 1 – Getting Started**

This section describes basic aspects of setting up the encoder.

### **Section 2 – Physical Interfaces**

This section describes how to connect your AV equipment to the encoder.

### **Section 3 – Management Interfaces**

You can manage the encoder using the IPTV Manager, web management interface and admin interface. These are described in this section.

### **Section 4 – General Device Management**

This section describes general configuration of the encoder. For example, IP address configuration and the firmware upgrade procedure are explained here.

### **Section 5 – Admin Interface**

This section describes how to use the serial admin interface.

### **Section 6 – Encoding and Streaming**

This section explains how to configure the encoder to take the analogue input of the AV source and convert this into an IPTV stream.

### **Section 7 – Remote Control**

This section explains how to use the encoder to control the attached AV device.

### **Section 8 – Status Monitoring**

This section explains how to check the operating status of the encoder.

### **Section 9 – Troubleshooting**

Review this section if you are having problems.

# 1 Getting Started

The AvediaStream e2110 encoder is a network device which takes the audio/video signal from a Standard Definition AV device (e.g. a DVD player or set-top box) and outputs it as an MPEG transport stream over an IP network.

There are certain procedures you need to perform in order to get the encoder up and running. These procedures are summarised in this section.

## Connecting the AV Source

Before the encoder can stream audio/video on the network, an AV source must be connected.

See [Physical Interfaces](#) on page 13 for details on how to connect your AV equipment to the encoder.

## Connecting to the Network

Connect the encoder to the network.

For more information, see the *AvediaStream Installation Guide*.

## Connecting to Power

Connect the encoder to a power source.

For more information, see the *AvediaStream Installation Guide*.

## Configuring the IP Address of the Encoder

By default, the encoder requires a DHCP Server to be available on the network to assign it an IP address.

**There are two methods of assigning a static IP address to the encoder, if required:**

- Use the serial admin interface to configure the IP address.  
For more information, see [Admin Interface](#) on page 24.
- Temporarily set up a DHCP server on an isolated network. Once an IP address is assigned to the encoder, you can configure a static IP address using the Web Management Interface.

For more information, see [Network Configuration](#) on page 18.

Allocating a static IP address to the encoder allows continued operation without a DHCP Server.

## Naming the Encoder

Provide a name for the encoder so you can easily identify it in the future. This can be done using the Web Management Interface (see [Device Naming](#) on page 18) or the IPTV Manager (see [IPTV Manager](#) on page 15).

## Configuring Audio/Video Input

The device starts encoding and streaming automatically when an appropriate AV source is connected. It may be necessary to configure the type of video source connected.

For more information, see [Audio/Video Input](#) on page 26.

## Configuring Encoding Options

The device starts encoding automatically when an appropriate AV source is connected. Some aspects of the encoding can be configured if required.

For more information, see [Encoding](#) on page 27.

## Configuring Stream Properties

The device starts streaming (transmitting an MPEG transport stream on the IP network) automatically when an appropriate AV source is connected. Some aspects of the stream can be configured if required.

For more information, see [Stream Properties](#) on page 29.

## Configuring Channel Announcements

The encoder uses SAP (Session Announcement Protocol) to announce its stream (channel) to receiving devices. Included in the announcements are the name of the channel and the multicast address and port on which the stream is sent.

You may wish to configure channel announcements to suit your requirements. For more information, see [Channel Announcements](#) on page 31.

## Checking Status

After carrying out the steps above, the encoder should be successfully transmitting an IPTV stream on the network.

See [Status Monitoring](#) on page 36 for details on how to check the operating status of the encoder.

## 2 Physical Interfaces

An AvediaStream e2110 encoder blade can operate in one of the following chassis:

- AvediaStream c1101
- AvediaStream c1103
- AvediaStream c1110

The blade has AV interfaces on its rear panel, while its edge connector enables it to access network and admin ports via the chassis front panel.

---

**Warning:** Take care not to touch the edge connector as static electricity might damage the product. Handle by the enclosure only and insert as soon as possible into the chassis.

---

### Chassis Interface

The encoder blade provides the following interfaces over its edge connector to the AvediaStream chassis.

- Ethernet interface (10/100Mbps)
- Admin interface
- Status LEDs
- Power supply

The actual physical interfaces can be found on the chassis front panel. Please refer to the *AvediaStream Installation Guide* for further details.

### Heartbeat LED

The heartbeat LED (marked H/B) on the AvediaStream front panel provides an indication of the current state of the unit without using any of the management interfaces. The LED behaviour is described in Table 2.

Pattern (approx rate)	Description
Twice a Second	Running Power on Self Tests
Solid On	Booting operating system, takes approximately 10-20 seconds
Once a second	Heartbeat indicates unit is running normally
Alternatively < 1 sec, > 10 secs	Upgrading

**Table 2 Heartbeat LED Patterns**

## Rear Panel Interface

The encoder provides video and audio inputs as follows; these are illustrated in Figure 1.



Figure 1 AvediaStream e2110 Rear Panel

### Video Inputs

The e2110 supports standard definition interlaced video input (i.e. 525i or 625i) in Composite, RGBS and S-Video formats. Frame rates of 50Hz and 60Hz are supported.

#### Composite

Connect the composite signal to the Composite/Sync input using an RCA (Phono) cable.

#### RGBS

Connect the red, blue and green signals to the appropriate colour-coded input, and the sync signal to the Composite/Sync input, all using RCA (Phono) cables.

#### S-Video

Connect the S-Video signal to the connector marked S-Video using a standard S-Video cable.

### Audio Inputs

Connect unbalanced stereo audio to the connectors marked Left and Right using RCA (Phono) cables.

### IR Out Socket

This is intended to control the attached AV device. The associated IR transmitter is provided with the unit.

## 3 Management Interfaces

The encoder has three management interfaces as follows:

- IPTV Manager
- Web Interface
- Admin Interface

Note that each encoding module in a chassis is required to be configured independently.

### IPTV Manager

The IPTV Manager is a Windows application which discovers Exterity devices on the network and uses SNMP to manage a subset of device functionality. It can also be used to start the device web interface as shown in Figure 2.

---

**Note:** You can also use a third-party SNMP tool to manage the encoder. Contact Exterity to obtain the Management Information Base (MIB).

---

For more details on using the IPTV Manager, see the *IPTV Manager Administrator's Guide*.

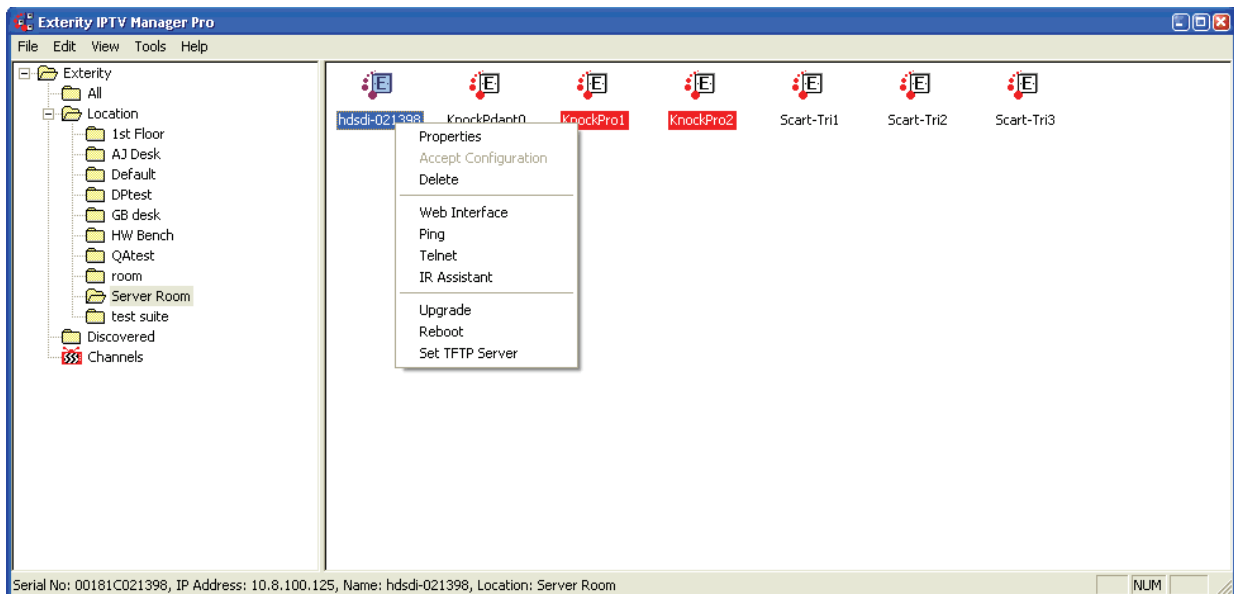


Figure 2 IPTV Manager

### Web Interface

You can manage every aspect of the encoder's functionality using its web management interface.

You can open the web management interface using the IPTV Manager as shown above, or by typing the encoder IP address directly into your web browser:

**Use the web management interface as follows:**

1. When prompted, enter the correct username and password. The default login details are:

**Username:** admin      **Password:** labrador

2. The web management interface opens in your browser as shown in Figure 3.

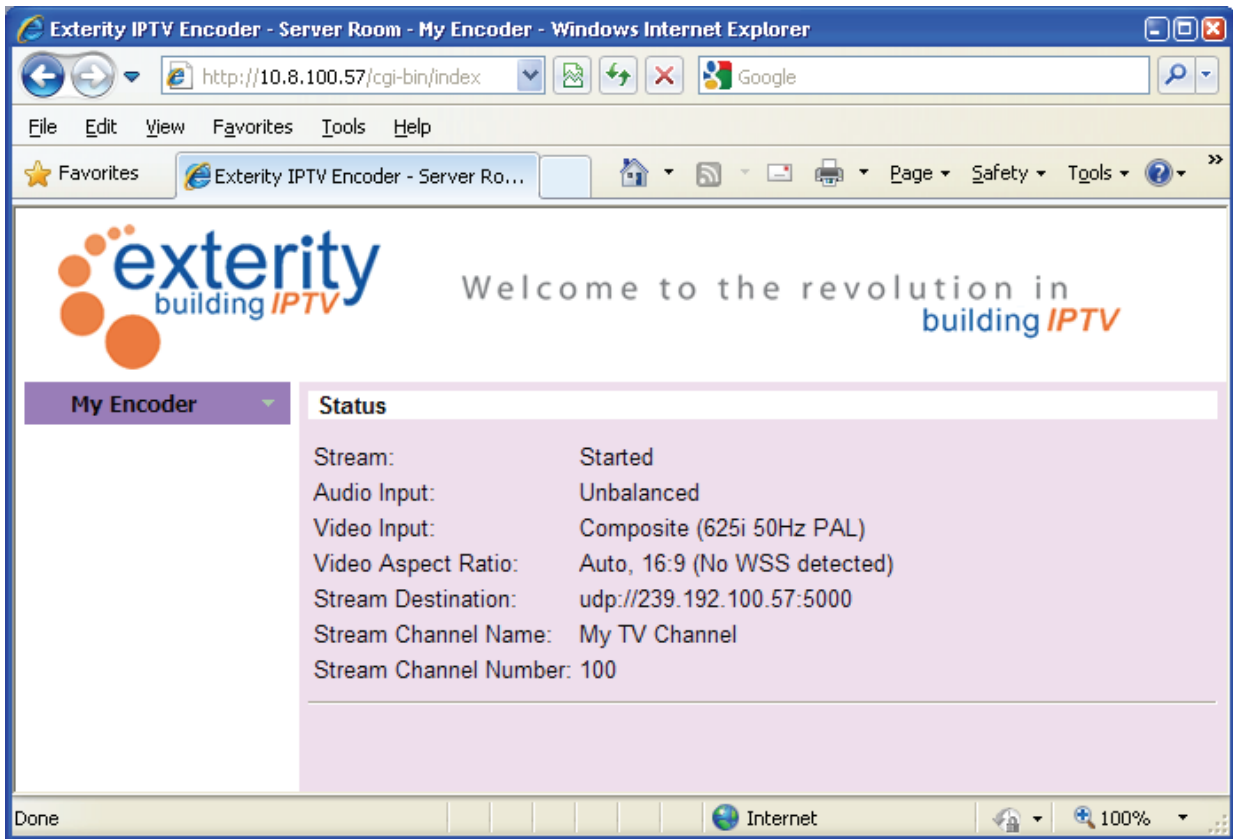


Figure 3 Web Management interface

3. Clicking on the encoder name on the left hand side will reveal the menu. Use this menu to navigate through the tabs, changing settings as appropriate. Click **Apply** on each tab to save your changes.

### Authentication

You can control access to the web management interface by changing the login details.

#### To change the admin password:

1. Click on the **Authentication** tab.
2. Specify a password and click **Apply**.

### Admin Interface

In certain circumstances it may not be possible to manage an encoder via its web interface. For these situations a text based admin interface is provided which is available via the serial interface (marked admin on the rear panel of the unit) or via telnet.

For details on use of the admin interface, see **Section 5 - Admin Interface**.



## 4 General Device Management

This section of the manual describes how to manage attributes of the encoder not associated with IPTV streaming. For example, you will find out how configure IP addressing, and to upgrade firmware. All procedures described in this section assume that you are running the web management interface, as described in Section 3 [Management Interfaces](#).

### About The Encoder

You can find out specific information about the encoder from the **General** page in the web interface as shown in Figure 4. Much of this information is useful in identifying the software and hardware revisions in use in this module. If contacting technical support regarding a problem with the device, it can be useful to provide all this information.

**Software version:** The version of software (often known as firmware) running on this device.

**Software description:** A detailed version description identifying when the software was built.

**Serial number:** The MAC address of the unit.

**IP Address:** The IP address being used by the unit

**Product Type:** This identifies the exact type of hardware module.

**Uptime:** The length of time this device has been running since the last restart.

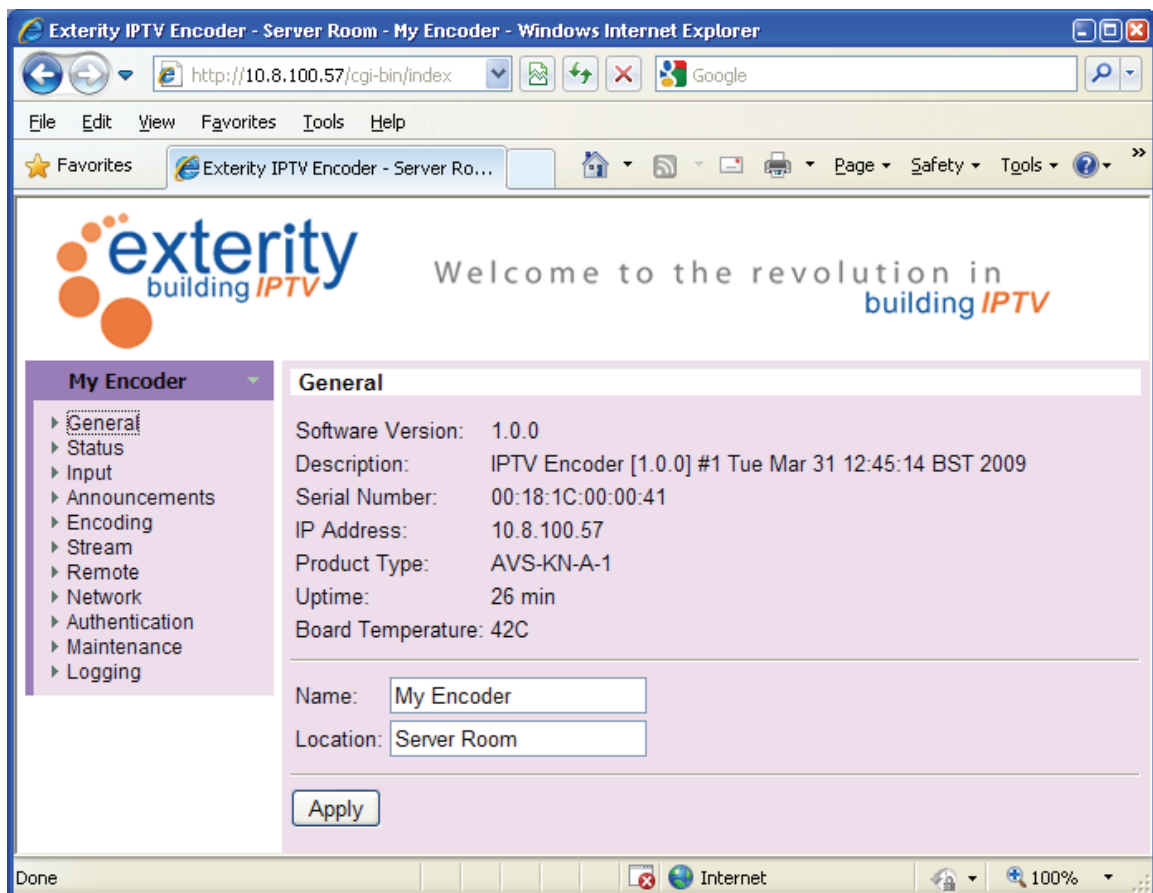


Figure 4 Web Interface General Page

## Device Naming

The encoder can be assigned a name and location. This name can be used to identify the device within the IPTV Manager, while the location you specify is used by the IPTV Manager to organise devices into folders.

### To specify the name and location:

1. Click on the **General** page.
2. Enter the name and location as appropriate.
3. Click **Apply**.

---

**Note:** The name and location can also be configured using the Properties page in IPTV Manager.

---

## Network Configuration

This section describes encoder options relating to network connections. These options are all available from the Network page in the web interface which is shown in Figure 5.

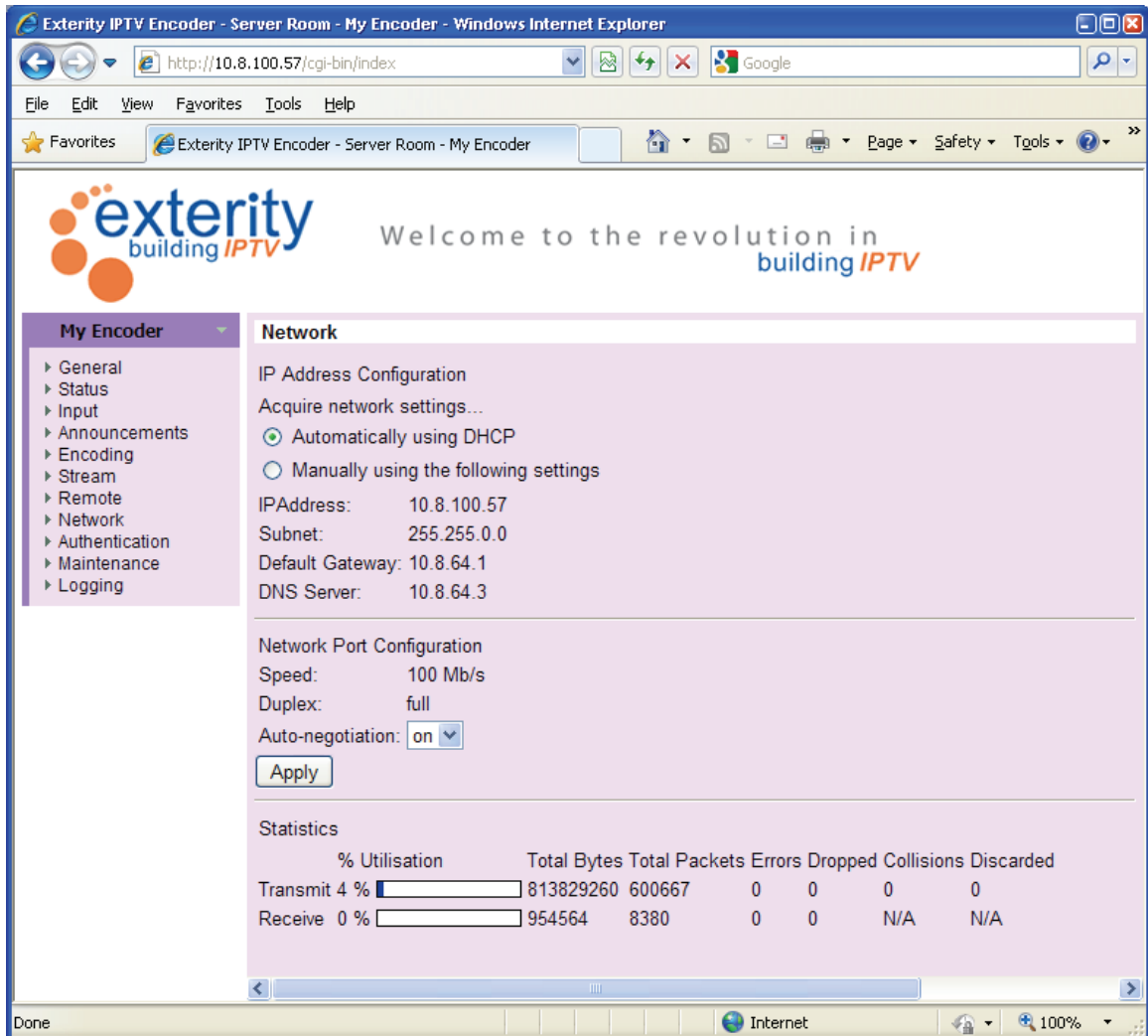


Figure 5 Web Interface Network Page

## Device IP addressing

You can configure the encoder to obtain an IP address automatically using DHCP, or you can specify static addressing information i.e. IP address, subnet mask and default gateway.

---

**Note:** After applying an IP addressing change, this change will take effect after a short time and the device will start using the new IP address. No reboot is necessary.

---

### To configure the encoder to be allocated an IP address automatically:

1. Click on the **Network** page.
2. In the IP Address Configuration section, click **Automatically using DHCP**.
3. Click **Apply**.

### To configure a static IP address:

1. Click on the **Network** page.
2. In the IP Address Configuration section, click **Manually using the following settings**.
3. Specify values for **IP Address**, **Subnet Mask**, **Default Gateway**, **DNS Server**.
4. Click **Apply**.

## Ethernet settings

The encoder can automatically negotiate any combination of 10/100 Mbps/sec and half/full duplex with an Ethernet switch. However, it is also possible to disable auto-negotiation and use a fixed setting of 100 Mbps full duplex (100FD).

The default setting is auto-negotiation enabled.

---

**Note:** It is important to make sure that the encoder settings match the settings on the switch port to which the encoder is connected. i.e. if auto-negotiation is enabled on the encoder it must also be enabled at the switch. If auto-negotiation is disabled, a fixed setting of 100FD must be configured on the switch. Failure to do this may result in dropped packets which in turn may cause poor quality video output at the client device.

---

### To enable/disable Ethernet auto-negotiation:

1. Click on the **Network** page.
2. In the **Network Port Configuration** section, choose **on** or **off** as appropriate from the **Auto-negotiation** dropdown box.
3. Click **Apply**.

## Authentication

### Admin Password

You can control access to the web management interface and admin interface by changing the password.

### To change the admin password:

1. Click on the **Authentication** page.
2. Enter the required password in both fields.
3. Click **Apply**.

## SNMP

To control the management of the encoder via SNMP, it is possible to configure the SNMP community names used to access the device. It is also possible to completely disable the use of SNMP.

### To configure SNMP community strings:

1. Click on the **Authentication** page.
2. Enter the required **read/write** and **read-only community** strings in the appropriate boxes.
3. Click **Apply**.

### To enable/disable SNMP control:

1. Click on the **Authentication** page.
2. Check or uncheck the **Enable SNMP Agent** box as required.
3. Click **Apply**.

## Maintenance

This section describes various maintenance tasks. It covers:

- Restoring the encoder to factory default settings
- Upgrading the encoder's firmware
- Storing/restoring configuration settings

Maintenance tasks are managed from the Maintenance page in the web interface which is shown in Figure 6.

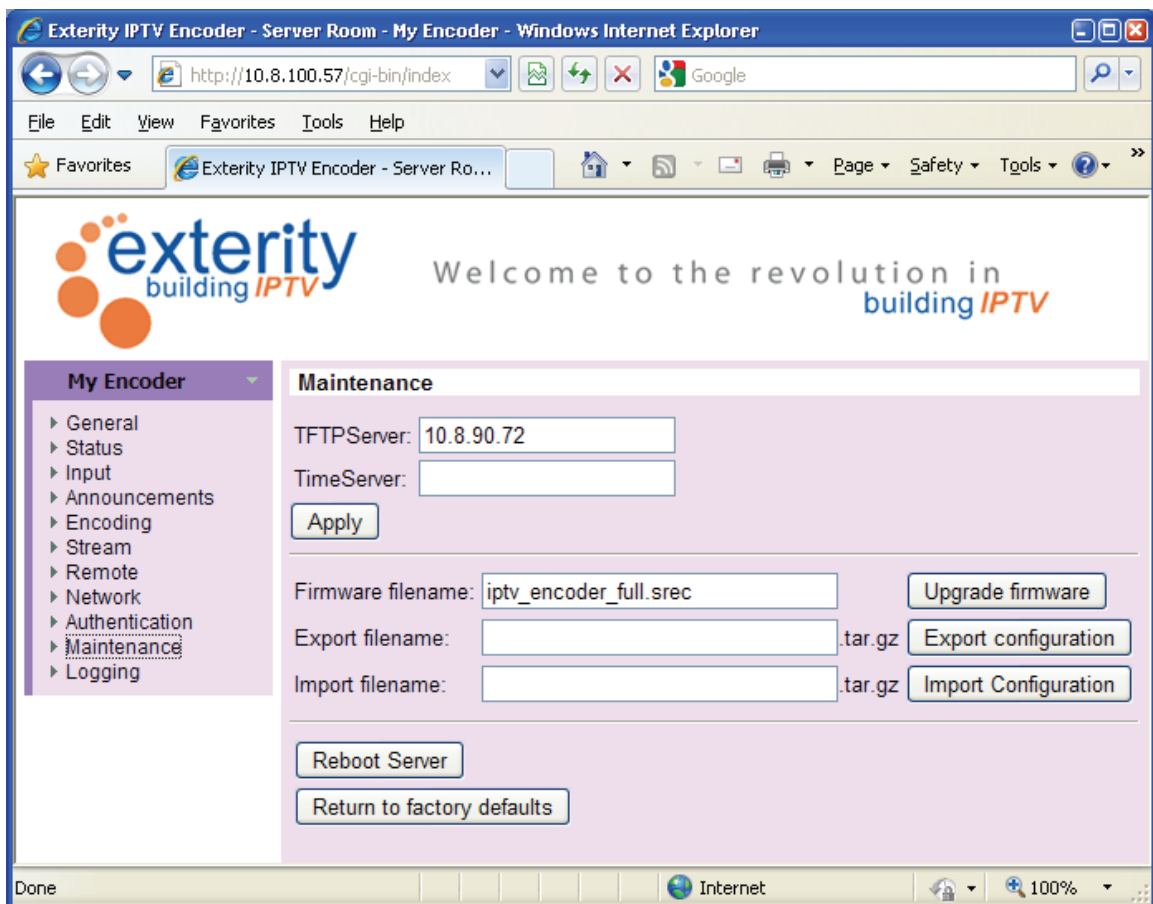


Figure 6 Web Interface Maintenance Page

## TFTP server

The encoder uses TFTP to download new firmware releases and transmitter files. For this to operate correctly, the encoder must be configured to communicate with the TFTP server.

### To specify the TFTP server IP address:

1. Click on the **Maintenance** page
2. Enter the IP address of the TFTP server in the **TFTP Server** box.
3. Click **Apply**.

## Restarting the Encoder

You can restart the encoder at any time.

To restart the encoder, click on the **Maintenance** page and click **Reboot Server**.

## Upgrading the encoder firmware

By upgrading the encoder's firmware regularly, you can ensure that you are always using the most recent version.

---

**WARNING:** Do not switch the encoder off while the upgrade process is running. The process takes several minutes, during which time the LED flashes indicating that the upgrade is in process, firstly by flashing on/off at half second intervals, then rapid flashing as the new firmware is copied to flash memory.

---

### To upgrade the encoder to a new version of firmware:

1. Ensure that the TFTP server is running.
2. Ensure that the following firmware file is hosted correctly in the root directory of the TFTP server:  
`iptv_encoder_full.srec`
3. Click on the **Maintenance** page.
4. Ensure that the **TFTP Server** address is configured correctly (see above).
5. Ensure that the **Firmware filename** is `iptv_encoder_full.srec` (or matches the name of the firmware file if this is different).
6. Click **Upgrade Firmware**.
7. The firmware is downloaded from the TFTP server and copied to flash. This process will take several minutes.

## Restoring factory defaults

You can return the encoder to its factory default configuration.

---

**Note:** If you restore the encoder to factory default settings, you will lose all previously saved settings. You can however restore these if you have saved your configuration, as described later in this section.

---

### To restore the encoder factory default settings:

1. Click on the **Maintenance** page.
2. Click the **Return to factory defaults** button.

## Export/import configuration settings

Once you have configured the encoder, you can store your configuration settings in a single file. You can use the file to restore your settings should you need to. You can also use a saved configuration to replicate identical settings on multiple devices.

---

**NOTE:** Device naming and IP addressing information is not exported/imported. This means that a configuration file can be imported to multiple units.

---

**To export configuration settings:**

1. Ensure that the TFTP server is running.
2. Click on the **Maintenance** page.
3. Ensure that the **TFTP Server** address is configured correctly (see above).
4. Enter a name for your configuration archive in the **Export filename** box.
5. Click **Export configuration**.
6. The configuration file is uploaded to the root directory of the TFTP server.

**To import configuration settings:**

1. Ensure that the TFTP server is running.
2. Ensure that the configuration archive is hosted in the root directory of the TFTP server:
3. Click on the **Maintenance** page.
4. Enter the name of the configuration archive in the **Import Filename** box.
5. Click **Import configuration**.
6. The configuration archive is downloaded from the TFTP server

## Logging

The encoder saves historical information about internal events within the device to its log file. This can be useful in troubleshooting problems with the device. It is also possible to send these log messages to a remote syslog server.

Logging is configured in the web interface **Logging** page as shown in Figure 7.

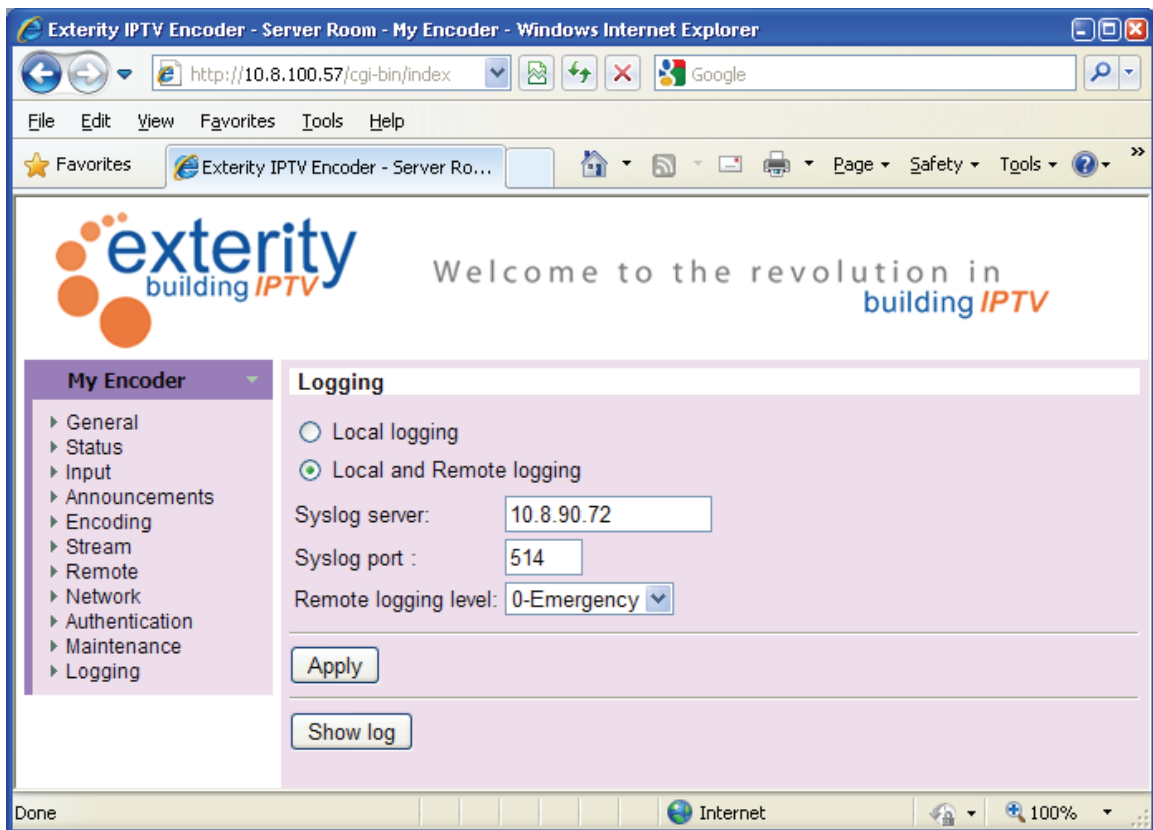


Figure 7 Web Interface Logging Page

## Local logging

All log file information is automatically saved locally.

### To view the log file:

1. Click on the **Logging** page.
2. Click the **Show log** button, resulting in the log being displayed in the browser window.

## Remote logging

To send device log information to a remote server, you need to install a syslog server application on the remote server. Then set up the remote logging function on the encoder as described below.

### To configure remote logging:

1. Click on the **Logging** page.
2. Select **Local and Remote Logging**.
3. In **Syslog server**, enter the IP address or host name of the syslog server where the log files are to be stored.
4. In **Syslog port**, enter the port number on the syslog server. The default value is 514.
5. For **Logging level**, select an option ranging from 0-Emergency to 7-Debug, where 0 represents the least debug information and 7 represents the most.
6. Click **Apply**.

## Time server

The encoder uses NTP to maintain accurate time on the device, using the time server specified. This is useful when examining the device log file as accurate time information will be attached to log messages.

If a time server is supplied to the device by the DHCP server, this will be used if the administrator has not already specified a time server.

### To specify a time server:

1. Click on the **Maintenance** page.
2. Enter the IP address or the host name of the time server in the **Time Server** box.
3. Click **Apply**.

## 5 Admin Interface

In certain circumstances it may not be possible to manage an encoder via its web interface. For these situations a text based admin interface is provided which is available via the serial interface (marked ADM on the chassis front panel) or via telnet.

See APPENDIX A for details of how to connect to the serial admin port.

Once connected, log in using username **admin** and password as for the web interface (default **labrador**).

### Admin interface pages

#### Main page

When successfully logged in, the main page is displayed as shown in Figure 8.

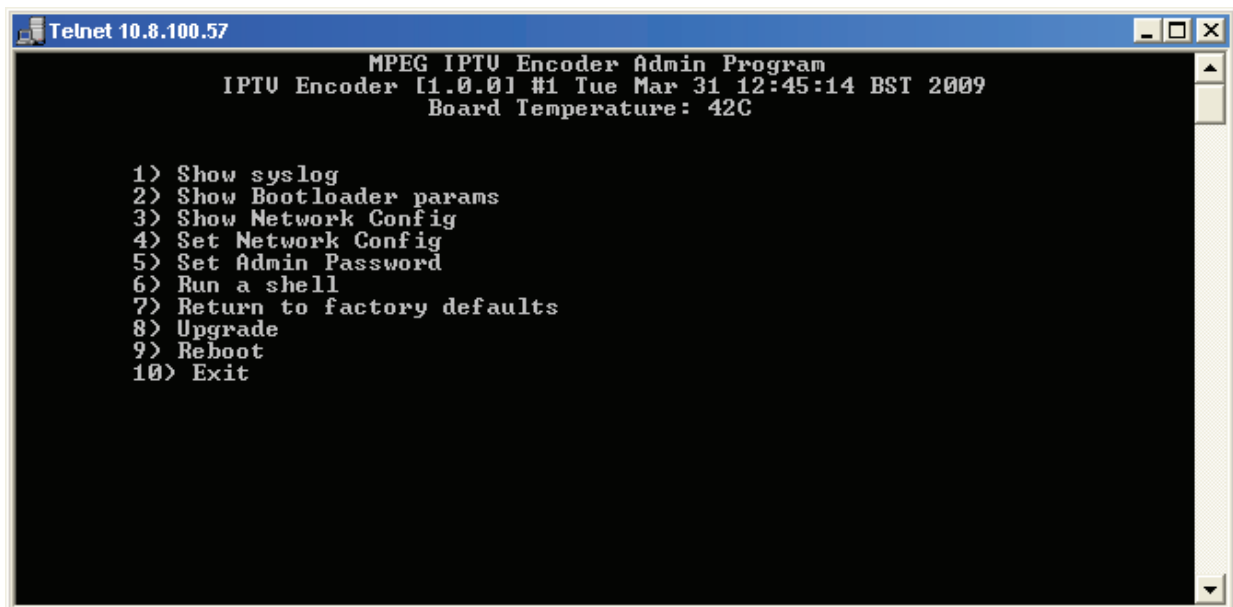


Figure 8 Admin Interface

#### Show syslog

This displays the device log file.

#### Show bootloader params

This page displays the internal configuration used by the bootloader.

#### Show network config

This page displays the IP addressing information of the device.

#### Set network config

This page allows the administrator to set the IP address of the device.

#### Set admin password

Allows the administrator to change the admin password for the serial and web interfaces



### **Run a shell**

This allows the administrator to run a shell as admin.

### **Return to factory defaults**

This page allows the administrator to set all configuration to factory defaults.

### **Upgrade**

This allows the administrator to specify the TFTP server and initiate a firmware upgrade.

### **Reboot**

Reboots the device.

## 6 Encoding and Streaming

This section of the manual describes how to manage those aspects of the encoder related to taking the analogue AV input and converting this to an IPTV stream. All procedures described in this section assume that you are running the web management interface, as described in Section 3 [Management Interfaces](#).

### Audio/Video Input

Audio/Video Input is configured from the **Input** page on the web interface as shown in Figure 9.

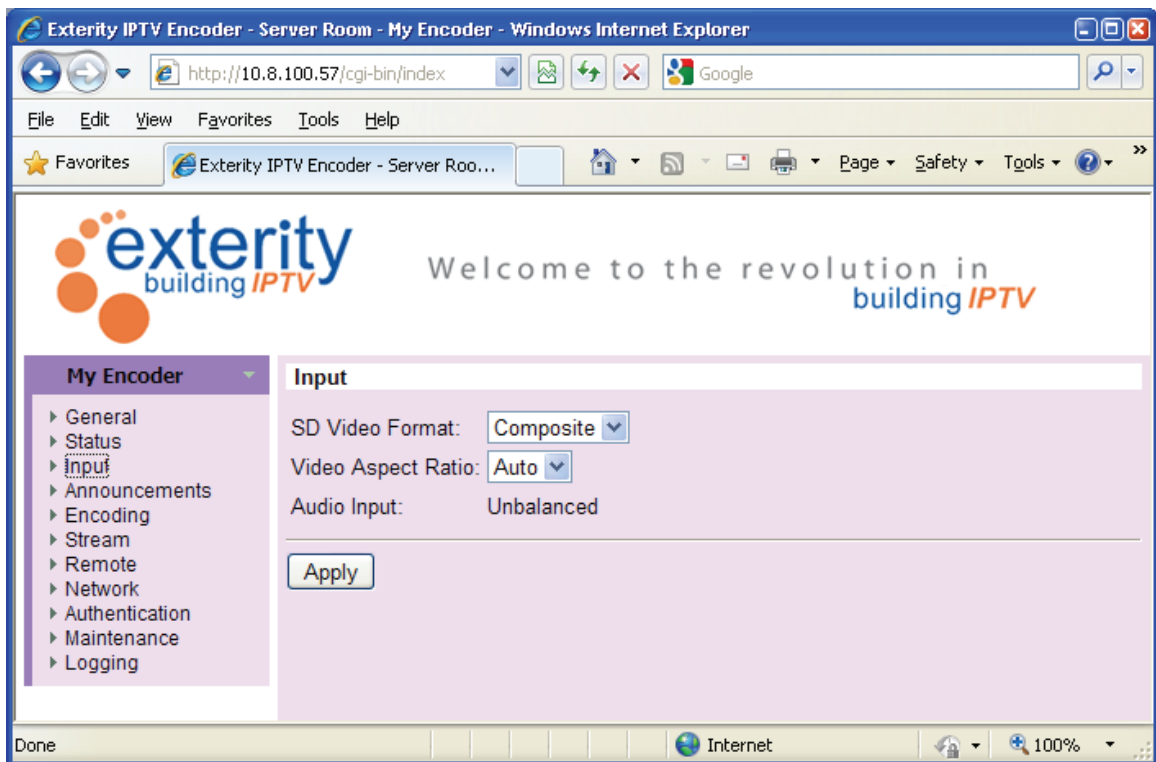


Figure 9 Web Interface Input Page

#### Video Format

Video Format sets the type of video input to the device. Valid settings are **Composite**, **S-Video** and **RGBS**. The default setting is **Composite**.

This should be set to match the type of video output from the attached AV source. See chapter 2 for details on how to attach your AV source to the encoder.

#### To specify the video format:

1. Click on the **Input** tab.
2. Choose an option from the **SD Video Format** box.
3. Click **Apply**.

## Video Aspect Ratio

Choose the correct video aspect ratio of your video source i.e. **4:3** (normal) or **16:9** (widescreen). This will ensure that receivers and clients will display the picture in the correct format.

The default setting is **Auto**, which means that the encoder will try to detect the aspect ratio from the WSS (widescreen signalling) in the input analogue video. If WSS is not detected, a 16:9 aspect ratio will be assumed.

### To specify the aspect ratio:

1. Click on the **Input** tab.
2. Choose an option from the **Video Aspect Ratio** box.
3. Click **Apply**.

## Audio Input

The encoder can input unbalanced stereo audio. There is no user configuration of the audio input.

## Encoding

The encoder has a number of encoding options which can be configured for both video and audio. It is also possible to disable video or audio encoding in order to transmit audio-only or video-only streams.

Encoding parameters are configured from the **Encoding** page on the web interface as shown in Figure 10.

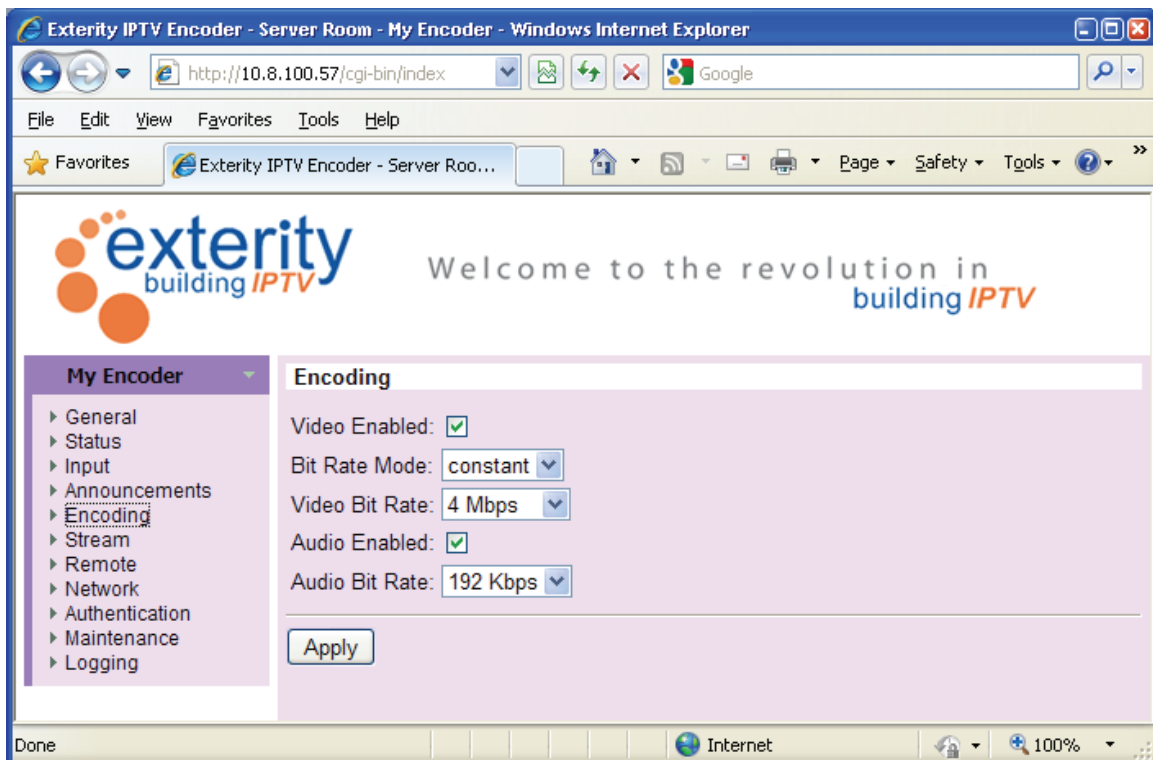


Figure 10 Web Interface Encoding Page

## Video Encoding

Video encoding is enabled by default. This can be disabled if required in order to send an audio-only stream.

### To enable/disable video encoding:

1. Click on the **Encoding** tab.
2. Check or un-check the **Video Enabled** box as appropriate.
3. Click **Apply**.

## Video Bit Rate

The device can be configured to transmit its stream with **constant** bit rate (CBR) or **variable** bit rate (VBR).

For a CBR stream, the bit rate can be configured to a value between 1.5Mbps and 15Mbps.

For a VBR stream, the maximum bit rate can be configured to a value between 1.5Mbps and 15Mbps while the average bit rate can be configured to a value between 1.5Mbps and 4Mbps.

The default setting is 4Mbps CBR. For best picture quality, use CBR at a bit rate of 4Mbps or greater. For best use of bandwidth use VBR and/or a lower bit rate, although this will result in degradation of picture quality.

### To specify the bit rate type:

1. Click on the **Stream Props** tab.
2. Choose an option in the **Bit Rate Mode** box.
3. Click **Apply**.

### To specify the video bit rate (CBR only):

1. Click on the **Stream Props** tab.
2. Choose an option in the **Video Bit Rate** box.
3. Click **Apply**.

### To specify the maximum bit rate (VBR only):

1. Click on the **Stream Props** tab.
2. Choose an option in the **Maximum Video Bit Rate** box.
3. Click **Apply**.

### To specify the average bit rate (VBR only):

1. Click on the **Stream Props** tab.
2. Choose an option in the **Average Video Bit Rate** box.
3. Click **Apply**.

## Audio Encoding

Audio encoding is enabled by default. This can be disabled if required in order to send a video-only stream

### To enable/disable audio encoding:

1. Click on the **Encoding** tab.
2. Check or un-check the **Audio Enabled** box as appropriate.
3. Click **Apply**.

## Audio Bit Rate

The audio on the encoder is sampled at 48kHz and encoded as MPEG 1 Layer II. The bit rate can be set to values from 48kbps to 384kbps. The default setting is 192kbps.

**To specify the audio bit rate:**

1. Click on the **Stream Props** tab.
2. Choose an option in the **Audio Bit Rate** box.
3. Click **Apply**.

## Stream Properties

Stream Properties are configured using the web interface **Stream** page as shown in Figure 11.

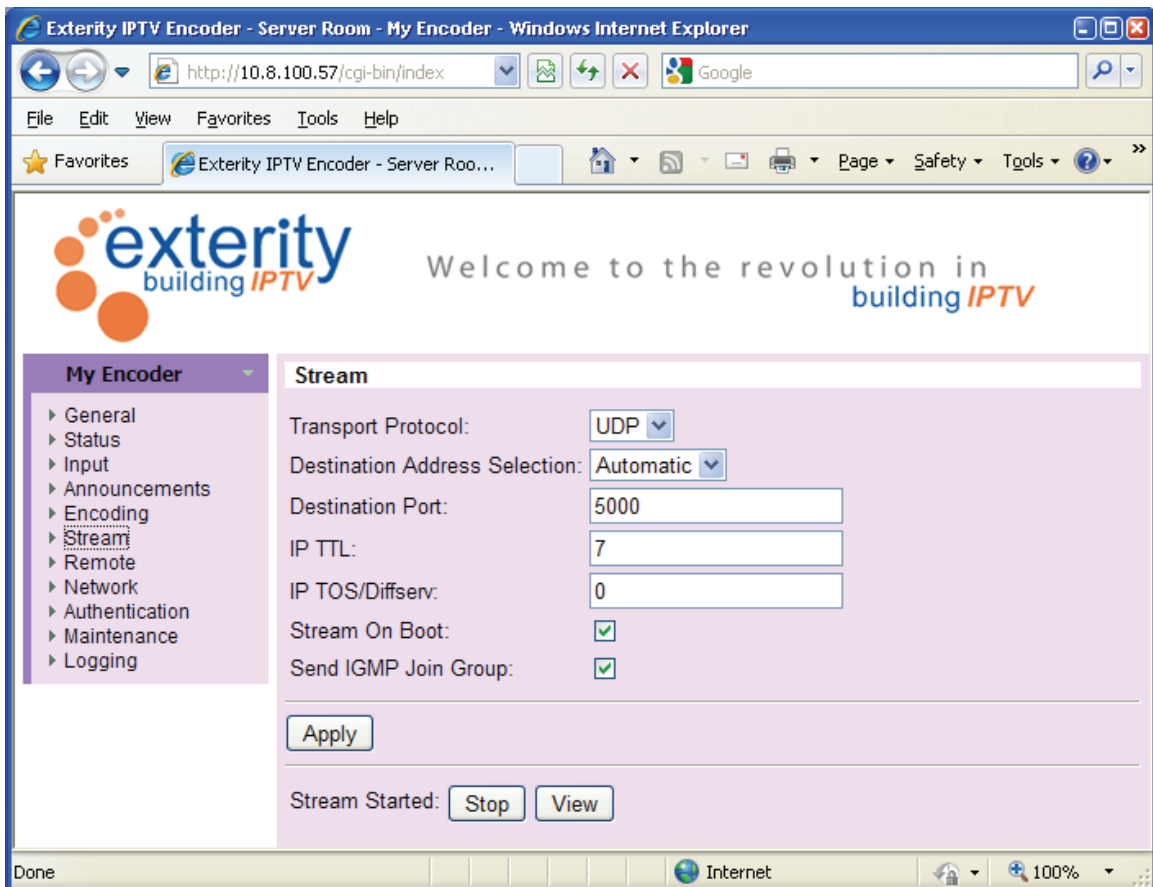


Figure 11 Web Interface Stream Page

## Transport Protocol

The encoder transmits its stream as an MPEG-2 transport stream carried over UDP or RTP. The default setting is UDP. RTP can be a useful diagnostic tool as RTP packets carry a sequence number and this can be used to check whether all packets arrive at a receiving device.

**To specify the transport protocol:**

1. Click on the **Stream** tab.
2. Choose an option in the **Transport Protocol** box.
3. Click **Apply**.

## Destination Address

By default the encoder sends its stream addressed to the automatically selected multicast address 239.192.x.y, where x and y are the last two digits of the device's own IP address. However, the destination address can be changed as desired by the administrator to a manually configured multicast or unicast address.

### To specify automatic address selection:

1. Click on the **Stream** tab.
2. Choose **Automatic** in the **Destination Address Selection** box.
3. Click **Apply**.

### To specify the destination address manually:

1. Click on the **Stream** tab.
2. Choose **Manual** in the **Destination Address Selection** box.
3. Enter the multicast or unicast address in the **Destination Address** field.
4. Click **Apply**.

## Port

By default, the stream is sent to the UDP port 5000. The port can be altered by the administrator as desired.

### To specify the port:

1. Click on the **Stream** tab.
2. Enter a value in the **Destination Port** box.
3. Click **Apply**.

## IP TTL

By default, the stream is transmitted with an IP TTL of 7. The TTL can be set to any value between 0 and 255 to allow operation across different network topologies.

### To specify the IP TTL:

1. Click on the **Stream** tab.
2. Enter a value between 0 and 255 in the **IP TTL** box.
3. Click **Apply**.

## IP TOS

By default, the stream is sent with an IP TOS value of 1. The value can be set between 0 and 255, though you should take care to set a value appropriate to your network and if necessary refer to RFC 2474 when choosing the value to set.

### To specify the IP TOS:

1. Click on the **Stream** tab.
2. Enter a value between 0 and 255 in the **IP TOS** box.
3. Click **Apply**.

## Stream on boot

When this option is selected, the encoder will automatically start to stream when it starts up (assuming the AV source is on). Deselect this if you do not want the stream to start immediately on boot. The default setting is for stream on boot to be enabled.

### To specify the stream on boot setting:

1. Click on the **Stream** tab.
2. Check or un-check the **Stream On Boot** box as required.
3. Click **Apply**.

### IGMP join group

The encoder by default uses IGMP to join the multicast group for its stream. This can be essential to prevent flooding on some network switches.

If required, this function can be disabled by deselecting the checkbox.

#### To specify the IGMP Join Group setting:

1. Click on the **Stream** tab
2. Check or un-check the **Send IGMP Join Group** box as required
3. Click **Apply**

## Channel Announcements

The device announces its stream (channel) every 30 seconds using SAP (Session Announcement Protocol). The information in the announcements includes the multicast address and port of the stream and enables client (receiver) devices to attach to the stream. SAP announcements are sent to multicast address 239.255.255.255, port 9875.

The options described in this section allow some additional information to be put into the announcements. It is also possible to disable the sending of announcements.

Announcements are configured using the web interface **Announcements** page as shown in Figure 12.

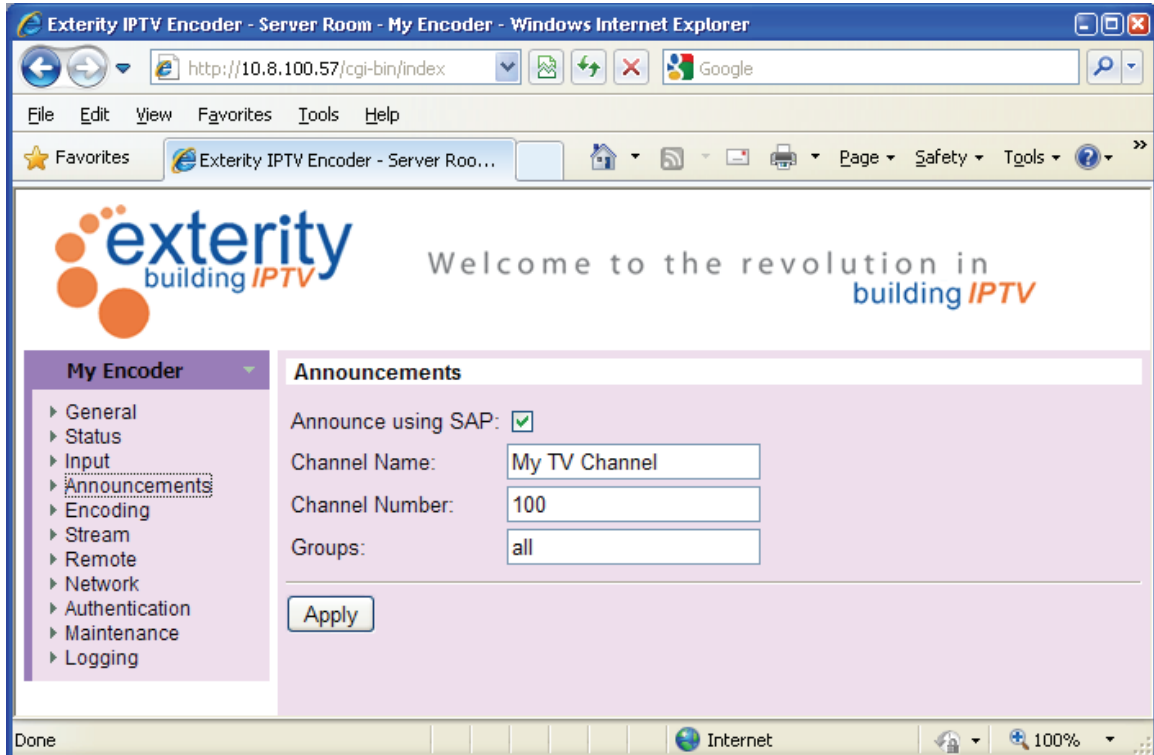


Figure 12 Web Interface Announcements Page

## Channel name

The channel name will be used by Exterity IPTV receivers and PC clients to identify the channel. The default channel name is "Exterity Encoder xxxxxx", where "xxxxxx" is the last six digits of the encoder's MAC address. This can be changed as desired.

### To specify the channel name:

1. Click on the **Announcements** tab.
2. Enter the desired name in the **Channel Name** box.
3. Click **Apply**.

## Channel number

The channel number will be used by Exterity IPTV receivers and PC clients to produce an ordered list of channels.

### To specify the channel number:

1. Click on the **Announcements** tab.
2. Enter a value between 0 and 999 in the **Channel Number** box.
3. Click **Apply**.

## Groups

The available channels across a network of Exterity devices can be split into groups e.g. *Teachers, Pupils, Administrators*, allowing the administrator to configure receiving devices to receive only a subset of available channels. By default, an encoder announces itself in the *all* group. Use the groups option to put the device into one or more specific groups.

### To add the device to a group or groups:

1. Click on the **Announcements** tab.
2. Enter a comma separated list of group names e.g. **teachers,administrators** in the **Groups** box.
3. Click **Apply**.

### To remove the device from every group (i.e. add the device to the all group):

1. Click on the **Announcements** tab.
2. Enter **all** in the **Groups** box.
3. Click **Apply**.

## Announce Using SAP

This option allows the administrator to turn on/off channel announcements.

### To configure the announcement setting:

1. Click on the **Announcements** tab.
2. Check or un-check the **Announce Using SAP** box as appropriate.
3. Click **Apply**.



## 7 Remote Control

The encoder has the ability to send infra-red remote control commands to the attached AV source. These commands are sent based on commands received over the network from IPTV Manager or an IPTV receiver. To do this it is necessary to obtain a configuration file with the remote control codes for that particular device.

This functionality is illustrated in Figure 13 where, for example, the remote control handset could be used to play/pause/stop the DVD player.

Remote Control is configured using the web interface **Remote** page as shown in Figure 14.

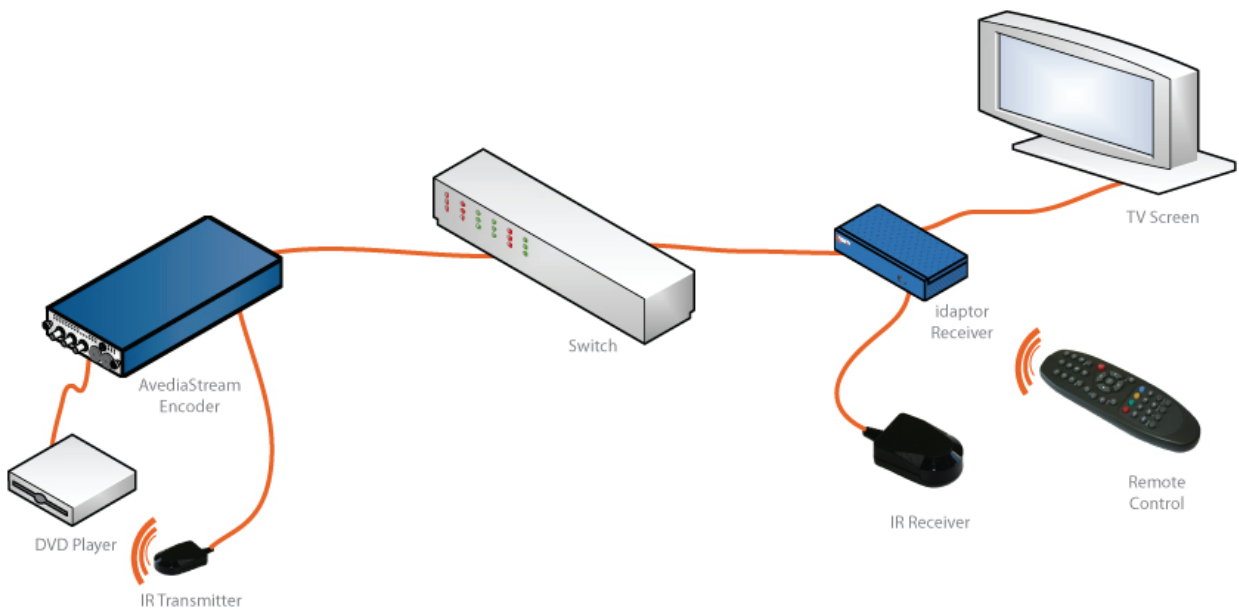


Figure 13 IR Control of AV Source

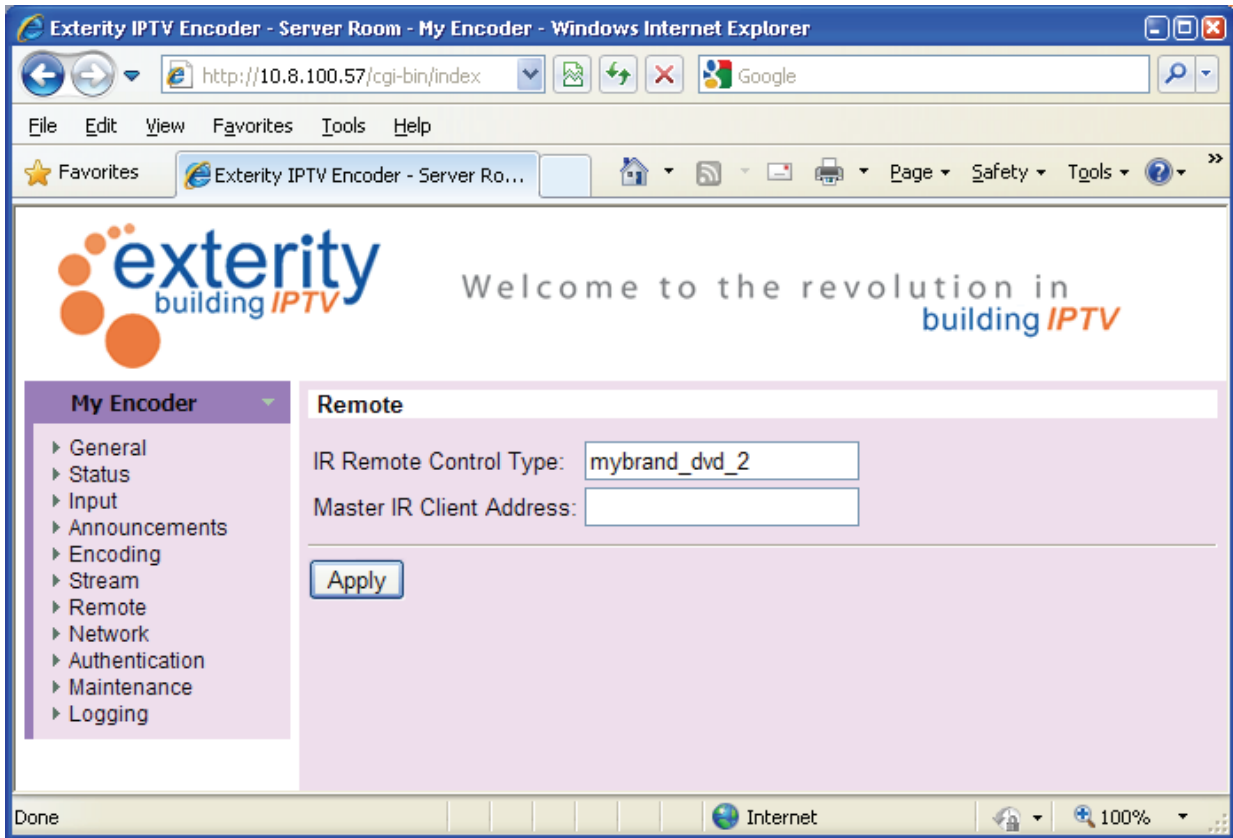


Figure 14 Web Interface Remote Page

### IR Configuration File

In order to use the infra-red transmitter to control the AV source, it is necessary to obtain a configuration file with the remote control codes for that particular device. Contact your Systems Integrator or Reseller in order to obtain a configuration file.

#### To download an IR config file:

1. The device uses TFTP to download new remote control config files from a TFTP server. To update the config file, first ensure that the correct TFTP server IP address is specified in the **Maintenance** page, and that the TFTP server is running.
2. Save the configuration file in the following directory on the TFTP server.  

```
<root>/remotes/<manufacturer>/<type>/<manufacturer>_<type>_<id>.conf
```

 For example:  

```
<root>/remotes/mybrand/dvd/mybrand_dvd_2.conf
```
3. Click on the **Remote** tab.
4. Enter the name of the configuration file in the **IR Remote Control Type** box.
5. Click **Apply**. The new configuration file is downloaded automatically from the TFTP server.

### Master IR Client

By default, any device on the network can send remote control commands to the encoder. To allow only one device to do this, configure that device as the Master IR Client.

#### To specify the master IR client:

1. Click on the **Remote** tab.
2. Enter an IP address in the **Master IR Client Address** box.
3. Click **Apply**.

**To remove the master IR client:**

1. Click on the **Server Props** tab.
2. Enter 0.0.0.0 in the **Master IR Client Address** box.
3. Click **Apply**.

## 8 Status Monitoring

This section explains how to check the operating status of an encoder.

### Operating Status

To view details such as the streaming status of the device, choose the **Status** page on the web interface. The information displayed here is described below and is shown in Figure 15.

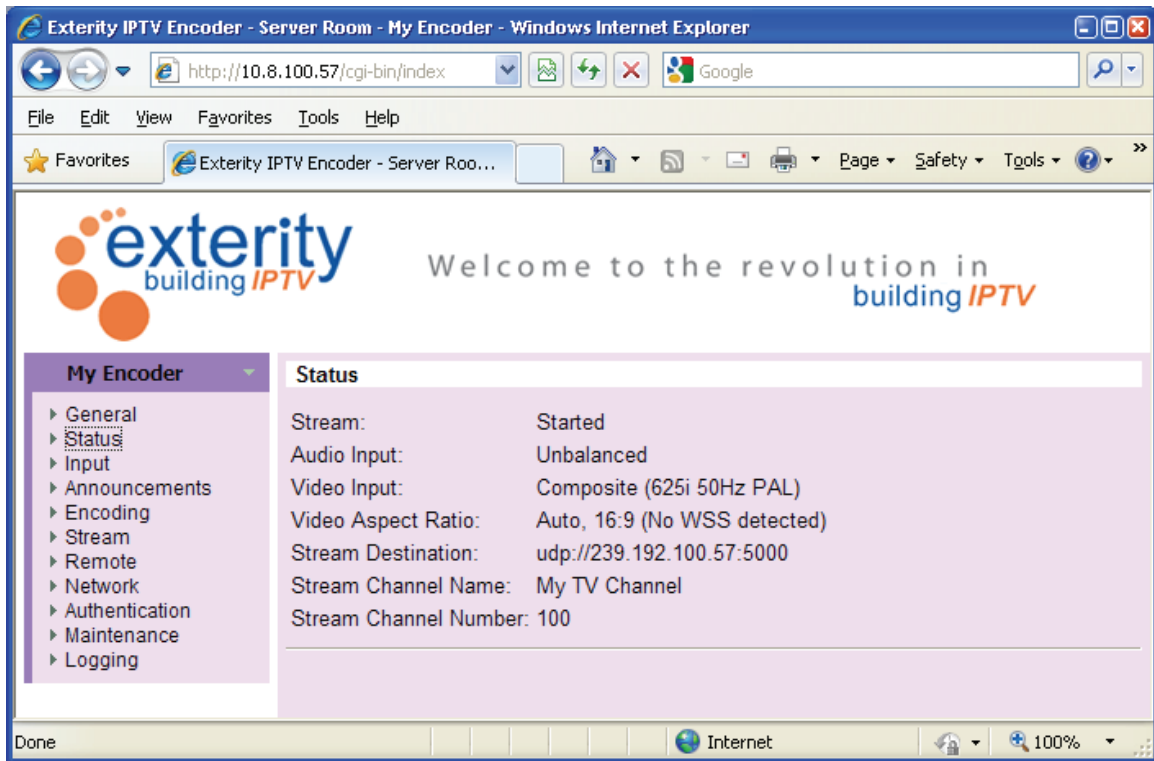


Figure 15 Web Interface Status Page

### Stream

Provides information on the status of the stream. This will be one of the states described in Table 3.

Status	Description
Started	The unit is currently streaming
Stopped	User has stopped streaming or has not attempted to start streaming.
Waiting for video source	The encoder has been unable to find a suitable video source. Check the video cable(s) has/have been correctly attached to the unit and that the video source is turned on and working.
Unsupported video format	The AV source has been detected but the video format cannot be encoded. This could occur if an HD video source or a video source with progressive scan is connected.

Table 3 Stream Status

## Video Input

Describes the input video the encoder has configured/detected. The following is reported here:

- Configured video input type: Composite, RGBS or S-Video
- Detected resolution: 525i or 625i
- Detected frame rate: 50Hz or 60Hz
- Detected colour encoding scheme: PAL, NTSC or SECAM (only if using Composite/S-Video)

If no video signal is detected, the message "No Signal" will be displayed here.

## Video Aspect Ratio

Indicates the configured aspect ratio, as configured on the **Input** page, as well as the aspect ratio in use for the encoding. The following is reported here:

- Aspect ratio configuration: Auto or Manual
- Aspect ratio in use: 4:3 or 16:9

If WSS/CGMS is not detected when in Auto mode, this will be indicated in brackets and the encoder assumes an aspect ratio of 16:9.

## Audio Input

This indicates that the encoder can input unbalanced stereo audio.

## Stream Destination Address

Displays the destination address of the stream, either an automatically generated multicast address, or a manually configured multicast or unicast address, as configured in the **Stream** page

## Stream Destination Port

Displays the currently configured destination port number, as configured in the **Stream** page.

## Stream Channel Name

Displays the currently configured channel name, as configured in the **Announcements** page.

## Stream Channel Number

The currently configured channel number, as configured in the **Announcements** page.

## Network Statistics

Viewing the network port utilisation is an easy way to check if the encoder is transmitting data at the rate expected by the streaming settings.

To view network port utilisation, go to the **Network** page on the web interface. The Ethernet interface statistics are shown at the bottom of the page. The **transmit utilisation** should approximately match the rate specified on the **Stream** page. You would normally expect to see very little traffic on the receive side.

## Viewing Stream

To view the stream in a browser window using Microsoft Internet Explorer, first ensure that the Exterity MPEG codecs and avediaPlayer are installed on the PC.

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Now go to the **Stream** page on the web interface and click **View Stream In New Window**. This will open a new browser window to play the stream.

## 9 Troubleshooting

Problem	Possible Cause	Solution
Device does not appear in IPTV Manager	Network connection faulty or cannot obtain IP address.	Check Ethernet connections or replace cable.  Check that DHCP Server is running on network.  Check switch settings match unit Ethernet settings.
	PC has firewall configured, blocking SNMP traps.	Disable firewall, or configure firewall to allow UDP port 162 traffic to this application.
	PC has another application listening for SNMP traps.	Close down SNMP trap listener.
IPTV Manager cannot communicate with device	Device is upgrading (indicated by alternately slow and fast LED flash)	Wait for upgrade to complete
Encoder does not appear to be streaming	AV source not connected or powered off.	Check connections and power to AV source. Check the status page to see if the encoder thinks it is attached to a valid video source
	Video interface setting wrong.	Check video interface settings on encoder and AV device are the same.
Device is definitely streaming but client cannot connect to stream.	If using PC client, PC Firewall is preventing video traffic.	Disable firewall, or configure firewall to allow traffic to this application.
Device is streaming but video and or audio is broken up on client	Network is not IGMP enabled	Check the configuration of the network switch(es).  Check the switch(es) for any errors
	The streaming bit rate exceeds the capability of the client	An Exterity SD Receiver (V2.3.0 or later) will receive up to 8Mbps using CBR. Make sure the rate is this or lower.
	Multicast address is not unique	Particularly if the multicast address was assigned manually check it is unique.
Device is streaming, clients can connect, but video appears to be black	Composite sync is connected to the encoder, encoder is in RGBS mode, no RGB cables are connected	Connect RGB signals from source device
	RGB and sync signals are connected, the encoder is in RGBS mode, the source device is not set to output RGB or does not support RGB	Enable RGB output on source device or use composite/s-video if RGB is not supported on the source

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After upgrade, the device is still running the old version of firmware.	The correct firmware file is not on the TFTP Server.	Put the correct file on the TFTP Server.
	The TFTP Server address configured for the device is wrong	Check that the TFTP Server address is the correct address of the TFTP Server.
	The TFTP Server is not running.	Start the TFTP Server.
	The TFTP Server is not configured to send files.	Fix the security settings on the TFTP Server.



## APPENDIX A Serial interface connection

The serial admin interface provides the ability to manage a small subset of device functionality e.g. to configure an IP address.

### Cabling

To connect to the serial interface use the female DB-9 connector supplied by Exterity (shown in Figure 16).



Figure 16 DB-9 to RJ45 serial adaptor

The female DB-9 connector should be plugged into the serial port on a PC. A straight-through network cable should be used between the RJ45 socket on the adaptor and the admin port on the Exterity device.

Note that although the cable fits, the admin port should not be connected to the Ethernet port on a PC.

### Connector Wiring

If you do not have a connector you can make one using the details shown in Figure 17, Figure 18 and Table 4.

DB9 Pin No	Description	RJ45 Pin No
2	TxD	8
3	RxD	2
5	GND	4

Table 4 Serial Pin Out

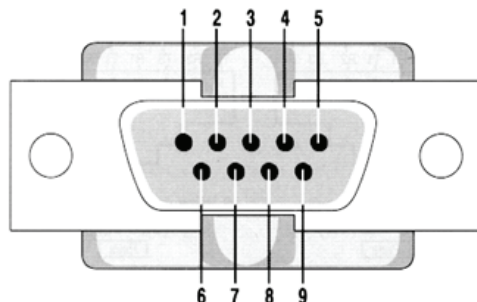


Figure 17 DB-9 connector

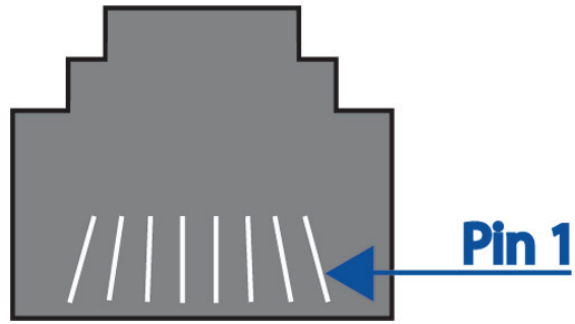


Figure 18 RJ45 connector

### Opening a Session

Open a terminal program such as Hyperterminal (this can be found on a standard Windows PC). Set up the serial port with the following settings (see example in Figure 19):

- Baud rate: 115200
- Data bits: 8
- Parity: none
- Stop bits: one
- Flow control: none

The program should now connect and present a login prompt if the return key is pressed.

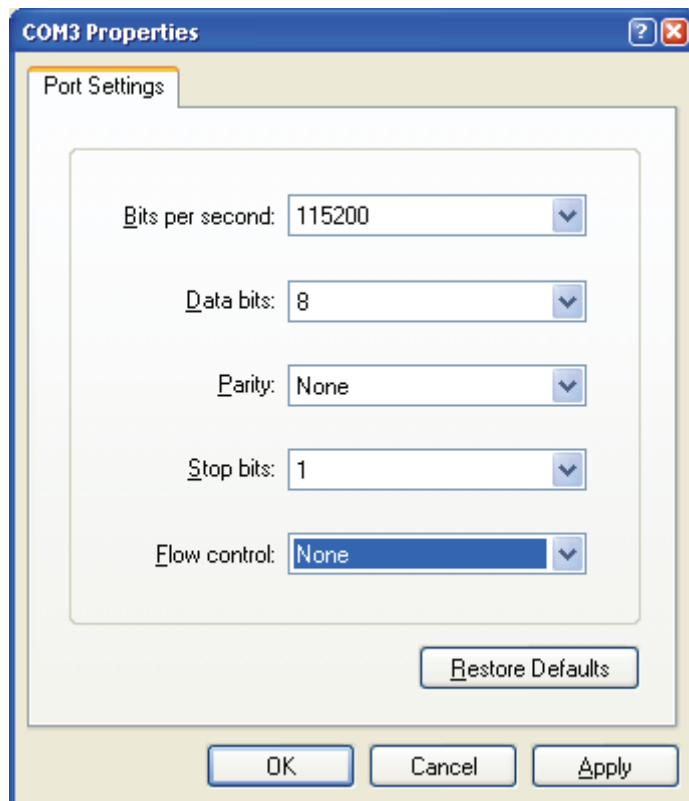


Figure 19 Serial port settings

## **APPENDIX B Support and contact information**

Technical Support for Exterity products is provided by authorised Systems Integrators and Resellers. Please contact your Systems Integrator or Reseller with any Support issues.