

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



**Exterity Encoder**  
**AvediaStream e35xx**  
**Administrator's Guide V1.1**

## **Notices**

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## **Products Covered By This Guide**

- AvediaStream e3520 (avstr-e3520)
- AvediaStream e3550 (avstr-e3550)

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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 AvediaStream e3520 and AvediaStream e3550 products, which are commonly referred to as “encoders”. Encoders are network devices that take a signal from an AV device, for example, a DVD player or set-top box, and output it as an MPEG transport stream over an IP network.

### Scope

This edition of the manual refers to version 1.1.x of the encoder software.

The following products are covered:

- AvediaStream e3520 (avstr-e3520) (HD PRO Encoder)
- AvediaStream e3550 (avstr-e3550) (HD SDI Encoder)

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**Note:** The AvediaStream e3520 was previously available using the order codes idapt-hdp and prdpt-hdp.

---

### 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 *AvediaStream Installation Guide*.

## Terms and Definitions

The following terms and definitions are used in this document:

**AC-3** – An audio compression scheme, also known as Dolby Digital.

**AES** – A standard for carrying digital audio.

**Board** – The printed circuit board within the unit.

**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.

**H.264** - A standard for video compression, also known as MPEG-4 Part 10 and MPEG-4 AVC (Advanced Video Coding).

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

**Input** – Physical interface on Exterity equipment that receives Audio/Video from a source.

**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).

**NTP** – Network Time Protocol, a protocol for synchronizing the clocks of computer systems.

**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

**SDI** - The Serial Digital Interface (SDI) is a high speed serial interface that carries uncompressed video with the option of embedded audio. It is specified as SMPTE 259M (270MB/s SD-SDI) and SMPTE 292M (1.485Gbit/s HD-SDI).

**Source** – A device that can provide an Audio/Video input to the encoder, for example, a DVD player.

**Telnet** – Telnet is a network protocol that enables one computer to communicate with another over an IP network.

**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, which provides a connectionless transport mechanism with low overhead.

**Unit** – Exterity product, for example, an AvediaStream e35x unit containing a printed circuit board.

**YPbPr** – A type of component analogue video signal consisting of a colourless component (luminance), combined with two colour-carrying components (chrominance). This is commonly referred to simply as "component".

## How this Manual is Organised

This manual is organised as follows:

<b>Section 1 – Getting Started</b>	This section describes how to get the encoder up and running.
<b>Section 2 – Physical Interfaces</b>	This section describes how to connect your AV equipment to the encoder.
<b>Section 3 – Management Interfaces</b>	This section describes the management interfaces you can use to manage the encoder: the IPTV Manager, Web Management Interface and admin interface.
<b>Section 4 – Configuring the Encoder</b>	This section describes how to configure the encoder using the Web Management Interface
<b>Section 5 – Admin Interface</b>	This section describes how to configure the encoder using the serial Admin Interface.
<b>Section 6 – Status Monitoring</b>	This section explains how to check the operating status of the encoder.
<b>Section 7 – Troubleshooting</b>	This section provides troubleshooting information if you are having problems with the encoder.

# 1 Getting Started

There are certain procedures you need to perform in order to get the AvediaStream e35xx range of encoders up and running. These procedures are described 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 [14](#) for details on how to connect your AV equipment to the encoder.

### Connecting an SD Video Source (e3520 only)

If connecting an SD video source, it is necessary to configure the type of video being input to the encoder.

For more information, see [Configuring Audio/Video Input \(e3520 only\)](#) on page [23](#).

## 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:**

- 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 [Configuring Network Settings](#) on page [22](#).

- Use the Admin Interface to configure the IP address.

For more information, see [Configuring the Encoder using the Admin Interface](#) on page [34](#).

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

For more information, see [Configuring Network Settings](#) on page [22](#).

## 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 [Naming the Encoder](#) on page [22](#)) or the IPTV Manager (see [IPTV Manager](#) on page [19](#)).

## Configuring Audio/Video Input

Now configure the Audio/Video input.

For more information, see [Configuring Audio/Video Input \(e3520 only\)](#) on page [23](#) or [Configuring Audio/Video Input \(e3550 only\)](#) on page [24](#).

## Configuring Encoding Options

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

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

## Configuring Stream Properties

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

For more information, see [Configuring Stream Properties](#) on page [25](#).

## 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.

This is done automatically once the encoder is up and running.

You may wish to configure channel announcements to suit your requirements. For more information, see [Configuring Channel Announcements](#) on page [28](#).

## Checking Status

### Checking the operating status of the encoder

You may wish to check the operating status of the encoder.

For more information, see [Status Monitoring](#) on page [36](#).

### Checking the encoder is transmitting data

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.

For more information, see [Viewing Network Statistics](#) on page [40](#).

## 2 Physical Interfaces

An AvediaStream e35xx HD encoder card can operate in one of the following chassis:

- AvediaStream c1101
- AvediaStream c1103
- AvediaStream c1110

The card 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 module provides the following interfaces over its edge connector to the 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 relevant AvediaStream chassis installation guide for further details.

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 1 Heartbeat LED Patterns**

## Encoder Rear Panel Interface

The AvediaStream e3520 and AvediaStream e3550 have the following functionality:

Name	Video Inputs	Audio Inputs	IR Out Socket
AvediaStream e3520 (HD PRO)	<ul style="list-style-type: none"> <li>• Composite</li> <li>• Component</li> </ul>	<ul style="list-style-type: none"> <li>• Balanced</li> <li>• Unbalanced</li> <li>• AES digital</li> </ul>	Yes
AvediaStream e3550 (HD SDI)	<ul style="list-style-type: none"> <li>• HD-SDI</li> <li>• SD-SDI</li> </ul>	<ul style="list-style-type: none"> <li>• Embedded SDI stereo</li> <li>• AES digital</li> </ul>	No

Table 2 Encoder Rear Panel Interface

### AvediaStream e3520 Interface

The encoder provides video and audio inputs as follows, as illustrated in [Figure 1](#) below.



Figure 1 AvediaStream e3520 Encoder Rear Panel

#### Video Inputs

The three BNC connectors for video input support:

- Composite (Connect the composite signal to the Y input)
- Component (Connect the Y signal to the Y input, the Pb/U signal to the Pb input and the Pr/V signal to the Pr input)

The following resolutions and frame rates are supported:

- 525i 59.94Hz
- 625i 50Hz
- 720p 50Hz/59.94Hz/60Hz
- 1080i 50Hz/59.94Hz/60hz

---

**Note:** 24Hz is not supported on the e3520 encoder.

---

### Audio Inputs

The two 6.35mm jack sockets for audio input support:

- Unbalanced audio (Connect mono or stereo audio to the Left/Stereo input via an adaptor such as the one shown in [Figure 2](#))
- Balanced audio (Connect to both left and right inputs. Use adaptors such as the one shown in [Figure 3](#), if necessary).
- AES digital audio (Connect AES audio to the Right/Digital input via an adaptor such as the one shown in [Figure 3](#)). The AES audio format can be uncompressed (PCM 48kHz) or compressed (AC-3).



Figure 2 Unbalanced audio adaptor



Figure 3 Balanced audio/AES audio adaptor

### IR Out Socket

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



## AvediaStream e3550 Interface

The encoder provides video and audio inputs as follows, as illustrated in [Figure 4](#) below.



**Figure 4 AvediaStream e3550 Encoder Rear Panel**

### SDI Interface (IN)

The SDI interface supports SMPTE 259M (270MB/s SD-SDI) and SMPTE 292M (1.485Gbit/s HD-SDI). Connect an SD-SDI or HD-SDI input using a BNC connector.

The following resolutions and frame rates are supported:

- 525i 59.94Hz
- 625i 50Hz
- 720p 50Hz/59.94Hz/60Hz
- 1080i 50Hz/59.94Hz/60Hz
- 1080p 23.98Hz/24Hz

### LEDs

The LEDs provide status on the SDI input as follows:

- Green: an SDI input has been detected.
- Red: data errors have been detected on the SDI input.

### SDI Interface (OUT)

The SDI (OUT) interface is a loop-through interface to enable you to connect the same SDI input to another device.

Connect using a BNC connector.

This output is disabled by default, and can be configured via the web interface "Input" page.

---

**Warning!** Do not connect the output interface to any other output interface as this may damage the unit.

---

### Audio Inputs

- Embedded SDI stereo audio (stereo pair selectable from one of 8 pairs embedded within the SDI video stream)
- Single female XLR for AES digital audio (PCM 48kHz or compressed AC-3)

This allows the user to encode audio from the SDI interface or to use the AES interface as the audio source.

---

**Note:** The BNC interface is marked with ASI/SDI as this interface is common to the SDI Encoder and ASI Gateway. The interface is committed to SDI or ASI in the factory and cannot have its function changed in the field.

---

## 3 Management Interfaces

The encoder has three management interfaces, as follows:

- IPTV Manager
- Web Management Interface
- Admin Interface

---

**Note:** Each encoding module in a chassis is required to be configured independently.

---

### IPTV Manager

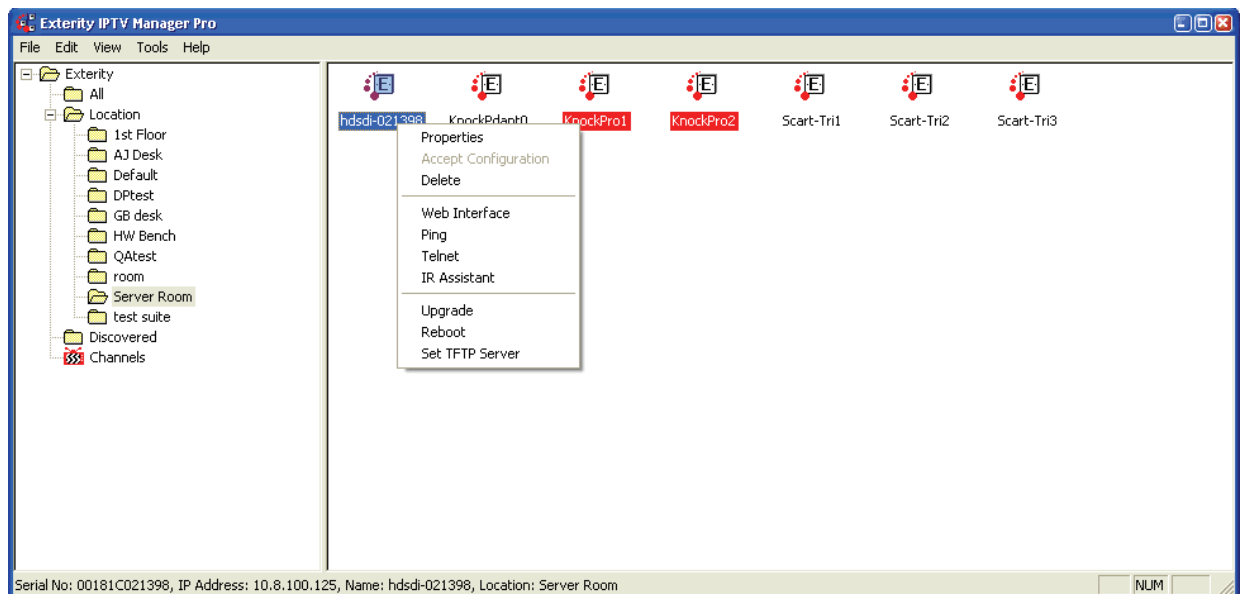
The IPTV Manager is a Windows application that discovers Exterity devices on the network and uses SNMP to manage a subset of device functionality. It can also be used to start the encoder's Web Management Interface, as shown in [Figure 5](#) below.

---

**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 information on using the IPTV Manager, see the *Exterity IPTV Manager Administrator's Guide*.



**Figure 5 Exterity IPTV Manager**

## Web Management Interface

You can manage every aspect of the encoder's functionality using the Web Management Interface.

The Web Management Interface supports the following web browsers: Microsoft Internet Explorer and Mozilla Firefox.

You can display the Web Management Interface using the IPTV Manager, as shown in [IPTV Manager](#) on page [19](#), or by typing the IP address of the encoder directly into your browser.

### Open the Web Management Interface as follows:

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

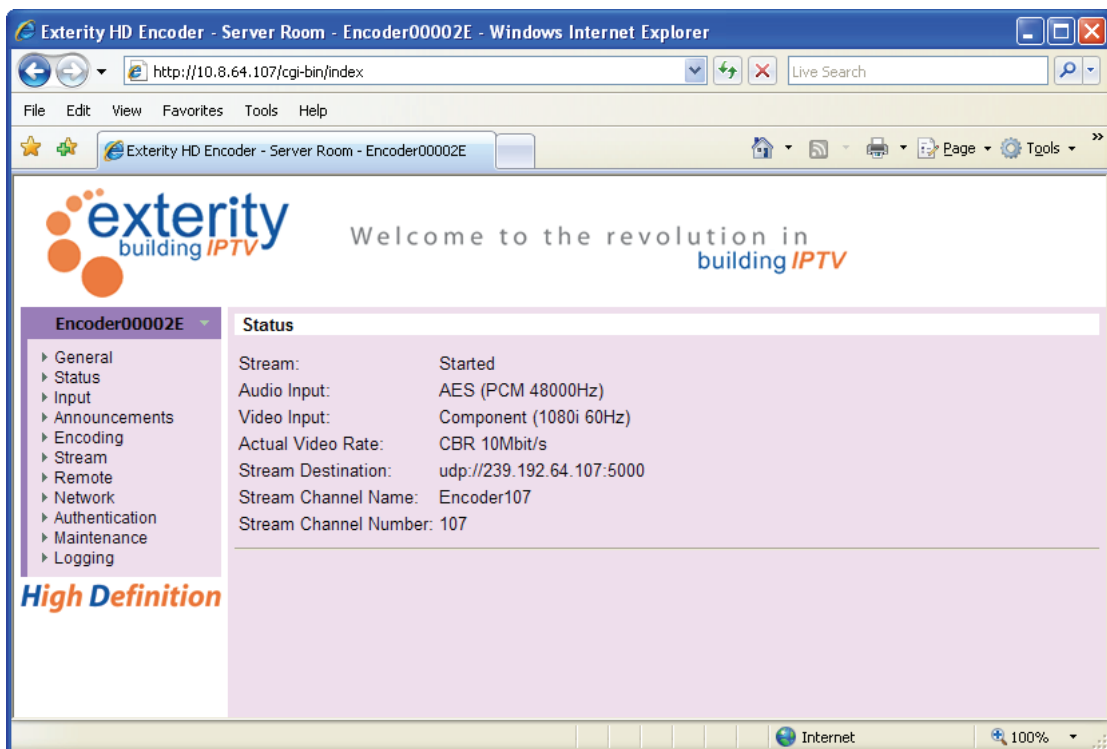
**Username:** admin  
**Password:** labrador

---

**Note:** The administrator can change the admin password using the Web Management Interface. For more information, see [Configuring the Encoder using the Admin Interface](#) on page [34](#).

---

2. The Web Management Interface opens in your browser, as shown below in [Figure 6](#):



**Figure 6** Web Management Interface displaying an AvediaStream e3520 encoder

3. Click on the encoder name in the purple bar on the left-hand side to display the menu. In the above example, it is **Encoder00002E**.
4. Navigate through the pages, changing settings as appropriate.
5. Click **Apply** on each page to save your changes.

**Note:** For more information on how to use the Web Management Interface to configure the encoder, see [Configuring the Encoder](#) on page [22](#).

---

## Admin Interface

In certain circumstances it may not be possible to manage an encoder via the Web Management Interface. For these situations, a text-based Admin Interface is provided, which is available via the serial interface (marked 'admin' on the chassis front panel) or via telnet.

For more information on how to use the Admin Interface, see [Configuring the Encoder using the Admin Interface](#) on page [34](#).

## 4 Configuring the Encoder

This section of the manual describes how to manage the encoder using the Web Management Interface (see [Web Management Interface](#) on page 20).

---

**Note:** When making changes using the Web Management Interface, click **Apply** to save your changes on each tab before moving to another tab, otherwise your changes will be lost.

---

### Naming the Encoder

The encoder can be assigned a name and location. This name can be used to identify the encoder within the IPTV Manager, while the location you specify is used by the IPTV Manager to organise devices, such as encoders, into folders. For example, if you specify **Group 1**, the encoder appears in `Location\Group 1` in the IPTV Manager.

**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.

---

### Changing the Admin Password

By default, a username/password pair of **admin/labrador** is required to gain access to the Web Management Interface and the Admin Interface. The admin password can be changed by the administrator, as required.

**To change the admin password:**

1. Click on the **Authentication** tab
2. Enter the desired password in both **Password** boxes
3. Click **Apply**

### Configuring Network Settings

#### Configuring IP address settings

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

---

**Note:** Changes to IP addressing take place immediately on clicking Apply.

---

**To configure the device to be allocated an IP address automatically:**

1. Click on the **Network** tab
2. Click **Obtain an IP Address automatically**
3. Click **Apply**

**To configure a static IP address:**

1. Click on the **Network** tab
2. Click **Use the properties below**
3. Specify values for **IP Address, Subnet Mask, Default Gateway, DNS**
4. Click **Apply**

**Configuring Ethernet Settings**

The encoder's Ethernet interface is a 10/100 port with auto-negotiation enabled by default. It is possible to disable auto-negotiation and run the interface with fixed settings of 100Mbps full duplex (100FD).

---

**Note:** In order to avoid Ethernet errors, ensure that the encoder's interface settings match the settings for the network switch port the encoder is connected to. This means that both devices should be configured for auto-negotiation, or both devices should be configured for a fixed setting of 100FD.

---

**To enable/disable auto-negotiation:**

1. Click on the **Network** tab
2. Choose an option from the **Auto-negotiation** drop-down box
3. Click **Apply**

**Configuring Audio/Video Input (e3520 only)****Video format**

If connecting an HD video source, there is no configuration necessary.

If connecting an SD video source, it is necessary to configure the type of video being input to the encoder. Valid options are **Composite** and **Component**, with the default setting being **Composite**. For SD, ensure that the video source is configured in 4:3 mode.

**To specify the SD video format:**

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

**Frame Rate**

The e3520 can handle sources with frame rates of 50Hz, 59.94Hz and 60Hz.

A frame rate of 50Hz is detected automatically and no configuration is required. However, the encoder cannot automatically distinguish between 59.94Hz and 60Hz, therefore the frame rate must be configured by the administrator if such a source is connected. The default setting is 59.94Hz.

**To specify frame rate:**

1. Click on the **Input** tab
2. Choose an option from the **24/60Hz Frame Rate** box
3. Click **Apply**

## Audio input

There are three options available when connecting audio to the encoder: **Balanced**, **Unbalanced** and **AES**. The default setting is **Unbalanced**. See [AvediaStream e3520 Interface](#) on page [15](#) for details on audio connections.

### To specify the audio input:

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

## Configuring Audio/Video Input (e3550 only)

### Frame Rate

The e3550 can handle sources with frame rates of 50Hz, 59.94Hz, 60Hz, 23.98Hz and 24Hz.

Usually the encoder will automatically detect the frame rate and no configuration is required. However, under certain circumstances the encoder may not be able to distinguish between 59.94Hz and 60Hz or between 23.98Hz and 24Hz. In this situation the frame rate can be configured by the administrator. The default setting is Automatic.

### To specify frame rate:

1. Click on the **Input** tab
2. Choose an option from the **24/60Hz Frame Rate** box
3. Click **Apply**

## Audio input

There are three options available when connecting audio to the encoder: **AES**, **Embedded** and **Embedded AC-3**. The default setting is **Embedded**. See [AvediaStream e3550 Interface](#) on page [17](#) for details on audio connections.

### To specify the audio input:

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

## SDI audio group

When using embedded audio, select from one of four possible groups.

### To specify the audio group:

1. Click on the **Input** tab
2. Choose an option from the **Audio Group** box
3. Click **Apply**

## SDI audio channel

When using embedded audio, within one group there are four channels. It is possible to select two different pairs, 1&2 or 3&4. These will often be a stereo pair but need not be.

### To specify the audio channel:

1. Click on the **Input** tab
2. Choose an option from the **Audio Channel** box
3. Click **Apply**



## SDI loop-through

There are two options available when connecting the encoder to another device: **Loop-through**, connecting using a direct wire connection, and **Re-clocked loop-through**, connecting using a re-timed connection. The default setting is **Disabled**.

### To specify the SDI loop-through:

1. Click on the **Input** tab
2. Choose an option from the **SDI Loop-through** box
3. Click **Apply**

## Configuring Stream Properties

### Specifying the transport protocol

The encoder transmits its stream as an MPEG 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**

### Changing the 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, you can change the destination address to a unicast or multicast address, as required.

---

**Note:** In order to avoid unnecessary network traffic, please ensure that the encoder is attached to a multicast-enabled network

---

### 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:

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 0. 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**

## Stream null packets

Null packets can be produced during the encoding process, and allow the generated transport stream to maintain a strict constant bit-rate. Null packets are used for padding only, and their contents are ignored by receivers. This option is enabled by default.

### To specify the Stream Null Packets setting:

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

## Stream control

As discussed above, the encoder will automatically start streaming on start-up if the **Stream On Boot** function is enabled. However it is possible to start and stop the stream manually as required.

You can check the current streaming status on both the **Status** and **Stream** pages.

### To stop or start the stream:

1. Click on the **Stream** tab
2. Click the **Start** or **Stop** button as required

## Configuring Encoding Options

The encoder has a number of encoding options which can be configured for both video and audio.

### Configuring video encoding

The device encodes the analogue video in H.264 format. The video can be encoded at **constant** bit rate (CBR) or **variable** bit rate (VBR). For a CBR stream, the encoding bit rate can be configured. For VBR, the maximum and average encoding bit rates can be configured.

It is possible that the configured bit rate may not be the bit rate used for the encoding, as the encoder has minimum and maximum limits based on the resolution of the connected video source. To see the actual encoding bit rate, look at the **Status** page.

The default setting is constant bit rate at 20Mbps.

For best picture quality, use constant bit rate with as high an encoding bit rate as possible.

### To specify the video bit rate mode:

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

### Configuring audio encoding

The audio input to the encoder is sampled at 48kHz and encoded as MPEG 1 Layer II. The bit rate can be set to values from 64kbps to 384kbps. The default setting is 384kbps.

---

**Note:** If the audio source is AES compressed (AC-3) or embedded AC-3, the audio bit rate setting is irrelevant. The audio bit rate is simply the original bit rate of the AC-3 source.

---

**To specify the audio bit rate:**

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

## Configuring Channel Announcements

The encoder uses SAP (Session Announcement Protocol) to announce its stream (channel) to receiving devices. This occurs every 30 seconds. The information in the announcements enables client (receiver) devices to attach to the stream. Included in the announcements are the name of the channel and the multicast address and port on which the stream is sent. SAP channel announcements are sent to multicast address 239.255.255.255, port 9875.

The following options allow some additional information to be put into the announcements.

### Turning on/off channel announcements

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**

### Specifying the channel name

This is the currently configured channel (or encoder) name and is configured in the Channel Name field on the **Announcements** page.

The default channel name is unique to each unit.

The format of the channel name is as follows: <Encoder type><last 6 digits of MAC address>

For example, Exterity HD-SDI 021391.

This unique name is also displayed on the Status page, in the 'Stream Channel Name' field.

**To specify the channel name:**

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

## Specifying the 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**

## Configuring groups

The available channels across a network of Exterity devices can be split into groups e.g. *Sport, Children, Adult*, 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 encoder into one or more specific groups.

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

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

### To remove the encoder 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**

## Configuring Remote Device Control

---

**Note:** This feature is not available for AvediaStream e3550.

---

### Infra-red control of AV Source

The encoder has the ability to send infra-red (IR) 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. In order to use the infra-red (IR) 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.

This IR functionality is illustrated below. In this example, the remote control handset could be used to play/pause/stop the DVD player.

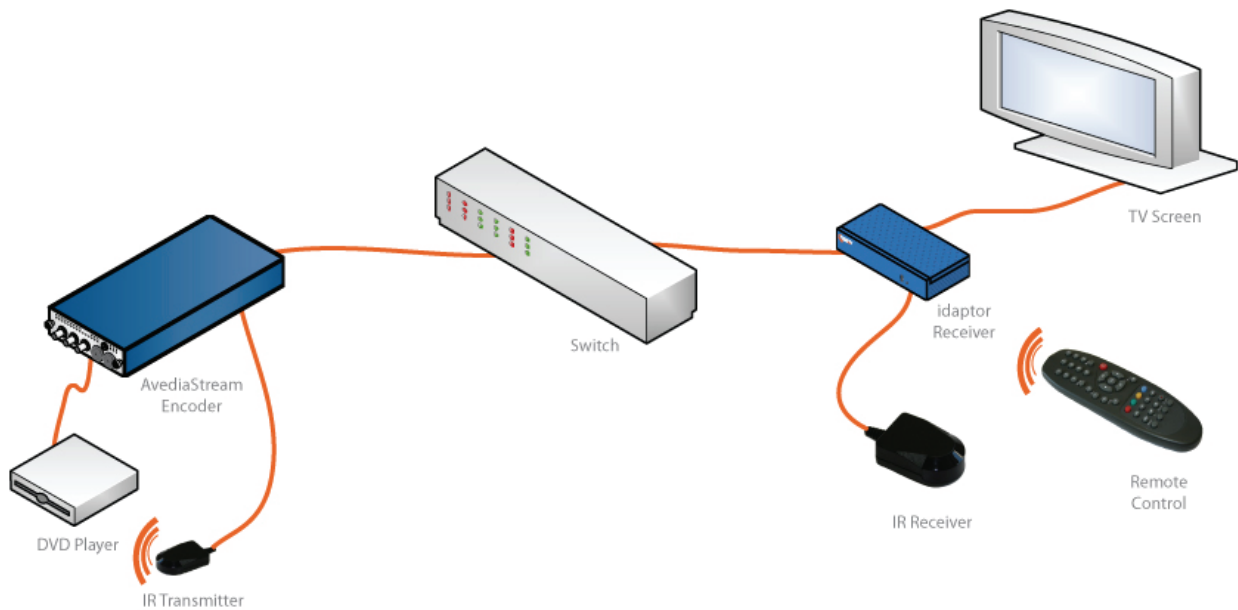


Figure 7 IR Control of AV Source

## Downloading an IR configuration file

### To download an IR configuration file:

1. The device uses TFTP to download new remote control configuration files from a TFTP server. To update the configuration 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/sony/dvd/sony_dvd_1.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.

## Configuring the 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 **Remote** tab
2. Enter 0.0.0.0 in the **Master IR Client Address** box
3. Click **Apply**

## Maintenance Tasks

This section describes the following tasks that can be used to maintain the encoder.

### Setting the TFTP server

The device uses TFTP to download new firmware releases and remote control configuration files. For this to operate correctly, the encoder must be configured with the IP address of the TFTP server on the network.

#### To specify a TFTP server IP address:

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

### Specifying a 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

Click **Apply**

### Restarting the encoder

You can restart the encoder at any time.

#### To restart the encoder:

1. Click on the **Maintenance** tab
2. 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 encoder software.

---

**WARNING:** Do not switch the encoder off while the upgrade process is running. The process takes several minutes, during which time the LED flashes alternately slow and fast.

---

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

1. Ensure that the TFTP server is running.
2. Ensure that the `hd_encoder_full.srec` firmware file (e3520 and e3550) is hosted correctly in the root directory of the TFTP server.
3. Click on the **Maintenance** page.
4. Ensure that the TFTP server address is configured correctly (see [Setting the TFTP server](#) on page 31)
5. Ensure that the **Firmware filename** is configured correctly and matches the name of the firmware file (by default `hd_encoder_full.srec`).
6. Click **Upgrade Firmware**

The firmware is downloaded from the TFTP server and copied to flash. This process will take several minutes.

## Restoring the encoder to factory default settings

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 in [Exporting/importing configuration settings](#) on page [32](#).

---

### To restore the encoder factory default settings:

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

## Exporting/importing configuration settings

Once you have configured the receiver, 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 [Setting the TFTP server](#) on page [31](#))
4. Enter a name for your configuration archive in the **Export filename** box
5. Click **Export configuration**  
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. Click on the **Maintenance** page
3. Ensure that the TFTP server address is configured correctly (see [Setting the TFTP server](#) on page [31](#)).
4. Enter the name of the configuration archive that you are using in the **Import Filename** box
5. Click **Import configuration**  
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.

### Viewing the local log file

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

The log file is displayed in the browser window.

### Configuring remote logging

To save device log information to a remote server, you need to install a syslog server, such as the Kiwi Enterprises Syslog Daemon.

#### 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 (default value is 514)
5. For **Logging level**, select an option ranging from **0-Emergency** to **7-Debug** (0 represents the least debug information and 7 represents the most)
6. Click **Apply**

## 5 Configuring the Encoder using the Admin Interface

In certain circumstances it may not be possible to manage an encoder via the Web Management Interface. For these situations, a text-based Admin Interface is provided, which is available via the serial interface (marked 'admin' on the chassis front panel) or via telnet.

See [APPENDIX A](#) for details of how to connect to the serial admin port.

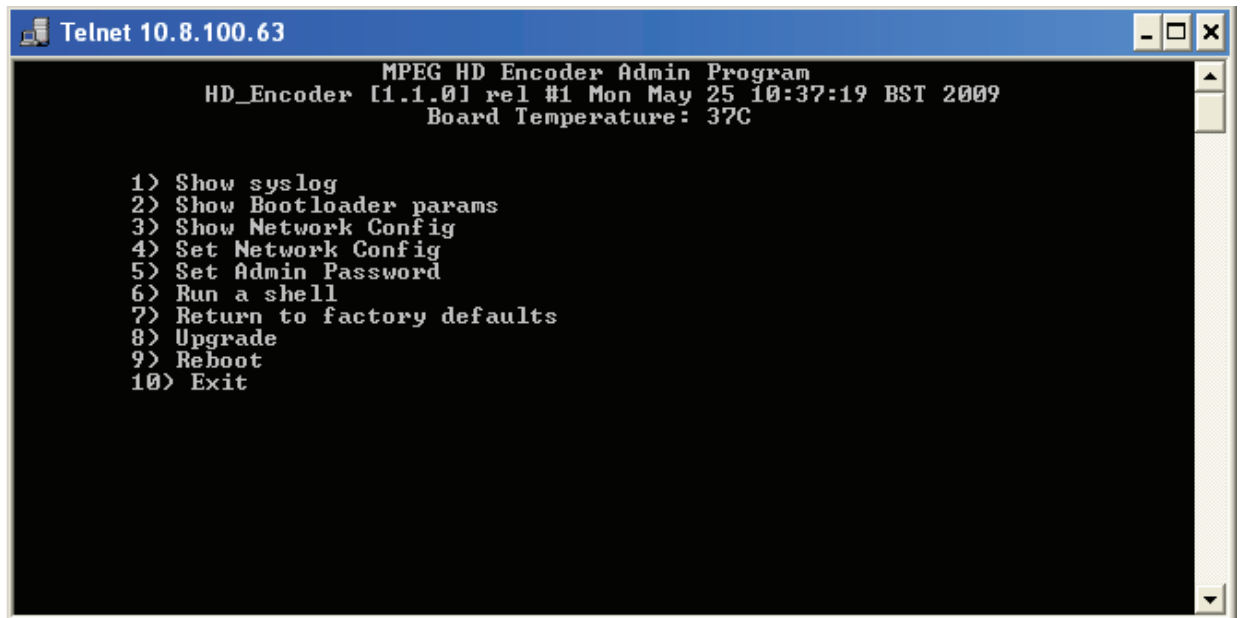
### Using the Admin Interface

Once connected, log in using the following details:

**Username:** admin

**Password:** labrador (default admin password for the Web Management Interface)

When successfully logged in, the Admin Interface Main Page is displayed, as shown below:



```
Telnet 10.8.100.63
MPEG HD Encoder Admin Program
HD_Encoder [1.1.0] rel #1 Mon May 25 10:37:19 BST 2009
Board Temperature: 37C

1) Show syslog
2) Show Bootloader params
3) Show Network Config
4) Set Network Config
5) Set Admin Password
6) Run a shell
7) Return to factory defaults
8) Upgrade
9) Reboot
10) Exit
```

Figure 8 Admin Interface Main Page

The following options are provided:

**1) Show syslog**

This displays the device log file.

**2) Show Bootloader params**

This page displays the internal configuration used by the bootloader.

**3) Show Network Config**

This page displays the IP addressing information of the device.

**4) Set Network Config**

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

**5) Set Admin Password**

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

**6) Run a shell**

This allows the administrator to run a shell as admin.

**7) Return to factory defaults**

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

**8) Upgrade**

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

**9) Reboot**

Reboots the device.

**9) Exit**

Exits the Admin Interface Main Page.

## 6 Status Monitoring

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

### Viewing Encoder Details

To view details about the encoder, select the **General** page using the Web Management Interface.

The **General** page is displayed, as shown below:

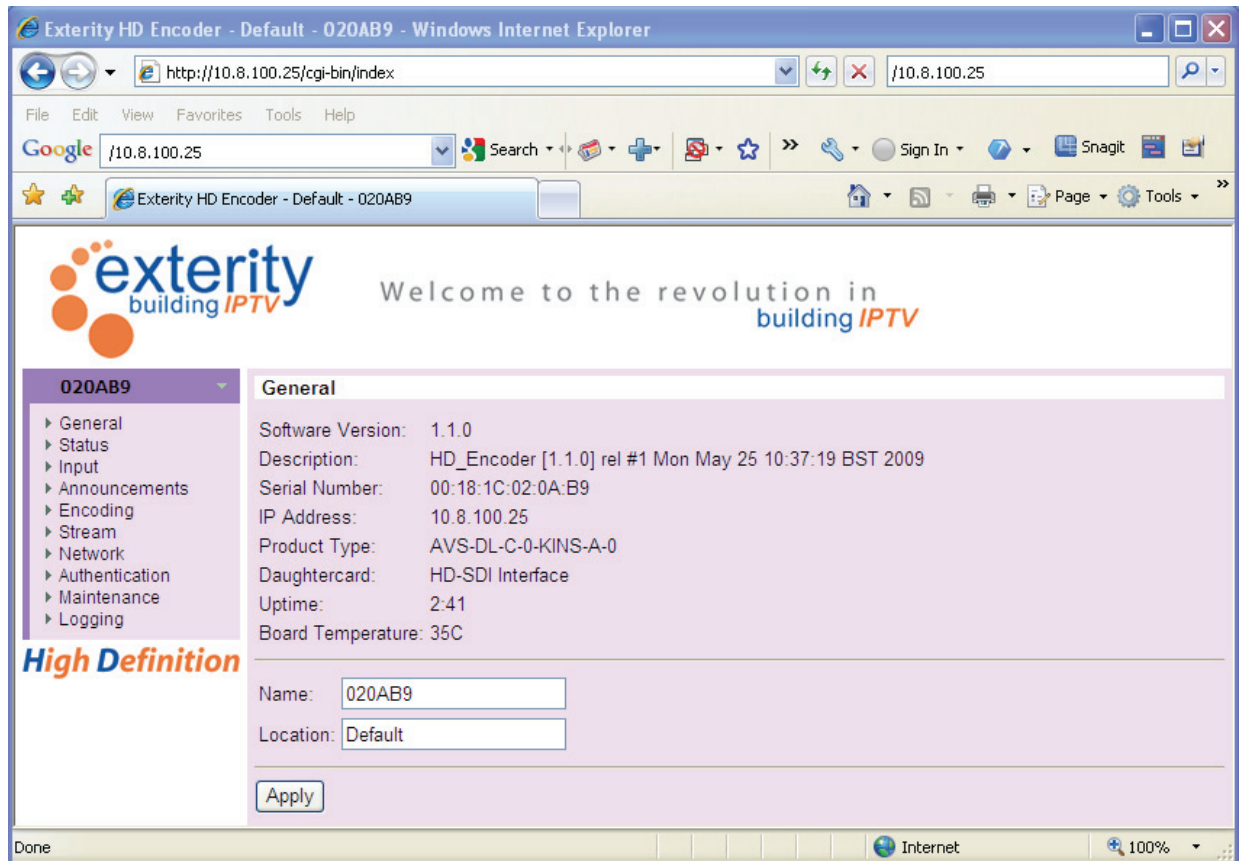


Figure 9 Web Manager Interface General Page

The following information is displayed on the **General** page:

#### Software Version

The current software version running on the device.

#### Description

A unique string identifying this particular software version.

#### Serial Number

The MAC address of the device.

## IP Address

The IP address in use on the device, either configured statically or assigned by DHCP.

## Product Type

Identifies the exact type of hardware in use on the unit.

## Daughtercard

Indicates which interface type is on this device.

## Uptime

The length of time since the last power-on or reboot.

## Board Temperature

The temperature of the board in the chassis.

---

**Note:** This information is useful for 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.

---

## Viewing Operating Status

To view details of the operating status of the encoder, select the **Status** page using the Web Management Interface.

The **Status** page is displayed, as shown below:

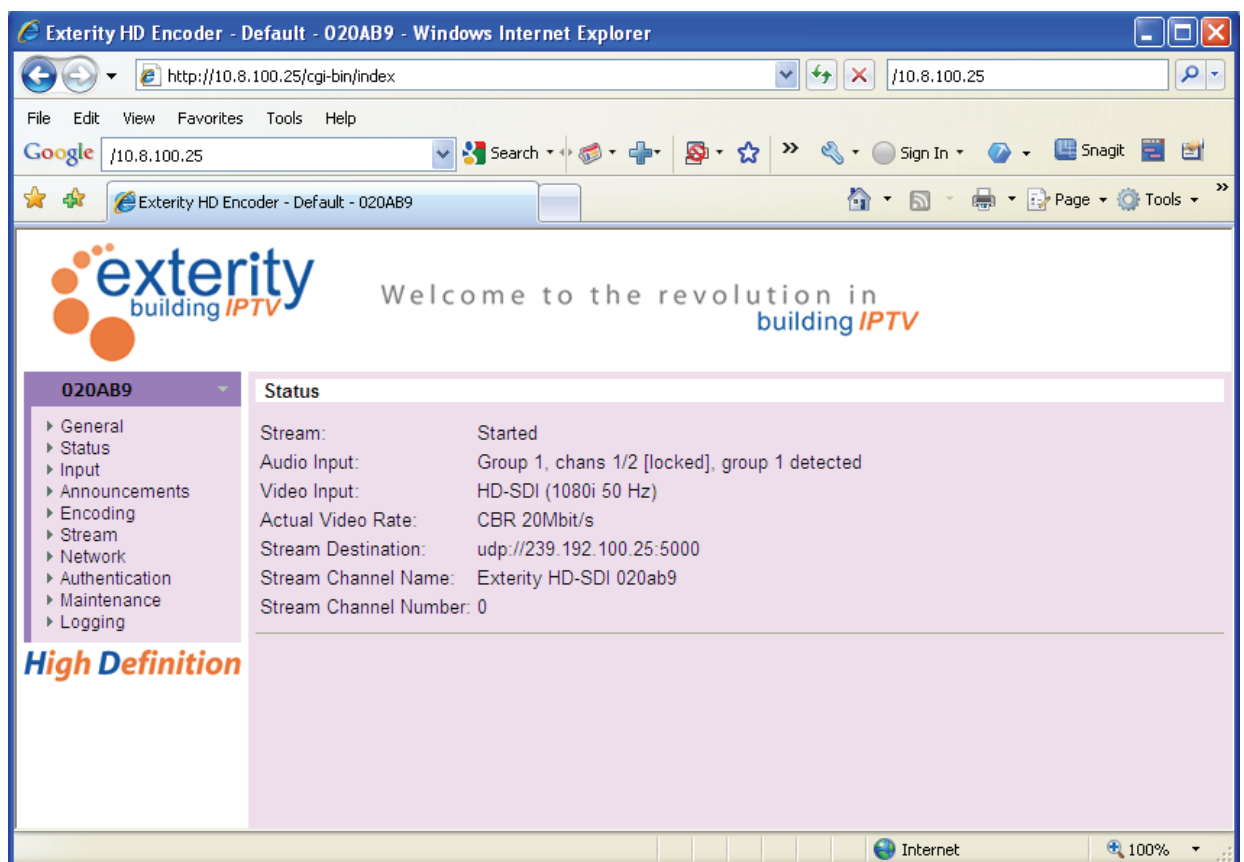


Figure 10 Web Manager Interface Status Page

The following information is displayed on the **Status** page:

**Stream**

Provides information on the status of the stream, as described in the table below:

<b>Status</b>	<b>Description</b>
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.

**Table 3 Stream Status**

**Audio/Video Input (e3520 only)**

**Audio Input**

Displays the currently configured audio input type, as configured on the **Input** page. This will be one of:

- Balanced
- Unbalanced
- AES

If using AES audio, the type of audio detected is also specified here. This will be one of:

- PCM 48000Hz (i.e. uncompressed digital audio. Other sampling rates may be reported but only 48000Hz is supported)
- Bitstream (i.e. compressed digital audio. AC-3 is the only type supported)

**Video Input**

Describes the input video the encoder has configured/detected. Three items are reported here:

- Format: Component (HD) or Component/Composite (SD), as configured in the **Input** page for the detected resolution.
- Detected resolution: 525i, 625i, 720p or 1080i
- Detected frame rate: 50Hz, 59.94Hz or 60Hz

See [AvediaStream e3520 Interface](#) on page [15](#) for a list of valid combinations of resolution and frame rate.

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

**Audio/Video Input (e3550 only)**

**Audio Input**

This is a textual output indicating the configured audio input and what has been detected.

If the unit is configured for **embedded audio**, the following information is displayed:

- Configured group (group 1, 2, 3 or 4 as configured on the **Input** page).
- Configured channels (channels 1/2 or 3/4 as configured on the **Input** page).

- Lock indicator ([locked] or [no lock] indicates if audio has been detected on the configured group and channels).
- Detected groups (any combination of groups 1 – 4) or the message “no audio detected”.

A sample output could be as follows:

```
Audio Input: Group 1, chans 1/2 [locked], groups 1,2,3,4 detected
```

If the unit is configured for **AES**, the information displayed will be one of the following:

- PCM 48000Hz (i.e. uncompressed digital audio. Other sampling rates may be reported but only 48000Hz is supported)
- Bitstream (i.e. compressed digital audio. AC-3 is the only type supported)

### Video Input

Describes the input video the encoder has detected. The items reported here are:

- SDI standard: SD-SDI or HD-SDI
- Resolution: 525i, 625i, 720p, 1080i or 1080p
- Frame rate: 23.98Hz, 24Hz, 50Hz, 59.94Hz or 60Hz

See [AvediaStream e3550 Interface](#) on page [17](#) for a list of valid combinations of resolution and frame rate.

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

### Actual Video Rate

Displays the Actual Video Rate, which is determined by the input/source present and the Video Bit Rate configured on the Encoding page.

The encoder uses a range of video rates, depending on the input/source that is present:

- SD sources have an allowable range of 2 to 10Mbits/s
- A 720p source has an allowable range of 4 to 20Mbits/s
- A 1080i source has an allowable range of 6 to 20Mbits/s
- A 1080p source has an allowable range of 6 to 20Mbits/s (e3550 only)

For example, if the Video Bit Rate is configured to 20Mbps but an SD source is connected, the actual video bit rate will be 10 Mbits/s.

### Stream Destination

Displays the URI of the stream, including the multicast address and port, as configured on the **Stream** page.

### Stream Channel Name

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

### Stream Channel Number

Displays the currently configured channel number, as configured on the **Announcements** page.

## Viewing 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 details of network port utilisation, select the **Network** page using the Web Management Interface.

The **Network** page is displayed, as shown below:

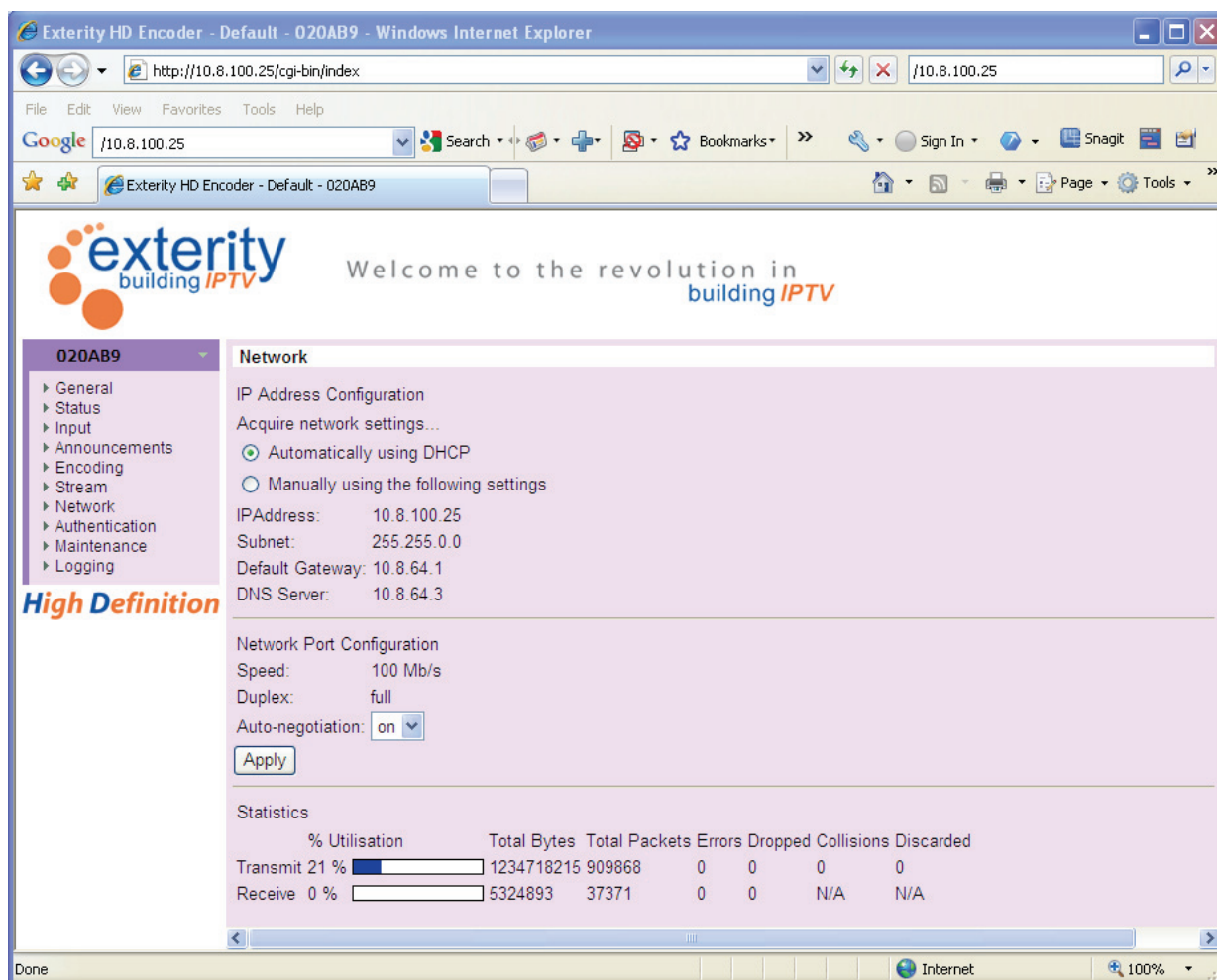
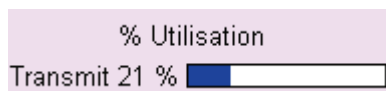


Figure 11 Web Manager Interface Status Page

The Ethernet interface statistics are shown at the bottom of the page. On the Transmit side, the % Utilisation should approximately match the "Actual Video Rate" specified on the **Status** page.



should approximately match:

Actual Video Rate: CBR 20Mbit/s

You would normally expect to see very little traffic on the Receive side.



## 7 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	Network connection faulty	See above
	Device has an IP address on a different subnet to the management station	Use a management station configured with an appropriate IP address to manage the 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 input setting wrong (SD mode).	Check the video input setting matches the AV input to the encoder.
	The cabling is incorrect e.g. the Y cable is not attached to the Y BNC	Check cabling.
Device is definitely streaming but client cannot connect to stream	Multicast address is not unique	Particularly if the multicast address was assigned manually, check it is unique.
	Client cannot accept H.264	Update the client software or use a different client to view the 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 errors
	The streaming bit rate exceeds the capability of the client	Lower the encoding bit rate.

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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 address of the machine the TFTP Server is running on.
	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.
Board temperature more than 20 degrees centigrade above ambient temperature	Air vents are blocked.	Check that air vents are not blocked.
	Fans have stopped running.	Check that fans are running.
	None of the above.	If the problem persists, switch off the unit and contact your Exterity systems integrator or reseller.

# 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 DB-9 – RJ45 adaptor supplied by Exterity (shown in [Figure 12](#)).



Figure 12 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 13](#) and [Table 4](#).

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

Table 4 Serial Pin Out

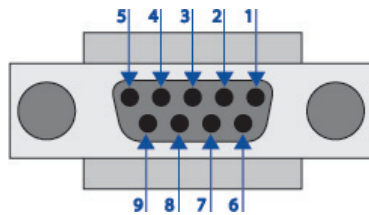


Figure 13 DB-9 connector

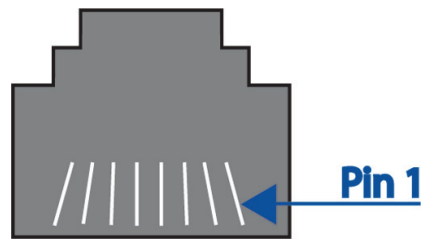


Figure 14 RJ45 socket

## 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 15](#)):

- 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.

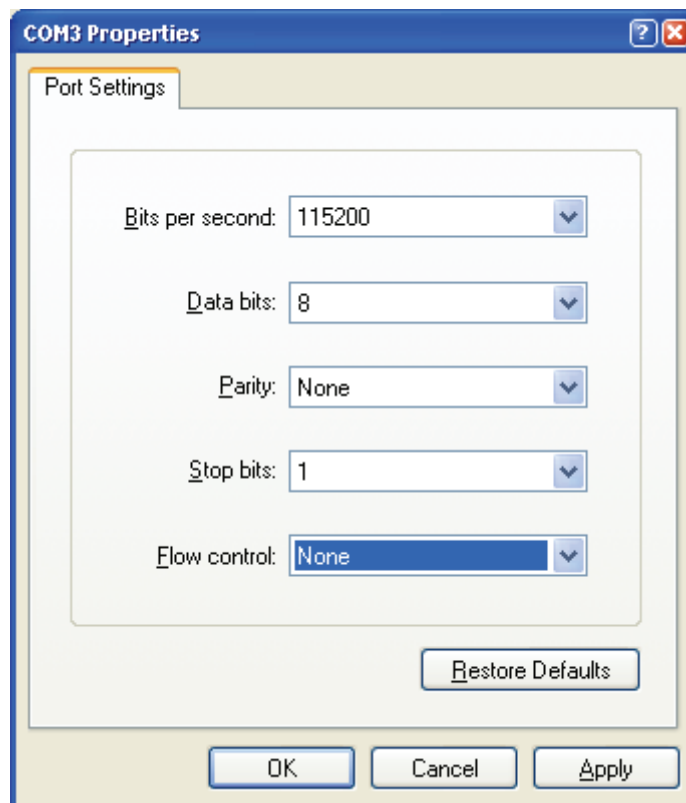


Figure 15 Serial port settings

## **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.