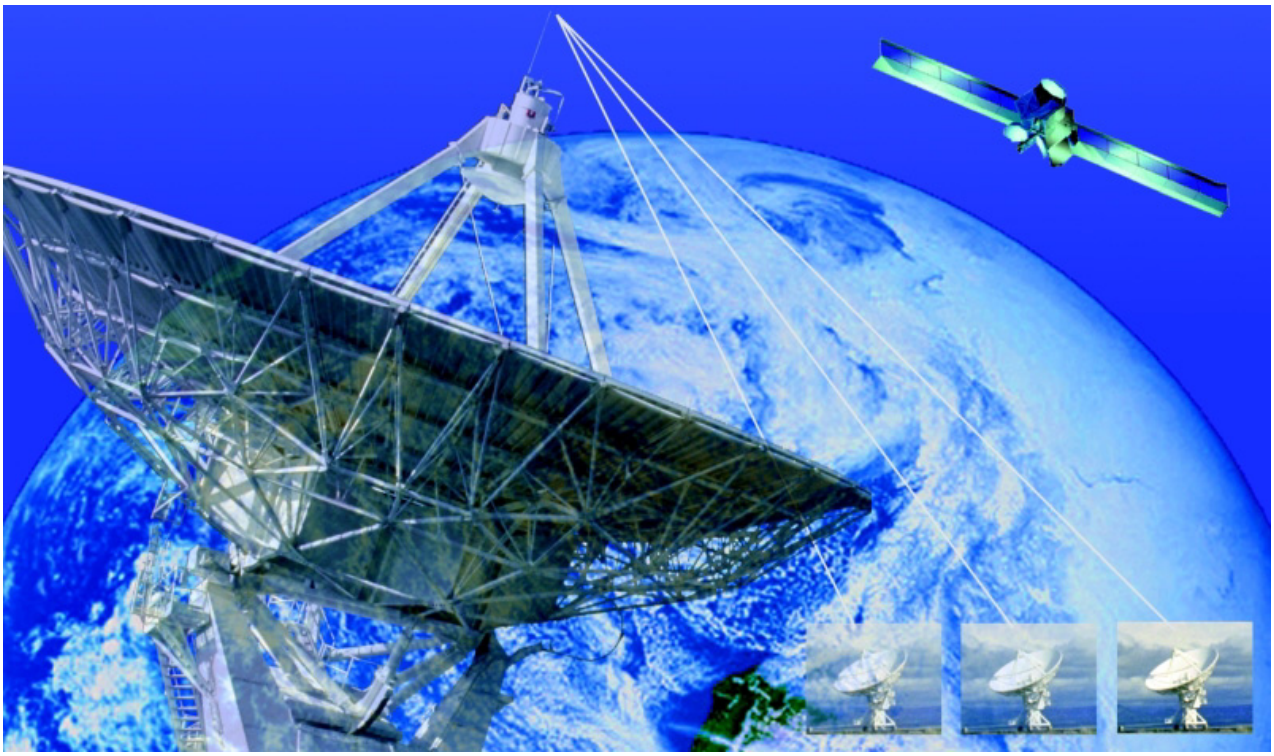
SE-6301, SE-6301R, SE-6401, SE-6401R, SE-6501, SE6501A, SE-6501R, SE-6601, SE-6601A, SE-6601R MPEG-4 AVC Product Manual

Version 1.0



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LIMITED WARRANTY

SE-6301, SE-6301R, SE-6401, SE-6401R, SE-6501, SE6501A, SE-6501R, SE-6601, SE-6601A, SE-6601R MPEG-4 AVC

To Original Commercial Purchaser

General Instrument Corporation doing business as the Home and Networks Mobility Sector of Motorola, Inc. hereby warrants only to the original commercial purchaser of SE-6301, SE-6301R, SE-6401, SE-6401R, SE-6501, SE6501A, SE-6501R, SE-6601, SE-6601A, SE-6601R MPEG-4 AVC(s) (“Encoder”) (“You”), that such Encoder and the media upon which any software is furnished in connection with the Encoder shall be free from defects in material and workmanship for a period of twelve (12) months commencing from date of shipment for commercial use.

The warranties set above shall not apply (i) to any Encoder or media subjected to accident, misuse, neglect, alteration, improper handling, improper transport, improper storage, improper use or application, improper installation, improper testing or unauthorized repair, or (ii) to cosmetic problems or defects which result from normal wear and tear under ordinary use, and do not affect the performance or use of the Encoder or media.

During the term of the Warranty Period, Motorola’s sole and exclusive liability will be, at its expense, to either repair or replace any nonconforming Equipment returned to Motorola. A replacement unit need not be new. Equipment returned for repairs shall be packed securely by You and shall be shipped prepaid, together with a statement setting forth the claimed defect, to Motorola’s designated repair facility. Motorola shall prepay and bear the cost of freight for shipments to You of repaired or replaced Encoders.

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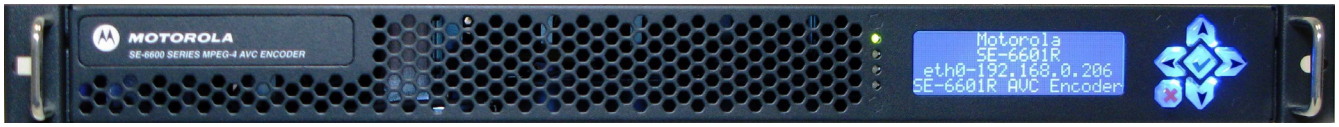
Introduction



This product manual provides instructions and reference information for the proper installation and operation of the Motorola SE-6x01X.

Note: *As shown in Table 1: Encoder Features where x = 3,4 5,or 6 and X = R or A.*

Encoders Features

The following features are associated with the specific encoders listed.

Table 1: Encoder Features

Description	SE-6301	SE-6301R	SE-6401	SE-6401R	SE-6501	SE-6501A	SE-6501R	SE-6601	SE-6601A	SE-6601R
Inputs										
SDI/HD-SDI/3G-SDI/Dual	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.
IP	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.
ASI	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.
ATSC RF		Std.		Std.			Std.			Std.
Outputs										
IP	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.
ASI						Std.			Std.	
Features										
PIP	Opt.	Opt.	Opt.	Opt.	Std.	Std.	Std.	Std.	Std.	Std.
CFCBR	Opt.	Opt.	Opt.	Opt.	Std.	Std.	Std.	Std.	Std.	Std.
STATMUX					Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
HD to SD	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
AVCDEC	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
Audio										

Table 1: Encoder Features

Description	SE-6301	SE-6301R	SE-6401	SE-6401R	SE-6501	SE-6501A	SE-6501R	SE-6601	SE-6601A	SE-6601R
MP2 enc	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
AC-3 pass through	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.
HE-AAC/LC-AAC	Opt.	Opt.	Opt.	Opt.	Std.	Std.	Std.	Std.	Std.	Std.
DD2	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
DD+	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
AC3 to AAC	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
AC3 to DD+	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.

Feature Definitions

The features available for the encoders are defined as follows.

Table 2: Encoder Features

	Description
Inputs	SDI/HD-SDI/3G-SDI/Dual: Serial Digital Baseband inputs. 3G-SDI and Dual for 1080P support
	IP – for MPEG-2 compressed transport stream inputs
	ASI – Asynchronous serial input for compressed MPEG-2 transport streams
	ATSC RF – for direct reception of ATSC off air feeds
Outputs	IP- MPEG-2 over UDP transport stream outputs
	ASI -MPEG-2 over ASI transport stream outputs
Features	
PIP	Low res proxy (PIP)
CFCBR	Constrained Fidelity CBR (capped VBR feature)
STATMUX	StatmuxIP mode
HD to SD	1080i/29.97 or 720P59.94 to 480i down conversion
AVCDEC	Decode AVC inputs
MP2 enc	MPEG-2 encode
AC-3 pass through	Dolby Digital pass through – Pass through compressed Dolby Digital streams
HE-AAC/LC-AAC	HE-AAC/LC-AAC stereo encoding ***Note:*** *AAC is now being rebranded by Dolby as Dolby Digital Pulse*
DD2	Dolby Digital 2.0 encode from baseband inputs
DD+	Dolby Digital Plus Pro stereo encode from baseband inputs
AC3 to AAC	Dolby Digital transcode to AAC (Dolby Digital Pulse). 5.1 surround and stereo 2.0
AC3 to DD+	Dolby Digital transcode to Dolby Digital Plus Pro. 5.1 surround and stereo 2.0

This chapter has the following topics.

Using This Manual

The following lists the contents of each chapter and appendix.

Table 3: Guide Conventions

Chapter / Appendix	Description
Chapter 1 on page 1	The Introduction describes the SE-6x Series encoder encoders and their functions.
Chapter 2 on page 13	The encoder Installation outlines procedures for the proper installation.
Chapter 3 on page 21	The encoder Configuration provides step-by-step instructions on how to start and configure the SE-6x Series encoder multi-format AVC encoder.
Chapter 4 on page 27	The Menu Orientation and Operation describes the user interfaces and operational controls of the SE-6x Series encoder.
Chapter 5 on page 103	The Maintenance and Troubleshooting provides information on maintaining the SE-6x Series encoder functionality and troubleshooting.
Appendix A on page 107	This appendix provides encoder specifications.
Appendix B on page 111	This appendix provides encoder defaults.
Appendix C on page 115	This appendix provides a list of common terms used in this guide.

Assistance

If You Need Help

To get assistance with your Motorola product or solution, or to access learning materials, use one of the following channels:

Technical Assistance Center (TAC) provides access to technicians 24 hours a day, 7 days a week for all products. Contact the TAC at 888-944-HELP (888-944-4357) or dial direct 847-725-4011.

Motorola Online (MOL) provides technical documentation and low-priority issue creation and tracking at http://businessonline.motorola.com (PON and BSR users see Extranet Support below).

Digital Configuration Management provides access to software downloads and release notes. Or you can order from our digital configuration management servers by going to http://digitalcm.motorola.com (PON users see Extranet Support below).

Learning Portal provides self-paced product training and course descriptions of instructor-led training classes at www.motorolatraining.com. In many cases training can be given at your location.

Extranet Support provides access to technical publications for **PON (FTTx)** users at http://compass.motorola.com/go/ftth site; and software downloads and technical publications for **BSR** users at http://bsr.motorola.com.

Table 4: Assistance Telephone Numbers

Country	International Toll-free number	Country	International Toll-free number
Belgium	800-72-163	Luxembourg	0-800-2-5310
Denmark	80-88-6748	Netherlands-Holland	0-800-022-0176
Finland	0-800-114-263	Norway	800-15-670
France	0-800-90-7038	Poland	00-800-111-3671
Germany	0-8001873019	Portugal	800-81-3461
Hungary	06-800-18164	Spain	900-99-1771
Ireland	1-800-55-9871	Sweden	020-79-0241
Israel-Barak	1-80-931-5435	Switzerland	0-800-561-872

Table 4: Assistance Telephone Numbers

Country	International Toll-free number	Country	International Toll-free number
Israel-Bezeq	1-80-942-9181	United Kingdom	0-800-404-8439
Israel-Golden	1-80-925-2071	United States	888-944-4357
Italy	800-788-304		

If there are any issues contacting the TSCC please contact us at toll number **+1 847-725-4011**.

Calling for Repairs

If repair is necessary, call Motorola's Repair Facility at **1-800-642-0442** for a Return for Service Authorization (RSA) number before sending the unit. The RSA number must be prominently displayed on all equipment cartons. The Repair Facility is open from 8:00 AM to 5:00 PM Central Time, Monday through Friday.

For after hours, or international customers, a request for an RSA can be submitted via e-mail to nogrepaircenter@motorola.com. Please include the following information in the e-mail:

- Shipping address (for returning the unit(s) to you)
- Contact name and phone number
- Serial number(s) of unit(s)
- Detailed description of problem(s) for each unit

When shipping equipment for repair, follow these steps:

1. Pack the unit securely.
2. Enclose a note describing the exact problem.
3. Enclose a copy of the invoice that verifies the warranty status.
4. Ship the unit **PREPAID** to the address indicated on the RSA form provided by Motorola.

For customers in **Europe**, the **Middle East**, and **Africa (EMEA)** contact the Technical Assistance Centre (TAC), which offers the following high levels of services:

- Toll-free phone numbers where available – see list above
- 24 hours a day, 7 days a week, multilingual technical assistance (Spanish, German, and French)
- Central tracking of all issues utilizing the Clarify Call Management System
- Automated escalation management, both technical and issue related, if necessary through to the high-level development teams or senior account management.

The e-mail address for the Call Management System is: BCS.Helpdesk@motorola.com.

If the toll-free number fails, please use **+1 847 725 4011**.

The new repair process enables you to track your issue by quoting your unique system ID or Customer Service Report number.

Encoder Overview

This section describes the specification of the main functional blocks within the encoder.

The Motorola SE-6x Series encoder encoder platform is designed for the delivery of full-resolution MPEG-4 Advanced Video Coding (AVC) high-definition and standard definition compressed video via an MPEG-2 transport stream. The encoder supports a comprehensive suite of advanced compression tools, as defined by the MPEG-4 AVC High Profile @ Level 3/4 standard.

MPEG-4 AVC has emerged as the next compression standard for high-definition DVD, digital TV, broadcast, and streaming video applications. The SE-6x Series encoder is designed for broadcast-quality video applications in which AVC streams are multiplexed into MPEG-2 transport streams, making it easy to co-exist with and deploy into an existing video infrastructure.

The following topics are discussed in this section:

- Video Compression
- Audio Compression
- Ancillary Signals
- Stream Descriptor Data

RF Reception

This RF module provides the latest generation of RF-reception technology to allow receipt of Advanced Television Systems Committee (ATSC) signals, which are then passed along to the Video Compression engine.

Note: *RF module is fitted on platform variants with R, S, or T suffix, for example, SE-6601R.*

Video Compression

The encoder utilizes the processing power of custom-built video acceleration hardware and the rich suite of AVC-standard software tools and options to deliver video at the lowest possible bit rates.

Table 5: Video Compression

Video Compression	Description
AVC MP at L4 Compression	When a high-definition input is selected, the encoder supports AVC compression High Profile.
AVC MP at L3 Compression	When a standard definition input is selected, the encoder supports AVC compression High Profile
Motion Prediction Modes	The encoder has a powerful processing acceleration card based on FPGA technology. This enables the encoder to support a feature-rich motion prediction toolkit that provides: • P,B, and reference B frame support • ¼ pixel interpolated prediction • Weighted prediction • Hierarchical search • 16x16 and 8x8 block processing
Intra Prediction Modes	The encoder supports all the intra-estimation modes.
Rate Control	The encoder supports Constant Bit Rate (CBR) applications. Constrained Fidelity – CBR (capped VBR), and VBR (Statmux).

Table 5: Video Compression

Video Compression	Description
GOP Structure	The GOP structure and repetition rates are controlled though the encoder's intuitive user interface.
Entropy Coding	The encoder is designed to support Context Adaptive Binary Arithmetic Coding (CABAC), the most powerful (and complex) AVC entropy coding tool. The simpler CAVLC (context adaptive variable length coding) may be supported for some modes of operation.
Field/Frame Coding	Depending on the source format, the encoder auto selects field or frame encoding mode.
Motion Compensated Temporal Filtering (Standard Definition Only)	The encoder supports Motion Compensated Temporal Filtering (MCTF) technology, which is used for Video Pre-Processing (VPP). See Video Pre-processing on page 7 for more information.
Deblocking Filter	The encoder incorporates an AVC de-blocking filter, which is useful for dealing with difficult scenes that can overload an encoder. When used, this feature provides graceful degradation when faced with aggressive encoding scenarios.
IDR Insertion	The encoder can be configured to insert Instantaneous Decoder Refresh (IDR) pictures at preset intervals.
Latency	The encoder-to-decoder processing delay is approximately two seconds and is similar to high-end MPEG-2 systems.

Video Pre-processing

The advanced models include a pre-processing module to augment the MCTF functionality that is standard on all units. The perceptual video processor (PVP) improves on the legacy technology by being able to accurately quantify and manage perceptual quality. The PVP utilizes original vision biology research that emanated from University of California, Berkeley campus. This patented technology allocates a huge processing resource towards supporting the Integrated Perceptual Guide (IPeG™). This is a model that quantifies and maps perceptual significance, the central function that discriminates where processing should be targeted and at what strength. In short, the IPeG masking algorithm provides a metric of perceptual distortion and steers the processing towards preserving the texture and detail that the eye cares most, the net result is delivery of better pictures at lower bit rates

The PVP processing core that supports two complementary pre-processing elements. The two elements are, an Adaptive Detail Preservation (ADP) and 3Dimensional Noise Reducer (3DNR). The 3DNR is a combination spatial and temporal noise reducer that is very effective at reducing noise in areas that the eye can easily track. The other element is the Adaptive Detail Preservation (ADP) element that aims to preserve visually important detail and to attenuate the higher motion detail to which the eye is less sensitive.

In summary the ADP identifies and focuses the processing towards the unpredictable high energy detail that the eye doesn't closely track. The system is able to effectively and consistently preserve the detail that matters most to the human eye. The result is reduced complexity in the content presented to the compression core so that the encoder can then allocate its bit budget towards more valuable elements in the content. One very notable attribute is that the ADP suppresses quantization noise that is present in incoming feeds.

In summary, *3DNR process performs noise level estimation*, then factors in the perceptual sensitivity and modifies the noise layer to effectively subtract the sub-visual noise from the original. The result is very effective random noise reduction such that the encoder can then allocate its bit budget towards the more valuable visual elements.

Audio Compression

The encoder delivers audio using industry standard compression methodologies. Rather than using special purpose DSPs, audio compression is performed on the general purpose CPUs inside the encoder.

Table 6: Audio Compression

Audio Compression	Description
MPEG-1 Layer II	The encoder has an embedded MPEG-1 layer II audio compression core that can process stereo audio.
HE-AAC	The encoder has an embedded Dolby Digital Pulse audio compression core that can process HE-AAC stereo audio. ***Note:*** *Since Dolby acquired the original codec supplier "coding technologies" and is in the process of rebranding the AAC functionality as Dolby Digital pules.*
LC-AAC	The encoder has an embedded audio compression Dolby Digital Pulse core that can process LC-AAC stereo audio. ***Note:*** *Dolby acquired the original codec supplier's coding technologies and is in the process of rebranding the AAC functionality as Dolby Digital pules.*
AC-3 PassThru	The encoder can pass through pre compressed AC-3 streams that are received over the serial digital, UDP, ATSC, and ASI inputs.
Transcode AC-3 to Dolby Digital + Pro	The encoder has an embedded AAC audio compression core (a licensable option) that can transcode AC-3 to Dolby Digital Plus.
Transcode AC-3 to HE-AAC	The encoder has an embedded AAC audio compression core (a licensable option) that can transcode AC-3 to Dolby Digital Pulse (HE-AAC).
Dolby Digital	The encoder has an embedded Dolby Digital compression core (a licensable option) that can encode audio.
Dolby Digital + Pro	The encoder has an embedded Dolby Digital + Pro compression core (a licensable option) that can encode stereo from baseband inputs.
Transcode Dolby E to DD	The encoder has an embedded compression core (a licensable option) that can transcode Dolby E to Dolby (stereo and 5.1 are supported).
Transcode Dolby E to DD+	The encoder has an embedded compression core (a licensable option) that can transcode Dolby E to Dolby Digital+ pro (stereo and 5.1 are supported).
Transcode Dolby E to HE-AAC	The encoder has an embedded compression core (a licensable option) that can transcode Dolby E to Dolby Pulse.

Note: *The user interface contains references to AC-3 and Dolby Digital. They are the same. AC-3 is the name in the SMPTE standard. Dolby Digital is the proprietary Dolby name.*

Ancillary Signals

In high-definition mode, the encoder is equipped to process and packetize EIA-708 ancillary data and into the transport stream. In standard definition mode, the encoder is equipped to process and packetize EIA-608 or EIA-708 closed caption and XDS ancillary data into the transport stream.

Stream Descriptor Data

The encoder produces a single program transport stream (SPTS) with audio, video, and ancillary data for delivery over MPEG-2 transport streams (MPEG-2 TS). The stream includes Program Specific Information (PSI) descriptors to allow a receiver to recognize and decode the contents of a stream.

The encoder sets the following basic PSI table information.

Table 7: PSI Information

PSI	Description
Program ID (PID)	Uniquely identifies the program elementary streams.
Program Map Table (PMT)	Identifies the programs available within the transport stream.
Program Association Table (PAT)	Identifies the PIDs within a program stream.

Front Chassis Description

Figure 1 shows the encoder's chassis front elevation with the air intake which is used to avoid overheating. Do not block the air intake vent.

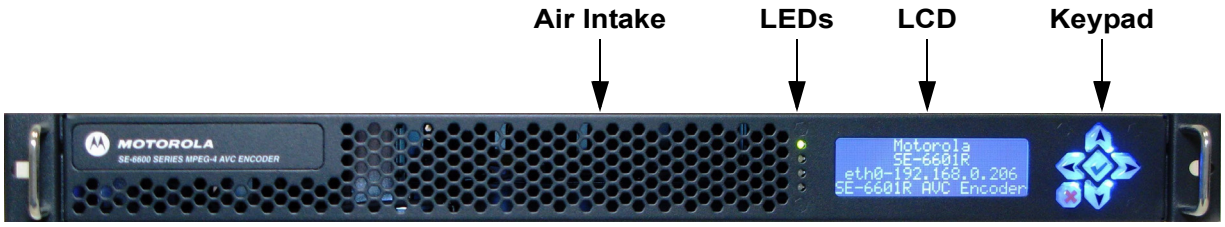


Figure 1: Front Chassis View

The following list describes each front chassis component.

LCD and Keypad	The front panel display shows the product model number, description, and networking settings for one of the Ethernet ports. Keypad functionality will be provided in a future release.
LED Status Indicators	The LED shows the status of several parts of the encoder as indicated in the following section.
Air Intake	To avoid overheating, do not block the air intake vent.

Status Section

Figure 2 shows the function of the status LEDs.

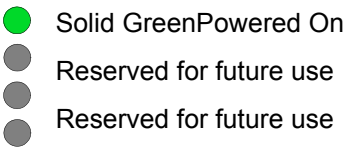


Figure 2: LED Status

Front Panel

Figure 3 shows the LCD display and operator keypad.

Figure 3: LCD Panel and Keypad

Back Chassis Description

Figure 4 shows the back chassis elevation.

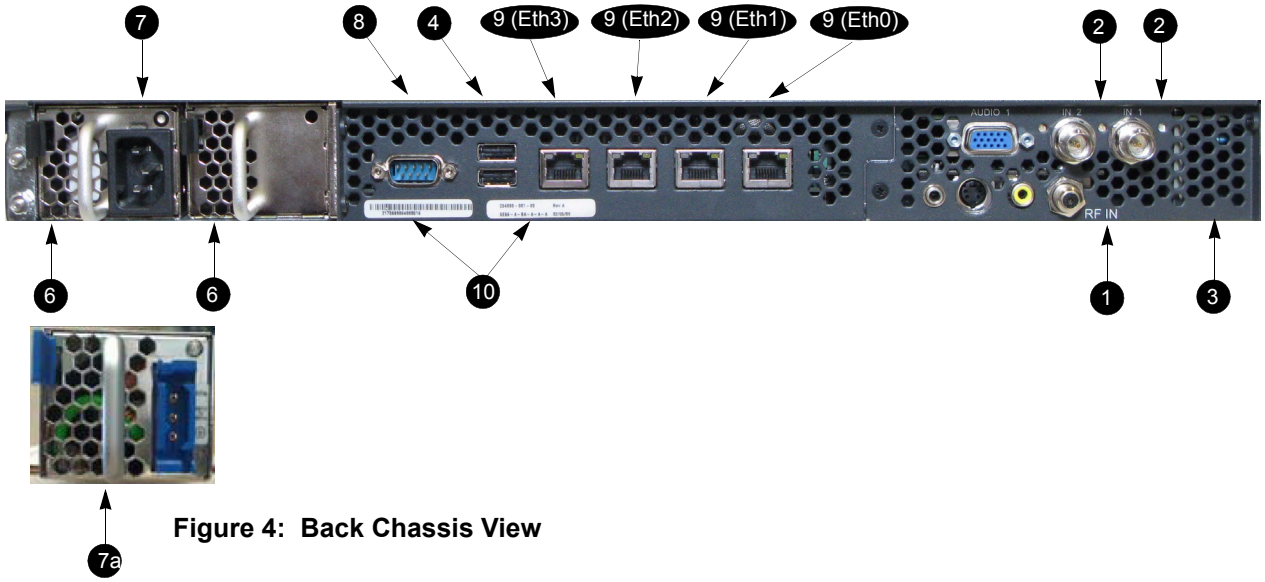


Figure 4: Back Chassis View

The following list describes each Back Chassis component.

1. Input Module – Provides the video input function and discrete AES digital audio input function. SDI, HD-SDI or ASI Input – One BNC with active loop through is provided for the encoder's SDI video input and dual BNC for discrete AES audio inputs, as shown in Figure 5.
2. Valid Input LED – A green LED is located just to the left of the each BNC connector. This LED indicates that the encoding module is powered up, as shown in Figure 5.

Figure 5: Input Module

Table 8: Input Module

PSI	Description
Video	Input video connector that serves as both SDI/HD-SDI and also ASI input.
LED	Green indicates that the encoding module is powered up.
AES (right)	AES audio input 2.
AES (left)	AES audio input 2.

3. Optional Card Location – The optional ATSC tuner board or ASI output board is located here when the encoder is so configured.
4. USB Ports – These connectors are not required for normal use (they may be used by service personnel for diagnostic and advanced control). Contact Motorola Technical Support for additional details.

5. Console Connector – This connector is not required for normal use (it may be used by service personnel for diagnostic and advanced control). Contact Motorola Technical Support for additional details.
6. Air Exhaust – Back vents are provided for chassis air exhaust. Do not obstruct the vents, as this may cause chassis overheating.
7. AC (auto sensing 100 to 240V) Power Supply Unit or 7a. DC (auto sensing -40 to -60 VDC) Power Supply Unit.
8. 9-pin D-type RS232 Serial Connector Port – This connector is not required for normal use (it may be used by service personnel for diagnostic and advanced control). Contact Motorola Technical Support for additional details.
9. Ethernet Ports – Four Ethernet ports are provided on the main chassis and are configurable via the GUI.
    - Eth 0 is a Gigabit Ethernet port and can be used for streaming H.264 UDP/IP data.
    - Eth 1 is a Gigabit Ethernet port and can be used for a redundant streaming H.264 UDP/IP data.
    - Eth 2 is a Gigabit Ethernet port and can be used for streaming H.264 UDP/IP data.
    - Eth 3 is a Gigabit Ethernet port and is typically used for control of the encoder.
10. Encoder label with serial number.

2

Encoder Installation

Overview

This chapter describes the basic procedures for the correct and safe installation of the SE-6x Series encoder. The following topics are discussed in this section.

Equipment Arrival and Unpacking

When the encoder arrives, perform the following.

- Carefully unpack the boxes.
- Retain all packing materials and the boxes themselves.
- Check the contents of each shipping container against the packing slip.
- Notify Motorola immediately if something is missing or damaged.

Content

Unpack the encoder packing box and use the following checklist to verify that all items are included.

- SE-6x Series encoder Encoder chassis with front bezel (all software and hardware are pre-installed).
- Encoder power cord.
- RF Module.

- ASI output module (SE-6XXX/SE-6XXX encoders only).
- CD-ROM with software tools and a PDF file of the Release Notes and Product Manual (this manual).
- Rack mount hardware and instruction sheet.

Encoder Install

To install the encoder

1. Use a screw driver and mounting screws (not included) to secure the SE-6x Series encoder in the rack.
2. Connect the included power cord to the SE-6x Series encoder and power receptacle.
3. Verify that the unit powers up and LED is activated.
4. Connect the appropriate or desired input source for your application to the encoder.
5. If the encoder is installed within an IP video network, make the appropriate Ethernet connection as described on page 22.
6. If the RF module is installed, make the appropriate connection to the RF connector.

Note: *RF Input is standard for the SE-6301R, SE-6301T, SE-6401R, SE-6401T, SE-6501R, SE-6501T, SE-6601R, and SE-6601T encoders.*

ASI Output is standard.

7. If the ASI Output module is installed, make the appropriate connection to the ASI connector.
8. Review the remaining topics in this chapter to verify the install.

Note: *If a different IP address is required for this encoder, refer to Network Parameters Page on page 88.*

Rack Mounting

The SE-6x Series encoder requires one RU in a standard 19-inch rack. The unit can be rack mounted or attached securely to a standard rack shelf. Please note.

- Rack rails are provided.
- Shelf installation is recommended when the unit is installed in a mobile van or truck.

Cable Connections

For the ASI input connection, connect a standard DVB-ASI signal to the encoder's video input. If the desired video source is not a compliant ASI format, an external converter is necessary.

Note: *There is a second BNC connector located next to the SDI/HD-SDI/ASI input connector, labeled LOOP. This connector acts as a loop-out of the input signal and can be used for periodic monitoring or other signal verification tasks, but should not be used for signal replication (i.e., to avoid needing a Distribution Amplifier to feed another encoder.) The loop-out signal will be interrupted if the SE is turned off or experiences certain system alarms or faults.*

Discrete AES inputs are fed in through the D type connector. A separate connector adapter option is available that provide a D type to 4 BNC connectors.

Most customers have transitioned to the use of embedded audio. If you need or want to use discrete audio delivered separately over discrete AES connections, you can use the optional break out cable or wire up to the following pin out.

Table 9: Pin outs

Pin out	Description
DB15 pin 1	BNC #1 Signal
DB15 pin 2	BNC #2 Signal
DB15 pin 3	GND
DB15 pin 4	DB9 pin 2
DB15 pin 5	DB9 pin 3
DB15 pin 6	GND (for BNC's)
DB15 pin 7	GND (for BNC's)
DB15 pin 8	GND (for BNC's)
DB15 pin 9	GND
DB15 pin 10	GND (DB9 pin 5)
DB15 pin 11	BNC #3 Signal
DB15 pin 12	BNC #4 Signal
DB15 pin 13	GND
DB15 pin 14	DB9 pin 1
DB15 pin 15	DB9 pin 4
DB15 shield	DB9 shield

For the RF Input connection, the connector type is an F-type connector that requires a standard ATSC antenna signal.

For an Ethernet control network connection, this connection defines the RJ-45 Ethernet cable connections to the encoder's network interface ports. The ports can be configured in one of three ways.

- A single port carries both control and data.
- Separate ports carry control or data.
- Dual redundant configurations of the above.

The suggested conventions are.

- Single port applications – Eth0 carries both control and data.
- Separate control and data applications – Eth0 carries data and Eth3 is for control.

- Dual redundant configurations of the above – Eth0 carries data, Eth1 is for control, Eth2 carries data, and Eth3 is for control.

The ports are auto-sensing and do not require crossover cables when connecting directly to a computer.

Ethernet bonding is available (it is off by default). This Ethernet bonding allows two IP interfaces to act as if they are one. They have the same IP address, but only one of them is active at any one time. One port is referred to as the Primary Master and the other port is referred to as the Primary Slave. This configuration is implemented by creating a virtual device called bond0 or bond1. This virtual device controls the two physical Ethernet ports by routing the data through the appropriate port.

Under normal circumstances, the bond device sends all data through the Primary Master device. Should the connection to the Primary Master port be lost, the bond0 or bond1 device automatically switches any data over to the Primary Slave port. To any other device on the network, the data would appear to be coming from the same IP address.

This creates a redundant connection that is automatically managed by the encoder itself. This bonding approach can be used for either management connections or data connections.

Encoder Cooling

The encoder is designed for an operating temperature range of 0 °C to 40 °C. Airflow intake is from the front and exhausted through the back.

The chassis includes six fans for cooling the unit. The encoder fans are mounted in a fan chamber located in the middle of the chassis to pull cooling air through the chassis. The power supply contains dual fans.

Power Provision

The encoder is supplied with either one or two 100 - 240 volt AC power supplies or one or two -48volt DC power supplies. Either type of power supply may provide up to 450 watts of power to the encoder.

Safety Guidelines

When servicing the encoder, follow these guidelines to avoid personal harm and to prevent damage to the encoder.

IMPORTANT: *Do not attempt to service the encoder except as explained in the documentation. Only trained service technicians should remove the encoder cover to access any of the internal components.*

General Precautions

To reduce the risk of bodily injury, electrical shock, fires, and damage to the equipment, observe the following precautions.

Note: *This equipment must be installed by trained service personnel in a restricted-access location, as defined by the NEC and IEC 60950-1 Second Edition Information technology equipment - Safety - Part 1: General requirements.*

Do not service any encoder except as explained in the documentation. Only trained personnel should remove enclosure covers or access the internal components due to possible hazardous energy levels. If an object falls into the encoder, or the encoder is exposed to water, or has been dropped, or is visibly damaged; safely remove power from the encoder and contact Motorola Technical Support for assistance.

Keep the encoder away from heat sources and be sure cooling vents are not blocked. Never operate the encoder in a wet environment. Keep food and all liquids away from the encoder. Allow the encoder to cool prior to removing the cover or handling internal components.

To help avoid possible damage to the encoder board, wait at least five seconds after turning off the encoder before removing a component from the encoder board or disconnecting a peripheral device from the encoder. Handle components with care. Do not touch the components or contacts on a card. Hold a card by its edges or metal mounting bracket.

Cabling Precautions

The power supplies may produce high voltages and energy hazards, which can cause bodily harm. To reduce the risk of electrical shock, disconnect all power supply cables before servicing the encoder. To help prevent electric shock, plug the encoder and peripheral power cables into properly grounded electrical outlets. These cables are equipped with three-prong plugs to help ensure proper grounding.

Do not use adapter plugs or remove the grounding prong from the power cable. If an extension power cord is used, Motorola recommends using three-wire cable with properly grounded plugs. Do not modify cables or plugs. Consult a licensed electrician or the power company if site modifications are necessary and be sure to follow local wiring and certification rules. Abide by extension cable and power strip ratings. Ensure the total ampere rating of all products plugged into the extension cable or power strip does not exceed 80 percent of the extension cable or power strip ampere ratings limit.

To help protect the encoder from sudden, transient fluctuations in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS). Route encoder cables and power cables to avoid human interference and ensure nothing rests on the encoder component's cables.

Rack Installation Precautions

Follow these precautions for any rack-mountable encoder.

- Carefully read all rack mount installation sheet and follow the instructions for proper rack cabinet assembly.
- Do not remove more than one encoder from the rack at a time. The weight of more than one extended component could cause the rack to tip over, resulting in bodily injury or damage to the encoder.
- Always load a rack from the bottom up, and load the heaviest item in the rack first.
- Ensure that the rack is level and stable before extending a component from the rack.
- Ensure that the rails are locked before installing encoder into the rack.
- Ensure that the proper airflow is provided to components in the rack.

Caution: *Slide/rail mounted equipment is not to be used as a shelf or a work space.*

Power On

Apply power in order to launch the SE-6x Series encoder. The encoder will start up after several minutes (typically in less than three minutes) in the last working configuration (or in the factory default if being powered on for the first time). The front panel LCD indicates that the unit is booting. After the bootup is complete, enter the SE-6x Series encoder's IP address into the web browser.

Note: *Do not operate this encoder without all fans, component heatsinks, and air baffles installed. Severe damage to encoder components will occur if operated without adequate cooling mechanisms.*

Caution: *Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on*

overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Caution: *The power supply plug is intended to serve as a power disconnect device. The socket outlet shall be installed near the equipment and shall be easily accessible.*

Caution: *This unit has up to two (2) 100-240 volt or two (2) -48volt input power feeders. Disconnecting less that the maximum will not de-energise the system. To reduce the risk of injury, disconnect the two (2) power feeders when removing power to the system.*

Caution: *This device when powered by DC must be protected by a listed branch circuit protector rated maximum 25 A.*

3

Encoder Configuration

This chapter provides important encoder configuration information and has the following topics.

Note: *The following topics provide easy instructions with convenient references to the Menu Orientation and Operation chapter. Follow these procedures in the given order.*

IP Address Setup

Ethernet Overview

Four built-in Ethernet ports are available for transmitting data and control signals in and out of the encoder. All four ports are GigE and can be used for generating MPEG-2 transport packets, and multicast over UDP.

Note: *If desired, the single GigE port can be used for both data and control.*

Factory Defaults

The encoder is preconfigured with the following default IP addresses.

Eth0 IP address:	192.168.0.202
Eth1 IP address:	192.168.1.202
Eth2 IP address:	192.168.2.202
Eth3 IP address:	192.168.3.202
Netmask:	255.255.255.0

The Eth0, Eth1, and Eth2 Ethernet ports are preferred for sending out IP video data. Eth3 is the preferred port for controlling the encoder. When looking at the back of the unit, the data ports are the three right most Ethernet ports, and the control port is the one on the left. See Figure 4 on page 11 for the specific layout of the back of the chassis.

Note: *When configuring any encoder make sure that you change the IP address before connecting it to a network to avoid IP address conflicts.*

Web Browser Logon

To log on to the web browser

1. Read the information pertaining to the Encoder Welcome Page on page 29.
2. Ensure that a valid input source is properly connected to the appropriate input connector.
3. Ensure that the encoder's Control Network port is properly connected to the facility LAN or a controlling computer.
4. Go to the computer and launch the web browser.
5. Type the encoder's IP address in the browser's Address Field and click **ENTER**.

   Note: *The encoder's IP address in displayed on the unit's front panel.*

6. When the Welcome Page appears, review the page to verify that the encoder is running.

Set Audio Parameters

To set encoder audio parameters

1. Read the information pertaining to the Input Selection on page 37.
2. In the Navigation pane, click **Audio** to display the Audio Parameters Page.
3. Select the stream to be configured.
4. Select the desired operating parameters for the audio stream being configured. Refer to Audio Parameters Page on page 46 for detailed description of what parameters are available, since this differs based on the input signal type.
5. Click **Save Changes**.

Set Video Parameters

To set encoder video parameters

1. Select the input type (ATSC, UPD/IP, ASI, or SDI), as described in the Input Selection section on page 37.
2. Read the information pertaining to the Video Parameters Page on page 61.
3. In the Navigation pane, click **Video** to display the Video Parameters Page.
4. Select the desired Video Output Resolution.
5. Set the desired Aspect Ratio.

   Note: *This is only necessary in SD. For HD, the aspect ratio is always 16:9.*

6. Set the desired GOP Structure.
7. Set the desired I-Frame Period.
8. In the Bit Rate field, enter the desired bit rate.
9. In the Rate Control section, select either Constant Bit Rate or Constrained Fidelity CBR encoding.
10. If Constrained Fidelity CBR encoding is enabled, use the pull-down menu to selected the desired Bandwidth Reclamation, and enable or disable Null Packets as required.
11. Click **Save Changes**.

Set Output Stream Parameters

To set network parameters

1. Review Output Streams Page on page 69.
2. In the Navigation pane, click **Output Streams** to display the Output Streams Parameters Page.
3. In the Primary IP Output section, choose the port (Output Interface) to stream.
4. Select either On, Off, or Keep Alive.
5. Select the desired Target Address Type.
6. Enter the desired Target Address.

7. Enter the desired Target Port.
8. Enter the desired Time-To-Live.
9. Click **Save Changes**.

Set Network Parameters

To set network parameters

1. Review the Network Parameters Page on page 88.
2. In the Navigation pane, click **Network** to display the Network Parameters.
3. In the IP Interfaces section, verify the EP addresses assign to eth0 -> eth3.
4. If changes to the IP Interfaces are desired, click the **edit this list** hyperlink at the bottom of the page.
5. Enter the new IP address and net mask for the desired interface.
6. Click **Save Changes and Restart**.

Save New Configuration

To save encoder settings in a new configuration file

1. Review Save/Select Configuration Page on page 80.
2. In the Navigation pane, click **Save/Select** to display the Save/Select Configuration Page.
3. To save a file of the new configuration parameters locally on the encoder, follow the steps outlined in Save/Select Configuration Page on page 80.

Download Configuration to Another Machine

To download the encoder's configuration file to another machine (as a safety backup)

1. Review Download/Upload Configuration Page on page 85.
2. In the Navigation pane, click **Download/Upload** to display the Download/Upload Configuration Page.
3. To save the configuration file on a machine other than the encoder, follow the steps outlined in Download/Upload Configuration Page on page 85.

Quality Control

If all procedures are complete, except the following, the encoder is completely set up and ready to run.

To perform quality control on the encode-to-decode path

1. Connect the desired test signal to the appropriate video, UDP/IP, ASI, or RP input.
2. Set up a professional decoder (such as a Motorola IP set-top) and connect the SE-6x Series encoder to the decoder using a point-to-point Ethernet connection. Because the Ethernet ports are auto-sensing, a crossover cable is not required.
3. Verify the quality of the decoded stream, and if required, make adjustments to the encoder's parameters. Save changes as required, and update the configuration file (or create a new one).
4. With the encode-to-decode path functioning properly, connect the encoder to the network infrastructure for stream distribution as required.

4

Menu Orientation and Operation

This chapter describes the user interface and operational control of the SE-6x Series encoder encoder using the Navigation Pane, as shown in Figure 6, with the following options.

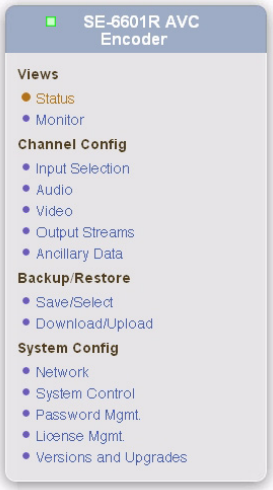


Figure 6: Navigation Pane

User Interface Overview

The SE-6x Series encoder is designed to be controlled by a number of different user interface options and for fail-safe operation. In the event that the configuration system or network fails, the encoder continues to run in the last known good state. The encoder configurations are also stored in flash memory to allow recovery from power failures.

System control can be achieved through two primary interface options.

Web Browser	Use this interface to set individual parameters that can be programmed from several pages. The web browser offers full access to the encoder element parameters, and also offers status information.
Command Line Interface	The unit has a command line interface that is intended for use by Motorola service, support, and operation personnel for manufacturing and troubleshooting.

To access the SE-6x Series encoder with a web browser

1. Ensure that the appropriate input source is connected to the encoder.
2. Ensure that the encoder's Control Network port is properly connected to the facility LAN or to a controlling computer.
3. Launch the web browser.
4. Enter the encoder's Control IP address in the browser's Address Field and click **ENTER**. The Welcome Page appears.

   The Welcome Page offers basic status information and contains the navigational menu for the equipment. Additional information about the browser is discussed in the sections that follow.

Global Browser Page Overview

The following are important points regarding the browser's page layout. These rules apply to all pages.

- The color scheme of the SE-6x Series encoder web browser uses white text on a blue background for menu headings.
- Two panes are provided within the browser window.
  - The left Navigation pane is a list of links to all SE-6x Series encoder browser pages. Orange highlighted text always refers to the current location in the menu tree. To jump to a specific page, there are links provided within the SE-6x Series encoder web browser interface.
  - The right Information pane provides specific information for the selected browser page, including status, data fields, and adjustable controls for setting encoder parameters, modes, and options.
- Below the Information pane, additional navigation links are provided (similar to those in the Navigation pane), along with copyright and the encoder's time-stamp information. Note that this section is not included in subsequent screen shots.
- The SE-6x Series encoder web browser pages update approximately every 30 seconds.

Encoder Welcome Page

Figure 7 shows the Welcome Page. To return to this page, click **Status** in the Navigation pane.

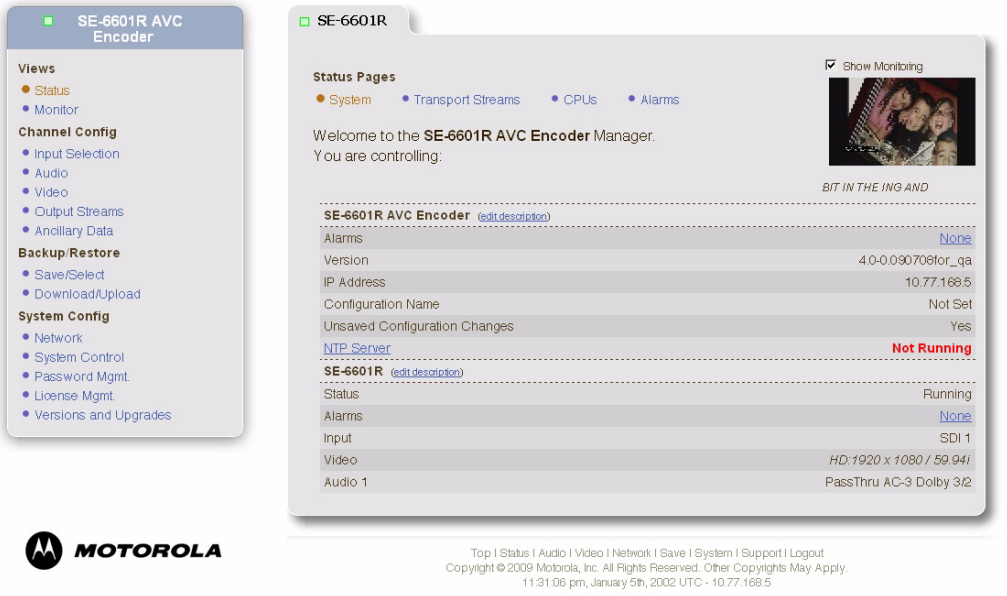


Figure 7: Welcome Page

The Welcome Page offers basic status information on various aspects of the encoder, including the ability to display the video monitor. These pages can be accessed by selecting the links in the Status Pages section of the Welcome page.

These four status pages are.

- System [Welcome Page] – Shows general information about the encoder's operational state. This is the page displayed when clicking on the Status link in the navigation pane.
- Transport Streams – Shows information about the status of the selected input, the Output Bitrate, Video, and Output Parameters.
- CPUs [System Diagnostics Page] – Shows information about the state of the CPUs in the encoder.
- Alarms – Shows information about the current alarms on the encoder.

Detailed information about each of these pages can be found in subsequent sections.

System Status Page

In the Navigation pane, click **Status** and the Welcome page is shown (see Figure 8). This page provides overall status for the encoder. It is split into two panes. The upper pane displays the general status. The lower pane shows detailed information about the encoder status.

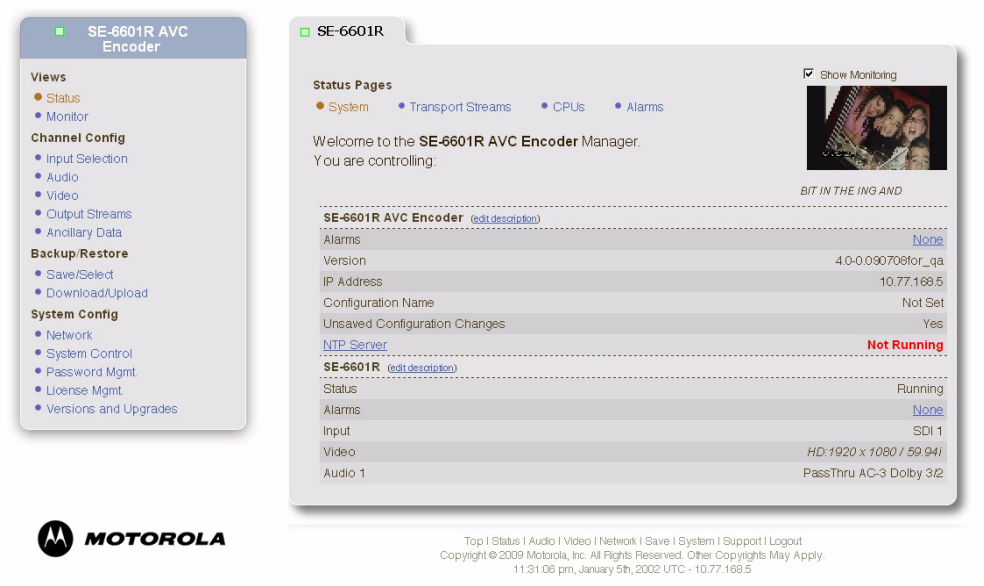


Figure 8: System Status Page

Note: *The heading for the status section of this page is by default the description of the encoder model number – in this case SE-6x Series Encoder Encoder. However, by selecting the edit description links, it is possible to change the default descriptions.*

There are two Edit Description links on this page. The upper portion of the status section applies to the whole encoder, and editing the description affects the text at the top of the Navigation bar on each page.

The lower section is status on each channel and the description text appears as the text on the tab at the top of the pane. This changes the heading shown at the top of the Navigation pane shown on each page. See the Description Pages section on page 101 for details on this feature.

Table 10: System Status Page

Label	Description
Show Monitor	If selected, displays the video in process, rating, and closed captioning information.
Upper pane	
Alarms	Indicates whether there are any alarms active and the type of the alarm. When the Alarm link is selected the Alarm page appears and lists all current alarms being generated by the encoder. There are five different alarm types; Critical, Major, Minor, Warning and Info. See the Alarms Page section on page 31.
Version	Lists the encoder's current software version.
IP Address	Indicates the IP address of the Eth0 control port or the control port as defined by the user.

Table 10: System Status Page

Configuration Name	Lists the name of the user-defined configuration within those parameters the encoder is currently operating. A configuration is a file that stores all of the Encoder's configuration options. Configurations can be named, saved, uploaded, or downloaded as desired. • For example, a sports configuration has a short GOP and a high bit rate. • A typical movie configuration has a long GOP and a low bit rate.
Unsaved Configuration Changes	Displays "Yes" if parameter changes were made to the current (or another) configuration file, but not yet saved. "No" displays if the on-line operating parameters match those in the current configuration file. If the encoder is rebooted, unsaved changes are lost.
NTP Server	Displays whether the encoder is configured for local clock or for getting the time from a network server.
Lower pane	
Status	Indicates whether or not the encoder is running. If running, a stream is being generated and valid video is present at the selected input.
Alarms	Indicates whether there are any alarms active and the type of the alarm. When the Alarm link is selected the Alarm page appears and lists all current alarms being generated by the encoder. There are five different alarm types; Critical, Major, Minor, Warning and Info. See the Alarms Page section on page 31.
Input	Indicates the selected input source type.
Video	Indicates the currently selected video parameters.

Alarms Page

In the Navigation pane, click **Status**, and then at the Welcome page, click **Alarms** to display the Alarms Page, as shown in Figure 9.

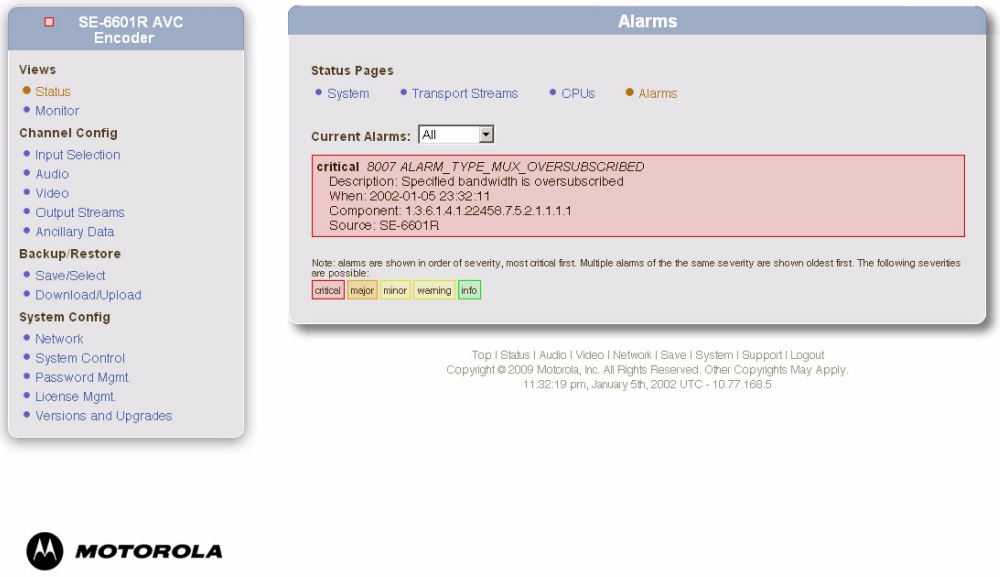


Figure 9: Alarms Page

Access to the Alarm Page is gained through either the Welcome or Encoder Status pages. Both displays provide a blue highlighted link to the Alarm Page. When selected from either page, a list of all current alarms are displayed along with the severity for each alarm. Multiple alarms of the same severity are displayed with the oldest first.

Table 11: Current Alarms

Label	Description
All	If selected, displays all alarms currently active.
System	If selected, displays system-level alarms that are not directly related to the video encoding processes (like an NTP synchronization failure, etc.).
Model-specific	If selected, displays alarms that are specifically related to the video or audio encoding processes (like video input signal loss, etc.).

Transport Streams Status Page

In the Navigation pane, click **Status**, and then at the Welcome page, click **Transport Streams** to display the Status Page.

The Status Page displays the encoder's current status, including information about the video and audio parameters that the encoder is currently using.

Note: *This is a status page only. Use the System Status or the Video and Audio set up menus to make changes. Unlike other pages, this page updates approximately every five seconds.*

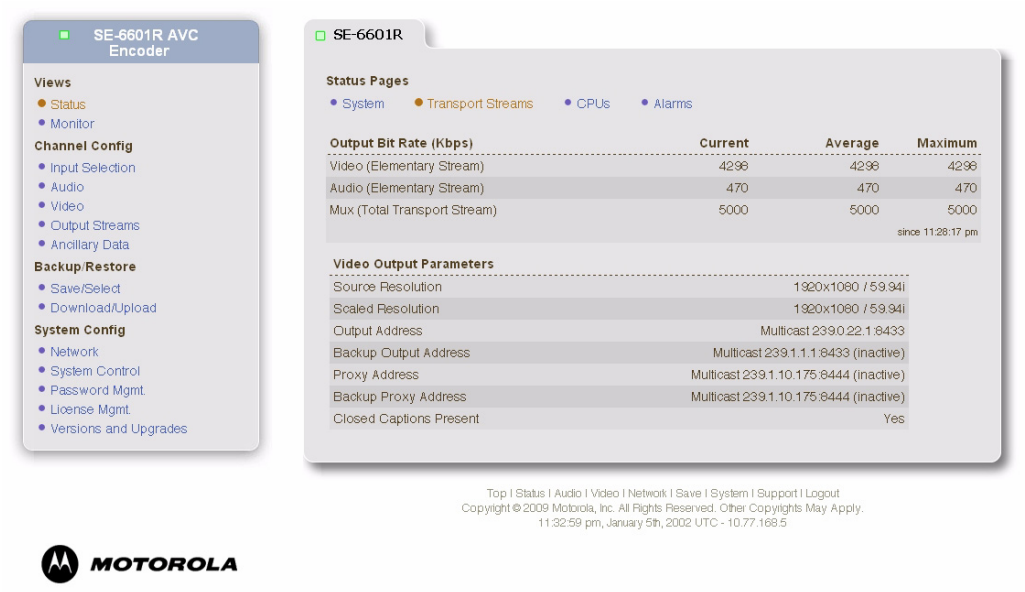


Figure 10: Transport Streams Page

CPUs Status Page

In the Navigation pane, click **Status**, and then at the Welcome page, click **CPUs** to display the System Diagnostics/CPUs Status Page.

The System Diagnostics page, as shown in Figure 11, shows the number of CPU's in the encoder, the type and processor speed, and the percentage of CPU usage that is free.

Note: *If an encoder problem occurs, Technical Support may need information from this page.*

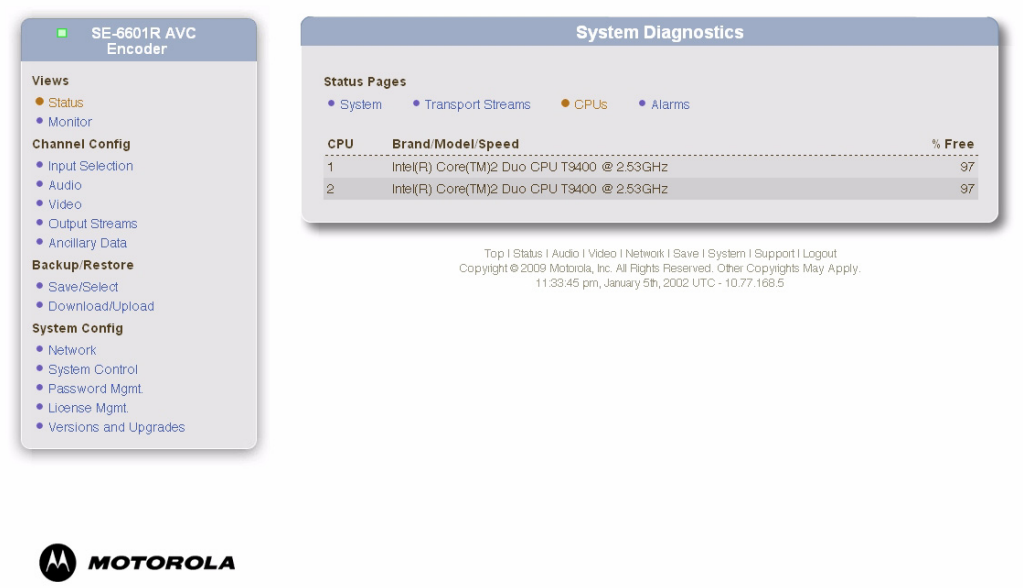


Figure 11: CPUs Status Page

Monitor Page

In the Navigation pane, click **Monitor** to display the Trap Receivers Page, as shown in Figure 12

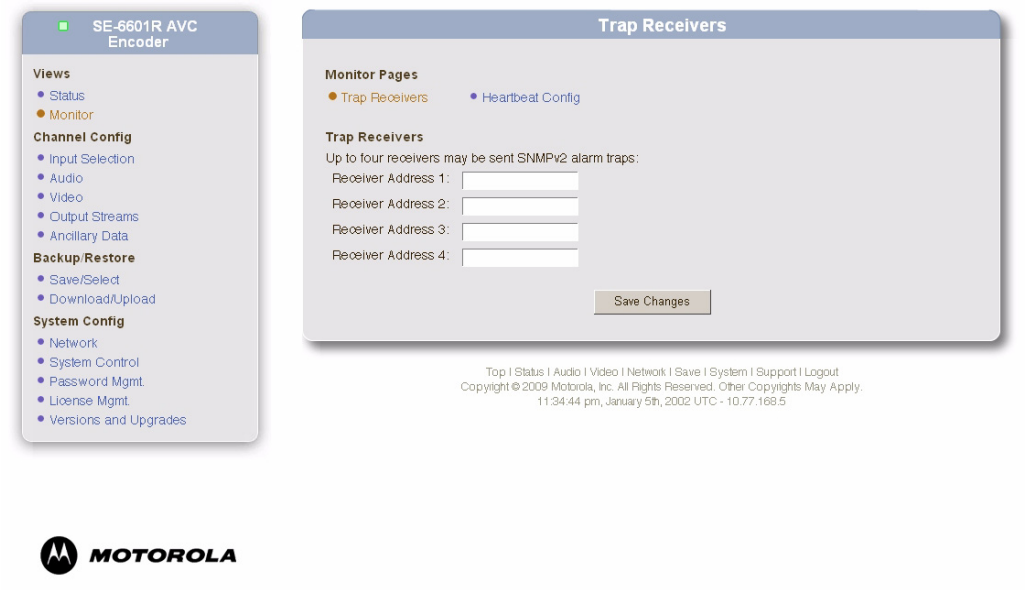


Figure 12: Trap Receivers Page

Trap receivers are "computers" running software that can capture SNMP trap messages. A trap receiver can collect trap messages from multiple encoders at one time.

In addition, each trap message is time-stamped so that events can be put in chronological order and trap message logs can span multiple encoder log files. For more information about the encoder log, see "Support Page" on page 104.

Trap Receiver Settings

In the Navigation pane, click **Monitor** and then click **Trap Receivers** to display Trap Receivers Page, as shown in Figure 12. Use this page to view and set up to four SNMP target trap receivers.

Table 12: Trap Receiver Settings

Parameter / Buttons	Description
Receiver Address	Input the destination IP address to where the trap messages are sent (up to four maximum).
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

Heartbeat Config Page

To display the Heartbeat Configuration Page, click **Monitor** from the Navigation pane and then click **Heartbeat Config** on the Monitor page, as shown in Figure 13.

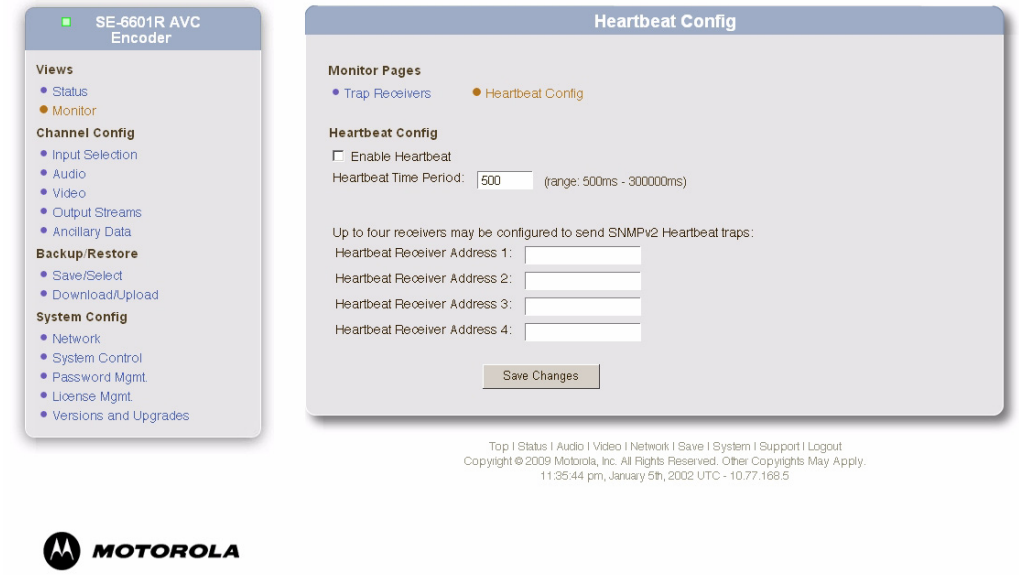


Figure 13: Heartbeat Config Page

The heartbeat provides a mechanism to validate that the encoder is running by requesting it to send out a regular trap message and allows the operator to enable and set the period and destination of the heartbeat trap used in establishing the operational health of the encoder.

Table 13: Heartbeat Configuration

Parameter	Description
Heartbeat Enabled	Check this box to enable a heartbeat output from the encoder.
Heartbeat Time Period	Sets the frequency of the Heartbeat Trap to the receiver. The time may be varied from 500 ms to 5 minutes. The value in this field is in milliseconds.
Heartbeat Receiver Addresses	Sets the receiver address for the Heartbeat Trap which may differ from the SNMP Trap receiver. Up to four different receivers may be identified.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

Input Selection

In the Navigation pane, click **Input Selection** to display the Input Selection Parameters Page, as shown in Figure 14. The Input Selection page allows the user to select the type of video input for the encoder. Choices are: SDI, ATSC tuner, UDP through a selected Ethernet port, or ASI input through a selected Ethernet port.

If ATSC, UDP, or ASI input is selected, a scanning process takes place to parse and understand the nature of the programs and streams contained in the ATSC, UDP, or ASI inputs. Refer to the Program Selection Page section on page 39 for explanations about how to use and interpret this information.

If the input type selected is ATSC Tuner, UDP, or ASI, two additional links appear on the Input Selection page – Program Selection and Status. Refer to the following sections for descriptions of these pages.

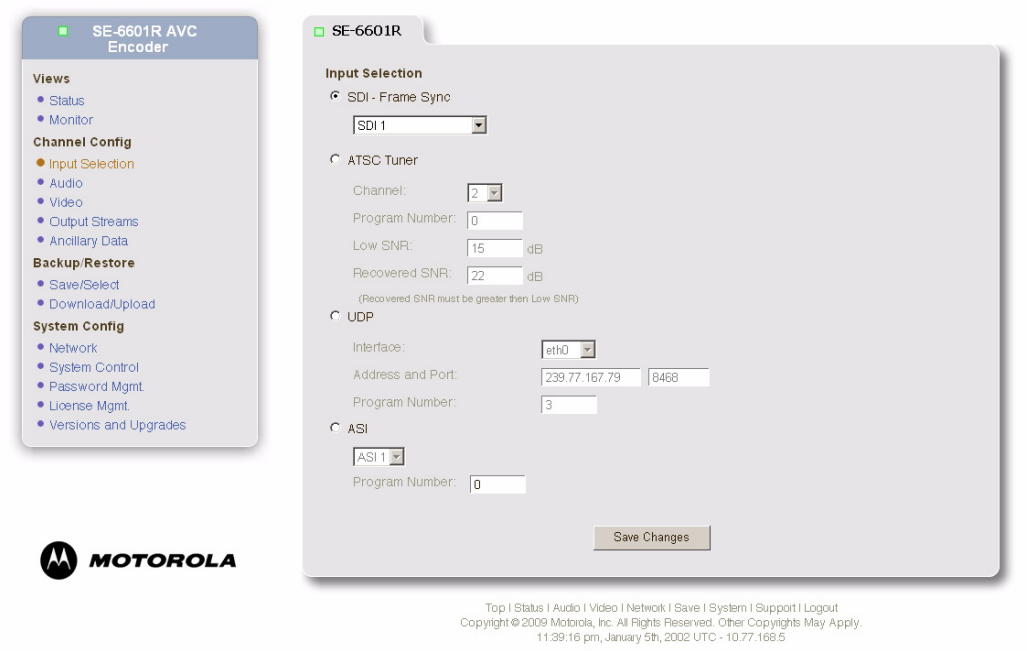


Figure 14: Input Selection Parameters Page

Note: *RF Input is standard for the SE-6301R, SE-6301T, SE-6401R, SE-6401T, SE-6501R, SE-6501T, SE-6601R, and SE-6601T encoders.*

Input Selection

Table 14: Input Selection Parameters

Label	Description
SDI	When selected, the SDI input allows the encoder to accept either standard definition SDI video or HD-SDI video depending on the licensed options on the encoder. SDI 1: Primary baseband Serial Digital Interface. Used for SDI, HD-SDI, 3G-SDI SDI 1 & 2: Dual Link may be used for input of 1080P content. Refer to the configuration matrix in the Encoders Features section on page 1 to determine the functionality available on the encoder. ***Note:*** *When selecting the SDI input, the input signal must be connected to the BNC connector on the rear of the encoder.*
ATSC Tuner	If selecting a signal from the ATSC tuner, a channel between 2 and 69 must be selected from the drop-down list shown. In addition, a program number must be supplied defining the program within the ATSC stream that is to be passed along to the encoder. Low SNR: This sets the threshold at which the a low signal input alarm trap is raised. Recovered SNR: This parameter sets the threshold at which the a low signal input alarm trap is remiitted. ***Note:*** *When the ATSC Tuner is selected and the selection is saved, the Program Selection screen is displayed, as shown in Figure 17.* ***Note:*** *If the program number is not known, leave it as 0, and then use the Program Selection page to determine the correct program.*
UDP	The UDP input is used to parse a desired program from an incoming MPEG-2 SPTS or MPTS stream, decode that program, and pass it to the AVC encoder module. The UDP input may also be used for Digital turnaround (DTA) of the same selected program, so that it can be converted to an MPEG-2 SPTS for distribution. When using a UDP input, define the following. • Interface – allows you to select which port is used to capture the incoming MPEG-2 SPTS or MPTS stream. • Address and Port – defines the address and port values of the multicast stream that contains the MPEG-2 program to be converted. • Program Number – defines the program number of the MPEG-2 stream to be converted to an SPTS. ***Note:*** *If the program number is not known, leave it as 0, and then use the Program Selection page to determine the correct program.*

Table 14: Input Selection Parameters

Label	Description
ASI	The ASI input is used to parse a desired program from an incoming MPEG-2 SPTS or MPTS stream, decode that program, and pass it to the AVC encoder module. The ASI input may also be used for Digital turnaround (DTA) of the same selected program, so that it can be converted to an MPEG-2 SPTS for distribution. When using an ASI input, the Program Number defines the program number of the MPEG-2 stream to be converted to an SPTS. ***Note:*** *If the program number is not known, leave it as 0, and then use the Program Selection page to determine the correct program.*
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

Program Selection Page

Selection of an ATSC, UDP or ASI input initiates a scanning process while the encoder parses the information on the incoming stream. This process can take 20 – 30 seconds. Scanning progress information screen is displayed, e.g., “Scanning in process, please wait.”

After the scan has completed, the results of the scan are presented.

If the scan has detected one or more programs, they are listed, as shown in Figure 15.

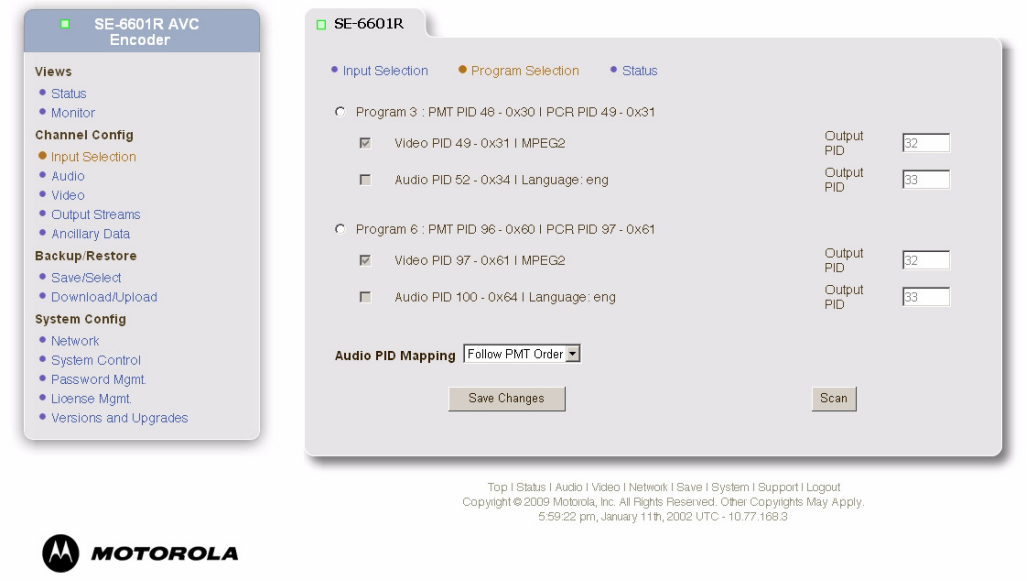


Figure 15: ATSC, UDP, or ASI Program Selection Page

This page allows you to select and configure the desired ATSC, UDP, or ASI program. You can:

- Select the video program that is passed to the encoder.
- Select which audio stream or streams that should be included with the video.
- Select the PID values that should be used for the video and audio stream outputs.
- Selecting the Audio PID Mapping mode.

Table 15: ATSC, UDP, or ASI Program Selection Parameters Page

Label	Description
Program (number)	Select one of the Program radio buttons to configure the encoder to process this incoming program stream. Only one program may be selected at a time. Information about each of the streams is presented, showing the type of video encoding (MPEG-2 is typical) and the language type for each of the audio streams. The Video PID for each program is always selected, but by default none of the audio streams are selected. One or more audio PID's may be selected to pass those audio streams through the encoder.
Output PID	Default values are automatically assigned to video and audio output streams. If different output PID values are desired, they can be changed.
Audio PID Mapping	Choose **Follow PMT order** to map the first audio stream in the PMT to the first audio PID configured on this page, the second audio stream in the PMT will map to the second audio PID, etc. Thus, if the input audio streams change PIDs, the output stream still preserves the audio outputs without needing a configuration change. Choose **Following Input PID** to cause the encoder to match the input PID selected exactly before it forwards the audio stream to the output. If the content provider changes the audio stream to a different input PID, that audio will no longer be passed through to the output stream until the encoder is reconfigured. Follow PMT order is the default setting.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*
Scan	Click the **Scan** button to initiate another scan of the incoming stream. After the parsing of the stream is complete, the results appear on the Program Selection page, as shown in Figure 15.

Input Selection Status Page

This page shows the status of the incoming signal for ATSC Tuner, UDP, and ASI input signals. The data shown on this page varies depending on the type of input selected

ATSC Tuner Input

If the input type selected is ATSC, the status page appears, as shown in Figure 16.

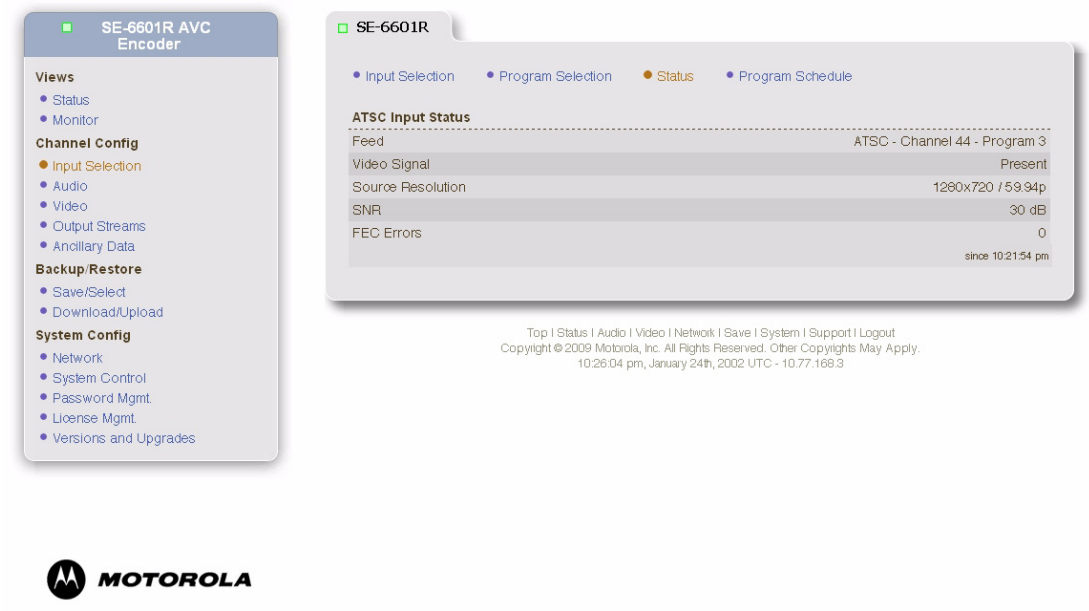


Figure 16: ATSC Tuner Selection – Status Information Page

Table 16: ATSC Status Information

Label	Description
Feed	Indicates the input type (ATSC), channel selected and program selected.
Video Signal	Shows the state of the input signal, which can either be Present or Blank.
Source Resolution	Displays the horizontal and vertical resolution of the incoming signal and the frame rate of this signal.
SNR	Displays the most recent SNR value of the incoming signal. The value is updated to the SNR value measured for the most recent one-second period each time the UI is refreshed.
FEC Errors	Displays the number of error packets detected on the incoming signal. This value continues to count up from zero until the encoder is restarted, at which time the value is reset to 0.

A subset of this status information is also shown on the main Status page (Welcome page) in the lower section of the main pane, as shown in Figure 17.

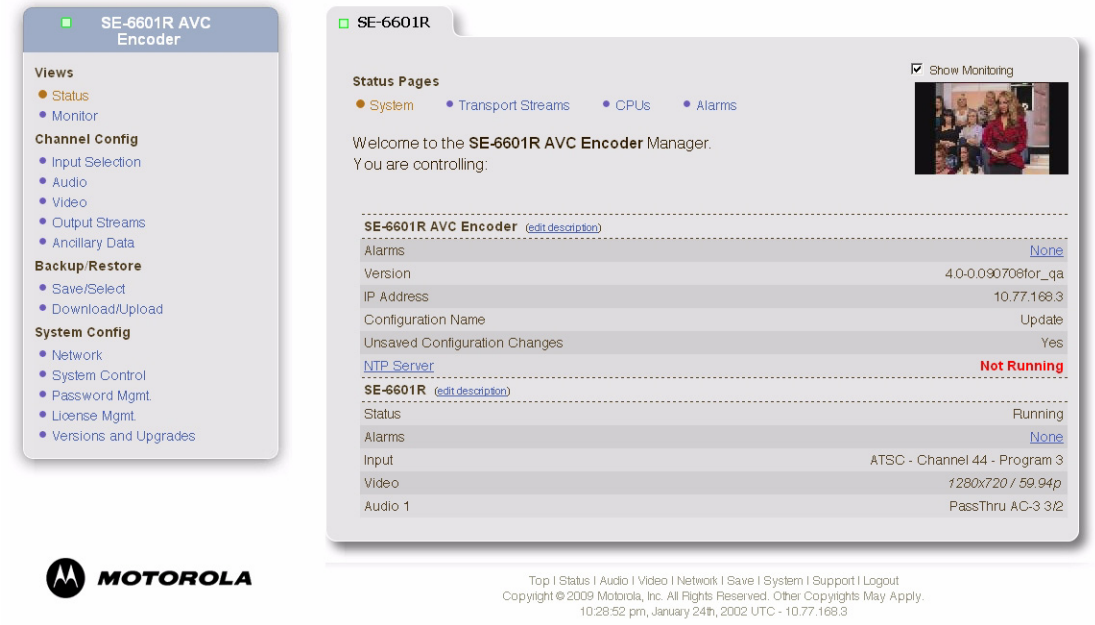


Figure 17: Welcome Status Page with ATSC Status

UDP Input

If the input type selected is UDP, the status page appears, as shown in Figure 18.

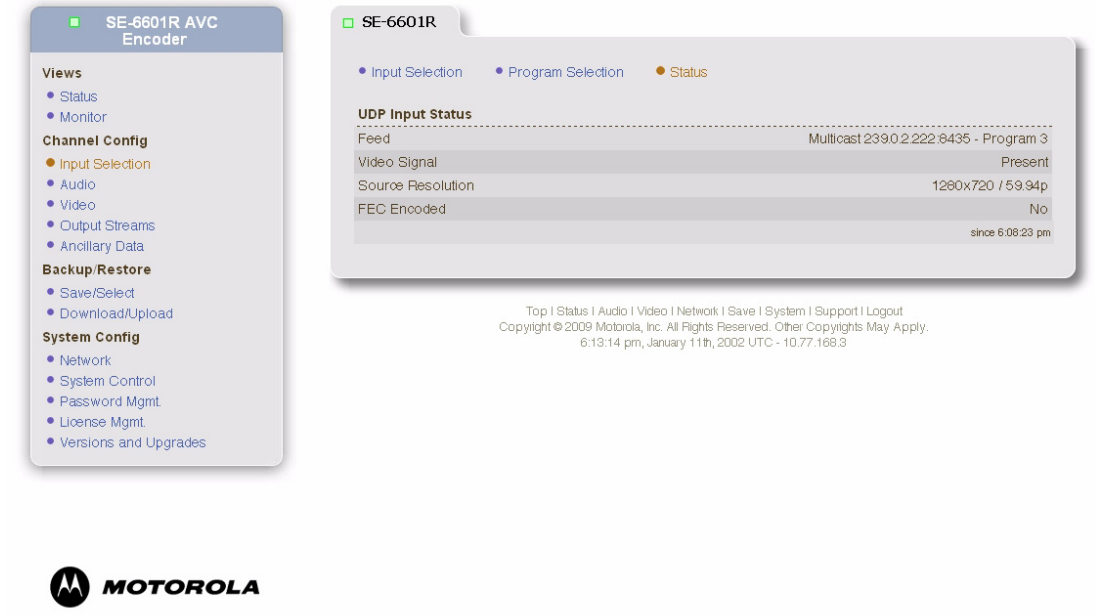


Figure 18: UDP Selection – Status Information Page

Table 17: UDP Status Information

Label	Description
Feed	Indicates the multicast address and port the signal is on, and indicates the program in the stream that is selected.
Video Signal	Shows the state of the input signal, which can either be Present or Blank.
Source Resolution	Displays the horizontal and vertical resolution of the incoming signal and the frame rate of this signal.
FEC encoded	Indicates whether or not the incoming signal was encapsulated with forward error correction.

A subset of this status information is also shown on the main Status page (Welcome page) in the lower section of the main pane, as shown in Figure 19.

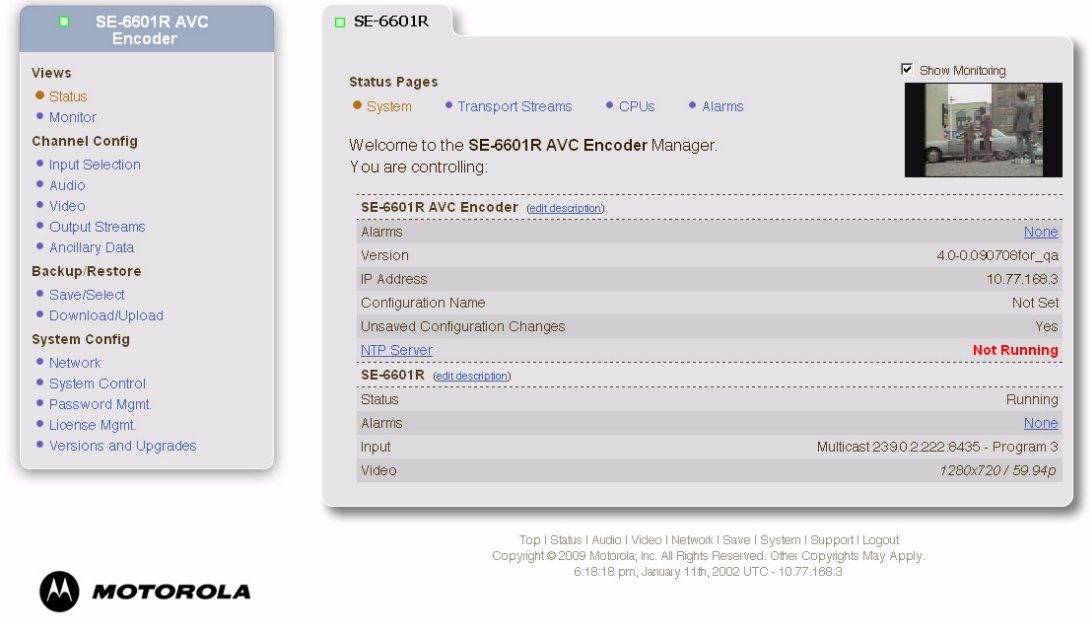


Figure 19: Welcome Page with UDP Status

ASI Input

If the input type selected is ASI, the status page appears, as shown in Figure 20.

Figure 20: ASI Selection – Status Information Page

Table 18: ASI Status Information

Label	Description
Feed	Indicates the multicast address and port the signal is on, and indicates the program in the stream that is selected.
Video Signal	Shows the state of the input signal, which can either be Present or Blank.
Source Resolution	Displays the horizontal and vertical resolution of the incoming signal and the frame rate of this signal.
ASI Packet Size	There are two packet sizes, 188 and 204. When 204 byte packets are used, they consist of the same 188-byte packet that would normally be sent plus a 16 byte trailer that contains FEC codes that can be used to recover from bit errors that may have crept into the first 188 bytes of the packet. 204 byte packets are generally used over satellite links but the FEC trailer is typically dropped by the satellite receiver.

A subset of this status information is also shown on the main Status page (Welcome page) in the lower section of the main pane, as shown in Figure 21.

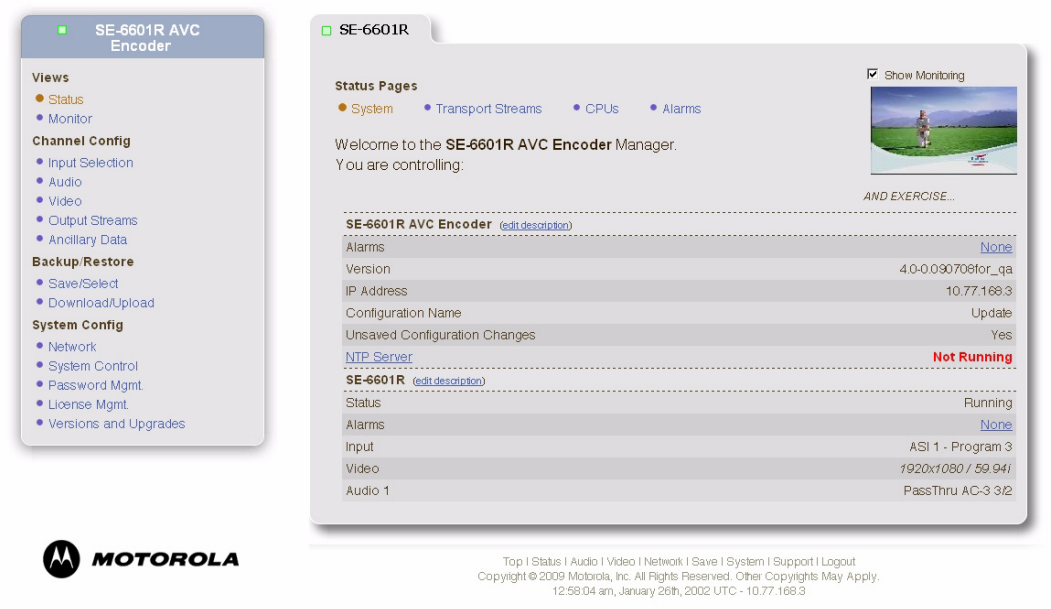


Figure 21: Welcome Page with ASI Status

Audio Parameters Page

In the Navigation pane, click **Audio** to display the Audio Parameters Page.

This section describes the available audio configuration of the encoders for both the main video and proxy video streams. The encoders support independent audio streams for the main video stream. The tables following each screen image describe the options.

Note: *For more information about common terms, refer to* *Common Terms on page 115*.

Audio Stream Configuration Table

The Audio Stream Configuration Table shows the parameters for each of the possible audio output streams for the main video stream, depending on the input selected on the Input Selection screen.

SDI Input Selection

For SDI, you can enable one or more audio streams, click the desired **Change** link in the Edit column. Figure 22 shows the resulting page.

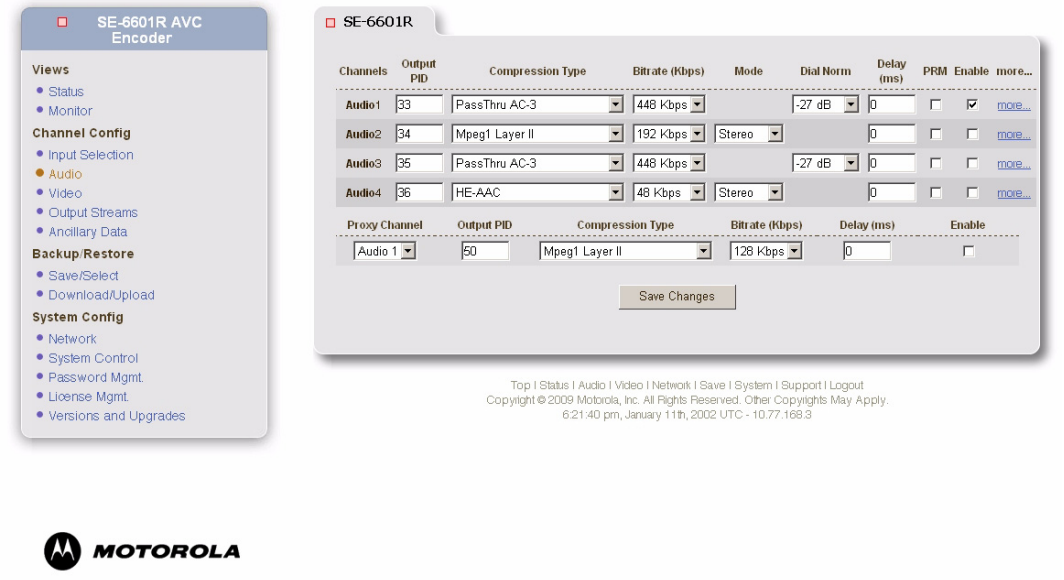


Figure 22: Audio Parameters Page – SDI

Table 19: Audio Stream Configuration with SDI

Label	Description
Channels	Indicates the channels availble for audio encoding.
Compression Type	This pulldown selects the processing option that are licensed and available to be used for each of the audio streams. Possible options include: • PassThru • AC-3 to HE-AAC • AC-3 to DD + Pro • Downsample to AC-3 stereo • Downsample to AAC stereo ***Note:*** *Refer to Table 1 on page 1 for more information about licensable audio options.*
Bit rate (Kbps)	The pulldown menu lets you select the appropriate bit rate.
Mode	This field lets you select different encoding modes that may be available with the selected compression type. For example MPEG1 Layer II offers Stereo, Stereo Ind, or Stereo Dual options.
Dial Norm	The Dial Norm parameter controls the amplification level in the set top box. The scale used ranges in 1 dB steps from –1 to –31 dB. Incoming: Incoming in the pulldown menu indicates that the incoming dial norm value has been mapped across to the output. ***Note:*** *Contrary to what you might assume at first, a setting of –31 represents no level shift in the consumer's decoder, and –1 represents the maximum level shift.*
Delay (ms)	This parameter shows the delay time in milliseconds that is applied to the audio stream. This allows the audio to be advanced or delayed relative to the video.
PRM	Peak Reading Monitor tracks and holds the peak level that has been encountered since the PRM was last reset.
Enable	Enable allows you to select whether this audio stream configuration is enabled for inclusion in the outgoing transport stream.

Table 19: Audio Stream Configuration with SDI

Label	Description
more...	When selected, this opens additional audio parameters and information. When in AC-3 pass through mode the more... tab provides access to modify the language descriptors in the stream. ***Note:*** *This feature is not normally required, may be used to correct descriptor errors in incoming streams. Refer to Figure 23 on page 49 for more information.* When in MPEG1 Layer II baseband encoding mode the more... tab provides access to amplify and attenuate the audio level. Refer to Figure 24 on page 49 for more information. When in AC-3 baseband encoding mode more... tab provides access to amplify and attenuate the audio level. In addition the tab provides access to a number of additional Dolby service configuration parameters, bit stream descriptor and preprocessing options. Refer to Figure 25 on page 50 for more information. When in AC-3 pass through mode the more... tab provides access to monitor the metadata that is present in an incoming stream. Refer to Figure 27 on page 51 for more information.
Proxy Channel	This allows you to select the audio proxy channel.
Output PID	This allows the audio PID value to be defined.
Compression Type	The compression menu lets you select from a menu of available Codecs that can be associated with the proxy.
Bitrate (Kbps)	The bit rate menu lets you select bit rates for the audio proxy service.
Delay (ms)	This parameter shows the delay time in milliseconds that is applied to the audio stream. This allows the audio to be advanced or delayed relative to the video.
Enable	This allows you to select whether this proxy audio stream configuration is enabled or disabled. ***Note:*** *You cannot enable proxy audio on a disabled audio channel.*
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

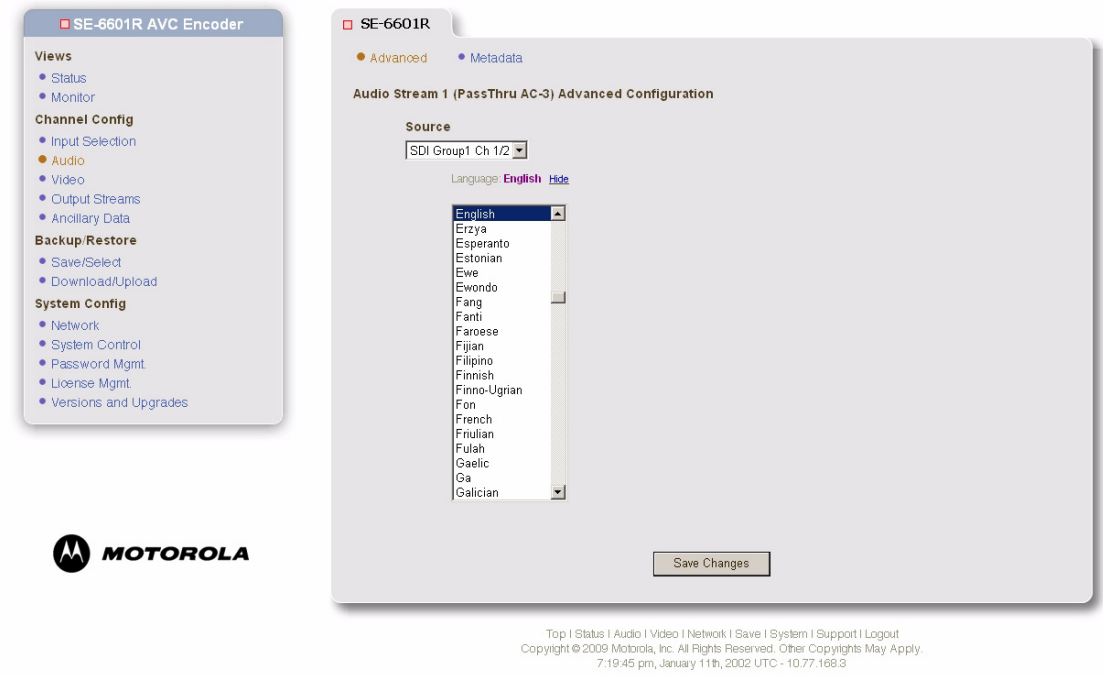


Figure 23: Audio – SDI continued... (Source and Language)

Figure 24: Audio – SDI continued... (Volume)

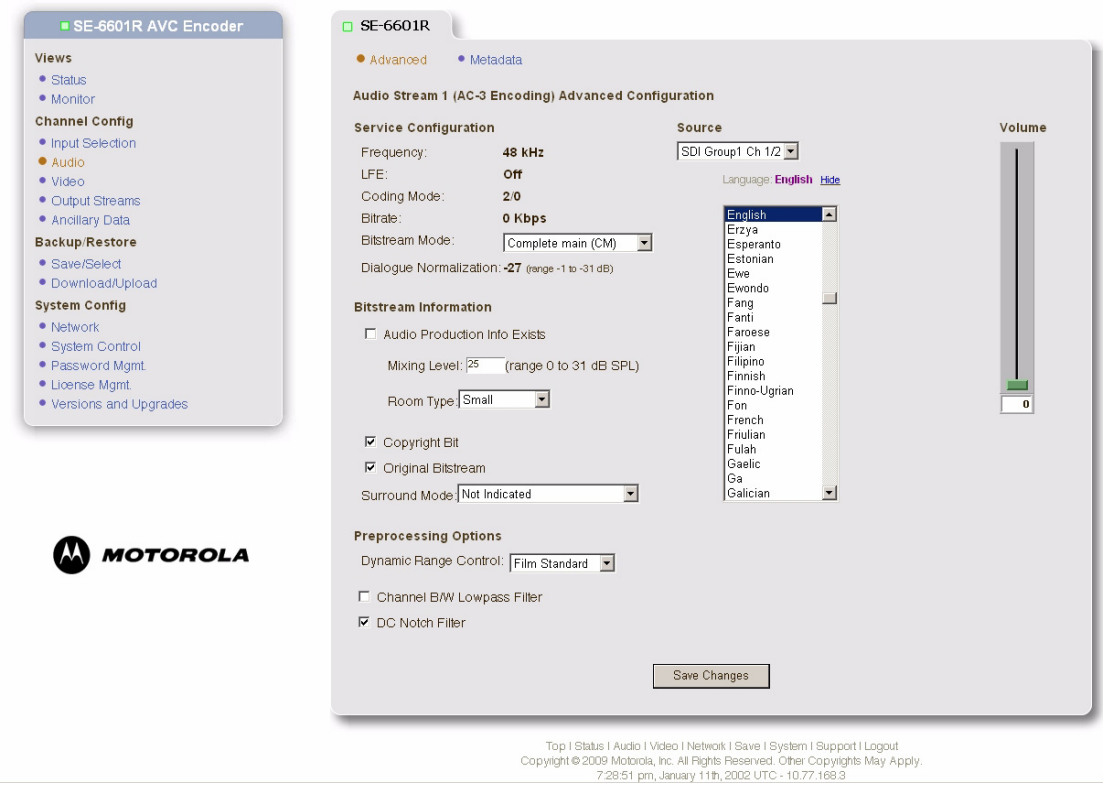


Figure 25: Audio – SDI continued... (Service Configuration, Bitstream Information, Preprocessing Options)

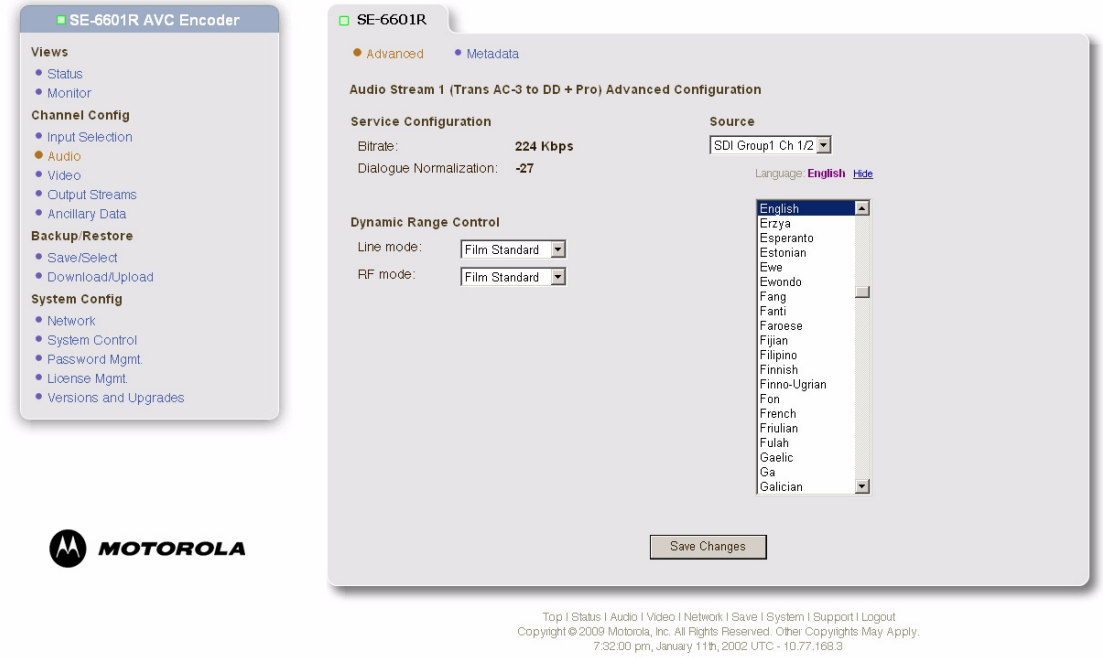


Figure 26: Audio – SDI cont.. (Service Configuration & Dynamic Range Control)

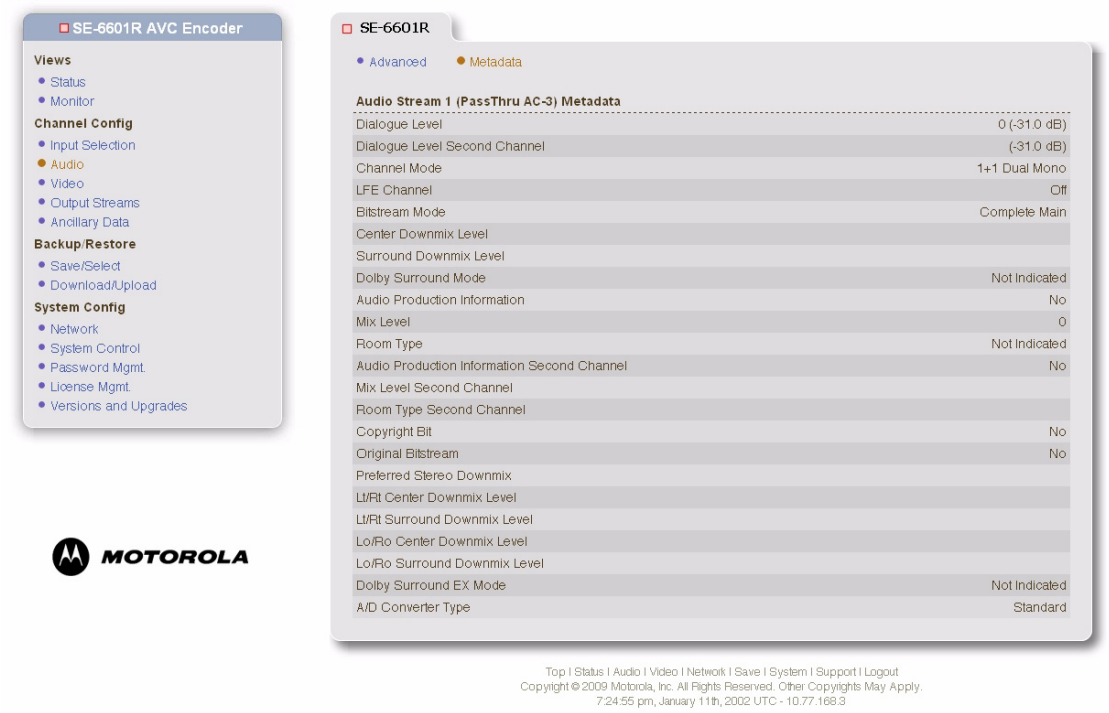


Figure 27: Audio – SDI continued... (Metadata)

ATSC Tuner Input Selection

For the ATSC Tuner, you can enable one or more audio streams, click the desired **Change** link in the Edit column. Figure 22 shows the resulting page.

Table 20: Audio Stream Configuration with ATSC Tuner

Label	Description
Channels	This identifies the number of audio channels found in the ATSC MPEG 2 Stream.
Compression Type	This pulldown selects the processing option that are licensed and available to be used for each of the audio streams. Possible options include: • PassThru • AC-3 to HE-AAC • AC-3 to DD + Pro • Downsample to AC-3 stereo ***Note:*** *Refer to Table 1 on page 1 for more information on licensable audio options.*
Bit rate (Kbps)	This field sets the bit that is allocated to the compression mode selected. If pass through mode is selected, the bit rate needs to equal or greater than the incoming audio rate that could be encountered.
Mode	This field lets you select different encoding modes that may be available with the selected compression type. For example AC-3 and HE-AAC offers Stereo, Stereo Ind, or Stereo Dual options.

Table 20: Audio Stream Configuration with ATSC Tuner

Label	Description
Dial Norm	The Dial Norm parameter controls the amplification level in the set top box. The scale used ranges in 1 dB steps from –1 to –31 dB. Incoming: Incoming in the pulldown menu indicates that the incoming dial norm value has been mapped across to the output. ***Note:*** *Contrary to what you might assume at first, a setting of –31 represents no level shift in the consumer's decoder, and –1 represents the maximum level shift.*
Delay (ms)	This parameter shows the delay time in milliseconds that is applied to the audio stream. This allows the audio to be advanced or delayed relative to the video.
PRM	Peak Reading Monitor tracks and holds the peak level that has been encountered since the PRM was last reset.
Enable	This allows you to select whether this proxy audio stream configuration is enabled or disabled. ***Note:*** *You cannot enable proxy audio on a disabled audio channel.*
Channels	This identifies the number of audio channels found in the ATSC MPEG 2 Stream.
Compression Type	This pulldown selects the processing option that are licensed and available to be used for each of the audio streams. Possible options include: • PassThru • AC-3 to HE-AAC • AC-3 to DD + Pro • Downsample to AC-3 stereo ***Note:*** *Refer to Table 1 on page 1 for more information on licensable audio options.*
more...	When selected, this opens additional audio parameters and information. Advanced: • Source and Language selection (including hide/show selection), see Figure 23 • Volume (with Mpeg1 Layer II, HE-AAC, LC-AAC, AC-3 encoding), see Figure 24 • Service Configuration, Bitstream Information, Preprocessing Options (with AC-3 encoding, Encode DD + Pro, Downsample to AC-3), see Figure 25) • Service Configuration and Dynamic Range Control (with Trans AC-3 to DD +Pro), see Figure 26 Metadata – see Figure 27
Proxy Channel	This allows you to select the audio proxy channel.
Output PID	This allows the audio PID value to be defined.
Compression Type	The compression type for each of the proxy audio streams can be: • PassThru AC-3 to HE-AAC
Bitrate (Kbps)	The bit rate menu lets you select bit rates for the audio proxy service.

Table 20: Audio Stream Configuration with ATSC Tuner

Label	Description
Mode	The bit rate of the proxy audio stream is shown. PassThru: AC-3 to HE-AAC: 48, 64, or 128 Kbps.
Dial Norm	The Dial Norm parameter controls the amplification level in the set top box. The scale used ranges in 1 dB steps from –1 to –31 dB. Incoming: Incoming in the pulldown menu indicates that the incoming dial norm value has been mapped across to the output. ***Note:*** *Contrary to what you might assume at first, a setting of –31 represents no level shift in the consumer's decoder, and –1 represents the maximum level shift.*
Delay (ms)	This parameter shows the delay time in milliseconds that is applied to the audio stream. This allows the audio to be advanced or delayed relative to the video.
Enable	This allows you to select whether this proxy audio stream configuration is enabled or disabled.
Save Changes	This allows you to select whether this proxy audio stream configuration is enabled or disabled. ***Note:*** *You cannot enable proxy audio on a disabled audio channel.*

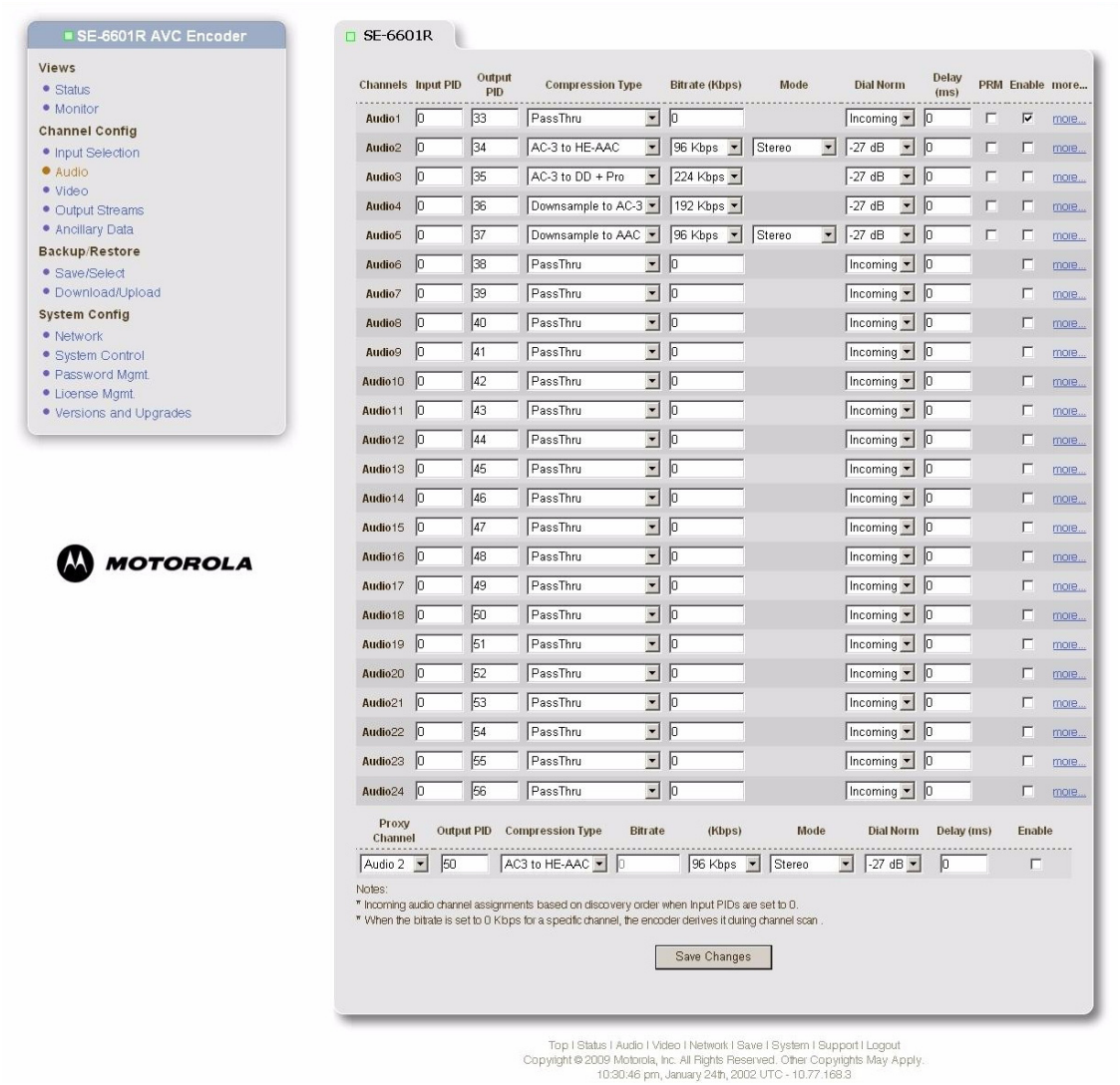


Figure 28: Audio Parameters Page – ATSC Tuner

UDP Input Selection

For UDP, you can enable one or more audio streams, click the desired **Change** link in the Edit column. Figure 22 shows the resulting page.

Table 21: Audio Stream Configuration with UDP

Label	Description
Channels	This identifies the PIP audio channel 1 through 24.
Compression Type	This pulldown selects the processing option that are licensed and available to be used for each of the audio streams. Possible options include: • PassThru • AC-3 to HE-AAC • AC-3 to DD + Pro • Downsample to AC-3 stereo ***Note:*** *Refer to Table 1 on page 1 for more information on licensable audio options.*
Bit rate (Kbps)	This field sets the bit that is allocated to the compression mode selected. If pass through mode is selected, the bit rate needs to equal or greater than the incoming audio rate that could be encountered.
Mode	This field lets you select different encoding modes that may be available with the selected compression type. For example MPEG1 Layer II offers Stereo, Stereo Ind, or Stereo Dual options.
Dial Norm	The Dial Norm parameter controls the amplification level in the set top box. The scale used ranges in 1 dB steps from –1 to –31 dB. Incoming: Incoming in the pulldown menu indicates that the incoming dial norm value has been mapped across to the output. ***Note:*** *Contrary to what you might assume at first, a setting of –31 represents no level shift in the consumer's decoder, and –1 represents the maximum level shift.*
Delay (ms)	This parameter shows the delay time in milliseconds that is applied to the audio stream. This allows the audio to be advanced or delayed relative to the video.
PRM	Peak Reading Monitor tracks and holds the peak level that has been encountered since the PRM was last reset.
Enable	Enable allows you to select whether this audio stream configuration is enabled for inclusion in the outgoing transport stream.

Table 21: Audio Stream Configuration with UDP

Label	Description
more...	When selected, this opens additional audio parameters and information. When in AC-3 pass through mode the more... tab provides access to modify the language descriptors in the stream. ***Note:*** *This feature is not normally required, may be used to correct descriptor errors in incoming streams. Refer to Figure 23 on page 49 for more information.* When in MPEG1 Layer II baseband encoding mode the more... tab provides access to amplify and attenuate the audio level. Refer to Figure 24 on page 49 for more information. When in AC-3 baseband encoding mode more... tab provides access to amplify and attenuate the audio level. In addition the tab provides access to a number of additional Dolby service configuration parameters, bit stream descriptor and preprocessing options. Refer to Figure 25 on page 50 for more information. When in AC-3 pass through mode the more... tab provides access to monitor the metadata that is present in an incoming stream. Refer to Figure 27 on page 51 for more information.
Proxy Channel	This allows you to select the audio proxy channel.
Output PID	This allows the audio PID value to be defined.
Compression Type	The compression menu lets you select from a menu of available Codecs that can be associated with the proxy.
Bitrate (Kbps)	The bit rate menu lets you select bit rates for the audio proxy service.
Delay (ms)	This allows you to select whether this proxy audio stream configuration is enabled or disabled.
Enable	This allows you to select whether this proxy audio stream configuration is enabled or disabled. ***Note:*** *You cannot enable proxy audio on a disabled audio channel.*
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

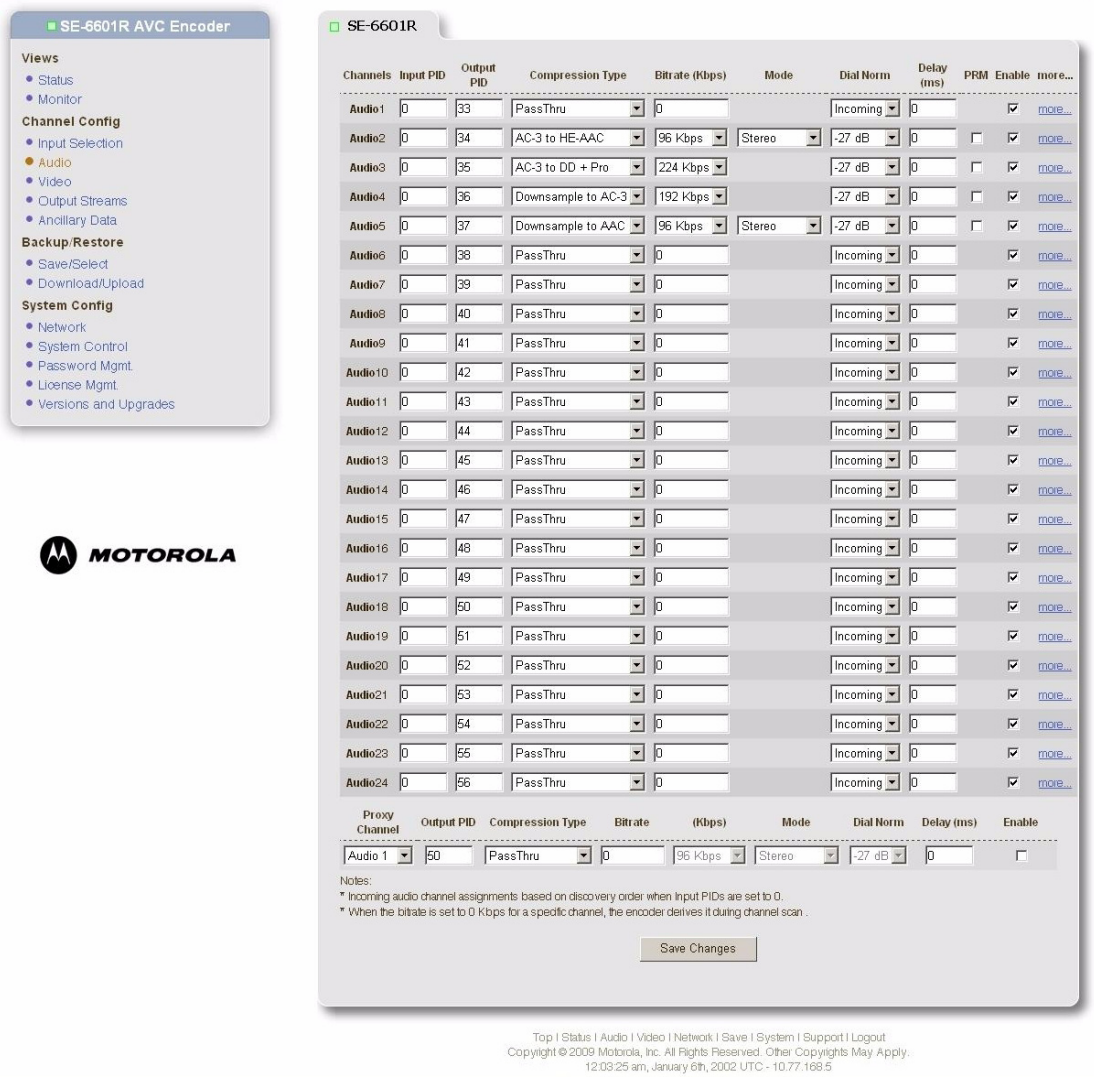


Figure 29: Audio Parameters Page – UDP Input

ASI Input Selection

For ASI, you can enable one or more audio streams, click the desired **Change** link in the Edit column. Figure 22 shows the resulting page.

Table 22: Audio Stream Configuration with ASI

Label	Description
Channels	This identifies the PIP audio channel 1 through 24.
Compression Type	This pulldown selects the processing option that are licensed and available to be used for each of the audio streams. Possible options include: • PassThru • AC-3 to HE-AAC • AC-3 to DD + Pro • Downsample to AC-3 stereo ***Note:*** *Refer to Table 1 on page 1 for more information on licensable audio options.*
Bit rate (Kbps)	This field sets the bit that is allocated to the compression mode selected. If pass through mode is selected, the bit rate needs to equal or greater than the incoming audio rate that could be encountered.
Mode	This field lets you select different encoding modes that may be available with the selected compression type. For example MPEG1 Layer II offers Stereo, Stereo Ind, or Stereo Dual options.
Dial Norm	The Dial Norm parameter controls the amplification level in the set top box. The scale used ranges in 1 dB steps from –1 to –31 dB. Incoming: Incoming in the pulldown menu indicates that the incoming dial norm value has been mapped across to the output. ***Note:*** *Contrary to what you might assume at first, a setting of –31 represents no level shift in the consumer's decoder, and –1 represents the maximum level shift.*
Delay (ms)	This parameter shows the delay time in milliseconds that is applied to the audio stream. This allows the audio to be advanced or delayed relative to the video.
PRM	Peak Reading Monitor tracks and holds the peak level that has been encountered since the PRM was last reset.
Enable	Enable allows you to select whether this audio stream configuration is enabled for inclusion in the outgoing transport stream.

Table 22: Audio Stream Configuration with ASI

Label	Description
more...	When selected, this opens additional audio parameters and information. When in AC-3 pass through mode the more... tab provides access to modify the language descriptors in the stream. ***Note:*** *This feature is not normally required, may be used to correct descriptor errors in incoming streams. Refer to Figure 23 on page 49 for more information.* When in MPEG1 Layer II baseband encoding mode the more... tab provides access to amplify and attenuate the audio level. Refer to Figure 24 on page 49 for more information. When in AC-3 baseband encoding mode more... tab provides access to amplify and attenuate the audio level. In addition the tab provides access to a number of additional Dolby service configuration parameters, bit stream descriptor and preprocessing options. Refer to Figure 25 on page 50 for more information. When in AC-3 pass through mode the more... tab provides access to monitor the metadata that is present in an incoming stream. Refer to Figure 27 on page 51 for more information.
Proxy Channel	This allows you to select the audio proxy channel.
Output PID	This allows the audio PID value to be defined.
Compression Type	The compression menu lets you select from a menu of available Codecs that can be associated with the proxy.
Bitrate (Kbps)	The bit rate menu lets you select bit rates for the audio proxy service.
Delay (ms)	This allows you to select whether this proxy audio stream configuration is enabled or disabled.
Enable	This allows you to select whether this proxy audio stream configuration is enabled or disabled. ***Note:*** *You cannot enable proxy audio on a disabled audio channel.*
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

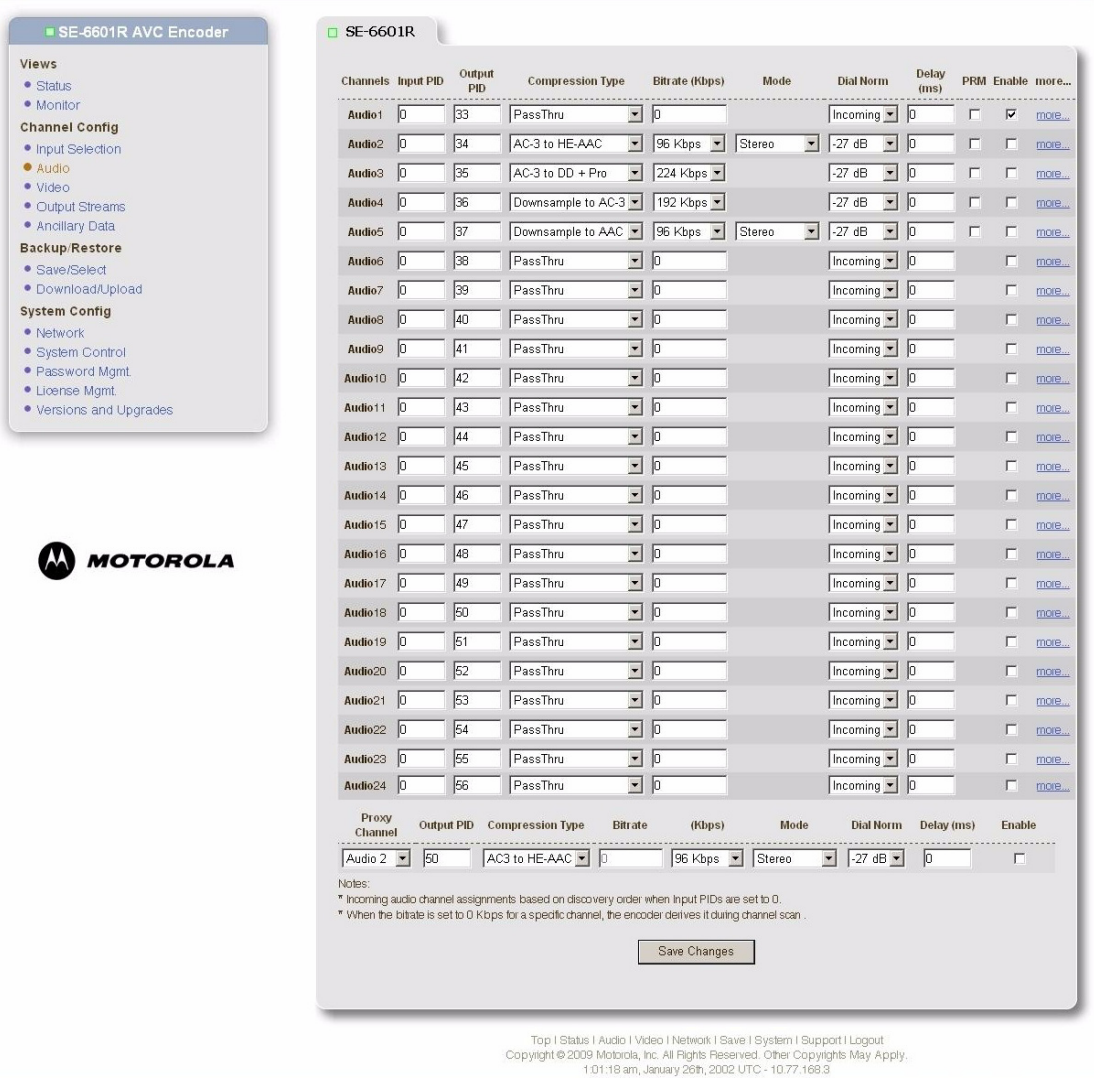


Figure 30: Audio Parameters Page – ASI Input

Video Parameters Page

In the Navigation pane, click **Video** to access Video parameters. This page allows the user to set up of Basic parameters, Advanced parameters, and Proxy parameters for the incoming video stream.

Basic Video Parameters Page

The Basic Video Parameter page changes depending upon the input source selection, as shown in Figure 31 through Figure 33.

To access the Basic Video Parameters, click Video from the Navigation pane and then click Basic to display the Basic Video Parameters Page, as shown.

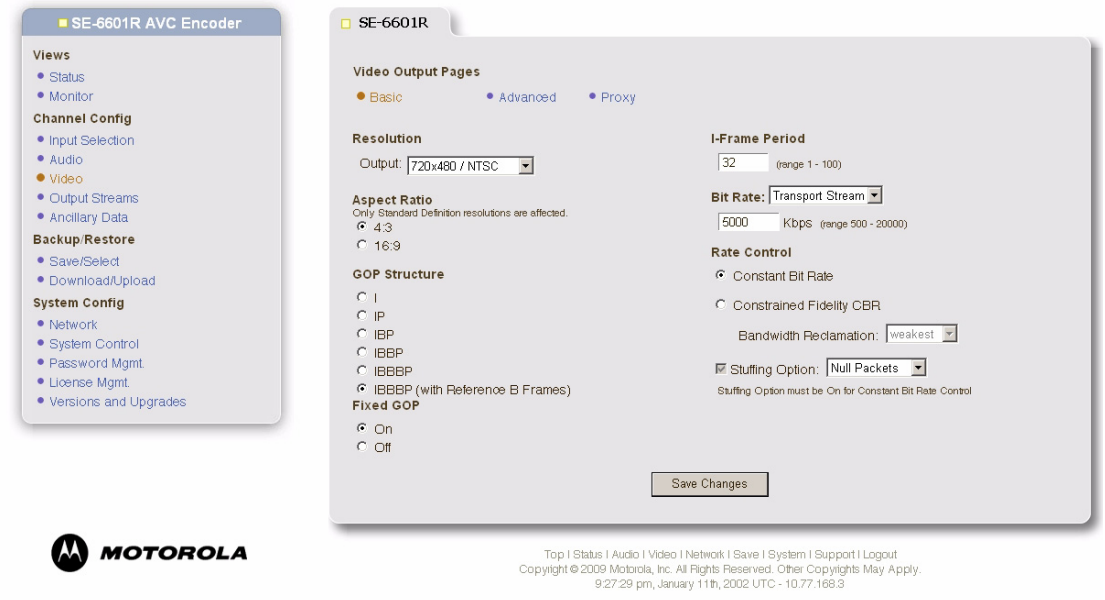


Figure 31: Basic Video Parameters Page

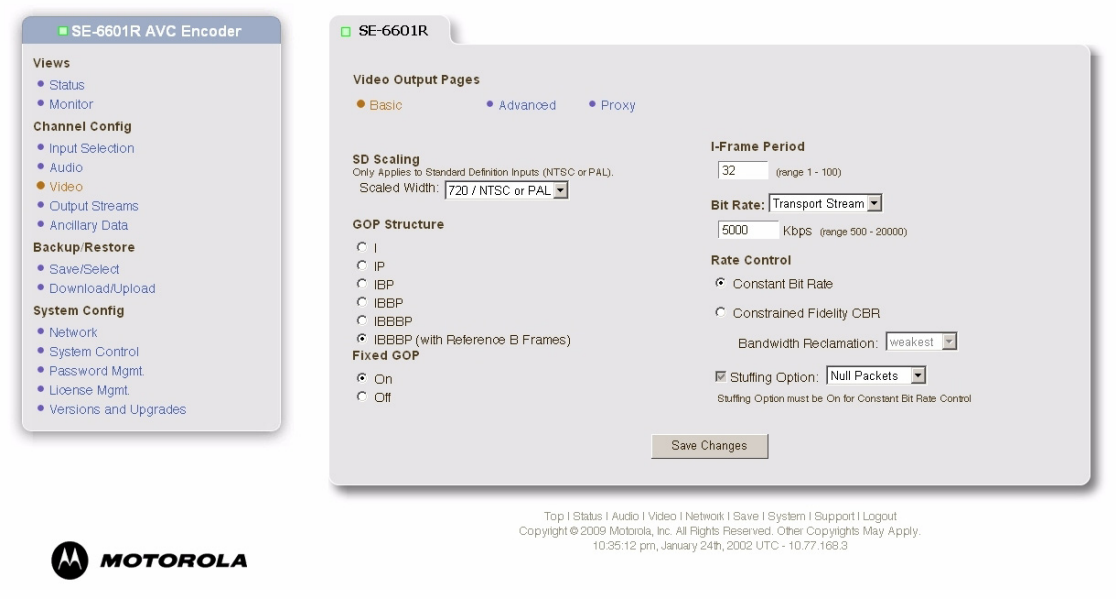


Figure 32: Basic Video Parameters Page – ATSC with SD input

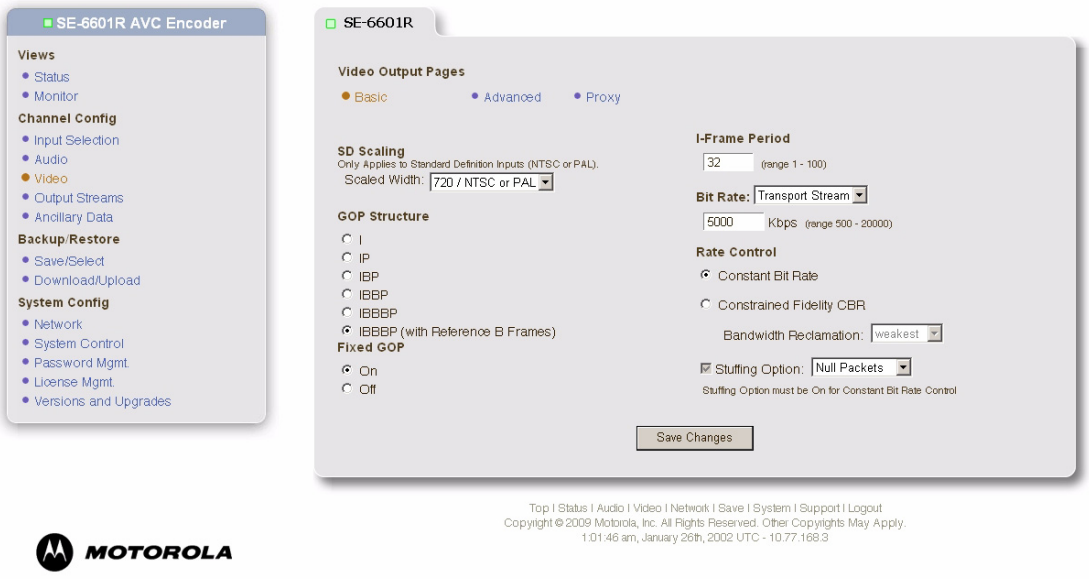


Figure 33: Basic Video Parameters Page – ASI with SD input

Table 23: Basic Video Parameters

Parameter / Button	Description
Resolution Output	If the SDI is selected on the Input Selection screen, you can select the following resolution output options from the Output pulldown menu: 480x480 / NTSC 528x480 / NTSC 544x480 / NTSC 704x480 / NTSC 720x480 / NTSC (default) 480x576 / PAL 528x576 / PAL 544x576 / PAL 704x576 / PAL 720x576 / PAL 960x720 / 50p 1280x720 / 50p 960x1080 / 50i 1280x1080 / 50i 1440x1080 / 50i 1920x1080 / 50i 960x1080 / 50p 1280x1080 / 50p 1440x1080 / 50p 1280x1080 / 50p 960x720 / 59.94p 1280x720 / 59.94p 960x1080 / 59.94i 1280x1080 / 59.94i 1440x1080 / 59.94i 1920x1080 / 59.94i 960x1080 / 59.94p 1280x1080 / 59.94p 1440x1080 / 59.94p 1960x1080 / 59.94p If UDP is selected on the Input Selection screen, you can select the following resolution output options from the Output pulldown menu: 480 / NTSC or PAL 528 / NTSC or PAL 544 / NTSC or PAL 704 / NTSC or PAL 720 / NTSC or PAL (default)
Aspect Ratio	Select the desired aspect ratio (4.3 or 16:9). ***Note:*** *This is only meaningful in SD. In HD the aspect ratio is always 16:9.*

Table 23: Basic Video Parameters

Parameter / Button	Description
GOP Structure	Select the GOP (Group of Pictures) structure for the encoded stream. Choose either I frame only, IP, IBP, IBBP, IBBBP, or IBBBP (with reference B Frame). ***Note:*** *Maximum efficiency and image quality is achieved using* **`IBBBP (with reference B Frame)`**.
Fixed GOP	Select the Fixed GOP – On or Off
I-Frame Period	Select the desired I-Frame Period (1 to 100).
Bit Rate	Select Transport Stream or Video Stream. Enter the bit rate of the stream to be encoded.
Rate Control	Check the Constant Bit Rate (CBR) box to stream data at the designated bit rate. This is the most common form of rate control. Enable the Constrained Fidelity CBR check box to introduce VBR (Variable Bit Rate) benefits into CBR domain applications. This hybrid feature does not allow the bit rate to exceed the designated rate (depending on the Bandwidth Reclamation selection). However, if the scene does not require the full data rate to achieve the desired picture fidelity, the encoder automatically reduces the bit rate. Use the Bandwidth Reclamation pull-down menu to set the desired bandwidth reclamation. Five choices are provided, ranging from weakest to the more aggressive (strongest) setting. The correlation between the setting and artifacts are synonymous; the more aggressive the setting, the more artifacts are created. If Constrained Fidelity CBR is selected, you can enable Stuffing Options: • Select Null Packets from the pulldown menu to produce a constant bit rate stream with transport stream stuffing, the process of filling up the complete spectrum with null packets to provide a constant data rate. For example, if the transport rate is 10 Mb/s and the elementary stream with audio and overhead is 7 Mb/s, the encoder inserts 3 Mb/s in null packets to achieve the selected 10 Mb/s rate. • Select Video Packets from the pulldown menu to select a capped VBR stream without null packets. ***Note:*** *The Stuffing Option must be On for Constant Bit Rate Control.*
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

Advanced Video Parameters Page

To access the Advanced Video Parameters, click **Video** from the Navigation pane and then click **Advanced** to display the Advanced Video Parameters Page, as shown in Figure 34.

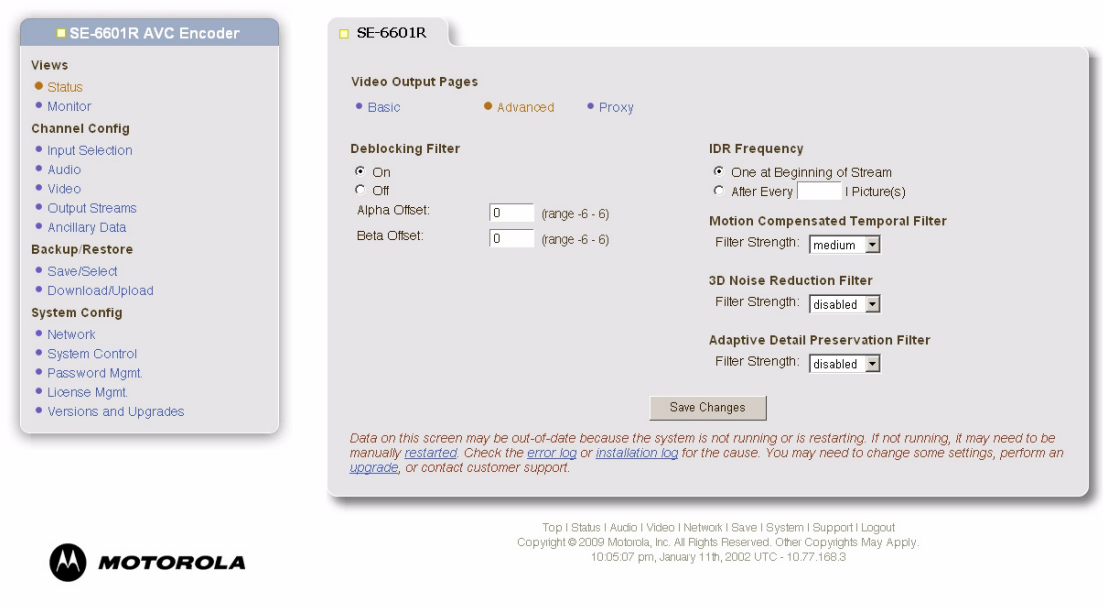


Figure 34: Advanced Video Parameters Page

Table 24: Advanced Video Parameters

Parameter	Description
Deblocking Filter	Use the radio buttons to enable (On) or disable (Off) the AVC de-blocking filter. This filter is used to improve block edge artifacts from becoming noticeable when the encoder is aggressively encoding. The de-blocking filter processes the block edges so that they merge with adjacent blocks. If the filter is enabled, then two additional values need to be entered to control the strength of the filtering. Alpha Offset – Appropriate values lie between -6 and 6. Beta Offset – Appropriate valued lie between -6 and 6. ***Note:*** *There is a strong correlation between data rate, content, and the amount of de-blocking that should be used. The higher the data rate being used, the lower the amount of de-blocking that should be used. For example, with file originated material at 1.5 Mbps, the deblocking setting should be set to Alpha=3 and Beta=3.*
IDR Frequency	Use this window to initialize a set top box or to enable trick modes in set top boxes. Each set top box may have different requirements as to the frequency with which IDRs are sent. The IDR Frequency allows the operator to set the frequency and location of IDRs. Select either One at the Beginning of Stream or After Every _ I Pictures.

Table 24: Advanced Video Parameters

Parameter	Description
Motion Compensated Temporal Filter	Temporal filtering is an averaging process applied across video frames. The averaging (or filtering) process cancels any random noise in the video stream using MPEG motion "prediction" technology. This technique is known as Motion Compensated Temporal Filtering (MCTF), which allows the temporal filtering to account for motion and thus avoid motion blur. The options are: • disabled • strongest • strong • medium • weak • weakest
3D Noise Reduction Filter	3D Noise Reduction (3DNR) is designed to remove the random noise in a compression environment. The basis for the 3DNR system is a combination of spatial and motion compensated temporal filtering elements that are applied in conjunction with the a perceptual significance map to identify the areas where effective noise reduction can be applied transparently. The options are: • disabled • strongest • strong • medium • weak • weakest
Adaptive Detail Preservation Filter	Adaptive Detail Preservation Filter (ADP) is designed to preserve visually important detail and to attenuate the quantization noise, impulse noise, and hard to compress detail to which the eye is not sensitive. The options are: • disabled • strongest • strong • medium • weak • weakest
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

Note: *Encoder defaults are described in* *System Defaults on page 111*.

Proxy Video Parameters Page

Note: *To access the Proxy Video Parameters, select SDI on the Input Selection screen.*

To access the Proxy Video Parameters, click **Video** from the Navigation pane and then click **Proxy** to display the Proxy Video Parameters Page, as shown in Figure 35.

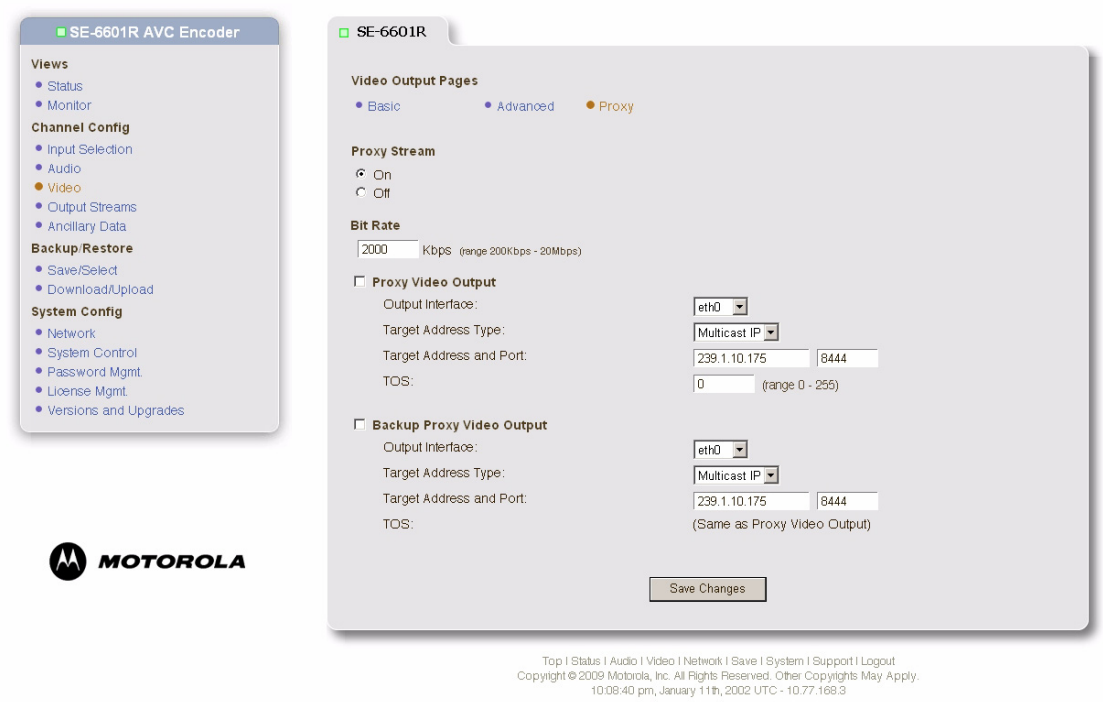


Figure 35: Proxy Video Parameters Page

Table 25: Proxy Video Parameters

Parameter / Button	Description	
Proxy Stream	When On is selected, allows configuration of proxy parameters for the incoming video stream. If Off is selected, then the horizontal resolution is modified by the settings on this page. The resolution is factory set at 128x96 for HD inputs, 96x96 for SD inputs, and 128x96 / HD - SD.	
Bit Rate	Select the bit rate that indicates the sum of the video plus audio bit rates for the incoming video stream, choices are: 200 kbps, 300 kbps, 400 kbps, or 500 kbps.	
Proxy Video Output	Output Interface	Select the Ethernet port associated with the output video stream.
	Type Address	Select either multicast or unicast for the output video stream.
	Target Address	Enter the desired IP address to which the encoder transmits the output video stream for either multicast or unicast. For multicast, the default address is set to 239.1.1.2. If the video is unicast, the IP address of the destination PC must be specified. The valid range of IP addresses for multicast is 224.0.0.0 to 239.255.255.255.
	Target Port	Enter the desired UDP port number (> 25) to which the encoder transmits the output video stream. Default port is 8434.

Table 25: Proxy Video Parameters

Parameter / Button	Description	
Backup Proxy Video Output	Output Interface	Select the Ethernet port associated with the backup output video stream.
	Target Address Type	Select either multicast or unicast for the backup output video stream.
	Target Address	Enter the desired IP address to which the encoder transmits the backup output video stream for either multicast or unicast. For multicast, the default address is set to 239.1.1.2. If the video is unicast, the IP address of the destination PC must be specified. The valid range of IP addresses for multicast is 224.0.0.0 to 239.255.255.255.
	Target Port	Enter the desired UDP port number (> 25) to which the encoder transmits the back up output video stream. Default port is 8434.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*	

Output Streams Page

In the Navigation pane, click **Output Streams** to access Output parameters. This page allows the user to set up IP Output, PID Parameters, DTA Output parameters, and Overlay for the output transport stream.

IP Output Parameters Page

To access the IP Output Parameters, click **Output Streams** from the Navigation pane to display the IP Output Parameters Page, as shown in Figure 36.

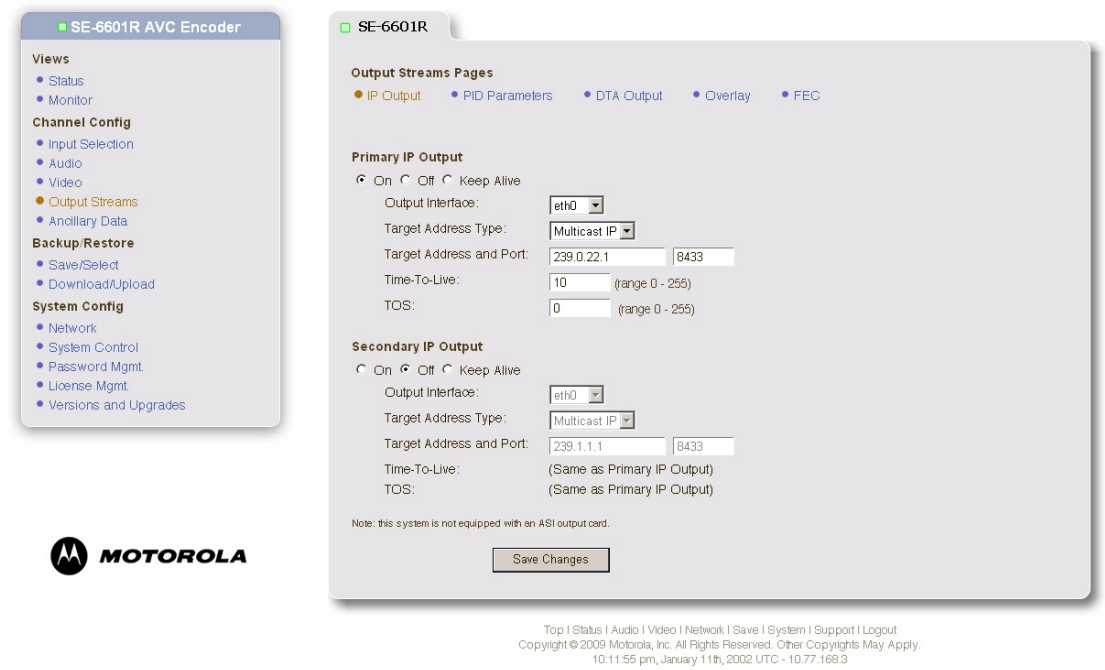


Figure 36: Output Streams Parameters Page

Table 26: IP Output Parameters

Parameter	Description
Primary/Secondary IP Output	When checked, indicates which IP output (Primary, Secondary, or both) is used for transmitting the output transport stream.
Keep Alive	When the keepalive function is on, a single UDP packet containing 7 null MTS packets is transmitted to the target IP address/port once per second. This allows operators to conduct network connectivity or other maintenance tests without consuming bandwidth using full video streams.
Output Interface	Select the Ethernet port associated with either the primary or secondary output video stream.
Target Address Type	Use the pull-down menu to choose between Multicast IP and Unicast (for the selected streaming port).
Target Address	Enter the desired IP address to transmit. This address can be multicast or unicast. By default, the multicast address is set to 239.1.1.2. If the video is unicast, the IP address of the destination computer must be specified. The valid range of class D multicast addresses is 224.0.0.0 to 239.255.255.255.

Table 26: IP Output Parameters

Target Port	Enter the desired UDP port number to transmit. The default Port used is 8434. Any port above 25 can be used.
Time-to-Live	Enter the number of hops that a packet can traverse. The value is decremented by one at each router that it encounters. The valid range is 0 to 255.
TOS	The TOS menu allows TOS header bits to be set. (Not normally used.)
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

PID Parameters Page

To access the PID Parameters, click **Output Streams** from the Navigation pane and then click **IP Output** to display the PID Parameters Page, as shown in Figure 37.

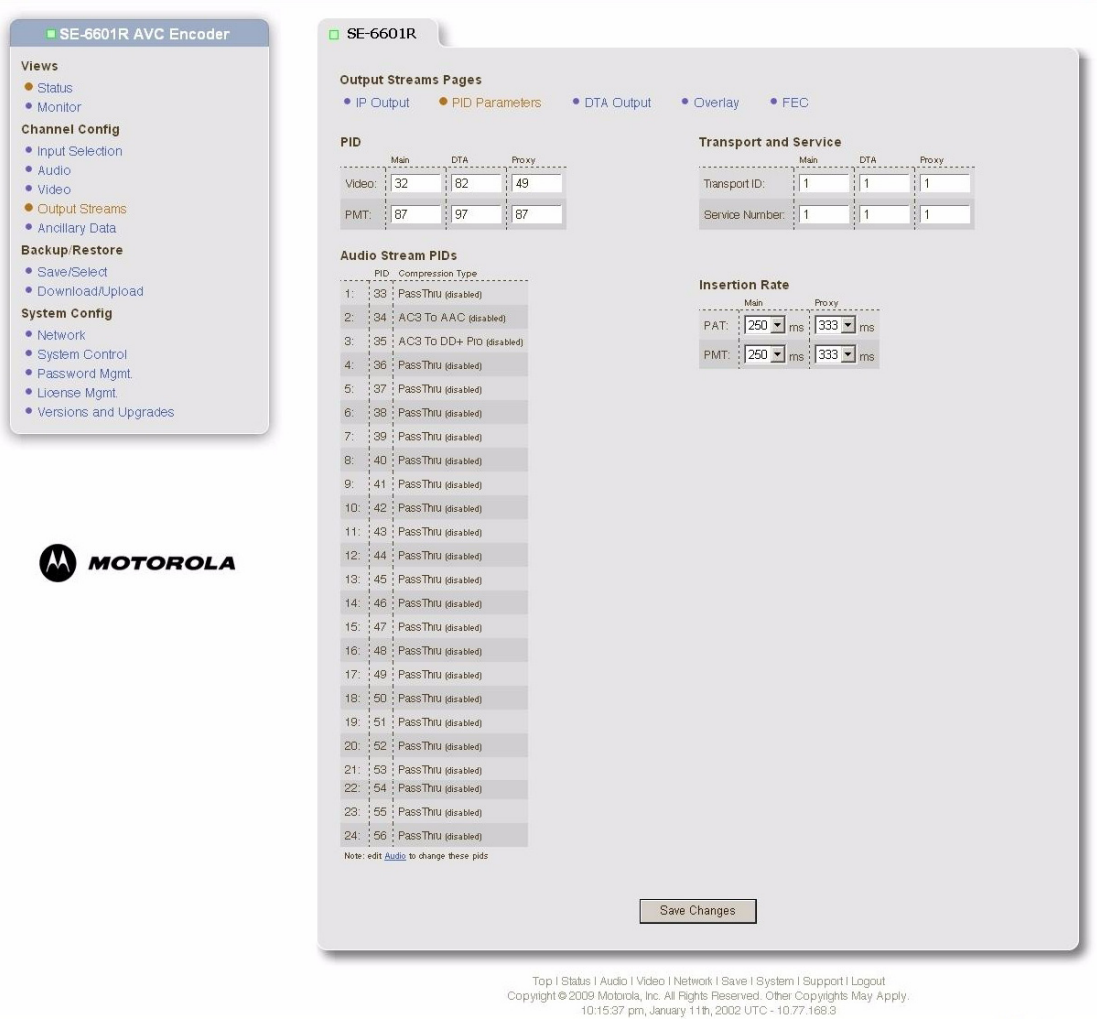


Figure 37: PID Parameters Page

Some IP video installations may require that the Audio, Video, and Program Map Table (PMT) PIDs, transport ID and Service Number have certain values. There may also be a requirement that the PAT and

PMT packets get inserted into the stream at a certain rate. Set these parameters to the values required for the specific installation.

Table 27: PID Parameters

Parameter	Description
PID	Enter the Packet Identification (PID) values for the Video, PMT, and VBI teletext packets of the transport stream. These values can be configured for both the Main and the Proxy streams. The default values (for both Main and Proxy streams) are: Video (32), PMT (87), and VBI Teletext (257), but these values can be modified to suit the specific site requirements. ***Note:*** *VBI Teletext is only available when using SDI and PAL video input.*
Audio Stream PIDs	Read-only information showing the audio stream PIDs and compression types that were defined in the Audio Parameters page. If a PID value or a compression type for an audio stream is changed, the new value is shown on this page.
Transport ID	Enter the Transport ID for both the Main and the Proxy stream. The default value is 1, but it can be changed to suit the specific site requirements.
Service Number	Enter the Service Number for both the Main and the Proxy stream. The default value is 1, but it can be changed to suit the specific site requirements.
Insertion Rates	Enter the insertion rates for the Program Association Table (PAT) and the Program Map Table (PMT), which are typically set to the same value. The values available for these two parameters are 100ms, 111ms, 125ms, 142ms, 166ms, 200ms, 250ms and 333ms. This equates to values of 1/10 sec, 1/9 sec and continuing down to 1/3 sec. The default value is 250ms for the Main and 333ms for the Proxy.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

DTA Output Page

To access the DTA Output Parameters, click Output Streams from the Navigation pane and then click DTA Output, as shown in Figure 38.

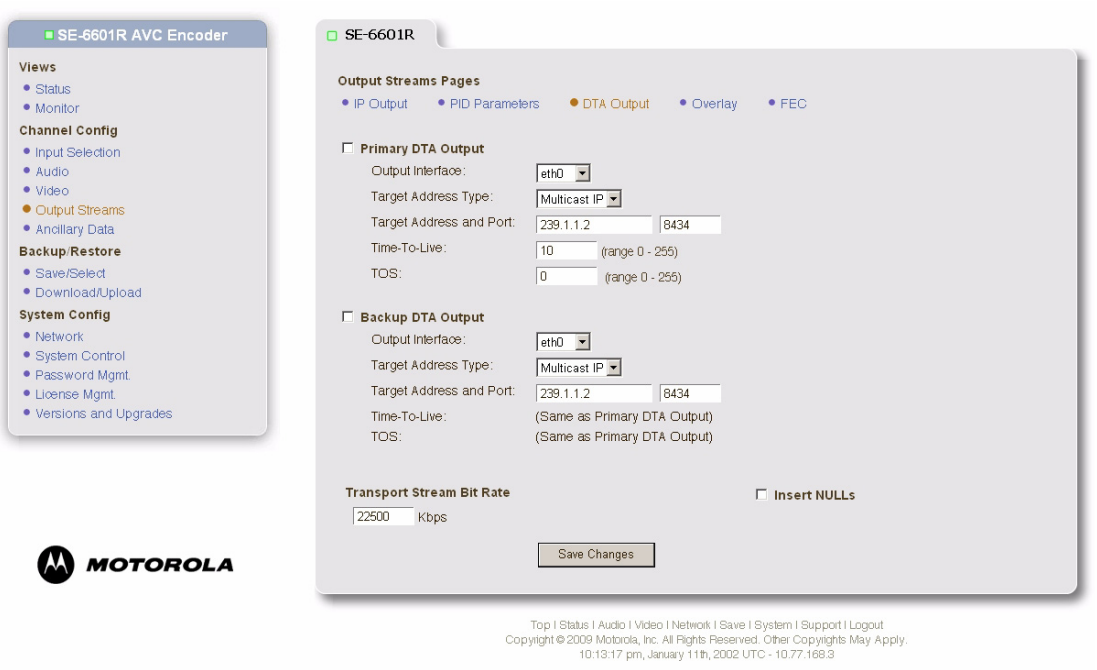


Figure 38: DTA Output Parameters Page

Table 28: IP Output Parameters

Parameter	Description
Primary/Secondary IP Output	When checked, indicates which IP output (Primary, Secondary, or both) is used for transmitting the output transport stream.
Output Interface	Select the Ethernet port associated with either the primary or secondary output video stream.
Target Address Type	Use the pull-down menu to choose between Multicast IP and Unicast (for the selected streaming port).
Target Address	Enter the desired IP address to transmit. This address can be multicast or unicast. By default, the multicast address is set to 239.1.1.2. If the video is unicast, the IP address of the destination computer must be specified. The valid range of class D multicast addresses is 224.0.0.0 to 239.255.255.255.
Target Port	Enter the desired UDP port number to transmit. The default Port used is 8434. Any port above 25 can be used.
Time-to-Live	Enter the number of hops that a packet can traverse. The value is decremented by one at each router that it encounters. The valid range is 0 to 255.
Transport Stream Bit Rate	The bitrate of the MPEG-2 transport stream that will be transmitted using the configured settings on that page.
Insert NULLs	When checked, the MPEG-2 transport stream will insert null packets as necessary so the output bitstream will be CBR. When unchecked, the MPEG-2 transport stream will be VBR, but always equal to or less than the specified Transport Stream Bit Rate.

Table 28: IP Output Parameters

Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

Overlay Parameters Page

To access the Overlay Output Parameters, click Output Streams from the Navigation pane and then click Overlay to display the Overlay Parameters Page, as shown in Figure 37.

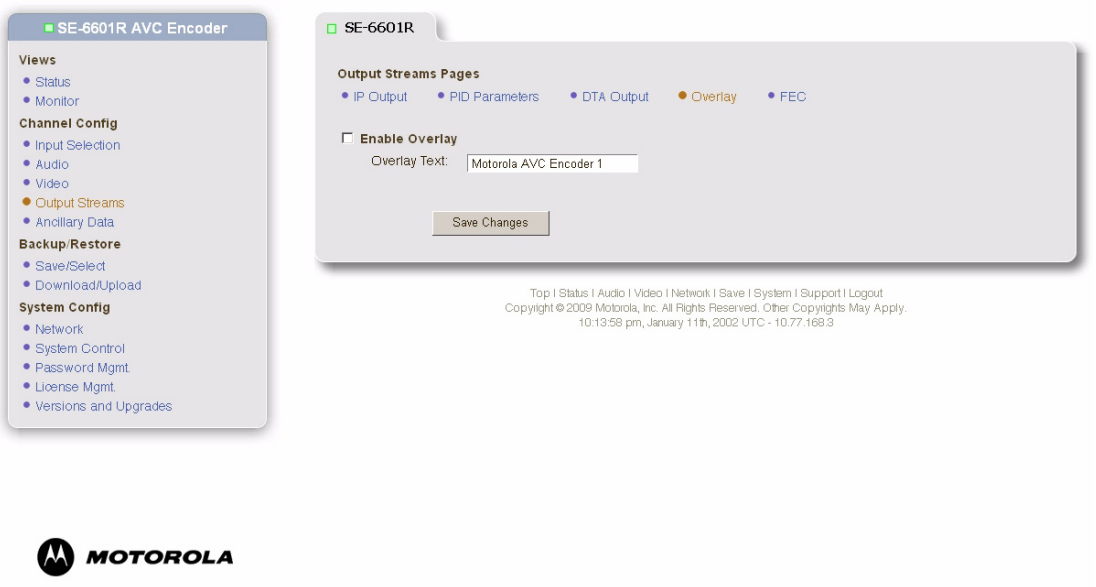


Figure 39: Overlay Parameters Page

The Overlay Text is superimposed on the video image prior to final compression, and is visible on the output video after the AVC stream is decompressed. This feature is intended for use during system installation or in diagnostic windows to aid the operator in testing channel lineups or other network functions.

Table 29: Overlay Parameters

Parameter	Description
Enable Overlay	You can change the Overlay Text when you enable Overlay Text.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

FEC Page

To access the FEC Page, click Output Streams from the Navigation pane and then click FEC to display the FEC Page, as shown in Figure 37.

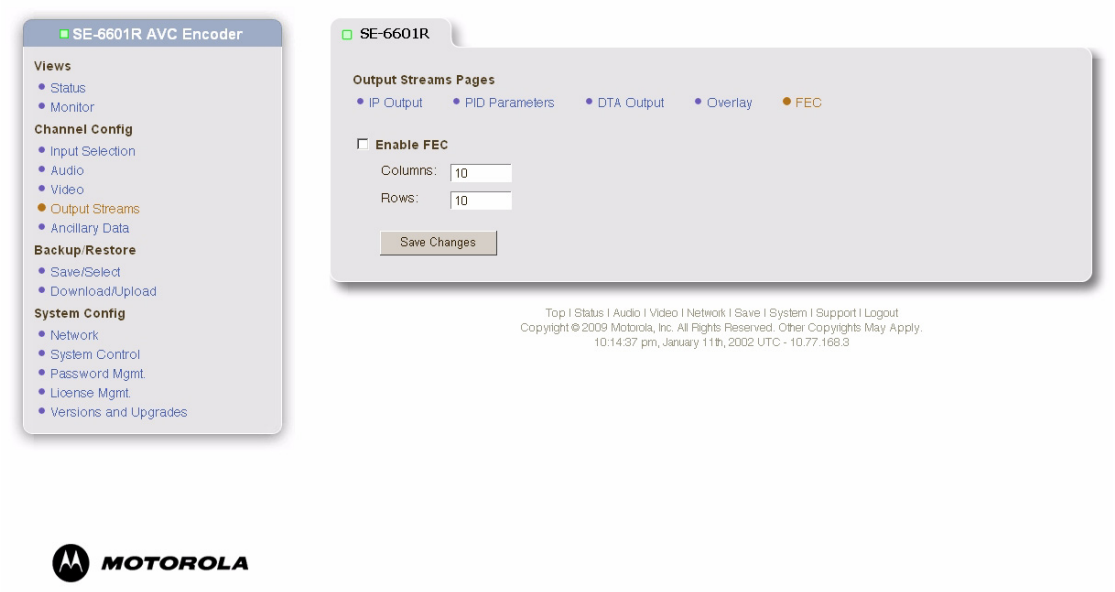


Figure 40: FEC Page

The encoder offers support for Pro-MPEG CoP3 Forward Error Correction (FEC). This feature is not normally enabled.

Table 30: FEC

Parameter	Description
Enable Overlay	You can change the Overlay Text when you enable Overlay Text.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

Ancillary Data Parameters Page

In the Navigation pane, click **Ancillary Data** to display the Ancillary Data Parameters Page, as shown in Figure 41 through Figure 44, depending on which input is selected on the Input Selection screen. These pages define how the encoder behaves in the presence of Copy Guard Management System (CGMS) signals, and how the encoder behaves when there are no such CGMS signals.

Basic Parameters Page

Note: *CGMS signals are intended to prevent the encoded signal from being copied (in the case of digital signal) or being recorded (in the case of analog signals). CGMS settings only have an effect when the encoder is running with a Standard Definition signal.*

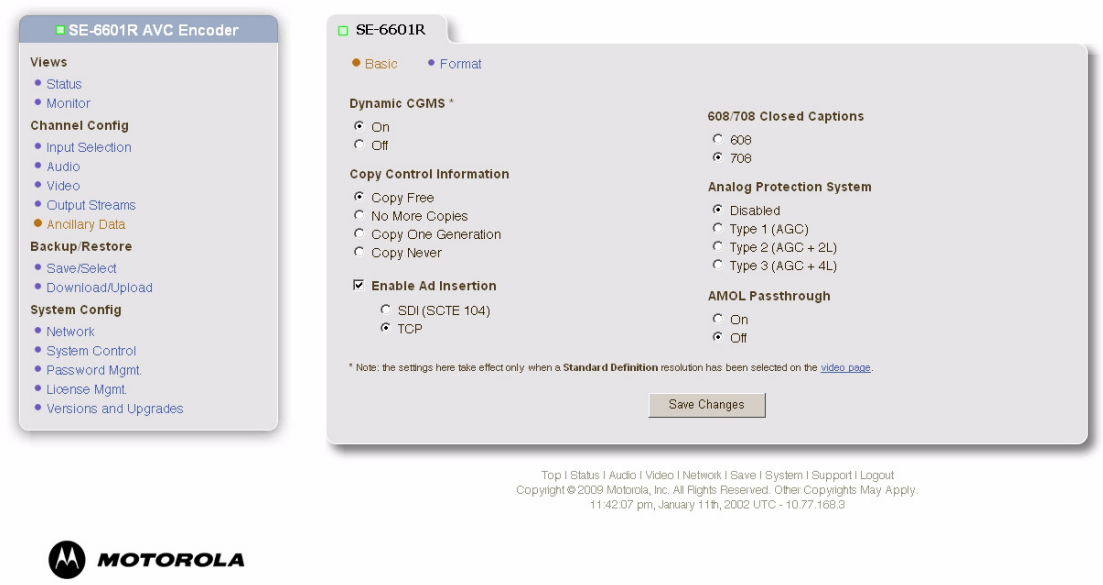


Figure 41: Ancillary Basic Parameters Page with SDI

Figure 42: Ancillary Basic Parameters Page – UDP

Table 31: Ancillary Basic Parameters

Parameter	Description
Dynamic CGMS	When Dynamic CGMS is On, the encoder determines the CGMS parameters allowed to pass through based on existing CGMS settings within the incoming video signal, without alteration in the encoded signal. When Dynamic CGMS is Off, the encoder uses the settings for the Copy Control Information, Analog Protection System, and Copyright Assertion and sends the appropriate settings within the incoming video stream. ***Note:*** *The settings take effect only when a Standard Definition resolution has been selected on the Basic Video Parameters Page.*
Copy Control Information	For NTSC as the video input, the choices are: Copy Free, No More Copies, Copy One Generation, or Never Copy. For PAL video input, the choices are: Copy Free or Never Copy.
Enable Ad Insertion	When checked, it indicates the encoder needs to pay attention to incoming ad insertion signals and generate the corresponding information in its outgoing video transport stream. The options are SCTE-104 PT and TCP. SCTE-104 PT is selected when the SCTE-104 ad insertion messages are embedded in SDI or HD-SDI signal. TCP monitors the TCP/IP network for SCTE-104 messages. TCP is selected when the SCTE-104 ad insertion message is being sent via Ethernet.
608/708 Closed Captions	The system supports encapsulation of EIA-608 and EIA-708 closed captioning data.

Table 31: Ancillary Basic Parameters

Parameter	Description
Analog Protection System	This functionality only applies to standard definition signals. Copy protection in the SD domain will always be passed through; however, the user may also control this by selecting “dynamic” control. When selected, the system monitors the incoming signal for CGMS signals and when they disappear for a period of time reverts to the user-defined internals settings.
AMOL Passthrough	The system can pass through AMOL information that may be present in the incoming stream.
ATSC Closed Caption Pass Through	This allows you to select whether or not you wish to pass through the closed captioning information found in ATSC broadcast signals.
DVB Subtitling Pass Through	When selected, this will allows subtitling information to be passed through to the output signal. This applies to PAL signals.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

Format Parameters Page

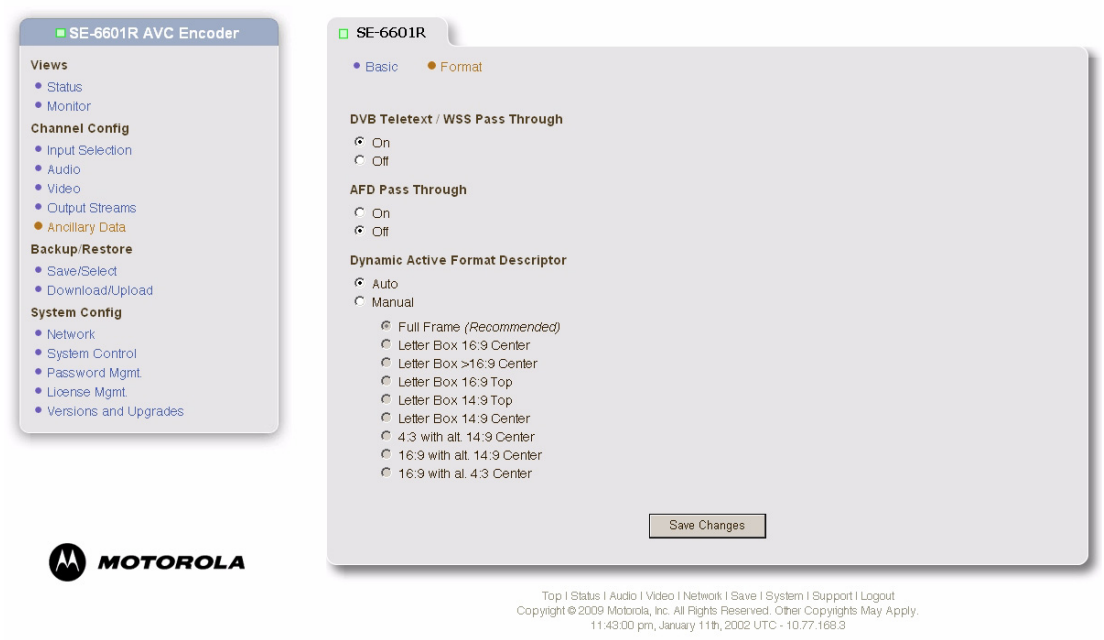


Figure 43: Ancillary Format Parameters Page – SDI and UDP

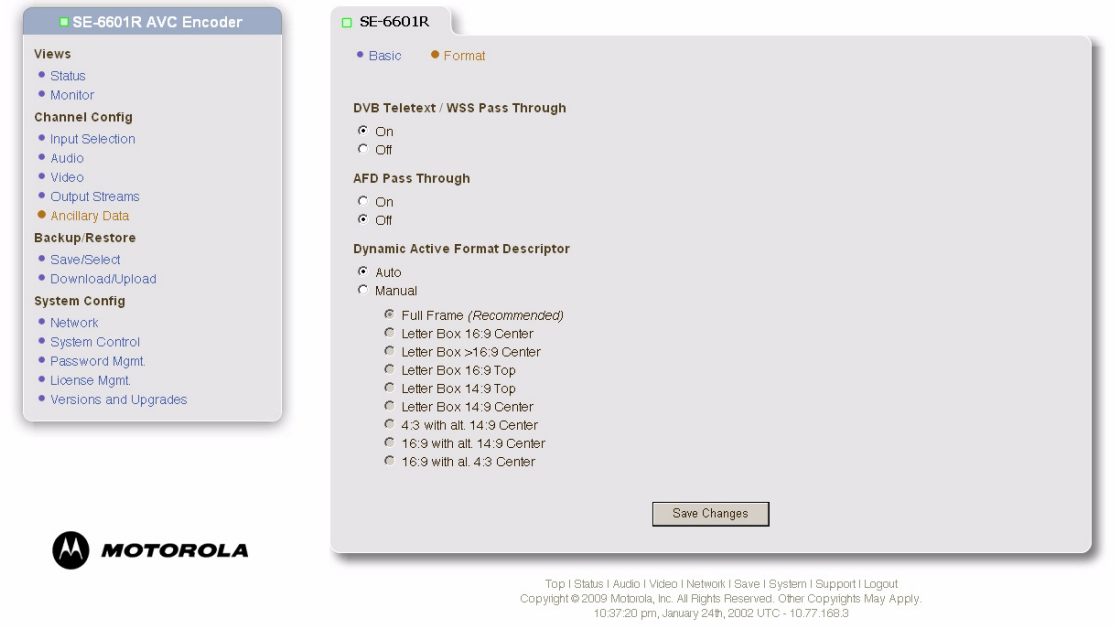


Figure 44: Ancillary Format Parameters Page – ATSC Tuner and ASI

Table 32: Ancillary Format Parameters

Parameter	Description
DVB Teletext / WSS Pass Through	Select this radio button to allow the encoder to pass WSS and Teletext information to the output. This applies to PAL signals.
AFD Pass Through	The Active Format Description is passed through to the output when this is selected.
Dynamic Active Format Descriptor	The Dynamic Active Format Descriptor function is relevant for HD to SD down conversion function. In auto mode the system will format the SD output mode based on the incoming AFD descriptor. If set to manual mode, the AFD descriptor is ignored and the radio buttons allow you to select a fixed output mode. The system supports dynamic AFD – When manual mode is selected the video is formatted according to the code that has been selected. The system supports dynamic AFD – When auto mode is selected the video is formatted according to the code that has been received in the incoming signal. The following selections are available: • Auto (default) • Manual - Full Frame (recommended) - Letter Box 16:9 Center - Letter Box > 16:9 Center - Letter Box 16:9 Top - Letter Box 14:9 Top - Letter box 14:9 Center - 4:3 with alt. 14:9 Center - 16:9 with alt. 14:9 Center - 16:9 with alt. 4:3 Center
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

Save/Select Configuration Page

In the Navigation pane, click **Save/Select** to display the Save/Select Configuration Page, as shown in Figure 45.

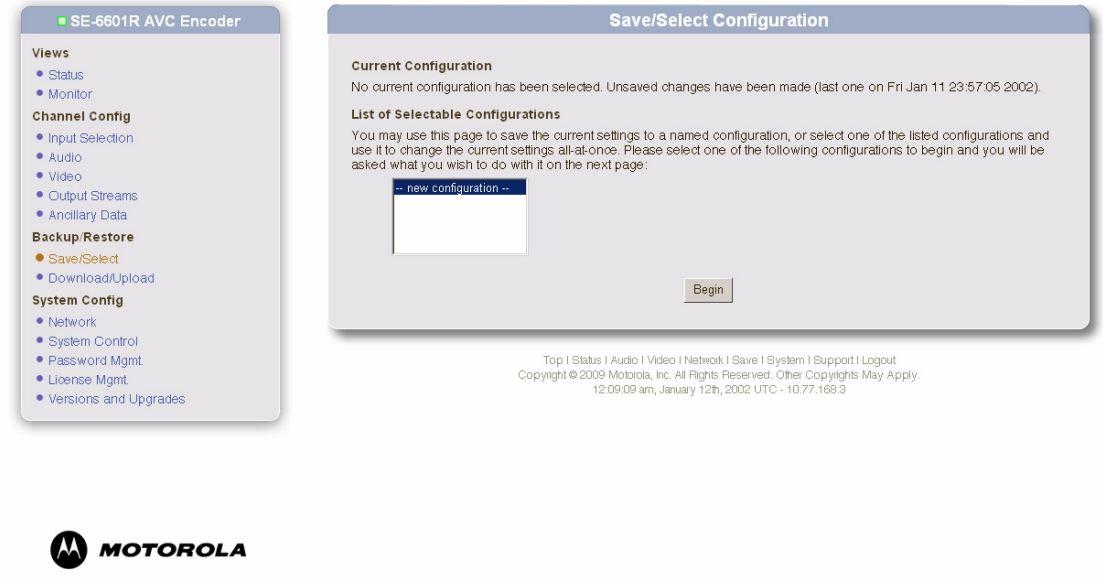


Figure 45: Save/Select Configuration Page

Use this page to perform an action on a selected configuration template or create a new configuration file. At the top (in the Current Configuration section), the page also reports if there are any unsaved changes. A configuration is selected from the list. Click **Begin** and use the sub menus to name, save, overwrite, or delete the configuration. These sub menus are explained on pages 80 to 87.

Create New Configuration

To create a new configuration

1. On the Save/Select Configuration Page, highlight the `-- new configuration --` label in the list and click **Begin**.
2. When the Save Configuration Menu appears, as shown in Figure 46, enter the new configuration name in the Configuration Name field. Do not use spaces in the file name. However, underscores are permitted.

3. Click **Save Configuration**. The file is saved locally on the encoder.

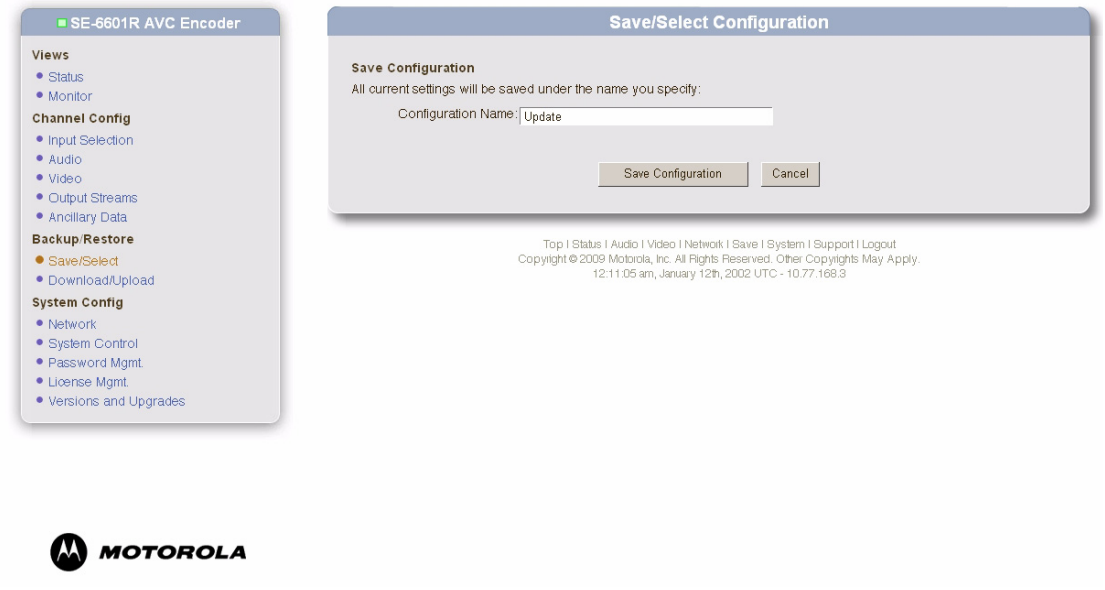


Figure 46: Save Confirmation Menu

Existing Configurations

To perform an action on an existing configuration

On the Save/Select Configuration Page, highlight an existing configuration in the list and click **Begin**. The Choose Action Menu appears.

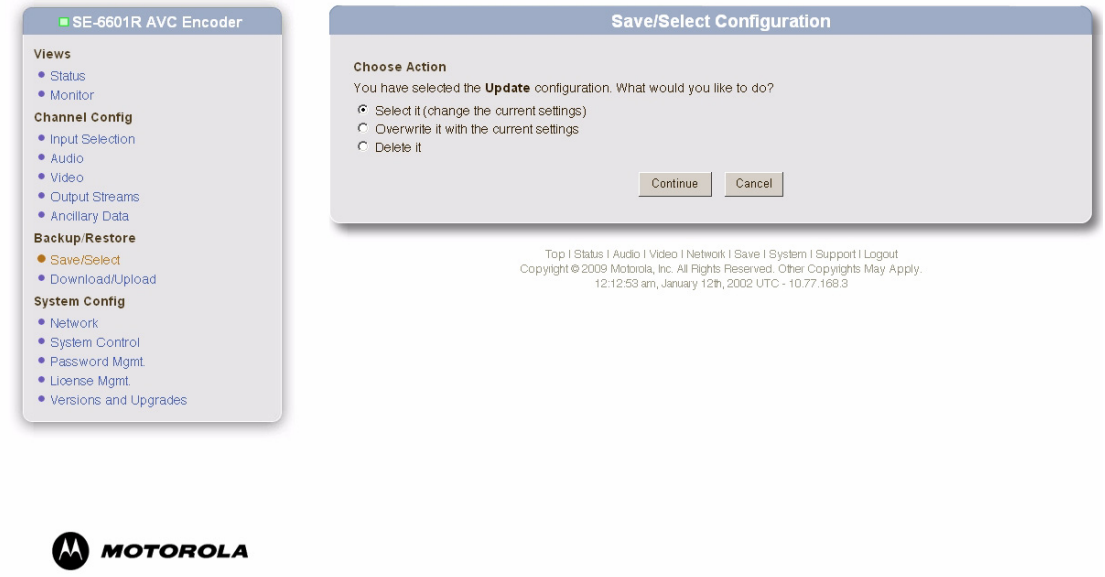


Figure 47: Choose Action Menu

The three options are described as follows.

- Select Configuration - page 82
- Overwrite Configuration - page 83
- Delete Configuration - page 84

Select Configuration

To download and activate a selected configuration's parameters

1. From the Choose Action Menu, click **Select It** if it is not already selected.
2. Click **Continue** to display the Select Confirmation Menu, as shown in Figure 48.

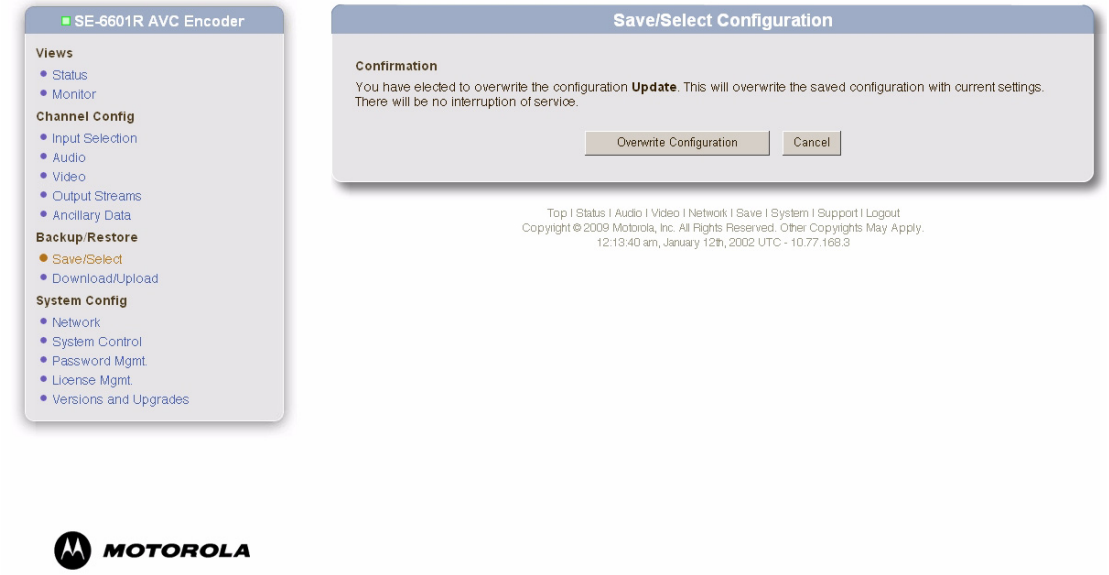


Figure 48: Select Confirmation Menu

3. Click **Select Configuration** to activate the configuration's parameters. The configuration name appears on the Welcome Page.

Overwrite Configuration

To overwrite a selected configuration file with new (current) parameters

1. From the Choose Action Menu, click **Overwrite Configuration**.
2. Click **Continue** to display the Overwrite Confirmation Menu.

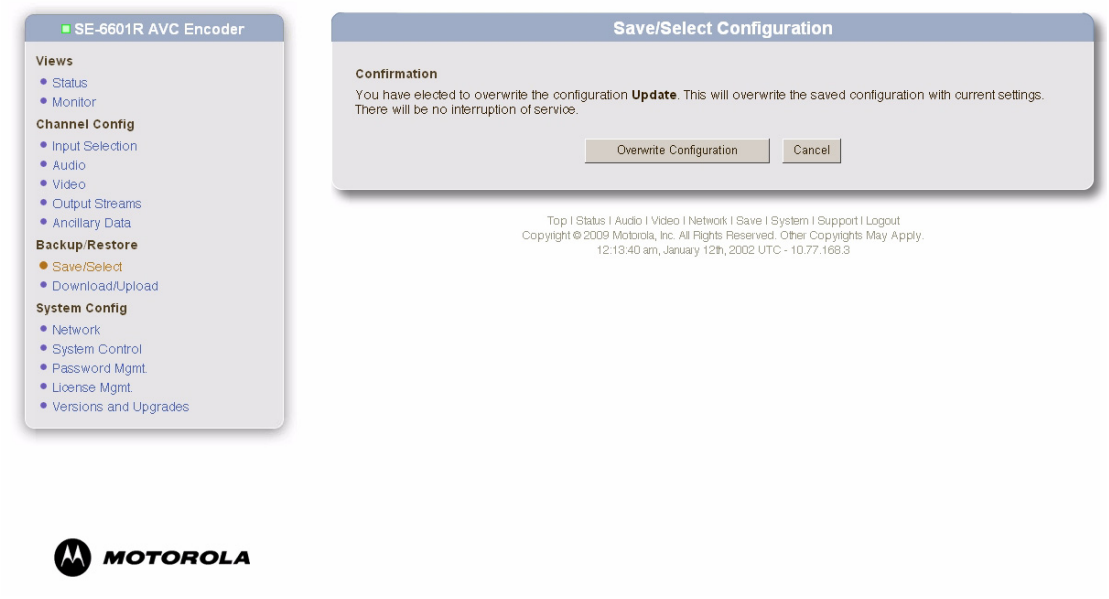


Figure 49: Overwrite Confirmation Menu

3. Click **Overwrite Configuration** to update (overwrite) the selected configuration with new data.

Delete Configuration

To delete a selected configuration file

1. From the Choose Action Menu, click **Delete Configuration**.
2. Click **Continue** to display the Confirmation Menu, as shown in Figure 50.

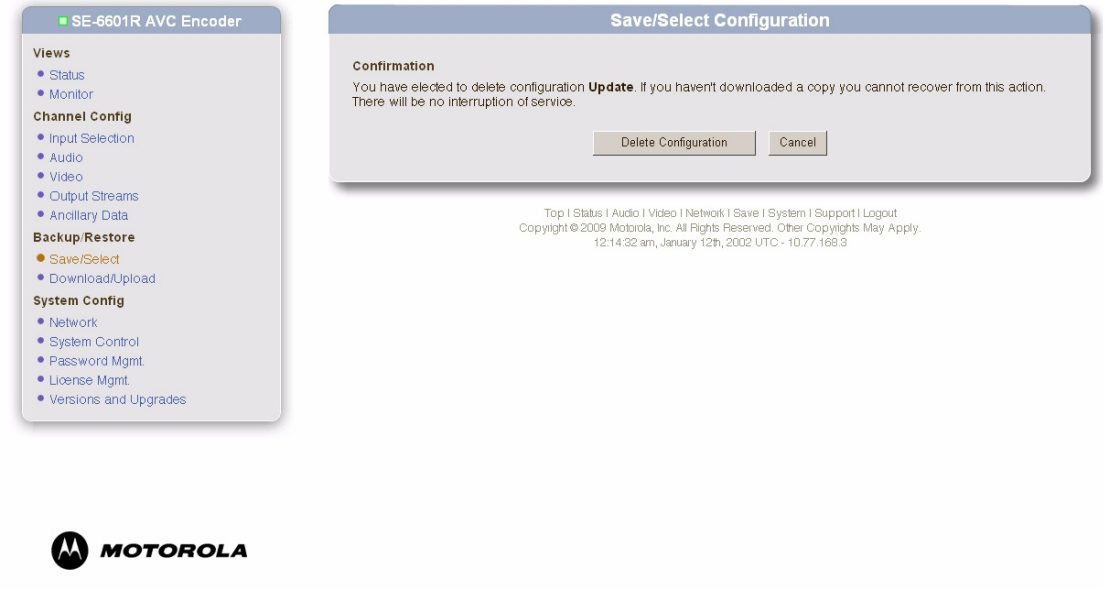


Figure 50: Delete Confirmation Menu

3. Click **Delete Configuration** to delete the selected configuration file from disk.

Download/Upload Configuration Page

In the Navigation pane, click **Download/Upload** to display the Download/Upload Configuration Page, as shown in Figure 51.

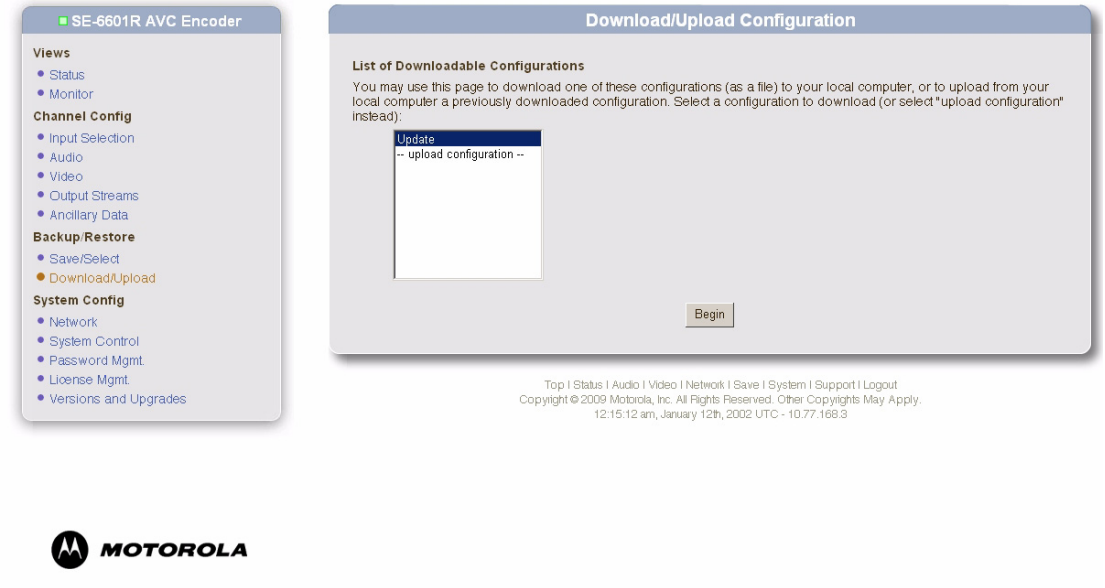


Figure 51: Download/Upload Configuration Page

Use this page to download (export) and upload (import) configuration templates between the encoder and the local machine (i.e., the computer running the web browser). The download and upload options are described as follows.

Download Configuration

Use the following procedure to save configurations on a machine other than the encoder.

To download a configuration to another machine

1. On the Download/Upload Configuration Page, select the existing configuration to be downloaded from the list.
2. Click **Begin** to display the Download Configuration Menu, as shown in Figure 52.

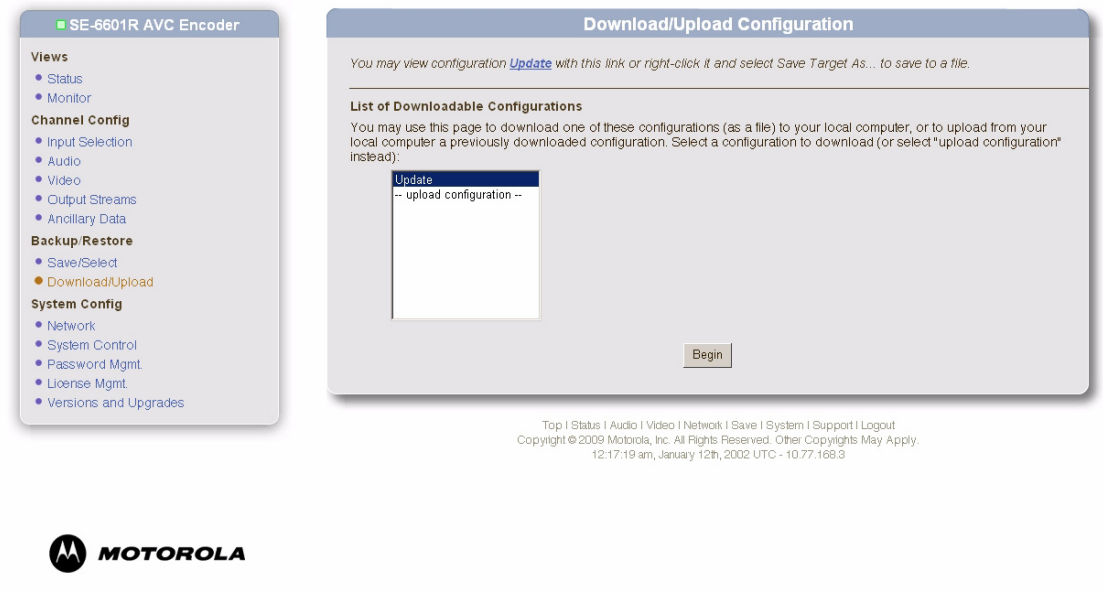


Figure 52: Download Configuration Menu

3. To view a text file of these parameters, click the hyperlinked file name at the top.

> ***Note:*** *This file only contains a list of parameters that were changed from their default values.*

4. To download the configuration, right-click the hyperlink and click **Save Target As**. See Figure 53.

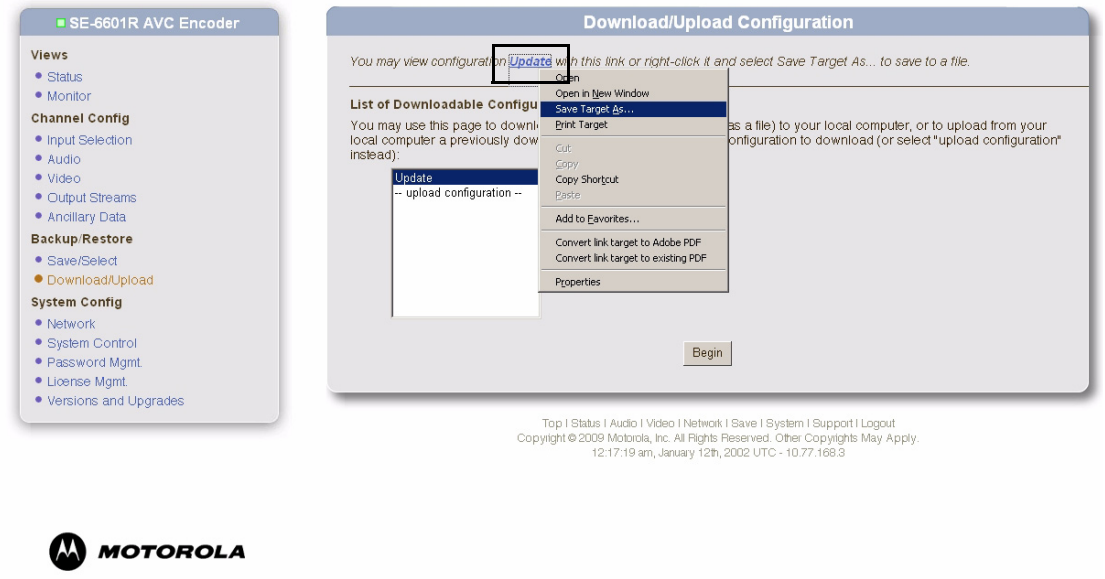


Figure 53: Save Menu

5. Select the desired target location and click **Save**.

Upload Configuration

Use this procedure to upload a configuration file from another machine to the encoder. In addition, if multiple encoders are deployed, use this procedure to upload one saved configuration to multiple encoders, eliminating the need to recreate the configuration on each individual machine.

To upload a configuration from another machine to the encoder

1. Go to the Download/Upload Configuration Page and click `-- upload configuration --`.
2. Click **Begin** to display the Upload Configuration Menu, as shown in Figure 54.

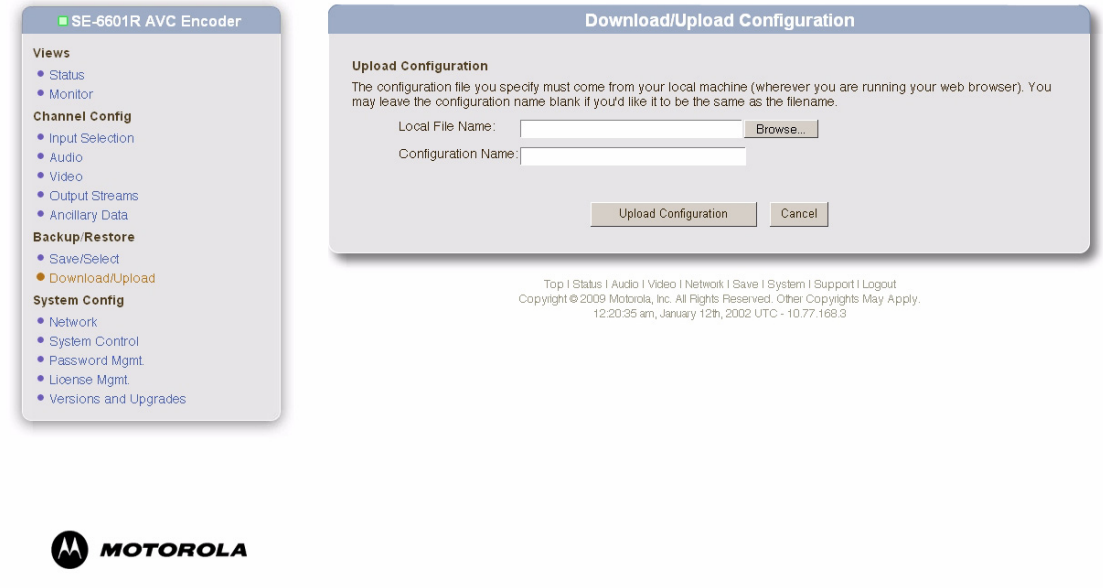


Figure 54: Upload Configuration Menu

3. Click **Browse** to display the Open Dialog.
4. Navigate to the location on the computer where the saved configuration file resides.
5. Highlight the desired file and click **Open**.

Note: *To rename the file, enter a different name in the Configuration Name field.*

6. Click **Upload Configuration** to complete the procedure. The file name appears in the list of configuration names.

Network Parameters Page

In the Navigation pane, click **Network** to display the Network Parameters Page, as shown in Figure 55.

Note: *The encoder must be stopped before you disable an Ethernet port. Click* ***edit this list*** *to access the list, as shown in* Figure 56.

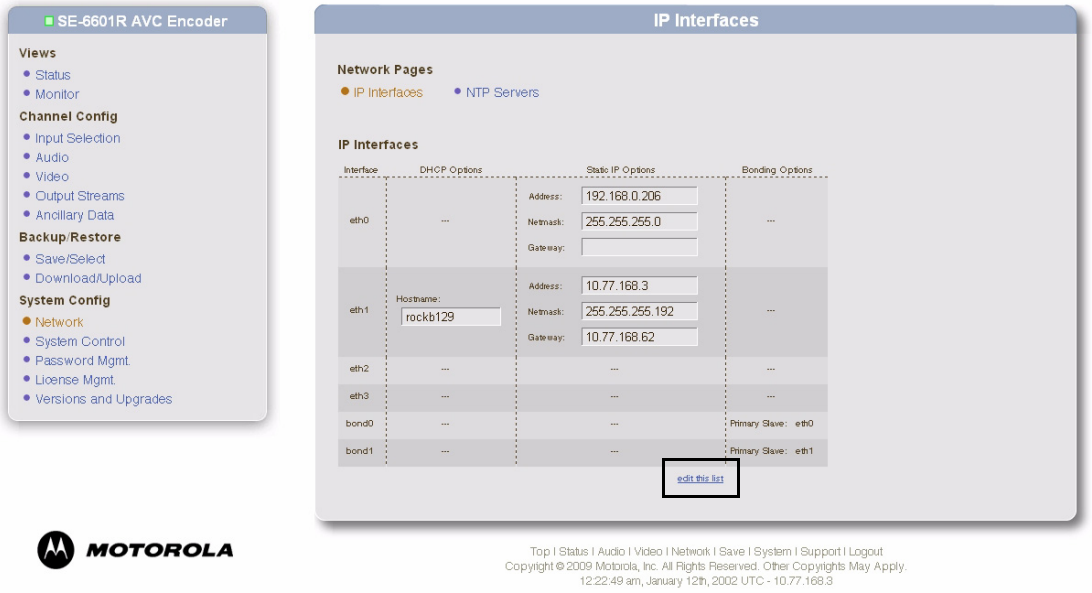


Figure 55: Network Parameters Page (edit list)

The Network Pages IP Interfaces screen is displayed, as shown in Figure 56.

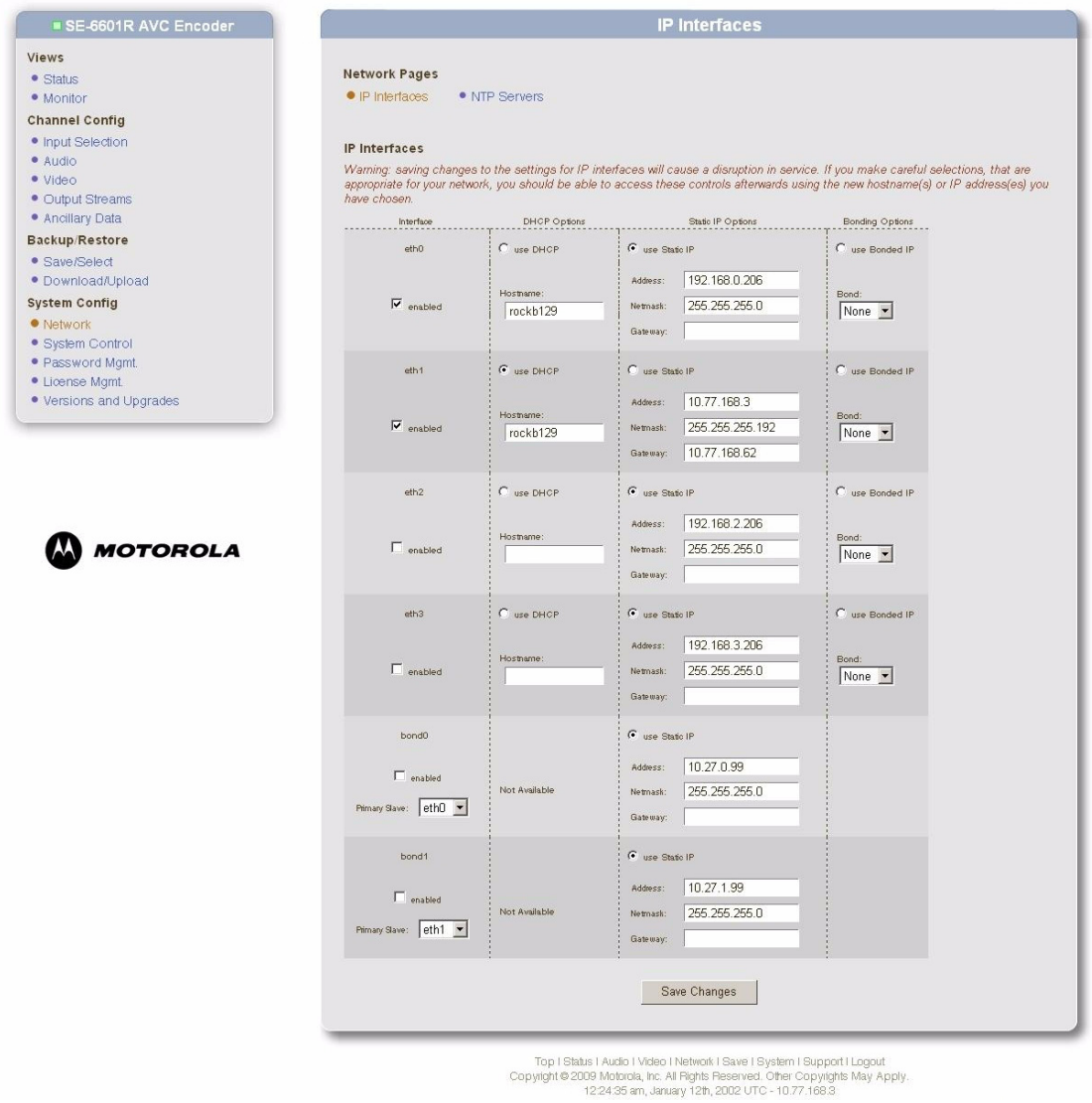


Figure 56: Network Parameters Page

Use this page to view and set network parameters. Networks Parameters are explained as follows.

IP Interfaces Page

To access the IP Interfaces Parameters page, click **Network** from the Navigation pane and then click **IP Interfaces** to display the IP Interfaces Parameters Page, as shown in Figure 56. While this information is read only, the user can edit and save the IP Interface parameters. To edit the parameters shown, click the **edit this list** hyperlink at the bottom of the page.

Note: *Ethernet bonding, when enabled, allows two IP interfaces to act as if they are one. They have the same IP address, but only one of them is active at any one time. One port is referred to as the Primary Master and the other port is referred to as the Primary Slave. This configuration is implemented by creating a virtual device called bond0 or bond1. This virtual device controls the two physical Ethernet ports by routing the data through the appropriate port.*

Under normal circumstances, the bond device sends all data through the Primary Master device. Should the connection to the Primary Master port be lost, the bond0 or bond1 device automatically switches any data over to the Primary Slave port. To any other device on the network, the data would appear to be coming from the same IP address.

This creates a redundant connection that is automatically managed by the encoder itself. This bonding approach can be used for either management connections or data connections.

Note: *Leading zeros should not be used when entering the IP address value.*

Note: *Ethernet bonding is disabled by default.*

Table 33: IP Interfaces

Parameter	Description
Interfaces	The four Ethernet ports on the back of the encoder.
DHCP Options	Allows the user to enable Dynamic Host Configuration Protocol (DHCP) on a particular port using a method by which networked devices encoders are to obtain IP addresses and other parameters such as the default gateway, subnet mask, and IP addresses of DNS servers from a DHCP server. If DHCP is enabled for a particular port, it also requires a host name.
Static IP Option	If desired, enter the IP Address for each port on the encoder, the network IP address for each port, and the default gateway address for the encoder, as needed.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

NTP Servers Page

To access the NTP Servers Parameters page, click **Network** from the Navigation pane and then click **NTP Servers** to display the NTP Servers Parameters Page, as shown in Figure 57.

The Network Time Protocol (NTP) is used to synchronize the internal clock of computers so that accuracy of Ad insertions can be assured. The NTP configuration defines with which device the encoder synchronizes. The encoder can be configured to look at two NTP devices – a primary and a backup. If the primary NTP device cannot be reached, the encoder then refers to the backup device for its time synchronization.

When the encoder starts up, it compares the local encoder time to the NTP reference device and adjusts the local time to be as close as possible to the NTP reference time. The time difference is sampled often when the encoder comes up, but as the drift approaches zero, the sampling of the NTP time is reduced. The goal of the NTP process is to have the time difference be less than one frame's worth of time.

Note: *For a 30 frame/sec video, one frame is 33 milliseconds, or 33,000 microseconds, and for a 25 frame/sec video, one frame is 40 milliseconds, or 40,000 microseconds.*

The Drift Information value is read-only and is shown in microseconds.

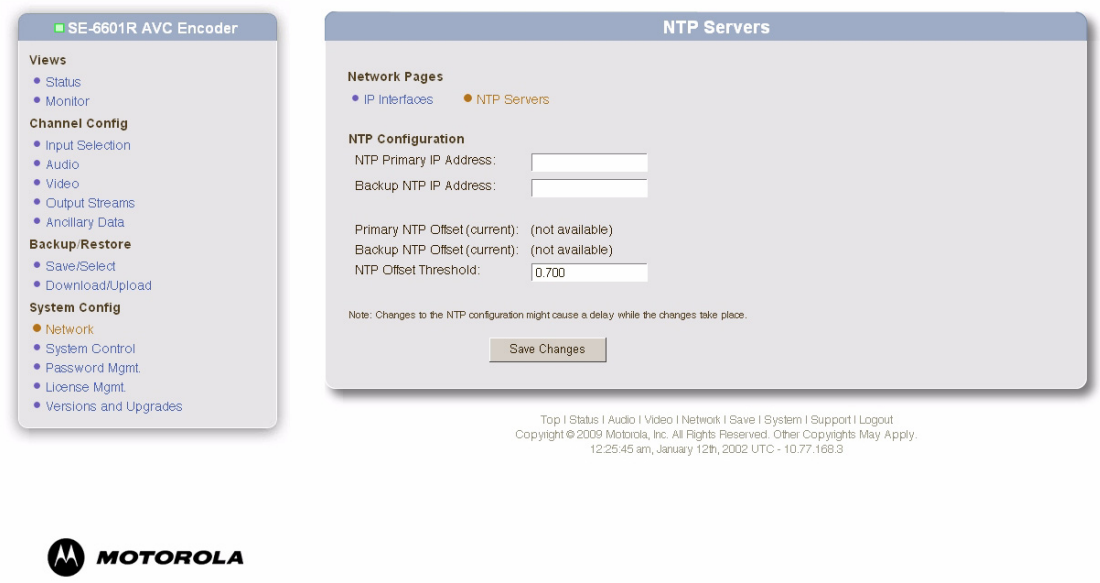


Figure 57: NTP Servers Parameters Page

Table 34: NTP Servers Parameters

Parameter	Description
NTP Primary IP Address	Enter the IP address of the primary NTP device.
Backup NTP IP Address	Enter the IP address of the backup NTP device.
Primary NTP Offset (current) Backup NTP Offset (current)	These are read-only parameters. The Primary and Backup NTP Offset values display the time difference between the primary (or backup) NTP server time and the current time on the local SE. The offset may be large when the unit first starts but should shrink as the SE skews its local clock to match the NTP server time.
NTP Offset Threshold	When the time difference between the active server and the local time exceeds this offset threshold, the SE generates a system alarm notifying the user accordingly.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

The columns in the NTP status table on the GUI have the following descriptions.

Note: *Unless otherwise stated, all time values referenced in these descriptions are in milliseconds.*

Table 35: NTP Status

Parameter	Description
Remote	The IP address of the remote NTP server. If the IP address has an asterisk (*) next to it, that is the server currently being used for time synchronization. A plus (+) indicates a high quality server that *could* be used if the currently active server become unavailable or unreliable.
Refid	Refid is a historical value that has meant different things over the evolution of NTP. It is displayed for diagnostic purposes but has little practical value. For more details, refer to the NTP specifications available on the Internet.
Strata	A number indicating which clock stratum that server is providing. Lower numbers are better, with a stratum 1 being the best available on an IP network.
Type	Values may be “u” for unicast, “b” for broadcast, “m” for multicast, and “l” for local transport type mechanisms. This value will almost always be “u” for unicast transmissions between the SE and the NTP server.
When	Length of time in seconds since the last synchronization request was completed.
Poll Interval	Length of time in seconds to wait between successive synchronization requests.
Reach	Indicates how many consecutive synchronization requests have completed successfully. This field is a bit shift register. For each successful synchronization request, a binary 1 is appended to the current value, up to 8 bits (synchronization requests) in a row. The value is displayed using octal notation. Therefore, if the Reach value is not equal to 377 (the octal representation of 8 ones a row, or binary 11111111) that NTP server has not been reliably responding and another NTP server may need to be selected for best performance.
Delay	The total round trip time the last synchronization request took.
Offset	The time difference between the server and the local time as of the last synchronization request.
Jitter	The variation in time differences noted between the server time and the local time over the last several synchronization requests. Higher values indicate a less reliable server (or network connection to that server).

System Control Page

In the Navigation pane, click **System Control** to display the System Control Page, as shown in Figure 58.

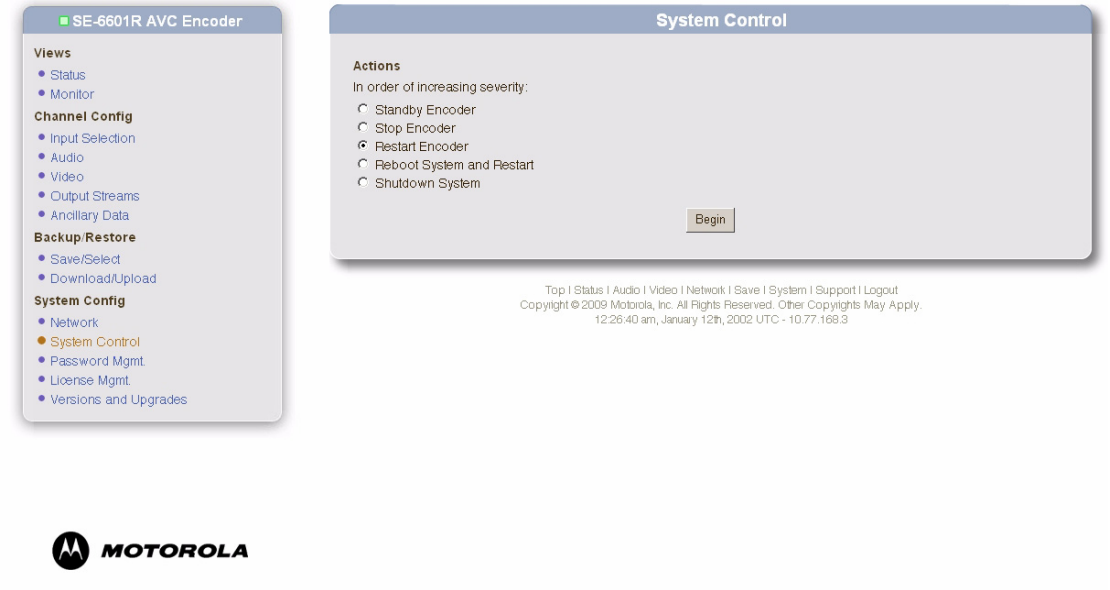


Figure 58: System Control Page

Use this page to.

- Place the encoder in standby mode
- Stop the encoder
- Restart the encoder
- Reboot the encoder
- Shut down the encoder

Restart Encoder is used to stop and restart the encoder application with the least amount of encoder disruption. This is a relatively brief interruption (the same one that is performed automatically when a encoder parameter is changed and you click **Save Changes**). This menu pick allows the user to perform a manual restart on the encoder.

To perform an action, select the desired option and **Begin**. The encoder will provide a confirmation page that allows the user to continue with the desired action or cancel the action and return to normal operation.

Password Management Page

In the Navigation pane, click **Password Mgmt.** to display the Password Management page, as shown in Figure 59.

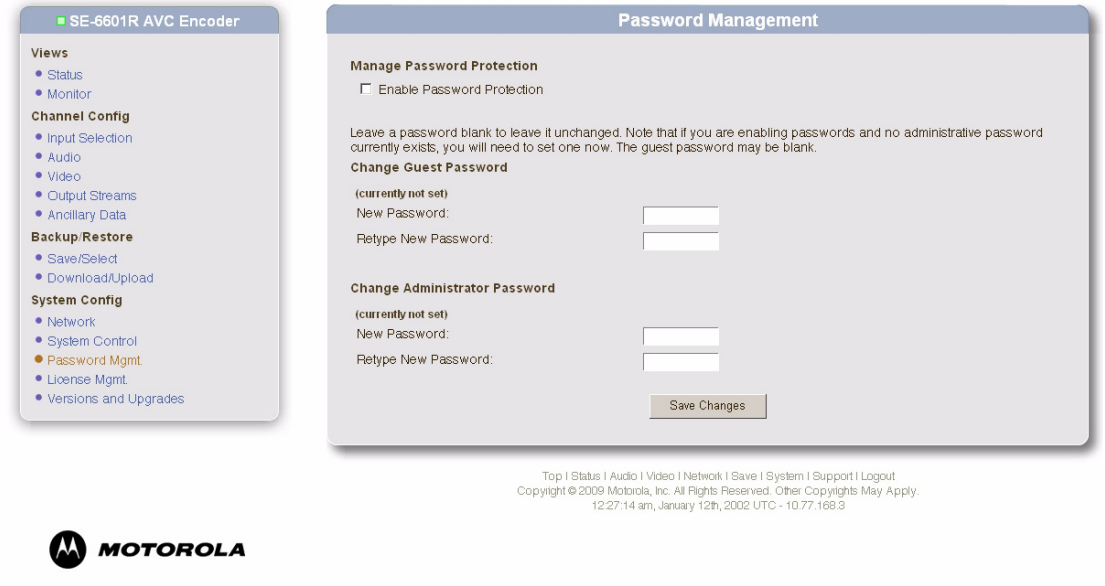


Figure 59: Password Management Page

Table 36: Password Management

Parameter / Button	Description
Manage Password Protection	For password protection, select the Enable Password Protection check box.
Change Guest Password	For password protection, select the Enable Password Protection check box.
Change Administrator Password	Enter New Password and Retype New Password to change the password.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

License Configuration Page

In the Navigation pane, click **License Mgmt.** to display the License Configuration Page, as shown in Figure 60.

Note: *Be sure the check that the serial number of the encoder matches the license serial number before attempting to upgrade the software or licence.*

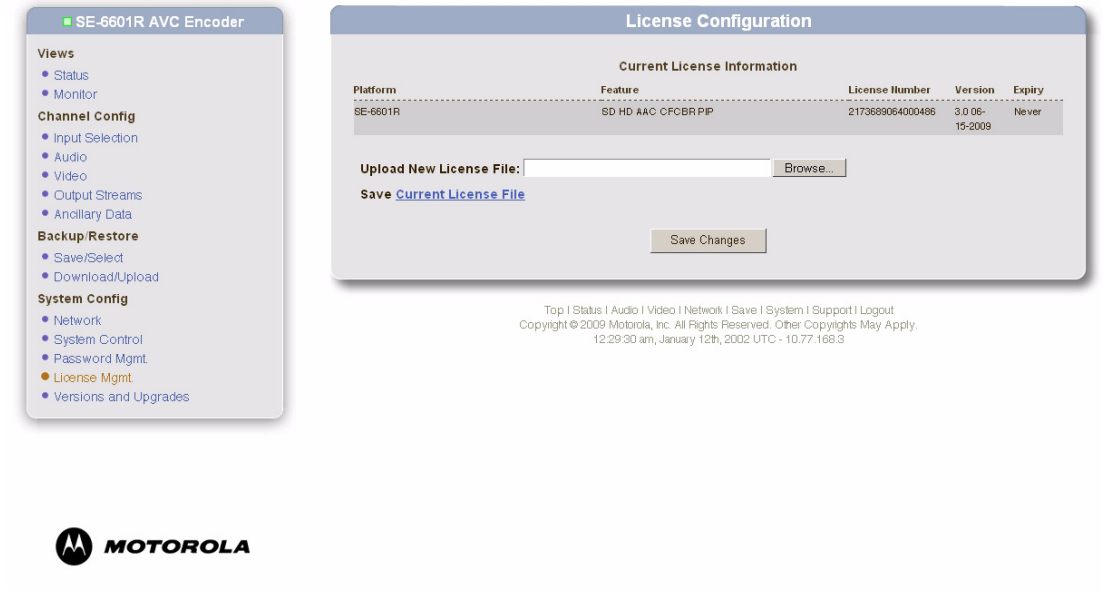


Figure 60: License Configuration Page

The encoder supports a software licensing system that enables features which are authorized for that particular encoder. To do this, a valid license file needs to be uploaded via the License Mgmt page. After a valid license file is uploaded it is automatically authenticated and authorized and the encoder supports the features associated with the new license file.

Table 37: License Configuration

Parameter / Button	Description
Current License Information	Displays information pertaining to the uploaded/authorized licenses for this encoder (e.g., platform, feature description, license number, version, and expiration date (if applicable).
Upload new License	Enter the filename of the new license to add functionality to the encoder.
Save Current License File	Click the **Current License File** link to save the file to your desktop.
Save Changes	To save changes made on this page, click **Save Changes**. ***Note:*** *If you make a change on this page, and switch pages without saving, all changes are lost and will not take affect.*

To view the license keys, or generate additional license keys that have been purchased but not generated, please visit:

http://slk.motorola.com/slk30

To request access to the Software License key (SLK 3.0) application go to the register link on the SLK website. If you experience problems with this site, please contact the Motorola Technical Services and Support department for assistance.

Versions and Upgrades Page

Use the Versions and Upgrades Page to view encoder version information, view the release notes, and manage installation packages. The Component, Available Installation Packages, and View Installation Log sections of the Versions and Upgrades Page are described as follows. To display this page, click **Versions and Upgrades**.

Note: *You should remove software packages that are no longer needed.*

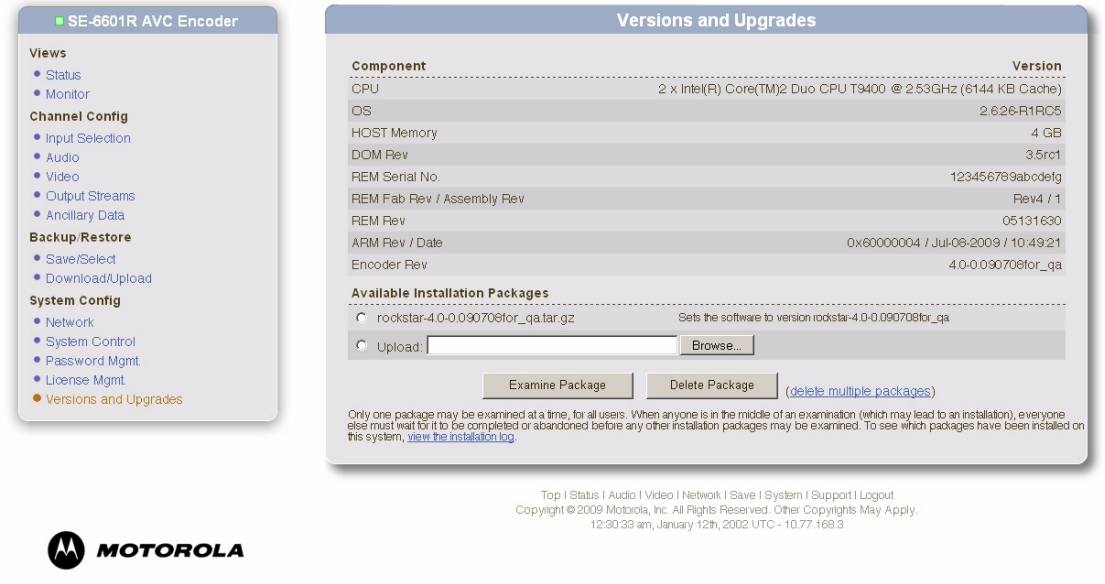


Figure 61: Versions and Upgrades Page

Component

This section lists the versions of the encoder's CPU, OS, DOM Rev, REM Serial No., REM Fab Rev/ Assembly Rev, REM Firmware Rev / Status, and Software. To view any associated release notes, click the **Release Notes** hyperlink to display the menu.

Available Installation Packages

The top portion of the Available Installation Packages section lists all available encoder software installation packages. File names have the **`.tar.gz extension`**. These packages can be viewed, installed, or deleted.

Note: *Some packages do not have associated release notes.*

Examine Package

To examine one of the listed software packages

1. Select the software package to examine.
2. Click **Examine Package**.
3. When the Confirmation Menu appears, click **Next -> Examine Package**.
4. To install, go to Upload and Install New Package section on page 98.
5. To abandon the installation, click **Abandon Installation**.

Delete Package

To delete one of the listed software packages

1. Select the software package to delete.
2. Click **Delete Package**.
3. When the Confirmation Menu appears, click **Delete Package**.

Upload and Install New Package

To upload and install a new software package

1. Ensure that the new software installation file is downloaded from Motorola (e.g., via e-mail), and stored in a known location on the computer.
2. Click **Browse** to display the Open Dialog.
3. Navigate to the file's location on the computer where the saved software installation file resides.
4. Highlight the file and click **Open**. The filename appears in the Upload field.
5. Click **Examine Package** to view the Package Confirmation Menu, as shown in Figure 61.
6. The Description Page is displayed, as shown in Figure 62.

Note: *The menu on the left side has changed to the Installation menu.*

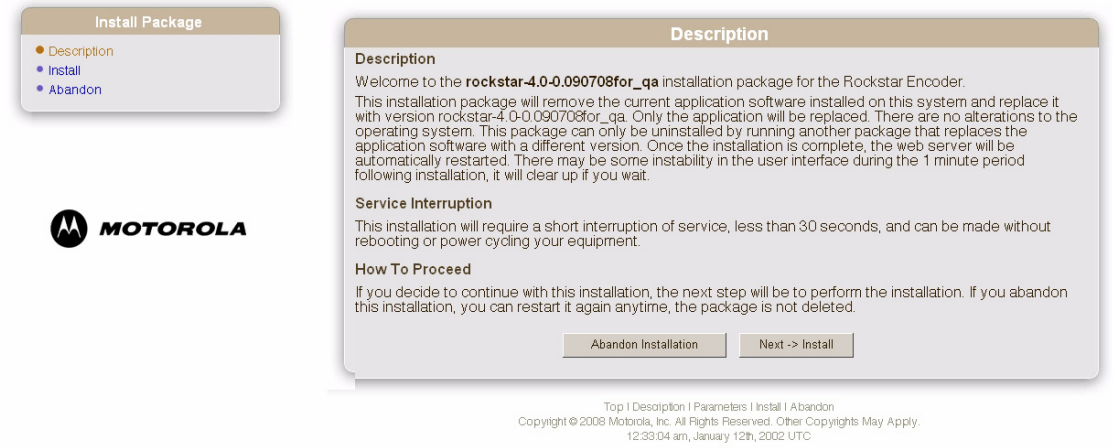


Figure 62: Description Page

Note: *This dialog box confirms the selected software package and offers the choice to abandon the installation procedure or continuing.*

7. Click **Next -> Install** to begin the installation page. The installation progresses, as shown in Figure 63.

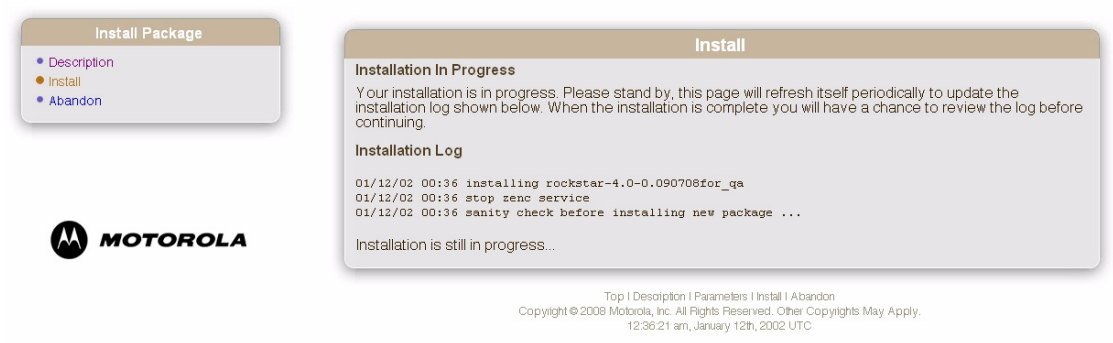


Figure 63: Installation In Process Page

8. At the conclusion of the procedure, click **Finish** on the final menu, as shown in Figure 64.

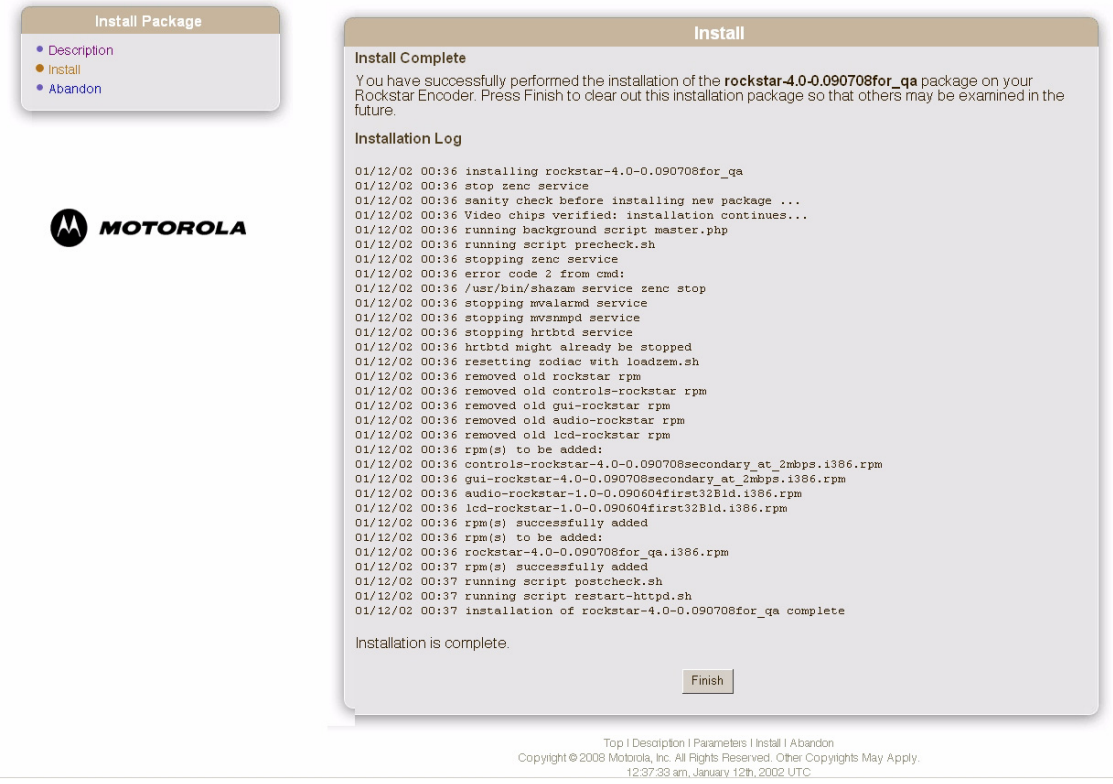


Figure 64: Installation Completed

View Installation Log

To view the installation log

1. At the bottom of the Available Installation Packages section, click the **View the Installation Log** hyperlink to review the installation process in log format.

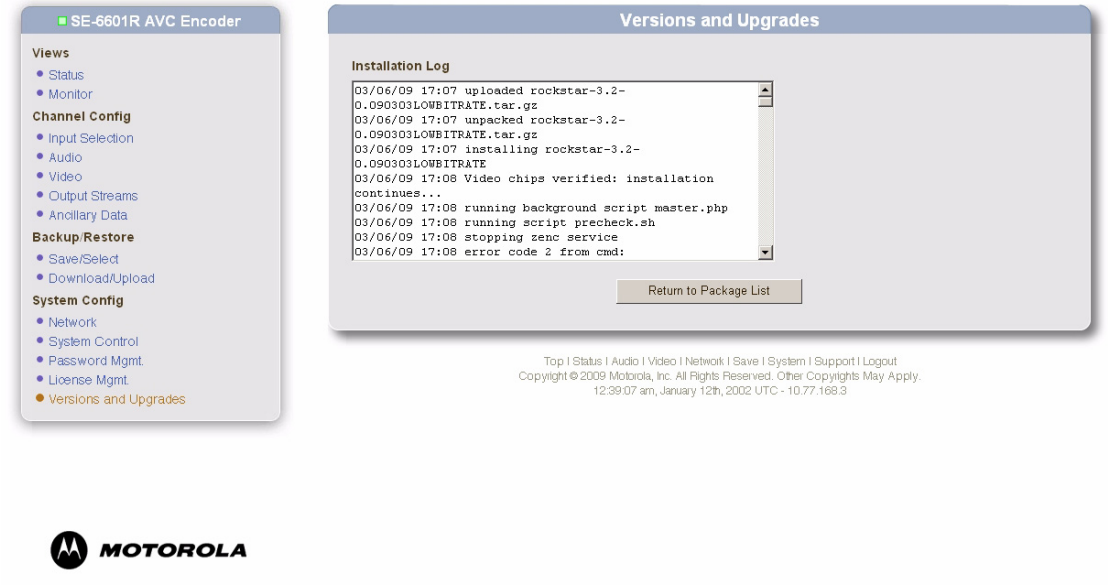


Figure 65: Installation Process in Log Format

2. Click **Return to Package List** to return to the Versions and Upgrades page.

Description Pages

Figure 66 illustrates the encoder Description Page, which allows the user to change the description of the encoder to help differentiate encoders in a large network. Two descriptions can be edited:

- Status Pages
- Channel Description

Click the **edit description** for either hyperlink on the Welcome page.

Figure 66: Description Pages

In a multiple-encoder network it can be difficult to determine which encoder is being controlled since all the browser pages look the same. By changing the description using this page, the description shown at the top of the Navigation pane on each browser page is altered. For example, if the description is changed to:

Channel 10 Comedy

This text appears on the top of the Navigation pane for each page making it much easier to identify the encoder being accessed. There is a limit of 20 characters that can be used to describe the encoder.

After the new description is entered and saved, this description is also shown on the fourth line of the LCD display on the front of the encoder. This makes it much easier to find a specific encoder in a group of encoders.

Note: *If the Display Description on Every Page checkbox is not checked, this description only appears on the Welcome page and all other pages will retain the default encoder description for that encoder in the Navigation pane.*

Save Changes

IMPORTANT: *The current stream will be interrupted while the encoder restarts.*

Click **Save Changes** to save any changes made on this page, and immediately restart the encoder with the new parameters.

Note: *If changes are made on this page and not saved, the changes will be lost and not take effect.*

5

Maintenance and Troubleshooting

This chapter describes maintenance and troubleshooting procedures and contains the following topics.

Software Revision

The platform's software revisions status is found on the Versions and Upgrades page. Please have this information on hand when making a call to Motorola Customer Support. See the System Diagnostics page section for details.

Version Upgrade

Use the Versions and Upgrades page to view system version information, view release notes, and manage installation packages. Refer to the following three sections for complete instructions.

- To delete a software installation package, see Delete Package on page 98.
- To install (or re-install) a current software package, see Examine Package on page 97.
- To install (or upgrade) a new software package, see Upload and Install New Package on page 98.

Support Page

Support Link

If a system problem occurs, access the SE-6x Series encoder Support page, as shown in Figure 67, by clicking on the support link under the information pane.

IMPORTANT: *The SE-6x Series encoder Debug Menus are designed for troubleshooting and diagnostics only. The menus are only to be used by qualified facility personnel in conjunction with Motorola Technical Support. If a system problem occurs, contact Motorola Technical Support immediately.*

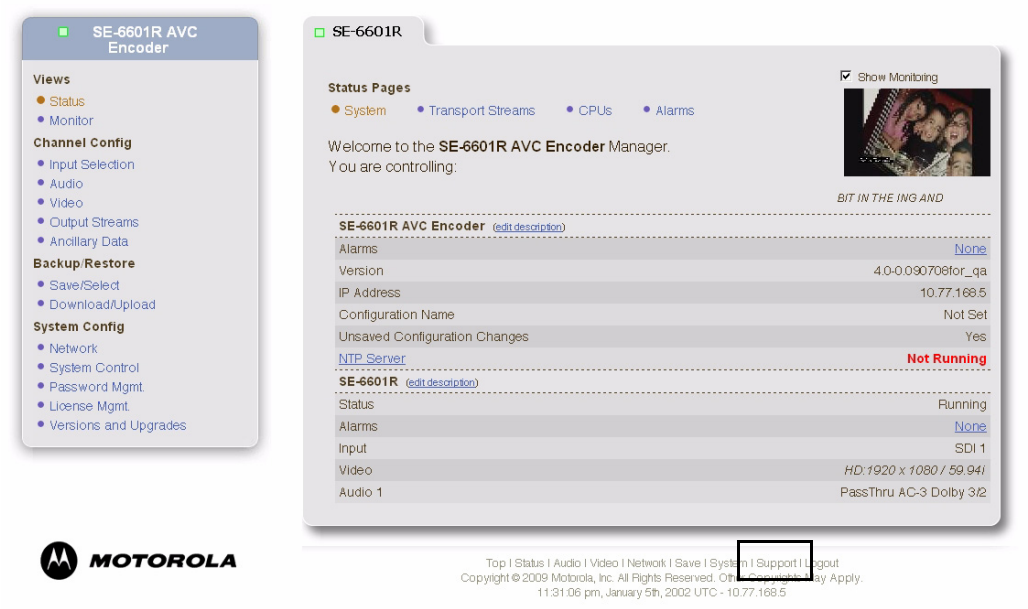


Figure 67: Support Link

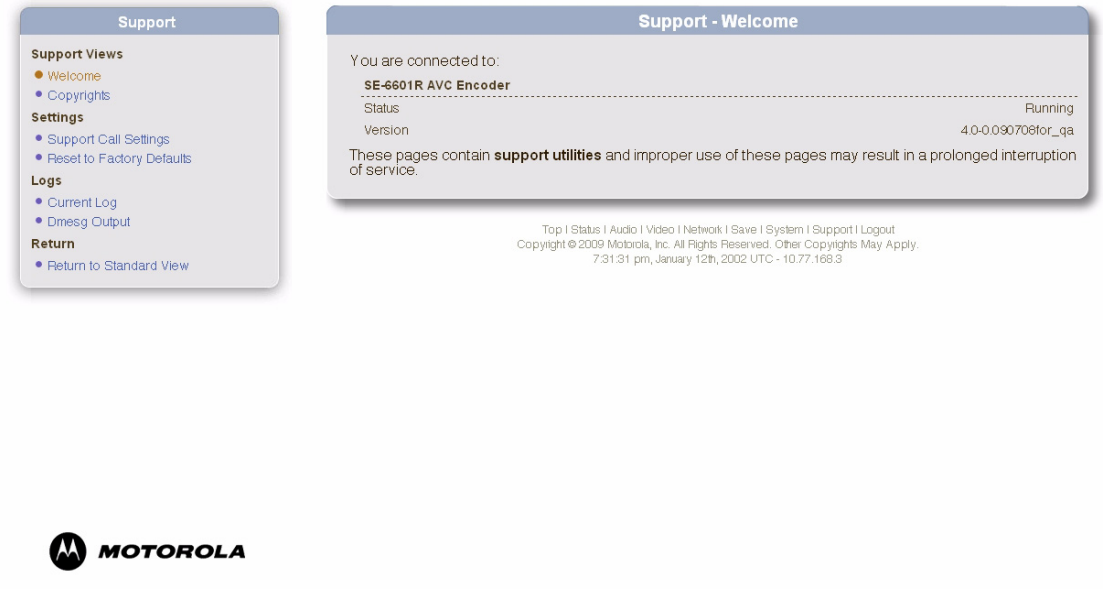


Figure 68: Support Page

Encoder Log

Most traps generated by the encoder can also be found in the encoder log, but the opposite is not true – not all messages in the log will appear as trap messages.

You can view the encoder log from the support link under the information pane.

Note: *The log is cleared and restarted each time the encoder restarts.*

Select the appropriate log from the Support Navigation pane, as shown in Figure 69.

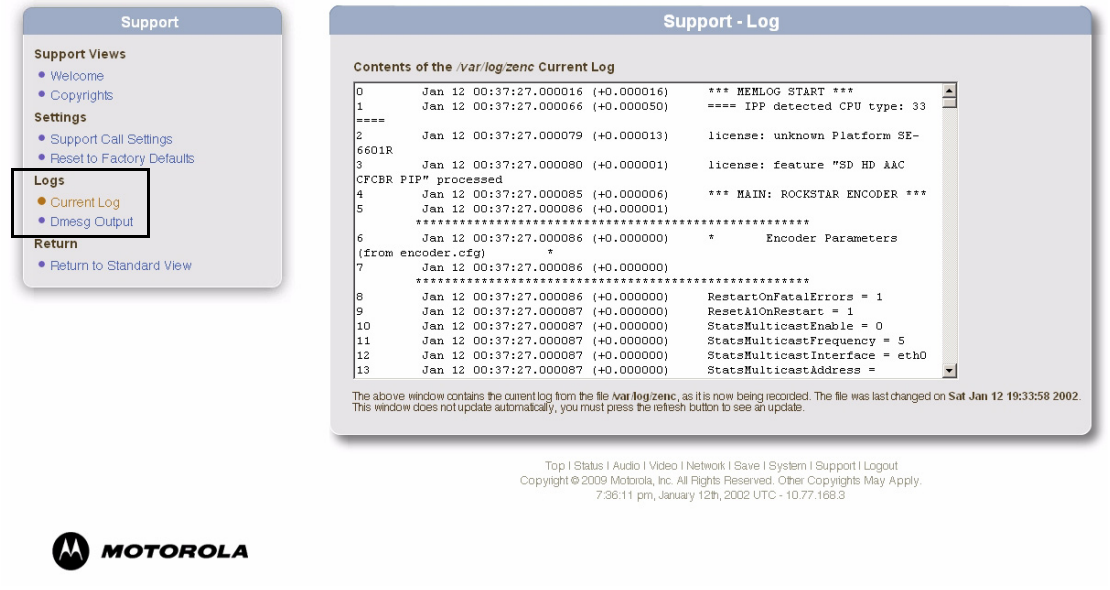


Figure 69: Current log

A

Encoder Specifications

This appendix lists all SE-6x Series encoder specifications.

Table 1: Base Features

Base Features	Specification
Encodes AVC (Main Profile at Level 4)	1080i Resolutions:1920, 1440, 1280, 960 1080p Resolutions:1920 720P Resolutions:1280, 960
Encodes AVC (Main Profile at Level 3)	625i Resolutions:720, 704, 544, 528, 480 525i Resolutions:720, 704, 544, 528, 480
Low Resolution Proxy (Main Profile at Level 3 with no B frames)	Resolution: 128 x 96 HD Selectable: 96 x 96 SD, 192x192 HD (HD-SDI input only) Data Rate Selectable: 200 kbps, 300 kbps, 400 kbps, 500 kbps

Table 2: Inputs

Inputs	Specification
SMPTE	SMPTE 259M SMPTE 292M SD/HD-SDI Serial Interface
Embedded Audio	SMPTE 299M at 48 kHz HD SMPTE 272M at 48 kHz
Language Support	ISO639
RF	ATSC
IP	UDP over IP, unicast or multicast
ASI	ASI per ETSI EN 50083-9
3G	
Dual	

Table 3: Output

Output	Specification
Compressed Streams	Video bitstream: H.264 in MPEG-2 TS PAT/PMT Network: ASI (optional) IP unicast or multicast

Table 4: Power and Physical Dimensions

Power and Physical Dimensions	Specification
AC Power	100 to 240 volt AC, Auto Sensing, 50 to 60 Hz
DC Power	-40 to -60 volt DC, Auto Sensing
Power Consumption	Less than 200 W
Dimensions	1 RU (1.75” x 18.9” x 15.5”)

Table 5: Country Compliance

Country Compliance	Specification
North America	FCC Part 15 Class A, ICES003, Class A UL 60950-1, CSA C22.2 No. 60950-1, TUV NRTL/C-Mark
European	EN55103-1, EN55103-2 (EMI/EMC) EN60950-1+A11: CE-Mark, ROHS WEEE

Table 6: Encoder Features

Encoder Features	Specification
Encoder Features	All Intra 4/16 Estimation Modes CABAC Coding De-blocking Filter Motion Estimation: P, B Frames, and Reference B Frames Hierarchical Search 16x16, 8x8, Block Sizes Field and Frame Rate Control: CBR and Constrained Fidelity CBR Adaptive Quantization Selectable I, P, B GOP Structures
Ancillary Signals	EIA 708 Closed Captioning EIA 608 Closed Captioning and XDS
Audio Specifications	4 Stereo Pairs MPEG-1 Layer 2 HE-AAC LC-AAC PassThru DD + Pro Encode DD + Pro AC-3 Encode (2.0)
System Management	Browser Interface for Single Unit Control SNMP v2 Network Management Interface

Table 6: Encoder Features

Audio Transcode Specifications	AC-3 to HE-AAC Trans Dolby-E to AC-3 Trans Dolby-E to DD + Pro Trans Dolby-E to AAC Downsample to Stereo AC-3 Downsample to Stereo AAC ***Note:*** *AC-3 to DD Plus and AC-3 to HE-AAC are licensed options for all encoders.* AC-3 to Dolby Digital Plus Pro	
Down Conversion	Convert HD input signals to SD output signals using AFD cues detected on the input signal, or use manual overrides. ***Note:*** *Optional with all encoders.*	
Proxy Audio	Pre-compressed inputs:	PassThru AC-3 to HE-AAC AC-3 to Dolby Digital Plus Pro ***Note:*** *AC-3 to DD Plus and AC-3 to HE-AAC are licensed options for all encoders.*
	SDI/HD-SDI inputs:	MPEG 1 Layer II HE-AAC LC-AAC AC-3 PassThru AC-3

B

System Defaults

This appendix provides all SE-6x Series encoder default settings.

Audio Defaults

Table B1:Audio Parameters

Audio Parameters	Default Setting
	Stream 1
PID	33
Compression Type	MPEG
Bitrate	192 Kbps
Input Source	GR1 CH 1/2
Language	English
Mode	Stereo
Delay	0ms
Enabled/Disabled	Enabled
	Stream 2
PID	34
Compression Type	MPEG
Bitrate	192
Input Source	GR1 CH 3/4
Language	English
Mode	Stereo
Delay	0ms
Enabled/Disabled	Disabled
	Stream 3
PID	35
Compression Type	AC3PT
Bitrate	448
Input Source	GR2 CH 1/2
Language	English
Mode	Dolby
Delay	0ms

Table B1:Audio Parameters

Audio Parameters	Default Setting
Enabled/Disabled	Disabled
Stream 4	
PID	36
Compression Type	HE-AAC
Bitrate	48 Kbps
Input Source	GR2 CH 3/4
Language	English
Mode	Stereo
Delay	0ms
Enabled/Disabled	Disabled

Video Defaults

Table 2: Video Parameters

Video Parameters	Default Setting
Format	480i
Horizontal Resolution	720
Field/Frame Encoding	Field
Close Caption Carriage	Enabled
GOP Structure	IBBBP (with Reference B Frames)
I-Frame Period	32
Bit Rate	2 Mbps
Rate Control	Constant Bit Rate

Table 3: Video Output Parameters

Video Output Parameters	Default Setting
Output Interface	eth0 (port1)
Target Address Type	Multicast
Target Address	239.1.1.1
Target Port	8433
Time-To-Live	10

Table 4: Video Advanced Parameters

Video Advanced Parameters	Default Setting
IDR Frequency	1 at the beginning of stream
De-blocking Filter	On
Alpha Offset	0
Beta Offset	0
Motion Compensated Temporal Filter	Medium
3D Noise Reduction Filter	Weak
Adaptive Detail Preservation Filter	Weak

Ancillary Data Defaults

Table 5: Ancillary Data Parameters

Video Parameters	Default Setting
DVB Teletext / WSS Pass Through	On
WSS Pass Through	On
WSS Package Mode	Mode 0
Teletext Lines Checkbox	Unchecked
Active Format Description	On
Active Format Description manual control	Auto

Network Defaults

Table 6: Network Parameters

Network Parameters	Default Setting	
Eth0 (Port 1)	IP Address	192.168.0.202
	Network Mask	255.255.255.0
Eth1 (Port 2)	IP Address	192.168.1.202
	Network Mask	255.255.255.0
Eth2 (Port 3)	IP Address	192.168.2.202
	Network Mask	255.255.255.0
Eth3 (Port 4)	IP Address	192.168.3.202
	Network Mask	255.255.255.0

C

Common Terms

This appendix provides a list of common terms that are used in this document.

Table C1:Common Dolby Definitions

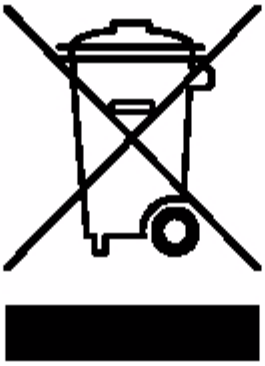
Term	Definition
Original Bitstream	This parameter indicates whether the encoded Dolby Digital bitstream is the master version or a copy. It has no affect on Dolby Digital decoders and is purely for information.
Copyright Bit	This parameter indicates whether the encoded Dolby Digital bitstream is copyright protected. It has no affect on Dolby Digital decoders and is purely for information.
DC Filter	This parameter determines whether a DC blocking 3 Hz highpass filter is applied to the main input channels of a Dolby Digital encoder prior to encoding. This parameter is not carried to the consumer decoder. It is used to remove DC offsets in the program audio and would only be switched off in exceptional circumstances.
Lowpass Filter	This parameter determines whether a lowpass filter is applied to the main input channels of a Dolby Digital encoder prior to encoding. This filter removes high frequency signals that are not encoded. At the suitable data rates this filter operates above 20 kHz. In all cases it prevents aliasing on decoding and is normally switched on. This parameter is not passed to the consumer decoder.
Mixing Level	The Mixing Level parameter describes the peak sound pressure level (SPL) as experienced during the final mixing session at the studio or on the dubbing stage. The parameter allows an amplifier to set its volume control such that the SPL in the replay environment matches that of the mixing room. This control operates in addition to the dialogue level control, and is best thought of as the final volume setting on the consumer's equipment. This value can be determined by measuring the SPL of pink noise at studio reference level and then adding the amount of digital headroom above that level. For example, 85 dB equates to a reference level of –20dBFS; the mixing level is 85+20, or 105 dB.
Room Type	The Room Type parameter describes the equalization used during the final mixing session at the studio or on the dubbing stage. A Large room is a dubbing stage with the industry standard X-curve equalization; a Small room has flat equalization. This parameter allows an amplifier to set the same equalization as heard in the final mixing environment.

Table C1:Common Dolby Definitions

Term	Definition
Bitstream Mode	This parameter describes the audio service contained within the Dolby Digital bitstream. A complete audio program may consist of a main audio service (a complete mix of all the program audio), an associated audio service comprising a complete mix, or one main service combined with an associated service. To form a complete audio program, it may be (but rarely is) necessary to decode both a main service and an associated service using a maximum total bit rate of 512 kbps. Although a detailed description of each option follows, in practice most programming uses the default setting, Complete Main. An example of an exception to this rule is a special karaoke DVD, or an emergency service within digital television. • Complete Main (CM) CM flags the bitstream as the Main Audio Service for the program and all elements are present to form a complete audio program. Currently, this is the most common setting. • Main M&E (ME) The bitstream is the Main Audio Service for the program, minus a dialogue channel. The dialogue channel, if any, is intended to be carried by an Associated Dialogue ervice. Different Dialogue Services can be associated with a single ME Service to support multiple languages. • Assc. Visual Imp. (VI) This is typically a single-channel program intended to provide a narrative description of the picture content to be decoded along with the Main Audio Service. The VI Service may also be a complete mix of all program channels, comprising up to six channels. • Assc. Hear Imp (HI) This is typically a single-channel program intended to convey audio that has been processed for increased intelligibility and decoded along with the Main Audio Service. The HI Service may also be a complete mix of all program channels, comprising up to six channels. • Assoc. Dialogue (D) This is typically a single-channel program intended to provide a dialogue channel for an ME Service. If the ME Service contains more than two channels, the D Service is limited to only one channel. If the ME Service is two channels, the D Service can be a stereo pair; the appropriate channels of each service are mixed together (requires special decoders). • Assc. Commentary (AC) This is typically a single-channel program intended to convey additional commentary that can be optionally decoded along with the Main Audio Service. This service differs from a Dialogue Service because it contains an optional, rather than a required, dialogue channel. The C Service may also be a complete mix of all program channels, comprising up to six channels. • Assc. Emergency (E) This is a single channel service that is given priority in reproduction. When the E Service appears in the bitstream, it is given priority in the decoder and the Main Service is muted. • Assc. Voice Over (VO) This is a single channel service intended to be decoded and mixed to the center channel (requires special decoders). • Main Sv Karaoke (K) The bitstream is a special service for karaoke playback.

Caring for the Environment by Recycling

When you see this symbol on a Motorola product, do not dispose of the product with residential or commercial waste.



Recycling your Motorola Equipment

Please do not dispose of this product with your residential or commercial waste. Some countries or regions, such as the European Union, have set up systems to collect and recycle electrical and electronic waste items. Contact your local authorities for information about practices established for your region. If collection systems are not available, call Motorola Customer Service for assistance.

Beskyttelse af miljøet med genbrug

Når du ser dette symbol på et Motorola-produkt, må produktet ikke bortskaffes sammen med husholdningsaffald eller erhvervsaffald.

Genbrug af dit Motorola-udstyr

Dette produkt må ikke bortskaffes sammen med husholdningsaffald eller erhvervsaffald. Nogle lande eller områder, f.eks. EU, har oprettet systemer til indsamling og genbrug af elektriske og elektroniske affaldsprodukter. Kontakt de lokale myndigheder for oplysninger om gældende fremgangsmåder i dit område. Hvis der ikke findes tilgængelige indsamlingssystemer, kan du kontakte Motorola Kundeservice.

Umweltschutz durch Recycling

Wenn Sie dieses Zeichen auf einem Produkt von Motorola sehen, entsorgen Sie das Produkt bitte nicht als gewöhnlichen Haus- oder Büromüll.

Recycling bei Geräten von Motorola

Bitte entsorgen Sie dieses Produkt nicht als gewöhnlichen Haus- oder Büromüll. In einigen Ländern und Gebieten, z. B. in der Europäischen Union, wurden Systeme für die Rücknahme und Wiederverwertung von Elektroschrott eingeführt. Erkundigen Sie sich bitte bei Ihrer Stadt- oder Kreisverwaltung nach der geltenden Entsorgungspraxis. Falls bei Ihnen noch kein Abfuhr- oder Rücknahmesystem besteht, wenden Sie sich bitte an den Kundendienst von Motorola.

Cuidar el medio ambiente mediante el reciclaje

Cuando vea este símbolo en un producto Motorola, no lo deseche junto con residuos residenciales o comerciales.

Reciclaje de su equipo Motorola

No deseche este producto junto con sus residuos residenciales o comerciales. Algunos países o regiones, tales como la Unión Europea, han organizado sistemas para recoger y reciclar desechos eléctricos y electrónicos. Comuníquese con las autoridades locales para obtener información acerca de las prácticas vigentes en su región. Si no existen sistemas de recolección disponibles, solicite asistencia llamando el Servicio al Cliente de Motorola.

Recyclage pour le respect de l'environnement

Lorsque vous voyez ce symbole sur un produit Motorola, ne le jetez pas avec vos ordures ménagères ou vos rebuts d'entreprise.

Recyclage de votre équipement Motorola

Veuillez ne pas jeter ce produit avec vos ordures ménagères ou vos rebuts d'entreprise. Certains pays ou certaines régions comme l'Union Européenne ont mis en place des systèmes de collecte et de recyclage des produits électriques et électroniques mis au rebut. Veuillez contacter vos autorités locales pour vous informer des pratiques instaurées dans votre region. Si aucun système de collecte n'est disponible, veuillez appeler le Service clientèle de Motorola qui vous apportera son assistance.

Milieubewust recycleren

Als u dit symbool op een Motorola-product ziet, gooi het dan niet bij het huishoudelijk afval of het bedrijfsafval.

Uw Motorola-materiaal recycleren.

Gooi dit product niet bij het huishoudelijk afval het of bedrijfsafval. In sommige landen of regio's zoals de Europese Unie, zijn er bepaalde systemen om elektrische of elektronische afvalproducten in te zamelen en te recycleren. Neem contact op met de plaatselijke overheid voor informatie over de geldende regels in uw regio. Indien er geen systemen bestaan, neemt u contact op met de klantendienst van Motorola.

Dbałość o środowisko - recykling

Produktów Motorola oznaczonych tym symbolem nie należy wyrzucać do komunalnych pojemników na śmieci.

Recykling posiadanego sprzętu Motorola

Produktu nie należy wyrzucać do komunalnych pojemników na śmieci. W niektórych krajach i regionach, np. w Unii Europejskiej, istnieją systemy zbierania i recyklingu sprzętu elektrycznego i elektronicznego. Informacje o utylizacji tego rodzaju odpadów należy uzyskać od władz lokalnych. Jeśli w danym regionie nie istnieją systemy zbierania odpadów elektrycznych i elektronicznych, informacje o utylizacji należy uzyskać od biura obsługi klienta firmy Motorola (Motorola Customer Service).

Cuidando do meio ambiente através da reciclagem

Quando você ver este símbolo em um produto Motorola, não descarte o produto junto com lixo residencial ou comercial.

Reciclagem do seu equipamento Motorola

Não descarte este produto junto com o lixo residencial ou comercial. Alguns países ou regiões, tais como a União Européia, criaram sistemas para colecionar e reciclar produtos eletro-eletrônicos. Para obter informações sobre as práticas estabelecidas para sua região, entre em contato com as autoridades locais. Se não houver sistemas de coleta disponíveis, entre em contato com o Serviço ao Cliente da Motorola para obter assistência.

Var rädd om miljön genom återvinning

När du ser den här symbolen på en av Motorolas produkter ska du inte kasta produkten tillsammans med det vanliga avfallet.

Återvinning av din Motorola-utrustning

Kasta inte denna produkt tillsammans med det vanliga avfallet. Vissa länder eller regioner, som t.ex. EU, har satt upp ett system för insamling och återvinning av el- och elektronikavfall. Kontakta dina lokala myndigheter för information om vilka regler som gäller i din region. Om det inte finns något insamlingssystem ska du kontakta Motorolas kundtjänst för hjälp.

リサイクルによる環境保護

モトローラ製品にこの記号が表示されている場合、製品を家庭または商業廃棄物として処分しないでください。

モトローラ装置のリサイクル

本製品を家庭または商業廃棄物として処分しないでください。欧州連合などの国または地域によっては、電気的・電子的廃棄物を収集およびリサイクルするシステムがあります。お住まいの地域で決められている方法についての情報は、地方自治体にお問い合わせください。収集システムがない場合、モトローラ・カスタマーサービスまでお問い合わせください。

재활용으로 환경 보호하기

Motorola 제품에 이 표시가 있는 경우, 해당제품을 가정용 또는 상업용 폐기물과 함께 버리지 마십시오.

Motorola 기기의 재활용

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重复利用，保护环境

如果 Motorola 产品上具有这个标识，请勿将产品丢弃到家庭或商业垃圾中。

Motorola 设备的重复利用

请勿将本产品丢弃到家庭或商业垃圾中。某些国家或地区，例如欧盟，已经建立起回收和重复利用电气与电子废弃物的体系。请与当地相关机构联系，获取有关所在地区相关规定的信息。如果当地尚未建立回收体系，请致电 Motorola 客户服务以寻求帮助。

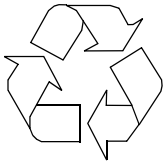
注意環保問題

在你看到產品上有Motorola的標誌時，請勿以住家或商用的廢棄物方式處置。

Motorola 設備的回收

請勿以住家或商用的廢棄物方式處置。某些國家或地區，如歐盟，已對廢棄的電器和電子產品制訂回收以及再利用體制。請與您所在地的管理機構諮詢相關規定。

若您所在的地區並未設置回收機制，請電Motorola客服部諮詢相關事宜。



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