edje 5110

MPEG 2 Standard Definition Encoder

User Guide

ADTEC Digital

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Chapter 1 - Introduction

Product Introduction

The edje 5110-RM is a high performance MPEG 2 Standard Definition encoder supporting the most demanding distribution applications and can easily be upgraded to support encrypted or free-to-air SD 4:2:2 contribution platforms. Its video performance is exceptional, ranging from the lowest 4:2:0 distribution rates all the up to 50 Mbs 4:2:2 for contribution. Offering dual stream on-board audio encoding, the edje-5110 audio CODEC support includes dual Dolby Digital and MPEG 1 Layer 2 encoding, plus rock-solid, dual-channel Dolby E/5.1 passthrough. Optional 4:2:2 and BISS 1/E encryption software upgrades make the edje-5110-RM the perfect SD Contribution encoder. User interfaces include an easy-to-use front panel interface and on-board Web application server for configuration and monitoring.

Operations & Applications

Flexible Transport Options The edje-5110 offers three ASI and one GIGE output, AES3 Digital, SDI and Analog Audio Inputs. It provides a stable, accurate MPEG 2 Transport Stream compliant with global DVB standards.

IPTV Multicast Output Directly output MPEG-2 IP Multicast and eliminate the need for additional IP streaming equipment.

Highest quality MPEG 2 SD When it comes to the best on-air look, edje-5110 delivers with excellent quality Standard Definition video encoding.

Rapid Configuration The edje-5110 responds rapidly and reliably to the desires of the operator. Rapidly configure and control the device using the integrated front panel keypad and LCD or on-board Web application.

Monitor Monitoring the encoder is easy and straight-forward using the built-in web browser interface, front panel LED and LCD and event logging.

Options and Accessories

- **BISS Encryption:** BISS-1 and BISS-E encryption.
- **M2SD422-Key:** enables 4:2:2 Chroma-type encoding.

Related Products

- **DTA-3050:** Digital turn-around router for transporting MPEG2 via ASI and IP sources to ASI, SMPTE 310, and IP outputs.
- **Soloist HD Pro:** Broadcast-quality, high-definition MPEG2 and MPEG4 AVC decoder for broadcast applications.

Notices and Disclaimers

Trademarks: edje5110 is a trademark of Adtec Digital. Dolby and the double-D symbol are registered trademarks of Dolby Laboratories. Other product and company names may be trademarks or registered trademarks of their respective companies.

The information in this document is subject to change without notice.

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Chapter 2 - Getting Started

Installation Instructions

Safety Warnings and Cautions

For your safety and the proper operation of the device:

- This unit must be installed and serviced by suitably qualified personnel only.
- Disconnect all power before servicing the unit.
- Do not expose this device to rain or other moisture. Clean only with a dry cloth.
- If not installed in an equipment rack, install the product securely on a stable surface.
- Install the product in a protected location where no on can step or trip over the supply cord, and where the supply cord will not be damaged.
- If a system is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature.
- Consideration should be given to installing the unit in an environment compatible with the maximum recommended ambient temperature of 50 degrees Celcius (122 degrees Fahrenheit).
- Install the unit in a rack so that the amount of airflow required for safe operation is not compromised.
    - ♦ The recommended clearance on the top and sides of the unit is at least ½ “ (one half inch/one centimeter).
- Mounting of the unit in a rack should be such that no hazardous condition is achieved due to uneven mechanical loading.
- Use only a grounded electrical outlet when connecting the unit to a power source.
- Reliable earth grounding of rack-mount equipment should be maintained.
    - ♦ Particular attention should be given to supply connection other than direct connections to the branch circuit (e.g., use of power strips).

Lithium Battery Safety Statement

⚠ Lithium Battery Safety Statement ⚠
Caution: Lithium battery inside. Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by battery manufacturer. (US)
Attention: Contient une pile de lithium. Risque d'explosion dans le cas où la pile ne serait pas correctement remplacée. Remplacer uniquement avec une pile semblable ou equivalente au type de pile recommandé par le fabricant. (FR)
Forsigtig: Indeholder lithiumbattterier. Risiko for eksplosion, hvis batteriet udskiftes forkert. Må kun udskiftes med samme eller tilsvarende type, som anbefalet af fabikanten. (DK)
Varoitus: Tämä tuote käyttää laservaloa. Skannerissa on jokin seuraavista tarroista. Lue Huomio-kohta. (FI)
Vorsicht: Enthält Lithium-Batterie. Bei unsachgemäßem Ersatz besteht Explosionsgefahr. Nur durch gleichen oder vom Hersteller empfohlenen Typ ersetzen. (DE)
Attenzione: Batteria al litio. Pericolo di esplosione qualora la batteria venga sostituita in maniera scorretta. Sostituire solo con lo stesso tipo o equivalente consigliato per il fabbricante. (IT)
Atenção: Contém pilha de lítio. Há perigo de explosão no caso de uma substituição incorreta. Substitua somente pelo mesmo tipo, ou equivalente, recomendado pelo fabricante. (PT)
Varning: Innehåller litiumbatteri. Fara för explosion om batteriet är felaktigt placerat eller av fel typ. Använd endast samma eller motsvarande typ batterier rekommenderade av tillverkaren. (SE)
Advarsel: Innmontert Lithium batteri. Eksplosjonsfare ved feil montering av batteri. Benytt kun batteri anbefalt av produsent. (NO)

Cuidado:
Pila de litio adentro. Peligro de explosión si la pila se reemplaza incorrectamente. Reemplace solamente con el mismo tipo o equivalente recomendado por el fabricante. (ES)

Oppassen:
Bevat Lithium-batterij. Incorrrecte plaatsing van batterij kan leiden tot explosiegevaar. Alleen vervangen door hetzelfde of door fabrikant aanbevolen gelijkwaardig type. (NL)

Προσοχή: Υπάρχει μπαταρία από λίθιο εσωτερικά. Υπάρχει κίνδυνος έκρηξης εάν η μπαταρία αντικατασταθεί με λανθασμένο τρόπο. Αντικαταστήστε μόνο με τον ίδιο ή ισοδύναμο τύπο που συνιστάται από τον κατασκευαστή. (GR)	경고: 본 제품은 레이저 광선을 사용합니다. 다음 라벨 중 하나가 스캐너에 제공됩니다. 주의 사항을 읽어 주십시오. (KR)
警告: この製品はレーザー光線を使用します。次のラベルのうち１つがスキャナーに貼られています。 注意事項をお読みください。(JP)	**Dikkat:** İçinde lityum bataryası bulunur. Bataryanýn yanlýþ deðiþtirilmesi patlama tehlikesi yaratýr. Aynýsýyla veya üreticinin önerdiði eþdeðer tiple deðiþtirin. (TR)
警告： 本产品使用激光。 下列一个标签将随扫描仪一道提供。 请阅读“当心”一栏的内容。(CN)	

Legend:

Chinese	CN	Italian	IT
Danish	DK	Japanese	JP
Dutch	NL	Korean	KR
English	US	Norwegian	NO

Compliance Notices

FCC:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning: Changes or modifications to this device not expressly approved by Adtec Digital could void the user’s authority to operate the equipment.

Industry Canada:

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions:(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Adtec Digital cannot accept responsibility for any failure to satisfy the protection requirements resulting from a user modification of the product. This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / EN 55022.

Front Panel

The edje5110 should be installed into a one-rack unit 19” rack slot. Power should be applied to the unit and configured with a valid IP address via the front panel. Once the IP is configured, you can use Telnet or a web browser to configure and control the unit.

LED Indicator Definitions

System	LED Status
Power	**Green:** Power is on. **Off:** Power is off
Alarm	**Off:** no alarm **Yellow:** minor alarm **Red:** major alarm
Link	**Off:** no link detected **Green:** link active
Busy	**Off:** no traffic **Green Flashing:** traffic
HD	**Green:** High Def Feaure is enabled. **Off:** High Def Feature is disabled.

Front Panel Navigation

The edje5110 has an LCD display on the front panel. Using the **Mode**, **Select**, **Enter**, **Escape** buttons and directional buttons, you can navigate the front panel menu and control the unit.

- The edje5110 is always logged in on startup
- If the device has logged out due to accident or a login duration timer being set (see below), you will need to log back in.

To log in from a logged-out status:

Step	Action
1	Press **<Select>**
2	Press **<Up>** arrow
3	Press **<Select>**
4	Press **<Enter>**
5	Press **<Right arrow>**
6	Press **<Enter>**

The front panel also has a login duration capability. This setting allows you to specify a time frame in which the unit will automatically log itself out if it receives no control inputs via the front panel or API session.

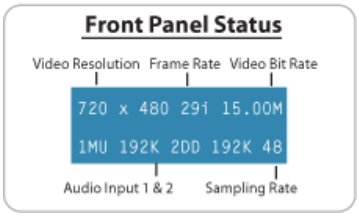
To set the duration:

Step	Action
1	Press mode until you see the System Menu.
2	Press **<Select>**
3	Press the **<Down>** arrow

4	Press **<Select>**
5	Using the **<Up>** and **<Down>** arrows, select the value you wish.
6	Press **<Enter>** to save your selection

Possible Values:
0 (Zero): The unit will not auto-log-out **1-9:** The number of minutes until log out if no input is received.

This snapshot tells you the current encode variables as shown in this diagram:.

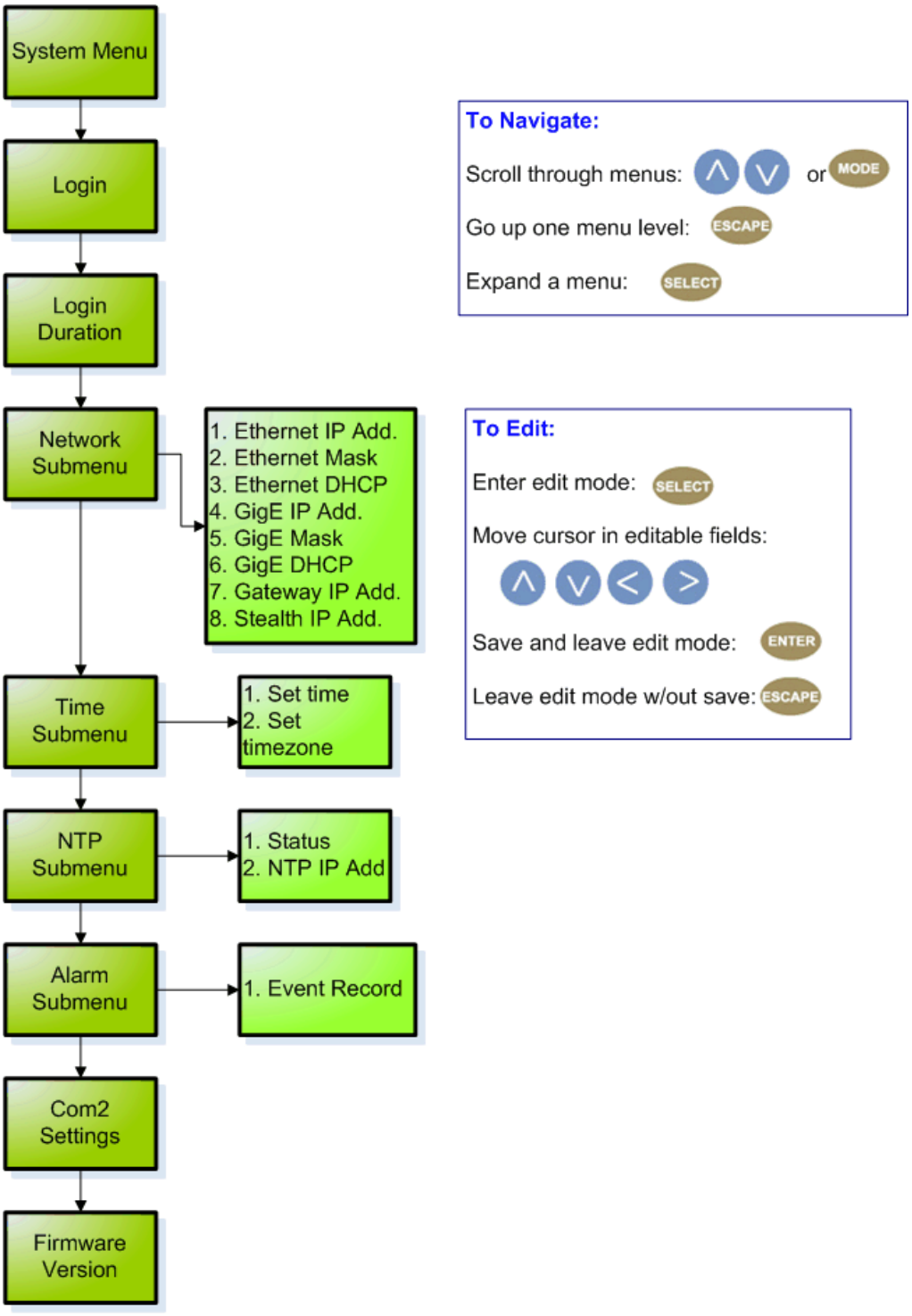


There are 8 menu trees accessible from the front panel. Using the **MODE** button, you can scan through the System, Decoder, Encoder, Transport, PID, Table, Profile, and Encryption menus. By pressing the **SELECT** button you can enter one of these sub menus.

System Menu

The following diagram represents the structure of the **System** Menu of the Adtec edje5110:

Definitions



Network Menu

Item	Function	Options	ADTEC API Command
	IP address of unit on your network		*.sysd IPA 0

Ethernet IP Address		user-defined using **<left/right arrow>** and **<select>** buttons default is 192.168.10.48	
Ethernet Mask	Defines the unit relative to the rest of your network	user-defined using **<left/right arrow>** and **<select>** buttons default is 255.255.255.0	*.sysd IPM 0
Ethernet DHCP	Dynamic Host Configuration Protocol; allows the edje-5110 to self-locate network Ethernet parameters	**On** (finds own DHCP Address) **Off** (defaults to last entered IP Address) default is OFF	*.sysd DHCP eth0
GigE IP Address	route of traffic in/out on IPTV	user-defined using **<left/right arrow>** and **<select>** buttons default is 192.168.20.48	*.sysd IPA 1
GigE Mask	defines unit relative to the rest of an IPTV network	user-defined using **<left/right arrow>** and **<select>** buttons default is 255.255.255.0	*.sysd IPM 1
GigE DHCP	Dynamic Host Configuration Protocol; allows the edje-5110 to self-locate network GigE parameters	**On** (finds own DHCP Address) **Off** (defaults to last entered IP Address) default is OFF	*.sysd DHCP eth1
Gateway IP Address	traffic director for off-LAN resources	user-defined using **<left/right arrow>** and **<select>** buttons default is 192.168.10.1	*.sysd GIP
Stealth IP Address	security feature that allows only the designated Stealth IP Address to communicate with the unit for FTP and other services. This control allows one-point override access to the Stealth IP Address.	user-defined using **<left/right arrow>** and **<select>** buttons	*.sysd SIP

Time Menu

Item	Function	Options	Adtec API Commands
Time	specifies system time	user-defined using **<left/right arrow>** and **<select>** buttons	*.sysd TIM
Timezone	specifies time zone unit operates in	user-defined using **<left/right arrow>** and **<select>** buttons	*.sysd TIZ

NTP Menu

Item	Function	Options	Adtec API Commands
NTP Status	Network Transfer Protocol	Defines whether or not your unit is in sync with the designated NIP server	none
NTP IP Address	IP address designated for Network Transfer Protocol	user-defined using **<left/right arrow>** and **<select>** buttons	*.sysd NIP

Alarm Menu

Item	Function	Options
Event Record	Log of events outside of operating parameters	scroll up and down to view log items

COM2 Menu

Item	Function	Options	Adtec API Commands
Com2 Settings	RS-232 terminal monitor for communicating with the internal host motherboard for diagnostics	115200 8 1 NONE 57600 8 1 NONE 38400 8 1 NONE 19200 8 1 NONE 9600 8 1 NONE default is 38400 8 1 None	*.ecmd com2

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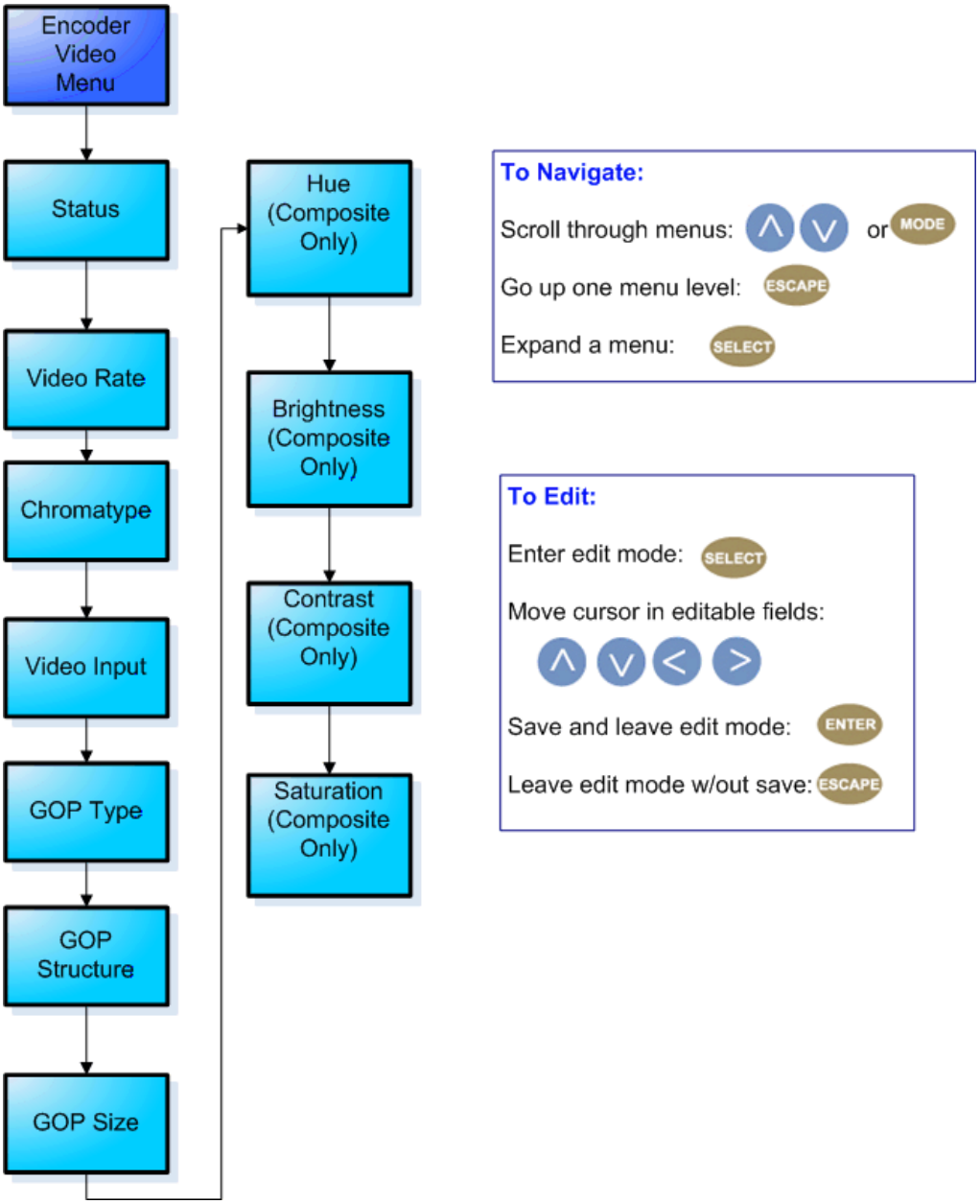
Encoder Video Menu

The following diagram represents the structure of the **Video Encoder** Menu of the Adtec edje5110:



Definitons

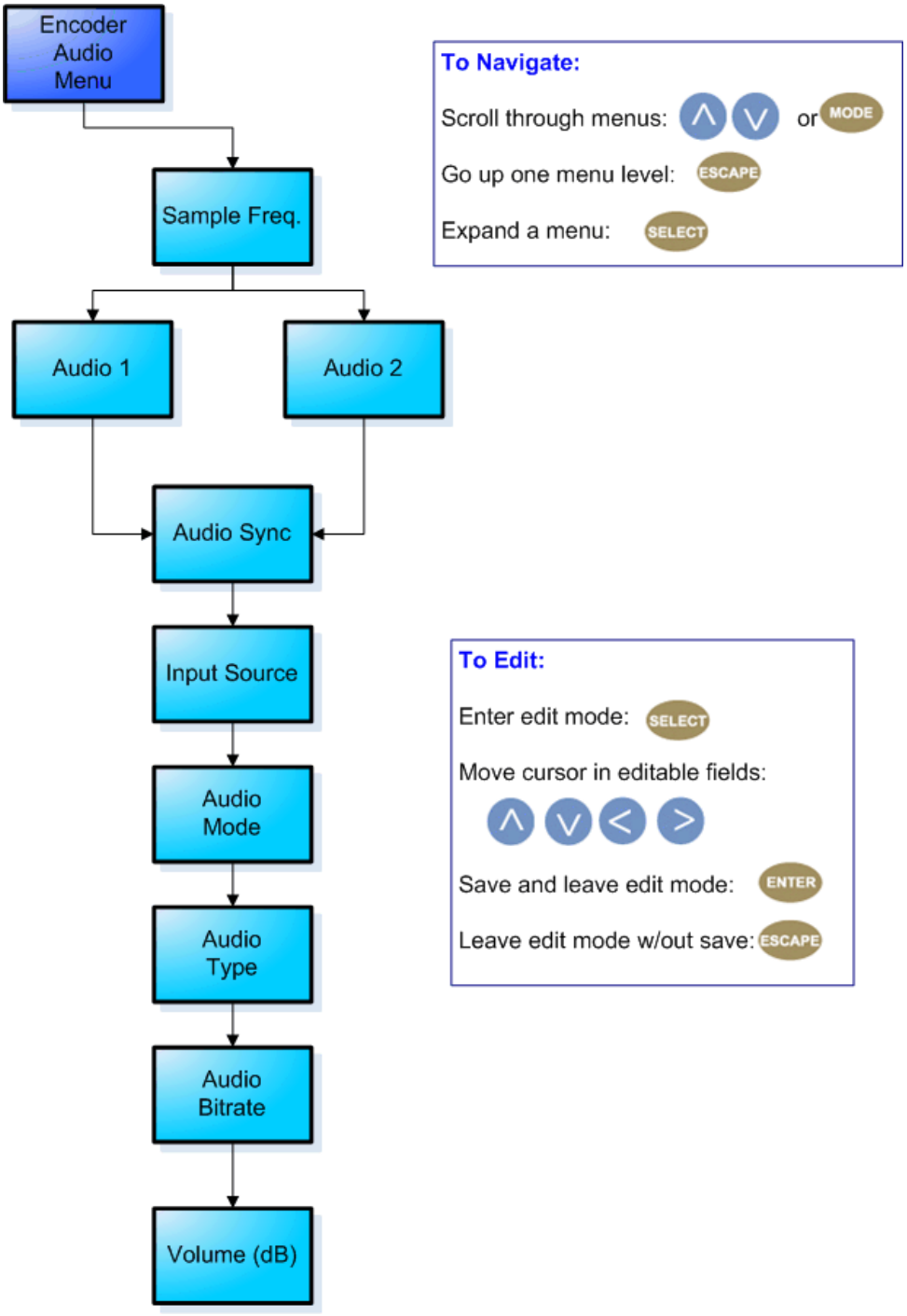
Item	Function	Options	API Commands
Status	Shows current status and provides encoder control.	Encode - begins encoding Stop - stops encoding	**.** ECMD REC - encode .ECMD STP - stop
Video Rate	rate at which video signal is being encoded	user-defined using **<left/right arrow>** and **<select>** buttons. Review Technical Specifications for full details on acceptable ranges.	*.ECMD VRT
Chromatype	chrominance; video color-component	420 422	*.ECMD CHT
Video Input	selects type of video input		*.ECMD INP

		Composite SDI	
GOP Type	Group of Pictures type as open or closed GOP is expressed as one command, i.e., *.ECMD GOP [type] [structure] [size]	Open Closed	*.ECMD GOP 0 = open 1 = closed
GOP Structure	Group of Pictures structure (format)	I IP IBBP	*.ECMD GOP 3 = I 2 = IP 0 = IBBP
GOP Size	Group of Pictures size	User-defined 1-30 in increments of 1	*.ECMD GOP 1-30
Hue	Composite Inputs Only; sets hue; range is 0 to 1024 with a default value of 512	range = 0 to 1024	*.DCMD HUE [value]
Brightness	Composite Inputs Only; sets brightness; range is 0 to 1024 with a default value of 512	range = 0 to 1024	*.DCMD BRI [value]
Contrast	Composite Inputs Only; sets contrast; range is 0 to 1024 with a default value of 512	range = 0 to 1024	*.DCMD CON [value]
Saturation	Composite Inputs Only; sets saturation; range is 0 to 1024 with a default value of 512	range = 0 to 1024	*.DCMD SAT [value]

Note: the Adtec edje5110 encoder function does not support MPEG1 Layer 3 or MP3.

Encoder Audio Menu

The following diagram represents the structure of the **Audio Encoder** Menu of the Adtec edje5110:



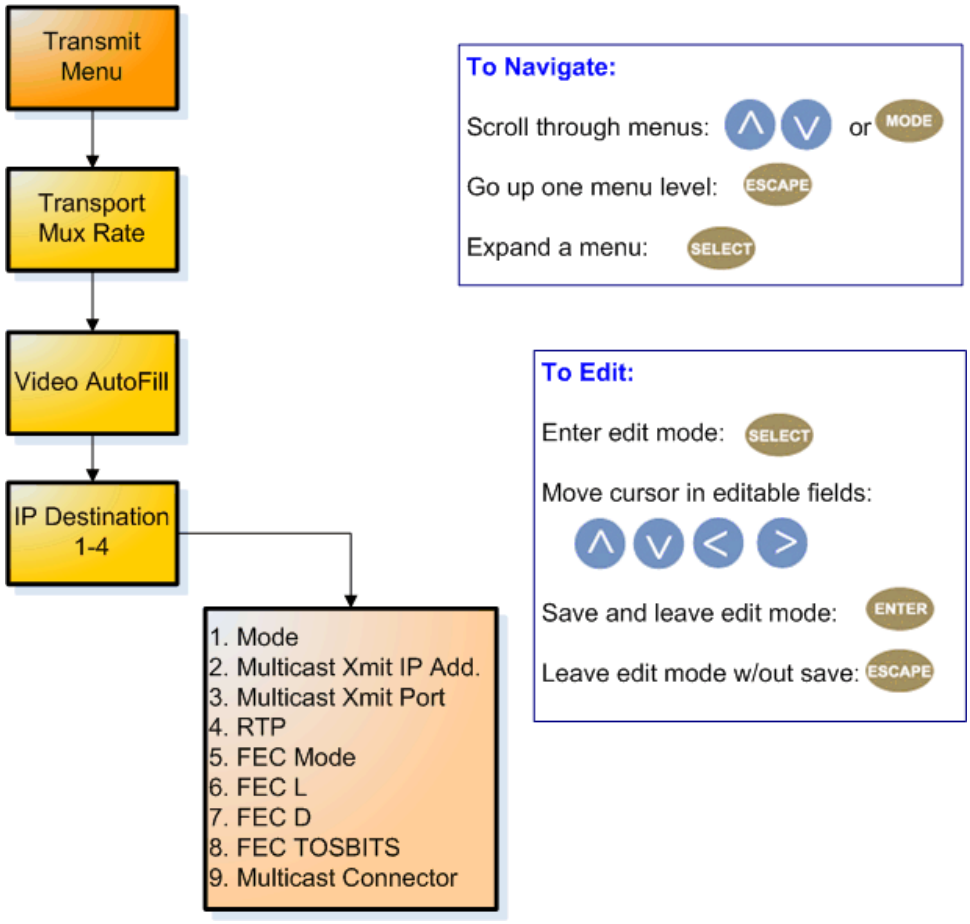
Definitions

Item	Function	Options	API Commands
Sample Frequency	how often signal is sampled in Hz only one frequency can be selected; will set both Audio 1 and Audio 2	32000 44100 48000	*.ECMD ASF [audio]
Audio Sync	Audio sync offset in milliseconds.	The range is -800 to +800	*.ECMD AUS
Audio Input Source	selects type of audio input menu is identical for Audio 1 and Audio 2	Analog SDI AES	*.ECMD AIN [audio] Audio 1 = 0

			Audio 2 = 1
Mode	specifies if the edje-5110 is encoding audio or passing it through as received	Off Encode Passthrough	See AMO in API Only functions?
Type	type of audio signal being encoded or passed	Dolby Digital AC3 Musicam Layer II Dolby E Linear PCM (LP)	See AMO in API Only functions?
Bitrate	audio codec	64000-384000 kBits/sec (Musicam encode) 64000-640000 kbits/sec (Dolby Digital/passthrough)	See AMO in API Only functions?
Volume Level	volume in dB	user-defined using **<left/right arrow>** and **<select>** buttons range is -18 dBs to 8 dBs in increments of 1	*.ECMD ALV [channel] [level in dB] Audio Channel 1 = 0 Audio Channel 2 = 1

Transmit Menu

The following diagram represents the structure of the **Transmit** Menu of the Adtec edje5110:



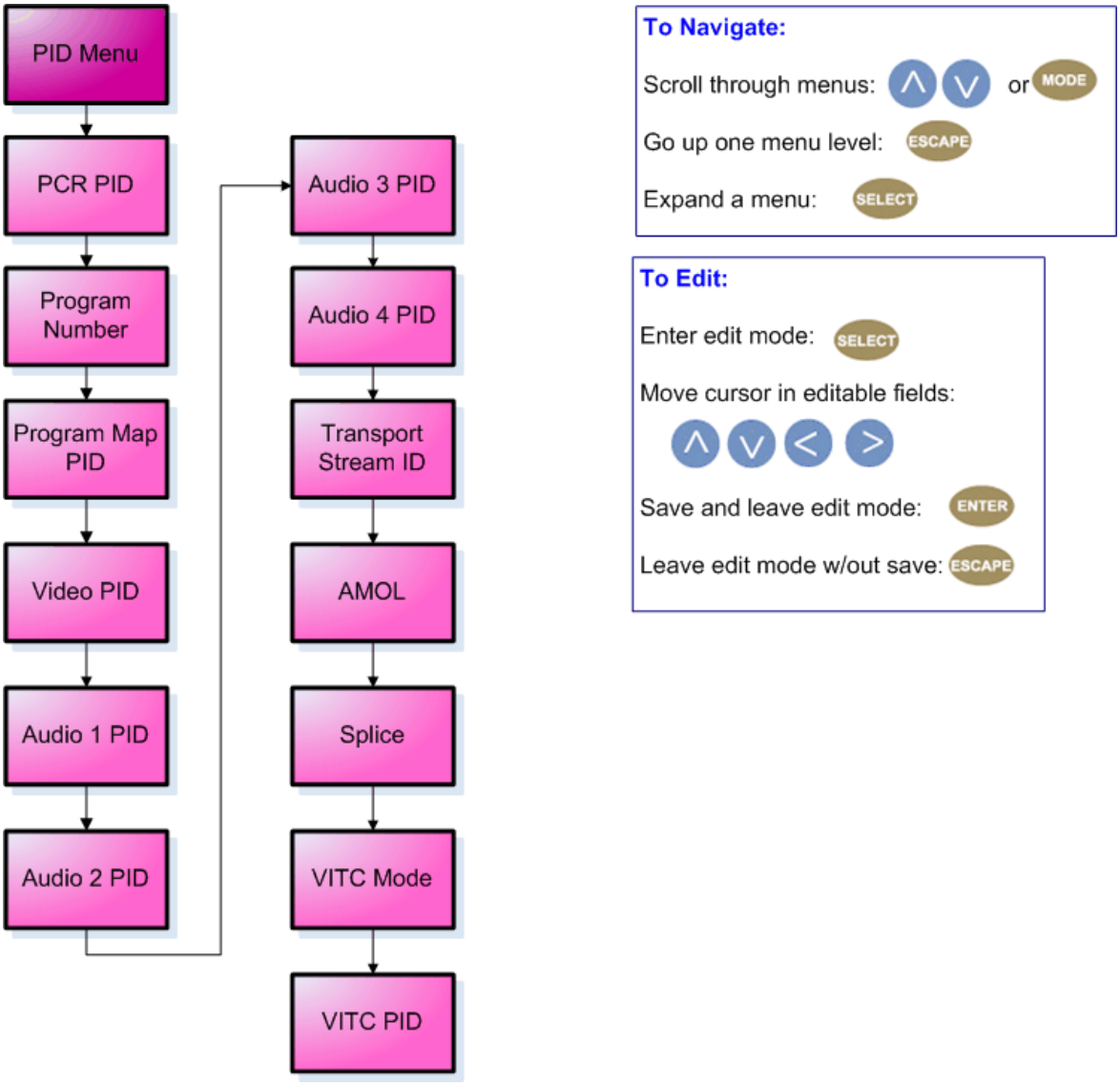
Definitions

Item	Function	Options	API Commands
Transport Mux Rate	rate, in bps, that the multiplexed signal is being handed off	max = 100,000,000 bps	*.ECMD TMR
Video Autofill	ties to Transport Mux Rate; uses non-audio packet space for video	On Off	*. ECMD VAF [x] 1 = on 0 = off
IP Destinations 1-4	sub-label for items below. The sub-menu repeats four (4) times for up to four multicasting IP destinations.	NONE	none
Mode	switches multicast function on and off	Off Send	*.ECMD MMO
Multicast Transmit IP Address	IP Address on which a transport stream is transmitted	user-defined using **<left/right arrow>** and **<select>** buttons	*.ECMD MSI
Multicast Transmit Port	port assignment used for transmitting a multicast	user-defined using **<left/right arrow>** and **<select>** buttons	*.ECMD MSP
RTP			*.ECMD RTP

	Turns RTP on or off RTP allows for sequence numbering and timing, which are crucial for the accurate playback of an audio or video data stream. Control is editable if Multicast Mode is set to 'Send'.	Off = [0] On = [1]	
FEC Mode	Forward Edge Correction; send2 two FEC RTP streams in addition to a source RTP stream enabling a receiver to reconstruct missing packets in the source stream. Used in conjunction with L and D values; described below.	Off = [0] On = [1] when RTP is also selected 'on')	*.ECMD FEP
FEC L	affects the maximum burstpacket loss that can be recovered	4-20 user-defined using **<left/right arrow>** and **<select>** buttons	*.ECMD FEP
FEC D	defines latency involved in burstrecovery	4-20 user-defined using **<left/right arrow>** and **<select>** buttons	*.ECMD FEP
TOS	Type of Service; selects the type of multicast that will forward the packet	Normal Minimize Cost Maximize Reliability Maximize Throughput Minimize Delay	*.ECMD TOS
Multicast Connector	specifies transport connection for multicast stream	Ethernet !GigE	*.DCMD ECN

PID Menu

The following diagram represents the structure of the **PID** Menu of the Adtec



Controls

Item	Function	Options	Adtec API Command
PCR PID	identifies packets which contain PCR adaptation field	user-defined 20-character hexadecimal	*. ECMD PRP
Program Number	identifies which program number in the PAT and PMT packets are associated with which video and audio PIDs 0x0001 - 0xFFFF are valid ID assignments	user-defined 20-character hexadecimal	*. ECMD PNU
Program Map PID	identifies packets containing the program map 0x0000: reserved for Program Association Table (PAT) 0x0001: reserved for conditional Access Table 0x0002 -> 0x001F: reserved 0x0020 - 0x1FFE are valid PID assignments	user-defined 20-character hexadecimal	*. ECMD PPI see reserved PIDs at left
Video PID	identifies video packets 0x0000: reserved for Program Association Table (PAT)	user-defined 20-character	*. ECMD VPI see reserved

	0x0001: reserved for conditional Access Table 0x0002 -> 0x001F: reserved 0x0020 - 0x1FFE are valid PID assignments	hexadecimal	PIDs at left
Audio 1 PID	identifies packets containing audio AES stream 0x0000: reserved for Program Association Table (PAT) 0x0001: reserved for conditional Access Table 0x0002 -> 0x001F: reserved 0x0020 - 0x1FFE are valid PID assignments	user-defined 20-character hexadecimal	*. ECMD API [Index] [PID] 0 = channels 1,2 1= channels 3,4 see reserved PIDs at left
Audio 2 PID	see above	user-defined 20-character hexadecimal	See above
AMOL	Automated Measurement of Line Ups; identifies packet which contains AMOL (NTSC) information Only applies to 525 line (NTSC) video. 0x0020 - 0x1FFE are valid PID assignments	user-defined 20-character hexadecimal	*.ECMD APQ
Splice	identifies packets which contain DVVS-255 splice information. 0x0010 - 0x1FFE are valid PID assignments	user-defined 20-character hexadecimal	*.ECMD SPI
VITC Mode	Vertical Interval Time Code (VITC); switches feature on or off. The device only passes VITC data; it does not utilize it. See the Vertical Interval Time Code article in this manual for more information.	Off On	*.ECMD BMO
VITC PID	defines the portion of the ANC PID carrying VITC data	user-defined 20-character hexadecimal	*.ECMD BPI

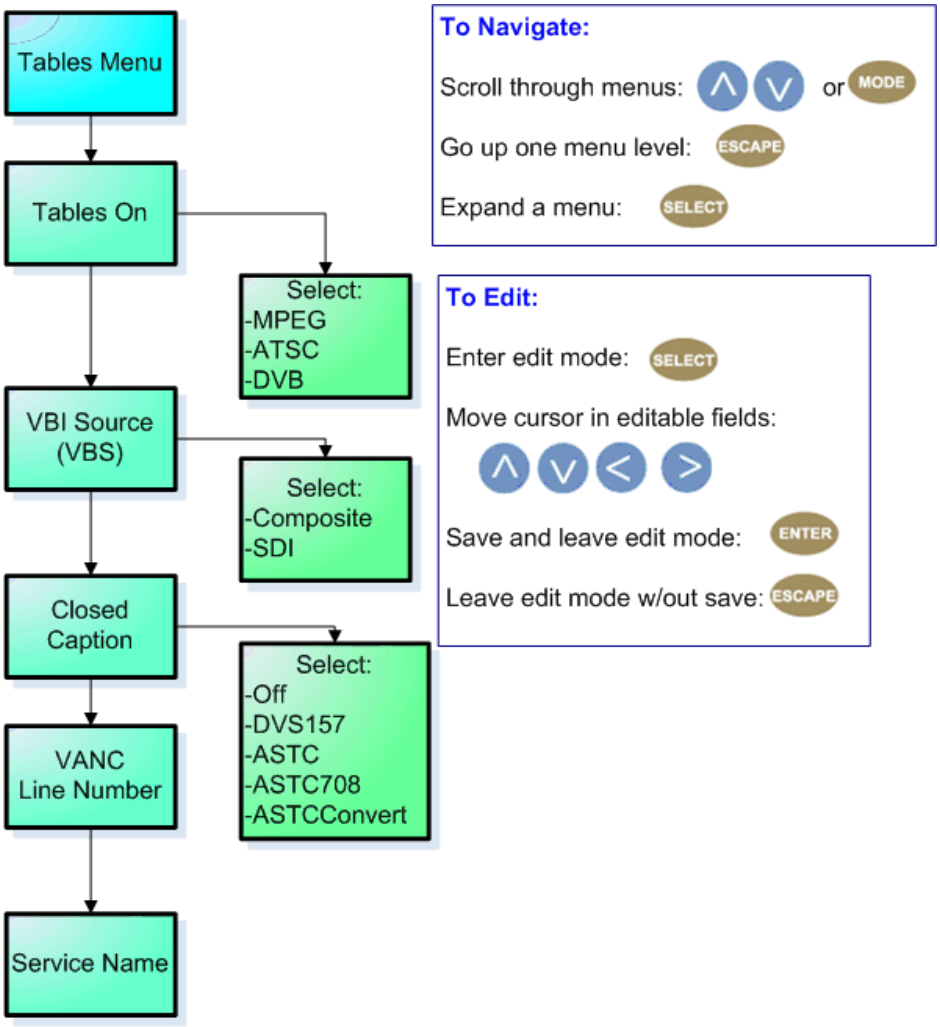
Note: Adtec PID API commands can accept Hex or Decimal values. PCR PID Examples: PRP 1E1 (set the PID to 0x1e1 (481 decimal) PRP , 481 (set the PID to 481 (the comma is an empty placeholder) PRP 1E1 500 (set the PID to 500 (assumes 500 is different from the currently configured PID).

PID Ranges

Range	Function
0x0000	Program Association Table
0x0001	Reserved for Conditional Access Table
0x0002->0x001F	Reserved
0x0020 - 0x1FFE	valid PID assignments

Tables Menu

The following diagram represents the structure of the **Tables** Menof the Adtec edje5110:



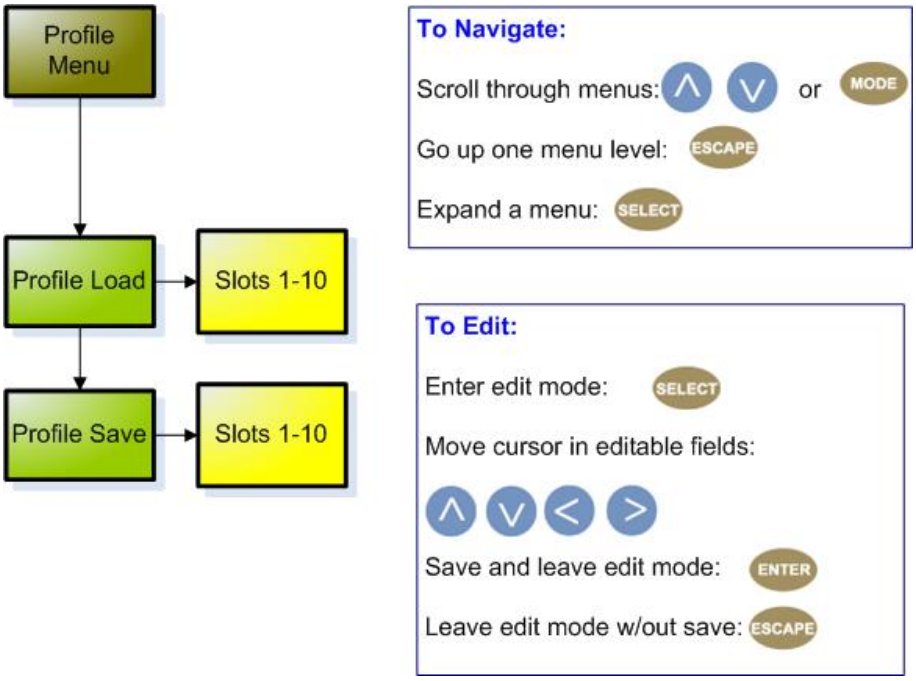
Controls

Item	Function	Options	Adtec API Command
Tables On	switches feature on and designates type of tables to be used	DVB MPEG ATSC	*.ECMD TON 0 = DVB 1 = MPEG 2= ATSC
VBI Source (VBS)	selects input source of Vertical Blanking Interval data	Composite SDI	see the Help Notes for this feature on your device's web control application, found on the VBI Tab.
Closed Caption	activates (or deactivates) closed-captioning and specifies closed-captioning standard to be used	Off ASTC ASTC708 ASTCConvert DVS157	**.ECMD CLC** **0 = Off** **1 = ASTC mode** **2 = ASTC708 mode** **4 = ASTCConvert mode** ***Note:** In std-def, all modes apply. In hi-def, for EIA-708 closed caption insertion, set to ATSC.
Line Number	VANC		*.ECMD LNA

		user-specified 7-32 in 1 line increments	
Service Name	name of program/network or other identifier;carried in the SDT table of a transport stream	user-specified 20-character alphanumeric text string	*.ECMD SNA [name]

Profile Menu

The following diagram represents the structure of the **Profile** Menu of the Adtec edje5110:



Operation

API Commands

There are five commands in the Profile group in the API command set for the device. They are:

Command Handler	Command	Function
*.ECMD PROFILE	LIST	lists all stored profiles
*.ECMD PROFILE	[slot #] or [name] LOAD	loads stored profile from the designated memory slot
*.ECMD PROFILE	[slot #] SAVE	saves a profile to the designated memory slot
*.ECMD PROFILE	[slot #] DELETE	deletes the profile stored at the designated memory slot
*.ECMD PROFILE	[slot #] RENAME	renames the profile stored at the designated memory slot

Naming

When saving a profile to Slots 1-10 from the front panel, the system will default to the Service Name associated with that configuration. To input a name of the user's choice, use the Profile/Save or Profile/Rename commands in a telnet/API session.

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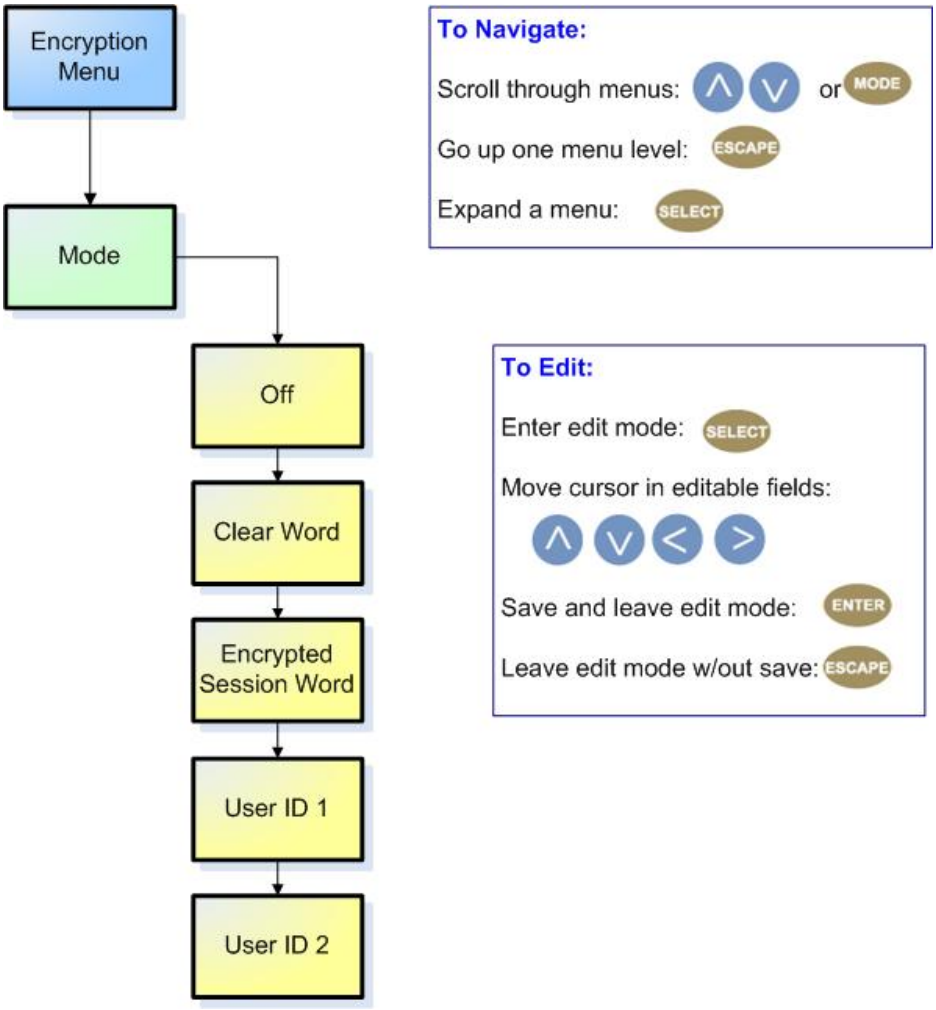
Encryption Menu

The following diagram represents the structure of the **Encryption** Menu of the Adtec edje5110:



Definitions

Control	Function	API Command
Mode	select between off, BISS-1, and BISS-E encryption	*.ECMD ECR
Clear Session Word	MODE BISS 1 uses a 12-digit hexadecimal Clear Session Word.	*.ECMD EKY
Encrypted Session Word	MODE BISS E XXX]uses a 16-digit hexadecimal Encrypted Session Word	*.ECMD EKY
User ID 1	used in BISS-E Mode only; the 14-digit hexadecimal User ID used for encryption	*.ECMD EKY
User ID 2	used in BISS-E Mode only; the 14-digit hexadecimal User ID used for encryption (secondary)	*.ECMD EKY

For more information about BISS and its use in Conditional Access, see the CAS Tab article.

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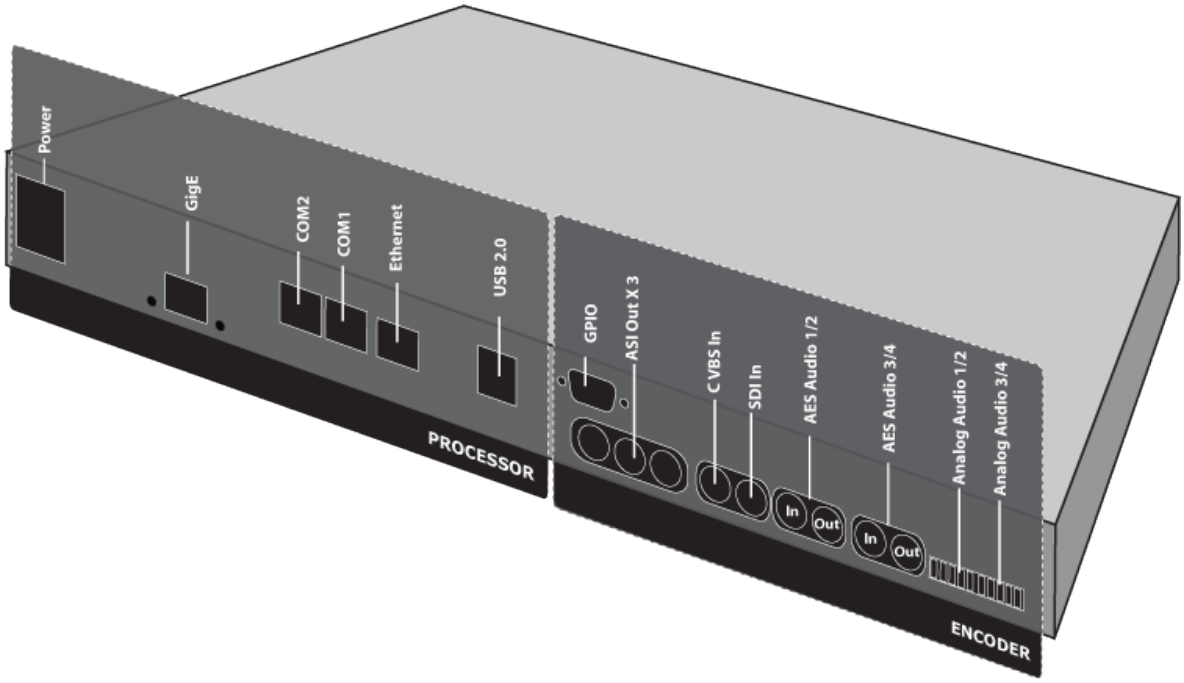
Back Panel

This graphic illustrates the ports and connections installed on the edje5110.



Port/Connection	Function
Power AC Line Input	Standard 3-pin computer power plug (Auto range 70-240 VAC Input)
GigE	IP Egress
COM2	RS232 Control
COM1	RS232 Terminal
Ethernet	10/100 Management
USB 2.0	Not currently supported
GPI IO Tally	Parallel IO Interface for Start, Stop, Status, Alarm, and general-purpose interfacing to control systems
ASI Outputs 1,2,3	Three mirrored 188 byte MPEG2 Transport Out, up to 211 Mbs
CVBS In (Analog Video Input)	75 Ohm terminated NTSC or PAL D1 Composite Video Input
SDI In	75 Ohm terminated input, SPMTE (SDI)259/(HD)292 Video and (SDI)272/(HD)299 Audio
AES3 Digital Audio 1 & 2	Compressed or uncompressed terminating (75 Ohm) digital audio inputs with compressed output.
Analog Audio 1/2	Analog balanced (800 Ohm) audio input. Stereo pairs (ch1 & ch2)
Analog Audio 3/4	Analog balanced (800 Ohm) audio input. Stereo pairs (ch1 & ch2)

Connecting Your edje5110

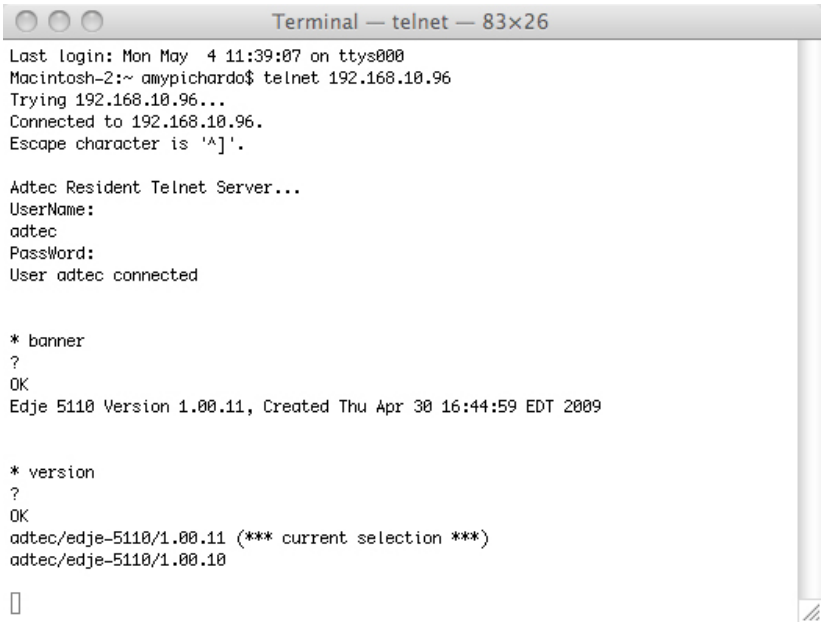
Using Telnet (standard 23 port)

To connect to your edje5110 using a terminal session you will need to set the IP address of the unit. See earlier instructions on setting the IP via the front panel.

Using a terminal window, complete the following:

Step	Action
1	Type 'telnet x.x.x.x' in a terminal window, without quotes, where x.x.x.x is the IP address of the unit.
2	Press **<Enter>**.
3	When prompted for a username, enter **adtec**.
4	When prompted for a password, enter **none**.

Once you see User adtec connected, the session is open and you may issue API commands to the unit.



For the edje 5110 there are specific commands for the encoder. Each has a unique way of accepting commands. If using telnet is your preferred method of communication to the edje5110, familiarize yourself with the API commands and their respective command handlers. For more information on this, point your browser to the IPA of your unit and look through the API notes that are described for the edje5110.

FTP Connections

FTP connections can be made to the adtec device using any ftp client.

Host: <ipa of the unit>

Default Username: adtec

Default Password: none

Port: 21

Chapter 3 - Using the on-Board Control Interface

Introduction - Control Application

Adtec Digital has deployed a web-based command and control (C&C) software application for our products. The program is optimized to work with the following browser versions:

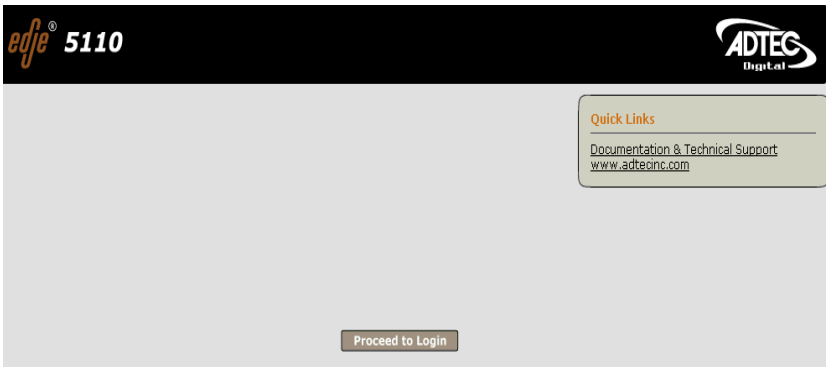
- Firefox: 3.0 (recommended)
- MS Internet Explorer: 7.0 and higher
- Safari: 3.0 and higher
- Opera: 9.0 and higher

Note for Safari users:

- The C&C program is designed to use the Bonjour Zero Configuration Protocol.
    - ♦ When using Safari, click on the " **^^** " symbol to open a networked devices list.
    - ♦ Select the device to point the browser to that device's IPA.

Access

Access the C&C application by pointing your web browser to the unit's IP address. The following screen (image reduced for clarity) will appear:



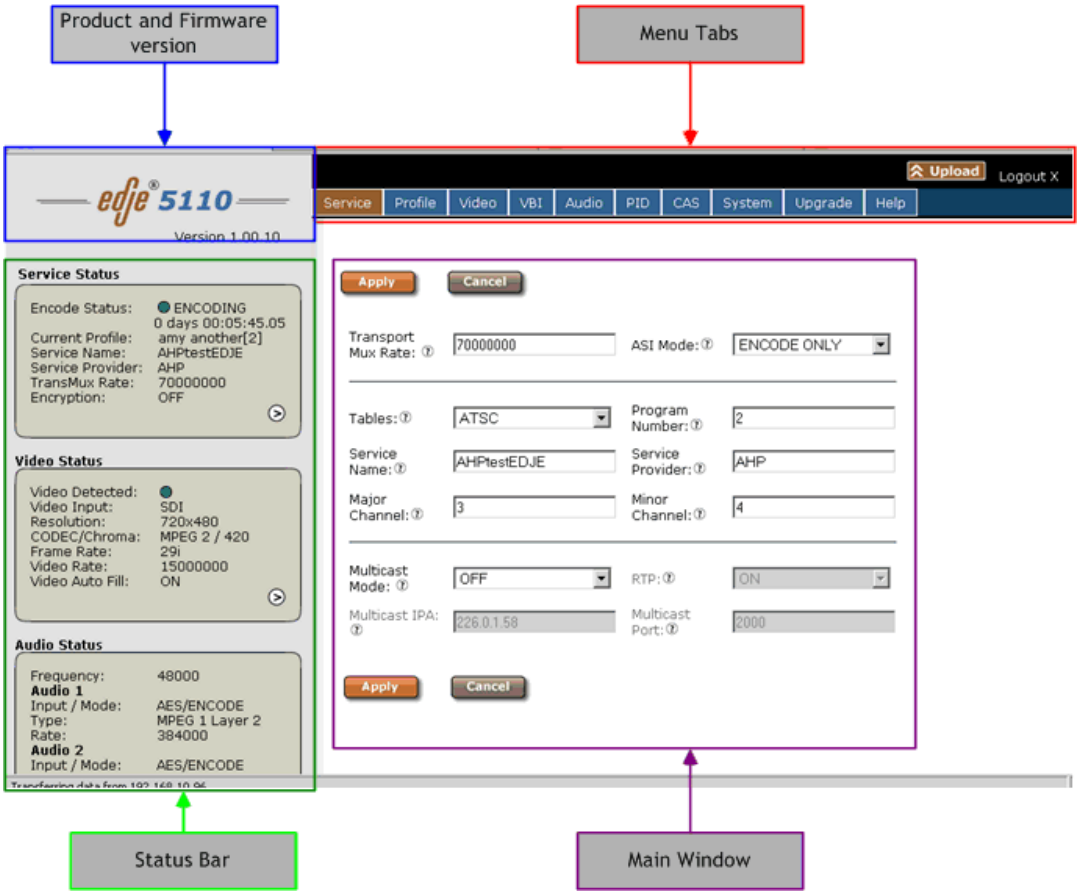
Links to the unit's Release Notes and a link to Adtec's Technical Support contact page are also located on this screen.

Login

Log in to the C&C application by clicking the **"Proceed to Login"** button and typing in the user name **'adtec'** and the password **'none'** in the pop-up box that appears.

C&C Screen

Once you are logged in, the C&C Screen will appear (screenshot reduced for clarity):



The C&C Screen has two operating windows, the **Status Bar** and the **Main Window**:

Status Bar: the Status Bar is fixed- it will display regardless of what function is being displayed in the Main Window. The current parameters of the unit's Service, Video, and Audio functions are always in view and are updated in real time. Further detail about the Status Bar is covered in a later section of this manual. The Status Bar also features "Jump Buttons" that serve as a second way to access associated Menu Tabs.

Main Window: the Main Window is used to access the device's controls and operating settings. The **Main Menu Tabs** determine which function is being controlled in the Main Window. Each Main Menu Tab is covered in more detail in further sections of this manual.

The screen also lists the product name and firmware version number that is running.

Status Bar

The Status Bar is a fixed component of the Command and Control interface- it constantly displays a summary of the edje5110's current activity level regardless of which tab is selected in the Main Window.

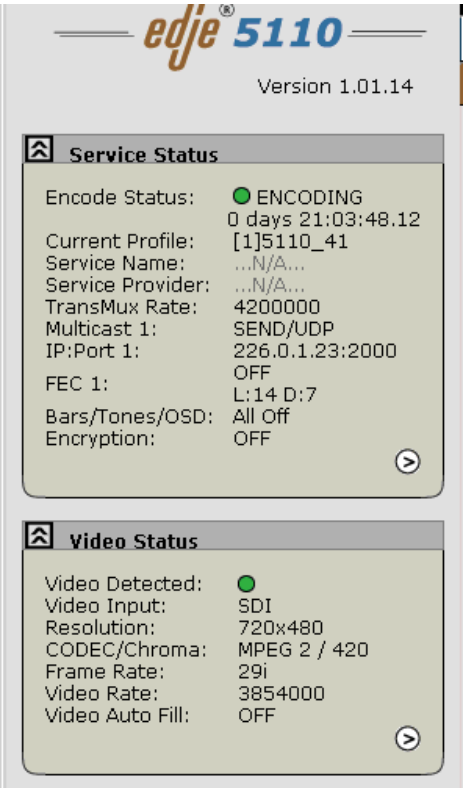
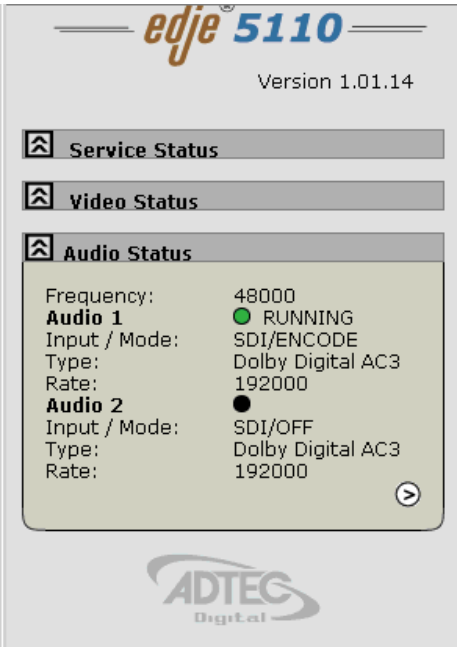


Image reduced for clarity

Notes:

- The **Encode Status** indicator includes a time clock showing the elapsed time the unit has been encoding.
- If a pre-defined Profile has been specified, then the Profile's name will be displayed ("Current Profile").
- Note that for the **Codec**/**Chroma** indicator, **MPEG2** is hard-coded in the display.
- The small buttons in the lower right corner of each Status Display are a quick-jump feature.
    - ♦ The button on the Status Panel jumps to the Service menu, and the buttons on the Video and Audio Panels jump to the Video and Audio menus.
- The double-arrow buttons in the upper left of each Status panel are collapse buttons, allowing you to select which Status panels you want to display at any given time. in the screenshot example below, the Service and Video panels are collapsed.



API Cross-Reference

The Status indicators displayed on the Status Bar correspond with API commands that can be used to access the same information during a Telnet session. A cross-reference is provided here.

System Status

Indicator	API Command
Encode Status	*.ECMD TRA
Decode Status	*.DCMD TRA
Service Name	*.ECMD SNA
Service Provider	*.ECMD SPR
TransMux Rate	*.ECMD TMR
Multicast	*.ECMD MMO
IP:Port:	*.ECMD MSP
FEC	*.ECMD FEP
Encryption	*.ECMD ECR

Video Status

Indicator	API Command
Video Detected	*.ECMD VDE
Video Input	*.ECMD INP
Resolution	*.ECMD QV1
Codec/Chroma	*.ECMD CHT
Frame Rate	*.ECMD QV1
Video Rate	*.ECMD VRT

Audio Status

Indicator	API Command
Frequency	*.ECMD ASF

Audio 1 Input/Mode	*.ECMD AMO
Audio 1 Type	*.ECMD AMO
Audio 1 Rate	*.ECMD AMO
Audio 2 Input/Mode	*.ECMD AMO 1
Audio 2 Type	*.ECMD AMO 1
Audio 2 Rate	*.ECMD AMO 1

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Service Tab

The **Service Tab** is used to set and view configuration options related to transmitting and capture rules. The Service tab is divided into 3 sub-tabs:

- ASI Transport
- IP Transport
- Bars, Tones, and ID

ASI Transport

Screenshot

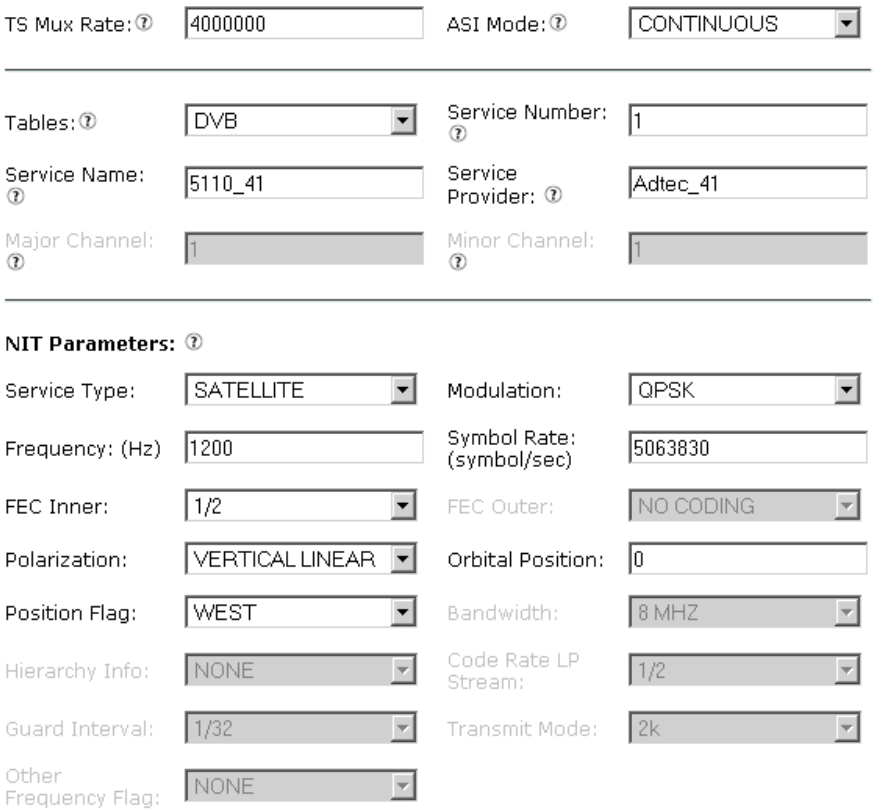


Image reduced for clarity

Controls

Control	Function	Options	API Command
TS Mux Rate	desired egress rate of the bitstream in bits per second max = 1,000,000,000 bps max video bit rate = 80,000,000 bps As a shortcut, the value can be entered as Mbps and the application will convert it on the fly. Example: Entering 19.4 in the text field will submit 19400000.	text field	*.ECMD TMR
ASI Mode	tell unit to send data constantly through ASI ports or cut off during periods when unit is idling	Continuous = 0 Encode Only = 1	*.ECMD ASM [option]
Tables	table format for the stream	DVB = [0] MPEG =[1] ATSC = [2]	*.ECMD TON [var]
			*.ECMD PNU

Program Number	The Service Number (or Program Number) in PAT & PMT packets identifies which program is associated with which Video & Audio PIDs.This value should be entered in decimal format	text field; 20-character limit (incl. spaces)	
Short Name	also known as Service Name; name of the program or event, carried in the SDT table of a transport stream	text field; 20-character limit (incl. spaces)	*.ECMD SNA
Long Name	also known as Service Provider; name of the party offering the program or event, carried in the SDT table of a transport stream	text field; 20-character limit (incl. spaces)	*.ECMD SPR
Major Channel	Major Channel Number is carried in the ATSC Static PSIP table of a transport stream. Field is active when Tables control is set to ATSC.	text field; 0-999	*.ECMD MAJ
Minor Channel	Minor Channel Number is carried in the ATSC Static PSIP table of a transport stream. Field is active when Tables control is set to ATSC.	text field; 0-999	*. ECMD MIN

NIT Parameters- specify options for the Network Information Table.

Control	Function	Options	API Command
Service Type	type of network carrier	Cable Satelllite Terrestrial	*.ECMD NPR
Modulation	type of modulation being applied Service Type is **cable**: 16, 32, 64, 128, 256 Service Type is **satellite**: QPSK Service Type is **terrestrial**: QPSK, 16QAM, 64QAM	see at left	*.ECMD NPR
Frequency	frequency of the signal measured in Hertz (Hz.)	text field	*.ECMD NPR
Symbol Rate	gross bit rate of the signal measured in Symbols per Second (symbols/sec.)	text field	*.ECMD NPR
FEC Inner	Forward Error Correction; extra data added to the inner 'edge' of the packet that can be used to detect errors on the receiving end	1/2 3/4 5/6 7/8 8/9 No Coding	*.ECMD NPR
FEC Outer	Forward Error Correction; extra data added to the outer 'edge' of the packet that can be used to detect errors on the receiving end	1/2 3/4 5/6 7/8 8/9 No Coding	*.ECMD NPR
Polarization	orientation of the transmitter that will send the encoded packet	Horizontal Linear Vertical Linear Left Circular Right Circular	*.ECMD NPR
Orbital Position	orbital position of a receiving satellite	text field	*.ECMD NPR
Position Flag	designates if the receiving satellite is in the eastern or western phase of its orbit	East West	*.ECMD NPR
Bandwidth	measure of the volume of information contained in the packet in megaHertz	8 MHZ 7 MHZ 6 MHZ	*.ECMD NPR
Hierarchy Info	specifies if the transmission is hierarchical	None 1 2 3 4	*.ECMD NPR
Code Rate LP Stream	Low Priority Code Rate	1/2 3/4 5/6 7/8	*.ECMD NPR
Guard Interval	time intervals used to maintain the "distinctness" of transmissions such as packets in a bitstream. Expressed as fractions of a symbol period. 1/32 = lowest protection/highest data rate; 1/4 = highest protection/lowest data rate.	1/32 1/16 1/8 1/4	*.ECMD NPR
Transmit Mode	specifies number of carriers in an OFDM frame	2k 8k	*.ECMD NPR

Other Frequency Flag	indicates whether other frequencies are in use	None 1 or more	*.ECMD NPR

IP Transport

Screenshot

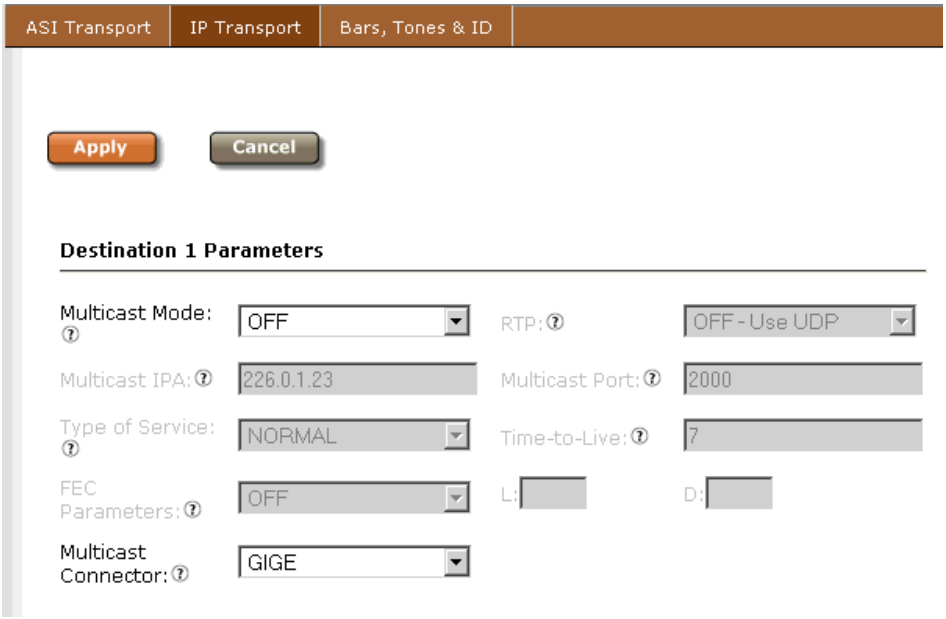


Image reduced for clarity

The IP Transport sub-tab has four (4) menus (labelled Destination 1 through 4) to allow for the configuration of the four possible multicast or unicast streams. All four menus feature the same controls.

Controls

Control	Function	Options	API Command
Multicast Mode	enables sending of streaming MPEG over properly-configured ports Multicast can be turned OFF or set to SEND mode. SEND Mode transmits the current encode via the GigE port. Multicast group IP and Port addresses must be specified.	Off = 0 Send = 2 note*: Multicast Output via GigE (eth1)	*.ECMD MMO [option]
RTP	Turns RTP on or off RTP allows for sequence numbering and timing, which are crucial for the accurate playback of an audio or video data stream. Control is editable if Multicast Mode is set to 'Send'.	Off = [0] On = [1]	*.ECMD RTP
Multicast IPA	set the multicast send group Internet Protocol Address Control is editable if Multicast Mode is set to 'Send'.	text field (hexadecimal)	*.ECMD MSI
Multicast Port	Port number are used for sending UDP transfers in conjuction with Multicast IPA. If the port number is set to 0, then no UDP transfers will take place. 0 is default. Control is editable if Multicast Mode is set to 'Send'.	1 - 65535	*.ECMD MSP
Type of Service	used to select the type of multicast that will forward the packet	Normal Minimize Cost Maximize Reliability Maximize Throughput Minimize Delay	*.ECMD TOS
Time-to-Live	specify the number of iterations or transmissions the packet can undergo before it is discarded	text field	*.ECMD TTL

FEC Parameters	Forward Error Correction; send two FEC RTP streams in addition to a source RTP stream enabling a receiver to reconstruct missing packets in the source stream. Used in conjunction with L and D values; described below.	Off On (when RTP is also selected 'on')	*.ECMD FEP
FEC L Value	affects the maximum burstpacket loss that can be recovered	text field; 4-20	*.ECMD FEP
FEC D Value	defines latency involved in burstrecovery	text field; 4-20	*.ECMD FEP
Multicast Connector	specifies transport connection for multicast stream	Ethernet !GigE	*.DCMD MCN

Bars, Tones, and ID

Screenshot

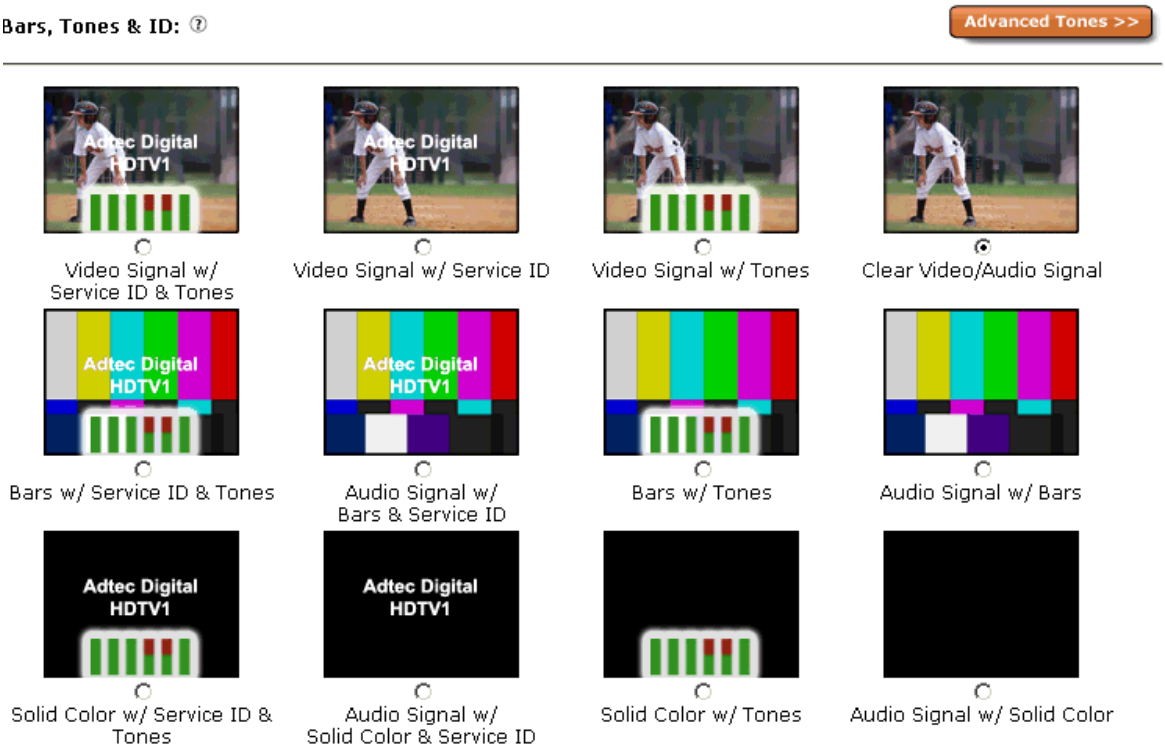


Image reduced for clarity

Controls

Radio buttons select the type of display desired (see illustrations). **Note:** A valid video input must be present in order to use Bars, Tones, and ID. At a glance, the "Video Detected" indicator on the Status Panel will alert you to the presence of a valid video input.

Advanced Bars and Tones

Clicking the **"Advanced Tones"** button will bring up the following screen, used to fine-tune tones by frequency, and to mute the left or right stereo signal.

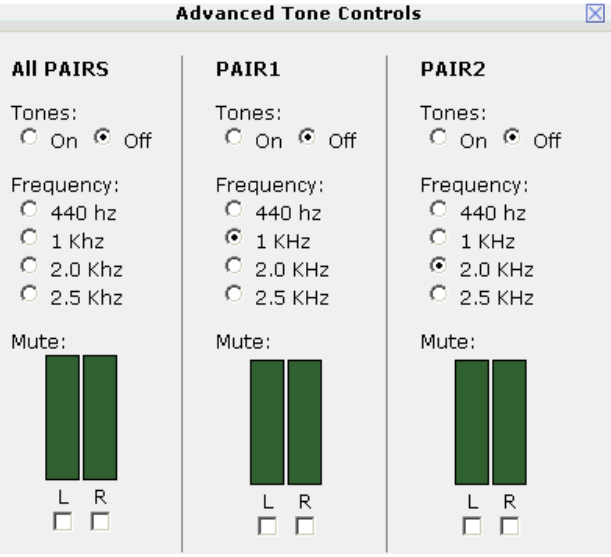


Image reduced for clarity

Profile Tab

The **Profile Tab** allows you to save specific encoder configurations on your edje5110, enabling you to quickly and easily reconfigure the device for different transport and playout requirements. The edje5110 has 40 available memory "slots" for Profiles- saved configurations. An in-use profile will be noted by name on the Status Panel and repeated on this screen (**'Current Encoding Profile'**).

To create a Profile:

Step	Action
1	On **all** Menu Tabs, make the control settings desired for your saved Profile.
2	Click the **<Profile>** Menu Tab.
3	On the Profile Tab, click **<Create New Profile>**.
4	On the pop-up panel that appears, give your Profile a name in the text field, and select the memory slot you want to save it in from the drop-down menu.
5	Click **<Apply>.**

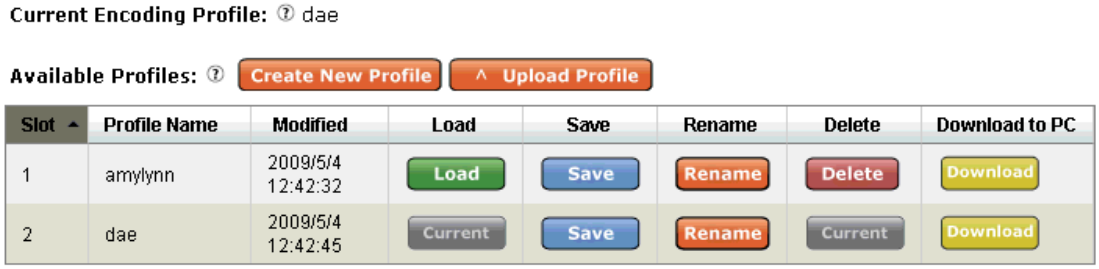
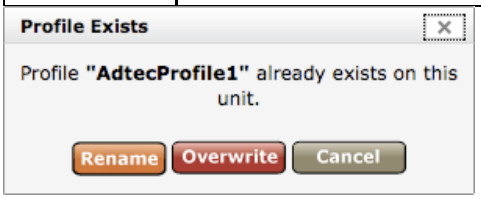


Image reduced for clarity

Controls:

Control	Function	Options
Create New Profile	defines and saves new Profiles into the selected available memory slot	Virtual button
Upload Profile	moves a valid file from your desktop to the unit; when upload is complete, the uploaded file and all of its configuration settings become the active profile. If you attempt to upload a profile that has the same name, you will be prompted to rename or overwrite the profile. (See "Profile Exisits" image below this table.)	Virtual button
Load	loads the selected Profile	Virtual button
Save	saves changes to existing Profiles	Virtual button
Rename	convenience button allowing the renaming of a Profile without changing the Profile's settings	Virtual button
Delete	convenience button; deletes the selected Profile and makes the slot available for re-use	Virtual button
Dowload to PC	moves the selected profile to your PC desktop	Virtual button



To use a saved Profile, simply click the **<Load>** button for the specific Profile you want. The edje5110 will apply all the settings associated with that Profile.

Video Tab

The Video Tab is used to precisely control the parameters of the video being decoded by the edje5110.

Screenshot :

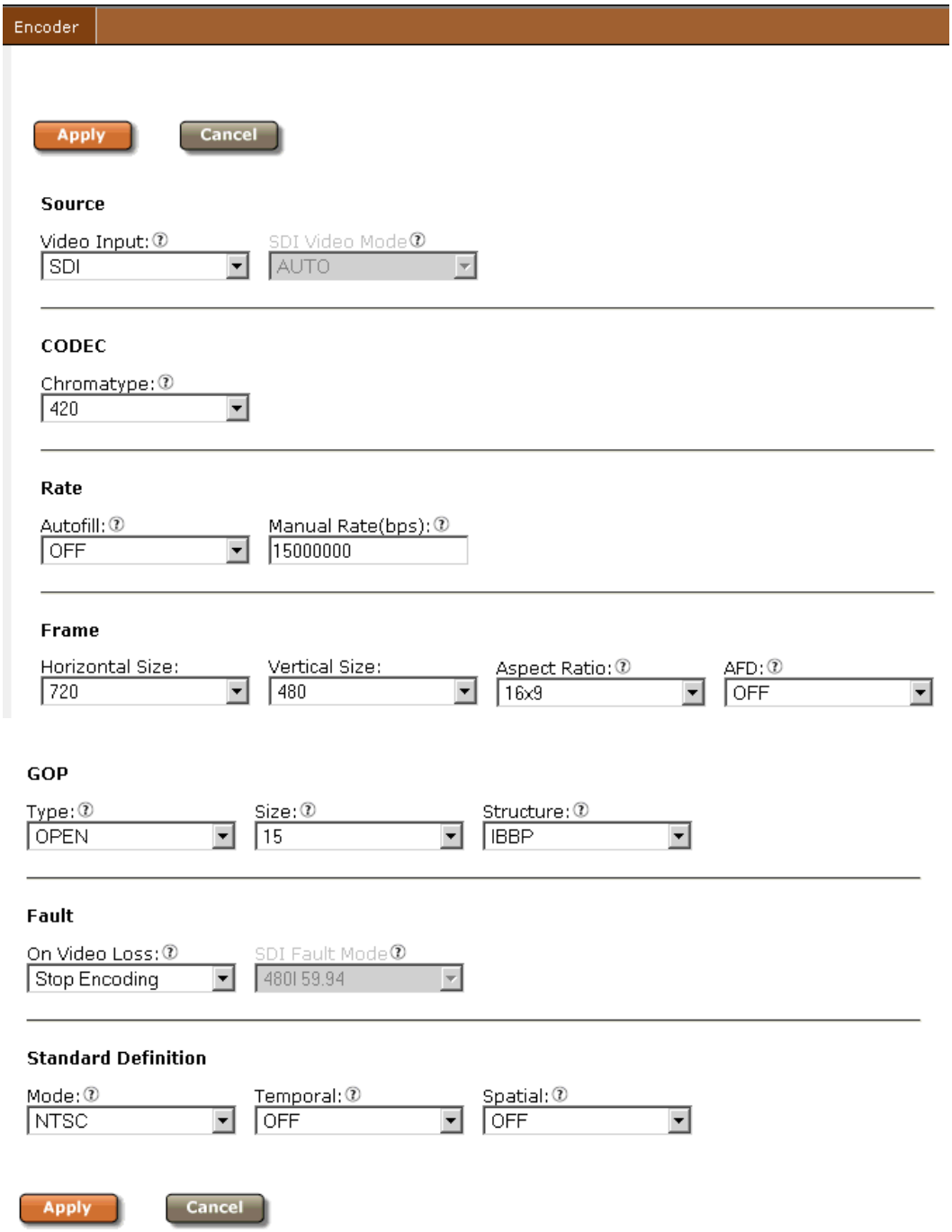


Image reduced for clarity

Controls:

Control	Function	Options	API Command
Video Input	type of video signal format being received, SDI or Composite. If the input is SDI, the encoder will automatically detect the resolution and frame rate of the incoming video source.	SDI = 3 Composite = 0	*.ECMD INP [type]

SDI Video Mode	allows automatic or fixed rate detection of SDI video signal	Auto = 0 SD = 1 HD1.4G = 2	*.ECMD SVM
Codec-Chromatype	chrominance (color information) of video component	420 = 0 422 = 1	*.ECMD CHT
Rate- Auto Fill	if enabled, the decoder will calculate and use the max video bitrate for the current TransMuxRate setting when disabled, the decoder uses the VRT setting for the video bitrate. Please see F.A.Q. for more detail.	On = 1 Off = 0	*.ECMD VAF [state]
Manual Bit Rate (Mbs/sec)	rate at which bits are streamed ; only available if AutoFill is set to 'Off'. Limitations: In **standard definition** encoding mode. (input is composite video, or SDI auto-detected at standard definition)	1000000 - 15000000 bits/sec. per desired setting	*.ECMD VRT
Video Size- Horizontal	horizontal pixel resolution. Auto-detected for SDI signals.	varies by encode mode	*.ECMD HSI
Video Size- Vertical	vertical pixel resolution. Auto-detected for SDI signals.	varies by encode mode	*. ECMD VSI
Aspect Ratio	ratio of horizontal to vertical lines in the encoded image	4 x 3 = 0 16 x 9 = 1 WSS (PAL) = 2	*.ECMD ARA
AFD	Active Format Descriptor is data that can be sent in a MPEG video stream that provides information about the aspect ratio and picture characteristics within the stream. AFD compatible display or STB/IRD is required. AFD is related to Aspect Ratio. Aspect Ratio defines pixel aspect ratio as encoded. AFD is used by downstream decoding devices to properly display pixel aspect ratio on displays with differing aspect ratios.	see pull-down list on UI	*.ECMD AFD
GOP Type	Group of Pictures; GOP type as open or closed An **Open** GOP uses referenced pictures from the previous GOP at the current GOP boundary. A **Closed** GOP starts with an I Frame and subsequent B Frames do not rely on I or P frames from the previous GOP. GOP is expressed as one command, i.e., *.ECMD GOP [type] [structure] [size]	Open = 1 Closed = 0	*.ECMD GOP [type] [structure] [size]
GOP Size	GOP Size is the distance between two full image frames (I-Frames) in a GOP Structure.	1-30	*.ECMD GOP [type] [structure] [size]
GOP Structure	Group of Pictures format; the order of interframes and the various types of picture frames that will be used.	I = 3 IP = 2 IPB = 1 IBBP = 0	*.ECMD GOP [type] [structure] [size]
On Video Loss	direct unit to stop encoding on video loss, or have the encoder generate a combination of Bars, Tones and Service ID.	Stop Encoding Black Bars Bars and Tones Bars and Service ID Bars, Tones, and Service ID	*.ECMD RVD
SDI Fault Mode	sets SDI video test pattern standard in the absence of a valid signal	0 = 480I59.94 1 = 576I50 2 =720P59.94 3 = 720P50 4=1080I59.94 5 = 1080I50	*.ECMD SVF
SD Standard (mode)	select television system standards the packet will be encoded for- NTSC or PAL video. This is only available if the incoming	NTSC PAL	

	SDI feed is standard definition, or if the input is Composite.	PAL-M PAL-N	
Temporal Video Filter	reduces noise in the signal's temporal domain **Note:** composite input only; handled in the video pre-processing section; and only available in standard definition	Off = 0 Weak = 1 Medium = 2 Max = 3	*.ECMD OFT [state]
Spatial Video Filter	reduces noise in the signal's spatial domain **Note:** composite input only; handled in the video pre-processing section; and only available in standard definition	Off = 0 Weak = 1 Medium = 2 Max = 3	*.ECMD OFS [state]

Notes:

- **Using RVD:** when using RVD, best results will be obtained by using RVD with **Composite** input.
  - ♦ SDI Input results with RVD vary.
- If **Video Autofill** is on, bitrate will be automatically calculated, and is not editable by the user in that case.
- The video rate designated on this panel is **inclusive** of the video payload and 1% (roughly) overhead buffer.
  - ♦ Note that when encoding to file, the file registration system will only report back the video payload rate.
    - ◊ **Example:** if the video rate is set to 15, the video rate detected for the file will be less than 15. (Ex. 14.60)
- **I-Frame Only Encoding:** at any given bitrate (fixed), video quality will be greatly degraded with I-frame only encoding. The table below gives a relative idea of the video quality that can be expected with different GOP types.

GOP Type	Relative Video Quality
IBBP	Highest
IBP	Medium
IP	Low
I	Poor

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VBI Tab

The controls on this tab govern video signal components that can be inserted into the Vertical Blanking Interval.

The tab's controls are grouped into two sub-tabs: **Captions** and **Teletext**.

Captions

Screenshot:

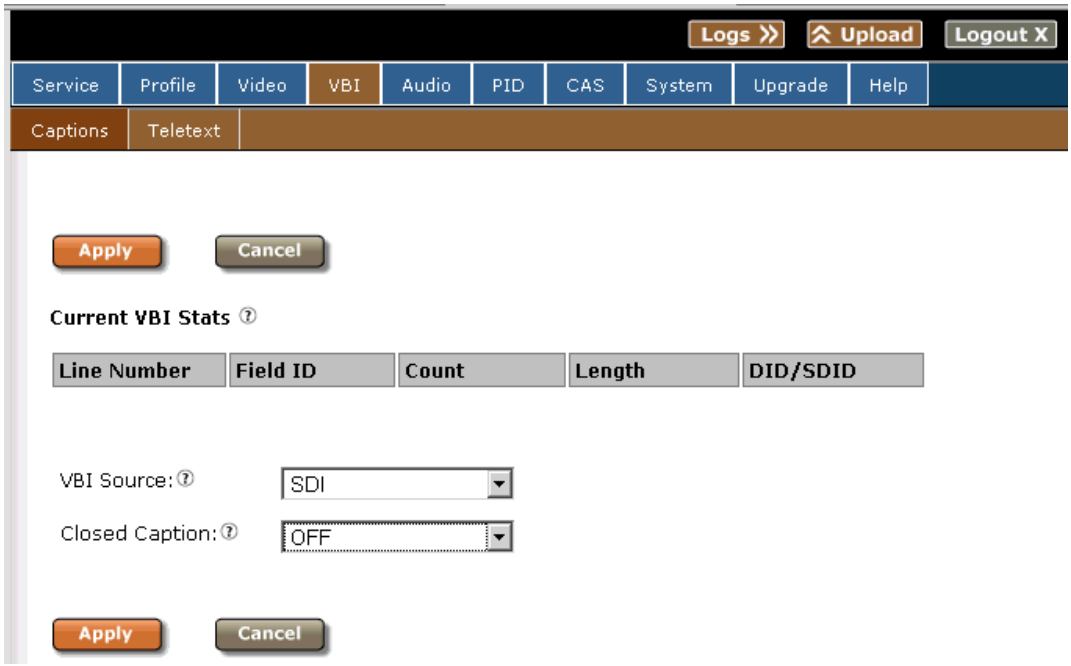

Image reduced for clarity

Current VBI Stats

This is read-only data that will display VBI waveform or VANC information history.

Key

- **Line Number:** Video line number where the data was found.
- **Field ID:** Video field ID where the data was found (0= 1st field (odd), 1= 2nd field (even)).
- **Count:** Counter which increments everytime a matching type is found.
- **Length:** Length of data payload in bytes.
- **DID/SDID:** Combined (packed) DID/SDID values as defined below.
- **DID:** The (DID) Data Identifier word (along with the SDID, if used), indicates the type of ancillary data that the packet corresponds to.
    - ♦ Data identifiers range from 1 to 255 (FF hex), with 0 being reserved.
- **SDID:** The SDID (Secondary Data Identifier) is only valid if the DID is less the 80 hex.
    - ♦ The SDID is nominally an 8-bit value, ranging from 0 to 255. It is encoded in the same fashion as the DID.

Controls

Control	Function	Options	API Command
VBI Source	selects input source for VBI data	Composite SDI	*.ECMD VBS
Closed Caption	Closed Captions can be turned off for the current stream/encode or set to ATSC Mode for EIA-708 closed caption insertion. This control is available for High Definition only.	608 708 608->708	*.ECMD CLC [selection]

The edje5110 Encoder features autoscan capability on SDI Inputs for VANC 708 VBI data, from line 8 to line 25.

Teletext

Screenshot:

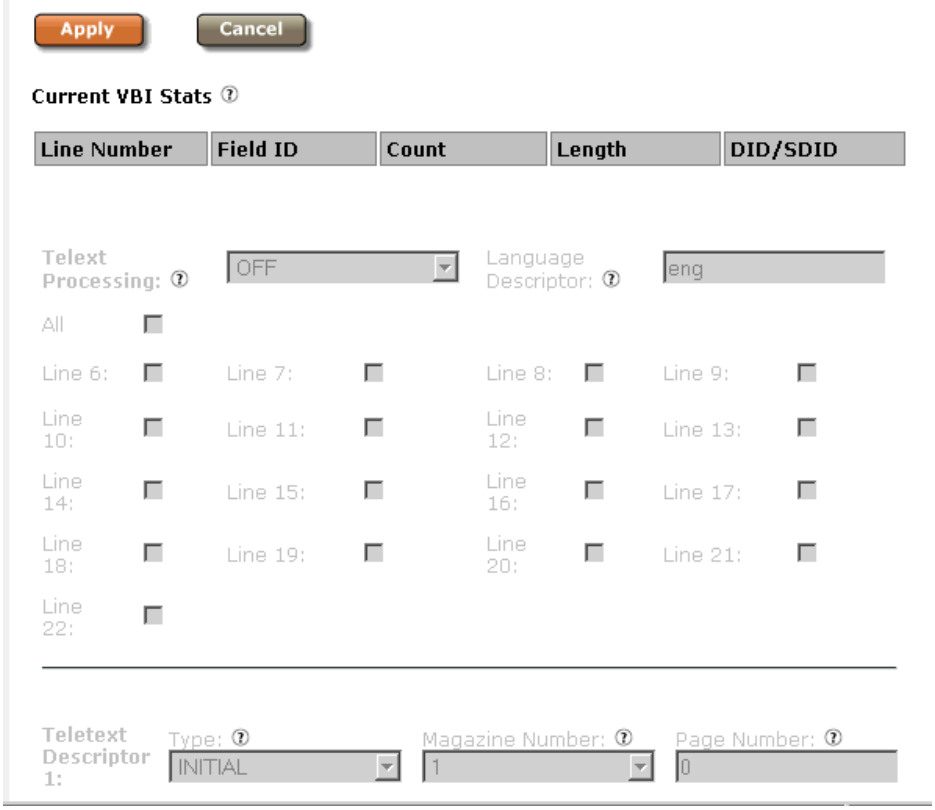

Image reduced for clarity

Controls

Control	Function	Options	API Command
VBI Mode	switches feature off or selects type of service	Off = 0 Eurotext = 1	*.ECMD VBP [mode]
Teletext Processing			
Language Descriptor	identifies language Teletext will display in. Auto-populates from PID	Auto-populates	none
VBI Start Line	designates first line for Teletext content within the Vertical Blanking Interval	6 - 22	*.ECMD VBP
VBNI Num Lines	total number of lines of Teletext	1 - 16	*.ECMD VBP
Teletext	Teletext PID refers to the PID used for defining teletext data and descriptors. It is enabled when standard definition PAL encoding.	user-defined hexadecimal	*.ECMD TXD
Teletext Descriptor-Type	classification of the Teletext; implemented per ETSI EN 300 468 , the Specification for Service Information (SI) in DVB systems and includes the following. Initial, Subtitle, Additional Information, Program Information and Subtitle Highlights control repeats for Teletext 2	Initial Subtitle Addlinfo PGM Sched SubtitleHI	*.ECMD TXD
Magazine Number	Teletext reference	0-7	*.ECMD TXD

	control repeats for Teletext 2		
Page Number	Teletext reference control repeats for Teletext 2	0-225	*.ECMD TXD

There are two sets of Teletext Descriptor controls. The function of each is identical. The descriptor for Teletext 2 can be switched off if desired.

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Audio Tab

The Audio Tab allows precision control over the Audio performance of the edje5110. For ease of reference, the Audio Tab's controls are divided among several sub-tabs. Each will be described in detail.

Audio Global Tab

The Audio Global tab features two settings which apply across the selected audio groups.

Screenshot:

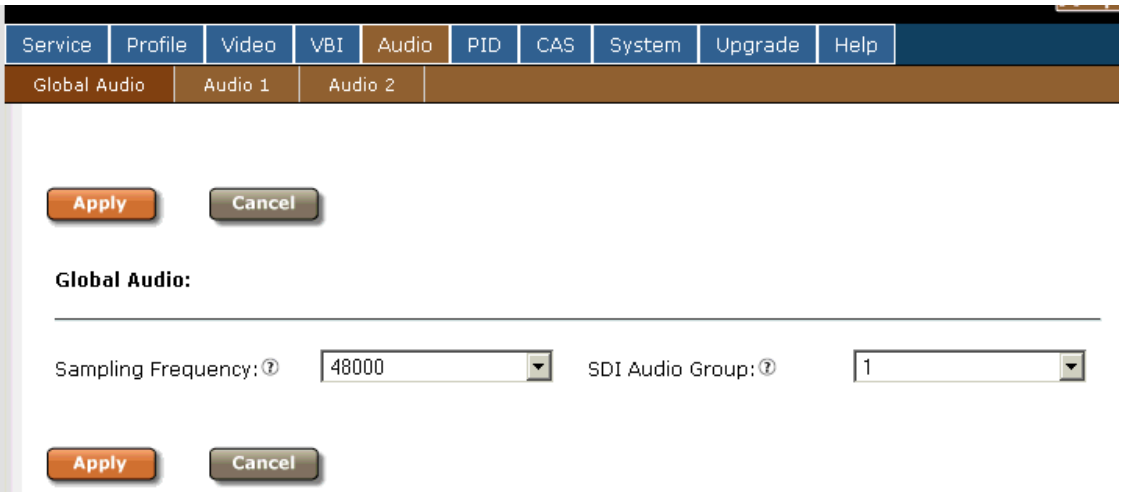


Image reduced for clarity.

Controls

Control	Function	Options	API Command
Sampling Frequency	determines sample frequency for the unit; all audio channels will sample on the same frequency; defines the number of samples per second taken from a continuous signal to make a discrete signal; setting selected applies to all audio inputs	32000 44100 48000	*.ECMD ASF [freq]
SDI Audio Group	sets the SDI audio group number (1-4) per SMPTE -272/299M; setting selected applies to all audio inputs. See the reference table below for group and channel assignments.	Group 1 and 2 Group 3 and 4	*.ECMD AGN [group #]

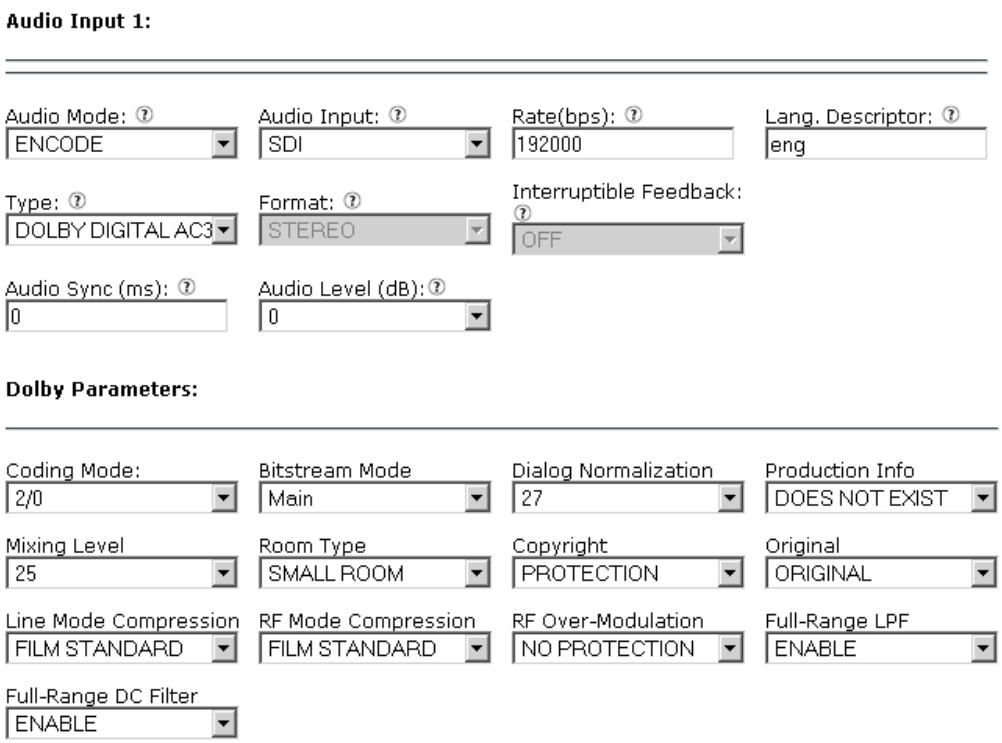
SDI Group	Channels
1	1,2,3,4
2	5,6,7,8
3	9,10,11,12
4	13,14,15,16

Audio Inputs 1 and 2

The edje5110 can interface with only **one** group at a time from within the Control Interface. Within the selected group it hard routes channel 1 to input 1 and channel 2 to input 2. Each of these inputs can encode Dolby AC3, MPEL 1 layer 2, and can passthrough Dolby 5.1 and Dolby E.

Audio Inputs 1 and 2 can encode Dolby Audio and can encode in passthru mode. The control options are the same for both inputs (Audio 2 illustrated).

Screenshot:



Reduced for Clarity Audio 1 shown; Audio 2 identical

Controls:

Control	Function	Options	API Command
Audio Mode	sets the unit to either use the on-board DSP's to perform audio compression (encode), or accept compressed Dolby-type bitstreams at the AES input and merge them into the transport stream (passthru),or the secondary audio can be set to off (*.ecmd SAS)	Encode = 0 Passthrough = 1	*.ECMD AMO [mode][type][rate]
Audio Input	selects the type of incoming audio signal to be encoded. Available on in Encode Mode. In Passthru Mode, AES or SDI input can be selected.	Analog = 0 SDI = 1 AES = 3	*ECMD AIN [type]
Rate	define the rate in Encode Mode. When in Passthru Mode, the rate is handled by the unit.	text field; user-defined 64-640 kBits/sec avail	*.ECMD AMO [mode][type][rate]
Language Descriptor	3 characters available for describing language	text field; user-defined	*.ECMD LAO
Type	selects Dolby Digital or MPEG 1 Layer 2 as the audio type in Encode Mode. In Passthrough Mode, unit defaults to Dolby E / 5.1 / 2.0 Type. Linear PCM/E2 is only available with AES inputs, if selected, all associated specifications will auto-apply.	-Dolby Digital AC3 = 0 -MPEG 1 Layer 2 =2 Linear PCM/E2 = 3 Dolby E/5.1/2.0	*.ECMD AMO [mode][type][rate]
Format	MPEG mode; can be set for either Mono or Stereo. Available if using Encode Mode and MPEG 1 Layer 2 Type\.	0 = Mono 1= Stereo 2 = Dual Mono (MPEG 1 Layer 2 only)	*.ECMD MCM
Interruptible Feedback	low-latency audio path used for communications to a remote van or studio usimng the same distribution path. Not lip-synch	0 = Off 1 = On	*. ECMD AIF

	aligned with video, no PID in PMT for this function. A special IFB receiver is required to utilize this feature.		
Audio Sync (ms)	audio sync offset in milliseconds (ms) with an available range of -800 ms to +800 ms	text field; user-defined	*.ECMD AUS
Audio Level	volume in decibels (dB); range of -18dB to +8dB in 1dB increments . Available only in Encode Mode	range of -18 through +8	*.ECMD ALV

Dolby Parameters

Control	Function	Options	API Command
Coding Mode	indicates which of the main service channels are in use and controls channel ordering; analog to the 3-bit 'acmod' code.	0 = N/A 1 = 1/0 (C channel) 2 = 2/0 (L and R channels)	*.ECMD DPA [mode]
Bitstream Mode	type of service the bitstream conveys; analog to the 3-bit 'bsmod' code.	0= Main 1 = Main-Dialogue 2 = Assoc-Visually Impaired 3 = Assoc-Hearing Impaired 4 = Assoc-Dialog 5 = Assoc-Commentary 6 = Assoc-Emergency Flash 7 = Assoc-VoiceOver 8 = Main-Karaoke (where "Assoc" is "Associated Service")	*.ECMD DPA [mode]
Dialog Normalization	"levels out" volume (loudness) levels when audio from different sources is combined and reproduced, by using a subjective standard for loudness. Analog to the five-bit 'dialnorm' code. Value available indicates subjective volume in decibels below digital 100% the reproduced audio will exibit.	0-31	*.ECMD DPA [value]
Production Info	identifies if production information exists for the audio content, or does not	0 = does not exist 1 = exists	*.ECMD DPA [value]
Mixing Level	indicates absolute acoustic sound pressure level of an individual channel during the final audio mixing session; analog to the 'mixlevel' 5-bit code.	0-31	*.ECMD DPA [value]
Room Type	indicates the type and calibration of the mixing room used in the final audio mixing session; analog to the 2-bit 'roomtyp' code.	0 = not indicated 1 = large room 2 = small room 3 = rsvd	*.ECMD DPA [option]
Copyright	identifies the audio content as protected by copyright or not protected	0 = not copyright protected 1 = copyright protected	*.ECMD DPA [option]
Original	identifies the audio bitstream as original or a copy	0 = copy of an original bitstream 1 = original bitstream	*.ECMD DPA [option]
Line Mode Compression	designates preset compression for for line-mode decoding	0 = None (custom) 1 = Film Std 2 = Film Light 3 = Music Std 4 = Music Light 5 = Speech 6 = Rsvd 7 = Rsvd	*.ECMD DPA [value]

RF Mode Compression	designates preset compression for for RF-mode decoding	0 = None (custom) 1 = Film Std 2 = Film Light 3 = Music Std 4 = Music Light 5 = Speech 6 = Rsvd 7 = Rsvd	*.ECMD DPA [value]
RF Over-Modulation	on/off switch; feature protects against over-modulation when signal is decoded and then modulated onto an RF carrier	0 = disable protection 1 = enable protection	*.ECMD DPA [option
Full-Range LPF	on/off switch; when selected, this control invokes a 120 Hz. lowpass filter to the LPF channel before beginning Dolby encoding	0 = disable 1 = enable	*.ECMD DPA [option]
Full-Range DC Filter	on/off switch; when selected, this control invokes a DC-blocking 3Hz highpass filter before beginning Dolby encoding	0 = disable 1 = enable	*.ECMD DPA [option]

Dolby 5.1
The edje5110 cannot encode in Dolby 5.1; it can only encode Dolby 2.0 per audio channel pair.
To encode in Dolby 5.1, an external 5.1 encoder must be plugged into the AES input and that input's mode set to passthrough.

Passing SDI Audio

Some users may experience difficulty passing embedded SDI audio. edje5110 devices using a PC 7412 board will not be able to pass embedded SDI audio due to processor design.

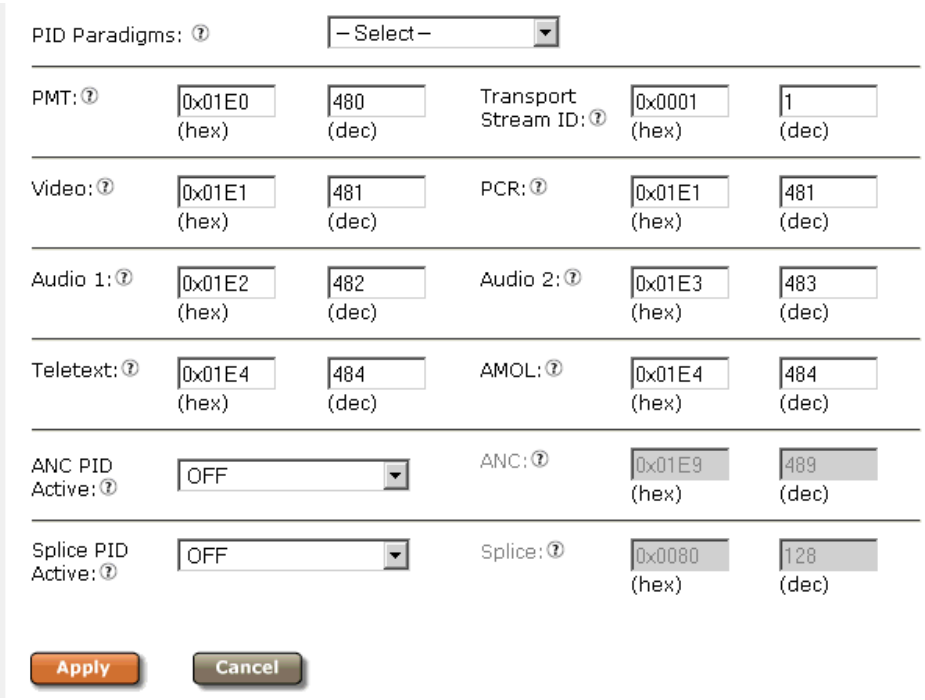
To learn if your device is using this board, click on the **<System>** tab in the User Interface. On the right-hand side of the screen, under the uptime counter, is a listing for the board type the device uses. If this reads **"PC74 ver 1.2"**, then the device will not be able to pass embedded SDI audio.

If you wish to upgrade your device to a model with a later processor, please contact your Adtec Sales Representative.

PID Tab

The PID tab is used to specify PID settings for programming.

Screenshot (reduced for clarity) **:**



Controls

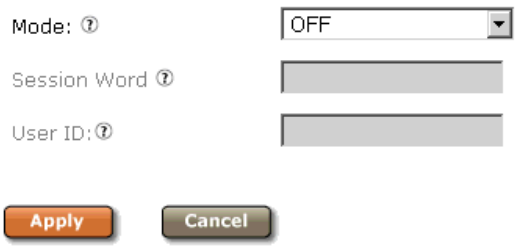
Control	Function	Options	API Command
PID Paradigm	this control allows for preset PID values to be automatically loaded. Once a selection is made from the drop-down menu, all values will populate based on the PID configuration chosen.	Adtec Tandberg ATSC PGM 3 ATSC PGM 4 ATSC PGM 5 ATSC PGM 6 ATSC PGM 7 ATSC PGM 8 ATSC PGM 9 WBU-ISOG	none-GUI only
PMT	identifies packets with the Program Map Table. Program Map Tables are used to describe the properties of a single program.	user-defined hexadecimal	*.ECMD PPI
Transport Stream ID	Transport Stream identifier; used in the PAT packet to identify one stream from others within the multiplex.	user-defined hexadecimal	*.ECMD TSI
Video	identifies packets which contain video Packetized Elementary Stream (PES) data.	user-defined hexadecimal	*.ECMD VPI
PCR	identifies packets which contain the Program Clock Reference (PCR; "Master Clock") adaptation field.	user-defined hexadecimal	*.ECMD PRP
Audio 1	identifies packets which contain audio content for Channels 1 and 2.	user-defined hexadecimal	*.ECMD API
Audio 2	identifies packets which contain audio content for Channels 3 and 4.	user-defined hexadecimal	*.ECMD API
Teletext	identifies packets carrying Teletext to be displayed in the Vertical Blanking Interval.	user-defined hexadecimal	*.ECMD TPI

AMOL	Automated Measurement of Lineups; used in capturing viewership data.	user-defined hexadecimal	*.ECMD APQ
ANC Active	set to ON to capture ANC (H & V) from incoming HD-SDI sources. ANC Data captured from HD-SDI source is carried per SMPTE-2038. Typically this is used to carry VITC. If VITC and LTC are carried concurrently, LTC is dropped.	Off = 0 On = 1	*.ECMD BMO
ANC PID	sets the Program ID (PID) for the ANC (H & V).	user-defined hexadecimal	*.ECMD BPI
Splice PIDs Active	if selected, this control allows for the definition and/or modification of the Splice PID.	Off = 0 On = 1	*.ECMD RIT [selection]
Splice PIDs	identifies splice packets.	user-defined hexadecimal	*.ECMD SPI

CAS Tab

The **CAS Tab** is used to control Conditional Access Services on the edje5110.

Screenshot (reduced for clarity) **:**



Controls:

Control	Function	Options	API Command
Mode	sets the unit to accept BISS-1 or BISS-E encryption keys, or switches Conditional Access off	Off = 0 BISS-1 = 1 BISS E User ID 1 = 2 BISS E USer ID 2 = 3	*.ECMD ECR [option]
Session Word	The session keys used for encryption. [MODE BISS 1] uses a 12-digit hexadecimal Clear Session Word. [MODE BISS E XXX] uses a 16-digit hexadecimal Encrypted Session Word	text field	*.ECMD EKY
User ID	appears in BISS-E Mode only; the 14-digit hexadecimal User ID used for encryption	text field	*.ECMD EKY

About BISS

The Basic Interoperable Scrambling System (BISS) works by inserting a 12-digit encrypted key into a multicast. BISS documentation refers to these encryption keys as "session words".

The Session Word is inserted at the points of transmission and reception

A Conditional Access Table (CAT) will be present in the multiplex, but this table will be empty, as no EMM stream will be present.

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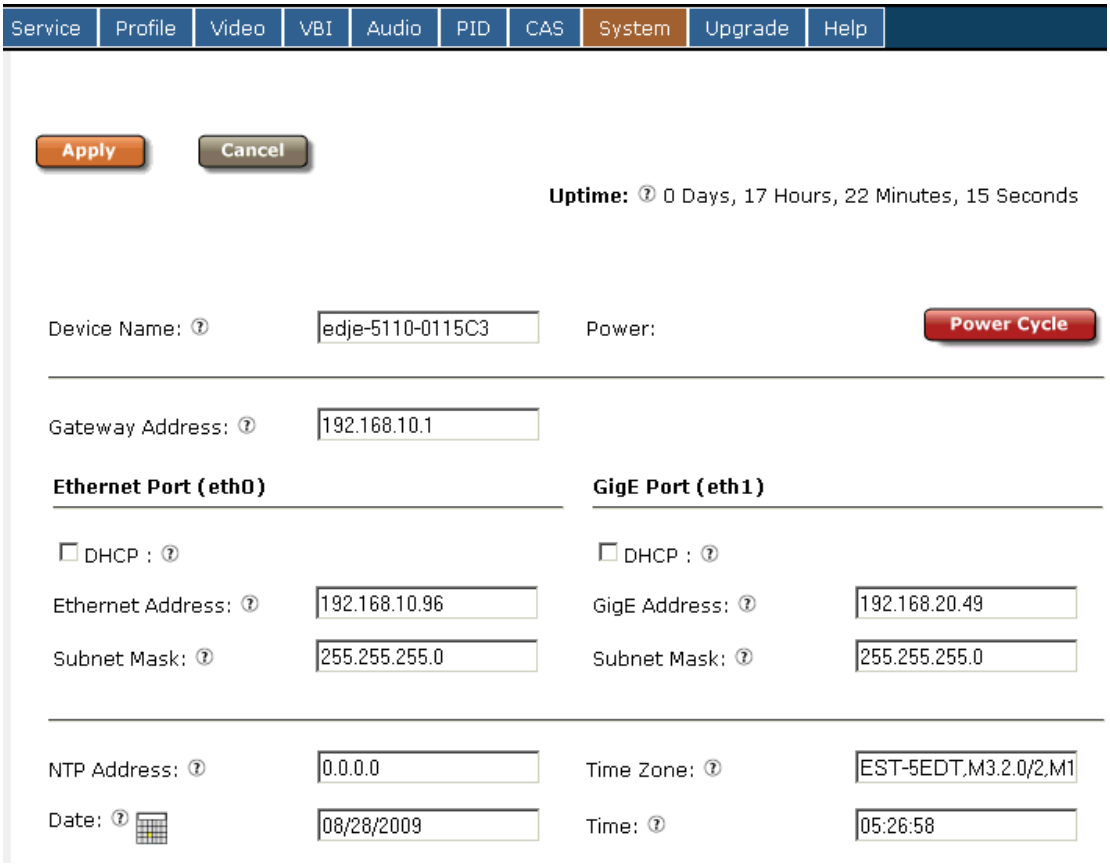
System Tab

The **System Tab** is used to define and control the Adtec edje5110's relationship to the rest of your network and to other devices. The System Tab screen also includes a System Uptime counter in the screen's upper-right corner, showing the elapsed time between power-up cycles.

Screenshot (reduced for clarity) **:**



Power Cycle

Clicking the **Power Cycle** button performs a complete power-down/power-up cycle on the device. A pop-up warning screen gives you the option of continuing or canceling the action. Cycling the power to the device will stop all encoding; the power-down/power-up cycle takes approximately 45 seconds to complete.

Warning screen:

Image reduced for clarity

Controls:

Control	Function	Options	API Command
Device Name	ease-of-identification; default is name that combines the product type and the serial number of the unit. For example,	text field; user-defined	*.SYSD NAME

	"edje5110 Encoder-012345"		
Gateway Address	the IP assignment of the gateway/router on your networ; limited to one IPA on Adtec devices	text field	*.SYSD GIP
eth0 DHCP	check box, allows unit to extract it's own IP address if switched on, from a DHCP server	selected = 1 not selected = 0	*.SYSD DHC eth0
eth0 Ethernet Address	IP address of the unit's Control-Ethernet port 10/100mbps	text field; valid IP address in form xxx.xxx.xxx.xxx	*.SYSD IPA 0
eth0 Subnet Mask	Subnet mask address of the unit's Control-Ethernet port	text field; valid IP address in form xxx.xxx.xxx.xxx	*.SYSD IPM 0
eth1 DHCP	check box, allows unit to extract it's own IP address if switched on, from a DHCP server	selected = 1 not selected = 0	*.SYSD DHC eth1
eth1GigE Address	IP address of the unit's GigE port	text field; valid IP address in form xxx.xxx.xxx.xxx	*.SYSD IPA 1
eth1 Subnet Mask	Subnet mask address of the unit's Control-Ethernet port	text field; valid IP address in form xxx.xxx.xxx.xxx	*.SYSD IPM 1
NTP Address	IP Address of a Network Time Protocol server	On = 1 Off = 0 used in conjunction with the server's IP address	*.SYSD NIP [state][IPA]
Time Zone	designate operating time zone of unit for timekeeping and internal scheduling Will auto-populate if unit is connected to an NTP Server.	text field- will auto-populate from NTP server if NTP enabled	*.SYSD TIZ
Date	set the date for the unit for timekeeping and internal scheduling Will auto-populate if unit is connected to an NTP Server.	text field- will auto-populate from NTP server if NTP enabled	*.SYSD TIM
Time	set system time for unit for timekeeping and internal scheduling Will auto-populate if unit is connected to an NTP Server.	text field- will auto-populate from NTP server if NTP enabled	*.SYSD TIM

Security Tab

The controls on this tab allow the setting of unit-level (on the device) security.

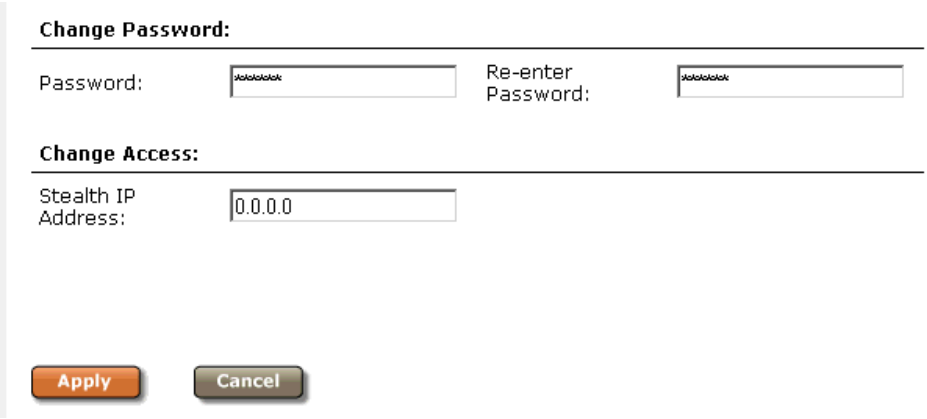


Image reduced for clarity

Controls

Control	Function	Options	API Command
Password	unit-level security; set or re-set password to limit access.	text field	*.SYSD CPW
Re-enter password	verify text of password changes.	text field	*.SYSD CPW
Stealth IP Address	security feature that allows only the designated Stealth IP Address to communicate with the unit for FTP and other services. This control allows one-point override access to the Stealth IP Address.	user-defined; valid IP address in format XXX.XXX.XXX.XXX	*.SYSD SIP

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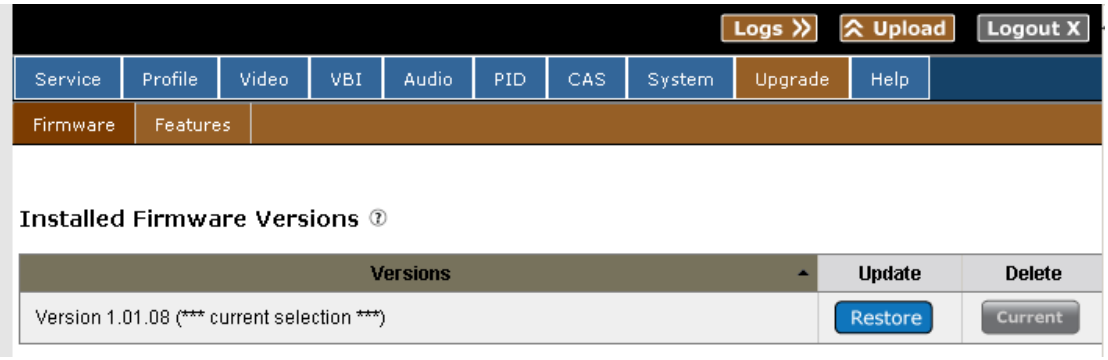
Upgrade Tab

The Upgrade Tab is used to easily select and upgrade your unit's firmware from the available versions. There are two sub-tabs: Firmware and Features

Firmware Tab

Firmware Screenshot (reduced for clarity) **:**



Procedure

Installed Versions are firmware versions that have been installed on your device and can be selected as the current operating version. To select one of these versions, simply click on the **<Select>** button associated with the version. Due to the caching properties of your browser, it is necessary to clear your cache or restart the browser to make sure that the new application pages load. Click the **<Upgrade>** tab a second time to view the currently loaded versions.

Other Controls

- **Restore** will reset the unit to the factory settings, **including** the removal of Feature Keys.
    - Prior to restoring the unit to the factory settings, be sure you have your Feature Key information recorded, so that the Feature Key information can be inputted again.
- **Delete:** clicking the **<Delete>** button will delete that stored firmware version from your device.

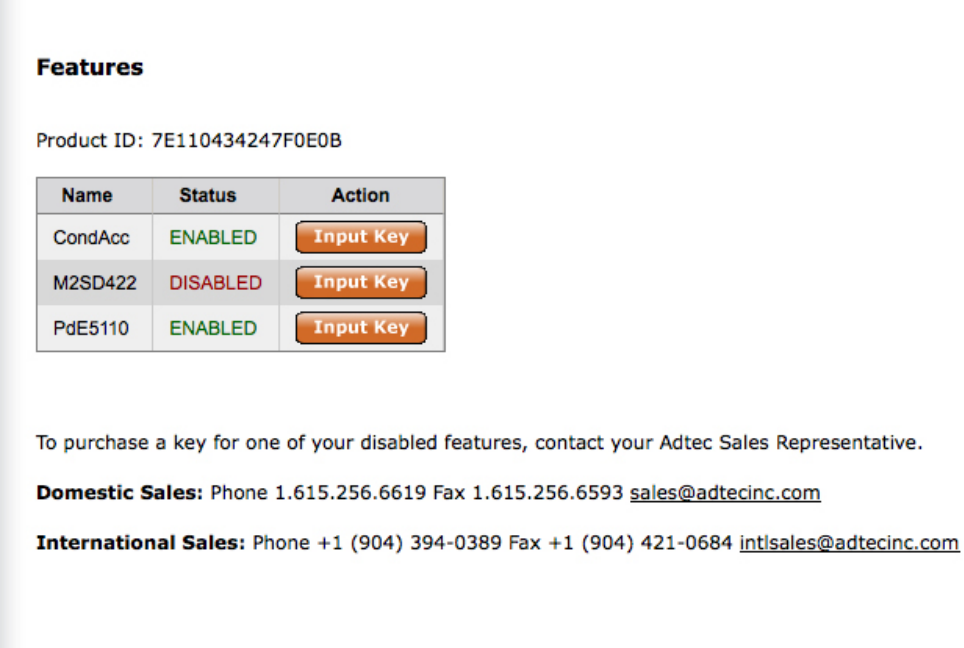
To upload new firmware versions, click on the **<Install>** button next to the desired firmware version.

After the new version is uploaded, a pop-up screen will confirm its availability on the device.

Features Tab

The Features tab shows optional features that you have purchased for use on your edje5110. To purchase additional Feature Keys, contact your Adtec sales representative.

Features Screenshot (reduced for clarity) **:**



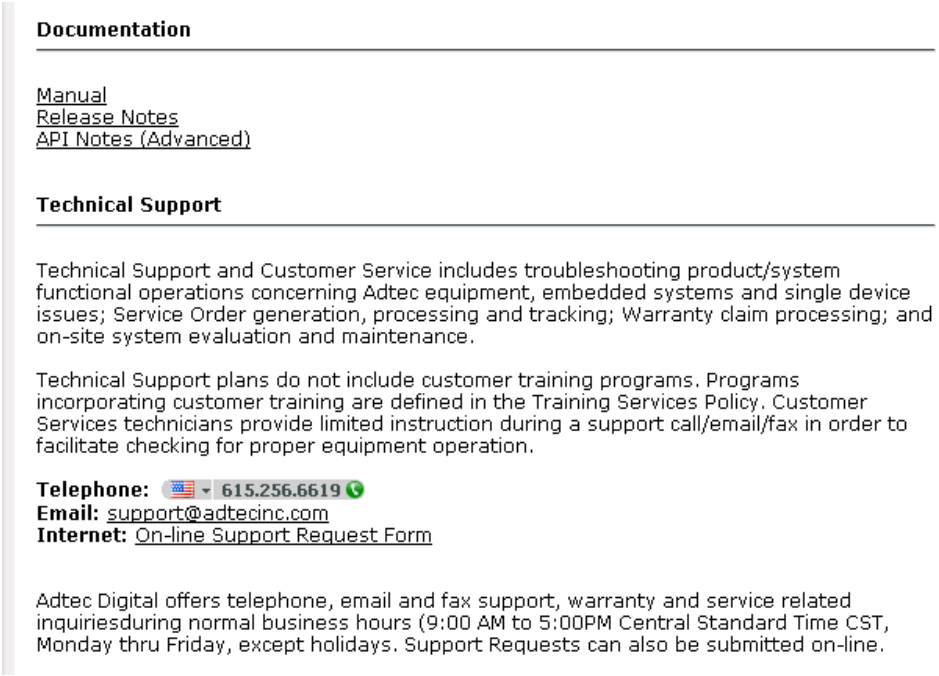
Controls:

- Two features are currently available for the edje5110:
  - **Conditional Access:** a feature key to enable BISS-1 and BISS-E encryption is available for the edje5110.
  - **M2SD422** a feature key to enable standard definition 422 chroma encoding for the edje5110.
  - **PdE5110** is a key for operations and will always be enabled for purchased edje5110 units.

Help Tab

The Help Tab provides another access to Technical Support's contact information, and to a link for the onboard User's Manual, Release Notes, and API information.

Screenshot (reduced for clarity) **:**



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Chapter 4 - How-To Guides

Encoding Frequently Asked Questions

Scenario	Information
What is the max mux rate with audio?	100,000,000 bps
What is Video Auto Fill (VAF)?	Video Auto Fill is an Adtec feature to reduce the amount of null packets in the Transport stream by automatically setting the Video Bitrate. The bitrate is automatically configured by the device based upon the Transport Mux Rate and the Audio rates (Transport Mux Rate - Audio Rate - minimal fill = Video Rate). VAF is recommended to be turned on for the highest possible video quality. Please note that 15Mbps is the highest possible video rate for Standard Definition Mpeg2.
Does a second Dolby channel have to be present? Do I have to have audio on the 2nd channel or is the Dolby signature in the file sufficient?	No, and the Dolby signature should be sufficient.
How do I determine what bit rates I need to use to encode my spots?	This depends on your system's parameters.
How do I set up a multicast stream?	Set it up on the Transmit -> Multicast Menu from the front panel: MODE: SEND MSP: 2000 MSI: 226.0.0.1
What is the recommended audio input level for analog audio?	0 (zero) dB is the recommended level for analog audio.

Manual Upgrades

Firmware Upgrade

You can upgrade your Adtec product's firmware via built-in web-based application, described in the Upgrade Tab section, or via a Telnet/FTP session, described in this article.

To update your Adtec device's firmware via a Telnet session, perform the following:

Manual Upgrade 'Step by Step'

Step	Action
1	Obtain the desired firmware version file from www.adtecinc.com note*: Firmware releases are found on the support section of the website, for each product note**: Windows Internet Explorer renames adtec firmware file extensions to .gz . When saving please add a t within the extension to read .tgz if IE has renamed your file.
2	Using your favorite FTP client to upload the firmware file to the device. If you are unfamiliar with FTP you may use a 'My Computer' window and type in the address bar, ftp://adtec:none@192.168.10.48 where 192.168.10.48 should be replaced with the IP Address of YOUR device. You may then drag and drop the firmware file into the hd0 folder.
3	Open a Telnet session and enter the IP address of the unit you are going to update. note*: If you are unfamiliar with telnet, open a command prompt window (windows: start -> run.., mac: macintosh hd -> applications -> utilities -> terminal) and type: telnet 192.168.10.48
4	Enter the username as ' **adtec** ' and the password as ' **none** '.
5	Enter the following in sequence: *.ecmd stop
6	*.sysd vrn search - from the results, look for the pathname of recently uploaded firmware file
7	*.sysd vrn install [pathname of the .tgz file] ex: *.sysd version install /media/hd0/filename.tgz

EIA-608/708 Captions

The new line of Adtec encoders (mediaHub HD Pro, mediaHub HD 422, and edje 5100) supports EIA-608 Captions in standard definition mode and EIA-708 Captions in high definition mode. The 708 captions must be carried as SMPTE-334M payloads with a DID of 0x61 and an SDID of 0x01.

In standard definition mode, the encoder automatically looks for 608 captions on line 21 when captions (CLC) are set to ATSC. When encoding 708 captions, the user may enter the Vertical Ancilleray line that the data resides on. We have found that it is common for most networks to put their data on VANC Line 9, the Adtec configured default.

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Appendix

Contacting Customer Support

Adtec Digital's Support Services

Technical Support and Customer Service includes troubleshooting product/system functional operations concerning Adtec equipment, embedded systems and single device issues; Service Order generation, processing and tracking; Warranty claim processing; and on-site system evaluation and maintenance. Technical Support plans do not include customer training programs. Programs incorporating customer training are defined in the Training Services Policy. Customer Services technicians provide limited instruction during a support call/email/fax in order to facilitate checking for proper equipment operation.

Telephone and Email Support

- **Telephone:** 615-256-6619 ext. 166
- **Email:** support@adtecinc.com
- **Internet:** www.adtecinc.com/supportrequest/

Adtec Digital offers telephone, email and fax support, warranty and service related inquiries during normal business hours: 9:00am to 5:00pm Central Standard Time (CST), Monday through Friday, holidays excepted. Support Requests can also be submitted on-line.

All inquiries will be processed in the order in which they are received and by the criteria outlined in the Call Response Order. Inquiries and inquiry responses made after 5:00 PM (CST) weekdays, Saturday, Sunday or on an Adtec-recognized holiday will be processed the next business day in the order received.

Callers on hold and returned calls will be prioritized by the following criteria:

- Priority-24 Subscription Customers
- Standard-Priority Subscription Customers
- All customers that have purchased Installation & Training, within 90 days of the installation
- Adtec Certified Operators (ACO)
- Limited Level Support, Warranty & Service Requests
- Multi-device system installations that have purchased Installation & Training from Adtec
- Distributors
- System Integrators
- Multi-device systems
- Single device users

Information needed for Support

To help expedite the troubleshooting process, please be prepared to provide the following information to the support representative:

- **Product(s) affected:** please provide a list of the Adtec Products involved including the Revision Number for each affected product.
- **Description of the Problem:** please include a detailed description of the problem. Include the approximate time and day the problem occurred, the spot ID of the material being inserted and what the operator reported about the incident. It is also helpful to note any recent changes to the system. More information is always better than too little information.
- **Your Contact Data:** please include contact information so we can reach you to discuss how to fix the problem, additional troubleshooting steps that are required or to gather more complete information regarding the problem. Please include your facility name (or call letters), your name, title, email address, telephone number, hours of work, and other contact persons if you are not available.

Advanced Support Plans

In addition to our basic Inquiry Response Policy, Adtec offers two advanced levels of priority inquiry support: **Standard-Priority** and **Priority-24**. The Standard-Priority & Priority-24 plans provide guaranteed* response times with the Priority-24 plan offering after hours and holiday support. Standard-Priority support is included with the Adtec Certified Operator (ACO) training. Contact Adtec Sales to upgrade your current support plan.

Standard-Priority Support Plan Description

Customers can improve upon our normal call processing times and can expedite inquiry support responses through our subscription Standard-Priority service plan. Under this plan all telephone inquiries are guaranteed* a telephone response of no more than 4 hours after they are received (within the designated hours of operation). Telephone inquiries received by 4:00 PM (CST) on weekdays- excluding Adtec holidays- are guaranteed a same-day telephone response. However, inquiry responses may be made after hours until 8:00 PM (CST). Email and fax inquiries are limited in scope to normal business hours, excluding holidays. Standard-Priority customers are entitled to a 10% discount on site visit and training charges after the initial system/product installation and training. Standard-Priority customers also receive a 3-day turnaround time guarantee* on warranty and non-warranty repairs on Adtec manufactured equipment, excluding Studio Encoders.

Priority - 24 Support Plan (24 Hour) Description

In addition to our Standard-Support plan, after hours, weekend and holiday support is available with the **Priority-24** support plan. This plan is a subscription only service available for service inquiries 24 hours a day, 7 days a week. All telephone inquiries are guaranteed* a telephone response time of no more than 2 hours. Email and fax inquiries are limited in scope to normal business hours, excluding holidays. Calls after 5:00 PM will be forwarded to a Customer Services representative on call. **Priority-24** customers are entitled to a 25% discount on site visit and training charges, after the initial system/product installation and training. **Priority-24** customers also receive a 1- day turnaround time guarantee* on warranty and non-warranty repairs on Adtec-manufactured equipment, **excluding** Studio Encoders.

Plan Comparisons

Feature/ Plan Name	Priority-24	Standard Priority	Limited
Hours	24 Hours/Day; 7 Days/Week	9:00 AM – 5:00 PM, (U.S.Central Standard Time), ExcludesWeekends & Holidays	
Call Response Time	Same day- 2 hours (1st in order of call list)	Same Day: 4 Hours (2nd in order of call list)	48 Hours
Discounted Site Visits	25%	10%	None
Discounted Training	25%	10%	None
Repair Service	Guaranteed* 1 Day Turnaround	3 Day Turnaround	None

* A one-month free service extension will be awarded if Adtec fails to meet its service guarantee.

Technical Specifications

Encoder Video Profiles

- Adaptive Field Frame (AFF) ISO13818-2 MP@ML
- ISO13818-2 422P@ML (optional)

Video Encoding Data Rates

- MPEG 2 MP@ML SD
    - ♦ 1 Mbs-15 Mbs - NTSC and PAL
- MPEG 2 422P@ML SD (Optional)
    - ♦ 1 Mbs-50 Mbs - NTSC and PAL

Video Frame Formats

- 480i
- 576i
- 480p
- 567p

Video Encode Resolutions Horizontal Resolutions

- 720
- 704
- 640
- 544
- 528
- 480
- 352

Vertical Resolutions

- 480
- 576

Video Processing

- Encoder Filters
- Temporal & Spatial (Median) Time Base Corrector (TBC) on SDI inputs
- Chroma filtering and scaling for NTSC/PAL

Encoder Video Input

- Composite (BNC)
- SDI
    - ♦ Video (SMPTE 259M)
    - ♦ Embedded Audio (SMPTE 272M)

Encoder Audio Profiles

- Dolby Digital 2.0 (AC3)
    - ♦ Dual Stream Encoders Included
- MPEG1 Layer 2
    - ♦ Dual Stream Encoders Included
- Dolby E, Dolby 5.1 & Dolby 2.0 (AC3) passthrough

Encoder Audio Input

- 2 - Analog Audio Stereo Balanced Inputs
- 2 - AES3 digital audio input uncompressed (PCM) or compressed bitstream passthrough from external Dolby 2.0, 5.1 or Dolby E encoders (BNC - 75 Ohm).
    - ♦ Includes compressed bit stream output.
- 1 SDI embedded input

        - 8 channels
        - Video per SMPTE 272M
        - User Selectable Group
    - User-defined analog and digital level control with sample rate conversion on all inputs

Transport Outputs

- 3 mirrored ASI Outputs - ISO13818-1 MPEG 2 Transport Stream - (188 byte only)
- 1 GIGE - MPEG 2 Transport (UDP or RTP)

Note: ASI and IP operate concurrently.

Transport User Data

- SMPTE 334 VANC data extraction for IEEE 708/608. Concurrent User defined VANC Line 7-32 data extraction supported
- Teletext: (NABTS) DVS053 Rev 6

Conditional Access

- BISS 1/E (optional)

Table Compliance

- MPEG Program Specific Information (PSI) Tables:
    - PAT
    - PMT
- DVB Service Information (SI) Tables (Static)
    - SDT
    - NIT
    - TDT/TOT
    - SCTE 35 Splice Point injection
- ATSC A65B (PSIP) Tables (Static)
    - MGT (TVCT, STT, RRT, EIT)

For dynamic DVB-SI use Adtec's DTA-3050 and DTVmanage SI Server .

For dynamic A65B PSIP use Adtec's DTA-3051 and DTVGuide web service.

Physical

- Footprint: 1 RU chassis (19in x 14in x 1.75in)
- Unit Weight: 13 pounds
- Power Start-up: 72 Watts Operational: 60 Watts

User Interface Requirements -Supported Browsers

- MS Internet Explorer 7 and higher
- Firefox 3.0.0 and higher
- Safari 3.0.0 and higher
- Opera 9.0 and higher

Encoder Glossary

Term	Definition
AC-3	Audio compression standard adopted by ATSC and owned by Dolby.
ADC	Analog to Digital Converter
ASCII	American Standard Code for information Interchange
ASI	Asynchronous Serial Interface. A standard DVB interface for a transport stream
ATM	Asynchronous Transfer Mode
ATSC	Advanced Television Systems Committee. Digital broadcasting standard developed in North America.
ATV	Advanced television. North American standard for digital Broadcasting
BAT	Bouquet Association Table. This DVB table describes a set of services grouped together by a broadcaster and sold as a single entity. It is always found on PID 0x0011.
BER	BER - Bit Error Rate
B-frames	Bi-directional predicted pictures, o pictures created from referenced to past and future pictures
Bitrate	The rate at which a bit stream arrives at the input of a decoder
Block	A set of 8x8 pixels used during Discrete Cosine Transformation (DCT).
Bouquet	A set of services sold as a single entity
Broadcaster	Someone who provides a sequence of scheduled events or programs to the viewer
CA	Conditional Access. This system allows service providers to control subscriber access to programs and services via encryption.
CAT	Conditional Access Table. This table identifies EMM streams with a unique PID value. The CAT is always found on PID 0x0001
CATV	Community Access Television, otherwise known as Cable TV.
Channel	A digital medium that stores or transports an MPEG-2 transport stream.
COFDM	Coded Orthogonal Frequency-Division Modulation
Compression	Reduction of the number of bits needed to represent an item of data
Conditional Access	A system used to control viewer access to programming based on subscription.
CRC	Cyclic Redundancy Check. This 32-bit field is used to verify the correctness of able data before decoding.
CVCT	Cable Virtual Channel Table. This ATSC table describes a set of one or more channels using a number or name within a cable network. Information in the table includes major and minor numbers, carrier frequency, short channel name, and information for navigation and tuning. This table is located on PID=0x01FFB.
D/A	Digital to Analog Converter
DAVIC	Digital Audio Visual Council
DBS	Direct Broadcasting Satellite or system
DCT	Discrete Cosine Transform. Temporal-to-frequency transform used during spatial encoding of MPEG video.
Decoding Time Stamp	This stamp is found in the PES packet header. It indicates the time at which a piece of audio or video will be decoded
DigiTAG	Digital Television Action Group
Downlink	Communication link from satellite to earth
DTV	Digital Television. A general term used to describe television that has been digitalized. It can refer to Standard-definition TV or High-definition TV.
DTS	See Decoding Time Stamp
DVB	

	Digital Video Broadcasting. The DVB Project is a European consortium that has standardized digital TV broadcasting in Europe and in other countries.
DVB ASI	Asynchronous Serial Interface. This is a standard DVB interface for a transport stream
DVB-C	Digital Video Broadcasting-Cable. The DVB standard for broadcasting digital TV signals by cable. The RF spectrum in digital cable TV networks has a frequency range of (approx) 46MHz to 850MHz
DVB-S	Digital Video Broadcasting-Satellite. The DVB standard for broadcasting digital TV signals via satellite DVB SPI - Synchronous Parallel Interface. This is a standard DVB interface for a transort stream. DVB-T - Digital Video Broadcasting-Terrestrial. The DVB standard for broadcasting digital terrestrial TV signals ECM - Entitlement Control Message. ECMs carry private conditional access information that allows receivers to decode encrypted information
EIT (ATSC)	Event Information Table. This table is part of the ATSC PSIP. It carries the TV guide information including titles and start times for events on all the virtual channels within the transport stream. ATSC requires that each system contain at least 4 EIT table, each representing a different 3-hour time block. The PIDs for these tables are identified in the MGT
EIT Actual (DVB)	Event Information Table. This table is part of the DVB SI. It supplies the list of events corresponding to each service and identifies the characteristics of each of these events. Four types of EITs are defined by DVB : 1) The EIT Actual Present/Following supplies information for the present event and the next or following event of the transport stream currently being accessed. This table is mandatory and can be found on PID=0x0012. 2) The EIT Other Present/Following defines the present event and the next or following events of other transport streams in the system that are not currently being accessed by the viewer. This table is optional. 3)The EIT Actual Event Schedule supplies the detailed list of events in the form of a schedule that goes beyond what is currently or next available. This table supplies a schedule of events for the transport stream currently being accessed by the viewer. 4) The EIT Other Event Schedule supplies the detailed schedule of events that goes beyond what is currently or next available. This table supplies a schedule of events for other transport streams in the system that are not currently being accessed by the viewer. The EIT Schedule tables are optional
EMM	Entitlement Management Message.EMMs specify authorization levels or services of specific decoders. They are used to update the subscription options or pay-per-view rights for an individual subscriber or for a group of subscribers
EPG	Electronic Program Guide. This guide represents a broadcasting data structure that describes all programs and events available to the viewer. It functions like an interactive TV guide that allows users to view a schedule of available programming and select what they want to watch.
Elementary Stream	A bit stream that includes video, audio or data. It represents the preliminary stage of the Packetized Elementary Stream (PES)
ETR	ETR - ETSI Technical Report
ETR 290	ETR 290 - ETSI recommendation regarding measurement of MPEG-2 DVB transport streams
ETSI	ETSI - European Telecommunication Standard Institute
ETT	ETT - Extended Text Table. This table is part of the ATSC PSIP. It carries relatively long text messages for additional descriptions of events and channels. There are two types of ETTs, the Channel ETT, which describes a channel, and the Event ETT, which describes individual events in a channel. The PID for this table is identified in the MGT
Event	A collection of elementary strean\ms with a common time base and an associated start time and end time. An event is equivalent to the common industry usage of “television program”
Frame	Lines of spatial information for a video signal
FEC	Forward Error Correction. This method adds error control bits before RF modulation. With these bits, errors in the transport stream may be detected and corrected prior to decoding
Group of Pictures (GOP)	a set of pictures usually 12-15 frames long used for temporal encoding of MPEG-2 video. HDTV - High Definition Television. HDTV’s resolution is approximately twice as high as that of Standard Definition Television (SDTV) for both horizontal and vertical dimensions. HDTV has an aspect ratio of 16x9 as compared to the 4x3 aspect ratio of SDTV
IEC	International Electrotechnical Commission.
IEEE	Institute of Electrical and Electronics Engineers.
I/F	Interface

I-frame	Intra-coded frame, or a picture encoded without reference to any other picture. I-frames provide a reference for Predicted and Bidirectionally predicted frames in a compressed video stream.
IRD	Integrated Receiver Decoder. This is a receiver with an MPEG-2 decoder, also known as a set-top box.
ISO	International Standardization Organization
ITU	International Telecommunications Union (UTI)
LVDS	Low Voltage Differantial Signal. An electrical specification used by some manufactures, usually on a parallel interface. It is a balanced interface with a low signal voltage swing (about 300mV)
Macroblock	A group of 16x16 pixels used for motion estimation in temporal encoding of MPEG-2 video. MFN - Multiple Frequency Network (DVB-T).
MGT	Master Guide Table. This table is part of the ATSC PSIP. It defines sizes, types, PIDs, and version numbers for all of the relevant tables within the transport stream. The PID value for this table is 0x1FFB.
MHEG	Multimedia and Hypermedia Expert Group. MIP - Megaframe Initialization Packet. This packet is used by DVB-T to synchronize the transmitters in a multi-frequency network.
MP@HL	Main Profile at High Level. MPEG-2 specifies different degrees of compression vs. quality. Of these, Main Profile at High Level is the most commonly used for HDTV.
MP@ML	Main Profile at Main Level. MPEG-2 specifies different degrees of compression vs. quality. Of these, Main Profile at Main Level is the most commonly used. MPEG - Moving Picture Experts Group, also called Motion Picture Experts Group.
MPEG-2	ISO/IEC 13818 standard defining motion video and audio compression. It applies to all layers of transmission (video, audio and system)
MPTS	Multiple Program Transport Stream. An MPEG-2 transport stream containing several programs that have been multiplexed.
Multiplex (n)	A digital stream including one or more services in a single physical channel. (v)-To sequentially incorporate several data streams into a single data stream in such a manner that each may later be recovered intact. Network - The set of MPEG-2 transport streams transmitted via the same delivery system
NIT	Network Information Table (NIT).The DVB table that contains information about a network's orbit, transponder, etc. It is always located on PID 0x0010. DVB specifies two types of NITs, the NIT Actual and the NIT Other. The NIT Actual is a mandatory table containing information about the physical parameters of the network actually being accessed. The NIT Other contains information about the physical parameters of other networks. The NIT Other is optional.
NTSC	Nation TV Standard Committee Colour TV System (USA and 60 Hz countries).
NvoD	Near Video on Demand. This service allows for a single TV program to be broadcast simultaneously with a few minutes of difference in starting time. For example, a movie could be transmitted at 9:00, 9:15 and 9:30.
Packet	Packet - See Transport Packet.
PAL	Phase Alternating Line.
PAT	Program Association Table. This MPEG-2 table lists all the programs contained in the transport stream and shows the PID vale for the PMT associated with each program. The PAT is always found on PID 0x0000. Payload - All the bytes in a packet that follow the packet leader.
PCR	Program Clock Reference. A time stamp in the transport stream that sets the timing in the decoder. The PCR is transmitted at least every 0.1 seconds.
PES	Packetized Elementary Stream. This type of stream contains packets of unidentified length. These packets may be comprised of video or audio data packets and ancillary data.
PES Packet	The structure used to carry elementary stream data (audio and video). It consists of a header and payload.
PES Packet Header	The leading bytes of a PES packet, which contain ancillary data for the elementary stream.
PID	Packet Identifier. This unique integer value identifies elements in the transport stream such as tables, data, or the audio for a specific program. PLL - Phase Lock Loop. This locks the decoder clack to the original system clock through the PCR.
PMT	Program Map Table. This MPEG-2 table specifies PID values for components of programs. It also references the packets that contain PCR.

P-frame	Predicted frame, or a picture coded using references to the nearest previous I- or P- picture.
Program	See Service.
PSI	Program Specific Information. PSI refers to MPEG-2 table data necessary for the demultiplexing of a transport stream and the regeneration of programs within the stream, PSI tables include PAT, CAT, PMT and NIT. PSIP - Program and System Information Protocol. The ATSC protocol for transmission of data tables in the transport stream. Mandatory PSIP tables include MGT, STT, RRT, VCT and EIT.
PTS	Presentation Time Stamp. This stamp indicates the time at which an element in the transport stream must be presented to the viewer. PTSs for audio and video are transmitted at least every 0.7 seconds. The PTS is found in the PES header.
QAM	Quadrature Amplitude Modulation. This type of modulation for digital signals used in CATV transmission (DVB-C). Amplitude and phase of a carrier are modulated in order to carry information.
QPSK	Quadrature Phase Shift Keying. A type of modulation for digital signals used in satellite transmission (DVB-S).
RRT	Rating Region Table. An ATSC PSIP table that defines ratings systems for different regions or countries. The table includes parental guidelines based on Content Advisory descriptors within the transport stream.
RS	Reed-Solomon Protection Code. This refers to the 16 bytes of error control that can be added to every transport packet during modulation.
RST	Running Status Table. A DVB-SI table that indicates a change of scheduling information for one or more events. It saves broadcasters from having to retransmit the corresponding EIT. This table is particularly useful if events are running late. It is located on PID 0x0013.
SDT	Service Description Table. This DVB SI table describes the characteristics of available services. It is located on PID 0x0011. Two types of SDTs are specified by DVB, the SDT Actual and the SDT Other. The SDT Actual is a mandatory table that describes the services within the transport stream currently being accessed. The SDT Other describes the services contained in other transport streams in they system.
SDTV	Standard Definition Television. SDTV refers to television that has a quality equivalent to NTSC or PAL.
Section	A syntactic structure used for mapping PSI/SI/PSIP tables into transport packets of 188 bytes.
Service	A collection of one or more events under the control of a single broadcaster. Also known as a Program.
SFN	Single Frequency Network (DVB-T).
SI	Service Information. This DVB protocol specifies all the data required by the receiver to demultiplex and decode the programs and services in the transport stream. Mandatory DVB SI tables include TDT, NIT, SDT and EIT. SMPTE - Society of Motion Picture and Television Engineers.
SNG	Satellite News Gathering. This refers to the retransmission of events using mobile equipment and satellite transmission. SNMP - Simple Network Management Protocol. This is the standard protocol for system and network administration.
SPI	Synchronous Parallel Interface. This is a standard DVB interface for a transport stream.
SPTS	Single Program Transports Stream. An MPEG-2 transport stream that contains one unique program.
ST	Stuffing Table. An optional DVB-SI table that authorizes the replacement of complete tables due to invalidation at a delivery system boundary such as a cable headend. This table is located on PID 0x0014.
STB	Set-top box. A digital TV receiver (IRD).
STD	See System Target Decoder.
STT	System Time Table. An ATSC PSIP table that carries time information needed for any application requiring schedule synchronization. It provides the current date and time of day and is located on PID 0x1FFB.
System Target Decoder	A hypothetical reference model of the decoding process defined by MPEG-2.
Table	Service Information is transmitted in the form of tables, which are further divided into subtables, then into sections, before being transmitted. Several types of tables are specified by MPEG, DVB and ATSC.
TDT	Time and Date Table. This mandatory DVB SI table supplies the time reference expressed in terms of UTC time/date. This enables joint management of the events corresponding to the services accessible from a single reception point. The PID for this table is 0x0014.

Time-stamp	An indication of the time at which a specific action must occur in order to ensure proper decoding and presentation.
TOT	Time Offset Table. This optional DVB SI table supplies the UTC time and date and shows the difference between UTC time and the local time for various geographical regions. The PID for this table is 0x0014. Transponder - Trans(mitter) and (res)ponder. This refers to the equipment inside a satellite that receives and re-sends information.
Transport Packet	188-byte packet of information in a transport stream. Each packet contains a header and a payload
Transport Stream	A stream of 188-byte transport packets that contains audio, video and data belonging to one or several programs
T-STD	See System Target Decoder.
TV	Television.
TVCT	Terrestrial Virtual Channel Table. This ATSC table describes a set of one or more channels or services using a number or name within a terrestrial broadcast. Information in the table includes major and minor numbers, short channel name, and information for navigation and tuning. This table is located on PID=0x1FFB
Uplink	Communication link from earth to a satellite
UTC	Universal Time, Co-ordinated
VTC	Virtual Channel Table. This ATSC table describes a set of one or more channels or services. Information in the table includes major and minor numbers, short channel name, and information for navigation and tuning. There are two types of VTCs, the TVCT for terrestrial systems and the CVCT for cable systems
VLC	Variable Length Coding. This refers to a data compression method (Huffmann)
VoD	Video on Demand
VSB	Vestigial Sideband Modulation. This is the terrestrial modulation method used in the ATSC. It can have either 8 (8VSB) or 16 (16 VSB) discrete amplitude levels.

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