

EN-100

10-bit/1080p Capable MultiCODEC Encoder
Includes modulator versions - LB, IF & IF/LB/10M

USER GUIDE

3.00.29

Table of Contents

[Table of Contents](#)

[Trademarks & Copyrights](#)

[Electrical Device Compliance Notices](#)

[Safety Warnings and Cautions](#)

[Compliance Notices](#)

[FCC](#)

[Industry Canada](#)

[European Union EMC Directive Conformance Statement](#)

[Chapter 1 - Getting Started](#)

[Front Panel](#)

[Front Panel LCD Quick Views](#)

[Transport LED Indicators](#)

[Audio Encode Indicators](#)

[System Indicators](#)

[Controls](#)

[Modulator Lineup](#)

[Front Panel Menu Structure](#)

[1. Services Menu](#)

[2. RF Tx Menu](#)

[3. IP Tx Menu](#)

[4. Video Menu](#)

[5. Audio Menu](#)

[6. PIDs Menu](#)

[7. VBI Menu](#)

[8. Profile Menu](#)

[9. CAS Menu](#)

[10. System Menu](#)

[10.1 Login](#)

[10.2 Duration](#)

[10.3 Network Sub Menu](#)

[10.4 Time Sub Menu](#)

[10.5 NTP Sub Menu](#)

[10.6 Alarm Menu](#)

[10.7 SNMP Sub Menu](#)

[10.8 Com2 Settings](#)

[10.9 Feature Sub Menu](#)

[10.10 Host Name](#)

[10.11 Firmware](#)

[10.12 Backlight Dim Delay](#)

[Back Panel](#)

[GPIO and Parport information](#)

[GPIO Pinout](#)

[Parport Pinout](#)

[Chapter 3 - Getting Connected](#)

[Compatible browsers](#)

[Ethernet Access](#)

[Zero Configuration Access](#)

[Login](#)

[Upgrading Via Web User Interface](#)

[Upgrading Via FTP & Telnet](#)

[Chapter 4 - Operational How-Tos](#)

[How to Use Vertical Interval Time Code](#)

[How to Configure Passthru Audio](#)

[Understanding Auto Transport Mux Rate](#)

[How to Use ASI-Receive Mode](#)

[How to Use ASI Remux](#)

[EN-XX ASI Remux with Manual PID Mapping](#)

[Chapter 5 - Appendix](#)

[Appendix A - GNU General Public License](#)

[Appendix B - Technical Specifications](#)

[Base Model \(EN100\)](#)

[Inputs](#)

[Outputs](#)

[Communications](#)

[Video - VE1 Hardware Option](#)

[Physical and Operational](#)

[IF Modulator \(option \) - IF-01](#)

[L-Band Modulator \(option \) - LB-01](#)

[L-Band Modulator + 10MHz \(option \) - No longer available](#)

[IF, L-Band Modulator + 10MHz \(option \) - IF/LB/10M-01](#)

[Appendix C - DB15-M Analog audio input pinout:](#)

[Appendix D - Adtec Digital Support & Service](#)

[Telephone and Email Support](#)

[Preparing for Support](#)

[SLA Options](#)

Trademarks & Copyrights

Copyright: (c) 2016 Adtec Digital. All rights reserved. This document may not, in whole or in part, be copied, photocopied, reproduced and translated, or reduced to any electronic medium or machine-readable form without prior written consent from Adtec Digital.

Trademarks: EN-100 is a trademark of Adtec Digital. Dolby, Dolby Digital, AC-3 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.

Electrical Device Compliance Notices

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.
- Do not break the warranty seals on the device or open the lid. Only approved service technicians are permitted to service this equipment.
- 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 one 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 Celsius (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).

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.

Cet appareillage numérique de la classe B répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif peut ne pas causer l'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée.

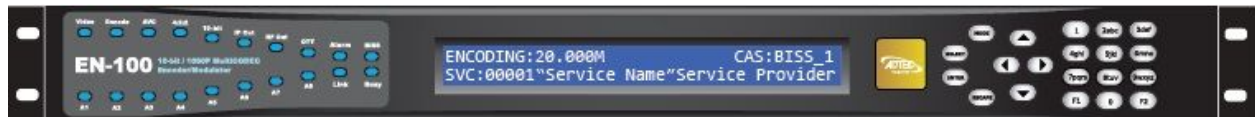
European Union EMC Directive Conformance Statement

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.

Chapter 1 - Getting Started

Front Panel

The Function Buttons and Directional Keypad of the EN-100 are used to configure and monitor the signal input and output of the device.



Front Panel LCD Quick Views

There are several Quick Views that can be accessed via the front panel LCD by pressing the up and down arrows.

1) **Service Data:** When in normal encoding mode, the LCD will display the following information: TS Mux Rate, Conditional Access Mode, Service ID Number, Service Name, and Service Provider.

```
ENCODING: 80.000M          CAS: OFF
SVC: 00001 "AdtechHDTV" Adtec Digital
```

2) **Encoding Status:** This quick view displays the Input and Output Resolution, Frame Rate, Input interface, SDI interface Mode, and Bars/Tones/ID status.

```
I/RES: 1920x1080 29i INP: SDI MODE: AUTO
O/RES: 1920x1080 29i B/T/ID: OFF/OFF/OFF
```

3) **Video Status:** This quick view displays the Video PID, CODEC, Chroma Type, Bit depth, Video Bitrate, Entropy Coding, and Video Autofill status.

```
UID: 481    COD: H.264    CHR: 422    BITD: 10
URT: 75489000b/s    ENT: AUTO    A/F: ON
```

4) **Audio Status:** This quick view displays the Audio Codec type, Encode or Pass Through Rate, Encode or Passthrough mode.

```
1:MU 384k 3:MU 192k 5:DD 384k 7:DD 384k
2:MU 192k 4:MU 384k 6:DD 384k 8:MU 192k
```

5) **Audio PIDs:** This quick view displays the Audio PIDs for all 8 pairs of audio.

```
Audio 1:0482 3:0485 5:0487 7:0490
PIDS 2:0483 4:0486 6:0488 8:0491
```

6) **TSoIP State:** This quick view displays the status of IP Transport mode, RTP, FEC mode, and Multicast Connector. Up to 4 destination IP addresses can be sent simultaneously.

```
1:SEND ON LLAT GIG 3:SEND ON OFF GIG
2:SEND OFF OFF GIG 4:OFF OFF OFF GIG
```

7) **Modulator State*:** This quick view displays the RF Tx status if the unit is equipped with optional modulator.

```
TX:ENABLED 32APSK_9/10 Pwr:-30dB RO:25%
Freq:1290MHz DVB-S2 Sym:15Ms Pilot:ON
```

8) **ASI Remux State:** This quick view displays the status of ASI Remux status if the feature is enabled.

```
REMUX:ACTIVE PROGRAMS:2
INPUT:058.061Mb/s RESERVED:060.000Mb/s
```


Transport LED Indicators

Indicator	Function
Video	Off - If modulator is installed, an off led indicates that no video is detected on the selected input or that ASI Receive mode is enabled. On - Video is detected on the selected input. Blink - No video is detected and fault mode is active.
Encode	Off - Device is not encoding. Idle State On - Device is encoding.
AVC	Off - Set to MPEG2 Encoding On - Set to H.264 (Advanced Video Coding) Encoding Note: MPEG2 encoding only available with EN100-VE2-01 option
4:2:2	Off - Encoding chroma type 4:2:0. On - Encoding chroma type 4:2:2.
10-bit	Off - Encoding bit depth of 8 On - Encoding bit depth of 10 Note: 10-bit encoding only available with EN100-VE2-01 option and in AVC mode
IP Out	Off - Transport of IP via Ethernet or GigE is idle. On - Transport of IP via Ethernet or GigE is active.
RF Out	Off - Modulator is not transmitting. On - Modulator is transmitting. Blink - Modulator is running in test mode. Note: Making changes to specific modulator parameters can cause the modulator to stop transmitting and you will need to re-enable it. This is by design to prevent transmission with an incorrect power setting.
OTT	Off - Over The Top transmission not enabled On - Over The Top transmission enabled Note: Available on future release

Audio Encode Indicators

Indicator	Function
A1 through A8	Off - Audio encoder configuration is set to off. On - Audio encoder configuration is set to encode or passthru. Note: This product offers optional extended audio encoding of the upper four pairs. If you experience issues engaging the upper pairs, check your feature keys first.

System Indicators

Indicator	Function
Alarm	Off - No system alarms. On - System alarm. (Typically NTP alarm)
BISS	Off - Service is not encrypted "Clear - Free to air" On - Service is Encrypted "Cyphed - Selected BISS mode"
Link	Off - No network detected On - Network communication active
Busy	Off - No network activity On - Network traffic present

Controls

Using the Mode, Select, Enter, Escape, and directional buttons, the user can control the unit via the front panel.

Control	Function
Mode button	Mode will cycle you through top layer menus.
Select	Select will enter you into edit mode.
Enter	Enter submits any edits.
Escape	Escape returns you to the previous menu layer.
Cursor Arrows	Arrows will navigate you within submenus
Programming Keypad	For value entry. F2 functions as a "." decimal or period.

Modulator Lineup

This feature enables the operator to quickly view and/or configure select modulator RF output parameters. The parameters available in this menu are;

1. Carrier Mode: [PURE_CARRIER or MODULATED]
2. Transmit: [ENABLED or DISABLED]
3. Output Power: [in 0.5dB increments]
4. Output Frequency: [in 1.0MHz increments]

To access the menu, press the F1 and F2 keys simultaneously. The front panel will briefly flash "MODULATOR LINEUP" then display the menu.

Note: To use this feature, the front panel display must be illuminated. If the display is dim, press ANY front panel button to illuminate it.

Note: If the unit has been previously configured by the operator and powered OFF and ON, then the display will read the last valid configuration, however, Tx will read DISABLED.

To select the desired Carrier Mode, press the front panel "SELECT" button.

```
Carrier: PURE_CARRIER Power (dBm): -50.0
Tx: DISABLED Mod. Freq. (MHz): 950.0000
```

To set Transmit to ENABLED or DISABLED, press the front panel "ENTER" button.

```
Carrier: ON Power (dBm): -50.0
Tx: ENABLED Mod. Freq. (MHz): 950.0000
```

To set the desired output Power Level, press and hold the front panel ↑ or ↓ button.

```
Carrier: ON Power (dBm): -40.0
Tx: ENABLED Mod. Freq. (MHz): 950.0000
```

To set the desired output Modulator Frequency, press and hold the front panel ← or → button.

```
Carrier: ON Power (dBm): -40.0
Tx: ENABLED Mod. Freq. (MHz): 1350.0000
```

Note: If the Modulator Frequency is reconfigured when Transmit = ENABLED, then Transmit will be automatically set to DISABLED.

Front Panel Menu Structure

1.Services Menu

Item	Function	Options
1.1 TS Mux Rate	Transport Mux Rate is the total transport stream rate. Use this number to match total circuit throughput	1000000 - 150000000 note: The actual lower limit is configuration dependent.
1.2 ABR Mode	<p>The Adaptive Bit-rate mode allows the encoder to adjust TMR and Video bit-rate without performing an encoder restart. This mode is useful for dynamic bandwidth based solutions.</p> <p>When this configuration is set to OFF, the default configuration, bit-rate changes to TMR or Video rate will restart the encoder if required. With this configuration set to Instant, bit-rate changes to TMR or Video rate will not restart the encoder.</p> <p>Note: With this mode enabled, a transport stream analyzer will show a PCR accuracy error on TMR changes. This is a type of "false alarm" if the error occurs during a bit-rate transition, the decoder adapts dynamically to the change.</p>	OFF Instant
1.3 Program Number	Sets the program number in the PAT (Program Association Table). This value can be set in hexadecimal and decimal format.	1 - 65535 0x0001 - 0xFFFF
1.4 Service Name	Identifies the service by name. This value is used to populate either the DVB SDT table, or ATSC VCT table. You are limited to 20 characters in DVB mode and 7 in ATSC mode. When using Bars, Tones and ID overlays, this field is displayed as part of the service information.	1- 20 ascii characters in DVB mode 1-7 ascii characters in ATSC mode
1.5 Service Provider	Identified the services provider. This value is used to populate either the DVB SDT table, or ATSC VCT. When using Bars, Tones and ID overlays, this field is displayed as part of the service information.	1-20 ascii characters in DVB mode 1-20 ascii characters in ATSC mode
1.6 Tables	Allows the operator to choose which type of Tables the encoder will generate.	DVB ATSC

	<p>DVB - includes PMT, PAT, NIT and SDT tables</p> <p>MPEG - includes PAT and PMT tables</p> <p>ATSC - includes PAT, PMT, VCT, RRT, MGT, and STT tables</p> <p>DVBSDTONLY - includes PMT, PAT, and SDT tables</p>	<p>MPEG</p> <p>DVBSDTONLY</p>
1.7 ASI Receive Mode	<p>Routes a external ASI signal from the HD/SDI input in the place of the internally encoded signal.</p>	<p>ON</p> <p>OFF</p>
1.8 ASI Mode	<p>Configures the ASI output ports transmit mode.</p> <p>When set to Continuous, Data is transmitted at the configured TMR rate continuously regardless of whether or not there is a valid video source.</p> <p>When set to Encode only, data will only be transmitted if there is a valid video source. Data will not be transmitted if the encoder is idling.</p>	<p>CONTINUOUS</p> <p>ENCODE ONLY</p>
1.9 ASI Reserve	<p>Set the reserve bandwidth for ASI Remux</p> <p>Note: Setting to zero disables ASI Remux</p>	<p>0-100Mb/s</p>
1.10 Carrier ID Menu	<p>Carrier ID contains unique information within the transport stream to aid in identifying and troubleshooting satellite sources. Specified by SUIRG and endorsed by the WBU-ISOG, the user will need to complete some fields. The Encoder Manufacturer and Encoder Serial Number fields will automatically be filled.</p>	<p>Provider ID: 5 characters.</p> <p>Phone: 17 Character number (typically operator MCR/POC number. '+','(', and ')').</p> <p>Longitude: 9 Characters ('+000.0000' to '+/-180.0000')</p> <p>Latitude: 8 Characters ('+00.0000' to '+/-90.0000')</p> <p>User Information: 15 characters.</p>
1.11 Bars, Tones, ID Menu	<p>Bars, Tones and Service ID information can be overlaid on top of valid video by selecting the desired combination from this menu.</p> <p>Note: When an audio input / channel is configured for Pass through operation Internal tone generation does not function for the pass through channels.</p>	<p>Bars Mode: ON, OFF</p> <p>Bars Type: BARS, Solid color, FLASH</p> <p>Tones Mode: ON, OFF</p> <p>OSD Mode: ON, OFF, BLINK</p>

2. RF Tx Menu

Note: This menu is dynamic. It will only appear if you unit has factory installed modulator option.

Item	Function	Options																																																		
2.1 Transmit	Allows the operator to enable or disable the Main RF output. If Transmit is enabled and any value for Type, Frequency, Rolloff, Symbol Rate, or Interface Rate is changed, then Transmit will be automatically disabled. However, the monitor output will remain active.	Disable Enable																																																		
2.2 Type	Allows the selection of the mod type.	DVBS DVB-S2 DVB-S2X																																																		
2.3 Mode	This control allows the operator to select the desired modulation mode and FEC code rate.	<p>We display all possible ranges available via our device in the Front Panel. This list will differ from the list found in the web UI as it only shows those options available based on the feature keys found.</p> <table data-bbox="932 1073 1377 1871"> <tbody> <tr><td>QPSK-1/2</td><td>16APSK-5/6</td></tr> <tr><td>QPSK-2/3</td><td>16APSK-8/9</td></tr> <tr><td>QPSK-3/4</td><td>16APSK-9/10</td></tr> <tr><td>QPSK-5/6</td><td>16APSK-7/15</td></tr> <tr><td>QPSK-6/7</td><td>16APSK-8/15</td></tr> <tr><td>QPSK-7/8</td><td>16APSK-32/45</td></tr> <tr><td>QPSK-1/4</td><td>16APSK-1/2-L</td></tr> <tr><td>QPSK-1/3</td><td>16APSK-8/15-L</td></tr> <tr><td>QPSK-2/5</td><td>16APSK-5/9-L</td></tr> <tr><td>QPSK-3/5</td><td>16APSK-26/45</td></tr> <tr><td>QPSK-4/5</td><td>16APSK-3/5</td></tr> <tr><td>QPSK-8/9</td><td>16APSK-3/5-L</td></tr> <tr><td>QPSK-9/10</td><td>16APSK-28/45</td></tr> <tr><td>QPSK-13/45</td><td>16APSK-23/36</td></tr> <tr><td>QPSK-9/20</td><td>16APSK-2/3-L</td></tr> <tr><td>QPSK-11/20</td><td>16APSK-25/36</td></tr> <tr><td>QPSK-11/45</td><td>16APSK-13/18</td></tr> <tr><td>QPSK-4/15</td><td>16APSK-7/9</td></tr> <tr><td>QPSK-14/45</td><td>16APSK-77/90</td></tr> <tr><td>QPSK-7/15</td><td>32APSK-3/4</td></tr> <tr><td>QPSK-8/15</td><td>32APSK-4/5</td></tr> <tr><td>QPSK-32/45</td><td>32APSK-5/6</td></tr> <tr><td>8APSK-5/9-L</td><td>32APSK-8/9</td></tr> <tr><td>8APSK-26/45-L</td><td>32APSK-9/10</td></tr> <tr><td></td><td>32APSK-2/3-L</td></tr> </tbody> </table>	QPSK-1/2	16APSK-5/6	QPSK-2/3	16APSK-8/9	QPSK-3/4	16APSK-9/10	QPSK-5/6	16APSK-7/15	QPSK-6/7	16APSK-8/15	QPSK-7/8	16APSK-32/45	QPSK-1/4	16APSK-1/2-L	QPSK-1/3	16APSK-8/15-L	QPSK-2/5	16APSK-5/9-L	QPSK-3/5	16APSK-26/45	QPSK-4/5	16APSK-3/5	QPSK-8/9	16APSK-3/5-L	QPSK-9/10	16APSK-28/45	QPSK-13/45	16APSK-23/36	QPSK-9/20	16APSK-2/3-L	QPSK-11/20	16APSK-25/36	QPSK-11/45	16APSK-13/18	QPSK-4/15	16APSK-7/9	QPSK-14/45	16APSK-77/90	QPSK-7/15	32APSK-3/4	QPSK-8/15	32APSK-4/5	QPSK-32/45	32APSK-5/6	8APSK-5/9-L	32APSK-8/9	8APSK-26/45-L	32APSK-9/10		32APSK-2/3-L
QPSK-1/2	16APSK-5/6																																																			
QPSK-2/3	16APSK-8/9																																																			
QPSK-3/4	16APSK-9/10																																																			
QPSK-5/6	16APSK-7/15																																																			
QPSK-6/7	16APSK-8/15																																																			
QPSK-7/8	16APSK-32/45																																																			
QPSK-1/4	16APSK-1/2-L																																																			
QPSK-1/3	16APSK-8/15-L																																																			
QPSK-2/5	16APSK-5/9-L																																																			
QPSK-3/5	16APSK-26/45																																																			
QPSK-4/5	16APSK-3/5																																																			
QPSK-8/9	16APSK-3/5-L																																																			
QPSK-9/10	16APSK-28/45																																																			
QPSK-13/45	16APSK-23/36																																																			
QPSK-9/20	16APSK-2/3-L																																																			
QPSK-11/20	16APSK-25/36																																																			
QPSK-11/45	16APSK-13/18																																																			
QPSK-4/15	16APSK-7/9																																																			
QPSK-14/45	16APSK-77/90																																																			
QPSK-7/15	32APSK-3/4																																																			
QPSK-8/15	32APSK-4/5																																																			
QPSK-32/45	32APSK-5/6																																																			
8APSK-5/9-L	32APSK-8/9																																																			
8APSK-26/45-L	32APSK-9/10																																																			
	32APSK-2/3-L																																																			

		8PSK-3/5 32APSK-32/45 8PSK-2/3 32APSK-11/15 8PSK-3/4 32APSK-7/9 8PSK-5/6 32APSK 2/3 8PSK-8/9 64APSK-32/45-L 8PSK-9/10 64APSK-11/15 8PSK-23/36 64APSK-7/9 8PSK-25/36 64APSK-4/5 8PSK-13/18 64APSK-5/6 8PSK-7/15 128APSK-3/4 8PSK-8/15 128APSK-7/9 8PSK-26/45 256APSK-29/45-L 8PSK-32/45 L 16QAM-3/4 256APSK-2/3-L 16QAM-7/8 256APSK-31/45-L 16APSK-2/3 L 16APSK-3/4 256APSK-32/45 16APSK-4/5 256APSK-11/15-L L 256APSK-3/4
2.4 Local Oscillator	Determines the Local Oscillator Frequency (in Mhz) variable in the embedded Uplink Calculator. For Normal (Non-Inverted) Spectrum Mode: $Freq_{Modulator} = Freq_{Uplink} - Freq_{Local Oscillator}$ For Inverted Spectrum Mode: $Freq_{Modulator} = Freq_{Local Oscillator} - Freq_{Uplink}$ <i>Note: This field is provided for convenience purposes only and to aid in the automatic calculation of the Modulator frequency. The actual setting will depend on your external hardware (Block Upconverter), and may differ from the value set in here.</i>	User defined
2.5 Uplink Frequency	Determines the Uplink Frequency (in Mhz) variable in the embedded Uplink Calculator. <i>Note: This field is provided for convenience purposes only and to aid in the automatic calculation of the Modulator frequency. The actual</i>	User Defined

	<p><i>setting will depend on your external hardware (Block Upconverter), and may differ from the value set in here.</i></p>	
2.6 Frequency (Read Only)	<p>Allows the operator to enter the desired output frequency of the main RF output port.</p>	<p>950MHz - 2.15GHz L-BAND 50MHz - 180MHz IF ** The monitor output frequency for the EN-XX IF is fixed at 1.080GHz. The monitor output frequency for the EN-XX L-Band tracks with the main RF output frequency.</p>
2.7 Power	<p>Allows the operator to configure the output power of the main RF output port. The monitor output power level for the EN-XX IF and L-Band is fixed at -45dBm. Power is defined as the composite power referenced to an un-modulated (Pure Carrier) carrier.</p>	<p>-35 to +5dBm LBAND -30 to +5dBm IF</p>
2.8 Spectrum Inversion	<p>The Spectrum Inversion options are either Normal or Invert. If Normal is selected, then spectrum inversion does not occur. Spectral inversion can occur when either the baseband signal is up-converted to an IF frequency or when the IF is upconverted to the desired RF output frequency.</p>	<p>Invert Normal</p>
2.9 FEC Frame	<p>When operating in DVB-S2, the Frame Type options are either Normal or Short. The Normal 64,800-bit FEC frame provides better protection but introduces more latency compared to the Short 16,200-bit FEC frame. Therefore, the Short FEC frame type should be selected in applications where latency is critical and the longer frame type should be used to optimize protection.</p>	<p>Short Normal</p>
2.10 Rolloff	<p>The Rolloff selection will determine the shape of the output filter. The occupied bandwidth of the modulated signal is the symbol rate multiplied by (1+α) where alpha (α) is the rolloff factor. By using a lower alpha, carriers can be spaced</p>	<p>5 10 15 20 25 30</p>

	closer together on a given transponder or an increased symbol rate can be realized for a given bandwidth.	
2.11 Pilot	When operating in DVB-S2, the Pilot options are either ON or OFF. When pilots are enabled, the total data throughput is reduced by approximately 3.0%.	On Off
2.12 Rate Priority	The Rate Priority control allows the operator to designate which rate will be kept constant. When the Symbol Rate is entered and Rate Priority is Symbol, the symbol rate is held constant and the Interface rate is calculated. When the Interface Rate is entered and Rate Priority is Interface, the interface rate is held constant and the symbol rate is calculated.	Symbol Interface
2.13 Symbol Rate	The number of symbols transmitted per second. The amount of data per symbol is dependant upon the modulation type, e.g. QPSK, 8PSK, etc.	Range can be determined by feature key.
2.14 Interface Rate	The Interface Rate is the bit rate at the baseband interface.	Range can be determined by feature key.
2.15 Carrier Mode	The Carrier Mode control allows the operator to select ON for normal operations or select one of four unmodulated carriers. The Pure Carrier option will provide an un-modulated output carrier at the desired frequency and output power.	Pure Carrier Modulated
2.16 10Mhz Clock	Allows operator to generate or pass a 10Mhz signal. The signal can be generated internally or sourced externally. *** This is a special order option. If your unit does not have the functionality the setting will read "N/A"	OFF ON EXTERNAL

<p>2.17 10 Mhz Clock Combined</p>	<p>Allows the operator to choose whether or not to combine the 10Mhz signal with the L-Band output.</p> <p>*** This is a special order option. If your unit does not have the functionality the setting will read "N/A"</p>	<p>UNCOMBINED COMBINED</p>
<p>2.18 PHYSICAL LAYER SCRAMBLER</p>	<p>Scrambles all of the PLFRAMES except for their header.</p>	<p>The PLS signature assumes values in the range 0, 262141</p>
<p>2.19 MODULATOR LINEUP</p>	<p>This feature enables the operator to quickly view and/or configure select modulator RF output parameters.</p>	<p>Carrier Mode: PURE_CARRIER or MODULATED Transmit: ENABLED or DISABLED Output Power: User defined in 0.5dB incr. Output Frequency: User defined in 1.0MHz incr.</p>

3. IP Tx Menu

Note: this is a parallel menu. It has four index. Use the left or right arrows to navigate to desired index.

Item	Function	Options
3.1 Mode	Enables IP Egress.	Off Send
3.2 IP Tx Mode	Switches from UDP/RTP and TCP	UDP/RTP TCP
3.3 Tx IP Address	The IP Address of which the Multicast or Unicast is broadcast. Multicast addressing supports the transmission of a single IP datagram to multiple receivers. Valid Multicast addressing range is 224.10.XXX.XXX to 239.XXX.XXX.XXX. Unicast addressing sends a single IP datagram to only one receiver. The Unicast address will be the unique IP of the receiving device.	user-defined; numeric field in format xxx.xxx.xxx.xxx
3.4 Tx Port	port assignment used for transmitting a multicast	user-defined using the numeric keypad
3.5 Tx GW Address	The Unicast Gateway automatically handles IP routing for unicast transmissions. This must be configured if the outgoing unicast requires a different gateway from the configured system default gateway. A route is automatically added when the unit is configured for transmit and a Unicast Gateway exists. The route is deleted if set to 0.0.0.0 or Multicast Mode set to OFF.	user-defined; numeric field in format xxx.xxx.xxx.xxx
3.6 DVB per IP	Configures the amount of DVB transport stream packets (188 bytes per DVB packet) per IP packet payload	1 4 7
3.7 RTP	allows for sequence numbering and timing; editable if Multicast Mode is set to 'Send'	On Off
3.8	Forward Edge Correction; selects	OFF

FEC Mode	on/off. When selected, sends two FEC RTP streams in addition to a source RTP stream enabling a receiver to reconstruct missing packets in the source stream.	ON MAXBURST BURST LOWLATENCY
3.9 FEC L	affects the maximum burst packet loss that can be recovered Note: The product of FEC L and FEC D cannot exceed a value of 100	4-20
3.10 FEC D	defines latency involved in burst recovery	4-20
3.11 TOS	Allows the operator to sets the TOS bits in the IPv4 header of the TSoIP payload	0 = Normal service 2 = Minimize monetary cost 4 = Maximum reliability 8 = Maximize throughput 16 = Minimize delay
3.12 TTL	Time-to-Live; specifies the number of iterations or transmissions the packet can undergo before it is discarded	user-defined using the numeric keypad
3.13 Tx Connector	sets the physical connector (on the rear of the unit) to use for multicast transmit purposes on the indicated encode channel.	Ethernet GigE

4. Video Menu

Note: There are several video encoding options marked by an * that pertain to EN100-VE1 and EN100-VE2 hardware options. EN-100 can be ordered with either VE1 (1080p AVC 8-bit 420) encoder module and/or VE2 (1080i AVC/MPEG2 10-bit 422)

Item	Function	Options
4.1 Encoder Select	Select between Encoder chipset	Encoder 1 - MultiCODEC 10-bit Encoder 2 - 1080p Low Latency
4.2 Input	Allows the operator to select which input the video will be sourced from.	SDI COMPOSITE OPTICAL
4.3 SDI Mode	Allows the operator to force the SDI receiver into a specified mode. *depending on installed / selected Video Encoder HD3G options may not be listed.* HD3G is a feature only supported by EN-100-VE1 encoder module.	AUTO SD HD1.4G HD3G SD480i SD576i HD1.4G 720p HD1.4G 720p 50 HD1.4G 720p 59 HD1.4G 1080i HD1.4G 1080i 50 HD1.4G 1080i 59 HD1.4G Any 50 HD1.4G Any 59 HD3G1080P50 HD3G1080P59 Any 50 Any 59
4.4 CVBS Input	Configures the CVBS encoder for NTSC or PAL video. Note: Frame rate for CVBS input must match SDI input. If having trouble with CVBS Input, simply disconnect SDI	NTSC PAL
4.5 CODEC	Allows the operator to select between available CODECS *MPEG2 and H.264_10bit is a feature only supported by EN100-VE2 encoder module.	MPEG2 H264 H264_10BIT
4.6 Entropy Coding	Allows the operator to set the entropy coding settings *H.264 encoding only, Auto mode will use CABAC at video bitrates <= 30Mbps/sec and CAVLC at rates > 30Mbps/sec.	CABAC CAVLC AUTO

<p>4.7 Chroma</p>	<p>Allows the operator to set the encoder chroma type. *Chroma is forced to 422 when H264_10BIT is the selected codec.</p>	<p>420 422</p>
<p>4.8 Deblock Filtering</p>	<p>Allows the operator to turn deblock filtering on and off *H.264 encoding only</p>	<p>ON OFF</p>
<p>4.9 Video Field Coding</p>	<p>Allows the operator to choose between different types of video field coding *H.264 encoding only</p>	<p>AUTO FIELD FRAME ADAPTIVE</p>
<p>4.10 Video Rate</p>	<p>The rate at which video is being encoded. Video bitrate changes are not dynamic. They take effect at the start of the next encode session.</p>	<p>Encoder 1 - Multi CODEC 10-bit 422: In standard definition MPEG2 encoding mode. (input is CVBS, SD/SDI, or SD Optical) 420 1000000 - 15000000 bits/sec (1 - 15 Mb/s) 422 1000000 - 50000000 bits/sec (1 - 50 Mb/s)</p> <p>In high definition MPEG2 encoding mode. (input is HD/SDI, or HD Optical) 420 5000000 - 80000000 bits/sec (5 - 80 Mb/s) 422 6000000 - 80000000 bits/sec (6 - 80 Mb/s)</p> <p>In standard definition H.264 encoding mode. (input is CVBS, SD/SDI, or SD Optical) 420 1000000 - 15000000 bits/sec (1 - 15 Mb/s) 422 1000000 - 50000000 bits/sec (1 - 50 Mb/s)</p> <p>In high definition H.264 encoding mode. (input is HD/SDI, or HD Optical) 420 3500000 - 62500000 bits/sec (3.5 - 62.5 Mb/s) 422 4500000 - 80000000 bits/sec (4.5 - 80 Mb/s)</p> <hr/> <p>Encoder 2 - H.264 1080p 420: In standard definition encoding mode. (input is CVBS, SD/SDI, or SD Optical)</p>

		<p>700000 - 15000000 bits/sec (0.7 - 15 Mb/s)</p> <p>In high definition encoding mode. (input is HD/SDI, or HD Optical) 1500000 - 60000000 bits/sec (1.5 - 80 Mb/s)</p> <p>*If video autofill is enabled, this value will change based on other variables.</p>
4.11 Autofill	When Video AutoFill is turned ON, the encoder will calculate and use the max video bit rate for the current TransMuxRate setting. This is recommended. If Autofill is set to OFF the encoder will use the manual setting for the video bitrate.	ON OFF
4.12 Latency	<p>It is dependent upon the video rate, frame size/rate (NTSC,PAL,HIGH-DEF) and GOP structure. Long IBBP GOPs will produce higher latency over short IP GOPs. Short IP GOPs at lower bit rates produce lower quality video.</p> <p>*1,2, and 3 Frame latency is a feature only supported by EN100-VE1-01 model</p>	<p>LONG: Latency will measure close to 1 second.</p> <p>NORMAL: Should be used for distribution and standard contribution transmissions. Latency is approximately 1/2 second.</p> <p>LOW: Latency is approximately 3 frames less than NORMAL.</p> <p>VERYLOW: Latency is approximately 5 frames less than NORMAL.</p> <p>3FRAME/2FRAME/1FRAME Feature keyed option that provides super low end-to-end latency when paired with an RD-60/RD-70. GOP settings are ignored.</p> <p>Interoperability with other vendor decoders is not guaranteed in these modes.</p>
4.13 Latency Trim	<p>Use this setting in conjunction with the Latency setting to fine tune the latency in order to match various manufacturers latency settings. The setting is rounded down and applied in video frame multiples (a +50 mSec offset would result in the following.. one additional frame delay with 29.97 frame material and two additional frame delays with 59.94 frame material).</p> <p>*Latency Trim only supported by</p>	Max range is -400 to +200 and is constrained based on the ENCODELATENCY setting (NORMAL) and current video mode.

	EN100-VE1 encoder module.	
4.14 Fault Mode	The user can select encoder behavior during video loss. The encoder can stop encoding, encode black, or generate a combination of Black, Bars, Tones and Service ID.	OFF BARS BARSTONES BARSOVERLAY BARSTONESOVERLAY
4.15 Fault Resolution	Allows the operator to select what resolution to encode at during fault mode. *1080P modes only supported by EN100-VE1 encoder module.	480I59.94 576I50 720P59.94 720P50 1080I59.94 1080I50 1080P59.94 1080P50
4.16 Aspect Ratio	Aspect Ratio is the ratio of horizontal lines to vertical lines in the encoded image. Options are: - Wide Screen Signaling (WSS) reads incoming WSS flag and adjusts aspect ratio accordingly. - 4 X 3 defaults standard definition to 4 X 3 display. - 16 X 9 defaults standard definition to 16 X 9 display. Aspect Ratio is related to Active Format Descriptor (AFD). It is recommended to set AFD to WSS if Aspect Ratio is WSS.	4x3 16.9 WSS *This is not a scaling option. Output display is completely dependent on input signal
4.17 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.	OFF WSS BOX16:9_T BOX14:9_T BOX16:9_C AS_CODEDFRAME 4:3_C 16:9_C 14:9_C 4:3_SP_14:9_C 16:9_SP_14:9_C 16:9_SP_4:3_C
4.18 GOP Type	GOP Type can be set to OPEN, CLOSED, or AUTO. OPEN GOP uses referenced pictures from the previous GOP at the current GOP boundary. CLOSED	Open Closed AUTO

	<p>GOP starts with an I Frame and subsequent B Frames do not rely on I or P frames from the previous GOP. AUTO mode is supported on VE2 only, the encoder adjusts the GOP size based on video content in order to maximize picture quality. When the video codec is H264 you MUST use AUTO GOP to yield the best results. The maximum AUTO GOP size is 132 frames for MPEG2, and 300 frames for H264.</p>	
4.19 GOP Structure	<p>GOP Structure sets the format Group-of-Pictures will use; the order of interframes and the various types of picture frames that will be used.</p>	<p>I IP IBP IBBP</p>
4.20 GOP Size	<p>GOP Size is the distance between two full image frames (I-Frames) in a GOP Structure.</p>	<p>user-defined using the numeric keypad range = 1-30</p>
4.21 3-D Sync Mode *EN-100-VE1 Only	<p>Enables multiple ADTEC Encoders to be synchronized. One unit is designated as 'master' which is tracked synchronously by units that are designated as 'slave'. The synchronization is transmitted over an ethernet connection using broadcast packets.</p>	<p>OFF GENERIC MASTER MASTER GROUP 1 - 9 GENERIC SLAVE SLAVE GROUP 1 - 9</p>

5. Audio Menu

Item	Function	Options
	<< 1 - 2 >> Parallel Menus.	
5.1 Surround Sound	Determines the surround sound mode	DD,DD-06,AAC-LC,AAC-HEv1,AAC-6,
5.2 Surround Anchor	Determines the first audio pair for surround encode. Note: surround encode occupies 3 consecutive audio pairs	0 - Pair 1,2,3 1 - Pair 2,3,4 2 - Pair 3,4,5 3 - Pair 4,5,6 4 - Pair 5,6,7 5 - Pair 6,7,8
	<< 1 -8 >> Parallel Menus.	
5.3 Input	Selects the audio input to use during encoding.	Analog SDI AES
5.4 Mode	Allow you to configure your device to Encode per audio or Passthru	Off Encode Passthru
5.5 Type	Defines the type of audio to encode or pass.	DD = Dolby Digital AC3 MU = Musicam Layer II DE = Dolby E LP = Linear PCM DD-06 = Dolby Digital, PMT stream type 0x06 MU-04 = Musicam Layer II, PMT stream type 0x04
5.6 Rate	The Audio Rate is the bitrate for audio encoding / transport and depends on mode selected.	user-defined using the numeric keypad If MPEG 1 Layer 2, the available rates are 32, 48, 56, 64, 80, 96, 112, 128, 160, 192*, 224, 256, 320, 384 kBits/sec . If Dolby Digital AC3, the available rates are 56, 64, 80, 96, 112, 128, 160, 192*, 224, 256, 320, 384, 448, 512, 576, 640 kBits/sec. Note: * For MPEG 1 Layer 2 and Dolby Digital AC3, the recommended lowest rate for professional applications is

		192 kBits/sec. In Dolby-E mode, do not set this value. The bitrate will be auto-detected.
5.7 Level	Controls the volume level in dBs	user-defined using the numeric keypad range = -18 dBs to 8 dBs in increments of 1
5.8 Analog Audio Level	Control the volume level -15 to +15 (dBs) in 1 dB increments for AUDIO 1 and 2 only	This trims the level on the analog audio path (only) to accommodate external audio gear variability.
5.9 Sync	Audio Sync sets the audio sync offset. This measurement is in milliseconds, and works only on analog audios.	+/- 800
5.10 MPEG Format	Allows the operator to choose how to encode left and right analog audio inputs.	STEREO MONO DUALMONO
5.11 IFB	This is a low latency audio path for communications to a remote van or studio using the same distribution path. It requires a special IFB receiver or manual PID selection with a standard IRD. Note: There is no PID reference in the PMT for this functionality. It is considered a ghost PID. It is also not lip-sync aligned with video.	OFF ON GHOST
5.12 SDI Pair	Allows the operator to route embedded audio from SDI input to the specified audio encoder.	1-8
5.13 SDI Clock Source	The embedded audio clock source configuration determines whether to use the embedded clock phase words or derive from video clock. Default is EMBEDDED. If the SDI source has problem (or non-compliant) embedded audio clock phase words, then choose the video clock as the source. Note that choosing the video clock requires that all audio channels are embedded in a fully synchronous fashion.	EMBEDDED VIDEO

5.14 ECC Words	Default is ON. Select OFF if the SDI source has problematic (or non-compliant) ECC words.	OFF ON
5.15 Audio Level B-DL Mapping	The 3G-SDI Level B Source configuration is only valid with 3G-SDI Level B sources. 16 channels of audio can be extracted from either LINKA, the default configuration, or LINKB. **EN100-VE1 encoder module only	LINKA LINKB

6. PIDs Menu

Item	Function	Options
6.1 Transport Stream ID	Sets the Transport Stream ID in PAT and other tables in the egress transport stream. Configure this value in Hex.	0x0001 - 0x1FFE
6.2 PMT PID	PMT PID refers to the PID of the Program Map Table (PMT). Program Map Tables are used to describe the properties of a single program.	user-defined using the numeric keypad
6.3 PCR PID	Programs periodically provide a Program Clock Reference, or PCR, on one of the PIDs in the program. This is also known as the master clock. The PCR PID identifies the packets which contain PCR adaptation fields.	user-defined using the numeric keypad
6.4 Video PID	Video PID identifies packets containing the video Packetized Elementary Stream data.	user-defined using the numeric keypad
6.5-6.12 Audio PID 1-8	Identify packets containing audio content for the specified channels	user-defined using the numeric keypad
6.13 Teletext PID	Teletext PID identify packets containing teletext information.	user-defined using the numeric keypad
6.14 AMOL PID	Automated Measurement of Line Ups; identifies packet which contains AMOL (NTSC) information Only applies to 525 line (NTSC) video.	user-defined using the numeric keypad
6.15 VITC Mode	Enable VITC PID	ON OFF
6.16 VITC PID	Sets the Program ID (PID) for the ANC (H & V). 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	user-defined using the numeric keypad

	is dropped.	
6.17 Splice Mode	Enable Splice PID	ON OFF
6.18 Splice PID	Splice PID is used for Cablelabs SCTE 35 Splice Point identification.	user-defined using the numeric keypad

7. VBI Menu

Item	Function	Options
7.1 Source	selects the source of Vertical Blanking Interval spacing	Composite SDI
7.2 Closed Caption	activates (or deactivates) closed-captioning and specifies closed-captioning standard to be used	OFF DVS157 WAVEFORM DTVCC ASTCConvert

8. Profile Menu

Command	Function
8.1 Last Loaded Profile	Displays the last profile loaded
8.2 Select	The select submenu lists all stored profiles and allows loading
8.3 Save	The save submenu saves a profile with a user designated name
8.4 DELETE	The delete submenu deletes a profile from the available list

9. CAS Menu

Control	Function
9.1	select between off, BISS-1, and BISS-E encryption.

Mode	options: OFF, BISS_1, BISS_E_USER_ID_ONE, BISS_E_USER_ID_TWO
9.2 Clear Session Word	MODE BISS 1 uses a 12-digit hexadecimal Clear Session Word.
9.3 Encrypted Session Word	MODE BISS E XXX uses a 16-digit hexadecimal Encrypted Session Word
9.4 User ID 1	used in BISS-E Mode only; the 14-digit hexadecimal User ID used for encryption
9.5 User ID 2	used in BISS-E Mode only; the 14-digit hexadecimal User ID used for encryption (secondary)

10. System Menu

10.1 Login

Units ship with the front panel logged in by default. If you become logged out and are prompted for a password, use the following key sequence for access.

Action
Press <Select>
Press <Up> arrow
Press <Select>
Press <Enter>
Press <Right arrow>
Press <Enter>

10.2 Duration

The front panel also has a login duration feature. This setting Allows the operator to specify a time frame (in minutes) until the unit will automatically log itself out.

Action
Press mode until you see the System Menu.
Press <Select>
Press the <Down> arrow

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

Possible Configurations:

0 (Zero): The unit will not automatically log out.

1-9: The duration of time, in minutes, before the unit logs out, if no input is received.

10.3 Network Sub Menu

Item	Function	Options
10.3.1 Ethernet Address	This is the address of your device on your network specific to the Ethernet Port.	user-defined using the numeric keypad Default is 192.168.10.48
10.3.2 Ethernet Mask	Defines the unit relative to the rest of your network.	user-defined using the numeric keypad Default is 255.255.255.0
10.3.3 Ethernet DHCP	The Dynamic Host Configuration Protocol allows your device to self-locate network Ethernet parameters.	On (finds own DHCP Address) Off (defaults to last entered IP Address) Default is OFF
10.3.4 GigE Address	This is the address of your device on your network specific to the GigE Port.	user-defined using the numeric keypad Default is 192.168.20.48
10.3.5 GigE Mask	Defines the unit relative to the rest of your network.	user-defined using the numeric keypad Default is 255.255.255.0
10.3.6 GigE DHCP	The Dynamic Host Configuration Protocol allows your device to self-locate network GigE parameters.	On (finds own DHCP Address) Off (defaults to last entered IP Address) Default is OFF
10.3.7 Gateway IP Address	The gateway is a routing mechanism that passes traffic between different subnets and networks.	user-defined using the numeric keypad Default is 192.168.10.1
10.3.8 Stealth IP Address	This is a security feature that allows only the designated Stealth IP Address to	user-defined using the numeric keypad

	communicate with the unit for FTP and other services. This control allows one-point override access to the Stealth IP Address.	Default is 0.0.0.0. Using all 0s effectively turns this function off.
--	--	---

10.4 Time Sub Menu

Item	Function	Options
10.4.1 Time	Defines system time	user-defined using the numeric keypad
10.4.2 Timezone	Defines the time zone the unit operates in	

10.5 NTP Sub Menu

Item	Function	Options
10.5.1 NTP Status	Network Transfer Protocol	Read-only
10.5.2 NTP IP Address	IP address designated for Network Transfer Protocol	user-defined using the numeric keypad Default is 0.0.0.0. Using all 0s effectively turns this function off.

10.6 Alarm Menu

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

10.7 SNMP Sub Menu

Item	Function	Options
10.7.1 SNMP	Controls the status (ON/OFF) of the Simple Network Management Protocol (SNMP) feature. We support SNMPv2c version.	OFF ON CLEAR
10.7.2 Read-only community	The Simple Network Management Protocol (SNMP) Read-Only Password. Default Value: "adtec"	user-defined
10.7.3	The Simple Network	user-defined

Read-write community	Management Protocol (SNMP) Read-Write Password. Default Value: "none"	
10.7.4 Trap community	The Simple Network Management Protocol (SNMP) trap community. Default Value: "public"	user-defined
10.7.5 Trap sink	The Simple Network Management Protocol (SNMP) trap sink. Default Value: "127.0.0.1"	Enter the IP address of your SMNP trap sink server.

10.8 Com2 Settings

Item	Function	Options
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

10.9 Feature Sub Menu

Item	Function	Options
10.9.1 Permanent ID	This is one of the unique IDs for your unit. This number along with your serial number are used to generate permanent feature keys.	read only value
10.9.2 Temporary ID	This is the other unique ID. It along with the permanente ID, and serial number are used to generate temporary feature keys.	read only value
10.9.3 - 10.9.12 Key status	Depending on what keys you have and if they are temp or permanent they will be listed here.	read only values with countdown for temp keys.

10.10 Host Name

Item	Function	Options
Host Name	Displays and allows editing of	Enter Ascii characters.

	the units name. This becomes the units host name for networking purposes.	
--	---	--

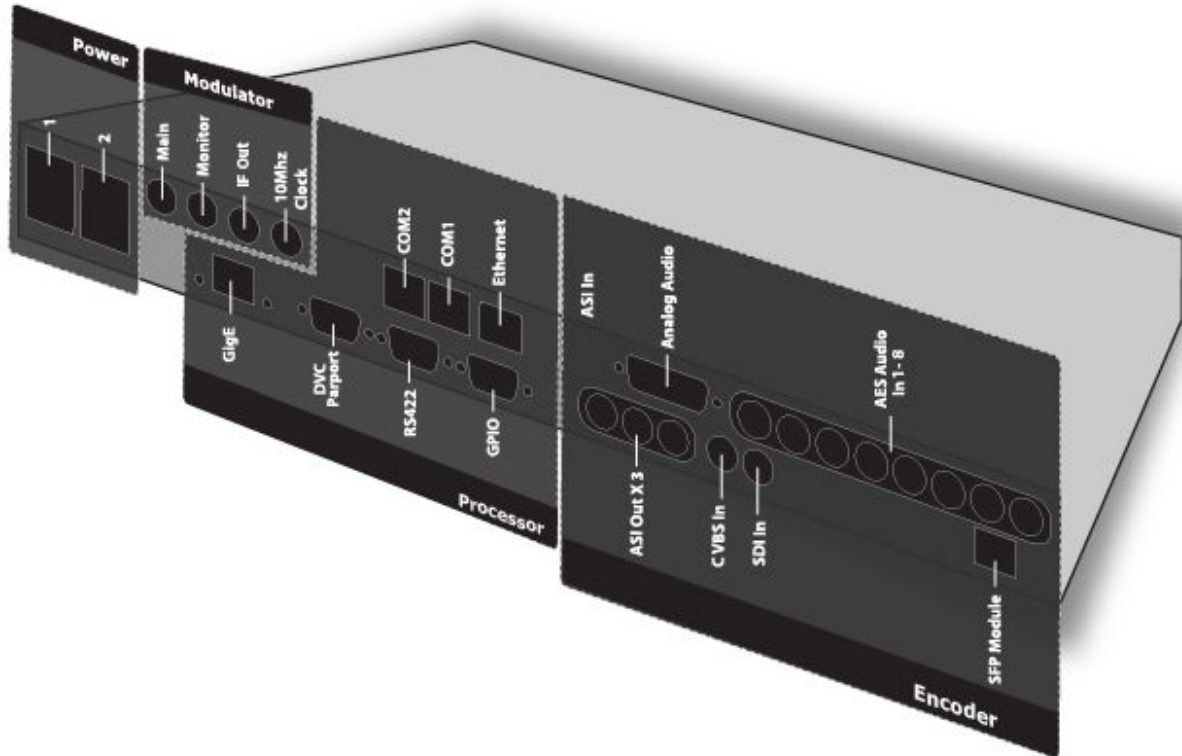
10.11 Firmware

Item	Function	Options
Firmware	Displays the currently running firmware version	Read-Only

10.12 Backlight Dim Delay

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

Back Panel



Connector	Description
Power 1 & 2	Redundant AC Power, Standard 3 pin computer power plug (Auto range 70-240 VAC Input)
GigE / Gbe	MPEG2 or RTP multicast transport egress port (SMPTE 2022)
(A) Main	RF output, 50 Ohm BNC L-Band: Frequency range 950 MHz to 2.150 GHz, Power Level -35 to +5 dBm
(B) Monitor	RF output, 50 Ohm BNC L-Band: Fixed power level at -45 dBm IF: Fixed power level at -45 dBm, fixed frequency at 1.08 GHz
(C) IF Out	IF: Frequency range 50 MHz to 180 GHz, Power Level -35 to +5 dBm
(D) 10MHz Clock	BNC 50 Ohm connector for external 10MHz reference input
COM2	API Serial Communication Interface **
COM1	Serial Port Used for Troubleshooting (Terminal)
ETH0 10/100	10/100 base T ethernet interface (Monitoring/Management)
DVC Parport	9-pin parallel I/O interface for control systems **
RS422 CTRL	Not Currently Supported **
GPIO	Tally and Control Port
Transport Out (ASI) 1-3	75 Ohm source ASI x3 per EN5000839. Up to 100 Mbps.
CVBS In	75 Ohm terminated Standard Definition Composite Video Input
HD/SD SDI In	75 Ohm terminated Input, Video & Audio (SMPTE 259M for SD & SMPTE 292M for HD) BNC ** Use this input for ASI Receive mode
AES Audio In 1-8	75 Ohm AES-3 per AES3-2003
Analog Audio In	Stereo Pairs 1 and 2 (600 Ohm Balanced) **
SFP	SFP slot used for single channel optical receiver module

GPIO and Parport information

The GPIO port allows encoder stop / start control and TTL voltage output for monitoring systems. TTL pin behavior by default is HI (3V) when encoding and LO (0V)

when not encoding. Logic of the TTL pin can be configured based upon video detection, encode status, and manual override with the PP9 API command. Please view API details for further configuration information.

The DVC Parport allows custom events to be programmed upon input pin voltage change. It contains 4 available inputs for custom commands. Please contact technical support for advanced usage in programming the parallel port.

GPIO Pinout

PIN	Designation	Function
1	NC	No Connect
2	D3	reserved for future functionality
3	D2	RECORD (start encoder) (input)
4	D1	STOP (stop encoder) (input)
5	D0	reserved for future functionality
6	NC	No Connect
7	5VDC	+5V DC
8	GND	ground
9	TTL Tally	HI (3V) or LO(0V) based upon PP9 logic (output)

Parport Pinout

PIN	Designation	Function
1	NC	No Connect
2	D3	Data bit 3 (input)
3	D2	Data bit 2 (input)
4	D1	Data bit 1 (input)
5	D0	Data bit 0 (input)
6	NC	No Connect
7	5VDC	+5V DC
8	GND	ground
9	NC	No Connect

Chapter 3 - Getting Connected

Compatible browsers

Firefox (recommended)
MS Internet Explorer
Safari
Chrome

Ethernet Access

To begin, you will need to connect to your EN-100 via ethernet directly, or by adding the EN-100 to your local area network. The default address for all Adtec devices is 192.168.10.48.

To connect directly to the device, make sure that your computer and the device have IP addresses within the same IP class range (ex. 192.168.10.48 for the device and 192.168.10.49 for your computer).

If you need to change the IP address of the device, this can be done via the front panel, System > Network menu. Using a CAT5 crossover cable, connect one end to your computer and the other to the Ethernet port found on the processor section of the back panel. (Some computers can auto negotiate the connection and a crossover may not be necessary.)

To add the device to a LAN, connect a standard CAT 5 Ethernet cable to your network router and then to the Ethernet port on the back of the device. If your network is DHCP enabled and you prefer that over a static IP, you can turn on DHCP for the device via the front panel, System > Network menu.

Zero Configuration Access

Adtec Digital has adopted zero-configuration networking technology, streamlining the setup and configuration processes for our products. The use of this technology enables automatic discovery of Adtec devices and services on an IP network. Used in tandem with the web-based control and configuration applications we can now provide 1-click access to any device.

By using the built-in Bonjour locator in Apple's Safari browser or the plug-ins readily available for IE or Firefox browsers, users can locate all of the Adtec devices on a network by referencing the serial number on the back of the device. Clicking on the unit in the Bonjour list will re-route you to a login page. If you do not wish to use Bonjour, you can reach the device's web application by pointing your browser to the IP Address of the device. Ex. <http://192.168.10.48/>.

Login

Once you reach the default login page for the web-based application, you will need to login by pressing the login button. You will be prompted for a username and password. The default username is 'adtec'. The default password is 'none'. The left-hand panel of the application will report current status in real-time while the right panel tabs will allow you to configure your device. As you navigate through the web application look for the ? icons associated with each parameter. By clicking on these question marks, you can view additional information about how the parameter is used.

Upgrading Via Web User Interface

Periodically, we will provide firmware updates to our products via our website. (<http://www.adtecdigital.com>) To upgrade your device, download the firmware file from our website and store it locally. Login to the web-based application and navigate to the Upgrade > Firmware tab. Click on the upload button located at the top right of the application. Select the firmware file from your local machine and wait for it to upload. Once it has finished uploading, it will appear in the Available Versions list. Click on the Install button associated with the new file. Wait for it to completely extract and become available in the Installed Versions List. Once available there, simply click on the Select button associated with the new firmware and wait for your device to reboot.

Upgrading Via FTP & Telnet

For those times when using the web user interface is not convenient, you can upload the firmware file via ftp and then extract and select into it via Telnet.

File Transfer Protocol (FTP)

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

You will want to drop the firmware file in the media/hd0/media folder.

Telnet (standard 23 port)

To connect to your unit 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.

To extract and select into the new firmware version you have uploaded, issue the following commands.

*.sysd version search

Copy the line designating the location of the new file.

Then type:

*.sysd version extract "copied path to new file"

Wait for the extraction to complete. Once complete, type the following command:

*.sysd version

Copy the line referencing the firmware version you wish to use and then issue the following command.

*.sysd version select "copied new firmware version"

Once you press enter, this will reboot your device into the new version.

Chapter 4 - Operational How-Tos

How to Use Vertical Interval Time Code

Vertical Interval Time Code (VITC) is typically used in transmissions that require time code from the originating source to be preserved. It was originally developed for analog television recording systems, but has new standards for transmitting in digital systems (SMPTE-12M-1 / SMPTE-12M-2). Preserving time code is beneficial for future editing and playback of captured material.

EN-XX-series devices can pass VITC ancillary data as part of the ANC PID. The ANC PID is a separate PES located in the transport stream. Additionally, time code within the GOP of the video will also be adjusted at encoder start up to match the incoming ancillary VITC.

VITC data packets will contain a DID of 0x60 and an SDID of 0x60. The VBI tab contains an SDI ancillary inspector that allows users to view ANC data present at the input. This tab can be viewed for verification of present ancillary data at the SDI input.

Refresh Stats

Current VBI Stats ?

Line	Field ID	Count	Length	DID/SDID
09	1	14254	32	6060

VBI Source: ?

Closed Caption: ?

To enable VITC passthrough:

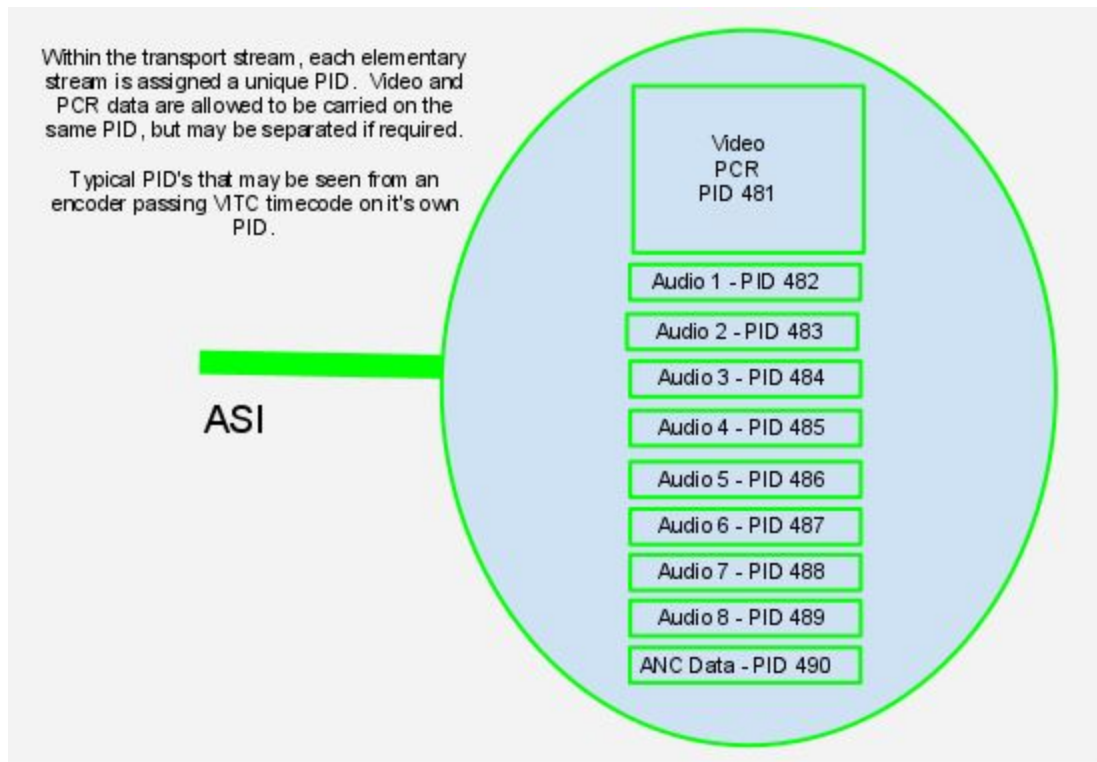
Step	Action
1	On the VBI Tab in the Web GUI Control Application, configure the "VBI Source" for <SDI>.
2	On the PID Tab in the Web GUI Control Application, select the <On> setting for "ANC PID Active".

How to Configure Passthru Audio

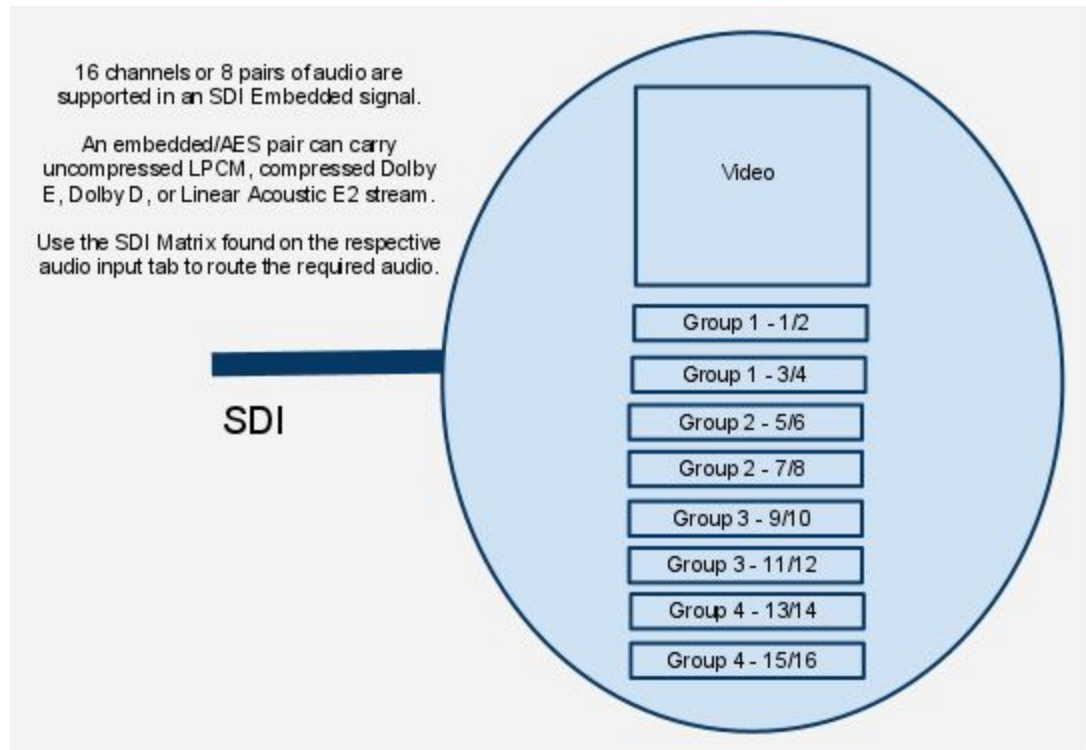
Adtec EN-Series encoders have the flexibility to meet many demanding audio requirements. Each model contains specific encoding options, but every Adtec EN-Series encoder supports two audio passthru. An audio passthru consists of a compressed bitstream (Dolby E 20 Bit / Dolby E 16 Bit / Dolby Digital / Linear Acoustic Stream Stacker 2) or an uncompressed stereo pair (LPCM) from an embedded SDI or AES input passed into the egress transport stream (IP, RF, ASI).

The EN-100 supports four passthru audios on the first four audio inputs. The SDI Matrix and ASI Transport Stream PID configurations allow for custom configurations if required.

Every audio input engine has an internal SDI Matrix to route any audio to one or multiple inputs. Each audio engine output can be assigned a user configurable PID in the transport stream to meet any job requirement.



If the passthru audio is coming in via embedded SDI, the SDI Audio Matrix may be used in conjunction with the 'PID' tab to manipulate the input and output routing.



To enable Audio passthru for Audio 1:

Step	Action
1	On the <u>Audio</u> -> Audio 1 in the Web GUI Control Application, configure the "Audio Mode" for <PASSTHRU>.
2	Configure the "Audio Input" for the desired input <AES> or <SDI>. note: If using SDI, select the proper audio pair from the SDI audio matrix.
3	Select the type of audio from the "Type" drop down. <Dolby Digital>, <Dolby E>, or <Linear PCM / E2>. note: If Dolby E or Dolby Digital is valid at the input, the bit depth and bitrate are automatically determined after clicking Apply.
4	On the "PID" tab, type in the desired Audio PID for "Audio 1".
5	Adjust other audio PID's if necessary.

Common Passthru Problems:

Dolby E Line Placement and/or Dolby E Continuity Count Errors:

Dolby E audio compression technology is designed so that 1 Dolby E audio frame corresponds to 1 Video frame. This 1:1 ratio of video and audio timing was designed to assist in Video editing and seamless cuts without losing audio data. Due to the crucial and

sensitive timing, Dolby E encoders *must* have a reference phase locked to the video. In other words, the SDI video timing feeding the encoder must match the same composite reference timing that is connected to the Dolby E encoder. A simple black burst generator that does not share the same SDI video timing **will not** work to source a Dolby E encoder. A composite video reference that shares the same timing as the video source should be used. Typically, SDI video should be run through a frame synchronizer that is utilizing the same reference as the DE encoder.

The Adtec encoder preserves audio and video timing as it is presented. If the audio timing does not match video timing at the inputs, there will be potential line placement errors and/or CRC errors seen on a decoder.

No Detection of Dolby E / Dolby Digital, Front Panel shows "DE ---", "DP ---", "LP ---":

The encoder will automatically detect the bit depth of Dolby E (16 / 20 bit) and the bitrate of Dolby E / Dolby Digital. If Dolby E is selected and Dolby Digital is presented, the encoder will change automatically and vice versa. If Dolby Digital is selected and Dolby E is presented, the encoder will change the configuration automatically. If the front panel shows dashes for the detected bitrate '---', Dolby is not being detected. This is most commonly due to a mis-configured SDI Audio Matrix or Dolby not being present on the specified input pair.

Look at the SDI signal on an SDI analyzer to verify that Dolby is present on the pair intended. If an SDI analyzer is not available, one troubleshooting tip is to set the mode to ENCODE. If silence or regular audio is heard on the decoder, a compressed bitstream is not being presented on the corresponding input. The SDI matrix can be changed to each pair without restarting the encode session. Once hash is heard, then a compressed bitstream should be present. Set the mode back to Passthru for the automatic detection mechanism to configure the Dolby type and bitrate.

Note: When an audio input / channel is configured for Pass through operation Internal tone generation does not function for the pass through channels.

Understanding Auto Transport Mux Rate

Auto Transport Mux Rate (TMR) is a feature of Adtec EN-Series built with the optional modulator. This feature will automatically configure the overall data rate of the encoder (its TMR; Transport Mux Rate), based upon its Modulator configuration. In other words, when the modulator Transmit configuration is set to 'ENABLED', the encoder's TMR becomes the Modulator's configured Interface Rate. The TMR is a key configuration for modulator functionality and must match the modulator interface rate.

Please note that the configured video and audio data rates must be lower than the targeted modulation data rate for this feature to work properly.

For example, HD Video (3Mbps) + 8 pairs of Mpeg1 Layer2 @ 384Kbps (3.072Mbps) = ~6.2Mbps.

The TMR will not fit into a 3MBaud DVB-S QPSK 3/4 modulation configuration (As 3MBaud with this settings would only support a data rate of 4.14Mbps). In this case, additional audios would need to be turned off or rates adjusted to meet the 4.14Mbps modulation data requirement.

How to Use ASI-Receive Mode

The Adtec EN-Series with optional integrated modulator has been designed with different applications in mind. The encoder / modulator combo supports three different modes of operation.

- 1) They can be used together.
- 2) The modulator only can be used as a stand alone device
- 3) The encoder only can be used as a stand alone device.

The default mode of operation has the 'ASI Receive Mode' configuration turned OFF. In this mode, the SDI input serves as the primary SD/HD-SDI video input into the encoder. The encoder processes the video/audio/ancillary data and places the compressed data into a transport stream. The transport stream is fed concurrently to the ASI output module, IP output module, and internal modulator input. The ASI output will always be enabled, while IP and RF outputs have individual controls.

The second mode of operation has the 'ASI Receive Mode' configuration turned ON. In this mode, the SDI input is changed to an ASI input. This can be useful in situations where the encoder may not meet specific requirements for a job without losing up to 32APSK optional modulation capabilities. The ASI input is routed directly to the ASI output module and to the internal modulator input. All internal paths to and from the encoder module are terminated in this mode with encode functionality disabled. The modulator will be acting as a stand alone device with 3 ASI outputs available for pre-modulation monitoring capability. In this mode, the modulator interface rate must also match the ASI rate coming into the encoder for proper RF modulation. There is no reporting of the ASI input data rate or rate adaptation supported at this time. There is no null packet insertion or null packet dropping support at this time. The ASI input rate must be configured / viewed from the device feeding the EN unit. The third mode can be used by DISABLING modulator transmit.

To enable your Adtec EN-series device for ASI Receive Mode, follow the following steps:

Step	Action
1	On the rear panel of the device, connect your ASI cable to the "ASI-IN" BNC connector. This is a shared connector; it also functions as the SDI-In connector.
2	Access the Web UI for your unit.
3	On the "Video" tab, select <On> as the option for "ASI Receive Mode". This routes the ASI signal to the unit's internal modulator.
4	On the Status Display on the LCD Panel (unit front panel), "ASI Receive/Passthru" should be shown.

How to Use ASI Remux

Terminology:

"ASI Remux" refers to the ability for an Adtec EN to accept a Transport Stream (TS) via ASI input, and multiplex the incoming service or services with it's locally encoded service.

The results is that the transport stream output becomes a MPTS containing the services from the ASI input in addition to to the locally encoded service.

"ASI Reserve" refers to the bandwidth the user must define to allocate enough space for the incoming services. "ASI Input Reserve" is how the field is displayed in the WebUI and should be set to the same or greater than the aggregate rate of the services from the Input ASI transport stream.

"Downstream Device" refers to a unit that is receiving an ASI transport stream and multiplexing the services.

"Upstream Device" refers to a unit that is supplying the ASI transport stream.

Example:

If my "Upstream Device" is generating a transport stream with 2 services with an aggregate rate of 50 Mb/s then the "ASI Reserve" for my "Downstream Device" should be set to 50 Mb/s.

The TMR of my "Downstream Device" needs to be configured to allow for the incoming services as well as it's locally encoded service. If the user wanted to receive a 50 Mb/s ASI TS and encode it's locally service at a rate of 30 Mb/s then the TMR for the "Downstream Device" should be set to greater than 80 Mb/s
 $50 \text{ Mb/s (ASI Reserve)} + 30 \text{ Mb/s (Local Encoding)} = 80 \text{ Mb/s (TMR)}$

Thing to be aware of:

- ASI Remux requires enabling of the ASI Remux Feature Key.
- Setting ASI Input Reserve to zero disables ASI Remux.
- If there is a ASI Input Reserve value set but nothing on the input, then there will be null packets filling the bandwidth allocated for the ASI Input.
- If Upstream and Downstream services have PID or Service Number conflicts (meaning they are the same value) the MPTS of the Downstream EN can and will be corrupt.
- ATSC tables are not supported on the ASI input. DVB and MPEG are.
- The downstream drops all Ingress tables and rebuilds only PAT, SDT and NIT with the upstream services information.
- Users should ensure that the same table 'types' are being used (DVB to DVB, MPEG to MPEG) to reduce SI table packet incompatibility issues.
- If the Upstream Device is supplying more data than is allocated by ASI Input Reserve, then there Upstream services are truncated and packets are lost. Locally

encoded service is not affected by this condition.

- Null packets are stripped from the incoming ASI TS.
- There is no "Table Mapping" functionality with ASI Remux. Ingress tables are copied to the egress.
- If the user attempts to set a TMR and an ASI Input Reserve that does not allow enough bandwidth for the locally encoded service (dependent on resolution and encoding modules) the TMR will be auto calculated to allow for ASI Reserve and minimum value allowed for locally encoded service.
- TMR is currently capped at 150 Mb/s ASI. Input Reserve is currently capped at 100 Mb/s.

TMR and locally encoded services take priority over remuxed services. Therefore if TMR is set to a rate that does not allow enough bandwidth for native encoding, then the ASI Reserve setting will be truncated

EN-XX ASI Remux with Manual PID Mapping

Terminology:

Transport Stream - A stream of 188-byte transport packets that contains audio, video and data belonging to one (SPTS) or several (MPTS) programs.

PID - Packet Identifier. This unique integer value identifies elements in the transport stream such as tables, data, or the audio for a specific program

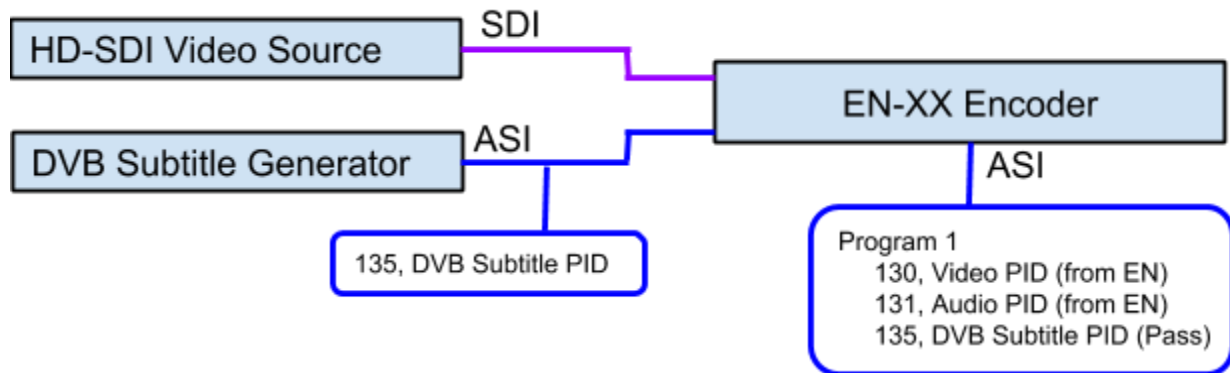
PAT - Program Association Table. This MPEG-2 table lists all the programs contained in the transport stream and shows the PID value for the PMT associated with each program. The PAT is always found on PID 0x0000.

PMT - Program Map Table. This MPEG-2 table specifies PID values for components of programs.

The Adtec EN-3X and EN-100 encoders have an ASI input available for the ASI remux feature. Further information can be read about ASI Remux in the ASI Remux article. In some cases, users may want to add custom PID's from third party generators, such as a DVB Subtitles, into the main video programming. With a custom application, the standard ASI remux feature would not work without additional configuration. To keep the system open-ended and to allow any type of special passthrough application, we have allowed the user to configure *any* type of PID passthrough.

Some DVB Subtitle Generators do not generate MPEG Transport Stream Tables (PAT, PMT). In order to associate DVB Subtitle PIDs with the desired program on the EN output, the encoder

PMT must be modified. A wiring diagram and sample PMT view can be seen in the drawing below.



In the example above, a raw PID was sent into the system with no program association. The EN modified the main program PMT, Program 1, to add an additional DVB Subtitle PID entry. As EN encoders do not perform PID conflict resolution at this time, the PID's inserted into the system should not conflict with other PID's utilized by the EN-31.

To configure ASI Passthrough of DVB subtitles, visit the Manual PIDs tab. This tab contains PMT template entries that will be used to insert into the PMT.

The screenshot shows the 'Manual PIDs' configuration interface. At the top, there are three tabs: 'Service PIDs', 'Manual PIDs', and 'Manual PID Mapping'. Below the tabs are 'Apply' and 'Cancel' buttons. The 'Manual PIDs' section has a 'Manual PIDs ?' label and a 'Clear All PIDs' button. Below this is a table with the following columns: 'Manual PID 1', 'Hex:', 'Dec:', 'Type:', and 'Descriptor:'. The table contains one entry with the following values: 'Manual PID 1' is empty, 'Hex:' is '0x0087', 'Dec:' is '135', 'Type:' is '6', and 'Descriptor:' is '52010259086974611000020002'. There is a 'Clear PID' button to the right of the table.

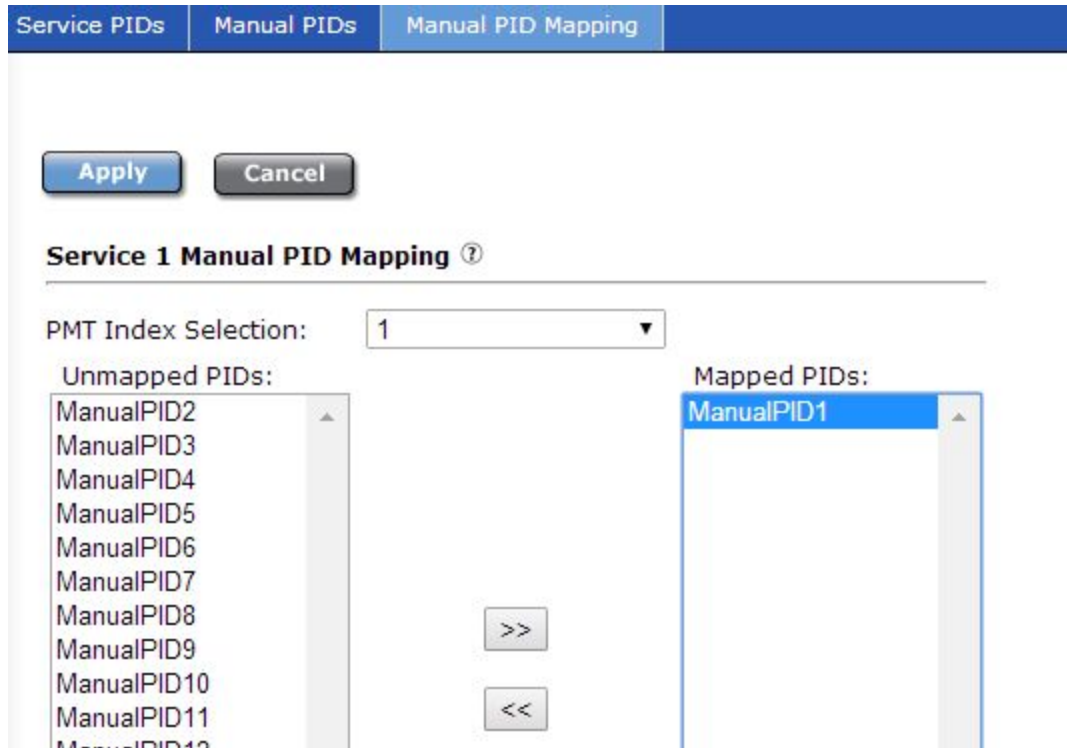
Manual PID 1	Hex:	Dec:	Type:	Descriptor:
	0x0087	135	6	52010259086974611000020002

The user will need to know:

- The PID number of which they would like to pass. This can be entered into the Hexadecimal or Decimal fields.
- The Stream Type identifier of the PID that will be written into the PMT. This can be entered in decimal only.
- The Descriptor of the PID that will be written into the PMT. This field is entered as hexadecimal pairs where each pair represents a byte field. Up to 32 pairs (64 characters) can be entered.

In the DVB Subtitle example, the PID is 135, DVB Subtitles use stream type 0x06 and a sample DVB descriptor with Italian language is 52010259086974611000020002.

The user will then need to map the entry into the associated PMT by visiting the Manual PID Mapping tab. The Italian DVB Subtitle PID was entered into the first manual PID configuration. This can be mapped by moving the associated PID from the 'Unmapped PIDs' box into the 'Mapped PIDs' box.



For dual encoder products, the Service 1 heading refers to the first logical encoder. The PMT Index selection refers to the first or second program being generated by the logical encoder. In most applications, this should always be 1.

Once configured, the encoder will have a new PMT with an additional DVB-Subtitle subtitle entry. It will be described as stream type 6 with an Italian language descriptor and referencing PID 135. It is up to the user to verify accuracy of all information entered.

To aid in user configuration a few common stream types are below.

Stream Description	Stream Type (Decimal)
--------------------	-----------------------

ISO_IEC_11172_VIDEO1	1
ISO_IEC_13818_VIDEO	2
MPEG1_Layer2	3
MPEG2_Part3	4
ISO_IEC_13818_PRIVATE	5
ISO_IEC_13818_PES_PRIVATE	6
DVB_AC3_AUDIO	6
ISO_IEC_13522_MHEG	7
DSM_CC	8
ITU_T_REC_H222_1	9
ISO_IEC_13818_6_Type_A	10
ISO_IEC_13818_6_Type_B	11
ISO_IEC_13818_6_Type_C	12
ISO_IEC_13818_6_Type_D	13
ISO_IEC_13818_1_Aux	14
AAC	15
ISO_IEC_13818_7_AUDIO_ADTS	15
AAC	17
H264_VIDEO	27
AVC_VIDEO	27
DCII_VIDEO	128
DOLBY_AC3	129
DCII_SUBTITLES	130

DVB Specification for Service Information (SI) in DVB systems. Descriptor information can be reviewed here.

Chapter 5 - Appendix

Appendix A - GNU General Public License

Version 2, June 1991 Copyright (C) 1989, 1991 Free Software Foundation, Inc.

59 Temple Place, Suite 330, Boston, MA 02111-1307 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU GENERAL PUBLIC LICENSE TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you". Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program. You may charge a fee

for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program. In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically

receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program. If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances. It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice. This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

<one line to give the program's name and a brief idea of what it does.> Copyright (C) <year> <name of author>
This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA 02111-1307 USA

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

Gnomovision version 69, Copyright (C) year name of author Gnomovision comes with ABSOLUTELY NO WARRANTY;
for details type `show w'. This is free software, and you are welcome to redistribute it under certain conditions;
type `show c' for details.

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than `show w' and `show c'; they could even be mouse-clicks or menu items--whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program `Gnomovision' (which makes passes at compilers) written by James Hacker. <signature of Ty Coon>, 1 April 1989 Ty Coon, President of Vice

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Library General Public License instead of this License.

Appendix B - Technical Specifications

Base Model (EN100)

Inputs

SD-SDI / HD-SDI / 3G-SDI

Use: Video & Audio input

Standard: SD - SMPTE 259M-C - 270Mbit/s with embedded audio per SMPTE 272M A, B, and C. HD - SMPTE 292M - 1.485Gbit/s with embedded audio per SMPTE 299M. 3G-SDI Level A and Level B.

Connector: BNC (75 Ohm). Auto Detect SD/HD/3G or manual configuration.

Note: This connector serves as the DVB-ASI input when configured for ASI receive mode. This mode allows for the use of the modulator 'PASSTHROUGH' feature.

SFP Slot

Use: Video & Audio input

Standard: With optional SFP Optical module, supports SD-SDI, HD-SDI, and 3G-SDI (3G-SDI Level A and Level B).

Connector: Open SFP cage for optional SFP optical module.

CVBS

Use: Video input

Standard: SD NTSC or PAL D1 Composite Video Input

Connector: BNC (75 Ohm)

AES Audio

Use: Digital audio input (x8 pairs or x16 channels) for uncompressed LPCM or compressed bit stream processing

Standard: AES3

Connector: Eight BNC (75 Ohm)

SDI Embedded Audio

Use: Digital audio input (x8 pairs or x16 channels) for uncompressed LPCM or compressed bit stream processing

Standard: Digital audio embedded per SMPTE 272M (SD) and SMPTE 299M (HD)

Connector: SFP module or BNC (75 Ohm)

Analog Audio

Use: Analog Balanced Stereo input (x2). Analog audio input via DB15 male connector. Clip level 18dB.

Connector: DB15 (10 kohm)

*** See "DB15-M Analog audio input pinout" in this Appendix.

Outputs

DVB-ASI

Use: Transport Stream output. Physical interface 100Mbit/s. ASI concurrent with TSoIP (GigE) and RF Tx (DVBS/S2).

Standard: ISO13818-1 MPEG 2 Transport Stream per EN 50083-9:1997 (188 byte only)

Connector: Three BNC (75 Ohm)

GigE Transport Over IP (TSoIP)

Use: Transport Stream Output, but may also be used for control. Four (4) unique TCP, UDP, or RTP (RFC 3550) encapsulated routes with SMPTE 2022 (COP3 FEC). TSoIP (GigE) concurrent with ASI and RF Tx (DVBS/S2).

Standard: MPEG 2 RTP v2 transport (RFC 3550)

Output Rates: 1 - 150Mbps (188 byte DVB packet size, 7 per IP packet)*

Standard: MPEG 2 UDP transport

Output Rates: 1 - 150Mbps (188 byte DVB packet size, 7 per IP packet)*

Standard: RTP SMPTE 2022-1 2007 FEC

Output Rates: 1 - 150Mbps (188 byte DVB packet size, 7 per IP packet)*

Standard: TCP Transport

Output Rates: 1 - 25Mbps (188 byte DVB packet size, 7 per IP packet)*

Connection speed: GigE (100/1000BaseT)**

*Overall egress supported bandwidth decreases when using multiple TSoIP streams. The sum of all UDP/RTP streams must fall within the IP supported limit of 200Mb/s. TCP does not support high throughput at this time.

**The user has the ability to transmit IP streams via the GigE or 10/100 management port. When transmitting streams via the 10/100 management port, throughput is limited to the physical interface throughput.

Connector: 8 pin RJ45

Communications

COM2 Serial Port

Use: API Serial Communication Interface

Default Baud Configuration: 38,400 bps 8 data bits 1 stop bit no parity

Connector: 8 pin RJ45 (supplied with DB9 to RJ45 adapter)

COM1 Serial Port

Use: Serial Port Used for Troubleshooting (Terminal)

Baud Configuration: 115,200 bps 8 data bits 1 stop bit no parity

Connector: 8 pin RJ45 (supplied with DB9 to RJ45 adapter)

RS422

Use: integration with non-linear editor workstations

Standard: Sony 9 PIN Protocol

Default Baud Configuration: 38,400 bps 8 data bits 1 stop bit no parity

Connector: DB9 Female

Ethernet Port

Use: ethernet port used for network control, but can be used for TSoIP

Format: IPv4 Ethernet 10/100BaseT

Communication Methods: SNMP, FTP, Telnet, HTTP, TSoIP

Connector: 8 pin RJ45

Parallel Port

Use: GPIO DB9 parallel port used for custom triggering / integration

Connector: DB9 Male

GPIO Port

Use: GPIO DB9 parallel port used for Encode, Stop, Status/Alarms, and SCTE 35 generation

Connector: DB9 Male

Video - VE1 Hardware Option

H.264 MPEG-4 SD (ITU-T H.264 ISO 14496-10)

Format: Standard Definition D1 NTSC 29.97 fps (480i59.94) and PAL 25 fps video (576i50) Level 3.0 to Level 3.2

4:2:0 Chroma: High Profile, Level 3.0

4:2:2 Chroma: High Profile, Level 3.0*

Pre-Processing

Encoder Filters: Temporal & Spatial (Median)

Time Base Correction (TBC) on Analog and SDI inputs

Data rates: 0.7 - 20Mb/s

H.264 MPEG-4 HD (ITU-T H.264 ISO 14496-10)

Format: 1080p59.94, 1080p50 (Level 4.2)**

Format: 1080i59.94, 720p59.94, 1080i50, 720p50 (Level 4.1)

420 Chroma: High Profile, Level 4.1

422 Chroma: High Profile, Level 4.1*

Pre-Processing

Encoder Filters: Spatial (Median)

Data Rates: 1.5 - 80Mb/s

* Support for HD 420 based on feature key.

* Support for HD 422 based on feature key.

Group of Pictures (GOP)

1-30. I, IP, IBP, IBBP, Adaptive GOP

Interlaced Encoding

Field / Frame / MBAFF / PAFF

Motion Estimation and Precision

Precision : 1, 1/2, 1/4 Pixel

Block Size: 16 X 16, 16 X 8, 8 X 16, 8 X 8, 4 X 4

Entropy Coding

CAVLC, CABAC

Video - VE2 Hardware Option

H.264 MPEG-4 HD (ITU-T H.264 ISO 14496-10)

Format: 1080i59.94, 720p59.94, 1080i50, 720p50 (Level 4.1)

8 Bit 422 Chroma: High Profile, Level 4.1

10 Bit 422 Chroma: High 10 Profile, Level 4.1

422 Data Rates: 4.5 - 80Mb/s

8 Bit 420 Chroma: High Profile, Level 4.1

420 Data Rates: 3.5 - 62.5Mb/s

H.264 MPEG-4 SD (ITU-T H.264 ISO 14496-10)

Format: Standard Definition D1 NTSC 29.97 fps (480i59.94) and PAL 25 fps video (576i50) Level 3.0 to Level 3.2

4:2:0 Chroma: High Profile, Level 3.0

4:2:2 Chroma: High Profile, Level 3.0

Time Base Correction (TBC) on Analog and SDI inputs

Data rates: 0.7 - 20Mb/s

MPEG-2 SD

Format: Standard Definition D1 NTSC 29.97 fps (480i59.94) and PAL 25 fps video (576i50) Level

420 MP@ML

Data Rates: 1 - 15Mb/s

422 MP@HL

Data Rates: 1 - 50Mb/s

MPEG-2 HD

Format: 1080i59.94, 720p59.94, 1080i50, 720p50

420 MP@HL Data Rates: 5 - 80Mb/s

422 422P@HL Data Rates: 6 - 80Mb/s

Group of Pictures (GOP)

Dynamic 'AUTO' GOP. 1-255. IP, IBP, IBBP, Adaptive GOP

Entropy Coding

CAVLC, CABAC

Audio Encode

MPEG 1 Layer 2 audio (4 pairs) encode standard. 4 additional pairs are optional for a total of 16 channels.

48 Khz. Bit rates include 32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384 Kbit/s.

Stereo, Mono, Dual Mono.

Audio Passthrough

- Dolby E 5.1/2.0/1.0, AC-3, LPCM, Linear Acoustic

Audio Signal Generation

- MPEG 1 Layer 2 audio tones user selectable frequency per pair from 440 hz to 2.5Khz. Group L/R mute or Pair L/R mute. No audio inputs are required to generate audio tones.

Transport Table Generation

MPEG Program Specific Information (PSI) table compliance:

PAT / CAT / PMT

DVB Service Information (SI) static table compliance: (Dynamic Option)

SDT / NIT / EIT / TDT/TOT

ATSC A65B (PSIP) static table compliance (Dynamic Option)

MGT (TVCT) – Terrestrial / STT / RRT / EIT 0-3

Ancillary and Waveform Data

(V/H) ANC and WSS Video User Data

- Waveform (Composite or SD SDI):

Closed Captions per CEA-608-C (2005), (Carriage per SCTE DVS-157, ATSC-A_72).

Wide Screen Signaling (WSS) per ETSI EN300_294 V1.4.1 (2003-04), (Carriage per ATSC-A_72 AFD).

Teletext per ITU-R BT.653 (Carriage per ETSI EN 300_472 V1.2.1 (2003-01)

AMOL

- (V/H) ANC per SMPTE 291M (Native via SD/HD SDI):

Closed Captions per CEA-708 (Carriage per ATSC-A_72).

Teletext/Subtitles per OP47 (Carriage per ETSI EN 300_472 V1.3.1 (2003-01).

VITC per SMPTE 12M-2-2008 (Carriage per SMPTE 2038-2008, also inserted in GOP headers).

AFD/Bar Data/Pan Scan per CEA-CEB16 (2006) per SMPTE 2016 (Carriage per ATSC-A_72).

Waveform Bridging and Conversion of Video User Data

- CEA 608 to CEA 708 bridging

- Caption Carriage:

CEA-608 via Composite merged with SD or HD Video via SDI (Similar frame rates required)

- Teletext Carriage:

Waveform Teletext via Composite merged with SD or HD Video via SDI

- WSS Carriage:

Waveform WSS via Composite merged with SD Video via SDI

Encryption

DVB Common Scrambling Algorithm Basic Interoperable Scrambling System (BISS). Mode 0 Clear (Free To Air - FTA), Mode 1, and Mode E.

System and Host

Alarms

- Front Panel LED, Web UI, SNMP, GPIO

Physical and Operational

Physical / Environmental

1 RU chassis (19" X 18" X 1.65" / 482mm x 457mm x 44mm)
Weight – 9-14lbs. Dependent on installed options

Power

Input Voltage: Redundant auto switching dual 100 - 240 VAC 50/60Hz (Standard)
Power Consumption Start-up: 46 Watts
Operational: 45 Watts
(base consumption, actual consumption depends on installed options)

Operational

Ambient operating temperature: -20 C to 40 C.
Ambient storage temperature: -30 C to 80 C.
Non-condensing relative humidity range: 30% to 85%

Safety

CE

Optional SFP module (purchased separately)

Sensitivity: -22dBm
Overload: 0dBm
Exceeds SMPTE 297-2006 specifications
Robust error free reception of signals from 50Mbps to 3Gbps
Supports SD-SDI, HD-SDI and 3G-SDI
Hot-pluggable
RoHS compliant

IF Modulator (option) - IF-01

Requires factory installation

Modulation Scheme Support: QPSK / 8PSK / 16APSK / 32APSK*

Interface Rate: 50 kbit/s- 216 Mb/s (FEC-& interface dependent)

Baudrate range: 0.06-45/68 Mbaud

Selectable baseband shaping : 20%, 25%, 35%

DVB-S2 compliant per EN 302307

DVB-S compliant per EN 300421

DVB-DSNG compliant per EN301210

Output level: -30 to +5dBm (+/- 2dB)

Frequency: 50 to 180MHz

Connector: Two BNC (50Ohm)**

* software keys are required to unlock full hardware support. Base modulator supports DVB-S QPSK 15 Mbaud.

**MAIN BNC: IF Frequency (50-180MHz), MONITOR BNC: Fixed L-Band 1080MHz -45dBm

L-Band Modulator (option) - LB-01

Requires factory installation

Modulation Scheme Support: QPSK / 8PSK / 16APSK / 32APSK*

Interface Rate: 50 kbit/s- 216 Mb/s (FEC-& interface dependent)

Baudrate range: 0.06-45/68 Mbaud

Selectable baseband shaping : 20%, 25%, 35%

DVB-S2 compliant per EN 302307

DVB-S compliant per EN 300421

DVB-DSNG compliant per EN301210

Output level: -35 to +5dBm (+/- 2dB)

Frequency: 950 to 2150MHz

Connector: Two BNC (50Ohm)**

* software keys are required to unlock full hardware support. Base modulator supports DVB-S QPSK 15 Mbaud.

**MAIN BNC: L-Band Frequency (950-2150MHz), MONITOR BNC: Fixed Power Level -45dBm

L-Band Modulator + 10MHz (option) - No longer available

Requires factory installation

Modulation Scheme Support: QPSK / 8PSK / 16APSK / 32APSK*

Interface Rate: 50 kbit/s- 216 Mb/s (FEC-& interface dependent)

Baudrate range: 0.06-45/68 Mbaud

Selectable baseband shaping : 20%, 25%, 35%

DVB-S2 compliant per EN 302307

DVB-S compliant per EN 300421

DVB-DSNG compliant per EN301210

Output level: -35 to +5dBm (+/- 2dB)

Frequency: 950 to 2150MHz

10MHz Option: Adds option to add 10MHz onto L-Band output

Connector: Two BNC (50Ohm)**

* software keys are required to unlock full hardware support. Base modulator supports DVB-S QPSK 15 Mbaud.

**MAIN BNC: L-Band Frequency (950-2150MHz), MONITOR BNC: Fixed Power Level -45dBm

IF, L-Band Modulator + 10MHz (option) - IF/LB/10M-01

Requires factory installation

note*: software keys are required to unlock full hardware support.

Compliant standards supported: DVB-S (EN 300421), DVB-S2 (EN 302307) and DVB-S2X (DVB-S2 Extensions)

Modulation Scheme Support: QPSK / 8PSK / 16APSK / 32APSK

DVB-S QPSK FEC rates: 1/2, 2/3, 3/4, 5/6, 7/8

DVB-S2 QPSK FEC rates: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10

DVB-S2 8PSK FEC rates: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10

DVB-S2 16APSK FEC rates: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10

DVB-S2 32APSK FEC rates: 3/4, 4/5, 5/6, 8/9, 9/10

DVB-S2X QPSK 13/45, 9/20, 11/20, 11/45, 4/15, 14/45, 7/15, 8/15, 32/45

DVB-S2X 8APSK 5/9-L, 26/45-L

DVB-S2X 8PSK 23/36, 25/36, 13/18, 7/15, 8/15, 26/45, 32/45

DVB-S2X 16APSK 1/2-L, 8/15-L, 5/9-L, 26/45, 3/5, 3/5-L, 28/45, 23/36, 2/3-L, 25/36, 13/18, 7/9, 77/90, 7/15, 8/15, 32/45

DVB-S2X 32APSK 2/3-L, 32/45, 11/15, 7/9, 2/3

DVB-S2X 64APSK 32/45-L, 11/15, 7/9, 4/5, 5/6

DVB-S2X 128APSK 3/4, 7/9

DVB-S2X 256APSK 29/45-L, 2/3-L, 31/45-L, 32/45, 11/15-L, 3/4

Interface Rate: 50 kbit/s- 150 Mb/s (modcod & interface dependent)

Baudrate range: 0.05 - 54 Mbaud. (modcod dependent)

Clean Channel Technology - Roll-off factors: 5%, 10%, 15%, 20%, 25%, 35% for all modulations

RF Carrier ID compliant

IF and L-Band outputs are not active simultaneously

IF Output

Output level: -35 to +5dBm (+/- 2dB)

Frequency: 50 - 180MHz

Connector: BNC (50Ohm)

L-Band Output

Output level: -35 to +5dBm (+/- 2dB)

Frequency: 950 - 2150MHz

Connector: BNC (50Ohm)

L-Band Monitor Output

Output level: -45 dBm (+/- 5 dB)

Frequency: Follows L-Band main output or fixed at 1050 MHz when IF output active.

Connector: BNC (50Ohm)

note*: When IF is selected, monitor will be fixed at 1080MHz in future firmware update.

Reference Input

Level: -3 to +7 dBm

Frequency: 10 MHz

Connector: BNC (50Ohm)

Appendix C - DB15-M Analog audio input pinout:

Adtec sells an analog audio input cable as part of our accessory offerings. If you prefer to make your own cable, below is the pinout.

Pin	Signal
1	Channel 0 left +
2	No Connection
3	Channel 0 Right -
4	Channel 1 left +
5	No Connection
6	Channel 1 right -
7	Ground
8	No Connection
9	Channel 0 left -
10	Channel 0 right +
11	No Connection
12	Channel 1 left -
13	Channel 1 right +
14	No Connection
15	Ground

Appendix D - Adtec Digital Support & Service

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:** <http://adtecdigital.com/support/support-request>

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

Preparing 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.

SLA Options

Effective January 1, 2014

For questions, please email slaquestions@adtecinc.com

- **SLA STANDARD***
Services: Includes initial product orientation
Technical support M-F 8AM-8PM (EST)
Firmware and software upgrades
Includes repair expenses**
Includes ground shipping within US
International shipping is extra
Fees: Free for one year after purchase
- **SLA PRIORITY 24***
Services: SLA Extended Warranty plus...
Technical support 24x7x365
Expedited shipping is extra
- **SLA PREMIUM 24***
Services: SLA Priority 24 plus...
Next business day advance loaners
- **SLA EXTENDED WARRANTY***
Services: Extends warranty after year one
Includes repair expenses
Expedited shipping is extra
- **SLA LEGACY**
Services: Includes initial product orientation
Technical support M-F 8AM - 8PM (EST)
Firmware and software upgrades
Includes Duet, Soloist 2/ 2S, Mirage, edje1013/1015/2000/2100/2110.
Most legacy products cannot be repaired
- **SLA SESSION SUPPORT**
Services: Technical support M-F 8AM - 8PM (EST)
Includes support for 5 days after first call
- **SE SUPPORT**
Services: Event based on-site technical representation

*Available for up to three years after purchase for Adtec manufactured products only
**Excludes equipment that has been subject to misuse, negligence, or accident

All SLAs are subject to terms and conditions of sale. For details see
adtecdigital.com/sales/terms