DTA*3050*

10 Port ASI / IP Multiplexer and
Media Router

ADTEC
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USER GUIDE

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Product Overview

Introduction - About Digital Turn Around

Digital Turn Around (DTA) is a commonly required function for Terrestrial, Cable, and IPTV distribution. Adtec's DTA-3050-HW3 provides the means of receiving up to ten physical Single (SPTS) or Multiple (MPTS) Program Transport Streams and re-multiplexing, table processing, ciphering and routing to a single triplex-mirrored Asynchronous Serial Interface (ASI) and or Gigabit Ethernet (GIGE) interface.

Applications

- **Telco IPTV / Broadband IPTV:** Cost-effective and reliable delivery of video, audio and data services to an unlimited number of consumer set top boxes or PC/MAC clients on an IP network.
- **Satellite Digital TV:** Aggregate video, audio and data services, process services, inject tables, encrypt and pass them via ASI or IP to modulators supporting traditional DVBS and the emerging DVBS2 or other satellite distribution method.
- **Terrestrial Digital TV:** Aggregate video, audio and data services, process services, inject tables, encrypt them and pass them via ASI or IP to modulators supporting ATSC, DVBT, DVBH, DMB, or other terrestrial distribution method.
- **Cable Digital TV:** Aggregate video, audio and data services, process services, inject tables, encrypt them and pass them via ASI or IP to modulators supporting traditional DVBC (Annex A, B, C) distribution method.
- **IP over MPEG 2 Transport:** Delivery of IP data services to set top boxes or computers over MPEG-2 transport using IP encapsulation.

Benefits of an Adtec Digital Turn Around Router

- **Conditional Access:** The DTA-3050 provides DVB-CSA encryption and AES conditional access encrypt and decrypt capabilities. DVB-CSA encryption is available as a Simulcrypt based interfacescompatible with most major DVB-CSA CAS vendors. AES decryption and encryption include support for Verimatrix VCAS for residential set top and computer-based decryption.
- **Aggregation of ASI, SMPTE-310, or IP based SPTS or MPTS services:** The DTA-3050 provides ten ASI input ports enabling it to aggregate locally encoded SPTS or re-muxed MPTS from encoders, receivers, video servers or other devices providing MPEG 2 Transport via ASI or IP.
- **IPTV:** Gigabit Ethernet distribution of digital television services includes MPTS, SPTS over UDP, RTP for Set Top or computer decoding and MPTS over UDP or RTP for bundled distribution (Digital Simulcast).
- **ASI:** An optional 3 port mirrored ASI output interface provides integration with traditional distribution methods including Cable, Satellite, and Terrestrial.
- **SMPTE-310:** An optional 2 port mirrored SMPTE-310 output interface provides integration with ATSC distribution.
- **Flexible Configuration & Control:** Controlling and configuring the DTA-3050 is easy. Whether using the integrated front panel keypad and LCD, Terminal or remote Web page interface, they respond rapidly and reliably to the desires of the operator.
- **Dynamic EIT Injection:** Adtec's free EIT scheduler service DTVGuide comes standard with all DTA products.

About Your Purchase

Thank you for purchasing Adtec's DTA-3050 Digital Media Multiplexer/Router! The DTA-3050 is a revolutionary ASI MPEG 2 Transport Multiplexer and Digital Media Router designed for DVB-ASI distribution applications.

The DTA-3050 represents a revolutionary enhancement for real-time multiplexing applications that require high reliability and broadcast quality without requiring a large budget. The DTA-3050 is capable of providing aggregation of up to ten (10) Single Program Transport Streams (SPTS) or Multiple Program Transport Streams (MPTS) over copper ASI MPEG 2 inputs and producing a Multiple Program Transport Stream (MPTS) output over ASI, SMPTE 310M, or GigE. The DVB-ASI output is targeted to cable and digital satellite television and digital television (DTV) applications over 8VSB (19.39 Mbps) using SMPTE 310M.

All Adtec DTA-3050 Multiplexer/Routers provide table support for MPEG-2 PSI, DVB SI, ATSC PSIP, and DigiCipher II tables. Additionally, they support encapsulation of IP packets via Multi-Protocol Encapsulation (MPE) as defined by ISO/IEC 13818-6 and conditional access: support for the Common Scrambling Algorithm (CSA) using the Ethernet SimulCrypt Interface and Advanced Encryption Standard (AES) with RSA public/private key distribution.

Key features of the Multiplexer/Router include:

- Highly-Reliable Embedded Design based on Linux Operating System
- 10 copper ASI Inputs
- Copper ASI Outputs (triple-mirrored outputs)
- SMPTE 310M (dual-mirrored outputs)
- PCR Restamping
- PID Remapping
- LCD/Keypad display for front panel management and control
- 13818-6 Multiprotocol Encapsulation of Multicast and Unicast IP Data (Optional)
- SPTS and MPTS to MPTS aggregation
- DCII Input to DVB feeds
- PSIP Table Generation
- Conditional Access
  - ♦ Built in DVB Common Scrambler Algorithm (CSA) (Optional)
  - ♦ AES encryption for Verimatrix (Optional)
- Transport Stream over IP

Notices and Disclaimers

Hardware Specification & Requirements

Front Panel

Front Panel

Front Panel Features:

- 8 Button Tactile Raised keypad:
  - ♦ Mode, Select, Enter, Escape, Up, Down,Left, Right
- Blue Translucent LCD
  - ♦ 20 character by 2 row
- Front Panel Host LED's
  - ♦ Power, Alarm, Link, Busy, MPE
- Front Panel LEDs
  - ♦ In : 1 - 10 ASI
  - ♦ Out : Alarm, ASI, SMPTE 310, CA, GigE

Back Panel

Back Panel Image:
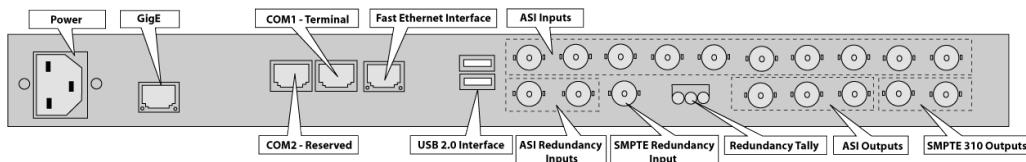
Physical Dimensions

Dimension	Value
Heighth	1.75 inches (44.5mm)
Width	19 inches (483mm)
Depth	16 inches (406mm)
Footprint	1 rack unit
Weight	13 pounds

Power Requirements

- 70-240 VAC switching power supply
- 50/60 Hertz
- Rated at 94 Watts; return nominal usage 20 Watts

ASI Inputs

- ASI x 10 (BNC)
- 188 or 204 Byte mode
- SPTS or MPTS
- 210 Mbps per input
- 256 PIDs per input
- Input Modes
  - ♦ Auto (Remap all services)
  - ♦ Manual (Add/Drop/Remap PID/Services)
  - ♦ Pass (Pass all services as-is)
  - ♦ MHP Injector
  - ♦ SI Injector

Outputs

- Gigabit Ethernet
    - SPTS over UDP or RTP
    - MPTS over UDP or RTP
    - 210 Mbs
    - Very low jitter
- ASI (model is DTA 3050)
    - Mirrored (BNC x 3)
    - Byte or Burst Mode
        - 54 Mbs Byte
        - 210 Mbs Burst
    - Jitter less than 150 (nS)
- SMPTE-310 (model is DTA 3051)
    - Mirrored (BNC x 2)
    - Byte Mode only
    - 19.39 Mbs fixed
    - SMPTE-310 option includes ASI

Table Processing

- No Tables
- MPEG Tables
    - PAT
    - CAT (if CA is enabled)
    - PMT
- DVB Tables (Add/Drop/Remap DVB Services)
    - NIT
    - SDT
    - TDT/TOT
    - EIT
- ATSC Tables (Add/Drop/Remap ATSC Services)
    - VCT (Cable or Terrestrial)
    - MGT
    - STT
    - RRT
    - EIT (1-4)
- DCII Tables (Add/Drop/Remap Digicypher services to DVB or ATSC)

Conditional Access Encryption

- DVB-Common Scrambling Algorithm (CSA)
- DVB Simulcrypt TS 103 197 v 1.2.1 and SCTE
- OpenCAS ™ DVS-278 compliant
- FIPS 140-2 hardware based random number generator (RNG)
- Advanced Encryption Standard (AES)
    - IP Set Top and Computer compatibility
- Approved 3rd Party CA Vendors include:
    - CSA:
        - Irdeto
        - Conax
        - EuroCAS
        - KeyFly
        - Xcrypt
    - AES:
        - Verimatrix

Host Platform

- PowerPC
- Adtec optimized Linux Kernel
- 10/100 Ethernet RJ-45 (Eth 0)
- 10/100/1000 Ethernet RJ-45 (Eth 1)
- Serial Port (RJ-48)
- USB 2.0 (2)

- N.C. / N.O. Tally Interface
- XML Configuration
- HTTP, FTP, Telnet, IP Logging, DHCP,
  - ♦ (XCP Adtec encrypted layer 3 protocol)

Environmental Requirements Operational

Factor	Conditions
Temperature	0 degrees C to +50 degrees C (+32 degrees F to +122 degrees F)
Humidity	5% to 95% (non-condensing)
Cooling	Convection Cooling/Free Airflow
Handling/Mounting	Fixed Use Only

Storage

Factor	Conditions
Temperature	-30 degrees C to +65 degrees C (-22 degrees F to +149 degrees F)
Humidity	5% to 95% (non-condensing)

Specifications Legal Disclaimer

Note: Specifications subject to change without written notice. Copyright 2008-2010 Adtec Digital. Product and company names may be trademarks or registered trademarks of their respective companies.

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

Lithium Battery Safety Statement

⚠ Lithium Battery Safety Statement ⚠

Caution:
Lithium battery inside. Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by battery manufacturer. (US)

Attention:
Contient une pile de lithium. Risque d'explosion dans le cas où la pile ne serait pas correctement remplacée. Remplacer uniquement avec une pile semblable ou equivalente au type de pile recommandé par le fabricant. (FR)

Forsigtig:
Indeholder lithiumbattterier. Risiko for eksplosion, hvis batteriet udskiftes forkert. Må kun udskiftes med samme eller tilsvarende type, som anbefalet af fabikanten. (DK)

Varoitus:
Tämä tuote käyttää laservaloa. Skannerissa on jokin seuraavista tarroista. Lue Huomio-kohta. (FI)

Vorsicht:
Enthält Lithium-Batterie. Bei unsachgemäßem Ersatz besteht Explosionsgefahr. Nur durch gleichen oder vom Hersteller empfohlenen Typ ersetzen. (DE)

Attenzione:
Batteria al litio. Pericolo di esplosione qualora la batteria venga sostituita in maniera scorretta. Sostituire solo con lo stesso tipo o equivalente consigliato per il fabbricante. (IT)

Atenção:
Contém pilha de lítio. Há perigo de explosão no caso de uma substituição incorreta. Substitua somente pelo mesmo tipo, ou equivalente, recomendado pelo fabricante. (PT)

Varning:
Innehåller litiumbatteri. Fara för explosion om batteriet är felaktigt placerat eller av fel typ. Använd endast samma eller motsvarande typ batterier rekommenderade av tillverkaren. (SE)

Advarsel:
Innmontert Lithium batteri. Eksplosjonsfare ved feil montering av batteri. Benytt kun batteri anbefalt av produsent. (NO)

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.

Getting Started

Installation

The DTA-3050 can be installed and made operational in minutes.

1. First, the unit must be installed into a one-rack unit (1U) 19" rack slot, or any secure space where it cannot be easily moved.
2. Power should be applied to the unit and configured with a valid IP address, subnet mask, and default gateway via the front panel via the LCD/Keypad for details on setting the IP parameters via the front panel refer to the procedures in this section.
3. Once the IP parameters have been configured, configuration may take place via the front panel or over the Local Area Network via a Web browser.
4. Select the output type: ASI (default) or SMTPE 310M.
   - If using IP only, please select ASI.
   - When setting the unit up for ASI, a rate must be assigned to the output port before it should be connected to a modulating device.
5. From a PC connected to a LAN, start a Web browser and in the URL box type the IP address configured.
   - Note, if no IP address has been configured, the default IP address can be used (192.168.10.48).

Tour the DTA3050

Front Panel Layout
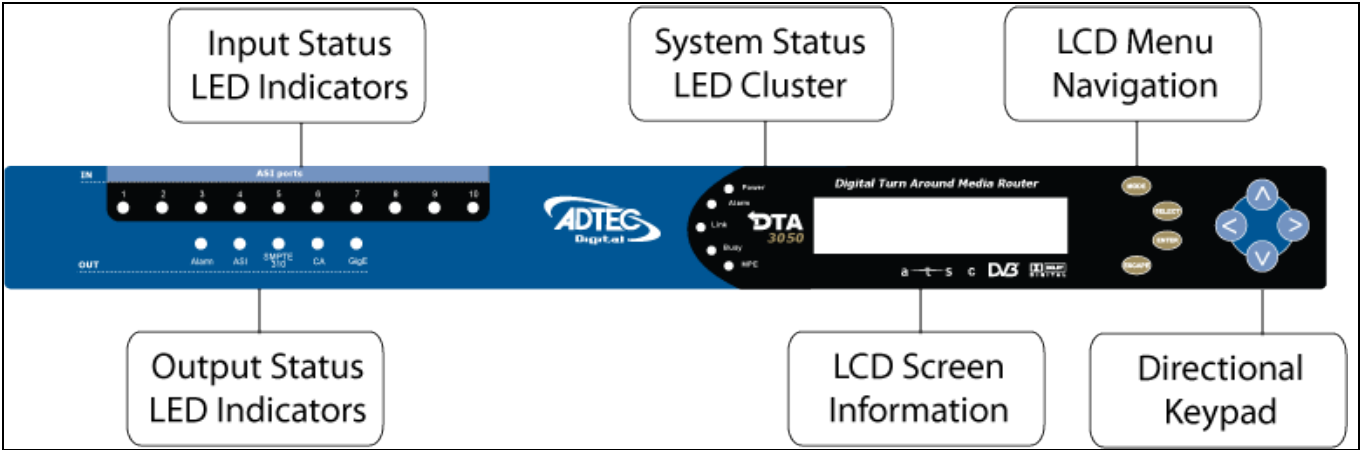
Features and Controls:

Item	Function
Arrow buttons	move cursor on the LCD
System Programming Action Buttons	
Mode programming button	selects a menu for configuring the unit's operations; 13 available plus 3 informational "read only" menus
Select programming button	chooses a command or field for the router to execute
Enter programming button	confirms/stores a command and/or data for the router to execute
Escape programming button	exits a field or moves up to the next menu level
LCD display	shows selections available or selected for directly programming the router

Item	Function
System Status LED Indicator Cluster	
Power LED indicator	indicates if power is available to the unit; see LED Indicators for more information
Alarm LED indicator	indicates if a system alarm is in force
Link LED indicator	indicates if the unit is linked into a network; see LED Indicators for more information
Busy LED indicator	indicates if the unit is receiving or sending traffic; see LED Indicators for more information
MPE LED indicator	indicates if multiprotocol encapsualtion is enabled; see LED Indicators for more information
Input Status LED Indicators	
ASI Input LEDs (10)	indicates status/function on each of the ten ASI ports; see LED Indicators for more information
Output Status LED Indicators	
Output Alarm LED	indicates if an Output alarm is in force
Output ASI Status LED	indicates if output is occuring in this mode, and of what level; see LED Indicators for more information
Output SMPTE 310 Status LED	indicates if output is occuring in this mode, and of what level; see LED Indicators for more information
Output CA Status LED	indicates if Conditional Access is enabled (indicates on/off)
Output GigE Status LED	not currently used; no functionality. See GigE Indicator on the **back** panel, described below.
LCD display	20-line liquid-crystal display for direct programming of the unit

Back Panel

Illustration:
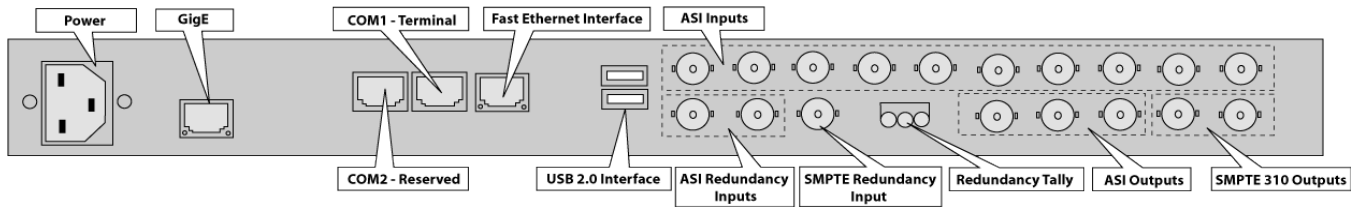
Connectivity Features

Connection	Purpose
Power	standard 12V A/C electrical power connection
GigE	used for IP Egress
Terminal Interface	used to communicate with a PC for serial communications
Fast Ethernet Interface	management of the DTA-Control GUI
Serial Port	used to communicate with redundancy switch
USB 2.0 Interface (2)	for future use (not currently supported in documentation)
ASI Inputs (10)	Asynchronous Serial Inputs (receive programming)
ASI Redundancy Inputs (2)	used to link 2 Muxers (DTA3050's) in tandem; one as primary, one as backup
SMPTE Redundancy Input	used to link 2 Muxers (DTA3050's) in tandem; one as primary, one as backup
Redundancy Tally	used to hookup an external alarm device
ASI Outputs (3)	triple-mirrored ASI Outputs the first two connectors are used for redundant set-ups
SMPTE 310 Outputs (2)	mirrored SMPTE Output the first connector is used for redundant set-ups

LED Status Indicators

System Indicators

Host Alarm LED- located next to the blue LCD display area.

LED Color	Status
Red	Major Alarm
Yellow	Minor Alarm
Green	No Alarms

Power LED- located next to the blue LCD display area.

LED Color	Status
Green	Power to unit
Unlit	No power to unit

Link LED- located next to the blue LCD display area

LED Color	Status
Green	Link to unit
Unlit	No link to unit

Busy LED- located next to the blue LCD display area

LED Color	Status
Yellow-blinking	Traffic on unit
Unlit	No traffic on unit

MPE LCD- located next to the blue LCD display area (multiprotocol encapsulation)

LED Color	Status
Clear	No MPE data
Yellow	Enabled; no traffic
Green	Enabled; active traffic

Output LEDs

Output Alarm LED - located in "Out" indicator group at left of front panel

LED Color	Status
Red	major alarm until cleared or resolved
Yellow	Minor alarm (until cleared or resolved)
Green	OK- normal operation

Output ASI LED- located in "Out" indicator group at left of front panel (Asynchronous Serial Interface)

LED Color	Status
Red	no egress; overflow
Yellow	Outputting Fills (only when 100%; do not flash green and yellow)
Green	Outputting data
Flashing Green	when unit is configured as the back-up

Output SMPTE 310M LED- located in "Out" indicator group at left of front panel

LED Color	Status
Red	no egress; overflow
Yellow	Outputting fills
Green	Outputting data
Clear	not configured

Output CA LED - located in "Out" indicator group at left of front panel (Conditional Access)

LED Color	Status
Yellow	sharing Conditional Access keys
Green	Conditional Access enabled
Unlit	Not enabled

Output GigE LED

Although there is an LED on the panel, it is non-functional. On the **rear** panel, a functional GigE indicator is found. See Rear Panel Connections in the "Tour the Box" section for a full description.

Input LEDs

ASI Inputs 1-10

LED Color	Status
Red	no sync/no tables
Yellow	port enabled, but no programs are mapped to output
Green	OK- normal operation
Green-flashing	port is a backup in a redundant pair

Setting IP Parameters

The IP Parameters for the unit can be set from either the Front Panel or through a terminal session. Setting it via the Front Panel is easiest, but both methods are described in this topic.

Setting IP Parameters from the Front Panel

The IP address for the unit can be configured through the front panel by following this procedure:

Step	Action
1	Press **"Mode"** twice, **'eth0 IP Address'** will display in the LCD.
2	Press **"Select"**; the cursor will flash.
3	Press the **"Right"** arrow key to move through the IP Address fields; press the **"Up"** and **"Down"** arrow keys to change the values in those fields.
4	Press **"Enter"** when all values have been changed.
5	Press the **"Up"** arrow to display **'eth0 IP Mask'** on the LCD.
6	Press **"Select"**; the cursor will flash.
7	Press the **"Right"** arrow key to move through the the IP Address fields; press the **"Up"** and **"Down"** arrow keys to change the values in those fields.
8	Press **"Enter"** when all values have been changed.
9	Repeat Steps 1-8 to set the eth1 parameters.
10	Press the **"Up"** arrow to display **'Default Gateway'** on the LCD. 'Default Gateway' is the IP Address of your Default Gateway.
11	Press **"Select"**; the cursor will flash.
12	Press the **"Right"** arrow key to move through the the IP Address fields; press the **"Up"** and **"Down"** arrow keys to change the values in those fields.
13	Press **"Enter"** when all values have been changed.
14	Press **"Escape"** until the top menu appears again.

Setting IP Parameters via a terminal (Telnet) session

To set the IP Address via a terminal Telnet session:

Step	Action
1	Attach a serial cable between your DTA's terminal interface and the serial communications port on your PC.
2	Log onto the PC and pull up a command prompt in the terminal communications window.
3	Set IP address and Subnet Mask. 　-Command: ifconfig eth0 xxx.xxx.xxx.xxx netmask xxx.xxx.xxx.xxx.xxx 　　-Substitute the hexadecimal values for the IP Address and Subnet Mask to be used.
4	Set the Default Gateway: 　- Command: route add default gw xxx.xxx.xxx.xxx eth0 　- Substitute the hexadecimal values for the Default Gateway to be used.

Front Panel Programming and Control

The front panel control group (function buttons, arrow keys, and LCD display) can be used to program and control virtually all aspects of the DTA3050's operations. In fact, there are several commands that can only be carried out through the front panel control group. For more information on these commands, please see the "Front Panel Only Control Options" article.

Modes

The mode button is used to access menus which control the major settings and configurations of the unit.

Mode List

Mode	Purpose	# of Sub-menus	User Configurable
Main Menu/Login	log into unit and control access	7	Yes
IP Address	allows entry of IP addresses for various components	10	Yes
Port State 1-10	configures the operation of each of the 10 input ports	8 (per port)	Yes
Output	cycles output of aggregate signal into SMPTE or ASI	2	Yes
Tables	cycles through table formats	3	Yes
IPTV	input of Global Settings and Mapped Programs	2	Yes
Audio Format	DVB audio settings	1	Yes
MPE 1-30	configure settings for Multiprotocol Encapsulation	12	Yes
DECAP 1-5	specifies decapsulization	4	Yes
CA1 1-5	conditional access configuration	16	Yes
ENC RED SWITCH	Encoder Redundancy Switch; used to select PESA LNS8 for redundancy (only supported option)	1	Yes
MUX Redundancy Mode	Defines whether the unit is designated a Primary or Back-up Muxer in a dual-redundancy Mux configuration.	2	Yes
Logs	none-not supported	n/a	n/a
H/W Version	informational only; gives the version number of the installed hardware		No
S/W Version	informational only; gives the version number of the installed on-board GUI		No
O/S Version	informational only; gives the version number of the installed operating system		No

Status Mode

The front panel can be used to completely configure, operate, and maintain the DTA3050.

When first powered up, the unit will activate in **Status Mode**.

- Status Mode shows the following operating parameters:
  - operating bit rate.
  - quantity of data ('D' value).
  - quantity of IP data ('V' value).
    - If there is no IP data, an 'F' value will appear, signifying the quantity of fill data.
- By pressing the "Mode" button, each mode menu can be accessed in turn.
- If there is no user activity from the front panel or GUI, the unit automatically shifts to status mode.
  - The default setting for the for this feature is five minutes; however, it can be user-configured for periods between one and nine minutes.

Administrator Mode

Important: As of Release v.5, all Adtec DTA3050 units are shipped with auto log-out time set to **"None"**. The unit can be configured by any user without going through a log-in procedure.

To set up an auto-time out:

Step	Action
1	Press the **<Up>** arrow twice, until the panel reads **"Auto Logout Time"**.
2	Press **<Select>** until the cursor appears on the word **"NONE"**.
3	Use the **<left>** and **<right arrows>** to select a time from 1-9 (minutes).
4	Press **<Enter>**.
5	**<Escape>** takes you back to the **"Status"** menu.

Logging In: If you must log back in after being timed out, you must log into the unit from the front panel as an administrative user. The default front panel login password is "USER".

To log in, press the following key sequence:

Step	Action
1	Press UP arrow
2	Press SELECT
3	Press ENTER
4	Press RIGHT arrow
5	Press ENTER

Once logged into the unit as an administrative user, the entire suite of configuration possibilities is unlocked for use. Note that changes made in Administrator Mode are **not** permanent until a "save all" command is executed or until the menu times out and returns to Status mode.

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Front Panel Menu Flows

This graphic illustrates the menu flow of the Front Panel in Status and Admin modes:
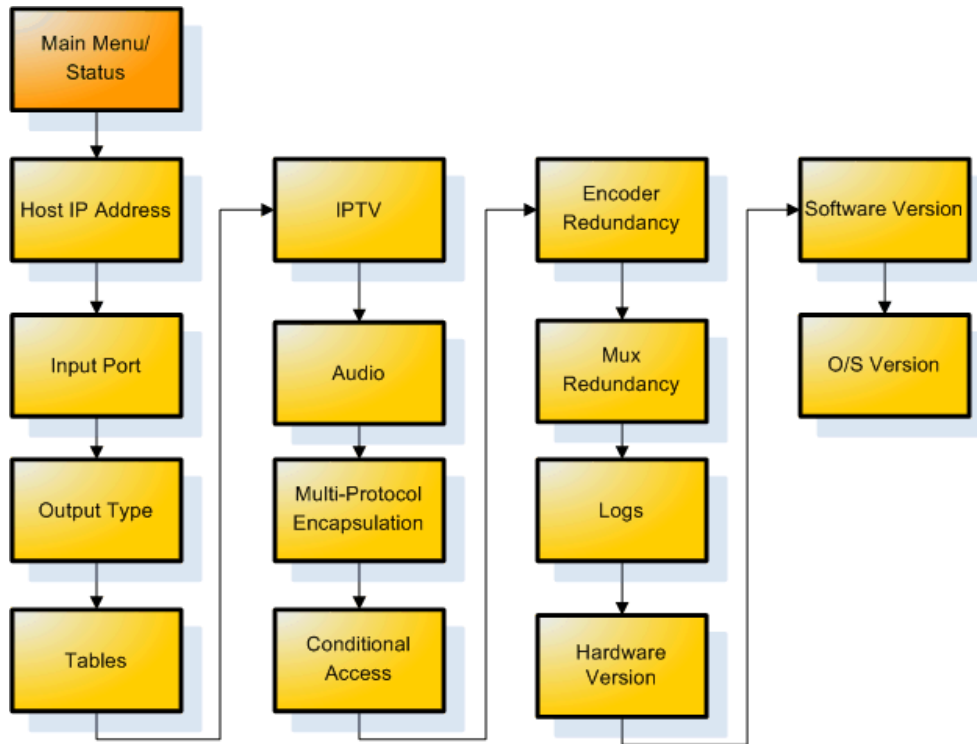
Pre-programmed Key Sequences

The Adtec DTA3050 has a number of "pre-programmed" shortcut key sequences that can be used to access information about the router or change the contrast on the LCD display, without having to navigate the menu system:

Key Sequence	Result
MODE + ESCAPE + DOWN arrow	LCD Contrast Down
MODE + ESCAPE + UP arrow	LCD Contrast Up
SELECT + UP arrow	Firmware version
SELECT + DOWN arrow	FPGA Version
SELECT + LEFT arrow	Hardware Version
SELECT + RIGHT arrow	O/S Version

Front-Panel-Only Control Options

The following Settings and Features are only available from the front panel of the DTA3050- there is no GUI support for these features:

1."Audio Format".

  • Set to **DVB** for audio type 6
  • Set to **ATSC** for audio type 0x81

2.Transport stream ID "PAT Tran Strm ID"

3.Resetting the unit.

  • Press and hold the "Mode", "Escape", and "Right Arrow" buttons simultaneously, then release them all to affect a reset.

4.MPE routes.

5.Logging

6."SAP IP address"

7.Backup and Restore configurations.

8.Enable / Disable auto logout.

Communications

LAN

The DTA-3050 incorporates two network ports for Ethernet communications over a Local Area Network (LAN) using the Internet Protocol (IP). Command and control over a LAN can be accomplished using a Web browser using HTTP.

RS-232

The DTA-3050 provides an RS-232 interface for an experienced user for advanced troubleshooting. An RJ-45 connector provides a console connection to the DTA-3050, so the unit may be connected directly to a PC's communications port.

RS-232 Serial Default Parameters

Variable	Setting
Baud Rate	115,200
Data Bits	8
Stop Bit	1
Parity	none
Flow Control	none; this is required if you are using Hyper Terminal or some other simple terminal application to communicate with the DTA-3050 via command line.

Ethernet

The DTA-3050 provides an Ethernet (10/100BaseT IEEE 802.3u) interface to communicate with the unit over a Local Area Network (LAN). Use of the Ethernet port supports connecting multiple units to a single PC through the use of an Ethernet Concentrator (Hub). The only limitation is the number of ports on the hub and available IP addresses on the network. Point-to-Point Ethernet connection can be achieved with an Ethernet crossover cable. The DTA-3050 also provides a Gigabit Ethernet (10/100/1000) interface for IP Destinations. Both ports can provide web administration.

Caution: both interfaces **must** be on separate subnets. If both interfaces reside on the same IP network, there will be loss of communication.

Ethernet Default Parameters

Variable	Setting
eth0 10/100	192.168.10.48
eth0 10/100 subnet mask	255.255.255.0
eth1 GigE IP address	192.168.20.48
eth1 GigE subnet mask	255.0.0.0
Gateway IP	0.0.0.0 (defaulted off)
User Name	adtec
Password	none

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User Interface

Port and Table Mode

This article compares and contrasts Port Mode and Table Mode on the DTA3050 Router. Table Mode and Port Mode are accessed using the "Mode" button on the DTA3050's front panel.

Port Mode

Function	Explanation
Pass	All programs and PID's that are present at the ingress get passed directly to the Egress with no remapping performed. In this mode, no PID conflict detection is performed on the Egress, so it is the user's responsibility to ensure that no conflicts exist.
Manual	**Recommended for most applications.** Only programs and PID's that are manually added by the user are passed to the Egress. PID values and program information are mapped using user-defined values. As a default, the incoming values are used for the outgoing values. In this mode, the DTA **does** prevent PID conflicts in the Egress as part of the auto-logic algorithm.
Auto	All programs and PID's present in the Ingress that are added to the Egress by the user, will be added and remapped by the DTA Router according an auto-logic algorithm. In this mode, the DTA **does** prevent PID conflicts in the Egress as part of the auto-logic algorithm.
SI Injector	**NIT only** Used for inputting multiple NIT tables and appending them to NIT Other.
MHP Injector	Special mode used only for MHP applications. In this mode, MHP services present in the Ingress can be mapped and associated to services coming in through other ports.

Table Mode

Table Format	Explanation
DVB	Incoming services are processed using DVB table structure
MPEG	Incoming services are processed using PAT and PMT only
ATSC	Incoming services are processed using ATSC table structure
DCII	Incoming services are processed using Digicypher II table structure
None	Incoming services are processed using information in the manualpidconfigX.xml file (where 'X' is the port number. These files are located in the /etc/asimux/ directory

Using the GUI Interface

Introduction

The Adtec DTA3050 features an on-board Graphical User Interface for easy operability.

To access the GUI, bring up a web browser, such as Internet Explorer, Netscape Navigator, or Mozilla Firefox, and type your DTA's IP address into the URL locator, and press **"Enter"**. The DTA's on-board GUI will launch, displaying a page like this:
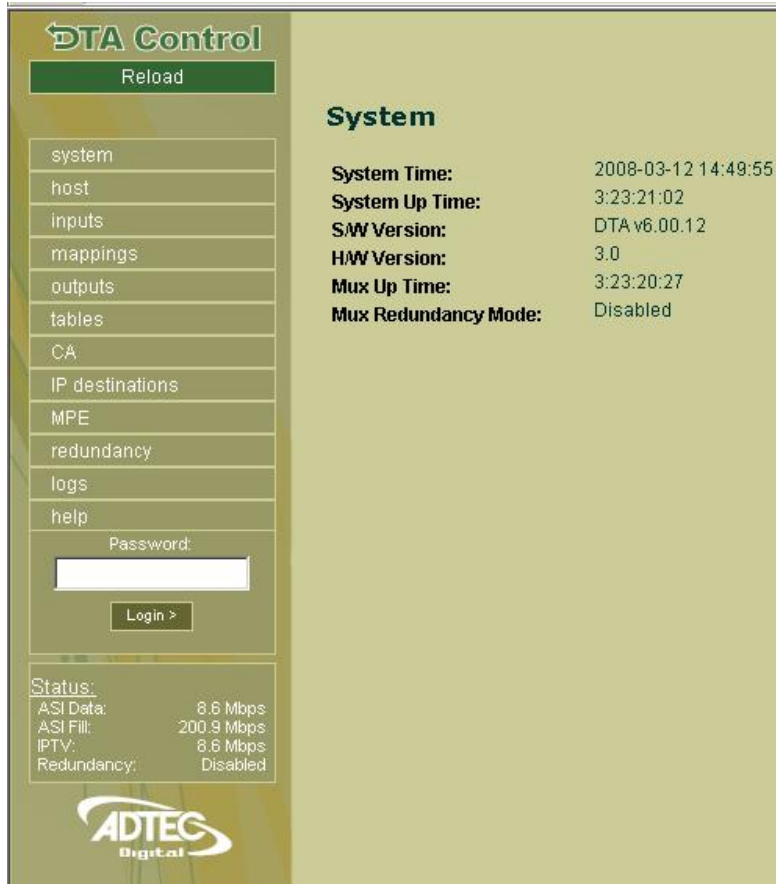
This page lists basic version and operating time information for the unit, and contains a login window. "USER" (in all caps) is the default login password.

Also on this screen (and repeated on every screen) is a **Status** snapshot window, giving current status for ASI Data, ASI Fill, IPTV, and Redundancy.

The GUI enables you to interface with the DTA3050 through 11 screens. These screens are accessed with the navigation buttons in the left-hand window. These buttons are labelled:

- System
- Host
- Inputs
- Mappings
- Outputs
- Tables
- CA
- IP Destinations
- MPE
- Redundancy
- Logs

Signing in to the GUI

Each screen and its controls are detailed in individual articles which follow. Each screen can be viewed in two ways. If you are signed into the GUI, each screen has editable controls for the configuration of the router's operations. If you view the screen without signing in to the GUI, you see a summary screen of the DTA's current settings, without being able to edit them.

Important: note that signing into the GUI and being signed in from the main control panel are two **separate** actions.

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System Screen

The System screen is primarily informational and does not directly impact the operations of the DTA. Six pieces of information are displayed on this screen:
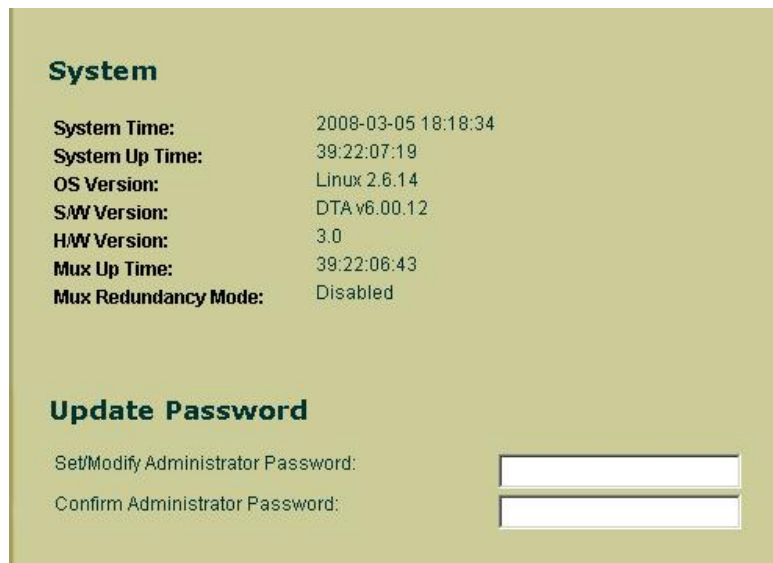
Data	Function
System Time	Mirrors the CPU time of the PC connected to the DTA Router
System Up Time	total time the unit has been activated since last power-down
S/W Version	Adtec version number of the software installed on this DTA unit
H/W Version	Adtec version number of the hardware installed in this DTA unit
Mux Up Time	total amount of time the unit has been multiplexing during this run; will be a portion of System Up Time (see above)
Mux Redundancy Time	flag indicator; is feature on or off

Screenshot:
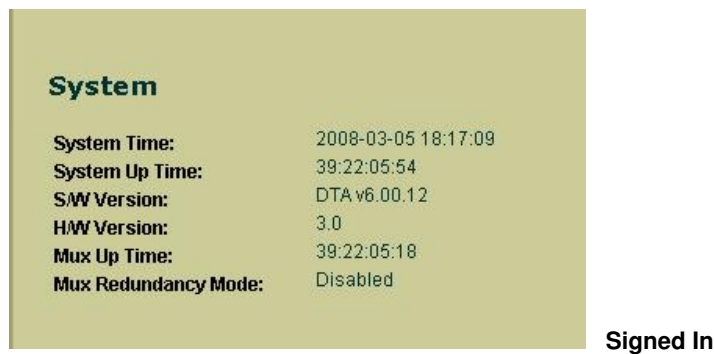
Signed In

When signed in to the GUI, the only difference on the screen is that two fields for updating the GUI password appear.
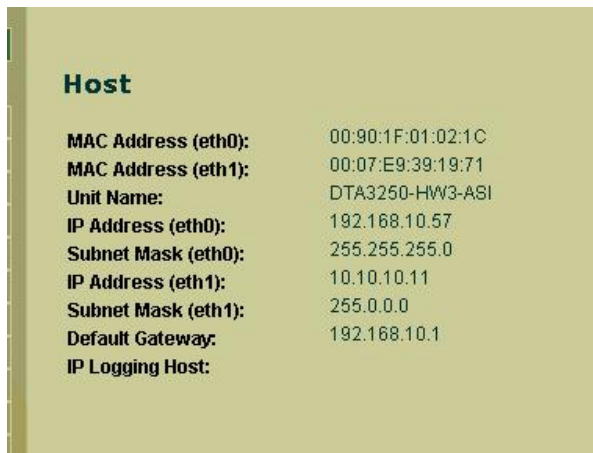
Screenshot:

Host Screen

The Host Screen provides information about the DTA's connection to the rest of your network:

Data	Function
MAC Address (Eth0)	a six-byte Media Access Control (MAC) address assigned to the Ethernet ports of the unit; set by the factory and corresponds to the unit's serial number. Not configurable.
MAC Address (Eth1)	see above
Unit Name	unit name given by the user for login purposes; factory default is "User".
IP Address (Eth0)	the Internet Protocol address of Port 0
Subnet Mask (Eth0)	range of the local subnet for Port 0
IP Address (Eth1)	the Internet Protocol address of Port 1
Subnet Mask (Eth1)	range of the local subnet for Port 1
Default Gateway	an IP address that allows the DTA3050 to communicate with devices not on the local subnet; defined by IP address and the subnet mask
IP Logging Host	address of the IP Logging Host; if IP Logging is set to "yes" then events are sent to the IP logging host at the configured IP address

Screenshot:

Logged In

When logged in to the unit, you can edit the settings displayed. The fields described above do not change, but become editable text-box fields. A new field, **"IP Logging"**, appears, which contains a yes/no pull-down control to turn IP Logging on and off.

Screenshot:

DTA Control

Reload

Apply Changes

- system
- host
- inputs
- mappings
- outputs
- tables
- CA
- IP destinations
- MPE
- redundancy
- logs
- help

Status:
ASI Data:	8.6 Mbps
ASI Fill:	200.9 Mbps
IPTV:	8.5 Mbps
Redundancy:	Disabled

Host

MAC Address (eth0):	00:90:1F:01:02:1C
MAC Address (eth1):	00:07:E9:39:19:71
Unit Name:	DTA3250-HW3-ASI
IP Address (eth0):	192.168.10.57
Subnet Mask (eth0):	255.255.255.0
IP Address (eth1):	10.10.10.11
Subnet Mask (eth1):	255.0.0.0
Default Gateway:	192.168.10.1
IP Logging:	No
IP Logging Host:	

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Inputs Screen

The Inputs screen the settings and function of the 10 ASI inputs featured on the DTA3050. For each input, the following is listed:

Data	Function
State	status of the input; active port, inactive port, or inactive due to stream issue
Format	bytes of incoming data per DVB packet; will display 188 or 204
Mode	type of signal the DTA is passing
Redundancy	this is an on/off indicator signifying whether the feature is enabled/disabled for this input
Data Rate	quantity of data coming in, measured in Mbps
Fill Rate	quantity of fill packets in Mbps
Total Rate	sum of data rate and fill rate

Logged In

When logged into the unit, the Inputs screen offers two levels of access to the unit's programming. The first level looks much like the screenshot above, with the addition of a clickable **"Edit"** control:

Screenshot- Inputs Level 1: Portion of Main Window shown

When **<Edit>** is clicked for a given input, this screen is displayed:

Screenshot- Inputs Level 2: Portion of Window shown

Control	Type	Options	Function
Input State	pull-down menu	Enabled Disabled Clear	designates status (role) for this port
Input Mode	pull-down menu	Auto MHP Injector SI Injector **Manual** Pass	manual is **strongly** recommended
Input Tables	pull-down menu	None MPEG DCII DVB ATSC	specifies table format
Pass CA	pull-down menu	Yes No	designates if CA programming will be passed on by the DTA
Redundancy Group	pull-down menu	Inputs 1-10 Disabled	designates an input stream as a backup
Redundancy Role	pull-down menu	Primary Backup Disabled	designates the unit as the primary or the backup in a two-Mux Master/Slave setup **Note:** select 'Disabled' if operating the unit as a stand-alone.

Available Programs and Current Programs

These windows display the available programming coming into the DTA, and programming streaming out. To make an available program current, highlight it and click **<add>**. To delete a program in either window, highlight it and click **<remove>**.

Important: remember to click **<Apply Changes>** and **<Reload>** for any edits to be applied to the DTA.

Mappings Screen

Main Window shown (signed in) **Signed In** When signed into the unit, the Mappings screen offers 8 pages of information on mapped services coming into the DTA. These pages are accessed via the Group Display buttons across the top of the screen:

- All
- General
- PIDs
- CA 1-5

Additionally, you can filter the view by Input, selected the Input desired via the **"Filter Input Port"** drop-down menu.

"All" Screen

(Main Window shown)
This screen lists the following:

- **Service ID in** - ID number for services provided by the provider/originator of the multiplex. Not editable.
- **Service ID out** -text field; option for assigning new ID numbers to services.
- **LCN** - Logical Channel Number; used to match Service IDs to channel assignments for programming purposes.
- **Name** - text box used to provide a descriptive name for the service.
- **Provider** - text box used to provide a descriptive name for provider of the service.

Control Group The next set of fields lists **Stream Type, Mode**, **PID In**, **PID Out**, **Dynamic Track**, and **Language Descriptor** per Input. Mode, PID Out, Dynamic Track, and Language Descriptor can be edited. The **Description** field is an optional mnemonic for describting the program or service. **Service Type** designates the type of transmission. **MHP Program Number** allows for a program number assignment for Multimedia Home Platform interactive services. The other **"General"** and **"PIDs"** Group Display screen selections filter the information listed on the **"All"** Group Display screen.

Conditional Access Screens

- CA1 -	
Scramble:	1: XCrypt ▼
Criteria Length:	8
Criteria:	4143543220010001
Private Data Length:	14
Private Data:	0812AC20010C0032393935340000
ECM PID:	0000

Main Window
Shown The Conditional Access (CA) screens list the following:
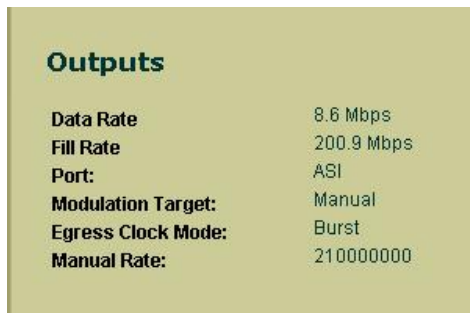
- **Scramble:** type of CA being applied; available CA paradigms are listed in the drop-down menu.
- **Criteria Length:** allows you to specify the length of the access criteria (passcode) in bytes
- **Criteria:** the actual access criteria (passcode);must be entered in hexadecimal form.
- **Private Data Length:** CAT private data length, entered in bytes.
    - ♦ Generally this will be provided by the CA provider and is carried in the CA Table.
- **Private Data:** CAT private data, entered in hexadecimal.
- **ECM PID:** Entitlement Control Message PID assignment for the program; tells set-top boxes what encryption is being used.

Outputs Screen

The **Outputs screen** summarizes the services being streamed out over the DTA3050's ASI and GigE output ports. Information is summarized in a table format.

Data	Function
Data Rate	quantity of data going out, measured in Mbps
Fill Rate	quantity of outgoing fill packets, measured in Mbps
Port	physical port identification
Modulation Target	modulation frequency of the output
Egress Clock Mode	type of stream being multicast
Manual Rate	output in bits per second

Screenshot:
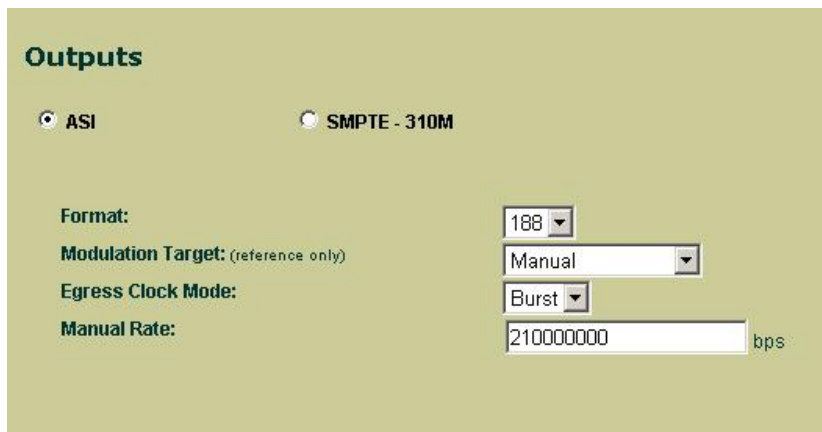
Signed In

When you have signed into the GUI, a different screen appears and you can now edit the screen settings:

Screenshot:

Description:

Control	Type	Options	Function
ASI	Radio button	selected/not	turns ASI on or off
SMPTE-310M	Radio button	selected/not	turns SMPTE-310M on or off See cautionary note below.
Format	pull-down menu	188 (bytes) 204 (bytes)	MPEG mode
Modulation Target	pull-down menu	Manual **(recommended)** 8 QAM modulations QPSK 8PSK	modulation of output Refer to the Modulation Targets Reference for more information.
Egress Clock Mode	pull-down menu	Burst Byte Off	type of stream to be multicast **byte** - evenly spaced bytes; restricts unit to a clock range of 0.3 Mbps to 50.0 Mbps **burst** - each byte transmits back-to-back; range is 2.4 Mbps to 213.0 Mbps.
Manual Rate	text box	user-defined	bit per second rate of output defined by user Refer to the Modulation Targets Reference for more information.

Caution: after changing from SMPTE to ASI, or from ASI to SPMPTE, the device **must** be rebooted.

Tables Screen

The Tables screen lists parameters for the three table formats that can run on the DTA3050, and states which table format is active.

The three table formats are:

- MPEG 2 – PSI (Default is enabled for each port)
- DVB – SI (Default is enabled for each port)
- ATSC – PSIP (Output Only)

A "None" option in the drop-down menu turns tables off.

Signed In

When you have signed into the GUI, the main screen difference is that now all fields are text/pull-down boxes for editing the screen settings. Additionally, the first control is a pull-down to designate the active table type- DVB, NTSC, or MPEG.

Use of Tables

Service tables provide information about incoming content. Tables allow content in Single Program Transport Streams (SPTS) and Multi Program Transport Streams (MPTS) to be aggregated into a single MPTS and announced to downstream devices in a dynamic fashion.

MPEG

Main Window Shown:

MPEG tables organize the transmission of compressed audio and video in a single transport stream.

Control	Type	Function
PAT Rate	text box	assign rate, in tenths of a second, of how often this table is transmitted in the stream
PMT Rate	text box	assign rate, in tenths of a second, of how often this table is transmitted in the stream
CAT Rate	text box	assign rate, in tenths of a second, of how often this table is transmitted in the stream

DVB

Digital Video Broadcasting - the DTA3050 uses four tables to organize DVB data for ingress and egress. Each is described below.

Table Sharing: there are two drop-down controls available. **Enable** switches the feature on and off. **Master** designates the unit as the master (control) unit for table insertion.

Network Information Table

- NIT; contains information about a network's satellite orbit, transponder, tuning parameters, and other network-specific information.
    - It is always located on PID 0x0010.

Control	Type	Options	Function
Enable	pull-down menu	Yes No	switches inclusion of an NIT on and off
Rate	text box	user-defined	determines how often an NIT will be included in the stream number entered is expressed in tenths of a second
Network Name	text box	user-defined	network's name that will be announced by the NIT
Network ID	text box	user-defined	network's ID that will be announced by the NIT
Delivery Descriptor	pull-down menu	Cable Satellite Terrestrial	type of network carrier
Frequency	text box	user-defined	frequency of the carrier allows set-top boxes to dynamically determine information about the carrier supporting the network
Symbol Rate	text box	user-defined	symbol rate of the carrier allows set-top boxes to dynamically determine information about the carrier supporting the network
Modulation Type	text box	user-defined	
Polarization	pull-down menu	linear horizontal linear vertical circular horizontal circular vertical	orientation of the transmitter that will send the encoded stream
East/West	pull-down menu	East West	modulation parameter; user-defined
Orbital Position	text box	user-defined	orbital position of a receiving satellite
Center Frequency	text box	user-defined	modulation parameter; user-defined
Bandwidth	pull-down menu	6Mghz 7Mghz 8Mghz	bandwidth used; measured in megahertz
Constellation	pull-down menu	QPSK 16-QAM 64-QAM	modulation parameter; user-defined
Hierarchy Information	pull-down menu	Alpha = 1 Alpha = 2 Alpha = 4 Non-hierarchical	modulation parameter; user-defined
Code Rate HP Stream	pull-down menu	1/2 2/3 3/4 5/6 7/8	modulation parameter; user-defined
Code Rate LP Stream	pull-down menu	1/2 2/3 3/4 5/6 7/8	modulation parameter; user-defined
Guard Interval	pull-down menu	1/32 1/16 1/8 1/4	enhances transmission integrity; 1/32 = low protection/high data transfer rate 1/4 = high protection/low data transfer rate

Transmission Mode	pull-down menu	2K 8K	controls speed at which the DTA re-transmits the re-muxed stream
Other Frequency Flag	pull-down menu	Yes No	modulation parameter; user-defined

SDT

Service Description Table;;The Service Description table describes services which are part on an MPEG2 transport stream.

- There is one SDT per transport stream.
  - ♦ The SDT may include:
    - ◊ name of the service.
    - ◊ service identifier.
    - ◊ service status.
    - ◊ whether or not the service is scrambled.
  - ♦ The SDT uses the reserved PID 0x0011.

Control	Type	Options	Function
Enable	pull-down menu	Yes No	Switch table type on or off
Rate	text input box	user-defined	determines how often an SDT will be included in the stream; measured in tenths of a second

TOT

Local Time Offset Descriptor; allows for local time to be converted from UTC.

Control	Type	Options	Function
Country Code	text field	user-defined	three-letter country designator
Country Time Zone	text field	user-defined	numeric time zone indicator

EIT

Control	Type	Options	Function
Enable	pull-down menu	Yes No	Switch table type on or off
Rate	text input box	user-defined	determines how often an EIT will be included in the stream; measured in tenths of a second

ATSC

The Advanced Television Systems Committee (ATSC) developed standards which became HDTV. Like DVB tables, ATSC uses additional tables to function as extensions of the basic MPEG-2 system layer. Called Program and System Information Protocol (PSIP) tables, they allow service providers to offer a multitude of broadcast products to viewers. ATSC was created for terrestrial and cable broadcast systems.

PSIP Tables include:

- **Virtual Channel Table** (VCT): list and defines all the channels in a transport stream, including source IDs used by the EIT (which see) to generate the Electronic Program Guide.
- **Master Guide Table** (MGT): indexes other tables in the PSIP standard; defines table sizes, version numbers, and PID values.
- **System Time Table** (STT): single packet that contains the current time; enables the receiver to begin events per schedule.
- **Rating Region Table** (RRT): provides content-based program rating system information for countries that have standardized ratings.
- **Event Information Table** (EIT): defines the events (programs) contained in the transport stream for a 3-hour block of time; uses data from the VCT to populate the Electronic Program Guide; per ASTC, between 4 and 128 EITs must be in the transport stream at any given time; can contain up to 16 days' worth of programming information.

Control	Type	Options	Function
VCT-Rate	text input box	user-defined	rate, in tenths of a second, that a Virtual Channel Table will be included in the outgoing stream.
VCT- Major Channel #	text input box	user-defined	announce the physical channel/frequency of the carrier
VCT- Minor Channel #	text input box	user-defined	segments Major Channels (physical channels) into Minor Channels (logical channels)
VCT- Primary Language Code	text input box	user-defined	specifies language being supported ENG, ENglish, is the default factory setting
VCT- Secondary Language Code	text input box	user-defined	specifies a secondary language being supported SPAN, Spanish, is the default factory setting
MGT Rate	text input box	user-defined	rate, in tenths of a second, that a Master Guide Table will be included in the outgoing stream.
SIT Rate	text input box	user-defined	rate, in tenths of a second, that a System Time Table will be included in the outgoing stream.
RRT Rate	text input box	user-defined	rate, in tenths of a second, that a Rating Region Table will be included in the outgoing stream.
EIT Rate	text input box	user-defined	rate, in tenths of a second, that an Event Information Table will be included in the outgoing stream.

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Conditional Access Screen

The **Conditional Access** screen shows the status of scrambled services and related decryption operations to make those services accessible to authorized viewers.

The informational screen contains the following information for each CA-enabled service (up to 5):

Data	Function
Enable #	describes which Conditional Access System (CAS) provider's encryption scheme is in use
Super CAS ID	provided by CAS manufacturer
CAS System ID	provided by CAS manufacturer
ECMG IP	use the IP address the of the CAS hardware
ECMG Port	set to the port of the CAS hardware
ECMG Channel ID	provided by CAS manufacturer
ECMG Crypto Period	provided by CAS manufacturer
ECMG Keep Alive	provided by CAS manufacturer
EMMG Mode	TCP and are support; this value will be provided by the CAS manufacturer
EMMG Port	set to the port configured on the CAS hardware
EMMG Maximum	provided by CAS manufacturer
EMMG PID	enter value in hexadecimal format, or leave blank and the DTA will autoselect a free PID
EMMG Data Channel ID	provided by CAS manufacturer
EMMG Keep Alive	provided by CAS manufacturer
Private Data Link	provided by CAS manufacturer
Private Data	provided by CAS manufacturer

Logged In:

When you have signed into the GUI, a different screen appears (one for each enabled service; up to 5 total) and you can now edit the screen settings:

Screenshot (Main Window shown):

Parameter Descriptions:

Parameter	Type	Options
Adtec AES Decrypt	pull-down menu	No Yes
Enable #	pull-down menu	No Irdeto Eurocast Conax Keyfly AdtecOST (AES) XCrypt
Super CAS ID	text field	user-defined
CAS System ID	text field	user-defined
ECMG IP	text field	user-defined
ECMG Port	text field	user-defined
ECMG Channel ID	text field	user-defined
ECMG Crypto Period	text field	user-defined
ECMG Keep Alive	text field	user-defined
EMMG Mode	pull-down menu	UDP TCP
EMMG Port	text field	user-defined
EMMG Maximum	text field	user-defined
EMMG PID	text field	user-defined
EMMG Data Channel ID	text field	user-defined
EMMG Keep Alive	text field	user-defined
Private Data Link	text field	user-defined
Private Data	text field	user-defined

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IP Destinations Screen

In View-Only mode (not signed into the GUI), the IP Destinations screen gives the following information:

Data	Function
IPA	destination's IP Address
Port	egress port assignment
Src Port	shows the Source Port that will be stamped in the header packet
IP TTL	time to live; number of iterations the multicast can go through before it expires
Name	destination name
Destination	destination's IP domain
Type	stream format
Action	Click the **<View>** link to access the next level.

Once **<View>** has been clicked, the screen shifts to this configuration:

Each of the four tables contains specific information. **General Table**

Data	Function
Name	IP destination address
Modulation Target	modulation type; recommended to be set to **manual**
IPA	destination's IP domain
Bit Rate	rate of transport in bits per second
Port	port assignment on the DTA this stream is using
IP TTL	time-to-live
Src Port	sets the Source Port stamp in the header packet
State	on or off (enablement)

Programs Table

Lists assigned programs.

Tables Table

Data	Function
Type	table format selected
PAT	Program Association Table; lists all the programs contained in the transport stream; shows the PID value for the PMT associated with each program. The PAT is always found on PID 0x0000.

DVB-NIT Table

Data	Function
Enable	on or off
Network Name	user-entered; Network's name as appears in program guides
NIT Rate	frequency with which an NIT is sent in the stream
Network ID	ID code of the network
Symbol Rate	gross bit rate of the stream
Original Network ID	network ID code as used by the signal's provider
RF Frequency	RF frequency of the carrier being streamed through the DTA

Signed In

When signed in to the unit, you now have the options, under **"Actions"** of editing or deleting an existing IP destination, or adding a new one (screen button in upper right; see first illustration).

When **"Add New"** is selected, the following screen appears:

General

Control	Type	Options
Name	text box	User-defined
IPA	text box	User-defined
Port	text box	User-defined
Src Port	text box	User-defined
Modulation Range	text box	User-defined
Bit Rate	text box	User-defined
IP TTL	text box	
Enable	pull-down	Checked Not checked
Transmit	pull-down	UDP RTP
Interface	pull-down	eth0 eth1

Programs

- Use the arrow keys to move highlighted programs from "Available" to "Assigned" as desired for your broadcast needs.

Tables and DVB-NIT Screenshot:

Tables

- Type: select MPEG or DVB format tables.
- For PAT, numbers 1-5 can be selected to designate output Program Association Table rates in tenths of a second.
- Transport Stream ID: text field, for ease of reference; the transport stream tables are to be injected into.

Applying Changes

Always click **<Apply Changes>** and **<Reload>** in order to update the DTA. If these buttons are not clicked, your changes will **not** be applied.

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Multi-Protocol Encapsulation Screen

Multi-Protocol Encapsulation (MPE) is combining unicast and multicast Ethernet IP data into one output.

Display:

The Multi-Protocol Encapsulation (MPE) screen is a flag indicating whether MPE is enabled or not.

Signed In

When signed in to the unit, you can switch MPE on or off for up to 32 routes.

The screen now looks like this (Main Window shown):

Control	Type	Purpose	Options
Route	pull-down menu		1-32
Name	text box		user-defined
IP Address	text box		user-defined
PID	text box		user-defined
Max Rate	text box		user-defined
Enabled	pull-down menu		Yes No

Unicast Support

The support of Unicast is straightforward since Ethernet frames are directed to the DTA-3050's Ethernet port as a "default gateway." As a default gateway, the DTA-3050 will either route the IP datagram, if there is an explicit route for the IP address, or silently discard the IP datagram if there is no route for the destination.

A unicast packet is one that has a non-broadcast MAC address associated with it, for example, the most significant byte of the MAC address has the least significant bit set to '0'. Unicast IP addresses that may be supported will fall into the standard class range of A, B, or C. The DTA-3050 has a provision to route unicast IP datagrams based on an IP and subnet mask structure. **Example:**

Parameter	Value
IP address	10.10.10.0
Mask	255.255.255.0 "C Class"
Resulting IP addresses to be routed	10.10.10.0 to 10.10.10.255
Assigned MAC Address	0x00 00 00 00 00 00 to 0x00 FF FF FF FF FF, and excluding 0xFF FF FF FF FF FF

For Unicast support, there is no correlation between the IP address and the MAC address as will be described in the Multicast section.

Multicast Support

MPE support of Multicast is not as straightforward to support, since Linux causes unique challenges. Unlike Unicast, where all devices communicates to the Multiplexer over the single hardware MAC address assigned to the Multiplexer; the support of Multicast requires that each Multicast address that is going to be enabled must be statically entered into a list and the Ethernet port enables a "hash" table, allowing specific Multicast MAC addresses to be enabled. What makes this somewhat daunting is the fact that there are a finite number of multicast addresses that may be supported.

Multicast is considered as "class D" addressing and falls within the IP address range of 224.0.0.0 to 239.255.255.255. The corresponding MAC address range is 0x01 00 5E 00 00 00 to 0x01 00 5E 7F FF FF and is derived as follows:

- 1st three octets and the most significant bit of the 4th byte's octet are always set to 0x01 00 5E '1'.
- The least significant bits of the 4th byte, and bytes five and six are the last three bytes of the multicast IP address.

Example:

Parameter	Value
Multicast IP Address	239.1.1.10
MAC Preamble	0x01 00 5E

Multicast to MAC Mapping:
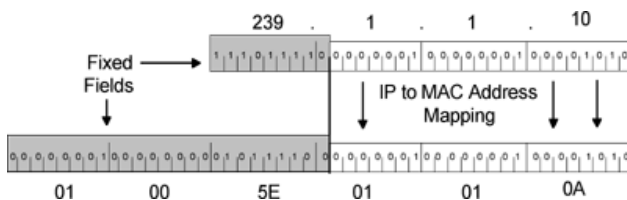
Redundancy Screen

The Adtec DTA3050 can be used in conjunction with a second DTA3050 as a back-up. The unit designated as the back-up will receive setting information from the Primary unit (the Primary unit essentially clones itself onto the back-up) and monitors the Primary's input and output activity. Should the Primary unit suffer an output failure, the back-up immediately begins to stream the same programming, providing greater service reliability for your customers.

Important: In order to use this feature, your DTA3050 **must** be running firmware version **6.03.02**. Contact Adtec Technical Support to obtain this firmware.

The **Redundancy Screen** lists the following information:

Data	Function
Mux Redundancy Role	which role this unit is designated to perform
Mux Redundancy Other IP	the IP address of the other unit in a redundant pair
Encoder Switch	switch type

Screenshot:

Signed In

If the Redundancy screen is viewed while signed in, the table doesn't change in appearance, except for the presence of pull-down menus for editing the settings:

Data	Control Type	Options
Mux Redundancy Role	pull-down menu	Disabled Primary Back-up
Mux Redundancy Other IP	text field	user-defined
Encoder Switch	pull-down menu	PESA LNS8 none

Screenshot:

Encoder Redundancy

The DTA3050 enables encoder redundancy for Adtec's line of encoders. Three types of redundancy are supported:

- 1:1
- N + 1
- N + 2

1:1 Encoder Redundancy

The most basic form of redundancy is 1:1. Input-port pairs on the DTA-3050 support redundancy. The configuration is set as a Boolean for 1:1 redundancy on any of the ten input ports. The port pairs are: 1 and 2, 3 and 4, 5 and 6, 7 and 8, and 9 and 10. If either port in a pairing group is set to be redundant, then both ports are put in redundant mode. Once a port has been defined as redundant, the paired port will become the identical configuration of the port set to redundant.

Redundancy is determined monitoring the status of sync and reception of table information. In the event the primary port is no longer receiving table information from the encoder, the port is disabled and the secondary is placed on line.

1:1 Encoder Redundancy Illustration:
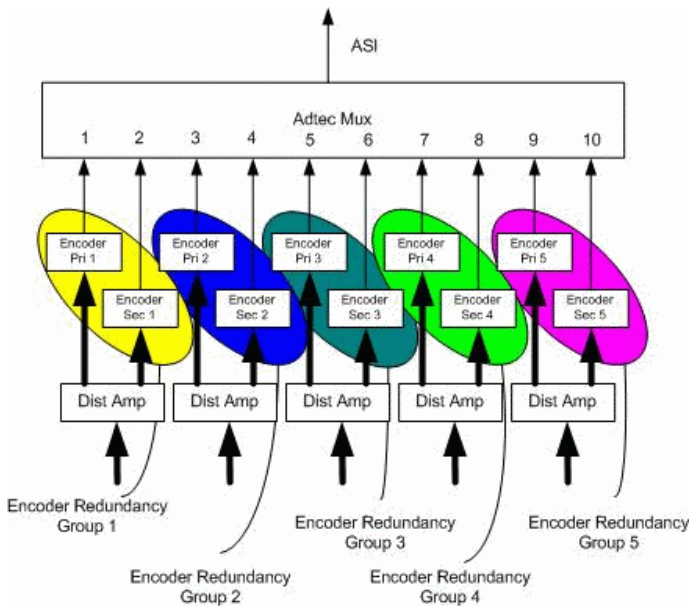
1:1 Encoder Redundancy Connections-Graphic

ASI out to Modulator

Audio In   Audio Out   Audio Out   Audio Out   Audio Out

Video In   Video Out   Video Out   Video Out   Video Out

Audio Input to DA

Video Input to DA
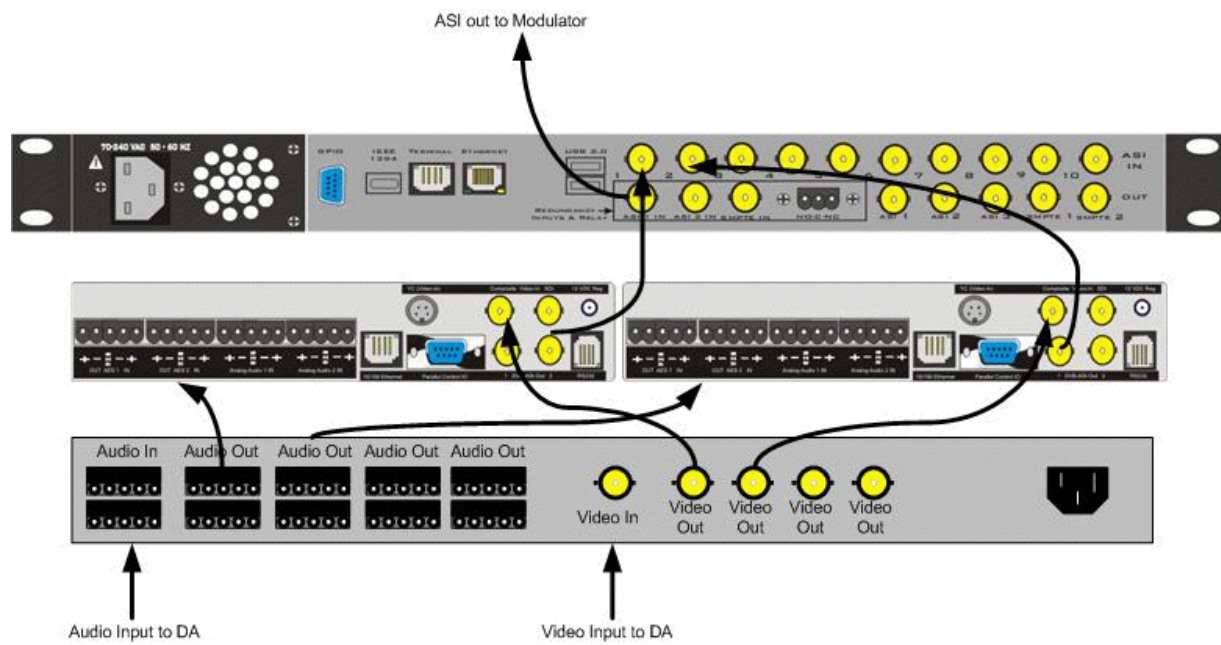
N + 1 Encoder Redundancy and N + 2 Encoder Redundancy

N+1 and N+2 encoder redundancy allow one encoder to act as a redundant encoder for a group of encoders. Though 1:1 provides one backup for each primary encoder, this level of redundancy is seldom required, since the Edje-2x00 encoders are highly reliable and seldom fail. Therefore, N+1 and N+2 encoder redundancy provide a more economical solution.

To support N+1 or N+2 redundancy requires an external router/switcher be connected before the encoders. The Pesa LNS8 has been integrated into the DTA-3050 design.

N +1 Encoder Redundancy- Illustration

ASI

Adtec Mux
1   2   3   4   5   6   7   8   9   10

Encoder Pri 1   Encoder Pri 3   Encoder Pri 5   Encoder Pri 7   Encoder Pri 9
Encoder Pri 2   Encoder Pri 4   Encoder Pri 6   Encoder Pri 8   Encoder Sec 1 - 9

Dist Amp + Switch

Single Redundancy Group
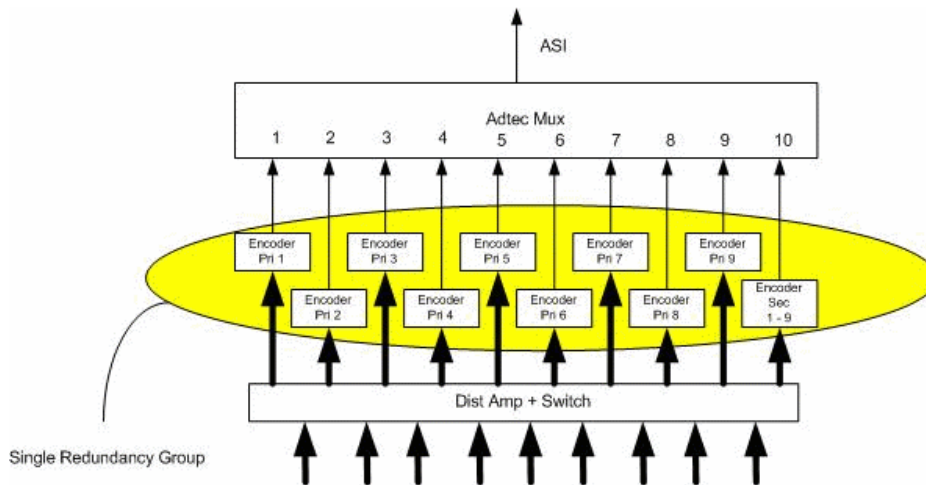
4 + 1 Redundancy Example

4+1 Redundancy Example

————	ASI Output
————	ASI Input
————	Input Video
————	Redundant ASI
————	Switched Video N+1
————	Async Pesa Control
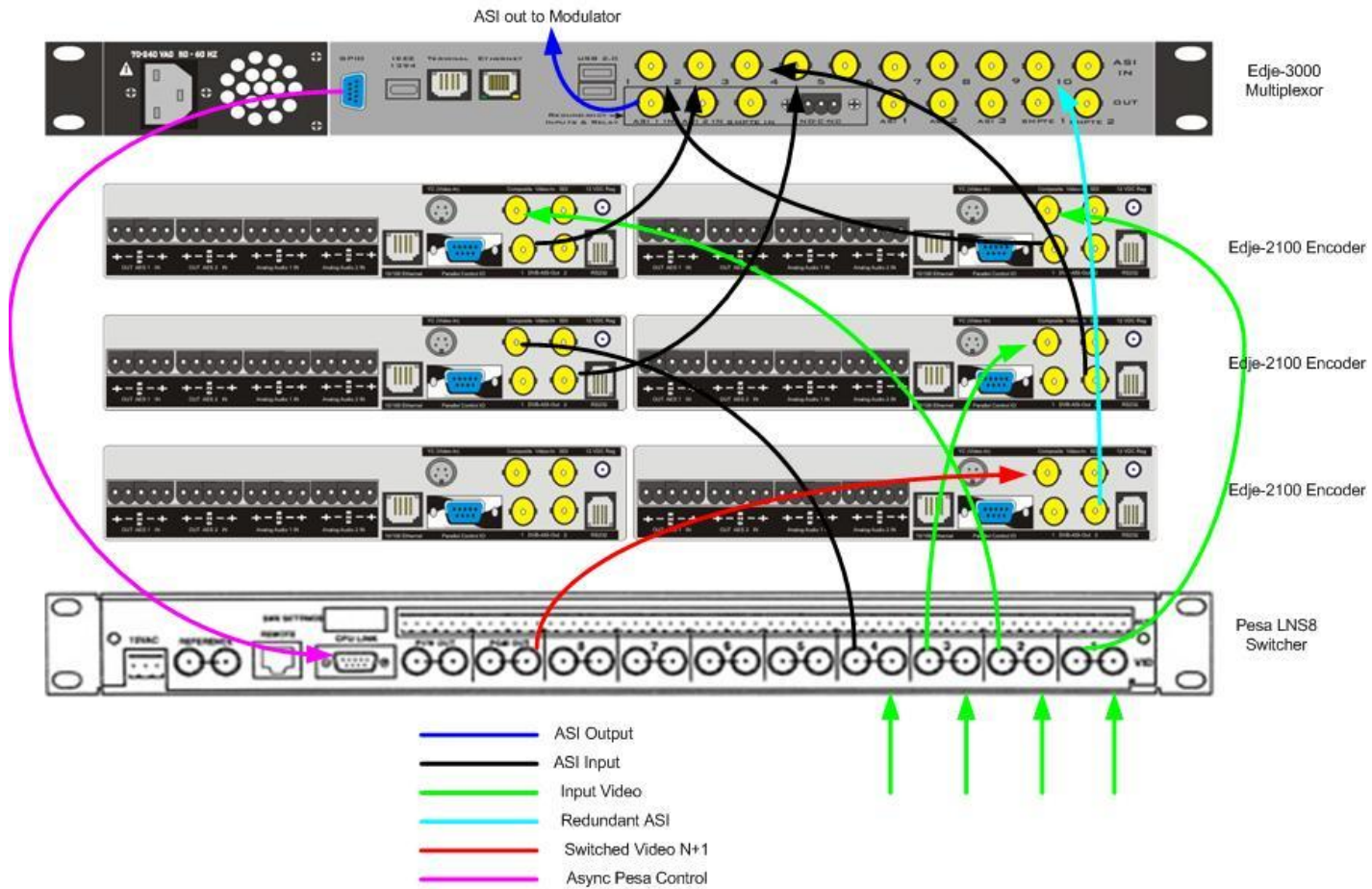
N + 2 Encoder Redundancy- Illustration

4 + 2 Redundancy- Example

4+2 Redundancy Example

———	ASI Output
———	ASI Input
———	Input Video
———	Redundant ASI
———	Switched Video N+1
- - - - - -	Switched Video N+2
———	Async Pesa Control
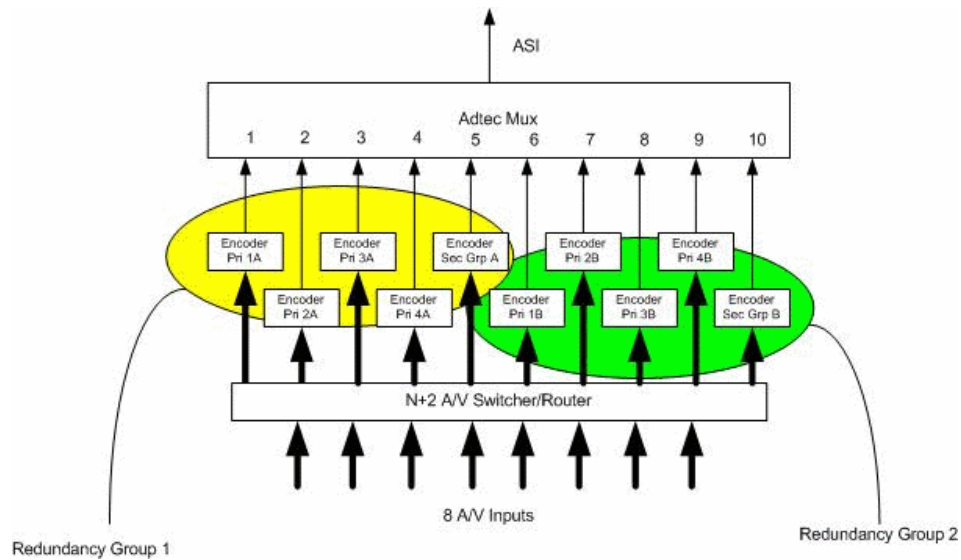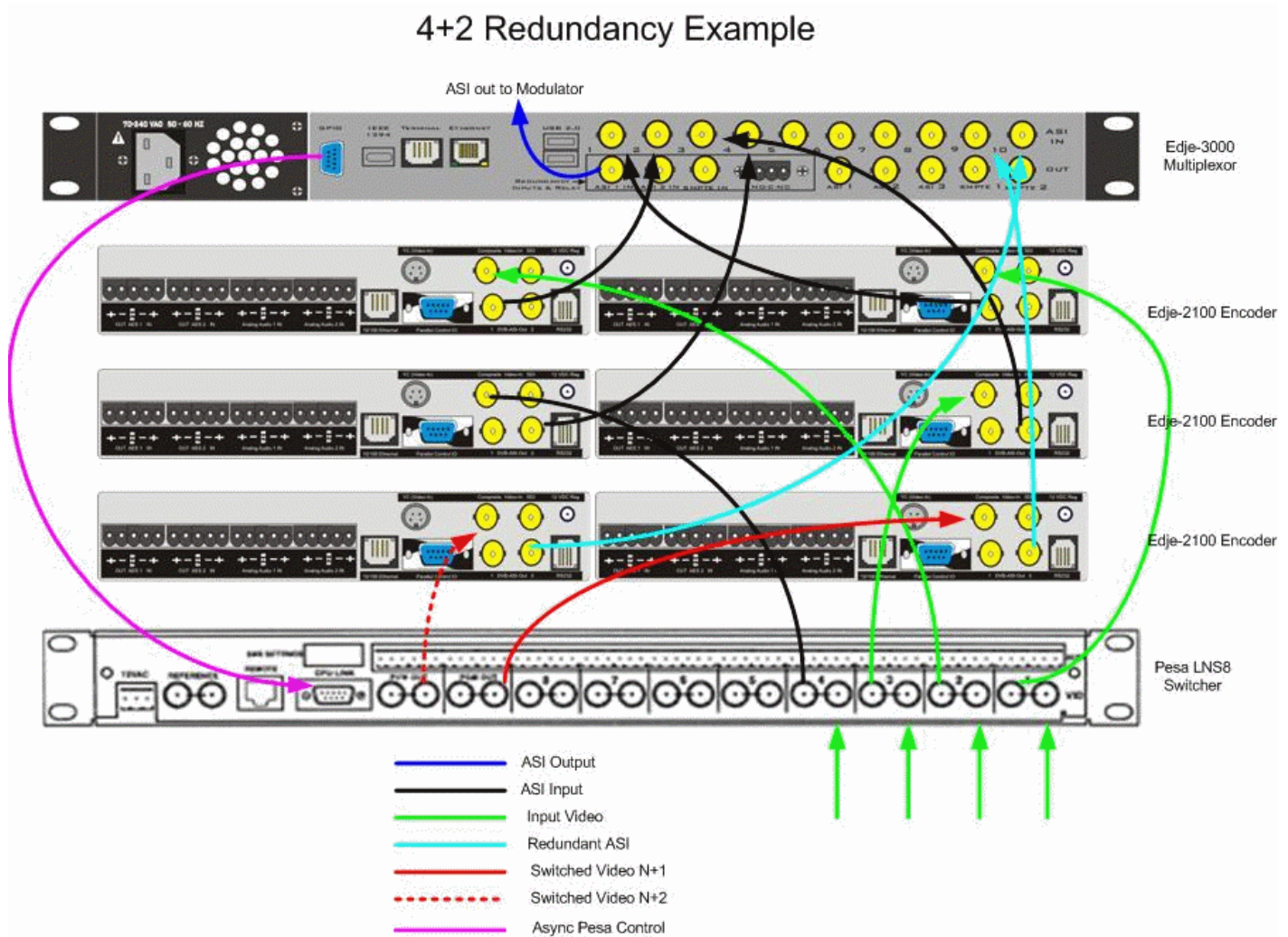
Redundancy Pinout

The redundancy cable between the DTA-3050 and the Pesa LNS8 is an RS-232 cross-over cable and is pinned as follows:

DB-9 Female	DB-9 Female
Pin 2	Pin 3
Pin 3	Pin 2
Pin 5	Pin 5

Multiplexer Redundancy

The DTA-3050 is designed to provide 1:1 encoder redundancy when connected to a second DTA-3050 encoder. No external redundancy switch is required to provide 1:1 redundancy – all redundancy support is contained in the unit. The secondary Multiplexer will be "upstream" to the primary Multiplexer. When the secondary is online, the output will flow through the primary. When the secondary is offline, then the output will simply terminate into the primary and the primary's output will be the egress present at the output.

Redundancy is controlled by the primary Multiplexer. A relay has been added to the product and when the normally closed (NC) circuit, in its non-energized state, will route the secondary traffic to the output. When the relay is energized, output will be from the primary mux.

To determine the status of an encoder (Primary / Secondary), the user can look in the upper-right corner of the LCD display. The LCD screen shows a letter to denote the redundancy status:

- **P** = Primary
- **S** = Secondary.

A blank in the upper-right hand corner denotes stand-alone mode.

Connections

Redundancy is achieved by cabling two DTA-3050's in a serial fashion as shown in the following figure:
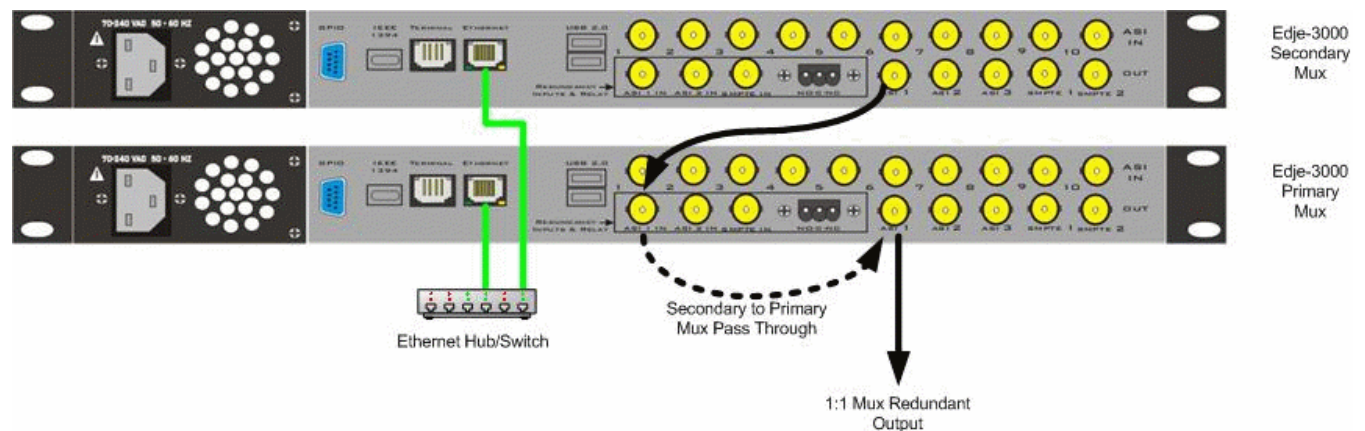
Intentionally Left Blank

Operations

When the primary mux is powered up and operational, all output is from the **primary**. In the event the primary fails or power is removed, the secondary will be switched in de-energizing a relay inside the primary. When the relay is de-energized, all traffic from the secondary will be routed from the ASI In 1 to the ASI 1 (output) and ASI In 2 will be routed in the a similar fashion to ASI 2 (output).

Redundancy control is accomplished by monitoring critical function in the DTA-3050 and if any fail or power is removed from the unit, then the unit is taken offline.

Both the primary and secondary Multiplexers are connected via an Ethernet LAN connection. The LAN connection ensures that both Multiplexers can communicate with one another and configuration information is constantly exchanged between the units.

Configuration changes should be made to the primary Multiplexer, and these changes will be reflected on the secondary via a redundancy-configuration application.

Multiplexer Configuration

Redundancy must be configured via the front panel interface and is not support via the Web interface at this time. A redundant configuration requires that when one Multiplexer experiences a configuration change, the redundant partner must be changed accordingly. Therefore, the primary and secondary Multiplexer must periodically exchange configuration information to ensure that both units are configured identically.

The user must configure each Multiplexer's role as follows:

Primary

1. Redundancy relay must be energized to become online primary.
2. Secondary's IP address must be configured.
3. Primary should send configuration updates to the secondary.
4. When online, events and IP logging should be performed.

Secondary

1. Redundancy relay should always be energized during operation
2. Primary's IP address should automatically be displayed when the primary contacts the secondary
3. Secondary should receive and verify configuration updates
4. When online, events and IP logging should be performed

Standalone (Default Configuration)

1. Redundancy relay should always be energized during operation.

Logs Screen

Two Log reports are available from this screen, **Multiplexer Logs** and **OS Logs**.

Multiplexer Logs: to access Multiplexer logs, select the type desired (choices are All Mux, Major Mux, and Minor Mux) from the pull-down menu, and press the **<Submit Query>** button.

OS Logs: "All" is the only option on the OS Logs pull-down; press the **<Submit Query>** button to complete the request.

Display

Reports will display the following information, although in a linear table format:

Heading	Information Contained
ID	identification number of an event
Date	date an event occured
Time	time of the event (in 24-hour format)
Application	the application reporting the event
Severity	Major- events that impact service Minor-events that no dont impact service Info- Information only Config- configuration changes Notice- event notices
Message	text that describes the event

There is no "logged in" option on the **Logs** screen.

Updates Screen

The Upgrade Tab is used to easily select and upgrade your unit's firmware from the available versions, and to unlock optional features available. There are two sub-tabs on this screen- Firmware and Features.
Firmware
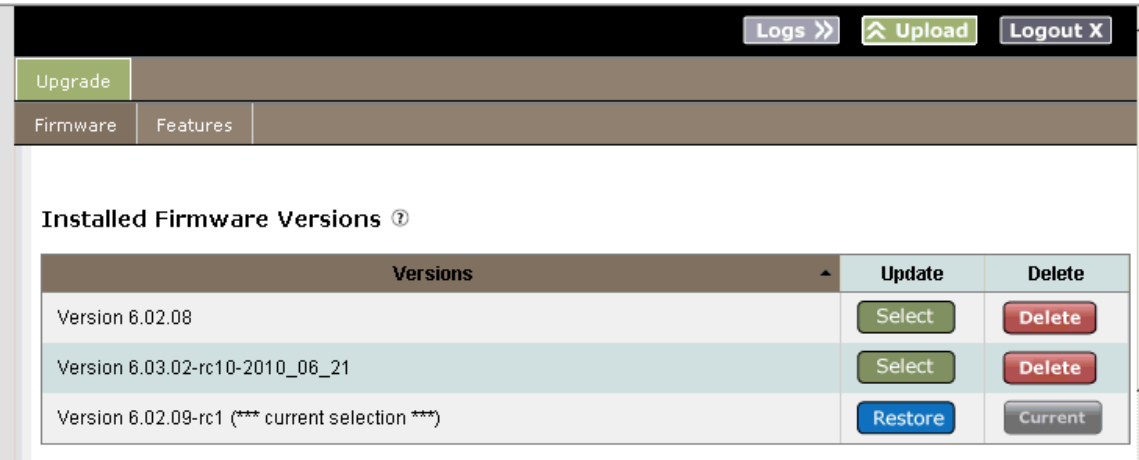
Screenshot:
Image reduced for clarity **Installed Versions** are firmware versions that have been installed on your device and can be selected as the current operating version. To select one of these versions, simply click on the **<Select>** button associated with the version. Due to the caching properties of your browser, it is necessary to clear your cache or restart the browser to make sure that the new application pages load. Click the **<Upgrade>** tab a second time to view the currently loaded versions. **Other Controls**

- **Delete:** clicking the **<Delete>** button will delete that stored firmware version from your device.
- **Restore:** the **<Restore>** button only appears next to the currently installed firmware version. Clicking **<Restore>** will reset all user-defined configuration settings back to the factory defaults.
    - ♦ This **includes** the IP Address defined for the unit **and** the removal of any Feature Keys.
    - ♦ If **<Restore>** is selected, the unit will ask for a confirmation before carrying out the reset.
    - ♦ If your broswer doesn't re-direct after **<Restore>** is selected, close it and re-open it, directed to the IP Address 192.168.10.48 (the factory default IPA).

To upload new firmware versions, click on the **<Upload>** button, then click on the **<Upload>** button on the "Adtec Uploader" pop-up that appears, and select the desired firmware version by clicking it. After the new version is uploaded, a pop-up screen will confirm its availability on the device.

Features

Main Window Shown; screenshot shows optional Feature Keys enabled. Your DTA may differ.

Clicking the **"Input Key"** button will pop-up a screen so that the key sequence can be entered. On the DTA, ASI Input ports 1-5 will ship unlocked. Optional features include Conditional Access and ASI Input ports 6-10. Contact your Adtec sales representative regarding the purchase of feature keys. Check www.adtecinc.com for news regarding new features that may be available for the DTA-3050.

Modulation Targets Reference

When connecting to a modulator (QAM for cable or QPSK for satellite), the DTA3050 will automatically calculate the desired egress rate and NIT table parameters, based on the modulation target selected.

QAM

Modulation Target	188 Byte Mode	204 Byte Mode
QAM64NTSC	5.056900 Msps	4.660400 Msps
QAM256NTSC	5.360530 Msps	4.940000 Msps
QAM64PAL	6.742500 Msps	6.213400 Msps
QAM256PAL	7.147400 Msps	6.586700 Msps

QPSK

For QPSK, refer to the following formula:

- Bit Rate= Symbol Rate*(2* Viterbi * 188/204)
    - ♦ where **Symbol Rate** = Symbol Rate of the satellite carrier
    - ♦ and **Viterbi Rate** = 1/2, 2/3, 3/4, 5/6, or 7/8 coding

Manual Rate

- In the event the pre-configured rates are not desired, the user can manually enter the desired rate. This is the default mode of operation on the DTA3050.

SMPTE-310M

- Provides 19,392,568.46 bps of output over the SMPTE-310M interface.
    - ♦ The ASI port operates concurrently, but at a fixed rate of 19,392,568.46 bps.
    - ♦ The ASI port can be used as a "monitor port" in this mode.

Manual Upgrades

Important Notes

- This upgrade **must** be executed from the local area network that the unit- or units- are attached to.
    - ♦ There is a limitation in the Units FTP server and it does **not** work through NAT devices.
    - ♦ Please turn **off** any personal firewall software before running the upgrade.
        - ◊ If you do not want to turn off personal firewalls, then ports 43 and 79 must be opened up.

Upgrading the Unit

Follow these steps:

Step	Action
1	Save the file to your PC.
2	Run the file.
3	When the command prompt window opens type ' **upgrade** ', press the space bar, type your unit's IP address, and press < **Enter>**. **Example:** C:\DTA_Upgrade\upgrade 192.168.10.48 **<Enter>**
4	Follow on the screen prompts.

Restoring the Backup

The upgrade creates a tar file at the root of the file system. The file is named <date>_system_backup.tgz. This file can be un-tared and the unit will revert to the previous state.

In the event you want to revert back to the old version and configuration, here are the steps to restore the unit to the previous state:

Step	Action
1	rcasimux stop
2	cd /
3	pwd. This MUST respond with / this command lets you know what directory you are in. You **must** be in the root of the filesystem, which is '/ not root'.
4	tar –xvzf <date>_system_backup.tgz
5	shutdown –rn now

The steps outlined above will un-tar the back-up, including the configuration. **Additional Support** Contact Support (615-256-6619 or 904-720-2003 x 241) if you have any problems with the upgrade.

Operations

Manual PID Injection - Overview

The DTA's ingress logic requires Service Information (SI) to present a list of programs or PIDs to map to the output. Manual PID injection is used to pass a program or PID that is not referenced in the SI. The most common example of manual PID injection is a transport stream from an SI generator or Transport Stream spooler. Manual PID injection mode is useful for:

- **PID injection -** passing a PID or PIDs unreferenced by the SI/PSI/PSIP generated by the DTA.
- **Program injection -** passing a PID or PIDs and referencing them in the SI/PSI/PSIP generated by the DTA.
- **SI/PSI/PSIP injection -** passing PIDs that are tables.
- **Elementary Stream Addition -** adding a PID or PIDs to an existing program (or programs).

This article will explain in detail how to use manual PID injection modes, and provide examples of the process in use.

Requirements

Attention: referenced third-party software is **suggested**; Adtec does **not** endorse any third-party software product over another.

- Telnet/ssh client: http://the.earth.li~sgtatham/putty/latest/x86/putty.exe
- File transfer utility: http://winscp.net/download/winscp425.exe
- Text Editor: http://www.editpadpro.com/download.html (**note:** program is not freeware)
- Correct version of the DTA software.
    - ♦ must use version 6.02.04a (or higher) software.
- Know the value(s) of the PIDs you want to inject.
- A manualpidconfigX.xml file with entries that match your application.

Procedure

Step	Action
1	Connect the transport streaming source device to the desired input.
2	Edit the manualpidconfig file with the desired values. (You can either get the file from the unit or use one of the samples located at adtecftp.com.
3	Transfer the file back to the unit (to /var/local/lib/asimux).
4	From the unit's Front Panel or browser-based GUI, configure the port that the transport streaming source device is connected to as follows: Port State = **Enabled** Port Mode = **Manual** Tables = **None**
5	Reset the unit.
6	Confirm that PIDs are present from the Mappings page. They will show up as program 100000, and be listed under "Components".

Examples/Samples

PID Injection

This sample will pass an unreferenced PID, 0x1234 from Input 5:

<?xml version="1.0" encoding="UTF-8"?> <configuration xmlns:xi="!http://www.w3.org/2001/XInclude"> <manual_pid_config index="5">   <pid>   <pid_in base="16">1234</pid_in>   <pid_out base="16">1234</pid_out>   <stream_type>Private</stream_type>   </pid>   </manual_pid_config> </configuration>

SI/PSI/PSIP Injection

The sample below will pass PIDs ox10 (NIT) and Ox11 (SDT) from Input 5. When using this mode you **must** turn off NIT and

SDT generation by the DTA. If your SI Generator is to supply all tables, you should disable all tables in the DTA. This can be accomplished from the Tables menu (Front Panel) or Tables page in the GUI.

```
<?xml version="1.0" encoding="UTF-8"?> <configuration xmlns:xi=!"http://www.w3.org/2001/XInclude">
<manual_pid_config index="5">        <pid>          <pid_in base="16">10</pid_in>          <pid_out
base="16">10</pid_out>          <stream_type>Private</stream_type>        </pid>        <pid>          <pid_in
base="16">11</pid_in>          <pid_out base="16">11</pid_out>          <stream_type>Private</stream_type>
</pid>        </manual_pid_config> </configuration>
```

Program Injection

The following sample will pass PID 0x257 from Input 5, and build a program number 9999 (PMT) 0x256 that references it.

```
<?xml version="1.0" encoding="UTF-8"?> <configuration xmlns:xi="!http://www.w3.org/2001/XInclude">
<manual_pid_config index="5">        <pid>          <program_number_out base="10">9999</program_number_out>
        <pid_in base="16">0</pid_in>          <pid_out base="16">256</pid_out>
<stream_type>PMT</stream_type>        </pid>        <pid>          <program_number_out
base="10">9999</program_number_out>          <pid_in base="16">257</pid_in>          <pid_out
base="16">257</pid_out>          <stream_type>Private</stream_type>        </pid>        </manual_pid_config>
</configuration>
```

Elementary Stream Addition

The sample below will pass PIDs Oxcf and Oxd) from Input 5 ans add htem to porgram number 2 sourced from input 2. This sample is from an MPH injection application. If you wanted to add the MHP objects to additional programs, you would add additional xml notes with the corresponding <port> and <program_number_out> elements.

```
<?xml version="1.0" encoding="UTF-8"?> <configuration xmlns:xi="http://www.w3.org/2001/XInclude">
<manual_pid_config index="10">        <pid>          <port>2</port>
<program_number_out_base="10">2</program_number_out>          <pid_in base="16">cf</pid_in>
<pid_out base="16">cf</pid_out>          <stream_type>Type B</stream_type>        </pid>        </manual_pid_config>
</configuration>
```

XML Elements

Complete breakdown on all the XML elements:

XML Element	Function
<manual_pid_config_index>	signals the application as to which input to look for the PIDs to pass
<port>	used in conjunction with <program_number_out> and signalls the egress as to which program (PMT) to update with the injected PIDs.
<pid_in>	signals the ingres as to which PID to look for.
<pid_out>	signals the egress to pass the <pid_in> on the defined value.
<stream_type>	signals the egress (PMT) how to define the injected PIDs.

Valid Stream Types

List of valid stream types:

- "Mpg1Vid"
- "Mpg2Vid "
- "Mpg1Aud"
- "Mpg2Aud "
- "Private"
- "Ac3Aud "
- "MHEG"
- "DSMCC "
- "H222"
- "Type A"
- "Type B"
- "Type C"
- "Type D"
- "Aux"
- "H264Vid"
- "DCIIVid"
- "ATSCAud"
- "SubTitl"
- "PMT"
- "PCR"
- "Teletxt"
- "SubTitl"
- "VbiData"
- "VbiTTxt "
- "EMM"
- "ECM"

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Using XCrypt with the DTA3050

In addition to functioning as a MUX for Digital Turn Around, the DTA3050 can also function as a scrambler with many Conditional Access systems. This article describes setting the DTA3050 to scramble using XCrypt.

This article should be considered a **DRAFT**; actual procedures may vary based on local installation.

Network Communications

Communications between the DTA and XCrypt server are to reside on the management network (eth0). TSOIP is to reside on the Media network (eth1, aka GIG-E). These networks **must** be separated physically.

Configure CA for XCrypt

CA	CA1	CA2	CA3	CA4	CA5
Enable:	XCrypt				
Super CAS ID:	4AD10000				
CAS System ID:	4AD1				
ECMG IP:	192.168.10.17				
ECMG Port:	9954				
ECMG Channel ID:	0001				
ECMG Crypto Period:	10				
ECMG Keep Alive:	5				
EMMG Mode:	TCP				
EMMG Port:	55555				
EMMG Maximum Bandwidth:	100				
EMMG PID:	0500				
EMMG Data Channel ID:	0001				
EMMG Keep Alive:	5				
Private Data Length:	28				
Private Data:	200110AC01103400B00				

Main Window shown

On the **Conditional Access** page, select the CA tab you want to set. Up to five different CA system parameter settings can be stored on the unit, one per tab. These settings are saved on the device as a configuration file, but are not transferrable to another DTA device. Set the parameters as follows:

Parameter	Setting
Enable	select **XCrypt** from the drop-down menu
Super CAS ID	enter the CAS ID (value supplied by XCrypt), **plus** four zeros (0000)
CAS System ID	enter the CAS ID (value supplied by XCrypt)
ECMG IP	enter the IP address of the XCrypt server
ECMG Port	set to match **Host Port** (the default is the setting provided by XCrypt)
ECMG Channel ID	enter **0001**
ECMG Crypto Period	enter **10**
ECMG Keep Alive	enter **5**
EMMG Mode	select **TCP** from the pull-down menu
EMMG Port	set to match **Host Port** (the default is the setting provided by XCrypt)
EMMG Maximum Bandwidth	enter **100** (maximum bandwith of the DTA3050 **)**
EMMG PID	set to hex value (user-defined)
EMMG Channel ID	enter **0001**
EMMG Keep Alive	enter **5**
Private Data Length	enter value supplied by XCrypt
Private Data	enter value supplied by XCrypt

You **must** click **<Apply Changes>** to apply and save your CA configuration!

Encrypting a Service

 After configuring the CA type, access the **Mappings** page in the UI, then click on the CA tab corresponding to the CA tab you just configured (in our example, CA1):

 Main Window shown   Set the parameters on this page according to the following table:

Parameter	Setting
Scramble	select **XCrypt** from the pull-down menu, with the numeral that corresponds to the CA tab that XCrypt was configured on.
Criteria Length	divide the Criteria number (next field) by 2; enter the result. (This is the Criteria value expressed in bits.)
Criteria	enter the Criteria value supplied by XCrypt
Private Data Length	divide the Private Data number (next field) by 2; enter the result. (This is the Private Data value expressed in bits.)
Private Data	enter the Private Data number supplied by Xcrypt
ECM PID	hexadecimal value; user-defined.

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Appendix

Contacting Customer Support

Adtec Digital's Support Services

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

Telephone and Email Support

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

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

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

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

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

Information needed for Support

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

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

Advanced Support Plans

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

Standard-Priority Support Plan Description

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

Priority - 24 Support Plan (24 Hour) Description

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

Plan Comparisons

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

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

Troubleshooting Guide: DTA3050

Problem	Solution
I have video, but no audio, on my receiver	Check the table type on your Mux input. If table type is set to ATSC, then manually change your DTA's Audio Input setting to ATSC (the default is DVB) from the front panel (cannot be done on the GUI)
I have an old mux, and my IP out does not appear on my GIGE network	Telnet on port 43, root, 1root! Next, issue this command: IP route add 224.0.0.0/4 dev eth1
My web interface (GUI) went away	Telnet on port 43, root, 1root! Next, issue this command: rcapache restart
I am missing one of my services on the output. Inputs are on manual mode	On the Mappings page in the GUI, are there red boxes around one or more of the listed services? If so, there is a service ID conflict. To resolve: 1. Change service numbers manually, or clear your inputs. 2. Start over with them in Auto Mode and allow the mux to auto-assign, then set inputs back to Manual. All detected services will be passed in the output multiplex without conflict. Individual services and service components can be dropped to clean up the output
New IP addresses don't work	Check: are your eth0 and eth1 addresses on the same subnet? If so change one of them to a different subnet
Input indicators are constantly red	check to ensure that the appropriate ASI input port has a cable securely attached. Also, ensure that the cable type is a standard 75-ohm coaxial cable.
Input indicators are neither red or green	the port has been administratively disabled. Re-enable the port via the front panel or on-board GUI
Input indicators continue to flash red	the port sees 188/204 byte synchronization, but does not contain PSI (PAT/PMT) tables.
Output indicator periodically flashes red	an Output overflow is occurring- there is more input data than can be multiplexed to the Output port.
I do not see the Modulation type used in the Output menu	if the modulation type is not inm the menu selection, the egress rate can be selected by choosing **'Manual Selection'** mode on the front panel or on-board GUI interface

I cannot get Ethernet (LAN) connectivity to my DTA3050	1. Verify that the LINK LED (center group, front panel) is lit.
	   a. If the LED is not illuminated, verify the connection between the Ethernet patch cord and the hub/switch.
	   b. An Ethernet cross-over cable will not work- it must be a patch cord.
	2. Ensure that the port on the hub/switch is **not** the MDI or chaining port- if this port was used, move the patch cord to a non- MDI or -chaining port.

the front panel displays "Mux shutdown "	this message is displayed when the ASIMUX application has shut down and the multiplexer is not usable. Please contact Adtech's technical support staff at your earliest convenience.
Web Interface (on-board GUI) displays "cannot get session"	a user is already logged on as an administrative user. To resolve, the first user must log off of the unit.
Changes are not persistant (permanent)	Front panel changes are only saved when the users explicitly selects the save parameter feature or when the unit transitions from Administratyive mode to Status mode. On the GUI, the "Apply Changes" button must be clicked to apply your edits. A progress bar will be displayed while the unit writes the changes to the configuration file, and will disappear automatically when the operation is complete.

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Technical Specifications for the Adtec DTA30-50-HW3 Digital Turn Around Media Router

Inputs

General: the DTA has 10 BNC physical Asynchronous Serial Interfaces (ASI).

ASI Input Specifications (ingress):

- Byte (55 Mbs) and Burst (211 Mbs) modes (Auto detect)
- 188 and 204 byte wide Transport Stream (TS) packetization (Manual configuration)
- 100 kbs to 210 Mbs data input

Redundant ASI Input Specifications (for future use):

- Two discrete ASI inputs with relay bypass to ASI out (egress)
- Automatic switch over on egress loss of Sync (TS)
- Automatics switch over on egress loss of PAT

Input Payload Support:

- Removes stuffing (null) packets
- MPEG 2 Standard (SD) or High (HD) Definition video
- MPEG 4 part 10 (H.264/AVC) Standard (SD) or High (HD) Definition video
- MPEG 1 Layer 1, 2 audio
- Dolby Digital 2.0 (AC3) audio
- Dolby Digital 5.1 audio
- Dolby Digital Plus (2.0, 5.1 or 7.1) audio
- AAC audio
- ASI TS packetized data (set top code loads, MHP, table injection etc.)
- IP UDP data (limited to 20 Mbs with no PCR re-stamping)

Input Table Support:

No tables -No Table structure is referenced on an input. Raw transport stream (TS) packetized data with sync bytes based on 188 or 204 byte width. This is typically used with data carouselling that is not time based.

Digicypher

Motorola proprietary tabel structure based on MPEG (Only supported on inputs):

Motion Picture Experts Group (MPEG) Program Specific Information(PSI):ISO 13818-1 Sytems Information establishes and defines the use of Program Specific Information (PSI). This includes digital television video, audio, data and conditional access information. The PSI implementation is basic and fundamental and provides the foundation on which DVB and ATSC tables are built. The use of PSI is not intended (but is used) for Direct To Home (DTH) distribution of digital television and radio services.

- Program Association Table (PAT)
- Conditional Access Table (CAT)
- Program Map Table(s) (PMT)

Digital Video Broadcasting (DVB) System Information (SI):

ETSI EN300468 establishes and defines the use of System Information (SI) tables to provide a hunanistic interface between digital television video, audio and anciliarry data services such as Subtitles, Teletext, MHP or other data payloads. Decoding devices such as Set Top Boxes for residential and Integrated Receiver Descrambler (IRD) for professional applications use the SI table data. The SI information adds versobes service names, modulation details, date, time and program (event) information for the distribution of digital television and radio services via satellite, cable, terrestrial, handheld and IPTV viewing methods.

- Service Descriptor Table (SDT)
- Network Information Table (NIT)
- Event Information Table (EIT)
- Time and Date or Time Offset Table (TDT/TOT)
- Bouquet Association Table (BAT)
- Running State Table (RST)
- Stuffing Table (ST)
- Discontinuity Information Table (DIT)*
- Selection Information Table (SIT)*

* Optional Table

Advanced Television Systems Committee (ATSC) Program and System Information Protocol (PSIP):

Document A/65B establishes and defines the use of Program and System Information Protocol (PSIP) tables to provide a hunanistic interface between digital television video, audio and ancillary data services such as Captions, Subtitles, Teletext, or other data payloads. Decoding devices such as Set Top Boxes for residential and Integrated Receiver Descrambler (IRD) for professional decoder or DTA applications use the PSIP table data. The PSIP information adds verso bes service names, modulation details, date, time and program (event) information for the distribution of digital television and radio services via terrestrial, cable and handheld viewing methods.

- Master Guide Table (MGT)
- System Time Table (STT)
- xVCT (x = T for Terrestrial or C for Cable)
    - ♦ Terrestrial Virtual Chanel Table (TVCT)
    - ♦ Cable Virtual Channel Table (CVCT)
- Rating Region Table (RRT)
- Event Information Table (EIT)
- Extended Text Table (ETT)
- Directed Channel Change Table (DCCT)*
- Directed Channel Change Selection Code Table (DCCSCT)*

* Optional Table

Outputs

General: the DTA has three BNC physical Asynchronous Serial Interfaces (ASI)

- Mirrored outputs (same signal on ALL three physical ports)
- One ASI output containing an SPTS or MPTS per DTA
- The DTA provides copper GIGE
- Many GIGE output routes containing an SPTS or MPTS per DTA
- Supports UDP and RTP
- RTSP in development

Output Payload Support:

- Injects stuffing (null) packets and re-stamps PCR for ASI output and GIGE routes
- Enables Constant Bit Rate (CBR) for SPTS and MPTS
- All egress PCR jitter no greater than 80 nS
- MPEG 2 Standard (SD) or High (HD) Definition video
- MPEG 4 part 10 (H.264/AVC) Standard (SD) or High (HD) Definition video
- MPEG 1 Layer 1, 2 audio
- Dolby Digital 2.0 (AC3) audio
- Dolby Digital 5.1 audio
- Dolby Digital Plus (2.0, 5.1 or 7.1) audio
- AAC audio
- Other private data payloads

Output Table Support:

- MPEG Program Specific Information (PSI)
- DVB System Information (SI)
- ATSC Program and System Information Protocol (PSIP)

Output Table Modes:

- **Pass Mode:**
  - ♦ The DTA will pass input tables to output, based on user configuaration;
  - ♦ MPEG, DVB, ATSC supported
- **Local Mode:**
  - ♦ The DTA will locally generate Tables to output based on user configuration
  - ♦ Requires Adtec DTVGuide server
  - ♦ Local on site
  - ♦ Remote Web hosted service
    - ◊ Optional third part spooler support for ASI injection
- **Mixed Pass-Local Mode:**
  - ♦ If no input service tables are available, the local generator will build tables
  - ♦ If input service tables are available and the DTA has been configured to generate locally for a service, the local generator will take prescedence over pass.

Output re-multiplexing:

The DTA provides full multiplexing and re-multiplexing capabilities including:

- PCR re-stamping
- Jitter on ASI and GIGE less than 80 nS
- PID remapping
- PID collision detection and re-mapping
- Transport Stream and Service ID renumeration
- Service ID renaming
- Full Table (MPEG, DVB, ATSC) support
- Any Table type in to any table type out
- Concurrent DVB and ATSC table support in development
- Ghost (virtual service) creation

ASI Output

- ASI egress up to 210 Mbs
    - ♦ Any input service(s), SPTS or MPTS can be re-multiplexed into the single SPTS or MPTS ASI output.
- Tables per DTA ASI output
    - ♦ One PAT, CAT
- A PMT per service

Format	Tables Allowed
DVB	1. One SDT 2. Lists all services routed to ASI 3. One NIT a. List RF Parameters b. Lists all services routed to ASI 4. One EIT a. Provides event information data (viewer guide) b. Pass and/or Local generation One TDT/TOT
ATSC	1. One MGT a. xVCT 2. One STT 3. One RRT 4. Four (minimum) EITs (One for each 3 hour block) a. Up to 128 EITs (16 days) are supported per ATSC A65/B b. Pass and/or Local generation 5. Four(minimum) ETTs (One for each EIT) a. Up to 128 ETTs (16 days) are supported per ATSC A65/B b. Pass and or Local generation

GIGE Output

- GIGE route egress up to 280 Mbs
- Any input service(s), SPTS or MPTS can be re-multiplexed into the **many** SPTS or MPTS GIGE routes.
- Tables per DTA GIGE route (MANY GIGE routes per DTA, each route may be a SPTS or MPTS)
    - ♦ One PAT, CAT per route.
    - ♦ A PMT per service per route.
    - ♦ by format:

Format	Tables Allowed per route
DVB	1. One SDT per route a. Lists all services included within a route 2. One NIT per route a. Lists RF parameters per route b. Lists all services included within a route 3. One EIT per route a. Provides event information (guide) data within a route b. Pass or Local generation 4. One TDT/TOT per route
ATSC	1. One MGT per route a. xVCT 2. One STT per route 3. One RRT per route 4. Four (minimum) EITs (One for each 3 hour block) per route a. Up to 128 EITs (16 days) are supported per ATSC A65/B b. Pass and/or Local generation 5. Four ETTs (One for each EIT) per route a. 128 ETTs (16 days) are supported per ATSC A65/B b. Pass and/or Local generation

Output Ciphering

The DTA provides **DVB-CSA** and **AES** ciphering:

- Ethernet Simylcrypt and Multicrypt support per ETSI103197.
- DVB-CSA and AES are supported via ASI output and per GIGE route.

DTA Management

- Front Panel LCD and Keypad Alarm LEDs
  - ♦ One per input
  - ♦ Output
  - ♦ Host
  - ♦ CA
  - ♦ ASI Out
  - ♦ GIGE
- Two Serial ports
  - ♦ Fast Ethernet
  - ♦ TCP/IP
    - ◊ Telenet
    - ◊ SSH
    - ◊ FTP
    - ◊ HTTP (Apache)
  - ♦ Application Server (in development)
- Web page for command and control
  - ♦ MIB II
  - ♦ Uptime
  - ♦ Temperature
  - ♦ IP Address
  - ♦ MAC Address
  - ♦ No Private configuration MIB support

Platform

- Power PC CPU
- Adtec Micro-Monitor
- Adtec optimized Linux POSIX-compliant 2.6 kernel

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