

Digital Broadcast Test Platform

Model DTS-330



Key Features

- Provides a one-box solution that meets the widest variety of applications, eliminating the need to purchase additional test tools
- Performs analysis, evaluation, and troubleshooting in real time, minimizing the hassle and delay of capturing files for later detailed analysis
- Uses the familiar Windows® XP interface to provide beginners and experts with quick, easy access to needed information
- Allows engineers to quickly isolate and diagnose problems, providing faster response times for field service organizations
- Monitors, analyzes, records, creates, and plays transport streams at speeds from 1 kbps to 214 Mbps

Applications

- Measures, interprets, and displays transport stream status, content and statistics for all PIDs, programs/channels, tables and PCR/PTS/DTS timestamps
- Plays and analyzes simultaneously for simulation and examination in real time
- Includes a wide range of standard interfaces (DVB ASI, DVB SPI, and SMPTE-310M)
- Offers additional interface options (DHEI, QPSK, QAM, Gigabit Ethernet)
- Provides simultaneous analysis of multiple transport streams over multiple interfaces as an option
- Provides simultaneous play-out of multiple transport streams as an option
- Provides thumbnail and real-time view of program audio and video content

The JDSU Digital Broadcast Test Platform (DTS-330) is the industry's fastest, most flexible, and comprehensive solution for MPEG-2, DVB, and ATSC testing. This revolutionary, single-platform test set provides developers, broadcasters, system integrators, and field operators with multiple application modules that are easily configured to fit any test scenario. Due to the DTS-330's modular architecture and extensive set of application modules, users need only purchase the capabilities currently required, adding supplementary capabilities as new testing demands arise. Both desktop and portable versions of the DTS-330 are available.

- Continuous real-time monitoring and analysis of all transport stream data: PIDs, PCR/PTS timing, programs/channels, network information, conditional access, full PSI/SI/PSIP table and descriptor analysis, and complete private table decode at the industry's highest maximum input data rates of up to 214 Mbps. This eliminates the hassle and delay of capturing files for later detailed analysis
- Continuous real-time creation and emulation of a test stream, eliminating the storage-intensive and time-consuming "build-then-play" procedure required by all other stream-creation or manipulation devices. Offers industry-high output data rates of 214 Mbps
- Complete recording of transport streams with the original timing information for accurate playback and post-analysis. Performs PID filtering and records from memory at up to 214 Mbps
- Complete play out of transport streams using the original timing parameters. Performs continuous loop operation and play-out from memory at up to 214 Mbps.

2

Applications

Indispensable during equipment validation and acceptance testing, the DTS-330 verifies system performance by pinpointing and resolving equipment and system failures and interoperability issues while complying with the extremes of the MPEG-2, DVB, and ATSC standards. Its powerful stream creation, generation, and analysis tools combine to provide the complete solution for any test and measurement environment, including:

- R&D provides rigorous, aggressive design validation that enables multiplexer, set-top box, and digital TV manufacturers to reach the market faster and guarantee system quality
- Deployment trials assists in testing leading-edge technologies such as digital terrestrial TV, Video On Demand, and statistical multiplexing
- System installation allows integrators to solve configuration, interworking, and performance issues prior to system acceptance and turn-up of the service
- Network operation generates baselining reports and monitors quality of service in both contribution and distribution networks The DTS-330 is easily configured with one or more of the following application modules:
 - The Analyzer – for continuous, detailed, real-time analysis of all transport stream content and statistics
 - The Multiplexer – Continuous real-time transport stream creation
 - The Generator – for real-time transport stream recording and play-out Recording and play out of transport streams

DTS-330 Software Options

To expand the DTS-330's Analysis capabilities additional software options are available.

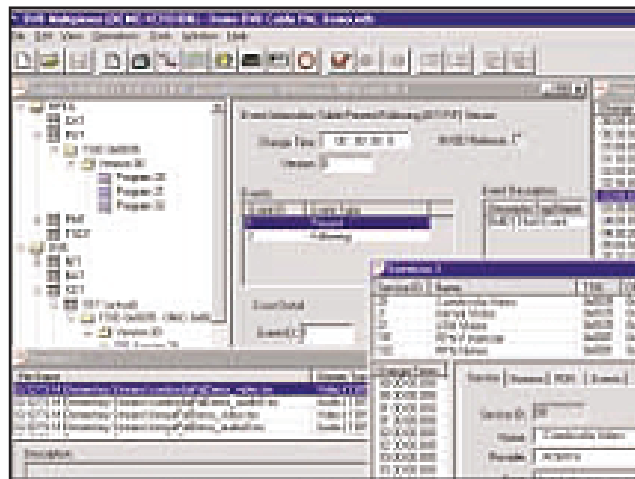
Offline Elementary Stream Analysis

The VISUALmpeg 110/150/AVC software options to the Analyzer allows for the troubleshooting of video elementary stream data embedded in the transport stream. It offers:

- Header information, picture coding type, quantizer values, motion vectors, macro block types, VBV buffer model
- Bit allocation, DCT coefficients, picture frequencies, MPEG artefacts, transport stream demul- tiplexing, extraction of video streams
- Bit rate viewer, bits per frame diagram, frame distortion index, frame quality index
- AVC modules enables off-line analysis of MPEG-4 content
- VISUALmpeg 110/150/AVC®

The Interra H264 analyzer helps analyze and troubleshoot encoded video and audio problems. Key features include:

- Supports the H.264, MPEG-2, MPEG-4, MP4, and the AAC Audio standards
- Provides powerful debug capabilities
- Graphical user interface and command line interface for batch processing
- Easy forward and backward navigation options



Multiplexer View

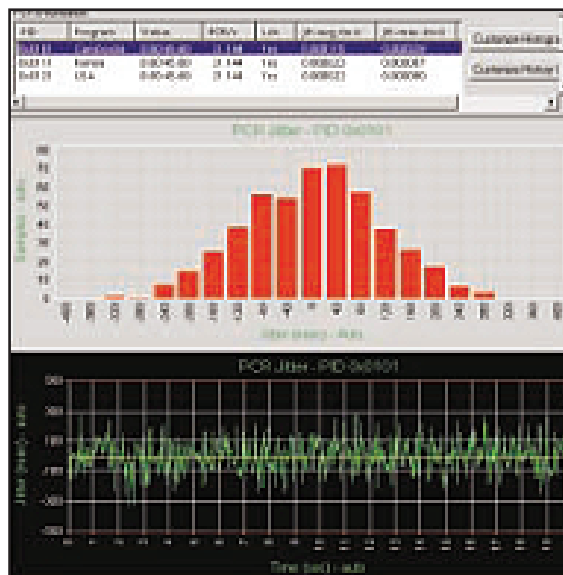
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Continuous, Real-Time Stream Creation and Storage

The Multiplexer is the industry's only real-time stream creation device. It generates demanding, user-created test streams that measure system performance under extreme conditions and can be used to perform exhaustive stress tests on encoders, multiplexers, and set-top-boxes to guarantee component reliability and compliance with MPEG-2 DVB and ATSC standards. With the Multiplexer, users can continuously create and emulate a test stream in real time, eliminating the storage-intensive and time-consuming "build-then-play" procedure required by all other stream-creation or manipulation devices. The Multiplexer generates a transport stream from a small database file containing the necessary user-defined timing, table, and elementary stream content. Its unique database creation capability and continuous looping of elementary stream segments allow an entire library of custom test scenarios to be stored in the space needed for just one recorded transport stream. These test streams can be e-mailed from the lab to the field, or an entire test library can be mailed on a single CD-ROM. Testing a digital TV or set-top box requires long-duration test streams with dynamic changes over time. The Multiplexer creates an output transport stream in real time that can play continuously for days or weeks. At any time during transmission, users can stop the output multiplex, modify any values, and start transmission again within seconds. Unlike any other stream creation tool, the Multiplexer updates all timing parameters so the output multiplex is seamless. Testing at data rates up to 214 Mbps, the Multiplexer allows users to create multiplexes containing:

- An unlimited number of PIDs, programs/channels, events, PCRs, and elementary streams
- PCR jitter, offset, and drift
- PSI/SI/PSIP tables and descriptors with user-defined content and rates
- Private tables and descriptors with user-defined content and rates
- Private data, including DSM-CC, teletext, subtitling, MPE/IP, and DVB data carousels
- Unlimited errors, including synchronization, continuity counter, transport, and PSI/SI/PSIP table errors

Additionally, with the Multiplexer, users do not have to wait for events to occur naturally in the transport stream. Instead, they can manipulate timing so a stream starts seconds before the scenario they want to test. For example, they can create a stream that starts at the PCR wrap point or seconds before the EIT changes. All Multiplexer displays are based on the Windows XP interface and can be accessed with a single mouse click from the main Multiplexer window. Users can view database content from the following eight displays: summary, services/channels, tables, streams, errors, PCRs, PIDs, and time. New users can quickly and easily modify sample databases using the menu bar, toolbar, and right-click menus; more advanced users can create customized, advanced MPEG-2/ ATSC/DVB transport streams using the Multiplexer's Wizard; and expert users can bypass the Wizard and start from scratch to specify all parameters in the transport stream. The Multiplexer offers a unique validation capability that warns the user when database content falls outside the specified standards. This prevents the insertion



PCR View

of unwanted errors and helps users become familiar with the limitations and the complexities of MPEG-2 transport streams. Manufacturers and developers of set-top boxes and digital TVs can configure their DTS-330 with both the Multiplexer and Generator modules and create a library of user-defined test streams to rigorously stress test their equipment, record live streams, and play test streams into a unit. By configuring the DTS-330 with the Analyzer, Multiplexer, and Generator application modules, developers can create a custom library of test streams for input and perform comprehensive analysis of a unit's output in real time. With this configuration, equipment errors are easily isolated, diagnosed, and resolved. Users can also perform acceptance testing by generating known good input sources and then using the Analyzer to create detailed reports for baselining.

DTS-330 Hardware Options

Multiple Analysis

The DTS-330 Multiple Analysis option allows users to simultaneously analyze and compare the input and output streams of a system or network. Unique in the industry, this capability eliminates the cost and hassle of using multiple analyzers for simultaneous analysis. With dual analysis on a single platform, a user can also simultaneously compare multiple points within a transmission system for rapid troubleshooting and problem localization.

Multiple Play

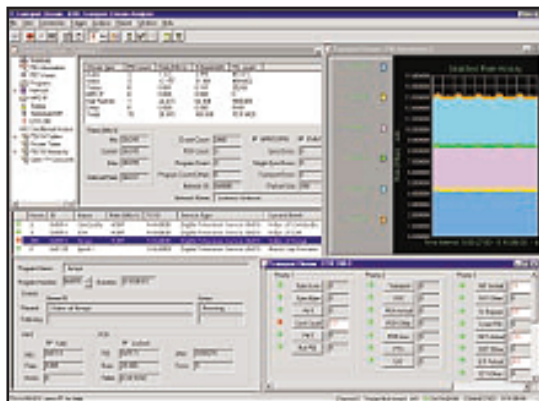
The DTS-330 Multiple Play option, the only tool that allows users to effectively test frequency hopping on set-top boxes and digital TV, plays two different streams with independent PSIP/SI tables to two different carriers from the same unit. This type of testing greatly increases set-top box and digital TV reliability and eliminates the need to purchase two pieces of generation equipment to perform a single test.

Baseband Interfaces (ASI/SPI/SMPTE-310M)

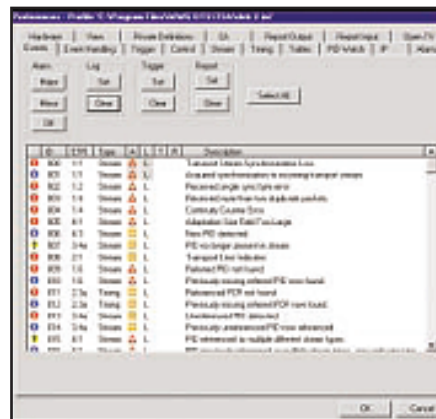
The DTS-330 Baseband interface option allows users to record and analyze MPEG-2-based ASI/SPI or SMPTE-310M signals. This built-in interface demodulates the signal and performs MPEG analysis on the underlying Transport Stream. (Please refer to MPEG-over-Baseband Interface specification sheet for additional info)

Satellite Interfaces

The DTS-330 DVB QPSK interface option allows users to record and analyze MPEG-based satellite signals, eliminating the need for field-service personnel to carry additional QPSK receiving equipment. This built-in interface demodulates the signal QPSK, 8PSK, TurboCode and performs MPEG analysis on the underlying Transport Stream. In addition, a QPSK application gives users control over carrier frequency, polarity, symbol rate, and LNB voltages as well as status information such as signal strength, signal lock, signal-to noise ratio, and error status. (Please refer to MPEG-over-QPSK Interface specification sheet for additional info)



Analyzer Multiple View



Event Listing and Control

Cable Interfaces

The DTS-330 QAM interface option allows users to record and analyze MPEG-2 Transport Stream encapsulated within CATV RF signals, eliminating the need for field-service personnel to carry additional QAM receiving equipment. This built-in interface demodulates the signal 6 & 8 Mhz QAM and performs MPEG analysis on the underlying Transport Stream. In addition, the QAM analyzer application gives users status information such as signal strength, signal lock, MER, BER, EVM, and constellation diagrams. (Please refer to MPEG-over-QAM Interface specification sheet for additional info)

IP Interface

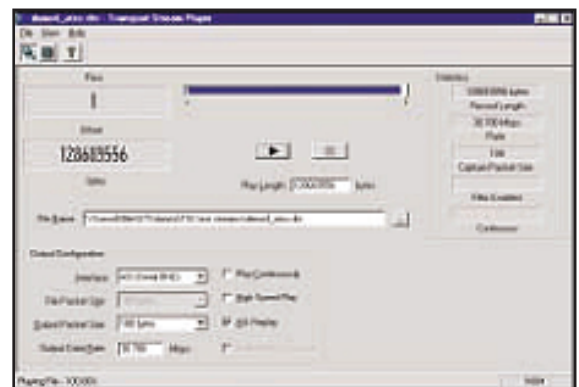
The DTS-330 IP interface option allows users to record and analyze MPEG-2 Transport Stream encapsulated within IP datagrams and carried over the IP networks. This built-in interface provides insight into the entire IP network pipe and allows the user to perform MPEG analysis on any underlying Transport Stream. In addition, the MPEG-over-IP analyzer application gives users status information such as link status, Frame rates, IP error condition identification and counts. (Please refer to MPEG-over-IP Interface specification sheet for additional info)

Terrestrial Broadcasting Interface

The DTS-330 terrestrial broadcasting interfaces allow users to receive and analyze MPEG-2 transport streams encapsulated within COFDM or 8VSB modulated RF signals. This built-in interface demodulates the RF signal and performs MPEG analysis on the underlying TS while providing some rudimentary measurements on the RF layer parameters in order to facilitate root cause analysis across layers. (Please refer to MPEG over Terrestrial Broadcast specification sheet for additional info)



Multiple Analysis View



Play View

System Specifications

The DTS-330 system is self-contained and based on the Microsoft Windows XP platform with 160 GB disk drive space, DVD-R/RW, CD-R/RW Combo drive, floppy disk drive, and Ethernet interface (10/100/1000 BaseT).

Portable 15" TFT display, mouse & keyboard

Ordering Information

Interface Options

DHEI Interface 7551/92.74	I7554/9274
MPEG Analyzer ASI Interface Module 7554/92.10	I7554/9210
MPEG Analyzer/Recorder ASI Interface Module 7554/92.50	I7554/9250
MPEG Player ASI Interface Module 7554/92.20	I7554/9220
MPEG Analyzer Gigabit Ethernet Interface Module 7551/92.80	I7554/9280
MPEG Analyzer QAM-8Mhz Interface Module 7554/92.82	I7554/9282
MPEG Analyzer QAM-6Mhz Interface Module 7554/92.80	I7554/9281
MPEG Analyzer Satellite Interface Module 7554/92.71	I7554/9271
MPEG Analyzer 8VSB Interface Module 7554/91.20	I7554/9221
MPEG Analyzer COFDM Interface Module 7554/91.24	I7554/9224

Ordering Information continued

Software Options

VISUALmpeg 110/150 7551/94.09	I7554/9309
7551/94.07	I7554/9307
Real-Time Analysis for OpenTV 7551/94.02	I7554/9307
Real-Time Analysis for XSI 7551/94.01	I7554/9301

Miscellaneous

Hard Travel Case 7554/90.32	I7554/9132
DTS-330 Mainframe 7554/90.01	I7554/9001

Software Subscriptions
(must be bought with main product purchase)

Analyzer Software Update (Per Update) 7551/95.02	I7554/9702
Multiplexer Software Update (Per Update) 7551/95.03	I7554/9703
Player Software Update (Per Update) 7551/95.04	I7554/9704
Recorder Software Update (Per Update) 7554/95.05	I7554/9705
Analyzer Software Annual Software Maintenance 7554/95.07	I7554/9707
Multiplexer Software Annual Software Maintenance 7554/95.08	I7554/9708
Player Software Annual Software Maintenance 7554/95.09	I7554/9709
Recorder Software Annual Software Maintenance 7554/95.10	I7554/9710