MPEG Generators

MTX100B MPEG-2 Recorder and Player Data Sheet

MTX100B MPEG-2 Recorder and Player

Features & Benefits

- Transport Stream Generation and Recording in a Portable Form Factor with Real-time Updating of Time Stamps and Time Tables for Error-free Looping
- IPTV and Video over IP Stress Test Generation for STB Test or Migrating to IP Interface Technology, Including Support for IPv6 and TTS Standards
- Comprehensive Suite of DVB, ATSC, and MPEG Test Streams Supplied as Standard Provides Ready-made Content for Stream Creation and Generation
- Multiplexer Software Option with New Integrated Playout Functionality Provides a Complete Solution for Stream Creation, Editing, and Generation
- High-capacity Storage, and High Data Rate Recording and Playout of MPEG Transport Streams Let You Build, Maintain, and Use a Large Local Library of Test Streams
- IEEE1394b, USB 2.0, and GbE Interface Download of Transport Streams for Optimum Flexibility in Storing and Managing Transport Stream Libraries
- PCR Jitter Insertion to Help You Fully Stress Your Product or System Design
- Remote Control using Ethernet, with Standard Command for Programmable Instruments (SCPI) Command Set
- Easy Integration with Tektronix MPEG Analysis Tools for Transport Stream Creation to Support Compliance and Stress Testing of Video Products Using MPEG-2 Technology
- Integrated with Tektronix Monitoring Tools for Powerful and Cost-effective Transport Stream Monitoring, and Error Recording
- Color Hierarchical Display of Transport Stream Components for Quick and Easy Interpretation of Complex Structures
- A Full Suite of Electrical Interfaces Lets You Address a Wide Range of Applications

Applications

- IRD/STB Design and Manufacturing Test
- Evaluation of Professional MPEG Equipment
- Performance Verification of MPEG Systems
- Scheduling of Stream Playout and Recording for Broadcast and Production Line Applications
- Portable, In-field Analysis Tool for System Installation, Commissioning, and Debug of MPEG Transmission Systems

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Product Information

The MTX100B MPEG-2 Recorder and Player offers a flexible, affordable solution for design evaluation and conformance testing of digital video products using MPEG-2 technology. The MTX100B records and plays out MPEG-2 transport streams compliant with ATSC, DVB, and ISDB standards at the high data rates needed to verify and troubleshoot designs for high-performance video products and systems. The large internal storage, USB 2.0, and Ethernet download capability help you build and maintain a large library of test streams. A suite of DVB, ATSC, and MPEG Test streams are provided with the instrument and optional Multiplexer software with new integrated playout functionality, provides a complete stream creation and generation tool set.

The MTX100B offers continuous, error-free transport stream looping for long-duration playout, and PCR jitter insertion for stressing designs. Users can continuously loop all sample streams, including updating of all time stamps, continuity counters, time tables (TDT, TOT, and STT), Normal Playtime Reference, ISDB-T Reed Solomon FEC plus RTP time stamps and sequence numbers for IPTV, without fear of buffer under- or overflow. IP generation capability negates the need to purchase a separate IP Player and provides a consistent user experience regardless of which physical interface is used to generate streams. Investment is protected through inclusion of support for IPv6 and TTS standards.

Ethernet network remote control functionality enables control of functions such as Play, Record, Clock Rate, and Jitter Insertion using the SCPI (Standard Control for Programmable Instruments) command set.

The MTX100B can play any transport stream files, including custom transport streams created with offline multiplexers in the Tektronix MPEG Analysis Tools. In addition, the MTX100B can play data files in other formats, including elementary streams and files in DSS format.

Applications

Development

For the development of instruments that process digital television signals, the MTX100B is a powerful signal source for parametric stress tests and evaluation. Streams can be repeatedly played out into development systems and equipment without timing discontinuities, simulating transmissions easily and consistently.

Manufacturing

The ability to repeatedly playout a range of transport streams directly into equipment in a manufacturing environment is crucial when checking quality and conformance. The user interface makes control of MTX100B intuitive and simple, and remote control interfaces provide the flexibility of remote and automated control.

Integration

The MTX100B can be used as a broadcast simulator when installing and debugging transmission chains by using test streams and recording transmissions. The user's control over the source material removes a major element of uncertainty when installing systems and equipment. This speeds up the installation and debugging process, and helps ensure a better end result. The large number of physical and electrical transport stream interfaces that Tektronix supports means that interfacing to other pieces of equipment in the transmission chain is easy.

Transmission

For error analysis of Transport Streams, the MTX100B provides continuous recording that can be controlled by external trigger signals from the MTM400 Transport Stream monitoring tool. Digital TV broadcasters and Network operators can analyze captured streams in-depth using Industry-leading Tektronix Analysis Tools.

A Scheduler application enables the MTX100B to be used as a simple content scenario server for transport-stream based transmissions. The extendable storage allows users to tailor the amount of storage they require.

IPTV

Support for IP Stress test playout with capabilities for error insertion (IP Packet Drops, Checksum Errors, Sequence Errors, and Packet Jitter), burst mode (both timing and packet number based), and manual error generation capabilities provide a complete solution for validating IPTV equipment designs. Advanced Mode provides protocol header customization capabilities for source and destination ports and addresses, setting MAC address, transport checksum, network checksums, and user editing of any packet header field parameters.

Session replication functionality is provided to simultaneously encapsulate and play a TS over many IP sessions to simulate an IPTV environment.

Portable MPEG Analysis

The addition of the MTS400 MPEG analysis toolset to the MTX100B platform provides the broadest, deepest MPEG tool set on a highly portable platform. Ideally suited to in-field installation, commissioning, and debug of complex MPEG transmission systems the analysis options offered with the MTX100B provide both real-time and offline transport stream analysis capability for ASI/SMPTE310M interfaces. Additional options provide offline multiplexing, PES and buffer analysis, elementary stream analysis, and data broadcast analysis and generation.

A separate data sheet is available covering the MTX100B Stream Multiplexing and Analysis options in greater detail.

Performance You Can Count On

Depend on Tektronix to provide you with performance you can count on. In addition to industry-leading service and support, this product comes backed by a one-year warranty as standard.

Characteristics

System Characteristics

Characteristic	Description
MPEG Stream Source	Supports MPEG-2, DVB, ATSC, and ISDB protocols. Records and plays out MPEG streams in multiple formats. Error-free looping. PCR jitter insertion
Packet Length	188, 204, or 208 bytes, and Non-TS
ASI Maximum Data Rate	
Memory	200 Mb/s
Disk	120 Mb/s
Maximum individual file size of 100 GB	
ASI Minimum Data Rate, Play and Record	256 Kb/s
ASI Minimum Data Rate, Portable MPEG Analysis	500 Kb/s
IP Generation	Supports IPv4, IPv6,RTP. UDP. Unicast, IGMP Multicast and broadcast modes, TTS
IP Maximum Data Rate	
Single session	160 Mb/s
Session replication	300 Mb/s
Number of Input/Output Interfaces	One DVB SPI I/O standard, with a second I/O available
Available Optional Interfaces	Asynchronous Serial Interface (ASI/M2S), Universal Parallel/Serial Interface, IEEE1394 (Firewire), SMPTE310M
Internal Reference Clock	27 MHz ±1 ppm when manufactured
Stability	±1 ppm over temperature range
Long-term drift	±0.5 ppm per year
External Reference Input	27 MHz ±1 ppm (recommended)

Transport Stream Interfaces

Characteristic	Description
DVB Synchronous Parallel Interface (Standard)	Connector: 25-pin D-sub Maximum data rate: 200 Mb/s
IP Interface (Standard)	10/100/1000BaseT RJ45 Network Interface
Asynchronous Serial Interface (Option 01)	Connector: BNC Maximum data rate: 200 Mb/s, User-selectable burst and nonburst transmission format
Universal Parallel/Serial Interface (Option 02)	Parallel, Serial, and Event Output Modes
Parallel Mode	Connector: 25-pin D-sub Maximum Data Rate: 200 Mb/s Output Levels: ECL, LVDS, and TTL with/without termination, Single-end Input Levels
ECL and TTL with Termination	
Serial Mode	Connector: 25-pin D-sub Maximum Data Rate: 40 Mb/s Output Levels: ECL, LVDS, and TTL Differential Input Levels: ECL and TTL with/without termination, Single-end Input Levels
ECL and TTL with Termination	
Event Output	Connector: BNC
IEEE1394/ASI Interface (Option 05)	
IEEE1394 Connector	4-pin standard, Data Rate: 400 Mb/s
ASI Connector	BNC, Maximum Data Rate: 200 Mb/s
SMPTE310M/ASI/SPI Interface (Option 07)	
SMPTE310M Connector	BNC, Data Rate: 19.39 Mb/s
ASI Connector	BNC, Maximum Data Rate: 200 Mb/s
SPI In Connector	25-pin D-sub, Maximum Data Rate: 200 Mb/s

Platform Characteristics

Characteristic	Description
Operating System	Microsoft Windows XP
Disk Space	19.5 GB, MPEG storage: 182 GB
RAM	1024 MB
Display	1024×768, Color LCD
Character Input	Keypad
Keyboard and Mouse	Standard
Interfaces	VGA output, Printer port, Serial port, USB 2.0, 1000 BASE-T Ethernet, IEEE1394b

Environmental Characteristics

Characteristic	Description
Temperature	
Operating	+5 °C to +40 °C
Nonoperating	-20 °C to +60 °C
Humidity	
Operating	20% to 80% (noncondensing)
Nonoperating	5% to 90% (noncondensing)
Altitude	
Operating	Up to 3 km
Nonoperating	Up to 12 km

Regulatory

Characteristic	Description
EMC	EN61326-1
Safety	UL61010-1, CAN/CSA C22.2 No. 61010-1-04, EN61010-1
Australia Declaration of Conformity	AS/NZS 2064

Power Requirements

Characteristic	Description
Mains Voltage Range	100 to 240 VAC
Mains Frequency	50/60 Hz
Power Requirements	180 VA Max

Physical Characteristics

Dimensions	mm	in.
Height	132	5.2
Width	214	8.4
Depth	435	17
Weight	**kg**	**lb.**
Net	6.2	13.7

PC System Requirements for Scheduler Software

The following PC configuration is required for installation:

- Intel, or 100% compatible motherboard chipset.
- Windows 2000 Operating System, or Windows XP Operating System.
- 256 MB RAM.
- 2-3 MB of available hard disk space for applications and documentation.
- VGA (640 × 480) resolution video adapter and monitor. (XVGA (1024 × 768), or higher resolution recommended)
- CD-ROM, or DVD drive.
- Keyboard and Microsoft Mouse, or compatible pointing device.

Important Note – Apart from those specifically authorized by Tektronix, no other applications should be installed on the PC. If other applications are installed, they may interfere with the operation of the software supplied. Software operation under these circumstances cannot be guaranteed.

Ordering Information

When ordering Option 05, please consider the following guidelines:

- When considering the purchase of Option 05 (Firewire), the MTX100B's Option 05 interoperability with the target device should be verified prior to order placement.
- Interoperability of Option 05 (Firewire) with a given model of a manufacturer's product does not guarantee interoperability with:
  - Other models from the same manufacturer
  - That same model employing new software or firmware

MTX100B Recorder and Player

Includes: Stream capture and playout over DVB SPI and IP interfaces with error-free looping, error and jitter insertion, 512 MB RAM, 182 GB MPEG stream storage, T-clips sample stream library, USB keyboard and mouse, front cover, user manual, and one-year warranty.

Note: Please specify power plug when ordering.

MTX100B Options

Options

Option	Description
Opt. 01	Add ASI Interface Module
Opt. 02	Add Universal Parallel/Serial Interface Module
Opt. 05	Add IEEE1394/ASI Interface Module
Opt. 07	Add SMPTE310M/ASI/SPI Interface Module
Opt. SC	Scheduler
Note: Options 01, 02, 05, and 07 are mutually exclusive.	
Important: Option 07 is required to run Opt. TSCX and Opt. MTX10UP.	
Security Dongle key to add:	
Opt. TSCX	Real-time Transport Stream Compliance Analyzer to MTX100B
Opt. TSCA	Deferred-time Transport Stream Compliance Analyzer to MTX100B
Opt. MX	Deferred-time Multiplexer to MTX100B
Opt. ES	ES Analyzer to MTX100B
Opt. PA	PES Analyzer to MTX100B
Opt. BA	Buffer Analyzer to MTX100B
Opt. DB	Carousel Analyzer to MTX100B
Opt. CG	Carousel Generator to MTX100B
Opt. DBCG	Carousel Analyzer and Carousel Generator to MTX100B

Service

Option	Description
Opt. C3	Calibration Service 3 Years
Opt. C5	Calibration Service 5 Years
Opt. D1	Calibration Data Report
Opt. D3	Calibration Data Report 3 Years (with Opt. C3)
Opt. D5	Calibration Data Report 5 Years (with Opt. C5)
Opt. G3	Complete Care 3 Years (includes loaner, scheduled calibration and more)
Opt. G5	Complete Care 5 Years (includes loaner, scheduled calibration and more)
Opt. R3	Repair Service 3 Years
Opt. R5	Repair Service 5 Years

Power Plug Options

Option	Description
Opt. A0	North America
Opt. A1	Universal EURO
Opt. A2	United Kingdom
Opt. A3	Australia
Opt. A4	240 V, North America
Opt. A5	Switzerland
Opt. A6	Japan
Opt. A10	China
Opt. A11	India
Opt. A99	No Power cord

Language Options

Option	Description
Printed Manual	
Opt. L0	English
Opt. L5	Japanese
Opt. L99	Electronic manuals only (no printed manual)

Upgrade Kit

Option	Description
MTX10UP	Field Upgrade Kit for MTX100B. Any options shall be transferred to OptionDongle. This option includes a USB memory stick and upgrade instructions
Opt. 01	Add ASI Interface Module
Opt. 02	Add Universal Parallel/Serial Interface Module
Opt. 05	Add IEEE1394/ASI Interface Module
Opt. 07	Add SMPTE310M/ASI/SPI Interface Module
Opt. SC	Scheduler Option
Opt. IPTVP	Add IPTV Gigabit Ethernet interface with 10/100/1000 Base-T RJ45 electrical port. Requires Opt. TSCX and Opt. 07
MTXPAUP	Field upgrade kit for MTX100B. Any options shall be transferred to OptionDongle. This option includes a USB memory stick and upgrade instructions
Upgrade to add Security Dongle key for:	
Opt. MX	Deferred-time Multiplexer to MTX100B
Opt. ES	ES Analyzer to MTX100B
Opt. PA	PES Analyzer to MTX100B
Opt. BA	Buffer Analyzer to MTX100B
Opt. DB	Carousel Analyzer to MTX100B
Opt. CG	Carousel Generator to MTX100B
Opt. DBCG	Carousel Analyzer and Carousel Generator to MTX100B
Opt. TSCA	Transport Stream Compliance Analyzer to MTX100B
Opt. TSCX	Real-time Transport Stream Compliance Analyzer to MTX100B
Software	
Opt. UPG	Upgrade to latest version of software
Documentation	
Opt. L0	English Documentation for Portable Analyzer printed (MTS400)
Opt. L5	Japanese Documentation for Portable Analyzer printed (MTS400)
Opt. L99	Electronic manuals only (no printed manual) for Portable Analyzer (MTS400)

Optional Accessories

Option	Description
071-1754-xx	Service Manual
WFM7F05 Opt. NN	Rackmount Kit
1700F06	Blank Panel

CE

Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.

Contact Tektronix:

ASEAN / Australasia (65) 6356 3900

Austria 00800 2255 4835*

Balkans, Israel, South Africa and other ISE Countries +41 52 675 3777

Belgium 00800 2255 4835*

Brazil +55 (11) 3759 7627

Canada 1 800 833 9200

Central East Europe and the Baltics +41 52 675 3777

Central Europe & Greece +41 52 675 3777

Denmark +45 80 88 1401

Finland +41 52 675 3777

France 00800 2255 4835*

Germany 00800 2255 4835*

Hong Kong 400 820 5835

India 000 800 650 1835

Italy 00800 2255 4835*

Japan 81 (3) 6714 3010

Luxembourg +41 52 675 3777

Mexico, Central/South America & Caribbean 52 (55) 56 04 50 90

Middle East, Asia, and North Africa +41 52 675 3777

The Netherlands 00800 2255 4835*

Norway 800 16098

People's Republic of China 400 820 5835

Poland +41 52 675 3777

Portugal 80 08 12370

Republic of Korea 001 800 8255 2835

Russia & CIS +7 (495) 7484900

South Africa +41 52 675 3777

Spain 00800 2255 4835*

Sweden 00800 2255 4835*

Switzerland 00800 2255 4835*

Taiwan 886 (2) 2722 9622

United Kingdom & Ireland 00800 2255 4835*

USA 1 800 833 9200

* European toll-free number. If not accessible, call: +41 52 675 3777

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For Further Information. Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit **www.tektronix.com**

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