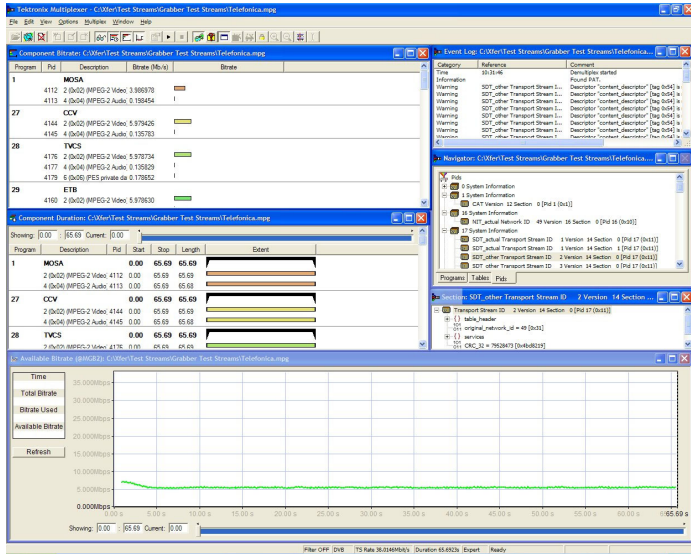


# MTS400 Series MPEG Analysis Tools

## Multiplexer and SI Table Editor Data Sheet



### Characteristics

#### Applications

When testing network elements or set-top boxes, a Transport Stream of the representative type needed is often not available. Even if there is a similar one, vital components within it may be missing or suffer from a lack of SI (system information) or other tables, or are multiplexed to the incorrect Transport Stream rate for the application.

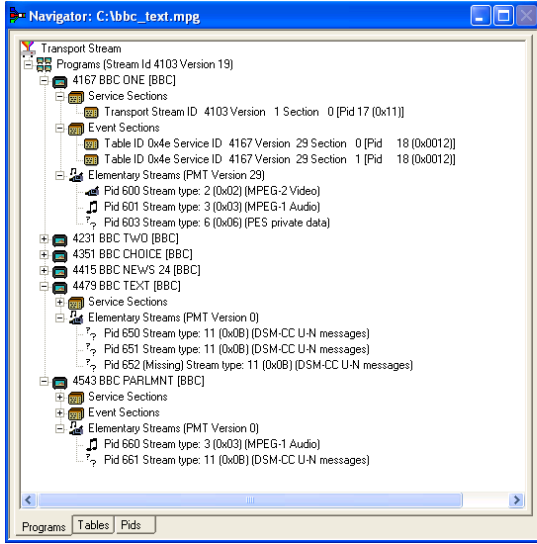
Use the Multiplexer/Remultiplexer/Demultiplexer application to create multiprogram Transport Streams with custom SI/PSI/PSIP information for DVB (including Annex A stream support), ATSC, ISDB, and MPEG compliant Transport Streams. A Single Segment mode is included with both ISDB-T and ISDB-TB (Brazil) standards.

H.264 Elementary Streams may also be multiplexed into a Transport Stream. H.264 streams both with and without SEI timing messages are supported. The PTS and DTS generated for non-SEI streams are based upon the POC (Picture Order Count) information. PTS/DTS generation may be suppressed for SEI streams. Bit rate and frame rate auto-detection features aid the import process. These may be overridden for non-SEI streams.

This enables the user to create their own test streams that they can use to validate and debug their designs more quickly, and also to create errored streams to perform parametric stress testing and ensure robustness and quality of their MPEG-2 or H.264 implementation.

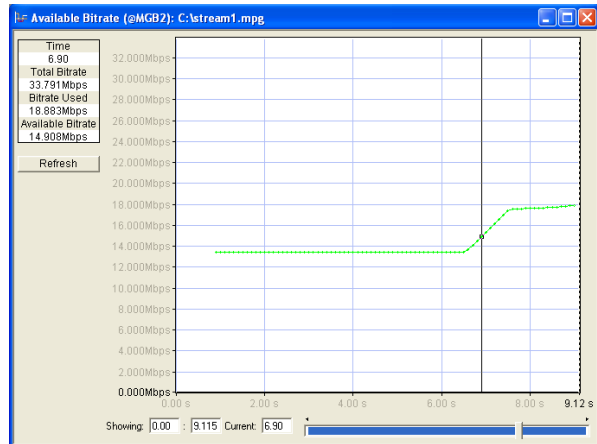
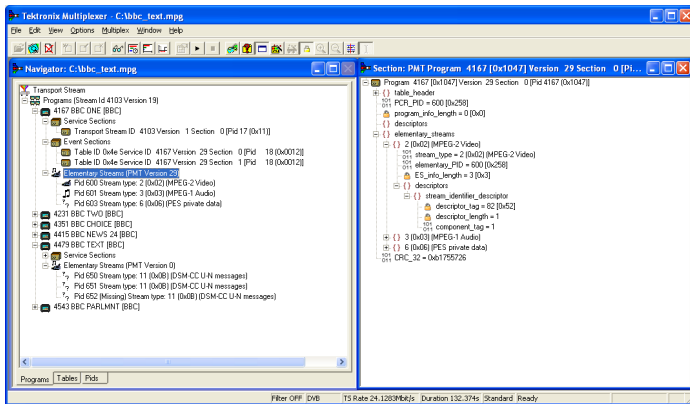
### Features & Benefits

- Demultiplex Existing Transport Streams
- Create New Transport Streams and Modify Existing Ones
- Supports MPEG, DVB, ATSC, and ISDB (including ISDB-T and ISDB-TB Single Segment) Service Information
- Create and Edit Streams using the Proprietary Sky XSI Service Information (Approved customers only)
- Supports a Wide Range of CODEC Types, including AVC/H.264 and MPEG-4 AAC
- Wizards for Common Tasks, such as Transport Stream Creation and Program Addition
- Add and Modify Elementary Streams and SI/PSIP
- Instantaneous Display of Available Bandwidth
- Generate Compliant Timing at Specified Output Bit Rates
- Expert Mode for Creating Errored Streams
- Integrated with Player for Fast Real-time Stream Playout



Component Duration: C:\stream1.mpg

Program	Description	Pid	Start	Stop	Length	Extent
2098	Flextech Service 6	0.00	9.12	9.12		
	2 (0x02) (MPEG-2 Video 2304	0.00	9.12	9.12		
	3 (0x03) (MPEG-1 Audio 2306	0.00	9.11	9.11		
	6 (0x06) (PES private da 2305	0.01	9.11	9.10		
2099	Flextech Service 7	0.00	6.63	6.63		
	2 (0x02) (MPEG-2 Video 2307	0.00	6.63	6.63		
	3 (0x03) (MPEG-1 Audio 2309	0.00	6.63	6.63		
	6 (0x06) (PES private da 2308	0.00	6.63	6.63		
6001	Living	0.00	9.12	9.12		
	2 (0x02) (MPEG-2 Video 2310	0.00	9.12	9.12		
	3 (0x03) (MPEG-1 Audio 2312	0.00	7.27	7.27		
	6 (0x06) (PES private da 2311	0.01	8.47	8.46		
6002	Challenge TV	0.00	9.12	9.11		
	2 (0x02) (MPEG-2 Video 2314	0.00	9.12	9.11		
	3 (0x03) (MPEG-1 Audio 2316	0.00	9.11	9.11		
	6 (0x06) (PES private da 2315	0.01	9.11	9.10		
6003	Trouble	0.00	9.12	9.12		
	2 (0x02) (MPEG-2 Video 2318	0.00	9.12	9.12		
	3 (0x03) (MPEG-1 Audio 2320	0.00	9.11	9.11		
	6 (0x06) (PES private da 2319	0.01	9.11	9.10		



## Multiplexer Details

The multiplexer allows the user to collect together components from streams recorded off hard disk or CD/DVD-ROM, manipulate them in an unlimited manner, and then rebuild a fully compliant output stream. The stream may either be stored to disk or streamed directly from a physical interface when installed as part of an MTS400 Series instrument. The software's built-in knowledge of table syntax and descriptors ensures compliance and high-quality output of the final multiplexed Transport Stream.

## Demultiplex Existing Streams

The multiplexer accepts any recorded Transport Stream as an input source. The user can then demultiplex this Transport Stream into its component PES. The user can then save the resulting PES and ES streams onto disk. The demultiplexer is Elementary Stream agnostic and can be used to extract H.264 and VC-1 Elementary Streams from a Transport Stream.

## Add and Modify Elementary Streams and SI/PSIP

The multiplexer allows all the standard ATSC, DVB, ISDB, ISDB-TB (Brazil), and MPEG PSIP/SI tables and descriptors to be added or edited. It also supports the proprietary Sky XSI standard. Scripting allows new or proprietary tables and descriptors to be added safely with built-in compliance checks. The user is permitted

to generate illegal conditions that allow stress of decoder or transmission chain equipment to verify its robustness.

Elementary Streams within donor Transport Streams may be multiplexed into a new Transport Stream. Individual ES or PES files may also be imported.

## Program Groups

PES, or elementary video and audio streams, can be grouped together into logical groups – "Programs" of video, audio, and other associated data (such as Teletext / Closed Caption and MHP applications) with the original timing preserved. PIDs can be remapped as required.

## Component Views and Available Bandwidth View

The Component Bit Durations view graphically displays the durations as well as start and stop times for each video or audio content PID. Duration and start/stop times can be changed by "drag and drop" or numerical entry. The available bandwidth view clearly shows the user how much content can be added into a Transport Stream so the user can expand or optimize.

**Generate Compliant Timing at Specified Output Bit Rates**

The multiplexer is able to insert PCRs at the correct repetition rate and also allows the user to specify the PCR repetition rate, if desired.

**“Expert” and “Standard” Modes**

Standard mode will calculate related fields and table pointers. Expert mode is also provided to allow the user to set these to illegal conditions for stress and robustness test of network elements and STB decoders.

**Wizards for Common Tasks**

- Create new Transport Streams
- Specify ATSC, DVB, ISDB, ISDB-TB, and MPEG standards
- Add programs
- Add Elementary Streams

**Supported CODEC Types**

- MPEG-1 Video
- MPEG-1 Audio
- MPEG-2 Video
- MPEG-2 Audio
- MPEG-2 AAC Audio
- MPEG-4 AAC Audio, including High Efficiency and 5.1 channels
- AC-3 Audio
- H.264 Video (both with and without optional SEI timing messages)
- All the above are supported in Elementary and PES (Packetized Elementary Stream) formats
- PIDs from other Transport Streams of any format can be imported including H.264 and VC-1
- Other data – the bit rate must be specified

**Make Seamless Wizard**

The Make Seamless wizard is provided with the Multiplexer. When looping a Transport Stream to simulate continuous playout, errors can be generated at the loop point caused by discontinuities in timing information. The Make Seamless wizard provides the opportunity of creating a seamless version of a Transport Stream file by adjusting:

- The stream SI to comply with the DVB and ATSC standards
- The video ES components at the endpoints such that Closed GOPS are created. This means that all picture predictions may be resolved
- Audio ES components such that there are no partial frames at the stream endpoints

**Stand-alone Software System Requirements (MTS4SA)**

- PC with Genuine Intel Pentium class 1.2 GHz processor
- Intel or 100% compatible motherboard chipset
- Windows XP or Windows Vista operating system
- Internet Explorer 5.0 or above
- 256 MB of RAM
- 50 MB of available hard disk space for the application and documentation
- Additional space will be required for generated Transport Streams
- SVGA (800×600) 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

**Ordering Information**

**Multiplexer and SI Table Editor**

This application is available on MTS400 Series analyzer instruments, as MTS4SA stand-alone software, and on MTX/RTX Series generator instruments.



Product(s) are manufactured in ISO registered facilities.



Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

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