

Read This First



**MTS300 MPEG Test System
Software Version 5.1**

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www.tektronix.com



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Read This First

Read This First contains release information about the Tektronix MTS300 MPEG Test System Software Version 5.1 and associated components. This document is organized as follows:

- *CD-ROM Directories* page 2
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Version 5.1 of the MTS300 MPEG Test System now supports both DHEI (Digicypher) and SSI (SMPTE310M) optional input formats, in addition to the standard ASI/M2S and optional SPI (LVDS) inputs. These changes are documented in the MTS300 MPEG Test System Hardware and Software Installation Technical Reference that is included with each MTS300 MPEG Test System and with each hardware upgrade kit.

The following changes were made to the user interfaces of the applications indicated for this release of the MTS300 MPEG Test System:

- The Expert Client ETR290 panel changed to reflect the revised ETR290 standard.
- The Configuration Client panels that enable some of the ETR290 probes have changed to reflect the new nomenclature of these tests.
- The Configuration Client PCR Timing Analysis Panel changes, allowing you to select the bandwidth used in the calculation of PCR Jitter.

These changes are described in *New Applications and Features* beginning on page 6. A subsequent release of the MTS300 MPEG Test System will include this information in the manuals that accompany the test system and upgrade kits. For now, however, use the information in this document to familiarize yourself with the changes to the test system applications.

CD-ROM Directories

The following directories are provided on the *MTS300 MPEG Test System Application Software Recovery* CD-ROM supplied with your MTS300 system:

AVDelay This directory contains audio and video elementary streams and configuration files so that you can create transport streams that can be used to measure audio/video delay using the Tektronix VM700 or VM700A instruments.

Manuals This directory contains user manuals for all of the MTS300 MPEG Test System applications in Adobe Acrobat (.pdf) format. You can read and print the manuals using Acrobat Reader, which is also supplied in this directory.

The PDF files on the CDROM apply to the 5.0 release of the MTS300 MPEG Test System. New manuals and PDF files with the changes from this release of the test system (5.1) will be available at the next release of the test system (tentatively scheduled for February, 2001). To order new manuals, see your Tektronix Sales representative.

PerformanceVerification This directory contains a transport stream file and utility that can be used to verify the rate specifications of the MTS300 system, and to verify the accuracy of transport stream recording and play back. The Readme.txt file in this directory provides instructions for using the verification stream and utility.

Sp6a This directory contains the Windows NT Service Pack 6a upgrade installation file (sp6I386.exe). Service Pack 6a is standard on all MTS300 systems. Refer to the *MTS300 MPEG Test System Hardware and Software Installation Technical Reference* (Tektronix part number 071-0667-00) for installation instructions.

UpgradeWizard This directory contains the MTS300 upgrade program file (mts3wiz.exe).

NOTE. You must use the Upgrade Wizard program to order upgrades for your MTS300 system.

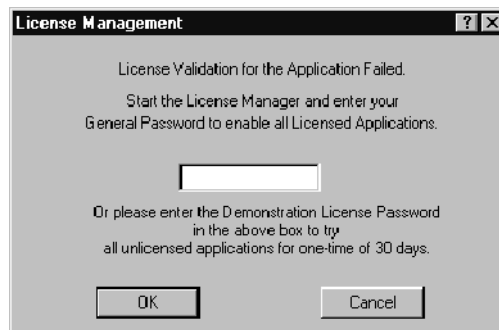
Demonstration License

MTS300 MPEG Test Systems are manufactured with files, icons, and menu items for all MTS300 applications that work with the installed hardware, even though some applications may not be licensed for use with your test system.

NOTE. *The Demonstration License applies to all unlicensed applications concurrently and cannot be renewed. Be sure to try all applications of interest within thirty days of activating the license.*

To try optional applications, use the following procedure to activate the Demonstration License, which enables all unlicensed applications for thirty days:

1. Consult the password document supplied with your MPEG Test System product and identify the eight-digit Demonstration Password.
2. Start any unlicensed application. The License Management dialog box opens.



3. Enter the password in the License Management dialog box and then click **OK**. After you have correctly entered the password, all unlicensed or optional applications are available for the following thirty days.

Standard and Optional Applications

Table 1 lists the standard and optional applications available with the MTS300 system. You can upgrade your existing MTS300 system with the optional applications listed below.

Table 1: MTS300 standard and optional applications

Instrument	Licensed applications
MTS300 (standard)	Master Client Expert Client Configuration Client Stream Recorder Stream Player Private Syntax Interpreter Error Injector
MTS300 Option DT	MPEG-2 DVB/ATSC System Analyzer (deferred time) ATSC Table Editor DVB Channel Coder/Decoder DVB Table Editor Jitter Adder Multiplexer (deferred-time)
MTS300 Option ES	MPEG Audio Stream Analyzer MPEG Video Stream Analyzer
MTS300 Option OC (ViAccess Conditional Access)	None
MTS300 Option OM	OpenMux
MTS300 Option PS	Program Stream Analyzer
MTS300 Option AC-3	Dolby Digital Audio Stream Analyzer

Hardware Upgrades

You can add one of the following upgrade kits to your MTS300 system for an additional signal-format, I/O interface:

- MTS3FLV. This kit adds two I/O ports using the SPI (LVDS parallel) interface.
- MTS3FDE. This kit adds two I/O ports using the DHEI (Digicipher II) interface.
- MT32FSS. This kit adds two I/O ports using the SMPTE310M interface.

Software Version Numbers

The application version numbers for the 5.1 release of the test system are listed in Table 2.

Table 2: MTS300 V5.1 software version numbers

Program file	Application name	Version	File date
Adn_carb.exe	MPEG-2 DVB/ATSC System Analyzer	05.01.03	03 Apr 2000
AnalysisServer.exe		1.6.0.0	10 Oct 2000
Audace.exe	Dolby Digital Audio Stream Analyzer	1.31	05 Apr 2000
Austral.exe	MPEG Audio Stream Analyzer	01.04.01	08 Sept 1999
BrowserServer.exe		1.0.0.8	03 Apr 2000
Canal.exe	DVB Channel Coding and Decoding	01.00.03	23 Jul 1998
Compiler.exe			08 Oct 1999
Config.exe	OpenMux Client	1.6.4.0	06 June 2000
ConfigurationClient.exe	Configuration Client	1.6.0.0	14 Sept 2000
Editable.exe	DVB Table Editor	02.07.00	26 Aug 1999
EditableAtsc.exe	ATSC Table Editor	01.01.00	26 Aug 1999
Einjwin.exe	Error Injector	1.02	18 Jun 1998
ExpertClient.exe	Expert Client	1.4.0.0	14 Sept 2000
Gigue.exe	Jitter Adder	2.00.04	23 Jul 1998
Master.exe	Master Client	1.6.0.0	18 Sept 2000
MpegAnalysisService		1.6.0.0	14 Sept 2000
Mux_Mpg2.exe	MPEG-2 DVB/ATSC Transport Stream Multiplexer	03.07.04	04 May 2000
OpenMux.exe	Open Mux Server	1.60.11.0	12 July 2000
OpenTable.exe	Private Syntax Interpreter	01.00.02	11 Oct 1999
PlayerClient	Stream Player Client	1.6.0.0	10 Nov 2000
PlayerServer.exe	Stream Player Server	1.6.0.0	14 Sept 2000
Protek.exe	License Manager	01.00.02	23 Jul 1998
Pulsar.exe	Program Stream Analyzer	01.04.02	24 Feb 2000
RecorderClient.exe	Stream Recorder Client	1.6.0.0	14 Sept 2000
RecorderServer.exe	Stream Recorder Server	1.6.0.0	20 Oct 2000
SelfTest.exe		01.01.04	19 July 2000
ServerManagerV2.exe		1.6.0.0	14 Sept 2000

Table 2: MTS300 V5.1 software version numbers (Cont.)

Program file	Application name	Version	File date
Vistal.exe	MPEG Video Stream Analyzer	01.03.01	31 Aug 1999
Uninst50.isu	Uninstall MTS V5.0		

New Applications and Features

The Real Time Analyzer (RTA) of the MTS200 Series was replaced by a client/server architecture with the version 5.0 release of the MTS300 MPEG Test System. The applications that you use to monitor and analyze transport stream inputs are the Master, Expert, and Configuration clients. Each of these clients are briefly described in this section, and changes in the version 5.1 software are noted.

Master Client

The Master Client uses the following panels to provide an intuitive interface for monitoring the status of transport stream inputs:

- The Port Manager panel displays icons representing each I/O port you have installed on the MTS300 system. You can assign each I/O port to one of the following applications: Analysis Server (to analyze a stream), Stream Recorder, Stream Player, or OpenMux (MTS300, Option OM only).

You will start the Expert and Configuration Clients from the Master Client.

- The Services panel displays icons for the services (also called programs) encoded in the transport stream.
- The Details panel displays icons indicating the type, status, and severity of errors on a transport stream or service.

Expert Client

The Expert client allows you to analyze a single stream (I/O port) in greater detail. You will use the following Expert Client features to help troubleshoot errors in your digital transmission system:

- Graphical displays that show the structure (hierarchy) of the input stream and display characteristics of each component of the input stream (for example: PID and type allocation, section rate analyses, and timing analyses).
- Report views that indicate the types of errors recorded by the Analysis Server and the characteristics of the input stream.
- Error views that show specific errors recorded for the various components of the stream; for instance, PMT section rate errors and ETR290 errors.

Changes to the ETR290 panel. With the 5.1 release of the MTS300 MPEG Test System, the ETR290 panel changes to reflect the new structure of the ETR290 standard. These changes are shown in this section.

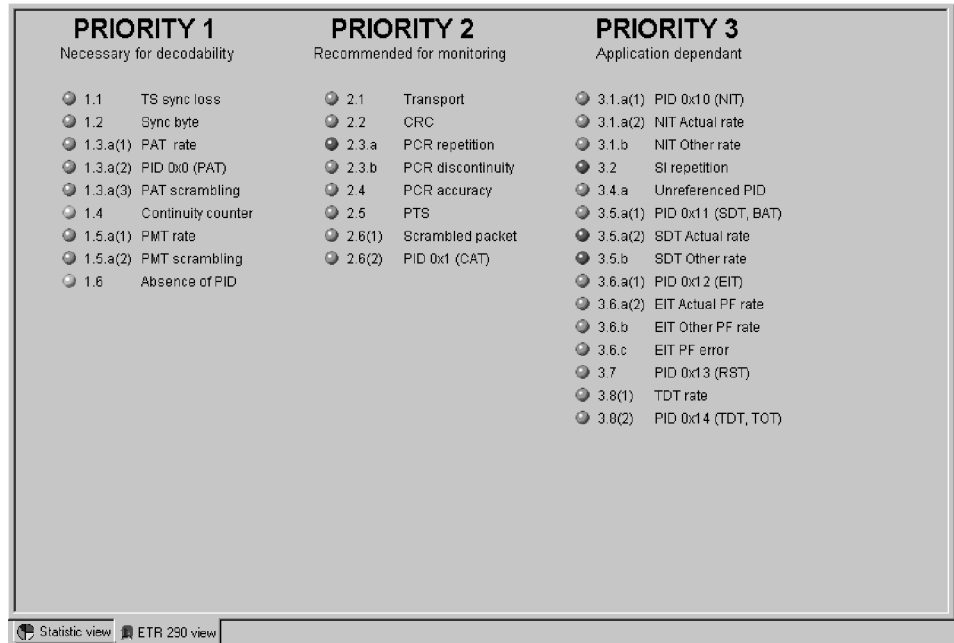


Figure 1: ETR 290 view (DVB mode)

Configuration Client

The Configuration Client allows you to specify which transport stream parameters you want monitored, and how you want errors in your system to be reported. The Configuration client allows you to perform the following tasks:

- Specify the standard to which you are testing an input: MPEG-2, DVB, or ATSC.
- Set, remove, or modify the probes that test transport streams for valid syntax and semantics and rates.
- Specify the way in which errors are reported in both the Expert and Master clients. You can configure each probe to report an error as Critical, Major, Minor, Warning, or as information only.
- Stop and restart an Analysis Server running on an MTS300 system.
- Set passwords on specific inputs that prevent others from changing the Analysis Server configuration for that input.
- Set parameters for capturing part of an input transport stream.

Changes to the PCR Timing Analysis Panel. Select Analysis:Advanced:Timing:PCR in the Navigation panel to open the PCR Timing Analysis configuration panel as shown in Figure 2. Use the PCR Timing Analysis panel to configure and set PCR probes one program at a time and, if desired, use unique error limits for each individual program. You can also set probes on all stream programs at once, but you must then use the same measurement error limits for all programs.

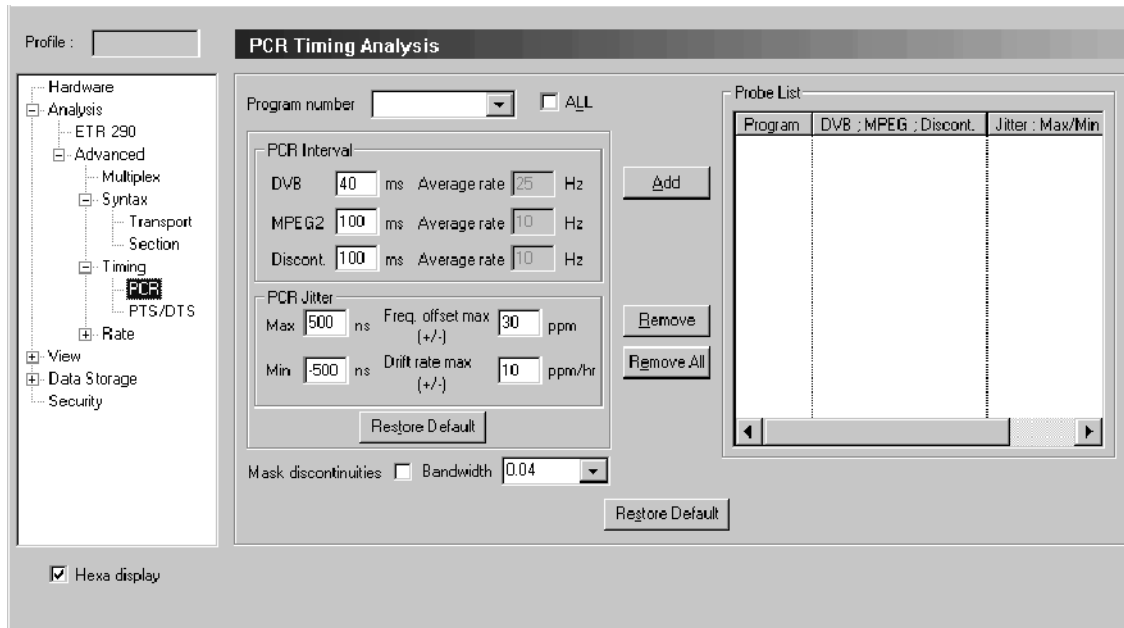


Figure 2: PCR Timing Analysis configuration panel

NOTE. The PCR Interval and the PCR Jitter Max and Min settings determine thresholds for errors reported on the ETR 290 view. The default settings are consistent with ETR 290 recommendations. Do not change these settings if you plan to use ETR 290 tests to judge DVB compliance of the input stream.

The PCR Timing Analysis panel contains the following configuration options:

- Use the Program Number box to select individual programs or all programs to probe.
- The Table Identity box contains a list of the selected programs.
- The PCR Interval settings specify the maximum permissible interval between consecutive PCRs. When a PCR probe is active, errors are reported when the interval between two consecutive PCRs for the monitored program exceeds the applicable (DVB or MPEG-2) value. The default for DVB mode is 40 ms; the default for MPEG-2 is 100 ms.

- The Max and Min PCR Jitter settings specify the maximum permissible deviation from the expected PCR value. When a PCR probe is active, errors are reported when the deviation falls outside of the Max and Min values. The default for all analysis modes is +500 ns/-500 ns.

The Frequency offset setting determines the threshold for frequency offset errors. The default for all analysis modes is 30 ppm.

The Drift rate max setting determines the threshold for frequency drift rate errors. The default for all analysis modes is 10 ppm/hr.

- Select Mask discontinuities to ignore very inaccurate PCRs, both for error reporting and for calculating the PCR jitter model. Under normal circumstances, every PCR value in the stream is used to build the accuracy model that is used to judge the jitter of each newly decoded PCR. Occasional discontinuities (large PCR errors due to looped input, for example) can prevent creation of a valid model and hinder PCR analysis.
- The Bandwidth box allows you to define the bandwidth of the highpass filter response used to calculate PCR Jitter. You can enter a discrete value, or you can choose one of the profiles from the ETR290 standard (TR 101 290): .01 Hz, .1 Hz, or 1 Hz. The default bandwidth is .04 Hz.

The Configuration client is also updated to reflect changes to the ETR290 standard. A list of the ETR290 changes incorporated into the Configuration client is shown in Table 3.

Table 3: Changes to the Configuration client due to ETR290 changes

ETR290 probe name	New probe name	Comments
1.3.1 through 1.3.3	1.3.a(1) to 1.3.a(3)	
1.5.1 and 1.5.2	1.5.a(1) and 1.5.a(2)	
2.2	2.3.a	PCR Interval
	2.3.b	PCR Discontinuity
3.1	3.1.a(1)	Bad Table ID on PID 0x10
	3.1.a(2)	NIT Actual Rate error
	3.1.b	NIT Other Rate error
3.5	3.5.a(1)	Bad Table ID on PID 0x11
	3.5.a(2)	SDT Actual Rate error
	3.5.b	SDT Other Rate error

Table 3: Changes to the Configuration client due to ETR290 changes (Cont.)

ETR290 probe name	New probe name	Comments
3.6	3.6.a(1)	Bad Table ID on PID 0x12
	3.6.a(2)	EIT P/F Actual Rate error
	3.6.b	EIT P/F Other Rate error
	3.6.c	If section 0 or 1 of and EIT P/F is detected in the stream, both must be present.

Performance and Release Issues

This section describes known issues at the time of the MTS300 MPEG Test System release.

Real-Time Analysis

Configuration Profiles (Reference CSEdb19930). To save, load (restore), or delete Real-Time Analysis configuration profiles, you must be logged in to Windows NT as a user that is a member of either the Administrators user group or the Backup Operators user group. To restore or delete a profile, you must be logged in as the user who saved the profile.

The default user in the standard MTS300 V5.0 configuration, *MTS300*, is a member of the Backup Operators group. To add a user or change the group memberships of a user, log in as the *administrator* (password = *MPEG2*) and select the User Manager application from the Windows NT Start/Programs/Administrative Tools (common) subdirectory. Refer to the Windows NT documentation for additional information about the User Manager application.

PID Bit Rate Limitation. Each PID of the stream is limited to a bit rate of 98 566 144 bits/s. The bit rates of any PID with bit rates over this limit will be reported by subtracting 98 566 144 bits/s from the actual value. Therefore, a Null packet rate of 150 Mbps is reported in the Expert client as 51 433 856 bits/s.

MPEG-2 DVB/ATSC System Analyzer

Analysis of Large Files (Reference N/A). While analyzing large transport stream files, the analyzer can appear to be busy with no indication of progress; in addition, the message window can obscure the “Press Escape to abort” reminder. Analysis of large transport stream files can take many minutes; press ESC to suspend or abort most MPEG-2 System Analyzer operations.

Fonts (Reference CSEdb03373). When displaying a large font, some characters are displayed badly (or not at all) in the packet views. Use a smaller font.

Buffer Overflow using Dynamic Analysis (Reference CSEdb17277). Streams generated with the MPEG Test System Multiplexer application can cause buffer overflow during Dynamic Analysis with the MPEG-2 System Analyzer. This can occur because the Dynamic Analysis algorithm uses the “Leak method” to transfer video elementary stream data from the main buffer (MB n) to the elementary stream buffer (EB n); therefore, buffer overflow can occur when analyzing streams—such as those created with the Multiplexer application—that require “VBV delay method” data transfer.

Refer to ISO/IEC 13818-1 for additional information about leak method and VBV delay method buffering.

Timing Analysis using the System Analyzer (Reference N/A). When using the System Analyzer to examine a partial, filtered transport stream captured with the Expert and/or Configuration Clients, timing analysis is not advised for the following reasons:

- The System Analyzer cannot compute the bit rate if the first PMT declared in the PAT has no PCR information, which occurs when the corresponding PID has been filtered by the Expert Client.
- Even if you input the correct overall bit rate, all information related to timing (PCR, PTS/DTS, section rates, and dynamic analyses) can be incorrect because the time distribution of the packets repartition is lost when filtered data is captured. PCRs, for example, will be incorrect because they are computed at the source on the complete stream, not on a filtered part of it.

If you intend to perform in-depth timing analysis of a captured stream, always select **No PID filtered** on the Data Storage Configuration tab of the Configuration Client **Settings** window.

Open Mux Server

In ATSC mode, when the configuration is one PSI/ATSC input and one ES video only input, the video descriptor and smoothing descriptor may be missing.

Analysis Server

Some MPEG2 and ATSC compliant transport streams use packets with PID 16 to carry video elementary streams. Do not try to analyze transport streams with video in packets with PID 16 while in the DVB mode. In the DVB mode, the analysis server expects packets with PID 16 to be NIT sections, complying with the DVB standard.

ATSC Corrigendum

The MTS300 system is compliant to the *Corrigendum for Program and System Information Protocol for Terrestrial Broadcast and Cable (A65)*. The corrigendum is an amendment to the A65 standard that replaces the 2-bit zero field taking the value 00 with the reserved field taking the value 11 in all PSIP tables. Disregard syntax errors reported in the Expert client related to this field because the transport stream being analyzed may not be compliant to the corrigendum.

Rackmount Installation Kit

The kit instructions included with the rackmount kit for the MTS300 system indicates that the kit is for RFA300 instruments. The rackmount kit is correct for all instruments using the mainframe common to a number of Tektronix instruments, including the MTM300, RFA300, and PQM300.