

**MTS400 Series
MPEG Test Systems
Release Notes**

This document applies to software version 1.7.1005

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Release Notes

These release notes provide the following information for version 1.7 of the MTS400 Series MPEG Test Systems:

- Document part numbers
- Features in this version
- Installation and operational problems or behaviors that you might encounter while using the instrument and explanations of how you can minimize or eliminate the impact on instrument operation

Introduction

Tektronix has redefined the MPEG analyzer with its ground-breaking MTS400 Series MPEG Test Systems and the MTS400 Series portable analyzer software options for the MTX100B, RTX100B, and RTX130B instruments. Increased productivity is provided through many new technical features:

- The MTS430 is well suited for applications in research, development, and manufacturing test.
- The MTS415 is equally well suited for applications in broadcasting and network operations.
- The MTS4SA provides the MTS400 Series software applications for standalone use on PCs.
- The MTS400P provides the MTS400 Series software applications in a portable configuration.
- The MTX100B, RTX100B, and RTX130B instruments with analysis and generation options are ideal where portability is required.

A wide variety of applications simplify the complex tasks of creating transport streams for set top box design and manufacturing, as well as triggering and recording intermittent errors during live broadcasts.

NOTE. *Analysis software running on RTX100B/RTX130B instruments can only be used in deferred time, that is, for analysis of files from disk.*

The following information provides an overview of the MTS400 Series, MTS400P, MTX100B, RTX100B, and RTX130B features:

- **IP and RF Connectivity and Analysis** - Acquires transport streams from the network interface for analysis and recording of streams over IP (internet protocol), or RF broadcast interfaces (High Performance Network Interface (MTS415, MTS430, and MTS400P) and RF Interfaces (MTS415 and MTS430)).
- **CaptureVu™** - Simplifies the task of triggering, recording, and analyzing events.
- **High Performance Engine** - Measurement throughput up to 400 Mbps.
- **Intuitive GUI** - A simple, yet powerful GUI (graphic user interface) provides real time analysis and recording, as well as deferred time analysis.
- **Languages** - Microsoft Windows Unicode fonts provide regional language support.
- **Hardware/Interfaces (MTS415 and MTS430)** - 144 GB of storage, ASI up to 214 Mbps, fast Intel P4 processor, integrated XGA display, and dual Ethernet ports for LAN support and GigE transport analysis. (For the equivalent MTS400P, MTX100B, RTX100B, and RTX130B hardware specifications, refer to the user documentation for those products.)
- **Application Packages** - Analysis of Audio and Video Elementary Streams, Packetized Elementary Streams, Transport Streams, and Data Broadcasting Streams, as well as Multiplexing Audio, Video, and Data Broadcasting Streams.
- **International Standards** - Support for MPEG-2, ATSC, DVB, and ISDB.

Related User Documentation

The following user documentation supports firmware version 1.7:

- *MTS400 Series Quick Start User Manual* (English), Tektronix part number 071-2607-xx.
- *MTS400 Series Quick Start User Manual* (Japanese), Tektronix part number 071-2608-xx.
- *MTS400P Quick Start User Manual* (English), Tektronix part number 071-2610-xx.
- *MTS400P Quick Start User Manual* (Japanese), Tektronix part number 071-2611-xx.
- *MTS400 Series Generator Applications User Manual* Tektronix part number 077-0204-xx. (Available in PDF format on the Product Documentation CD-ROM.)
- *MTS400 Series Analyzer Applications User Manual*, Tektronix part number 077-0205-xx. (Available in PDF format on the Product Documentation CD-ROM.)
- *MTS400 Series Carousel Applications User Manual*, Tektronix part number 077-0203-xx. (Available in PDF format on the Product Documentation CD-ROM.)
- *MTS400 Series Specifications and Performance Verification Technical Reference*, Tektronix part number 077-0207-xx. (Available in PDF format on the Product Documentation CD-ROM.)
- *MTS400P Specifications and Performance Verification Technical Reference*, Tektronix part number 077-0202-xx. (Available in PDF format on the Product Documentation CD-ROM.)
- *MTS400 Series Programmer Manual*, Tektronix part number 077-0206-xx. (Available in PDF format on Product Documentation CD-ROM.)
- *MTS400 Series Declassification Instructions*, Tektronix part number 077-0208-xx. (Available in PDF format on the Tektronix Web site.)
- *MTS400 Series Software Licenses*, (Available in PDF format on the MTS400 Series Product Documentation CD-ROM, Tektronix part number 063-4197-xx.)

Refer to the *MTX100B*, *RTX100B*, and *RTXI30B Release Notes*, Tektronix part number 077-0195-xx, for information about software issues related to those instruments.

Enhancements - Software Version 1.7

- | | |
|---|---|
| Buffer Analyzer | <ul style="list-style-type: none">■ Support for MPEG-4 AAC audio CODEC, including support for High Efficiency (HE) profile.■ Support for analysis of ISDB-T partial reception streams.■ Y-axis zoom. |
| Multiplexer | <ul style="list-style-type: none">■ Support for MPEG-4 AAC audio CODEC, including support for High Efficiency (HE) profile.■ Support for Brazil ISDB-TB standard, including One Segment regions and Sky XSI standard.■ Psuedo real-time playout (requires player to be installed). |
| Transport Stream Compliance Analyzer | <ul style="list-style-type: none">■ New MTM400A-style user interface, including cumulative bitrate display and FlexVu display.■ PTS - PCR graph for detecting T-STD buffer problems.■ Tear off Graphs that allow comparison of different aspects of a Transport Stream, such as Pid bitrates.■ Direct ES Analyzer Invocation (MTS4EA/4CC).■ Custom Packet Search based upon multiple logical conditions.■ Display Filter available on tables to quickly identify rows of interest.■ Support for Brazil ISDB-TB standard, including One Segment regions and Sky XSI standard.■ Addition of IP Video option for GigE video over IP and IPTV analysis. This includes IGMPv3 support.■ Addition of DPI tests. |
| MPEG Player | <ul style="list-style-type: none">■ Support for IPv6.■ Support for TTS packet structure. |
| Option Key | <p>The hardware dongle security mechanism for MTS400 Series software applications has been updated to a software option key system. Hardware Parallel and USB dongles will be retained for use with the MTS series but will now be used only for their serial number as a unique ID. All permissions will be set by the software option key system.</p> |

Installation Issues (MTS415 and MTS430)

The following issues affect the installation of the MTS400 Series instruments and/or software on MTS415 and MTS430 platforms only.

Using the Correct Software Recovery Media

Install software version 1.7 only on MTS400 Series instruments with serial numbers B02xxxx and above.



CAUTION. *Installing software version 1.7 on MTS400 Series instruments with serial numbers below B02xxxxx may cause instrument failures.*

Internal Error Dialog Box

After the files have been copied during installation, the instrument may report an internal error. Clicking OK will close the dialog box, and the installation will complete successfully.

Uninstalling the MTS400

When uninstalling the MTS400, a dialog box lists a number of DLLs that cannot be deleted from the registry. Clicking OK will close the dialog box, and the uninstall will complete successfully.

MPEG Player IP Auto Configuration after Platform Restore

After restoring an MTS415 or MTS430, running the MpegPlayer for the first time (with the IP interface selected) causes the Auto Configuration dialog box to display. If accepted, the platform will attempt to reboot. The reboot will fail and you must shutdown and restart the platform manually.

New Hardware Wizard

If the Found New Hardware Wizard opens after the system has started, you must complete the wizard before the instrument will operate properly. (See Figure 1.)

Perform the following steps to complete the Found New Hardware Wizard:

1. In the Found New Hardware Wizard window, enable the **No, not this time** option. (See Figure 1.)
2. Click **Next** to continue.



Figure 1: Found New Hardware Wizard page 1

3. On the second page of the wizard, verify that **Install the software automatically (Recommended)** is selected. No installation CD or floppy disk is required. (See Figure 2.)
4. Click **Next** to continue.

The wizard will search for the required drivers. When the drivers are found, the Next button will be enabled.
5. Click **Next** to proceed.

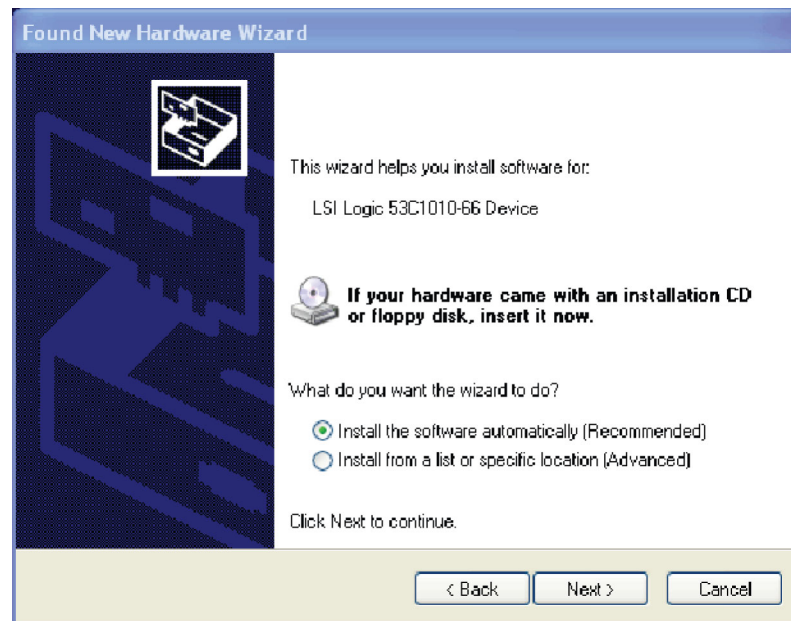


Figure 2: Found New Hardware Wizard page 2

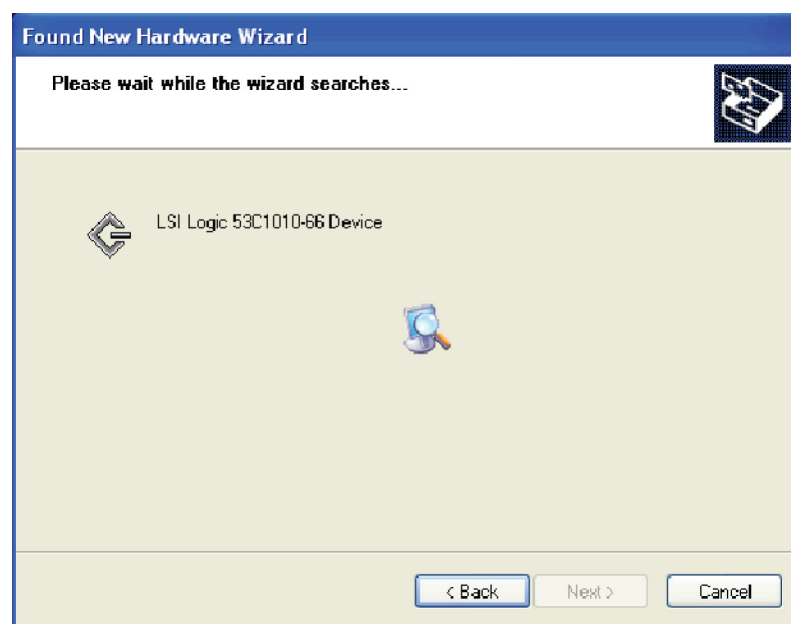


Figure 3: Wizard searching for drivers

6. When the Completing the Found New Hardware Wizard dialog box, click **Finish**.
7. Select **Restart** from the Start menu to reboot the MTS400 Series system.

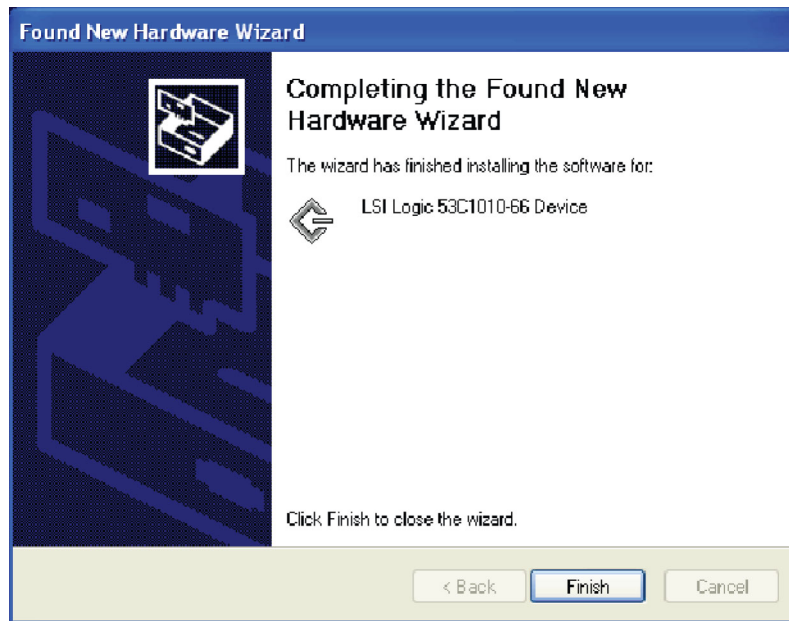


Figure 4: Completing the wizard

Restoring the MTS415 and MTS430

The MTS400 Series System restore process is described in the *MTS400 Series Quick Start Start User Manual*.

If, after the system is restored, you are unable to import the SCSI drives, perform the following steps:

1. Copy the file "SCSIKeyDel.reg" from the restore DVD to C:\.
2. Double-click the file name, and when prompted to add information to the registry, press Yes.
3. When the process has successfully completed, press OK.
4. Reboot the instrument.
5. Use the process described in the *MTS400 Series Getting Started Manual* to Import the SCSI drives.

Installation Issues (MTS4SA)

The following issues affect the installation of the MTS4SA software:

Windows NT Installation of the MTS4SA is no longer supported on Windows NT.

Multiplexer If the latest Multiplexer software is installed from the MTS4SA application CD-ROM, versions of the Multiplexer previously installed and prior to version 2.0 will no longer work.

Installation Issues (MTX100B, RTX100B, RTX130B, and MTS400P)

For issues affecting the MTX100B, RTX100B, RTX130B, and MTS400P installation, please refer to the product documentation for those products.

MPEG Player Issues

The following issues affect the MTS415, MTS430, and MTS400P. The issues will also be relevant for the MTX100B, RTX100B, and RTX130B where the MPEG Player is installed.

Administrator Rights for Recording The MPEG Player application allows you to record to RAM. You need local administrator rights on the machine to make a recording.

MPEG Player and TSCA Application Interaction If the MPEG Player application is playing a stream near its maximum bit rate limit (214 Mbps simplex or 107 Mbps duplex), and you start the TSCA application, the instrument may display the message "Mega FIFO empty error" and the player application may stop. Once the TSCA has started, you can start playing the stream again.

A workaround is to ensure that the TSCA is started before playing a stream at high bit rates.

Duplex Support in IP Mode The MPEG Player does not support duplex mode (via any interface) when in IP Playout mode.

Maximum IP Playout Bit Rate The maximum playout bit rate supported by the player is determined by the NIC interface setting and Windows Network Component settings.

To reach optimal bit rates, the NIC configurations should be optimized and the Windows ICS service should be turned off.

DVB SPI In Port Ignores the D Valid Setting When recording using the SPI port marked "DVB SPI In", the setting in the "Ignore Dvalid" check box under the Record > Target dialog box is ignored, and all data will be recorded with Dvalid active and inactive.

The port marked "DVB SPI Out" is capable of both input and output, and this setting is applied correctly. However, recordings made using this port will not be timestamped.

| | |
|---|---|
| Ensure that File Path is set before Triggered Recording | Before performing a triggered recording, ensure that the correct path is set using the File > Save... dialog box. If the path is not set, a File Not Found error will be generated when the recording starts. |
| Incorrect Output Position Indicator | If the Fixed ES Rate check box is selected in the Clock dialog box, the output position indicator may not show the correct position. |
| Software Update Mode Behavior | <p>When the MPEG Player plays out in the Software Update mode, you may observe the following:</p> <ul style="list-style-type: none">■ PCR inaccuracy errors might occur at the beginning of every loop.■ If PCR errors preexist in a TS file, they will continue to exist across all loops. <p>Preprocessing the stream with the Make Seamless utility (before playout) prevents these looping errors.</p> |
| Rapid scroll bar movement may stop Player responding | When the scroll bar is moved rapidly in the Record mode, the MPEG Player may stop responding. Clicking the Hierarchical window returns the MPEG Player to the normal state. |
| Burst of IP packets at start of Playout | When playing out in IP mode, a delay (above 250 ms) may occur once in the first few packets. This may result in the burst mode delays not occurring at correct intervals. |
| Simultaneous TSCA and MPEG Player Triggered Recording | If the TSCA and the MPEG Player are simultaneously configured to record for individual triggers events, both the applications are triggered when the first trigger event occurs. |
| Data Rate Auto Converter for ISDB-Tsb Streams | Setting the Data Rate Auto Converter (Auto Play) value does not update the bitrate of ISDB-Tsb streams. |
| Player Does Not Use Time in TDT/TOT Dialog Box | During playout, the MPEG Player does not use the time value set in the TDT/TOT dialog box. |
| Hierarchical Window Does Not Always Show Stream Contents | While in record mode, the MPEG Player is unable to display the contents of the stream onto the hierarchical window for some TS files (for example, Test40.mpg) at high bitrates although it is able to receive the TS file. |

Transport Stream Compliance Analyzer Issues

The following issues affect the MTS415, MTS430, MTS4SA, and MTS400P. The issues will also be relevant for the MTX100B, RTX100B, and RTX130B where the Transport Stream Compliance Analyzer is installed.

Administrator Rights for IP Analysis

To perform real-time IP analysis using an NIC (network interface card), you must have local administrator rights.

Lost Packets During Recording on IP Analysis on Low Specification PCs

On some low-specification PCs (with old network cards and slower hardware), if you record a stream that is being analyzed over IP using an NIC, packets might be lost. This is because of the hardware dropping Ethernet frames.

Processing may Become Strained with Script Validation enabled in Real Time Mode

If you enable Script Validation for Real Time Analysis, the TSCA might become strained. If this occurs, and script validation is required, disable the feature, make a recording in real time, and then perform a deferred analysis on the recording with the feature enabled.

RTP Analysis - TS Availability Error Reported for 204 byte Packet Streams

When analyzing a 204 byte packet stream over RTP, the TS Availability test will activate at the start of the stream.

Analyzing RTP Streams Using UDP causes the TSCA to Become Overwhelmed

When you select an IP session to analyze from the "Browse for UDP flow..." dialog box, the TSCA attempts to identify whether it is RTP or UDP, and automatically updates the "Use RTP" check box in the Real-time Analysis Open Transport Stream dialog box. If you manually clear the "Use RTP" and analyze a known RTP stream, this can cause the TSCA to become overwhelmed and data to be lost.

Streams Transmitted Over UDP May be Recognized as RTP

It has been seen very infrequently that UDP sessions are detected as RTP in the "Browse for UDP flow..." dialog box. This is due to specific byte patterns appearing in the transport stream. If this occurs, clear the "Use RTP" check box manually.

IP Packet Interarrival Timing

The TSCA uses WinPcap for IP input using an NIC. The timing of WinPcap is affected by the type of processor, hyper-threading and SMP. See the WinPcap change log (<http://www.winpcap.org/misc/changelog.htm>) for more details.

IP Packet timing measurements using an NIC are based on timestamps averaged over a 40 ms period. You can define an integration period for the graphical display of average Packet Inter-Arrival Time. The default integration period is 1 second.

Ethernet Packet Timestamp Smoothing

Under certain conditions of heavy network traffic, it has been noted that timestamping of Ethernet packets can be delayed within the network interface kernel mode driver when using an NIC.

To overcome this issue, an Ethernet packet arrival smoothing algorithm has been implemented in this release to ensure that erroneous jitter does not affect the transport stream timing measurements. This algorithm results in the smoothing of the PCR Arrival Interval measurement and the associated graphs when using the IP interface through an NIC.

MDI Media Loss Rate Calculation

The TSCA provides an RTP Jitter Buffer to reorder out-of-order packets. This can be set within a range of 0 ms and 5000 ms. If the value is set to 0 ms, all out-of-order packets will contribute to the MDI Media Loss Rate calculation. When the value is greater than 0 ms, any packets reordered will not be taken into account. This allows the user to determine the effect on MDI MLR of the Jitter Buffer.

A packet is considered out of order if the sequence number received is less than or equal to the previous sequence number received.

RTP Dropped Packet Test

The RTP Dropped Packet tests checks the RTP sequence number of packets leaving the Jitter buffer after they have been reordered. The test will fail if the difference in the RTP sequence number between two subsequent packets is greater than one.

H.264 Thumbnails with Recovery Points

The TSCA thumbnail decoder does not support H.264 Recovery Points.

Concurrent Analysis Behaviour

It is possible to have multiple instances of the TSCA running at the same time. However, the following behavior should be noted:

- Triggers are saved on restarting analysis. The effect of setting a trigger in an instance and restarting analysis will be to cause the trigger to be inherited in other instances when analysis is restarted in those instances.
- When a parameter is modified in one instance, it will be inherited in other instances when analysis is restarted.

Connection to VLAN Sessions Using a NIC

The VLAN tag will not appear in the TSCA analysis because, by default, Intel adapters strip the VLAN tag before passing IP up the stack.

If you need to analyze VLAN sessions, you should update to the latest Intel driver for the NIC, and add a DWORD registry entry "MonitorModeEnabled" to a value of 1 within:

HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Control\Class\{4D36E972-E325-1100-8C0A-000000000000}\00000000-0000-0000-0000-000000000000
- where xx is the instance of the network adapter.

Packet Search Locks UI if searching for non existent Null PID

The Packet Search feature generally prevents you from entering PIDs which are not in the stream. However, if you attempt to perform a packet search for non-existent Null PIDs, the User Interface becomes locked. The TSCA should then be restarted.

Transport Stream Compliance Analyzer IPTV Option Issues

The following issues affect the MTS415, MTS430, and MTS400P where the Transport Stream Compliance Analyzer IPTV Option is installed.

VBR-CBR Mode Removed

The VBR-CBR mode has been removed from this release. It may be listed in some user documentation.

VBR or CBR With Jitter May Make Interface Lose Lock on Selected Session

If a selected session is extremely bursty (for example VBR or CBR with jitter), the GigE can lose lock, which can cause TS Availability, Sync, Sync Byte, and Continuity Errors to be reported in the Transport Stream Analysis, but no errors will appear in the Traffic Table. If the card was set to Smoothed mode when lock was lost, the setting will automatically be changed to As Received mode.

Errors Reported if Session Stops and Starts Quickly

If a selected session stops and starts quickly, the Transport Stream Analysis may report TS Availability and Continuity Errors, but no errors will appear in the Traffic Table.

Errors Reported When New Sessions Selected

Occasionally, when a new session is selected for Transport Stream Analysis, TS Availability, Sync, Sync Byte, and Continuity Errors may be reported in the Tests Tree at the beginning of analysis. If this occurs, you should reset these tests before continuing the analysis. No errors will appear in the Traffic Table.

Dips Shown in Total Bit Rate Trend Graph

The Total Bit Rate Trend Graph may occasionally have a glitch (approximately every 30 minutes) and show dips in the bit rate.

Transport Stream Compliance Analyzer GBE Option Issues

The following issues affect the MTS415 and MTS430, where the GBE Option is installed.

Packets with IP Checksum Errors are Discarded

Packets with IP checksum errors will be discarded by the interface card. The user will be notified that the checksum errors have occurred, but they will not be passed on for analysis. This will result in dropped packet and continuity count errors.

Interface Card Startup Time

The Interface Card takes around 90 seconds to boot up after the user logs in. No sessions will be visible during this time.

Cheetah Connection Appears in Network Connections

A connection called "Cheetah Connection" will appear in the Network Connections window. Users must not change any of the settings for this connection, as any modifications will prevent the interface card from operating. Note that the IP address specified within the Internet Protocol (TCP/IP) settings is not the IP address of the ports on the card. This is set through the TSCA user interface on a port by port basis.

Maximum Aggregate Bit Rates across all Four Ports Restricted to 3.6 Gbps

Although a user may be analyzing a session through a single port, all four ports are still active. The maximum total bit rate that the card can handle through all ports is 3.6 Gbps.

Laser Active on all Optical SFP Ports during Analysis

It should be noted that although only one port can be used for analysis, all ports are active on the card. Therefore, if an optical SFP is plugged into one of the ports not being used for analysis, the laser will be active.

Only Select Active Mode on Ports with Live Connections

Active mode, used when ARP and IGMP support is required, should only be selected on ports with live connections. If active mode is selected for a port without a live connection, the card will attempt to issue live messages, and will block until they can be delivered. This will also prevent ARP and IGMP messages being transmitted on other ports. If you suspect that you have selected a port in active mode on a connection that is not live, restarting the unit will ensure that ARP and IGMP messages can be transmitted on the live connections.

ES Analyzer Issues

The following issues affect the MTS415, MTS430, MTS400P, MTX100B, RTX100B and RTX130B where the ES Analyzer is installed.

Only Partially Decodes 4:2:2 Profile@HighLevel File

4:2:2 Profile@HighLevel files are only partially supported by the ES Analyzer. It fails to correctly recognize the 0x82 Profile/Level type.

Presentation Order is Incorrect

Sometimes the Presentation Order chart does not present field encoded material in the correct order.

Buffer Analyzer Issues

The following issues affect the MTS415, MTS430, MTS4SA, and MTS400P. The issues will also be relevant for the MTX100B, RTX100B, and RTX130B where the Buffer Analyzer is installed.

- When private data is processed and the Show All Graphs button is pressed, only the event log pops up. However, The TB and MB graphs can be brought up using the appropriate buttons.
- There is no support for streams which have multiple access units per PES packet.
- When System PIDs are analyzed, the MB graph shows the variations and details. However, the trace window does not show any details of the analysis.

Multiplexer Issues

The following issues affect the MTS415, MTS430, MTS4SA, and MTS400P. The issues will also be relevant for the MTX100B, RTX100B, and RTX130B where the Multiplexer is installed.

- Elementary stream within other containers, such as *.h264, *.MP4, Fluxmux and others, are **not** directly supported.
- Incomplete access units (for the last access unit), will be dropped during multiplexing.
- On looping small files, the PAT and PMT table stop time resets to the start time. The repetition interval then becomes zero because there is only one occurrence in each of these table sections.
- The multiplexer does not consider the start time of the stream when adjusting the PTS/DTS values of the elementary stream. A workaround for this is to enter a DTS offset for the PID equal to its lag against the PCR PID.
- Altering some stream properties (like duration) does not affect other stream properties. For Example, other PIDs do not automatically adjust to new transport stream durations automatically. However, the stream properties can be set manually.

Support for Generating Partial Reception Streams

Support for generating Partial Reception Streams has some limitations:

- While multiplexing H.264 elementary streams, the Multiplexer puts one access unit per PES packet. Remultiplexing some H.264 PES, which has more than one access unit in one PES packet, will result in a slightly increased bitrate.
- The Multiplexer currently expects the PCR to be carried in one of the audio or video PIDs. However, if you need to generate a separate PCR only PID, perform the following steps:
 - a. While creating the new TS, in the add program stream dialogue, go to the PCR tab.
 - b. Uncheck the Carry PCR and enter the PCR PID number.
 - c. Check that you have the right PCR PID on all audio and video streams.
 - d. Finish the process of adding the streams and tables.
 - e. You will get an PCR error message here if you are working with the wizard (no PCR).
 - f. On the File Examine TS menu, open the reference stream from which you want to use the PCR from.
 - g. Drag the PCR PID from the examine TS to the PID tab of the stream being created.
 - h. Check the PID number and click ok.

- Select an appropriate stream type when providing an input file to the Multiplexer. For example, providing a transport stream as input and selecting PES or ES as the stream type may result in a crash.
- When a non-SEI H.264 PES is provided as input, the Multiplexer displays the detect bitrate dialog. However, the Detect Bitrate button, Scan settings button, and frame rate combo box are all grayed out. You will need to provide a bitrate manually.
- The Multiplexer will (at most) put one section in a transport packet. If the original stream has multiple sections per packet and remultiplexed, the resulting transport stream will increase the cycle time of the tables if the stream has no null packets.
- Support for H.264 in the Make Seamless feature of the Multiplexer and Seamless Wizard is not available yet.
- In ISDB-T (One Segment), ISDB-TB (One Segment) interpretations, NIT/ TOT/ TDT setup screens are not available. However, you can add these tables through the table and section views.
- The Multiplexer allows you to create multiple sections of a TDT/ TOT table, but when the muxed file is opened in Mux again, these multiple sections are not seen. However, these are present in the stream, evident when the stream is analyzed with the TSCA.
- When two TDT sections are added to a stream and both are given two different start and stop times, the generated stream will have identical sections.

MTS400P Issues

On the first use of the Pseudo real-time playout, the path for the MPEG Player application needs to be changed to:

```
C:\Program Files\Tektronix\mpeg\MTS400\Apps\TSCA\bin\  
MpegPlayer.exe
```

The path can be changed using the Player Settings dialog under the Multiplex Menu.

Carousel Analyzer Issues

The following issue affects the MTS415, MTS430, MTS4SA, and MTS400P. The issues will also be relevant for the MTX100B, RTX100B, RTX130B where the Carousel Analyzer is installed.

Spikes on Bite Rate Graphs for Long Streams

The Carousel Analyzer bit rate graphs for long streams may show spikes.

Security Patches

The MTS415, MTS430, MTS4SA, and MTS400P software has been verified with the following Microsoft Security Patches:

Microsoft Windows 2000 (Service Pack 4)

No patches.

Microsoft Windows XP Professional (Service Pack 2)

| | | |
|----------|----------|----------------------------|
| KB887742 | KB889588 | KB888113 |
| KB905915 | KB899591 | KB891781 |
| KB896424 | KB883939 | KB888302 |
| KB900725 | KB890046 | KB885250 |
| KB901017 | KB896428 | KB890175 |
| KB905749 | KB896358 | KB873339 |
| KB905414 | KB896422 | KB885836 |
| KB904706 | KB893086 | KB885835 |
| KB902400 | KB893066 | KB885884 |
| KB899589 | KB890859 | KB834707 |
| KB899587 | KB890923 | KB870669 |
| KB896727 | KB873333 | KB893803 |
| KB893756 | KB867282 | Q819696 |
| KB896423 | KB890047 | KB912945 |
| KB918118 | KB927802 | KB929969 |
| KB924667 | KB928090 | KB931836 |
| KB926436 | KB928255 | Nero 7 Essentials OEM STE1 |
| KB927779 | KB928843 | |

Microsoft Windows XP Professional (Service Pack 3)

Patch KB923789

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