**Release Notes**

**Tektronix**

**MTS400 Series
MPEG Test Systems**

**071-1726-07**

This document applies to software version 1.4.

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# Release Notes

These release notes provide the following information for version 1.4 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 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 MTS400 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 MTX100B, RTX100B, and RTX130B 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.

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

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The following information provides an overview of the MTS400 Series and 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 and RF Interfaces available for MTS400 and MTS430 only).

- **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** - Windows Unicode fonts provide regional language support.

- **Hardware/Interfaces (MTS400)** - 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 MTX100B, RTX100B, and RTX130B hardware specifications, refer the the MTX100B, RTX100B, and RTX130B user documentation.)

- **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 1.4:

- *MTS400 Series Getting Started Manual* (English),
  Tektronix part number 071-1505-06.

- *MTS400 Series Getting Started Manual* (Japanese),
  Tektronix part number 071-1727-03.

- *MTS400 Series User Manual* (English),
  Tektronix part number 071-1507-05.

- *MTS400 Series Specifications and Performance Verification Technical
  Reference* (English), Tektronix part number 071-1724-05.
  (Available in PDF format on the Product Documentation CD-ROM.)

- *MTS400 Series Programmer Manual* (English),
  Tektronix part number 071-1725-02.
  (Available in PDF format on Product Documentation CD-ROM.)

- MTS400 Series Software Licenses.
  (Available in PDF format on Product Documentation CD-ROM,
  Tektronix part number 063-3857-10.)

Refer to the MTX100B, RTX100B, and RTX130B Release Notes, Tektronix part
number 061-4320-xx, for information about software issues related to those
instruments.

# Enhancements - Software Version 1.4

## Buffer Analyzer

- T-SDT Buffer Analysis for H.264 video CODEC streams

- New Trace view has been added into the application that provides details of
  the buffer movements for in-depth analysis of the results.

  - Trace view entries may be synchronised with other views for enhanced
    diagnosis capability.

- Usability enhancements including a new program view added (looks similar
  to other applications), and view synchronization now includes the tracer tool.

**Transport Stream Compliance Analyzer**

- H.264 thumbnails:

  - Video thumbnail decode enhanced to display video streams encoded using the H.264 compression standard.

  - ES header information will also be displayed with the thumbnails.

**Option Key**

The hardware dongle security mechanism for MTS400 series software applications has been updated to a software option key system to aid Tektronix manufacturing. 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.

**Version 1.4 Software Features Availability**

Table 1 shows the options required to access the new features.

**Table 1: Software availability**

| Feature | MTS430 | MTS400 | MTS4SA | MTX100B/RTX100B/ RTX130B |
|---|---|---|---|---|
| H.264 thumbnail display [TSCA] | Standard | Real time standard <br><br> Deferred time requires TSCA | Real time requires TSCR <br><br> Deferred time requires TSCA | Real time standard <br><br> Deferred time requires TSCA |
| H.264 Buffer Analysis [Buffer Analyzer] | Standard | Requires Option BA | Requires Option BA | Requires Option BA |
| H.264 Multiplexing [Multiplexer] | Standard | Requires Option MX | Requires Option MX | Requires Option MX |
| IP playout over host NIC [Player] | Standard | Requires Option IPE | Not applicable | Standard |

**GbE Interface - Option GBE (MTS400 and MTS430 only)**

Video over IP interface - GbE electrical and optical High performance hardware interface card.

- High resolution H/W timestamp

  - Enables precise cross layer timing analysis

- MDI and statistical display of IP Packet Interarrival time (histograms)

- IP Session Capture and real or deferred time analysis down to the IP packet level

■ Uses industry standard PCAP file format for use with Wireshark (Ethereal)

■ H/W packet filtering enables use with up to full line rate traffic on GbE link

■ Can be used simultaneously with ASI or RF interface

■ Wide range of interface options available with four SFP ports

■ 1000BaseT electrical

■ 1000BaseSX optical

■ 1000BaseLX optical

■ 1000BaseZX optical

■ Will not support 10/100BaseT electrical. Existing MTS400 platform has 10/100BaseT IP interconnection available through the host Network Interface Card (NIC).

**Table 2: New video over IP feature availablility**

| Feature | MTS430 | MTS400 | MTS4SA | MTX100B |
|---|---|---|---|---|
| Capture files to disk in PCAP format [TSCA] | Requires Option GBE | Requires Option GBE | Not applicable | Not applicable |
| Open files for deferred time analysis of IP stream captures [TSCA] | Standard | Requires TSCA | Requires TSCA | Requires TSCA |
| MDI metrics [TSCA] | Real time requires Option GBE<br><br>Deferred time standard | Real time requires Option GBE<br><br>Deferred time requires TSCA | Real time not applicable<br><br>Deferred time requires TSCA | Real time not applicable<br><br>Deferred time requires TSCA |
| IP Parameters and Statistics, IP layer checksums [TSCA] | Standard | Real time requires Options IPE or GBE<br><br>Deferred time requires TSCA | Real time requires TSCR<br><br>Deferred time requires TSCA | Real time requires TSCX and IPE<br><br>Deferred time requires TSCA |
| PIT Histograms and Instantaneous PIT Measurements (Min, max, mean) [TSCA] | Real time requires Option GBE<br><br>Deferred time standard | Real time requires Option GBE<br><br>Deferred time requires TSCA | Real time not applicable<br><br>Deferred time requires TSCA | Real time not applicable<br><br>Deferred time requires TSCA |

**Table 3: Existing video over IP feature availablility**

| Feature | MTS430 | MTS400 | MTS4SA | MTX100B |
|---|---|---|---|---|
| PCR_OJ, PCR_FO, PCR_DR: [TSCA] | Real time requires Option GBE<br><br>Deferred time standard | Real time requires GBE<br><br>Deferred time requires TSCA | Real time not applicable<br><br>Deferred time requires TSCA | Real time not applicable<br><br>Deferred time requires TSCA |
| Average PIT Measurement [TSCA] | Standard | Real time requires IPE or GBE<br><br>Deferred time requires TSCA | Real time requires TSCR<br><br>Deferred time requires TSCA | Real time requires TSCX and IPE<br><br>Deferred time requires TSCA |

**COFDM Interface**    Option CF (MTS400 and MTS430 only)

- Supports DVB-T terrestrial broadcast standard

- MER measurements to 37 dB

- Support for hierarchical modulation

- Impulse response measurements for Single Frequency networks

- Constellation with innovative MER rings, EVM, SNR, and BER measurements

- Can be used simultaneously with IP interface

- Dual level warning and failure alarms plus RF drift tests for long term trend monitoring

- Trend graphs and alarms for detection of long term signal degradation

**8VSB Interface**    Option VS (MTS400 and MTS430 only)

- Supports 8VSB for ATSC terrestrial broadcast standard

- Leverage existing ATSC analysis capabilities such as Closed Caption consistency checking

- Symbol distribution display with innovative MER lines, EVM, SNR, and BER measurements

- Can be used simultaneously with IP interface

- Dual level warning and failure alarms plus RF drift tests for long term trend monitoring

- Trend graphs and alarms for detection of long term signal degradation

**8PSK Interface**     Option EP (MTS400 and MTS430 only)

- Supports QPSK for DVB-S and 8PSK for Broadcom Turbo code satellite broadcast standards

- Constellation with innovative MER rings, EVM, SNR, and BER measurements

- Can be used simultaneously with IP interface

- Dual level warning and failure alarms plus RF drift tests for long term trend monitoring

- Trend graphs and alarms for detection of long term signal degradation

- Will not support the DVB-S2 standard

- IPTV broadcast infrastructure

**QAM (Annex B) Interface**     Option QB2 (MTS400 and MTS430 only)

- Supports ITU J.83 Annex B for US Cable broadcast standard

- Support for QAM 64 or 256 modes

- Both Levels 1 and 2 interleaving

- Constellation with innovative MER rings, EVM, SNR, and BER measurements

- Can be used simultaneously with IP interface

- Dual level warning and failure alarms plus RF drift tests for long term trend monitoring

- Trend graphs and alarms for detection of long term signal degradation

# Installation Issues (MTS400 and MTS430)

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

**Using the Correct Software Recovery Media**

The serial number range assigned to the MTS400 Series instruments changed from B01xxxx to B02xxxx, and the software version changed from v1.0 to v1.1. The software number change was required only because of a hardware change; there were no changes to the software functionality. However, the software versions are not compatible between the two serial number ranges of the instrument. This issue does not affect the MTS400 Series standalone software.

*CAUTION. To prevent software problems on your MTS400 Series instrument, use the v1.0 recovery media only on instruments with a serial number of B01xxxx, and use the v1.1 recovery media only on instruments with a serial number of B02xxxx.*

*For instruments with serial numbers B01xxxx, if you know or suspect that hardware changes have been made, look at the rear panel of the instrument for upgrade information labels. If a label states that the instrument has been upgraded to B02xxxx hardware, use the v1.1 recovery media or later to restore the software on that instrument.*

**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.

**License Agreement Acceptance Follow-up**

When the instrument is powered up for the first time, you must complete the Windows XP license and registration process, after which the instrument will automatically restart.

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

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

1.  In the Found New Hardware Wizard window (see Figure 1), enable the **No, not this time** option.

2.  Click **Next** to continue.



**Figure 1: Found New Hardware Wizard page 1**

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

4.  Click **Next** to continue.

    The wizard will search for the required drivers, as shown in Figure 3. When the drivers are found, the Next button will be enabled.
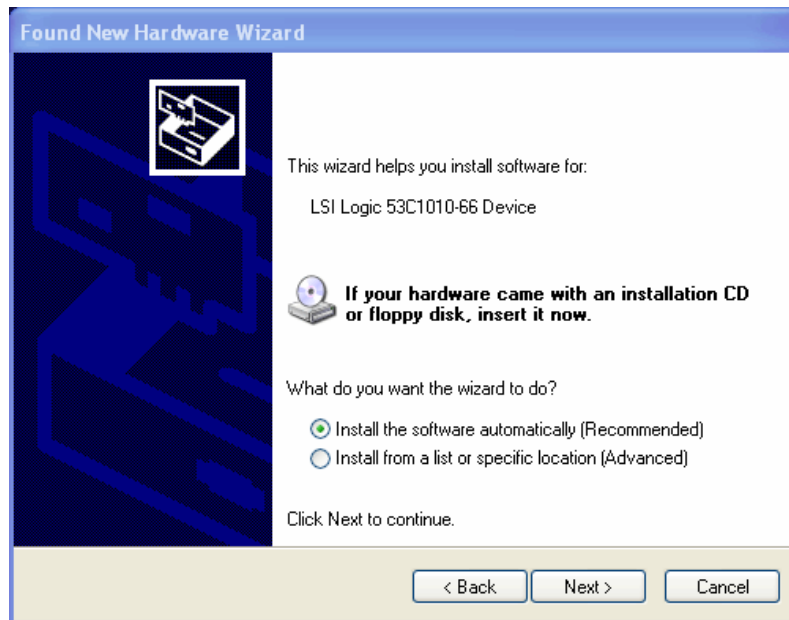
5.  Click **Next** to proceed.
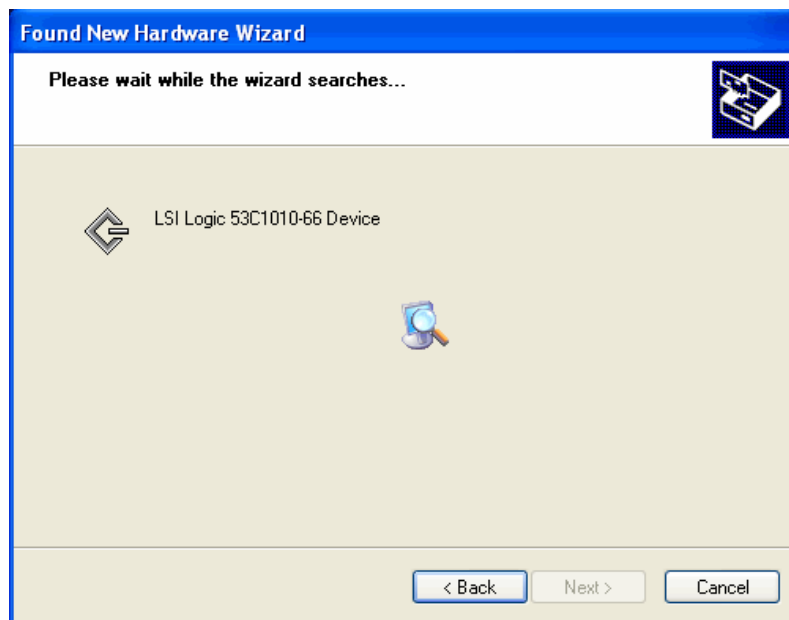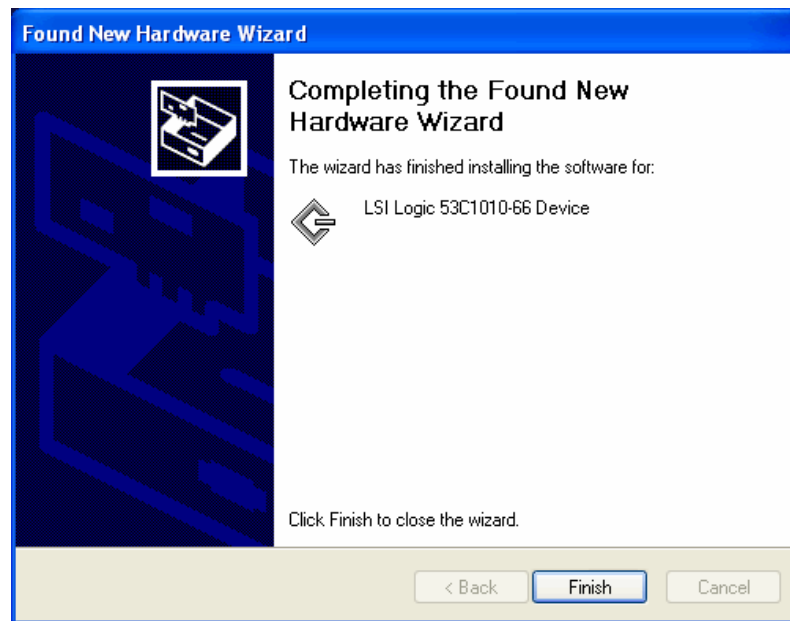
**Figure 2: Found New Hardware Wizard page 2**



**Figure 3: Wizard searching for drivers**

6. When the wizard dialog box shown in Figure 4 is displayed, click **Finish**.

7. Select **Restart** from the Start menu to reboot the MTS400 Series system. The Windows XP registration and hardware setup are complete.



**Figure 4: Completing the wizard**

## Restoring the MTS400 and MTS430

The MTS400 Series System restore process is described in the *MTS400 Series Getting Started 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, and RTX130B)

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

# MPEG Player Issues

The following issues affect the MTS400 and MTS430. 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.

# Transport Stream Compliance Analyzer Issues

The following issues affect the MTS400, MTS430, and MTS4SA. The issues will also be relevant for the MTX100B, RTX100B, and RTX130B where the MPEG Player is installed.

**Program Tree Does Not Always Update Correctly**

After deferred analysis has completed, occasionally the program tree might not display the program names even though they appear in the Summary View. If you switch from the Program tab to another tab, and then back again, the program names will appear.

**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 ValidationEenabled 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 a registry entry "MonitorModeEnabled" to a value of 1 within:

HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Con-trol\Class\{4D36E972−E325−11CE−BFC1−08002BE10318}\00xx - where xx is the instance of the network adapter.

**Symbol Distribution Graph not listed in the Add Graphs menu for 8VSB**

When using an 8VSB interface card for analysis, the "Symbol Distribution" graph entry is missing from the Add Graphs menu on the Instantaneous Graphs tab panel. You can display the Symbol Distribution graph by selecting the Add All Graphs option.

# Transport Stream Compliance Analyzer Issues

The following issues affect the MTS400 and MTS430, where the Option GBE 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 MTS400, MTS430, and MTS4SA. The issues will also be relevant for the 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.

# Multiplexer Issues

The following issues affect the MTS400, MTS430, and MTS4SA. 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 elementry 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.

# Carousel Analyzer Issues

The following issue affects the MTS400, MTS430, and MTS4SA. The issues will also be relevant for the MTX100B, RTX100B, and 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 MTS400, MTS430, and MTS4SA software has been verified with the following Microsoft Security Patches:

**Microsoft Windows 2000 (Service Pack 4)**

No patches.

**Microsoft Windows XP Pro (Service Pack 2)**

| | | |
|---|---|---|
| KB887742 | KB899588 | 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 | |

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