

Technical Reference



MTM400 and MTM400A MPEG Transport Stream Monitors RUI v3.0 Upgrade

071-2505-00

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Contacting Tektronix

Tektronix, Inc.
14200 SW Karl Braun Drive
P.O. Box 500
Beaverton, OR 97077
USA

For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.



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User Interface Overview

This document introduces you to the MTM400A user interface and explains the differences between the MTM400 RUI and the MTM400A RUI.

The MTM400A MPEG Transport Stream Monitor is functionally similar to the MTM400 MPEG Transport Stream Monitor. However, the MTM400 was based on Microsoft Java technology, for which Microsoft is withdrawing support. The MTM400A is based on Sun Java, and is more closely aligned with the MTS400 MPEG Test System.

The MTM400A remote user interface (RUI) looks similar to the MTM400 RUI, but the MTM400A RUI provides a rich, multi-layered user interface that allows structured access to all information.

Differences between the two RUIs include:

- The MTM400 hot spot view, featuring device and stream buttons is no longer displayed. The device and stream features have been integrated into the single MTM400A display.
- In the MTM400, the button bar was the primary means of moving between information screens. In the MTM400A, although the button bar is still present, screens are also directly accessible using tabbed pages.
- The button bar can be displayed on its own to provide a high-level view of the error state of the monitored stream. The bar can also be customized by hiding and revealing buttons.
- For detailed analysis and specific monitoring situations, the button bar can be hidden, leaving only the main application view visible.
- Detail views in the main application can be displayed as separate windows using the tear-off function.

User Interface Components

Figure 1 shows the major components of the user interface implemented in the MTM400A and version 3.0 of the RUI.

The menu bar, toolbar, and status bar, while visually different, contain options and buttons similar in function to those in the MTM400.

The main viewing areas of the window is divided into two areas: the Button Bar and the Main Application View.

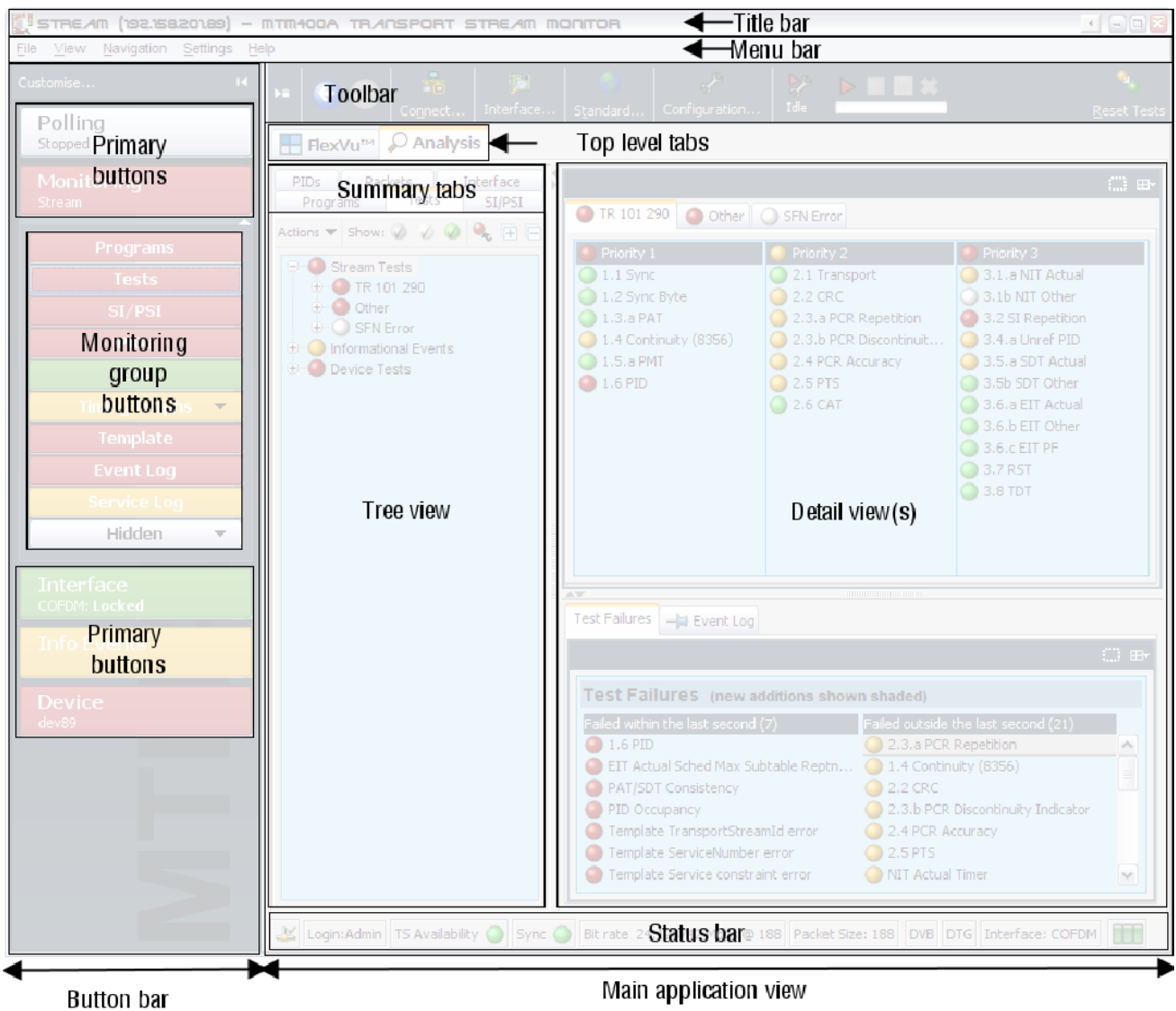


Figure 1: MTM400A user interface components

Button Bar The MTM400 button bar showed monitoring status and displayed a corresponding view when clicked. The MTM400A RUI copies this idea, but rearranges the buttons into a more intuitive order. The MTM400 Stream and Device hot spot buttons become Monitoring and Device buttons in the MTM400A RUI.

The buttons from the MTM400 Stream window have been streamlined and grouped under the MTM400A Monitoring button. The buttons from the MTM400 Device window have been removed and replaced by a node in the Analysis Tests view.

Main Application View In the main application view, two top-level views are selected using tabs: FlexVu™ and Analysis. You can customize the FlexVu™ display to contain the analysis views of your choice.

The main analysis views are Programs, Tests, SI/PSI (tables), PIDs, Packets, and Interface (when an optional interface card is installed). The analysis views are selected using the summary tabs.

Each analysis view contains a tree view and a detail view. The content of the detail view is dependent on which node is selected in the tree view.

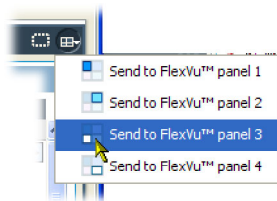
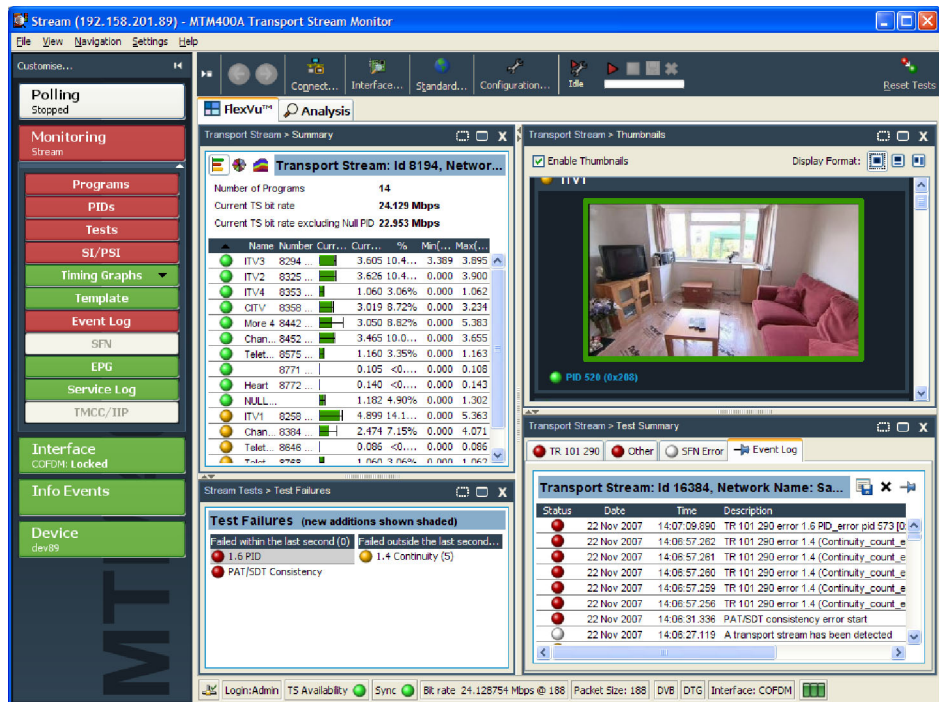
RUI Navigation The MTM400 RUI navigation was simple, allowing the right view to change in accord with the button being clicked.

The MTM400A RUI has comprehensive navigation possibilities that use the button bar, context menus, hyperlinks, and double-clicks.

FlexVu™ Display

The FlexVu™ display philosophy (first introduced in the Tektronix WVR600 Waveform Rasterizer), is now adapted for the MTM400A. This gives users up to four concurrent views of a monitored signal and the flexibility to configure each of the windows independently. Each of the FlexVu™ views is derived from views available under the Analysis tab. FlexVu™ setups will be remembered between MTM400A sessions.

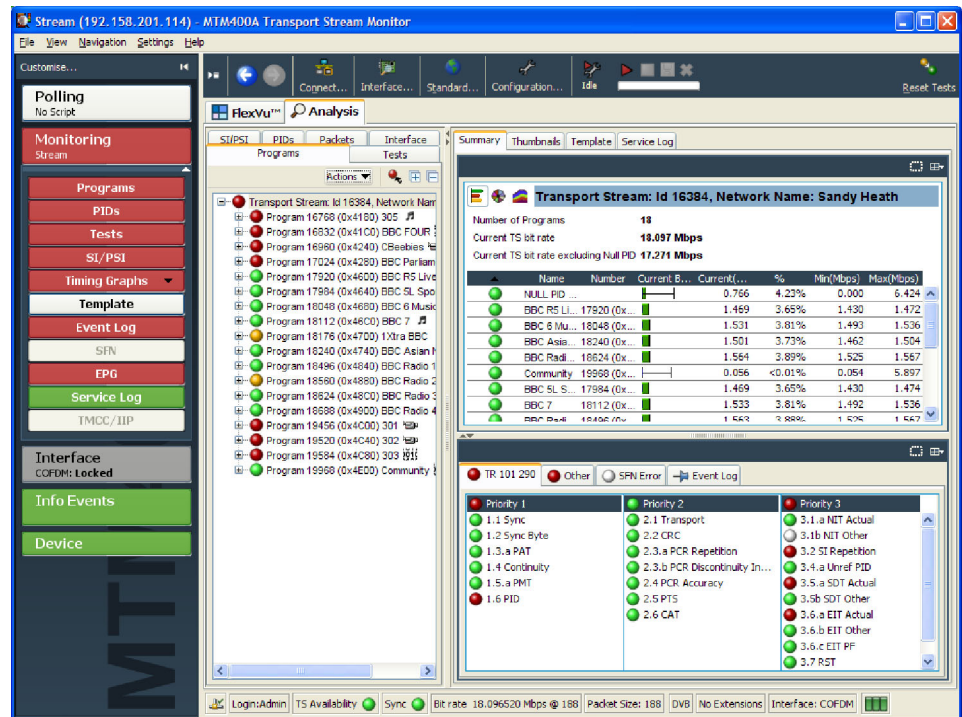
With a virtually unlimited variety of stream monitoring displays from which users can choose, this exceptional flexibility enables the MTM400A to perform like a “4-in-1 monitor” on a single incoming stream. The FlexVu™ display enables users to easily configure their MTM400A to provide a monitoring solution that is optimized for their specific requirement.



Present on all Analysis detail views, the FlexVu™ selection icon is used to extract views to the FlexVu™ panels.

Analysis Views

The MTM400A Analysis views each use a single tree view with different context-sensitive detail views contained within tabbed frames. From the main window, you can access the following views: Program, Tests, Tables, PID, Packets, and Interface.



Programs View

The Program view provides a fast overview of the transport stream contents in terms of program content, bit rated use by each program, and TR 101 290 test results. Red, amber and green LEDs highlight errors associated with each program, or element of a program, within the transport stream. Red LEDs indicate that there are current errors in the stream, amber LEDs indicate that errors have occurred but are now clear, and green LEDs indicate that no errors have been detected.

Errors that are detected at lower levels in the program stream hierarchy propagate up to the highest level. This allows you to monitor all of the programs in the stream at a high level and then quickly go to lower levels as necessary to locate a problem.

The contents of the MTM400A Programs view are broadly equivalent to the following MTM400 screens: Stream view: Summary, Detail (All Programs), Service and Event Logs, SFN, TMCC/IIP, Templates.

Tests View With the Tests view you can identify the tests that are signaling errors in a monitored stream. The error log is automatically filtered by the selected test, and can also be filtered by Packet Identifier (PID). In addition to the standard first, second, and third priority tests included in TR 101 290 standard, tests are available for Program Clock Reference (PCR) jitter and program/PID bit rate. A variability test enables you to test the changes in the bit rate of a specific PID, and there are many tests that are specific to ISDB-T and ISDB-S streams. Informational events are also reported, including interface card warnings and polling events.

Also displayed in the Tests view are tests related to the MTM400A monitor, for example, the system card temperature.

The contents of the MTM400A Tests view are broadly equivalent to the following MTM400 screens: Device View: Status, Device Log; Stream view: Tests, Event Log.

SI/PSI (Tables) View The SI/PSI (Tables) view displays the service information tables that have occurred in the analyzed stream that comply with the selected digital video standard. This includes MPEG-specific program information, DVB service information (SI), and ATSC (PSIP), ISDB program, and system protocol information. The tables are grouped together by function and hyperlinks enable you to quickly access related information within other tables. The SI/PSI tables repetition rate graphs and section data are available on additional tabs.

The contents of the MTM400A SI/PSI view are broadly equivalent to the following MTM400 screens: Stream view: SI graphs and tables.

PIDs View The PID view displays information about all of the PIDs found in the transport stream. When you select the transport stream, the associated summary view provides a PID-oriented overview of the transport stream, displaying the relative data rates of all of the PIDs contained within the stream. The information can be displayed as either a bar chart or as a pie chart. Pop up menus enable fast limit selection and links.

Each PID is associated with a number of tests. When one or more tests fail, each failed test will be listed under the relevant PID. Select a specific PID to display a summary of all the associated tests. Select a specific test to display the Event Log and Parameters for only that test.

The contents of the MTM400A PIDs view are broadly equivalent to the following MTM400 screens:
Stream view: PIDs, PID groups, PCR timing graphs.

Packets View In DVB mode, the Packets view displays SFN (single frequency network) data if detected in the stream. In ISDB-T mode, this view displays ISDB-T information packets (IIPs) and TMCC information, if detected in the stream.

The contents of the MTM400A packets view are broadly equivalent to the following MTM400 screens: Stream view: SFN and TMCC.

Interface View The Interface view provides a central location for information related to the RF interface card (where installed).

- Test results
- Graphical representation of specific RF card measurements
- RF card readings and control settings

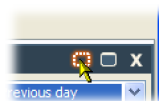
The graphical views display a selection of graphs of instantaneous measurements and measurement trends. Trend graphs use accumulated readings to represent trends in selected readings for up to a week. Also available are an Event Log and a Parameter view.

The Interface tab is displayed only when an interface card is installed.

The contents of the MTM400A interface view are broadly equivalent to the following MTM400 screens: Stream view: Configuration (interface) and Input Card.

Tear-off Views

The ability of the MTM400 to display multiple detail views at the same time is replicated in the MTM400A using the tear-off function. Any detail view displaying the tear-off icon shown below can be displayed as a separate window. The tear-off window will continue to be updated independently of the main application. The displayed content can also be modified independently of the main display.



Tear-off icon

Configuration

All configuration elements, including stream, parameters, device, interface, and display, previously distributed throughout the MTM400 user interface, are now combined in a single dialog box that can be accessed from the menu bar or the toolbar.

User Documentation

Table 1 lists the user documentation available for the MTM400A monitor.

Table 1: MTM400A product documentation

Document title	Tektronix part number	Description
Quick Start User Manual	071-2492-xx (English) 071-2493-xx (Japanese)	Contains installation information and high-level operational overviews
Release Notes	071-2494-xx	Contains information about known operational issues
Technical Reference	071-2495-xx	Contains in-depth operational information
Specifications and Performance Verification Technical Reference	071-2496-xx	Contains the product specifications and a performance verification procedure
Test Parameter and Configuration File Technical Reference	071-2497-xx	Contains information about test parameters and configuration files
Programmer Manual	071-2498-xx	Contains syntax information about remote control commands
Declassification and Security Instructions	071-2499-xx	Contains information about how to remove user proprietary information from the instrument

Upgrades

Table 2 lists the ordering information that has changed for product upgrades.

Table 2: Upgrade ordering information

MTM400 upgrades (old)	MTM400A upgrades (new)	Description
MTM4UP Opt. 01	MTM4UP 01	Triggered recording capability up to 160 MB
MTM4UP Opt. 02	MTM4UP 02	Transport stream service information analysis (PSI/SI/PSIP/ARIB view)
MTM4UP Opt. 03	MTM4UP 03	Template testing (for user-defined service plan testing)
MTM4UP Opt. 04	MTM4UP 04	In-depth PCR analysis with graphical result views
MTM4UP Opt. 05	MTM4UP 05	Bit rate testing functionality
MTM4UP Opt. 06	MTM4UP 06	Service logging
MTM4UP Opt. 07	MTM4UP 07	Polling
MTM4FCF	MTM4UP CF	COFDM interface
MTM4FGE	MTM4UP GE	Ethernet Interface With 10/100/1000Base-T; RJ-45 Electrical Port
MTM4FGE Opt. SX	MTM4UP SX	1000Base-SX Short Wavelength Optical port with LC connector (Multi-Mode 850 nm)
MTM4FGE Opt. LX	MTM4UP LX	1000Base-LX Long Wavelength Optical port with LC connector (Single Mode 1310 nm)
MTM4FGE Opt. ZX	MTM4UP ZX	1000Base-ZX Optical port with LC connector (Single Mode 1550 nm)
MTM4FQA	MTM4UP QA	QAM Annex A interface
MTM4FQB2	MTM4UP QB2	QAM Annex B Level 1 and Level 2 interface
MTM4FEP	MTM4UP EP	8PSK/QPSK interface
MTM4FQC	MTM4UP QC	QAM Annex C interface
MTM4FVS	MTM4UP VS	8VSB Interface
MTM4FEPIFC	MTM4UP IFC	One-time install of all selected options and calibration for one product
MTM4FGEIFC		
MTM4FQB2IFC		
MTM4FQCIFC		
MTM4FVSIFC		
MTM4FCFIFC		
MTM4FQPIFC		
MTM4FQAIFC		

RUI Control Equivalents

Table 3 describes the control equivalents between the MTM400A RUI and the MTM400 RUI.

Table 3: RUI control equivalents

MTM400 RUI controls		MTM400A RUI equivalent controls
Button bar	Button / Field	
Summary	Pie Chart and Test Summary	Click the Programs button in the button bar Select the Pie Chart button on the right hand Summary tab
Detail	All PIDs	Click the PIDs button in the button bar Select the Pie Chart button on the right hand Summary tab
	SI Tables	Click the PIDs button in the button bar Select the SI/PSI PIDs node in the PIDs tree Select the Pie Chart button on the right hand Summary tab
	Program...	Click the Programs button in the button bar Select the desired Program Select the Pie Chart button on the right hand Summary tab
Tests	Status	Click the Tests button in the button bar Status is shown in the Tests tree and right hand panes
	Set Alarms	Click the Tests button in the button bar Right click desired test to show menu Select required Trigger Action from menu
	Parameters...	Click the Tests button in the button bar Right click desired test to show menu Select Edit Parameters... from menu Note that not all tests have editable parameters
Custom	Tests List	This feature is not implemented in the MTM400A RUI
Info	Status	Click the Info Events button in the button bar Status is shown in the tree and right hand panes
	Set Alarms	Click the Tests button in the button bar Right click desired event to show menu Select required Trigger Action from menu

Table 3: RUI control equivalents (Cont.)

MTM400 RUI controls		MTM400A RUI equivalent controls
Button bar	Button / Field	
Programs	Histogram view	Click the Programs button in the button bar Select the Histogram Chart button on the right hand Summary tab
	Set Program Bit rate limits	Click the Programs button in the button bar Right click the required program to show menu Select Set Bit Rates Limits... from menu
	Clear Limits	Click the Programs button in the button bar Right click the required program to show menu Select Clear Bit Rates Limits from menu
	Reset Change Bars	Click the Programs button in the button bar Right click the required program to show menu Select Reset Range Bars from menu
PIDs	Histogram View	Click the PIDs button in the button bar Select the Histogram button on the right hand Summary tab
	Filter on test	Click the Tests button in the button bar Select the desired test in the tree Associated PIDs view on the right shows PIDs for the test
	Set PID bit rate limits	Click the PIDs button in the button bar Right click the required PID to show menu Select Set Bit Rates Limits... from menu
	Clear PID bit rate limits	Click the PIDs button in the button bar Right click the required PID to show menu Select Clear Bit Rates Limits from menu
	Set per PID Parameters	Click the PIDs button in the button bar Select the required PID In right hand Associated Tests view, right click test and select Edit Parameters... from menu
	Reset Change Bars	Click the PIDs button in the button bar Right click the required PID to show menu Select Reset Range Bars (all PIDs) from menu

Table 3: RUI control equivalents (Cont.)

MTM400 RUI controls		MTM400A RUI equivalent controls
Button bar	Button / Field	
PIDs (continued)	Manage User PIDs...	Click the PIDs button in the button bar Right click the User PIDs node in the PIDs tree to show menu Select Add User PID
	Program PID grouping	Click the Programs button in the button bar Select the Program node PIDs are grouped in tree and in Histogram view
PID Groups	PID Group Management	Click the PIDs button in the button bar Select the PID Groups node Group Management is via the right hand view and the context menus for the PID Group nodes in the tree
PCR Jitter	PID x Timing graphs	Click the Timing Graphs button in the button bar Select the required PID from the menu Timing Graphs tab shown on the right hand side
SFN	SFN View	Click the SFN button in the button bar Right hand side shows SFN data Note: This is only available when there is SFN data in the stream
TMCC	TMCC Summary View	Click the TMCC/IIP button in the button bar Select the Transport Stream node in the tree Select the TMCC/IIP tab on right hand side Note: This is only available when there is TMCC data in the stream
SI Graphs	SI Graphs for Table x	Click the SI/PSI button in the button bar Select the desired table in the tree Select the SI Repetition Graphs tab on the right hand side
SI Tables	SI Tree view	Click the SI/PSI button in the button bar The SI/PSI tree structure is shown in the tree
Template		Click the Template button in the button bar Right hand side shows Template data Note: This is only available when Template Checking is enabled
Recording		Click the Recording Settings button on the toolbar (to the right of the Configuration... button) The configuration dialog is opened at the recording page
Recording	Status	Status is shown on the toolbar and on the Recording page

Table 3: RUI control equivalents (Cont.)

MTM400 RUI controls		MTM400A RUI equivalent controls
Button bar	Button / Field	
Log	Event Log	Click the Event Log button in the button bar Right hand side shows Event Log at bottom Note: Filtered event logs are present when clicking on each test in the Tests tree
	Change displayed timezone of log entries	Click the Configuration... button on the toolbar Select the Preferences page Edit the Timezone for timestamp display field
	Download and Clear Log	Click the Event Log button in the button bar Right hand side shows Event Log at bottom Download and Clear buttons are above log entries
Config	Standard and Region	Click the Standard... button on the toolbar Select the standard and/or region
	Interface (select/configure)	Click the Interface... button on the toolbar Use the dialog to select channels and edit parameters
	Interface (lock)	Displayed as text on Interface button
	Stream Name	Click the Configuration... button on the toolbar Select the Stream page
	Template Checking	Click the Configuration... button on the toolbar Select the Stream page
	Maintenance Mode	Click the Configuration... button on the toolbar Select the Stream page
	Configuration Slot management	Click the Configuration... button on the toolbar Select the Slot Management page
	Scheduling management	Click the Configuration... button on the toolbar Select the Schedule Management page
	Enable Thumbnails	Click the Configuration... button on the toolbar Select the Stream page
SI Parameter Processing (ISDB only)	Click the Configuration... button on the toolbar Select the Stream page	
Service Log	Status and Management	Click the Service Log button in the button bar The service log view is shown on the right hand side

Table 3: RUI control equivalents (Cont.)

MTM400 RUI controls		MTM400A RUI equivalent controls
Button bar	Button / Field	
Polling	Polling Channel List	Click the Polling button in the button bar The Polling window is displayed containing the selected channels
	Channel configuration	Click the Polling button in the button bar The Polling window is displayed containing the selected channels Select the Configure button Press OK to use the currently defined presets in the interface dialog as the polling channels
Thumbnails		Click the Programs button in the button bar Select the Thumbnails tab on the right hand side Note: Thumbnails can also be viewed for individual programs and for all PIDs
Input Card	Graphs	Click the Interface button in the button bar Select the Graphs tab Select the Add Graph button and select desired graph
	Controls	Click the Interface... button on the toolbar In the dialog, edit the parameters for the desired preset, press Apply to see the effects without closing the dialog.
	Readings	Click the Interface button in the button bar Select the Graphs tab Readings is displayed on the right hand side of the tab Note: This readings table can be shown in a floating or torn-off window

Reverting the RUI to v2.6.1

You can use the following procedure to replace the RUI on your instrument with version 2.6.1. You would do this if you have an MTM400A monitor, or an MTM400 monitor that has been upgraded to RUI version 3.0, and you want to use the previous version of the RUI.

Requirements

To perform this procedure, you need the RUI version 2.6.1 firmware file (MTM400 v2.6.1 build 03.hex). This file is available on the Tektronix Web site (www.tektronix.com/software). It is also provided on the application firmware CD that was shipped with your monitor:

- MTM400 (Tektronix part number 063-3719-07)
- MTM400A (Tektronix part number 063-4136-xx)

Procedure

The process for reverting the firmware version of the instrument is initiated from the initial **Connect to MTM Device** dialog box.



CAUTION. To prevent software problems, do not open the *Connect to MTM Device* dialog box from the *Connect* button in the MTM400A RUI toolbar.

1. On a networked PC, launch Microsoft Internet Explorer.
2. In the Web browser address bar, enter the IP address or network name of the MTM400 or MTM400A monitor (see Figure 2), for example:
`http://TSMonitor01` or `http://192.158.201.105`.

After you press the Enter key, a Java applet is downloaded from the the MTM400A monitor and launched.
3. In the **Connect to MTM Device** dialog box, select the **Administrator** Login Type from the drop-down list, and then enter the password.
4. Click **Upload Firmware** to open the Upload Device Firmware dialog box.
5. In the Upload Device Firmware dialog box (see Figure 3), enter the path and name of the firmware file or use the Browse button to locate and select the firmware file.

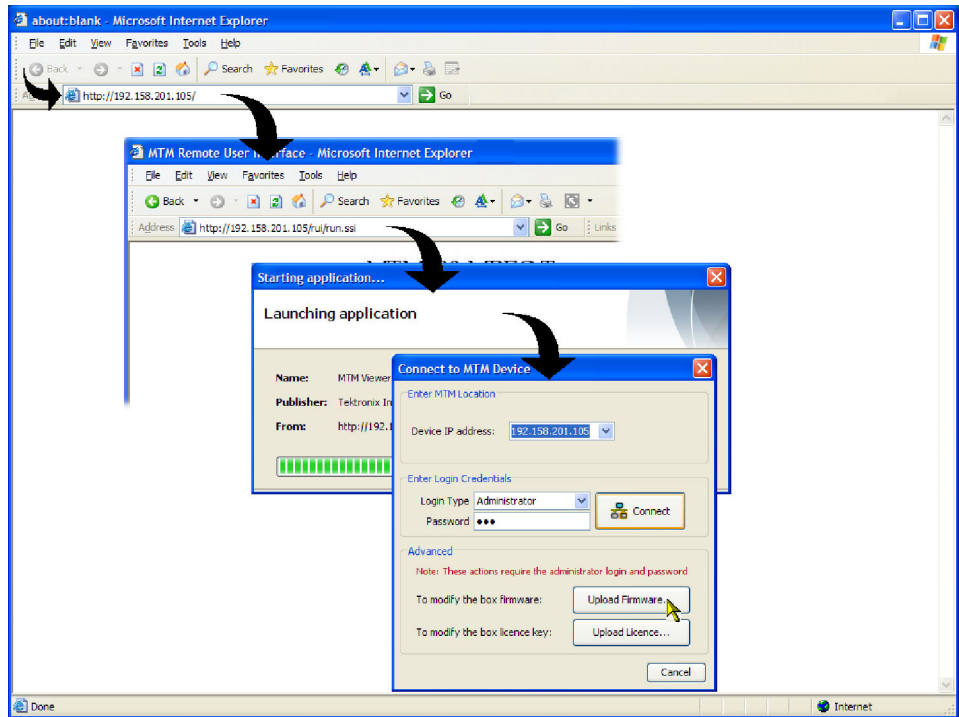


Figure 2: Connecting to the instrument

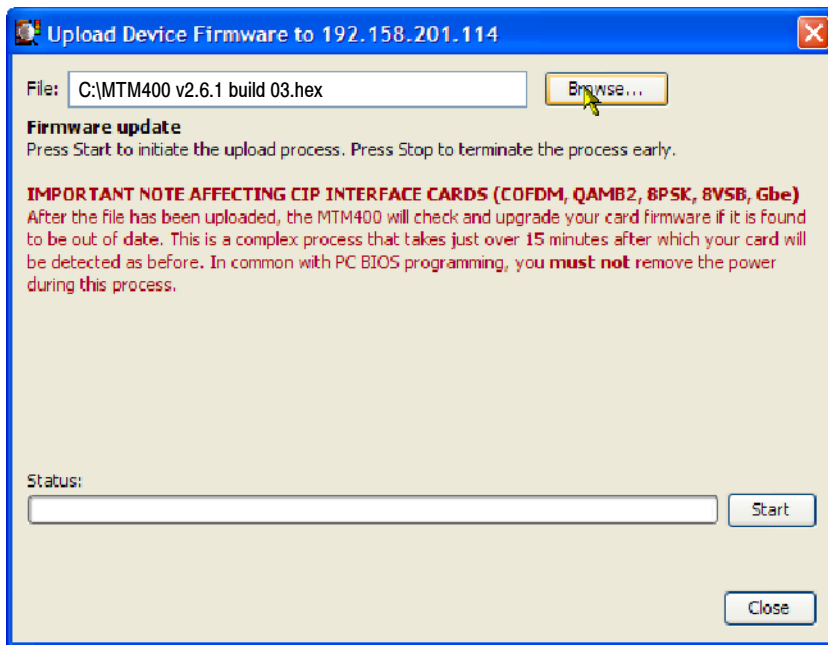


Figure 3: Upload Device Firmware dialog box

6. In the Upload Device Firmware dialog box, click **Start** to initiate the firmware installation.
7. When the firmware upload is complete, a **Firmware upload complete** message is displayed in the Upload Device Firmware dialog box (see Figure 4).

As stated in the message, the uploaded firmware will be checked, and if valid, reprogramming of the instrument will start. The reprogramming process can take up to fifteen minutes.



CAUTION. *To prevent software problems, do not remove power from the instrument during the reprogramming process.*

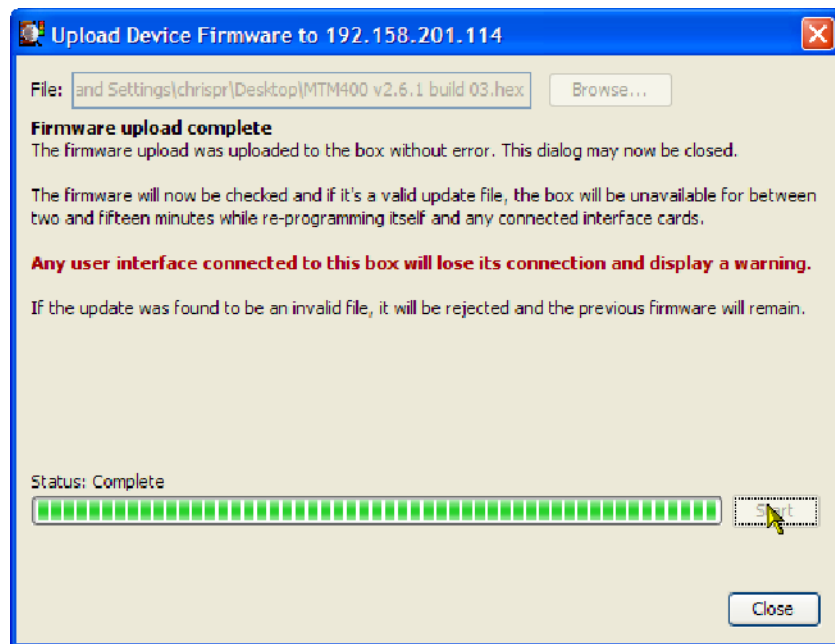
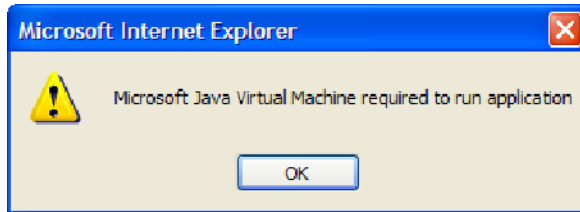


Figure 4: Firmware upload complete message

8. When the reprogramming process is complete, close the RUI, and if necessary, close the associated Web browser window.

9. Launch Microsoft Internet Explorer.

NOTE. Before the MTM400 RUI can be opened, you must disable the Java Runtime Environment in the Internet Explorer. If you attempt to open the MTM400 RUI before disabling the Java Runtime Environment, the following message will be displayed.



10. From the Internet Explorer menu bar, select **Tools > Internet Options...**, and then select the **Advanced** tab.

11. Locate the **Java (Sun)** node, and then clear the **Use JRE** check box (see Figure 5).

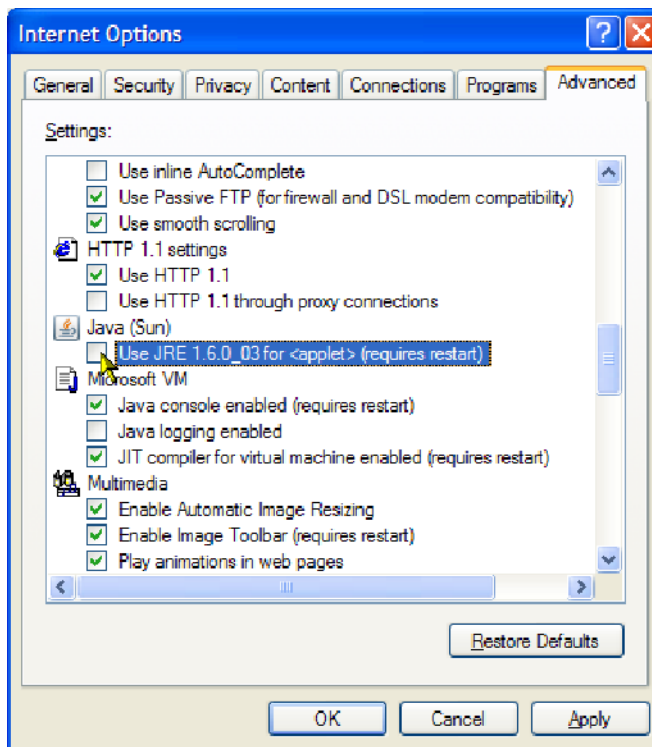


Figure 5: Internet Options dialog box

12. Close the Internet Options dialog box.
13. Close and restart Internet Explorer.
14. In the Web browser address bar, enter the IP address or network name of the MTM400 or MTM400A monitor.

NOTE. After you have disabled the Java Runtime Environment, if you still receive the message (Microsoft Java Virtual Machine required to run application), you may need to reinstall the Microsoft Virtual Machine. This is available on the Internet or from the support folder on the MTM400A monitor application firmware CD, Tektronix part number 063-4136-00.

15. In the Logon Details dialog box (see Figure 6), select the user type from the drop-down list, and enter the password.

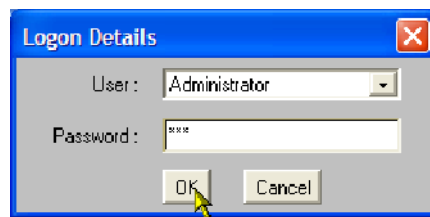


Figure 6: Login Details dialog box

16. The MTM400 RUI hot spot and Stream Summary windows should now be displayed (see Figure 7).

NOTE. If the instrument on which you reverted the firmware version was an MTM400A monitor, and especially if the login password was changed from the factory default value, the v2.6.1 RUI may be inaccessible. In this situation, you must clear the NVRAM and reassign the IP address of the instrument. The procedure to perform that task is located in the Installation section of the MTM400A Quick Start User Manual, Tektronix part number 071-2492-xx.

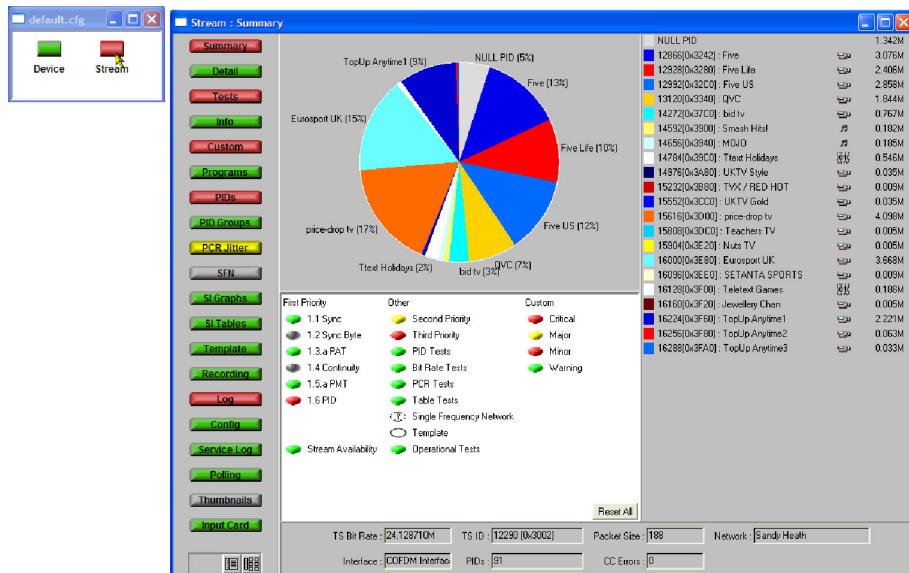


Figure 7: RUI version 2.6.1 display

RUI v2.6.1 Product Documentation

You can download the latest versions of the user documentation for the v2.6.1 RUI listed in Table 4 from the Tektronix Web site (www.tektronix.com).

Table 4: RUI v2.6.1 product documentation

Document	Tektronix part number
User manual	071-1224-xx (English) 071-1538-xx (Japanese)
Technical reference	071-1560-xx
Programmer manual	071-1375-xx
Release notes	071-1564-xx