

# Instructions



## **MTM4FQA, MTM4FQB, MTM4FQC, and MTM4FQP Hardware Upgrades for MTM400 MPEG Transport Stream Monitor 075-0768-03**

### **Warning**

The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

**[www.tektronix.com](http://www.tektronix.com)**



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# General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

*Only qualified personnel should perform service procedures.*

## **To Avoid Fire or Personal Injury**

**Use Proper Power Cord.** Use only the power cord specified for this product and certified for the country of use.

**Ground the Product.** This product is grounded through the grounding conductor of the mainframe power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

**Ground Equipment Connected to the Product.** Ensure that any equipment connected to this product is grounded and at the same potential.

**Observe All Terminal Ratings.** To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the manual for further ratings information before making connections to the product.

**Do Not Operate Without Covers.** Do not operate this product with covers or panels removed.

**Use Proper Fuse.** Use only the fuse type and rating specified for this product.

**Avoid Exposed Circuitry.** Do not touch exposed connections and components when power is present.

**Do Not Operate With Suspected Failures.** If you suspect there is damage to this product, have it inspected by qualified service personnel.

**Do Not Operate in Wet/Damp Conditions.**

**Do Not Operate in an Explosive Atmosphere.**

**Keep Product Surfaces Clean and Dry.**

**Provide Proper Ventilation.** Refer to the installation instructions for details on installing the product so it has proper ventilation.

## Symbols and Terms

**Terms in this Manual.** These terms may appear in this manual:



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**WARNING.** *Warning statements identify conditions or practices that could result in injury or loss of life.*

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**CAUTION.** *Caution statements identify conditions or practices that could result in damage to this product or other property.*

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**Terms on the Product.** These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

**Symbols on the Product.** The following symbols may appear on the product:



# Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

**Do Not Service Alone.** Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

**Disconnect Power.** To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

**Use Care When Servicing With Power On.** Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Use only Tektronix approved components when servicing the unit.

## Contacting Tektronix

<b>Phone</b>	1-800-833-9200*
<b>Address</b>	Tektronix, Inc. Department or name (if known) 14200 SW Karl Braun Drive P.O. Box 500 Beaverton, OR 97077 USA
<b>Web site</b>	<a href="http://www.tektronix.com">www.tektronix.com</a>
<b>Sales support</b>	1-800-833-9200, select option 1*
<b>Service support</b>	1-800-833-9200, select option 2*
<b>Technical support</b>	<a href="http://www.tektronix.com/support">www.tektronix.com/support</a> 1-800-833-9200, select option 3* 6:00 a.m. -- 5:00 p.m. Pacific Standard Time

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\* - This phone number is toll free in North America. After office hours, please leave a voice mail message.

Outside North America, contact a Tektronix sales office or distributor; see the Tektronix Web site for a list of offices.

# Kit Description

This document provides instructions for the MTM400 Hardware upgrades. The following upgrades are currently available:

These instructions are for adding each of the hardware option upgrades to the MTM400 MPEG Transport Stream Monitor; removal of an installed option is also described.

## MTM400 Field upgrade kits (Hardware)

Kit number	Description
MTM4FQP	Adds a QPSK (L-Band) Interface to an existing MTM400.
MTM4FQA	Adds a QAM Annex A Interface to an existing MTM400.
MTM4FQB	Adds a QAM Annex B Interface to an existing MTM400.
MTM4FQC	Adds a QAM Annex C Interface to an existing MTM400.

This document supports Tektronix modification: ECO1090 and ECR30021.

## Products

MTM400 MPEG Transport Stream Monitor  
WebMSM  
WebMSM Configuration Editor

### MTM400 Serial Number Variants

Two variants in the construction of the MTM400 are currently available. They are differentiated by the format of the Serial Number. The serial number of each unit is printed on a label attached to the unit.

#### Serial number formats

GB400-xxxx (Example: GB400-1234)  
Bxxxxxx (Example: B010100)

**NOTE.** *These instructions do not apply to units carrying the GB\* serial number. If your unit carries this form of serial number, you will be advised on the correct procedure when you order your upgrade.*

## Minimum Tool and Equipment List

Required tools and equipment	Part number
Anti-static wrist-strap	NA
A screwdriver with T10, T15, and T20 Torx tips	NA

## Kit Parts List

### MTM4FQP Field upgrade kit

Quantity	Part number	Description
1 EA	063-3719-01	FIRMWARE PKG, CD: MPEG TESTSTREAMS V. 2.0.7, MTM400 SERIES
1 EA	075-0768-03	KIT INSTRUCTIONS; MTM4FQA, MTM4FQB, MTM4FQC, & MTM4FQP HARDWARE UPGRADE
1 EA	071-1224-02	USER MANUAL; MTM400 MPEG TRANSPORTATION STREAM MONITOR
1 EA	174-4782-00	CA ASSY, PWR; 8 CONDUCTOR, 15.9 L
2 EA	174-4850-00	CA ASSY, RF; COAXIAL; RFD, 50 OHM, 16.0 L, RTANG SMB BOTH ENDS
7 EA	211-0722-00	SCREW, MACHINE; 6-32 X 0.250, PNH, T-15 TORX
1 EA	334-9141-00	MARKER, IDENT; BLANK STOCK, SUPER LABEL
1 EA	671-5607-01	CKT BD ASSY; QPSK, L-BAND, 679-5607-01 TESTED, 389-3408-00



**MTM4FQA Field upgrade kit**

Quantity	Part number	Description
1 EA	063-3719-01	FIRMWARE PKG, CD: MPEG TESTSTREAMS V. 2.0.7, MTM400 SERIES
1 EA	075-0768-03	KIT INSTRUCTIONS; MTM4FQA, MTM4FQB, MTM4FQC, & MTM4FQP HARDWARE UPGRADE
1 EA	071-1224-02	USER MANUAL; MTM400 MPEG TRANSPORTATION STREAM MONITOR
1 EA	174-4782-00	CA ASSY, PWR; 8 CONDUCTOR, 15.9 L
2 EA	174-4850-00	CA ASSY, RF; COAXIAL; RFD, 50 OHM, 16.0 L, RTANG SMB BOTH ENDS
7 EA	211-0722-00	SCREW, MACHINE; 6-32 X 0.250, PNH, T-15 TORX
1 EA	334-9141-00	MARKER, IDENT; BLANK STOCK, SUPER LABEL
1 EA	671-5608-01	CIRCUIT BD ASSY; QAM, BUILD OPTION A; 389-3409-00

**MTM4FQB Field upgrade kit**

Quantity	Part number	Description
1 EA	063-3719-01	FIRMWARE PKG, CD: MPEG TESTSTREAMS V. 2.0.7, MTM400 SERIES
1 EA	075-0768-03	KIT INSTRUCTIONS; MTM4FQA, MTM4FQB, MTM4FQC, & MTM4FQP HARDWARE UPGRADE
1 EA	071-1224-02	USER MANUAL; MTM400 MPEG TRANSPORTATION STREAM MONITOR
1 EA	174-4782-00	CA ASSY, PWR; 8 CONDUCTOR, 15.9 L
2 EA	174-4850-00	CA ASSY, RF; COAXIAL; RFD, 50 OHM, 16.0 L, RTANG SMB BOTH ENDS
7 EA	211-0722-00	SCREW, MACHINE; 6-32 X 0.250, PNH, T-15 TORX
1 EA	334-9141-00	MARKER, IDENT; BLANK STOCK, SUPER LABEL
1 EA	671-5623-00	CIRCUIT BD ASSY; QAM, TESTED, BUILD OPTION B/C, 389-3409-00

**MTMF4QC Field upgrade kit**

<b>Quantity</b>	<b>Part number</b>	<b>Description</b>
1 EA	063-3719-01	FIRMWARE PKG, CD: MPEG TESTSTREAMS V. 2.0.7, MTM400 SERIES
1 EA	075-0768-03	KIT INSTRUCTIONS; MTM4FQA, MTM4FQB, MTM4FQC, & MTM4FQP HARDWARE UPGRADE
1 EA	071-1224-02	USER MANUAL; MTM400 MPEG TRANSPORTATION STREAM MONITOR
1 EA	174-4782-00	CA ASSY, PWR; 8 CONDUCTOR, 1 5.9 L
2 EA	174-4850-00	CA ASSY, RF; COAXIAL; RFD, 50 OHM, 16.0 L, RTANG SMB BOTH ENDS
7 EA	211-0722-00	SCREW, MACHINE; 6-32 X 0.250, PNH, T-15 TORX
1 EA	334-9141-00	MARKER, IDENT; BLANK STOCK, SUPER LABEL
1 EA	671-5625-00	CIRCUIT BD ASSY; QAM, TESTED; BUILD OPT C, 389-3409-00

# Installation Instructions

The following software activities require access to the MTM400, using either the Remote User Interface or a WebMSM interface. (Refer to the *MTM400 User Manual*, Tektronix part number: 071-1224-xx.)

The activities for adding any of the hardware options to the MTM400 are essentially the same. The following description is generic.

Overall, the steps required are as follows:

- If necessary, upgrade the BIOS version and the Processor board software version
- Enter and upload the new license key
- Install the new interface board and affix the new label
- Configure the MTM400 for the new interface type
- If necessary, configure the new interface board
- Reinstall the WebMSM software

## Identify the Current BIOS and Firmware Versions

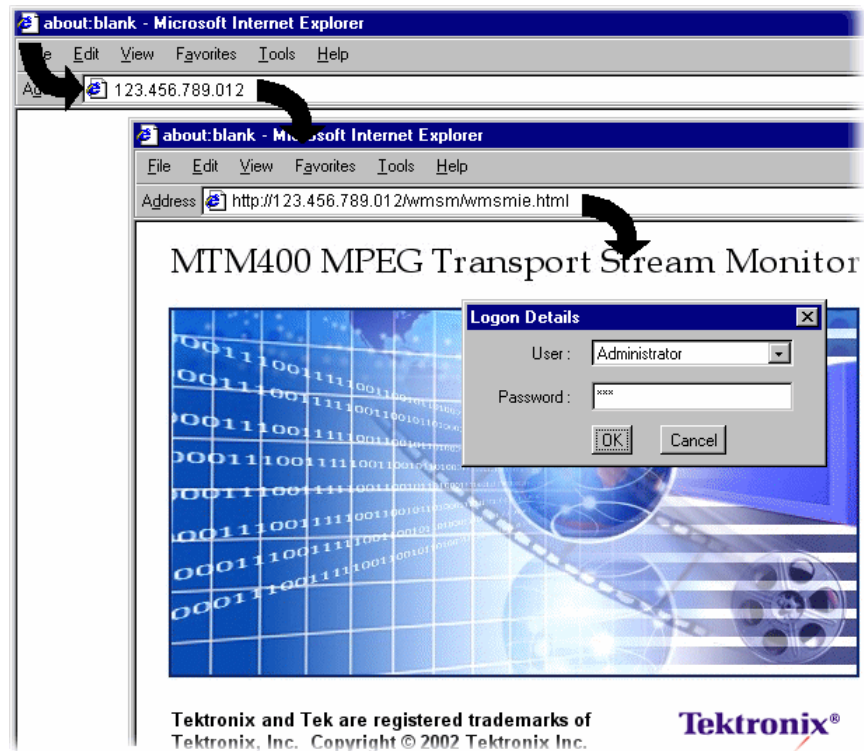
Before proceeding, identify the current BIOS and firmware versions. It is assumed that power and networking are available; a signal source is not required.

1. Power up the MTM400 unit and wait for initialization to complete.
2. From a client PC, open the MTM400 remote user interface.
  - a. At a networked PC, launch Microsoft Internet Explorer.
  - b. In the browser address bar, enter the network identity or IP address of the MTM400 unit;  
for example, <http://TSMonitor01> or <http://192.123.234.345>.

When the Enter key is pressed, a Java applet is downloaded from the MTM400 unit and launched. The file size is approximately 1.5 MB; the download time will depend on the network speed and traffic.

The MTM400 user interface can also be accessed via the Web Monitoring Systems Manager (WebMSM). This is described in the WebMSM User Manual.

The MTM400 splash screen is displayed, overlaid shortly thereafter by the **Login Details** dialog:



**Figure 1: Logging On**

3. Select the User name (Administrator) and enter the password.

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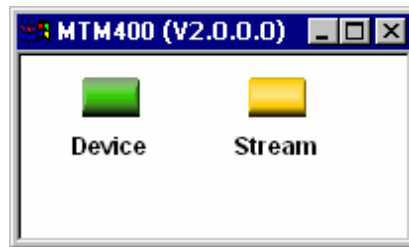
**NOTE.** The upgrade can only be done by logging on as an administrator; the default password is 'tek'.

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Select **OK** to accept the details. Select **Cancel** to close the dialog.

(To redisplay the **Login Details** dialog, either reenter the network identity of the MTM400 or select the **Refresh** button in the browser.)

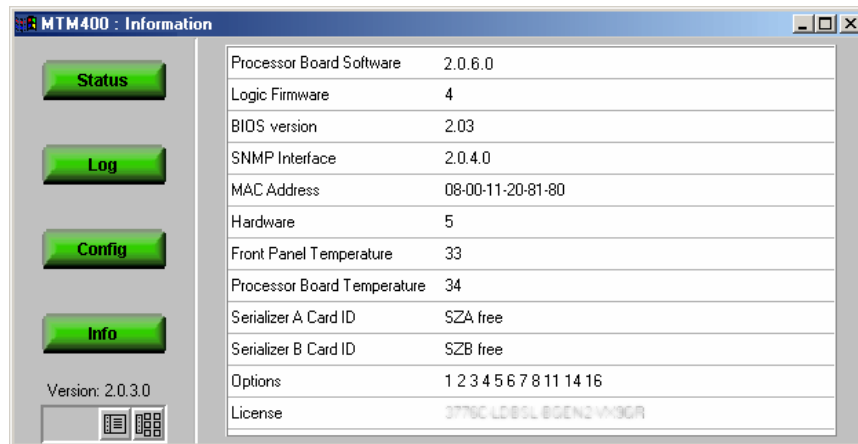
- The Hotspot view is displayed.



**Figure 2: Hotspot View**

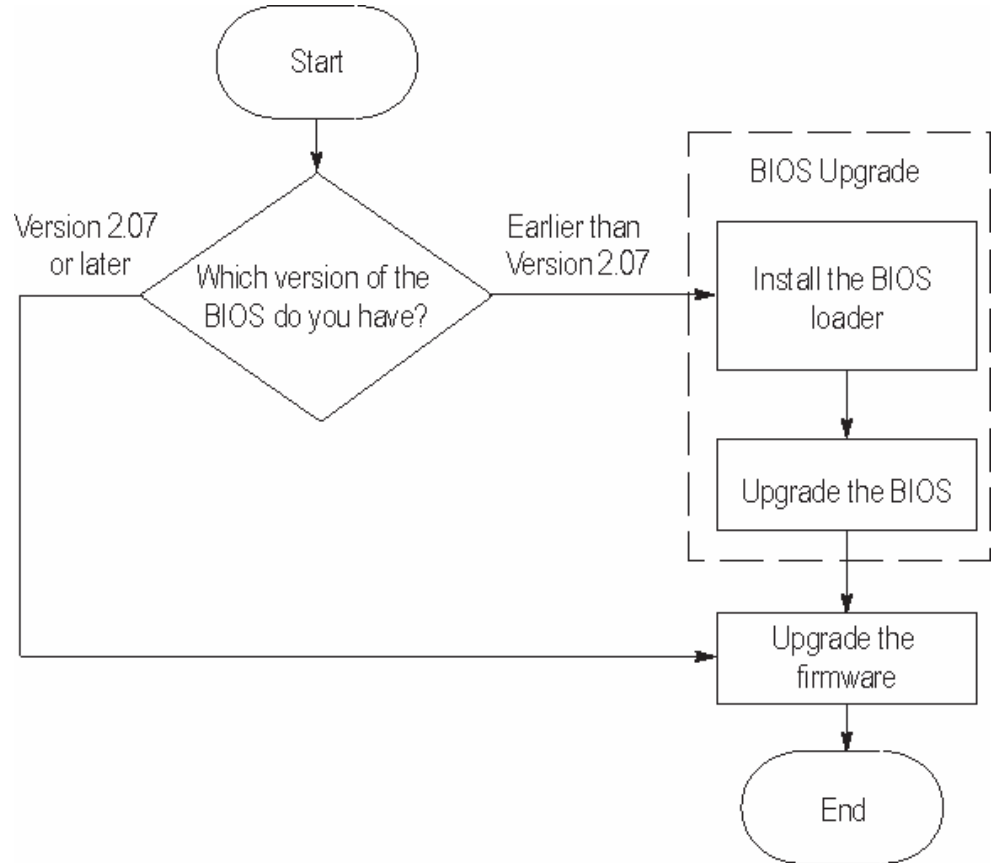
- Select **Device**.
- In the Device View, select **Info** to display the Device Information screen.

The Device Information view details the software and hardware build state of the MTM400. (The values shown in Figure 3 will differ from the values shown on your display.)



**Figure 3: Device View - Information**

- Note the Processor Board Software and BIOS version values.
- Refer to Figure 4 and identify the actions required.



**Figure 4: Upgrade Path**

## Upgrade Files

The upgrade files can be found on the CD-ROM accompanying the kit.

MTM400 <bios loader version> BIOSLDR <bios version>.hex  
For example: MTM400 v2.0.6.1 BIOSLDR v2.07.hex

MTM400 <Processor Board Software version>.hex  
For example: MTM400 v2.0.6.0.hex

For the update to be successful, the files must be copied from the CD-ROM to a writable location; for example, the local hard drive.

## Signal Source



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**CAUTION.** *Disconnect all transport stream inputs and outputs from the MTM400 before attempting the following procedure.*

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## MTM400 BIOS Upgrade

The BIOS is upgraded by installing a program (BIOS Loader) which, when activated, automatically installs the new BIOS.



**CAUTION.** *The BIOS upgrade is a critical process.*

*If, for any reason, the BIOS upgrade procedure fails there is potential risk that the unit will need to be returned to Tektronix service for reprogramming.*

*It is therefore recommended that this procedure is only carried out during a period of time where monitoring is not required or where alternative arrangements can be made for system monitoring.*



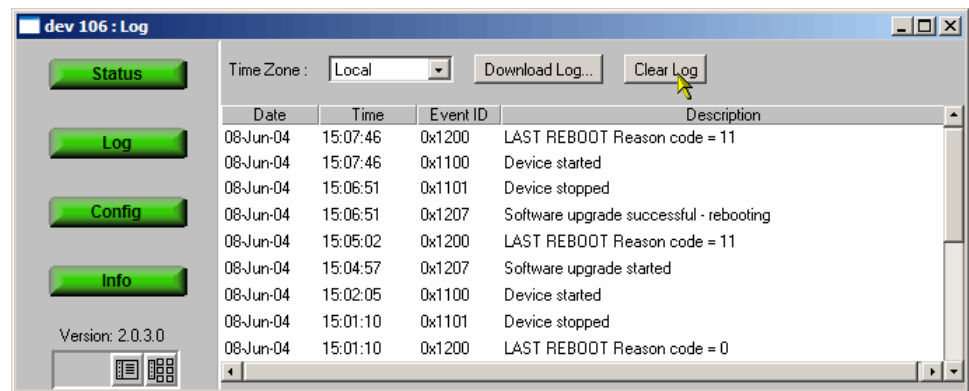
**CAUTION.** *Do not remove power or manually reboot the MTM400 during the following procedures, unless instructed to do so.*

### Install the BIOS Uploader



**CAUTION.** *You must clear the Device Log immediately before uploading the firmware.*

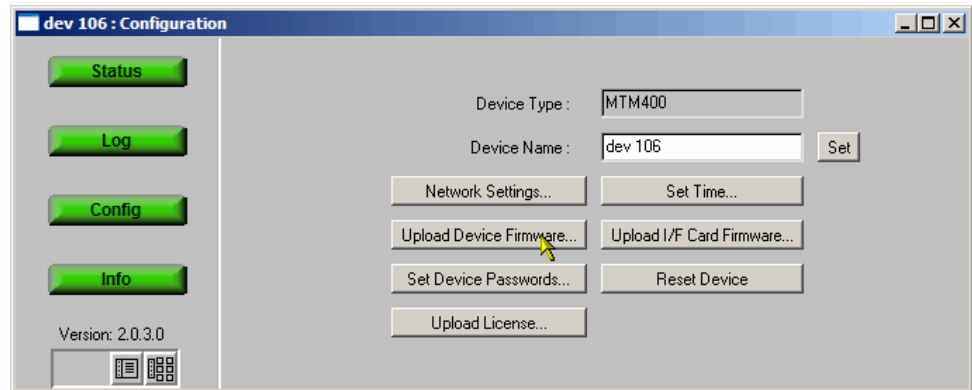
1. In the Device View, select **Log** to display the Device Log view. Select **Clear Log** to clear the device log.



**Figure 5: Device View - Log**

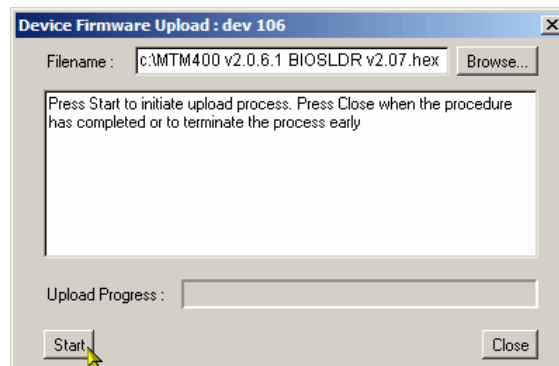
A message is displayed in the Device Log view confirming that the log has been cleared.

2. In the Device View, select **Config** to display the Configuration screen.



**Figure 6: Device View - Configuration**

3. To upload the BIOS loader, select **Upload Device Firmware**.



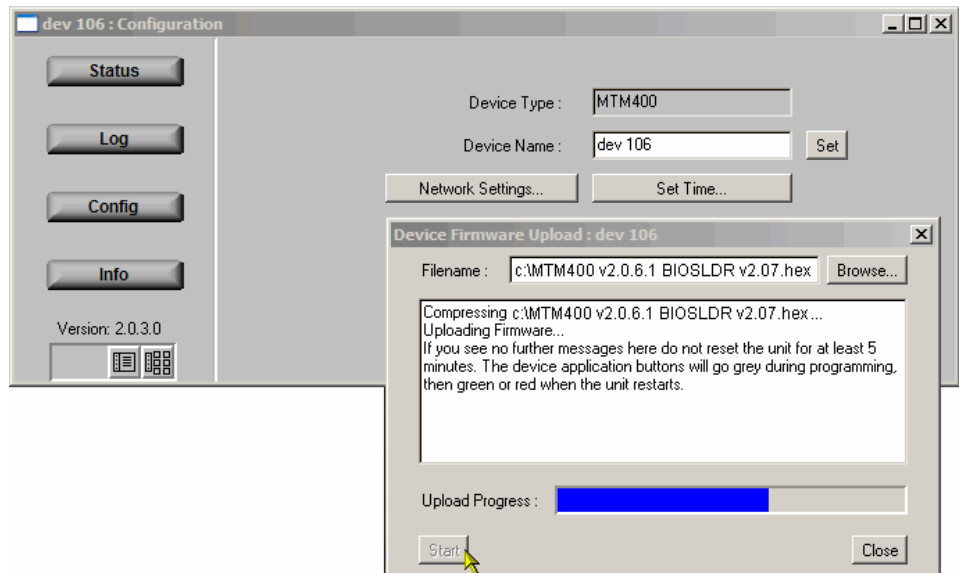
4. Browse to the location on the local drive where the upgrade files have been placed.
5. Select the BIOS loader file.  
For example, MTM400 v2.0.6.1 BIOSLDR v2.07.hex.

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**NOTE.** Remember that for the update to be successful, the file must be copied from the CD-ROM to a writable location; for example, the local hard drive.

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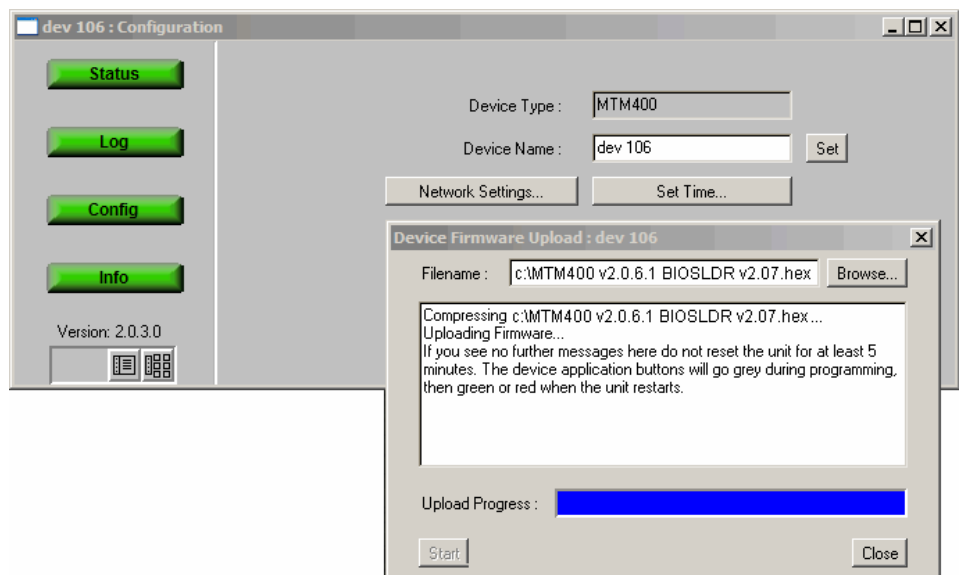
6. Select **Start**. While the process completes, the four buttons in the Device view will remain grayed out as shown below. The process may take a few minutes since the MTM400 is automatically restarted.



7. When all four buttons in the Device view have been active for longer than 20 seconds and the progress bar in the Device Firmware Upload dialog is full as shown below, the BIOS Loader is successfully loaded.



**CAUTION.** Do not proceed until *all* four buttons in the Device view have been active (either red, green or yellow) for longer than 20 seconds.

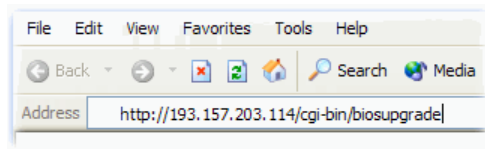


### Upgrade the BIOS

With the BIOS Loader successfully loaded, the BIOS can now be upgraded.

8. From the client PC, launch a second instance of Microsoft Internet Explorer.
9. In the browser address bar, enter the following command and press the Enter key:

<IP address>/cgi-bin/biosupgrade



where : <IP address> is the IP address of the MTM400 unit.

This begins the BIOS upgrade. The process should take no longer than 15 seconds.

10. On successful completion, a message is displayed in the browser and the buttons in the Device view are active.



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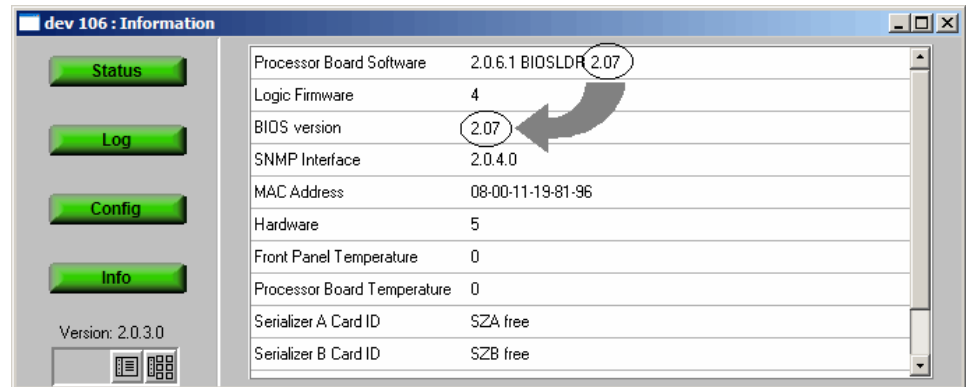
**CAUTION.** Do not proceed until *all four buttons in the Device view have been active (either red, green or yellow) for longer than 20 seconds.*

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11. Close the Internet Explorer.
12. Close the Device Firmware Upload dialog.

If, for any reason, the upgrade is unsuccessful, the original BIOS will be reinstated, if possible, and the MTM400 automatically restarted.

- Using the Device view Information screen, check that the BIOS version matches the BIOS uploader.



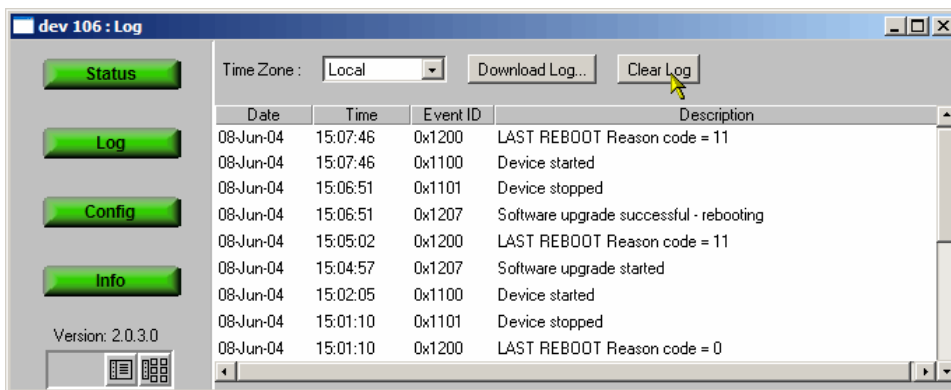
**Figure 7: Device View - Information**

## Upgrading the MTM400 Firmware



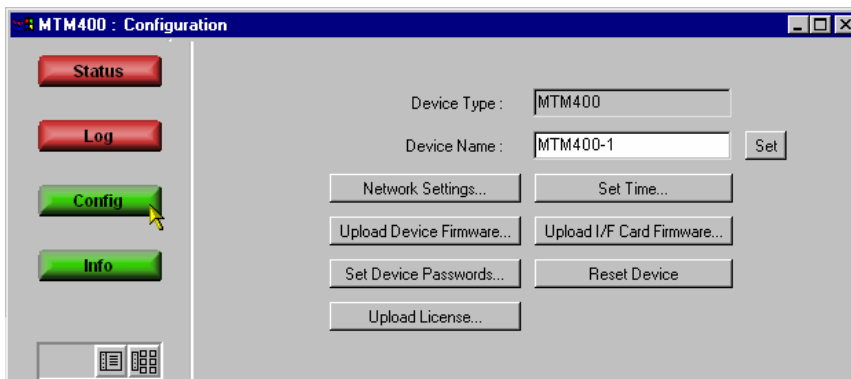
**CAUTION.** You must clear the Device Log immediately before uploading the firmware.

1. In the Device view, select **Log** to display the Device Log screen. Select **Clear Log** to clear the device log.



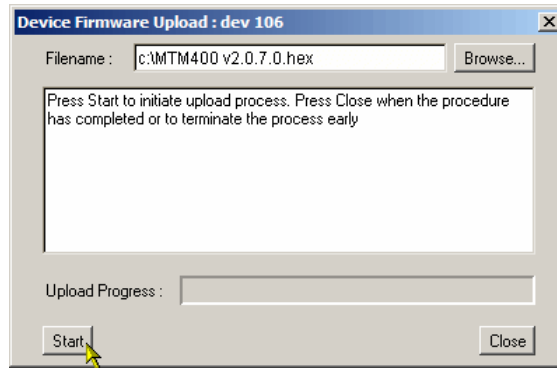
**Figure 8: Device View - Log**

2. In the Device view, select **Config** to display the Device Configuration screen.



**Figure 9: Device View - Configuration**

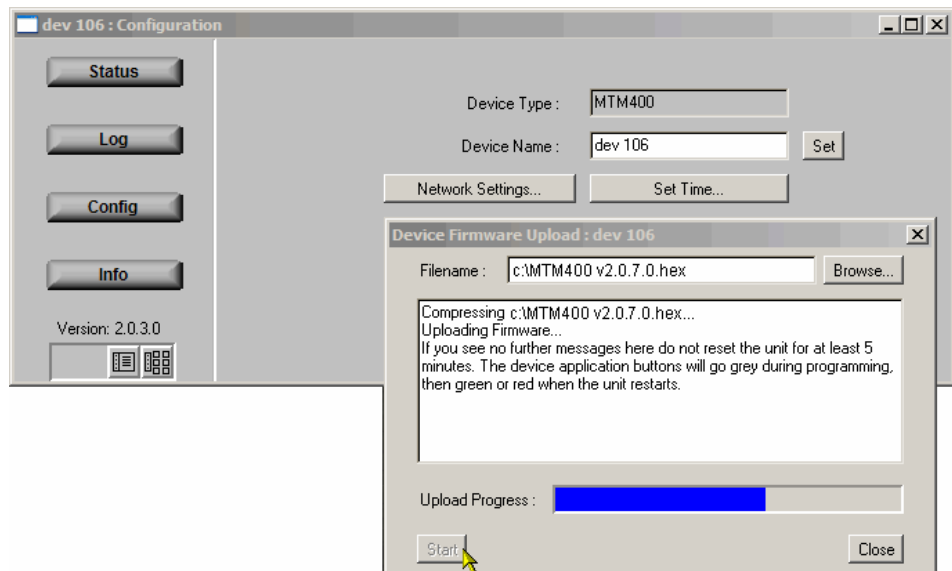
3. To upload the device firmware, select **Upload Device Firmware...**.
4. Identify the firmware file either by entering the path and filename or by using **Browse...**.



The firmware file is located on the MTM400 FW CD-ROM supplied with the kit. The firmware filename format is \*.hex.

**NOTE.** Remember that for the update to be successful, the file must be copied from the CD-ROM to a writable location; for example, the local hard drive.

5. Select **Start** to upload the firmware. While the process completes, the four buttons in the Device view will remain grayed out as shown below. The process may take a few minutes since the MTM400 is automatically restarted.

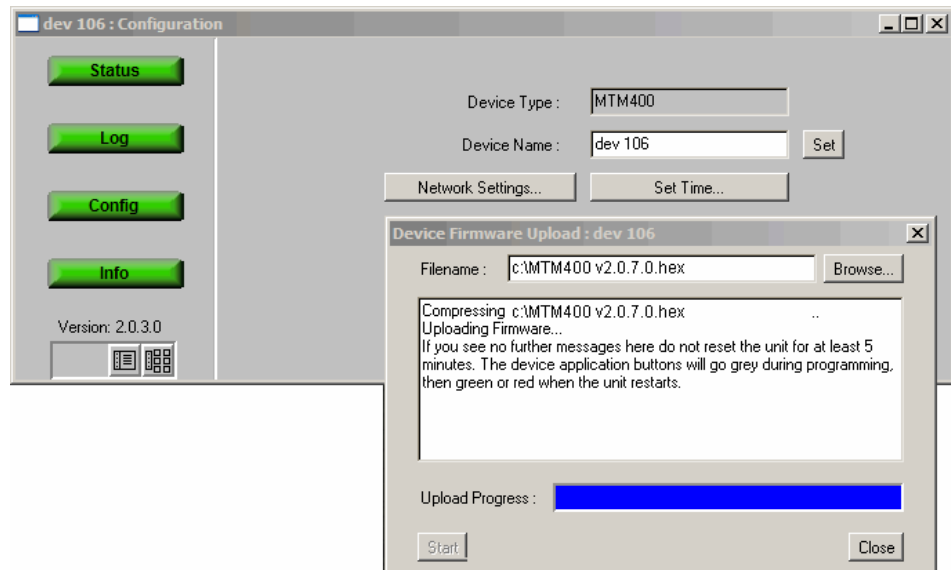


- When all four buttons in the Device view have been active for longer than 20 seconds and the progress bar in the Device Firmware Upload dialog is full as shown below, the firmware is successfully loaded.



**CAUTION.** Do not proceed until **all** four buttons in the Device view have been active (either red, green or yellow) for longer than 20 seconds.

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- Select **Close** when the process has completed or to terminate the process.

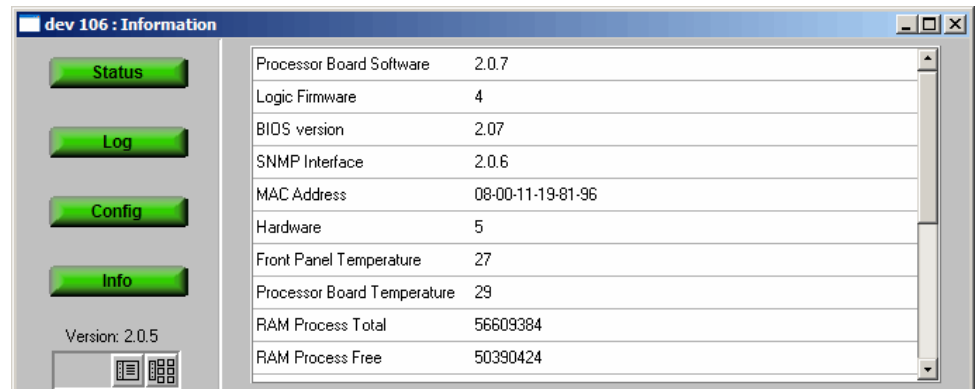


## Verifying the Upgrade

To verify the upgrade, the values displayed in the Device Information view must be checked. Before this can be done the MTM400 user interface (including the browser) must be closed and restarted.

1. Open the MTM400 user interface and log on (see *Identify the Current BIOS and Firmware Versions*, page 6).
2. In the Device View, select **Info** to display the Device Information screen.

The view details the software and hardware build state of the MTM400. (The values shown in this example screenshot will differ from the values shown on your display.)



**Figure 10: Device View - Information**

Note that the following items have changed:

- Processor Board Software
- BIOS Version
- MTM400 version (displayed below the buttons)

The BIOS Version displayed should not be less than 2.07. Earlier versions are not able to decompress new Processor Board Software uploads correctly.

## Enter and Upload New License Key

A license key is applied to the RTM device to enable functionality. When new or upgraded functions are added, for example as part of a field upgrade, you may receive a new license key with the upgrade kit. Use the **License Upload** dialog to apply the new license key.

1. Select **Upload License** from the Device Configuration screen.



2. Enter the new License Key. Select **Upload**. A progress message will be displayed.

The license key will be stored on the RTM device.

Licensing is specific to a single RTM device.

## Opening the Unit

Disconnect the unit, remove it from the rack and place it on a workbench.



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**WARNING.** *To prevent serious injury or death from electrical shock, do not operate with the cover or panels removed.*  
*Disconnect power from the unit before removing the covers or panels.*

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**CAUTION.** *Only qualified personnel should perform this procedure. Read the Service Safety Summary before performing this procedure.*

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All connectors are polarized; they will only fit into their respective socket in one way; do not use unnecessary force.

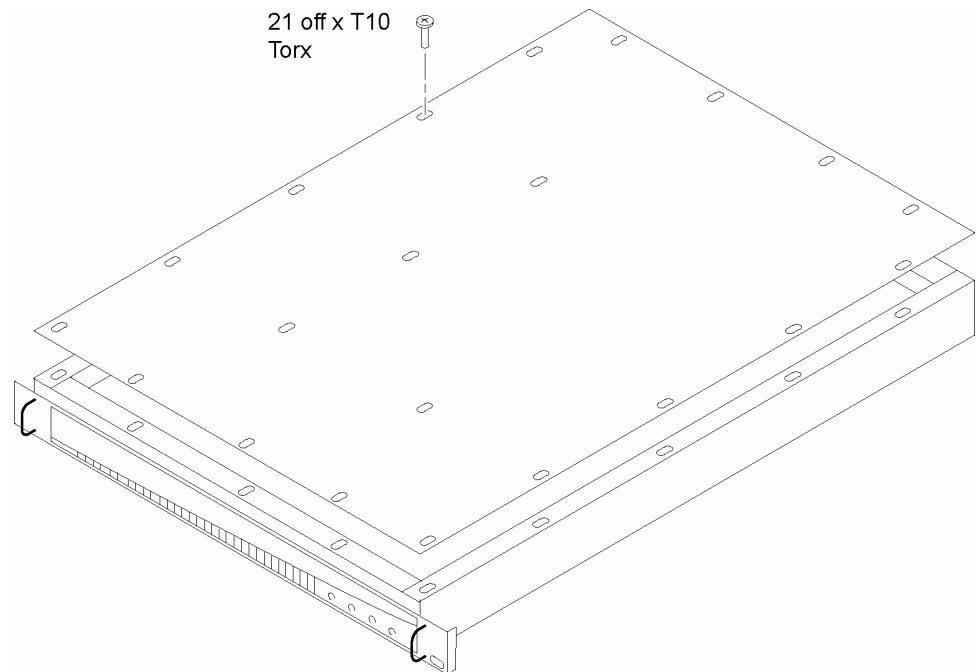
### Tools Required

The following tools are recommended for MTM400 module assembly removal and replacement:

- An anti-static wrist-strap for safe handling of components containing static sensitive devices. It is advisable to wear the wrist-strap for all MTM400 maintenance activity.
- A screwdriver with T10, T15, and T20 Torx tips to remove the unit cover and module mounting screws.

### Accessing the Components

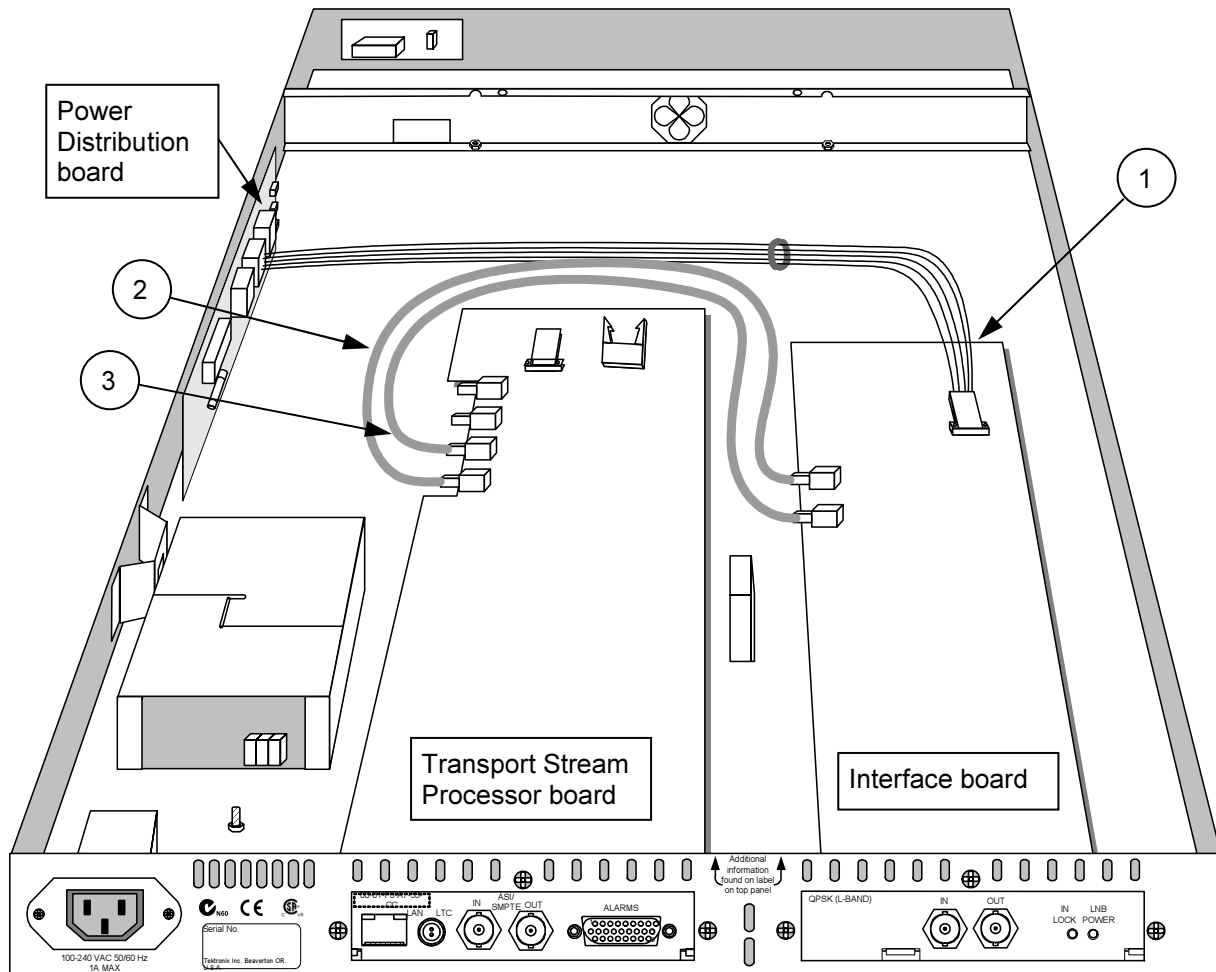
1. Remove and retain the 21 cover retaining screws.
2. Lift the cover clear.
3. Before replacing the cover, ensure that all components are in place and that all connections are secure.
4. Replace the 21 cover retaining screws and ensure that they are uniformly tightened.



**Figure 11: Removing the Unit Cover**

## Interface Board

The interface board is mounted on the right side of the MTM400 unit as viewed from the rear. Figure 12 shows the connector locations and Table 1 describes the connectors.

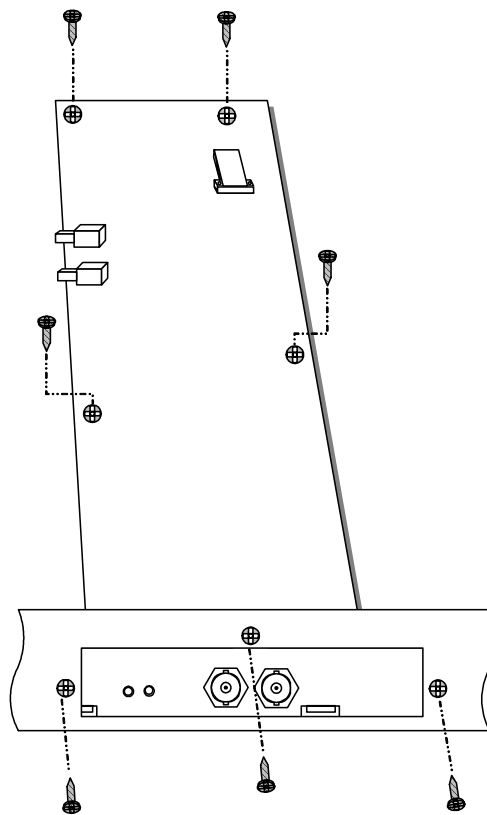


**Figure 12: Interface Board Position and Connections**

**Table 1: Interface boards connections**

Key	From interface board	To	Function
1	Connector identity: <b>P1</b> 8 wires	Power Distribution board Connector identity: <b>J7</b> 8-way wire	Power
2	Connector identity: <b>O/P</b> Miniature coaxial	TS Processor board Connector identity: <b>I/P A</b> Miniature coaxial	Data (serializer)
3	Connector identity: <b>I/P</b> Miniature coaxial	TS Processor board Connector identity: <b>O/P A</b> Miniature coaxial	Data (serializer)

The interface board is retained using four screws in the body of the board. Three screws also secure the end-plate to the rear panel. All screws are fitted with locking washers.



**Figure 13: Removing the Interface board**

Three connectors are mounted on the board (excluding the rear panel connectors).

- Two SMB connectors; **I/P**, **O/P**.  
Used to communicate with the interface board. The connectors are a push-fit.
- A single 8-way connector; **P1**.  
Connects to the Power Distribution board (**J7**).

### Removing an Interface Board

If an interface board is already installed in the unit, it must be removed before the new one can be installed.

1. Disconnect the three connectors on the interface board.
2. Remove and retain the seven retaining screws (four on the board, three in the rear panel).
3. Lift the board clear of the unit.

### Installing an Interface Board

1. If an interface board has not been previously installed in the unit, a blank cover is installed in the rear panel. Before installing the board, remove the three retaining screws and remove the blank cover.
2. Place the board in the unit.
3. Line up the mounting points and replace the seven retaining screws (four on the board, three in the rear panel).
4. Reconnect the connectors; refer to *Table 1: Interface boards connections*.
5. Replace the unit cover.

## Apply the Unit Label

Affix the label supplied in the kit to the top of the unit; instructions are supplied with the new label.





# Verifying the Hardware Options

The information in this section allows you to verify that the required hardware option has been installed and is functioning correctly.

These procedures require the following conditions:

- A suitable feed signal is connected to the Interface input.
- The signal under test is known to be good.
- The user is familiar with the technical characteristics of the signal under test.
- The MTM400 unit is powered up and networked.
- The user is familiar with the MTM400 user interface; refer to the *MTM400 MPEG Transport Stream Monitor User Manual* for more detailed information.
- The user is logged on to the MTM400 unit via the user interface, as the Administrator.

## Selecting the Interface

1. At the user interface Hot Spot view, select the **Stream** button.



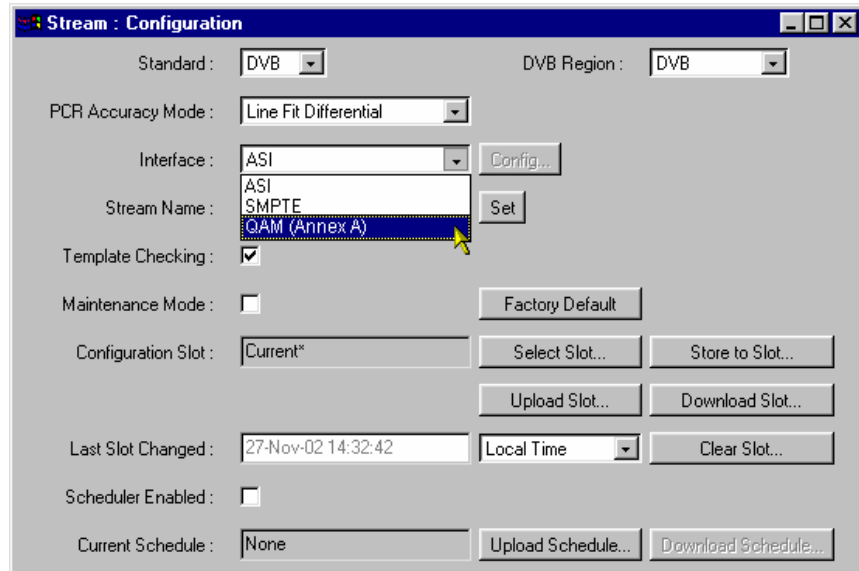
The Stream View button bar is displayed.

2. Select **Config** from the Stream view button bar.



The Stream Configuration dialog is displayed.

3. On the Stream Configuration screen, select the interface required from the **Interface** drop-down list.



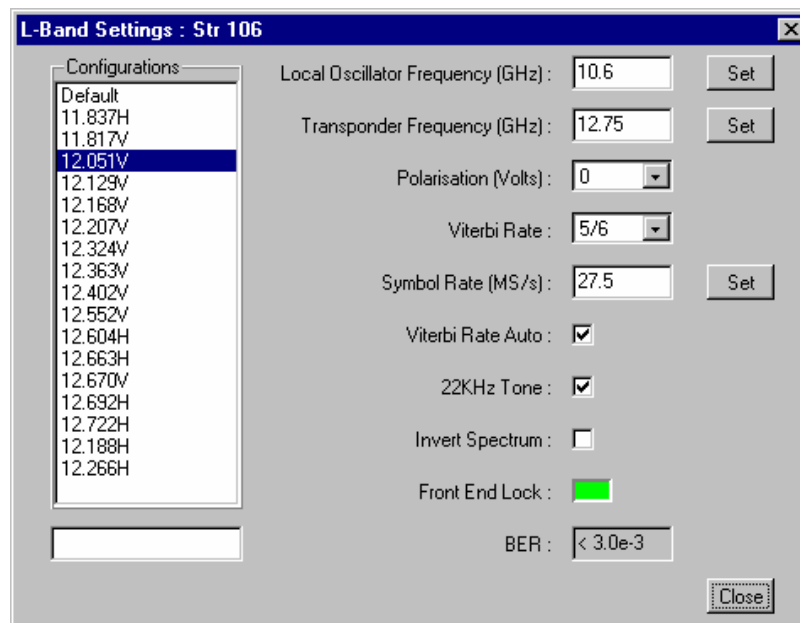
**NOTE.** If the required interface entry is not available in the drop-down list, one of the following events has occurred:

- *The start-up routine has failed to detect the new board.  
Remedy: Power down the unit and reapply power.*
- *The interface board has not been installed correctly in the unit  
Remedy: After powering down and disconnecting the unit, remove the top cover and check the presence of the board and its connections. Replace the top cover, reconnect the unit and apply power.*

## Interface Configuration

When the interface is successfully installed, configure it to suit the incoming stream. The settings available are described in the following paragraphs:

### QPSK (L-Band) Settings



**Figure 14: Interface Configuration - QPSK (L-Band)**

The QPSK (L-Band) Interface option allows you to connect to QPSK equipment operating in the L-Band (950 MHz to 2150 MHz). It will internally I-Q demodulate the signal with its on-board AGC control, Viterbi decoder, and FEC decoder.

The module will tune the full Satellite IF band, which is considerably wider than the L-Band itself. LNB support is included, which allows the module to be used with a stand alone TVRO dish.

The input to the interface card is looped through to the output connector, allowing subsequent processing of the input signal.

The L-Band Interface allows the user to monitor and/or record the transport streams from within the L-Band signal.

Bit Error Rate (BER) values are available during operation.

Refer to the *Specification* section in the *MTM400 MPEG Transport Stream Monitor Technical Reference* (071-1560-xx) for more details about the QPSK interface.

### Configurations

Allows you to select from a range of preset L-Band configurations.

The configurations are made available in the MTM400 configuration file. Refer to the *MTM400 MPEG Transport Stream Monitor Technical Reference*, Tektronix part number: 071-1560-xx for details.

To activate an L-Band configuration, highlight the name in the **Configurations** field; the field below will display the message **Updating values** until the settings are recalled.

### Local Oscillator Frequency (GHz)

The Local Oscillator (LO) frequency of the Low Noise Block (LNB) is dependent on the Transponder frequency and must be such that the difference falls within the input range of the receiver. Typically, these values are 10.6 GHz (Hi-Band) and 9.75 GHz (Lo-Band) when converting from KU band. The values are 5.7 GHz (Hi-Band) and 5.15 GHz (Lo-Band) respectively when converting from C-Band. This information should be confirmed for the specific type of LNBs used.

Enter the required value and select **Set**.

### Transponder Frequency (GHz)

The IF frequency that is used to initialize the L-Band Interface card is calculated as follows:

$$\text{Transponder\_Frequency} - \text{LO\_Frequency.}$$

If you want to specify the IF frequency rather than the individual LO and Transponder frequencies, set the Local Oscillator Frequency to a value of 0 (zero) and specify the required IF frequency under this parameter. If you specify the IF frequency, it must be in the range 0.950 GHz to 2.150 GHz; the tuning increment is 125 kHz.

Enter the required value and select **Set**.

### Polarization (Volts)

This parameter selects the polarization by applying 13 V (vertical) or 18 V (horizontal) to the LNB (Low Noise Block).

A value of 0 can be used if no voltage is to be applied from this card; for example, the polarization voltage is being supplied from an external source.

### **Viterbi Rate**

This is the harmonic fraction and takes one of the values specified in the drop-down list: 1/2; 2/3; 3/4; 5/6; 6/7; 7/8. However, it may be overwritten if the Viterbi Rate Auto selection is enabled.

### **Symbol Rate (MS/s)**

This is the symbol rate value. Enter the required value and select **Set**.

### **Viterbi Rate Auto**

When enabled, the L-Band adapter automatically establishes the Viterbi Rate when acquiring Front End Lock.

---

**NOTE:** Do not use the Viterbi Rate Auto option if the Viterbi rate is known or suspected to be 5/6.

---

### **22 kHz Tone**

The Local Oscillator Frequency is selected by applying the 22 kHz tone.

### **Invert Spectrum**

The sense of modulation may be inverted due to the number of mixing stages in the installation. Enabling the Invert Spectrum checkbox will invert the L-Band output.

### **Front End Lock**

If the L-Band adapter Front End is able to acquire full lock onto the channel and is receiving the signal correctly, the **Front End Lock** (FEL) indicator will light up green. When no lock is achieved the indicator stays unlit (gray).

### **BER**

Bit Error Rate indicator.

### QAM Interface Settings

The following QAM interfaces are available for the MTM400:

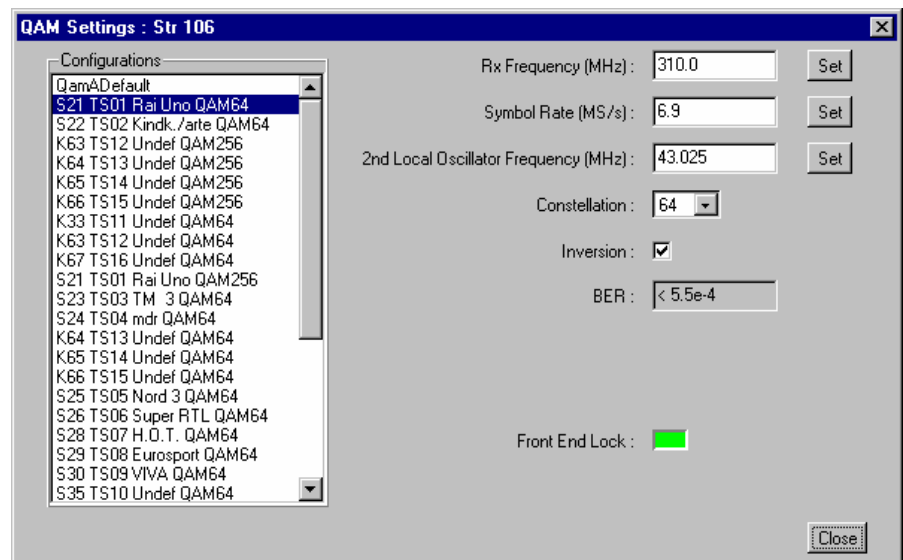
- Annex A
- Annex B
- Annex C

Table 2 shows the parameters that you can set for each interface:

**Table 2: QAM settings – Overview**

Setting	Annex A	Annex B	Annex C
Rx Frequency	✓	✓	✓
Symbol Rate	✓	-	✓
2 <sup>nd</sup> Local Oscillator Frequency	✓	-	✓
Constellation	✓	✓	✓
Inversion	✓	✓	✓
BER	✓	✓	✓
Front End Lock	✓	✓	✓

For example, the Annex A interface appears as shown in Figure 15:



**Figure 15: QAM Interface Configuration – Annex A (Example)**

Refer to the *Specification* section in the *MTM400 MPEG Transport Stream Monitor Technical Reference* (071-1560-xx) for more details about the QAM interface.

### Configurations

The **QAM Settings** dialog provides an option to recall a number of settings configuration files. The configuration files are created and stored in the MTM400. To select a configuration file, highlight the required name in the list.

### Rx Frequency (MHz)

This is the receive frequency. Enter the required value and select **Set**.

### Symbol Rate (MS/s)

This is the symbol rate value. Enter the required value and select **Set**.

### 2<sup>nd</sup> Local Oscillator Frequency (MHz)

Allows you to select the internal 2<sup>nd</sup> IF (intermediate frequency). Optimum performance is achieved when the 2<sup>nd</sup> IF is equal to the Symbol Rate. The 2<sup>nd</sup> IF is equal to the selected value minus 36.125 MHz.

Enter the required value and select **Set**.

### Constellation

Provides the option to set the modulation scheme (i.e.: 4-QAM, 16-QAM, 64-QAM or 256-QAM). Select the required value from the drop-down list.

### Inversion

The sense of modulation may be inverted due to the number of mixing stages in the installation. Enabling the **Inversion** checkbox will invert the QAM output.

### Signal Strength

Indicates signal strength. Values in the order of 100 indicate that the signal strength is sufficient to achieve Front End Lock.

### BER

Bit Error Rate indicator.

### Front End Lock

If full lock is acquired on the channel and it is receiving the signal correctly, the **Front End Lock** (FEL) indicator will light up green. When no lock is achieved the indicator will be red.



### **SMPTE310 Settings**

There are no user settings associated with the SMPTE (Society of Motion Picture and Television Engineers) interface.

Refer to the *Specification* section in the *MTM400 MPEG Transport Stream Monitor Technical Reference* (071-1560-xx) for more details about the SMPTE interface.

### **ASI Settings**

There are no user settings associated with the ASI (Asynchronous Serial Interface) interface.

Refer to the *Specification* section in the *MTM400 MPEG Transport Stream Monitor Technical Reference* (071-1560-xx) for more details about the ASI interface.



# WebMSM Installation Instructions

If you own the WebMSM software, you must reinstall WebMSM and the WebMSM Configuration Editor as part of this upgrade. The necessary files are available on the Tektronix Web site, [www.tektronix.com](http://www.tektronix.com).

The following steps are required:

- Locate and download the WebMSM software from the Tektronix Web site.
- Uninstall WebMSM and WebMSM Configuration Editor
- Install WebMSM and WebMSM Configuration Editor

All configuration files and enabled options will be retained.

## Uninstalling WebMSM

1. At the computer containing WebMSM, run Setup for the WebMSM application.
2. Follow the onscreen instructions and remove the WebMSM application.

## Uninstalling WebMSM Configuration Editor

1. At the computer containing the WebMSM Configuration Editor, run Setup for the WebMSM Configuration Editor.
2. Follow the onscreen instructions and remove the WebMSM Configuration Editor.

## Installing WebMSM

1. Run Setup for the WebMSM application.
2. Follow the onscreen instructions and install the WebMSM application.

## Installing WebMSM Configuration Editor

1. Run Setup for the WebMSM Configuration Editor.
2. Follow the onscreen instructions and install the WebMSM Configuration Editor.

If you require further information regarding either WebMSM or the WebMSM Configuration Editor, refer to the *Web Monitoring System Manager User Manual* (Tektronix part number 071-1239-xx).

### Technical Support

If the upgrade is unsuccessful, please contact Tektronix Technical Support. Ensure that the MTM400 Serial Number is available.

■ End of document ■