MTS4UP Upgrades
MTS400 Series and MTS400P MPEG Test Systems

Instructions

Tektronix

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Instructions

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.

Tektronix

Contacting Tektronix

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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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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 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.

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

Power disconnect. The power cord disconnects the product from the power source. Do not block the power cord; it must remain accessible to the user at all times.

Do not operate without covers. Do not operate this product with covers or panels removed.

Do not operate with suspected failures. If you suspect that there is damage to this product, have it inspected by qualified service personnel.

Avoid exposed circuitry. Do not touch exposed connections and components when power is present.

Use proper fuse. Use only the fuse type and rating specified for this product.

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 manual's installation instructions for details on installing the product so it has proper ventilation.

Terms in This Manual   These terms may appear in this manual:

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

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

Symbols and 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.

The following symbol(s) may appear on the product:

⚠ CAUTION
Refer to Manual

⏚ Protective Ground
(Earth) Terminal

⏻ Standby

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.

Kit Description

This document provides instructions for performing hardware and/or software and option key upgrades on the following Tektronix products:

- MTS400 Series MPEG Test Systems (MTS400, MTS415, and MTS430)

- MTS4SA MPEG Test System

- MTS400P MPEG Test System

Upgrade Kits Covered by These Instructions

- **MTS4UP UPG -** This kit provides a software upgrade for your MTS4xx systems. This upgrade is included with all of the hardware updates, or may be ordered separately.

As the user of an MTS400 Series MPEG Test System, you will be familiar with the software key (or dongle) that must be attached to your unit before you can open any of the MTS400 Series applications. Two styles of software key are available, each performs the same function: parallel port or USB (MTS4SA only). The option key string supplied with this upgrade kit is generated using the serial number of the software key and the list of options to be licensed.

NOTE. Only the software applications already installed on your MPEG test system will be available after the upgrade. If additional applications are required, contact your Tektronix representative.

- **MTS4UP IPTVD -** This kit adds an IPTV Gigabit Ethernet interface with a 10/100/1000Base-T electrical port to your MTS400, MTS415, or MTS430 instrument. When you install the IPTV interface card you must remove any other installed optional interface cards (options GBE, CF, EP, QB2, or VS).

  There are three optical length input options available for option IPTVD:

  - MTS4UP LX - Adds a 1000Base-LX wavelength optical port with LC connector (single mode 1310 nm).

  - MTS4UP SX - Adds a 1000Base-SX short wavelength optical port with LC connector (multimode 850 nm).

  - MTS4UP ZX - Adds a 1000Base-ZX wavelength optical port with LC connector (multimode 1550 nm).

■ **MTS4UP GBE -** This kit adds a Gigabit Ethernet interface and IP Analysis software to your MTS400, MTS415, or MTS430 instrument (SFP required). This kit may be combined with any of the following hardware upgrade kits.

There are also four optical length input options available with option GbE:

- MTS4UP LX - Adds a 1000Base-LX wavelength optical port with LC connector (single mode 1310 nm).

- MTS4UP SX - Adds a 1000Base-SX short wavelength optical port with LC connector (multimode 850 nm).

- MTS4UP ZX - Adds a 1000Base-ZX wavelength optical port with LC connector (multimode 1550 nm).

- MTS4UP CU - adds a 1000Base-T electrical port with RJ45 connector.

■ **MTS4UP CF -** This kit adds a COFDM DVB-T interface to your MTS400, MTS415, or MTS430 instrument. This kit may only be combined with the MTS4UP GBE kit.

■ **MTS4UP EP -** This kit adds a QPSK/8PSK interface to your MTS400 Series instrument. This kit may only be combined with the MTS4UP GBE kit.

■ **MTS4UP QB2 -** This kit adds a QAM B interface to your MTS400 Series instrument. This kit may only be combined with the MTS4UP GBE kit.

■ **MTS4UP VS -** This kit adds an 8VSB interface to your MTS400 Series instrument. This kit may only be combined with the MTS4UP GBE kit.

■ **MTS4UP IPTVP -** This kit adds an IPTV Gigabit Ethernet interface with a 10/100/1000Base-T electrical port to your MTS400P.

There are three optical length input options available for option IPTVP:

- MTS4UP LX - Adds a 1000Base-LX wavelength optical port with LC connector (single mode 1310 nm).

- MTS4UP SX - Adds a 1000Base-SX short wavelength optical port with LC connector (multimode 850 nm).

- MTS4UP ZX - Adds a 1000Base-ZX wavelength optical port with LC connector (multimode 1550 nm).

■ **MTS4UP <software option>** – The following table lists the software options that can be enabled in MTS400 Series systems.

MTS4UP options	Description
MTS4UP BA	Upgrade to add Buffer Analyzer
MTS4UP CG	Upgrade to add Carousel Generator
MTS4UP DB	Upgrade to add Carousel Analyzer
MTS4UP DBCG	Upgrade to add Carousel Generator and Carousel Analyzer
MTS4UP ES	Upgrade to add Elementary Stream Analyzer
MTS4UP MX	Upgrade to add deferred time Multiplexer
MTS4UP PA	Upgrade to add PES Analyzer
MTS4UP PB	Upgrade to add PES and Buffer Analyzers
MTS4UP PL	Upgrade to add Player to MTS400P
MTS4UP TSCA	Upgrade to add deferred time Transport Stream Compliance Analyzer
MTS4UP TSCL	Upgrade to add Transport Stream Compliance Analyzer Lite (limited file size)
MTS4UP TSCR	Upgrade to add real time Transport Stream Compliance Analyzer (MTS4SA only)

Minimum Tool and Equipment List

No tools are required to perform the software upgrade. The hardware upgrades will require:

Required tools and equipment	Part number
Anti-static wrist strap	Standard equipment
Screwdriver handle with T15 and T10 TORX tip	Standard equipment

Kit Parts Lists

MTS4UP UPG   This kit updates the software in an MTS400, MTS415, MTS430, MTS4SA, or MTS400P MPEG Test System. The MTS4UP UPG software upgrade kit contains these parts:

Quantity	Part number	Description
1 Each	063-4197-xx	SOFTWARE; DOCUMENTATION CD; MTS400 SERIES
1 Each	020-2994-xx	SOFTWARE KIT; APPLICATION SOFTWARE MEDIA KIT; MTS400 SERIES
1 Each	063-4220-00	MTS400 Series Version 1.7: SOFTWARE PKG; MICROSOFT WINDOWS XP PROFESSIONAL, W/SP2B RECOVERY MEDIA AND NERO BURNING SOFTWARE, VER 1.7; MTS400 SERIES
1 Each	063-4220-01	MTS400 Series Version 1.9: SOFTWARE PKG; MICROSOFT WINDOWS XP PROFESSIONAL, W/SP2B RECOVERY MEDIA AND NERO BURNING SOFTWARE, VER 1.9; MTS400 SERIES
1 Each	NS [1]	IMPORTANT DOCUMENTS ENVELOPE, WITH PRODUCT OPTION KEY
1 Each	075-0979-02	MANUAL; UPGRADE INSTRUCTIONS; MTS4UP

[1]   NS - Not Saleable

MTS4UP IPTVD   This kit updates an MTS400, MTS415, or MTS430 MPEG Test System. The MTS4UP IPTVD upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit, and these additional parts:

Quantity	Part number	Description
1 Each	671-6439-xx	CIRCUIT BD ASSEMBLY, TESTED;MTS415/430; 389-3832-01 WIRED; SAFETY CONTROLLED
1 Each	174-5336-xx	CABLE ASSEMBLY;5-PIN;RS232 INTERFACE BETWEEN SBC AND RF CARD; 12.5 INCH L +/- .500; SAFETY CONTROLLED
1 Each	174-5135-xx	CABLE ASSY; RF, BNC TO BNC;75 OHM
2 Each	211-0722-xx	SCREW, MACHINE; 6-32 X 0.250, PNH, STL, ZINC FINISH, T-15 TORX DR

MTS4UP GBE   This kit updates an MTS400, MTS415, or MTS430 MPEG Test System. The MTS4UP GBE upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit, and these additional parts:

Quantity	Part number	Description
1 Each	672-6300-xx	ASSEMBLY, CHEETAH II SPE-0028-03-002 AND OPTICAL EAGLE BOARD; PMC-0005-03-001, SAFETY CONTROLLED
2 Each	211-0722-xx	SCREW, MACHINE; 6-32 X 0.250, PNH, STL, ZINC FINISH, T-15 TORX DR

MTS4UP CF   This kit updates an MTS400, MTS415, or MTS430 MPEG Test System. The MTS4UP CF upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit, and these additional parts:

Quantity	Part number	Description
1 Each	672-1780-xx	TESTED SET, BASE BAND AND COFDM; SAFETY CONTROLLED
1 Each	174-5336-xx	CABLE ASSEMBLY;5-PIN;RS232 INTERFACE BETWEEN SBC AND RF CARD; 12.5 INCH L +/- .500; SAFETY CONTROLLED
1 Each	174-5135-xx	CABLE ASSY;RF , BNC TO BNC;75 OHM
1 Each	015-0688-xx	ADAPTER, RF; BNC JACK TO F PLUG
2 Each	211-0722-xx	SCREW, MACHINE; 6-32 X 0.250, PNH, STL, ZINC FINISH, T-15 TORX DR

MTS4UP EP   This kit updates an MTS400, MTS415, or MTS430 MPEG Test System. The MTS4UP EP upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit and these additional parts:

Quantity	Part number	Description
1 Each	672-1781-xx	TESTED SET, BASE BAND AND 8PSK; SAFETY CONTROLLED
1 Each	174-5336-xx	CABLE ASSEMBLY;5-PIN;RS232 INTERFACE BETWEEN SBC AND RF CARD; 12.5 INCH L +/- .500; SAFETY CONTROLLED
1 Each	174-5135-xx	CABLE ASSY;RF , BNC TO BNC;75 OHM
2 Each	211-0722-xx	SCREW, MACHINE; 6-32 X 0.250, PNH, STL, ZINC FINISH, T-15 TORX DR

MTS4UP QB2   This kit updates an MTS400, MTS415, or MTS430 MPEG Test System. The MTS4UP QB2 upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit and these additional parts:

Quantity	Part number	Description
1 Each	672-1782-xx	TESTED SET, BASE BAND AND QB2; SAFETY CONTROLLED
1 Each	174-5336-xx	CABLE ASSEMBLY;5-PIN;RS232 INTERFACE BETWEEN SBC AND RF CARD; 12.5 INCH L +/- .500; SAFETY CONTROLLED
1 Each	174-5135-xx	CABLE ASSY;RF , BNC TO BNC;75 OHM
2 Each	211-0722-00	SCREW,CAP; 6-32 X 0.75,HEX SKT,SST

MTS4UP VS   This kit updates an MTS400, MTS415, or MTS430 MPEG Test System. The MTS4UP VS upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit, and these additional parts:

Quantity	Part number	Description
1 Each	672-1783-xx	TESTED SET, BASE BAND AND 8VSB; SAFETY CONTROLLED
1 Each	174-5336-xx	CABLE ASSEMBLY;5-PIN;RS232 INTERFACE BETWEEN SBC AND RF CARD; 12.5 INCH L +/- .500; SAFETY CONTROLLED
1 Each	174-5135-xx	CABLE ASSY;RF , BNC TO BNC;75 OHM
1 Each	015-0688-xx	ADAPTER, RF; BNC JACK TO F PLUG
2 Each	211-0722-xx	SCREW,CAP; 6-32 X 0.75,HEX SKT,SST

MTS4UP IPTVP   This kit updates an MTS400P MPEG Test System. The MTS4UP IPTVP upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit, and these additional parts:

Quantity	Part number	Description
1 Each	671-6438-xx	CKT BD ASSY; VIDEO-GBE BD
1 Each	335-2072-xx	MARKER, IDENT; MKD CONNECTORS FOR VIDEO-GBE BD
2 Each	343-1729-xx	RETAINER; VIDEO-GBE BD
1 Each	174-5626-xx	CABLE ASSY; RF, BNC TO BNC; 75 OHM, 6.0 L
1 Each	174-5627-xx	CABLE ASSY; RS232 CIP

MTS4UP SX This kit adds an 850 nm optical port to an IPTVx module. The MTS4UP SX upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit, and these additional parts:

Quantity	Part number	Description
1 Each	131-7834-xx	OPTICAL GIGABIT ETHERNET/FIBRE CHANNEL 850NM SFP, 1.25/1.0625GBAUD, 3.3V, SAFETY CONTROLLED

MTS4UP LX This kit adds an 1310 nm optical port to an IPTVx module. The MTS4UP LX upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit, and these additional parts:

Quantity	Part number	Description
1 Each	131-7957-xx	OPTICAL GIGABIT ETHERNET/FIBRE CHANNEL 1310NM SFP SFF, 1.25/1.0625GBAUD, 3.3V, SAFETY CONTROLLED

MTS4UP ZX This kit adds aN 1550 nm optical port to an IPTVx module. The MTS4UP ZX upgrade kit contains all the parts listed for the MTS4UP UPG software upgrade kit, and these additional parts:

Quantity	Part number	Description
1 Each	131-7957-xx	OPTICAL GIGABIT ETHERNET/FIBRE CHANNEL 1550NM SFP, 1.25/1.0625GBAUD, 3.3V, SAFETY CONTROLLED

Upgrade Instructions Overview

These instructions are for personnel who are familiar with servicing the product. If you need further details for disassembling or reassembling the product, refer to the appropriate product manual. Contact your nearest Tektronix, Inc., Service Center or Tektronix Factory Service for installation assistance.

⚠️ **CAUTION.** *To prevent static discharge damage, service the product only in a static-free environment. Observe standard handling precautions for static-sensitive devices while installing this kit. Always wear a grounded wrist strap, grounded foot strap, and static resistant apparel while installing this kit.*

Choose the correct upgrade procedure:

If you are installing	Use this procedure
MTS4UP UPG software upgrade *only*	(See page 9, *Option UPG Software Upgrade*.)
MTS4UP <option> software upgrade *only*	(See page 14, *Software Option Upgrade*.)
Any of the interface card options into an MTS400, MTS415, or MTS430	(See page 16, *Hardware Upgrade (MTS400, MTS415, and MTS430)*.)
Option IPTVP interface card into an MTS400P	(See page 38, *Hardware Upgrade (MTS400P)*.)
SFP optical port module (Option LX, Option SX, or Option ZX) into an MTS400, MTS415, MTS430, or MTS400P system that already has an IPTV or GbE option installed	(See page 53, *SFP Module Upgrade (Option LX, Option SX, or Option ZX)*.)

Option UPG Software Upgrade

Perform the following steps to upgrade the MTS400 Series software and software key:

1. Ensure that the instrument or PC to be upgraded is switched on and has completed the start-up process.

2. Ensure that the software key (dongle) is attached to your instrument.

3. Insert the upgrade media into the instrument. An MTS400, MTS415, MTS430, or MTS4SA will use the *MTS400 Series Application Install CD-ROM* supplied with this kit, while an MTS400P will use the USB flash drive. The InstallShield Wizard will autostart and display the Welcome screen shown in Figure 1.

NOTE. If the InstallShield Wizard fails to autostart, use Windows Explorer to locate and run the following file on the media: start.exe.

4. Click **Next** to initiate the upgrade process. (See Figure 1.)
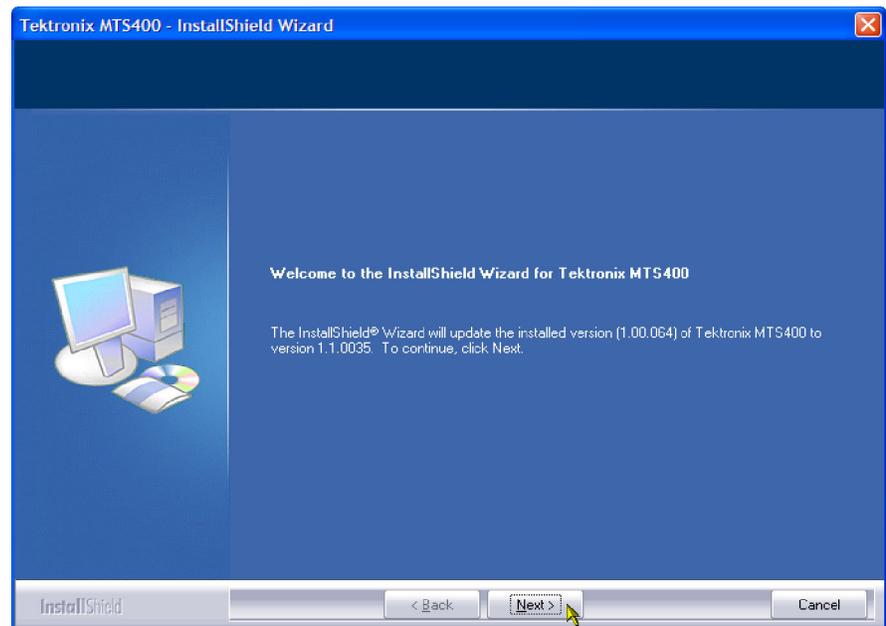
Figure 1: InstallShield Wizard welcome screen

5. Allow the installation process to proceed. The average installation time is approximately five minutes.

NOTE. A number of dialog boxes are displayed during the installation process. Normally, no user intervention is required.

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6. When the upgrade installation is complete, the Update Complete screen is displayed. (See Figure 2.)
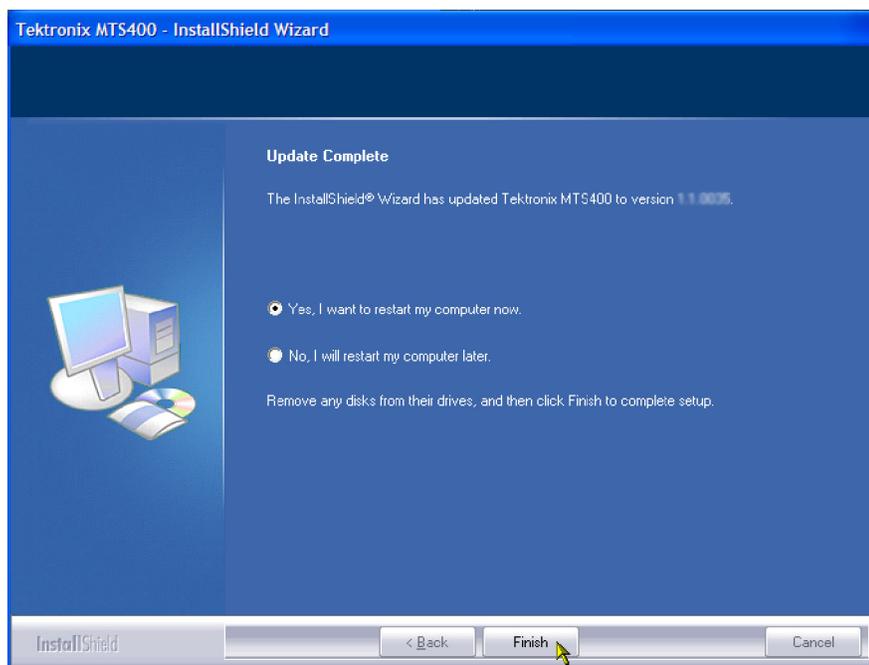
Figure 2: InstallShield Wizard update complete screen

7. Select the **Yes, I want to restart my computer now** option, and then click **Finish**. The instrument or PC will shut down and then restart.

8. When the unit has completed the start-up process, the Tektronix Option Update wizard will start automatically. (See Figure 3.)
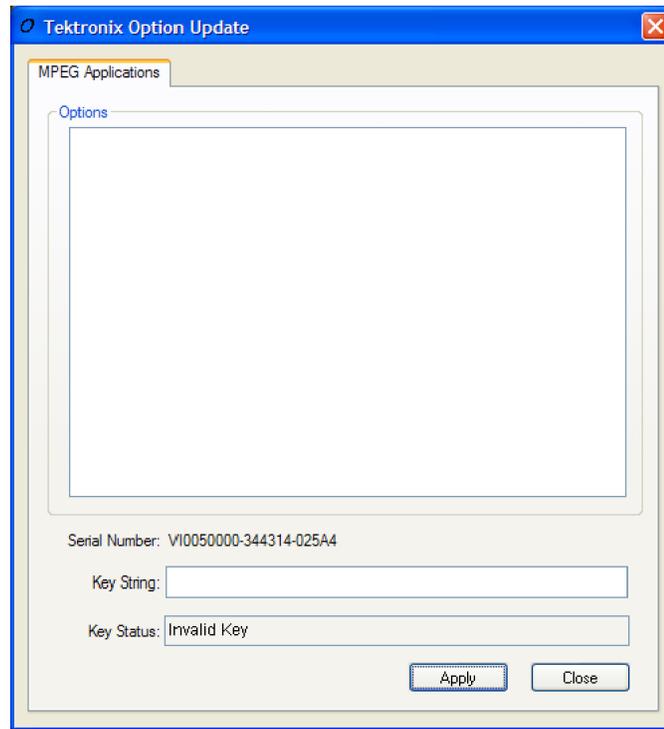
Figure 3: Tektronix Option Update Wizard - Initial view

Note that the Serial Number of the software key has been detected, but the Key Status is invalid because no Key String has been entered.

9. In the Tektronix Option Update dialog box, enter the Option Key String, found on the Product Option Key label supplied with these upgrade instructions, in the Key String field. Click **Apply**.
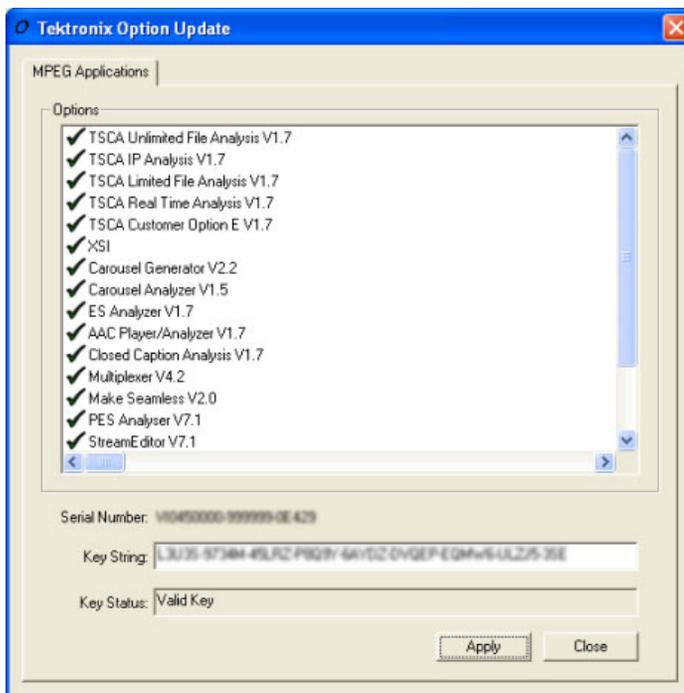
Figure 4: Tektronix Option Update Wizard - Complete

NOTE. The version numbers displayed in the Options pane of your Tektronix Option Update dialog box may differ from the screenshots in these instructions.

10. Inspect and verify the list of licensed options.

11. Close the Tektronix Option Update wizard.

12. Peel the backing off of the Product Option Key label and apply it to the instrument rear panel. (See Figure 5.) If there is already an option key label on the rear panel apply the new one over the old one.

The upgrade is now complete.

Figure 5: Product Option key label location

Verify Operation   To verify operation of the upgraded applications, open and close each installed application in turn.

If any licensed application fails to open correctly, contact your Tektronix representative.

Software Option Upgrade

Perform the following steps to upgrade the MTS400 Series software key and enable additional options:

1. Ensure that the instrument or PC to be upgraded is switched on and has completed the start-up process.

2. Ensure that the software key (dongle) is attached to your instrument.

3. Select **Start > Tektronix > MTS400 > OptionKey wizard** to display the Tektronix Option Update dialog box. (See Figure 6.)
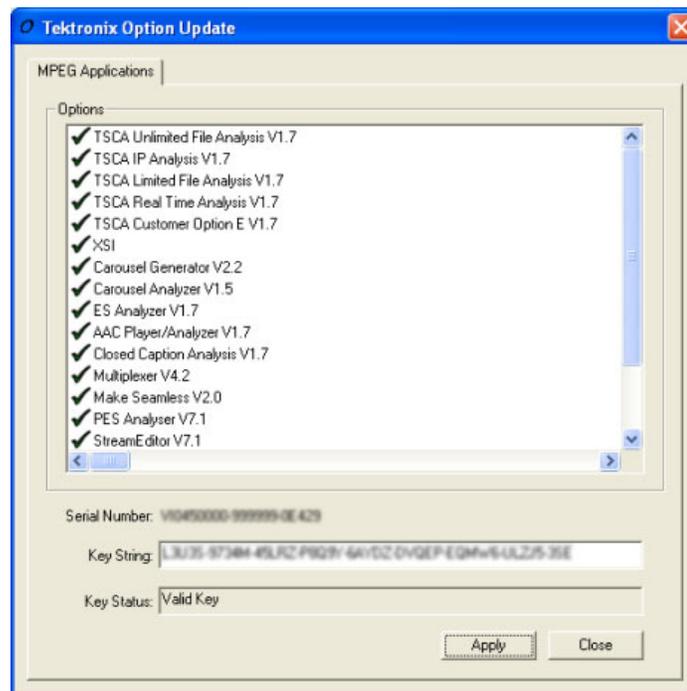
Figure 6: Tektronix Option Update Wizard

NOTE. The version numbers displayed in the Options pane of your Tektronix Option Update dialog box may differ from the screenshots in these instructions.

Note that the Serial Number of the software key has been detected, and the currently enabled options are displayed.

4. In the Tektronix Option Update dialog box, enter the Option Key String, found on the Product Option Key label supplied with these upgrade instructions, in the Key String field. Click **Apply**.

5. Inspect and verify the list of licensed options.

6. Close the Tektronix Option Update wizard.

7. Peel the backing off of the Product Option Key label and apply it to the instrument rear panel. (See Figure 7.) If there is already an option key label on the rear panel apply the new one over the old one.

Figure 7: Product Option key label location

The upgrade is now complete.

Verify Operation
To verify operation of the upgraded applications, open and close each installed application in turn.

If any licensed application fails to open correctly, contact your Tektronix representative.

Hardware Upgrade (MTS400, MTS415, and MTS430)

Use the following procedure to install any of the hardware upgrades into an MTS400, MTS415, or MTS430 MPEG Test System.

Access the Module Bay

⚠️ **WARNING.** *To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power. Failure to do so can cause injury or death.*

In order to install any of the hardware upgrades you must first remove the cabinet and the circuit board retaining plate. Follow these steps to access the module bay:

1. Power off the system and unplug the power cord.

2. Disconnect any cables from the rear panel. Note the location of any cables for reinstallation.

3. Install the protective cover on the front of the instrument and place the cabinet on the working surface with the rear panel facing up.

4. Remove the handle from the side of the instrument and remove the four feet from the rear of the instrument. Retain the screws for reinstallation.

⚠️ **WARNING.** *To prevent damage to the EMI shielding and injury to yourself, use care when touching the EMI shielding strips around the front of the chassis. If you accidentally bend the "fingers" of the strip, it could create sharp protruding edges, which may cut you as you handle the chassis.*

5. Use a wrench as a lever to pry the cabinet loose from the chassis. Loosen each side alternately until the cabinet is released from the EMI gasket.

6. Slide the cabinet up and off the chassis.

7. Set the instrument onto the work surface so the bottom is down. (See Figure 8.)

8. Remove the five T-15 screws securing the circuit board retaining plate to the chassis and lift it away. (See Figure 8.)

Remove
screws (5)

Circuit board
retaining plate
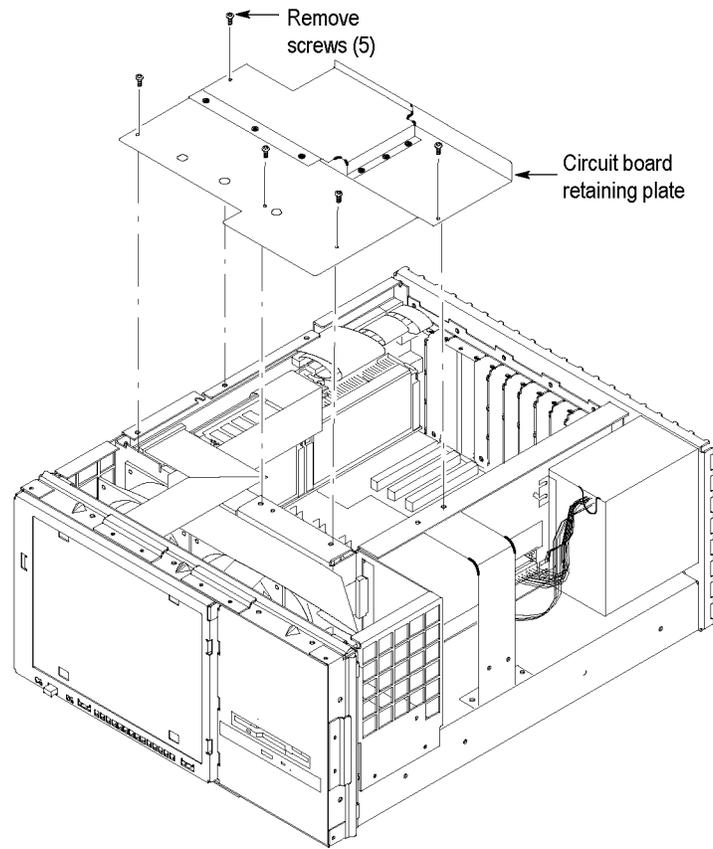
Figure 8: Removing the circuit board retaining plate

To continue, choose the correct upgrade procedure:

If you are installing	Continue with this procedure
MTS4UP IPTVD IP Video Gigabit Ethernet upgrade into an MTS400, MTS415, or MTS430 Test System	(See page 18, *MTS4UP IPTVD Upgrade*.)
MTS4UP GBE Gigabit Ethernet input upgrade, with or without any of the other hardware upgrades	(See page 21, *MTS4UP GBE Upgrade*.)
MTS4UP CF, MTS4UP EP, MTS4UP QB2, or MTS4UP VS upgrade without an MTS4UP GBE	(See page 22, *MTS4UP CF, EP, QB2, or VS Upgrade*.)

MTS4UP IPTVD Upgrade

Perform the following steps to install the MTS4UP IPTVD, IP Video Gigabit Ethernet interface. This module must be installed in slot 4.

1. Remove the two blank panels covering slots 4 and 5.

2. Align the hardware upgrade module over the slot 4 connector, with the edge of the long card engaged in the slot 4 card guide, and slide the module down into slot 4.

3. Press down firmly to engage the module into the slot 4 connector. (See Figure 9.)
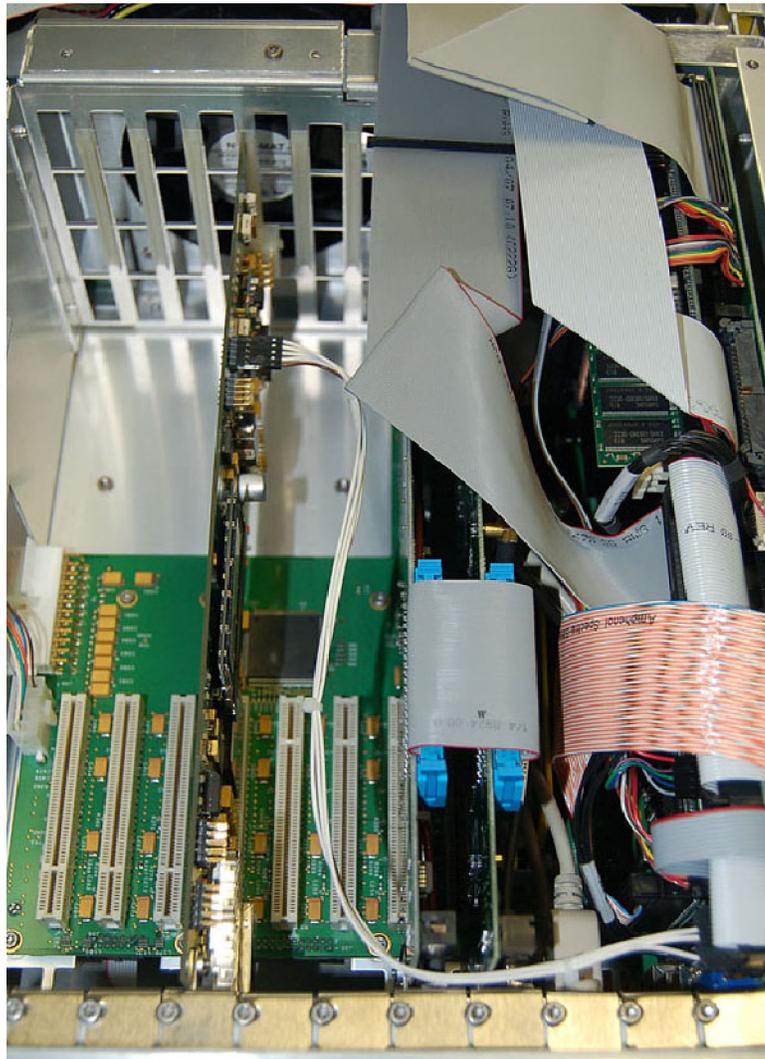
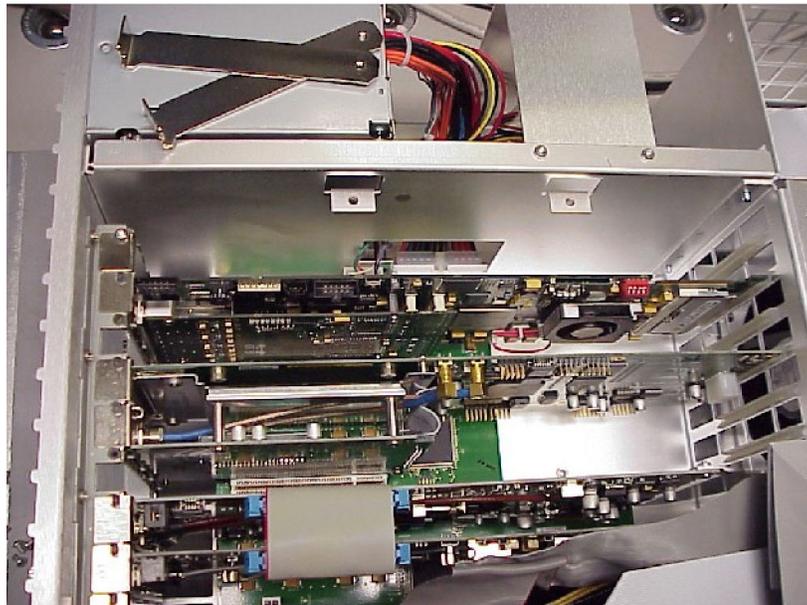**Figure 9: IPTVD IP Video Gigabit Ethernet Interface module in place**

4. Secure the hardware upgrade module in place, using the screws that held the slot 4 blank panel in place.

5. Replace the slot 5 blank panel.

6. Attach the 2x5 connector end of the interface cable, provided in the kit, to the COM2 connector on the controller board in slot 11. (See Figure 10.) This connector is keyed and can only be installed one way.

7. Connect the other end of the interface cable to J10 on the hardware upgrade module. (See Figure 11.)
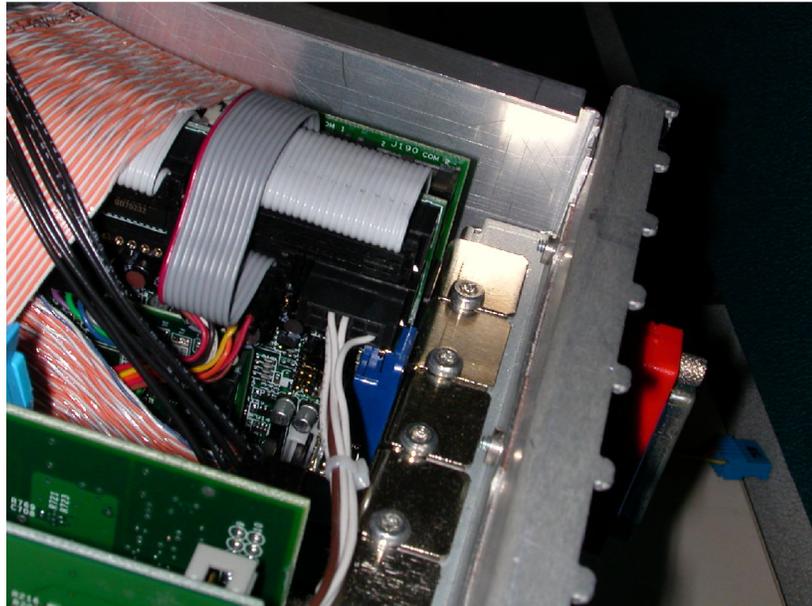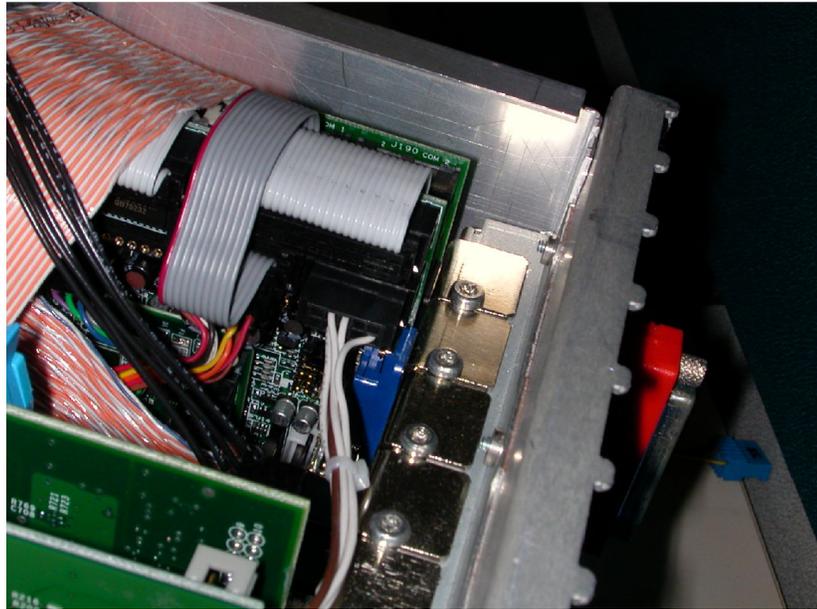

Figure 10: Interface cable connected to controller board

0979-001
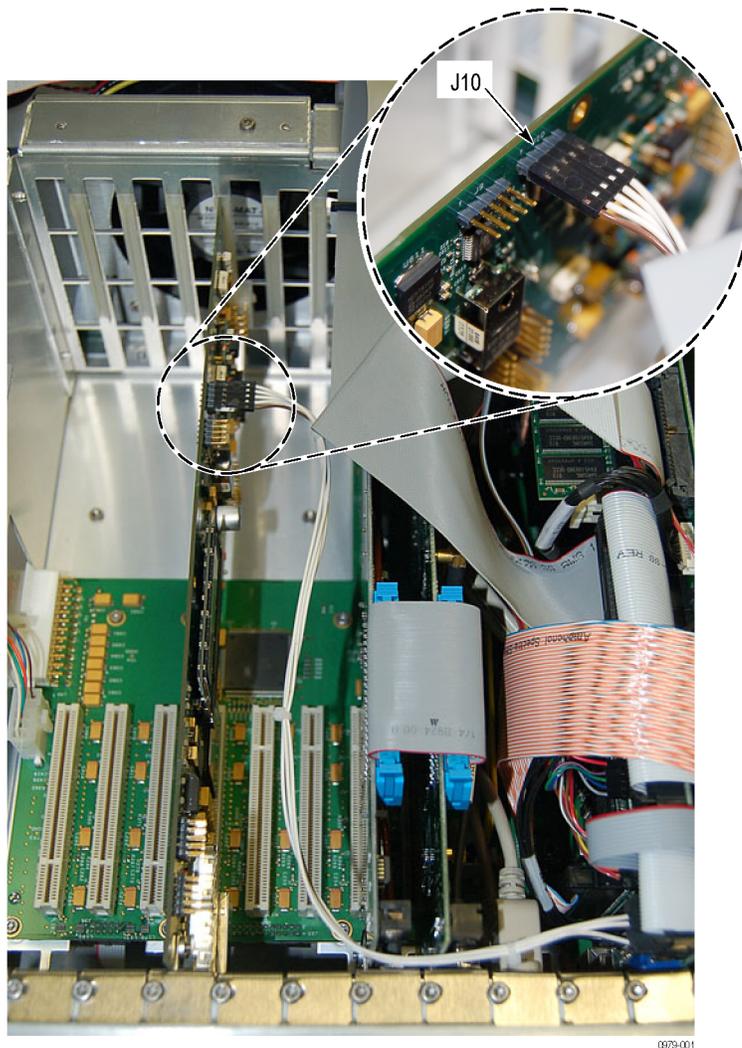
Figure 11: Interface cable connected to the IPTVD module

This completes the MTS4UP IPTVD installation. Go to *Replace the Cabinet*. (See page 24.)

MTS4UP GBE Upgrade

Perform the following steps to install the MTS4UP GBE Gigabit Ethernet interface:

1. Turn the instrument so the rear panel is facing you.

2. Remove the two blank panels covering slots 2 and 3.

3. Align the Gigabit Ethernet interface module over the slot 2 connector, with the card edge engaged in the slot 2 card guide, and slide the module down into slot 2. (See Figure 12.)

4. Press down firmly to engage the module into the connector. (See Figure 12.)
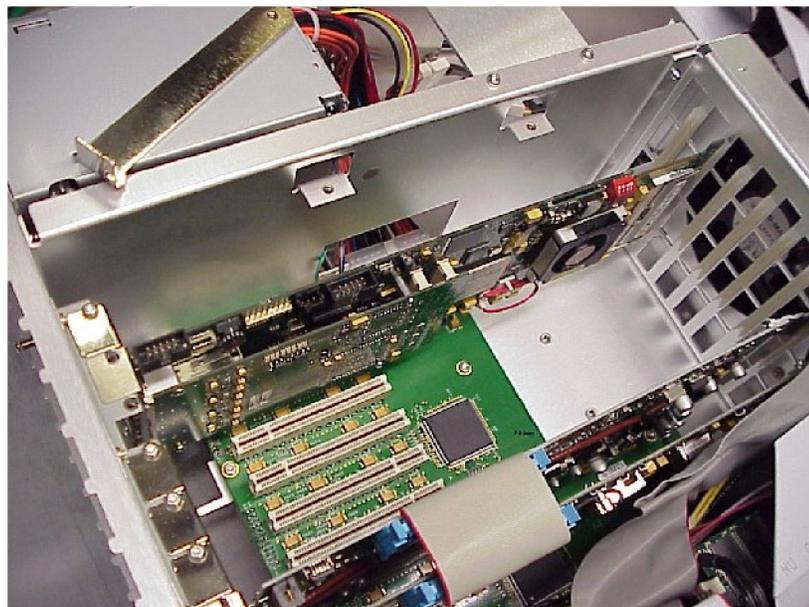
Figure 12: Gigabit Ethernet module in place

5. Secure the Gigabit Ethernet module in place, using the screws that held the slot 2 blank panel in place.

6. Replace the slot 3 blank panel.

If you are installing any of the other hardware options at this time, continue with the following *MTS4UP CF, EP, QB2, or VS Upgrade Instructions*. Otherwise, go to *Restore the Operating System*. (See page 24.)

MTS4UP CF, EP, QB2, or VS Upgrade

These hardware upgrades are all installed in a similar manner, and must be installed in slot 4.

1. Remove the three blank panels covering slots 4, 5, and 6.

2. Align the hardware upgrade module over the slot 4 connector, with the edge of the long card engaged in the slot 4 card guide, and slide the module down into slot 4.

3. Press down firmly to engage the module into the slot 4 connector. (See Figure 13.)

Figure 13: Hardware upgrade module installed in slot 4

4. Secure the hardware upgrade module in place, using the screws that held the slot 4 and 5 blank panels in place.

5. Attach the 2x5 connector end of the interface cable provided in the kit to the COM2 connector on the controller board in slot 11. (See Figure 14.) This connector is keyed and can only be installed one way.

6. Connect the other end of the interface cable to J14 on the hardware upgrade module. (See Figure 15.)

Figure 14: Interface cable connected to controller board

Figure 15: Interface cable connected to the hardware upgrade module

Replace the Cabinet

Replace the circuit board retaining plate and the cabinet by reversing the *Access the Module Bay* instructions. (See page 16, *Access the Module Bay*.)

> ⚠ **CAUTION.** *To prevent damage to the instrument, make sure that the internal cables do not catch when you slide the cabinet back onto the chassis. Make sure that the edges of the cabinet go under the retaining tabs around the front of the chassis. You may have to push on the side of the cabinet to get all of the edges under the tabs and over the EMI gasket.*
>
> *At the rear of the chassis, you may have to push on the sides of the cabinet to get the rear of the cabinet to fit over the edges of the chassis and EMI gasket.*

Restore the Operating System

After installing the hardware upgrade, you must restore the operating system to install the new application software and drivers required for the hardware.

> ⚠ **CAUTION.** *To avoid losing access to your licensed applications, you must use the MTS400 Series System Recovery media supplied with this upgrade kit.*
>
> *If your MTS400 Series instrument has an 80 GB hard disk, you must use the version 1.7 Operating System restore disk; Tektronix part number 063-4220-00.*
>
> *If your MTS400 Series instrument has an 250 GB hard disk, you must use the version 1.9 operating system restore disk; Tektronix part number 063-4220-01.*
>
> *Failure to use the correct recovery disk may result in the hard disk being incorrectly formatted.*

MTS400 Series Operating System Restore

To restore the MTS400 Series system operating system, use the following steps. This restore process is effective only if the hard disk drive is still good. The process will restore the operations system and the application software. (The process should take less than one hour.)

> ⚠ *CAUTION. To prevent data loss, back up your hard drive before you restore the MTS400 Series system. All data on the hard drive will be destroyed during the system restore process.*

1. Start the MTS400 Series system.

2. Verify the size of the operating system disk (c:) and ensure that you are using the correct restore disk. Refer to the caution at the beginning of this section; (See page 24, *Restore the Operating System*.).

3. During the boot process, insert the *MTS400 Series System Operating System Restore DVD* in the CD-ROM drive. The system will autostart the recovery application when the boot process finishes. (See Figure 16.)
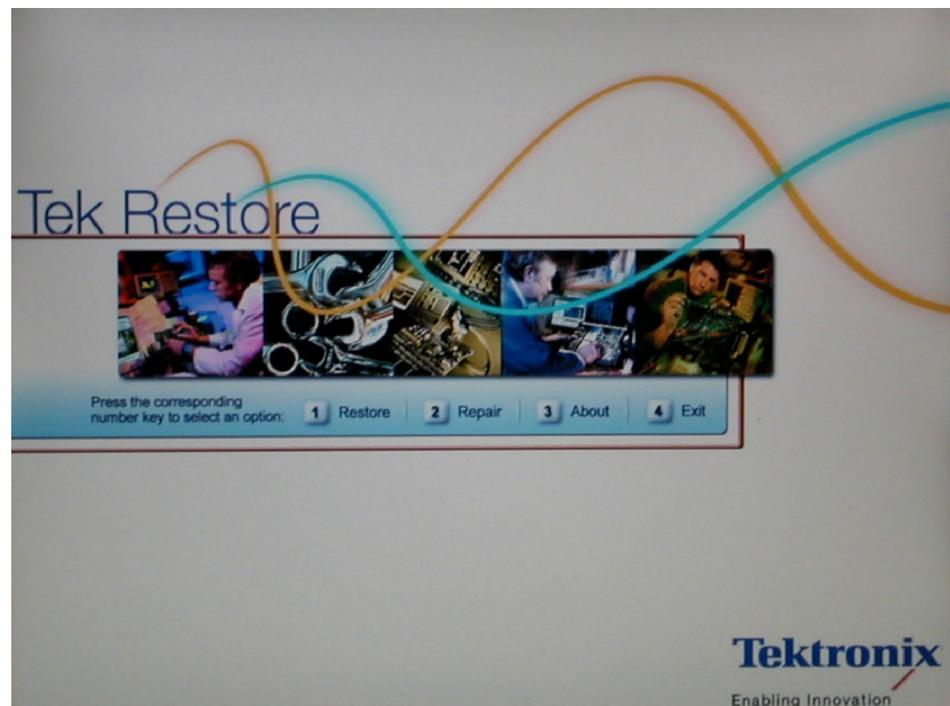
Figure 16: Operating system recovery application

4. Press the "1" key to begin the system restore process. The Acquiring Device... dialog box will appear briefly and display a progress bar.

5. When the system restore is complete, press any key and then press the "4" key. (See Figure 17.)
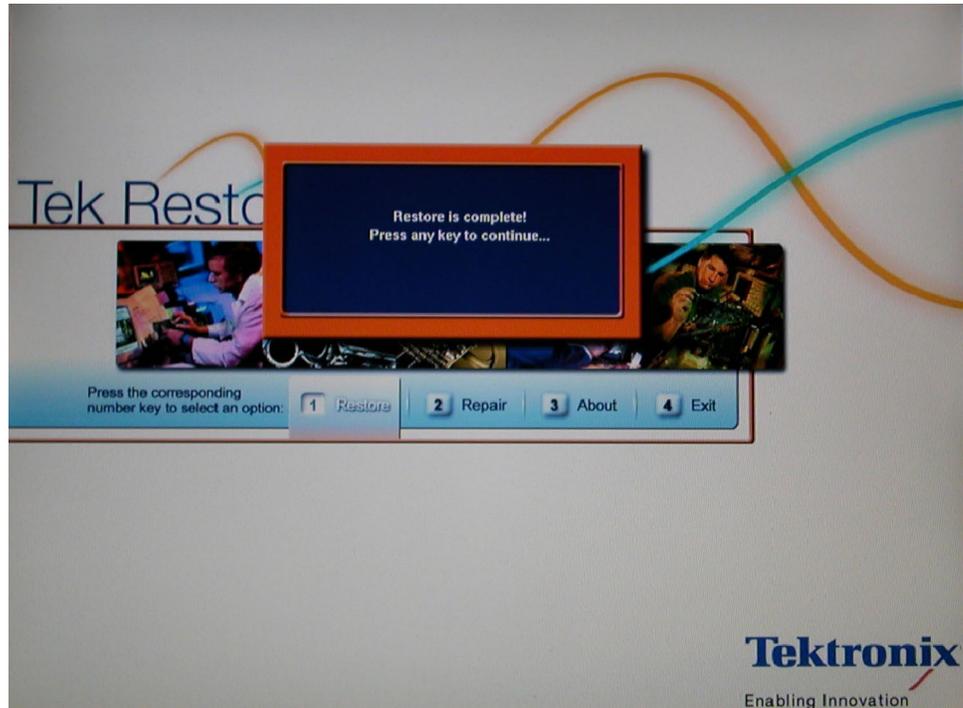
Figure 17: Restore Complete

6. When prompted, press the "Y" key to reboot the instrument. Remove the DVD from the CD-ROM drive while the system is rebooting.

7. On startup, the system will prompt you to set up Windows XP. Follow the onscreen procedure, accepting the license agreement and defaults where necessary.

NOTE. The screen will go blank for a few minutes during this process. Do not turn the instrument off.

8. The system will restart on its own.

Reinstate the SCSI Drives   After restoring the operating system, use Windows Explorer to confirm that the SCSI drives (drives E and F) have been recognized by the system. (See Figure 18.)
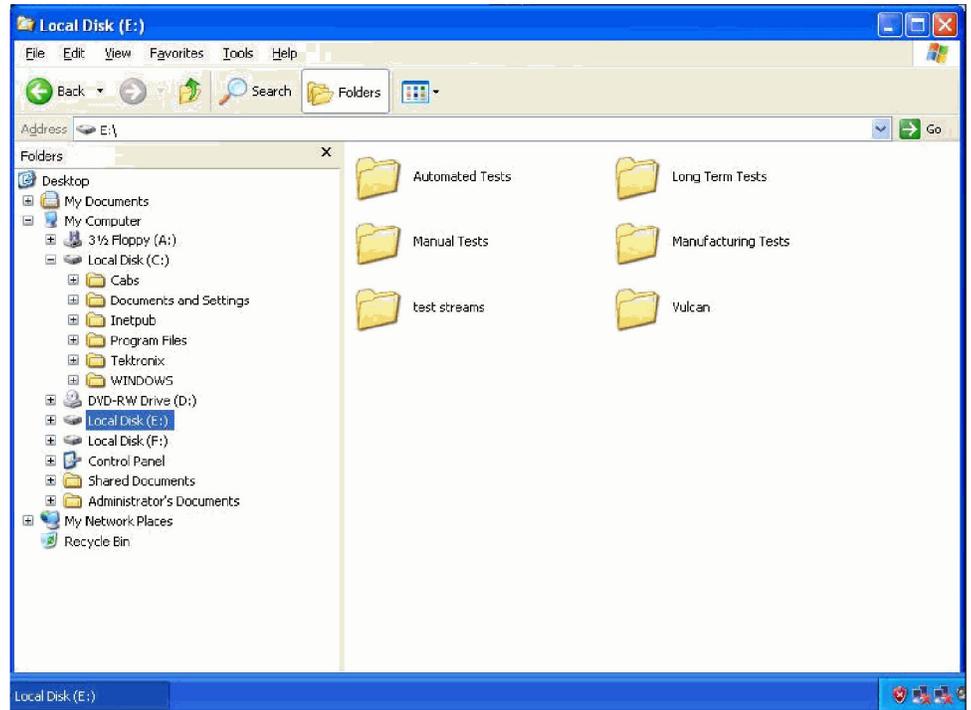
Figure 18: SCSI drives automatically recognized

If the SCSI drives (drives E and F) have been recognized by the system, close the Computer Management window, and then proceed with the *Software Upgrade Instructions*. (See page 31.)

If the SCSI drives E and F are not listed in Windows Explorer, continue with the following procedure to allow them to be recognized by the system.

Import the SCSI drives. If drives E and F are not listed in Windows Explorer, complete the following procedure.

1. Open the Windows Disk Management window (**Start > Control Panel > Performance and Maintenance > Administrative Tools > Computer Management > Storage > Disk management**).

   Note that Disk 0 and Disk 1 are described as Foreign. (See Figure 19.)
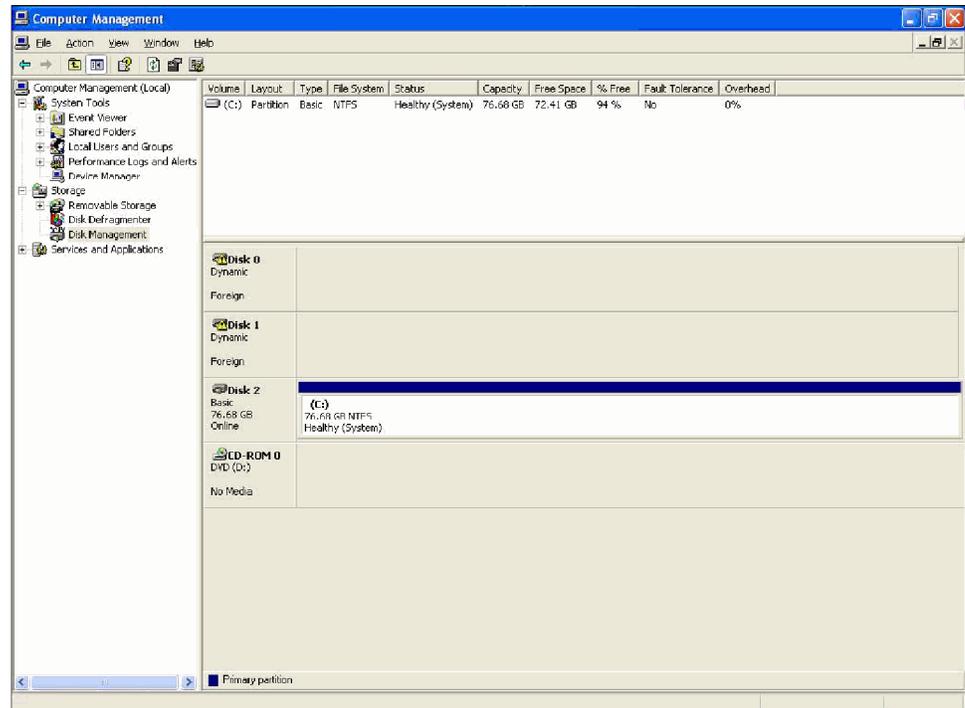
Figure 19: Computer Management - SCSI drives, foreign

2. Right-click on Disk 0 or Disk 1 and select **Import Foreign Disks...** from the shortcut menu. (See Figure 20.)
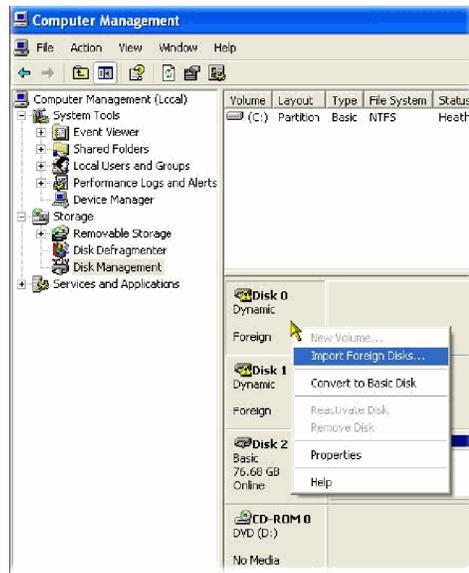
Figure 20: Select Import Foreign Disks...

3. In the Import Foreign Disks dialog box, ensure that the disk group is checked and select OK. (See Figure 21.)
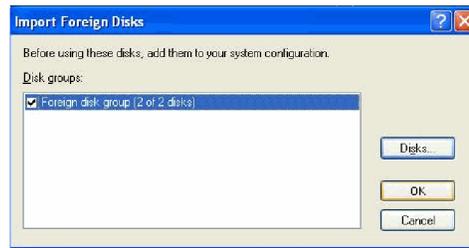
Figure 21: Import Foreign Disks dialog box

4. In the Foreign Disk Volumes dialog box, select OK. (See Figure 22.)
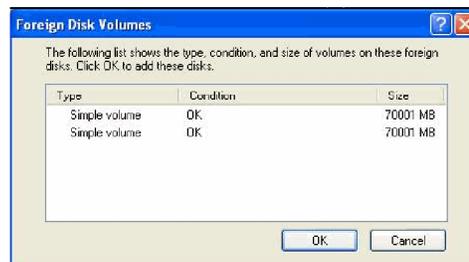
Figure 22: Foreign Disk Volumes dialog box

5. This takes a little time. Wait until the drives appear in the upper window. (See Figure 23.)
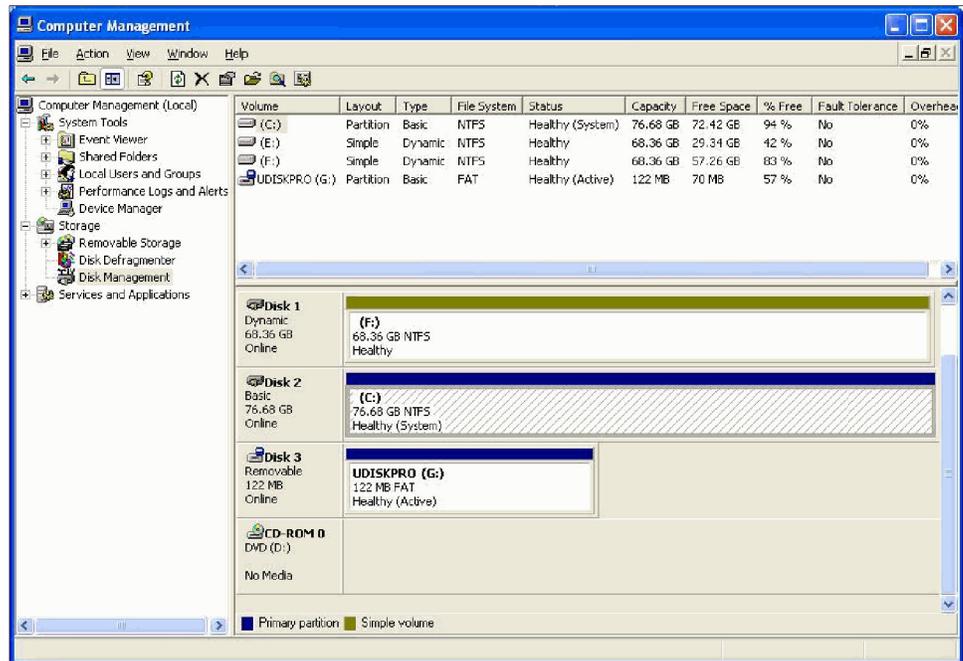
Figure 23: SCSI drives manually recognized

If the SCSI drives fail to import, follow this procedure:

1. Copy the file "SCSIKeyDel.reg" from the restore DVD to your C: drive.

2. Double-click the file to execute it.

3. When prompted to add information to the registry, press "Yes."

4. When the information successfully entered message appears, press "OK."

5. Reboot the MTS400 platform.

6. Import the SCSI drives again. (See page 28, *Import the SCSI drives*.)

This completes the *MTS400 Operating System Restore Procedure*. Close the Computer Management window. You must now upgrade the software, as described in the following procedure.

Software Upgrade

Perform the following steps to upgrade the MTS400 Series software and software key:

1. Ensure that the instrument or PC to be upgraded is switched on and has completed the start-up process.

2. Ensure that the software key (dongle) is attached to your instrument.

3. Insert the *MTS400 Series Application Install CD-ROM* supplied with this kit into the CD-ROM drive of the instrument or PC to be upgraded. The CD-ROM will autostart and display the Welcome screen. (See Figure 24.)

NOTE. If the CD-ROM fails to autostart, use Windows Explorer to locate and run the following file on the CD-ROM: start.exe.
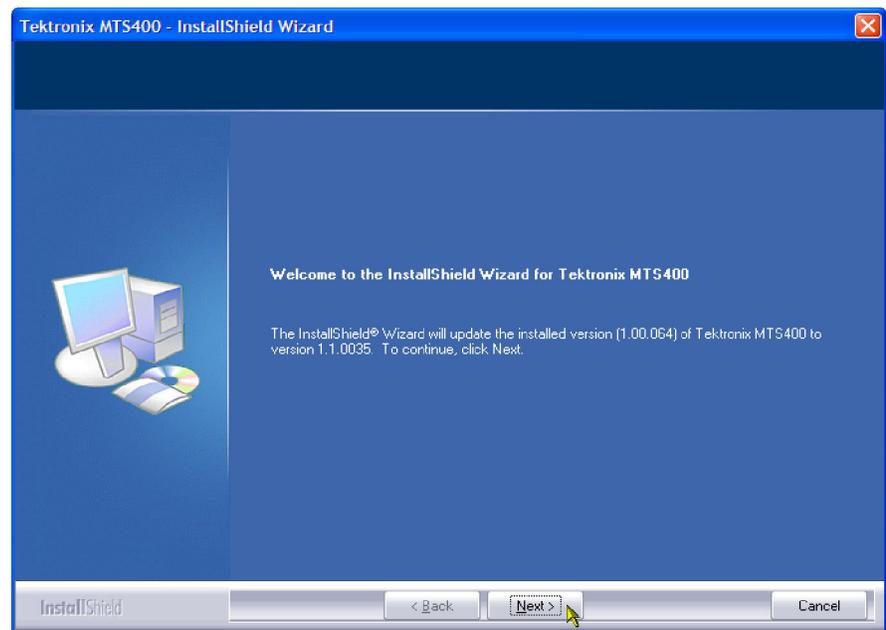
Figure 24: InstallShield Wizard welcome screen

4. Click **Next.**

-   If you have not installed Option GBE, just accept the defaults during the upgrade process and restart when complete. Go to step 13 of this procedure.

-   If you have installed Option GBE the Setup Type dialog box will be displayed, which allows you to select the type of installation. (See Figure 25.) Continue to step 5 of this procedure.
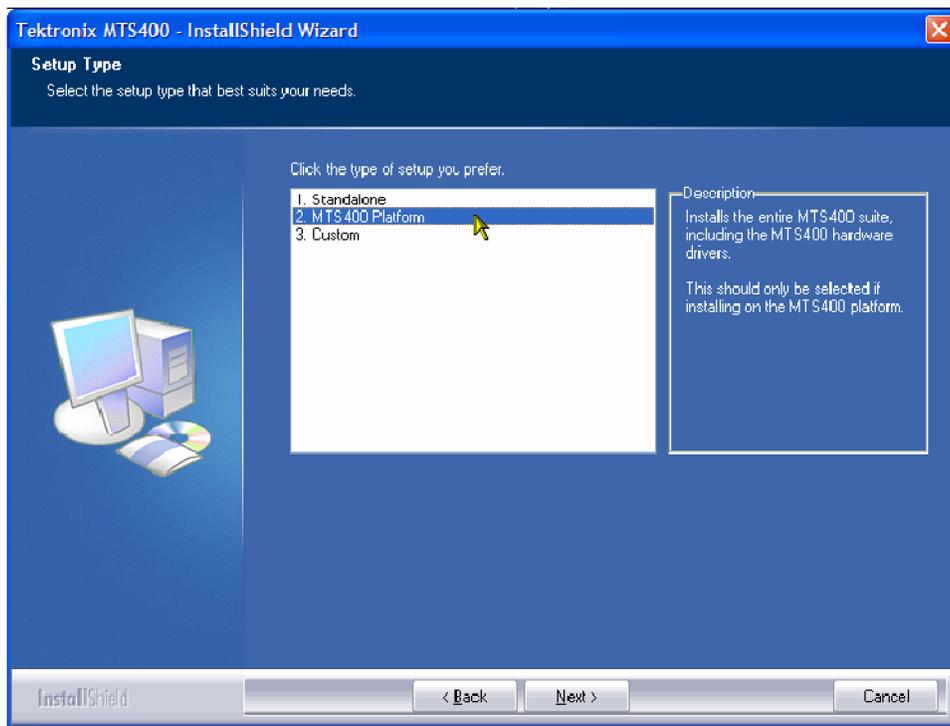

Figure 25: MTS400 Installation - Setup Type

5. Choose and select **Next**.

6. Allow the installation process to proceed. The average installation time is approximately five minutes.

NOTE. A number of dialog boxes are displayed during the installation process. Normally, no user intervention is required.

7. Allow the installation process to proceed until the WinPcap Setup dialog box is displayed. (See Figure 26.)

NOTE. If WinPcap has been previously installed, the following message will be displayed:

WinPcap 3.1 is already installed on this machine. The installation will be aborted.

Select OK to abort the WinPcap installation and continue with the MTS400 installation.
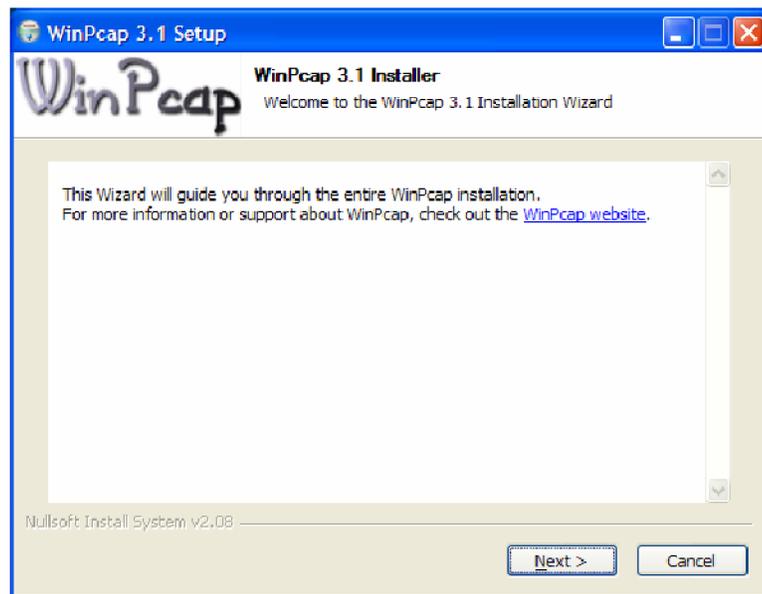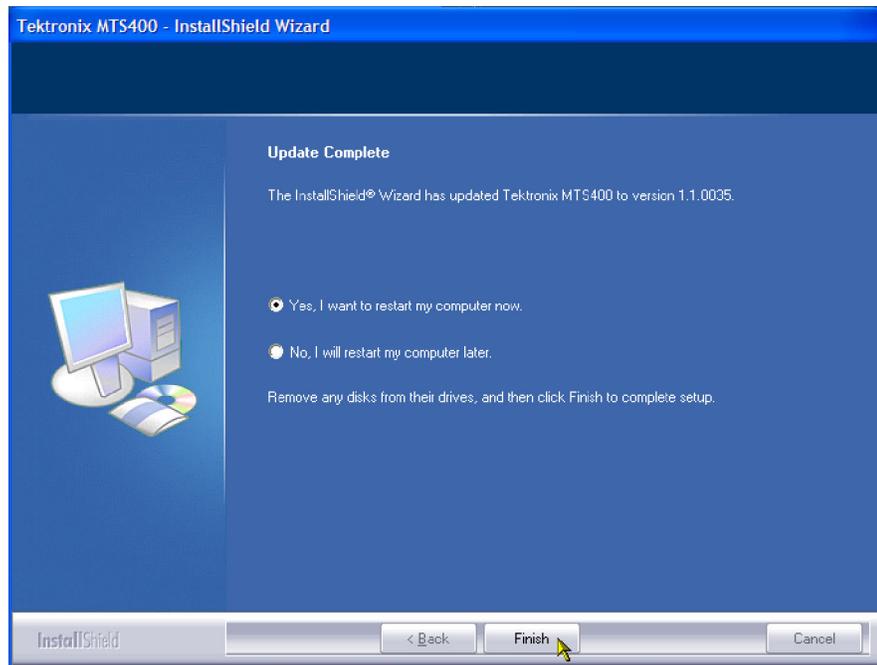

Figure 26: WinPcap Setup dialog

8. In the WinPcap Setup dialog box, select **Next**.

9. The WinPcap License agreement is displayed. Read the agreement and select **I Agree** if you agree.

10. When the WinPcap completed dialog appears, click **FINISH**.

11. When the upgrade installation is complete, the Update Complete screen is displayed. (See Figure 27.)

Figure 27: InstallShield Wizard update complete screen

12. Select the **Yes, I want to restart my computer now** option, and then click **Finish**. The instrument or PC will shut down and then restart.

13. After the unit has completed the start-up process, start the Tektronix Option Update wizard by selecting **Start > Programs > Tektronix MTS400 > OptionKey Wizard**. The Option Update window should open. (See Figure 28.)
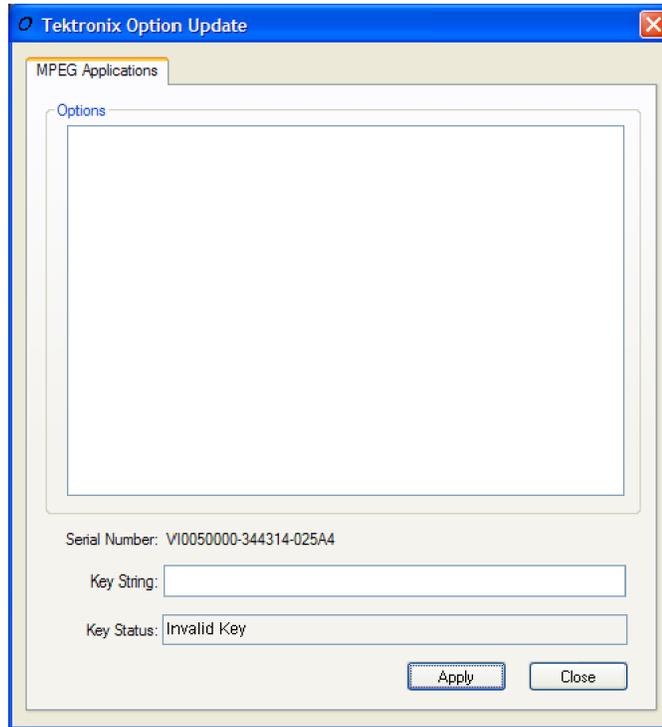
Figure 28: Tektronix Option Update Wizard - Initial view

Note that the Serial Number of the software key has been detected, but the Key Status is invalid because no Key String has been entered.

14. In the Tektronix Option Update dialog box Key String field, enter the Option Key String, found on the Product Option Key label supplied with these upgrade instructions, and then click **Apply**.

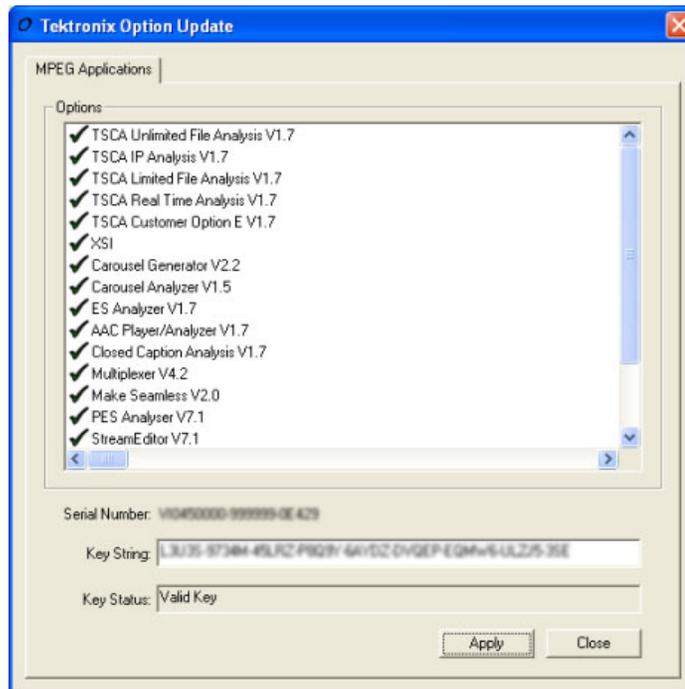**15.** Inspect and verify the list of licensed options. (See Figure 29.)

Figure 29: Tektronix Option Update Wizard - Complete

16. Close the Option Key Wizard.

17. Peel the backing off of the Product Option Key label and apply it to the instrument rear panel. (See Figure 7 on page 15.) If there is already an option key label on the rear panel, paste the new one over the old one.

The upgrade is now complete. The licensed MTS400 applications will now be available in the Windows Start menu.

Verify Operation   For complete verification, perform the Performance Verification procedure found in the *Specifications and Performance Verification* manual (071-1724-xx), on the documentation CD included in this kit.

If any licensed application fails to open correctly, contact your Tektronix representative.

Software Key Upgrade

Perform the following steps to upgrade the MTS400 software key. This process can be used where a new application is to be licensed on an MTS400, software version 1.4 or later, but the software does not require an upgrade.

1. Ensure that the software key (dongle) is attached to your instrument.

2. Switch the instrument on and allow the start-up process to complete.

3. Start the Tektronix Option Update Wizard (**Start** > **Programs** > **Tektronix MTS400** > **OptionKey Wizard**).

4. In the Tektronix Option Update Wizard dialog box, enter the Option Key String, found on the Product Option Key label supplied with these upgrade instructions, in the Key String field. Click **Apply**.

5. Inspect and verify the list of licensed options.

6. Close the Option Key Wizard.

7. Peel the backing off of the Product Option Key label and apply it to the instrument rear panel. (See Figure 7 on page 15.) If there is already an option key label on the rear panel, paste the new one over the old one.

The software key upgrade is now complete.

Verify Operation   To verify operation of the upgraded applications, open and close each installed application in turn.

If any licensed application fails to open correctly, contact your Tektronix representative.

Hardware Upgrade (MTS400P)

Use these procedures to install an MTS4UP IPTVP into an MTS400P.

⚠️ **CAUTION.** *To ensure that the instrument functions properly after the upgrade procedures, perform the software upgrades before the hardware upgrades.*

Software Upgrade

Perform the following steps to upgrade the software, using the USB flash drive and the UPG option.

1. Connect the USB flash drive to the USB connector of the instrument. A dialog box with various install options is displayed.

2. Select **Install Tektronix MPEG Application Suite** and click **OK**. Immediately, an InstallShield Wizard that allows you to install the application is displayed. Click **Next** to continue.
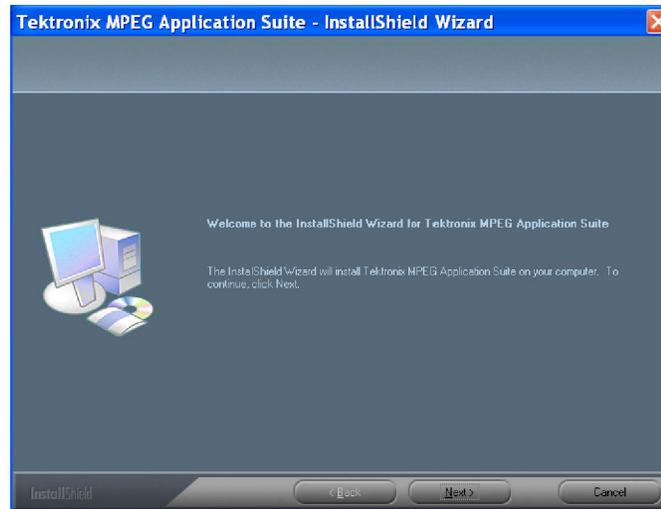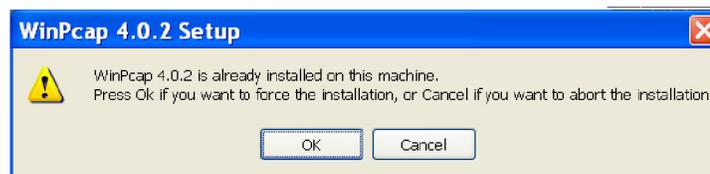

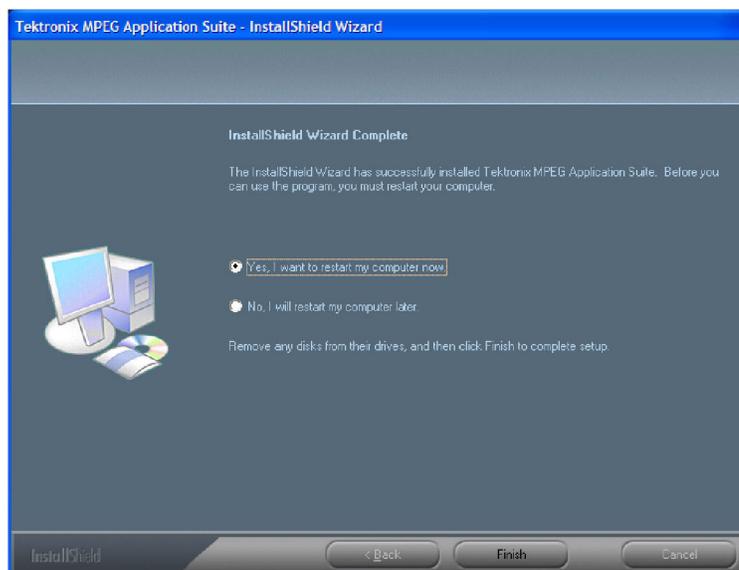**3.** Select **MTS400P** as the Setup type and click **Next** to continue.
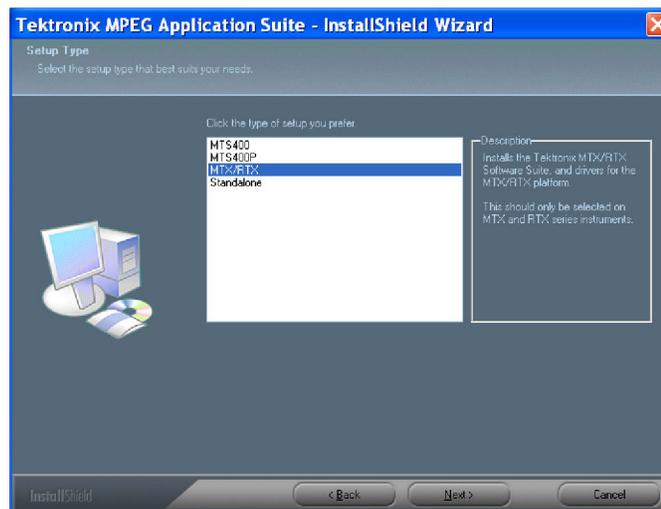
4. Click **Install** to begin the installation process.
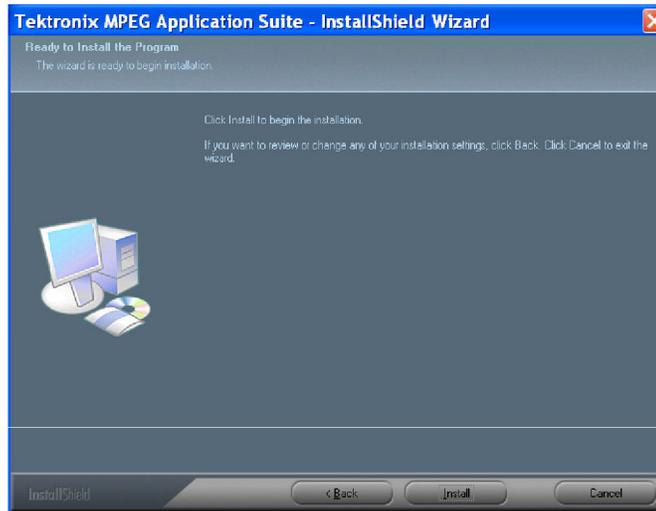
During the progress, the following WinPcap 4.0.2 Setup message is displayed. Click **OK** to continue.

5. Choose the option to restart the PC, and then select **Finish**. The PC will shut down and restart.

6. After the restart, a Hardware Update Wizard dialog box is displayed. Choose **No, not this time** option and click **Next** to proceed. Follow the on screen instructions, and the wizard automatically installs the hardware driver.


7. Continue with the following procedure to enter the UPG option key.

Entering the Option Key   Perform the following steps to enter the option key that is supplied with the upgrade kit.

1. Connect the dongle that is supplied with the instrument.

2. From the Start menu, select **Programs > Tektronix MTS400 > Optionkey Wizard** to open the Tektronix Option Update dialog box. (See Figure 30.)
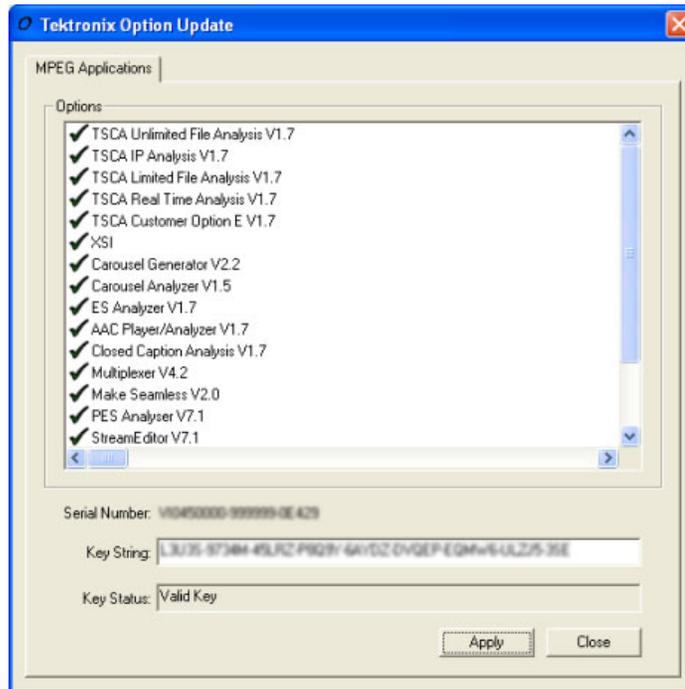
Figure 30: Tektronix Option Update dialog box

3. Refer to the option key document that is supplied with the kit to identify the option key numbers.

4. Enter the alphanumeric numbers in the Key String text box, and click the Apply button.

   The Tektronix Option Update dialog box is updated and the ordered option is displayed along with the other options. If a wrong key string is entered, the **Key Status** box displays the entered string as invalid.

5. Apply the label of the ordered option to the right side of the cabinet.

6. Restart the instrument to display the application screen.

Access the Module Bay

⚠ *CAUTION. To prevent static discharge damage, service the product only in a static-free environment. Observe standard handling precautions for static-sensitive devices while installing this kit. Always wear a grounded wrist strap, grounded foot strap, and static resistant apparel while installing this kit.*

⚠ *WARNING. Dangerous voltages may be present inside the instrument. Before performing the hardware procedures, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury.*

Perform the following procedure to install an Option IPTVP interface module into the MTS400P:

Remove the Cabinet

1. Disconnect all external cables and the power cord from the MTS400P rear panel.

2. Use a screwdriver with a T15 TORX tip to remove the two screws securing the cabinet to the instrument. (See Figure 31.)

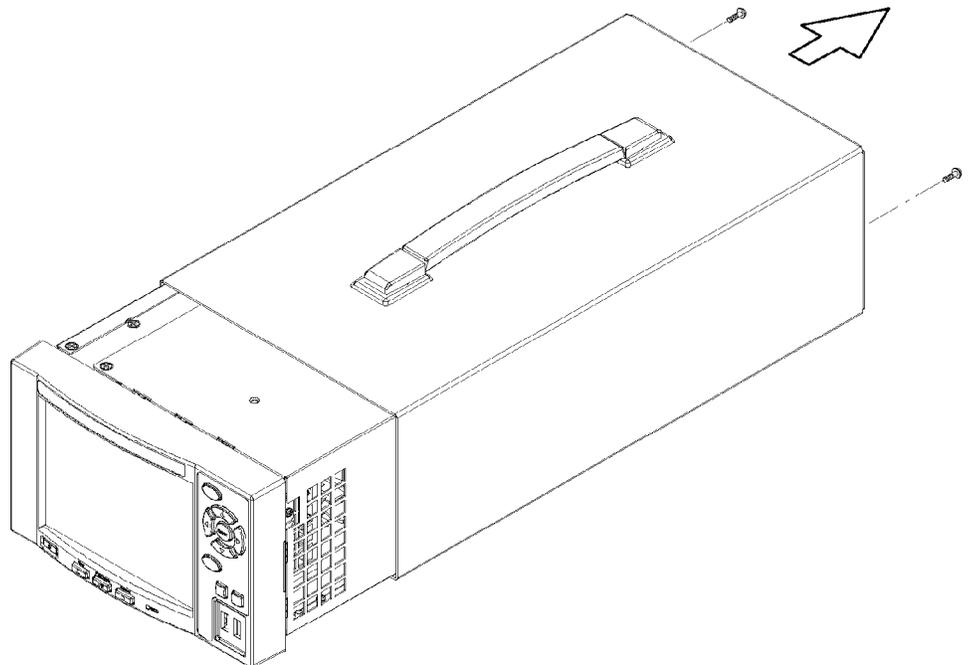3. Slide the instrument forward to remove the instrument from the cabinet. (See Figure 31.)

Figure 31: Removing the MTS400P cabinet

Remove the Right-side and Left-side Covers

1. Set the instrument so that the left side is down on the work surface and the front is facing you.

2. Use a screwdriver with a T10 TORX tip to remove the seven screws securing the right-side cover to the top and bottom of the chassis. (See Figure 32.)

3. Remove the right-side cover from the chassis.

4. Set the instrument so that the right side is down on the work surface and the front is facing you.

5. Use a screwdriver with a T10 TORX tip to remove the six screws securing the left-side cover to the top and bottom of the chassis. (See Figure 32.)

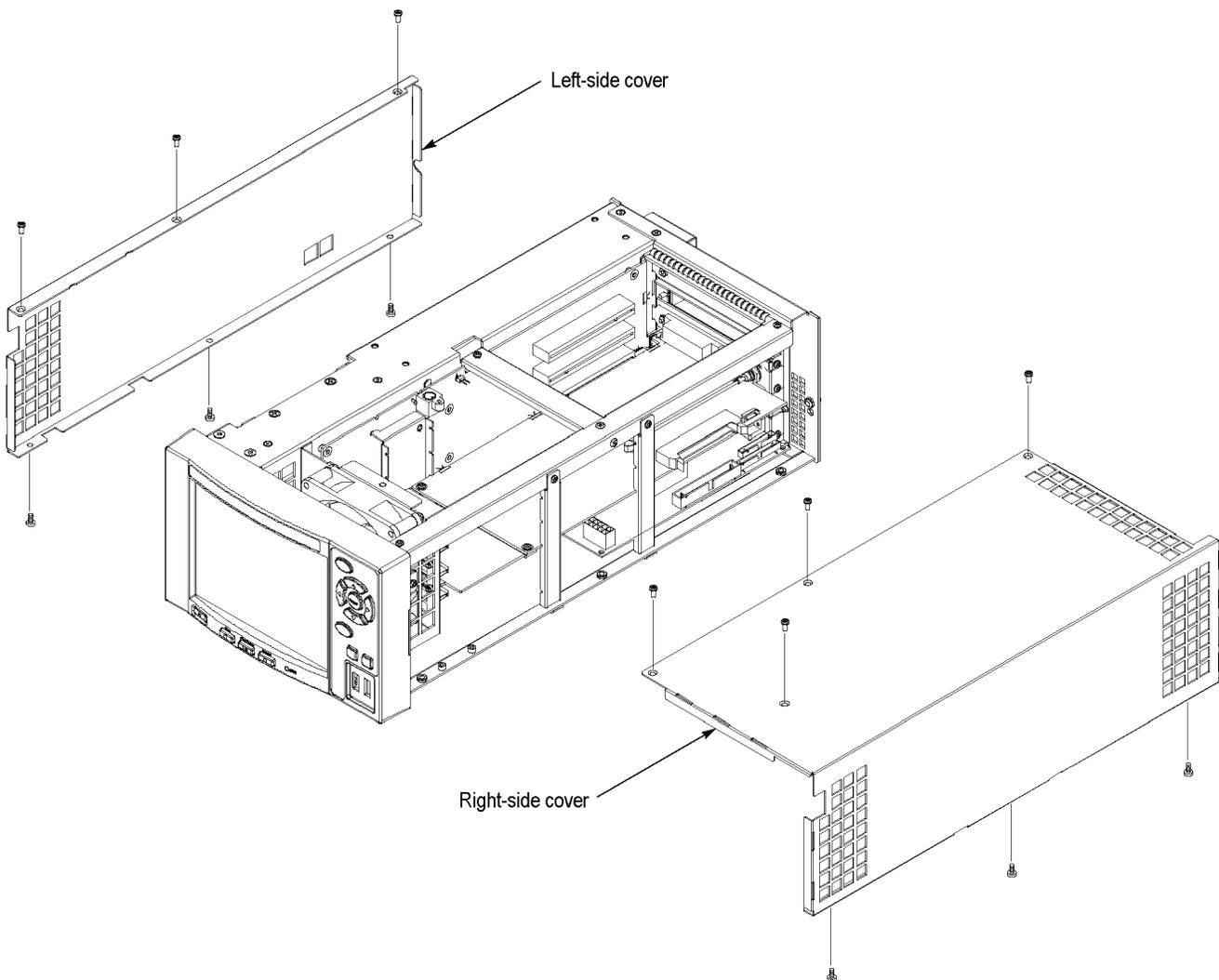6. Remove the left-side cover from the chassis.

Figure 32: Removing the right-side and left-side covers

Remove the Board Retainers

1. Set the instrument so that the bottom is down on the work surface and the right side is facing you.

2. Use a screwdriver with a T10 TORX tip to remove the two screws securing the board retainers to the chassis. (See Figure 33.)

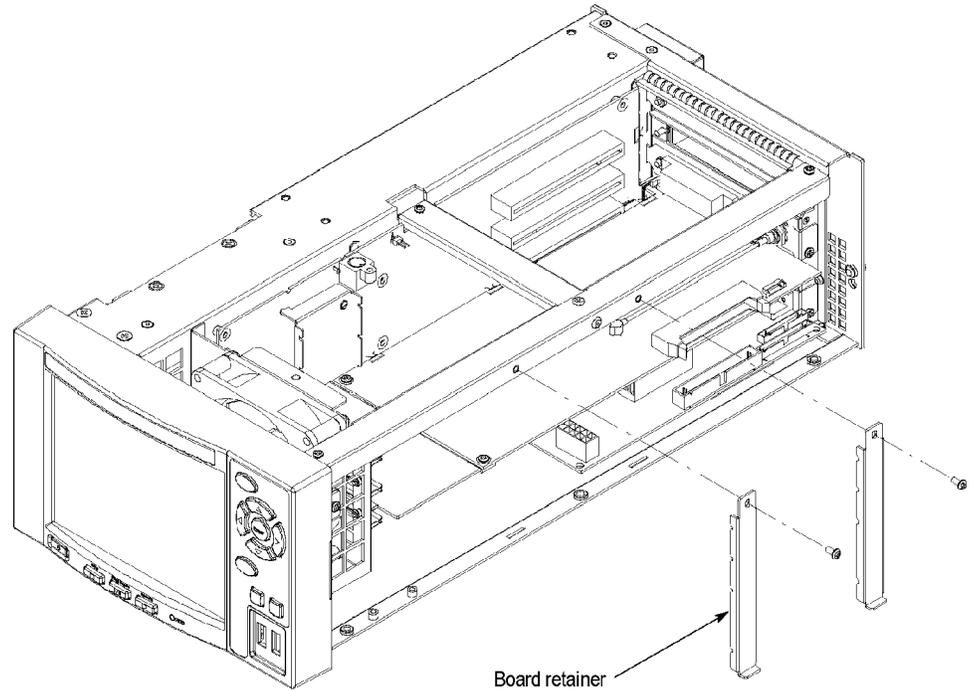3. Lift the retainers away from the chassis. (See Figure 33.)

Board retainer

Figure 33: Removing the board retainers

Remove the Blank Panel   Use a screwdriver with a T10 TORX tip to remove the screws to the side and rear of the chassis, that secure the top blank panel.

1.   Lift the blank panel away to remove it. (See Figure 34.) Save the screws.

Figure 34: Removing the top blank panel

MTS4UP IPTVP Upgrade

Perform the following steps to install the MTS4UP IPTVD, IP Video Gigabit Ethernet interface.

Install the Option IPTVP Cable

1. Locate the A170 SMPTE310M/ASI/SPI Interface (slot 2) and the A12 Main board (slot 3).

2. Remove the screws securing the A170 SMPTE310M/ASI/SPI Interface board and set them aside.

3. Gently remove the A170 SMPTE310M/ASI/SPI Interface board from the instrument and set it aside.

4. Remove the screws securing the A12 Main board to the instrument and set them aside.

5. Gently remove the A12 Main board from the instrument and set it aside.

6. On the processor board at the bottom of the instrument:

   a. Move the jumper on JP2 to pins 1 and 2. (See Figure 35.)

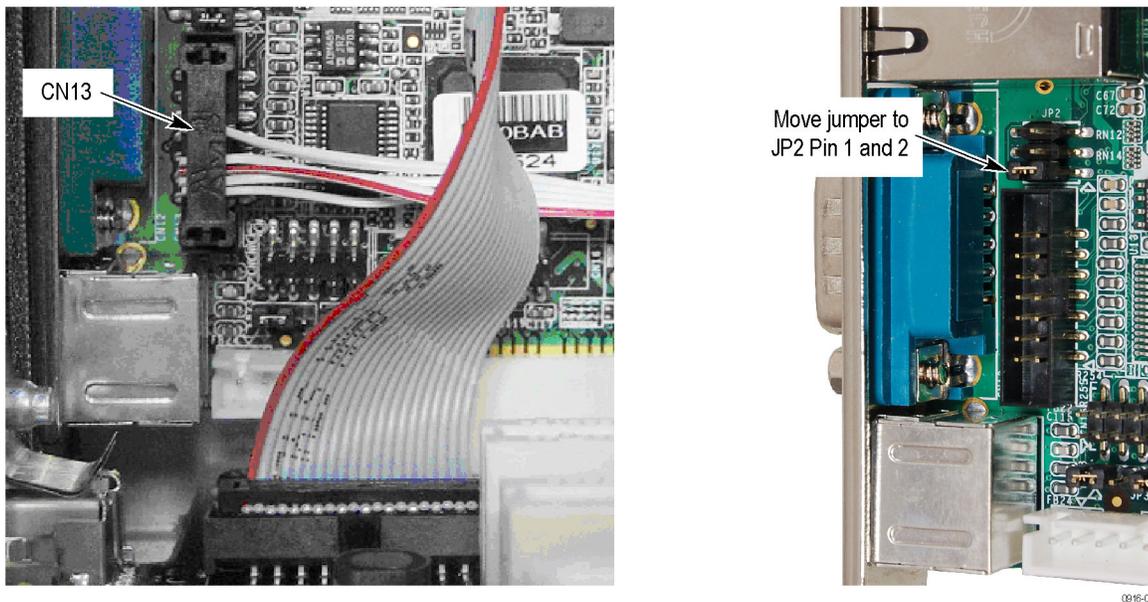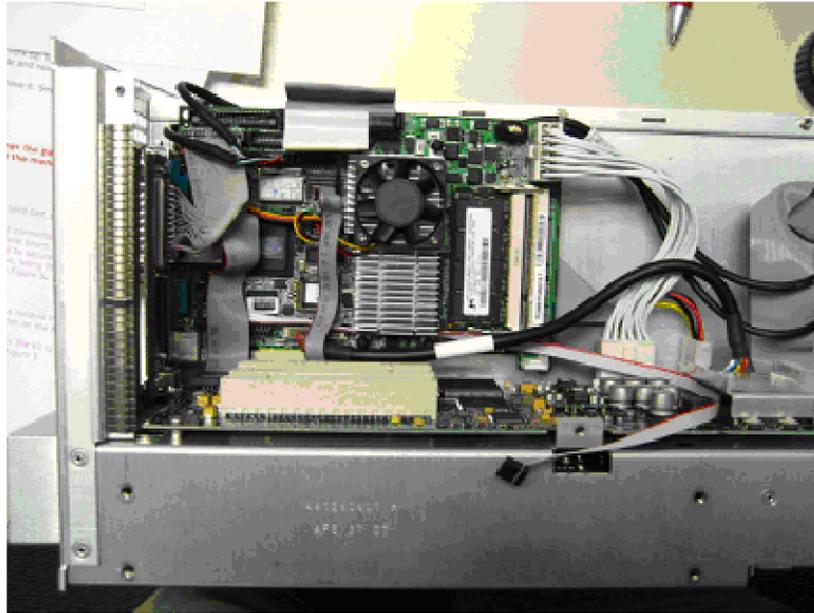   b. Connect one end of the RS232 CIP cable, provided in the kit, to CN13. (See Figure 35.)

Figure 35: Jumper and RS232 CIP cable connection on Processor board

7. Route the new cable across the bottom of the instrument. (See Figure 36.) You will connect the other end of the cable later.

Figure 36: RS232 CIP cable routing

8. Carefully reinstall the A12 Main and A170 SMPTE310M/ASI/SPI Interface boards into the instrument, using care to not pinch the new RS232 CIP cable. Push each module in until the module edge-connector is firmly seated in the A20 PCI backplane connector.

9. Reinstall the screws that secure the A170 and A12 boards to the instrument.

**Install the Option IPTVP Gigabit Ethernet interface**

Perform the following steps to install the Option IPTVP interface module.

⚠ **CAUTION.** *The cables and parts of the interface module can be damaged if you improperly insert the module into the instrument. To avoid damaging any parts, use care when you insert the module into the instrument.*

1. Insert the interface module into the upper card slot (slot 1), paying attention to the module orientation. (See Figure 37.)

2. Push the IPTVP module in until the board-edge connector is firmly seated in the A20 PCI Backplane board connector.

3. Secure the interface module at the side and rear of the chassis, using the two screws that were removed from the top blank panel.
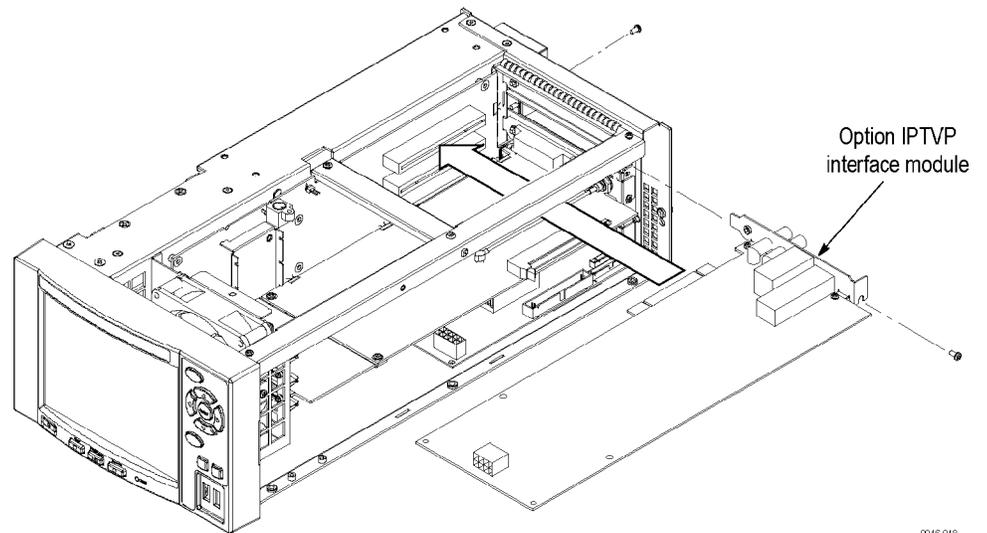
Figure 37: Installing the Option IPTVP interface module

**4.** Connect the free end of the new RS232 CIP cable to J10 on the interface module. (See Figure 38.)
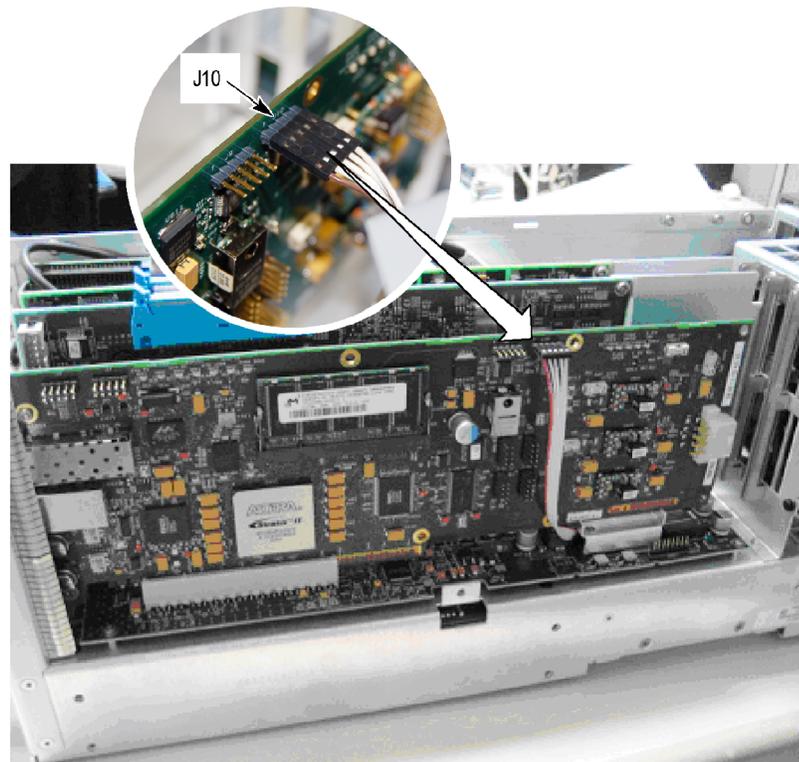
Figure 38: Connect the RS232 CIP cable to the IPTVP module

Install the Board Retainers Install the two new board retainers provided in the kit. (See Figure 39.) Use a screwdriver with a T10 TORX tip to install the screws (removed with the original board retainers) that secure the board retainers to the chassis.

Option IPTVP interface
module retainers

0916-019
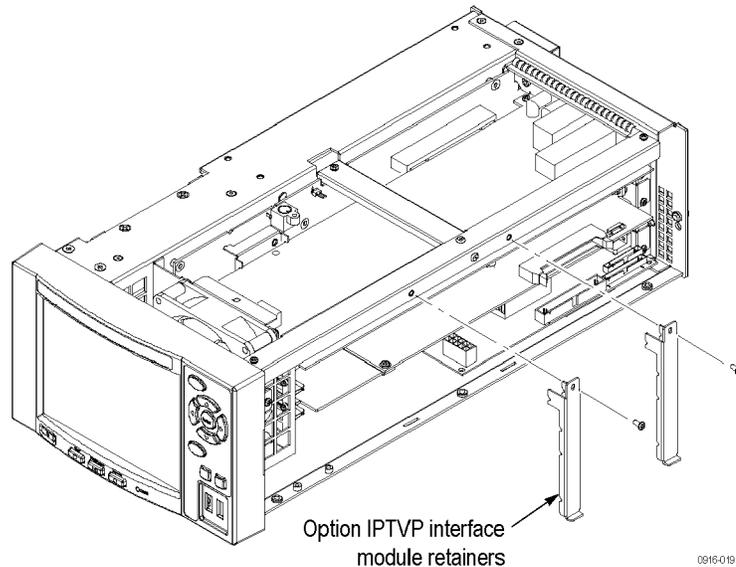
Figure 39: Installing the Option IPTVP board retainers

**Install the Right-side and Left-side Covers**

1. Use a screwdriver with a T10 TORX tip to install the seven screws securing the right-side cover to the top and bottom of the chassis.

2. Use a screwdriver with a T10 TORX tip to install the six screws securing the left-side cover to the top and bottom of the chassis.

Install the Cabinet

1. Slide the instrument into the cabinet.

2. Use a screwdriver with a T15 TORX tip to install the two screws securing the cabinet to the instrument.

Apply the Connector Label   Remove the protective backing from the connector label that is provided in the kit, and then apply it to the rear-panel frame, just below the installed module. (See Figure 40.)
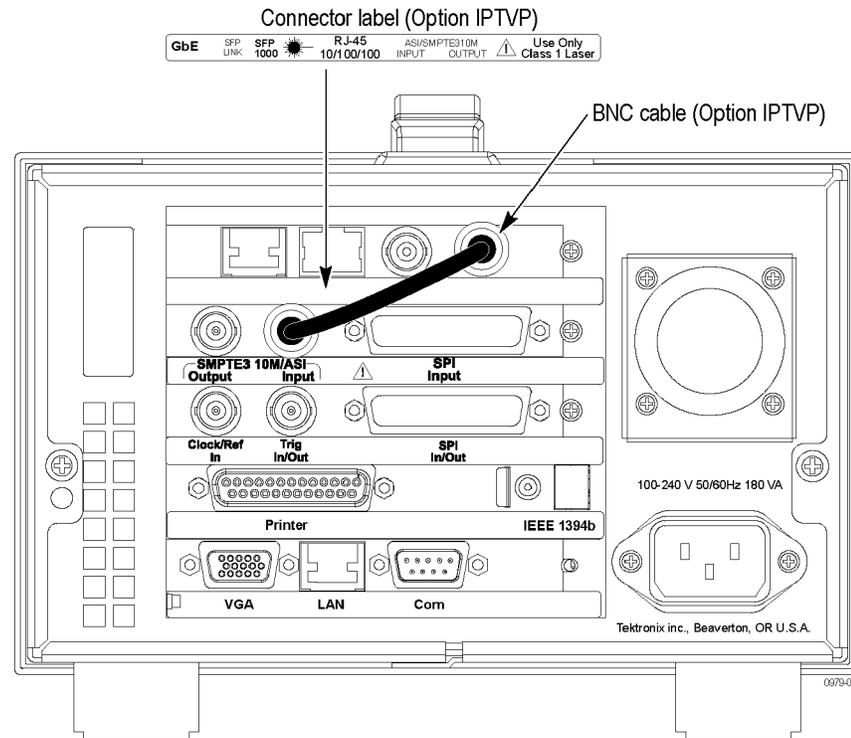
Figure 40: Apply the connector label

Connect the BNC Cable   Connect the BNC cable, provided in the kit. (See Figure 40.)

Enable COM2   Perform the following steps to enable COM2:

1. Connect the keyboard and mouse to the instrument.

2. Power on the instrument and press the **Delete** key when the instrument displays "Press DEL to enter SETUP" at the bottom of the screen. The BIOS setup utility window appears.

3. Select **Integrated Peripheral**, and then set the Onboard Serial Port 2 setting to **2F8** to enable COM2. (See Figure 41.)
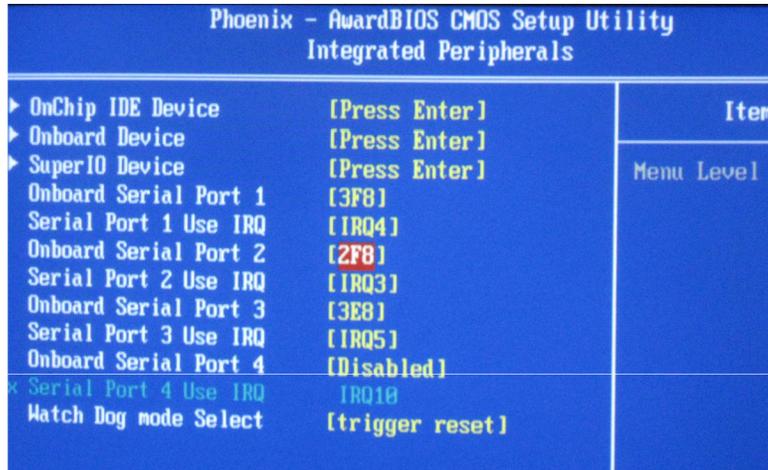

Figure 41: Enabling COM2

SFP Module Upgrade (Option LX, Option SX, or Option ZX)

The Option IPTVP IP Video Gigabit Ethernet (GbE) interface card allows you to remotely monitor and measure the quality of video-over-copper and optical IP networks. The SFP (Small Format Pluggable) modules are available to facilitate different optical wavelengths.

⚠️ **WARNING.** *To avoid exposure to hazardous laser radiation, use only Class 1 lasers as defined in the USA Federal Regulations CDRH 21 CFR 1040 and IEC/EN 60825/A2:2001.*

⚠️ **CAUTION.** *To prevent static discharge damage, service the product only in a static-free environment. Observe standard handling precautions for static-sensitive devices while installing this module. Always wear a grounded wrist strap, grounded foot strap, and static resistant apparel while installing this module.*

The following figure shows an SFP module with the optical port plug removed. Use the plug to protect the optical interface when no cable is connected or the module is not in use.

NOTE. *The optical port plug must be in place when no cable is connected.*

NOTE. *The following illustrations show an MTS400P MPEG Test System, but the installation and removal steps are the same for any MTS400 Series instrument.*

SFP Installation   Perform the following steps to install an SFP module into the IPTV or GbE interface module:

> ⚠️ **CAUTION.** *To avoid damage to the SFP module, remove power from the MS400P instrument before removing or inserting an SFP module.*

1. Disconnect the power cord from the instrument.

2. Insert the SFP module into the connector labeled SFP 1000 on the rear panel of the module. When pushed in fully, the module latches into position.

3. Remove the optical port plug and insert the optical fiber cable into the SFP module. (See Figure 42.) When pushed in fully, the cable connector latches into position. Retain the optical port plug for later use when you need to disconnect the optical fiber cable or remove the SFP module from the instrument.
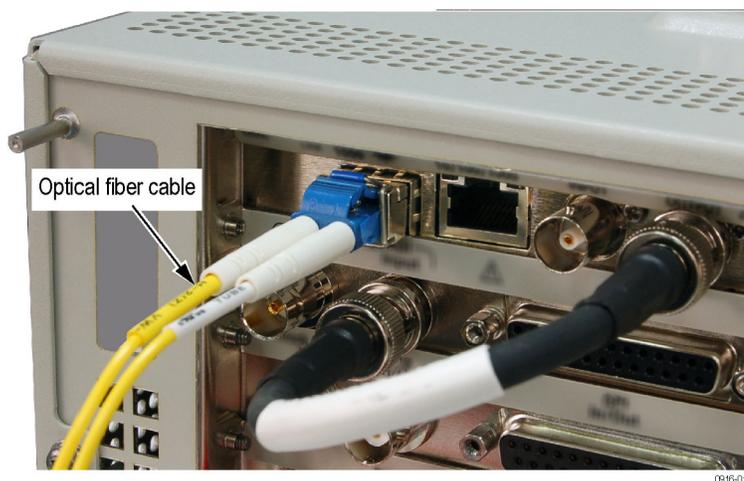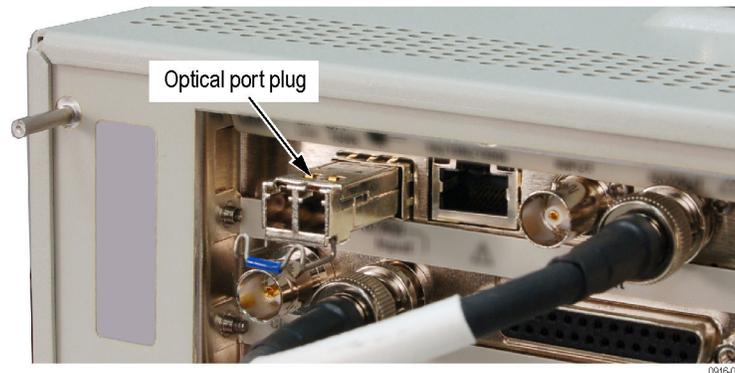
4. Reconnect the power cord to the instrument.

Figure 42: Optical cable connected

SFP Removal   Perform the following steps to remove an SFP module from the Option IPTVP or GbE interface module:

1. Disconnect the power cord from the instrument.

2. Press the top of the SFP module connector to unlatch the optical fiber cable, and then disconnect and withdraw the cable from the SFP module.

3. Flip down the SFP module retaining latch, and then remove the module from the instrument. (See Figure 43.)

Figure 43: SPF module removal

4. Install an optical port plug into the removed SFP module to protect the optical port interface.

5. Reconnect the power cord to the instrument.

End of document