

# Instructions



## MTS4UP Upgrades MTS400 Series and MTS400P MPEG Test Systems 075-0979-00

### **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.

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

- In North America, call 1-800-833-9200.
- Worldwide, visit [www.tektronix.com](http://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.

**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 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.

**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 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:



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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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**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 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.





# 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 (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.

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**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.*

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- **MTS4UP IPTVD** - This kit adds an IPTV Gigabit Ethernet interface with a 10/100/1000Base-T electrical port to your MTS415 or MTS430. 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 MTS415 or MTS430 (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 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 MTS415 or MTS430 instrument. This kit may only be combined with the MTS4UP GBE kit.
- **MTS4UP QB2** - This kit adds a QAM B interface to your MTS415 or MTS430 instrument. This kit may only be combined with the MTS4UP GBE kit.
- **MTS4UP VS** - This kit adds an 8VSB interface to your MTS415 or MTS430 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).

## 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 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	NS	IMPORTANT DOCUMENTS ENVELOPE, WITH PRODUCT OPTION KEY
1 Each	075-0979-00	MANUAL;UPGRADE INSTRUCTIONS,PRINTED;MTS4UP

**NS - Not Saleable**

### MTS4UP IPTVD

This kit updates an 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 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
1 Each	063-4220-xx	SOFTWARE PKG; MICROSOFT WINDOWS XP PROFESSIONAL, W/SP2B RECOVERY MEDIA AND NERO BURNING SOFTWARE, VER X.X; MTS400 SERIES
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 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
1 Each	063-4220-xx	SOFTWARE PKG; MICROSOFT WINDOWS XP PROFESSIONAL, W/SP2B RECOVERY MEDIA AND NERO BURNING SOFTWARE, VER X.X; MTS400 SERIES
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 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
1 Each	063-4220-xx	SOFTWARE PKG; MICROSOFT WINDOWS XP PROFESSIONAL,W/SP2B RECOVERY MEDIA AND NERO BURNING SOFTWARE, VER X.X;MTS400 SERIES
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 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
1 Each	063-4220-xx	SOFTWARE PKG; MICROSOFT WINDOWS XP PROFESSIONAL,W/SP2B RECOVERY MEDIA AND NERO BURNING SOFTWARE, VER X.X;MTS400 SERIES
2 Each	211-0722-00	SCREW,CAP; 6-32 X 0.75,HEX SKT,SST

**MTS4UP VS** This kit updates an 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
1 Each	063-4220-xx	SOFTWARE PKG; MICROSOFT WINDOWS XP PROFESSIONAL,W/SP2B RECOVERY MEDIA AND NERO BURNING SOFTWARE, VER X.X;MTS400 SERIES
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

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.



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**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.*

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If you are installing an MTS4UP UPG software upgrade *only*, follow the procedure starting on page 10.

If you are installing any of the interface card options into an MTS415 or MTS430, go to page 15.

If you are installing the Option IPTVP interface card into an MTS400P, go to page 38.

If you are installing an SFP optical port module (Option LX, Option SX, or Option ZX) into an MTS415, MTS430, or MTS400P system that already has an IPTV or GbE option installed, go to page 53.

# 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 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.

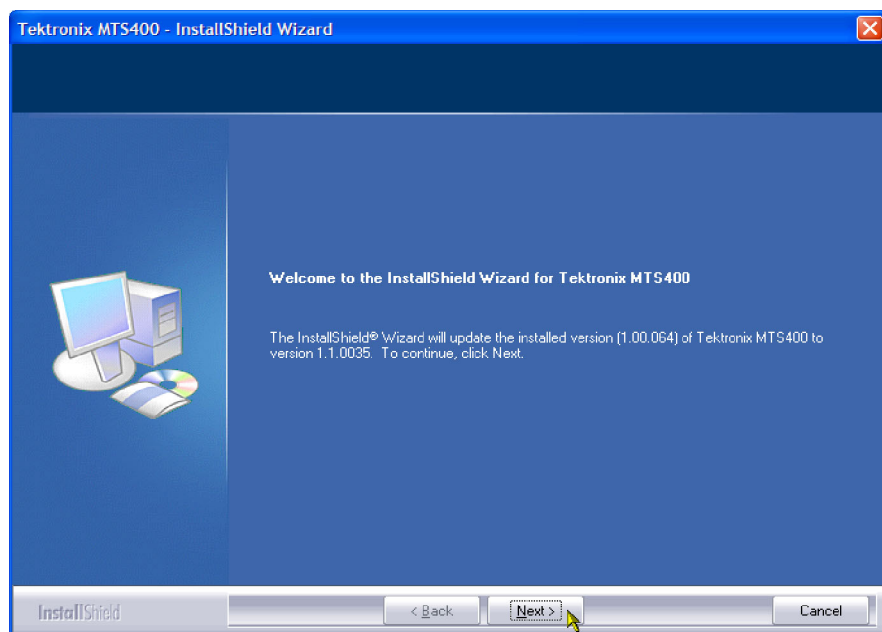
The InstallShield Wizard will autostart and display the Welcome screen shown in Figure 1.

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

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4. Click **Next** to initiate the upgrade process (see Figure 1).



**Figure 1: InstallShield Wizard welcome screen**

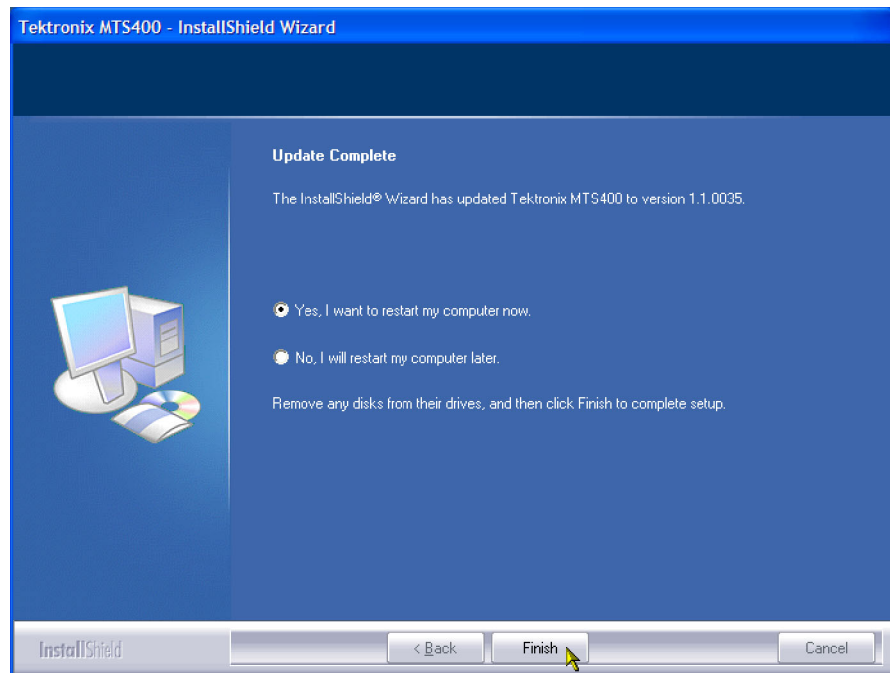
5. Allow the installation process to proceed. The average installation time is approximately five minutes.

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

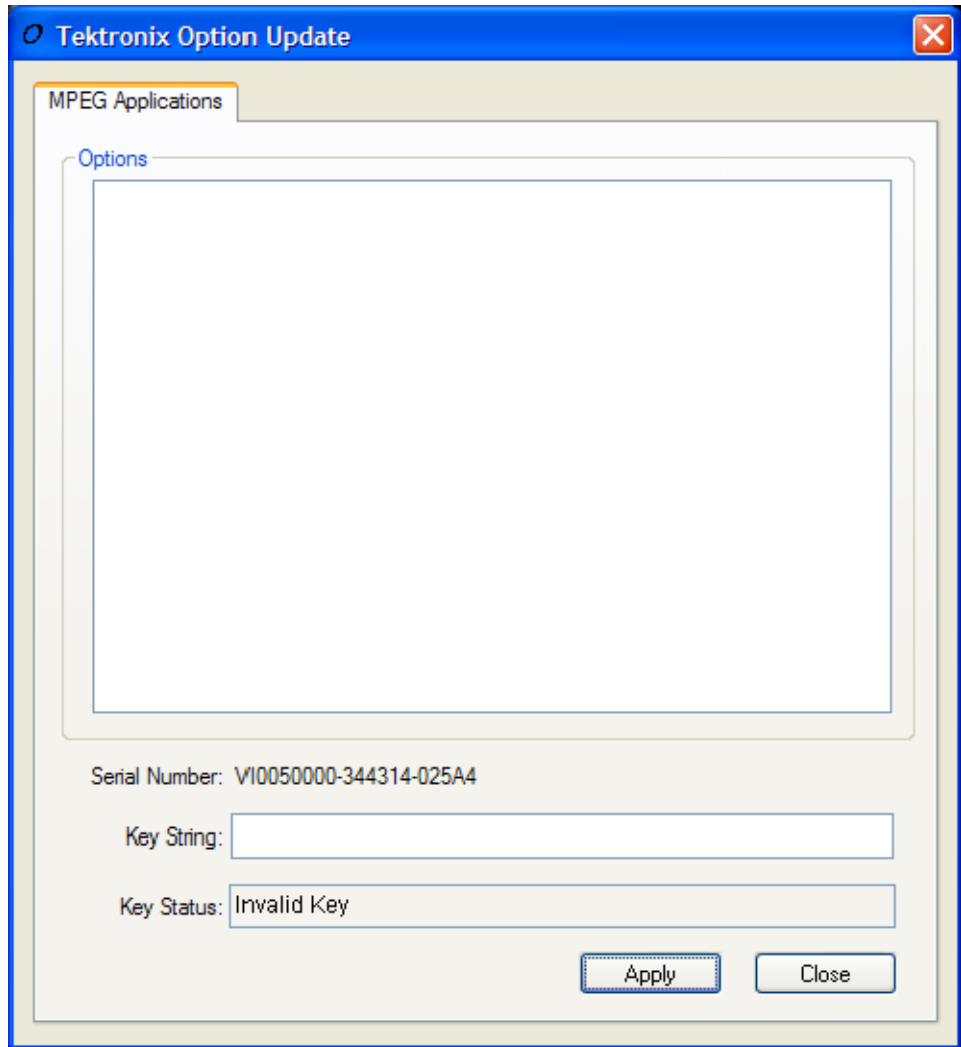
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6. When the upgrade installation is complete, the Update Complete screen is displayed as shown in Figure 2.



**Figure 2: InstallShield Wizard update complete screen**

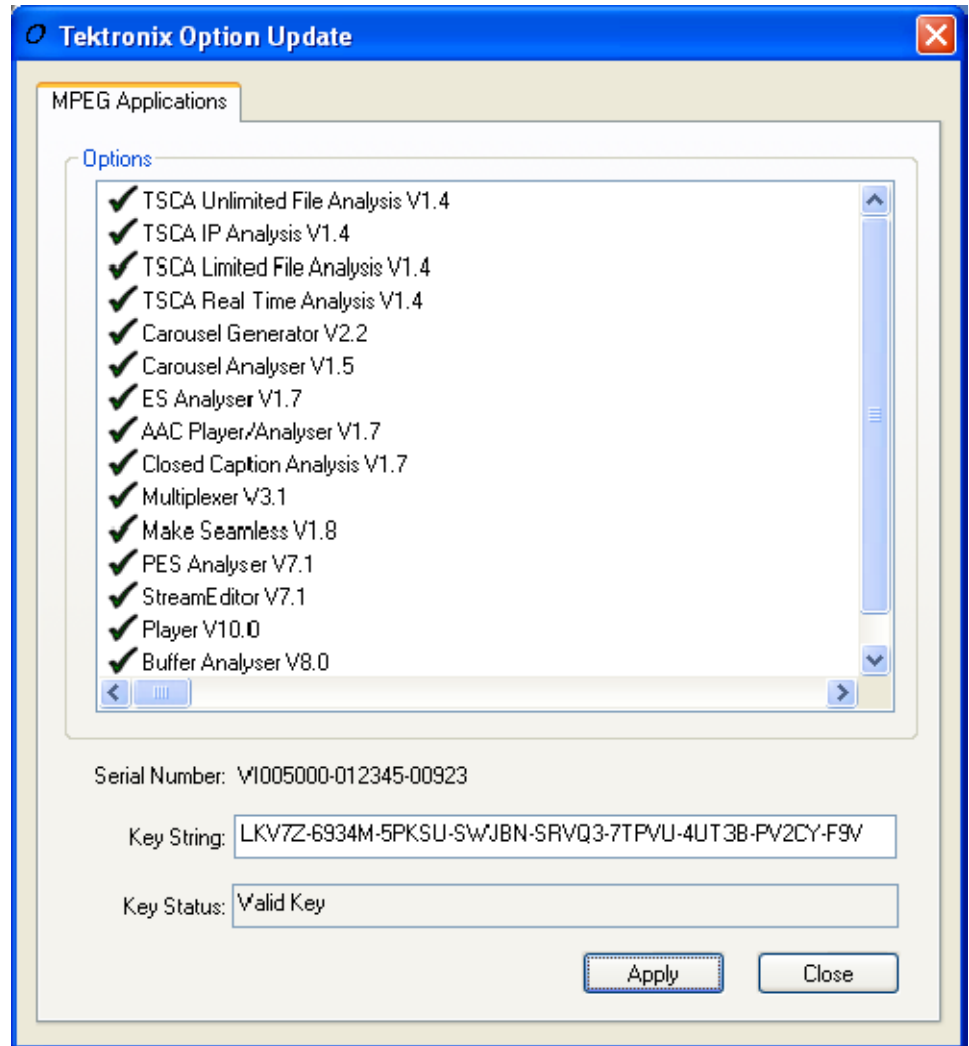
7. Select the **Yes, I want to restart my computer now** option, and then click **Finish**. The instrument or PC will shut down and then restart.
8. When the unit has completed the start-up process, the Tektronix Option Update wizard will start automatically (see Figure 3).



**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**

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, as shown in 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.

# Hardware Upgrades (MTS415 and MTS430)

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

## Access the Module Bay



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**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.

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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 down 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.

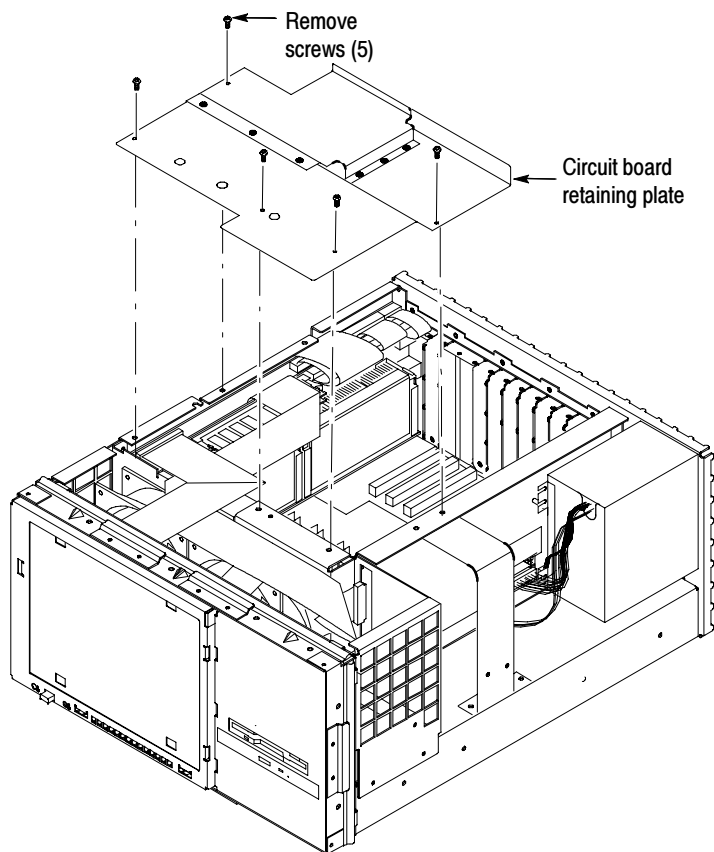


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**WARNING.** To prevent damage to the EMI shielding and injury to yourself, use care when touching the EMI shielding strips around the front of the chassis. If you accidentally bend the “fingers” of the strip, it could create sharp protruding edges,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

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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, as shown in Figure 6.
8. Remove the five T-15 screws securing the circuit board retaining plate to the chassis and lift it away (see Figure 6).



**Figure 6: Removing the circuit board retaining plate**

If you are installing an MTS4UP IPTVD IP Video Gigabit Ethernet upgrade into an MTS415 or MTS430 Test System, continue with the process below.

If you are installing an MTS4UP GBE Gigabit Ethernet input upgrade, with or without any of the other hardware upgrades, go to page 19.

If you are installing an MTS4UP CF, MTS4UP EP, MTS4UP QB2, or MTS4UP VS upgrade without an MTS4UP GBE, go to page 20.



## MTS4UP IPTVD Upgrade Instructions

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 7).

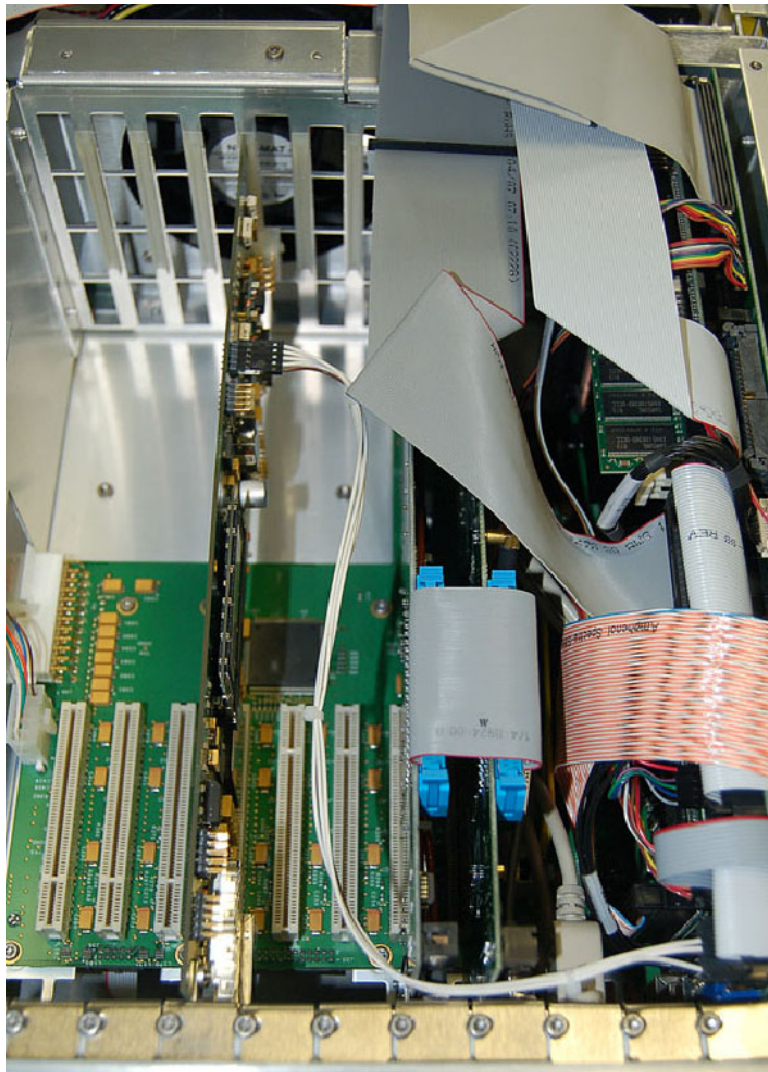
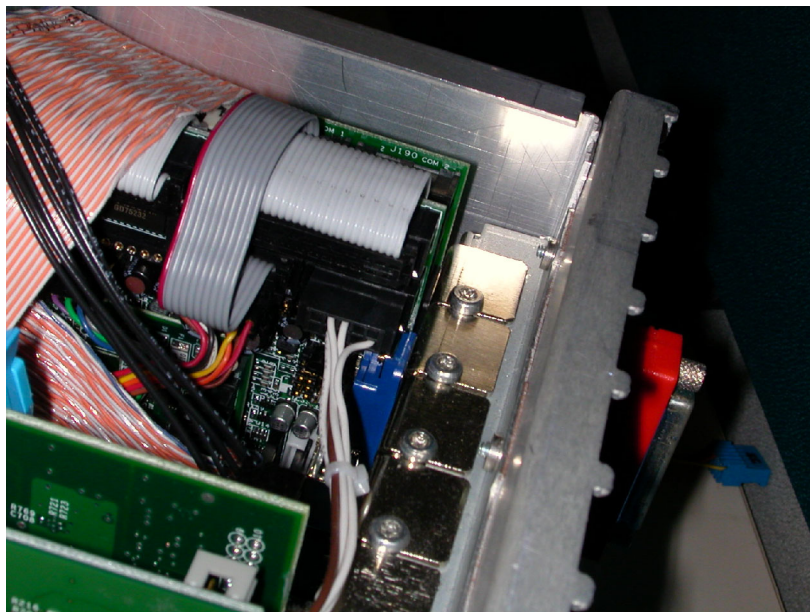
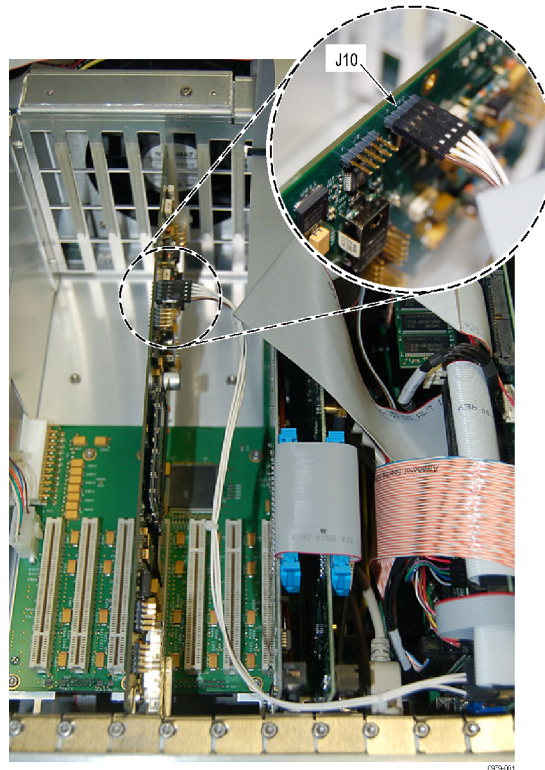


Figure 7: IPTVD IP Video Gigabit Ethernet Interface module in place

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, as shown in Figure 8. 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, as shown in Figure 9.



**Figure 8: Interface cable connected to controller board**



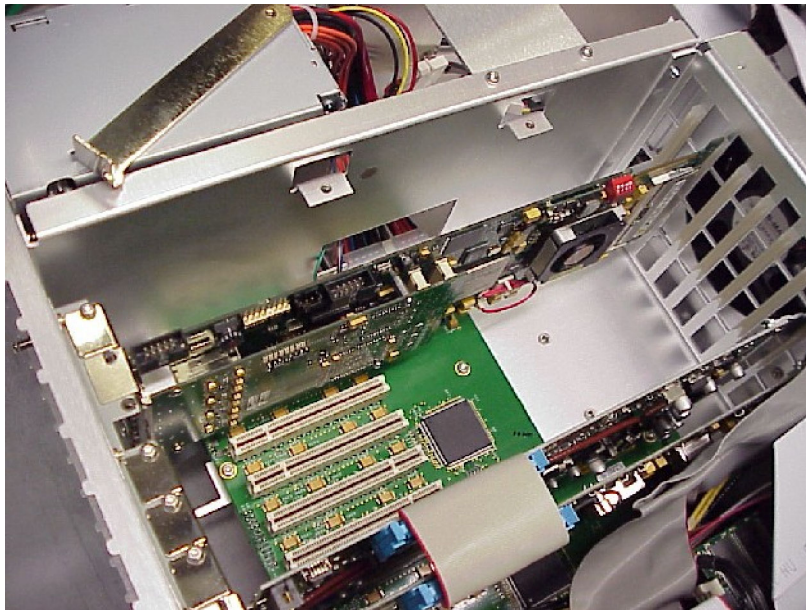
**Figure 9: Interface cable connected to the IPTVD module**

This completes the MTS4UP IPTVD installation. Go to *Replace the Cabinet* on page 23.

## MTS4UP GBE Upgrade Instructions

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 10).
4. Press down firmly to engage the module into the connector (see Figure 10).



**Figure 10: Gigabit Ethernet module in place**

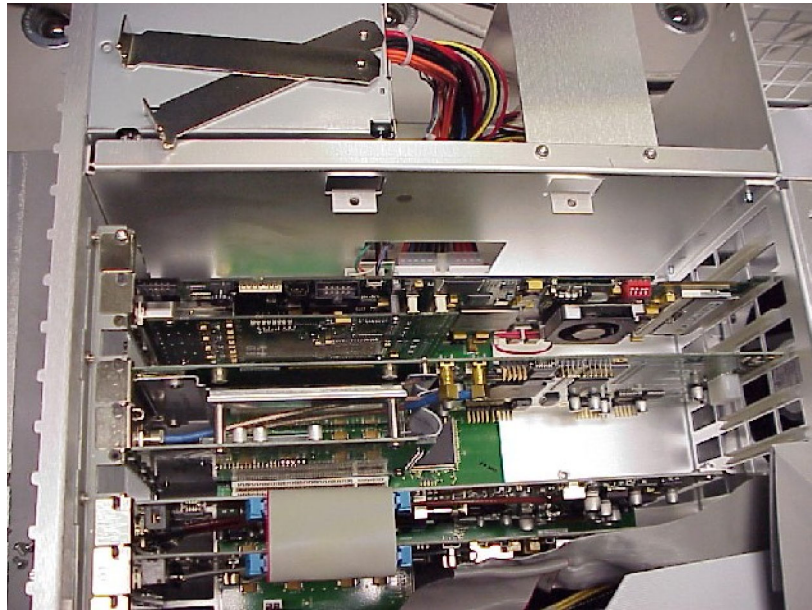
5. Secure the Gigabit Ethernet module in place, using the screws that held the slot 2 blank panel in place.
6. Replace the slot 3 blank panel.

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* on page 24.

## **MTS4UP CF, EP, QB2, or VS Upgrade Instructions**

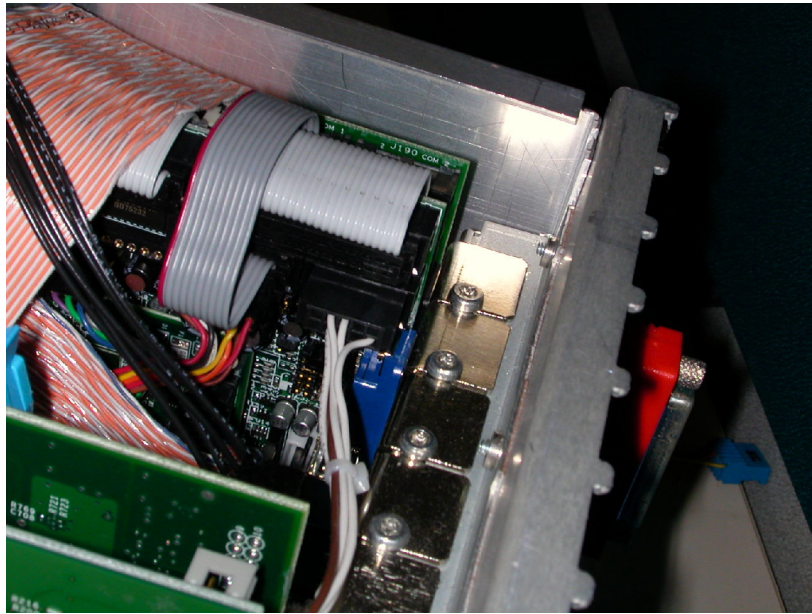
These hardware upgrades are all installed in a similar manner, and must be installed in slot 4.

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 11).



**Figure 11: 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, as shown in Figure 12. 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, as shown in Figure 13.



**Figure 12: Interface cable connected to controller board**



**Figure 13: 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 on page 15.



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**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.*

---

### MTS400 Series system 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.*

---

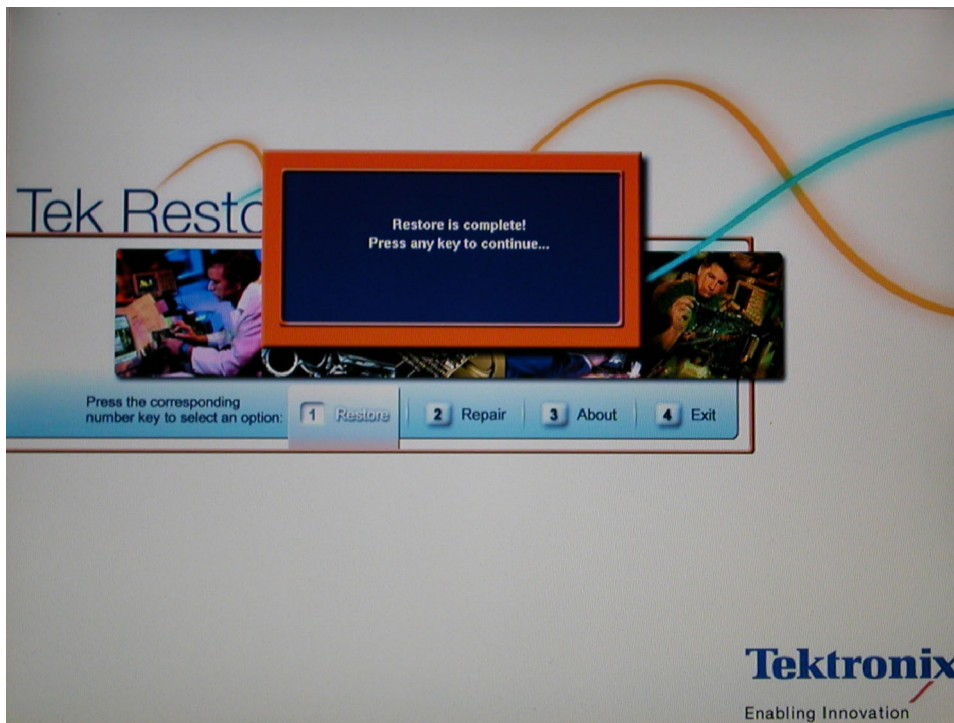
1. Start the MTS400 Series system.
2. During the boot process, insert the *MTS400 Series System Operating System Restore DVD* in the CD-ROM drive. The system will autostart the recovery application when the boot process finishes, see Figure 14.





**Figure 14: Operating system recovery application**

3. Press the “1” key to begin the system restore process. The Acquiring Device... dialog box will appear briefly and display a progress bar.
4. When the system restore is complete, press any key and then press the “4” key, see Figure 15.



**Figure 15: Restore Complete**

5. When prompted, press the “Y” key to reboot the instrument. Remove the DVD from the CD-ROM drive while the system is rebooting.
6. On startup, the system will prompt you to set up Windows XP. Follow the onscreen procedure, accepting the license agreement and defaults where necessary.

---

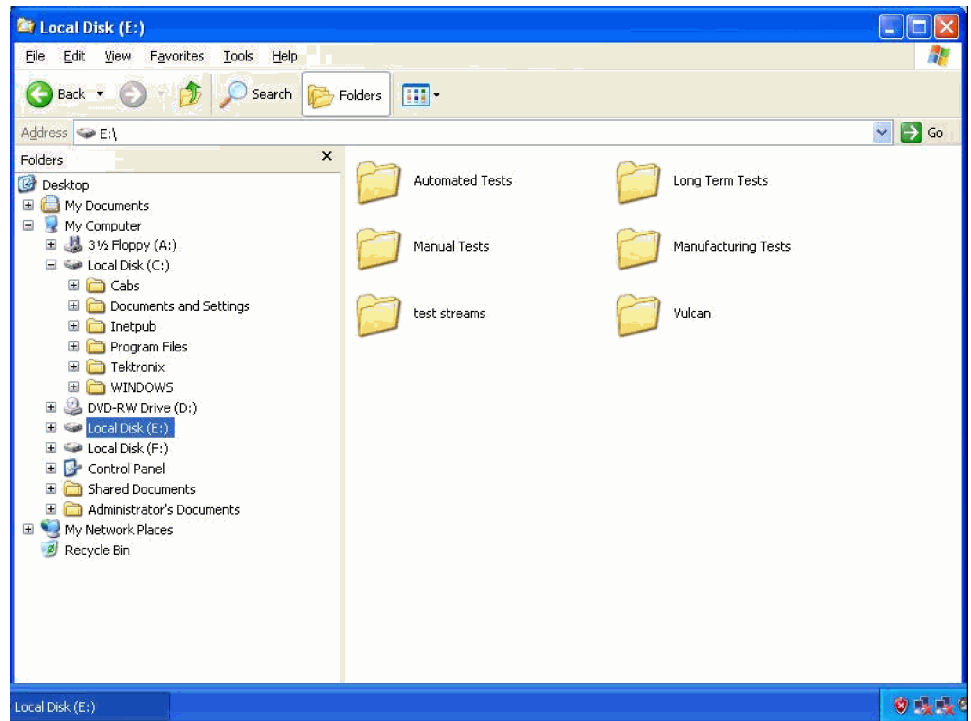
**NOTE.** The screen will go blank for a few minutes during this process. Do not turn the instrument off.

---

7. The system will restart on its own.

### **Reinstate the SCSI Drives**

After restoring the operating system, confirm that the SCSI drives (drives E and F) have been recognized by the system. Figure 16 shows the drives in Windows Explorer.

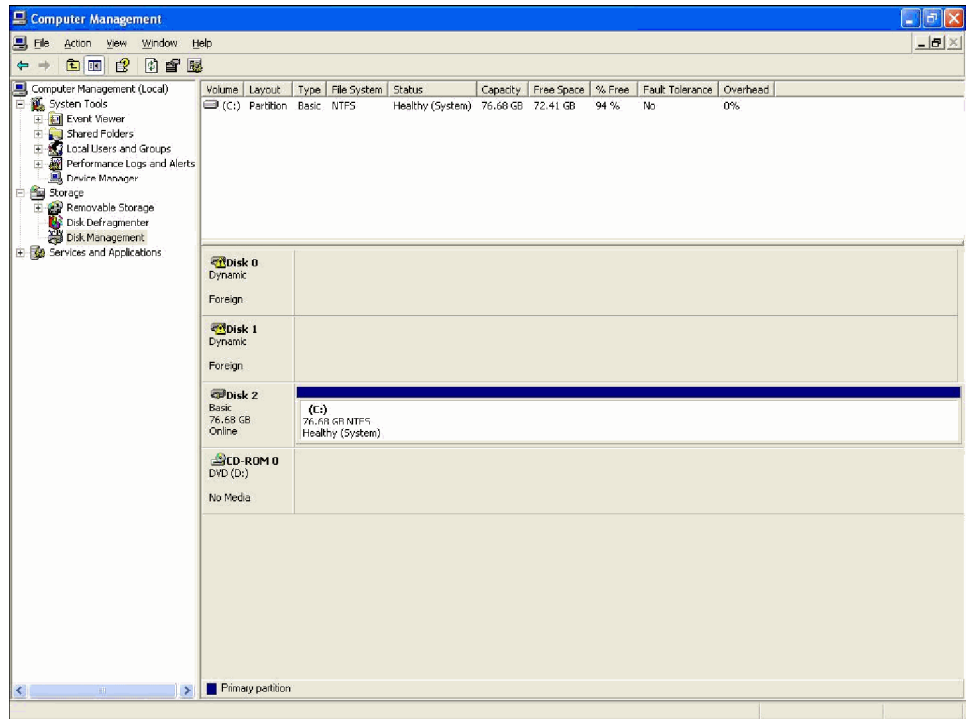


**Figure 16: SCSI drives automatically recognized**

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

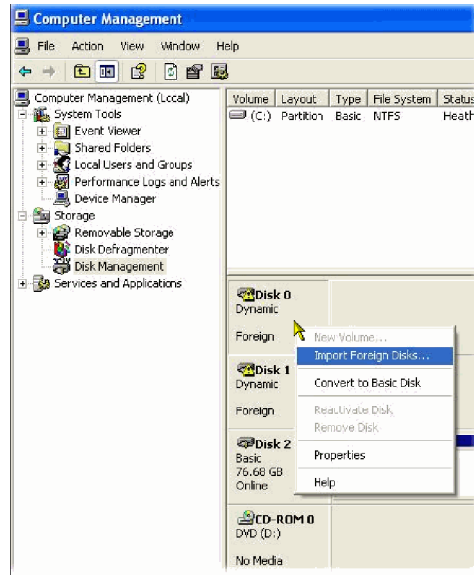
1. Open the Windows Disk Management window (**Start > Control Panel > Performance and Maintenance > Administrative Tools > Computer Management > Storage > Disk management**).

Note that Disk 0 and Disk 1 are described as Foreign, as shown in Figure 17.



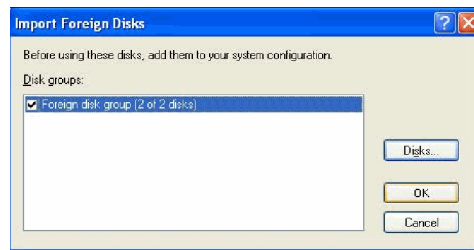
**Figure 17: Computer Management - SCSI drives, foreign**

2. Right-click on Disk 0 or Disk 1 and select **Import Foreign Disks...** from the shortcut menu (see Figure 18).



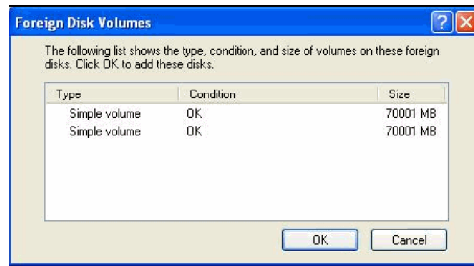
**Figure 18: Select Import Foreign Disks...**

3. In the Import Foreign Disks dialog box, ensure that the disk group is checked and select OK. See Figure 19.



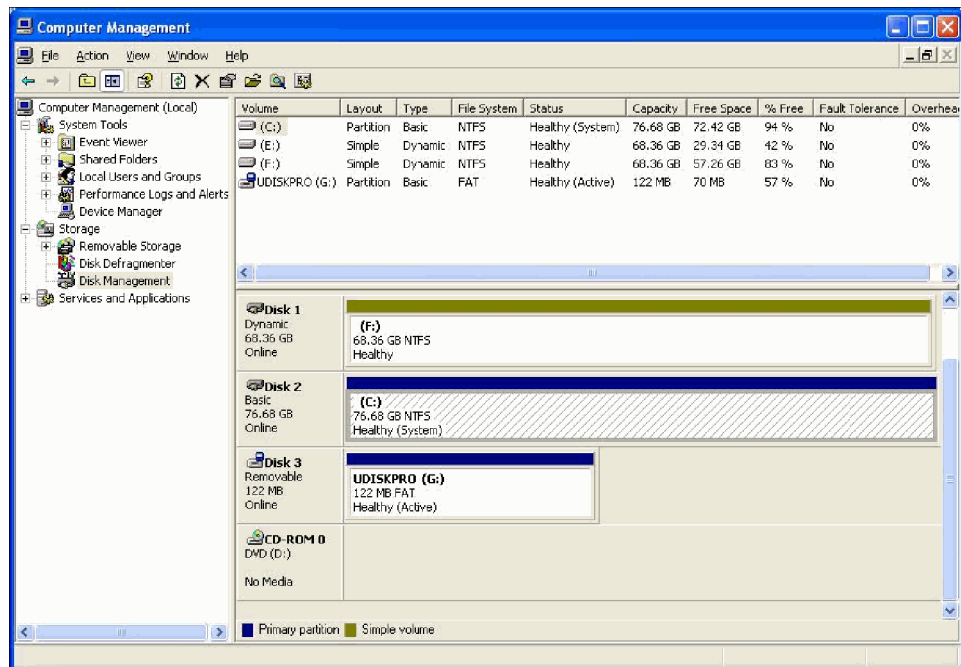
**Figure 19: Import Foreign Disks dialog box**

4. In the Foreign Disk Volumes dialog box, select OK. See Figure 20.



**Figure 20: Foreign Disk Volumes dialog box**

5. This takes a little time. Wait until the drives appear in the upper window, as shown in Figure 21.



**Figure 21: 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 initiate 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, using the procedure above, starting on page 27.

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 Instructions

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 shown in Figure 22.

---

**NOTE.** *If the CD-ROM fails to autostart, use Windows Explorer to locate and run the following file on the CD-ROM: start.exe.*

---

4. Click **Next**.
  - If you have not installed Option GBE, just accept the defaults during the upgrade process and reboot when complete. Go to step 13 on page 34.
  - 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 23). Continue to step 5.

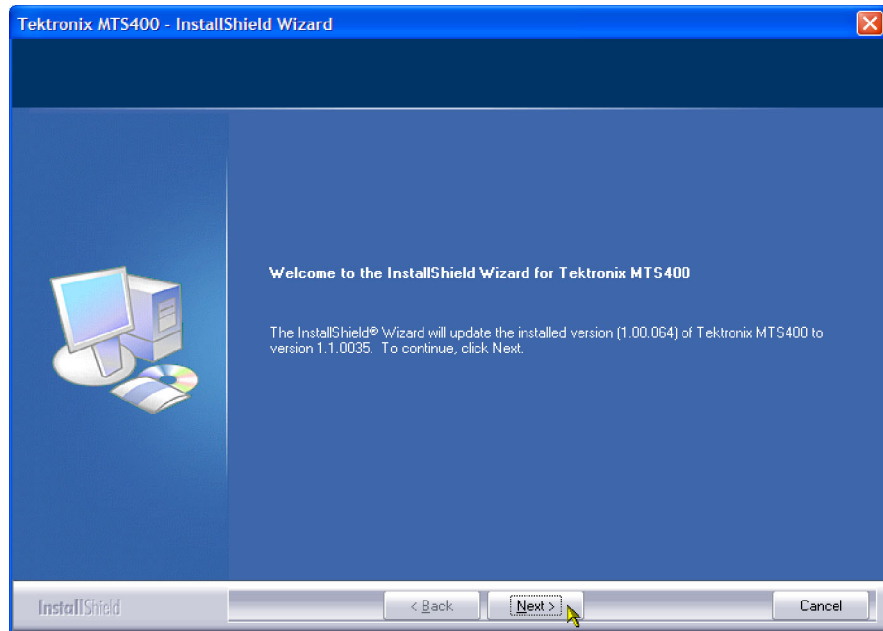


Figure 22: InstallShield Wizard welcome screen

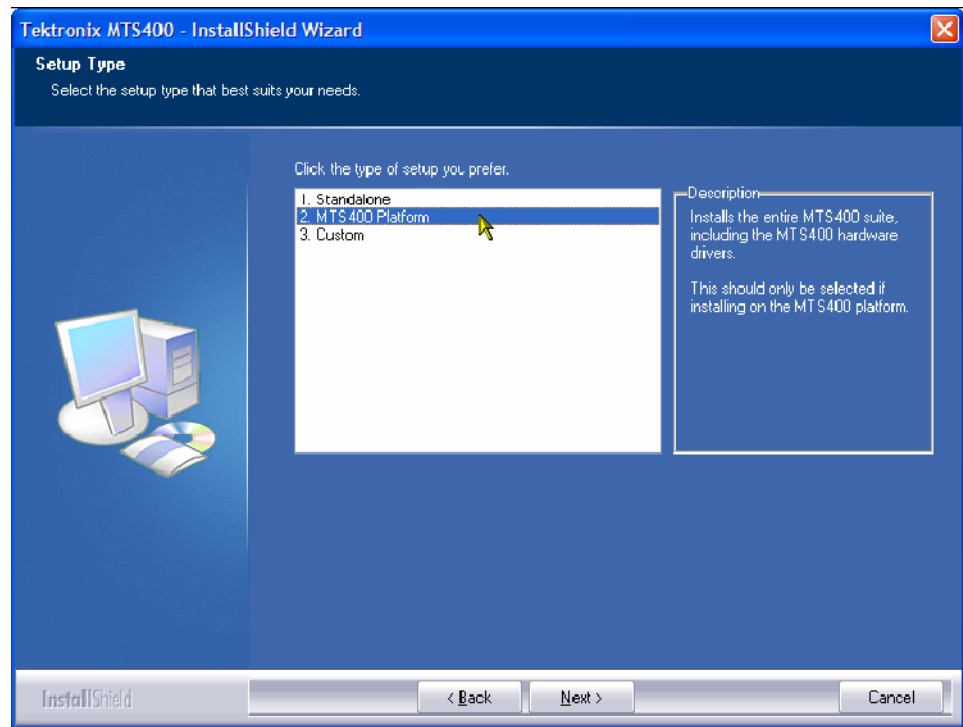


Figure 23: MTS400 Installation - Setup Type



5. Choose **2. MTS400 PLATFORM** 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 24.

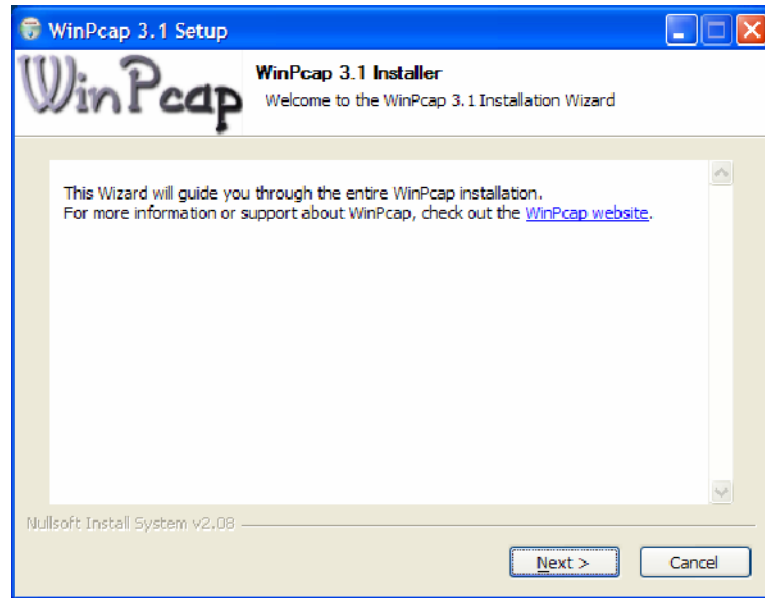
---

**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.

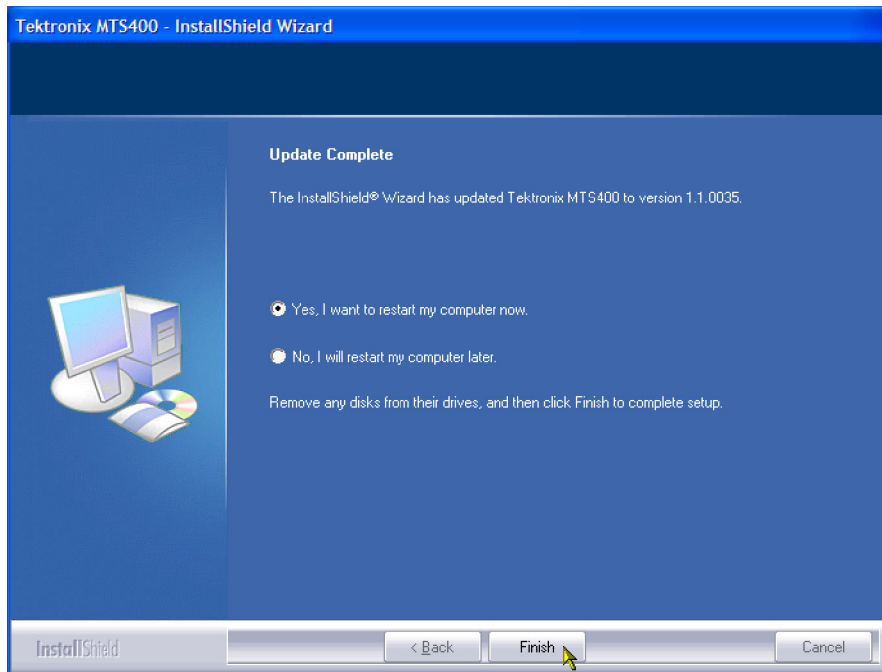
---



**Figure 24: WinPcap Setup dialog**

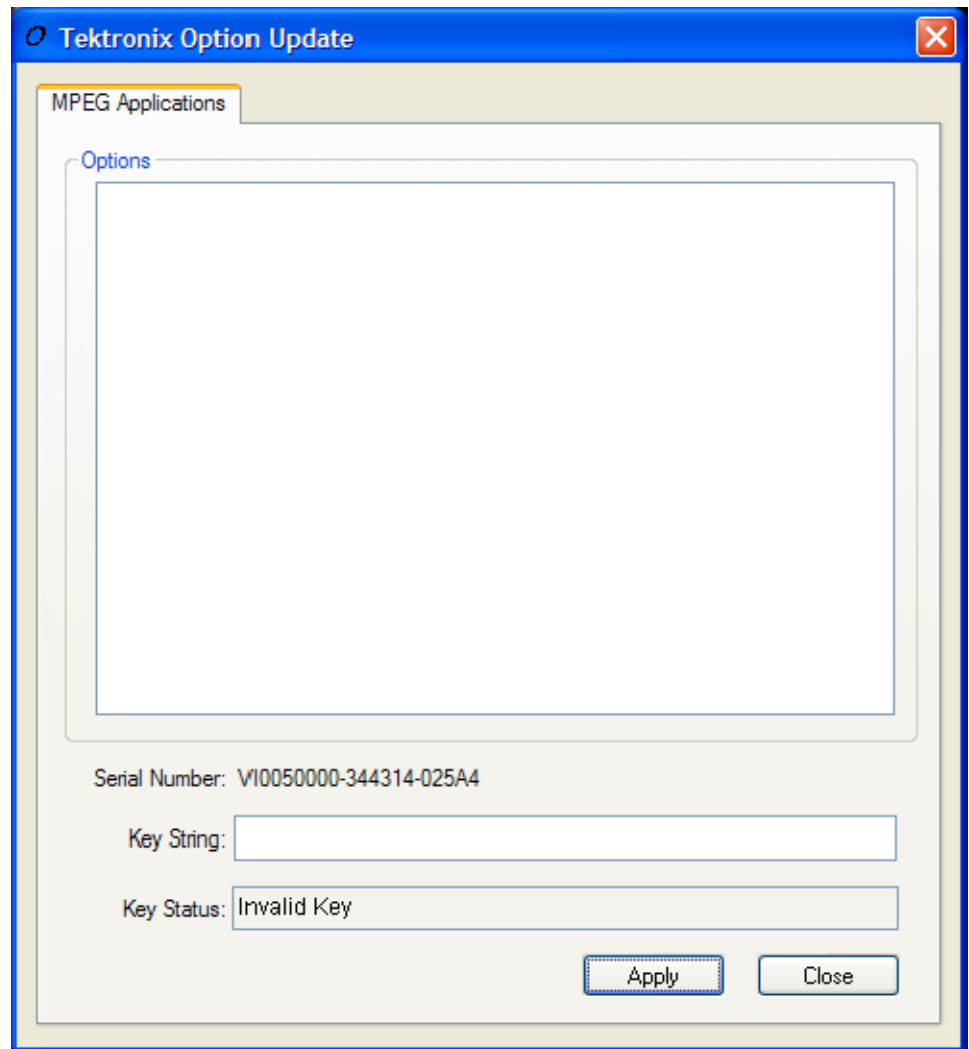
8. In the WinPcap Setup dialog box, select **Next**.

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 as shown in Figure 25.



**Figure 25: InstallShield Wizard update complete screen**

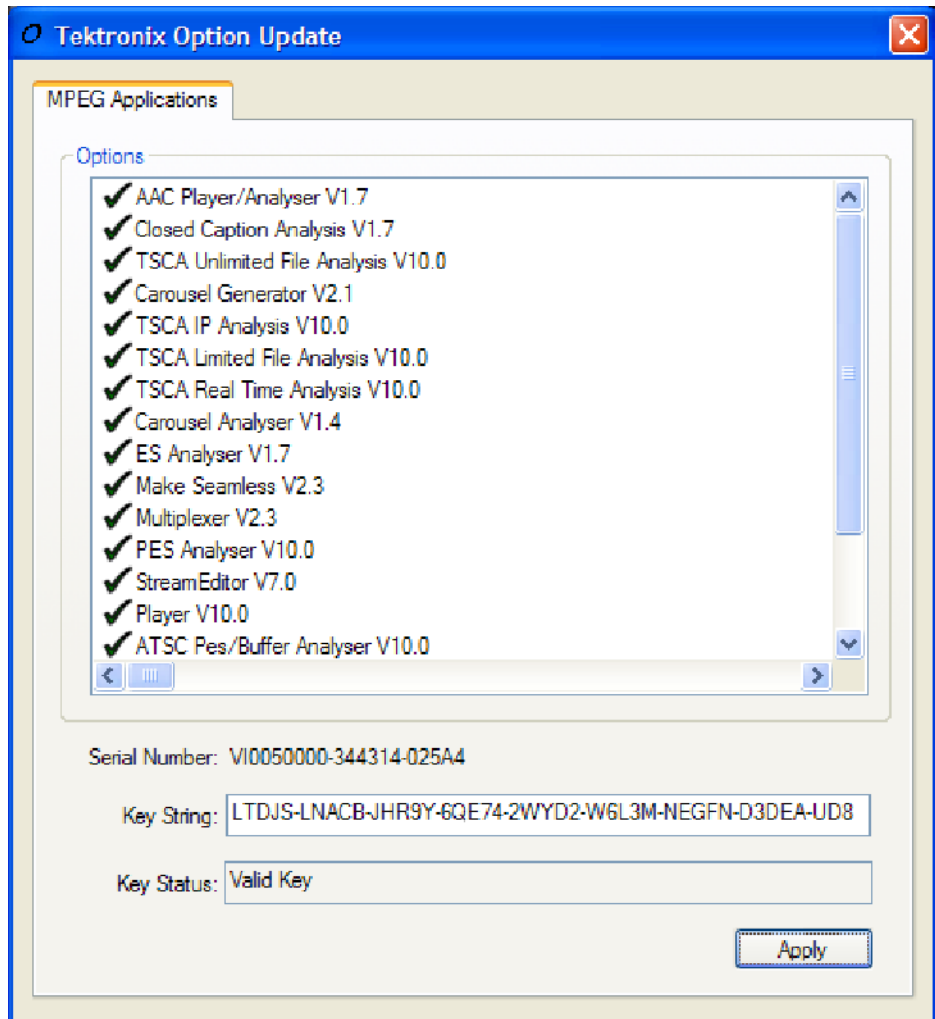
12. Select the **Yes, I want to restart my computer now** option, and then click **Finish**. The instrument or PC will shut down and then restart.
13. After the unit has completed the start-up process, start the Tektronix Option Update wizard by selecting **Start > Programs > Tektronix MTS400 > OptionKey Wizard**. The Option Update window should open, as shown in Figure 26.



**Figure 26: 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 27).



**Figure 27: 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, as shown in Figure 5. 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 Instructions

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, as shown in Figure 5. 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 Upgrades (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.

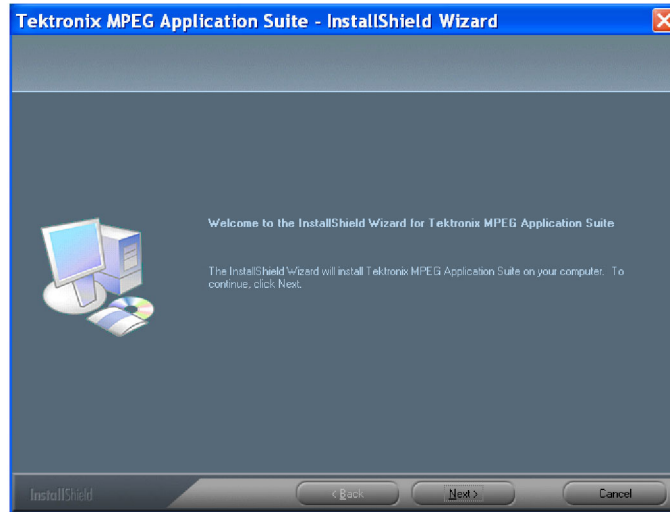
## Software Upgrade

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

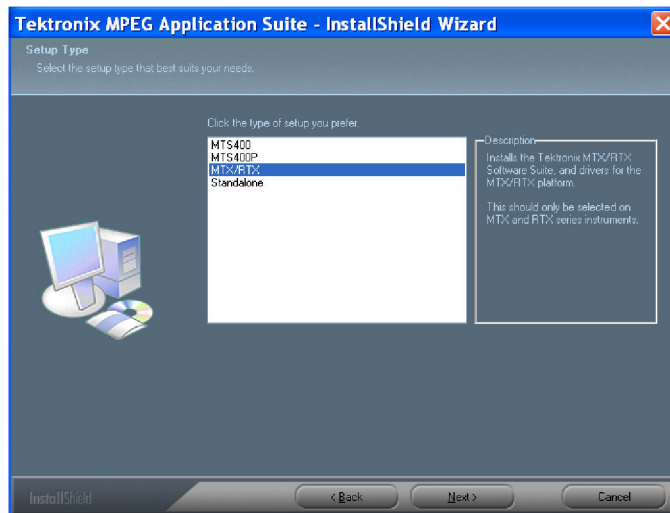
1. Connect the USB flash drive to the USB connector of the instrument. A dialog box with various install options is displayed.



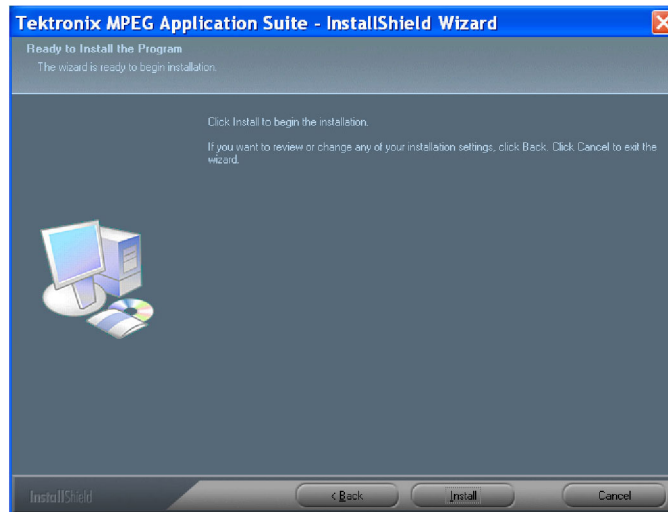
2. Select **Install Tektronix MPEG Application Suite** and click **OK**. Immediately, an InstallShield Wizard that allows you to install the application is displayed. Click **Next** to continue.



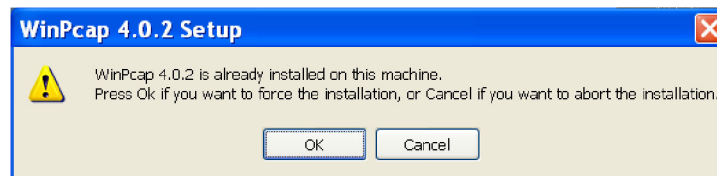
3. Select MTS400P as the Setup type and click Next to continue.



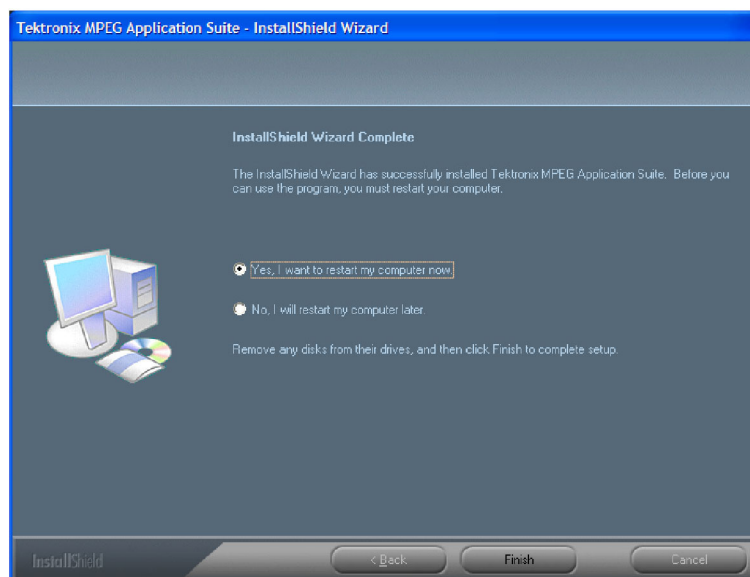
4. Click Install to begin the installation process.



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.

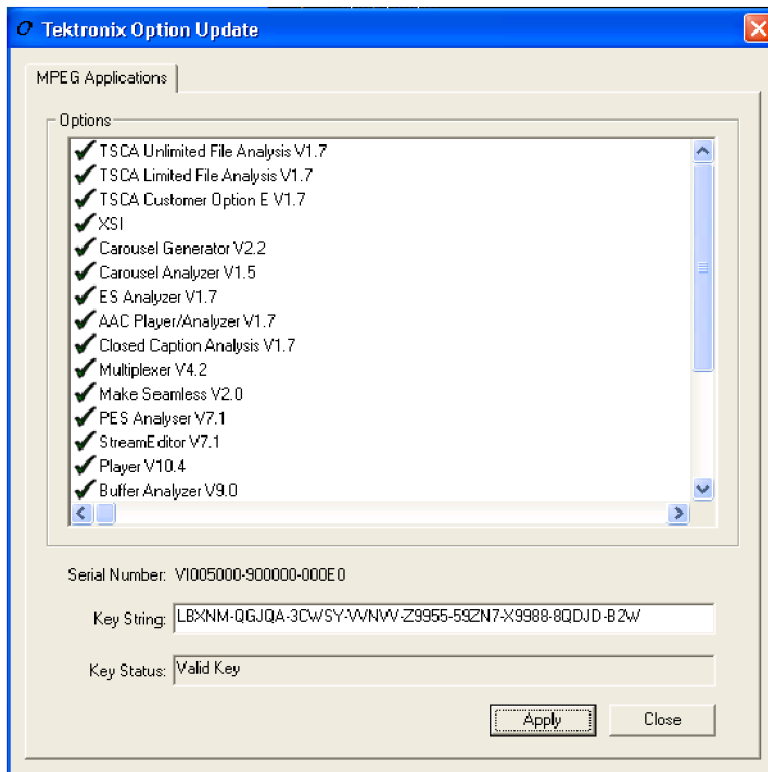


7. Perform steps 3 through 7 listed in the *Entering the Option Key* section to enter the UPG option key. (See page 41.)

### Entering the Option Key

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

1. Connect a keyboard and mouse to the USB connectors of the instrument (if they are not already installed).
2. Power on the instrument and wait for it to start.
3. Connect the dongle that is supplied with the instrument.
4. From the Start menu, select **Programs > Tektronix MTS400 > Optionkey Wizard** to open the Tektronix Option Update dialog box. (See Figure 28 on page 42.)



**Figure 28: Tektronix Option Update dialog box**

5. Refer to the option key document that is supplied with the kit to identify the option key numbers.
6. 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.

7. Apply the label of the ordered option to the right side of the cabinet.
8. 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.

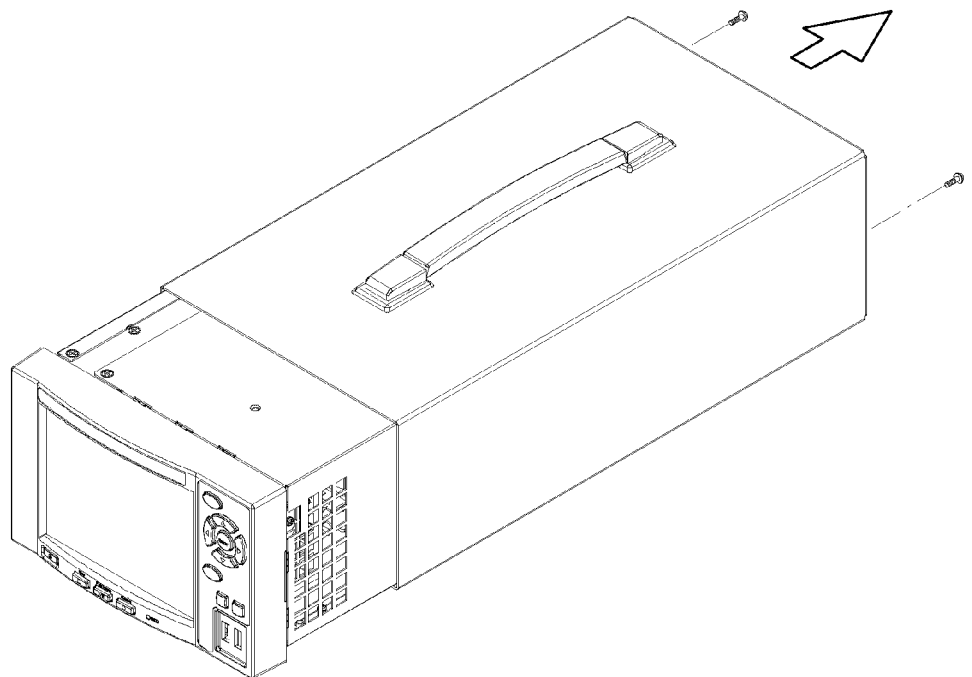


**WARNING.** Dangerous voltages may be present inside the instrument. Before performing the hardware procedures, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury.

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

### Remove the Cabinet

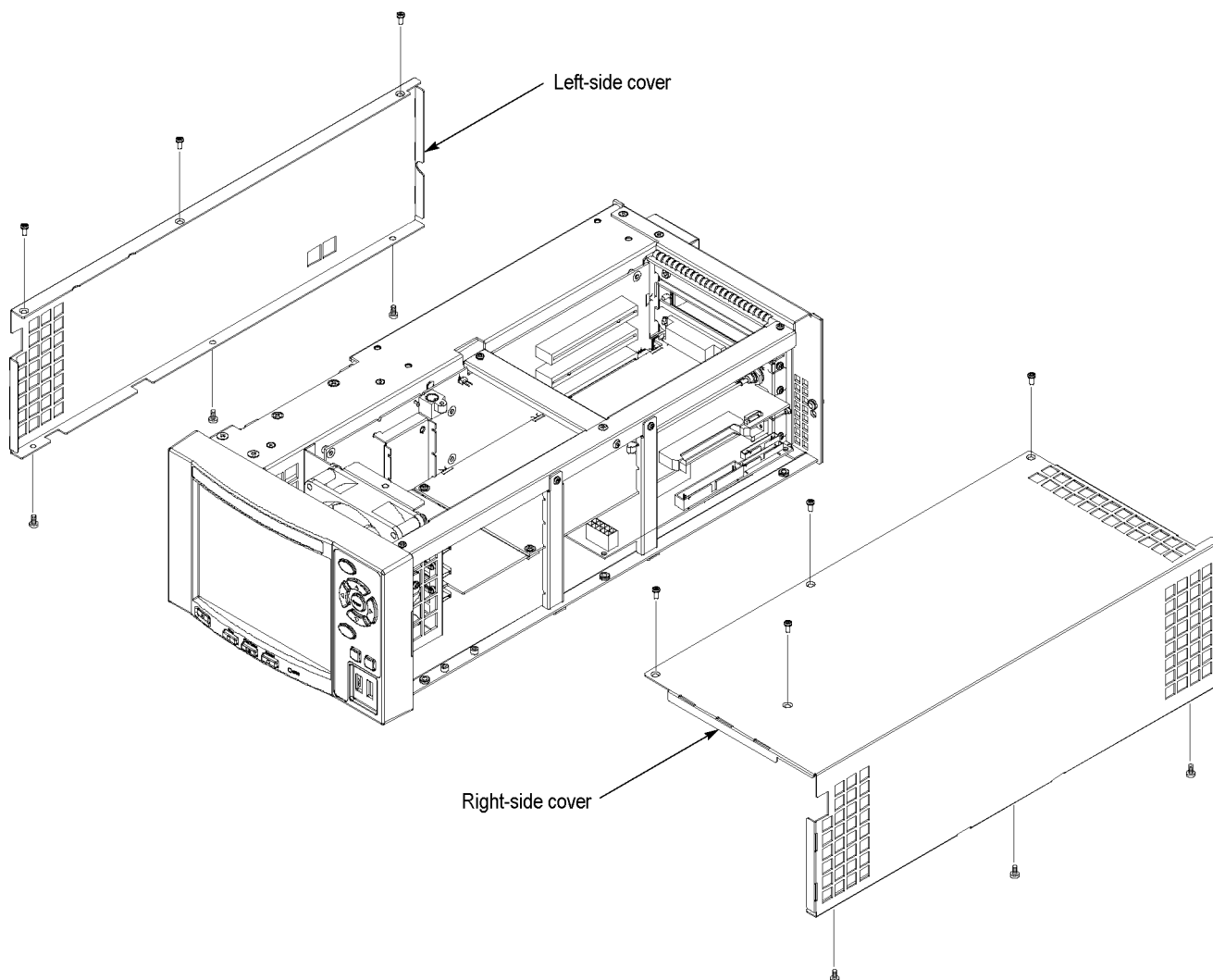
1. Disconnect all external cables and the power cord from the MTS400P rear panel.
2. Use a screwdriver with a T15 TORX tip to remove the two screws securing the cabinet to the instrument. (See Figure 29.)
3. Slide the instrument forward to remove the instrument from the cabinet. (See Figure 29.)



**Figure 29: Removing the MTS400P cabinet**

### Remove the Right-side and Left-side Covers

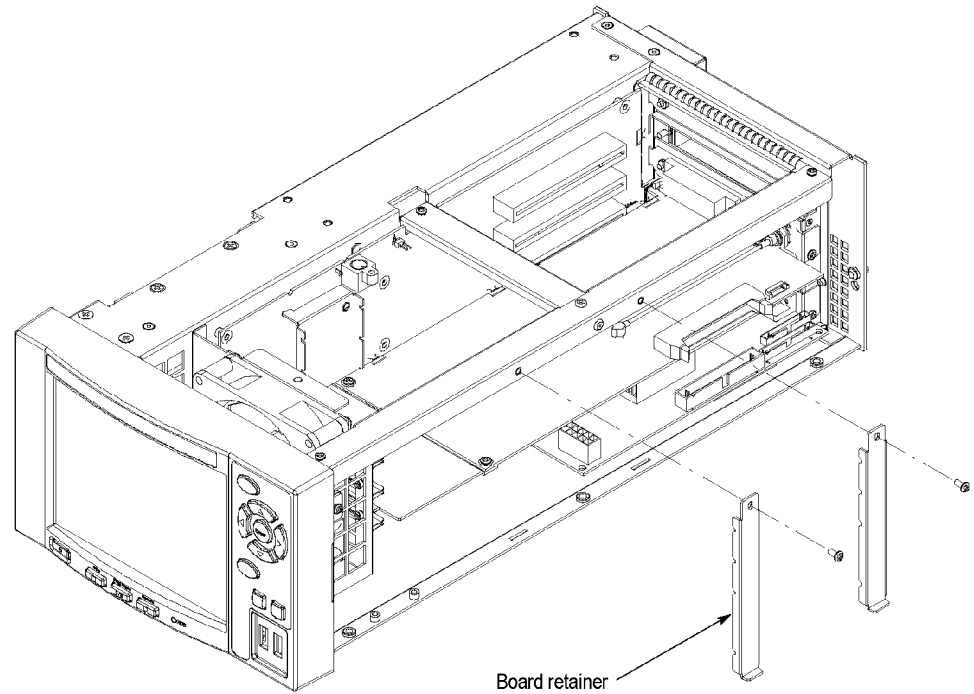
1. Set the instrument so that the left side is down on the work surface and the front is facing you.
2. Use a screwdriver with a T10 TORX tip to remove the seven screws securing the right-side cover to the top and bottom of the chassis. (See Figure 30.)
3. Remove the right-side cover from the chassis.
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 30.)
6. Remove the left-side cover from the chassis.



**Figure 30: Removing the right-side and left-side covers**

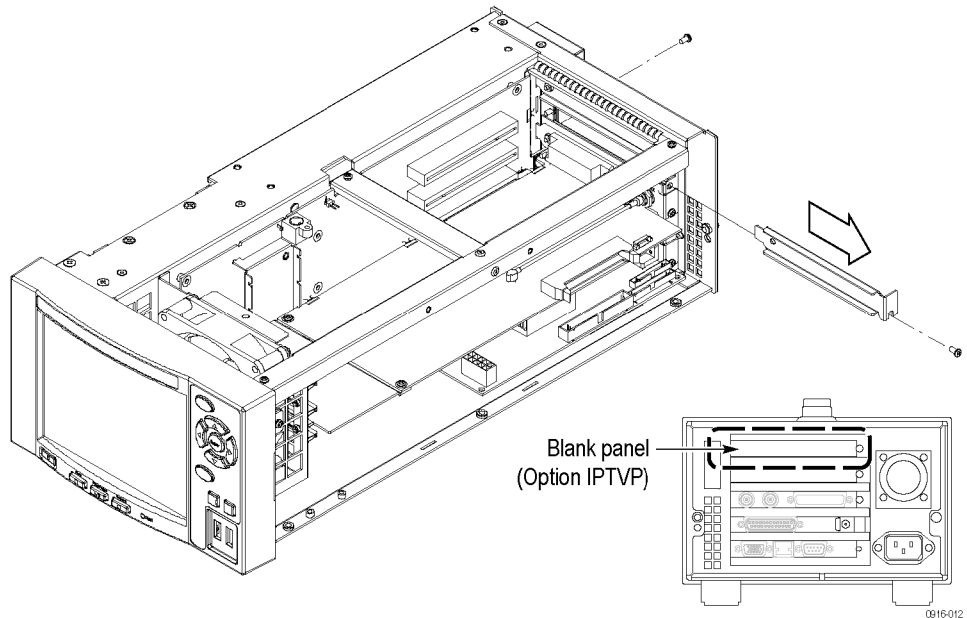
**Remove the Board Retainers**

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 31.)
3. Lift the retainers away from the chassis. (See Figure 31.)

**Figure 31: Removing the board retainers**

### Remove the blank panel

1. 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.
2. Lift the blank panel away to remove it. (See Figure 32.) Save the screws.



**Figure 32: Removing the top blank panel**

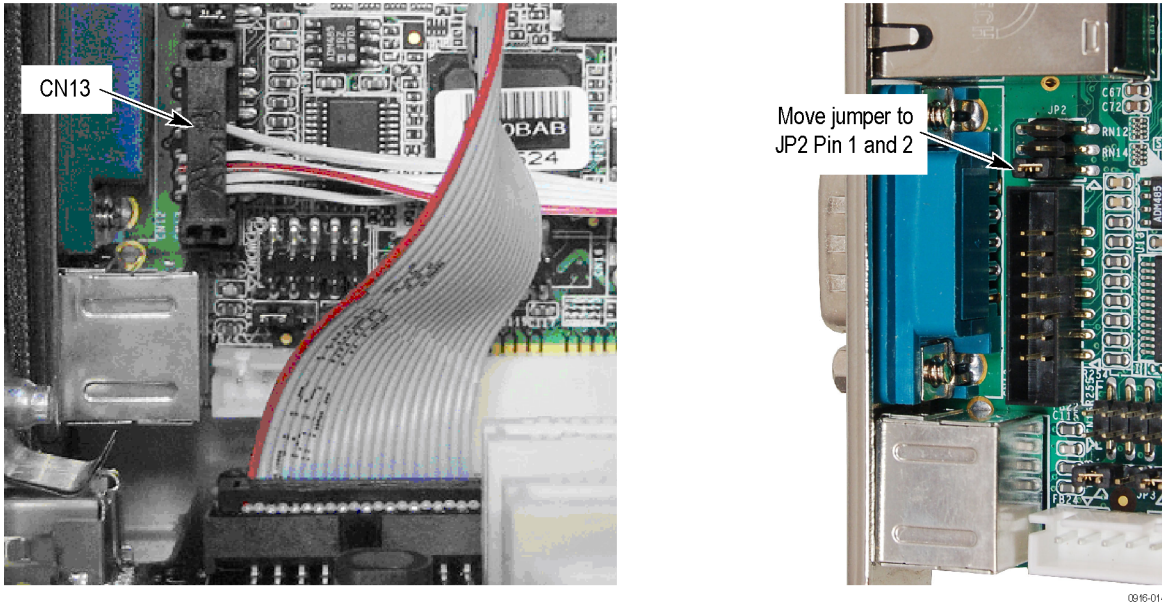
## MTS4UP IPTVP Upgrade Instructions

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

### Install the Option IPTVP Cable

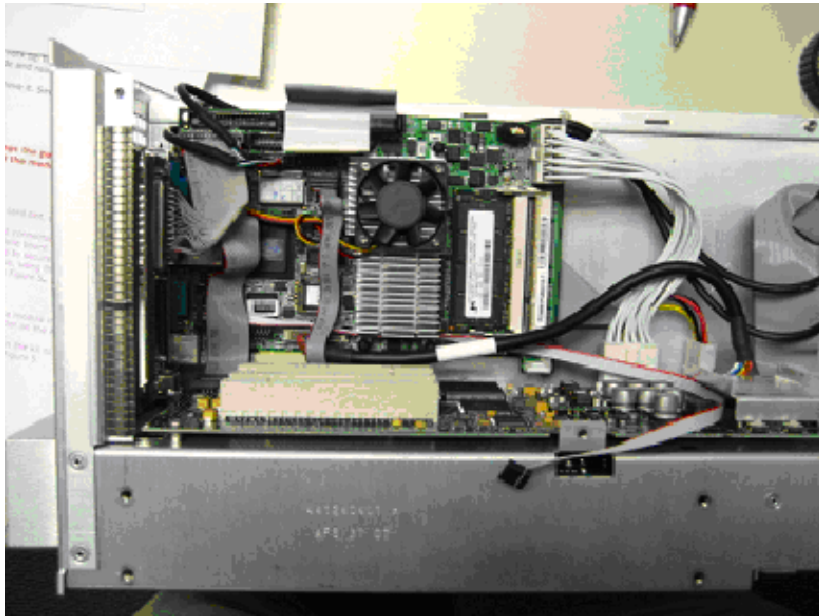
1. Locate the A170 SMPTE310M/ASI/SPI Interface (slot 2) and the A12 Main board (slot 3).
2. Remove the screws securing the A170 SMPTE310M/ASI/SPI Interface board and set them aside.
3. Gently remove the A170 SMPTE310M/ASI/SPI Interface board from the instrument and set it aside.
4. Remove the screws 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 33).
  - b. Connect one end of the RS232 CIP cable, provided in the kit, to CN13 (see Figure 33).



**Figure 33: Jumper and RS232 CIP cable connection on Processor board**

7. Route the new cable across the bottom of the instrument as shown in the following figure. You will connect the other end of the cable later.



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.

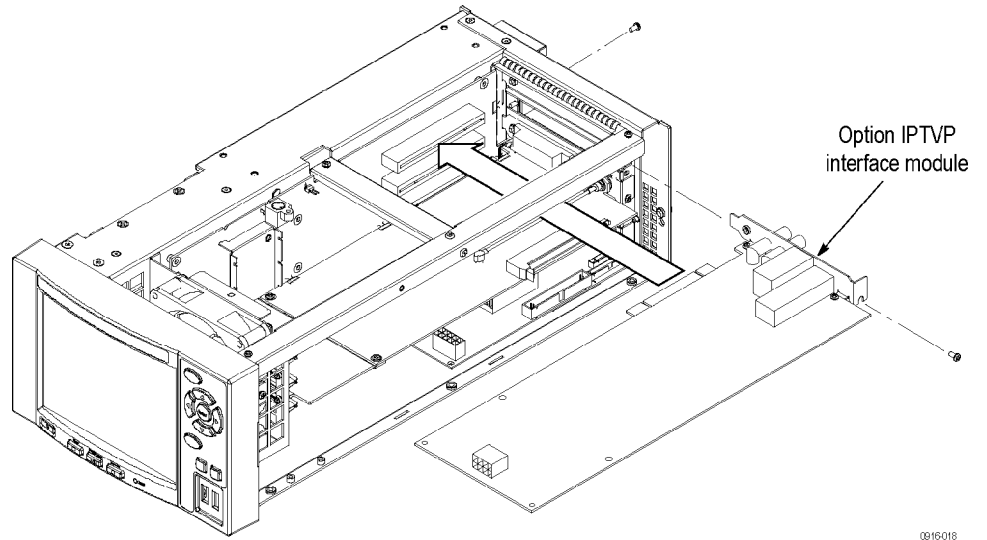
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**CAUTION.** *The cables and parts of the interface module can be damaged if you improperly insert the module into the instrument. To avoid damaging any parts, use care when you insert the module into the instrument.*

---

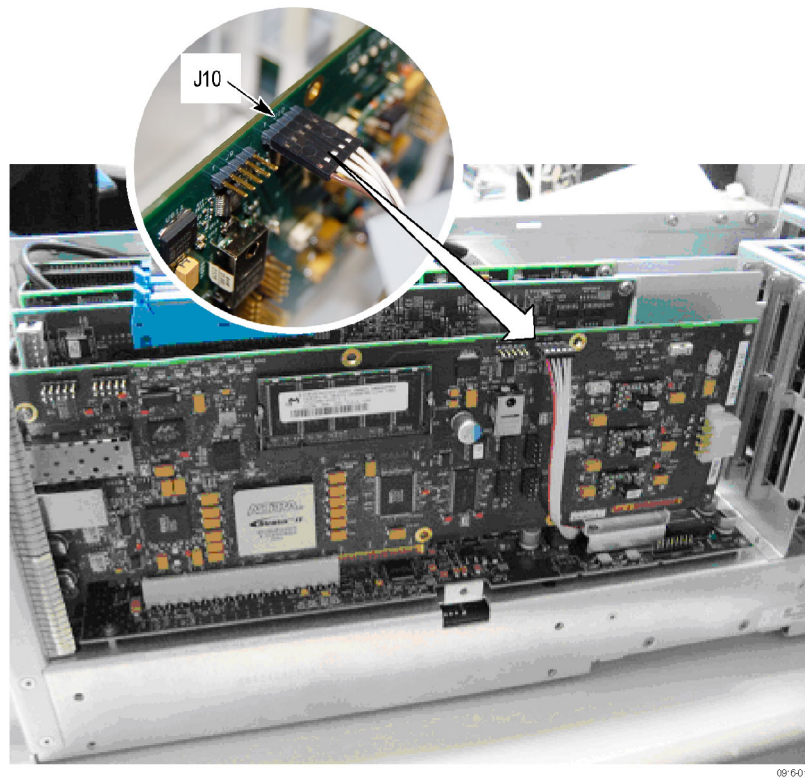
1. Insert the interface module into the upper card slot (slot 1), paying attention to the module orientation. (See Figure 34.)
2. Push the IPTVP module in until the board-edge connector is firmly seated in the A20 PCI Backplane board connector.
3. Secure the interface module at the side and rear of the chassis, using the two screws that were removed from the top blank panel.





**Figure 34: Installing the Option IPTVP interface module**

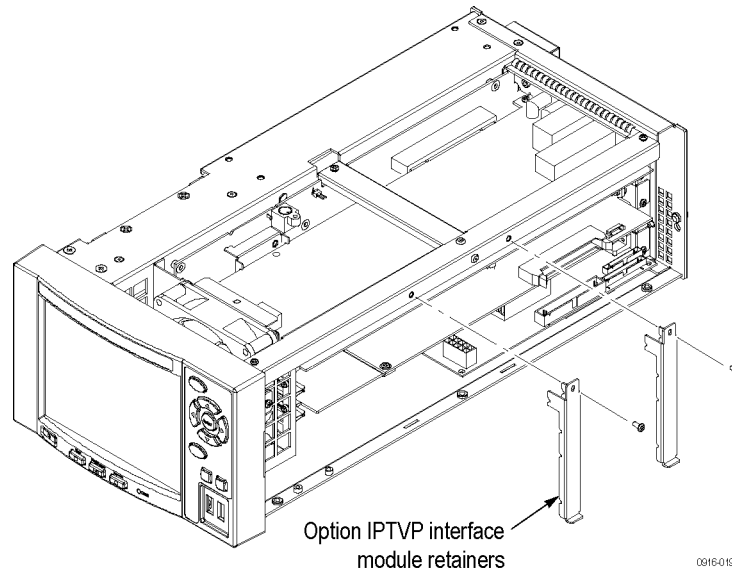
4. Connect the free end of the new RS232 CIP cable to J10 on the interface module as shown in Figure 35.



**Figure 35: 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 36.) 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.



**Figure 36: Installing the Option IPTVP board retainers**

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

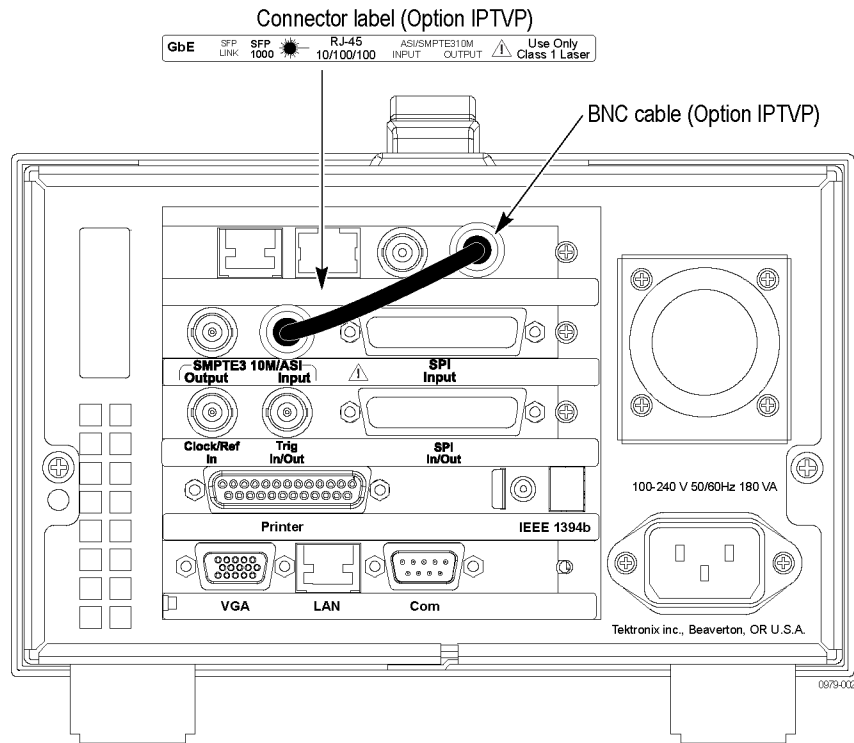
1. Use a screwdriver with a T10 TORX tip to install the seven screws securing the right-side cover to the top and bottom of the chassis.
2. Use a screwdriver with a T10 TORX tip to install the six screws securing the left-side cover to the top and bottom of the chassis.

**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 37.)



**Figure 37: Apply the connector label**

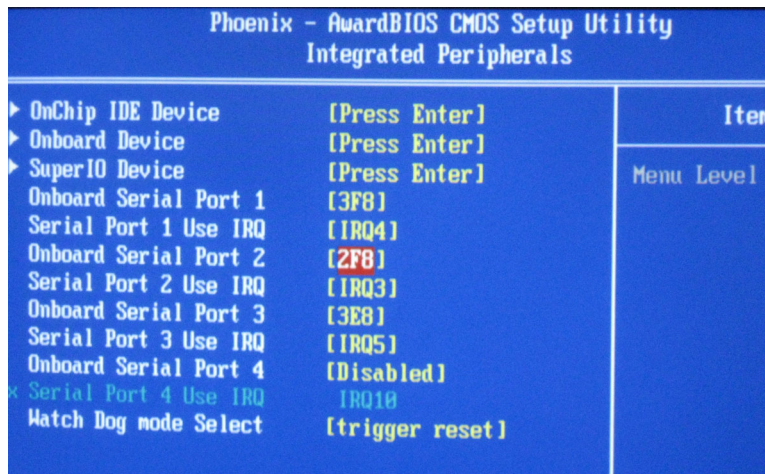
### Connect the BNC Cable

Connect the BNC cable, provided in the kit, as shown in Figure 37.

### 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, as shown in Figure 38 on page 52.



**Figure 38: Enabling COM2**

## Option LX, Option SX, or Option ZX SFP Module Upgrade

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.



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**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.

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**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.

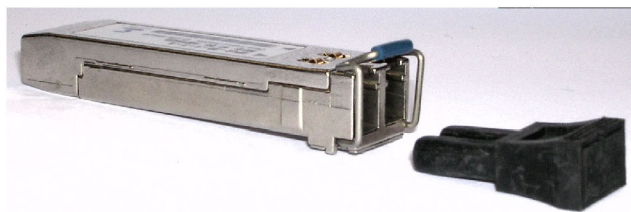
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The following figure shows an SFP module with the optical port plug removed. Use the plug to protect the optical interface when no cable is connected or the module is not in use.

---

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

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

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### SFP Installation

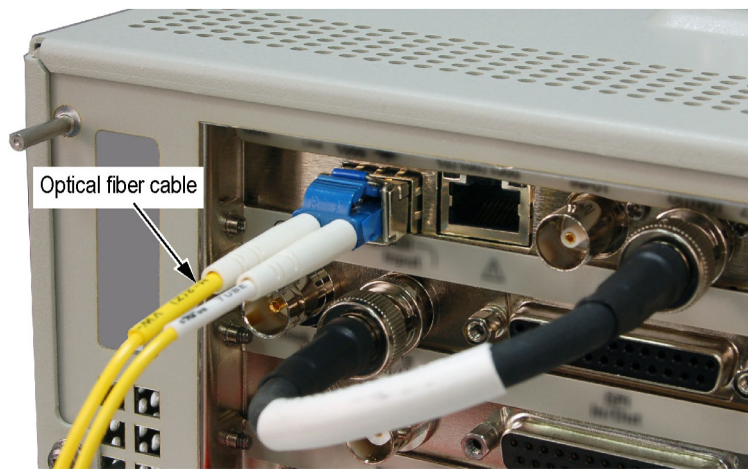
Perform the following steps to install an SFP module into the IPTV or GbE interface module:



**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 as shown in Figure 39. 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.

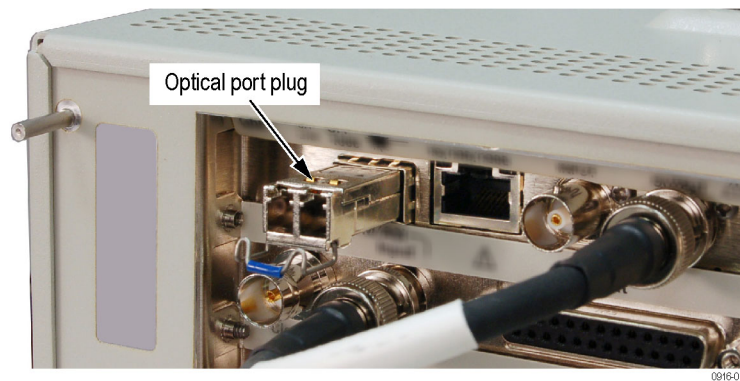


**Figure 39: Optical cable connected**

### 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 as shown in Figure 40.



**Figure 40: SFP 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 ❑