

**TG700 and TG8000
Multiformat Test Signal Generators
Module Installation**

Instructions

www.tektronix.com



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Tektronix

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- = 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.

While using this product, you may need to access other parts of a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.

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.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

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.

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

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.

Introduction

This document provides instructions for installing generator and special function modules in the TG700 and TG8000 generator mainframes. The installation process includes upgrading the instrument firmware to the latest version. These instructions also apply if you are installing a replacement Power Supply module in a TG8000 mainframe (TG800UP PW kit).

These instructions are composed of the following sections:

- *Firmware Upgrade* describes how to upgrade the firmware of the TG700 and TG8000 mainframes.
- *Installation Instructions* describes how to install and remove modules from the TG700 and TG8000 mainframes.
- *Entering the Option Key (SDI7 Option 3G only)* describes how to enter the option key that is required to enable Option 3G on the SDI7 module.

For detailed information about module features and specifications, refer to the appropriate User Manual or Specifications and Performance Verification Technical Reference document for your product. These documents are included on the DVD that was supplied with the module.

Standard accessories

The following accessories are shipped with each module:

- *TG700 and TG8000 Module Installation Instructions* (this document)
Tektronix part number: 075-1045-XX
- *TG700 and TG8000 SW Library and Documentation DVD*
Tektronix part number: 063-4440-XX

Product documentation

The user documentation for your product is located on the *TG700 and TG8000 SW Library and Documentation DVD* supplied with this upgrade kit. Check the Tektronix Web site for the latest version of the documents (www.tektronix.com\downloads).

Firmware upgrade

This section describes how to upgrade the firmware of the TG700 and TG8000 mainframes. Procedures are provided for each of the mainframe types:

- TG700 firmware upgrade (See page 5.)
- TG8000 firmware upgrade (See page 11.)

You do not need to upgrade the instrument firmware if the firmware version on the DVD provided with this kit is the same as the firmware version already installed on your TG700 or TG8000 mainframe. In this case, proceed to *Installation Instructions*. (See page 18.)



CAUTION. *If the firmware version listed on the DVD provided with this kit is later than the firmware version installed on your TG700 or TG8000 generator, be sure to upgrade the firmware before installing the module.*

TG700 firmware upgrade

This section describes how to upgrade the firmware of the TG700 mainframe.

You do not need to upgrade the instrument firmware if the firmware version on the DVD provided with this kit is the same as the firmware version already installed on your TG700 mainframe. In this case, proceed to *Installation Instructions*. (See page 18.)



CAUTION. *If the firmware version of the DVD provided with this kit is later than the firmware version installed on your TG700 mainframe, be sure to upgrade the firmware of the mainframe before installing the module.*

Equipment required

The following equipment is required to upgrade the firmware:

- PC with Windows 2000/Vista/XP/7 and Ethernet interface installed
- 10 BASE-T Ethernet cable (crossover or straight)
- TG700 Signal Generator Platform Software Library DVD provided with the new module

TG700 mainframe memory requirements

With software version 5.6, the TG700 mainframe must have at least 32 MB of memory installed. If you intend to install frame picture files (*.pic), created by the Frame Picture Generator application for the DVG7, HDVG7, AVG7, or AWVG7 modules, or if you intend to install bitmap frame picture files (*.bmp) for the SDI7 module, then the mainframe must have 64 MB of memory installed.

Software upgrades. If your existing mainframe has 32 MB of memory and you have loaded the TG700 memory with frame picture files, you may not be able to upgrade the instrument to software version 5.6.

If you receive a memory error while attempting to upgrade the software version, you need to either delete some of the frame picture files or upgrade your instrument to 64 MB of memory.

Memory upgrades. Option FP provided extra memory, which allowed the TG700 mainframe to support the Frame Picture Generator application. This option is no longer necessary for new TG700 mainframes.

If you have an older mainframe with less than 64 MB of memory, you can increase the memory in your mainframe to 64 MB by ordering the following upgrade kit: 040-1698-xx. Contact your local Tektronix representative for more information.

TG700 upgrade procedure

NOTE. Refer to Mainframe Memory Requirements before you perform the upgrade procedures. (See page 5.)

Perform the following procedure to upgrade the firmware. It is not necessary to uninstall the earlier version.

1. If you are connecting the TG700 directly to a PC:
 - a. Using a crossover Ethernet cable, connect between the 10 BASE-T port on the TG700 and the Ethernet port or NIC on the PC.
 - b. Power on the TG700 and the PC.
 - c. Identify the PC's IP address and subnet mask.

NOTE. You can find the PC's IP address and subnet mask by bringing up the "Command Prompt", using the "Startup" menu under "Accessories" and typing "ipconfig" at the prompt.

 - d. Set the IP address of the TG700 such that all the digits are the same except for the last digit, which should be changed by 1.
 - e. Set the subnet mask of the TG700 to the same subnet as the PC.
 - f. Proceed to step 4.
 2. If you are connecting the TG700 to your local Ethernet network using a static IP address:



CAUTION. Using an IP address that is already in use can cause network conflicts, resulting in system instability and/or the system locking up. Ensure that the IP address is not already in use before connecting to the network. Contact the network administrator for assistance.

- a. Power on the TG700.
- b. Set the IP address of the TG700 as specified by the network administrator.
- c. Set the subnet mask of the TG700 as specified by the network administrator.
- d. Using a straight Ethernet cable, connect between the 10 BASE-T port on the TG700 and the Ethernet hub port of your local network. By connecting to an Ethernet network, you can access the TG700 using any PC on the network.
- e. Power on a PC connected to the network and proceed to step 4.

3. If you are connecting the TG700 to your local Ethernet network using a DHCP server (dynamically allocated IP addresses):
 - a. Power on the TG700.
 - b. Set the NET SETUP:DHCP setting to Enable on the TG700.
 - c. Power off the TG700.
 - d. Using a straight Ethernet cable, connect the 10 BASE-T port on the TG700 to the Ethernet hub port of your local network. By connecting to an Ethernet network, you can access the TG700 using any PC on the network.
 - e. Power on the TG700 and a PC connected to the network.
 - f. Identify the IP address assigned to the TG700 by the DHCP server.
 - g. Proceed to step 4.
4. Insert the *TG700 Signal Generator Platform SW Library and Documentation DVD* provided with the new module into the DVD drive on your PC.
5. When the Product Software and Documentation Browser window appears, select the **Mainframe and Module Software** link.
6. Select one of the following upgrade options:
 - Select **Upgrade to V5.X** if your mainframe has 32 MB or more of memory.
 - Select **Upgrade to V4.1** if your mainframe has 16 MB of memory.

The PC will open a Windows Explorer window displaying the contents of the selected upgrade folder.

NOTE. With software version 5.6 and later, it is strongly recommended that the TG700 mainframe have 64 MB of memory if you intend to install logo and/or frame picture files into a DVG7, HDVG7, or SDI7 module. (See page 5, *TG700 mainframe memory requirements*.)

7. Double-click the tgUpgrade.exe icon in the folder. The TG700 Upgrade dialog box appears as shown in the following figure.

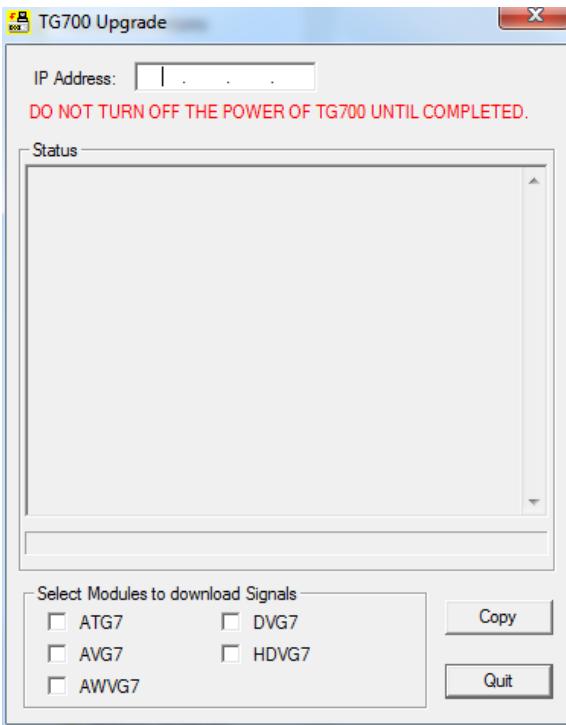


Figure 1: TG700 Upgrade dialog box

NOTE. In the following cases, an error message appears when you double-click the tgUpgrade.exe icon. If this happens, copy all of the files in the Upgrade folder to the hard disk, and then repeat the operation.

- When you upgrade the TG700 with firmware version 1.3 or earlier and use the ATG7, AVG7, or AWVG7 module in it.
 - When you upgrade the TG700 with firmware version 2.1 or earlier and use the AVG7 or AWVG7 module in it.
-

8. In the dialog box, enter the IP address that you assigned to your TG700.
9. If you want to download the signals for the specified module(s), use the check boxes at the bottom of the dialog box. Normally, you do not need to select any check boxes. Select the appropriate check box(es) in the following cases:
 - ATG7 check box: when you upgrade the TG700 mainframe with firmware version 1.3 or earlier and use the ATG7 module in the mainframe.
 - AVG7 check box: when you upgrade the TG700 mainframe with firmware version 2.1 or earlier and use the AVG7 module in the mainframe.
 - AWVG7 check box: when you upgrade the TG700 mainframe with firmware version 2.1 or earlier and use the AWVG7 module in the mainframe.
10. Click the **Copy** button. The PC will start transferring the files in the Upgrade folder to the TG700.



CAUTION. *Do not power off the TG700 until the file transfer is complete. Doing so will prevent the instrument from starting up normally.*

11. When the file transfer is complete, the message box shown below appears.



Figure 2: Message box appearing after the file transfer is complete

12. Click the **OK** button in the message box.
13. Disconnect the power cable from the power cord connector on the TG700 rear panel, and then connect it again to restart the instrument.

14. If your TG700 includes an HDLG7 module, proceed with the following steps to complete the upgrade:



CAUTION. *While upgrading, do not press the front panel buttons or cycle the instrument power. Doing so can corrupt the module memory and FPGA image.*

- a. Power on the TG700.
- b. Press the **MODULE** button until the name of the module you are upgrading appears.
- c. Press and hold the **ENTER** button until “Upgrade FPGA” appears .
- d. Press the **ENTER** button to upgrade the module.
- e. The upgrade will take approximately three minutes. After it is complete, remove power from the TG700 and then reapply power to reboot the system.

NOTE. *If you are upgrading the FPGA of multiple modules, you need to upgrade them separately and reboot the instrument after each upgrade. For example, if you have three HDLG7s, the FPGA upgrade process sequence will be: select and upgrade a module, then reboot, then select and upgrade another module, then reboot, select and upgrade the final module, then reboot. You do not need to upgrade the modules in any particular order.*

TG700 firmware version check

Perform the following procedure to verify that the new firmware version was properly installed:

1. Press the front-panel MODULE button to display the TG700 main menu.
2. Use the up (▲) or down (▼) arrow button to select **UTILITY**, and then press the **ENTER** button.
3. Use the up (▲) or down (▼) arrow button to select **VERSION INFO (F/W)**.
4. Use the left (◀) or right (▶) arrow button to select **CPU[0]**.
5. Check that the new firmware version number is displayed in the menu.

Refer to the *Release Notes* included on the DVD for information about the new firmware version.

TG8000 firmware upgrade

Use this procedure to upgrade the firmware of the TG8000 mainframe. To upgrade a TG700, refer to *TG700 firmware upgrade*. (See page 5, *TG700 firmware upgrade*.)

You can use the UTILITY menu to upgrade the firmware installed in the instrument using one of the following two methods:

- **USB upgrade:** Install the upgrade using a USB drive that is connected to the instrument.
- **Network upgrade:** Install the upgrade using a PC that has an Ethernet network connection to the instrument.

Before you begin the upgrade

You do not need to upgrade the firmware if your instrument has the latest firmware version already installed. Perform the following steps to determine if the firmware on your instrument needs to be upgraded:

1. Power on the instrument.
2. Verify the current firmware version installed on the instrument:
 - a. Press the **MODULE** button to select **TG8000 : PRESET**.
 - b. Press the up (▲) or down (▼) arrow button to select **TG8000 : UTILITY**, and then press the **ENTER** button.
 - c. Press the up (▲) or down (▼) arrow button to select **VERSION INFO (F/W)**.
 - d. In the second line of the display readout, note the version number of the installed firmware.

Instrument firmware version number	
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3. Verify the latest version of firmware at the Tektronix Web site:
 - a. Use the Web browser on a PC to navigate to the following Tektronix Web site:
<http://www.tektronix.com/downloads>
 - b. On the Downloads Finder Web page, search by model number (such as TG8000) and filter by software and software type to locate the firmware-upgrade package for the instrument.
 - c. Note the latest version number of the firmware-upgrade package(s).

Web site firmware version number	
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4. If the latest firmware version at the Web site is the same as the version on your instrument, you do not need to upgrade the firmware and no action is required.

5. If the latest firmware version at the Web site is newer than the version on your instrument, you should upgrade the firmware.
6. Download the latest firmware version to your PC.
7. After the software package is downloaded, click on the self-extracting archive to extract the following files into the directory of your choice: transfer.exe and firmware.pkg. There may also be a readme.txt file.

NOTE. *If the firmware upgrade package contains a readme.txt file, be sure to read the file before you attempt to upgrade the firmware on your instrument.*

If you are performing the upgrade using a network connection, the transfer.exe and firmware.pkg files must be located in the same directory on the PC.

To perform the upgrade, you can use either the USB upgrade procedure or the network upgrade procedure. The time required to complete the upgrade is about 10 minutes.



CAUTION. *During the upgrade process, once the instrument has started to erase internal flash memory, DO NOT remove power from the instrument. If you do so, the instrument flash memory will be corrupted. The instrument will have to be sent to a Tektronix factory service center to have the system firmware restored.*

If power to the instrument is lost before it begins erasing the internal flash memory, you can restart the firmware upgrade after the instrument reboots.

To upgrade the TG8000 firmware using a USB drive

1. Connect a USB drive to the PC that contains the latest TG8000 firmware.
2. On the PC, navigate to the USB drive.
3. In the root directory of the USB drive, create a directory named:

TgUpgrd



CAUTION. To prevent an upgrade failure, the upgrade files must be located in a folder named "TgUpgrd" in the root directory of the USB drive. The folder name is case sensitive.

4. Open the TgUpgrd directory and copy the firmware.pkg file (from the extracted archive) to the USB device.

The USB drive should have a directory path of TgUpgrd\firmware.pkg.

NOTE. For a USB upgrade, you do not need to copy the transfer.exe file from the extracted archive to the USB drive.

5. Safely remove the USB device from the PC and insert it into the USB port on the front panel of the instrument.
6. If necessary, power on the instrument.
7. Press the **MODULE** button to select **TG8000 : PRESET**.
8. Press the up (▲) or down (▼) arrow button to select **TG8000 : UTILITY**, and then press the **ENTER** button.
9. Verify the status of the USB drive:
 - a. Press the up (▲) or down (▼) arrow button to select **TG8000 : UTILITY : USB (status)**.
 - b. Verify that the USB status is **Mounted**.
 - c. If the status is Not Mounted, press the **ENTER** button to mount the USB drive.
10. Press the up (▲) or down (▼) arrow button to select **TG8000 : UTILITY : FIRMWARE UPGRADE**.
11. Press the left (◀) or right (▶) arrow button to select **USB Upgrade**, and then press the **ENTER** button to start the upgrade process.

12. A warning message is displayed asking you to verify the upgrade operation. The old and new firmware version numbers are displayed. Press the **ENTER** button to proceed or press the **BACK** button to cancel the operation.

NOTE. *If the instrument displays a message indicating that a USB device containing the firmware was not detected, verify that the USB drive is properly mounted and has the correct directory path (*TgUpgrd\firmware.pkg*).*

13. Monitor the progress of the upgrade operation:
 - a. During the upgrade process, the display shows the progress of the upgrade and shows messages such as “Reading Firmware Data” and “Erasing Application FS Partition”. This may take several minutes.
 - b. When the upgrade has completed, the message “Tektronix Generator Booting” is displayed while the instrument reboots before the menu display returns to normal.

NOTE. *The instrument power must be cycled in order for the firmware upgrade process to complete.*

14. After the upgrade process is complete and the instrument reboots, unmount the USB drive:
 - a. Press the **MODULE** button to select **TG8000 : PRESET**.
 - b. Press the up (▲) or down (▼) arrow button to select **TG8000 : UTILITY**, and then press the **ENTER** button.
 - c. Press the up (▲) or down (▼) arrow button to select **TG8000 : UTILITY : USB (status)**. The USB status should be **Mounted**.
 - d. Press the **ENTER** button to unmount the USB drive. After the message “You may now safely remove the USB drive” is displayed, the menu readout should change to **TG8000 : UTILITY : USB (Not mounted)**.
 - e. Remove the USB drive from the instrument.

-
- 15.** If your TG8000 includes an HDLG7 module, proceed with the following steps to complete the upgrade:



CAUTION. *While upgrading, do not press the front panel buttons or cycle the instrument power. Doing so can corrupt the module memory and FPGA image.*

- a. Power on the TG8000.
- b. Press the **MODULE** button until the name of the HDLG7 module you are upgrading appears.
- c. Press and hold the **ENTER** button until “Upgrade FPGA” appears.
- d. Press the **ENTER** button to upgrade the module.
- e. The upgrade will take approximately three minutes. After it is complete, remove power from the TG8000 and then reapply power to reboot the system.

NOTE. *If you are upgrading the FPGA of multiple HDLG7 modules, you need to upgrade them separately and reboot the instrument after each upgrade. For example, if you have three HDLG7s, the FPGA upgrade process sequence will be: select and upgrade a module, then reboot, then select and upgrade another module, then reboot, select and upgrade the final module, then reboot. You do not need to upgrade the modules in any particular order.*

- 16.** Verify that the firmware version in the instrument is the same version you just installed:
- a. Press the **MODULE** button to select **TG8000 : PRESET**.
 - b. Press the up (**▲**) or down (**▼**) arrow button to select **TG8000 : UTILITY**, and then press the **ENTER** button.
 - c. Press the up (**▲**) or down (**▼**) arrow button to select **VERSION INFO (F/W)**.
 - d. In the second line of the display readout, verify that the CPU (0) version number is the same version number as the upgrade file you installed.

To upgrade the TG8000 firmware using an Ethernet network

1. Connect the TG8000 generator and a PC to your local Ethernet network.
2. Download the upgrade files to the PC. (See page 11, *Before you begin the upgrade*.)
3. If necessary, power on the instrument.
4. Prepare the instrument for the firmware upgrade:
 - a. Press the **MODULE** button to select **TG8000 : PRESET**.
 - b. Press the up (**▲**) or down (**▼**) arrow button to select **TG8000 : UTILITY**, and then press the **ENTER** button.
 - c. Press the up (**▲**) or down (**▼**) arrow button to select **TG8000 : UTILITY : FIRMWARE UPGRADE**.
 - d. Press the left (**◀**) or right (**▶**) arrow button to select **Network Upgrade**, and then press the **ENTER** button. This puts the instrument in upgrade mode and makes it ready to receive the upgrade files through the 10/100/1000 BASE-T port.
5. From the instrument display, note the current IP address of the instrument.
6. On the PC, double-click the **transfer.exe** file to launch the transfer program.
7. Type the IP address or DNS name of the instrument you are upgrading, and then press **Enter**. This starts the firmware upgrade process.



CAUTION. To prevent upgrade failure, do not close the transfer.exe window until the transfer utility asks for another IP address.

8. The transfer utility displays done when the software upgrade completes and asks for the address of another instrument. When the software upgrade completes, the instrument should reboot.

```
Please enter DNS name or address of target instrument:  
128.181.221.2  
Opened TCP connection to 128.181.221.2:77  
Reading Firmware Data... done  
Erasing Flash... done  
Programming Flash... done  
Verifying Flash Programming... done  
done
```

```
Please enter DNS name or address of target instrument:  
=
```

Figure 3: Example transfer.exe window after the network upgrade is complete

9. If the instrument does not reboot at the completion of the firmware upgrade, remove and reapply power to the instrument to cause it to reboot.
10. If your TG8000 includes an HDLG7 module, proceed with the following steps to complete the upgrade:



CAUTION. *While upgrading, do not press the front panel buttons or cycle the instrument power. Doing so can corrupt the module memory and FPGA image.*

- a. Power on the TG8000.
- b. Press the **MODULE** button until the name of the HDLG7 module you are upgrading appears.
- c. Press and hold the **ENTER** button until “Upgrade FPGA” appears.
- d. Press the **ENTER** button to upgrade the module.
- e. The upgrade will take approximately three minutes. After it is complete, remove power from the TG8000 and then reapply power to reboot the system.

NOTE. *If you are upgrading the FPGA of multiple HDLG7 modules, you need to upgrade them separately and reboot the instrument after each upgrade. For example, if you have three HDLG7s, the FPGA upgrade process sequence will be: select and upgrade a module, then reboot, then select and upgrade another module, then reboot, select and upgrade the final module, then reboot. You do not need to upgrade the modules in any particular order.*

Installation instructions

This section provides procedures for installing and removing modules from the TG8000 and TG700 mainframes. A screwdriver with a #1 Phillips tip is the only tool you need to install or remove a module.



CAUTION. *To prevent damage to the mainframe and module, always remove the power cord before installing or removing a module.*

If the software version of the provided DVD is later than the firmware version of your mainframe, be sure to upgrade the firmware of the mainframe before installing the module. (See page 4, Firmware upgrade.)

Preventing component damage



CAUTION. *Electrostatic discharge (ESD) can damage components on the modules and mainframe. To prevent ESD or other component damage, follow the steps below when installing, removing, or handling modules:*

- Wear a grounded antistatic wrist strap to discharge the static voltage from your body while installing or removing modules from the mainframe.
- Transport and store modules in a static-protected bag or container.
- Do not slide the module over any surface.
- Handle modules as little as possible.
- Do not touch module components or connector pins.
- Do not use any devices capable of generating or holding a static charge in the work area where you remove, install, or handle modules.
- Avoid handling modules in areas that have a floor or work-surface covering capable of generating a static charge.

Installing a module

To install a module into an empty slot in the mainframe, perform the following procedure:

1. Unplug the power cord from the power connector on the rear panel of the mainframe.
2. Use the following guidelines to select the slot where you will install the module. The following figure shows a sample module configuration with the associated slot numbers.

TG700 mainframe guidelines:

- For AGL7 and GPS7 modules, only one of these modules can be installed in the mainframe at a time, and it must be installed only in slot 1. All other modules may be installed in any slot location.



CAUTION. *When installing a GPS7 module into an existing TG700 mainframe, you must calibrate the mainframe oscillator oven and characterize the oscillator frequency as a function of voltage. Refer to the Configure the GPS7 Module section in the TG700 User Manual for instructions.*

- For AG7, ATG7, AVG7, BG7, DVG7, HDLG7, and SDI7 modules, up to four of the modules can be installed in the mainframe.
- The HD3G7, AWVG7, and HDVG7 modules consume higher power than most of the modules. Because of this, there can only be a maximum of three of these modules installed at one time. If an HDVG7 module that has a rear-panel fan is installed, then only one other high-power module may be installed with it.

When the maximum number of these high-power modules are installed the lower-power modules (AG7, ATG7, AVG7, BG7, DVG7, HDLG7, or SDI7) may be installed in any of the remaining available slots.

- The TG700 Power Supply module is user replaceable and must be installed only in the position shown in the following figure. The TG700 Power Supply module cannot be installed in a TG8000 mainframe.

TG8000 mainframe guidelines:

- For AGL7 and GPS7 modules, only one of these modules can be installed in the TG8000 mainframe at a time, and it must be installed only in slot 1. All other modules may be installed in any slot location.

NOTE. When installing a GPS7 module into an existing TG8000 mainframe, it is suggested that you calibrate the mainframe oscillator oven as part of the installation and qualification process. Refer to the Configure the GPS7 Module section in the TG8000 User Manual for instructions.

Although the GPS7 module will operate only in slot 1, in the TG8000 mainframe you can use the GPS7 module to test diagnostics in each of the four mainframe slots. Refer to the TG8000 Specifications and Performance Verification Technical Reference for more information.

- For the AG7, ATG7, AVG7, AWVG7, BG7, DVG7, HD3G7, HDLG7, HDVG7, and SDI7 modules, up to four of the modules can be installed in the TG8000 mainframe.
- The TG8000 Power Supply module is user replaceable and must be installed only in the position shown in the following figure. The TG8000 Power Supply module cannot be installed in a TG700 mainframe.

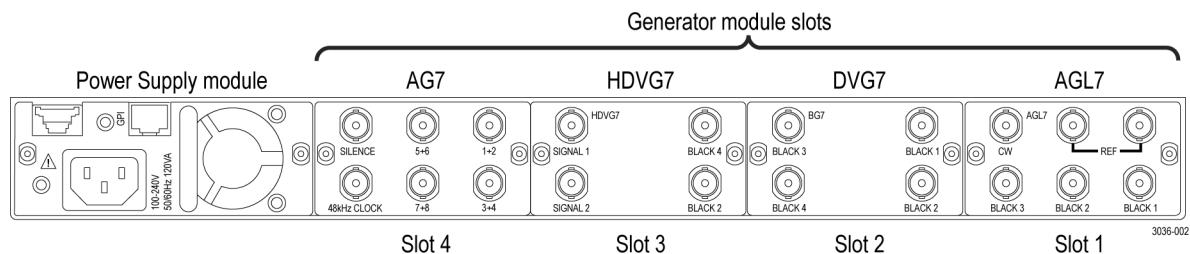


Figure 4: TG700 and TG8000 slot numbering (TG8000 shown)

3. Use a screwdriver with a #1 Phillips tip to loosen the two screws of the blank panel attached to the slot you want to use, and then pull it away from the instrument. Save the blank panel for future use. (See Figure 5.)

If you are installing a new module into a slot that already contains a module, remove the existing module. (See page 25, *Removing a module*.)

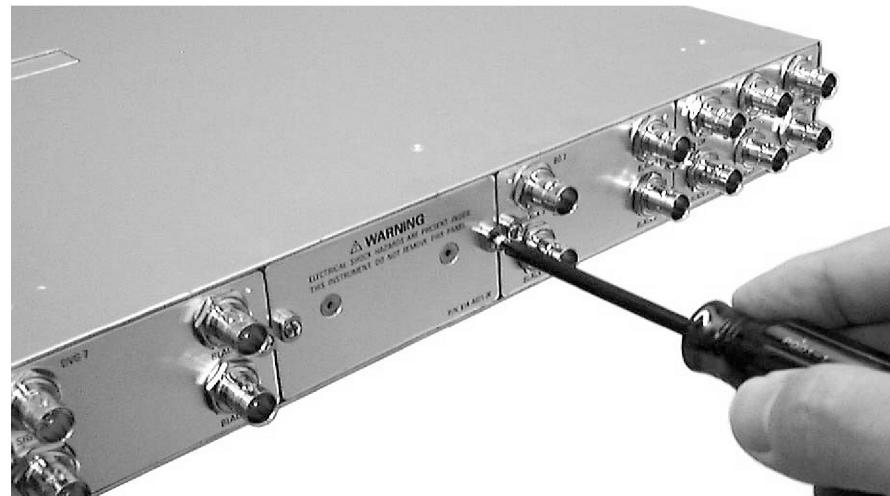


Figure 5: Removing the blank panel (TG700 shown)



CAUTION. Be careful not to damage the parts and cables inside of the module when you insert the module into the mainframe.

4. Insert the module into the slot, paying attention to the module orientation. (See Figure 6.) Push the module into the slot until the connector board of the module is firmly engaged with the Main board of the mainframe.

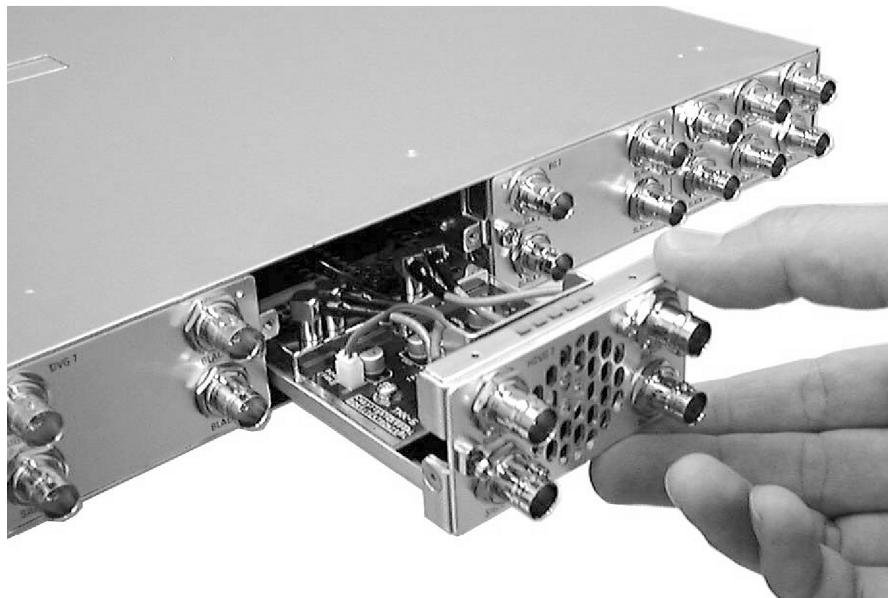


Figure 6: Installing the module (TG700 shown)

5. Tighten the two screws to secure the module to the mainframe. (See Figure 7.)

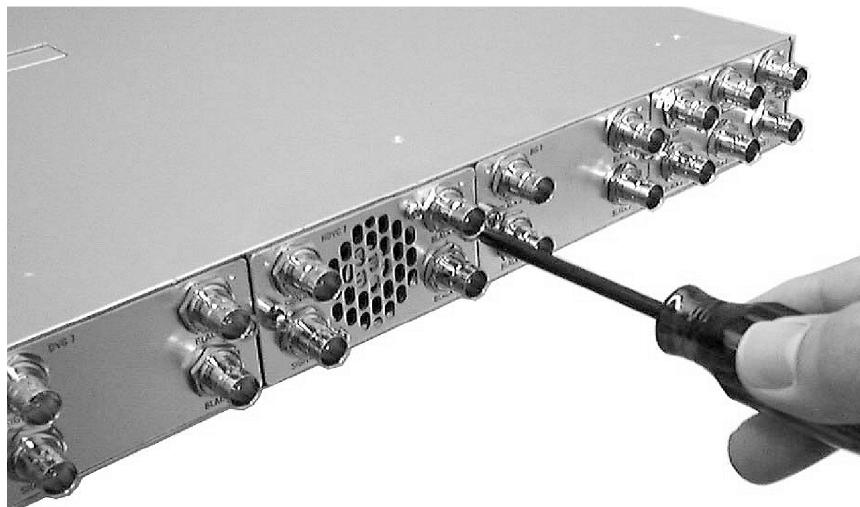


Figure 7: Securing the module (TG700 shown)

Entering the option key (SDI7 option 3G only)

If you ordered Option 3G with the SDI7 module, you must enter the option key that was supplied with the module in order to enable the 3G software option.

Each option key applies to only one SDI7 module. You need to enter the option key only once. After the option key is entered, the option key stays with that SDI7 module, enabling Option 3G even when the module is moved to another mainframe.

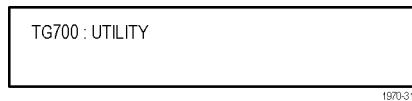
Locate the option key document, and then perform the following steps to enter the option key:

NOTE. *The following procedure uses the instrument front panel to enter the option key. You can also use the TGSetup utility to remotely enter the option key. Refer to the TG8000 PC Tools Technical Reference for instructions on how to use TGSetup to enter the option key.*

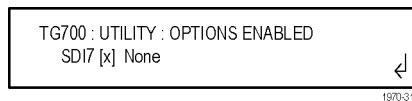
1. Press the front-panel **MODULE** button until the mainframe main menu is displayed as shown below. (TG700 shown.)



2. Press the up (▲) or down (▼) arrow button until **TG700** (or TG8000) **UTILITY** is displayed, and then press the **ENTER** button. (TG700 shown.)

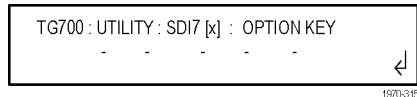


3. Press the up (▲) or down (▼) arrow button until **TG700** (or TG8000) : **UTILITY : OPTIONS ENABLED** is displayed. The bottom line of the display will list the slot number in which the SDI7 module is installed and will indicate whether option 3G is enabled: **None** is displayed when the option is not enabled, **3G** is displayed when the option is enabled. (TG700 shown.)



4. If more than one SDI7 module is installed in the mainframe, use the left (◀) or right (▶) arrow button to select the desired module, and then press the **ENTER** button.
5. Press the up (▲) or down (▼) arrow button until **TG700** (or TG8000) : **UTILITY : MODULE ID** is displayed.

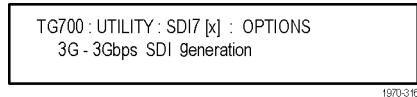
6. Verify that the displayed module ID matches the module ID listed on the option key document.
7. Enter the option key:
 - a. Press the up (\blacktriangle) or down (\blacktriangledown) arrow button until **TG700** (or TG8000) : **UTILITY : OPTION KEY** is displayed. When Option 3G is not enabled, the option key string is blank as shown below. (TG700 shown.)



8. Press the **ENTER** button to enter the option key edit mode. The underscore character ($_$) appears under the first character of the option key.
9. Use the up (\blacktriangle) or down (\blacktriangledown) arrow button to select the first character of the option key.
10. Use the left (\blacktriangleleft) or right (\triangleright) arrow button to move the underscore character to the next character in the option key.
11. Enter all of the option key characters, and then press **ENTER** button to confirm the selection.
12. Press the **CANCEL** button twice to exit the UTILITY submenu. This returns to the top of the UTILITY submenu.

8. Verify that Option 3G is enabled:

9. Press the **ENTER** button to enter the UTILITY submenu.
10. Press the up (\blacktriangle) or down (\blacktriangledown) arrow button until **TG700** (or TG8000) : **UTILITY : OPTIONS ENABLED** is displayed.
11. Verify that **SDI7[slot number] 3G** is displayed. This indicates that Option 3G has been enabled. (TG700 shown.)



12. Press the **CANCEL** button to exit the UTILITY submenu. This returns to the mainframe main menu.

Removing a module

To remove a module from the mainframe, perform the following procedure:



CAUTION. To facilitate module removal, attach terminations or BNC cables to the module connectors. The connector may be damaged if too much force is applied to it during module removal.

1. Unplug the power cord from the power connector on the mainframe rear panel.
2. Attach 75Ω terminations or BNC cables to the BNC connectors on the module to be removed. Module removal becomes easier if the terminations or cables are attached to the connectors at the left and right ends.
3. Use a screwdriver with a #1 Phillips tip to loosen the two screws securing the module to the mainframe.



CAUTION. Be careful not to damage the parts and cables inside of the module when you remove the module from the mainframe.

4. Pull the module slowly toward you while supporting the terminations or BNC cables attached to the connectors. (See Figure 8.)

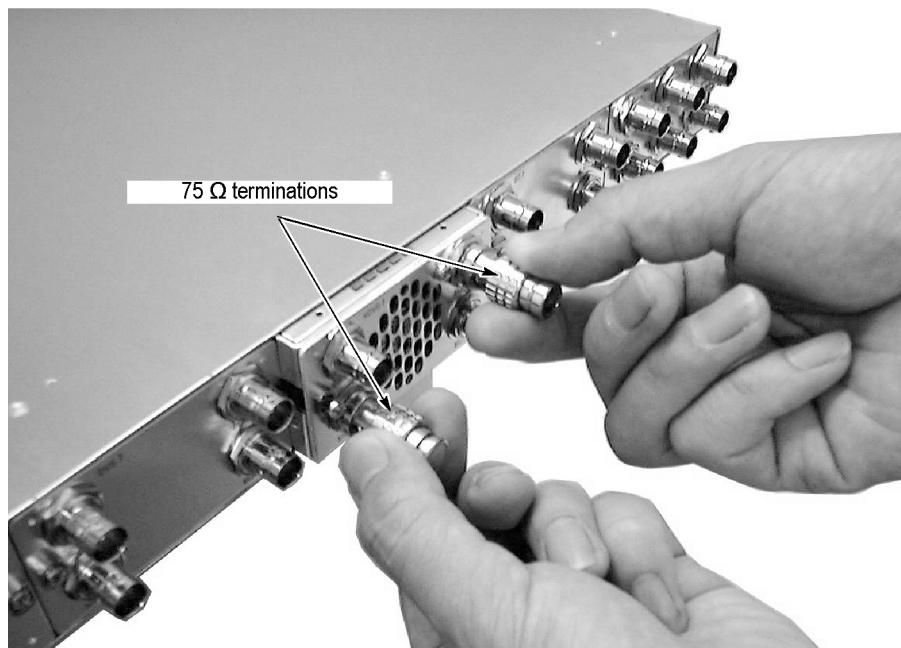


Figure 8: Removing the module (TG700 shown)

5. If this empty slot will not be used, you must attach a blank panel to the mainframe to control instrument cooling and EMI emissions.
 - a. Align the blank panel with the open slot of the mainframe.
 - b. Tighten the two screws to secure the blank panel to the mainframe.

A blank panel is available as an optional accessory for the TG8000 mainframe. Refer to the mainframe user manual.
6. If you want to install another module into the slot from which the module is removed, perform *Installing a Module*. (See page 19.)