



**SPG8000A  
Master Sync / Clock Reference Generator  
SPG800AUP Field Upgrade  
Instructions**

[www.tek.com](http://www.tek.com)



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# Important safety information

This manual contains information and warnings that must be followed by the user for safe operation and to keep the product in a safe condition.

To safely perform service on this product, additional information is provided at the end of this section. (See page 3, *Service safety summary*.)

## General safety summary

Use the product only as specified. Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. Carefully read all instructions. Retain these instructions for future reference.

Comply with local and national safety codes.

For correct and safe operation of the product, it is essential that you follow generally accepted safety procedures in addition to the safety precautions specified in this manual.

The product is designed to be used by trained personnel only.

Only qualified personnel who are aware of the hazards involved should remove the cover for repair, maintenance, or adjustment.

Before use, always check the product with a known source to be sure it is operating correctly.

This product is not intended for detection of hazardous voltages.

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.

When incorporating this equipment into a system, the safety of that system is the responsibility of the assembler of 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, make sure that the product is properly grounded.

**Power disconnect.** The power cord disconnects the product from the power source. See instructions for the location. Do not position the equipment so that it is difficult to operate the power cord; it must remain accessible to the user at all times to allow for quick disconnection if needed.

**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.

**Do not operate without covers.** Do not operate this product with covers or panels removed, or with the case open. Hazardous voltage exposure is possible.

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

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

Disable the product if it is damaged. Do not use the product if it is damaged or operates incorrectly. If in doubt about safety of the product, turn it off and disconnect the power cord. Clearly mark the product to prevent its further operation.

Before use, inspect voltage probes, test leads, and accessories for mechanical damage and replace when damaged. Do not use probes or test leads if they are damaged, if there is exposed metal, or if a wear indicator shows.

Examine the exterior of the product before you use it. Look for cracks or missing pieces.

Use only specified replacement parts.

**Do not operate in wet/damp conditions.** Be aware that condensation may occur if a unit is moved from a cold to a warm environment.

**Do not operate in an explosive atmosphere.**

**Keep product surfaces clean and dry.** Remove the input signals before you clean the product.

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

Slots and openings are provided for ventilation and should never be covered or otherwise obstructed. Do not push objects into any of the openings.

**Provide a safe working environment.** Always place the product in a location convenient for viewing the display and indicators.

Be sure your work area meets applicable ergonomic standards. Consult with an ergonomics professional to avoid stress injuries.

Use only the Tektronix rackmount hardware specified for this product.

## Service safety summary

The *Service safety summary* section contains additional information required to safely perform service on the product. Only qualified personnel should perform service procedures. Read this *Service safety summary* and the *General safety summary* before performing any service procedures.

**To avoid electric shock.** Do not touch exposed connections.

**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 product power and disconnect the power cord from the mains power before removing any covers or panels, or opening the case for servicing.

**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.

**Verify safety after repair.** Always recheck ground continuity and mains dielectric strength after performing a repair.

## 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.



When this symbol is marked on the product, be sure to consult the manual to find out the nature of the potential hazards and any actions which have to be taken to avoid them. (This symbol may also be used to refer the user to ratings in the manual.)

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



CAUTION  
Refer to Manual



Protective Ground  
(Earth) Terminal

# Introduction

This document provides instructions for installing the following field upgrades for the SPG8000A Master Sync / Clock Reference Generator:

- Option DPW – adds a second, hot-swappable redundant (backup) Power Supply module
- Option LX – adds a Gigabit Ethernet optical SFP module (1310 nm, single-mode, LC connector)
- Option SX – adds a Gigabit Ethernet optical SFP module (850 nm, multimode, LC connector)
- Option PTP – adds PTP (IEEE 1588) support, including support for SMPTE ST2059 and AES67 profiles

## Document organization

These instructions are composed of the following sections:

- *How to install and configure Option DPW* describes how to install the backup Power Supply module into the SPG8000A generator. This section also describes how to configure one of the Power Supply module as the preferred (active) supply. (See page 8.)
- *How to install an SFP module (Options LX and SX only)* describes how to install, remove, and transport an SFP module. (See page 13, *How to install an SFP module (Options LX and SX only)*.)
- *How to install Option PTP* describes how to enter the option key that is required to enable Option PTP. (See page 15.)
- *How to upgrade the instrument firmware* describes how to upgrade the upgrade the instrument firmware to the latest version. (See page 17.)

## Firmware upgrade

Tektronix releases software and firmware updates for products to add new features and to fix product problems. You can find the latest firmware for your product at the Tektronix Web site ([www.tek.com/downloads](http://www.tek.com/downloads)).

We recommended that you verify your instrument has the latest firmware installed when performing upgrades. (See page 17, *How to upgrade the instrument firmware*.)

## Standard accessories

The following accessories are shipped with the field upgrade kit:

- *SPG800AUP Field Upgrade Instructions* (this document)  
Tektronix part number: 075-1092-XX
- Option DPW: Power Supply module with the power cord option you ordered (see list below)
- Option LX: Gigabit Ethernet optical SFP module (1310 nm, single-mode, LC connector)
- Option SX: Gigabit Ethernet optical SFP module (850 nm, multimode, LC connector)
- Option PTP: Document listing the unique module ID and Option Key for the instrument you are upgrading

### International power cord options

All of the available power cord options except as noted below include a lock mechanism to keep the power cord attached to the instrument.

- Opt. A0 – North America power (standard)
- Opt. A1 – Universal EURO power
- Opt. A2 – United Kingdom power
- Opt. A3 – Australia power
- Opt. A5 – Switzerland power
- Opt. A6 – Japan power
- Opt. A10 – China power
- Opt. A11 – India power (no locking cord)
- Opt. A12 – Brazil power (no locking cord)
- Opt. A99 – No power cord

## Product documentation

The user documentation for your product is listed in the following table. Check the Tektronix Web site for the latest version of the documents ([www.tek.com/downloads](http://www.tek.com/downloads)).

**Table 1: Product documentation**

Document	Tektronix Part Number	Description	Availability	
			Print	Web
Installation and Safety Instructions	071-3479-xx (English)	Describes how to install the instrument and provides basic safety and operating information	✓	✓
	077-1214-xx (Japanese)			✓
	077-1215-xx (Russian)			✓
User Manual	077-1216-xx (English)	Provides detailed operating information		✓
	077-1217-xx (Japanese)			
	077-1218-xx (Russian)			
Specifications and Performance Verification	077-1219-xx	Lists the product specifications and provides procedures for verifying the performance of the instrument		✓
Service Manual	077-1220-xx	Describes how to service the instrument to the module level (such as circuit boards and fuses)		✓
Declassification and Security Instructions	077-1221-xx	Describes how to clear or sanitize the data storage (memory) devices in the product for customers with data security concerns.		✓
Release Notes	077-1222-xx	Describes the new features, improvements, and limitations of the instrument firmware		✓
Video Sync Pulse Generator and Electronic Changeover Unit System Integration Technical Reference	077-0563-xx (ECO422D) 077-0877-xx (ECO8000, ECO8020)	Provides information for system integrators who are designing systems for high-definition (HD) and standard-definition (SD) digital video content where Tektronix electronic changeover units and video sync pulse generators are to be deployed.		✓

## How to install and configure Option DPW

This section provides the following information on how to install the Option DPW backup Power Supply module into the SPG8000A generator:

- Guidelines for preventing component damage
- Instructions for installing or replacing the Power Supply module
- Instructions for how to configure the preferred (active) supply

### Required equipment

No equipment is required to install the backup Power Supply module.

### How to prevent component damage



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**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:*

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- 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.

## Install the backup Power Supply module

Perform the following steps to install the backup Power Supply module or to replace a failed supply:

1. If your instrument was shipped with only one Power Supply module, remove the blank power supply cover from the Power Supply 2 slot by pushing the retaining latch to the left, and then pulling the cover out of the instrument as shown in the following figure. Proceed to step 3.

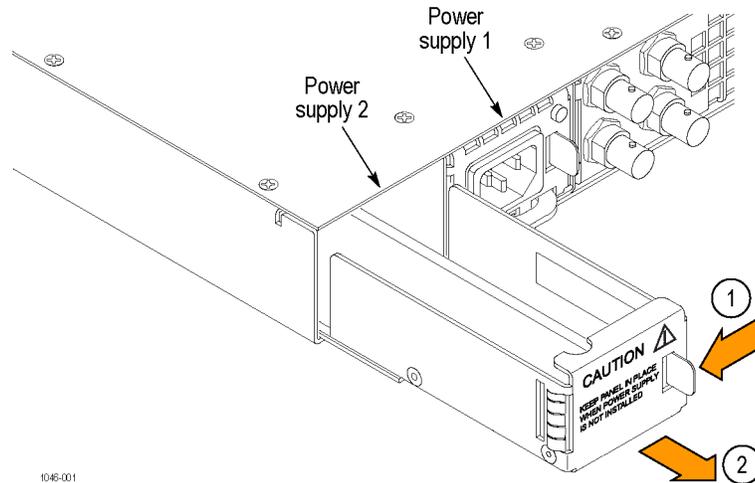


Figure 1: Removing the shield from the Power Supply 2 slot

2. If your instrument has two Power Supply modules installed, perform the following steps to install the new supply:
  - a. Remove the power cable from the Power Supply module that you are replacing.



**WARNING.** Disconnect the power cord from a Power Supply module before you remove the module from the instrument. Also, do not connect a power cord to a Power Supply module while the module is not installed in the instrument. There are dangerous high voltages on the module when the power cord is connected.



**CAUTION.** To prevent an unexpected shutdown of the instrument, be sure to unplug the correct power cord if you are replacing a faulty Power Supply module. (See Figure 2.)

*When viewed from the front of the instrument, Power Supply 1 is the left Power Supply module and Power Supply 2 is the right Power Supply module. This matches the orientation of the PWR1 and PWR2 indicators on the front panel. The STATUS LED on the rear panel of each Power Supply module will match the status shown by the front-panel PWR1 and PWR 2 indicators.*



## Configure the preferred (active) supply

When two Power Supply modules are installed in the instrument, one is configured as the primary supply and the other is configured as the backup supply. In the event that the primary supply fails, the backup supply automatically provides power to maintain instrument operation.

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**NOTE.** *The preferred supply configuration only applies if two Power Supply modules are installed and both of the supplies are connected to a power source. If there are two Power Supply modules installed but one of the supplies has a failure, the good supply will be used to power the instrument regardless of the preferred supply configuration.*

*The recommended usage strategy is to configure one supply as preferred, and use the second supply only in case the first supply has a failure. This usage strategy allows the backup supply to have the maximum remaining life when it is needed.*

*The preferred supply configuration is not saved as part of the preset system. Therefore, the preferred supply configuration will not change when you activate any of the system presets, including the Factory Default preset.*

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Perform the following steps to configure which Power Supply module is the preferred (active) supply:

1. Check the status of the front-panel PWR1 and PWR2 indicators:
  - Bright green indicates the preferred (active) supply.
  - Dim green indicates the inactive (backup) supply.

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**NOTE.** *If the color of the PWR1 or PWR2 indicators is other than bright or dim green, service the faulty Power Supply module before proceeding.*

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2. Check the temperature weighted hours of the installed supplies:

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**NOTE.** *It is recommended that you configure the supply with the most temperature weighted hours to be used as the primary preferred supply. This allows for the newer supply to be preserved so it can provide the best possible backup should the primary supply fail. For more information about temperature weighted hours, see the SPG8000A User Manual.*

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- a. Press the **SYSTEM** button to access the SYSTEM menu.
- b. Press the up (▲) or down (▼) arrow button to select **SYSTEM : DIAGNOSTICS**, and then press the **ENTER** button to access the DIAGNOSTICS menu.

- c. Press the up (▲) or down (▼) arrow button to select **SYSTEM : DIAGNOSTICS : POWER SUPPLY 1**. The second line of the display will list the number of hours the supply has been the active supply and the backup supply.
- d. Press the right (▶) arrow button to display the number of temperature weighted hours of the first supply as shown below. Note the number of hours of hours shown.

SYSTEM : DIAGNOSTICS : POWER SUPPLY 1 Tmp Wtd: 0000677 (OK)(limit:131400)
--

3080-063

- e. Press the up (▲) or down (▼) arrow button to select **SYSTEM : DIAGNOSTICS : POWER SUPPLY 2**.
  - f. Press the right (▶) arrow button to display the number temperature weighted hours of the second supply. Note the number of hours of hours shown.
3. If the Power Supply module with the greatest number of temperature weighted hours is not the currently the preferred supply, then continue this procedure. Otherwise, you do not need to change the preferred supply configuration.
  4. If you want to change the preferred supply configuration, press the **SYSTEM** button to access the SYSTEM menu.
  5. Press the up (▲) or down (▼) arrow button to select **SYSTEM : POWER SUPPLY PREFERRED SELECT**.
  6. Press the left (◀) or right (▶) arrow button to display the supply you want to be the primary (active) supply: Power Supply 1 or Power Supply 2. The second line of the display shows the supply status: **Active**, **Preferred** or **Inactive**.

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**NOTE.** *When viewed from the front of the instrument, Power Supply 1 is the left Power Supply module and Power Supply 2 is the right Power Supply module. This matches the orientation of the PWR1 and PWR2 indicators on the front panel.*

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7. If status of the supply is Inactive, press the **ENTER** button to change the status to Active, Preferred. The front-panel indicator for the selected supply should change to bright green.

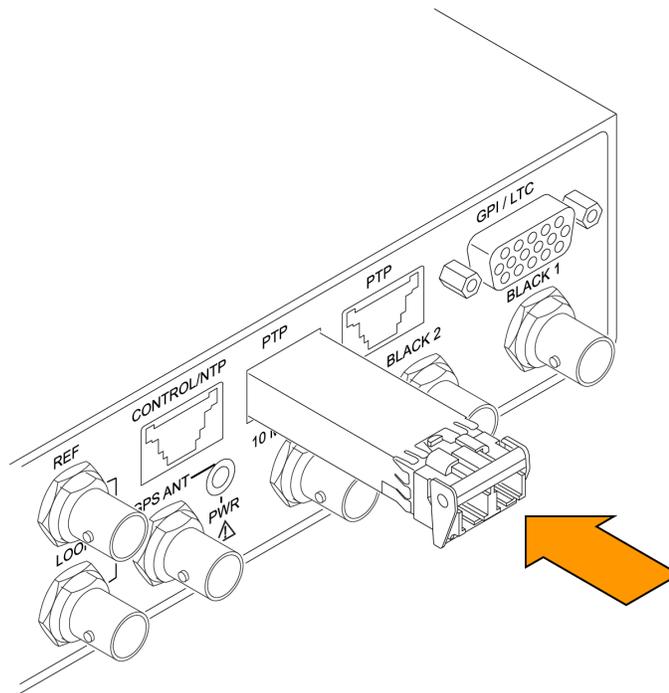
## How to install an SFP module (Options LX and SX only)

There are two optional, optical SFP modules available when Option PTP is installed in the instrument:

- Option LX: Gigabit Ethernet optical SFP module, 1310 nm, single-mode, LC connector
- Option SX: Gigabit Ethernet optical SFP module, 850 nm, multimode, LC connector

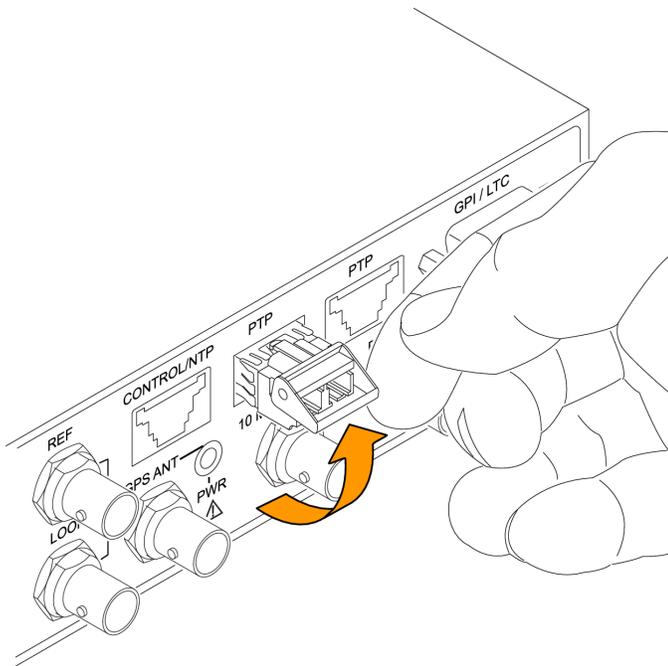
### Install the SFP module

To install the SFP module, you will first need to remove the plug from the SFP connector. Insert the SFP module into the PTP connector on the rear-panel of the instrument as shown below. The module will latch into place when fully inserted.



## SFP module removal

To remove the SFP module, lift up on the latch and then pull the module out of the PTP connector as shown below.



## SFP module transportation

The SFP module should be removed from the generator while the instrument is being transported.



**CAUTION.** To prevent static damage to the SFP module while you are transporting the instrument, always transport the SFP module in a antistatic bag or container.

## How to install Option PTP

Although you do not need to upgrade the firmware as part of an Option PTP upgrade, we recommended that you verify your instrument has the latest firmware installed when performing upgrades. Proceed as follows:

- Perform the *How to upgrade the instrument firmware* procedure. (See page 17.)
- Perform the *Enter the new option key* procedure. (See page 15.)

### Enter the new option key

To enable Option PTP, you must enter the option key supplied with this kit. Each option key applies to only one instrument.

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

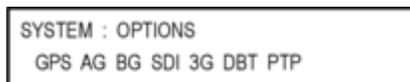
---

**NOTE.** *This procedure uses the instrument front panel to enter the option key. You can also use the SPG8000A Web interface to remotely enter the option key. Refer to the SPG8000A User Manual for information about using the SPG8000A Web interface to enter the option key.*

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1. Press the front-panel **SYSTEM** button to access the SYSTEM menu.
2. Press the up (▲) or down (▼) arrow button until **SYSTEM : OPTIONS** is displayed. The second line of the display lists the options installed in the instrument. Option PTP should not be already listed.
3. Press the **ENTER** button to enter the OPTIONS submenu.
4. Press the up (▲) or down (▼) arrow button until **SYSTEM : OPTIONS : UNIQUE ID** is displayed.
5. Verify that the displayed unique ID matches the module ID listed on the option key document.

6. Enter the option key:
  - a. Press the up (▲) or down (▼) arrow button to select **SYSTEM : OPTIONS : KEY**. The existing option key string is displayed.
  - b. Press the **ENTER** button to enter the option key edit mode. The underscore character ( ) appears under the first character of the option key.
  - c. Use the up (▲) or down (▼) arrow button to select the first character of the option key.
  - d. Use the left (◀) or right (▶) arrow button to move the underscore character to the next character in the option key.
  - e. Enter all of the option key characters, and then press **ENTER** button to confirm the selection.
  - f. Press the **BACK** button to exit the **OPTIONS** submenu.
7. Cycle power on the instrument to ensure the newly enabled option(s) is fully operational.
8. Verify that Option PTP is enabled:
  - a. Press the up (▲) or down (▼) arrow button until **SYSTEM : OPTIONS** is displayed.
  - b. Check that **PTP** is displayed in the second line of the display. This verifies that Option PTP has been enabled.



- c. If Option PTP is not enabled, use the **SYSTEM : OPTIONS : UNIQUE ID** display and the **SYSTEM : OPTIONS : KEY** display to verify that you are updating the correct instrument and that you entered the new option key correctly.

# How to upgrade the instrument firmware

Tektronix releases software and firmware updates for products to add new features and to fix product problems. You can find the latest firmware for your product at the Tektronix Web site ([www.tek.com/downloads](http://www.tek.com/downloads)).

## Determine if a firmware upgrade is needed

Before you begin the upgrade, perform the following steps to determine if the firmware on your instrument should be upgraded and to backup your user files.



**CAUTION.** *The firmware upgrade process replaces all installed user files with the factory default files. To prevent the loss of your user files, including custom test signals, logo and ID text overlays, and saved presets, be sure to backup all of your user data before you perform the upgrade. The following procedure includes instructions for backing up your user data.*

1. Power on the instrument.
2. Verify the current firmware version installed on the instrument:
  - a. Press the **SYSTEM** button to access the SYSTEM menu.
  - b. Press the up (▲) or down (▼) arrow button to select **SYSTEM : VERSION INFO (F/W)**.
  - c. In the second line of the display, note the firmware version number of the instrument.

Installed firmware version number	
-----------------------------------	--

3. Verify the latest version of software at the Tektronix Web site:
  - a. On a computer, use a Web browser to navigate to the following Tektronix Web site:  
<http://www.tek.com/downloads>
  - b. On the Downloads Finder Web page, search by model number (such as SPG8000A) 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 installed on your instrument, you do not need to upgrade the instrument firmware.
5. If the latest firmware version at the Web site is newer than the version on your instrument, download the latest firmware package to your computer.
6. After the firmware package ZIP file is downloaded, extract the following files into the directory of your choice: transfer.exe and firmware.pkg.

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**NOTE.** *If a readme.txt file is included in the firmware package, be sure to read the file before you upgrade the firmware.*

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7. If the firmware in your instrument needs to be upgraded, verify which options are currently installed before you install the software. After you install the upgrade, you will verify that any previously installed options are still enabled.
  - a. Connect the instrument and computer to your local Ethernet network.
  - b. Connect the power cable to power on the instrument.
  - c. Press the **SYSTEM** button to access the SYSTEM menu.
  - d. Press the up (▲) or down (▼) arrow button to select **SYSTEM : OPTIONS**. The second line of the display lists the hardware options (GPS, BG, AG, SDI) and software option (PTP) that are installed in the instrument as shown below.

SYSTEM : OPTIONS GPS BG AG SDI 3G DBT
--

3080-067

- e. Make a note of the installed options.
8. Proceed as follows:
  - If your instrument needs a firmware upgrade, proceed to *Backup user files to a USB drive*. (See page 19.)
  - If your instrument does not need a firmware upgrade, proceed to *Enter the new option key*. (See page 15.)

## Backup user files to a USB drive

If your instrument has custom user files installed, perform the following steps to backup the user files to a USB drive. You will restore the user files at the end of the upgrade procedure.

1. Insert a USB memory device into the USB port on the front of the instrument.
2. Verify that the USB device is properly installed:
  - a. Press the **SYSTEM** button to access the SYSTEM menu.
  - b. Use the up (▲) or down (▼) arrow button to select **SYSTEM : USB (Mounted)**.

---

**NOTE.** The display will read “Mounted” if the USB device is properly installed. If the display reads “Unmounted” or “Not Connected”, try to reinstall the USB device.

*If the instrument still does not recognize the USB device, attempt this procedure again using a different USB device from a well known brand that is 16 GB or less.*

---

3. Use the up (▲) or down (▼) arrow button to select **SYSTEM : BACKUP/RESTORE**.
4. Use the left (◀) or right (▶) arrow button to select **Backup All User Data to USB**, and then press the **ENTER** button.



---

**CAUTION.** To prevent the loss of your user files, be sure to use the **Backup All User Data to USB** option in the backup procedure.

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5. In the overwrite confirmation display, press the **ENTER** button to perform the selected backup function.
6. During the backup process, progress messages are displayed. When the message **Backup completed successfully** is displayed, press any button to return to the SYSTEM menu display.
7. Use the up (▲) or down (▼) arrow button to select **SYSTEM : USB (Mounted)**.
8. Press the **ENTER** button to safely unmount the USB device. You can now use the USB device to transfer the saved files to another SPG8000A generator or to restore user files after a firmware upgrade.

## Firmware upgrade overview

There are two methods for upgrading the instrument firmware:

- Using a USB memory device (See page 21, *USB firmware upgrade.*)
- Using an Ethernet network (requires a Windows PC) (See page 23, *Network firmware upgrade.*)

The time required to complete the firmware upgrade is approximately 10 minutes.



**CAUTION.** *The instrument automatically reboots at the end of the upgrade process. Do not perform the upgrade while the instrument is in use as a sync reference.*

*Once the instrument has started to erase internal flash, do not remove power from the instrument. If you do so, the instrument flash may be corrupted and you will have to run the recovery procedure. (See page 28, Troubleshoot the firmware upgrade.)*

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**NOTE.** *If power to the instrument is lost before it begins erasing the internal flash, you can restart the firmware upgrade after the instrument reboots. If the instrument displays only a blank screen after power is reapplied, see the troubleshooting section for help. (See page 28, Troubleshoot the firmware upgrade.)*

*If you have loaded the SPG8000A memory with a large number of test signals or frame picture files, you may not be able to upgrade the instrument firmware because the memory is too full. If you receive a memory error while attempting to upgrade the firmware, you need to delete some of the test signal or frame picture files and then perform the upgrade.*

---

## USB firmware upgrade

Use the following steps to upgrade the instrument firmware using a USB memory device.

1. Insert a USB memory device into a USB port of the computer containing the latest instrument firmware.
2. On the computer, navigate to the USB device.
3. On the USB device, create a directory named **SpgUpgrd**.



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**CAUTION.** *To prevent upgrade failure, be sure to correctly name the upgrade directory. The directory name is case sensitive, with the “S” and the “U” in SpgUpgrd being upper case.*

---

4. Open the SpgUpgrd directory and copy the firmware.pkg file from the downloaded ZIP file to the USB device. The USB device should have a directory path of **SpgUpgrd\firmware.pkg**.
5. Eject and safely remove the USB device from the computer.
6. If necessary, power on the instrument and wait for the instrument to fully boot up before inserting the USB device into the front-panel USB port on the instrument.
7. Press the **SYSTEM** button to access the SYSTEM menu.
8. Verify that the USB device is properly installed by pressing the up (▲) or down (▼) arrow button to select **SYSTEM : USB (Mounted)**.

---

**NOTE.** *The display will read “Mounted” if the USB device is properly installed. If the display reads “Unmounted”, try to reinstall the USB device.*

*If the instrument still does not recognize the USB device, attempt this procedure again using a different USB device from a well known brand that is 16 GB or less.*

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9. Press the up (▲) or down (▼) arrow button to select **SYSTEM : FIRMWARE UPGRADE**.

10. Press the left (◀) or right (▶) arrow button to select **USB Upgrade**, and then press the **ENTER** button. A confirmation message is displayed as shown below.

---

**NOTE.** *If the instrument displays the message **ERROR: SpgUpgrd/firmware.pkg not found**, make sure you have the correct directory path on the USB device and then restart this procedure at step 6.*

---

```
*      Upgrade firmware 1.1 to X.X?      *
*      Yes : ENTER / No : BACK           *
*                                         *
```

3080-007

11. A second confirmation is displayed as shown below to remind you that the upgrade will delete all user-created files on the instrument.



---

**CAUTION.** *If you did not backup your user files as part of the upgrade preparation process, it is recommended that you press the **BACK** button to cancel the upgrade and then backup your user files before performing the upgrade. The instructions for backing up user files is described in the section *To transfer user files from an instrument to a USB drive*. (See page 19.) You will restore the user files at the end of the upgrade procedure.*

---

```
*!      User data will be lost. Continue?      !*
*      Yes : ENTER / No : BACK                 *
```

3080-065

12. Press the **ENTER** button to proceed with the upgrade or press the **BACK** button to cancel the upgrade.
13. When you press **ENTER**, the upgrade process begins. During the upgrade process, the instrument displays messages indicating the upgrade status.



---

**CAUTION.** *Once the instrument has started to erase internal flash, do not remove power from the instrument. If you do so, the instrument flash may be corrupted and you will have to run the recovery procedure. (See page 28, *Troubleshoot the firmware upgrade*.)*

---

14. If the instrument does not reboot at the completion of the firmware upgrade, remove and then reconnect the power cable.

15. Remove the USB device after the upgrade is complete:



**CAUTION.** To prevent a loss of data on the USB device, use the **SYSTEM** menu to unmount the USB device before removing it from the instrument.

- a. Press the **SYSTEM** button.
  - b. Press the up (▲) or down (▼) arrow button to select **SYSTEM : USB (Mounted)**, and then press the **ENTER** button.
  - c. Remove the USB device from the instrument when the message **You may now safely remove the USB drive** appears.
16. Proceed to *Verify the firmware upgrade*. (See page 26.)

## Network firmware upgrade

Use the following steps to upgrade the instrument firmware using a network connection:

1. Connect the instrument and a Windows PC to your local Ethernet network or directly connect the instrument to a Windows PC.
2. Power on the instrument.
3. Prepare the instrument for the firmware upgrade:
  - a. Press the **SYSTEM** front panel button.
  - b. Press the up (▲) or down (▼) arrow button to select **SYSTEM : FIRMWARE UPGRADE**.
  - c. Press the left (◀) or right (▶) arrow button to select **Network Upgrade**, and then press the **ENTER** button. A confirmation message is displayed as shown below.

*	Begin network firmware upgrade?	*
*	Yes : ENTER / No : BACK	*

3080-008

- d. A second confirmation is displayed as shown below to remind you that the upgrade will delete all user-created files on the instrument.



**CAUTION.** *If you did not backup your user files as part of the upgrade preparation process, it is recommended that you press the BACK button to cancel the upgrade and then backup your user files before performing the upgrade. The instructions for backing up user files is described in the section To transfer user files from an instrument to a USB drive. (See page 19.) You will restore the user files at the end of the upgrade procedure.*

```
*!   User data will be lost. Continue?   !*
*           Yes : ENTER / No : BACK           *
```

3080-065

- e. Press the **ENTER** button to proceed with the upgrade or press the **BACK** button to cancel the upgrade.
- f. When you press ENTER, a **Waiting for network connection** message is displayed along with the IP address of the instrument. This indicates the instrument is ready to be upgraded. An example display is shown below.

```
Waiting for network connection ...
IP Address : XXX.XXX.XXX.XXX (DHCP)
```

3080-009

- g. If no network connection is established, cycle power on the instrument and verify the network connection before attempting the firmware upgrade again. See the *SPG8000A User Manual* for details on configuring the network connections.

4. Perform the firmware upgrade:
  - a. On the PC, double-click the **transfer.exe** file to launch the transfer program.
  - b. Type the IP address or DNS name of the instrument you are upgrading, and then press **Enter**. This starts the firmware upgrade process. Messages indicating the progress of the upgrade appear in the transfer program window and on the instrument display.



**CAUTION.** *Once the instrument has started to erase internal flash, do not remove power from the instrument. If you do so, the instrument flash may be corrupted and you will have to run the recovery procedure. (See page 28, Troubleshoot the firmware upgrade.)*

**NOTE.** *The upgrade will not proceed until all of the firmware data is transferred to the instrument. Once the upgrade has started, the instrument will attempt to complete the upgrade even if it loses contact with transfer.exe. So that you can monitor the progress of the upgrade, it is suggested that you do not close the transfer.exe window until the transfer utility asks for another IP address.*

```
J:\proj\vp\ torino\build\Nightly\torino_spg\carepkg\LATEST\transfer.exe
Please enter DNS name or address of target instrument:
XXX.XXX.XXX.XXX
Opened TCP connection to XXX.XXX.XXX.XXX
Reading Firmware Data... done
Programming Flash... done
done.
Please enter DNS name or address of target instrument:
```

Figure 3: Sample of transfer.exe window after the upgrade is complete

5. If the instrument does not reboot at the completion of the firmware upgrade, remove and then reconnect the power cable.
6. Proceed to *Verify the firmware upgrade*. (See page 26.)

## Verify the firmware upgrade

1. If your instrument had a failure during the firmware upgrade, proceed to *Troubleshoot the firmware upgrade*. (See page 28.)
2. After the instrument reboots at the end of the upgrade process, press the **SYSTEM** button to access the SYSTEM menu.
3. Press the up (▲) or down (▼) arrow button to select **SYSTEM : OPTIONS**. The second line of the display lists the hardware options (GPS, BG, AG, SDI) and software options (3G, DBT) that are installed in the instrument as shown below.

SYSTEM : OPTIONS
GPS BG AG SDI 3G DBT

3080-067

4. Verify that the options listed match those that you noted before the upgrade.
5. Press the up (▲) or down (▼) arrow button to select **SYSTEM : VERSION INFO (F/W)**. The second line of the display lists the installed firmware version.
6. Verify that the displayed firmware version is the same version as the firmware package you used to perform the upgrade.
7. Proceed as follows:
  - If you backed up your user files to a USB drive before you upgraded the firmware, proceed to *Restore user files from a USB drive*.
  - If you did not backup your user files, proceed to *Enter the new option key*. (See page 15.)

## Restore user files from a USB drive

If you backed up your user files to a USB drive before you upgraded the firmware, perform the following steps to restore the user files:

1. Insert a USB memory device containing the user files you want to install on the SPG8000A generator into the USB port on the front of the instrument.
2. Verify that the USB device is properly installed:
  - a. Press the **SYSTEM** button to access the SYSTEM menu.
  - b. Use the up (▲) or down (▼) arrow button to select **SYSTEM : USB (Mounted)**.

---

**NOTE.** *The display will read “Mounted” if the USB device is properly installed. If the display reads “Unmounted” or “Not Connected”, try to reinstall the USB device.*

*If the instrument still does not recognize the USB device, attempt this procedure again using a different USB device from a well known brand that is 16 GB or less.*

---

3. Use the up (▲) or down (▼) arrow button to select **SYSTEM : BACKUP/RESTORE**.
4. Use the left (◀) or right (▶) arrow button to select **Restore All User Data From USB**, and then press the **ENTER** button.



---

**CAUTION.** *To prevent the loss of your user files, be sure to use the **Restore All User Data from USB** option.*

---

5. In the overwrite confirmation display, press the **ENTER** button to perform the selected restore function.
6. During the restore process, progress messages are displayed. When the message **Restore completed successfully** is displayed, press any button to return to the SYSTEM menu display.
7. Use the up (▲) or down (▼) arrow button to select **SYSTEM : USB (Mounted)**.
8. Press the **ENTER** button to safely unmount the USB device.
9. Proceed to *Enter the new option key*. (See page 15.)

## Troubleshoot the firmware upgrade

If a power failure occurs during the upgrade and the instrument has a blank screen when you reapply power, perform the following procedure.

1. Connect an Ethernet cable between the instrument and your computer or local Ethernet network.
2. Remove the power cable to turn off the instrument.
3. Press and hold the STATUS button and then reconnect the power cable. Continue to hold the STATUS button until the message **Select upgrade network speed:** appears on the top line of the LCD display.
4. Press the left (◀) or right (▶) arrow button to select a network speed (10BaseT, 100BaseT, or 1000BaseT), and then press the **ENTER** button. If you do not know your network speed, the 100BaseT selection is recommended.
5. When the message **Select upgrade network mode:** is displayed, press the left (◀) or right (▶) arrow button to select from the following modes and then press the **ENTER** button.
  - **DHCP** – Use this selection if the instrument is connected to a network with DHCP support. An IP address will be assigned to the instrument from your network server.
  - **Local IP (192.168.1.1)** – Use this selection if the instrument is connected to a network without DHCP support or is connected to a standalone computer, and you want to use the factory default, static IP address of 192.168.1.1 for the upgrade.

---

***NOTE.** When you select either the Local IP or the Saved static IP upgrade mode, you cannot edit the displayed IP address. The IP address cannot be edited when the instrument is in recovery mode.*

---

- **Saved static IP (IP address)** – Use this selection if the instrument is connected to a network without DHCP support or is connected to a standalone computer, and you want to use the previously saved static IP address assigned to the instrument for the upgrade. The saved IP address is displayed.
  - **Quit and continue booting** – Use this selection to quit the upgrade process and leave the instrument in its current condition.
6. If you did not select Quit and continue booting in the previous step, the top line of the instrument display will show the message **Waiting for network connection** and the second line will list an IP address. Make a note of the displayed IP address.

7. Enter the IP address you noted in the previous step into the upgrade transfer application window on your PC to restart the upgrade process. See step 4 of the network firmware upgrade procedure. (See page 25.).



**CAUTION.** *To prevent upgrade failure, leave the instrument power on during the upgrade process. The upgrade process may take up to 15 minutes to complete.*

---

8. When the upgrade is complete, the instrument should reboot. If it does not, cycle the power.

If you continue to experience an upgrade problem, contact Tektronix customer support or your local Tektronix representative for assistance.