WFM220UP Upgrades
WFM2200 SD/HD/3G SDI Waveform Monitor and Generator

Instructions

Warning

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

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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.

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. Remove the power cord of the external AC adapter to disconnect mains power from the product. Also remove any installed battery pack to completely disconnect power from the product.

Do not operate without covers. Do not operate this product with covers or panels removed. The battery compartment cover can be removed during instrument operation to install or replace the battery pack.

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.

Replace battery pack properly. Replace the battery pack only with the specified type and rating.

Recharge battery pack properly. Recharge the battery pack only for the recommended charge cycle at the recommended temperature.

Use proper battery charger. Use only the WFM2200 waveform monitor or the WFM200BC external battery charger to charge the WFM200BA battery pack.

Use proper AC adapter. Use only the AC adapter specified for this product.

Remove battery pack before transporting or storing the instrument. Remove the battery pack when transporting or storing the instrument in an enclosed container such as the WFM200FSC Soft Carrying Case.

Do not operate in wet/damp conditions.

Do not operate in an explosive atmosphere.

Keep product surfaces clean and dry.

Provide proper ventilation. See 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

⏻
Standby

Kit description

This document provides instructions for installing the upgrades listed below into an existing Tektronix WFM2200 SD/HD/3G SDI Waveform Monitor & Generator.

Table 1: Supported upgrades

Upgrade	Description
Option 3G	Adds support for 3G-SDI signal formats (Level A and Level B)
Option DATA	Adds Ancillary Data monitoring (including decoding of 708 and 608 Closed Captions, Teletext and OP47 Subtitles, AFD, and CGMS-A) and the ANC Data Inspector

Products

All models of the Tektronix WFM2200 SD/HD/3G SDI Waveform Monitor & Generator are supported by this kit.

Kit parts list

The following table lists the parts supplied with the upgrade kit. Before you start the upgrade, verify that you received all of the parts listed below.

Table 2: Kit parts list

Quantity	Part number	Description
1 EA	——	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-1043-XX	INSTRUCTIONS; WFM220UP UPGRADES (this document)
1 EA	——	OPTION KEY LABEL
1 EA	——	OPTION KEY CERTIFICATE (8.5 X 11, PRINTED)

Installation requirements

The upgrade process consists of first installing the latest software version on the instrument (if required) and then installing the option key to enable the new software option(s).

There are two methods for installing the latest software version. The installation requirements depend on which upgrade method is used.

■ USB device. Use a PC or MAC to copy the upgrade files to a USB memory device, and then connect the USB device to the instrument.

■ Ethernet network. Copy the upgrade files to a PC that is connected to the same Ethernet network as the instrument.

NOTE. Using a USB device to install the upgrade files is preferred since it is typically faster and is less prone to failure.

An Ethernet network connection is required to installed the option key.

Table 3: Installation requirements

Item	Description
USB memory device (required for USB upgrade only)	Standard USB memory device; use a well known brand that is 16 GB or less
Ethernet network connection (required for network upgrade and for installing the option key)	Standard Ethernet network access
Computer	PC or MAC: Capable of writing to a USB memory device and capable of running a current Web browser (required for a USB upgrade and for installing the option key)
	Windows PC: Capable of running a current Web browser (required for an Ethernet network upgrade only)
SW Option Key	An option key was included in this kit. This key allows you to enable the option in your instrument through the remote Web interface.
WFM2200 Specifications and Performance Verification Technical Reference and all test equipment listed within to perform the verification checks (optional)	Tektronix part number 077-0662-XX Available for download from the Tektronix Web site at www.tektronix.com/manuals

Upgrade installation

This section provides instructions for the following upgrade tasks:

- Configuring the network interface

- Verifying the currently installed options

- Installing the software upgrade

- Installing the software option key

NOTE. *To ensure an uninterrupted upgrade process, fully charge the battery pack and connect the instrument to the AC adapter before you begin the upgrade.*

Configure the network interface

An Ethernet connection to the instrument is required to perform this upgrade. If your instrument is already configured to operate on your network and the Web interface is enabled, proceed to *Verify the currently installed options*. (See page 7.)

If your instrument is not configured to operate on an Ethernet network or the Web interface is not enabled, perform the following steps to configure the network interface of the instrument:

1. Make one of the following Ethernet connections:

    -   If you have a local Ethernet network, connect the instrument and computer to the network.

    -   If you do not have a local Ethernet network, connect the computer directly to the instrument using an Ethernet cable.

2. Press the Power button to power on the instrument.

3. Assign the instrument an IP address:

NOTE. When the instrument is connected to your local network, the instrument must be assigned a valid IP address to operate on your network. The instrument is shipped with a default IP address of 192.168.1.1, but the address will usually not be valid on your local network.

The network addresses of the instrument can be assigned either manually or automatically using DHCP. If your network does not use DHCP, you will have to manually enter the address for the instrument. In that case, contact your local LAN administrator to obtain the valid network addresses.

Alternatively, when you connect the computer directly to the instrument using an Ethernet cable, you can manually assign the instrument any IP address that is compatible with the IP address for the Ethernet interface of the computer.

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a. Press the **CONFIG** button on the front panel.

b. Navigate to **Network Settings** > **IP Config Mode**.

c. Set the IP configuration mode:

- If you connected the instrument to your local network, select either **Manual** or **DHCP** as directed by your LAN administrator.

- If you connected the instrument directly to your computer, select **Manual**.

d. If you set the IP configuration mode to Manual, perform one of the following tasks:

- If you connected the instrument to your local Ethernet network, enter the IP address, subnet mask, and gateway address as directed by your LAN administrator.

- If you connected the instrument directly to your computer, enter an IP address that is compatible with the IP address for the Ethernet interface of the computer. For example, if the IP address of the computer is 199.55.142.12, then set the IP address of the instrument to 199.55.142.x, where x ≠ 1.

  Set the subnet mask to the same value used by the computer. Set the gateway address to be the address of the computer.

NOTE. If you selected DHCP mode, the network automatically assigns the instrument an IP address. DHCP typically requires several seconds to assign the network address.

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e. Press the **CONFIG** button on the front panel to close the menus.

4. Enable the Web interface on the instrument:

NOTE. *The instrument is shipped with the Web interface disabled.*

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    a. Press the **CONFIG** button on the front panel.

    b. Navigate to **Network Settings** > **Web Enable**.

    c. Select **On** to enable the Web interface.

    d. Press the **CONFIG** button on the front panel to close the menus.

Verify the currently installed options

The software option key supplied in this kit is based on the serial number you supplied when you ordered the upgrade for the instrument. The new software option key should enable the new option(s) you ordered, and also preserve your previously purchased options.

Before you install the upgrade, verify which options are currently installed in your instrument. After you install the upgrade, you will verify that the new options are installed and that any previously installed options are still enabled.

1. Connect the instrument and computer to your local Ethernet network. (See page 5, *Configure the network interface*.)

2. Power on the instrument.

3. On the computer, open a Web browser.

4. In the URL address box, enter the IP address assigned to the instrument you are upgrading. For example, http://192.168.1.1. This opens the Tektronix WFM Remote Interface home page.

5. Click **Instrument Options**.

6. Make a note of the enabled options or print out the Active Options page.

Install the software upgrade

For the best upgrade results, your instrument should have the latest software version installed before you install the software option key. Software options which are dependent on the latest software version will not operate or appear in the enabled options list until the instrument software is upgraded.

Before you begin

Perform the following steps to determine if the software on your instrument should be upgraded:

1. Power on the instrument.

2. Verify the current software version installed on the instrument:

   a. Press the **CONFIG** button on the front panel.

   b. Navigate to **Utilities** > **View HW/SW Version**.

   c. In the Hardware and Software Versions display window, note the software version number of the instrument.

WFM2200 software version number	

3. Verify the latest version of software at the Tektronix Web site:

   a. Use the Web browser on a computer 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 WFM2200) and filter by software and software type to locate the software-upgrade package for the instrument.

   c. Note the latest version number of the software-upgrade package(s).

Web site software version number	

4. If the latest software version at the Web site is the same as the version installed on your instrument, proceed to *Install the software option key*. (See page 17.)

5. If the latest software version at the Web site is newer than the version on your instrument, download the latest version to your computer.

6. After the software package ZIP file is downloaded, extract the following files into the directory of your choice: transfer.exe and firmware.pkg.

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

Software upgrade overview   There are two methods for upgrading the instrument software:

- Using a USB memory device (See page 10, *USB software installation*.)

- Using an Ethernet network (See page 13, *Network software installation*.)

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

⚠ *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 16, Software installation troubleshooting.)*

NOTE. To help ensure an uninterrupted upgrade process, fully charge the battery pack and connect the instrument to the AC adapter before you begin the upgrade.

If power to the instrument is lost before it begins erasing the internal flash, you can restart the software 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 16, Software installation troubleshooting.)

Software upgrade from version 1.0.4.   When you upgrade an instrument that has software version 1.0.4 installed, you must perform the software upgrade process twice to completely load the new firmware package into the flash memory of the instrument.

During the first installation, the following error message will be displayed after the LCD driver upgrade is initialized:

`ERROR: R-1d-U21 Update failure.`

When this message is displayed, you need to reboot the instrument and restart the upgrade process as instructed in the following procedures. The second software installation attempt will finish programming the remaining LCD Driver and splash image into the flash memory.

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

1. Insert a USB memory device into a USB port of the computer containing the latest instrument software.

2. On the computer, navigate to the USB device.

3. On the USB device, create a directory named **WfmUpgrd**.

⚠ **CAUTION.** *To prevent upgrade failure, be sure to correctly name the upgrade directory. The directory name is case sensitive, with the "W" and the "U" in WfmUpgrd being upper case.*

4. Open the WfmUpgrd 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 **WfmUpgrd\firmware.pkg**.

5. Eject and safely remove the USB device from the computer.

6. Power on the instrument and wait for the instrument to fully boot up before inserting the USB device into the USB port on the top panel of the instrument .

7. Press the **CONFIG** front panel button.

8. Navigate to **Utilities** > **System Upgrade** > **Upgrade Options** > **USB Upgrade**.

NOTE. If the instrument displays a message indicating that a USB device containing firmware was not detected, make sure you have the correct directory path on the USB device. Also, press the MAIN front panel button to verify that the USB device is properly mounted.

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

9. Press the **SEL** front panel button. This displays the System Software Upgrade from USB window.

10. Select **Continue** from the System Software Upgrade from USB window and press **SEL** to start the software upgrade. 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 16, Software installation troubleshooting.)*

When you upgrade an instrument that has software version 1.0.4 installed, you must perform the software upgrade process twice as instructed below to completely load the new firmware package into the flash memory of the instrument.

11. If you are upgrading from software version 1.0.4, the following error message appears on the instrument display after the LCD driver upgrade is initialized:

```
Updating LCD Driver...
R-1d-U21 Update failure

***************************************************
* System Software Upgrade FAILED.                 *
* Error during Flash Programming.                 *
* DO NOT POWER CYCLE the instrument.  Verify the data   *
* on the USB storage device and restart the upgrade!  *
***************************************************
```

When this error message is displayed, press and hold the Power button for 5 seconds and then release to power off the instrument. Press the Power button again to power on the instrument.

NOTE. *If you are upgrading an instrument that has a later software version than 1.0.4 installed, then the upgrade should complete on the first attempt without any error messages.*

12. If you are upgrading from software version 1.0.4, perform this procedure a second time starting at step 6.

13. If the instrument does not reboot at the completion of the software upgrade, press and hold the Power button for 5 seconds and then release to power off the instrument. Press the Power button again to turn on the instrument.

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

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

    a. Press the **MAIN** front panel button.

    b. Navigate to **USB Unmount**, and then press the **SEL** button.

    c. Remove the USB device after the USB Unmount selection disappears from the MAIN menu.

Network software installation

Use the following steps to upgrade the instrument software using an Ethernet network connection.

1. Connect the instrument and a Windows PC to your local Ethernet network or directly connect the instrument to a Windows PC. (See page 5, *Configure the network interface*.)

2. Power on the instrument.

3. Prepare the instrument for the software upgrade:

   a. Press the **CONFIG** front panel button.

   b. Navigate to **Utilities** > **System Upgrade** > **Upgrade Options** > **Network Upgrade**.

   c. Press the **SEL** front panel button. Note the IP address of the instrument displayed in the System Software Upgrade window.

   d. Select **Continue** from the System Software Upgrade window, and then press the **SEL** button to prepare the instrument to receive a software upgrade.

4. Perform the software 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 software upgrade process.

⚠ *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 16, Software installation troubleshooting.)*

NOTE. The upgrade will not proceed until all of the software 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.

When you upgrade an instrument that has software version 1.0.4 installed, you must perform the software upgrade process twice as instructed below to completely load the new firmware package into the flash memory of the instrument.

c. If you are upgrading from software version 1.0.4, the following error message appears during the upgrade after the LCD driver upgrade is initialized:

- **Transfer utility window:** (See Figure 1.)

  ```
  Initializing LCD Driver Upgrade...  done
  ERROR: R-1d-U21 Update failure.
  Please enter DNS name or address of target
  instrument:
  ```

- **Instrument display:**

  ```
  Updating LCD Driver...
  R-1d-U21 Update failure
  Waiting for TCP connection at XXX.XXX.XXX.XXX
  ```
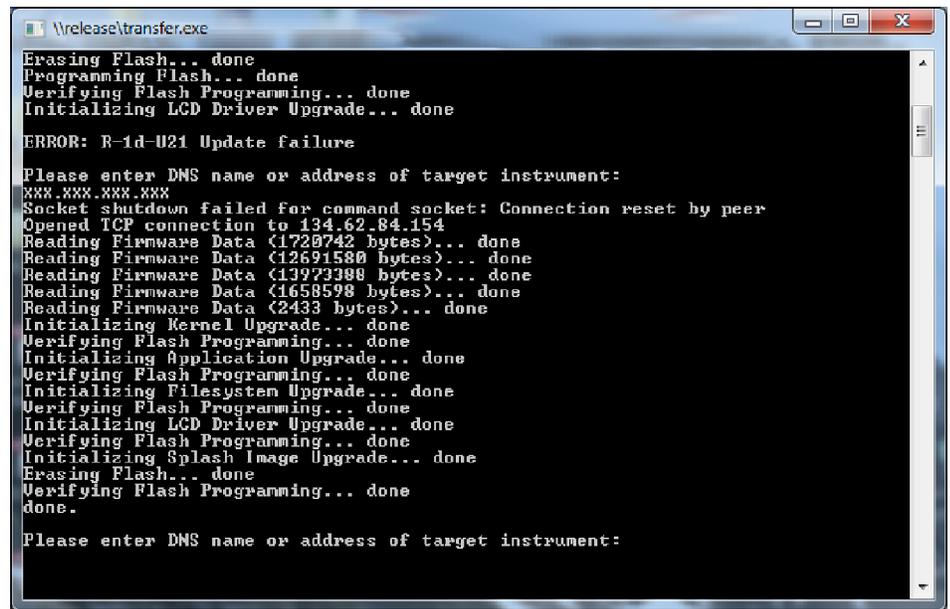
When this error message is displayed, press and hold the Power button for 5 seconds and then release to power off the instrument. Press the Power button again to power on the instrument.

NOTE. If you are upgrading an instrument that has a later software version than 1.0.4 installed, then the upgrade should complete on the first attempt without any error messages.

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d. After the instrument reboots, if you configured the network settings of the instrument for DHCP when you started this upgrade, navigate to CONFIG > Network Settings > IP Config Mode and select **DHCP**.

e. If you are upgrading from software version 1.0.4, perform this procedure a second time starting at step 3.

f. After the second upgrade process completes, the transfer utility displays **done**. The instrument then reboots after a few seconds.

Figure 1: Sample of transfer.exe window after the upgrade is complete

5. If the instrument does not reboot at the completion of the software upgrade, press and hold the Power button for 5 seconds and then release to power off the instrument. Press the Power button again to turn on the instrument.

Software installation troubleshooting

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

1. Connect an Ethernet cable directly from your computer to the instrument. You must use a direct network connection.

2. Press and hold the Power button for 5 seconds to turn off the instrument.

3. Press and hold the ◄ (left arrow) key while you press the Power button.

4. The instrument will turn on and the default IP address of 192.168.1.1 will be set.

5. Set the IP address of your computer to 192.168.1.x, where x ≠ 1.

6. Enter the IP address of the instrument (192.168.1.1) for the upgrade transfer application.

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

⚠ *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.*

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

Install the software option key

Read the entire procedure before installing the software option key.

NOTE. For the best upgrade results, it is suggested that your instrument have the latest version of software installed before you install the software option key. Software options which are dependent on the instrument software version will not operate or appear in the options list until the instrument software is updated. (See page 8, Install the software upgrade.)

1. Connect the instrument and computer to your local Ethernet network. (See page 5, *Configure the network interface*.)

2. Power on the instrument.

3. Verify the IP address of the instrument:

   a. Press the **CONFIG** button on the front panel.

   b. Navigate to **Network Settings**.

   c. Note the IP address of the instrument.

4. Perform the following steps to enter the software option key:

   a. On the computer, open your Web browser application.

   b. In the address bar of the Web browser, enter the IP address of the instrument you are upgrading. For example, http://192.168.1.1. This opens the **Tektronix WFM Remote Interface** home page.

   c. Click the **Instrument Options** link to open the **Active Options** page.

   d. In the **Key** field, enter the 20-character option key string (with or without dashes) that was supplied in the Important Documents envelope of the upgrade kit .

   e. Click the **Submit** button. A pop-up message will indicate whether the option key was accepted or rejected by the instrument. When accepted, the instrument enables the new option(s) and updates the list of currently enabled options shown at the top of the Active Options page.

NOTE. If you purchased multiple options, the software option key supplied with this kit activates all of the options you purchased.

Verify the upgrade

Quick verification

Perform the following procedure to verify that the new option(s) have been installed and the instrument is functioning correctly:

1. Power on the instrument.

2. Verify that the options installed prior to this upgrade are still enabled, and that the new option(s) you installed are enabled. (See page 7, *Verify the currently installed options*.)

NOTE. If the option(s) you just installed are not listed or if your previously installed options are not listed, contact Tektronix for assistance.

3. Verify that the instrument passes the advanced diagnostic tests by performing the following steps:

   a. In the Config menu, navigate to **Utilities** > **Run Diagnostics**.

   b. Press the **SEL** button.

   c. Press the right arrow key to highlight the box next to **Run Advanced Diagnostics**. This box is located at the bottom of the display screen.

   d. Verify that for each diagnostic test the result reads **Pass**.

   e. When the test is complete, press the right arrow key to highlight the box next to **Exit** to exit the diagnostics display.

   f. If you want to view the diagnostics test results again, select **View Diagnostic Log** from the **Utilities** menu.

NOTE. If a diagnostic test fails, contact Tektronix for assistance.

Detailed verification

If you want to perform additional verification of the installed options, perform the tests in the *Incoming Inspection* section of the *WFM2200 Specifications and Performance Verification Technical Reference* using the specified test equipment.