Optical Particle Sizer (OPS)
Model 3330

Firmware Update Instructions Version 1.3

The USB Firmware Upload application loads firmware to a TSI Optical Particle Sizer (OPS) instrument through a USB connection. The TSI OPS Firmware Update runs on a computer with Windows® XP or Vista® (32-bit only) or Windows® 7 (32-bit and 64-bit) operating system. This application is to be used with TSI Optical Particle Sizer instruments only.

This document contains three parts: a Quick Installation Guide, a Detailed Installation Guide, and a USB Firmware Upload Guide. These guides describe how to upload the new firmware to your OPS instrument. If needed, the Detailed Installation Guide and USB Firmware Upload Guide sections provide additional information useful when uploading the firmware from your computer to the OPS instrument.

Quick Installation Guide

This quick installation guide describes the process of obtaining the latest OPS firmware, and uploading this firmware to your Optical Particle Sizer. The best method of accessing updates to your OPS Operation Firmware is from the TSI website. In this way you are assured of getting the latest firmware version. If you are unable to successfully download the firmware from the TSI website, please contact TSI support.

Obtaining the Latest Optical Particle Sizer Firmware and Upload Program from the TSI Website

1. From your computer, access the TSI web page http://www.tsi.com/SoftwareDownloads and follow the instructions on the web page to locate firmware for your Optical Particle Sizer.

2. Click on the resulting Firmware Update link to download the file to your computer.

3. Once the download is complete, double-click on the downloaded file. This installs the OPS Firmware Upload program needed to upload the new firmware to your OPS instrument.

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4. Complete the installation process by selecting **Next**, **Next**, **Install,** and **Finish** buttons as required.

5. Proceed to "[Uploading the Latest Firmware to your Optical Particle Sizer](#)" to upload the new firmware to your Optical Particle Sizer.

Uploading the Latest Firmware to your Optical Particle Sizer

1. Once the firmware upload application programs are on your computer (see previous sections), the firmware can be transferred to your Optical Particle Sizer.

2. Using a USB cable, connect to the Series B receptacle (square shape) on your Optical Particle Sizer and to a USB receptacle on your computer.

3. Turn on the Optical Particle Sizer and allow it to complete its initialization sequence. If the New Hardware Wizard appears, simply follow the prompts to install the TSI NDIS driver. Continue past any warnings and press **Finish**.

4. Find the new TSI Update OPS Firmware icon on your computer's Desktop. This runs the Update program. Click on the icon to start the application.

5. Click the green button in the upper left corner of the first program screen. The Optical Particle Sizer display and pump will turn off during this part of the update process.

6. If this is the first time the OPS firmware has been updated, another New Hardware Wizard will appear. Simply follow the prompts to install the TSI USB driver. Continue past any warnings and press **Finish**. If the firmware update program "times out" during the TSI USB driver install, click the green button in the upper left corner again.

7. Once started, the firmware update process should take approximately 10 minutes. During this time, observe the warnings regarding interrupting the program upload.

8. After the update is completed successfully, power down your Optical Particle Sizer. Wait 10 seconds and power up the instrument.

9. On the Optical Particle Sizer instrument screen, go to the **Setup tab** and select **Device Info**.

10. Verify the Build String is the version of the firmware update, e.g. 1.3.

A "Detailed Installation Guide" is presented in the section which follows. Refer to this section if you had difficulty installing the firmware using the simplified Quick Installation Guide, or if errors were encountered.

Detailed Installation Guide

Installation Instructions

After installation from the TSI website, as described in the Quick Installation Guide, run **OPSFirmware130.exe.**
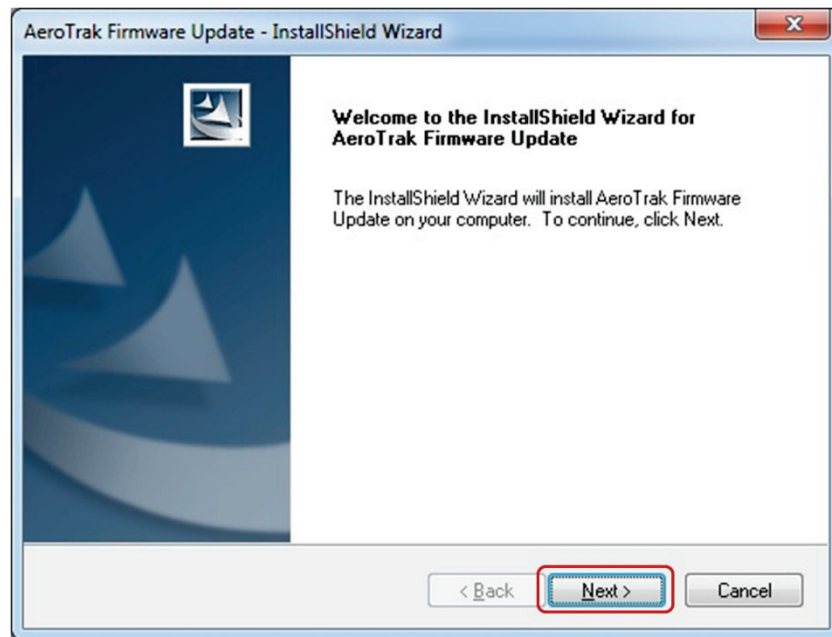
1. A Welcome Screen will be displayed (Figure 1).

Figure 1

2. Install to the default location by selecting the **Next >** button or change the location of the installed files by selection the **Change…** button (Figure 2).
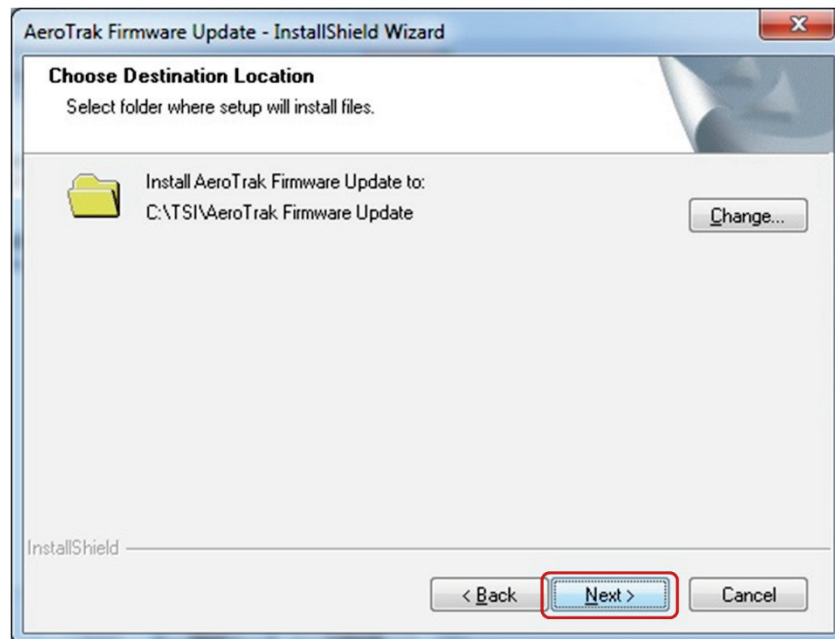

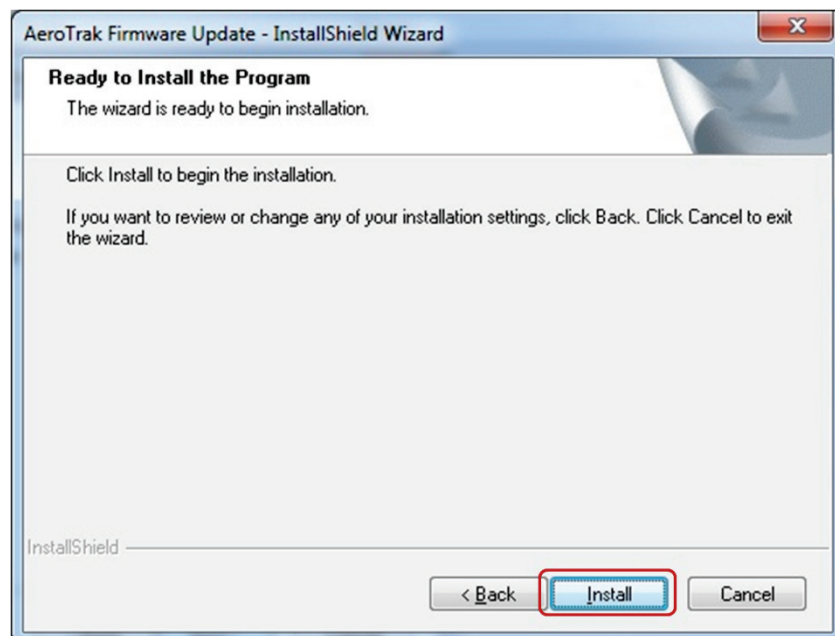**Figure 2**

3. Select the **Install** button to continue the installation (Figure 3).

Figure 3

4. Wait for the installation to finish (Figure 4).
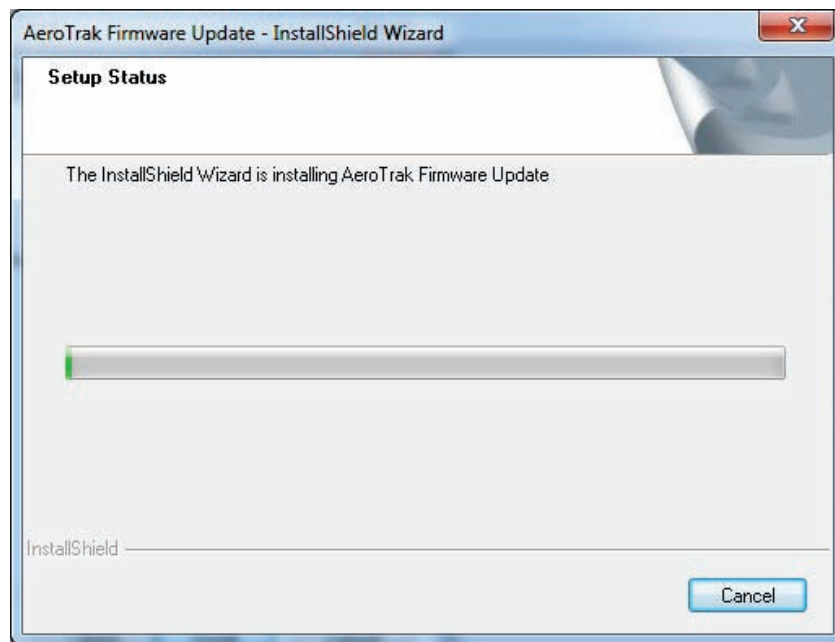
Figure 4

5. Select the **Finish** button to complete the installation (Figure 5).
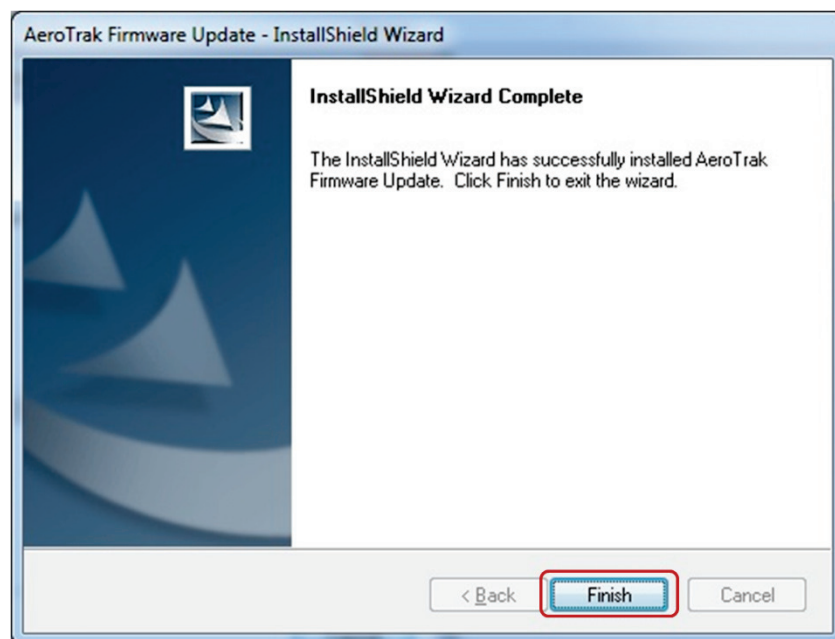
Figure 5

6. Attach the powered instrument to the system. If the instrument has not been attached to the system previously, the Found New Hardware Wizard *may* be displayed (see steps 9 to 14). Once this step is complete an Icon is placed on your Desktop. This is used to upload the firmware to your instrument as described in the section USB Firmware Upload Instructions.

7. Select **No, not this time** to not search the Windows® Update website. Then select the **Next >** button (Figure 6).
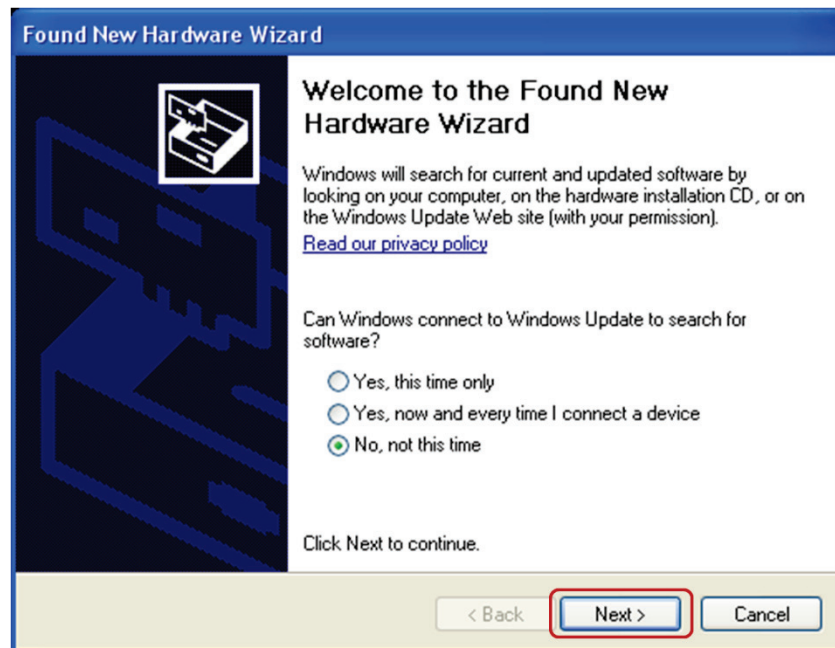
Figure 6

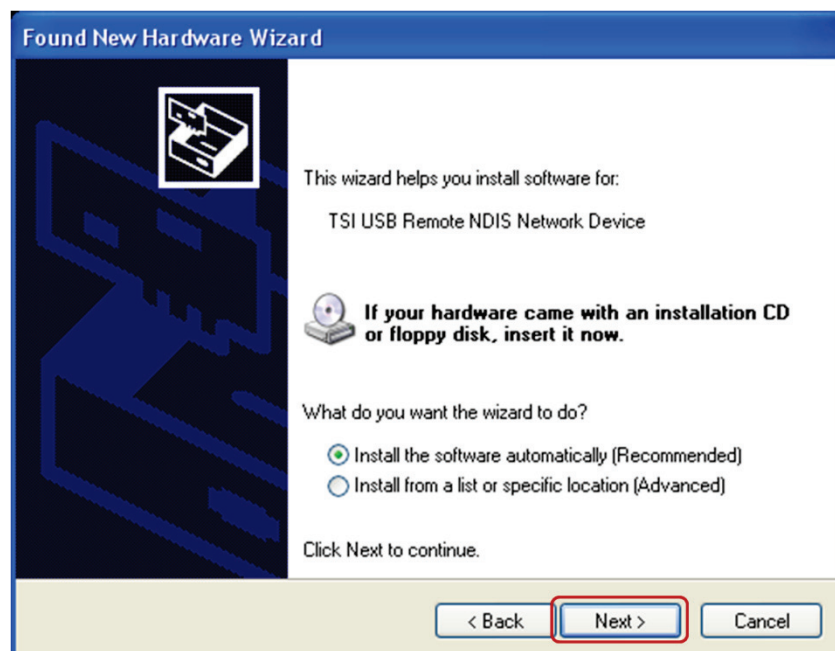8. Select the **Install the software automatically** action then, select the **Next >** button (Figure 7).

Figure 7

9. Select the **Continue Anyway** button (Figure 8).

Figure 8

10. Make sure that the device installed without any errors. Select **Finish** to complete the device installation and exit the dialog (Figure 9).
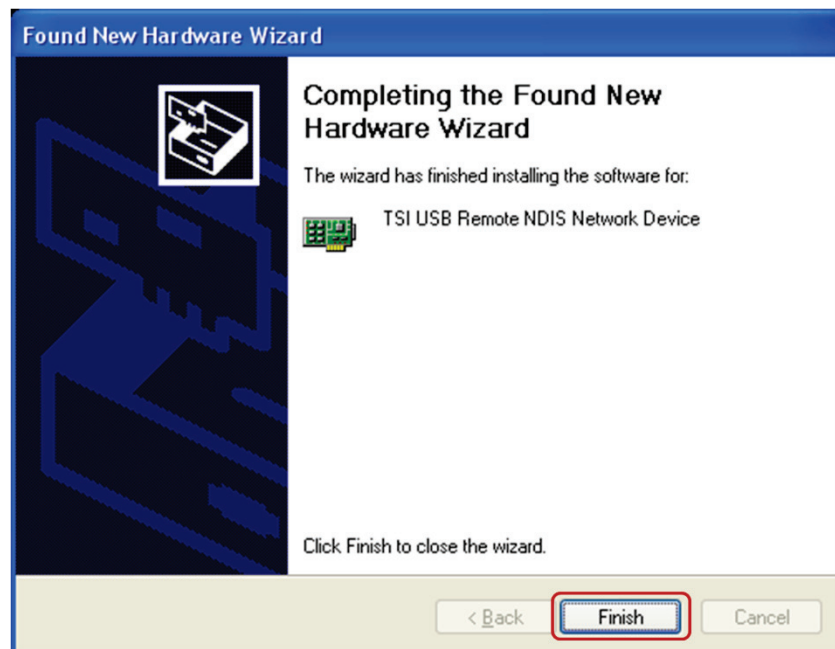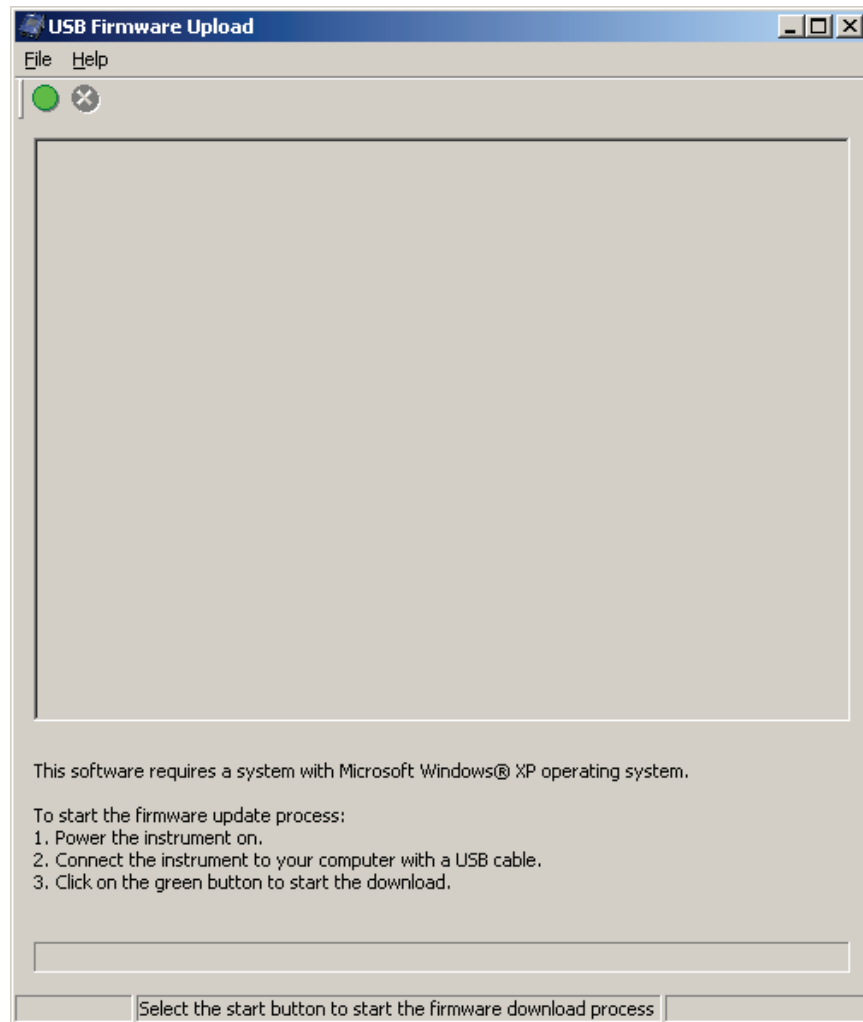

Figure 9

The Optical Particle Sizer is installed on the system and ready to run with the Firmware Upload application.

USB Firmware Upload Guide

For best results run the USB Firmware Upload application with a single TSI Optical Particle Sizer instrument attached to your system.

To upload firmware to the instrument, click on the new TSI Update OPS Firmware Icon on your computer's desktop to run the USB firmware Upload application. The following screen appears.

This software requires a system with Microsoft Windows® XP operating system.

To start the firmware update process:
1. Power the instrument on.
2. Connect the instrument to your computer with a USB cable.
3. Click on the green button to start the download.

Select the start button to start the firmware download process

Figure 10

1. Connect your Optical Particle Sizer instrument to the computer using a USB cable. Turn the DUSTTRAK instrument power ON. Wait for approximately one minute for the instrument to connect and become active on the system.

2. Click the green **START** button to start the firmware update process.

   In the event that the instrument is not attached or not powered, the following error will be shown in the status box of the application (Figure 11):
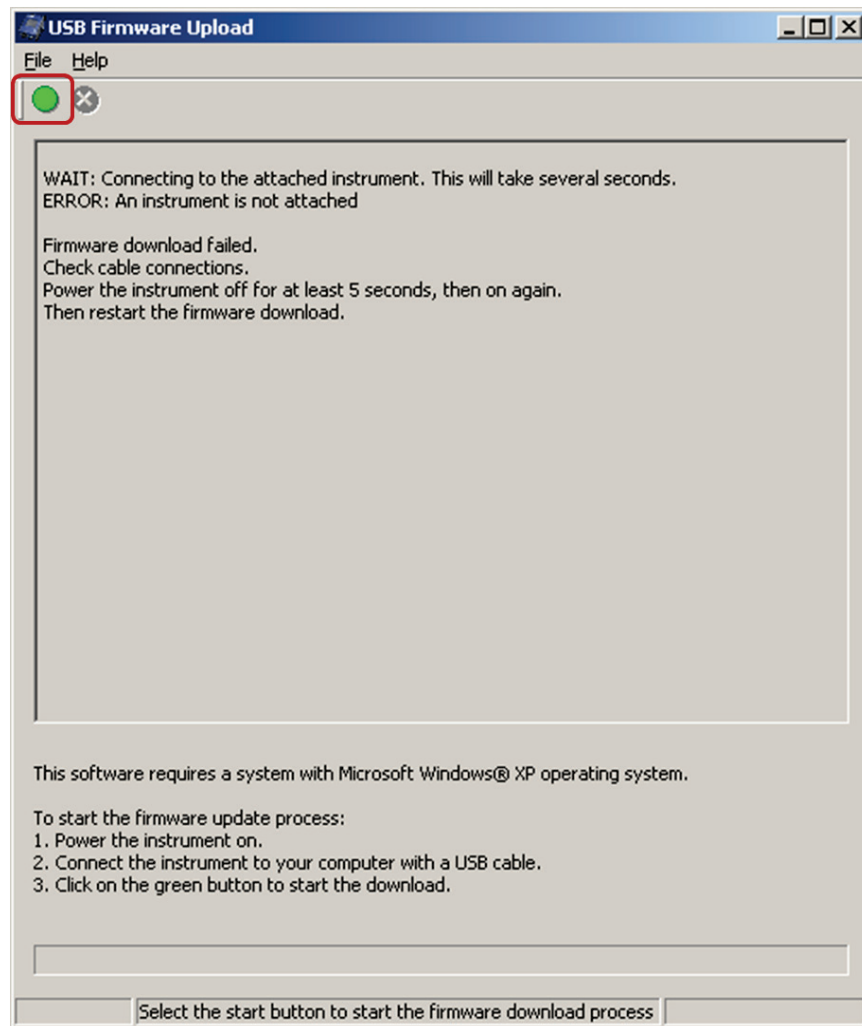
   "ERROR: An instrument is not attached"

Figure 11

3. The OPS instrument requires a switch in operation modes to allow firmware uploading to occur. Once the mode switch occurs, the Found New Hardware Wizard may be shown (steps 4 through 7).

   Allow the installation of the device on the system by following the Found New Hardware Wizard (Figures 12 through 15).

4. Select **No, not this time** to not search the Windows Update website. Then select the **Next >** button (Figure 12).
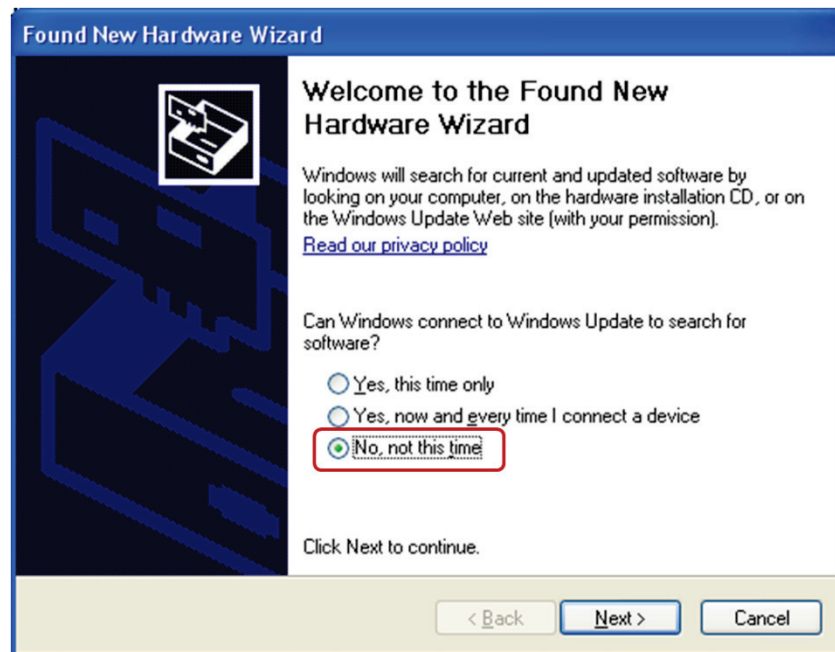
Figure 12

5. Select **Install the software automatically**, the recommended action. Then select the **Next >** button (Figure 13).
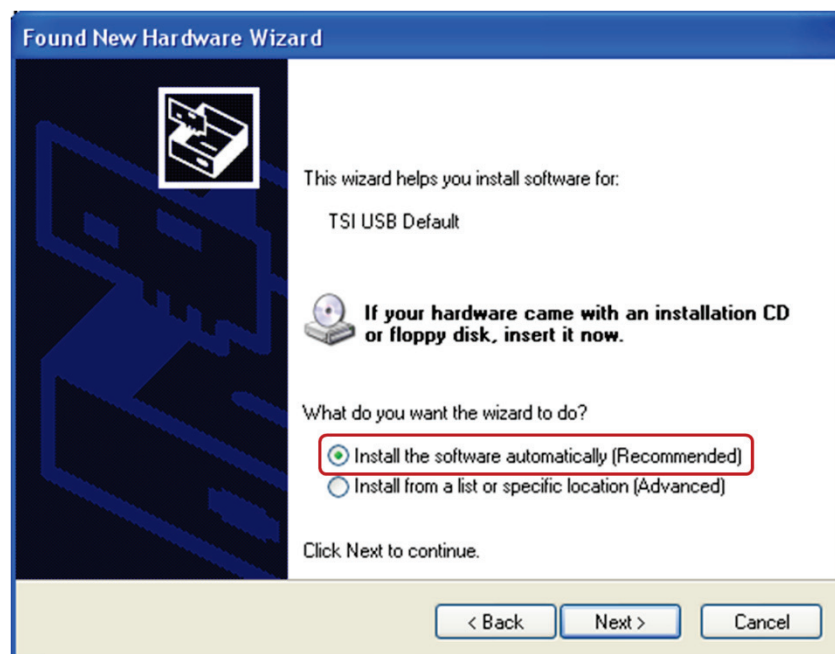

Figure 13

6. Select the **Continue Anyway** button (Figure 14).

Figure 14

7. Make sure that the device installed without any errors. Select **Finish** to complete the device installation and exit the dialog (Figure 15).
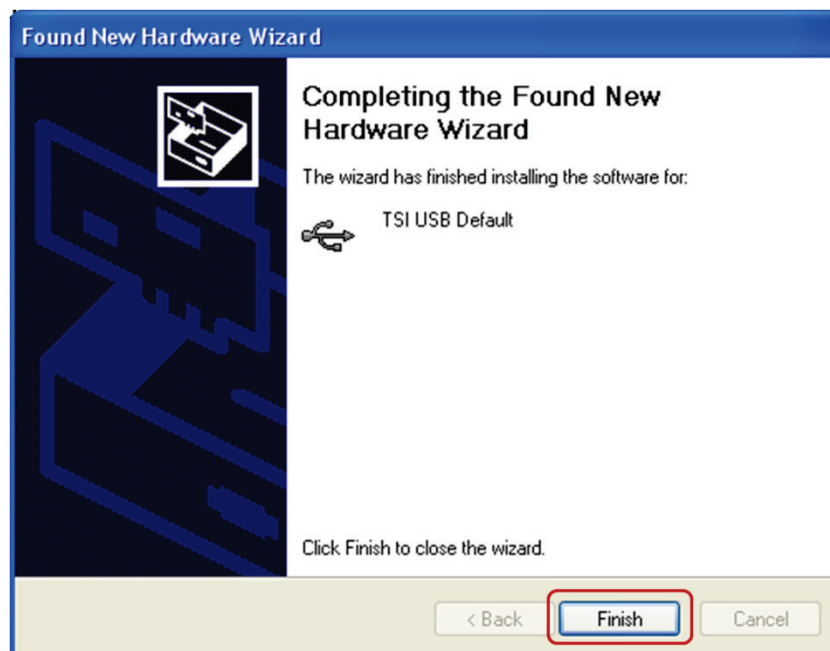

Figure 15

8. If the Firmware Upload application is displaying an error message similar to Figure 11, restart the Firmware Upload process by clicking the green **START** button.

9. In the event of the following message shown in the status box of the application:

   "ERROR: The Instrument Model is not supported. Please download the correct firmware upload application for the <XXX> instrument model"

   Make sure that the firmware upgrade you have is correct for the model of your instrument. The model of your instrument is displayed in the <XXX> placeholder of the message. If the problem persists, contact TSI customer service at 1-800-874-2811 or email technical.service@tsi.com to receive the correct firmware upgrade configuration for your instrument.

10. If the application detects that the firmware that is installed on the attached instrument is the same firmware that is being installed, a message will be displayed (Figure 16).

    Select **Yes** to rewrite or repair the existing firmware on the instrument. Select **No** if you do not need to rewrite the firmware on the instrument.
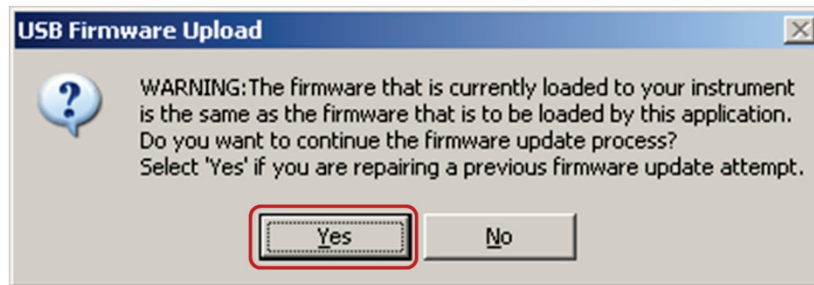
Figure 16

Selecting **Yes** will continue the installation.

11. The process of uploading firmware to an instrument will go through a series of erasing and writing firmware images. The number of images depends on the instrument and the released firmware. The status box of the application will list the firmware uploading tasks as completed. The progress bar of the application will update as the firmware images are written to the device.
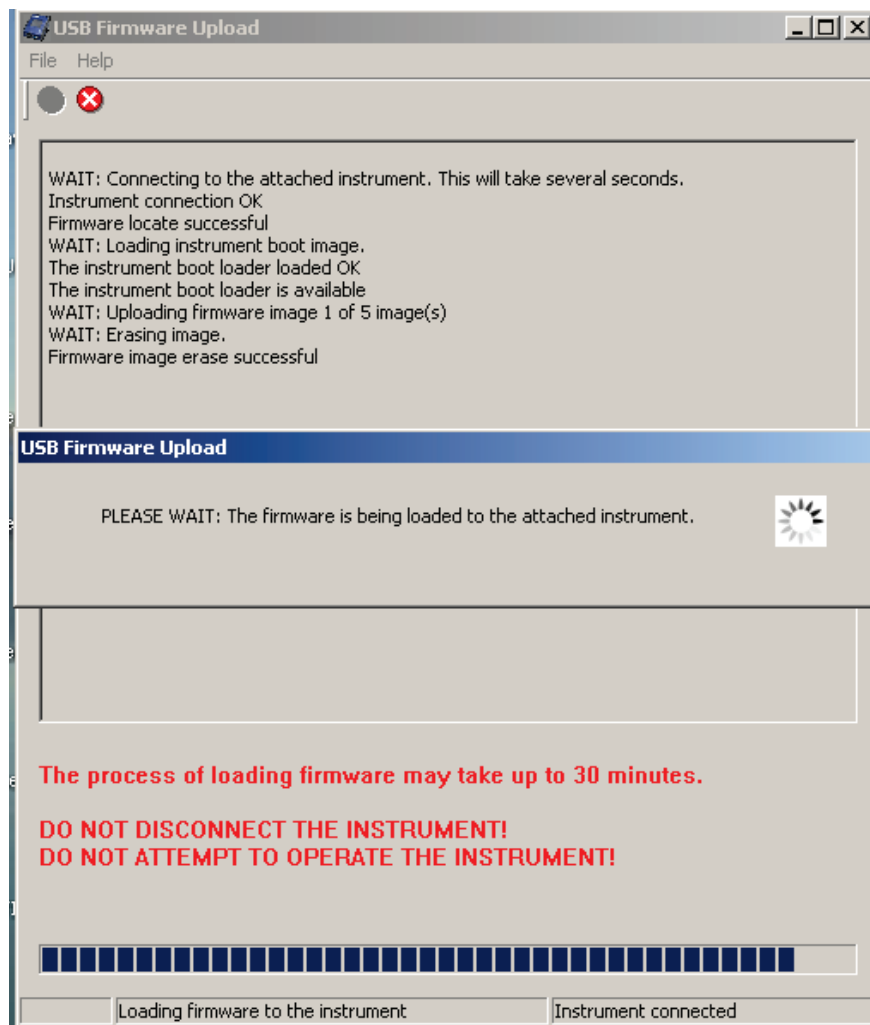

Figure 17

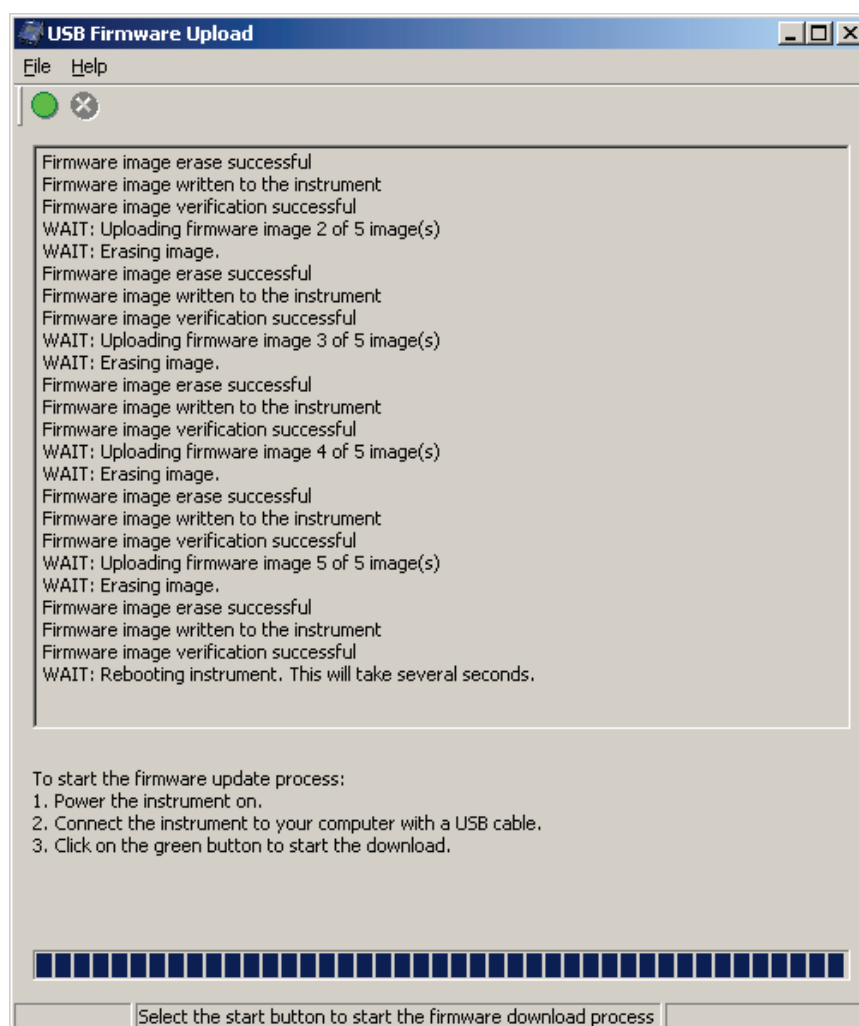12. When the firmware upload process is complete, the success message is displayed (Figure 18).

Figure 18

13. The software will prompt the user to exit at this point (Figure 19).
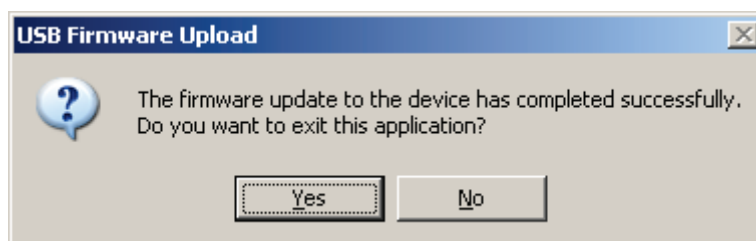
Figure 19

14. After the update is completed successfully, power down your Optical Particle Sizer. Wait 10 seconds and power up the instrument.

15. On the Optical Particle Sizer instrument screen, go to the **Setup tab** and select **Device** Info.

16. Verify the Build String is the version of the firmware update, e.g. 1.3.

The STOP Button

When the **Stop** button is clicked, the following message appears:

> "It is not recommended to select the Stop button during a firmware
> download".

Since it is necessary to erase the existing firmware of the instrument to write the new firmware of the device, the instrument will maintain an inoperable state until a complete and successful firmware upload occurs.

The following warning is displayed when the **Stop** button is pressed (Figure 20).
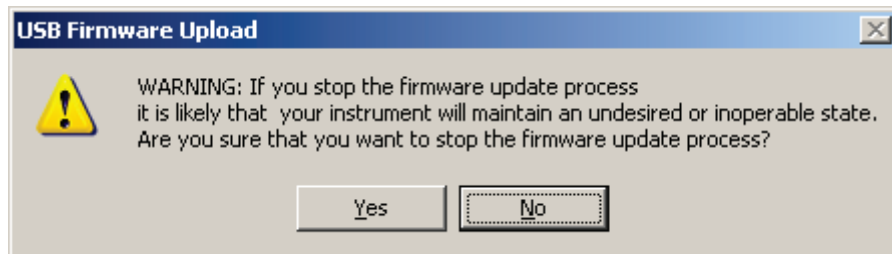
Figure 20

If the **No** button is clicked, the firmware upload will continue to upgrade the firmware of the instrument.

If the **Yes** button is clicked, the Firmware upgrade process will halt.

The following messages are displayed.

> CANCELLED: The firmware update process has been cancelled.
>
> This may result in an inoperable instrument!
>
> Please power down the instrument for at least five seconds then power on
> the instrument for at least 60 seconds prior to restarting any subsequent
> firmware updates.
>
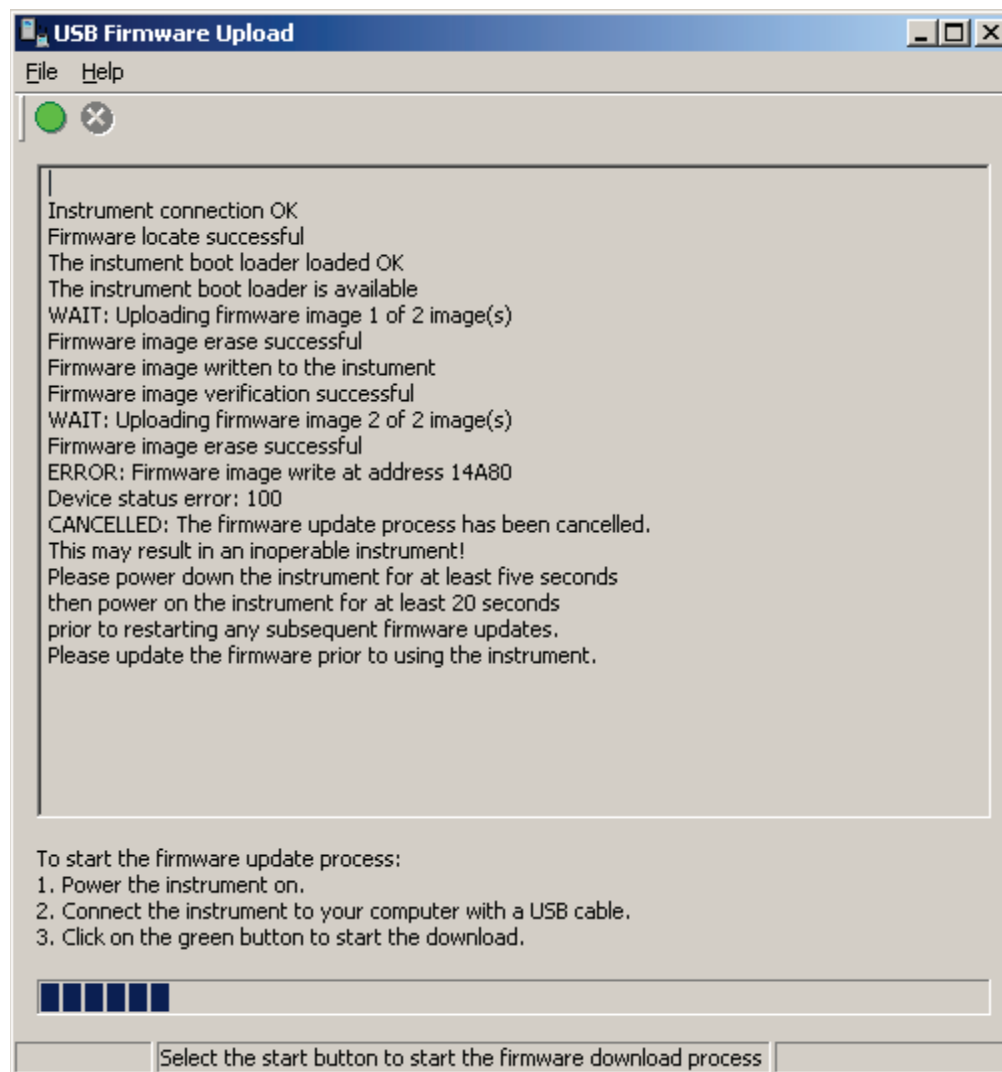> Please update the firmware prior to using the instrument.

Figure 21

Instrument Connection

If the instrument connection is disrupted or any error occurs during the firmware upgrade process, an error is reported. It is recommended to:

1. Power down the instrument.

2. Check the instrument cables.

3. Restart the firmware upgrade.

If the problem persists, please contact TSI customer service at www.TSI.com, 1-800-874-2811 or email technical.service@tsi.com to resolve the issue.

Figure 22