Head Calibration Utility
User Guide

For Eden/Connex/Objet1000 and
PolyJet Desktop Printers

stratasys®

About this Guide

This document is applicable for the following printers:

- All PolyJet desktop printers except V3
- Eden260V (software version 27.3 or above)
- Objet260 Connex (software version 28.1 or above)
- Eden350V (software version 36.3 or above)
- Eden500V (software version 50.3 or above)
- Connex350 (software version 37.1 or above)
- Connex500 (software version 57.1 or above)
- Objet1000 (software version 100.2)

Optimizing (Calibrating) Print Heads

The condition of the print heads directly affects the quality of printed models. To maintain optimum printing, you should routinely test the print heads, and calibrate them to the best working configuration by running the Head Calibration Utility as stated below.

During the optimization process, samples are printed on the build tray, one for each print head. After carefully inspecting and weighing each of them, you enter the data in the utility. The utility uses this data to optimize the print heads.

If, during the optimization process, the utility determines that a print head is faulty—or that it is negatively affecting layer uniformity with the current head configuration—the utility instructs you to replace it. If this happens, complete the Head Calibration procedure. Then replace the print head with the Head Optimization Wizard.

Run the Head Calibration Utility:

- after every 300 hours or one month of printing
- whenever the condition of print heads is negatively affecting the quality of printed models
- after replacing a print head

> **Important:**
> - To accurately test and calibrate the print heads, they must be clean. Run the wizard for cleaning the print heads before beginning this procedure.
> - Perform this procedure without interruption to ensure accurate results.
> - You can run the Head Calibration Utility using any of the materials loaded in the printer, including the Tango series of materials.
> - The samples printed using the Tango series of materials are more difficult to remove from the build tray, therefore it is recommended to use any of the rigid Model materials when running the Head Calibration Utility.

Prepare the following:

- isopropanol (IPA—isopropyl alcohol) or ethanol (ethyl alcohol)
- disposable cleaning gloves (any clean, powder-free protective gloves)
- the supplied cleaning cloth or equivalent
- a mirror
- scraper blade
- the weight samples scale (supplied in the Start-Up kit)
- the Missing Nozzles Ruler (supplied in the Start-Up kit with most printers. For Desktop printers, order MSC-34006-S)
- new print head (recommended if replacement is necessary)

Displaying the Maintenance Menu and Printing Samples

> **Important:**
> Weigh the samples immediately after the printing has finished.

To print samples:

1. On the printer computer desktop, move the mouse cursor to the lower right corner of the computer screen, beyond the right edge of the taskbar.

Figure 1: Cursor beyond right edge of taskbar

2. On the computer keyboard, press **Ctrl+Alt+M**.

   The *Maintenance* menu appears.

Figure 2: Maintenance menu

3. From the *Maintenance* menu, select the printing mode you need to calibrate.
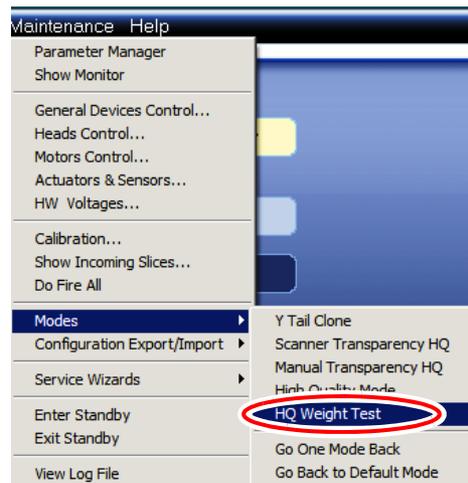
Figure 3: Maintenance menu — mode selections

4. Click **OK**.

Figure 4: Maintenance menu access screen

5. From the *Maintenance* menu, select **Modes** > **Weight Test**.

Figure 5: Selecting the Weight Test (sample menu)

6. Switch the printer to *Online* mode.

Figure 6: Online/offline button (sample)

The printer prints samples, one by each print head.

7. Exit the printer application.

Important:

The Head Calibration Utility can only adjust the print head calibration settings when the printer application is closed.
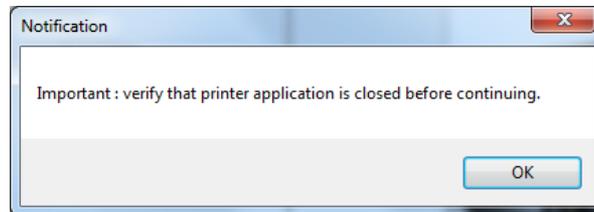
Using the Head Calibration Utility

To analyze the print samples:

1. On the printer computer desktop, double-click [Stratasys Head Calibr...] to open the Head Calibration Utility.

2. In the *Welcome* screen, click **Next**.

3. In the *Before continuing...* screen, click **Start Calibration**.

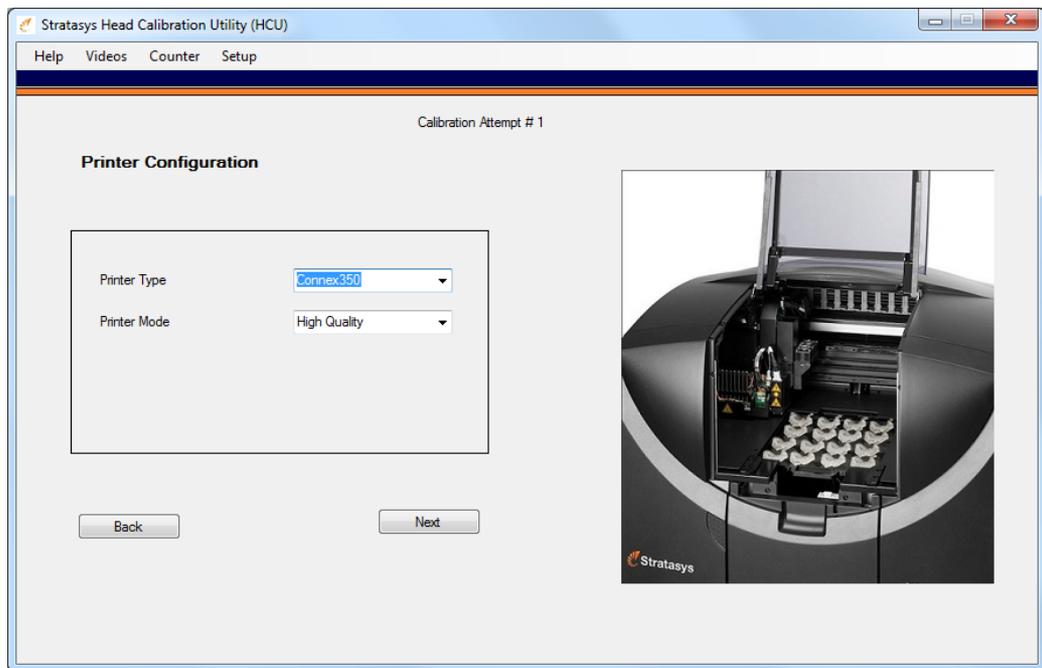   The following notification appears.

Figure 7: Notification to close the printer application

4. Verify that the printer application is closed, and click **OK**.
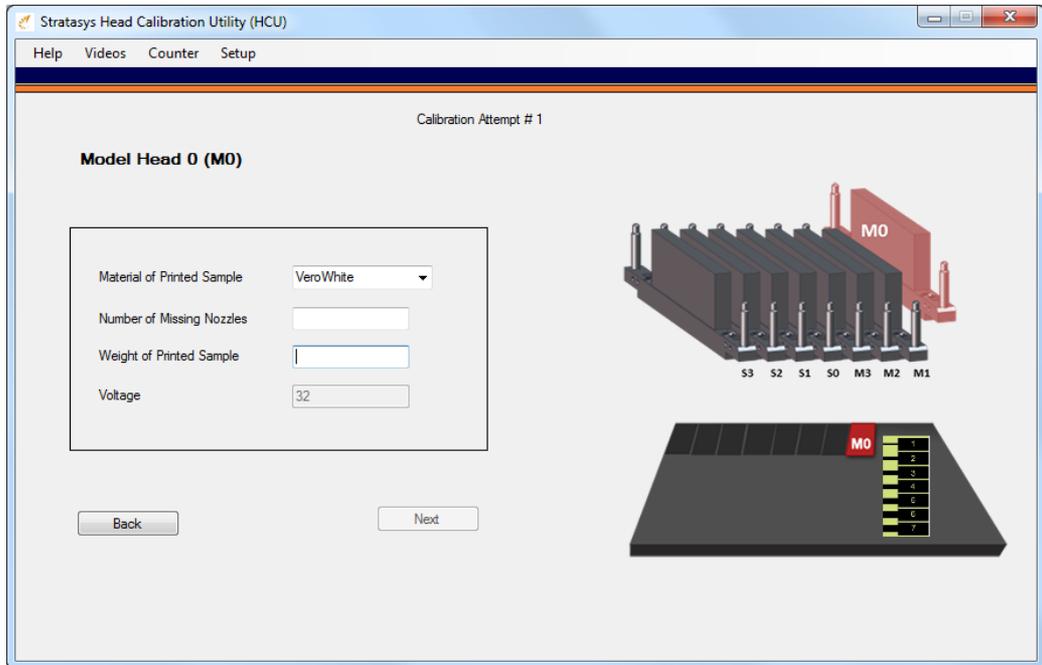
    The *Printer Configuration* screen appears.

Figure 8: Printer Configuration screen (sample)

5. Select the printer type and the printer mode that you want to calibrate, and click **Next**.

   The calibration screen for the first print head appears.

Figure 9: Print head calibration screen (sample)

6. Select the material used for printing the sample.

7. Before removing the samples from the tray, determine the number of missing nozzles using the Missing Nozzles Ruler.

Figure 10: Checking the number of missing nozzles
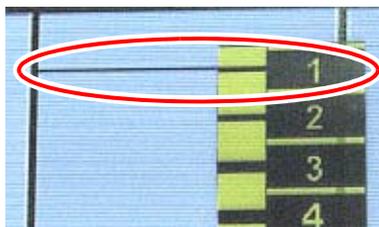
8. Enter the number of missing nozzles in the calibration screen.

   The *Number of Missing Nozzles* field background changes colors to indicate the status of the print heads, as follows:

   • **Green** (0-5 missing nozzles) = Good, no effect on quality.

   • **Yellow** (6-10 missing nozzles) = Acceptable, may affect quality.

   • **Orange** (11-15 missing nozzles) = Poor, will affect quality.

   • **Red** (16 or more missing nozzles) = Bad, will significantly affect quality, depending on the model printed.

9. Carefully remove the sample printed for the print head shown in the screen, and weigh it.

> **Important:**
> If the sample breaks while removing it from the tray, collect all of the pieces and place them on the scale.

10. Enter the weight of the sample in the calibration screen, and click **Next**.

    The *Calibration Attempt* screen for the next print head appears.

11. Repeat steps 6-10 for the rest of the print heads.

    When done, a message appears:

    • If the calibration was successful, continue with step 12.

    • If the calibration was not successful, you can perform another calibration attempt.
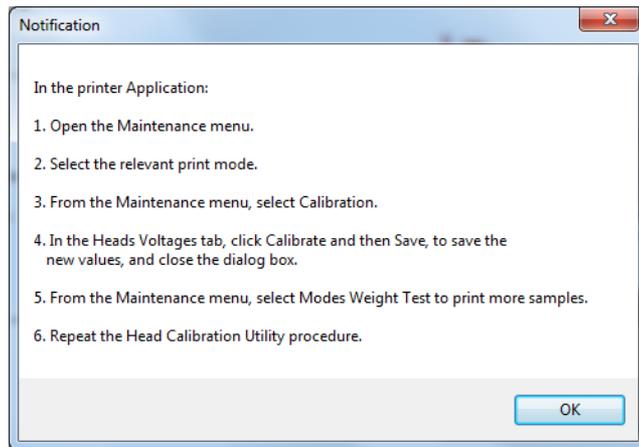
> After an unsuccessful calibration, a summary of the problems is displayed. For more information, view the log file from the *Help* menu.

12. Click **OK** on the message.

    A notification instructing you to how save the new parameters appears.

Figure 11: Notification instructing how to save the new parameters (sample)

13. Read the instructions on the message, and click **OK**.

> **Important:**
> The calibration process is iterative.
> Save the parameters in the printer application, even if the calibration attempt was not successful.

Saving the New Calibration Parameters

To save the new calibration parameters:

1. Verify that the build tray is empty.

> ⚠️ **Caution:**
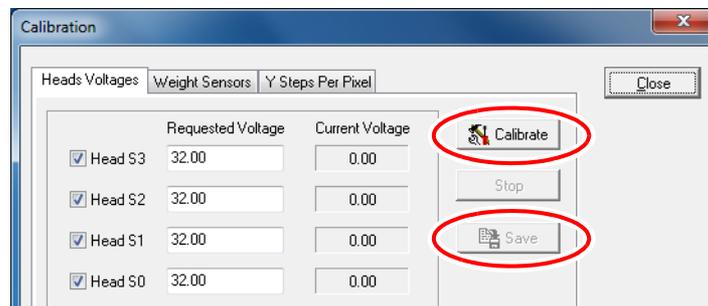> Leaving objects on the build tray might result in damage to the printer.

2. Close the printer cover.

> The cover must be closed for the print heads to receive the new parameters.

3. Open the printer application, and display the *Maintenance* menu (see steps 1-4 on page 3).
4. From the *Maintenance* menu, select **Calibrations**.

Figure 12: Calibration dialog box (sample)

5. In the *Heads Voltages* tab, click **Calibrate**.

    The *Current Voltage* values begin updating.

6. When the *Current Voltage* values are all updated, click **Save**.

    This saves the parameters from the latest calibration attempt.

7. Close the *Calibration* dialog box.

    *   After performing this procedure, if the print heads are not adequately calibrated, or you want to calibrate the print heads for another mode, click **Recalibrate** to print weight samples and calibrate the heads again. (Go to step 6 on page 4.)

    *   If your last calibration attempt was successful, click **Close** to close the Head Calibration Utility, and save the parameters as described in steps 1-7 in this section.

The print heads are calibrated.

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Page 8