HP Z840 Workstation Certified Hardware Setup Guide

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</table>
Welcome to the Autodesk HP Z840 Certified Hardware Setup Guide.

This guide provides instructions on building a certified Autodesk Creative Finishing workstation.

Flame Family products can run on non-certified hardware, however Autodesk will only guarantee performance with certified systems.
Preparing the Work Environment

Before you begin configuring the workstation, familiarize yourself with the following safety guidelines, and ensure your environments meet the power and air conditioning requirements.

Safety Guidelines

Consider the following environmental guidelines for hardware configurations:

**NOTE** These guidelines are in addition to and are not a substitution of the guidelines provided by the components supplier and manufacturer.

- Place all hardware components in an air-conditioned environment. Hardware components generate heat and must be kept cool.
- Ensure the test rack on which hardware components are mounted is open or well ventilated. Follow the ventilation specifications that apply to the workstation.
- Keep all hardware components in a clean, dust-free location.
- Minimize vibration and humidity.
- Do not block the vents on the hardware component housing.
- Do not drape anything, such as a jacket or a blanket, over hardware components.
- Minimize electromagnetic noise by separating digital data and power cables from analog audio cables and running them in different cable ducts.
- Ensure power is turned off on the hardware components you are configuring.
- Wear a grounded static wrist strap. Attach the strap's alligator clip to any grounded metal surface on the chassis of the hardware component you are working on.
- Do not handle hardware components unnecessarily, particularly boards and cards that slide in and out of PCI slots on their parent hardware components.
- It is important to properly ground the analog audio hardware components. Otherwise, ground loops can occur, causing an audible ‘hum’ on the analog outputs.

Power and Air Conditioning Requirements

The following table summarizes the peak (at startup) power consumed by the workstation and the heat it generates under the maximum processing load produced by a Creative Finishing application.
The values for power consumption and heat output were recorded on a workstation. For more detailed specifications, including noise output, see the documentation provided by the manufacturer.

**NOTE** These values can fluctuate if uncertified Components are added to the workstation. The use of uncertified Components is not supported. Adhere to the manufacturer's documentation for standardized minimum and maximum values.

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
<th>Startup Amps (120V / 240V)</th>
<th>Continuous Amps (120V / 240V)</th>
<th>Watts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z840 - Single GPU (with add-on cards)</td>
<td>1</td>
<td>7.0 / 3.5</td>
<td>4.0 / 2.0</td>
<td>840</td>
</tr>
<tr>
<td>Z840 - Dual GPU (with add-on cards)</td>
<td>1</td>
<td>9.0 / 4.5</td>
<td>5.0 / 2.5</td>
<td>1080</td>
</tr>
</tbody>
</table>

You must be able to meet the above power requirements and have a climate control system with the capacity to maintain the temperature of these components at the maximum processing load.

Use the following formulas to calculate the amount of air conditioning required:
- 1 Watt = 3.413 BTU
- 12000 BTU = 1 ton of air conditioning

**Tools You’ll Need**

It is recommended you use an anti-static mat and wrist strap when assembling the workstation

**Supported Peripherals**

The following peripherals have been tested by Autodesk, and certified for peak performance with Flame Family products. They will be referred to in this guide.

- Atto Celerity 16G 4-port Fibre HBA
- Mellanox InfiniBand FDR/40 GigE
- AJA KONA 4G
- NVIDIA Quadro M6000
Supported Memory Configurations

Autodesk supports three memory configurations for the HP Z840:

<table>
<thead>
<tr>
<th>Total Memory</th>
<th>Number of DIMMs to Use</th>
<th>DIMM Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 GB</td>
<td>8 x 8 GB</td>
<td>1, 3, 5, 7 &amp; 2, 4, 6, 8</td>
</tr>
<tr>
<td>128 GB</td>
<td>16 x 8 GB</td>
<td>All DIMM Slots</td>
</tr>
<tr>
<td>256 GB</td>
<td>16 x 16 GB</td>
<td>All DIMM Slots</td>
</tr>
</tbody>
</table>

The memory should be pre-installed when you receive the machine. Refer to this section for memory upgrades or configuration changes.

Memory Loading Rules

Each channel includes two DIMM sockets; black and white connector pairs represent a channel. The DIMMs should be loaded first in the black sockets and then in the white sockets, while alternating between the two processors. The DIMMs should be loaded starting with the DIMM furthest from each CPU, with the first DIMM loaded in the bottom most socket and alternating sides of the CPU.

See figure below for loading order on dual CPU configurations (also found on the back of the Z840 side panel):
Unpacking and Preparing the Workstation for Assembly

Perform the following tasks to unpack the hardware and prepare it for assembly:

1. Carefully remove the workstation from its box and lay it on its side on a workbench. Position it with the back plate towards you.
2. Carefully remove each adapter card from its packaging, but do not remove them from their anti-static bag for now.
3. Remove the HP workstation’s side-panel to access the inside of the computer.
   
   **NOTE** Plastic parts identified by a small green line sticker are removable by hand (screw-less).

4. Remove the airflow guide (the large black plastic part with the HP logo) by pulling it up.
5. Remove the expansion card cover (the silver cover above the PCI slots) by pulling the black plastic tab toward you and then lifting the card cover up.
6. Check that the following default components are installed in the HP workstation:
   - 2 CPUs;
   - 16 modules of memory (8 beside each CPU);
   - DVD reader/writer unit;
   - 2 system hard drives (in hard-drive bay 0 and bay 1).

7. Move the cables labeled HDD BAY 2 and HDD BAY 3 from the SAS ports to the sSATA ports labeled sSATA 0 and sSATA 1 respectively.

8. Validate that the SATA and SAS ports on the motherboard are properly connected, as follows:
   - SATA 0 = DVD drive (cable labeled SYS BRD);
   - SAS 0 = HDD BAY 0 (SSD 1st System Drive);
   - SAS 1 = HDD BAY 1 (SSD 2nd System Drive);
   - sSATA 0 = HHD BAY 2 – Empty Drive Bay;
   - sSATA 1 = HHD BAY 3 – Empty Drive Bay;
   - All other ports should be empty.
NOTE  A list of all the ports is displayed on the back of the HP workstation’s side panel.

<table>
<thead>
<tr>
<th>UO</th>
<th>PCI/PCIe</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front audio</td>
<td>PCIe x4 – CPU0</td>
</tr>
<tr>
<td>2</td>
<td>Front USB 3.0</td>
<td>PCIe x16 – CPU0</td>
</tr>
<tr>
<td>3</td>
<td>Internal USB 2.0</td>
<td>PCIe x8 – CPU1</td>
</tr>
<tr>
<td>4</td>
<td>Internal USB 3.0</td>
<td>PCIe x16 – CPU1</td>
</tr>
<tr>
<td>5</td>
<td>Keyboard/mouse</td>
<td>PCIe x8 (PC, single prod)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PCIe x8 (CPU1 dual prod)</td>
</tr>
<tr>
<td>6</td>
<td>Network</td>
<td>PCIe x16 – CPU0</td>
</tr>
<tr>
<td>7</td>
<td>Rear audio</td>
<td>PCIe x1 – PCIe</td>
</tr>
<tr>
<td>8</td>
<td>Rear USB 2.0</td>
<td>PCIe x1 – PCIe</td>
</tr>
<tr>
<td>9</td>
<td>Rear USB 3.0</td>
<td>PCIe x1 – PCIe</td>
</tr>
<tr>
<td>10</td>
<td>Serial</td>
<td>Auxiliary fan</td>
</tr>
<tr>
<td>11</td>
<td>Thunderbolt GP</td>
<td>CPU1 auxiliary cooler</td>
</tr>
<tr>
<td>12</td>
<td>Hard drive LED</td>
<td>Power button/LED</td>
</tr>
<tr>
<td>13</td>
<td>SAS/SATA</td>
<td>Power button/LED</td>
</tr>
<tr>
<td>14</td>
<td>SAS/SATA 6 Gb/s</td>
<td>Front fan 2 heat sink</td>
</tr>
<tr>
<td>15</td>
<td>SATA 6 Gb/s</td>
<td>Rear chassis fan</td>
</tr>
</tbody>
</table>

Installing the Adapter Cards into the HP Workstation

To install the adapter cards into the workstation’s slots:

1. Rotate the green PCI retaining clip to open it.
2. Remove the PCI slot fillers according to which adapters you need to install. There are 8 slot fillers, numbered 0 to 7 starting from the left.
3. Insert the NVIDIA Quadro PCIe graphics card in the correct slot, as per the tables below (Single GPU or Dual GPU). The card will also cover the next slot.
There are 3 power cables tied above a fan near the hard-disk bay. Unclip one cable from there and plug it to the 6-pin end of the "6-pin to 8-pin" adapter that came with the M6000. Connect the 8-pin end of that same adapter to the graphics card.

**NOTE** If you are configuring a dual GPU system, repeat steps 3 and 4 for the second graphics card.

5 Insert the ATTO Celerity 16Gb 4-port Fibre HBA PCIe adapter in the correct slot, as per the tables below (Single GPU or Dual GPU).

6 Locate another 6-pin power cable from the PC and connect it to the appropriate port on the card.

7 Insert the AJA KONA PCIe adapter in the correct slot, as per the tables below (Single GPU or Dual GPU).

8 Optional (if ordered): Insert the Mellanox InfiniBand FDR/40 GigE PCIe adapter in the correct slot, as per the tables below (Single GPU or Dual GPU).

Once all the cards are installed, the workstation should be configured as follows:

### Single GPU Configuration

<table>
<thead>
<tr>
<th>Slot</th>
<th>Card</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Atto 16G (PCIe3 x8)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Mellanox FDR (PCIe3 x8)</td>
<td>Only available with 2nd CPU</td>
</tr>
<tr>
<td>4</td>
<td>AJA Kona 4G (PCIe2 x8)</td>
<td>Only available with 2nd CPU</td>
</tr>
<tr>
<td>5</td>
<td>Optional ATTO</td>
<td>Optional Slot</td>
</tr>
<tr>
<td>6</td>
<td>NVIDIA Quadro M6000 (PCIe3 x16)</td>
<td>System GPU</td>
</tr>
<tr>
<td>7</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

### Dual GPU Configuration

<table>
<thead>
<tr>
<th>Slot</th>
<th>Card</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Mellanox FDR (PCIe3 x8)</td>
<td>Performance may be impacted by slot power restriction.</td>
</tr>
<tr>
<td>2</td>
<td>Atto 16G (PCIe3 x8)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AJA Kona 4G (PCIe2 x8)</td>
<td>Only available with 2nd CPU</td>
</tr>
<tr>
<td>4</td>
<td>NVIDIA Quadro M6000 (PCIe3 x16)</td>
<td>Background Reactor GPU</td>
</tr>
<tr>
<td>5</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>
Reassembling the Workstation

1. Close the green PCI retaining clip to secure the adapters in place.
2. Re-attach the airflow panel and the expansion card cover.
3. Re-attach the HP workstation’s side panel.

**NOTE** The adapter cards may require firmware upgrades. Refer to the *Flame Family Installation Guide* for the firmware upgrade procedure. The Linux operating system must be installed on the workstation prior to the peripherals firmware upgrade.

Connecting the Keyboard, Mouse and the EIZO Monitor

To connect a keyboard, mouse and monitor to the workstation:

1. Connect the keyboard to a USB port on the HP workstation.
2. Connect the mouse to a USB port on the HP workstation.
3. Connect the Display Port cable provided with the monitor from the DP port of the NVIDIA Quadro graphics card port to the monitor’s DP port.

**NOTE** If you decide to use the Display Port extender cable, ensure you connect the transmitter end of the cable to the PC and the receiver end of the cable to the monitor.

4. Connect the power cable to the EIZO monitor.
5. Connect the power cable to the HP workstation.

Updating the EIZO Monitor Firmware

Two EIZO monitors are currently supported:

- CG277W – 27” HD Monitor
- CG318-4K – 31” 4K Monitor

**NOTE** If you are configuring a system with the 31” 4K monitor, you must use the Avenview 4K DisplayPort Extender over Fiber Optic Cable in order to be able to display 4K graphics. This is especially important for upgrades from the 27” monitor to the 31” monitor, as the cable originally supplied with the 27” monitor will not work with the 31” monitor.

The minimum firmware version for the CG277W – 27” HD Monitor is 10001.
The minimum firmware version for the CG318-4K – 31” 4K Monitor is 10004.

If your EIZO monitor is running a firmware version older than the above, you must update it to the current version, which improves self-calibration accuracy and ensures stable performance.
Perform the following tasks to check the current firmware:

1. Power on the monitor.
2. Press
   - to enter the menu.
3. Go to the Tools / Monitor Info menu.

The first five digits in the “Version” line are the firmware version.

To update the firmware:

1. Download the firmware updater to a PC running Microsoft Windows:
   - CG277W: [http://www.eizoglobal.com/support/db/products/software/CG277#tab02](http://www.eizoglobal.com/support/db/products/software/CG277#tab02)
   - CG318-4K: [http://www.eizoglobal.com/support/db/products/software/CG318-4K#tab02](http://www.eizoglobal.com/support/db/products/software/CG318-4K#tab02)
2. Unzip the package.
3. Refer to the PDF guide inside the package for detailed step-by-step instructions on updating the firmware.
Updating and Configuring the HP Workstation BIOS

To ensure Autodesk Creative Finishing software performs properly, you must re-flash the workstation with the latest BIOS version that has been certified by Autodesk.

To update and configure the workstation’s BIOS, you must download two files:

- The .bin file (The BIOS) - from the HP website.
- HpSetup_<version_number>.txt (The BIOS Settings File) - from the DKU.

Go to the System Requirements page, to download these files.

The rest of this section assumes you have downloaded these files.

Updating the HP Workstation BIOS

To update the workstation’s BIOS to the latest version, you will need access to a working computer, other than your Creative Finishing workstation, and a USB key.

1. Create the following folder structure at the root of the USB key:
   Hewlett-Packard/BIOS/New/
2. Copy the BIOS BIN file on the USB key, in the folder created in previous step.
3. With the USB key connected to the workstation, boot the system.
4. When the HP logo is displayed, press F10 to enter the BIOS settings.
5. In the “Main” menu, select the option “Update System BIOS”.
6. Follow the onscreen instructions to flash the BIOS.

Configuring the HP Workstation BIOS

To configure the workstation’s BIOS to Autodesk specification, you will need access to a working computer, other than your Creative Finishing workstation, and a USB key.

1. Extract the Hp_Setup_<version_number>.txt file from the DKU. It is located in DKU_<version_number>/Utils/BIOS/HPZ840.
2 Copy the `Hp_Setup_<version_number>.txt` file to the root folder of the USB key and rename it to `HpSetup.txt`. This file contains all of the required BIOS settings and automatically configures your workstation’s BIOS to Autodesk specification.

**NOTE** The file MUST be renamed to `HpSetup.txt` in the root folder of the USB key for the configuration process to work.

3 With the USB key connected to the workstation, boot the system.
4 When the HP logo is displayed, press F10 to enter SETUP.
5 From the "Main" menu, select the "Replicated Setup" option.
6 From the "Replicated Setup" menu, select the "Restore current settings from USB device" option.
7 Wait until the LED on the USB key is off.
8 From the "Main" menu, select "Save Changes and Exit".

Your workstation’s BIOS is now configured to Autodesk specification.
RAID Configuration for the 2 SSD System Drives

RAID 1 (mirror) configurations with 2 SSD system drives are supported by default on the HP Z840. Following is the procedure to configure the RAID 1 using the onboard LSI chipset.

This procedure comes from the official Z840 document “Maintenance and Service Guide”

Follow these steps to configure an Integrated Mirroring (IM) volume with the BIOS-based configuration utility.

The procedure assumes that the system has the required drives and drive controllers.

1. During BIOS startup, press Ctrl-C when prompted to start the LSI Logic Configuration Utility. Use the arrow keys and the space bar to navigate and select "Options".
2. Select an appropriate adapter, then press Enter.
3. Select "RAID Properties", and then press Enter.
4. Select "Create RAID 1", and then press Enter.

Configuring a Two Drive Mirrored Volume with an Optional Hot-Spare Disk

To configure a two-drive mirrored volume with an optional hot-spare disk:

1. On the "Create New Volume" screen, select the primary disk for the RAID 1 volume (the disk with the data you want to mirror).
2. On the "RAID Disk" column for this disk, and then select Yes. The value in the "Array Disk" column changes to Primary.
   
   **NOTE** If partitions have been defined on the selected drive, data on the drive will be lost when the mirrored volume is created.

3. Select the secondary (mirrored) disk for the RAID 1 volume and set the "RAID Disk" column value to Yes.
4. Press Delete to allow the data on the disk to be erased, or press any other key to deselect the disk.
5. When all drives are selected, press C to create the array.
6. Select Save changes then exit this menu, and then press Enter.
When the new array is created, the Adapter Properties screen appears. Press \texttt{Esc} twice, and then select Exit.
Additional Resources

For additional resources on configuring your HP Z840 workstation, you can follow the links below:

- System Requirements:
  - Flame: http://www.autodesk.com/flame-sysreqs
  - Lustre: http://www.autodesk.com/lustre-sysreqs

Make sure to also check http://www.autodesk.com/vxf for the latest documentation (including User Guides, Installation Guides, Release Notes, and other documents).