# HP ProDisplay LCD Backlit Monitors

User Guide

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First Edition (November 2012)

Document Part Number: 711877-001

# About This Guide

This guide provides information on monitor features, setting up the monitor, and technical specifications.

**WARNING!** Text set off in this manner indicates that failure to follow directions could result in bodily harm or loss of life.

**CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

**NOTE:** Text set off in this manner provides important supplemental information.

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# 1 Product Features

## HP LCD Monitors

The LCD (liquid crystal display) monitors have an active matrix, thin-film transistor (TFT) panel. The monitor models and features include:

- P191 model, 47-cm (18.5-inch) diagonal viewable area display with 1366 x 768 resolution, plus full-screen support for lower resolutions; includes custom scaling for maximum image size while preserving original aspect ratio
- P201 and P201m models, 50.8-cm (20-inch) diagonal viewable area display with 1600 x 900 resolution, plus full-screen support for lower resolutions; includes custom scaling for maximum image size while preserving original aspect ratio
- P221 model, 55-cm (21.5-inch) diagonal viewable area display with 1920 x 1080 resolution, plus full-screen support for lower resolutions; includes custom scaling for maximum image size while preserving original aspect ratio
- Non-glare panel with an LED backlight that consumes less energy than traditional CCFL backlights
- Wide viewing angle to allow viewing from a sitting or standing position, or moving side-to-side
- Tilt capability
- Removable stand for flexible monitor panel mounting solutions
- Video signal input to support VGA analog with VGA signal cable provided
- Video signal input to support DVI digital with DVI-D signal cable provided (select models)
- Integrated speakers and audio cable (select models)
- Supports an optional HP Speaker Bar, HP Quick Release, and HP USB Graphics Adapter
- Plug-and-play capability if supported by the operating system
- Privacy filter slots to insert filters (purchased separately) to block side screen viewing
- Security slot provision on rear of monitor for optional cable lock
- Cable management feature for placement of cables and cords
- On-Screen Display (OSD) adjustments in several languages for easy setup and screen optimization
- HP Display Assistant for adjusting monitor settings and enabling the theft deterrence feature
- HDCP copy protection on DVI input
- Software and documentation CD that includes monitor drivers and product documentation
- Energy saver feature to meet requirements for reduced power consumption

- Energy Star® qualified
- Safety guidelines, certifications, and regulatory notices for these products are available in the HP LCD Monitors Reference Guide on the CD included with this monitor

# 2 Setting Up the Monitor

To set up the monitor, ensure that the power is turned off to the monitor, computer system, and other attached devices, then follow the instructions below.

## Attaching the Stand Base

1. Lift the stand base from the monitor box and set it on a flat surface such as a table top.
2. Using both hands, lift the monitor from its box, position the monitor stand over the stand base, and press down firmly to lock it in place. Be sure the stand base is securely locked in place and adjust the tilt angle to the desired position.

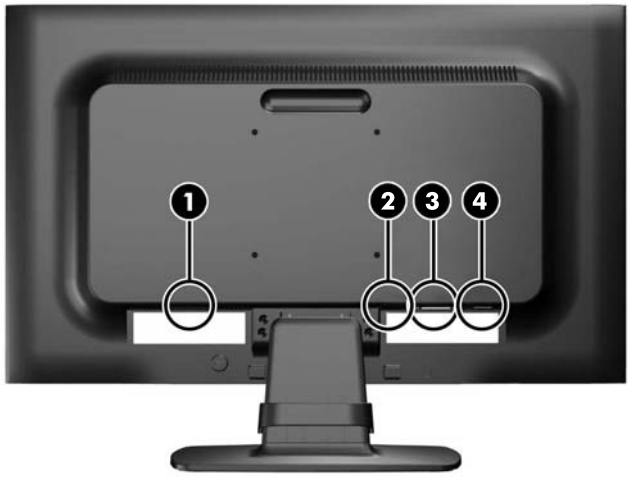
**CAUTION:** Do not touch the surface of the LCD panel. Pressure on the panel may cause non-uniformity of color or disorientation of the liquid crystals. If this occurs the screen will not recover to its normal condition.

**Figure 2-1** Attaching the Monitor Stand Base

**NOTE:** To remove the stand base, press inward on the tab in the center of the underside of the stand base and pull the stand base from the stand.

# Rear Components

**Figure 2-2** Rear Components

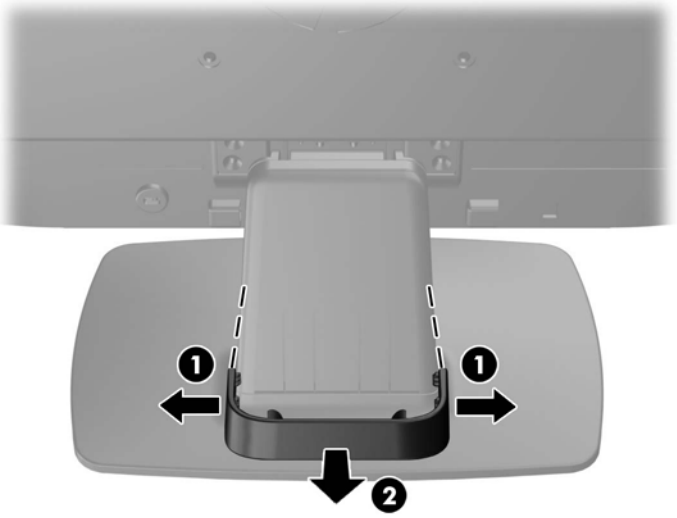



| Component | | Function |
|---|---|---|
| 1 | AC Power Connector | Connects the AC power cord to the monitor. |
| 2 | Audio Connector (select models) | Connects the audio cable to the monitor. |
| 3 | DVI-D (select models) | Connects the DVI-D cable to the monitor. |
| 4 | VGA | Connects the VGA cable to the monitor. |

# Connecting the Cables

1. Place the monitor in a convenient, well-ventilated location near the computer.
2. Remove the cable management clip from the stand by pulling outward on the two sides of the clip (1), then lifting the clip off the stand (2).

   **Figure 2-3** Removing the Cable Management Clip




3. Connect a VGA signal cable or DVI-D signal cable (select models).

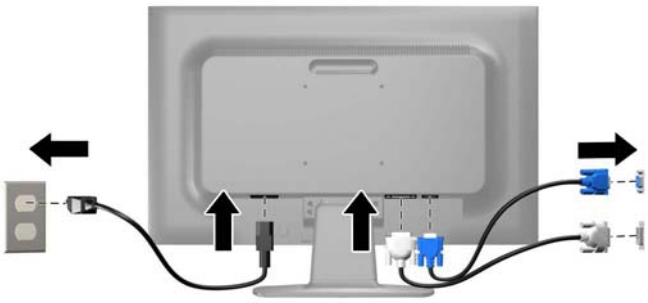
**NOTE:** The monitor is capable of supporting either analog or digital input (select models). The video mode is determined by the video cable used. The monitor will automatically determine which inputs have valid video signals. The inputs can be selected by pressing the +/source button on the front panel or through the On-Screen Display (OSD) feature by pressing the Menu button.

- For analog operation, use the VGA signal cable provided. Connect the VGA signal cable to the VGA connector on the rear of the monitor and the other end to the VGA connector on the computer.
- For DVI digital operation, use the DVI-D signal cable provided. Connect the DVI-D signal cable to the DVI connector on the rear of the monitor and the other end to the DVI connector on the computer.

4. Connect one end of the provided audio cable to the audio connector on the monitor (select models) and connect the other end of the cable to an audio output connector on the rear panel of the computer.

5. Connect one end of the power cord to the AC power connector on the back of the monitor, and the other end to an electrical wall outlet.

**Figure 2-4** Connecting the Cables



**WARNING!** To reduce the risk of electric shock or damage to the equipment:

Do not disable the power cord grounding plug. The grounding plug is an important safety feature.

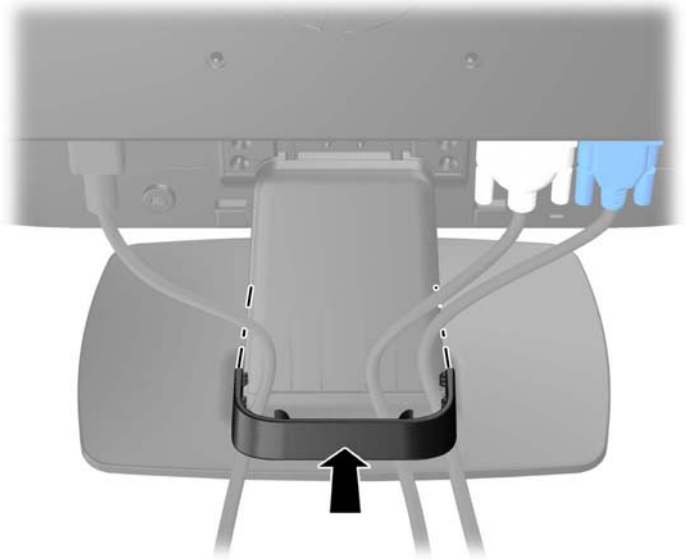
Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

Disconnect power from the equipment by unplugging the power cord from the electrical outlet.

For your safety, do not place anything on power cords or cables. Arrange them so that no one may accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

6. Secure the cables in place with the cable management clip. Press the clip straight down on the stand ensuring that the tabs on the sides of the clip snap into the slots on the stand.

**Figure 2-5** Installing the Cable Management Clip



# Front Panel Controls

**Figure 2-6** Monitor Front Panel Controls

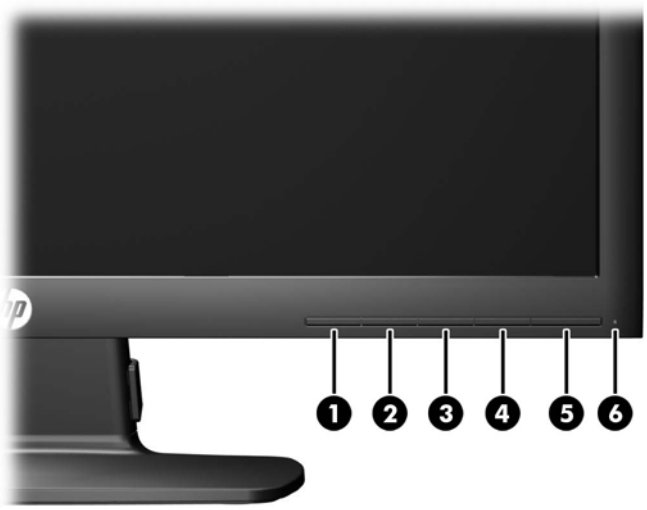



**Table 2-1 Monitor Front Panel Controls**

| Control | | | Function |
|---|---|---|---|
| 1 | | Menu | Opens, selects or exits the OSD menu. |
| 2 | —<br>or<br>—<br>🔊 | Minus<br>or<br>Minus/volume (P201m) | If the OSD menu is on, press to navigate backward through the OSD menu and decrease adjustment levels.<br>If the OSD menu is inactive, press to activate the volume adjustment bar. Press - or + to adjust the volume (select models). |
| 3 | + | Plus/source | If the OSD menu is on, press to navigate forward through the OSD menu and increase adjustment levels.<br>If the OSD menu is inactive, press to activate the source button that chooses the video signal input (VGA or DVI). |
| 4 | OK | OK/auto | If the OSD menu is on, press to select the highlighted menu item.<br>If the OSD menu is inactive, press to activate the auto adjustment feature to optimize the screen image. |
| 5 | ⏻ | Power | Turns the monitor on or off. |
| 6 | | Power LED | White = Fully powered.<br>Amber = Sleep mode.<br>Flashing Amber = Sleep Timer mode. |

**NOTE:** To view an OSD menu simulator, visit the HP Customer Self Repair Services Media Library at http://www.hp.com/go/sml.

# Adjusting the Monitor

Tilt the monitor panel forward or backward to set it to a comfortable eye level.

**Figure 2-7** Tilting the Monitor

# Turning on the Monitor

1. Press the power button on the computer to turn on the computer.
2. Press the power button on the front of the monitor to turn on the monitor.

**CAUTION:** Burn-in image damage may occur on monitors that display the same static image on screen for a prolonged period of time.* To avoid burn-in image damage on the monitor screen, you should always activate a screen saver application or turn off the monitor when it is not in use for a prolonged period of time. Image retention is a condition that may occur on all LCD screens. Monitors with a "burned-in image" are not covered under the HP warranty.

* A prolonged period of time is 12 consecutive hours of non-use.

**NOTE:** If pressing the power button has no effect, the power button lockout feature may be enabled. To disable this feature, press and hold the monitor power button for 10 seconds.

**NOTE:** You can disable the power LED in the OSD menu. Press the Menu button on the front of the monitor, then select **Management** > **Bezel Power LED** > **Off**.

When the monitor is powered on, a monitor status message is displayed for five seconds. The message shows which input (DVI or VGA) is the current active signal, the status of the auto-switch source setting (on or off; factory default is on), the default source signal (factory default is VGA), the current preset display resolution, and the recommended preset display resolution.

The monitor automatically scans the signal inputs for an active input and uses that input for the display. If two or more inputs are active, the monitor will display the default input source. If the default source is not one of the active inputs, then the monitor will display the highest ranking priority input in the following order: DVI then VGA. You can change the default source in the OSD by pressing the front panel Menu button and selecting **Source Control** > **Default Source**.

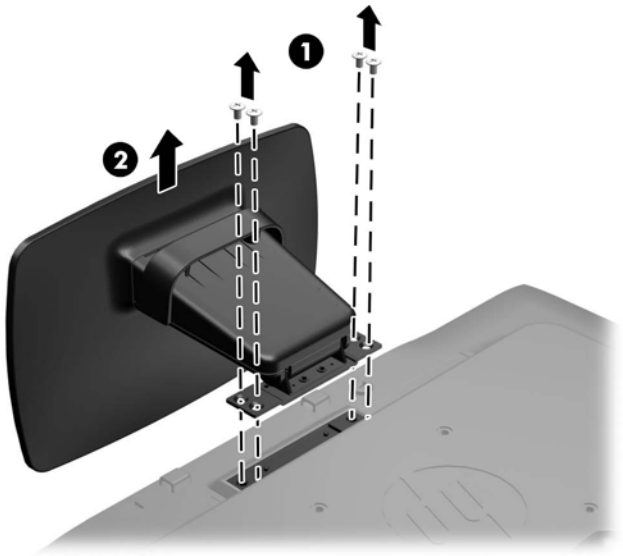
# Removing the Monitor Stand

You can remove the monitor panel from the stand to install the panel on a wall, a swing arm, or other mounting fixture.

⚠ **CAUTION:** Before beginning to disassemble the monitor, be sure the monitor is turned off and the power and signal cables are both disconnected.

1. Disconnect and remove the signal and power cables from the monitor.
2. Lay the monitor face down on a flat surface covered by a clean, dry cloth.
3. Remove the four screws (1) attaching the stand to the monitor and lift the stand (2) off the monitor.

**Figure 2-8** Removing the Screws Attaching the Stand to the Monitor




## Mounting the Monitor

The monitor panel can be attached to a wall, swing arm, or other mounting fixture.

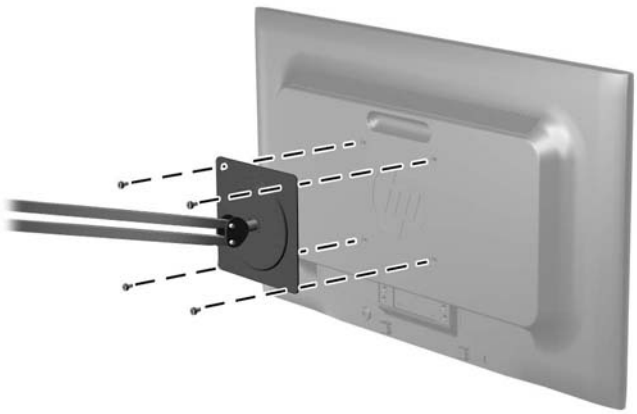
**NOTE:** This apparatus is intended to be supported by UL or CSA Listed wall mount bracket.

1. Remove the stand from the monitor. Refer to Removing the Monitor Stand on page 9.

**CAUTION:** This monitor supports the VESA industry standard 100 mm mounting holes. To attach a third-party mounting solution to the monitor, four 4 mm, 0.7 pitch, and 10 mm long screws are required. Longer screws must not be used because they may damage the monitor. It is important to verify that the manufacturer's mounting solution is compliant with the VESA standard and is rated to support the weight of the monitor. For best performance, it is important to use the power and video cables provided with the monitor.

2. To attach the monitor to a swing arm (sold separately), insert four 10mm screws through the holes on the swing arm plate and into the mounting holes on the monitor.

**Figure 2-9** Mounting the Monitor



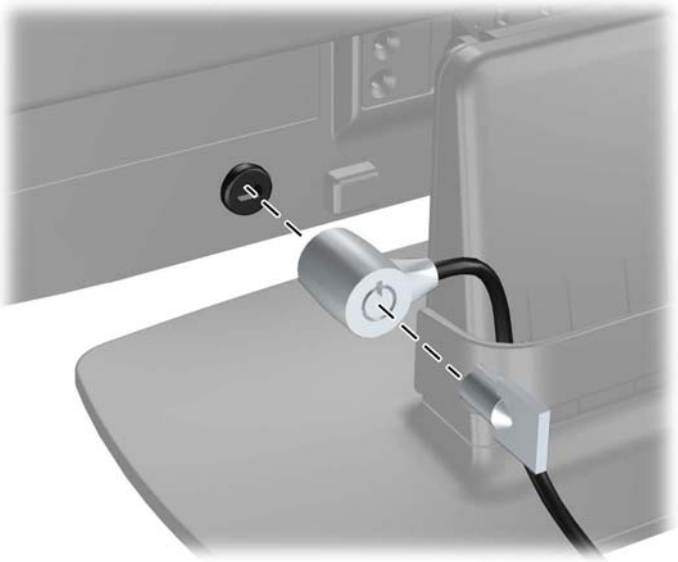
To attach the monitor to other mounting fixtures, follow the instructions included with the mounting fixture to ensure that the monitor is safely attached.

3. Reconnect the cables to the monitor panel.

# Installing a Cable Lock

You can secure the monitor to a fixed object with an optional cable lock available from HP (sold separately).

**Figure 2-10** Installing a Cable Lock



# 3 Finding More Information

Refer to the *HP LCD Monitors Reference Guide* included on the CD with your monitor for additional information on:

- Optimizing monitor performance
- Safety and maintenance guidelines
- Installing software from the CD
- Using the OSD menu
- Downloading software from the Web
- Agency regulatory information
- Troubleshooting and recommended solutions to common problems

## Product Support

For additional information on using and adjusting your monitor, go to http://www.hp.com/support. Select your country or region, select **Product Support & Troubleshooting**, and then enter your monitor model in the Search window.

**NOTE:** The monitor user guide, reference guide, and drivers are available at http://www.hp.com/support.

If the information provided in the guide or in the HP LCD Monitors Reference Guide does not address your questions, you can contact support. For U.S. support, go to http://www.hp.com/go/contactHP. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html. Here you can:

- Chat online with an HP technician

  **NOTE:** When support chat is not available in a particular language, it is available in English.

- Find e-mail support
- Find support telephone numbers
- Locate an HP service center

# 4 Technical Specifications

**NOTE:** All specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary.

## P191 Model

**Table 4-1 P191 Specifications**

| | | |
|---|---|---|
| Maximum Weight (Unpacked) | 3.2 kg | 7.1 lbs |
| Dimensions (include stand)<br>Height<br>Depth<br>Width | 34.0 cm<br>14.3 cm<br>44.93 cm | 13.4 inches<br>5.63 inches<br>17.69 inches |
| Maximum Graphic Resolution | 1366 x 768 (60 Hz) analog input | |
| Optimum Graphic Resolution | 1366 x 768 (60 Hz) analog input | |
| Power Source | 100 – 240 VAC 50/60 Hz | |
| Input Terminal | One VGA connector with cable included | |
| Tilt | 30° | |
| Operating Temperature | 0° to 35° C | 32° to 95° F |
| Operating Altitude | Up to 5,000 m above sea level | Up to 16,404 ft above sea level |

**NOTE:** For more information, go to http://www.hp.com/go/productbulletin and search for your specific display model to find the model-specific QuickSpecs.

## P201 and P201m Models

**Table 4-2 P201 and P201m Specifications**

| | | |
|---|---|---|
| Maximum Weight (Unpacked) | 3.5 kg | 7.7 lbs |
| Dimensions (include stand)<br>Height<br>Depth<br>Width | 35.92 cm<br>15.11 cm<br>48.20 cm | 14.14 inches<br>5.95 inches<br>18.98 inches |
| Maximum Graphic Resolution | 1600 x 900 (60 Hz) analog input<br>1600 x 900 (60 Hz) digital input | |

**Table 4-2 P201 and P201m Specifications (continued)**

| | | |
|---|---|---|
| Optimum Graphic Resolution | 1600 x 900 (60 Hz) analog input<br>1600 x 900 (60 Hz) digital input | |
| Power Source | 100 – 240 VAC 50/60 Hz | |
| Input Terminal | One VGA connector with cable included;<br>one DVI connector with cable included;<br>one audio connector with cable included (P201m only) | |
| Tilt | 25° | |
| Operating Temperature | 5° to 35° C | 41° to 95° F |
| Operating Altitude | Up to 5,000 m above sea level | Up to 16,404 ft above sea level |
| **NOTE:** For more information, go to http://www.hp.com/go/productbulletin and search for your specific display model to find the model-specific QuickSpecs. | | |

# P221 Model

**Table 4-3 P221 Specifications**

| | | |
|---|---|---|
| Maximum Weight (Unpacked) | 4.0 kg | 8.8 lbs |
| Dimensions (include stand)<br>Height<br>Depth<br>Width | 37.9 cm<br>16 cm<br>51.8 cm | 14.92 inches<br>6.3 inches<br>20.39 inches |
| Maximum Graphic Resolution | 1920 x 1080 (60 Hz) analog input<br>1920 x 1080 (60 Hz) digital input | |
| Optimum Graphic Resolution | 1920 x 1080 (60 Hz) analog input<br>1920 x 1080 (60 Hz) digital input | |
| Power Source | 100 – 240 VAC 50/60 Hz | |
| Input Terminal | One VGA connector with cable included;<br>one DVI connector with cable included | |
| Tilt | 30° | |
| Operating Temperature | 0° to 35° C | 32° to 95° F |
| Operating Altitude | Up to 5,000 m above sea level | Up to 16,404 ft above sea level |
| **NOTE:** For more information, go to http://www.hp.com/go/productbulletin and search for your specific display model to find the model-specific QuickSpecs. | | |

# Preset Display Resolutions

The display resolutions listed below are the most commonly used modes and are set as factory defaults. This monitor automatically recognizes these preset modes and they will appear properly sized and centered on the screen.

## P191 Model

**Table 4-4 Factory Preset Modes**

| Preset | Pixel Format | Horz Freq (kHz) | Vert Freq (Hz) |
|---|---|---|---|
| 1 | 640 × 480 | 31.47 | 59.94 |
| 2 | 720 × 400 | 31.47 | 70.09 |
| 3 | 800 × 600 | 37.88 | 60.32 |
| 4 | 1024 × 768 | 48.36 | 60.00 |
| 5 | 1280 × 720 | 45.00 | 60.00 |
| 6 | 1280 × 1024 | 63.98 | 60.02 |
| 7 | 1366 × 768 | 48.00 | 60.00 |

## P201 and P201m Models

**Table 4-5 Factory Preset Modes**

| Preset | Pixel Format | Horz Freq (kHz) | Vert Freq (Hz) |
|---|---|---|---|
| 1 | 640 × 480 | 31.469 | 59.940 |
| 2 | 720 × 400 | 31.469 | 70.087 |
| 3 | 800 × 600 | 37.879 | 60.317 |
| 4 | 1024 × 768 | 48.363 | 60.004 |
| 5 | 1280 × 720 | 45.00 | 59.94 |
| 6 | 1280 × 1024 | 63.98 | 60.02 |
| 7 | 1440 × 900 | 55.93 | 59.88 |
| 8 | 1600 × 900 | 60.00 | 60.00 |

## P221 Model

**Table 4-6 Factory Preset Modes**

| Preset | Pixel Format | Horz Freq (kHz) | Vert Freq (Hz) |
|---|---|---|---|
| 1 | 640 × 480 | 31.469 | 59.940 |

**Table 4-6 Factory Preset Modes (continued)**

| | | | |
|---|---|---|---|
| 2 | 720 × 400 | 31.469 | 70.087 |
| 3 | 800 × 600 | 37.879 | 60.317 |
| 4 | 1024 × 768 | 48.363 | 60.004 |
| 5 | 1280 × 720 | 45.00 | 60.00 |
| 6 | 1280 × 1024 | 63.981 | 60.02 |
| 7 | 1440 × 900 | 55.935 | 59.887 |
| 8 | 1600 × 900 | 60.00 | 60.00 |
| 9 | 1680 × 1050 | 65.29 | 59.954 |
| 10 | 1920 x 1080 | 67.50 | 60.00 |

# Entering User Modes

The video controller signal may occasionally call for a mode that is not preset if:

- You are not using a standard graphics adapter.
- You are not using a preset mode.

It this occurs, you may need to readjust the parameters of the monitor screen by using the on-screen display. Your changes can be made to any or all of these modes and saved in memory. The monitor automatically stores the new setting, then recognizes the new mode just as it does a preset mode. In addition to the factory preset modes, there are at least 10 user modes that can be entered and stored.

# Energy Saver Feature

The monitors support a reduced power state. The monitor enters the reduced power state if it detects the absence of the horizontal sync signal, the vertical sync signal, or both horizontal and vertical sync signals. Upon detecting the absence of one or both signals, the monitor screen is blanked, the backlight is turned off, and the power light is turned amber. When the monitor is in the reduced power state, the monitor uses .5 watts of power. There is a brief warm-up period before the monitor returns to its normal operating mode.

Refer to the computer manual for instructions on setting energy saver features (sometimes called power management features).

**NOTE:** The power saver feature only works when connected to computers that have energy saver features.

In the monitor's Energy Saver utility, you can also program the monitor to enter the reduced power state at a predetermined time. When the monitor enters the reduced power state, the power light blinks amber.