

# Hardware Reference Guide

HP ap5000 All-In-One Point of Sale System

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#### **Hardware Reference Guide**

HP ap5000 All-In-One Point of Sale System

First Edition (January 2010)

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## About This Book

This guide provides basic information for upgrading this computer model.

- △ **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

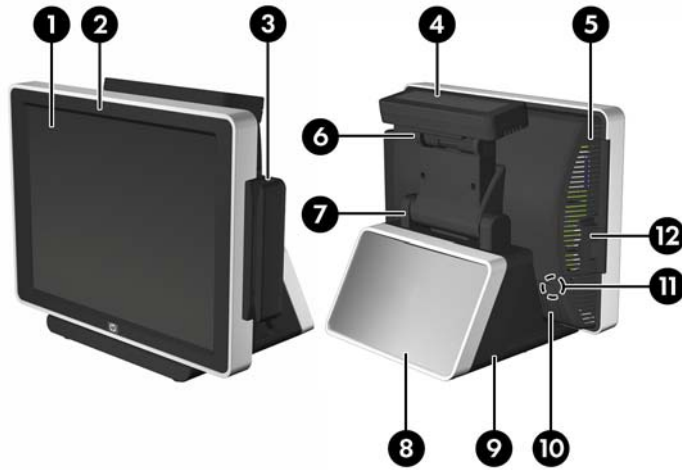
## Standard Features

The HP ap5000 All-In-One Point of Sale System features include:

- Water-resistant touch screen so wet fingers are not be a problem. You can use a stylus, finger tip, finger nail, or credit card edge on the touch screen.
- Two-line customer facing vacuum fluorescent display (VFD).
- Three-track magnetic stripe reader (MSR) integrated into the system.
- Advertising display panel allows you to insert and display print advertisements.
- Easily adjustable cashier display rotates 90 degrees from full vertical to full horizontal.
- Easily adjustable customer facing display rotates 80 degrees.
- Industrial hinge allows the system to remain firm and stable at any angle.
- Cable management feature allows cables to tuck into the stand and route out the bottom from either the front, sides, or rear of the stand.
- Color coded I/O panel for ease of installing cables.
- COM stickers so you can label your serial port cables.
- 24V USB+POWER port.
- 5V (COM1, COM2) and 12V (COM3) power configurable serial ports (configurable in BIOS).
- 40° C ambient thermal environment.
- Solid State drive (some models) for improved reliability against drive failure.
- RAID support for mirroring or striping.
- Eco-friendly design with reduction in hazardous materials (RoHS 2), partial reduction in Brominated Flame Retardants (BFCs) and Polyvinyl Chloride (PVC), energy efficient (E-STAR 5.0 compliant, EUP lot 6 and lot 7 compliant).
- Diagnostic beeps/blinks for pre-video issues.
- Stylish industrial design.
- Three year warranty.
- Compatible “plug-n-play” with HP branded POS peripherals.

# System Components

Figure 1-1 System Components

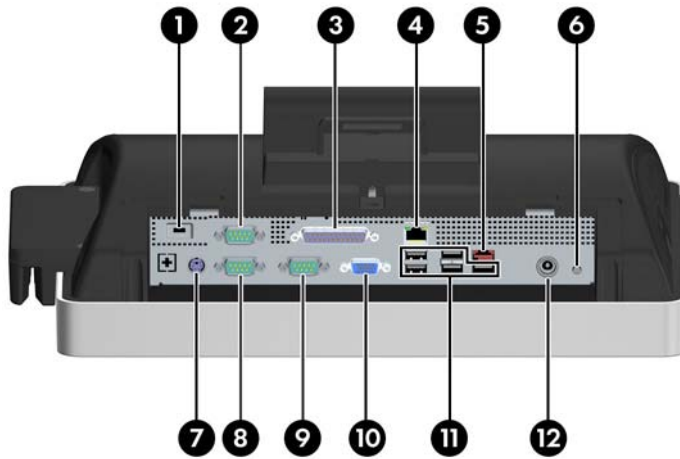


1	Touch Screen	7	Adjustable Touch Screen Hinge
2	Power LED	8	Print Advertisement Panel
3	Magnetic Stripe Reader (MSR)	9	Base and Power Supply Housing
4	VFD Customer Display	10	Bottom I/O Cover
5	Drive Cover	11	Power Button
6	Adjustable VFD Hinge	12	Side I/O cover



# Bottom I/O Panel Components

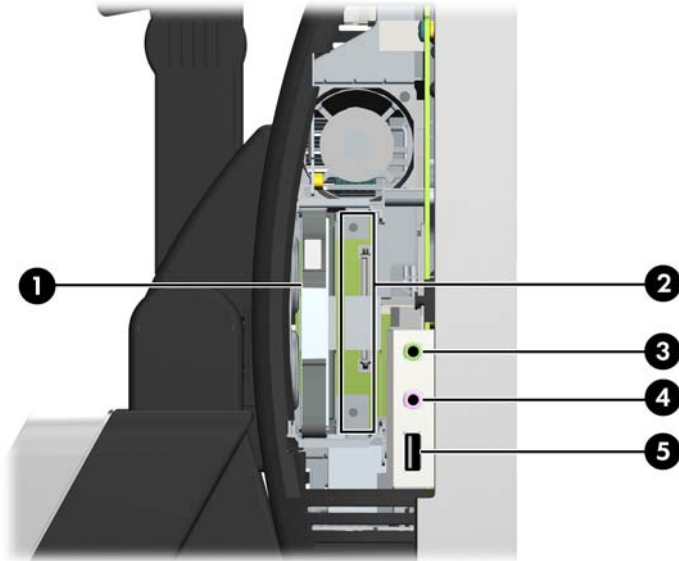
Figure 1-2 Bottom I/O Panel Connectors



1	Kensington Lock Slot	7	PS/2 Keyboard Connector
2	Serial Connector (COM2, 5V)	8	Serial Connector (COM1, 5V)
3	Parallel Connector	9	Serial Connector (COM3, 12V)
4	RJ-45 Network Connector	10	VGA Connector
5	24V USB+POWER Connector	11	Universal Serial Bus (USB) Connectors
6	Power Button	12	Power Cord Connector

# Side Panel Components

Figure 1-3 Side Connectors



1	Primary Hard Drive	4	Microphone Connector (pink)
2	Secondary Hard Drive Bay	5	Universal Serial Bus (USB) Connector
3	Audio Line-Out Connector (green)		

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## 2 Hardware Upgrades

### Tools Needed

A Phillips head screwdriver is the only tool needed for most of the procedures described in this guide.

### Warnings and Cautions

Before performing upgrades be sure to carefully read all of the applicable instructions, cautions, and warnings in this guide.

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△ **WARNING!** To reduce the risk of personal injury from electrical shock, hot surfaces, or fire:

Disconnect the power cord from the wall outlet and allow the internal system components to cool before touching.

Do not plug telecommunications or telephone connectors into the network interface controller (NIC) receptacles.

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

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

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation, setup, posture, and health and work habits for computer users, and provides important electrical and mechanical safety information. This guide is located on the Web at <http://www.hp.com/ergo>.

△ **CAUTION:** Static electricity can damage the electrical components of the computer or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See [Electrostatic Discharge on page 29](#) for more information.

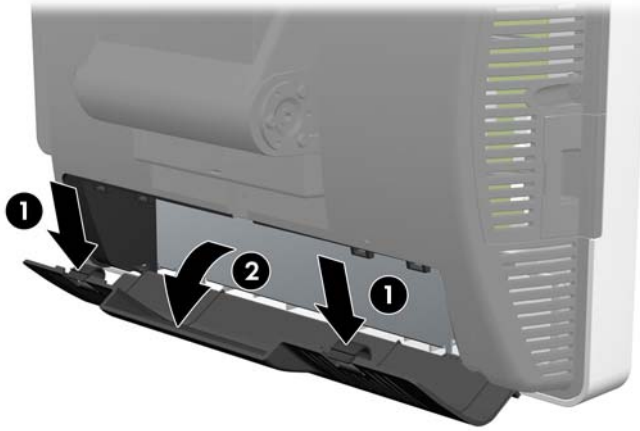
When the system is plugged into an AC power source, voltage is always applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent damage to internal components.

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## Removing the Bottom I/O Cover

To remove the bottom I/O cover, press downward on the two tabs at the top of the cover (1) and rotate the cover off (2).

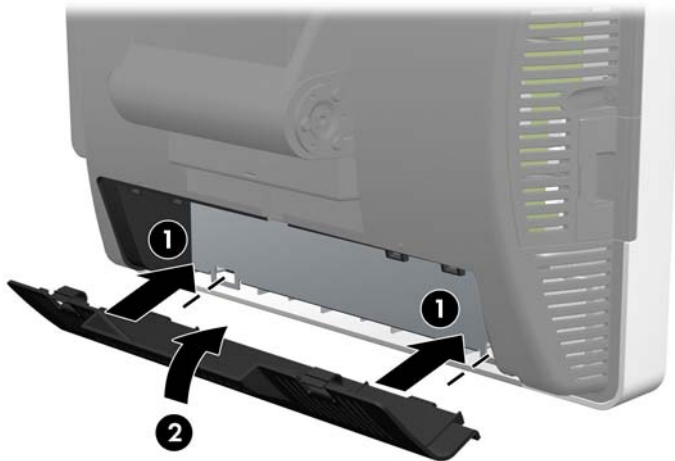
**Figure 2-1** Removing the Bottom I/O Cover



## Replacing the Bottom I/O Cover

To replace the bottom I/O cover, insert the bottom of the cover (1) and rotate the top of the cover on so that it snaps in place (2).

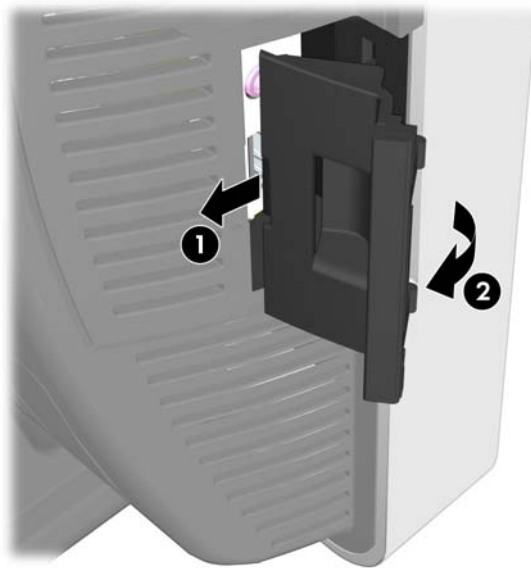
**Figure 2-2** Replacing the Bottom I/O Cover



## Removing the Side I/O Cover

To remove the side I/O cover, pull out on the center of the cover (1) and rotate the cover off (2).

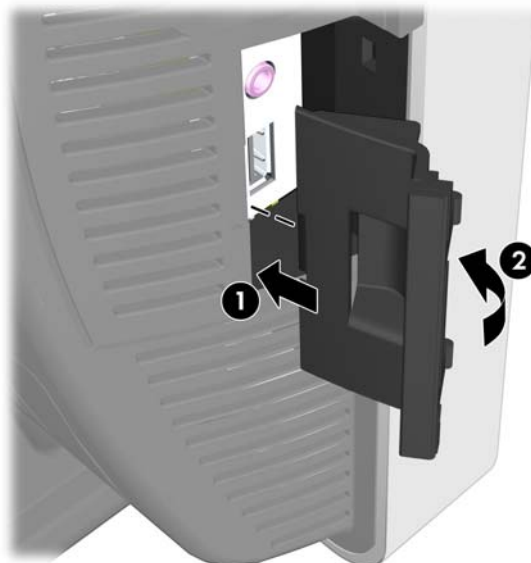
**Figure 2-3** Removing the Side I/O Cover



## Replacing the Side I/O Cover


To replace the side I/O cover, slide the hook on the side I/O cover into the slot on the larger drive cover (1) and rotate the cover on so that it snaps in place (2).

**Figure 2-4** Replacing the Side I/O Cover

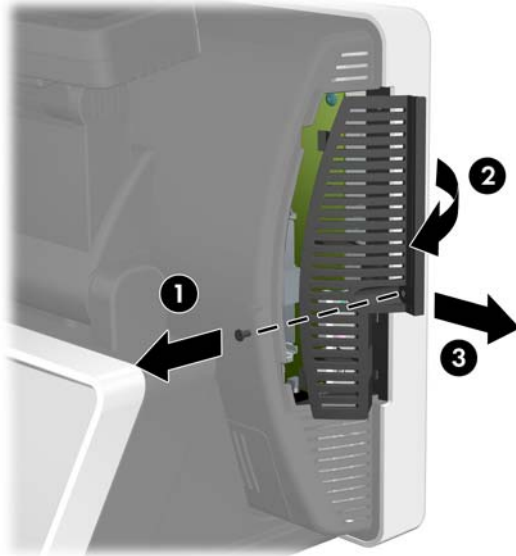


## Removing the Drive Cover

To remove the drive cover, loosen the screw that holds the cover in place (1), rotate the cover back (2), and pull the cover off the display head (3).

 **NOTE:** The drive cover screw is captive, therefore it does not disengage from the drive cover when loosened.

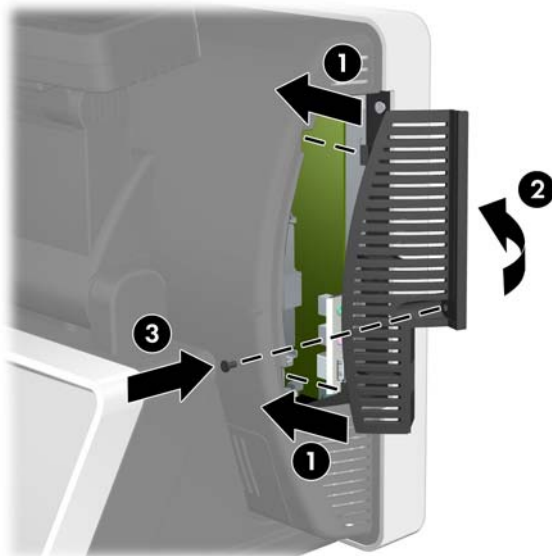
**Figure 2-5** Removing the Drive Cover



## Replacing the Drive Cover

To replace the drive cover, slide the tabs on the cover into the slots on the side of the display (1), rotate the cover onto the display (2), then tighten the screw (3).

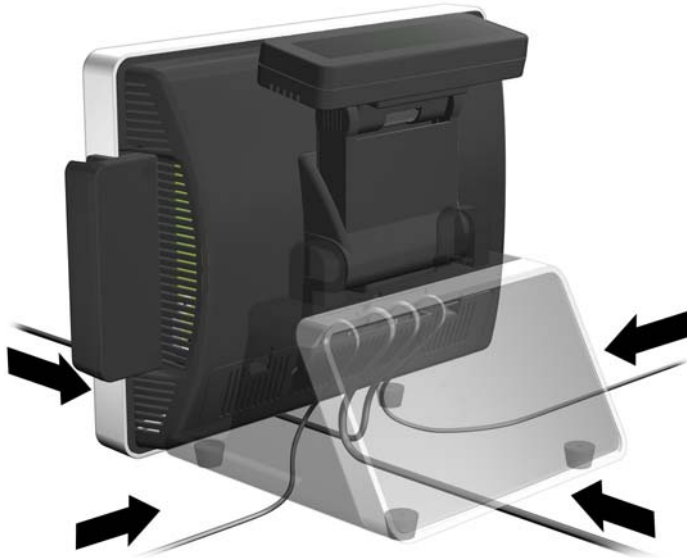
**Figure 2-6** Replacing the Drive Cover



## Routing Cables

When connecting peripherals to the bottom I/O panel, route the peripheral cables through the bottom of the base and out the center hole at the top of the base before connecting.

**Figure 2-7** Routing Cables



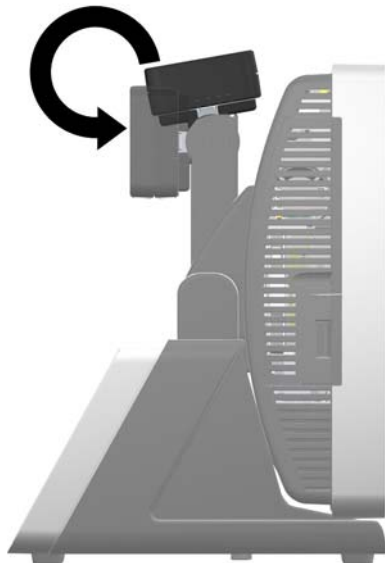
## Adjusting the Tilt

The main touch screen display has a 90 degree tilt range. The VFD customer display has an 80 degree tilt range.

**Figure 2-8** Adjusting the Touch Screen Display Tilt



**Figure 2-9** Adjusting the VFD Customer Display Tilt



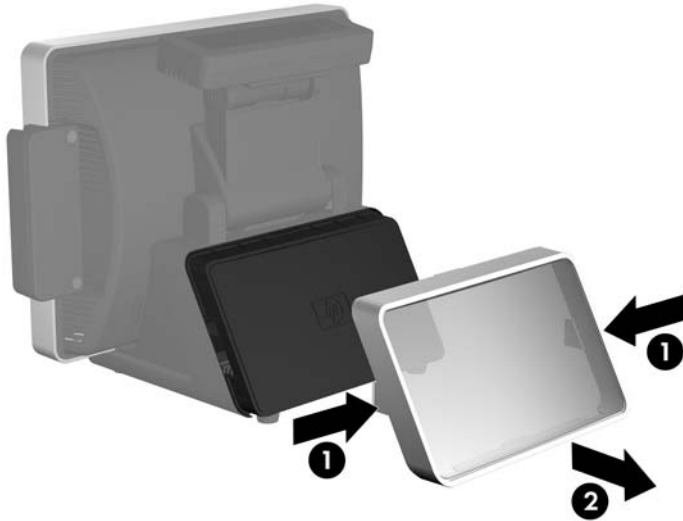


## Using the Print Advertising Panel


You can insert a print advertisement into the panel on the system's base. A print advertisement template is available on the system's hard drive.

1. Press inward on the two sides of the advertising panel (1) and pull the cover of the panel off the system's base (2).

**Figure 2-10** Removing the Print Advertising Panel Cover



2. Insert a print advertisement behind the panel cover.

 **NOTE:** A print advertisement panel template is available on the system's hard drive. In Windows XP or Windows Embedded POSReady 2009, select **Start > All Programs > HP Point of Sale Information** to access the template. In Windows 7, select **Start > HP Point of Sale Information** to access the template.

3. Replace the panel cover by pressing it straight onto the base.

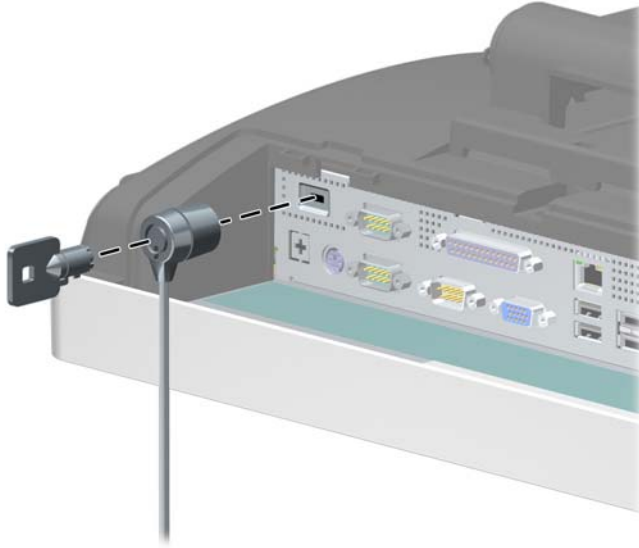
**Figure 2-11** Replacing the Print Advertising Panel Cover



## Installing an HP/Kensington MicroSaver Security Cable Lock

1. Remove the bottom I/O cover (see [Removing the Bottom I/O Cover on page 6](#)).
2. Install the cable lock into the lock slot on the bottom I/O panel.

**Figure 2-12** Installing an HP/Kensington MicroSaver Security Cable Lock

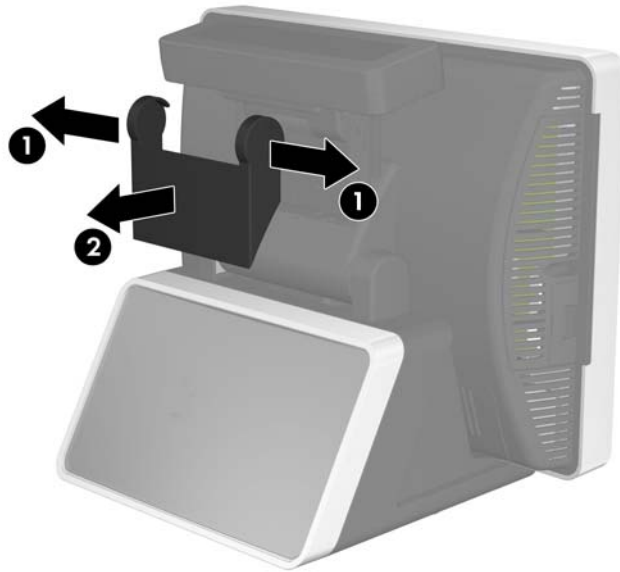


3. Replace the bottom I/O cover (see [Replacing the Bottom I/O Cover on page 6](#)).

## Removing and Replacing the VFD Customer Display

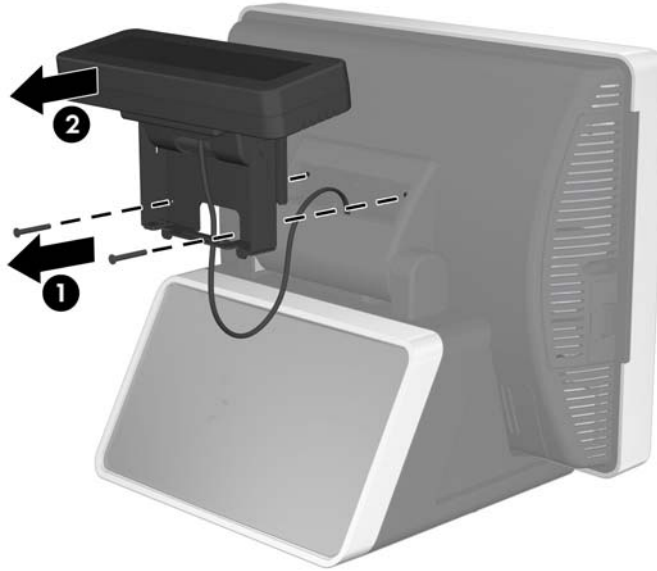
1. Turn off the computer properly through the operating system, then turn off any external devices.
  2. Disconnect the power cord from the power outlet.
- △ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.
3. Remove the bottom I/O cover (see [Removing the Bottom I/O Cover on page 6](#)).
  4. Unplug the VFD customer display's serial cable from the I/O panel.
  5. Remove the plastic VFD hinge bracket cover by pulling outward on both upper sides of the cover (1) then sliding the cover straight back and off the hinge bracket (2).

**Figure 2-13** Removing the VFD Hinge Bracket Cover



6. Remove the two screws below the display screen (1) and slide the display off the system (2).

**Figure 2-14** Removing the VFD Customer Display

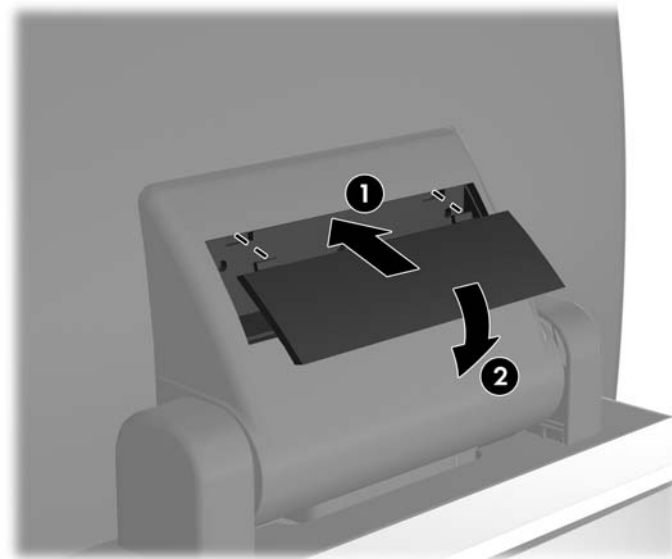


7. Route the serial cable of the new display through the center hole in the hinge area and connect the cable to the same COM port on the I/O panel that was used for the old display.

**NOTE:** If you are replacing the VFD customer display with an LCD customer display, connect the VGA cable of the LCD customer display to the VGA connector on the I/O panel.

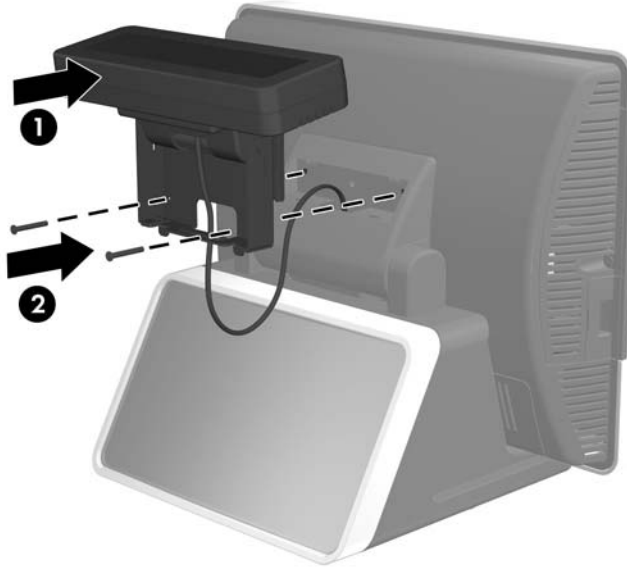
8. If you are removing but not replacing the customer display, cover the slot for the display with the customer display cover provided with the system. Slide the top of the cover in first (1) then press the bottom of the cover in place (2).

**Figure 2-15** Covering the VFD Customer Display Slot



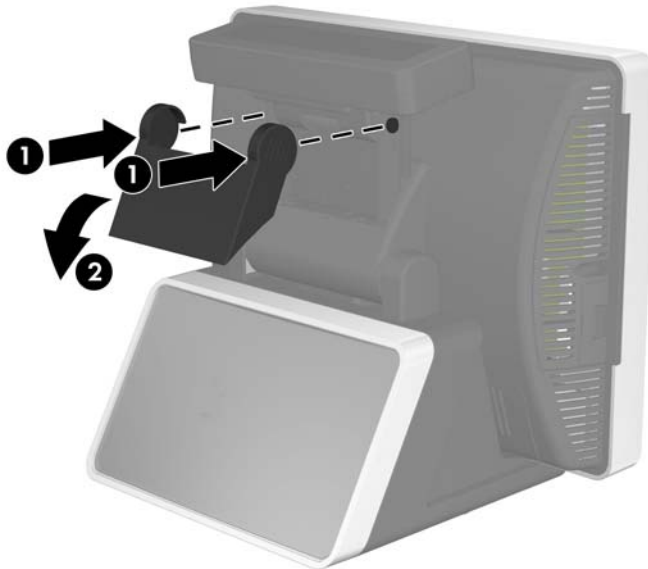
9. If you are replacing the VFD customer display, slide the new customer display into the slot on the hinge (1) and insert the two screws that secure it in place (2).

**Figure 2-16** Replacing the VFD Customer Display



10. Attach the hinge bracket cover by placing the upper sides of the cover over the sides of the bracket (1) then pressing the bottom of the cover onto the bracket so that it snaps in place (2).

**Figure 2-17** Replacing the VFD Hinge Bracket Cover



11. Replace the bottom I/O cover (see [Replacing the Bottom I/O Cover on page 6](#)).
12. Reconnect the power cord and press the power button.
13. Configure the new customer display (refer to [Configuring the MSR and VFD Customer Display on page 27](#)).

## Removing and Replacing the Hard Drive

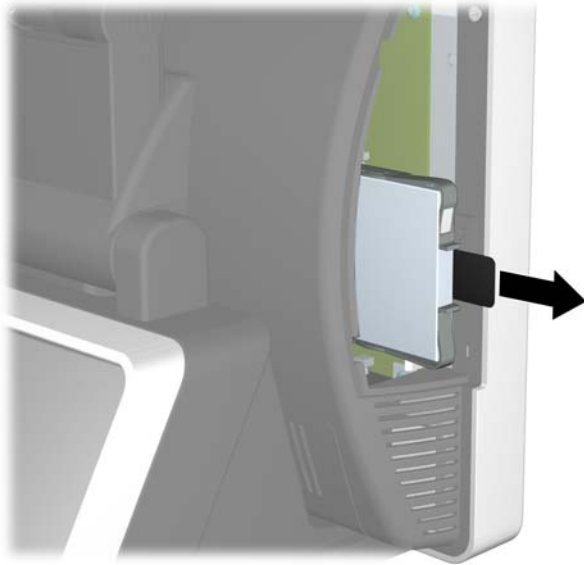
△ **CAUTION:** Before you remove the old hard drive, be sure to back up the data from the old hard drive so that you can transfer the data to the new hard drive.

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet.

△ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

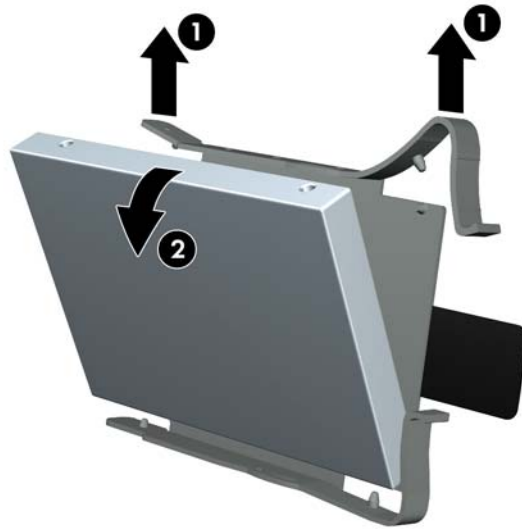
3. Remove the drive cover (see [Removing the Drive Cover on page 8](#)).
4. Grasp the plastic tab attached to the hard drive and pull the hard drive out of the bay,

**Figure 2-18** Removing the Hard Drive



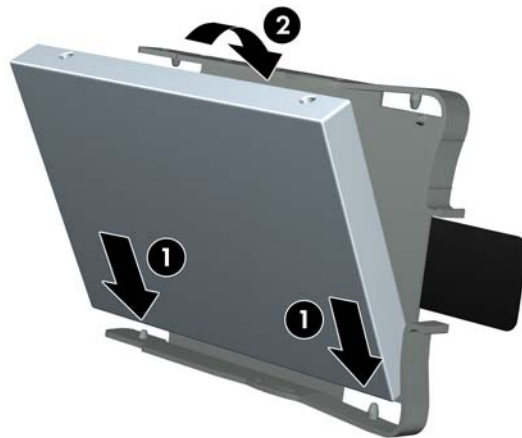
5. To remove the hard drive from the plastic carrier, pull up on the two ends on one side of the carrier (1) and rotate the drive out of the carrier (2).

**Figure 2-19** Removing the Hard Drive from the Carrier



6. To insert the new drive in the carrier, hold the drive at a slight angle and place one side of the hard drive in the carrier (1), then press the other side straight down into the carrier (2).

**Figure 2-20** Placing the Hard Drive in the Carrier



7. To replace the hard drive, slide the drive firmly into the bay with the end of the drive that has the connector going in first.


**Figure 2-21** Replacing the Hard Drive



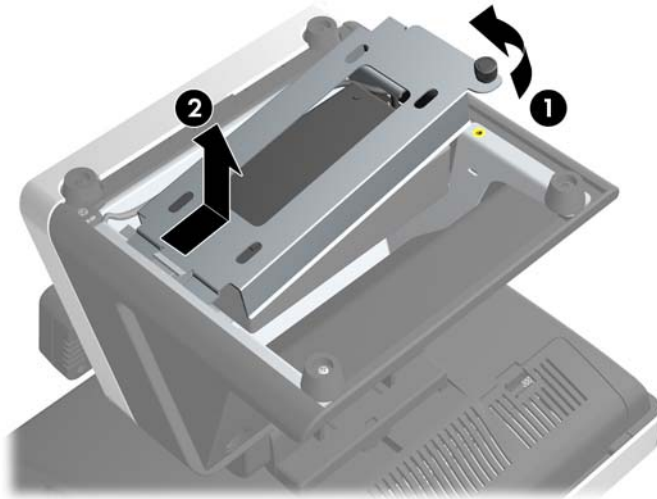
8. Replace the drive cover (see [Replacing the Drive Cover on page 8](#)).
9. Reconnect the power cord and press the power button.



## Removing and Replacing the Power Supply

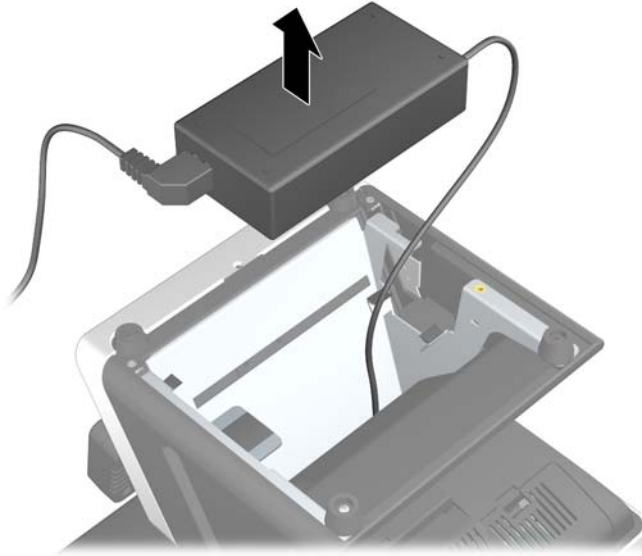
1. Turn off the computer properly through the operating system, then turn off any external devices.
  2. Disconnect the power cord from the power outlet.
    - △ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.
  3. Tilt the touch screen all the way back to its horizontal position and lay the unit face down on a soft, clean, dry cloth to avoid scratching the touch screen.
  4. Remove the bottom I/O cover (see [Removing the Bottom I/O Cover on page 6](#)).
  5. Unplug the power cord from the connector on the I/O panel.
  6. Loosen the thumbscrew that secures the power supply bracket to the bottom of the unit (1), then slide the bracket to the side and lift the bracket off the unit (2).
-  **NOTE:** The power supply bracket screw is captive, therefore it does not disengage from the bracket when loosened.

**Figure 2-22** Removing the Power Supply Bracket



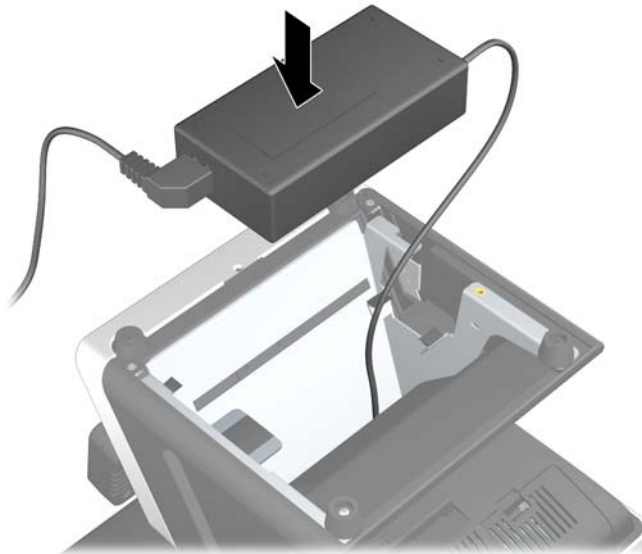
7. Lift the power supply and its cables out of the base of the unit.

**Figure 2-23** Removing the Power Supply



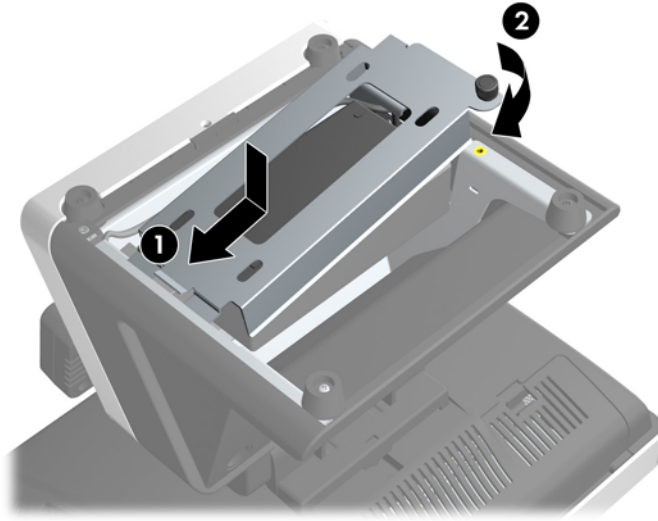
8. Connect the external power cord to the power supply.
9. Route the circular end of the power cord through the hole at the top of the base and connect the power cord to the power connector on the bottom I/O panel.
10. Place the power supply into the base so that it is sitting on the metal tabs inside the base.

**Figure 2-24** Replacing the Power Supply



11. Replace the power supply bracket by sliding the slotted end into frame (1) and tightening the thumbscrew (2).

**Figure 2-25** Replacing the Power Supply Bracket



12. Replace the bottom I/O cover (see [Replacing the Bottom I/O Cover on page 6](#)).
13. Turn the unit over and onto its base.
14. Plug the power cord into an electrical outlet and press the power button.

# Installing Additional Memory

The computer comes with double data rate 2 synchronous dynamic random access memory (DDR2-SDRAM) dual inline memory modules (DIMMs).

## DIMMs

The memory sockets on the system board can be populated with up to two industry-standard DIMMs. These memory sockets are populated with at least one preinstalled DIMM. To achieve the maximum memory support, you can populate the system board with up to 4-GB of memory.

## DDR2-SDRAM DIMMs

For proper system operation, the DDR2-SDRAM DIMMs must be:

- industry-standard 240-pin
- unbuffered PC2-5300 667 MHz-compliant or PC2-6400 800 MHz-compliant
- 1.8 volt DDR2-SDRAM DIMMs

The DDR2-SDRAM DIMMs must also:

- support CAS latency 5 DDR2 667 Mhz (5-5-5 timing), CAS latency 5 DDR2 800 Mhz (5-5-5 timing), and CAS latency 6 DDR2 800 Mhz (6-6-6 timing)
- contain the mandatory JEDEC SPD information

In addition, the computer supports:

- 512Mbit and 1Gbit non-ECC memory technologies
- single-sided and double-sided DIMMs
- DIMMs constructed with x8 and x16 DDR devices; DIMMs constructed with x4 SDRAM are not supported

---

 **NOTE:** The system will not start if you install unsupported DIMMs.

---

## Installing DIMMs

△ **CAUTION:** You must disconnect the power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

The memory module sockets have gold-plated metal contacts. When upgrading the memory, it is important to use memory modules with gold-plated metal contacts to prevent corrosion and/or oxidation resulting from having incompatible metals in contact with each other.

Static electricity can damage the electronic components of the computer or optional cards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. For more information, refer to [Electrostatic Discharge on page 29](#).

When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

---

The memory modules are located on the system board behind the touch screen. You must remove the drive cover, remove the MSR, and disassemble the touch screen display head to access the memory.

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet.

---

△ **CAUTION:** You must disconnect the power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

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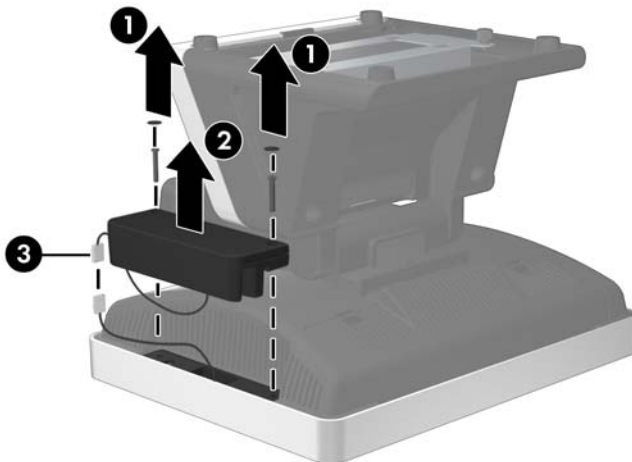
3. Unplug all peripherals from the side I/O panel.
4. Remove the drive cover (see [Removing the Drive Cover on page 8](#)).
5. Remove the bottom I/O cover (see [Removing the Bottom I/O Cover on page 6](#)).
6. Unplug the power cord and all peripherals from the bottom I/O panel.
7. Tilt the touch screen all the way back to its horizontal position and lay the unit face down on a soft, clean, dry cloth to avoid scratching the touch screen.
8. To remove the MSR, remove the two screws that attach the MSR to the display head (1), lift the MSR off the display head (2), and unplug the cable attached to the underside of the MSR (3).

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📝 **NOTE:** The screws may be covered by plugs that must be pried out before the screws can be removed.

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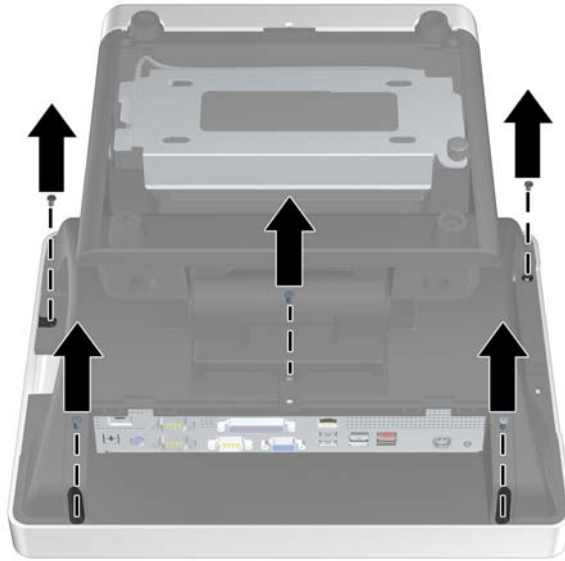
**Figure 2-26** Removing the MSR



9. Remove the five screws that secure the display head to the display head housing. Two of the screws are located under the bottom I/O cover. The third screw is located under the drive cover. The fourth screw is located under the MSR. The fifth screw is located below the touch screen hinge.

 **NOTE:** Some models may have only four screws. The center screw shown below may not be included.

**Figure 2-27** Removing the Display Head Screws




10. Lift the bottom side of the display head housing (where the two screws were removed) off the touch screen (1), then lift the top side off the housing off the touch screen (2).


**Figure 2-28** Removing the Display Head



11. Locate the memory module sockets on the system board.

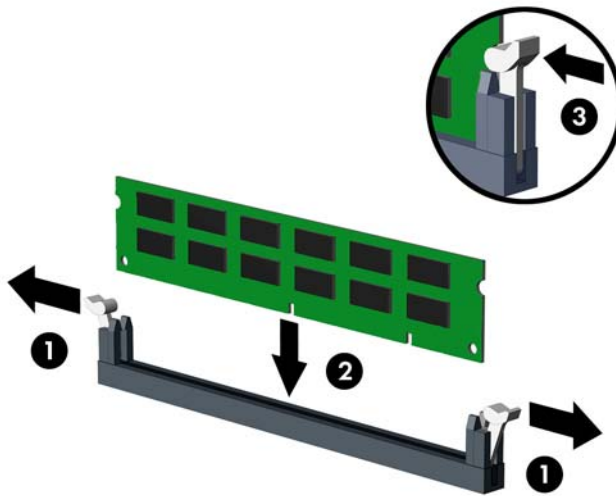
 **WARNING!** To reduce risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

12. Open both latches of the memory module socket (1), and insert the memory module into the socket (2).

 **NOTE:** A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket.

13. Push the module down into the socket, ensuring that the module is fully inserted and properly seated. Make sure the latches are in the closed position (3).

**Figure 2-29** Installing a DIMM




14. Repeat steps 12 and 13 to install any additional modules.
15. After installing the memory module(s), place the top of the display head housing onto the display head (1), then set the bottom of the display head housing onto the display head (2).

**Figure 2-30** Replacing the Display Head



16. Replace the five screws that secure the display head to the housing.

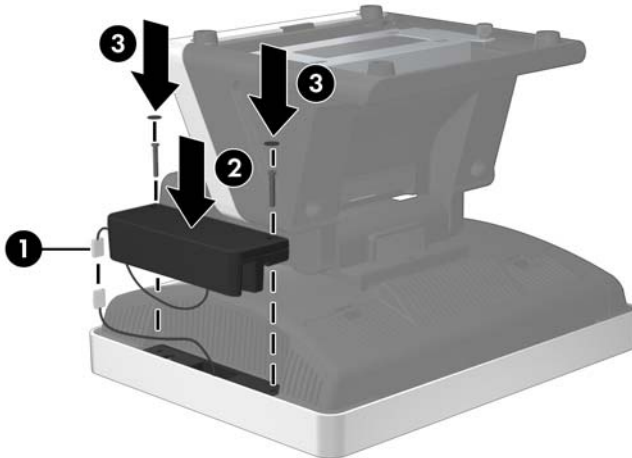
 **NOTE:** Some models may have only four screws. The center screw shown below may not be included.

**Figure 2-31** Replacing the Display Head



17. Connect the MSR cable (1), place the MSR onto the side of the display head (2), and replace the two screws that hold the MSR in place (3).

**Figure 2-32** Replacing the MSR



18. Turn the unit over and onto its base.
19. Plug the power cord and all peripherals into the bottom I/O panel.
20. Replace the bottom I/O cover (see [Replacing the Bottom I/O Cover on page 6](#)).
21. Replace the drive cover (see [Replacing the Drive Cover on page 8](#)).
22. Plug in any peripherals that were unplugged from the side I/O panel.
23. Plug the power cord into an electrical outlet and press the power button.




---

## 3 Configuring the Software

### Calibrating the Touch Screen

After the operating system is installed, you will need to calibrate the touch screen.

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 **NOTE:** You may want to connect a mouse (not included) to the system for this procedure.

---

1. Launch the TouchMon utility by right-clicking on the TouchMon icon in the system tray and selecting **4 points calibration** or selecting **Start > All Programs > HP Touch > HP TouchMon Calibration**.
2. When you see a red circle in the corner of the screen, touch the center of the circle with your finger and continue touching it until the progress counter changes to **OK**. A new red circle will then appear in another corner of the screen.
3. Repeat Step 2 for each corner of the screen. When the process is complete, the utility will close and return you to the Windows desktop.

### Configuring the MSR and VFD Customer Display

To configure the MSR and VFD, refer to the *HP Point of Sale Configuration Guide* (available in English only). The guide is available on the system's hard drive. In Windows XP or Windows Embedded POSReady 2009, select **Start > All Programs > HP Point of Sale Information** to access the guide. In Windows 7, select **Start > HP Point of Sale Information** to access the guide.

### Configuring the COM Port for the VFD Customer Display


You can connect the VFD customer display to either the COM1 port or the COM2 port. The COM port must be configured for 5 volts in the Computer Setup utility for the VFD customer display to function properly. The VFD is connected to the COM2 port from the factory and the COM2 port is already configured for 5 volts.

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 **NOTE:** Do not connect the VFD customer display to the COM3 port.

---

1. Press the power button to turn off the computer.
2. Press the power button again to turn on the computer and press the **F10** key before the system boots to the operating system to enter the Computer Setup utility.
3. Note which COM port (COM1 or COM2) on the rear panel is connected to the VFD customer display.
4. In the Computer Setup utility, go to **Advanced > Super IO Configuration > Serial Port1 Standard Mode/5V** or **Serial Port2 Standard Mode/5V** and change the setting to **5 V**.

 **NOTE:** If you set the **Serial Port2 Standard Mode/5V** port to **5 V**, you must set the **Serial Port1 Standard Mode/5V** to **Standard Mode**. Likewise, if you set the **Serial Port1 Standard Mode/5V** port to **5 V**, you must set the **Serial Port2 Standard Mode/5V** to **Standard Mode**.

5. In the Computer Setup **Exit** menu, select **Save Changes & Exit**.

---

# A Electrostatic Discharge

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

## Preventing Electrostatic Damage

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.


## Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm +/- 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heelstraps, toestraps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, contact an HP authorized dealer, reseller, or service provider.

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 **NOTE:** For more information on static electricity, contact an HP authorized dealer, reseller, or service provider.

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# B Computer Operating Guidelines, Routine Care and Shipping Preparation

## Computer Operating Guidelines and Routine Care

Follow these guidelines to properly set up and care for the computer and monitor:

- Although the display is water resistant, it is best to keep it away from excessive moisture, direct sunlight, and extremes of heat and cold.
- Never restrict the airflow into the computer by blocking any vents or air intakes.
- Never operate the computer with the cover or side panel removed.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.
- Keep liquids away from the computer vents.
- Never cover the ventilation slots on the monitor with any type of material.
- Install or enable power management functions of the operating system or other software, including sleep states.
- Turn off the computer before you do either of the following:
  - Wipe the exterior of the computer with a soft, damp cloth as needed. Using cleaning products may discolor or damage the finish.
  - Occasionally clean the air vents on all vented sides of the computer. Lint, dust, and other foreign matter can block the vents and limit the airflow.

## Shipping Preparation

Follow these suggestions when preparing to ship the computer:

1. Back up the hard drive files. Be sure that the backup media is not exposed to electrical or magnetic impulses while stored or in transit.



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**NOTE:** The hard drive locks automatically when the system power is turned off.

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2. Remove and store all removable media.

3. Turn off the computer and external devices.
4. Disconnect the power cord from the electrical outlet, then from the computer.
5. Disconnect the system components and external devices from their power sources, then from the computer.
6. Pack the system components and external devices in their original packing boxes or similar packaging with sufficient packing material to protect them.

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