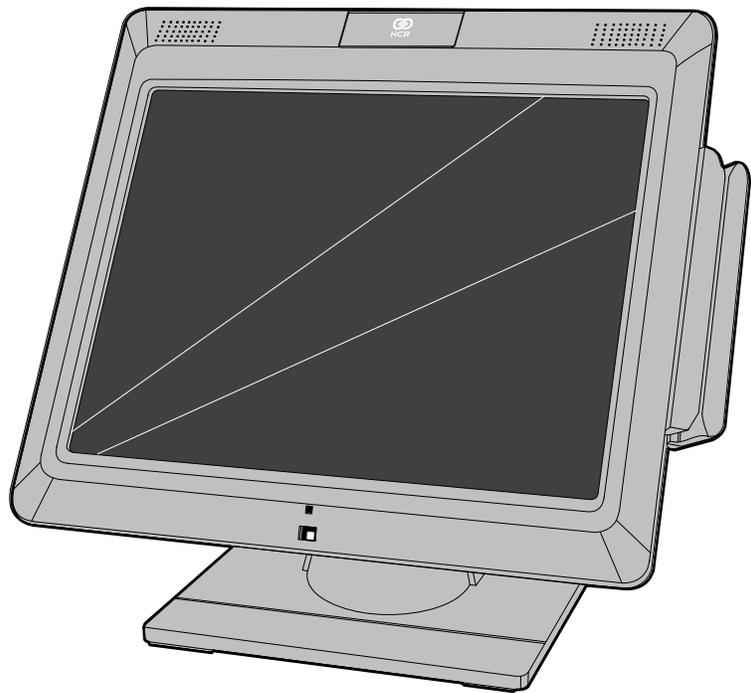


5965 15-inch Touch LCD

Release 1.0

User Guide



B005-0000-1865
Issue A

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Preface

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Audience

This book is written for hardware installer/service personnel, system integrators, programmers, and field engineers.

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Safety Requirements

The *NCR RealPOS 5965* conforms to all applicable legal requirements. To view the compliance statements see the *NCR RealPOS Peripherals Safety and Regulatory Statements* (B005-0000-1701).

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Revision Record

Issue	Date	Remarks
A	July 2010	First issue

Chapter 1: Overview

Introduction

The NCR 5965 is a 15-inch TFT Liquid Crystal Display with a capacitive Touch Screen. The display accepts industry-standard RGB video images from a PC motherboard and dynamically resizes VGA (640 × 480), SVGA (800 × 600), XGA (1024 × 768) & SXGA (1280 x 1024) @ 60Hz images to fill the entire viewable area. It is available in two color schemes:

- Beige (G11)
- Charcoal Gray (CG1)

Model Numbers

Major Model	Description
5965-1014	15" High Brightness Display, Capacitive Touch Screen, No MSR, No Mount (G11)
5965-1015	15" High Brightness Display, Capacitive Touch Screen, No MSR, No Mount (CG1)

Compatibility

The 5965 15" Touch LCD Display is designed as an optional input/output device for the following host terminals:

- NCR RealPOS 80_{XRT} (7459) Retail Terminal
- NCR RealPOS 80 (7458) Retail Terminal
- NCR RealPOS 80c (7456 and 7457) Retail Terminal
- NCR RealPOS 30 (7446) Retail Terminal

Standard Features

The 5965 consists of a plastic housing, sheet metal interior, a 15" LCD, an inverter, a controller board, a powered USB cable (1M/4M), an audio cable (0.9M/4.6M), a video cable (0.9M/4.6M), an optional Magnetic Stripe Reader (MSR), a standard power brick, a manual and a shipping box. It has the following features:

- Display size - 15" (diagonal)
- LCD Technology - TFT
- Native Format - XGA (1024 × 768) resolution
- Pixel Configuration - RGB vertical stripe
- Supported Colors - 16.2 Million (6 bits + FRC)
- Display text modes supported - SVGA (800 × 600 pixel), XGA (1024 × 768 pixel), VGA (640 × 480 pixel) & SXGA (1280 × 1024) images to full screen size.
- Moisture & dust sealed display (between touchscreen & display)
- OSD controls to allow display adjustments
- Auto selection DC voltage input to allow connection of 12V or 24v option.
- VGA Interface
- DVI Interface
- Three standard USB-A ports (downstream)
- USB PlusPower +12 VDC port
- Magnetic Stripe Reader- field installable, USB interface
- Integrated and remote mount options
- Integrated Stereo Speakers

Optional Features

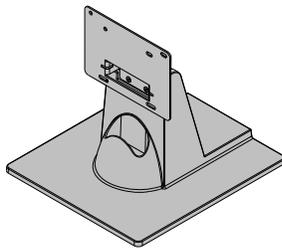
MSR Kits

The unit is shipped without an MSR installed. There is a neoprene plug installed in the MSR connector opening when no MSR is installed. This plug is tethered to the unit so if an MSR is removed for service, the plug can be reinstalled.

MSR Kits can be installed in the field or then can be ordered through a staging request

Table Top Mount

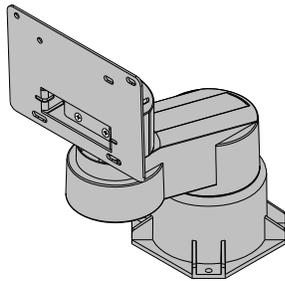
The 5965 15" Touch LCD display can be mounted on the Standard Remote Table Top Mount (5965-K030/K031).



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Integrated Mount (NCR 7457/7458)

The 5965 15" Touch LCD display can be mounted on the Standard Integration Tray Display Mount (5964-K022/K023).



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Chapter 2: Site Preparation

Physical Environment

The physical environments required for the 5965 LCD Display are listed in this section.

Operating Range

Condition	Range
Temperature	0° to 50°C
Relative Humidity	10% to 90% (Non-condensing)
Atmospheric Pressure	3000 meters (max.)

Storage Range

Condition	Range
Temperature	-10° to 50°C
Relative Humidity	10% to 90%

Transit Range

Condition	Range
Temperature	-40° to 60°C (One-week max.)
Relative Humidity	5% to 95%

Electrical Environment

Power is supplied to the display either from an external power supply or through a Powered USB interface. In either case, the nominal input voltage shall be +12 volts and conform to the following:

Parameter	Minimum	Typical	Maximum
Input Voltage	+10.8 V	+12.0 V	+13.2 V

Power Consumption

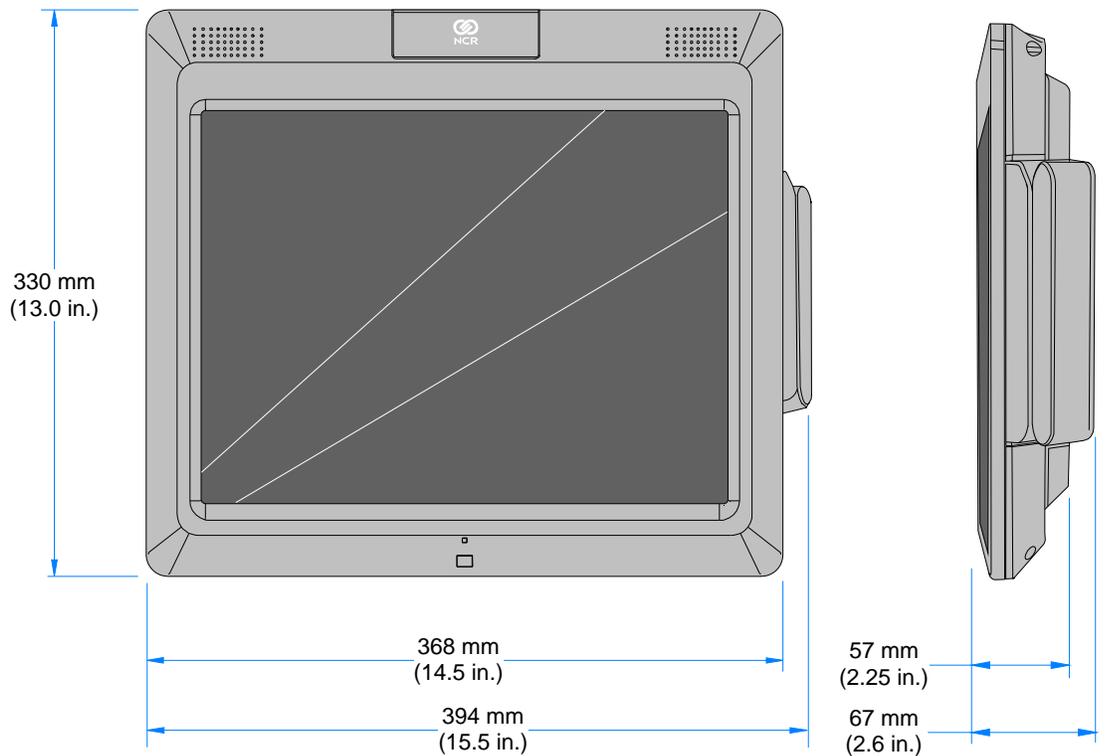
Parameter	Typical
Input Power	+17.0 W

Weight

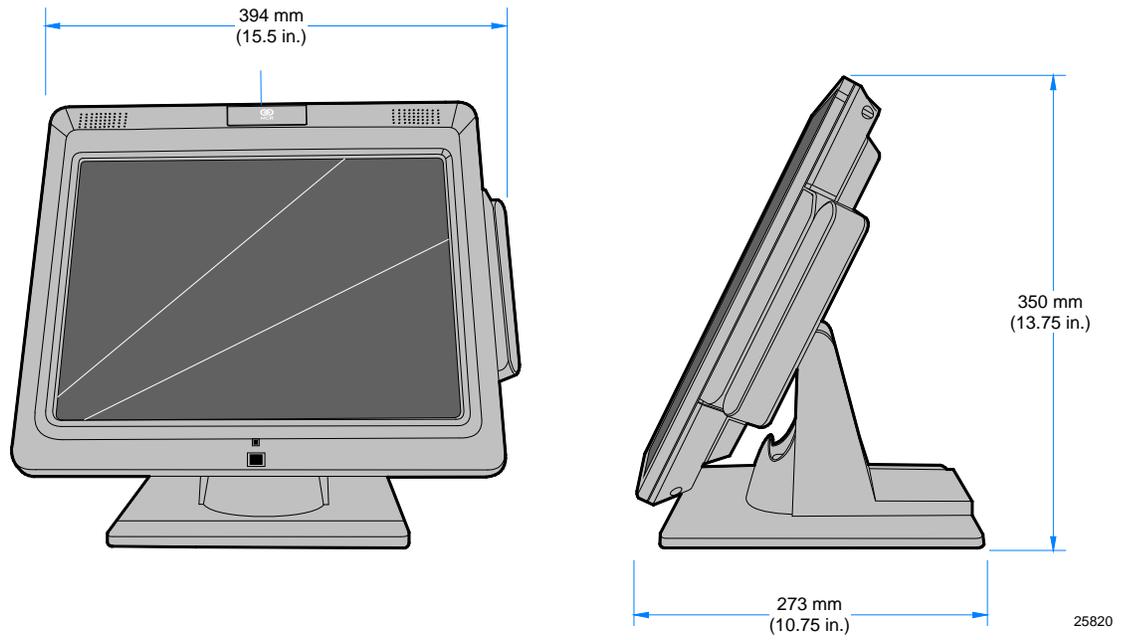
4.0 kg (8.8 lbs.)

Dimensions

Touch LCD Display



Touch LCD Display on the Standard Table-Top Mount



Chapter 3: Hardware Installation

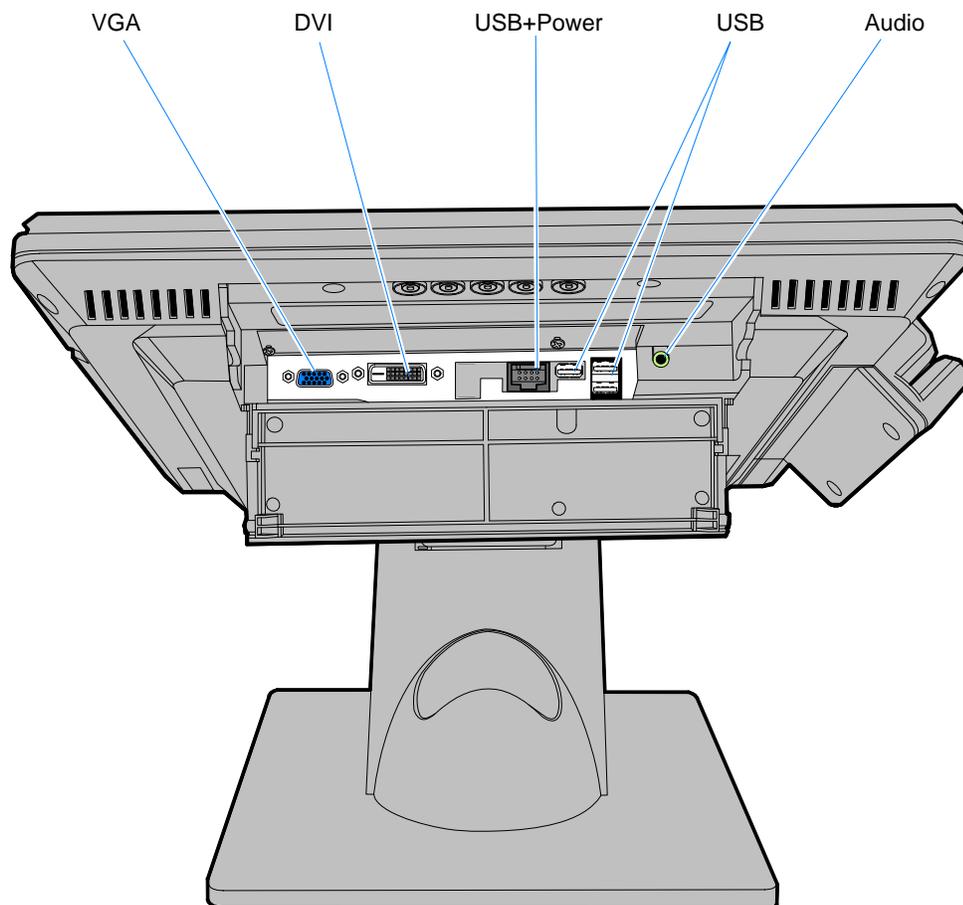
Installing the 5965

Caution: This device should only be powered by a power supply source which meets Safety Extra Low Voltage (SELV) and LPS (Limited Power Source) requirements per UL1950, IEC 950, and EN 60 950. The power source must be certified by the appropriate safety agency for the country of installation.

Caution: Use a grounding strap when installing this feature.

Connector Panel Access

The 5965 peripheral cable connectors are located on the bottom of the assembly.



Mounting Options

The 5965 has a VESA standard 75mm mounting pattern on the back of the enclosure. The unit is shipped with mounting screws installed.

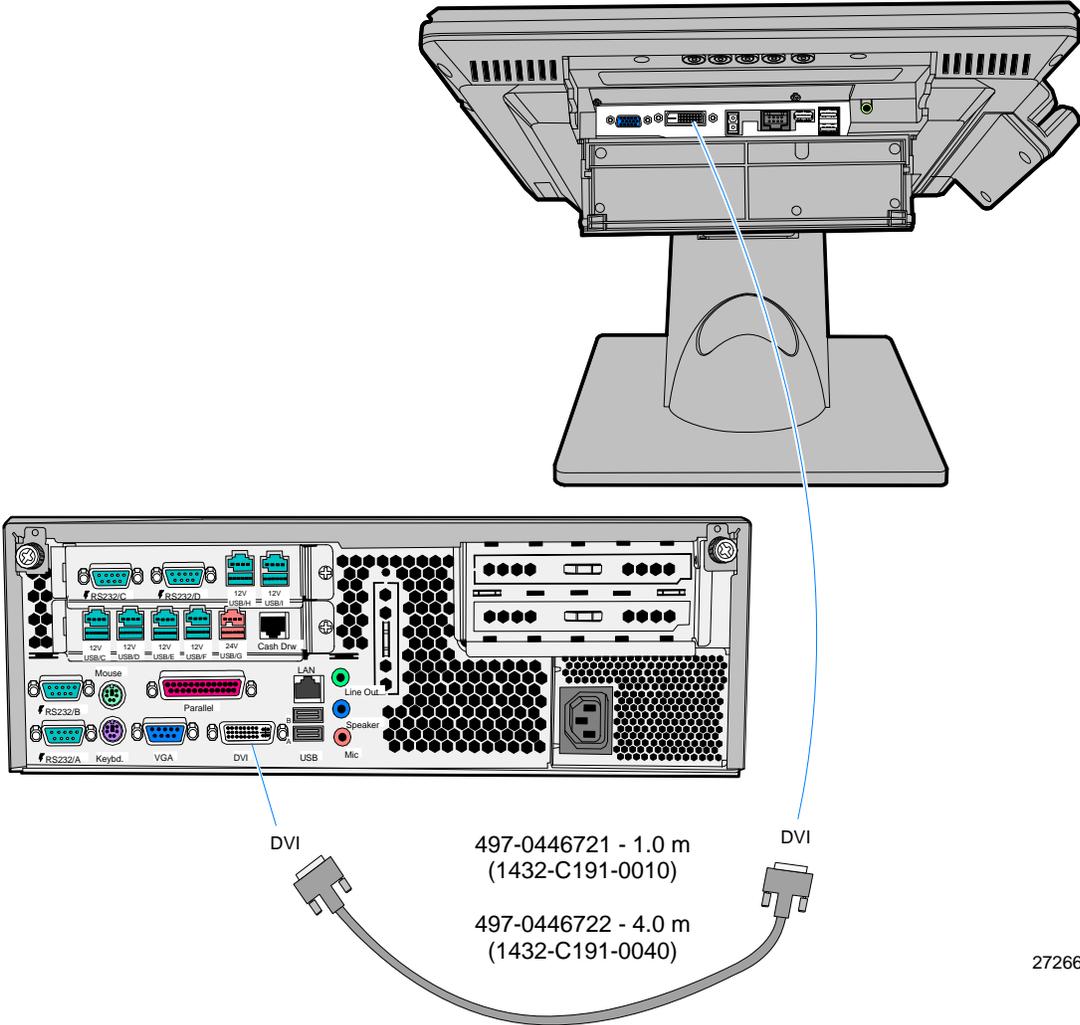
5965 Cables Connecting to a POS

The following illustrations show the cable connections for the 5965 and a host terminal. There are two cables required.

- DVI or VGA cable for video
- Powered Universal Serial Bus (USB) for data and power
Note: Optional Power Brick is available when USB power is not available on the host terminal. A special USB cable is used for data in this case.
- If audio is used, connect the Audio Connector on the 5965 to the Audio Out port on the host computer through the 0.9 m (3 ft.) or 4.6 m (15 ft.) Audio cable.
- There are standard USB ports (1-3) on the 5965 that can be used for additional USB devices.

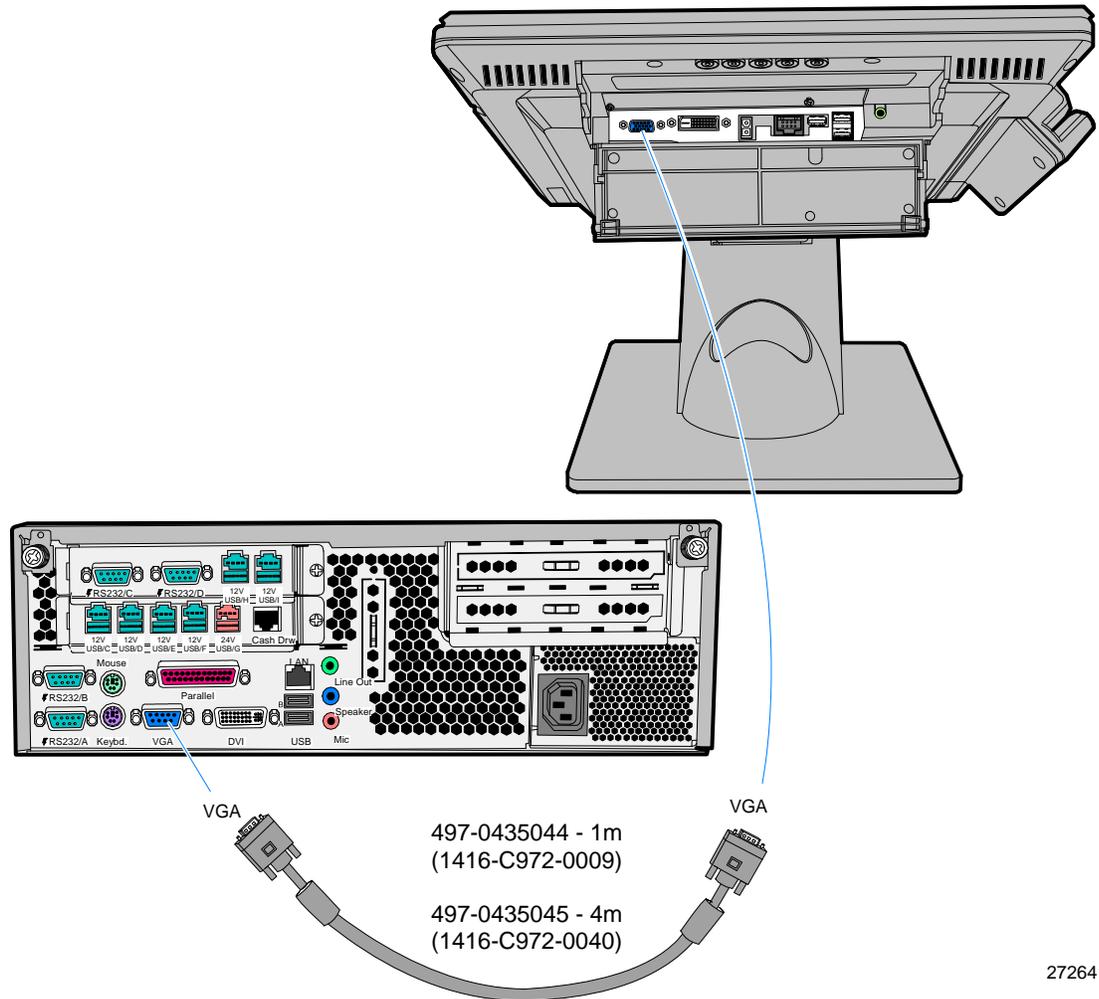
DVI Connections (Video)

Connect the VGA Cable to the VGA connectors on both the 5965 Touch LCD and host terminal.



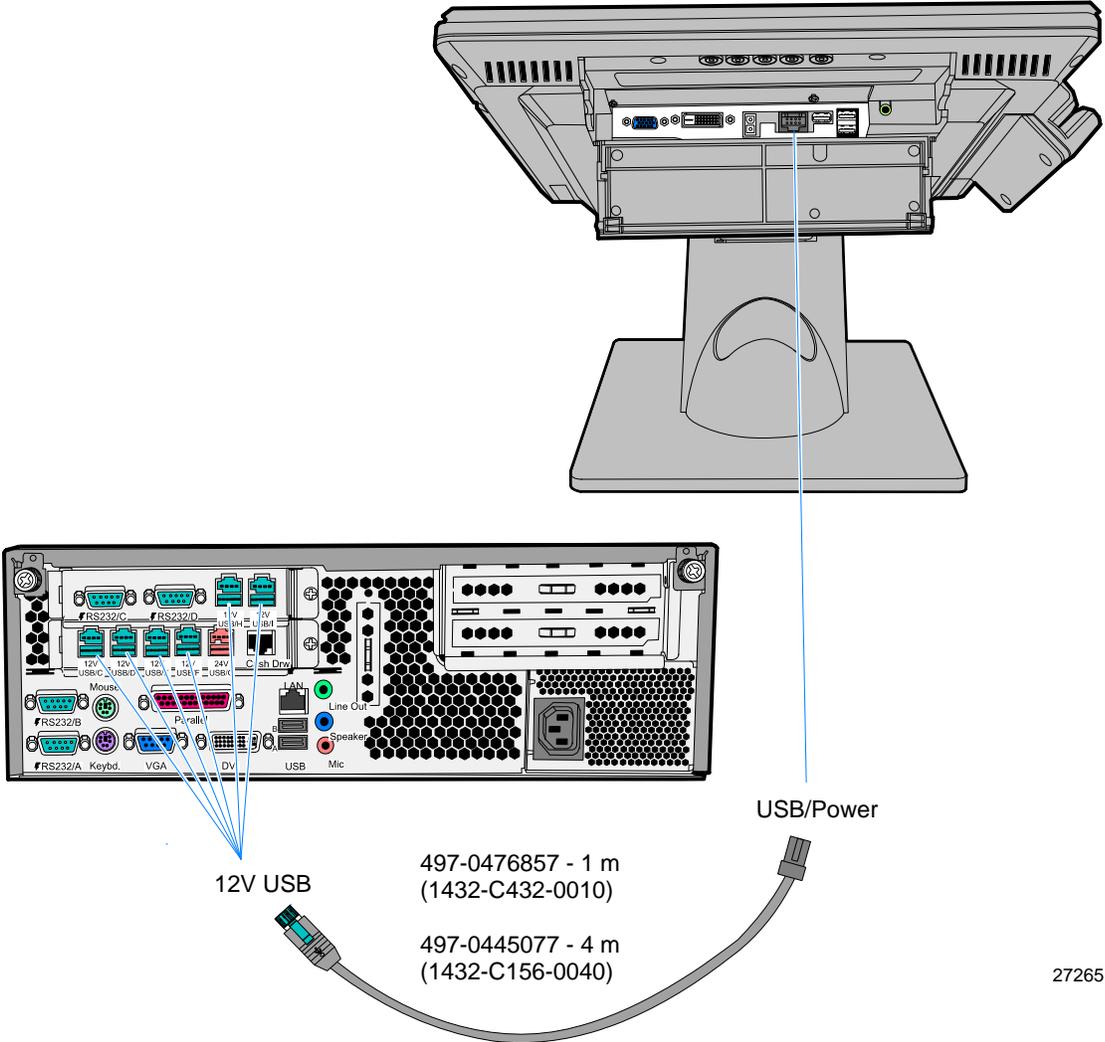
VGA Connections (Video)

Connect the VGA Cable to the VGA connectors on both the 5965 Touch LCD and host terminal.



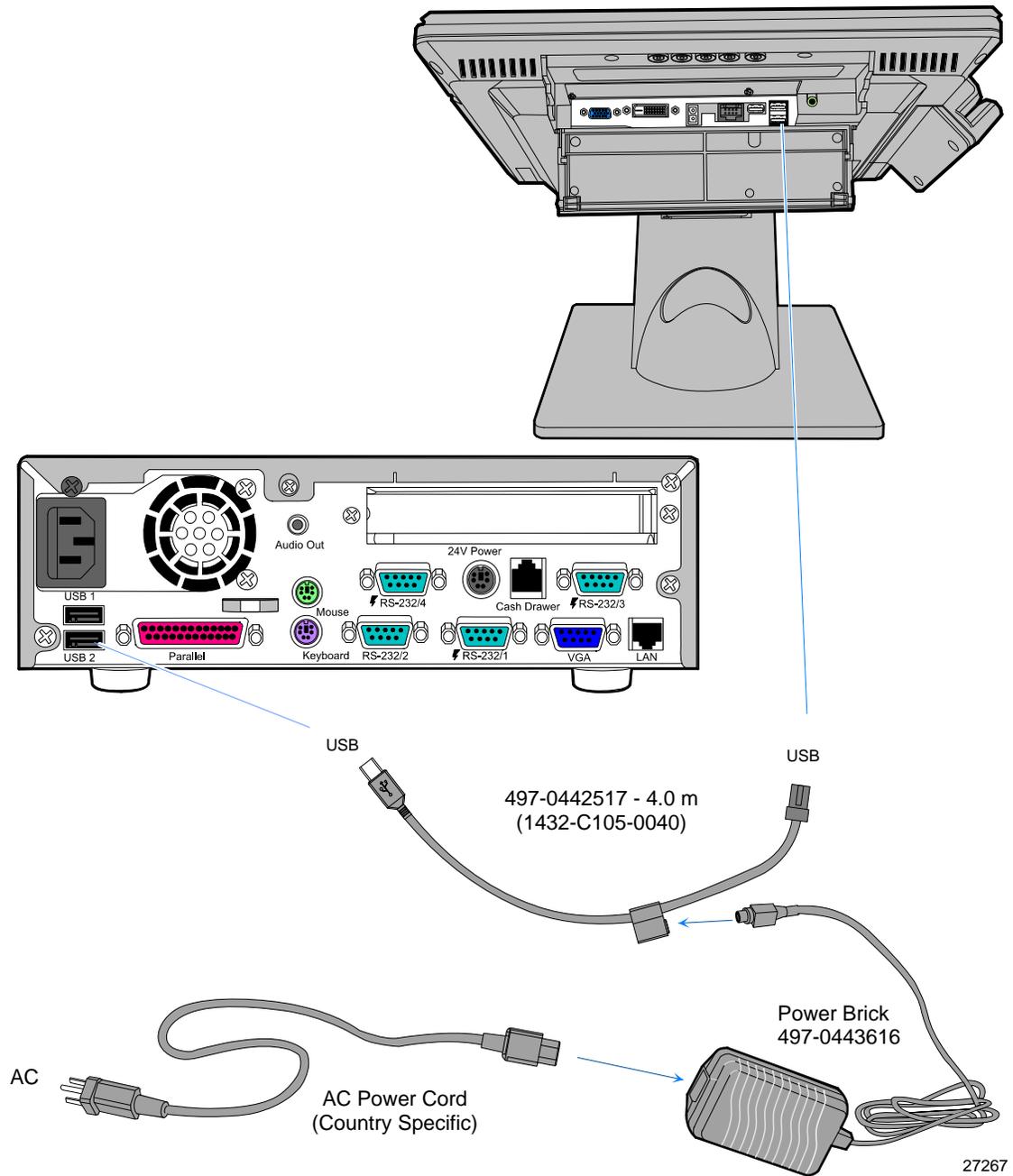
Powered USB Cable Connections (Data and Power)

Connect the Powered USB Cable to the 5965 Touch LCD and to one of the 12V Powered USB connectors on the host terminal.



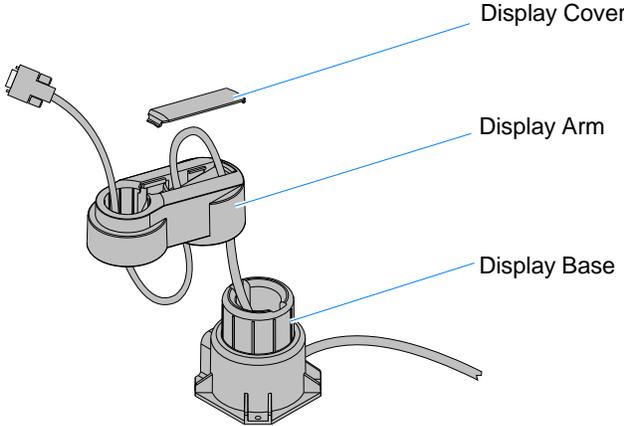
Power Brick and USB Connections (Power and Data)

Connect the USB Cable to the 5965 Touch LCD *USB* connector and to a *USB* connector on the host terminal.



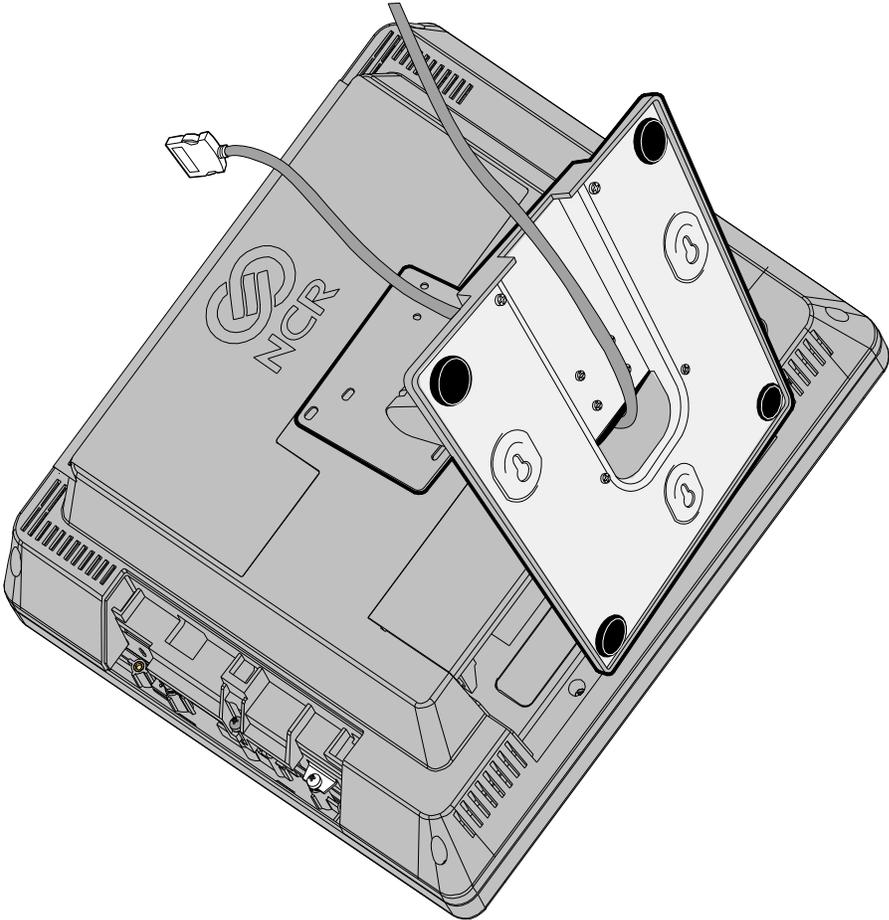
Cable Routing

Standard Integration Tray Display Mount (5964-K022/K023)



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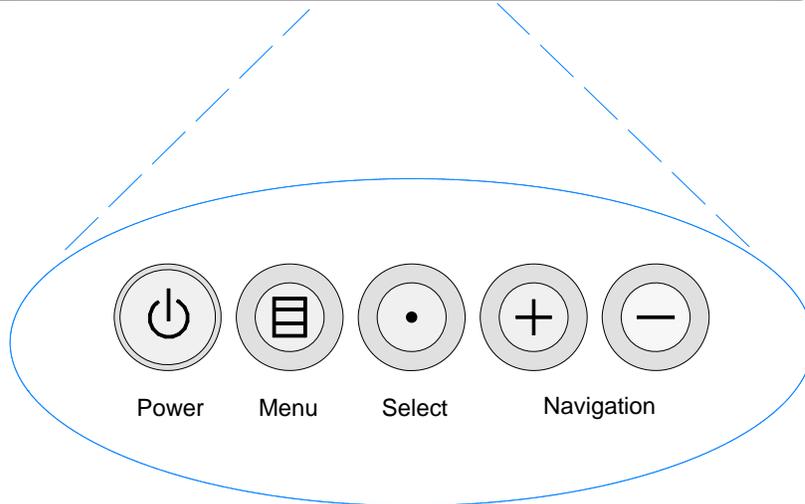
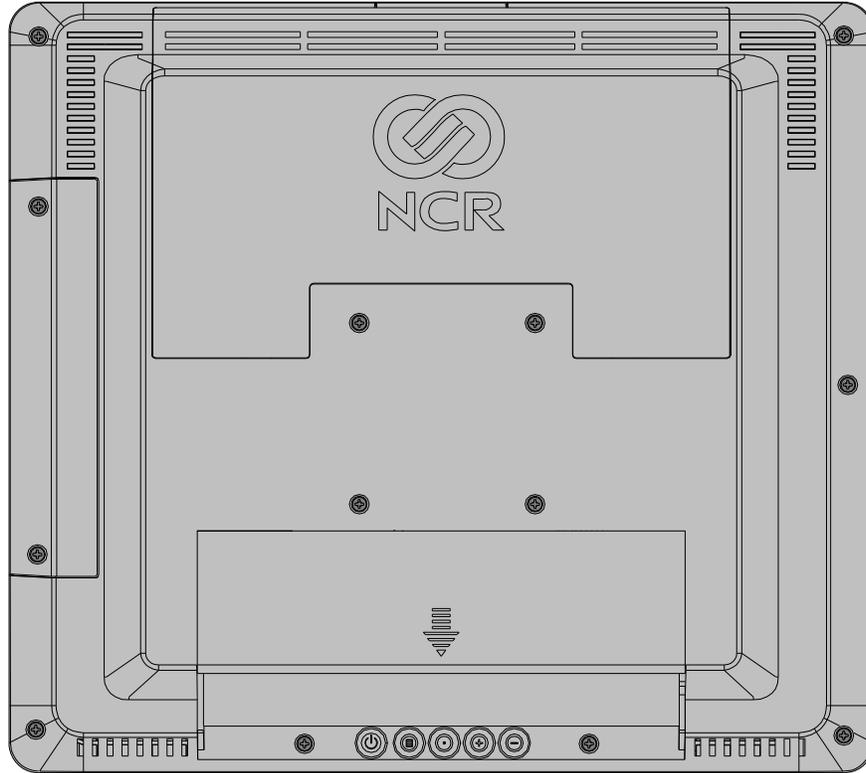
Standard Remote Table Top Mount (5964-K030/K031)



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On Screen Display (OSD)

The OSD is accessed through five pushbuttons on the rear of the display. These buttons provide a way to adjust display parameters of the unit. The button configuration on the rear cover is illustrated below.



Button Functions

Power Button

- **Power on-** pressing the **Power** button turns the unit on. The front panel LED is green.
- **Standby-** if horizontal, vertical or video signals are missing for more than 5 seconds, the unit goes to standby mode. The front panel LED is amber. In this mode, only the USB, Touch screen, and MSR circuits are powered. When all of the video signals come back up, the unit resumes the Power on state.
- **Power off-** holding the **Power** button down for 3 seconds or more puts the unit in the Off state. Only the power button circuitry is powered in this state.

Menu Button

The **Menu** button brings the OSD up on the screen. The menu displayed is the last menu that was on the screen when either the OSD was exited or the last menu on the screen when the OSD timed out.

Auto/Select Button

The Auto function is invoked when the **Auto/Select** button is pressed, and the OSD menu is not on the screen. The Auto function monitors the input signal, calculates the video adjustment parameters and automatically adjusts the timing of the LCD to display the incoming video properly. The Select function is active when the OSD is displayed on the screen. The (+) and (-) buttons are used to navigate within each menu. When the desired function is reached, press the **Select** button to choose that function and to advance the menu for that function.

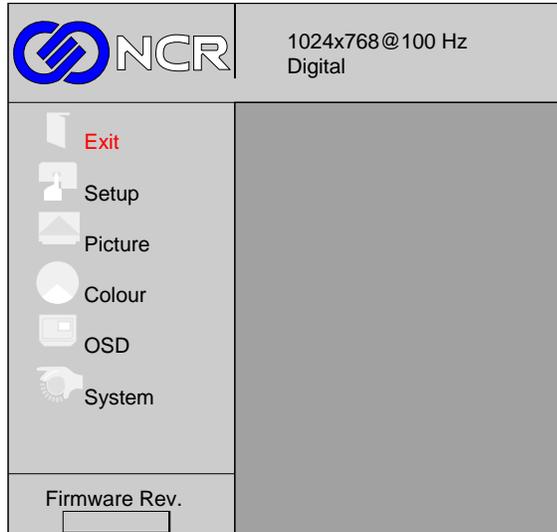
(+) and (-) Buttons

The (+) and (-) buttons are used to navigate within menus and to modify selected control values.

Main Menu

The *Main* menu is displayed when the **Menu** button is pressed. Press the (+) or (-) buttons to navigate the up and down list.

Note: A video signal must be present to display the OSD menus.



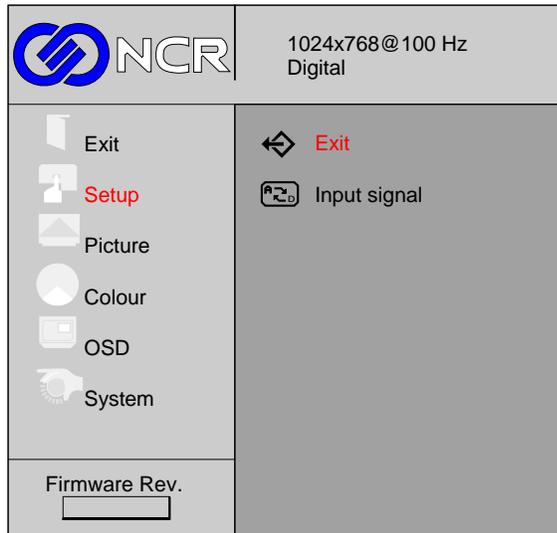
When the desired function is highlighted, press the **Menu** button to advance to that function's menu screen. If you want to adjust another parameter press the **Menu** button to get back to the sub-menu to exit.

To exit the OSD:

1. Choose **Exit** from within the sub-menu.
2. Press the **Menu** button, which takes you to the Main menu.
3. Choose **Exit** again and press the **Menu** button. If no buttons have been pressed for a short period of time, the menu automatically disappears.
4. Press the **Menu** button to exit the OSD.

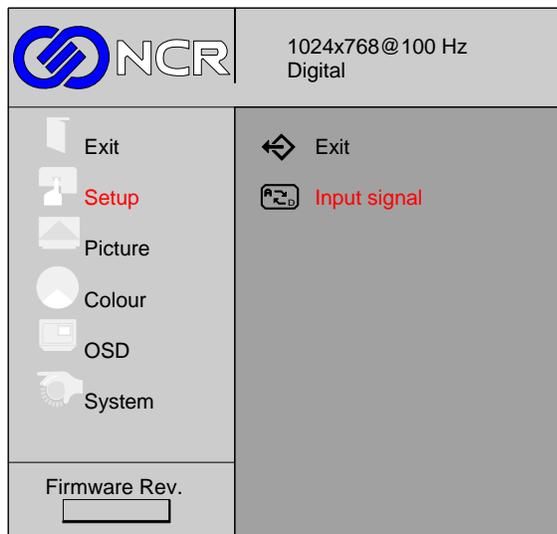
Setup Menu

Select **Setup** from the *Main* menu.

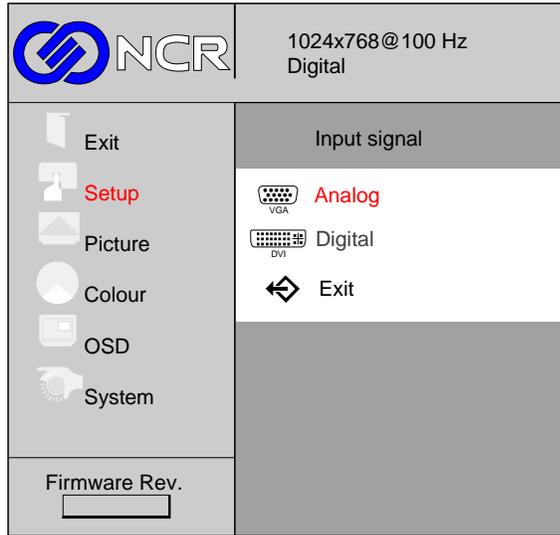


Input Signal

This control is used to select the input signal type. Select **Input signal** from the *Setup* sub-menu.



Select the correct input type from the menu.



To exit this screen and return to the *Setup* menu, press the **Menu** button.

Picture Menu

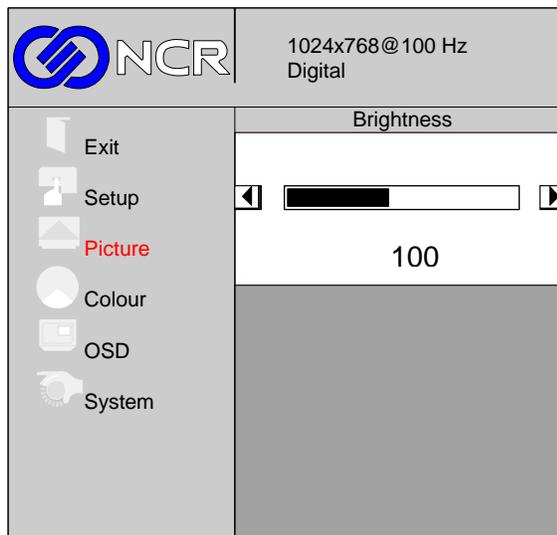
Select **Picture** from the *Main* menu.

Brightness Control

This control is used to adjust the overall display black level. It does not control the lamp brightness. Select **Brightness** from the *Picture* sub-menu.



The minimum value is 0 and the maximum value is 100. The (+) button increases the adjustment value and the (-) button decreases the adjustment value.



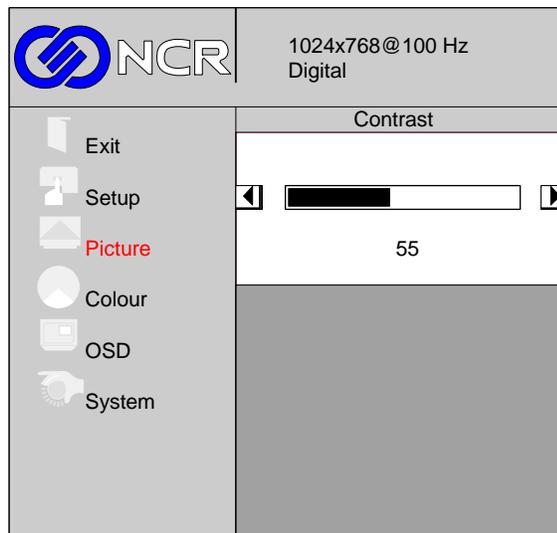
To exit this screen and return to the *Picture* menu, press the **Menu** button.

Contrast Control

This control is used to adjust the on pixel brightness (difference in brightness between an illuminated pixel and the screen background or black level). Select **Contrast Control** from the *Picture* sub-menu.



The minimum value is 0 and the maximum value is 255. The (+) button increases the adjustment value and the (-) button decreases the adjustment value.



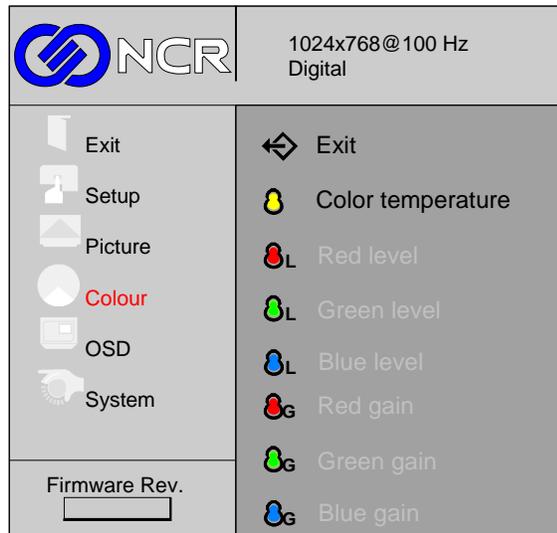
To exit this screen and return to the *Picture* menu, press the **Menu** button.

Color Menu

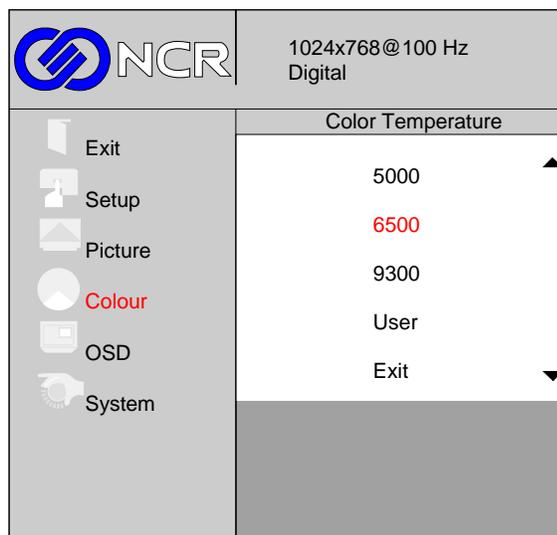
Select **Colour** from the *Main* menu.

Color Temperature

This control adjusts the color temperature of the display (the “whiteness” of the screen). Select **Color Temperature** from the *Colour* sub-menu.

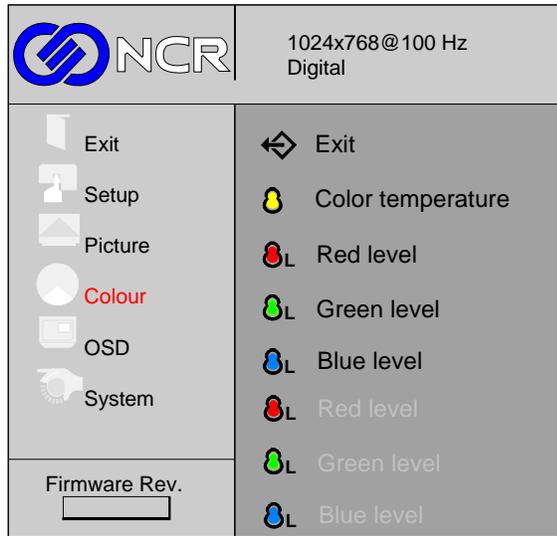


There are preset values to choose from or the individual colors can be adjusted through the *User* selection. To choose a value, scroll through the selections using the (+) and (-) buttons and then press the **Select** button.

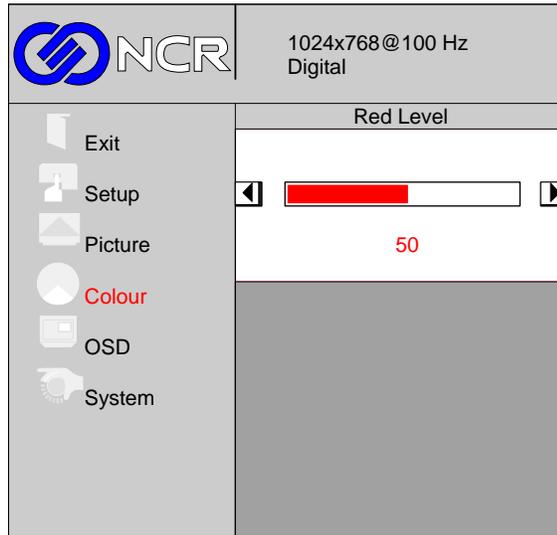


User Red/Green/Blue Control

If the *User* selection is chosen, the *Red*, *Green*, and *Blue* icons are enabled. This control is used to adjust the amount of red, green, or blue in a white screen displayed on the unit.



The minimum value is 0 and the maximum value is 100. The (+) button increases the value and (-) button decreases the value.



To exit this screen and return to the *Colour* menu, press the **Menu** button.

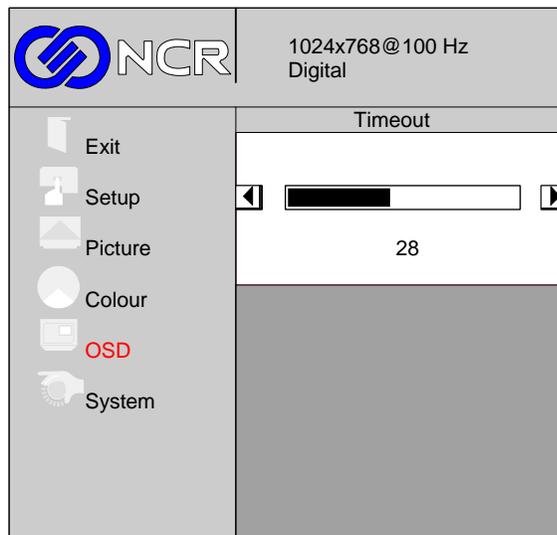
OSD Menu

Select **OSD** from the *Main* menu.



OSD Timeout

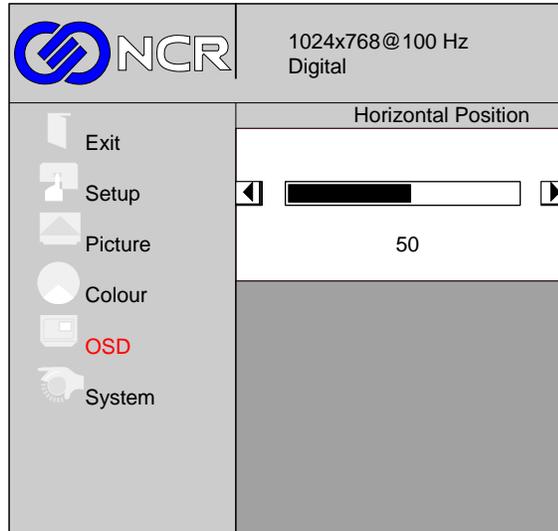
This control is used to set the amount of time the OSD screen stays displayed before timing out. Select **Timeout** from the sub-menu. The (+) button increases the amount of time and the (-) button decreases the amount of time.



To exit this screen and return to the *OSD* menu, press the **Menu** button.

Horizontal Positioning

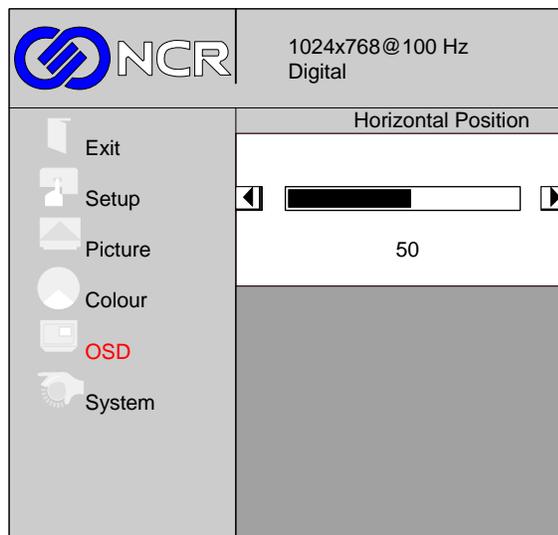
This control is used to adjust the position of the picture left or right on the screen. Select **Horizontal Position** from the sub-menu. The (+) button increases the value and moves the screen right. The (-) button decreases the value and moves the screen left.



To exit this screen and return to the *OSD* menu, press the **Menu** button.

Vertical Positioning

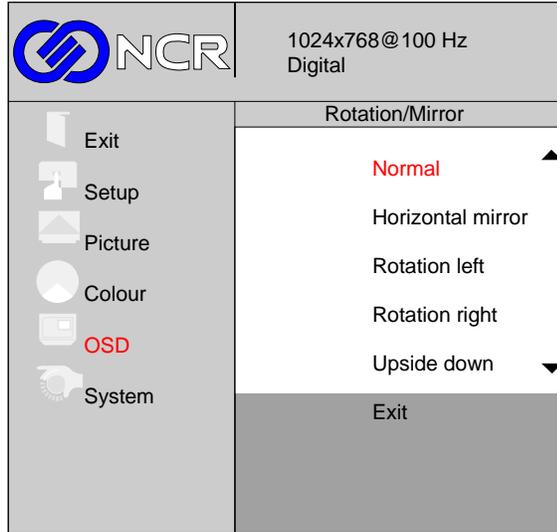
This control is used to adjust the position of the picture up or down on the screen. Select **Vertical Position** from the sub-menu. The (+) button increases the value and moves the screen up. The (-) button decreases the value and moves the screen down.



To exit this screen and return to the *OSD* menu, press the **Menu** button.

Rotation/Mirror

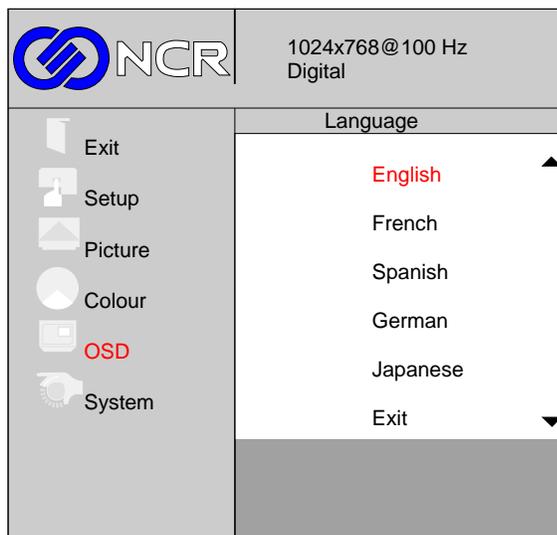
This control is used to adjust the orientation of the picture. The screen can be set to normal, a horizontal mirror image, rotated to the left, rotated to the right, or upside down. Select **Rotation/Mirror** from the sub-menu. To choose an orientation, scroll through the selections using the (+) and (-) buttons and then press the **Select** button.



To exit this screen and return to the *OSD* menu, press the **Menu** button.

Language

This control is used to set the desired language for the OSD. The OSD supports English, French, Spanish, German, and Japanese. Select **Language** from the sub-menu. To choose a language, scroll through the selections using the (+) and (-) buttons and then press the **Select** button.



To exit this screen and return to the *OSD* menu, press the **Menu** button.

System Menu



The System menu provides information about the display. This is information only and cannot be changed in the menus.

Chapter 3: Touch Screen Calibration

Note: This chapter discusses calibration procedures using Hampshire, Version 6.31gs.

Installing and Calibrating the Touch Screen

Be sure to observe for the following Touch Screen calibration guidelines:

- Calibrate the touch screen as part of the installation process.
- Recalibrate the touch screen when the system is installed at its final location.
- Recalibrate whenever the terminal is moved to a new location.
- Recalibrate the touch screen anytime the system has been disassembled for servicing.
- Download the Calibration software from the NCR website.

<http://www.ncr.com>

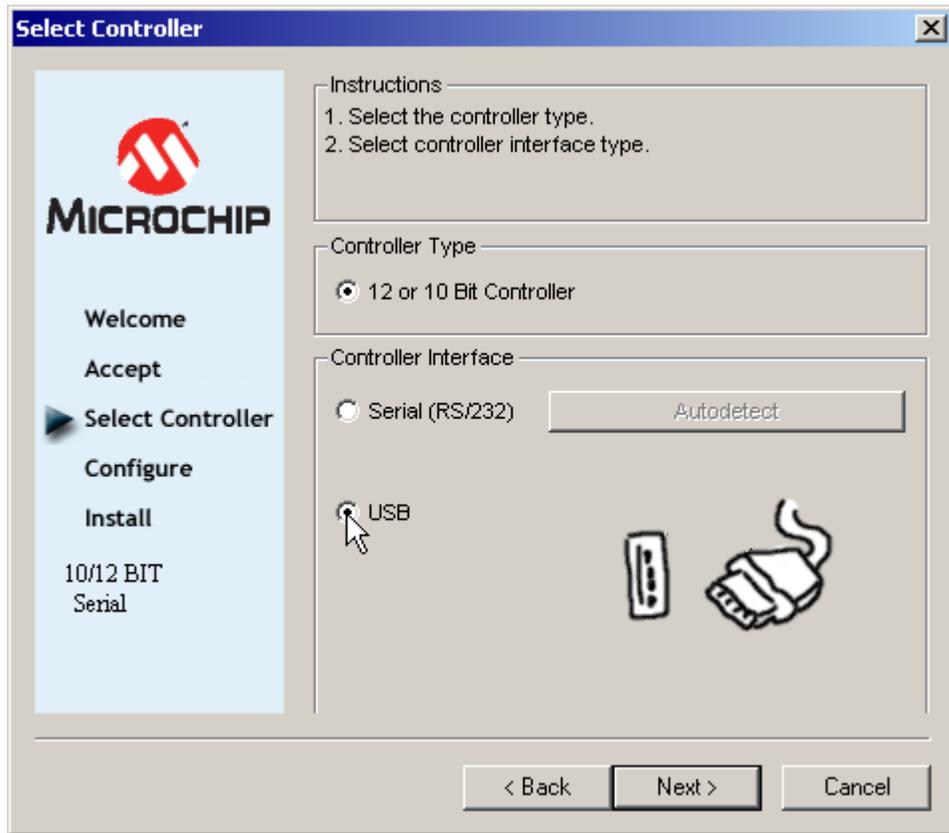
- a. At this site, select **Support**.
- b. Under Related Items, Services; select **Drivers and Patches** → **Retail Support Files** → **NCR RealPOS and SelfServ Peripherals** → **Displays** → **5965**.
- c. Download the Microchip Driver.

Installing the Driver

Note: If you have a previous version of another touch screen driver loaded on your system you must completely remove it using the Control Panel *Add/Remove* program before continuing with this installation process. Even though there is a message that it is not necessary do perform a *System Restart* after removing the old driver.

1. Extract the driver installation files into to a working directory on the POS terminal.
2. Run the **Setup.exe** program from this directory.
3. Welcome screen > **Next**
4. License Agreement screen > Accept, **Next**

5. Use the USB Controller Interface > **Next**.



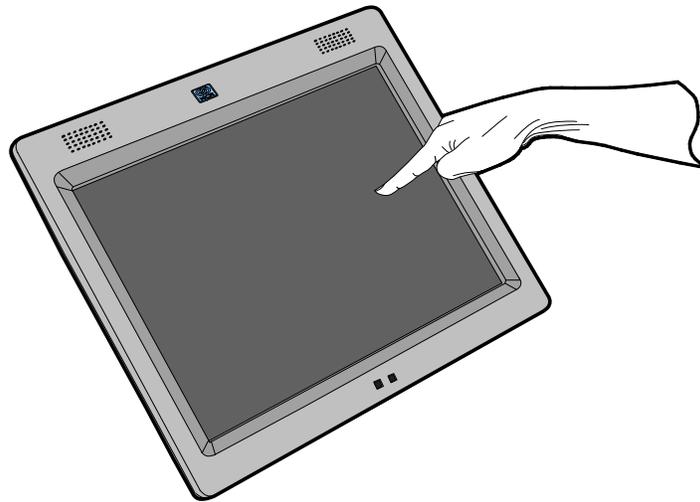
6. Setup is ready to install > **Next** > **Finish**

At the completion of the install program the driver is loaded and functioning. You do not have to restart your system.

Calibrating the Touch Screen

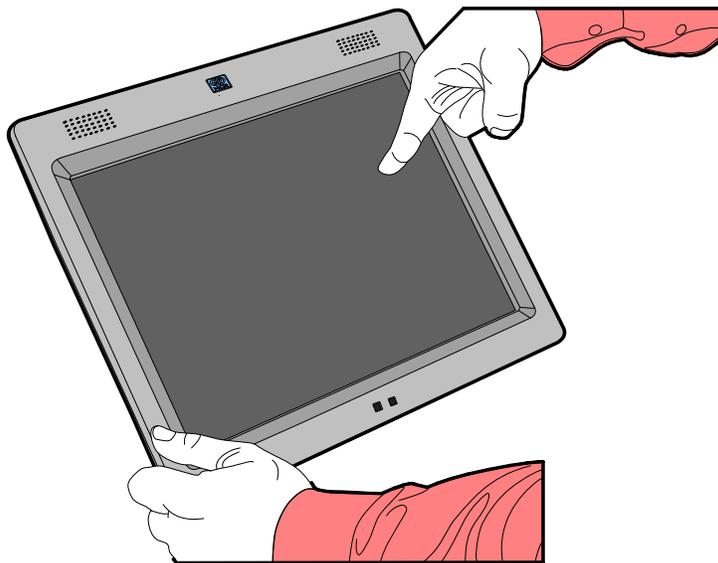
Before performing the calibration procedure please observe the following guidelines for proper/improper methods of touching the screen.

- Face the monitor directly.
- Perform the calibration in the position (sitting or standing) that you normally expect to use the touch screen.
- Touch the calibration target firmly and precisely with your fingertip. During calibration, be careful to keep your fingernails and other fingers away from the touch screen as you touch each target.
- The hand and calibration finger should be perpendicular (straight up) from the touch-screen during touch down and removal of the calibration finger. Keep the other fingers closed and away from the touch-screen.



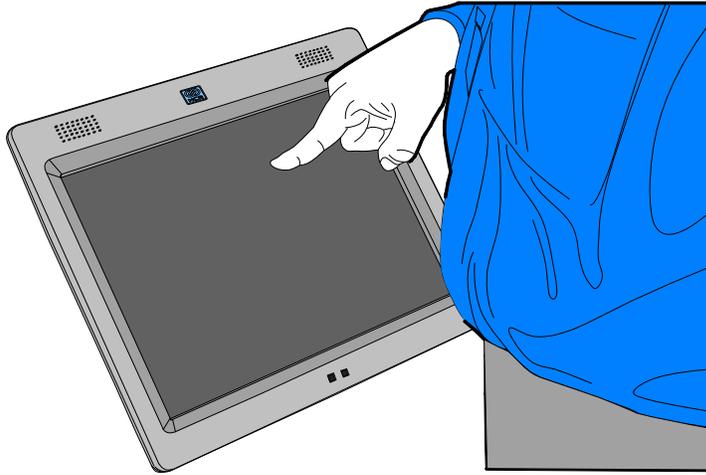
27732

- Do NOT touch the display or bezel with your other hand.



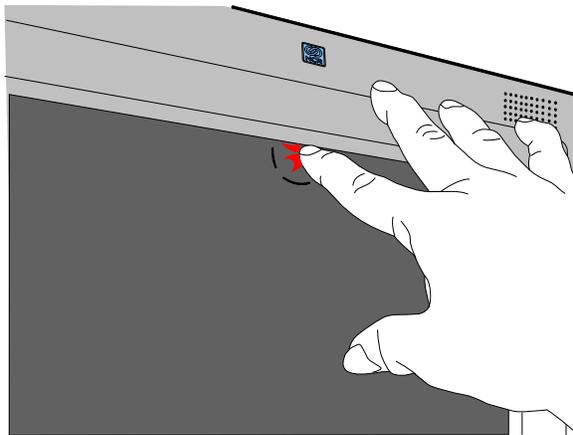
27733

- Do NOT get your body too close to the display.



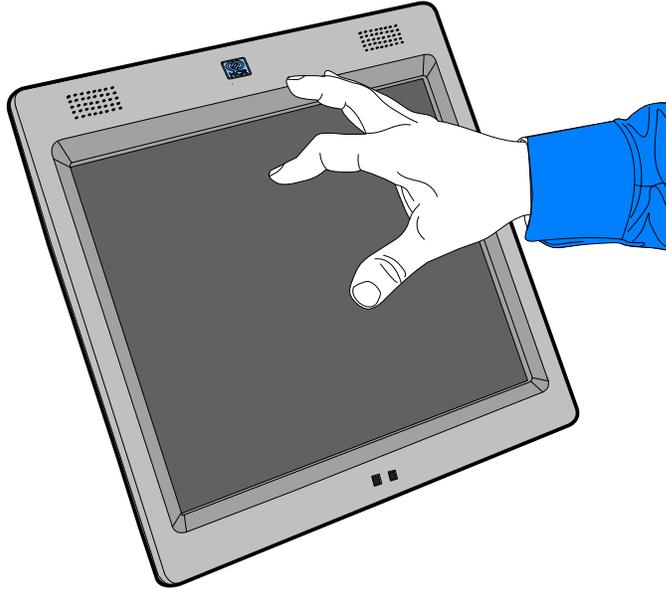
27734

- Do NOT touch the bezel with your other fingers.



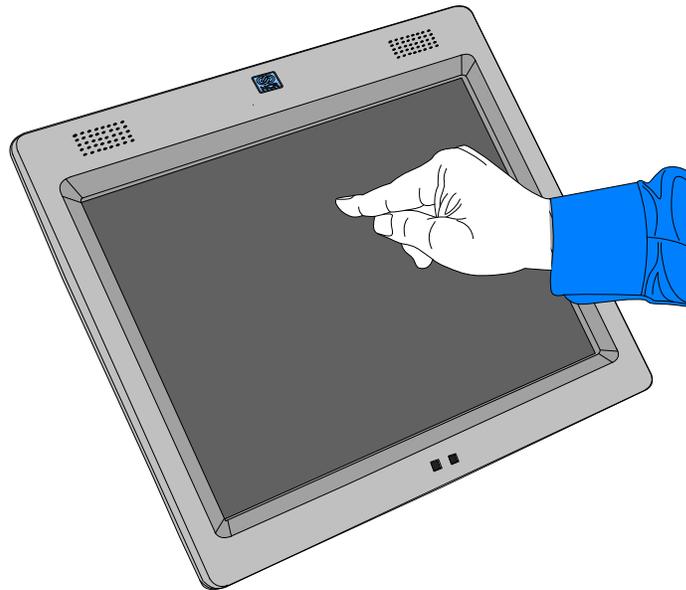
27735

- Do NOT spread your other fingers near the touch-screen surface.



27736

- Do NOT have get your hand and other fingers too close to the bezel.



27737

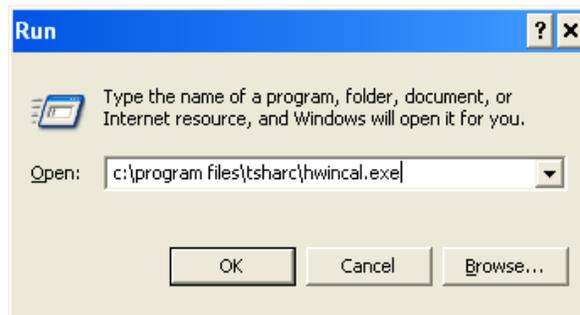
Calibration Procedures

Note: In order to achieve an accurate calibration the touch display must be in the normal operating position when AC power is applied to the terminal (45 degrees can be assumed if this is not known). If this was NOT done properly then begin with Step 1. Otherwise skip to Step 2.

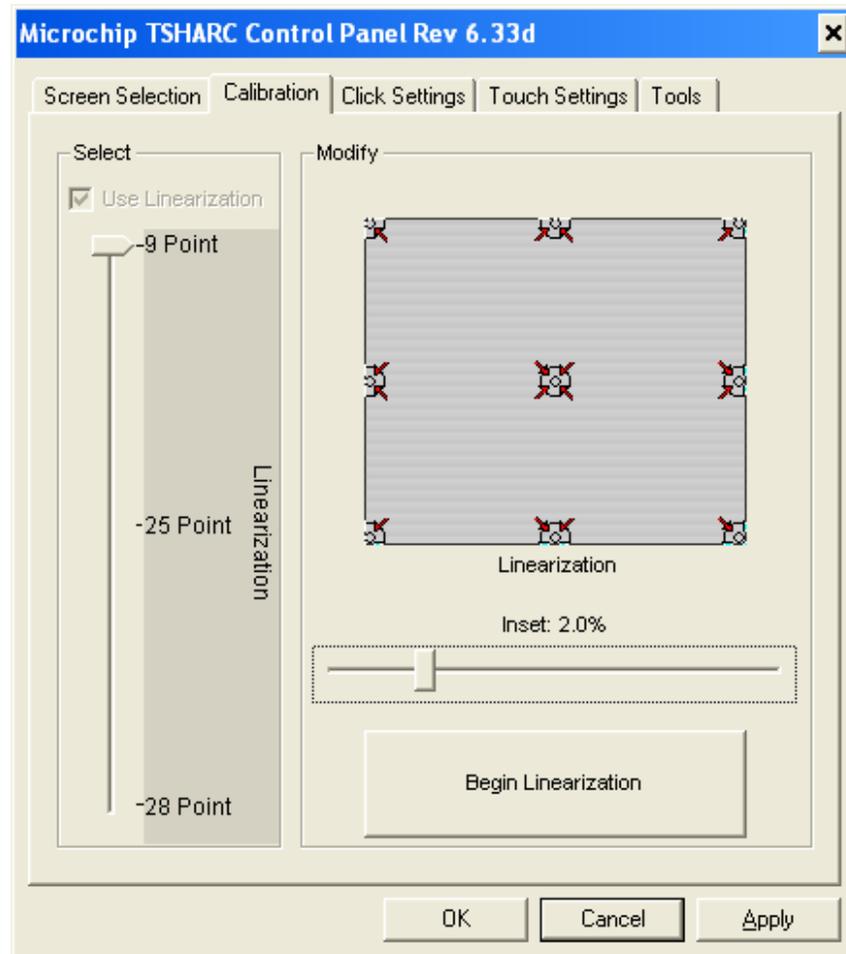
1. Disconnect the power cord from the power source, if possible. It is best to remove the AC power from the wall outlet to avoid having to move the head. But if that cannot be done, tilt the head up and remove the AC cord from the front of the unit. After removing the power cord, tilt the head back to the normal operating position.

Wait at least 10 seconds. Then, while keeping the head in the normal operating position and your hands off of the glass and bezel, plug the cord back in. The head can be touched or moved after AC power has been applied for at least two seconds.

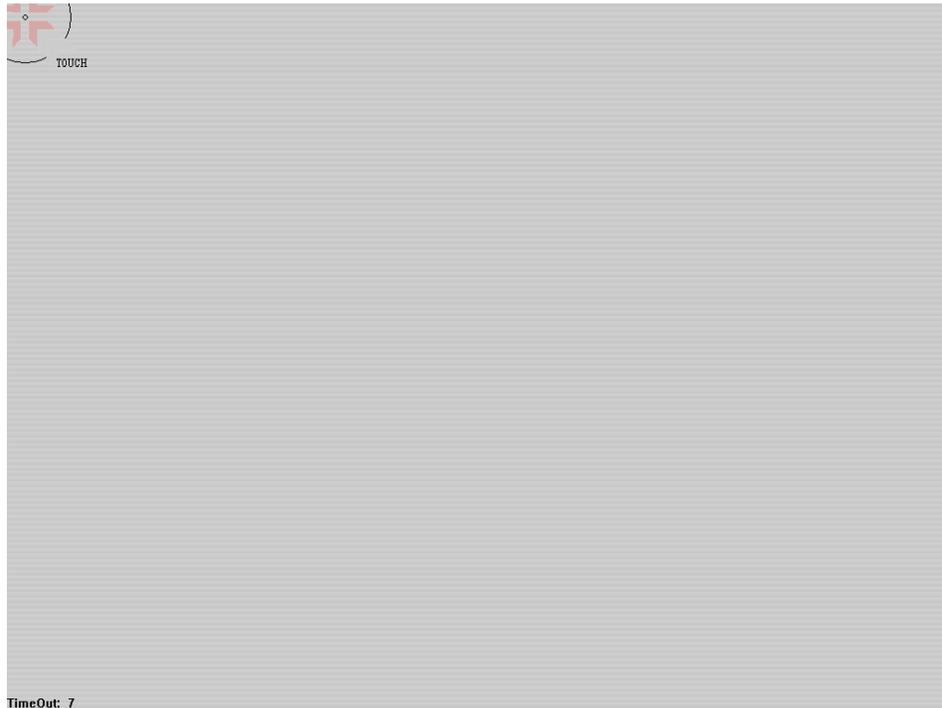
1. Select **Start > Programs > Microchip TSHARC Control Panel**.



2. Do one of the following:
 - Using the keyboard TAB until you see a dashed box around the *Screen Selection* tab. Right arrow to select the *Calibration* tab.
 - Tab until you get a dashed line around the Select section and select *9-Point w/Linearization* using the down arrow key.
- Note:** Earlier versions of the Control Panel show *4-Point* and *5-Point* calibration options. Use the *9-Point w/Linearization* option.
- TAB to the *Begin Linearization* button and press **[Enter]**.

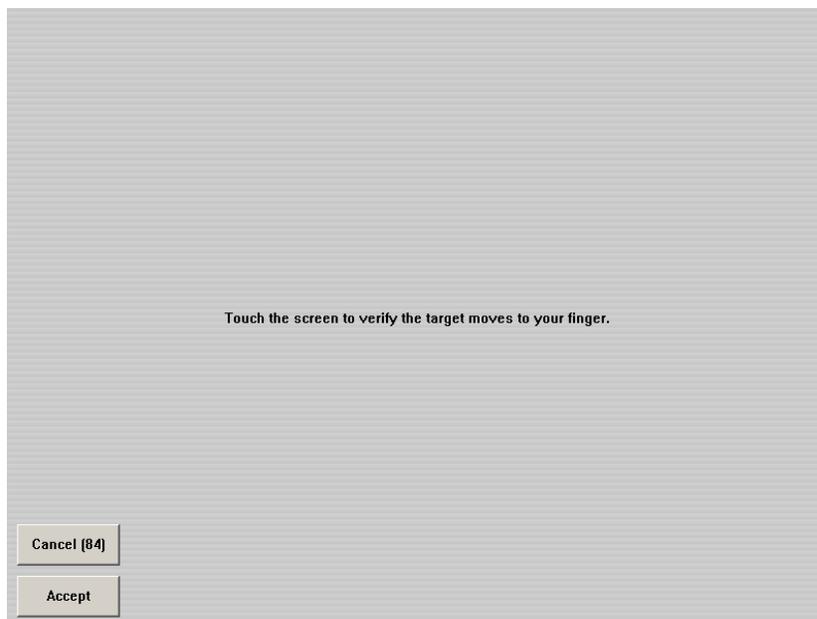


3. Touch the center of the target. Pull your finger a few inches away from the screen when you see the *Release* message.

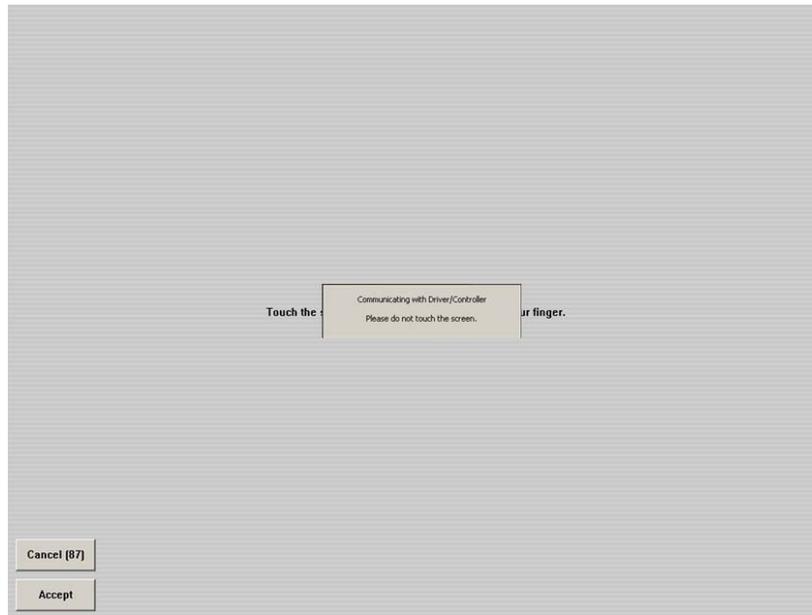


4. Repeat the process for each target location as they appear.
5. After all targets have been touched a test screen displays. Touch the screen in various locations to verify the calibration results. Select **Accept** if you are satisfied with the results. If not, select **Cancel** and repeat the process.

Note: Do not touch **ESC** to exit from this screen.



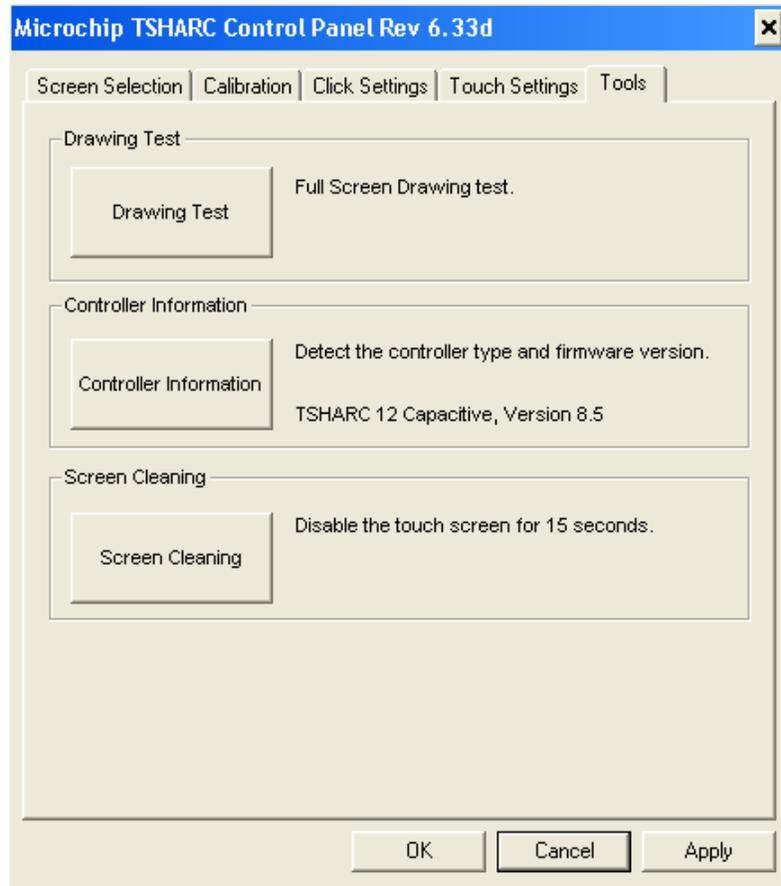
6. After touching **Accept** you are warned to not touch the screen.



Caution: Touching the screen during this time can cause the application to hang. This screen automatically closes after the touch controller has completed communicating. When complete, the system returns to the desktop with the TSHARC Control Panel displayed.

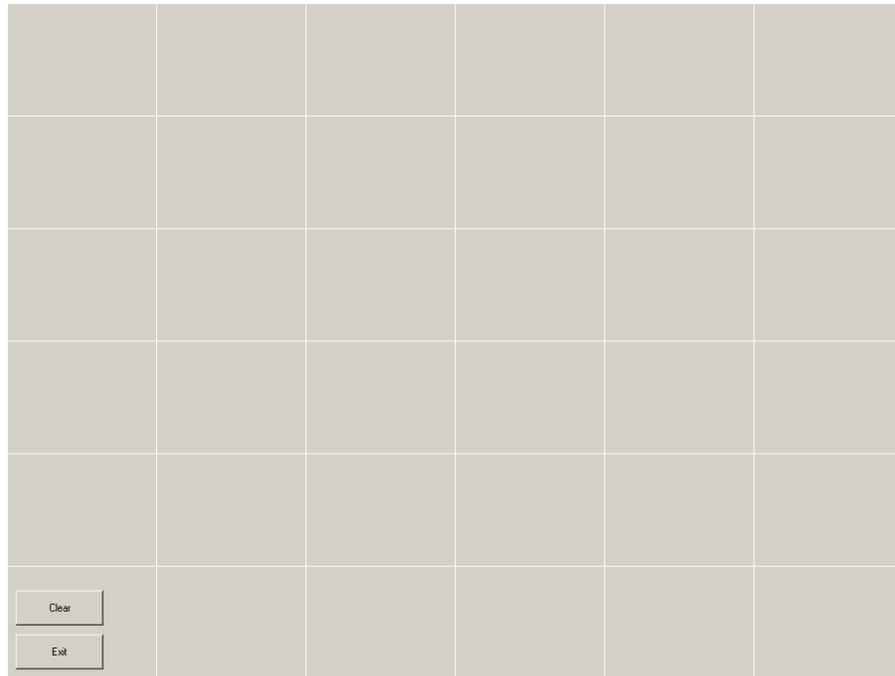
Verifying the Calibration

1. Select the **Tools** tab.
2. Select the **Drawing Test** button.



3. Test the calibration on the draw screen.

Touch the screen in various spots and trace each of the horizontal and vertical lines, including the border around the screen.



In this test, all touches are persistent, including touch downs (green dots) and touch ups (red dots).

After tracing the lines, review the drawn lines to make sure they closely follow the underlying pattern. Pay close attention to the edges of the display and the corners since this is where an incorrect calibration is most noticeable. If a line or point appears to be outside the pattern, try pressing the area to see how far the cursor is from the touch point. If the registered touch is greater than 7 mm away from where the touch occurred, repeat the calibration.

4. Select **Exit** to close this screen and to return to the Microchip TSHARC Control Panel.
5. Select the **Calibration** tab to repeat the calibration procedure or select **Apply** and then **OK** if you are satisfied with the results and want to close the application.

Caution: This application **must** be closed before a display hot swap occurs. If the display is hot swapped while this application is open, the system can hang.

Optional Settings

After the touch screen is calibrated, adjust the other features to meet your personal preferences.

- Double-Click Option
- Right-Mouse Click
- Touch Modes
- Touch Sounds
- Task Bar Pull Up
- Touch Offset

Chapter 4: Problem Isolation Procedures

General

NCR offers both on-site and mail-in service for the NCR 5965. Before calling for service or mailing in the unit for repair, step through the problem isolation procedures below to make sure the Touch Screen module is in need of repair. Also, the answers to these questions may speed the servicing of the 5965.

The following procedures provide general troubleshooting tips for the 5965. If you experience a problem with the 5965, please explore the possible solution options below before replacing any component in the system. These suggestions should be explored in the order presented below until the fault is found.

As a general guide to troubleshooting a flat panel display system it is worth considering the system as separate elements, such as:

- Main Controller PCB (Video register settings, USB hub controller, TS controller)
- LCD Panel (controller, cabling, connection)
- Lamps and invertors
- General Cabling
- Power supply
- Host Computer (display settings, operating system)

Hardware Component Descriptions

Video Input/LVDS Output Circuits – Controller PCB

This is not a serviceable part and, if a fault is suspected here, the PCB should be replaced.

This board is responsible for processing the video signal for input into the LCD panel and controlling the backlight brightness setting (as per the setting in the OSD) and on/off signal (for switching to power save mode). The board also stores user settings.

Power to the board is supplied by a USB+Power cable. When power is present on the board the dual color LED will light. It is initially amber, and then turns green when a valid video input is detected on either the VGA or DVI input.

If the LED remains amber when a video signal is present check the video lead and the signal source. If the LED does light at all check the power to the board (CN6/CN17).

EDID

Note that the host will only be able to read EDID data from a powered down monitor if 5V is supplied by the host on pin 9 of the D-sub connector or pin 14 of the DVI connector (depending on which video input is used). Note that the two video inputs have independent EDID's, though both should contain identical timing and product information.

USB Hub – Controller PCB

This is not a serviceable part and, if a fault is found here, the PCB should be replaced.

The USB hub requires power to be applied to the monitor. If the hub itself or connected devices are not registering on the host PC check that the upstream connection (USB+Power) is connected correctly and the cable is not damaged.

Fault Conditions/Solutions

Condition: Touch Screen not accurate

1. The Touch Screen may not be calibrated properly. Recalibrate Touch Screen using the Hampshire Touch Controller calibration procedure. Follow instructions in the *Touch Screen Calibration* section.
2. Replace the touch sensor and then perform the Calibration procedure.
3. Replace the main Controller Board and then perform the Calibration procedure.

Condition: No display

1. Check that the LCD backlights are functioning properly. You should be able to see light coming from the back edges of the LCD panel. If the backlights DO NOT appear to be functioning either the cable harness between the main Controller Board and the backlight inverter may be loose or damaged, one or both backlights in the LCD panel may have failed or be disconnected, or the backlight inverter board may have failed. Check/reseat the cable harness. If the unit is still not functioning replace the LCD & recalibrate the Touch Screen. If the problem remains, re-install the original LCD and replace the backlight inverter board.
2. Check that a cable is attached to the *Powered USB* port on the 5965 display and/or that the unit is operating from a power brick connected to the *DC powered connector* (depending upon the display's configuration). Ensure that this/these cable(s) are properly connected to the terminal, and that the display is turned on. Check that the VGA or DVI video cable is properly connected to both the 5965 and the terminal. Check each end of the cable to ensure that no pins have been bent. (If another 5965 display is available you can quickly isolate the problem to either the display or terminal by temporarily replacing the 5965 with another.)
3. Check that the terminal or application is not in a *standby*, or *suspend* mode. The front panel LED should be illuminated *Amber* if in one of these modes. If the system is found to be in one of these modes, return the system to normal operating mode as required by the application. In the normal operating mode the front panel LED should be illuminated *Green*.
4. Enter the On Screen Display (OSD) menu and check that the Brightness, Contrast, or Frequency controls are not misadjusted. Perform *Factory Reset* or *Autoadjust* from the OSD if necessary.
5. If, at this point, the unit is still not functioning correctly it may be necessary to open the unit for service. Visually inspect the front of the LCD panel for any obvious damage. Replace the LCD panel if damaged & recalibrate the Touch Screen.
6. If the LCD backlight is functioning correctly, check that the internal cable harness between the LCD panel and the main Controller Board is properly connected at both ends. Re-seat these connectors if necessary.
7. If the problem persists, replace the main Controller Board and then perform the *Calibration* procedure.

Condition: Image position

If it is impossible to position the image correctly, i.e. the image adjustment controls will not move the image far enough, then test using another graphics card.

Condition: Image appearance

A faulty panel can have blank lines, failed sections, flickering or flashing display. An incorrect graphics card refresh rate, resolution, or interlaced mode can cause the image to be the wrong size, to scroll, to flicker badly, or have no image.

Condition: Sparkling on the display

Faulty LCD panel or LVDS signal cable.

Condition: LCD Dim/Contrast too Light or Dark

1. Unit is *cold*. Wait 15 minutes for unit to reach operating temperature before measuring brightness or contrast. Do not expose the unit to operating temperatures below 5° C.
2. Unit in direct sunlight. For best display quality, keep the unit out of direct sunlight or other bright light sources.
3. The OSD controls may have been misadjusted. Enter the On Screen Display menu and check that the Brightness and Contrast controls are properly set. You may wish to perform *Factory Reset* from the OSD menu to establish the default settings for these controls.
4. One of the LCD's backlight tubes may have failed, or the LCD's backlight tubes may be near the end of their useful life. Replace the LCD panel. Recalibrate Touch Screen.
5. The Backlight inverter may be damaged. Replace the backlight inverter board if necessary.
6. If the problem persists, replace the main Controller Board and then perform the *Calibration* procedure.

Condition: Lines in LCD Display

1. The display may need to be calibrated. Enter the OSD menu and perform *Autoadjust*.
2. The external VGA cable may be loose. Check the VGA cable for bent pins and ensure that the VGA cable is securely fastened at both ends.
3. The Internal LCD harness running between the main Controller Board and the LCD panel may be loose. Re-seat the connectors at both ends of this wiring harness.
4. While very unlikely, it is possible that the LCD panel could have failed. Try replacing the LCD panel & recalibrate the Touch Screen. If this does not correct the problem reinstall the old LCD panel and replace the main Controller Board and then perform the *Calibration* procedure.

Condition: USB Device not Working Properly

Keyboard, Mouse, Touch I/f, MSR not Working Properly

1. Select that a cable is attached to the *Powered USB* port on the 5965 display, that this cable is properly connected to the terminal, and that the display is turned on.
Note: If another 5965 display is available you can quickly isolate the problem to either the display or terminal by temporarily replacing the 5965 with another.
2. Select **Control Panel** → **System** → **Hardware** → **Device Manager** to determine that the terminal sees the USB hub in the display and the USB devices (touch system, MSR, and whatever might be connected to the external USB port) connected to this hub.
3. If the display's USB hub is not found, verify that the display is receiving 12 volt power. Depending upon which terminal the 5965 is connected to there may be a fuse for the 12V PlusPower feed in the terminal.
4. Remove all USB drivers from the terminal in *Device Manager* and allow *find new hardware* to replace them.
5. If the hub is still not found, check the fuse inside the 5965 on the main Controller Board. If the fuse is good and the hub is still not found, replace the main Controller Board and then perform the *Calibration* procedure.
6. If the hub is found but a specific device is not operational, focus upon the failing device. If the failing device is the touch interface consider replacing the touch sensor. If this does not correct the failure use the old touch sensor and replace the main Controller Board and then perform *Calibration* procedure.
7. If the failing device is the MSR, make certain that the MSR card is oriented the correct way with respect to the card's magnetic stripe. Make certain that the MSR cable harness and ground connections are correctly attached and that the electrical integrity of the connections are good. Pay particular attention to the MSR cable harness connection at the main Controller Board. This connector can suffer particular abuse and may have completely, or, intermittently failed. This can be checked by temporarily attaching a known good MSR kit to the display. If the symptom is poor read performance or a missing track, try cleaning the MSR head, otherwise replace the MSR kit.
8. If the failing device is the touch interface, uninstall the Microchip UniWin driver and reinstall. If the problem persists, visually inspect the touch sensor for any obvious damage, check that the sensor's tail does not show obvious damage, check that the sensor's tail is properly connected to the main Controller Board and replace if necessary. Otherwise, replace the main Controller Board. If either the touch sensor or the main Controller Board is replace you must perform the *Calibration* procedure.
9. If the failing device is an externally connected USB device, verify that the external USB port is functioning by connecting some known good device to the port. If the port proves bad replace the main Controller Board and then perform the *Calibration* procedure. Otherwise, replace the failing device.

Condition: Audio not Working or Imbalanced

1. Check that the external audio cable does not have an open conductor and is properly attached at both the terminal and the display end.
2. Check the audio driver settings (in the terminal's control panel), pay specific attention to the *volume* and *balance* settings.
3. Check the 5965's OSD volume and mute setting.
4. Check that the internal audio cable harness is properly connected.
5. Replace internal speaker assembly.
6. Replace the main Controller Board and then perform the *Calibration* procedure.

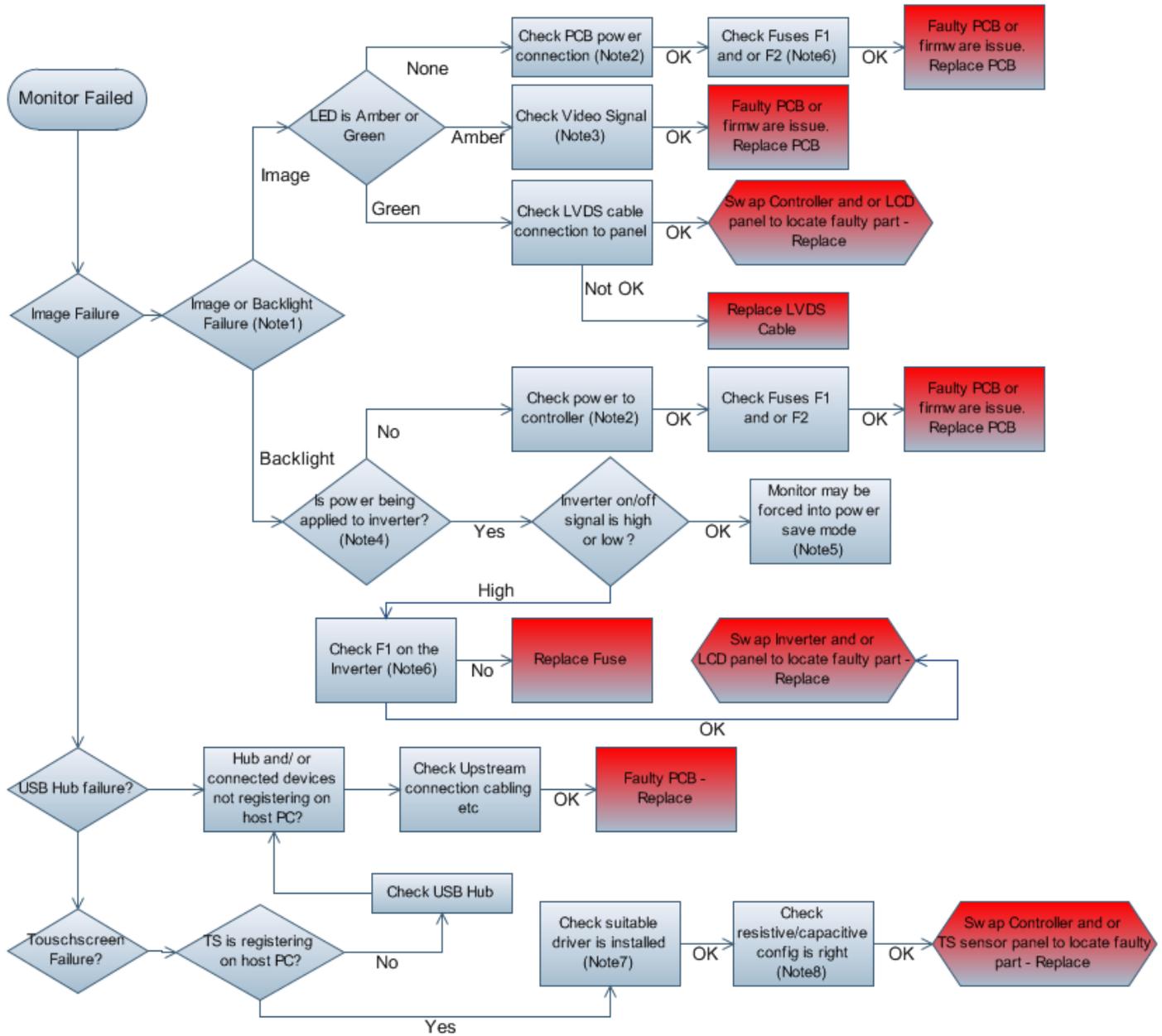
Condition: OSD Controls not Functioning Correctly

1. Check that the OSD control board is mounted correctly in the front bezel and that the button tree is mounted correctly in the rear bezel.
2. Check that the grounding lug near the OSD wiring harness does not short to nearby traces on the OSD board.
3. Ensure that the wiring harness connecting the OSD control board to the main Controller Board is not damaged and that the connectors are properly seated at both ends of the harness.
4. Replace the OSD control board.
5. Replace the main Controller Board and then perform the *Calibration* procedure.

Continued failure

If the unit keeps failing, consider and investigate whether you are short circuiting the equipment or doing something else seriously wrong. Generally, after common sense issues have been resolved we recommend step-by-step substitution of known working parts to isolate the problem.

Troubleshooting Flow Chart



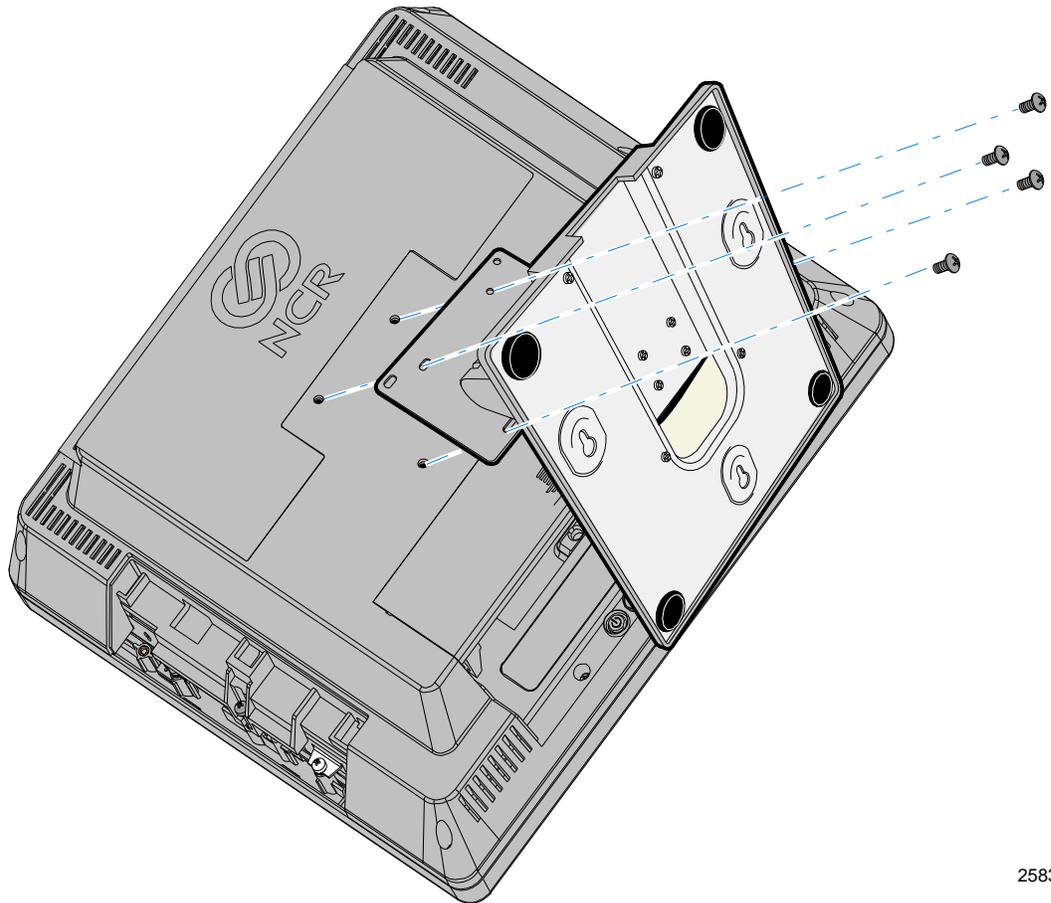
Chapter 5: Disassembly Procedures

This section explains how to disassemble the 5965 Touch LCD Display for servicing.

Caution: Power down the terminal before disassembling the unit.

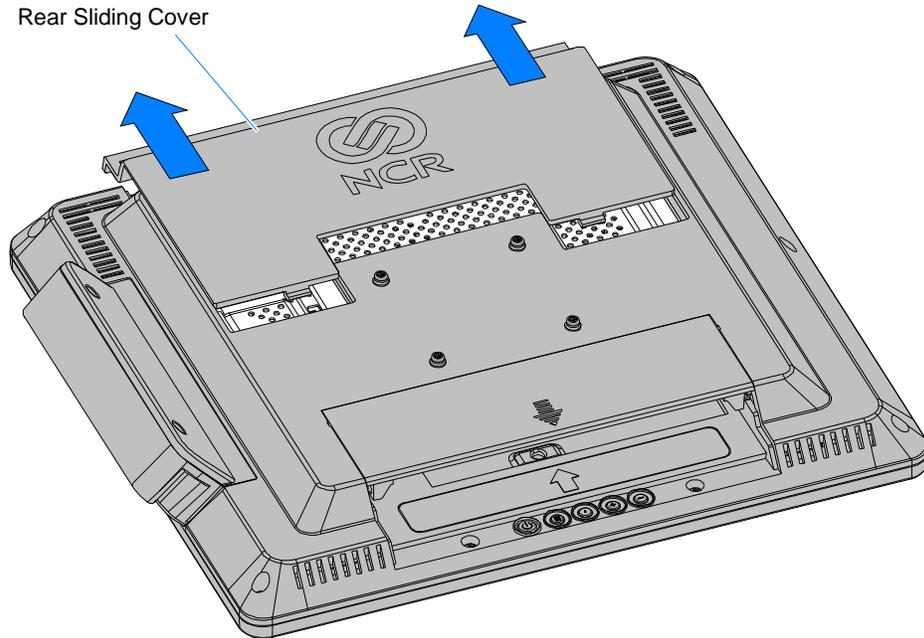
Removing the LCD Monitor from the Mount

1. Remove the screws (4) that secure the Mount to the 5965 Display.



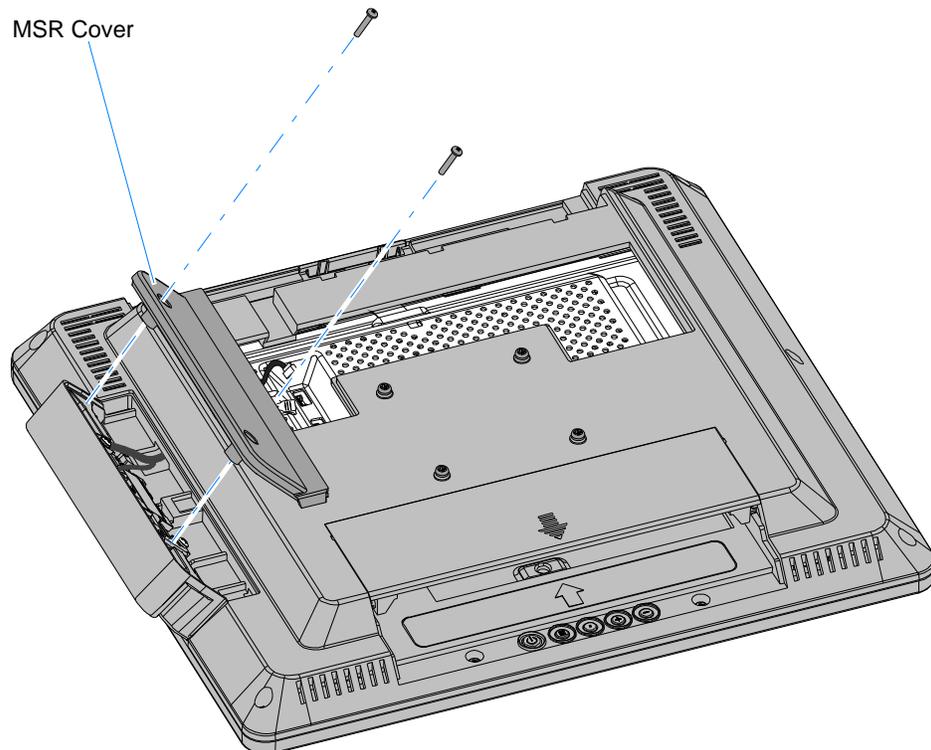
Removing the MSR

1. Remove the rear Sliding Cover by sliding it toward the top of the display as shown.



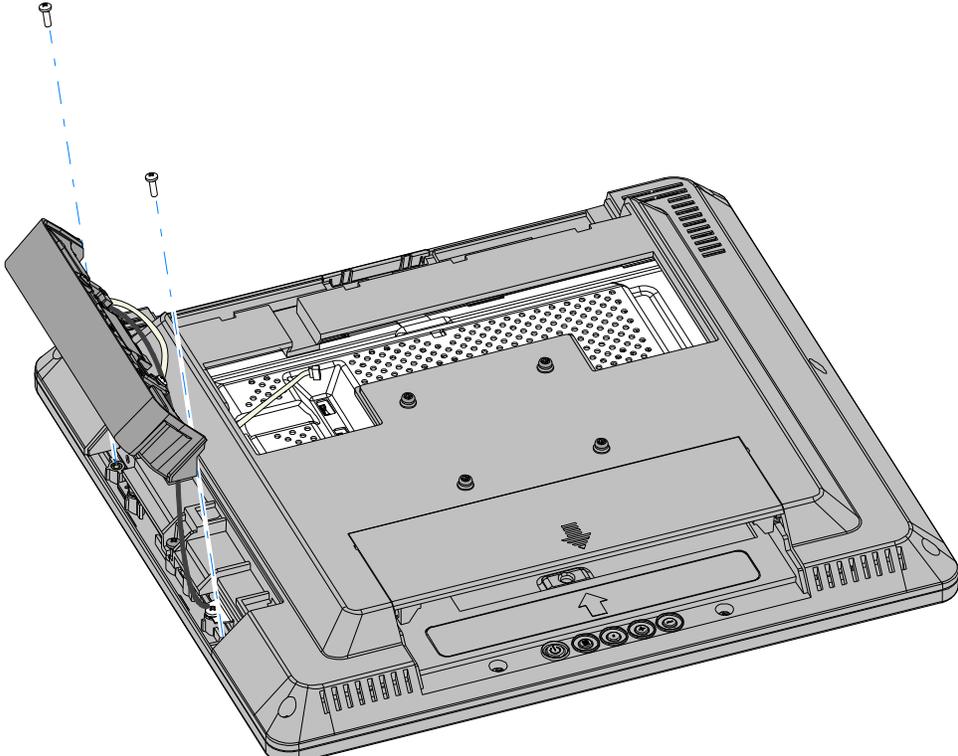
25825

2. Remove the MSR Cover (2 screws).



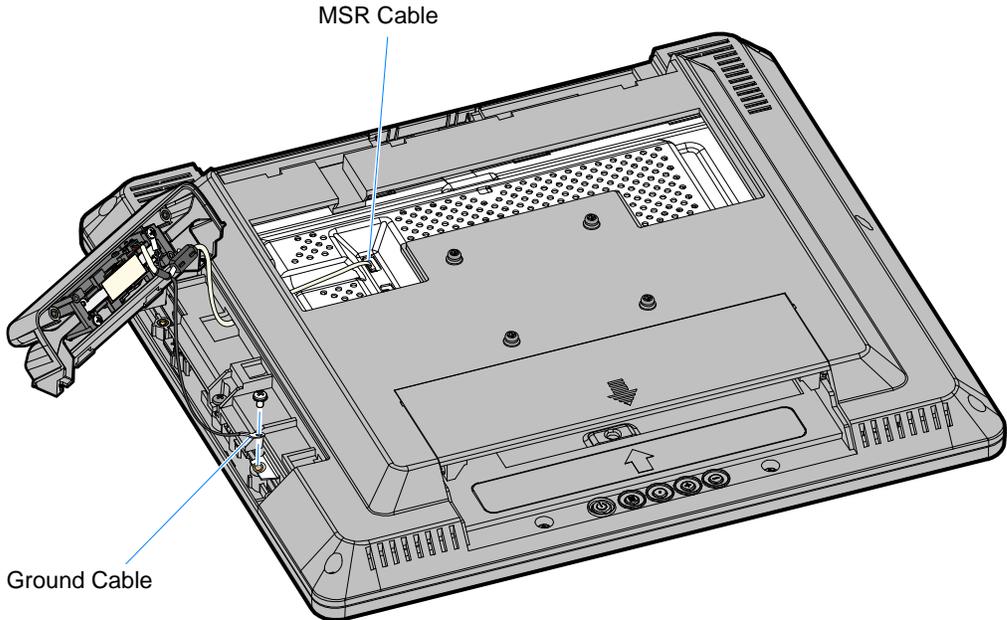
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3. Remove screws that secure the MSR (2 screws).



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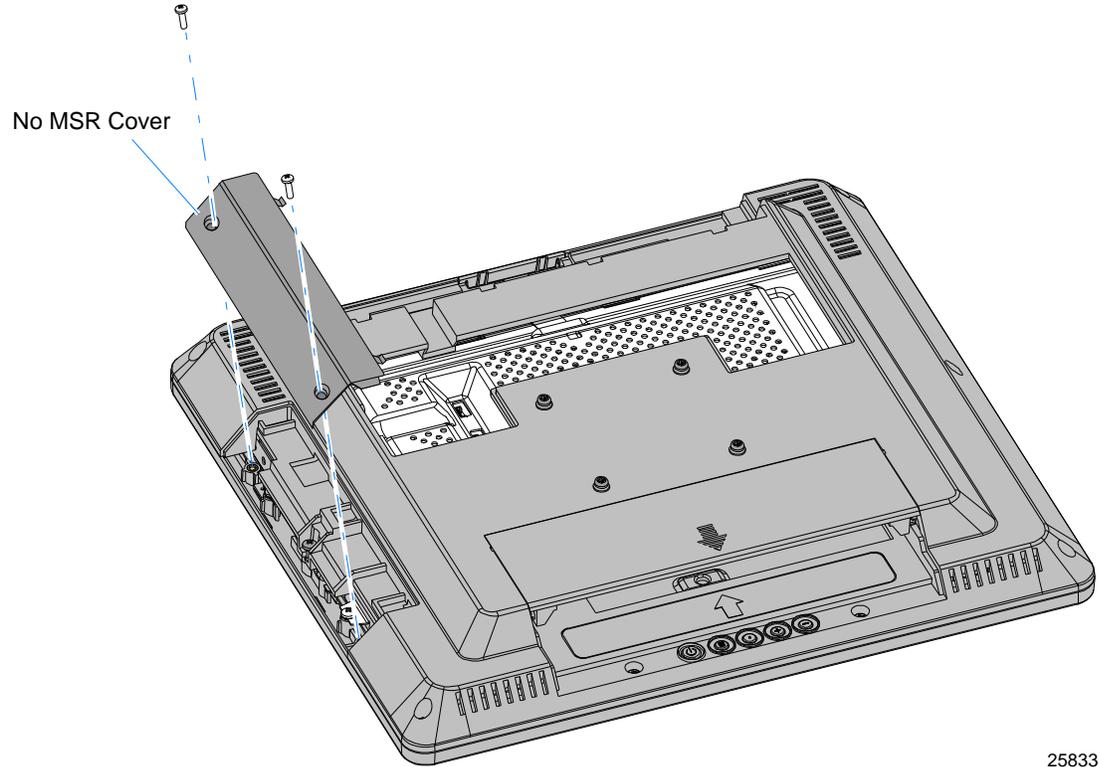
4. Disconnect the MSR Cable and the Ground Cable (screw) from the unit.



25829

No MSR

If your unit is not configured with an MSR it has a No MSR Cover to remove (2 captive screws).

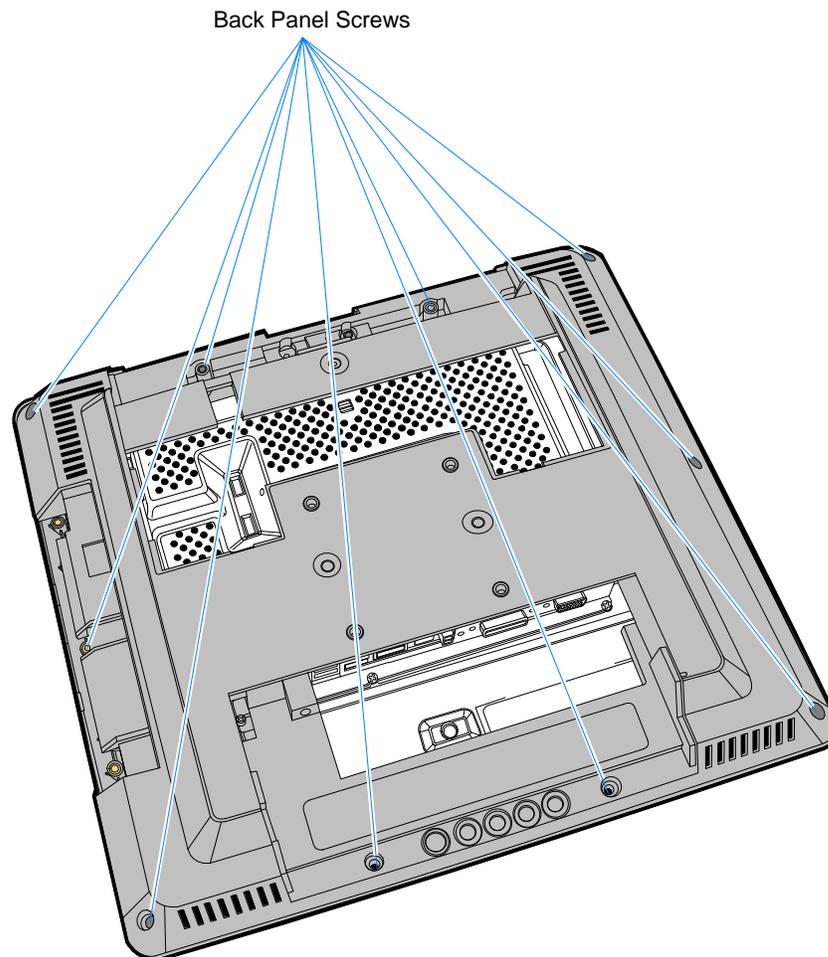


Disassembling the Display Head

Removing the Back Cover

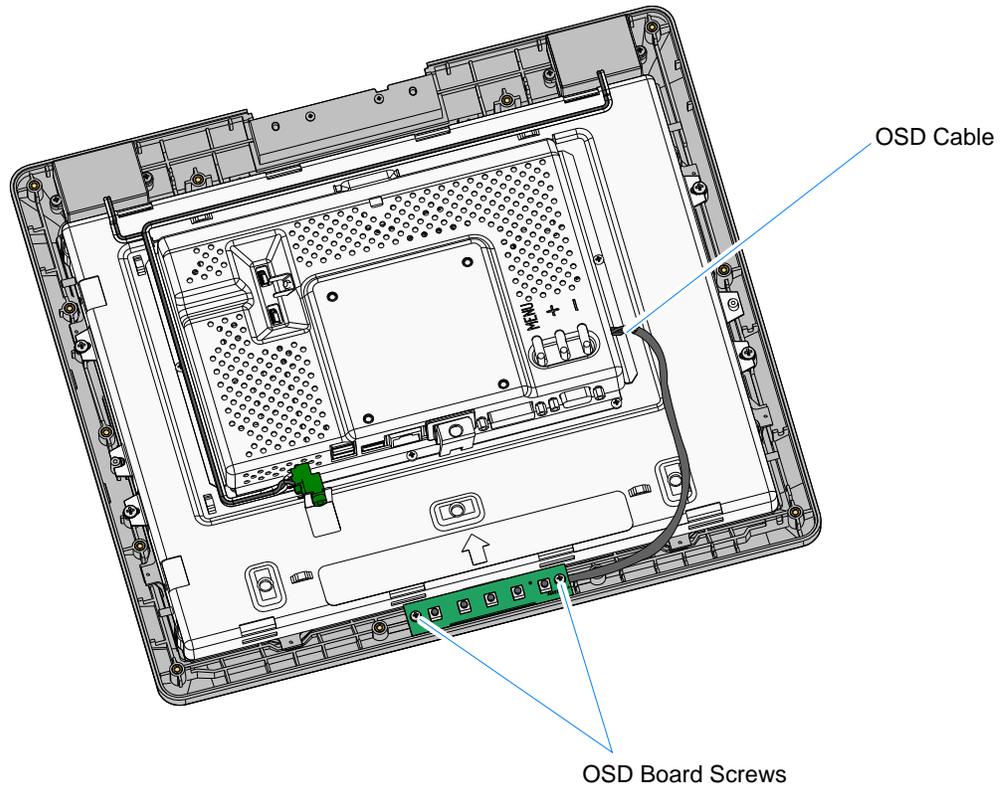
Note: This procedure assumes that the MSR and Mount have been removed.

1. Lay the monitor face down on a flat surface.
2. Remove the screws (10) that secure the Back Cover.



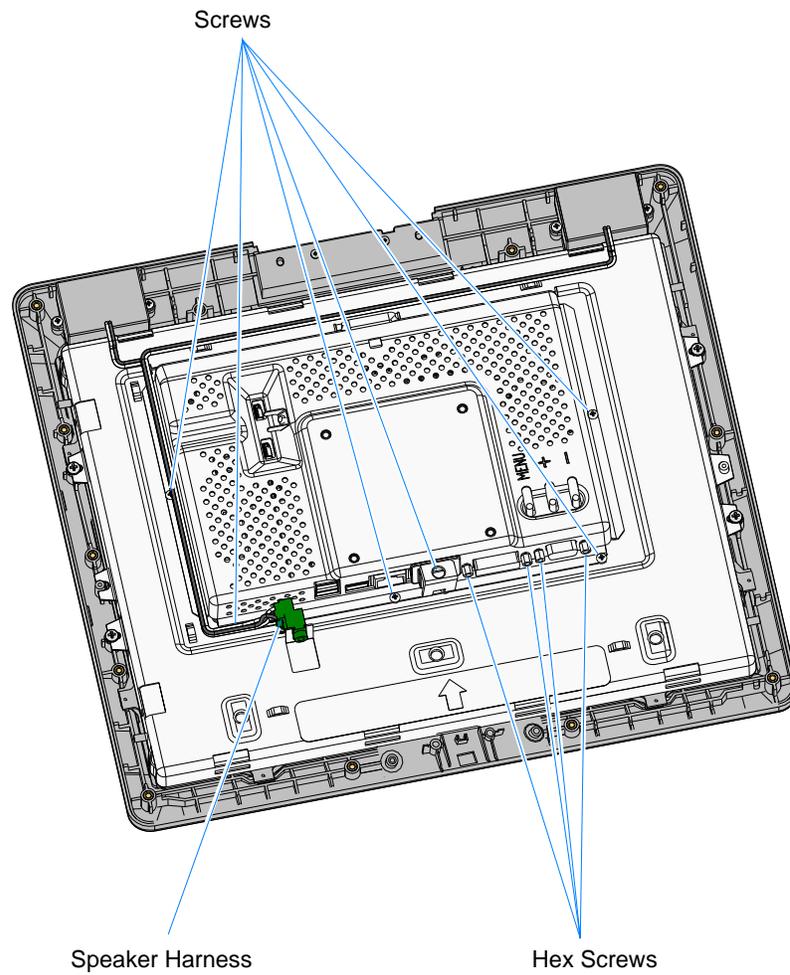
Removing the OSD Board

1. Disconnect the OSD Cable from the Controller Board.
2. Remove the screws (2) that secure the OSD Board.



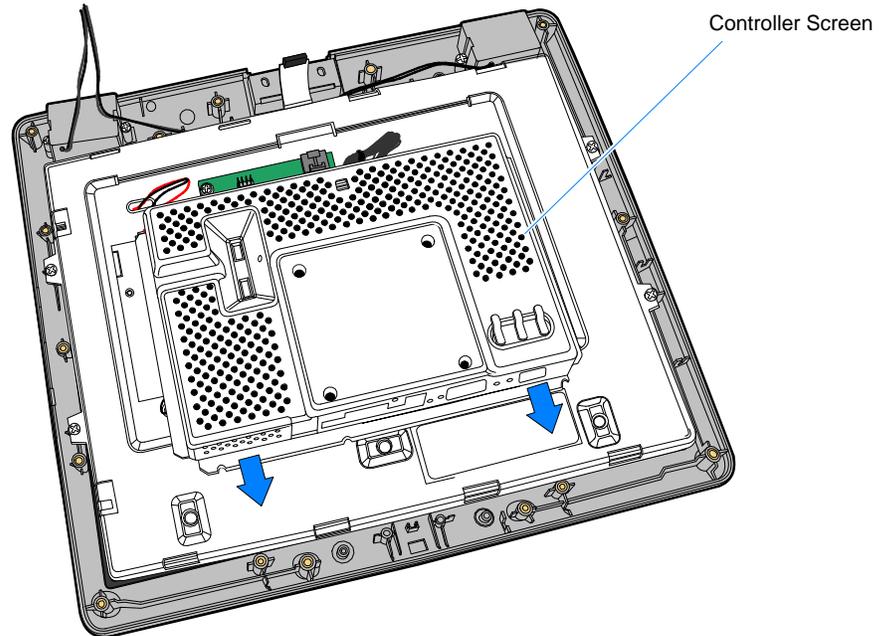
Removing the Controller Board

1. Remove the screws (6) from around the edge of the screen (one is located under a Connector Cover) and the 3/16 Hex screws (4) beside the video connectors.



2. Disconnect the Speaker Harness Connector.

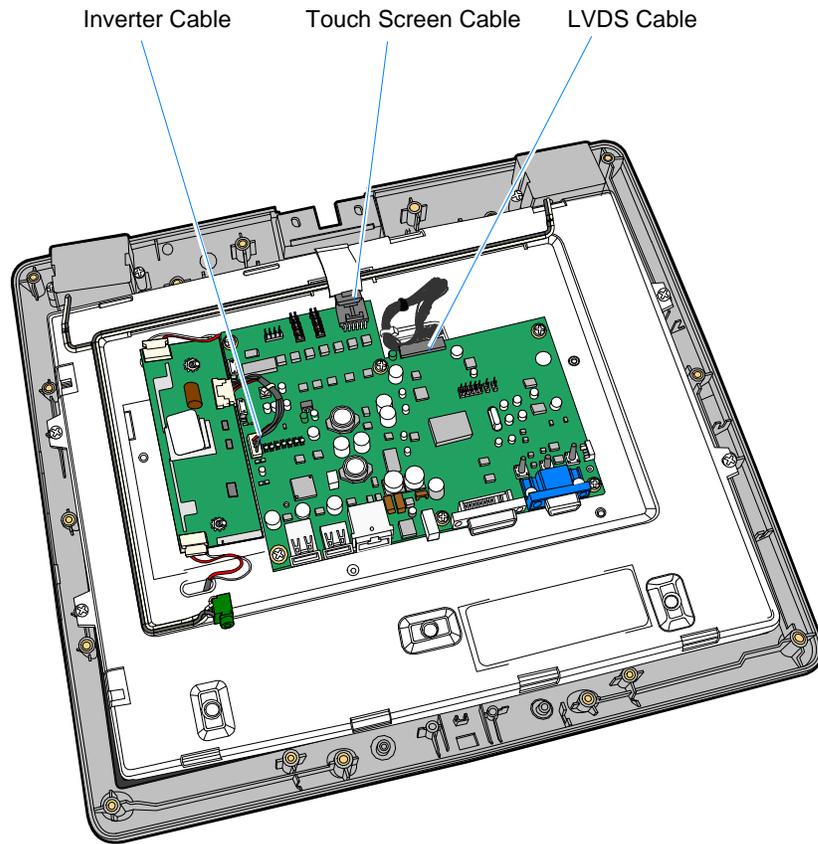
3. Slide the Controller Screen as shown to disengage the tabs from the chassis.



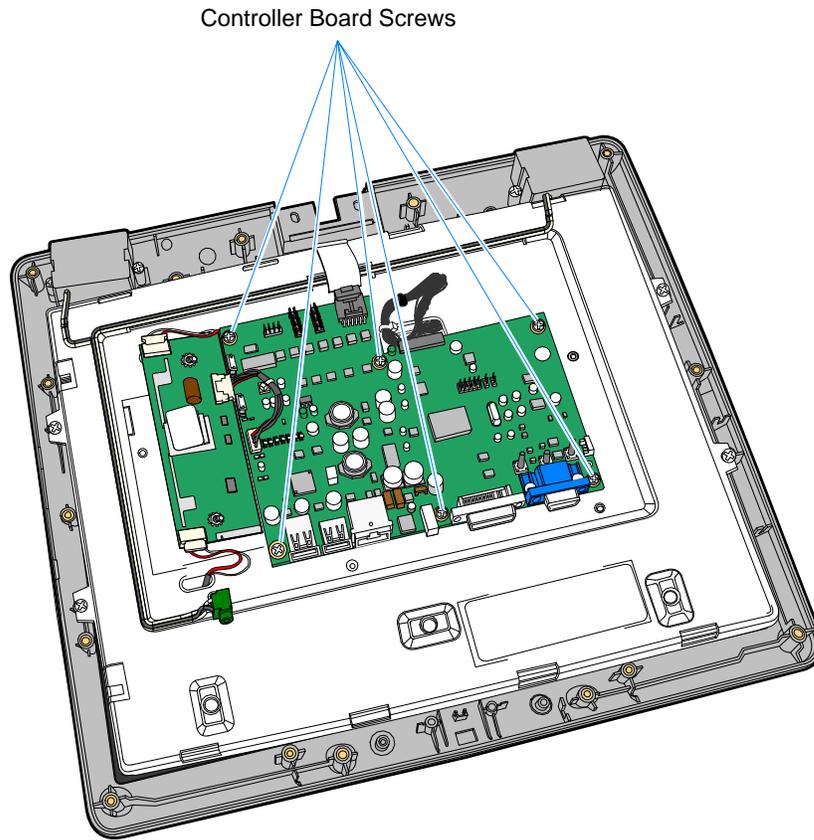
25449

Note: When replacing the Controller Screen make sure all cables are not pinched under the screen.

4. Carefully disconnect the Inverter Cable, Touch Screen Cable, and Inverter Cable from the Controller Board.



5. Remove the screws (6) that secure the Controller Board.

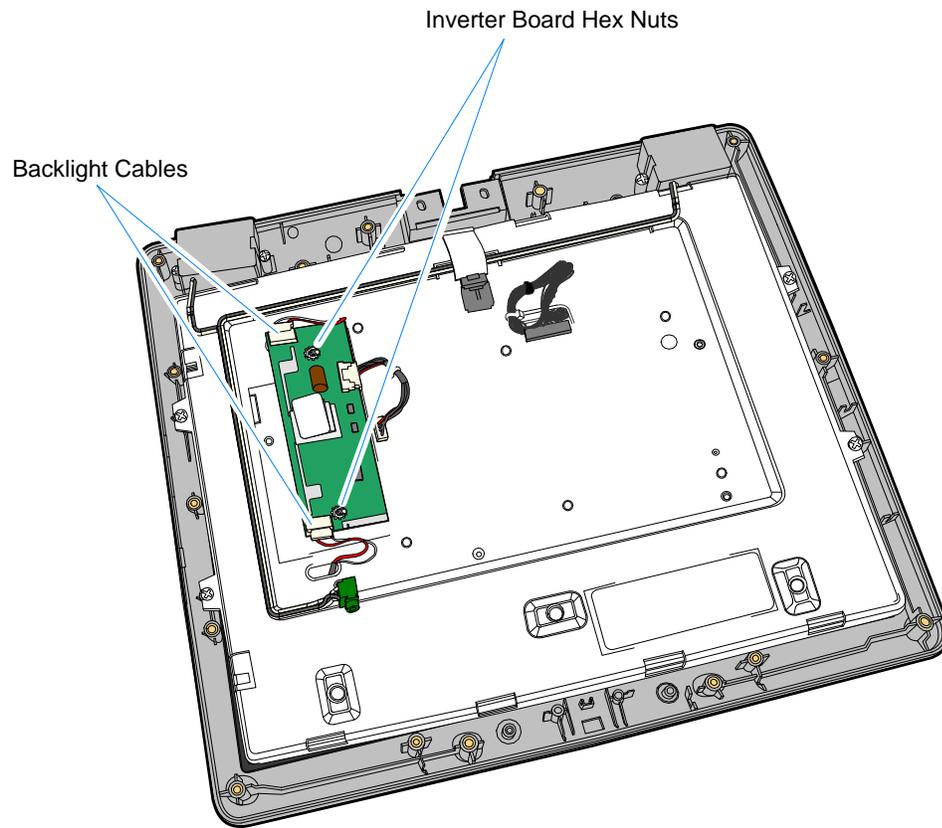


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Note: The *Calibration* procedure must be performed after reassembling the terminal.

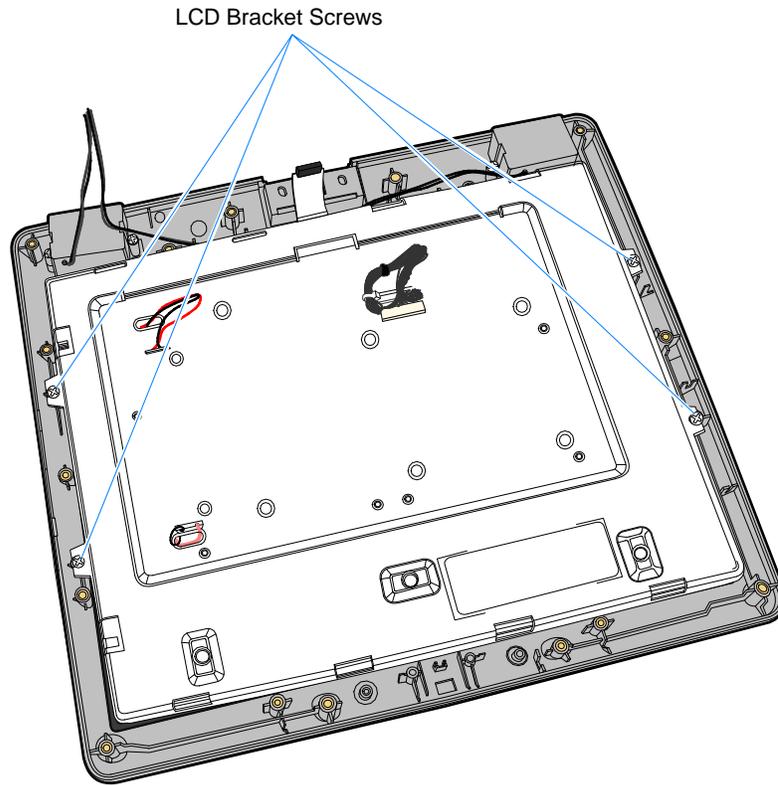
Removing the Inverter Board

1. Disconnect the Backlight Cables from the Inverter Board.
1. Remove the hex nuts (2) that secure the Inverter Board.

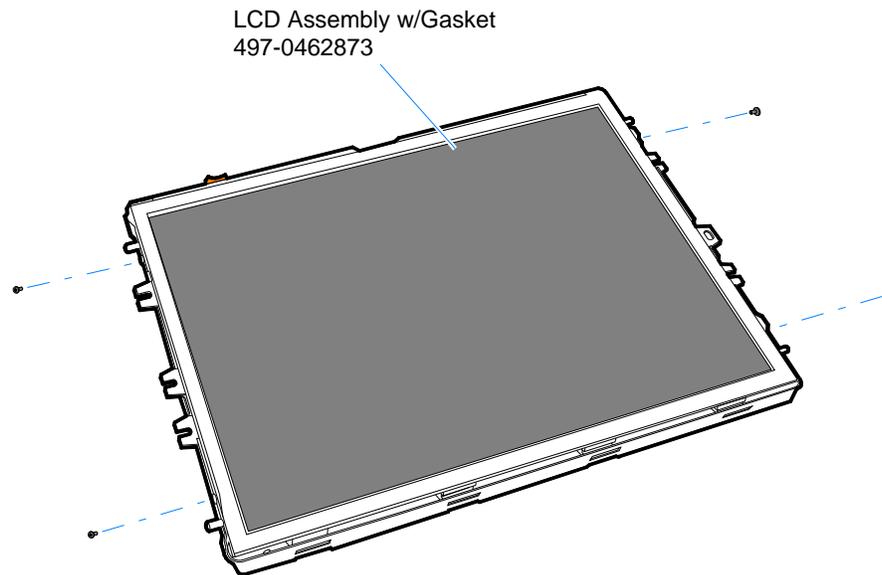


Removing the LCD

1. Remove the screws (7) that secure the LCD Bracket Assembly. Remove the assembly.



2. Remove the screws (4) that secure the LCD to the bracket.



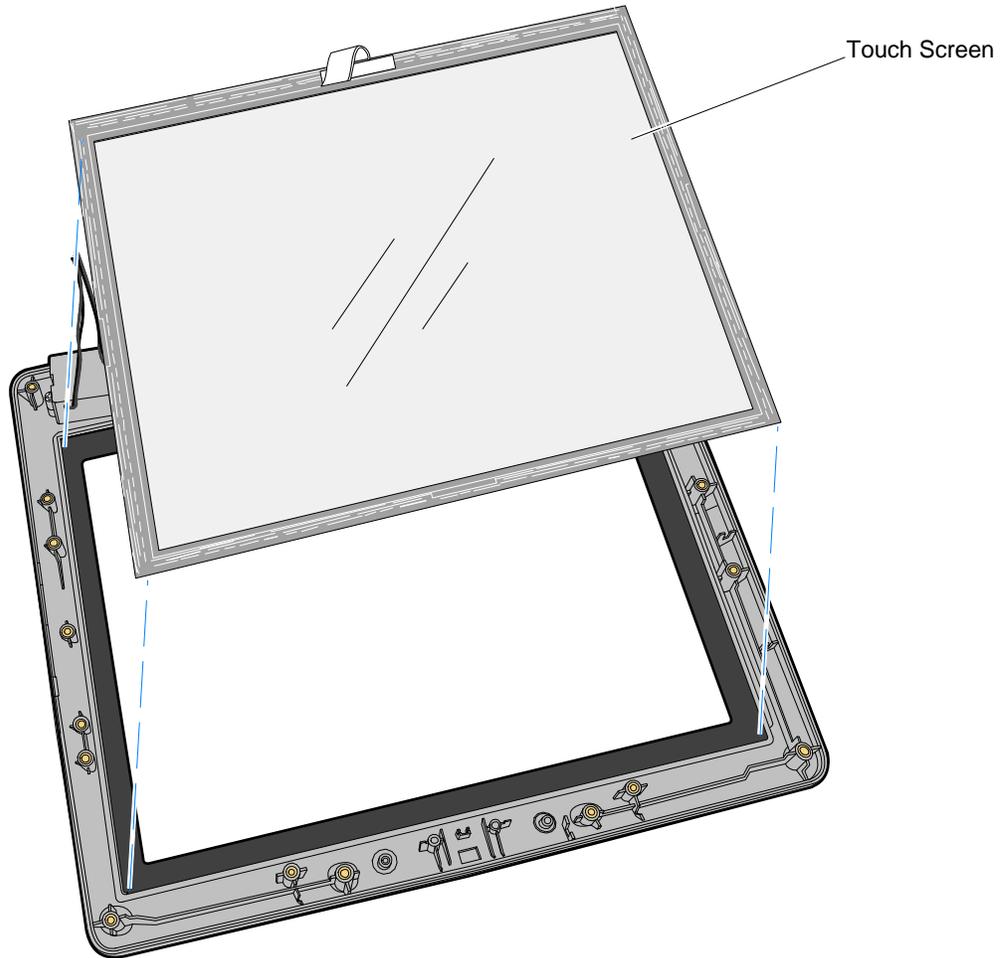
27262

3. Gently separate the LCD from the bracket and Touch Sensor.

Caution: Use care when handling the LCD Module and the Touch Sensor. These parts must be free of finger prints and foreign debris after reassembly.

Removing the Touch Screen

1. Note how the Touch Screen is oriented before removing it. Carefully remove the screen from the Bezel. The screen is not secured and only rests on a gasket.

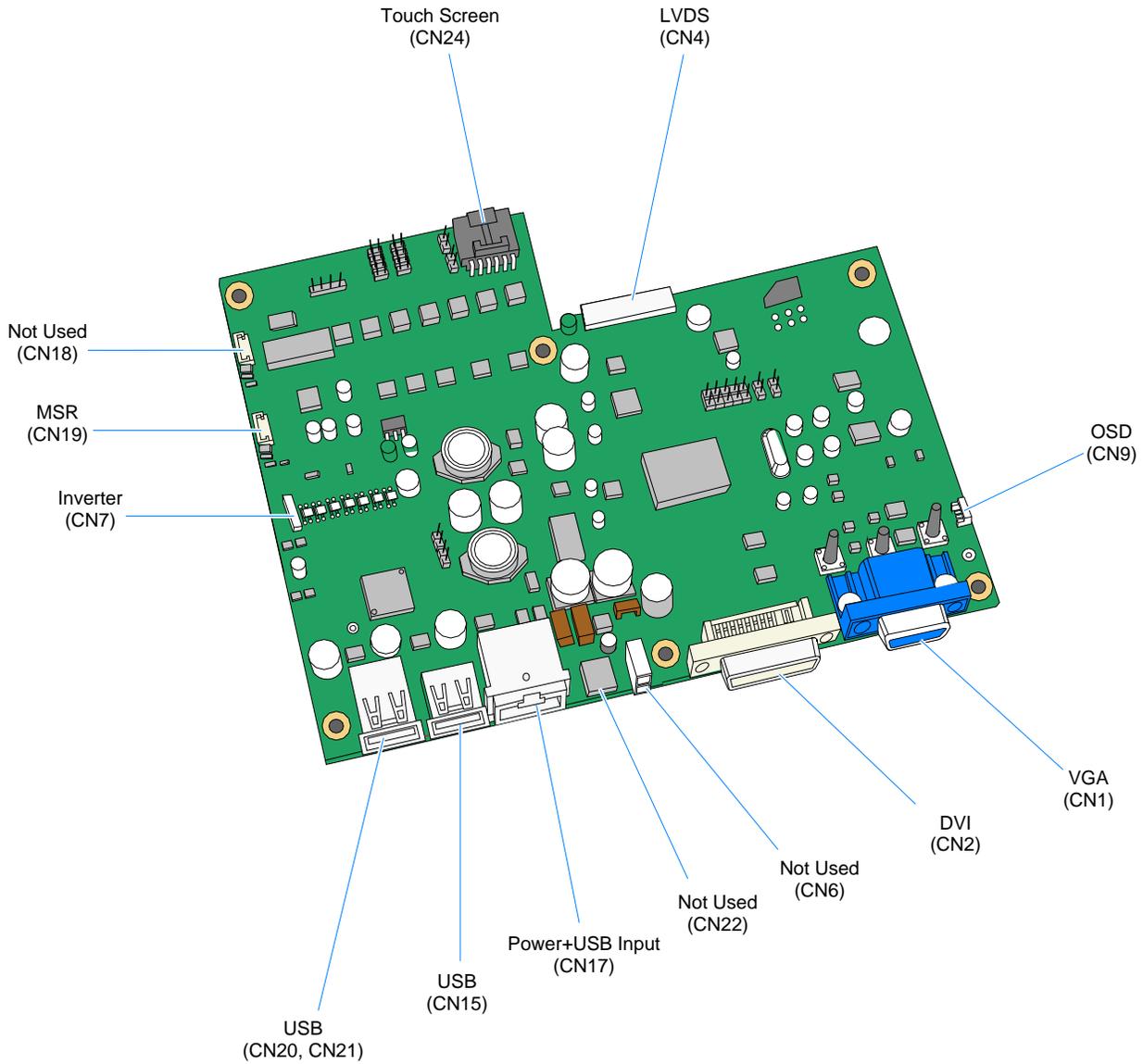


25841

Note: The *Calibration* procedure must be performed after reassembling the terminal.

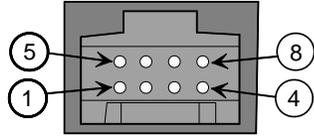
Chapter 6: Circuit Boards

Controller PCB



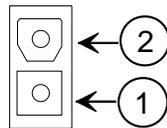
Connectors

Power + USB (CN17)



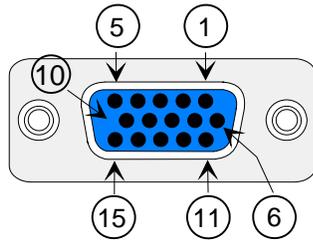
Pin	Function
1	Vbus
2	D-
3	D+
4	Ground
5	Ground
6	+12VDC
7	+12VDC
8	Ground

Power (CN6)



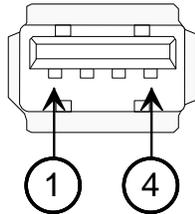
Pin	Function
1	12-24V DC
2	Ground

VGA Video (CN1)



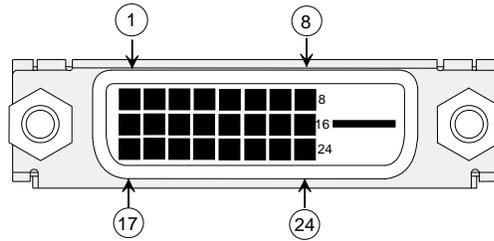
Pin	Function	Pin	Function
1	Red	9	+5V DDC
2	Green	10	Sync GND
3	Blue	11	Monitor ID bit 0
4	Monitor ID bit 2	12	SDA (for DDC)
5	VGA detect	13	H – Sync
6	Ground – R	14	V – Sync
7	Ground – G	15	SCL (for DDC)
8	Ground – B		

USB (CN20, CN21, CN15)



PIN	Signal	Color
1	VBUS	Red
2	D-	White
3	D+	Green
4	GND	Black

DVI (CN2)

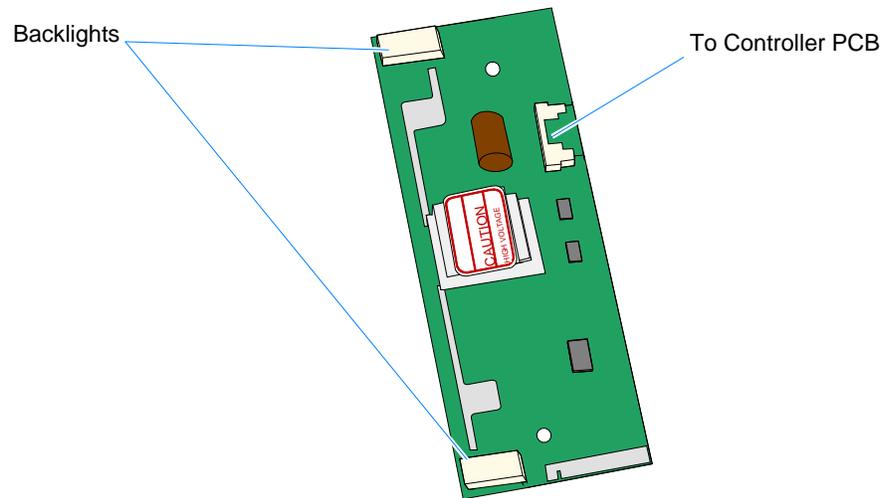


Pin	Function	Pin	Function
1	Data2-	13	Data3+
2	Data2+	14	+5V
3	Data2/4_SHLD	15	GND
4	Data4-	16	H_Plug_DET
5	Data4+	17	Data0-
6	DDC_CLK	18	Data0+
7	DDC_Data	19	Data0/5_SHLD
8	A_VSYNC	20	Data5-
9	Data1-	21	Data5+
10	Data1+	22	CLK_SHLD
11	Data1/3_SHLD	23	CLK+
12	Data3-	24	CLK-

LVDS (CN4)

Pin	Function	Pin	Function
1	+3.3Vcc	11	TXE2m
2	+3.3Vcc	12	TXE2p
3	GND	13	GND
4	GND	14	TXECKm
5	TXE0m	15	TXECKp
6	TXE0p	16	GND
7	GND	17	TXE3m
8	TXE1m	18	TXE3p
9	TXE1p	19	GND
10	GND	20	PNPWR

Inverter PCB



25848A

Connectors

Cable to Controller PCB (CN7)

Pin	Function
1	12V / 24V
2	5V
3	Bright
4	Light On
5	GND

PL1 / PL2 (Backlights)

Pin	Function
1	High V
2	NC
3	Low V

Chapter 6: Maintenance

Cabinet and Screen Cleaning Procedures

NCR touch screen terminals are designed for general retail applications. These products are resistant to spills and dust. However, these products are not spill proof or dust proof.

To maintain proper operation, users should prevent water, beverages, or cleaning agents from being introduced into the unit during storage, operation, or cleaning.

To clean your terminal, use the following procedures:

1. Disconnect the unit from the power outlet before cleaning.
2. Use a soft cloth dampened lightly with a mild non-abrasive soap & water solution or 70% Isopropyl Alcohol.
3. Gently wipe the subject area clean.
4. Wipe the damp areas dry. Make sure the glass and touch screen edges are completely dry before using the unit.
5. Avoid getting any liquids inside the unit. If liquid does get inside, have a qualified service technician check it before you power it on again.

Cleaners/Solvents to Use

Use the following cleaner/solvents to clean the unit.

- Mild Non-Abrasive Soap and Water Solution
or
- 70% Isopropyl Alcohol

Cleaners/Solvents to NOT Use

Do NOT use any of the following to clean the unit. They can damage the unit.

- Methyl Alcohol
- Degreasers
- Ethyl Alcohol
- Ammonia-based Cleaners such as glass cleaners (Windex)
- Abrasive Cleaners
- Vinegar Cleaners
- Any Strong Dissolvent
- Thinner
- Benzene
- Compressed Air.
- Solvents
- Bleach

Cleaning the Glass

1. Do not wipe the screen with a cloth or sponge that could scratch the surface.
2. Spray an ammonia-based glass cleaner on a soft cloth and gently wipe the glass screen clean.

Warning: Do not use any other types of cleaners such as vinegar, solvents, or degreasers. These can damage the screen.

1. Wipe the screen and edges dry.
2. Allow the glass and screen edges to completely dry before using the unit.

MSR Cleaning Procedures

MSR Cleaning Cards and MSR Treatment Cards may be purchased from NCR or KIC Products. For details, see <http://www.ncr-direct.com> or <http://www.kicproducts.com>.

MSR Cleaning and Treatment Cards

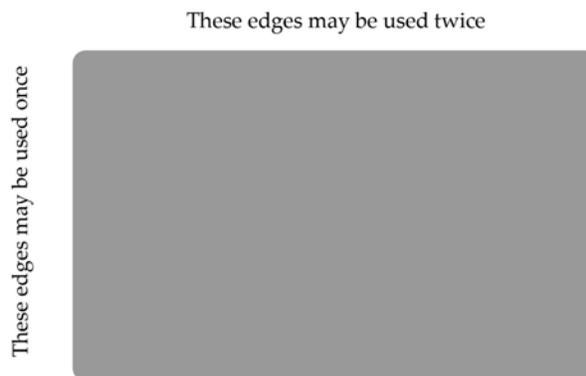
Part	Part Number	NCR Part Number
MSR Cleaning Card, Dry		998-0052929
MSR Cleaning Card, Wet	520522 (box of 50)	603-9014730
MSR Treatment Card	9436-2446 (box of 20)	497-0453056

MSR Treatment Card

The MSR Treatment Card is used to assist in protecting Magnetic Stripe Readers from Electrostatic Discharge (ESD), which can cause failures when swiping cards that have metallic hologram stripes.

Swipe the card through the MSR in a smooth motion. Only swipe it down ONCE and up ONCE. Allow the device to dry for 5 minutes before swiping any other cards.

Note: Each long side of the card may be used twice. Each short side of the card may be used only once. Thus, a single card can treat 6 MSR devices with one UP and one DOWN swipe per MSR device. These limits should not be exceeded due to the possibility of spreading contaminants from machine to machine and/or reducing ESD protection.



Note: If all six up/down swipes are not used on a fresh card it should be placed in a sealed (Ziploc) bag for future use.

Cleaning/Treatment Frequency

New MSR:

Prior to placing in operation, the MSR device should be swiped with the MSR Treatment Card.

Existing MSR:

An existing MSR should be cleaned using an MSR Cleaning Card before treating it with a MSR Treatment Card. For low use retail establishments, the cleaning and treatment procedures should be followed at least once per month. In areas of extremely high traffic (in excess of 500 swipes per day) or an operating environment that is high in contaminants, such as found in the food service industry, a weekly cleaning and treatment should be performed.

Chapter 7: Touch Screen Operation

Introduction

This chapter contains considerations for touch operations. Topics include:

- Touch Mode of operation
- Turning off the mouse pointer
- Terminal placement when there are multiple terminals in close proximity

Touch Mode of Operation

There are three modes of touch operation available. The desired mode is dependent on the type of application being used.

Normal Mode: This mode compares to normal mouse operation. The selection is made when the item on the screen is touched and activated when double-touched. Multiple items can be selected by touching and *dragging* your finger to another location, forming a rectangular box to encompass the items.

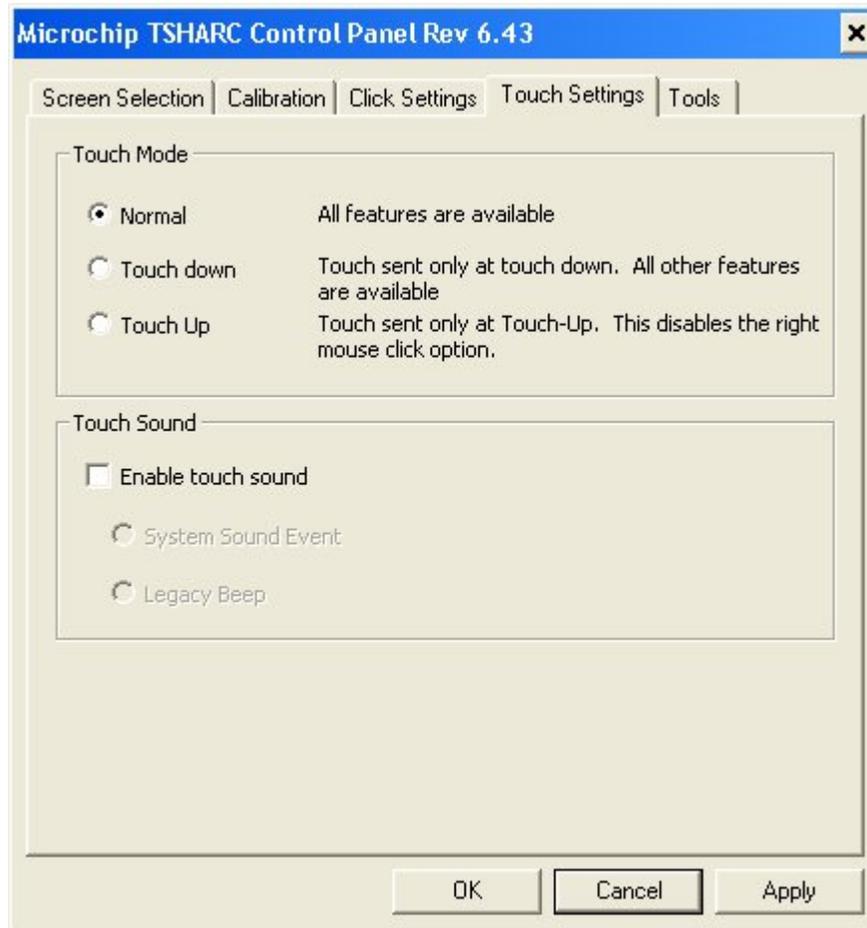
Touch Down Mode: The selection activates immediately when the screen is touched. This mode is popular in Convenience Store environments, where quick operation is demanding.

Touch Lift Off Mode: The selection activates when the finger is removed from the screen. This mode is preferred in environments where the operator prefers to *slide* their finger around on the screen until the item is located and then remove their finger to make the selection.

Changing the Touch Mode

The default touch mode setting is *Normal*. You can switch modes in the Windows Control Panel.

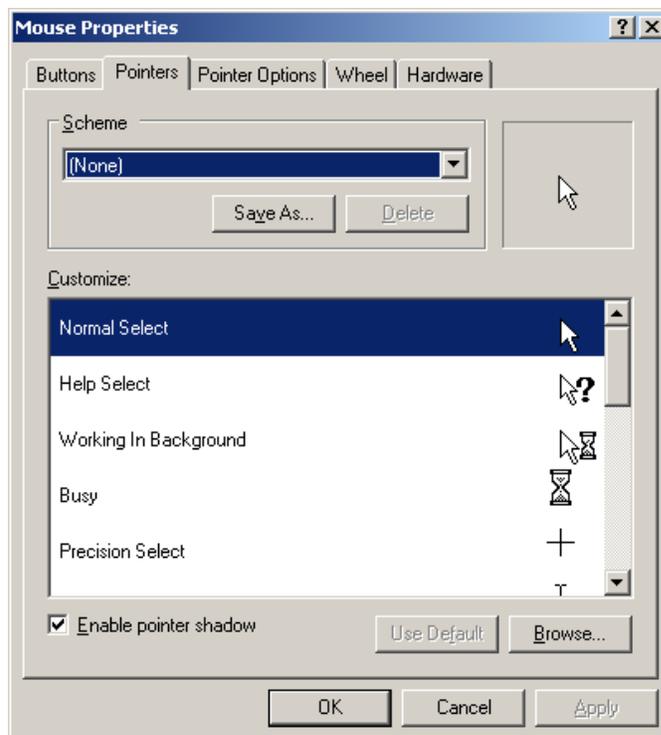
1. Select **Start > Programs > Microchip TSHARC Control Panel**.
2. Select the *Touch Settings* Tab.
3. Select the preferred *Touch Mode*.
4. Select **Apply**.



Turning Off the Mouse Pointer

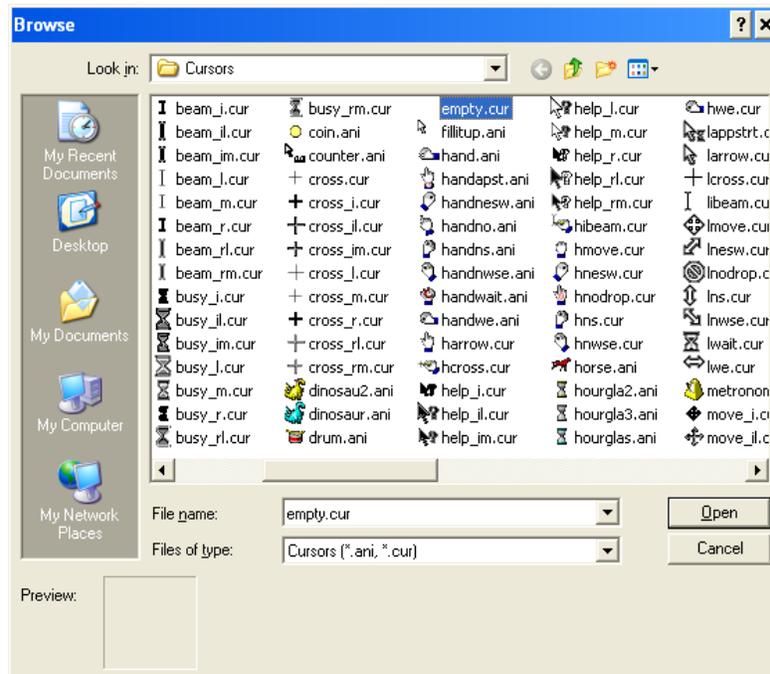
Certain applications prefer NOT to display a pointer during operations. Use the following procedure to turn the pointer off.

1. Download the file containing the mouse pointers from the NCR website.
2. <http://www.ncr.com>
 1. At this site, select the **Support** tab.
 2. Select **Drivers and Patches** → **Retail Support Files** → **NCR RealPOS and SelfServ Terminal and Operating Systems** → **NCR RealPOS 70XRT (7403)** → **Windows** → **Windows XP Pro, Windows EP Embedded, and WEPOS**
 3. Download *pointers.zip*.
3. Copy the ZIP file to the system.
4. Open the ZIP file and extract the *empty.cur* file to the folder that Windows uses to store all its cursor files:
C:\Windows\ursors.
5. Select **Start** → **Control Panel** → **Hardware and Sound** → **Mouse** → **Pointers** tab.



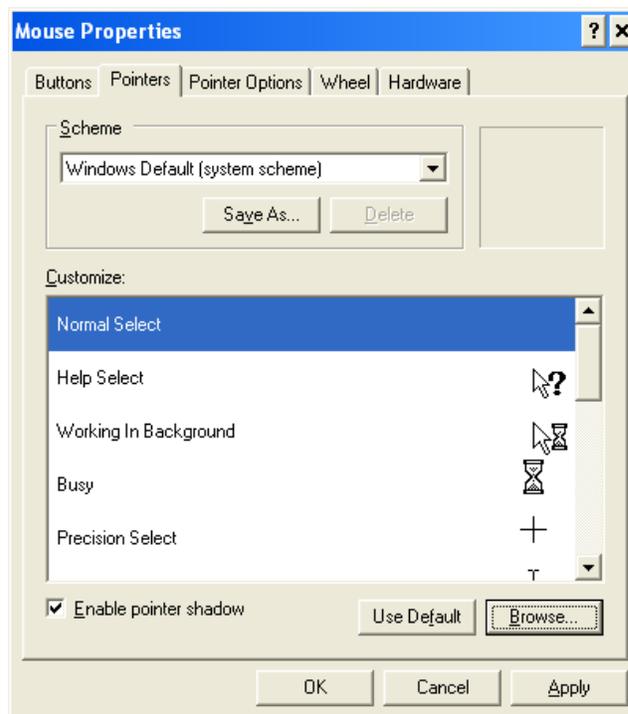
6. Select **Normal Select** from the *Customize* list.
7. Select **Browse**.

8. Navigate to the *empty.cur* file.



9. Select **Open** → **Apply**.

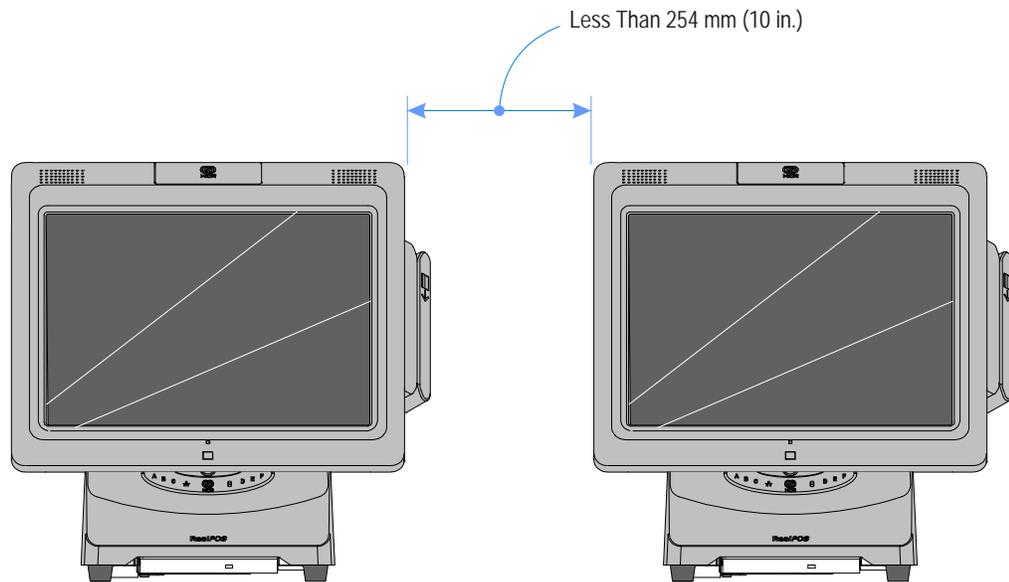
The pointer should now be changed to *none* in the Mouse Properties.



Note: To change back to the original settings select **Use Default** → **Apply** → **OK**.

Terminal Placement

If multiple touch terminals are installed within 254 mm (10 in.) of each other it may be necessary to change the touch operating frequency on one or more of the units to prevent interference when they are operated simultaneously.



Please contact *NCR Services* for software tools to accomplish this change.

Appendix A: Interconnection Diagram

