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Revision Record

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<th>Issue</th>
<th>Date</th>
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<tr>
<td>A</td>
<td>Feb 2007</td>
<td>First issue</td>
</tr>
<tr>
<td>B</td>
<td>July 2007</td>
<td>Added Calibration Chapter</td>
</tr>
<tr>
<td>C</td>
<td>Jan 2008</td>
<td>Added MSR Driver Chapter</td>
</tr>
<tr>
<td>D</td>
<td>Mar 2009</td>
<td>Added Site Preparation Chapter; updated Hardware Installation Chapter</td>
</tr>
</tbody>
</table>

Audience

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

**Note:** This document is NCR proprietary information and is not to be disclosed or reproduced without consent.

Safety Requirements

The NCR RealPOS 5966 conforms to all applicable legal requirements. To view the compliance statements see the *NCR RealPOS Peripherals Safety and Regulatory Statements* (B005-0000-1701).
Chapter 1: Overview

NCR’s RealPOS 5966 value touch display is designed and developed to provide a cost-effective touch solution for retailers who want to maximize store productivity and extend the life span of the touch display. The NCR 5966 is a 15-inch low cost XGA (1024x768) Liquid Crystal Display with a 5-wire resistive touch screen for operator input.

It has the following features:

- 15’ LCD XGA (1024x768) Native Resolution, 160 nit Brightness
- Dual Bulb TFT LCD (also supports VGA, SVGA Resolutions)
- 5-Wire Resistive Touch, USB Interface
- Video - VGA, Standard 15-Pin Female
- Integrated Stereo Speakers
- Power Supplied via AC Line Input or 12 DC Power Brick
- VGA, Touch, Speaker and Power Cables
- Remote Table Top Mount
- Optional MSR- Field Installable, USB Interface
- VESA standard 75mm mounting pattern on the back of the enclosure
- Uses NCR’s industry standard OPOS and JavaPOS drivers, supporting most applications and standard NCR supported retail Windows and Linux operating systems.

Model Numbers

<table>
<thead>
<tr>
<th>Major Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5966-1011</td>
<td>15” Value Resistive Touch Monitor, 350 nit, Remote Mount, Cables (G11)</td>
</tr>
<tr>
<td>5966-1012</td>
<td>15” Value Resistive Touch Monitor, 350 nit, Remote Mount, Cables (CG1)</td>
</tr>
</tbody>
</table>
Product Components

The 5966 is shipped with a Standard Table Top Mount. This mount can be replaced with an NCR 5964-K030 (Beige) or NCR 5964-K031 (Charcoal) Table Top Mount if desired.

**Note:** When using the alternate mount the Vesa Adapter Plate is required (included with the unit).

Also included with the unit:

- VGA cable for video
- USB cable for data
- Power Brick is included for when USB power is not available on the host terminal.

**Note:** The USB Power Cable is ordered separately.

- Audio cable (optional) - Connects to the Audio Connector on the 5966 and the Audio Out port on the host computer.
Chapter 2: Site Preparation

Electrical Requirements

5966 Electrical Requirements

The monitor's power cord plugs into a three-wire, single-phase, 120 or 240 VAC receptacle on the monitor. The available power cords are described in the System Cables section.

<table>
<thead>
<tr>
<th></th>
<th>120 volt</th>
<th>240 volt</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage Ranges</strong></td>
<td>100 - 127 VAC</td>
<td>200 - 240 VAC</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td><strong>Current (A) (Max.)</strong></td>
<td>0.9</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Store AC Wiring Requirements

The customer must provide suitable AC power for the monitor. A dedicated unswitched power line dedicated to the NCR equipment installation is recommended. Refer to the NCR Workstation and Peripherals AC Wiring Guide (BSTO-2115-53) for store AC wiring requirements. The AC outlet must be installed near the monitor and easily accessible to the operator.
Environmental Requirements

Barometric Pressure

The terminal operates within the following barometric pressure conditions:

- Maximum operating altitude: 2,750 m (9,843 ft.)
- Operating range of pressure: 105 to 72.4 kPa (15.2 to 10.5 lb./in.)

Temperature

The terminal operates over the temperature ranges shown below. Continuous operation must be avoided at or near the indicated temperature extremes or in locations where the temperature changes beyond the restrictions.

<table>
<thead>
<tr>
<th>Temperature Parameter</th>
<th>Restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating</td>
<td>0°C to 40°C (32°F to 104°F), dry bulb</td>
</tr>
<tr>
<td>Storage</td>
<td>-20°C to 60°C (-4°F to 140°F), three months</td>
</tr>
</tbody>
</table>

Humidity

The terminal operates within the humidity ranges shown below. Continuous operation must be avoided at or near the indicated humidity extremes or in locations where the humidity changes beyond the restrictions. Never expose the terminal to condensation.

<table>
<thead>
<tr>
<th>Humidity Type</th>
<th>Restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative</td>
<td>15% to 85%</td>
</tr>
<tr>
<td>Storage</td>
<td>15% to 85%</td>
</tr>
<tr>
<td>Shipping</td>
<td>15% to 85%</td>
</tr>
</tbody>
</table>

Weight

5.4 kg (11.9 lbs.)
Dimensions

5966 with Table Top Mount

5966 with 5964-K032 Table Top Mount
System Cables

VGA Cable

[Diagram showing VGA cable connections]

12.1-Inch LCD Aux Power Cable

[Diagram showing LCD aux power cable connections]

Power Cords

[Diagram showing power cords connection]

The following power cables (not shown) also have an IEC connection of 45 mm:

- 1416-C320-0030  006-8601011 - SEV
- 1416-C321-0030  006-8601012 - U.K.
- 1416-C322-0030  006-8601019 - Australia
- 1416-C323-0030  006-8601010 - International
- 1416-C391-0030  006-8605488 - China
- 1416-C393-0030  006-8601001 - Japan Twist-Lock

[Diagram showing power cords and terminal/CRT connection]
Chapter 3: Hardware Installation

Installing the 5966

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 5966 peripheral cable connectors are located on the bottom of the assembly.
Mounting Options

The 5966 is shipped with a unique 5966 table top mount. However it has a VESA standard 75mm mounting pattern on the back of the enclosure, which supports the following NCR mounts.

- Integration Tray Mount, Beige (5964-K022)
- Integration Tray Mount, Charcoal (5964-K023)
- Table Top Mount, Beige (5964-K030)
- Table Top Mount, Charcoal (5964-K031)
- Checkstand Mount, Beige (5964-K038)
- Checkstand Mount, Charcoal (5964-K039)

The additional mounts are sold as kits and are ordered separately.

**Note:** There is a Vesa Adapter Plate included with the 5966 that must be used with the NCR 5964-K030/K031 mount.

Cable Routing

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

- 5964-K022 (Beige)
- 5964-K023 (Charcoal)
Standard Remote Table Top Mount (5964-K030/K031)

5966 w/Propietary Mount

5966 w/5964-K030/K031 Mount
- 5964-K030 (Beige)
- 5964-K031 (Charcoal)
Connecting to a POS

The following illustrations show the cable connections for the 5966 and a host terminal. There are two cables required.

- VGA cable for video
- USB cable for data
- Powered Universal Serial Bus (USB) for power
  
  **Note:** Optional Power Brick is included for when USB power is not available on the host terminal.

- Audio cable (optional) - Connects to the Audio Connector on the 5966 and the Audio Out port on the host computer.

**Video Cable Connections**

Connect the VGA Cable to the *VGA* connectors on both the 5966 Touch LCD and host terminal.

![Diagram of cable connections](image-url)
Data Cable Connections

Connect the included USB Cable to the *USB* connector on the 5966 and to a *USB* connector on the host terminal.
Power Cable Connections

There are three methods that can be used to supply power to the 5966.

- Powered USB Cable from the host terminal
- DC Power Brick (Included with the 5966)
- AC – A U.S. Power Cord is supplied with the 5966. International cords must be ordered separately (See the System Cables section on Chapter 1).
Installing a 5964-K030/K031 Table Top Mount

The 5964-K030/K031 Table Top Mount can be used with the 5966 Display Head in place of the Standard Mount shipped with the unit. There are two versions:

- 5964-K030 (Beige)
- 5964-K031 (Charcoal)

Installation Procedures

1. Lay the 5966 face down on a flat surface.
2. Remove the Standard Mount (4 screws) from the display.

   **Note:** Discard these screws. The 5964 mount requires longer screws.
3. Place the Vesa Adapter Plate in the recess in the back of the display.
4. Install the 5964 mount using the screws included with the mount.
Display Controls

Power Indicator

The LED is green color while in the normal ON state and orange while in the Power Save mode.
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.

Menu Button
Used to enter the OSD menu. This button is also used to return to the previous menu. The changed data is not saved in memory.

Select Button
Used to confirm the current selection. It also used for go back to the previous menu. The changed data is saved in memory.

Navigate Up
Used to scroll up in sub menus or to increase the value of the selected item. Pressing this button when a menu is not active adjusts the Brightness.

Navigate Down
Used to scroll down in sub menus or to decrease the value of the selected item. When the OSD menu is not active this button is a shortcut key for the Auto Config function.

Power Button
Used to turn the monitor on/off.
Screen Adjustment Operation Procedure

1) Entering the screen adjustment
   The setting switches are normally at stand-by. Push the [1] button once to display the main menu of the screen adjustment. The adjustable items will be displayed in the main menu.

2) Entering the settings
   Use the Adjust ▲ and Adjust ▼ buttons to select the desired setting icon and push the SELECT button to enter sub-menu.

3) Change the settings
   After the sub-menu appears, use the Adjust ▲ and Adjust ▼ buttons to change the setting values.

4) Save
   After finishing the adjustment, push the [2] button to memorize the setting.

5) Return & Exit the main menu
   To go back to the previous menu, push the MEMU button.
Chapter 4: **OSD Adjustment**

**Main Menu**

The On Screen Display (OSD) main menu is displayed when the [I] key is pressed. The menu is a combination of graphics and text. The column inside the OSD menu shows input image information. The column beneath the menu indicates the item selected.

The ▲ and ▼ keys are used to scroll through items within the menu. The selected item is highlighted as you scroll. The [2] key is used to activate the highlighted item.
OSD Adjusting and Controls

 يونוט שיאטסן פודר

BRIGHTNESS
Setup the brightness of the panel.

CONTRAST
The Contrast menu item is used to adjust image contrast.

AUTO CONFIG
There are two items: AUTO ADJUST and AUTO COLOR. Use the Adjust ▲ and ▼ key to scroll up and down in menu, then press the [2] key to start this function. If the MENU key is pressed, the main menu is re-displayed and nothing is changed.
AUTO ADJUST: Used to perform automatic configuration of the phase, clock, vertical, and horizontal positioning.
AUTO COLOR: It is used to adjust the gain and offset of the Red, Green and Blue channels on the ADC automatically.

H-POSITION
H-Position is used to adjust the horizontal image position manually. A slider with current value is displayed.

V-POSITION
V-Position is used to adjust the vertical image position manually. A slider with current value is displayed.

CLOCK
Reduce vertical stripes in the screen image.

PHASE
Reduce horizontal stripes in the screen image.

SHARPNESS
This can adjust the video quality to be sharp or blur (special for text mode).

INFORMATION
The “INFORMATION” menu provides the user with detailed information regarding the current input format and version (include resolution, horizontal/vertical frequency, and firmware version).
COLOR

Configure the image color. There are three items: 9300K, 6500K, USER MODE.

9300K: The item “9300K” is used to default 9300K color temperature.

6500K: The item “6500K” is used to default 6500K color temperature.

USER MODE

RGB ADJUST:

- RED: The item “RED” is used to adjust the gain of red channel in ADC.
- GREEN: The item “GREEN” is used to adjust the gain of green channel in ADC.
- BLUE: The item “BLUE” is used to adjust the gain of blue channel in ADC.

OSD MENU

There are five items: LANGUAGE, OSD H POSITION, OSD V POSITION, OSD TIME OUT and OSD BLENDING.

- OSD H POSITION: The item "OSD H Position” is used to setup the OSD menu H position.
- OSD V POSITION: The item "OSD V Position” is used to setup the OSD menu H position.
- OSD BLENDING: To adjust the blending of the OSD MENU.
- OSD TIME OUT: “OSD Time out” is used to set the timeout of the OSD menu. There are three options for the automatic timeout: 20, 40 and 60 seconds.

MISC MENU

There are two items: audio and reset.

- AUDIO: This is used to adjust the sound volume.
- RESET: Press “Reset” to return the monitor to its factory default settings.
Installing and Calibrating the Touch Screen

The Touch Screen Calibration Utility is included when you install the TouchKit Driver. This driver can be downloaded from the NCR Web Site.

http://www.ncr.com

1. At this site, select Support → Drivers and Patches → Retail Support Files → Retail Platform Software → 5966.

2. Download the Touch Driver: 5966_touch_driver_4.3.6.2817 (or later).

Installing the Driver and Utility

1. Extract the driver installation files into to a working directory on the host terminal.

2. Locate the folder containing the operating system you are using and run the setup program. The name of the setup program varies from OS to OS. Follow the instructions to install the software
4-Point Calibration Procedure

**Note:** The 9-Point Linearization procedure should be performed first if either the Touch Screen Sensor or the Controller Board is replaced.

1. From the Windows Start button, select **Settings → Programs → TouchKit → Configure Utility**
2. From the TouchKit: USB Controller screen, select the **Tools** tab.
3. Select **4-Points Calibration** to begin calibration.
4. Place a stylus in the center of the flashing target in the lower left-hand corner of the screen and hold it until it stops blinking.

**Note:** For best results, a stylus should be used to calibrate the screen rather than your finger. Not all operators use the same touching techniques and can result in poor calibration on terminals that have multiple operators.

5. Repeat this procedure for the other three targets

6. Select **OK** to continue.

7. Test the calibration by moving the stylus around on the screen and verifying that the cursor follows it. Also, touch all 4 Corners and verify that the cursor moves deeply into the corners.

8. If you are satisfied with the calibration results select **OK** to exit the TouchKit Utility.
9-Point Linearization Procedure

The 9-Point Linearization procedure should be performed if either the Touch Screen Sensor or the Controller Board is replaced.

**Note:** On new terminals the display is pre-linearized from the factory and performing the linearization procedure can result in loss of the factory settings and reduced performance.

1. Select the **Linearization** button to begin the linearization process.

![Linearization Curve](image)
2. Place a stylus in the center of the flashing target in the lower left-hand corner of the screen and hold it until it stops blinking.

**Note:** As with the Calibration Procedure for best results a stylus should be used rather than your finger.

3. Repeat this procedure for the other eight targets.
4. Select **OK** to continue.
5. Perform the 4-Point Calibration procedure.
Chapter 6: Touch Screen Calibration - Linux

Calibration Procedures

The Touch Screen Calibration Utility is included in the NCR Linux Terminal Configurator, which gets installed when you install the NLPOS Linux software.

For more information about the Terminal Configurator, see the NCR Linux Terminal Configurator User's Guide, B005-0000-1743.

1. Start the Terminal Configurator Utility. At the prompt enter: `TerminalConfig`

2. At the Main Menu, select: 2) Video.
3. Select: **1) Adapter**.

![Image showing NCR Terminal Configurator with Adapter selection]

4. Select: **9) Calibrate Touch**.

![Image showing NCR Terminal Configurator with Calibrate Touch selection]
5. Press any key to continue.
4-Point Calibration Procedure

**Note:** The 25-Point Linearization procedure should be performed first if either the Touch Screen Sensor or the Controller Board is replaced.

1. From the TouchKit window, select the *Tool* tab.

![TouchKit Window](image.png)
2. Select **4-Pts Cal** to start the calibration.
3. Place a stylus in the center of the flashing target in the lower left-hand corner of the screen and hold it until it beeps.

**Note:** For best results, a stylus should be used to calibrate the screen rather than your finger. Not all operators use the same touching techniques and can result in poor calibration on terminals that have multiple operators.

4. Repeat this procedure for the other three targets.

5. Select **OK** to continue.

6. Test the calibration by moving the stylus around on the screen and verifying that the cursor follows it. Also, touch all 4 Corners and verify that the cursor moves deeply into the corners.

7. If you are satisfied with the calibration results select **OK** to exit the TouchKit Utility.
8. Select **OK** to continue.
25-Point Linearization Procedure

The 25-Point Linearization procedure should be performed if either the Touch Screen Sensor or the Controller Board is replaced.

**Note:** On new terminals the display is pre-linearized from the factory and performing the linearization procedure can result in loss of the factory settings and reduced performance.  

1. Select the **25 Pts Linz** button to begin the linearization process.
2. Place a stylus in the center of the flashing target in the lower left-hand corner of the screen and hold it until it beeps.

**Note:** As with the Calibration Procedure for best results a stylus should be used rather than your finger.

3. Repeat this procedure for the other 24 targets.

4. Select **OK** to continue.

5. Perform the 4-Point Calibration procedure.
Chapter 7: Auto Config Adjustment

How to Use the Auto Config Adjustment

This function can tune the parameters of PHASE, CLOCK, H-POSITION, and V-POSITION.

Suggesting Adjustment Steps:
1. Enter the “Windows” Shut-down frame.
   
   **Note:** The Wallpaper color CAN NOT be black.

2. Inactive OSD menu, then press knob ▼ key. The Picture will auto-adjust by itself. After 4 seconds, you can exit OSD and Shut-down frame.

Notes:
- If you do not like the effect of the AUTO CONFIG adjustment, you can adjust the PHASE and CLOCK items using the OSD.
- The AUTO CONFIG adjustment can be used in Windows except with a black background frame. The best effect is in the SHUT DOWN frame.
Chapter 8: MSR Driver

The 5966 MSR is a USB device with unique drivers that need to be loaded to enable it.
The drivers are contained within Retail Platform Software (2.4.3.0 or 2.5.0.0) in the directory
C:\Program Files\NCR\Retail Controls\Drivers, or can be downloaded from the NCR Web Site.
http://www.ncr.com

1. At this site, select Support → Drivers and Patches → Retail Support Files → Retail Platform Software.
2. In the Peripherals section select 5966.
3. Download the 5966MSRDri vers.ZIP file.
4. Copy the file to a working directory on the target retail terminal and extract the files.
5. Right-click on the *.inf file to begin the installation process.
   The device is from XAC and should appear as Vendor ID 2182 Product ID 8000. UPOS support is provided for this device.
Chapter 9: 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. 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.

2. Wipe the screen and edges dry.

3. Allow the glass and screen edges to completely dry before using the unit.

4. When cleaning has been completed, plug in the keyboard cable and power on the workstation.

### MSR Cleaning Procedures

#### MSR Cleaning and Treatment Cards

<table>
<thead>
<tr>
<th>Part</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSR Cleaning Card, Dry</td>
<td>998-0052929</td>
</tr>
<tr>
<td>MSR Cleaning Card, Wet</td>
<td>603-9014730 (box of 50)</td>
</tr>
<tr>
<td>MSR Treatment Card</td>
<td>497-0453056 (box of 20)</td>
</tr>
</tbody>
</table>

#### 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.

These edges may be used once
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.

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.
Appendix A: Technical Data

Video Input Pin Assignment

This section describes the pin assignment of the LCD’s video connector. It is called 15 Pin Mini D-sub Connector.

<table>
<thead>
<tr>
<th>Pin NO.</th>
<th>Signal Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red Video Signal</td>
</tr>
<tr>
<td>2</td>
<td>Green Video Signal</td>
</tr>
<tr>
<td>3</td>
<td>Blue Video Signal</td>
</tr>
<tr>
<td>4</td>
<td>N.C.</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>Ground for red video signal</td>
</tr>
<tr>
<td>7</td>
<td>Ground for green video signal</td>
</tr>
<tr>
<td>8</td>
<td>Ground for blue video signal</td>
</tr>
<tr>
<td>9</td>
<td>VGA +5 V</td>
</tr>
<tr>
<td>10</td>
<td>PC detection</td>
</tr>
<tr>
<td>11</td>
<td>N.C.</td>
</tr>
<tr>
<td>12</td>
<td>DDC data</td>
</tr>
<tr>
<td>13</td>
<td>Horizontal sync signal</td>
</tr>
<tr>
<td>14</td>
<td>Vertical sync signal</td>
</tr>
<tr>
<td>15</td>
<td>DDC clock</td>
</tr>
</tbody>
</table>
Display Timing

The following table lists the better display quality modes that the LCD monitor provides. If the other video modes are input, the monitor will stop working or display unsatisfactory picture quality.

<table>
<thead>
<tr>
<th>MODE</th>
<th>RESOLUTION</th>
<th>TOTAL</th>
<th>VCLK</th>
<th>VERTICAL</th>
<th>HORIZONTAL</th>
<th>NOMINAL FREQUENCY +/-0.5KHz</th>
<th>NOMINAL FREQUENCY +/-1Hz</th>
<th>NOMINAL PIXEL CLOCK (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VESA MODES</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>DOS</td>
<td>720*400@70Hz</td>
<td>900*449</td>
<td>31.469</td>
<td>70.087</td>
<td>28.322</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VGA</td>
<td>640*480@60Hz</td>
<td>800*525</td>
<td>31.469</td>
<td>59.940</td>
<td>25.175</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VGA</td>
<td>640*480@72Hz</td>
<td>832*520</td>
<td>37.861</td>
<td>72.809</td>
<td>31.500</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>VGA</td>
<td>640*480@75Hz</td>
<td>840*500</td>
<td>37.500</td>
<td>75.000</td>
<td>31.500</td>
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</tr>
<tr>
<td>SVGA</td>
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<td>1024*625</td>
<td>35.156</td>
<td>56.250</td>
<td>36.000</td>
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<tr>
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<tr>
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<td>48.077</td>
<td>72.188</td>
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<tr>
<td>SVGA</td>
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<td>1056*625</td>
<td>46.875</td>
<td>75.000</td>
<td>49.500</td>
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<td>XGA</td>
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<td>1344*804</td>
<td>48.363</td>
<td>60.004</td>
<td>65.000</td>
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<td>75.000</td>
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<tr>
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<td>1312*800</td>
<td>60.023</td>
<td>75.029</td>
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<td>70.087</td>
<td>28.322</td>
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<tr>
<td>VGA</td>
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<td>31.469</td>
<td>59.940</td>
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<tr>
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<td>800*525</td>
<td>31.469</td>
<td>59.940</td>
<td>25.175</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VGA</td>
<td>640*480@75Hz</td>
<td>864*525</td>
<td>35.000</td>
<td>66.667</td>
<td>30.240</td>
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<td>1152*667</td>
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<td>57.283</td>
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<td>60.001</td>
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<td>1328*804</td>
<td>60.241</td>
<td>74.927</td>
<td>80.000</td>
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