NCR RealPOS 40 (7600)

Release 1.0

User Guide

B005-0000-1974

Issue A

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To maintain the quality of our publications, we need your comments on the accuracy, clarity, organization, and value of this book.

Address correspondence to:

Manager, Information Solutions Group
NCR Corporation
Discovery Centre, 3 Fulton Road
Dundee, DD2 4SW
Scotland

Internet Address:
http://www.info.ncr.com/eFeedback.cfm

Preface

Audience

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

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Safety Requirements

The *NCR RealPOS 40* conforms to all applicable legal requirements. To view the compliance statements see the *NCR RealPOS Terminals Safety and Regulatory Statements* (B005-0000-1589).

Caution: The on/off switch is a logic switch only. The AC line voltage primaries are live at all times when the power cord is connected. Therefore, disconnect the AC power cord before opening the unit to install features or service this terminal.

Caution: This product does not contain user serviceable parts. Servicing should only be performed by a qualified service technician.

Fuse Replacement

Warning: For continued protection against risk of fire, replace only with the same type and ratings of fuse.

Attention: Pour prévenir et vous protéger contre un risque de feu, remplacer la fusible avec une autre fusible de même type, seulement.

Lithium Battery Warning

Warning: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Attention: Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

Battery Disposal (Switzerland)

Refer to Annex 4.10 of SR814.013 for battery disposal.

IT Power System

This product is suitable for connection to an IT power system with a phase-to-phase voltage not exceeding 240 V.

Peripheral Usage

This terminal should only be used with peripheral devices that are certified by the appropriate safety agency for the country of installation (UL, CSA, TUV, VDE) or those which are recommended by NCR Corporation.

Warning: DO NOT connect or disconnect the transaction printer while the terminal is connected to AC power. This can result in system or printer damage.

Warning: DO NOT connect or disconnect any serial peripherals while the terminal is connected to AC power. This can result in system or printer damage.

Grounding Instructions

In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This product is equipped with an electric cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances. Do not modify the plug provided – if it will not fit the outlet, have the proper outlet installed by a qualified electrician. Improper connection of the equipment-grounding conductor can result in a risk of electric shock.

The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor.

If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal. Check with a qualified electrician or service personnel if the grounding instructions are not completely understood, or if you are in doubt as to whether the product is properly grounded.

Use only 3-wire extension cords that have 3-prong grounding plugs and 3-pole receptacles that accept the product's plug. **Repair or replace damaged or worn cords immediately.**

References

- *NCR RealPOS 40 Site Preparation Guide* (B005-0000-1975)
- *NCR RealPOS 40 Hardware Service Manual* (B005-0000-1976)
- *NCR RealPOS 40 Parts Identification Manual* (B005-0000-1977)

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Revision Record

Issue	Date	Remarks
A	Oct 2010	First issue

Chapter 1: Product Overview

Introduction

The NCR RealPOS 40 (also known as NCR 7600) is a compact POS solution that combines the reliability and security of a retail-hardened POS terminal with the performance and flexibility of industry-standard PC technology. With an open architecture and Mobile Intel® processor, the NCR RealPOS 40 supports the latest POS applications for Windows® to help you service your customers quickly and efficiently. And, it all fits in a small footprint that helps conserve valuable space at the Checkstand.

To complete your POS solution, choose from NCR's extensive line of peripherals, including printers, displays, keyboards and scanners. The NCR RealPOS 40 enables you to protect your investment in legacy serial devices or choose from the growing list of USB peripherals. The powered peripheral ports and 24V printer interface simplify cable management and reduce potential points of failure.

Product IDs

Major Model	CPU
7600-1000	RealPOS 40, Intel Atom N270 1.6G Hz Celeron, 1 GB DDR2 533 MHz, 2.5" 160GB SATA HDD
7600-1010	RealPOS 40, Intel Atom N270 1.6G Hz Celeron, 1 GB DDR2 533 MHz, 2.5" 40GB SATA SSD

RealPOS 40 Base Model Comparison

Model	7600-1000	7600-1010
Chipset	Intel Atom 945 GSE	Intel Atom 945 GSE
CPU	Intel Atom N270	Intel Atom N270
Clock Speed	1.6 GHz	1.6 GHz
Front-Side Bus	533 MHz	533 MHz
Level 2 Cache	512 KB	512 KB
Memory	200 Pin SODIMM	200 Pin SODIMM
Memory (standard)	1GB DDR2 533 MHz	1GB DDR2 533 MHz
Memory (max.)	2GB DDR2 533 MHz	2GB DDR2 533 MHz
Memory slots	1	1
Standard Connectivity		
RS-232 (powered)	4 (4)	4 (4)
USB 5 volt	3	3
USB 12 volt	1	1
USB 24 volt	1	1
Audio Line Out	1	1
10/100 Ethernet	1	1
DVI-D	1	1
VGA	1	1
Dual PS/2	1	1
Dual Cash Drawer	1	1
Optional Connectivity		
Extended I/O card (3) 12 volt USB	1	1
Storage		
Hard Disk Drive 2.5” SATA 3.0 Gbs	160GB	N/A
Solid State Drive 2.5” SATA 3.0 Gbs	N/A	40GB
CD-ROM Drive	External (USB)	External (USB)
PCI Expansion Slot	N/A	N/A
Internal UPS	N/A	N/A
External Power Supply 87% efficient MEPS Level V	1	1
Power Cords	Order separately	Order separately
Color Scheme	Charcoal Gray	Charcoal Gray
Dimensions / Weight		
Terminal (WxHxD)	22.6x7.6x25.4cm (8.9x3x10”)	22.6x7.6x25.4cm (8.9x3x10”)
External Power Supply (WxHxD)	8.5x4x18cm (3.35x1.57x7.08”)	8.5x4x18cm (3.35x1.57x7.08”)
Terminal (kg / lbs)	2.54kg / 5.6 lbs	2.54kg / 5.6 lbs
External Power Supply (kg / lbs)	.77kg / 1.7 lbs	.77kg / 1.7 lbs

Energy Star

ENERGY STAR® qualified products and practices help you save money and reduce greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy. You can help reduce electricity usage and its environmental impact by power managing your POS product when it is not in use for extended periods of time.

What are the potential benefits of the new Energy Star® Specification?

Desktops (including POS terminals), Notebooks, and Workstations manufactured after July 1, 2009 that display the ENERGY STAR® label meet the more stringent 5.0 requirements. Because of these requirements, your computer has a highly efficient power supply and other hardware specific features that, based on EPA estimates, could annually:

- Save you up to 115 kWh of electricity per unit.
- Prevent up to 200 lbs of green house gas emissions per unit

Moreover, ENERGY STAR® compliant computers can save even more energy by using ENERGY STAR® power management features, which allow the computer to enter a very low power mode when not in use for a specified period of time. The EPA estimates that these power management features, when enabled on ENERGY STAR® qualified computers, could save you up to 115 kWh of electricity annually (per unit). This is equivalent to:

- Saving greenhouse gas emissions by taking your car off the road for 5 days
- Planting a grove of trees 46 ft. by 46 ft.

Power Management Settings

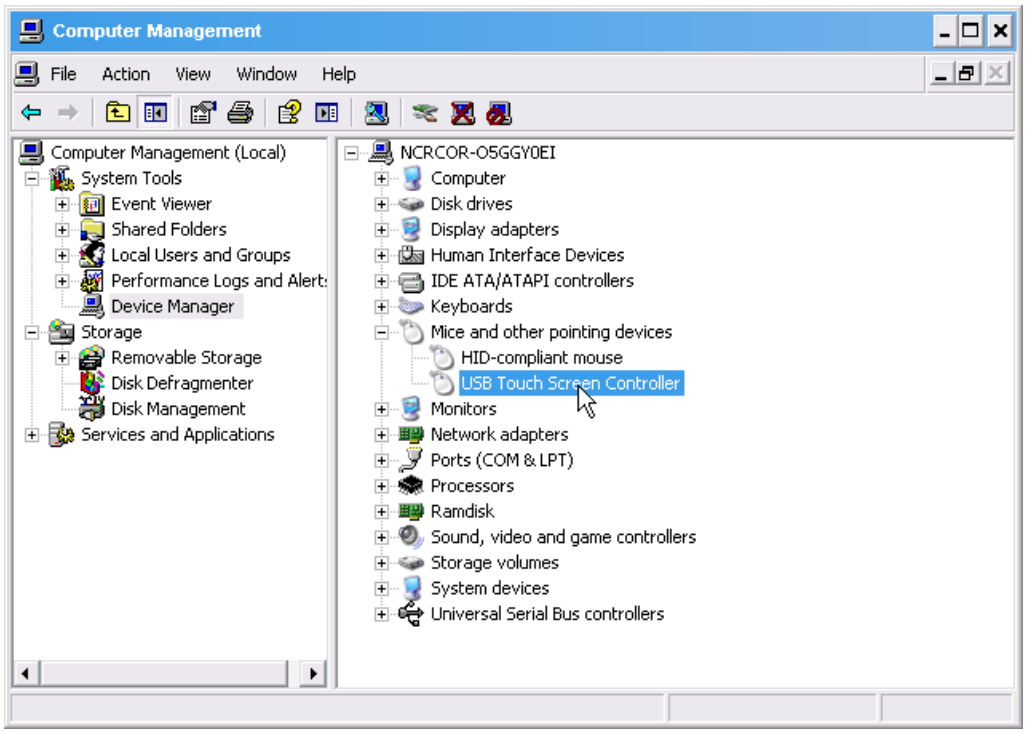
- This POS terminal has been shipped enabled for power management. The default settings for the terminal comply with the ENERGY STAR requirements of less than 15 minutes of user inactivity for the display and less than 30 minutes of inactivity for the terminal.
- The terminal can be awakened from sleep mode by any keyboard activity or by Wake on LAN if enabled.

Touch Screen Considerations

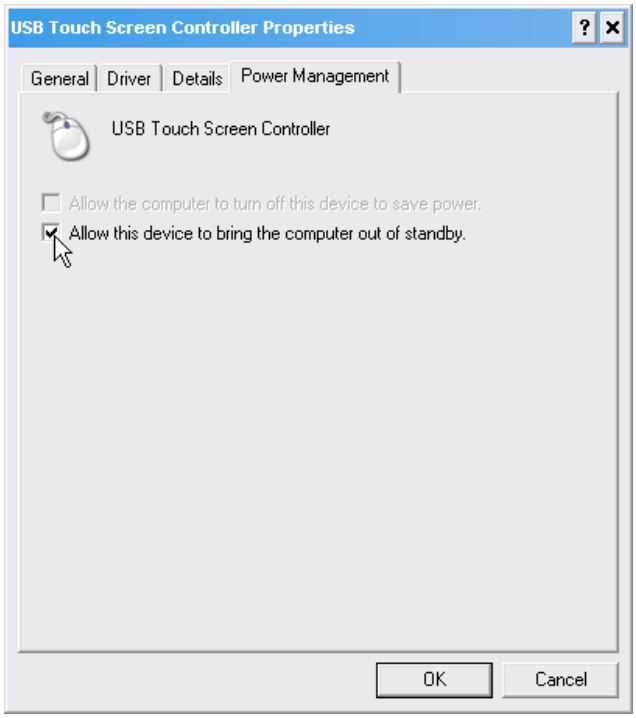
1. The POS will not go into standby mode with a touch display connected to a USB +12V port on the terminal unless the action noted below is implemented.
    a. **Start → Control Panel → Administrative Tools → Computer Management**.

b. Select **Device Manager** in the System Tools section.

c. Expand **Mice and other pointing devices** and then right-mouse click on *USB Touch Screen Controller*.



d. Select the **Power Management** tab. The *Allow this device to bring the computer out of standby* option is active by default. Un-check the check box.



2. The POS cannot be awakened from Standby Mode via Touch if the Touch device is connected to a +12V USB port. Power is removed from the +12V USB and without power Touch events cannot be detected.
3. After waking from Standby (via keyboard, mouse, or power switch), touch will not respond for approximately 30 seconds. This delay can be reduced significantly by changing disabling the *Allow this device to bring the computer out of standby* option as discussed in Step #1 above.
4. If wake from standby via Touch is required, the Touch Display must be powered from an independent source such as a power brick. If the Touch Display is powered by power brick, issues noted in 1), 2), and 3) no longer apply.

More Information about Energy Star

ENERGY STAR® compliant systems combined with power management settings can provide NCR customers the greatest TCO (total cost of ownership) savings[2]!

Go to ***www.energystar.gov/powermanagement*** to learn more about power management.

For more information on ENERGY STAR go to ***www.energystar.gov***

Configurations

The NCR RealPOS 40 is an affordable, retail-ready POS solution that provides outstanding value for any size retailer. It supports a broad range of certified NCR peripherals and applications.

The RealPOS 40 features the smallest form factor in its class and offers versatile configuration and mounting options.

Choose from NCR's extensive line of peripherals, including printers, displays, keyboards and scanners. The RealPOS 40 provides flexible connectivity options to power peripherals as well as dual display support for customer-facing advertising and messaging. The system can be configured modularly or stacked on an NCR 2181 Cash Drawer in an integrated fashion.

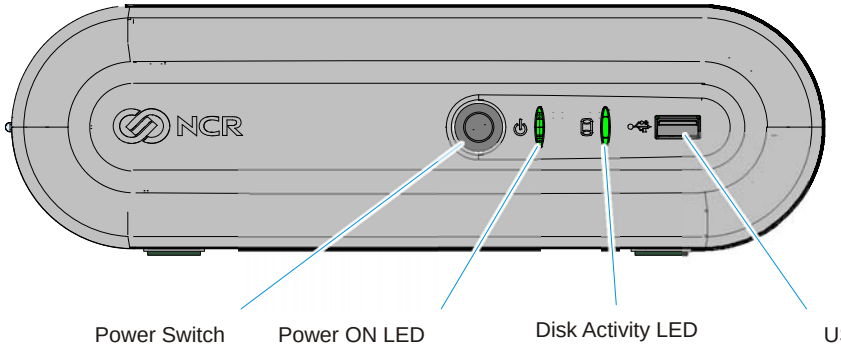
Modular Configuration

Stacked Configuration

An optional stand is available to mount the terminal vertically.

Vertical Stand Configuration

Operator Controls



LED Diagnostic Indicators

The two front panel LEDs also function as diagnostic indicators, defined as follows.

Note: The cell colors indicate the color of the LED at that particular time.

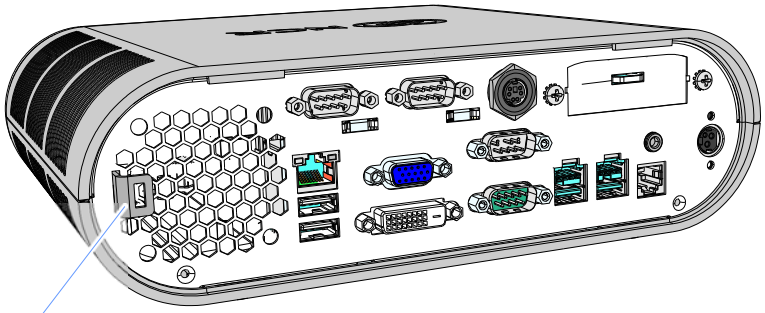
Current System Operation	Suspect Component	System State	Power LED	Disk Activity LED	Corrective Action
Normal Operation	N/A	System ON	ON	OFF	N/A
Normal Operation	N/A	System ON with HDD activity	ON	Flashing (HDD Access)	N/A
Normal Operation	N/A	Unit in Suspend (S3)	Blinking (1/sec.)	ON	N/A
- OFF - AC Present	N/A	- OFF - Not in Standby - External P/S ON.	OFF	ON	N/A

Current System Operation	Suspect Component	System State	Power LED	Disk Activity LED	Corrective Action
- OFF - AC Present	Power System	- OFF - Not in Standby - External P/S ON.	OFF	OFF	1. Check AC power to P/S 2. Check P/S 3. Check connection between unit and P/S 4. Check power connection from Back Panel to Motherboard and Motherboard to Front Panel 5. Replace P/S 6. Replace Motherboard 7. Replace Front Panel Board
Runtime	Cooling Component/ CPU	Over Temperature	Flashes red/green, then solid red as temperature increases	N/A	1. Check for blocked cooling vents 2. Check for excessive ambient temperature 3. Check cooling components
POST	CPU	CPU not operating	ON	ON	1. Check for correctly installed CPU 2. Replace Motherboard
POST	BIOS Chip	BIOS Checksum failure	ON	Flashing (4/sec.)	1. Perform BIOS crisis recover 2. Replace BIOS chip 3. Replace Motherboard
POST	Memory	Memory issue	ON	Flashing (1/sec.)	1. Check for properly installed memory 2. Replace memory 3. Replace Motherboard
POST	Motherboard	No display	ON	Flashing (1/4 sec.)	1. Replace Motherboard
POST	- Display - Mother Board - Peripheral	Stopped prior to boot	ON	Flashing (1/8 sec.)	No Display: 1. Check for power to display if no display 2. Check cable connection between Motherboard and display 3. Check for properly functioning display 4. Replace Motherboard Display Working: 1. Use display to determine failure point via onscreen message and BIOS Setup

Current System Operation	Suspect Component	System State	Power LED	Disk Activity LED	Corrective Action
Boot Time	Boot media (HDD, LAN)		ON	OFF	HDD is Boot Device: 1. Check HDD status in BIOS Setup 2. Check connections between HDD and Motherboard 3. Replace or re-image HDD 4. Replace Motherboard LAN is Boot Device: 1. Check for LAN link and activity LEDs on the Back Panel 2. Check LAN cable 3. Replace Motherboard

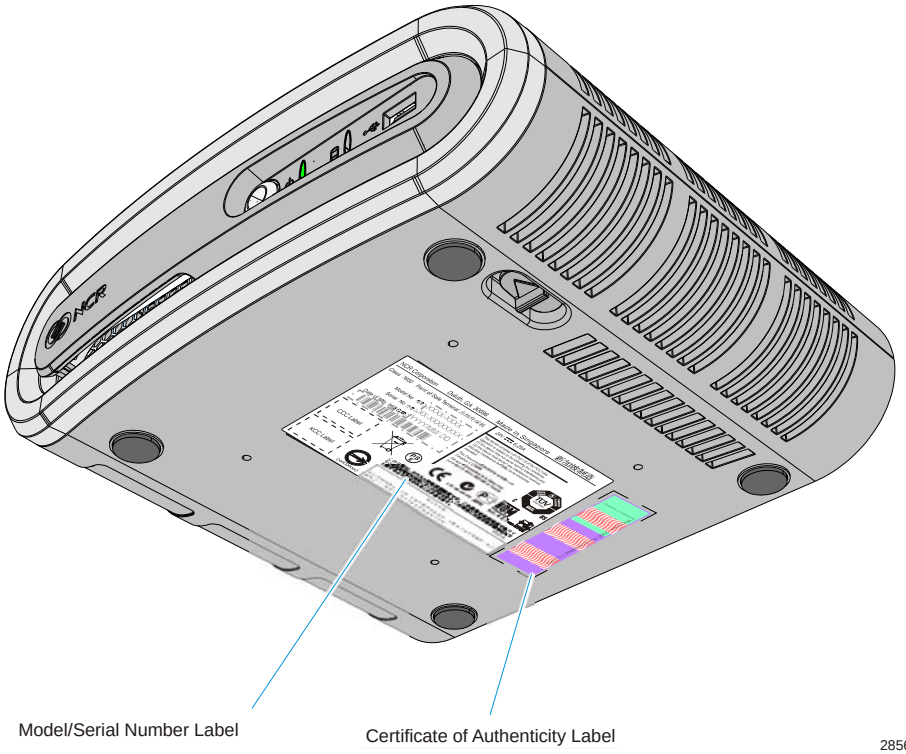
Cabinet Security

The 7600 has easy access to the internal components. However, the case can be secured to a fixed object (desk, pole, etc) by attaching a standard Kensington lock to the Security Hasp. In addition a small padlock can be attached to the hasp to prevent the unit from being opened.



Serial Number/Model Number Label

The serial number and model number are included on the Certification Label located on bottom of the terminal. A Microsoft Certificate of Authenticity (COA) label is included if the terminal is ordered and shipped with a pre-installed Microsoft Operating System. There are two types of Microsoft COA stickers. Depending on the Microsoft Operating System ordered the label is located on either the Bottom Cover for XP Professional and Windows 7 **OR** next to the Certification Label for XP Embedded, WEPOS, POSReady 2009, and POSReady 7.



Features

7600 Processor Board

- Intel's 945GSE Chipset
- Intel's Atom N270 single core mobile processor.
- Up to 2GB DDR2 Memory
- Serial ATA (SATA) Hard Drive Interface
- Option for single 2.5" Hard Drive
- High-speed 10/100Mb Ethernet
- Two Type-A USB Connectors
- Four Powered Serial ports
- DVI-D connector
- VGA connector
- PS/2 Connector supporting Mouse and Keyboard through a Y-cable
- One 12V USB+Power port
- One 24V USB+Power port
- Dual cash drawer support from one connector using Y-cable
- Audio Line Out
- Three 12V USB+Power ports on a USB Daughter Card (Optional)
- DC Power Jack for Power Brick

Storage Media

- Primary 2.5" SATA Hard Drive
- Solid State Drive – SATA interface

Power Supply

- 150W Output power
- Switching Power Supply, External 24V Adapter
- MEPS Level V mark (efficiency 87% minimum), Energy Star 5.0 capable
- Supports 24V retail printers at 55W maximum when connected to 7600

Operating Systems

- Windows 7 Professional
- Windows XP Professional, SP3
- SLEPOS11/SLEPOS11 SP1
- POSReady 2009

Power Management

The BIOS supports the Advanced Configuration and Power Management Interface (ACPI) 2.0 specification. A key feature of ACPI is that the operating system, not the BIOS, configures and implements power management. The 7600 terminal supports the Global system power states defined by ACPI:

G3 Mechanical Off

A computer state that is entered and left by a mechanical means

Example: Turning off the system's power through the movement of a large red switch.

Various government agencies and countries require this operating mode. It is implied by the entry of this off state through a mechanical means that no electrical current is running through the circuitry and that it can be worked on without damaging the hardware or endangering service personnel. The OS must be restarted to return to the Working state. No hardware context is retained. Except for the real-time clock, power consumption is zero.

G2/S5 Soft Off

A computer state where the computer consumes a minimal amount of power. No user mode or system mode code is run. This state requires a large latency in order to return to the Working state. The system's context will not be preserved by the hardware. The system must be restarted to return to the Working state. It is not safe to disassemble the machine in this state.

G1 Sleeping

A computer state where the computer consumes a small amount of power, user mode threads are not being executed, and the system *appears* to be off (from an end user's perspective, the display is off, and so on). Latency for returning to the Working state varies on the wake environment selected prior to entry of this state (for example, whether the system should answer phone calls). Work can be resumed without rebooting the OS because large elements of system context are saved by the hardware and the rest by system software. It is not safe to disassemble the machine in this state.

G0 Working

A computer state where the system dispatches user mode (application) threads and they execute. In this state, peripheral devices (peripherals) are having their power state changed dynamically. The user can select, through some UI, various performance/power characteristics of the system to have the software optimize for performance or battery life. The system responds to external events in real time. It is not safe to disassemble the machine in this state.

ACPI Sleep States (S0 – S5)

Under the G1 sleeping state ACPI defines levels of system sleep state support. The 7600 supports the following sleeping states:

- S0: Normal Powered-On state
- S1 (Standby): The S1 sleeping state is a low wake latency sleeping state. In this state, no system context is lost (CPU or chip set) and hardware maintains all system contexts.

  Note: The 7600 does not support S1 state. Turning off the backlight and hard drives provides the equivalent power savings (due to Intel's processor C-states feature) at nearly zero latency.
- S2: Not supported
- S3 (Suspend to Ram): The S3 sleeping state is a low wake latency sleeping state. This state is similar to the S1 sleeping state except that the CPU and system cache context is lost (the OS is responsible for maintaining the caches and CPU context). Control starts from the processor's reset vector after the wake event. In NCR systems, during S3, power is only provided to the on-board USB ports.

  Note: When the terminal resumes from an S3 state, all the USB devices re-enumerate. This causes speaker tones as if they were disconnected and then reconnected. This does not present a problem and the USB devices will continue to operate correctly.

  Requirements for S3 support:

  – O/S must be built on a system with S3 enabled in the BIOS

  – Some peripherals may not be S3 capable, which can prevent the system from entering S3 state.
- S4 (Suspend to Disk): The S4 state is the lowest power, longest wake latency sleeping state supported by ACPI. In order to reduce power to a minimum, it is assumed that the hardware platform has powered off all devices. Platform context is maintained.

  Requirements for S4 support:

  – O/S must be built on a system with S3 enabled in the BIOS

  – Some peripherals may not be S4 capable, which can prevent the system from entering S4 state.

  Reference the *ACPI Specification* for details.

Peripherals: ACPI defines power states for peripherals which are separate from the system power state. The device power states range from D0 (fully-on) to D3 (off) It is the responsibility of the driver developer for each peripheral to define and support the available power states.

Power State	S0 Working	S1 Standby	S2	**S3 Suspend to RAM	S4 Hibernate	**S5 Soft Off
Supported: Y / N	Y	Y	**N**	Y	Y	Y
Description	Fully Functional	-Video back light off -HDD off -Cache Flush - CPU halted		-Video back light off -HDD off -Cache Flush -Memory in slow refresh -CPU halted	-Video back light off -HDD off -Cache Flush -Memory data to HDD - CPU halted	OFF Note:Some devices remain powered by standby voltage (LAN, USB) to allow wake-up
Power Supply Status	On	On		Powered Down*	Powered Down*	Powered Down*
Power Consumption*	37	24		2	1	<1
Wake Options:						
Power Switch	N/A	Y		Y	Y	Y
PS/2 Keyboard	N/A	Y		Y	Y	Y
PS/2 Mouse	N/A	Y		N	N	N
USB Keyboard	N/A	Y		Per O/S	N	N
USB Mouse	N/A	Y		Per O/S	N	N
LAN (magic packet)	N/A	Y		Y	Y	Y
RTC Alarm	N/A	Y		Y	Y	Y
Serial Port (RI)	N/A	Y		Y	Y	Y

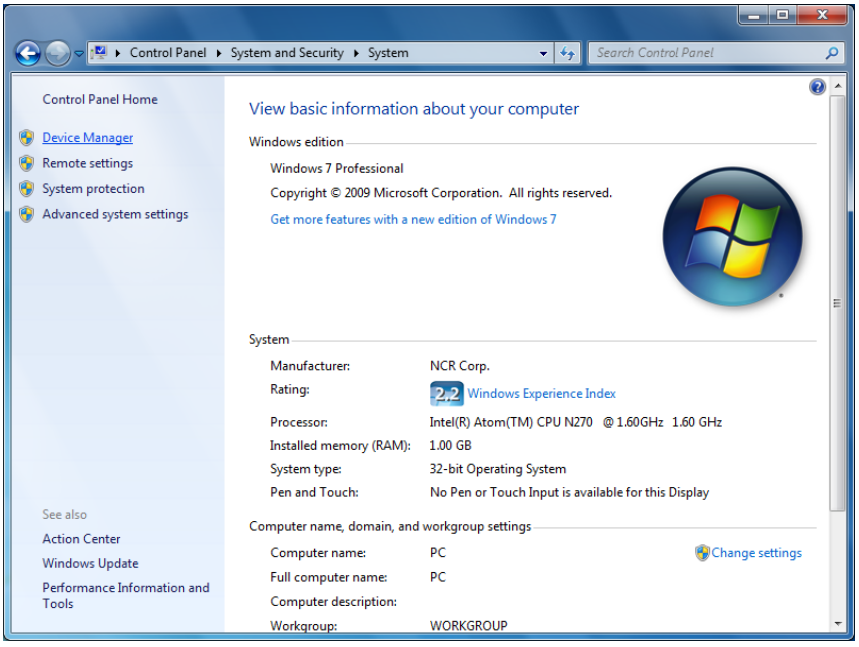
Note: Power consumption based on the following configuration with no peripherals Intel Atom 270 ,512MB DIMM, HDD
*Maintains small voltage to support wake circuits)
**The external power supply is ON while in S3-S5. The motherboard shuts down all power circuits except for a small voltage to support wake circuits. Power to the 24V USB printer port and the Cash drawer is also disconnected while in S3-S5

Enabling Wake on LAN

In order for Wake on LAN to function the Network driver must be enabled (factory default). The procedure for enabling the driver depends on which operating system you are using.

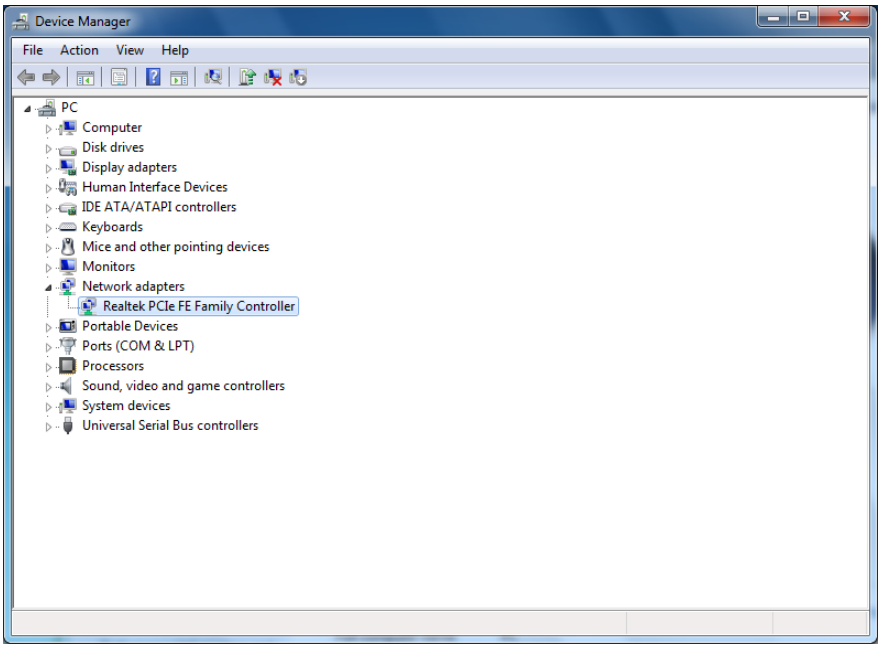
Windows 7

1. Select **Start** → **Computer** → **System Properties** Tab → **Device Manager**

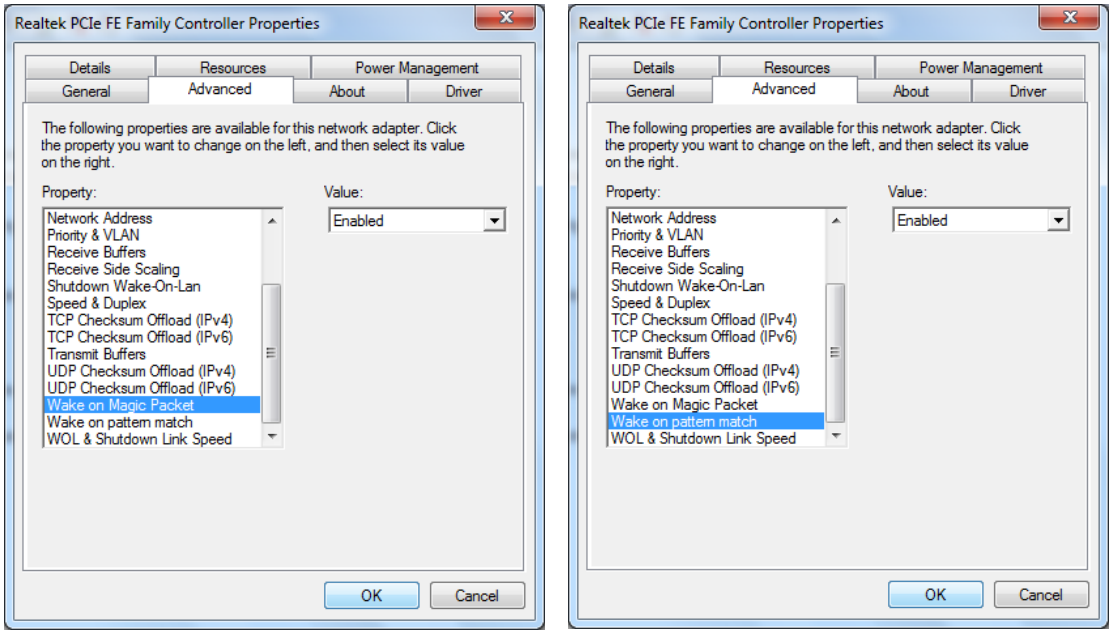


2. Select **Network adapters** and then

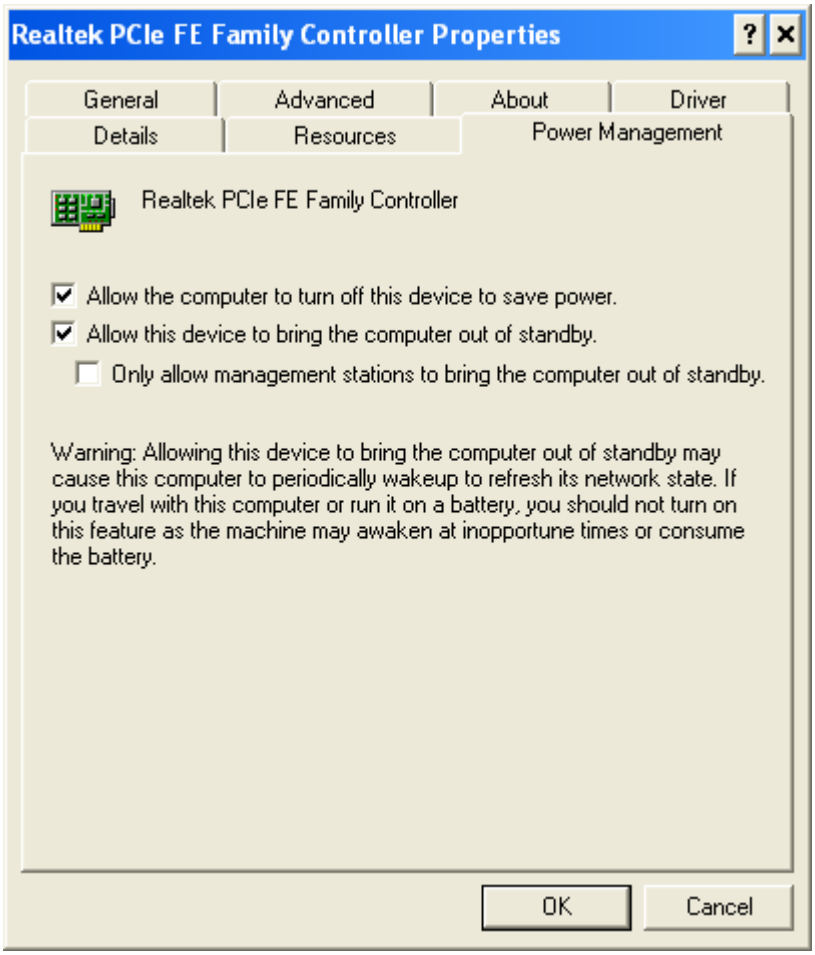
3. Right-mouse click the *Realtek PCIe FE Family Controller* driver and then select **Properties**.



4. Under the **Advanced** tab both *Wake on Magic Packet* and *Wake on Pattern Match* should be **Enabled**. Select **OK** after making any changes.



5. Under the **Power Management** tab all option boxes should be *checked*. Select **OK** after making any changes.

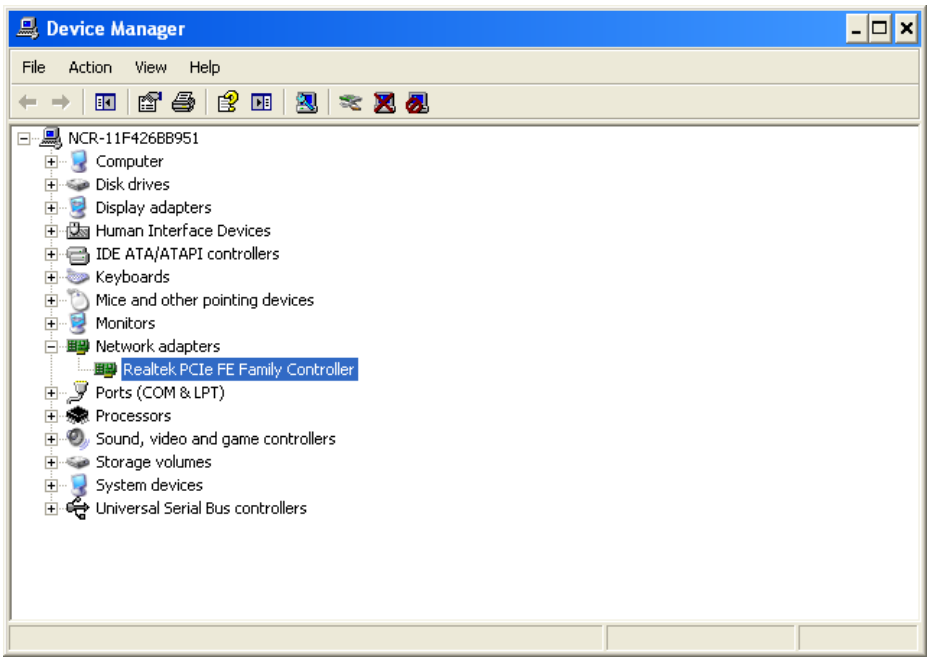


Windows XP

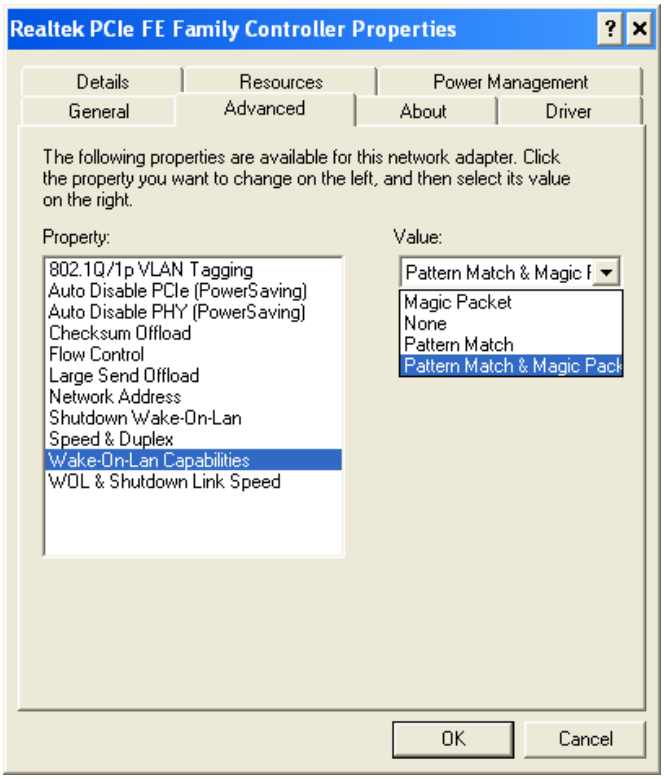
1. Select **Start** → **Control Panel** → **Hardware** Tab → **Device Manager** button.

2. Select **Network adapters** and then

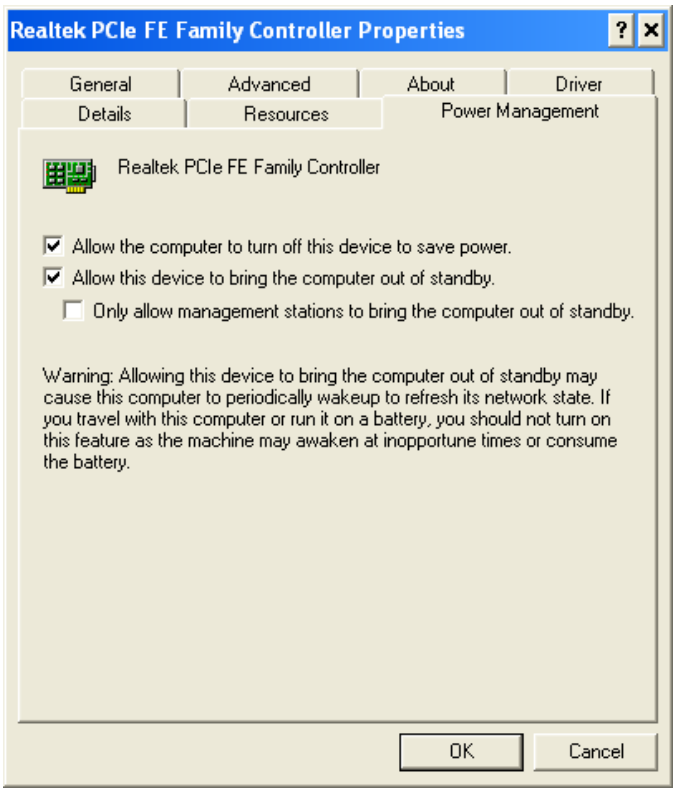
3. Right-mouse click the *Realtek PCIe FE Family Controller* driver and the select **Properties**.



4. Under the **Advanced** tab the *Wake on Magic Packet* should be **Enabled**. Select **OK** after making any changes.



5. Under the **Power Management** tab the option boxes as shown below should be *checked*. Select **OK** after making any changes.



ACPI Processor C-States

ACPI defines the power state of system processors while in the G0 working state as being either active (executing) or sleeping (not executing). Processor power states are designated C0, C1, C2, C3, …C*n*.

The C0 power state is an active power state where the CPU executes instructions. The C1 through C*n* power states are processor sleeping states where the processor consumes less power and dissipates less heat than leaving the processor in the C0 state.

While in a sleeping state, the processor does not execute any instructions. Each processor sleeping state has a latency associated with entering and exiting that corresponds to the power savings. In general, the longer the entry/exit latency, the greater the power savings when in the state.

To conserve power, OSPM places the processor into one of its supported sleeping states when idle. While in the C0 state, ACPI allows the performance of the processor to be altered through a defined "throttling" process and through transitions into multiple performance states (P-states).

Note: The 7600 Atom N270 Processor supports C0 and C1 states. Support of deeper sleep states is not required due to its inherently low power consumption.

Operator Displays

NCR 5954 15-Inch DynaKey

The NCR RealPOS 5954 USB DynaKey™ is a Point-of-Sale (POS) keypad with a built-in 15-inch flat panel Liquid Crystal Display (LCD). Unique to the DynaKey is a set of *ATM-style* keys (*DynaKeys)*, which are located beside the display. The functions of these keys change depending on the software application appearing on the LCD.

Note: USB DynaKey requires Windows XP/XPe.

The combined display and keypad is designed to reduce operator training time, simplify complex POS transactions and improve associate/cashier productivity. Combined with the appropriate applications software, the DynaKey can virtually eliminate the need for an operator to memorize function key locations and sequence.

The USB DynaKey interfaces with the host terminal via two cables.

- Digital Video Interface (DVI) cable for video
- Powered Universal Serial Bus (USB) for data and power

The DynaKey is available in two color schemes.

- Light Gray (G11)
- Charcoal Gray (CG1)

5942 12.1-Inch Color LCD

The 5942 12.1-Inch LCD is designed for customers who desire a color display and prefer the small footprint and ergonomic packaging of LCD technology versus traditional CRT's. Depending on the customer's requirements, this LCD display can be used either as an operator display or a customer information display (CID). The 5942 Display features a 12.1-Inch Active Matrix Color LCD with support for SVGA and XGA resolution.

5942 15-Inch Color LCD

The 5942 15-Inch LCD features a high brightness dual-backlight active matrix LCD with analog interface which plugs directly into the standard VGA (CRT) port on the RealPOS 80c terminal. It includes a 1.5 meter VGA cable and built-in power supply with standard IEC connector. Mount and power cable must be ordered separately.

5964 15-Inch Touch Screen

The NCR 5964-8xxx is a 15-inch XGA (1024x768) Liquid Crystal Display with either a resistive or capacitive Touch Screen for operator input.

Features

- 15" LCD XGA (1024x768) native resolution, 350 nit typical brightness (also supports VGA, SVGA, SXGA)
- Dual Bulb, adjustable brightness
- Capacitive or 5-wire resistive touch options, USB interface.
- Video - VGA, standard 15 pin female.
- Integrated stereo speakers-volume controlled via the OSD.
- One standard USB port in addition to the powered USB port.
- Optional MSR- field installable, USB interface.
- Energy Star, ACPI and VESA DPM compliance
- Choice of integrated or remote mounts

5965 15-Inch Touch Screen

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.

- 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 x 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

5966 15-Inch Touch Screen

The NCR 5966 is a 15-inch low cost XGA (1024x768) Liquid Chrystal Display with a 5-wire resistive touch screen for operator input. It is available in Beige (G11) and Charcoal (CG1).

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.

NCR 5982 6.5-Inch LCD Display

The 5982 LCD Display is a terminal-powered color 6.5-Inch VGA LCD.

Keyboards

5932 Keyboards

The NCR 5932 Keyboards are intended for harsh retail environments and contain an internal membrane to protect against objects such as paper clips, staple wires, pins, and so forth, from falling between the keys and damaging the electronics. This technology improves overall reliability not typically found in standard PC keyboards or many retail keyboards.

The RealPOS 40 supports the following NCR 5932 Keyboards:

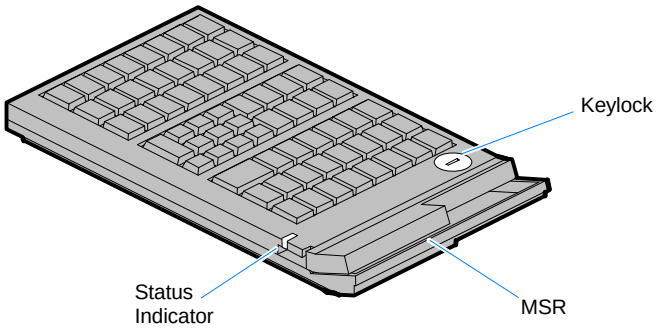
- NCR 64-Key PS/2 POS Keyboard (5932-2xxx)
- NCR USB Alphanumeric Big Ticket Keyboard (5932-5xxx)
- NCR 5932-66xx 104-Key Programmable POS Keyboard

Keyboard Power

The RealPOS 80 supplies power to the PS/2 keyboard even when in the OFF state. This is for configurations that require the terminal to turn on when a key is pressed. Most NCR PS/2 keyboards have a Power ON LED which stays illuminated, indicating power is present in the keyboard. Pressing a key may also cause tones to be sounded, but unless the terminal is configured to power up when a key is press, nothing happens.

NCR 64-Key PS/2 POS Keyboard (5932-2xxx)

The *NCR 64-Key POS Keyboard*, designed for checkout environments where alpha entry is not required, includes 55 assignable function keys and a numeric keypad with 11 keys.



Features

- Keylock
- Speaker
- Scanner
- System Status Indicator LED
- 68-Inch PS/2Keyboard Cable

Note: Configure a NCR 5932-2xxx if you need an MSR feature.

The Wedge controller handles the operations of the user-programmable speaker, Magnetic Stripe Reader (MSR), keylock, and scanner connector. Please refer to the *Wedge Software User's Guide* (BD20-1368-A) for detailed information about interfacing and configuring these devices.

Keylock

The Big Ticket and 64-key keyboards have a four-position keylock switch. The table following explains the keylock positions.

Abbreviation	Position	Description
Ex	Exception	Used by the customer or service representative to perform low-level programming such as terminal diagnostics, configuring the terminal, or loading the terminal.
L	Locked	Used to lock keyboard input to prohibit use of normal functions.
R	Register	Used when performing normal retail mode functions.
S	Supervisor	Used by supervisor to provide highest level of terminal control in cases such as refunds and running totals.

Speaker

A programmable speaker generates key clicks and error tones.

Buzzer

The buzzer is an internal on board Buzzer.

System Status Indicator LED

The system status indicator is a two-color LED. The green color indicates the keyboard has power. Red indicates an error condition. When the system is off, the LED does not light up.

When the 64-key keyboard is in the special *PC setup* mode, the LED flashes red/green.

The status and condition indicated by the LED are as follows:

Status	Condition
Green	Power on
Red	Wedge controller reporting an error condition
Flashing red/green	Keypad of 64-key keyboard in *PC Setup* mode
Off	System off (see *Keyboard Power* section)

Note: For more information about the Wedge controller, refer to *Wedge Software User's Guide* (BST0-1368-B).

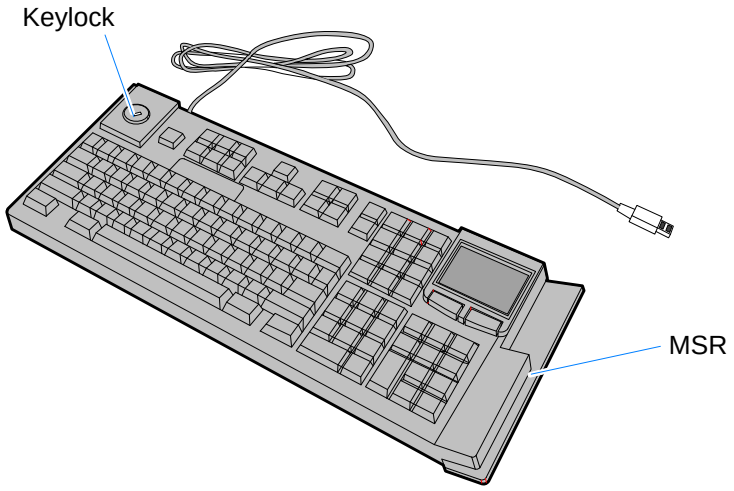
MSR (Magnetic Stripe Reader)

The MSR is an optional feature that provides support for reading magnetically coded data cards. The keyboards support two different types of MSR:

- ISO Tracks 1, 2, and 3
- JIS-II and ISO Track 2 (Big Ticket and full-featured 64-key keyboards only)

Note: MSR signals are routed to the Wedge controller and passed into the system keyboard data stream. For more information about the Wedge controller, refer to *Wedge Software User's Guide* (BD20-1368-A)

NCR 5932-5xxx USB Alphanumeric Big Ticket Keyboard



The *NCR USB Alphanumeric Big Ticket Keyboard* is a multifunction keyboard that is two keyboards built into one.

The keyboard consists of two major sections:

- 38-key POS keyboard
- Industry-standard alphanumeric PC keyboard

The keyboard contains the key matrix and other POS-specific functions such as keylock, speaker, system status indicator, and magnetic stripe reader (MSR). This 5932 keyboard also has a USB port to connect a Scanner or other USB device.

Features

The NCR 5932 USB Keyboard supports the following features:

- Integrated Touch Pad, Keylock, Speaker, 3-Track Magnetic Stripe Reader (MSR)
- Keyboard Status LEDs
- USB cable
- Additional external USB ports
- No language characteristics

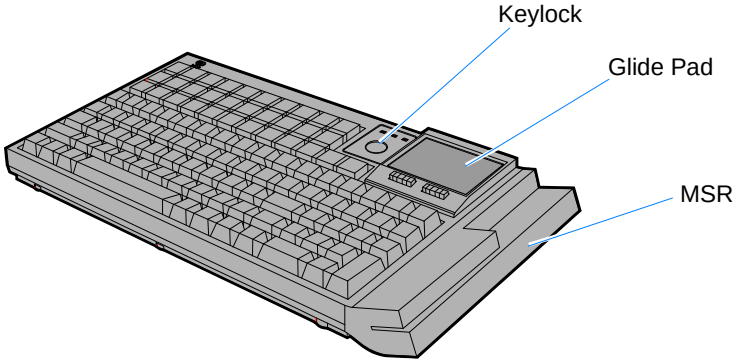
Note: Refer to *NCR 5932 USB Keyboard User's Guide* (B005-0000-1395) for further detailed information.

NCR 5932-65xx PS/2 Programmable POS Keyboard

The *NCR 5932 PS/2 Programmable POS Keyboard* is a multifunctional keyboard that is two keyboards built into one.

The keyboard consists of two major sections:

- 32-key Point-Of-Sale Keyboard
- PC type Alphanumeric Keyboard



29168

The keyboard includes the following features:

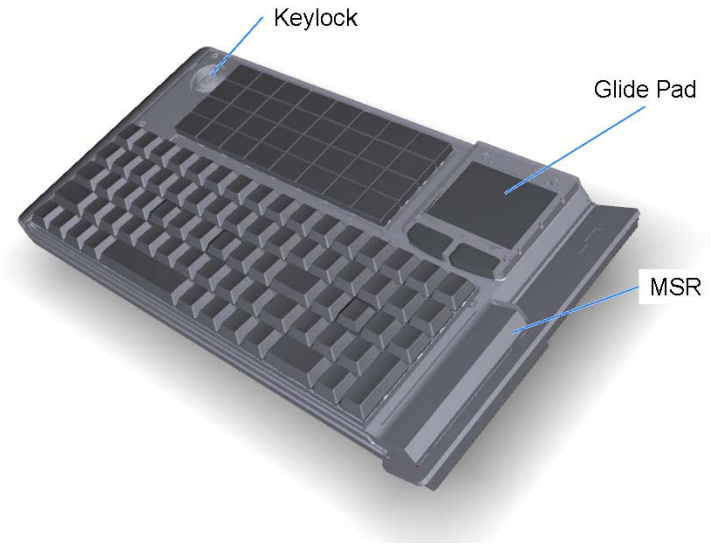
- Keylock
- Tone Indicator
- Keyboard Status Indicator
- Magnetic Stripe Card Reader (MSR)
- Glide Pad

NCR 5932-66xx USB Programmable POS Keyboard

The *NCR 5932 PS/2 Programmable POS Keyboard* is a multifunctional keyboard that is two keyboards built into one.

The keyboard consists of two major sections:

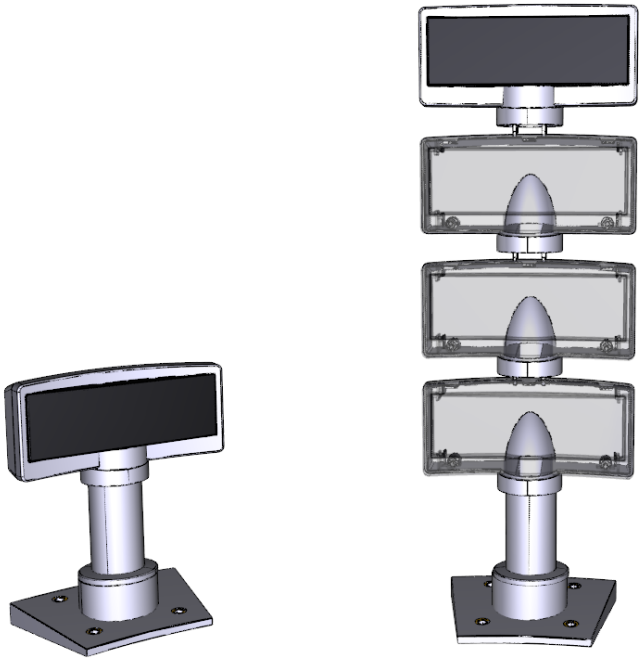
- 32-key Point-Of-Sale Keyboard
- PC type Alphanumeric Keyboard



The keyboard includes the following features:

- Keylock
- Tone Indicator
- Keyboard Status Indicator
- Magnetic Stripe Card Reader (MSR)
- Glide Pad

NCR 5975 2x20 VFD Customer Display



The NCR 5975 Customer Display is designed to be an optional display device for the NCR retail terminals. It can also serve as a display for any industry-standard PC. It is a Vacuum Fluorescent Display (VFD).

- 5975-1000 2x20 VFD (G11)
- 5975-1001 2X20 VFD (CG1)

There are four post options, available in 4 inch increments.

Features

- Display
  - 2X20 Character Vacuum Fluorescent Display (VFD)
  - 7X9 pixel characters
  - Character height
  - Minimum - 9mm
  - Maximum - 11mm
- PCB
  - Microcontroller
  - EIA 232 Interface support
  - USB 2.0 Interface support

- Cabinet
  - UV Stable Material
  - Available in NCR Light Gray (G-11) and NCR Charcoal Gray (CG1)
- Connectors
  - 9 pin D sub
  - Powered USB
- Cables
  - Powered EIA-232
  - Powered USB Cable
  - Unpowered EIA-232 Cable with Y-Connection for Power Brick
  - Unpowered USB Cable with Y-Connection for Power Brick
  - 1m and 4m Lengths
- Power Supply
  - Universal Power Supply (12V, 12W output)
  - 8 pin Molex Connector
- EIA-232 or USB 2.0 I/F support
  - The components for both interfaces are populated on a single printed circuit board. Both interfaces are active, though only one interface can be physically connected at a time. The display communicates via the interface connected to it.
- Mounting Options
  - Table Mount, 4-in. Post
  - Table Mount, 8-in. Post
  - Table Mount, 12-in. Post
  - Table Mount, 16-in. Post
  - Integrated Mount for NCR 7456, 7457, 7458

Character Sets

- Support for 19 character sets
- 3 Character sets in base unit
  - Code Page 858 (International)
  - Katakana
  - Code Page 866 (Cyrillic)
- 32 KB Flash Memory for support of up to 16 additional character sets

NCR 7167 Printer

The NCR 7167 Printer is a fast, quiet, relatively small and very reliable multi-function printer. It prints receipts, validates and prints checks, and prints on a variety of single or multiple part forms. There is not journal as it is kept electronically by the host terminal. The printer can connect through a USB port or a serial port. It can receive power from a power supply or through a USB+ power cable.

7168 Printer

The 7168 printer is a fast, quiet, relatively small and very reliable multiple-function printer with front and back printing on the receipt paper capability. It prints receipts, validates and prints checks, and prints on a variety of single- or multiple-part forms. There is no journal as it is kept electronically by the host computer.

The industry-standard RS-232C communication interface allows the 7168 to be connected to any host computer that uses RS-232C or USB communication interface.

The receipt station uses thermal printing technology. Therefore, there is no ribbon cassette to change and paper loading is extremely simple. Printing on single- or multiple-part forms, validating checks, and printing checks is also easy in the accommodating slip station.

Another feature is the Magnetic Ink Character Recognition (MICR) check reader with parsing, which reads account numbers on checks for easy verification. An extended slip table is available for handling large forms and is standard with the MICR option.

7197 Printer

The NCR 7197 Printer is a fast, quiet, relatively small and very reliable printer with front and back printing capability. The printer can connect through a USB port or a serial port. It receives power from the 24V connector on the terminal or from an external power supply.

NCR 7198 Printer

The NCR 7198 printer is a fast, quiet, relatively small and very reliable printer with front and back printing on the receipt paper capability. The printer can connect through a USB port or a serial port. It can receive power from a power supply or through a USB+ power cable.

Chapter 2: Hardware Installation

This chapter explains how to install the RealPOS 40 hardware, including out-of-box installation and how to install the optional peripheral devices. The 7600 is very flexible to install. This document discusses a *typical* configuration. Your configuration may require adjustments to the procedures.

Installation Restrictions

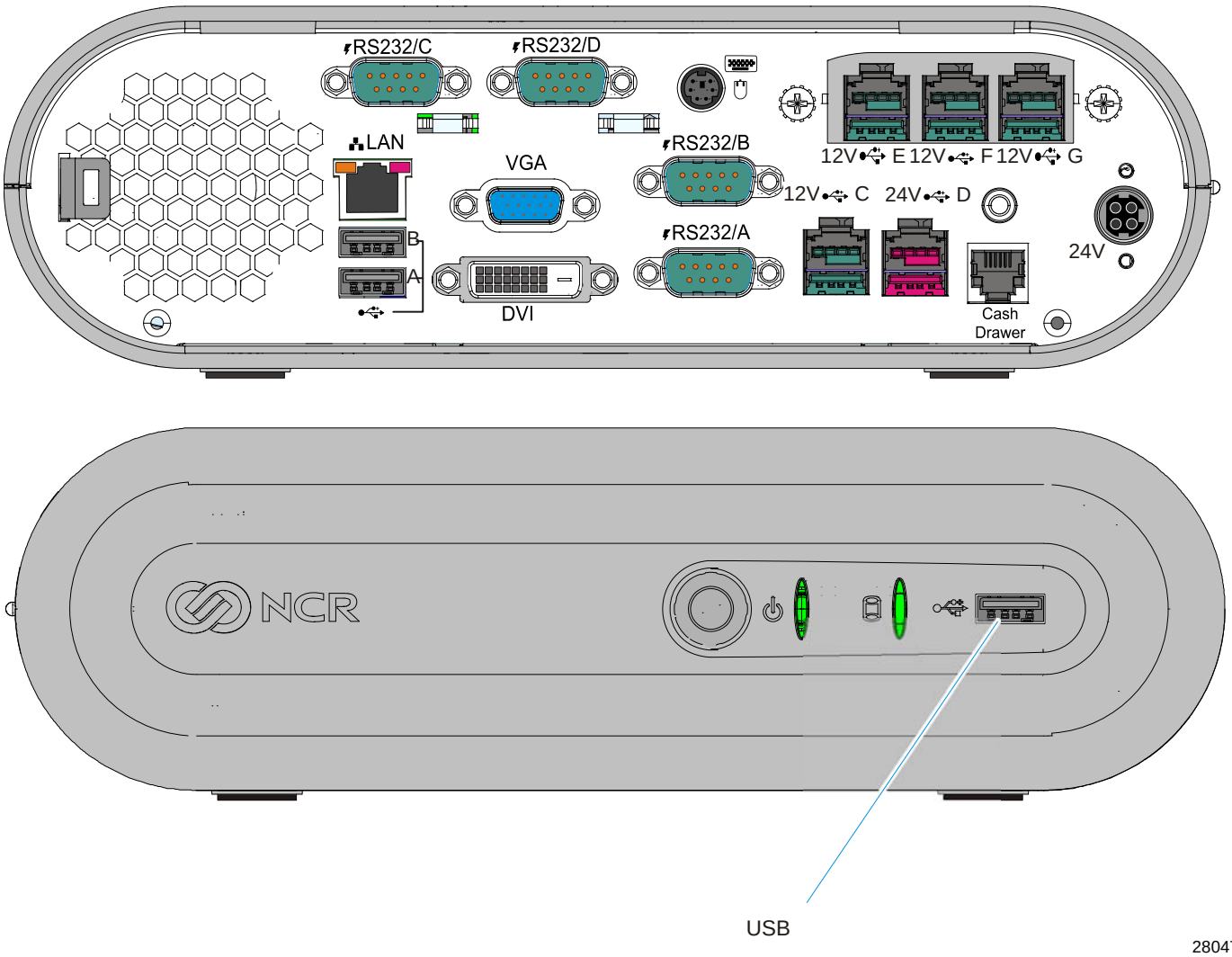
- Before installing the RealPOS 40, read and follow the guidelines in the *RealPOS 40 Site Preparation Guide* (B005-0000-1552) and the *NCR Workstation and Peripheral AC Wiring Guide* (BST0-2115-53).
- Install the RealPOS 40 near an electrical outlet that is easily accessible. Use the power cord as a power disconnect device.
- Do not permit any object to rest on the power cord. Do not locate the RealPOS 40 where the power cord can be walked on.
- Use a grounding strap or touch a grounded metal object to discharge any static electricity from your body before servicing the RealPOS 40.

Caution: This unit contains hazardous voltages and should only be serviced by qualified service personnel.

Caution: **Do not** connect or disconnect the transaction printer while the terminal is on. This can result in system or printer damage.

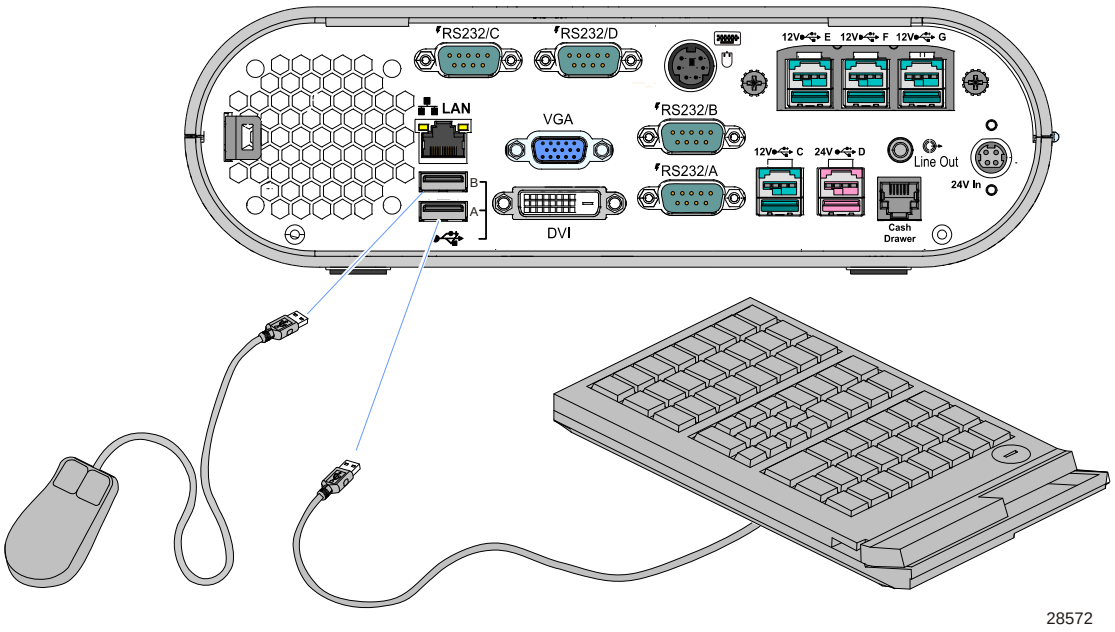
Installing the Terminal

1. Unpack the terminal in the desired location.
2. Connect the external cables to the connectors located on the rear of the unit. There is also a USB connector on the Front Panel. See the following sections for each component.

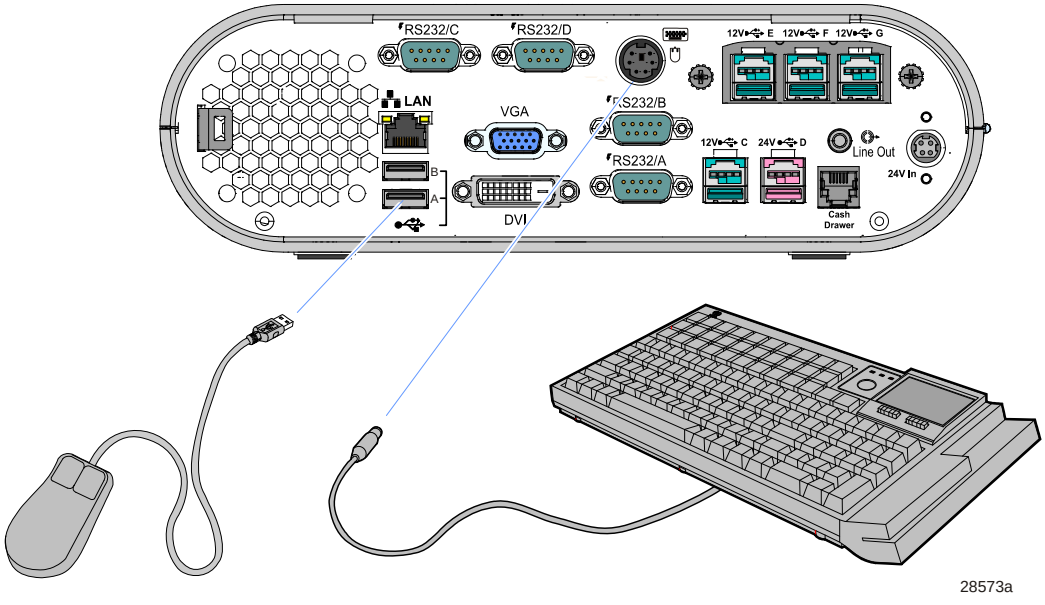


Installing the Keyboard and Mouse

The 7600 supports USB and PS/2 type keyboards. Only USB mice are supported. See the following examples of supported configurations.

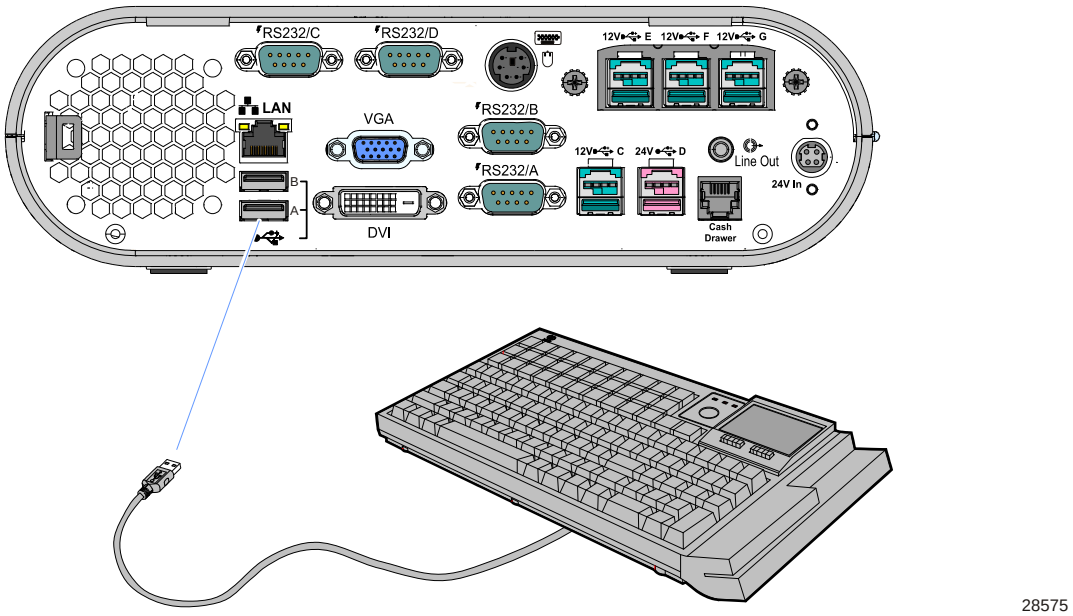


USB Keyboard and USB Mouse



PS/2 Keyboard and USB Mouse

Note: PS/2 Extension Cables cannot be used with a PS/2 Keyboard that has a Glide Pad.



28575

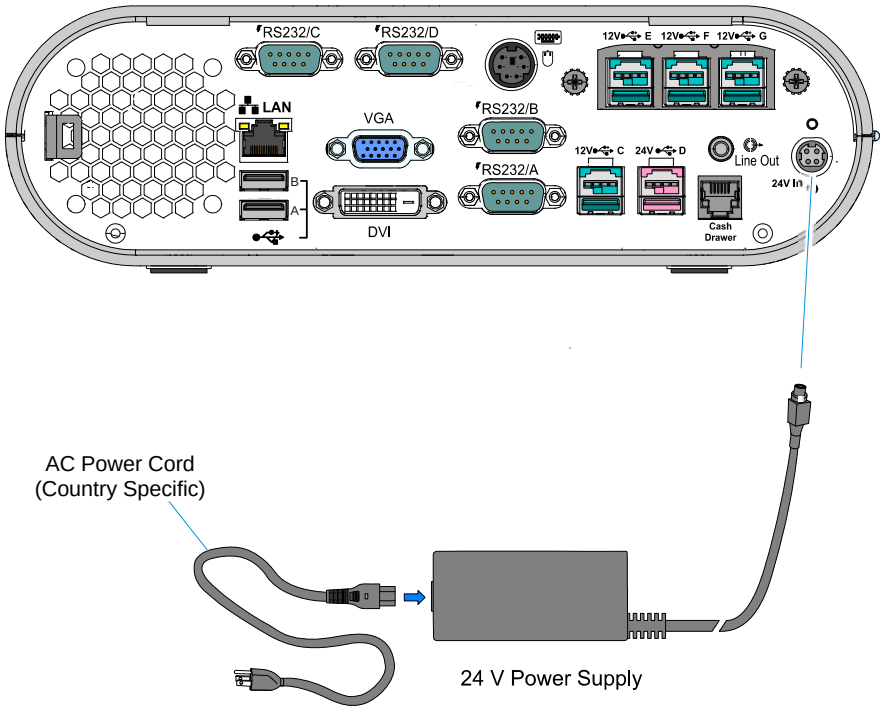
USB Keyboard w/Glide Pad

Connecting AC Power

The 7600 power supply is an external 24 V power brick.

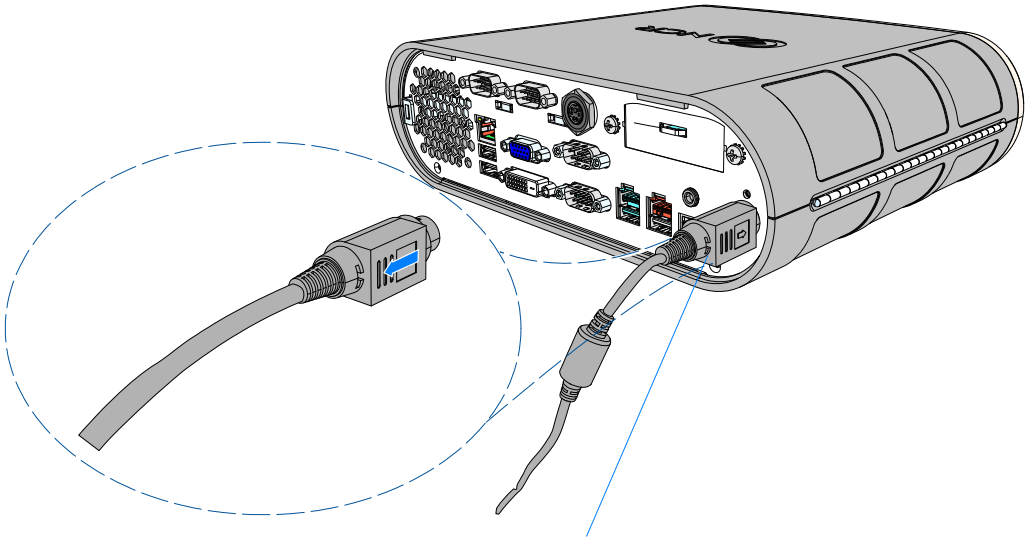
Caution: The 7600 requires the NCR 24 V power supply that is shipped with the terminal. Use of other power bricks may cause damage to the unit.

1. Connect the Power Supply cable to the *DC Power* connector on the terminal.
2. Connect the AC Power Cord to the Power Supply and to an AC outlet.



Disconnecting the Power Cable

The Power Cable connector *locks* into position when connected to the terminal and cannot be removed by simply pulling on the cable. You must grasp the connector and slide the outside housing out from the terminal to *unlock* it from the terminal connector.



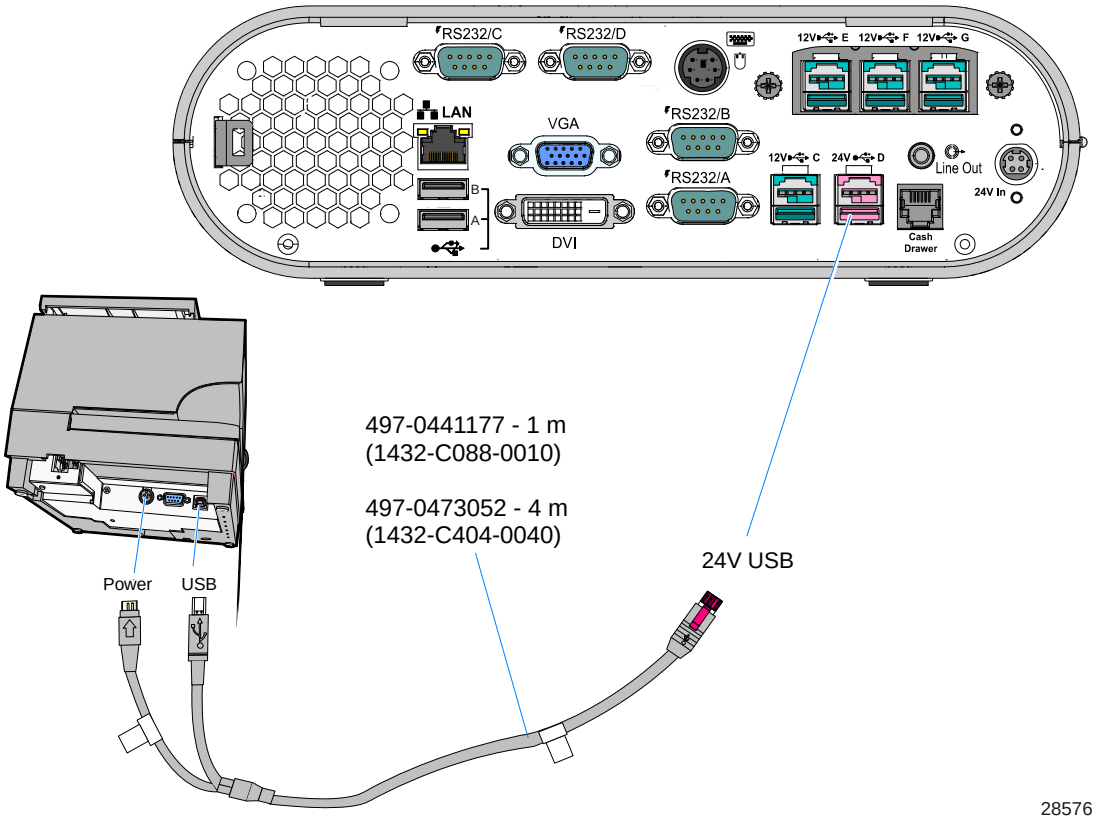
Terminal Power Cable 28690

Installing the Transaction Printer

The printers can connect through a USB connector or an RS-232 connector.

USB Installation

Connect the Powered USB Printer Interface Cable to the *USB Connector* and *Power Connector* on the printer and to the *24 V Powered USB Connector* on the terminal.

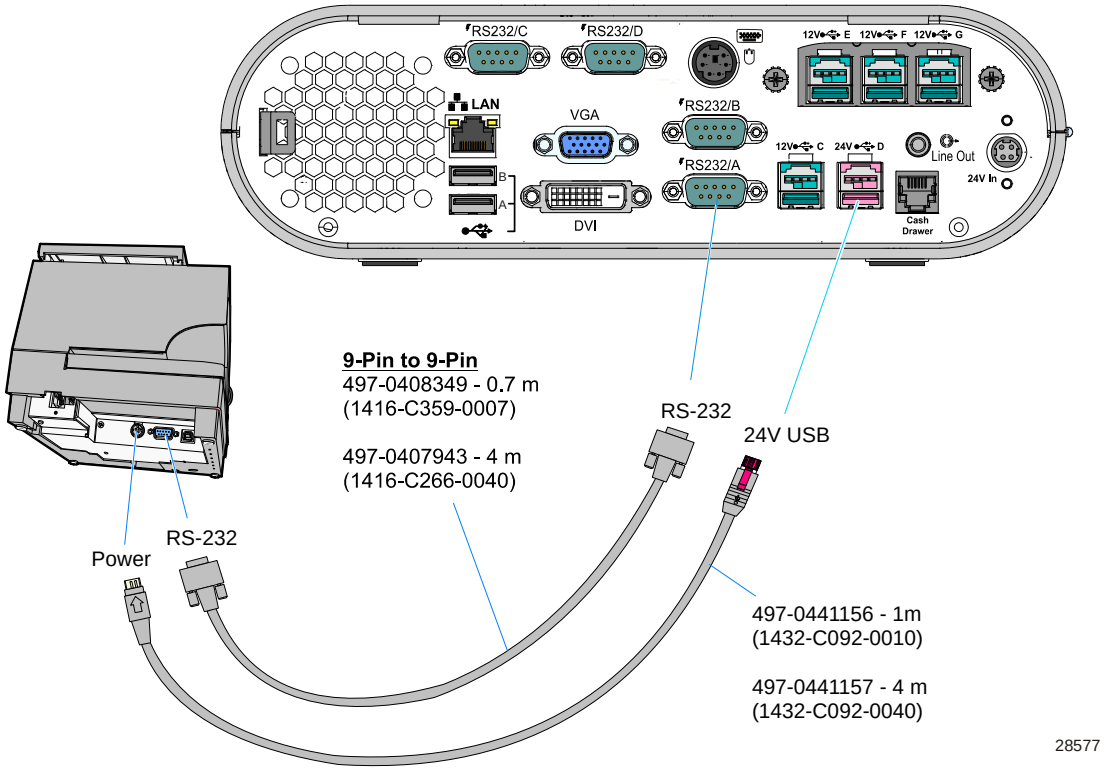


RS-232 Installation

1. Connect the RS-232 Printer Interface Cable to the *RS-232* connector on the printer and to a **non-powered** *RS-232* connector on the terminal.

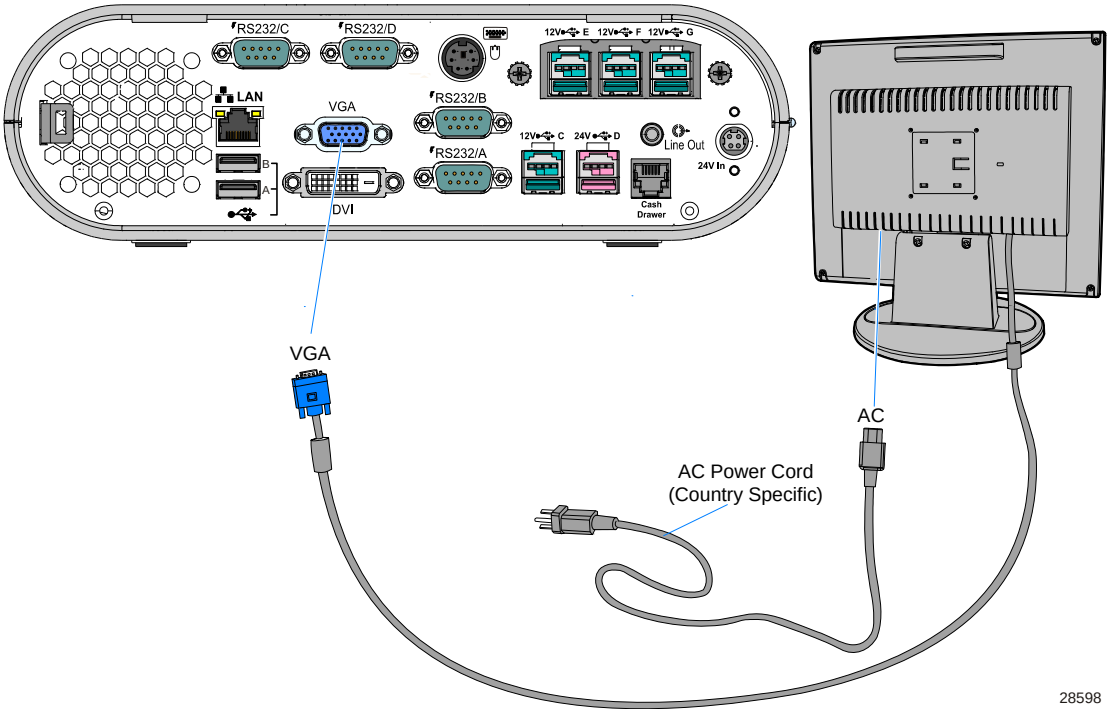
   Note: The factory default setting for the RS-232 ports is **powered**. See the Appendix: Powered Serial Port Settings.

2. Connect the Powered USB Printer Interface Cable to the *Power Connector* on the printer and to the *24V Powered USB Connector* on the terminal.



Installing a 5942 15-Inch LCD Monitor

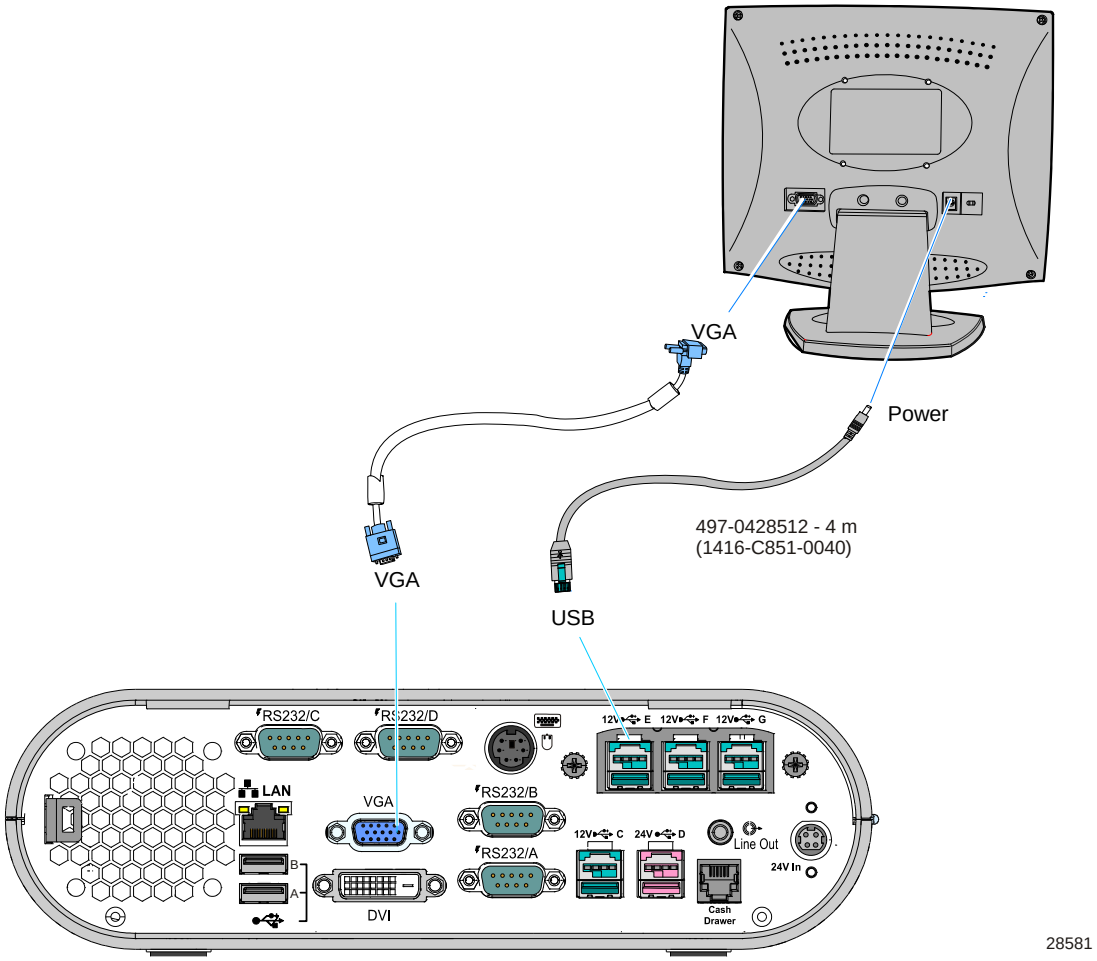
The 5942 15-Inch LCD Monitor receives video through the VGA interface. Power is received from an AC power source.



1. Connect the Video Cable from the 5942 to the *VGA* connector on the RealPOS 40 terminal.
2. Connect the AC Power Cable to the 5944 and to an AC power source.

Installing a 5942 12-Inch Monitor

Note: The 5942 LCD Monitors receive video through the VGA interface. Power is received from the terminal using a powered USB cable.



3. Connect the Video Cable to the *VGA* connectors on the 5942 monitor and RealPOS 40 terminal.
4. Connect the Powered USB Cable to the 5942 and to the *Powered 12V USB* connector on the terminal.

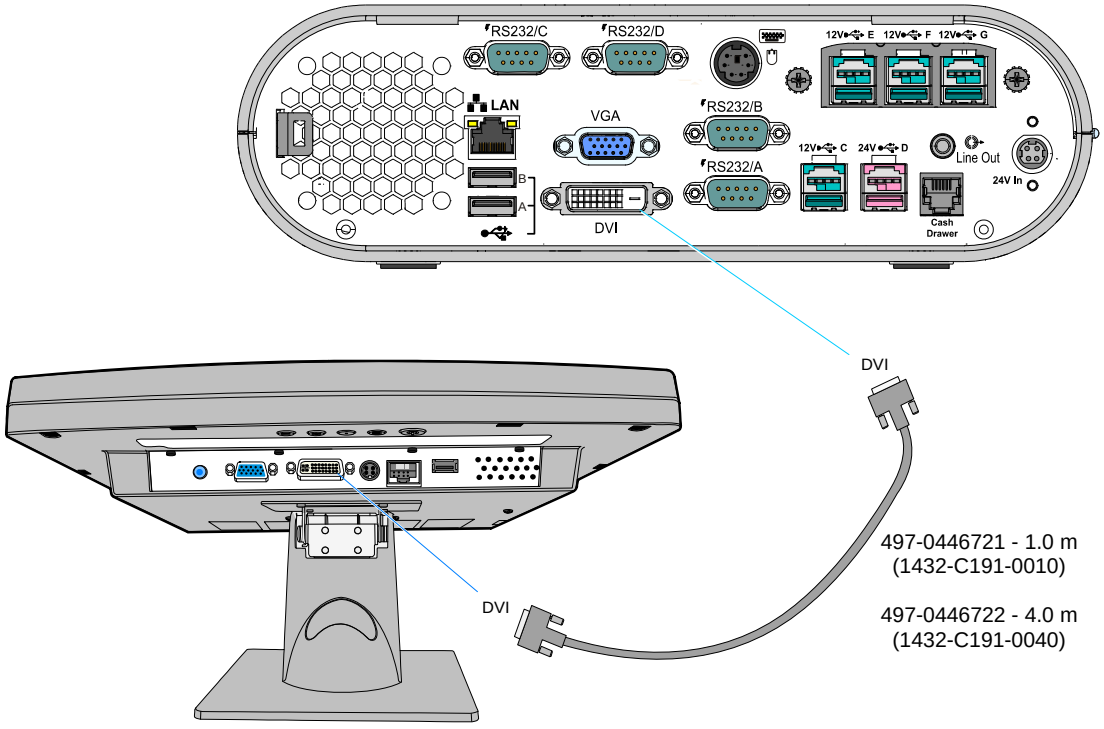
Installing a 5964 15-Inch LCD Touch Monitor

There are two cables required to configure a 5964 15-Inch Touch LCD.

- DVI or VGA cable for video
- Power Universal Serial Bus (USB) for data and power

DVI Connections (Video)

1. Connect the DVI Cable to the *DVI* connectors on both the 5964 Touch Monitor and the RealPOS 40 terminal.



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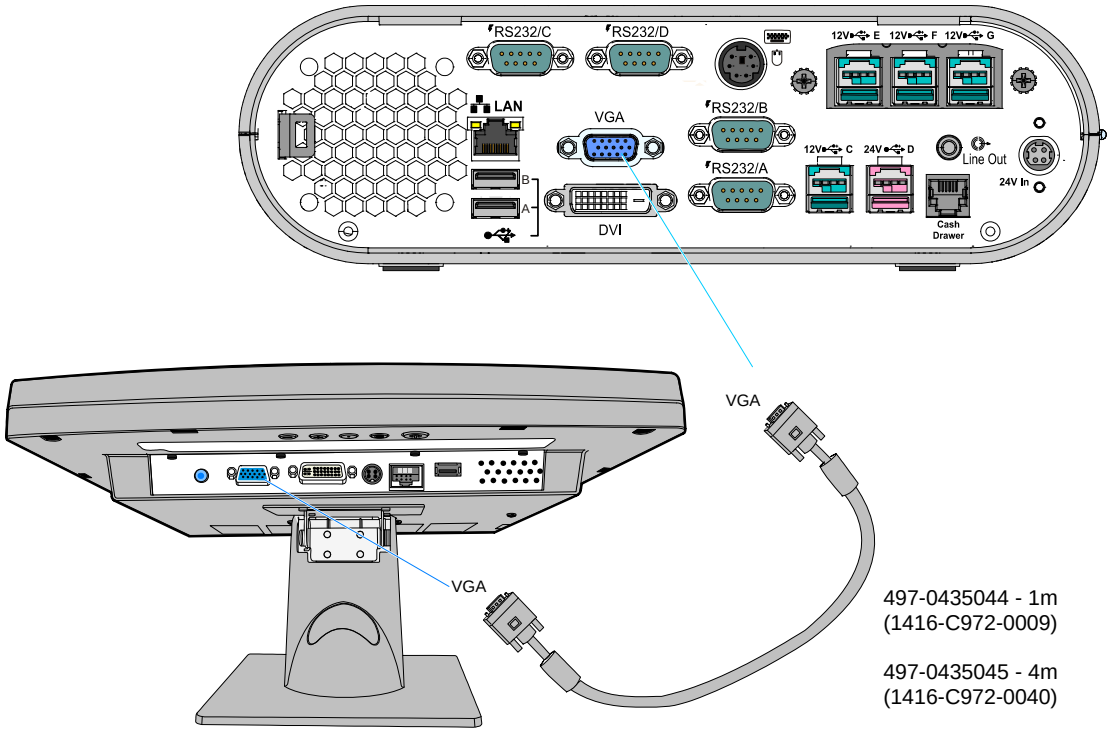
VGA Connections (Video)

1. Connect the VGA Cable to the *VGA* connectors on both the 5964 Touch Monitor and the RealPOS 40 terminal.



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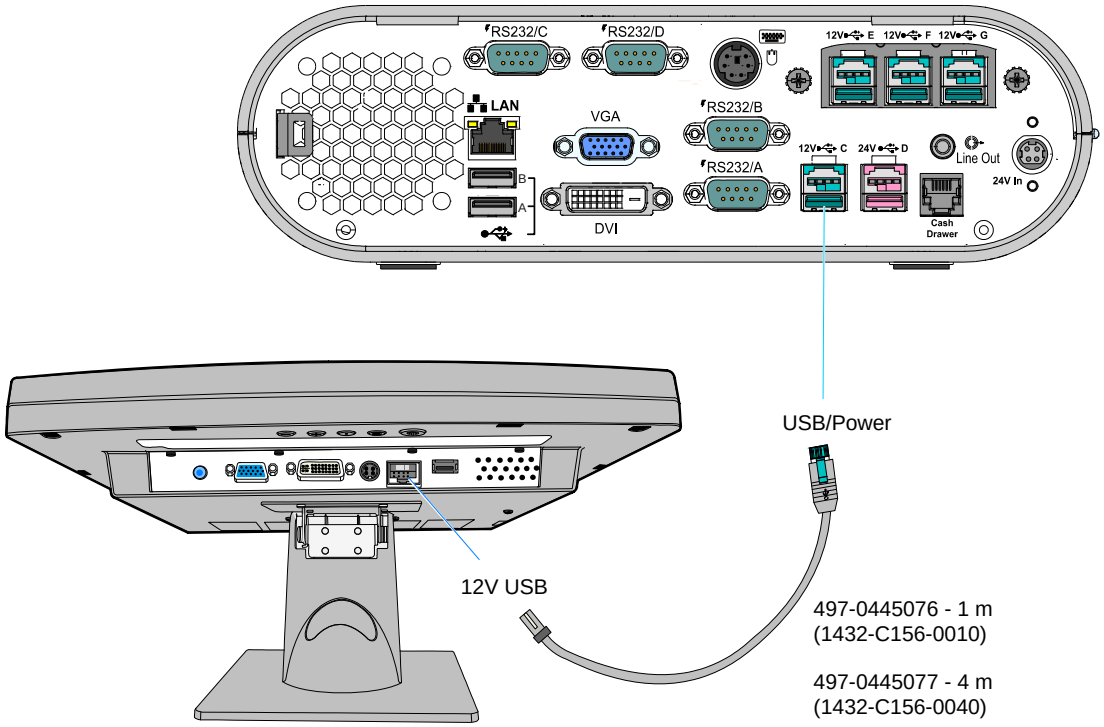
Powered USB Cable Connections (Data and Power)

1. Connect the Powered USB Cable to the 5964 and to one of the *12V Powered USB* connectors on the RealPOS 40 terminal.



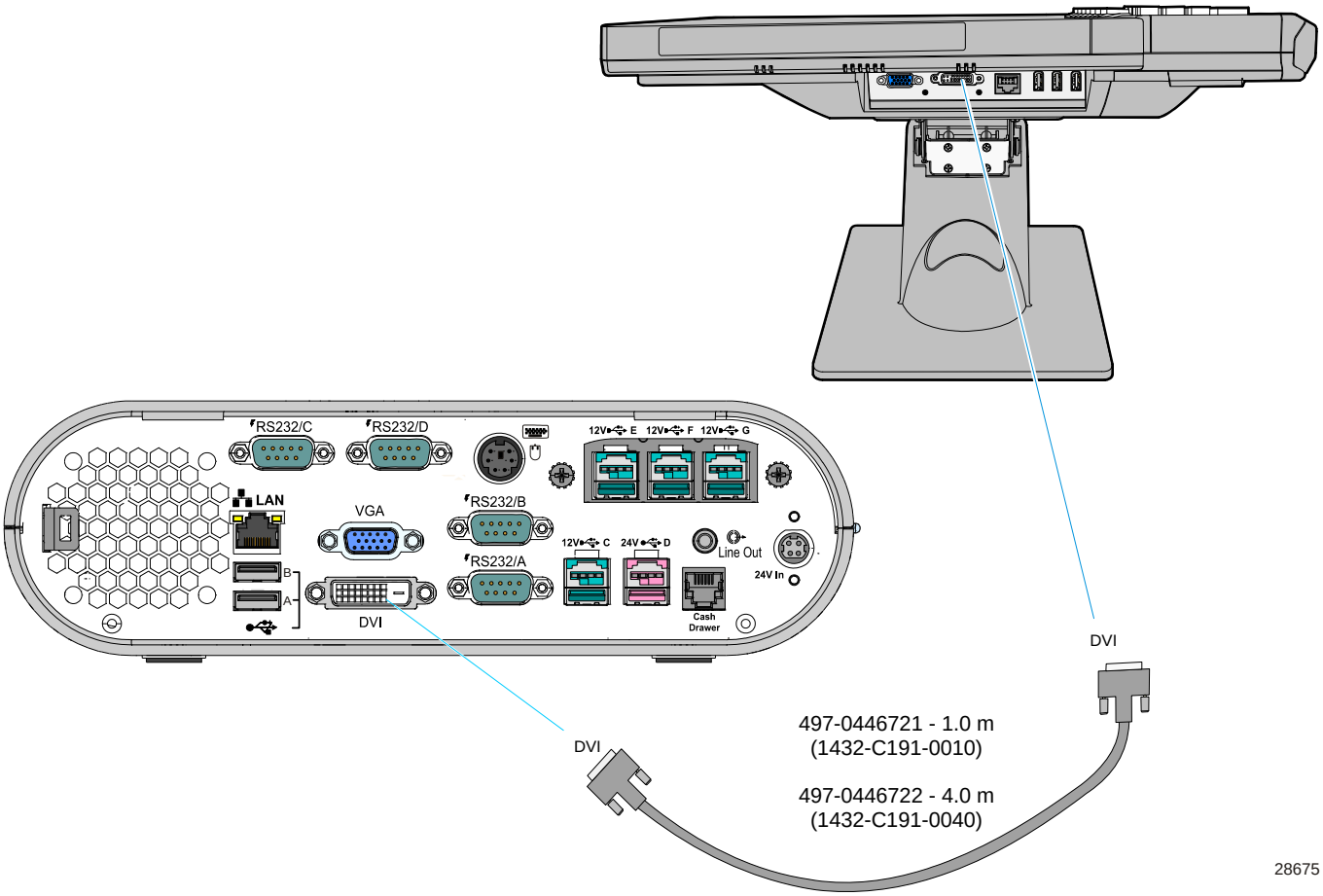
NCR 5954 USB DynaKey Cable Connections

The DynaKey connects to the terminal via two cables.

- Digital Video Interface (DVI) or VGA cable for video
- Powered Universal Serial Bus (USB) for data and power

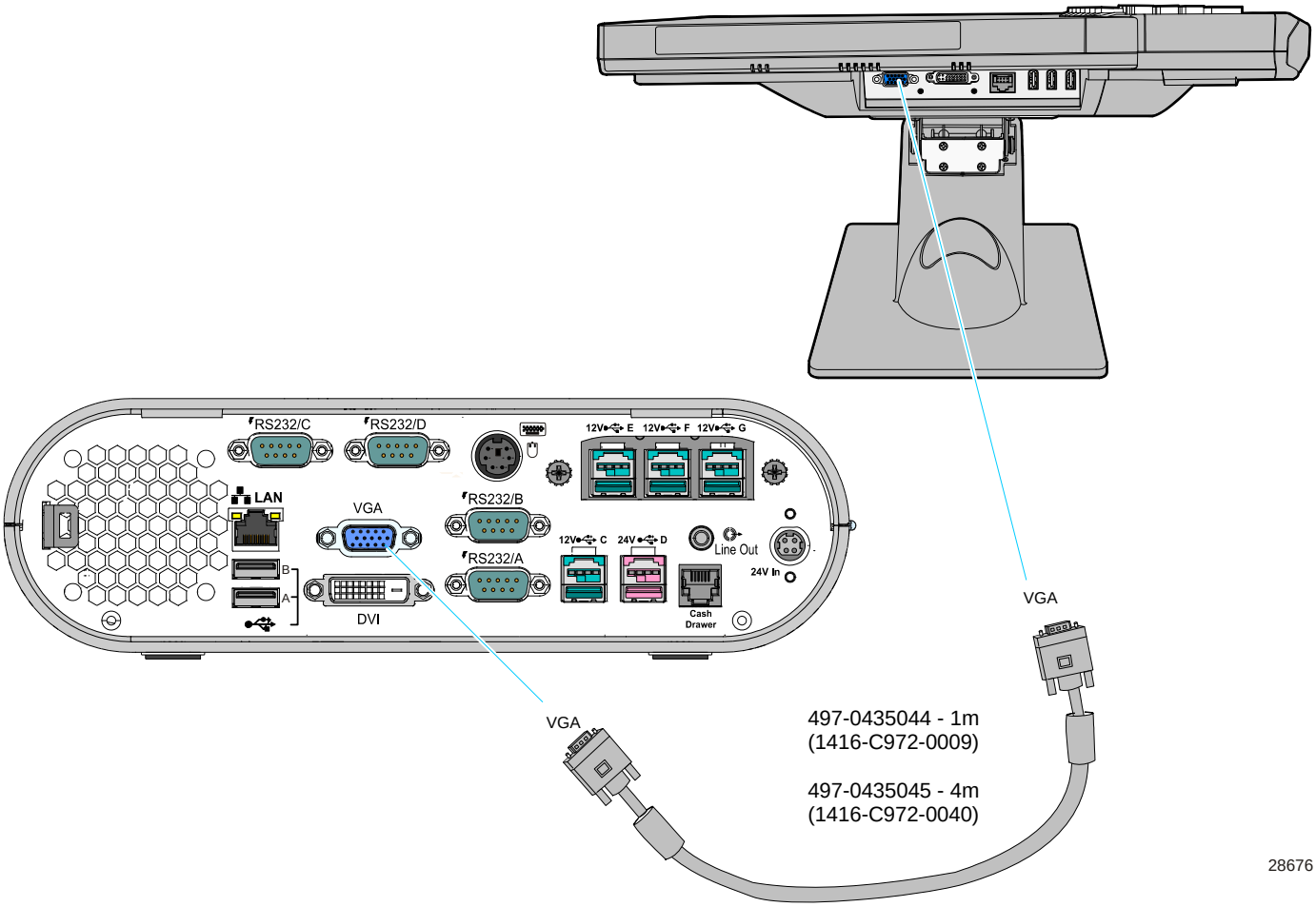
DVI Cable Connections

Connect the cable to the *DVI* connectors on the DynaKey and terminal.



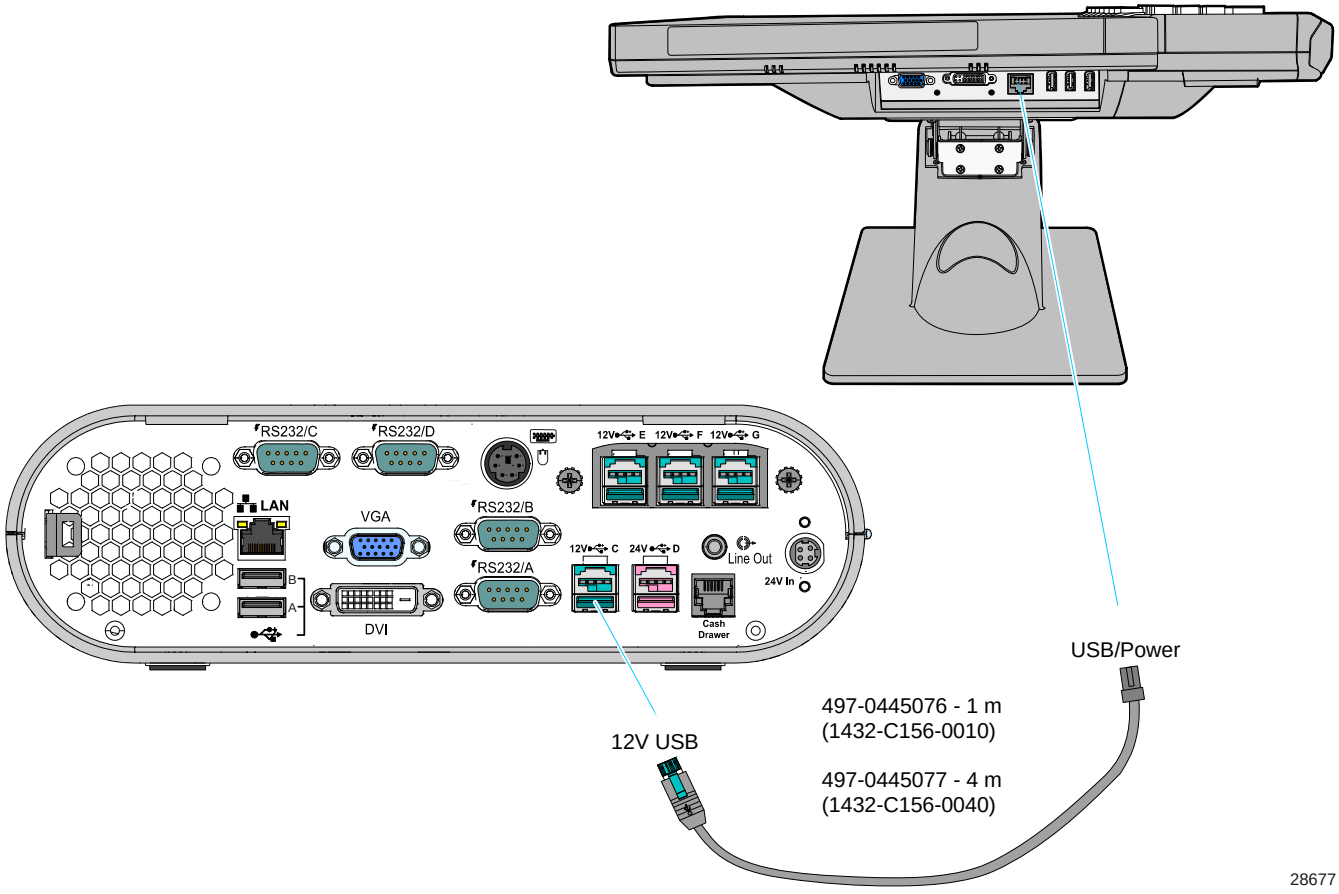
VGA Cable Connections

Connect the cable to the *VGA* connectors on the DynaKey and terminal.



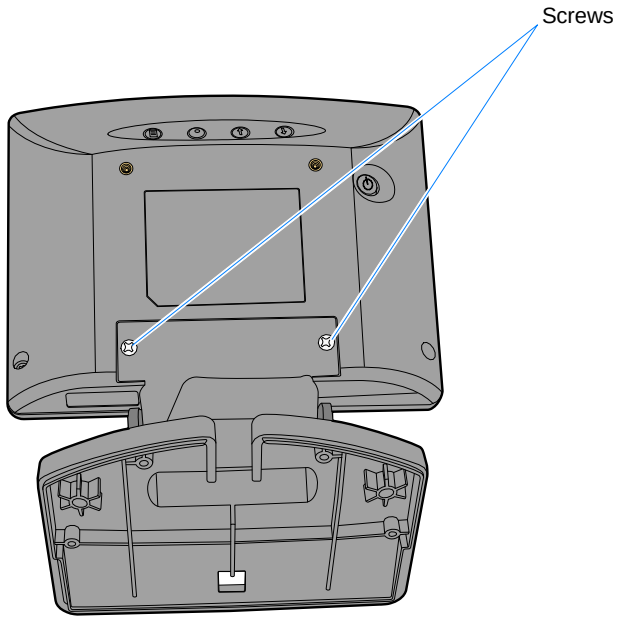
Powered USB Cable Connections

Connect the Powered USB Cable to the DynaKey and to one of the *Powered USB* connectors on the terminal.



Installing a 5982 6.5-Inch LCD

1. Remove the Base from the Display (2 screws).



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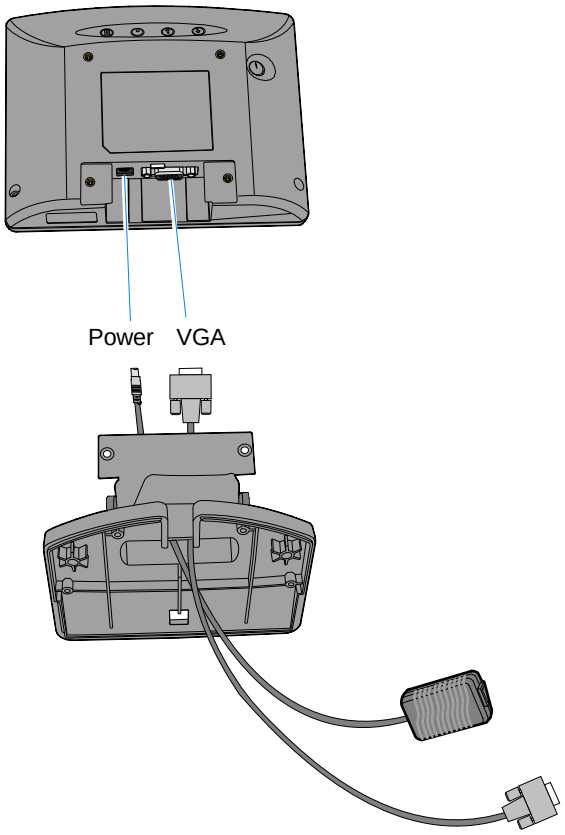
2. Route the VGA and Power cables up through the bottom of the Base and connect them to the Display.

   Note: The power cable can be either an External Power Supply or a Powered USB cable.



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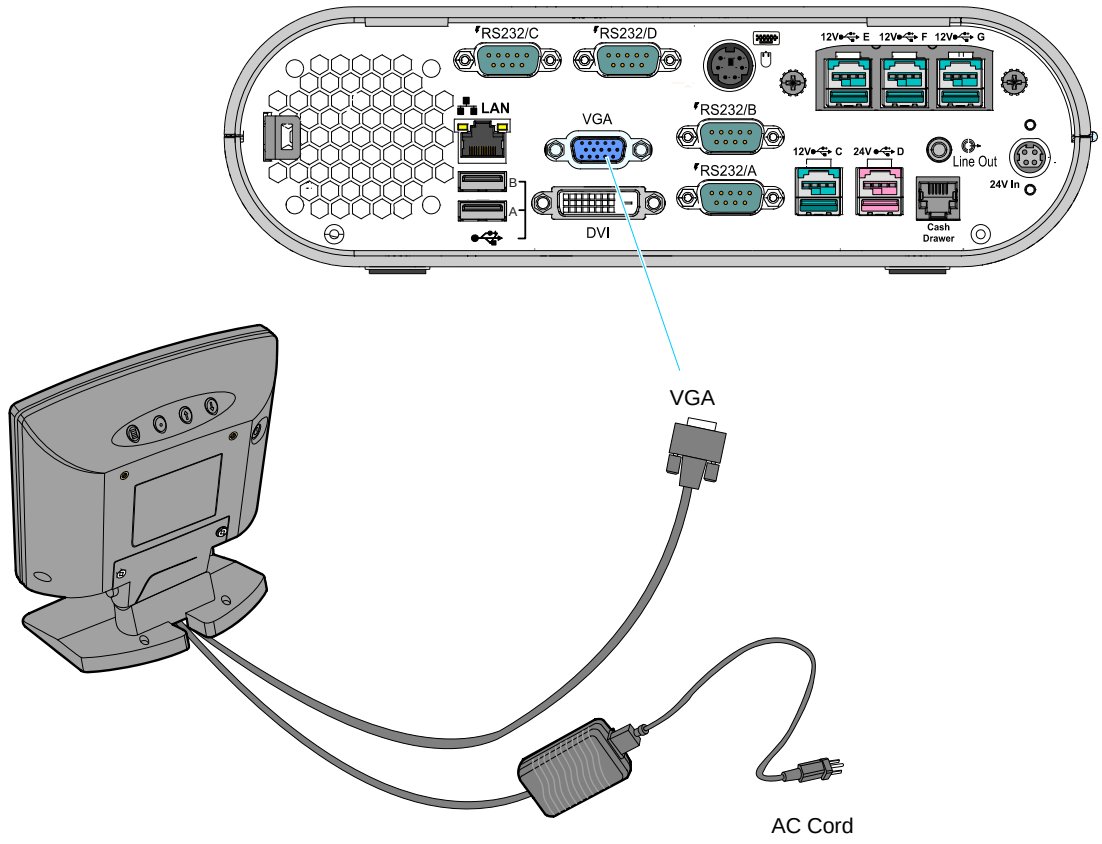
3. Install the Base to the Display (2 screws).
4. Route the cables out the rear of the Base.

5. Connect the Power Cable:

External Power Supply

a. Connect the AC Cord to the Power Supply.

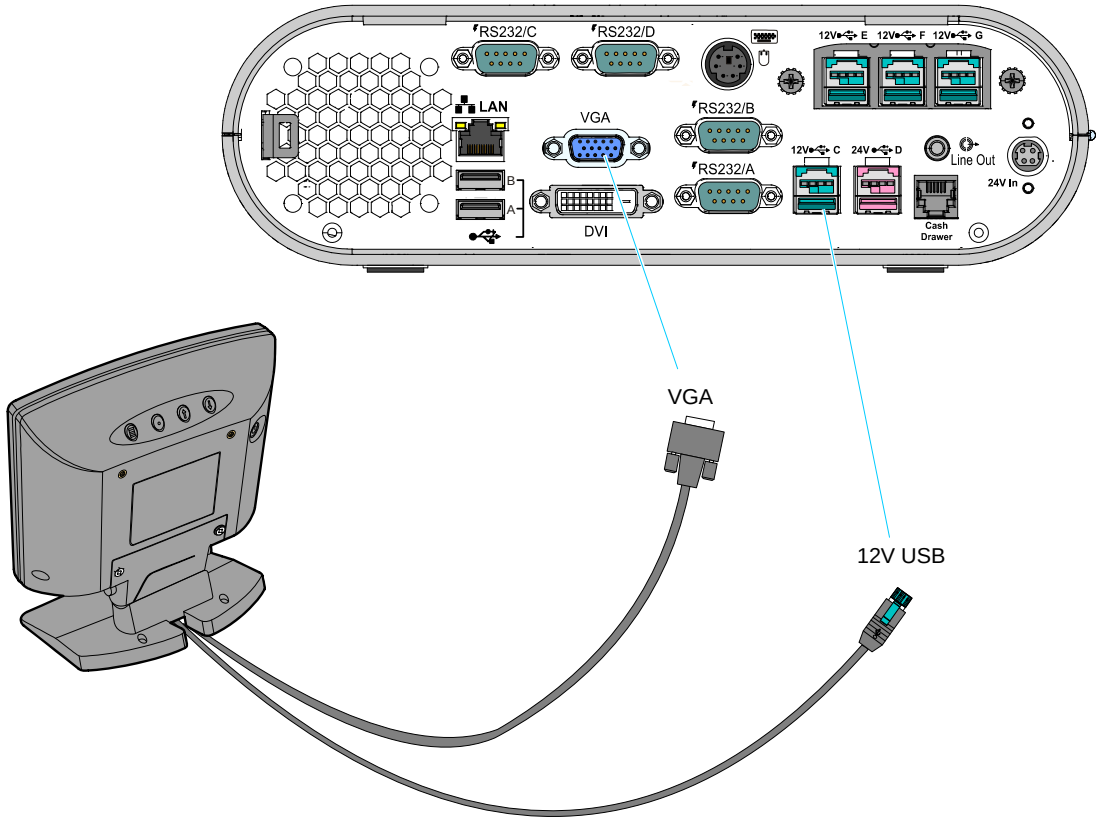


b. Connect the VGA cable to the *VGA* port on the host terminal.

c. Connect the power cable to an AC source.

Terminal Powered (7446-30303131)

a. Connect the Power Cable to the *Powered 12V USB* port on the host terminal.



Installing a Secondary Display (Dual Display)

The 7600 Motherboard uses an integrated video controller with the Intel 945GSE GMCH chipset. This controller provides a Monitor port (VGA) and a Digital Display port (DVI) on the motherboard connector row. These two ports provide a single display mode (DVI or VGA) or a dual display mode (DVI and VGA). Dual display mode can be a *clone* (same video data displayed on both displays) or an *extended desktop* (the desktop spans across both displays).

The dual mode is configured using the *Intel® Graphics Media Accelerator* control panel.

1. Power down the system.
2. Connect the secondary display.

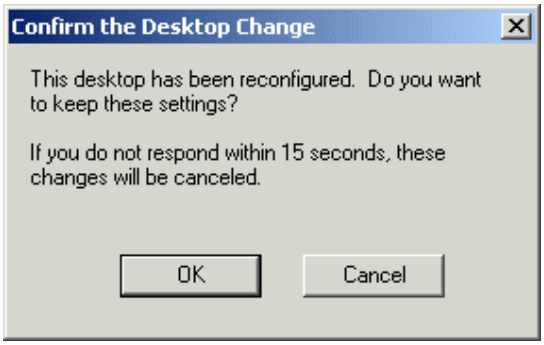
   Note: Both displays must be connected to the 7600 before powering up the system.

3. Apply power to the system.
4. Right click the Desktop and then select **Graphics Properties** from the menu to start the control panel. The following screen indicates the system was previously configured with a single VGA display.

Dual Display Clone

1. From the *Operating Mode* drop-down menu select **Intel(R) Dual Display Clone**.
2. Select the Primary Device: **Monitor** *or* **Digital Display**.
3. Select the Secondary Device: **Digital Display** *or* **Monitor**.
4. Select **Apply**.

5. Select **OK** within 15 seconds to accept the new settings.

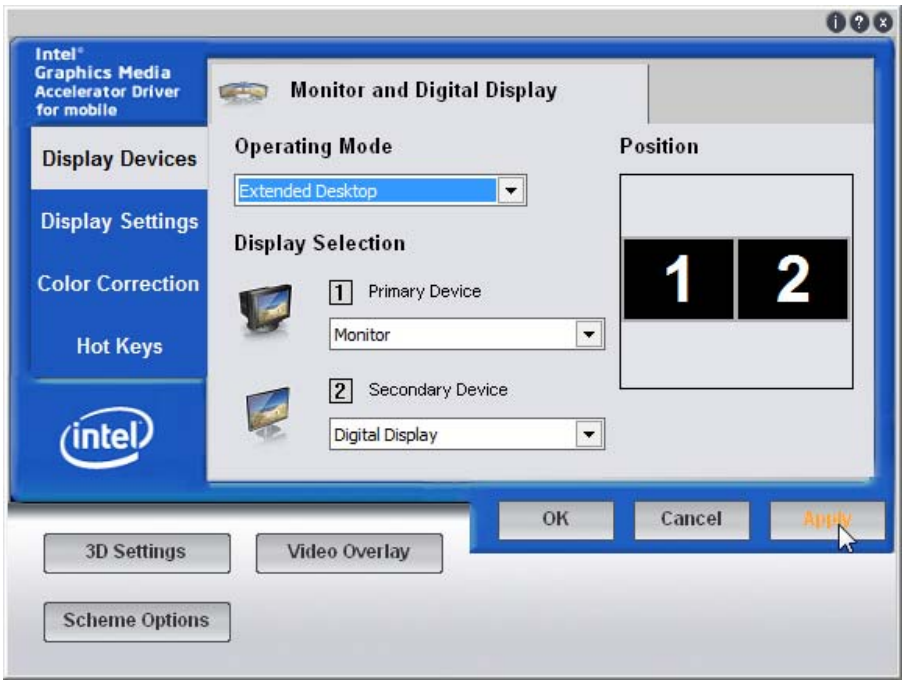


6. Select **OK** to close the Control Panel.

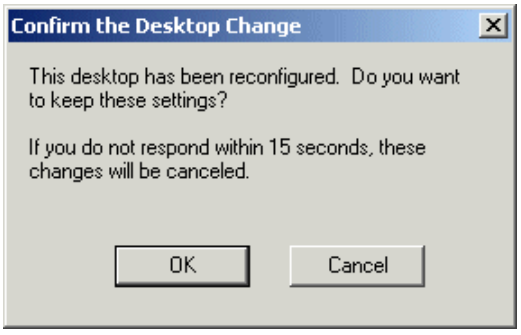
Extended Desktop Dual Display

1. Select Extended Desktop
2. Select **Primary Device**: Monitor or Digital Display. (This display has the Start button and Taskbar)
3. Select **Secondary Device**: Digital Display or Monitor. (This display is the desktop extension)

   You can re-position the displays as desired by dragging the 1 or 2 icons in the Position box.
4. Select **Apply**.



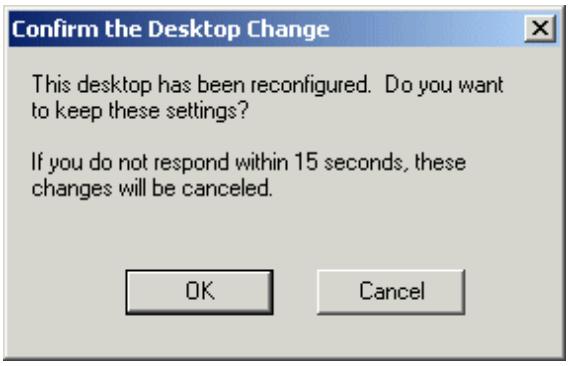
5. Select **OK** within 15 seconds to accept the new settings.



6. Select **OK** to close the Control Panel.

Single Display Mode

1. Select **Monitor** (or **Digital Display)**.
2. Select **Apply**.
3. Select **OK** within 15 seconds to accept the new settings.



4. Select **OK** to close the Control Panel.

Intel Graphics Controller Hot Keys

Hot Keys provide the same functionality as the Intel Graphics Control Panel with specific keystrokes on the keyboard. These hotkeys are listed in the Intel Control Panel under the Hot Keys tab. The most useful Hot Keys are:

`[CTRL][ALT][F1]` - Monitor in single display mode

`[CTRL][ALT][F4]` - Digital Display in single display mode

Note: The Hot Keys can be used to recover from a blank display in Windows. This is true only if Windows Desktop loads completely; meaning, if Windows is waiting for a login/password entry or if Plug and Play is waiting for operator input, the Hotkeys are not yet active.

Installing a Cash Drawer

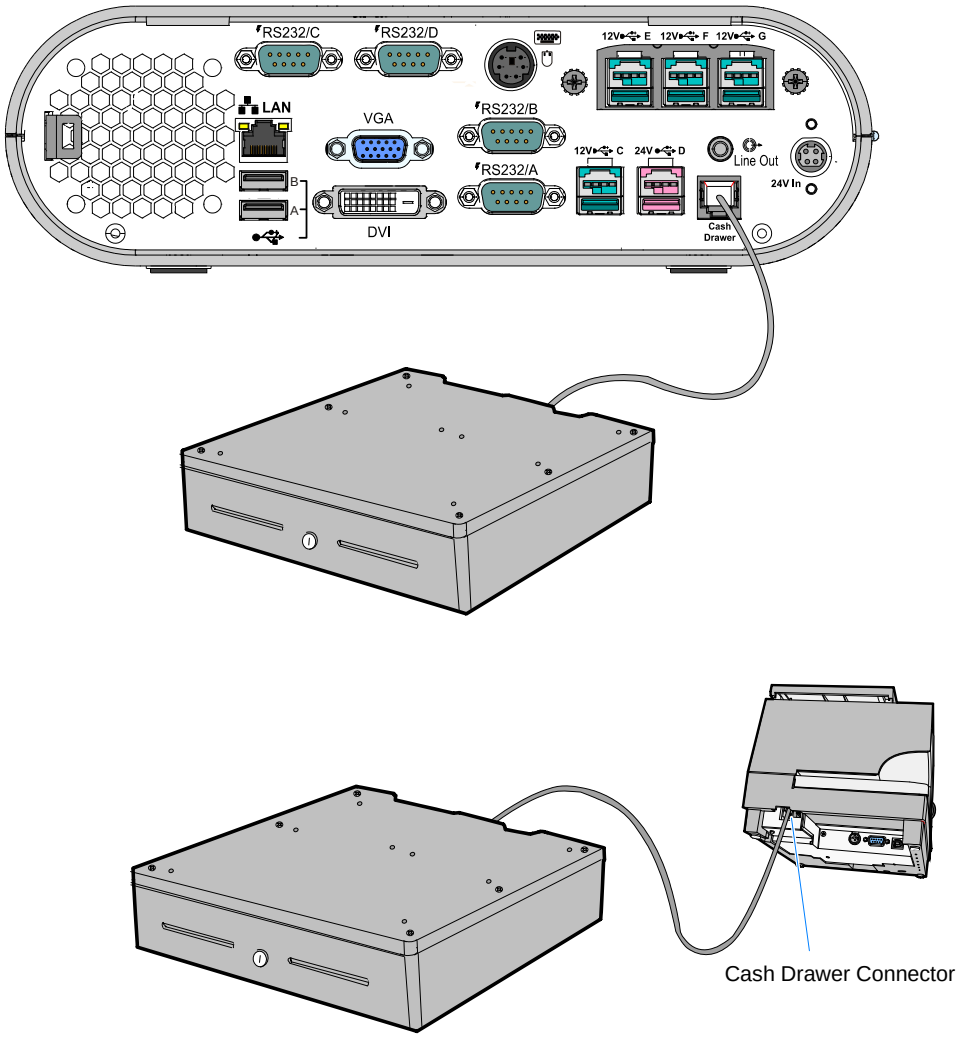
The small dimension of the RealPOS 40 permits the terminal to rest directly on most cash drawers. However, other peripherals like the keyboard or printer may or may not fit. The Cash Drawer can connect to the Cash Drawer connector or to the transaction printer.

Note: The 7600 is not designed for integration with any current NCR cash drawer.

The 7600 supports the following Cash Drawers:

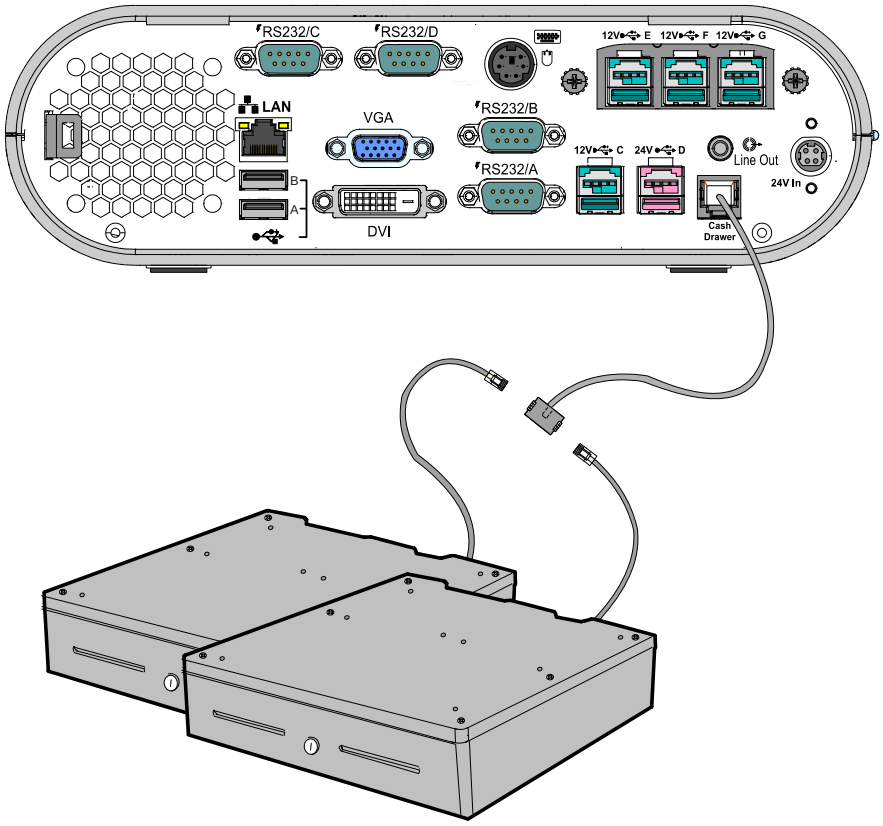
- 2185 Flip Top Drawer
- 2186 Compact Cash Drawer
- 2189 Full-size Cash Drawer

The Cash Drawer can be connected to the Back Panel on the 7600 or to the Cash Drawer Connector on the transacation printer.



Installing Two Cash Drawers

The 7600 supports a 2-drawer configuration with a Y-cable (1416-C372-0006).



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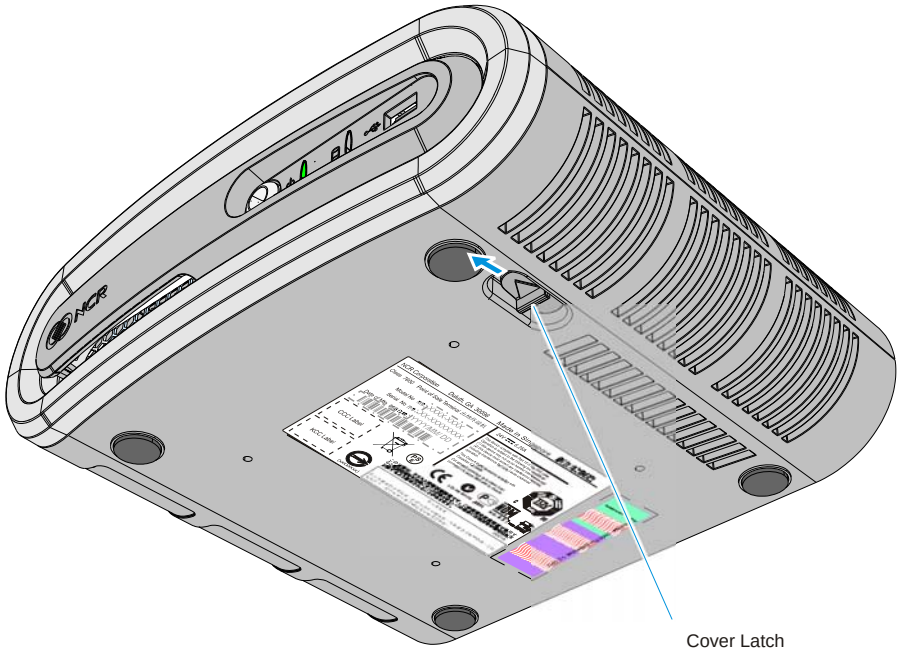
Replacing the Hard Disk Drive

The Hard Disk Drive (HDD) is mounted on the inside of the Top Cover and is easily accessed.

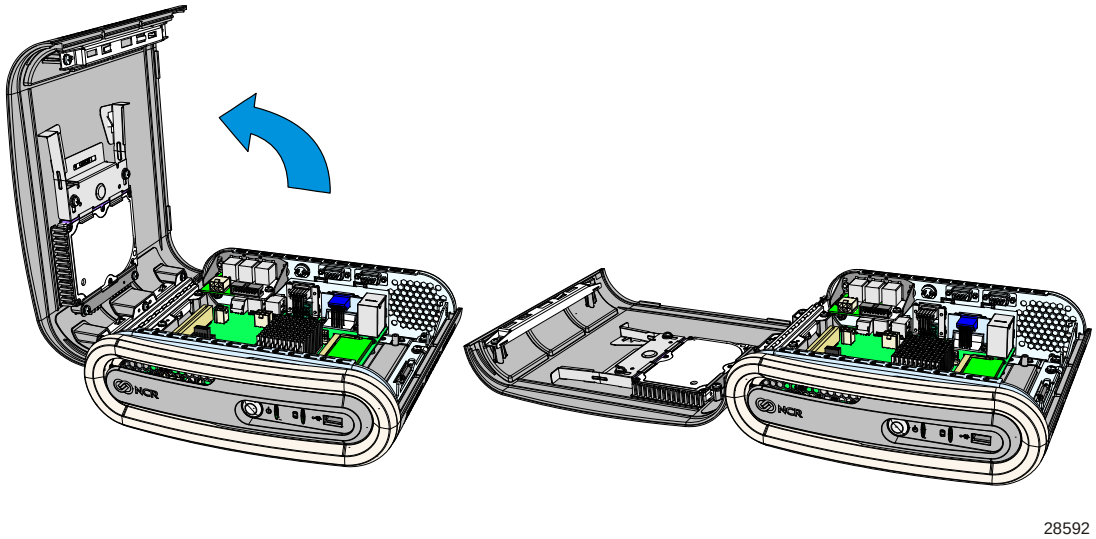
1. Slide the Cover Latch located on the bottom of the unit forward to unlock the Top Cover.

   Note: First remove the Security Lock on the rear if present.

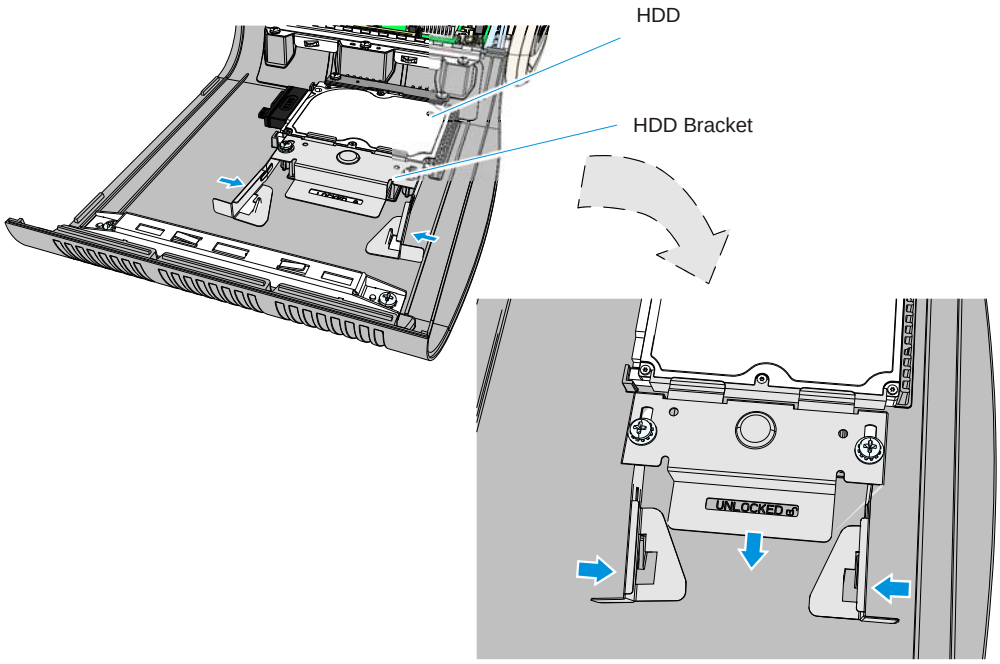


2. Pivot the Top Cover open and gently rest it on the table surface.

Caution: When opening the cover, do not allow it to drop onto the table surface. The mechanical shock can damage the HDD.



3. Squeeze the latches on the HDD Bracket as shown to unlock the bracket from the Top Cover and slide the HDD Bracket as shown until you see `Unlocked` displayed in the opening in the HDD Bracket.



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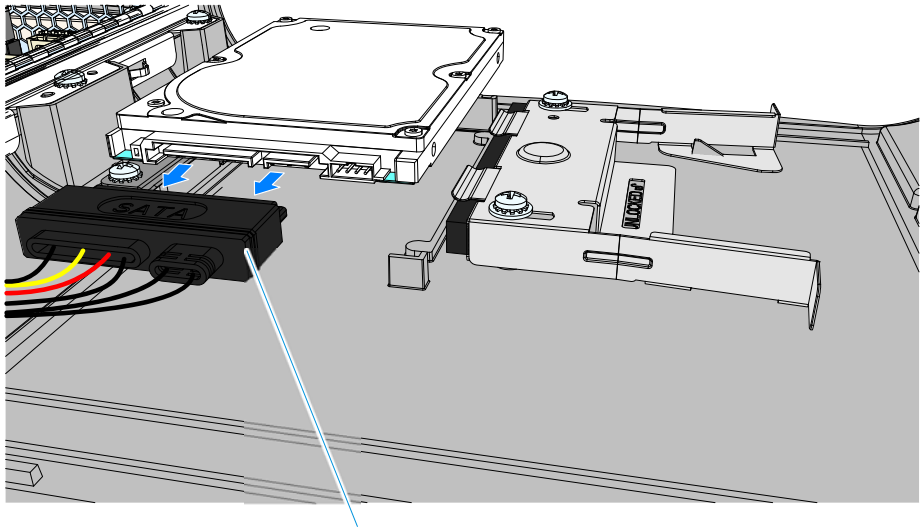
4. Remove the HDD from the Top Cover Bracket and disconnect the cables.



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5. Install the new HDD using the reverse procedure.

Chapter 3: Setup

Entering Setup

1. Connect an alphanumeric USB keyboard to the terminal.
2. Apply power to the terminal.
3. When you see the NCR logo displayed press **[Del]**.

How to Select Menu Options

The following keyboard controls are used to select the various menu options and to make changes to their values.

- Use the arrow keys to select (highlight) options and menu screens.
- Use the **[Enter]** key to select a submenu.
- Use the **[+]** and **[-]** keys to change field values.
- To view help information on the possible selections for the highlighted item, press **[F1]**.
- To save the changes, move the cursor to the ***Exit Menu***, select either ***Save Changes & Exit*** or ***Save Changes***, and press **[Enter]**.

Restoring Factory Settings

To reset all values to their default settings for the **current screen**, press **[F9]** and then **[Enter]** when the confirmation message is displayed. The terminal automatically loads the BIOS default values. To reset **all** BIOS settings to their default settings go to the ***Exit*** menu, press F9, select either ***Save Changes & Exit*** or ***Save Changes***, and press **[Enter]**.

Note: The 7600 Motherboard is used on other products and has a jumper that is used to select the proper BIOS defaults. If the Motherboard is replaced be sure this jumper is set to the RSD setting.

See the *BIOS Default Settings* sections later in this chapter for the pre-installed Setup defaults.

BIOS Default Values

NCR BIOS Version: 1.1.8.0

Main Menu

System Time	(variable)
System Date	(variable)

Advanced Menu

CPU Configuration	
Max CPUID Value Limit	[Disabled]
Execute-Disable Bit Compatibility	[Enabled]
Intel (R) SpeedStep(tm) tech	[Enabled]
Intel (R) C-STATE tech	[Enabled]
Enhanced C-States	[Enabled]
IDE Configuration	
ATA/IDE Configuration	[Enhanced]
Configure SATA#1 as	[AHCI]
SATA 0	[Hard Disk]
Type	[Auto]
LBA/Large Mode	[Auto]
Block (Multi-Sector Transfer)	[Auto]
PIO Mode	[Auto]
DMA Mode	[Auto]
S.M.A.R.T.	[Auto]
32Bit Data Transfer	[Enabled]
SATA 1	[Not Detected]
Type	[Auto]
LBA/Large Mode	[Auto]
Block (Multi-Sector Transfer)	[Auto]
PIO Mode	[Auto]

DMA Mode	[Auto]
S.M.A.R.T.	[Auto]
32Bit Data Transfer	[Enabled]
SuperIO Configuration	
Serial Port A/1 Address	[3F8]
Serial Port A/1 IRQ	[4]
Serial Port B/2 Address	[2F8]
Serial Port B/2 IRQ	[3]
Serial Port C/3 Address	[3E8]
Serial Port C/3 IRQ	[11]
Serial Port D/4 Address	[2E8]
Serial Port D/4 IRQ	[10]
System Hardware Health Monitoring	Typical *(Acceptable Range)*
CPU Temperature	:51°C/125°F *(less than 65°C)*
GMCH Temperature	:50°C/122°F *(less than 65°C)*
VRM Temperature	:49°C/120°F *(less than 60°C)*
Fan1 Speed	:N/A *(no fan)*
Fan1 Speed	:N/A
CPU Vcore	:1.184 V *(1.00 – 1.30)*
CPU VIT	:1.056 V *(0.90 – 1.20)*
+3.30V	:3.312 V *(3.05 – 3.55)*
+5.00V	:4.972 V *(4.60 – 5.40)*
+12.0V	:11.904 V *(11.20 – 12.80)*
5Vsb	:4.945 V *(4.60 – 5.40)*
ACPI/APM Configuration	
ACPI Aware O/S	[Yes]
Suspend mode	[S3 (STR)]
USB Device Wakeup From S4	[Enabled]
Power Button Mode	[On/Off]
Restore on AC Power Loss	[Last State]

Advanced Resume Event Controls	
LAN Wake Up From S5	[Enabled]
Resume On Ring	[Disabled]
Resume On RTC Alarm	[Disabled]
USB Configuration	
Legacy USB Support	[Enabled]
Port 64/60 Emulation	[Disabled]
USB 2.0 Controller Mode	[HiSpeed]
BIOSEHCI Hand-Off	[Enabled]
Legacy USB1.1 HC Support	[Enabled]

Boot Menu

Boot Settings Configuration	
Quick Boot	[Disabled]
Display POST Logo	[Enabled]
LAN Boot ROM	[Enabled]
Bootup Num=Lock	[On]
PS/2 Mouse Support	[Auto]
Interrupt 19 Capture	[Disabled]
BBS Menu	[Enabled]
Boot Order Defaults	[LAN First]
Boot Device Priority	
1st Boot Device	[Network:Realtek PX]
2nd Boot Device	[SATA:S0-TOSHIBA MK]
3rd Boot Device	[USB: *name of device*]
Hard Disk Drives	
1st Drive	[SATA:S0-TOSHIBA MK
CD/DVD Drive	
1st Drive	[USB: *name of device*]

Security Menu

Supervisor Password:	:Not Installed
User Password:	:Not Installed
Change Supervisor Password	[Enter]
Change User Password	[Enter]
Boot Sector Virus Protection	[Disabled]

Chipset Menu

NorthBridge Configuration	
Internal Graphics Mode Select	[Enabled, 8MB]
Video Function Configuration	
Boots Graphic adapter Priority	[PEG/PCI]
DUMT Mode Select	[DUMT Mode]
DUMT/FIXED Memory	[128MB]
PAVP Mode	[Disabled]
Boot Display Device	[Auto-Detect]
South Bridge Configuration	
USB 2.0 Controller	[Enabled]
Audio Controller	[Enabled]
LAN Controller	[Enabled]
SLP_S4# Min./ Assertion Width	[1 to 2 seconds]

Chapter 4: Operating System Recovery

Introduction

This chapter discusses procedures on how to recover the Operating System from CD-ROM using the following methods:

- Bootable USB DVD Drive
- Bootable USB Memory Drive

Prerequisites

The following are required in order to perform an OS recovery from a DVD.

- Bootable USB DVD-ROM Drive
- Keyboard

OS Recovery Procedures for Windows XP

1. Insert the *NCR Partition Image Application* CD (D370-0605-0100) into the CD/DVD drive.
2. Connect a keyboard to the terminal.
3. Apply power to the terminal.
4. Press **[F8]** during boot (when you see the NCR logo) to enter the Boot Select menu.
5. Select **USB:[***name of device***]**.
6. You should see a message during boot, indicating that the device has been recognized.
7. At the menu, enter **1** to select the image restore function and press **[Enter]**.

```
###################################
   NCR Partition Image Application
###################################

Select an option
   1 – Process Image/Script CD
   2 – View Partition Image Documentation on CD
   3 – Interactive Create/Restore Via Network/USB
   4 - Exit and reboot
```

8. At the prompt, insert the CD containing the operating system image (disk 1 if OS occupies more than one disk). Press **[Enter]**.

9. Press **[A]** at the following prompt to accept the arguments and to begin the restore process. Press **[Enter].**

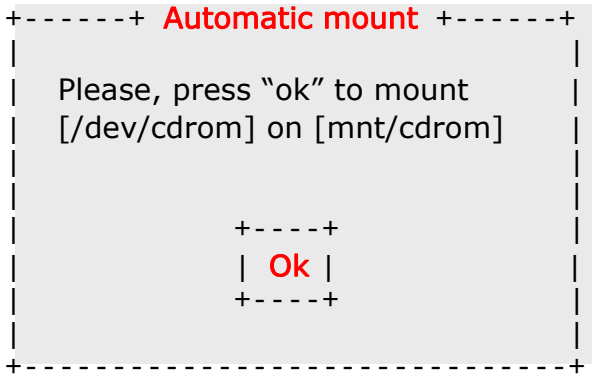
```
Confirm Pending Operation

      Mode is: restore

   2) Drive is: USB/SATA Storage A  Size: 80GB
   3) Directory path is: /Images/
   4) Filename is: nnnnnaaa
   5) Reboot after operation complete: yes
   6) Resize last data partition if possible: no
   7) Resize last data partition to: Full Disk

A) Accept these arguments
V) View OS Documentation
Q) Quit and reboot
```

10. At the following prompt replace the CD with the next CD. Press **[Enter]** to continue.

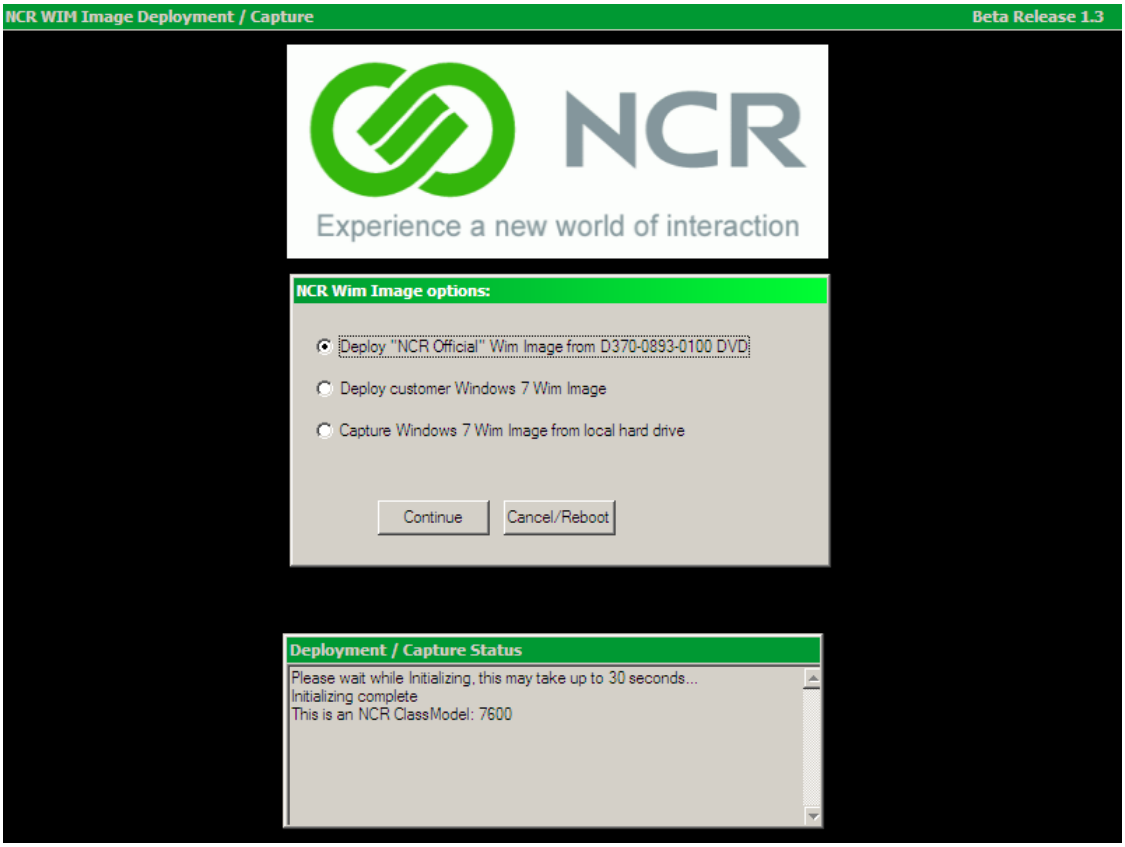


11. Repeat the previous step for each CD as required.
12. Remove the last CD before the system reboots.
13. Complete the OS installation as required per OS.

OS Recovery Procedures for Windows 7 Professional

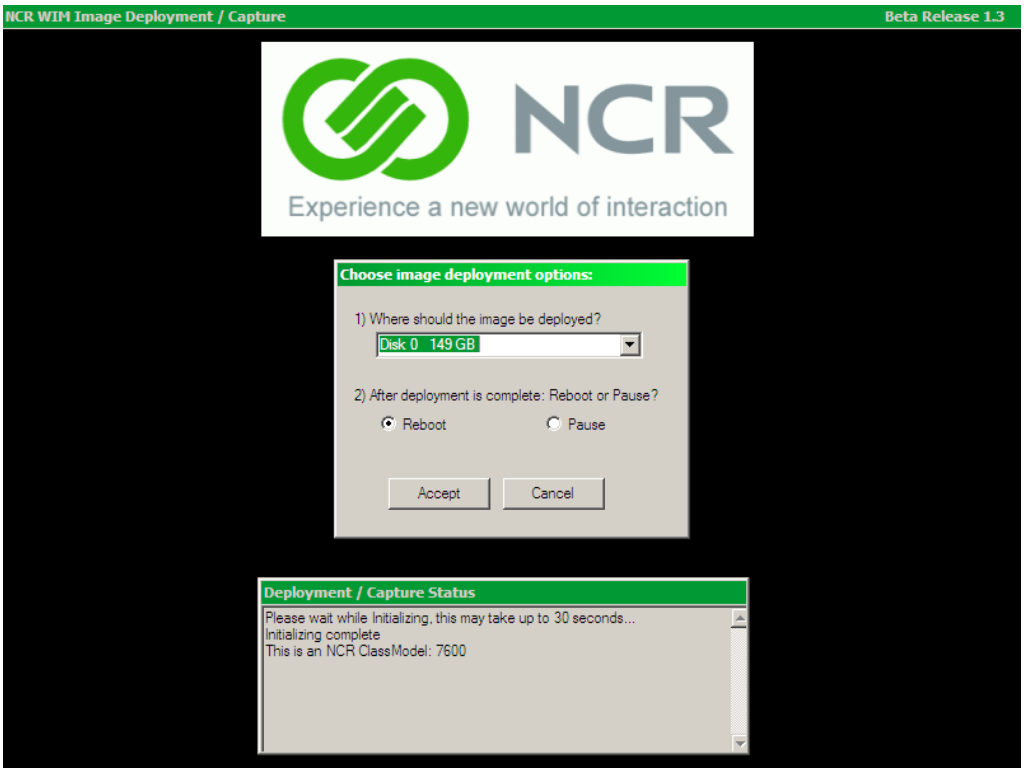
The Windows Imaging Format (WIM) application is used to deploy and capture Windows 7 images. It is available on a bootable DVD along with the operating system image for the 7600.

1. Insert the *NCR WIM Image Deployment/Capture* DVD (D370-0893-0100) into the DVD drive.
2. Connect a keyboard to the terminal.
3. Apply power to the terminal.
4. Press **[F8]** during boot (when you see the NCR logo) to enter the Boot Select menu.
5. Select **USB:[***name of device***]**.
6. You should see a message during boot, indicating that the device has been recognized.
7. At the options menu, select **Deploy "NCR Official" WIM Image from D370-0893-0100 DVD** and then select **Continue**.

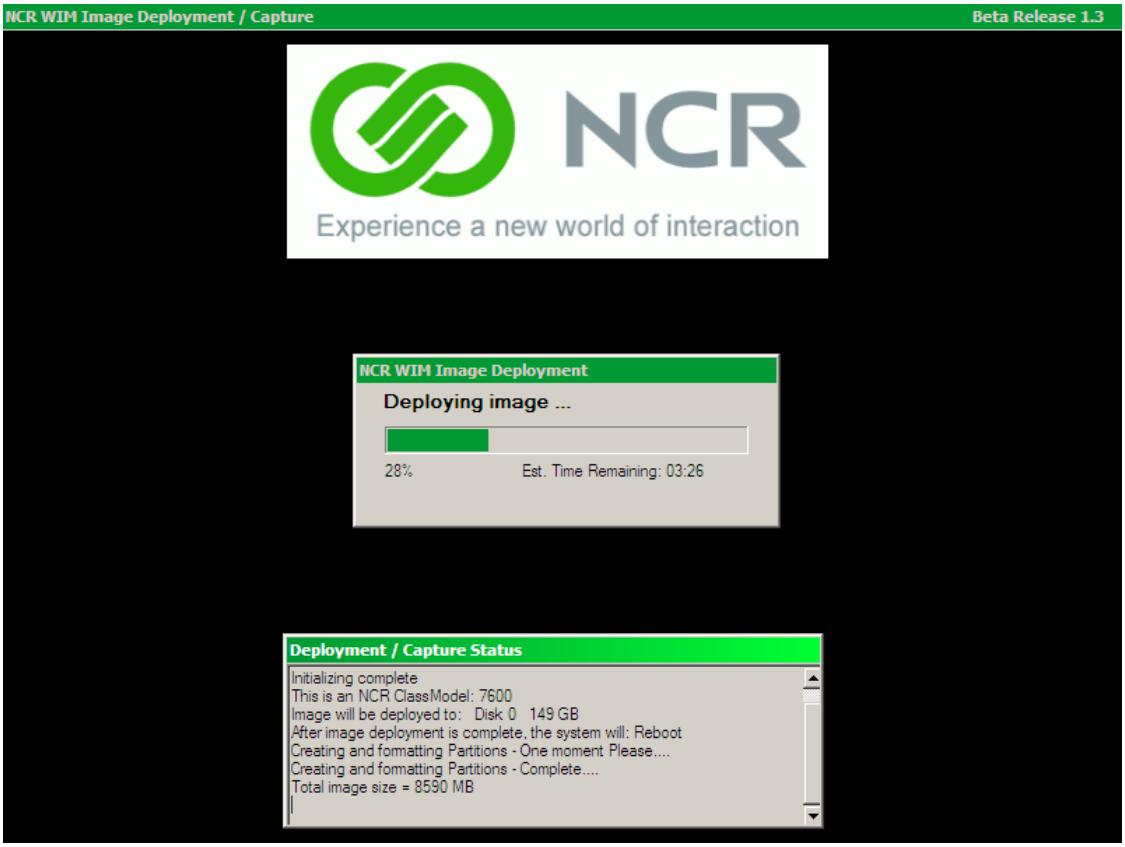


8. Next, you need to select the location where the image should be deployed. Select the drop down box and then the location for the image

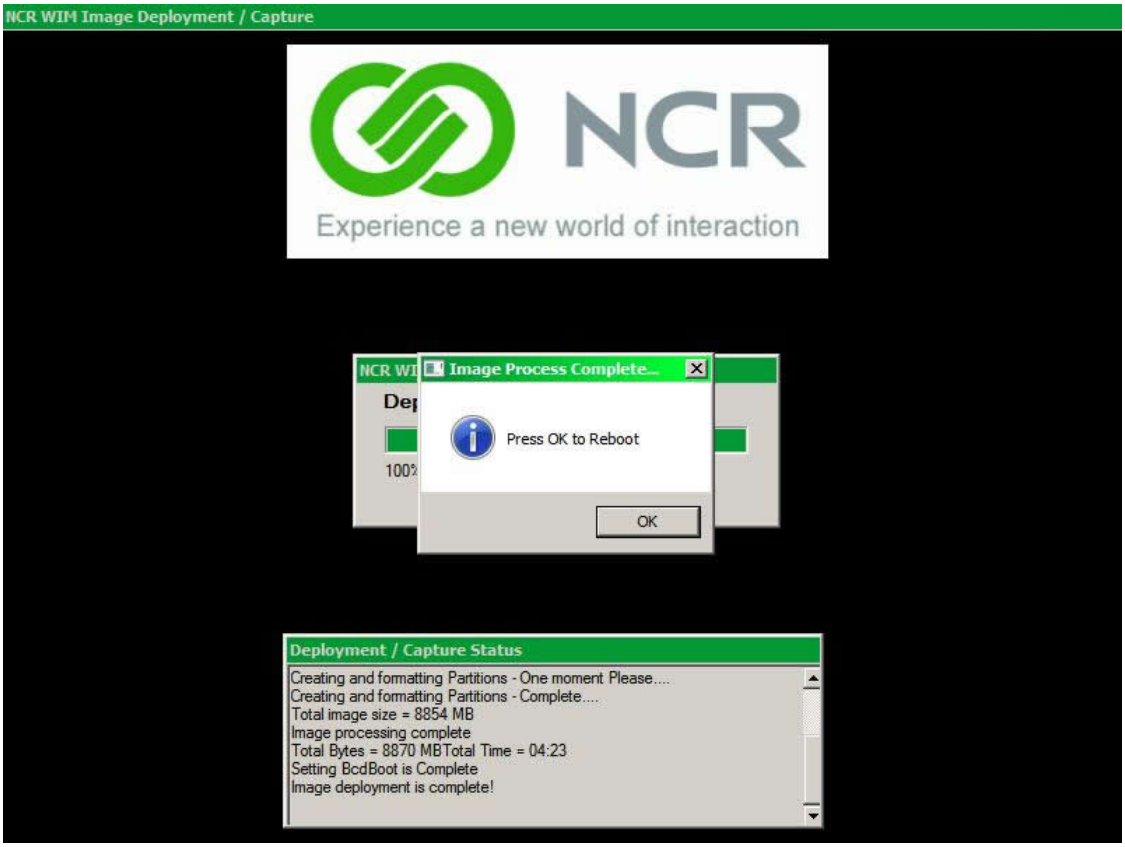
   Also select either the radio button to **Reboot** the terminal after the image has been installed or you can select **Pause** to view the statistics at the end of the image load. When you have made your choices, select **Accept**.



9. The WIM application then deploys the NCR Official image on to the terminal. The following displays while the terminal is loading.



10. After the image has been put on to your terminal, you are given the message "Press OK to Reboot". Select **OK**.



11. Remove the DVD before the system reboots.
12. Complete the Windows 7 setup; enter the time zone, computer name, accept the license, etc. Uncheck all the Security Warning message boxes about *Always ask before opening this file* as they appear and click **Run** for each of them.

Chapter 5: BIOS Updating Procedures

Introduction

This chapter discusses procedures on how to update the terminal BIOS. The software is distributed via the NCR Website.

BIOS updating can be performed using the following methods:

- Bootable USB CD Drive
- Bootable USB Memory Drive
- Network – Refer to the *NCR FitClient Software User's Guide*, (B005-0000-1235) for information about this procedure.

Prerequisites

The following are required to perform a BIOS update.

- Bootable USB CD-ROM Drive
- Keyboard
- BIOS Software. Download from the NCR website:

  http://www.ncr.com

  a. At this site, select the **Support** tab.

  b. Select **Drivers and Patches** → **Retail Support Files** → **NCR RealPOS and SelfServ Terminal and Operating Systems** → **NCR RealPOS 40 (7600)** → **BIOS**.

  c. Select the desired *BIOS* File.

  - ISO Image – Used with CD ROM boot device
  - Disk Image – Used with Floppy Disk boot device
  - Network Image – Used with Network boot
  - USB Memory Key Image – Used with USB boot device

  d. Save the software to your local hard drive.

Creating the Bootable Media

Creating a Bootable CD

The downloaded file is a CD image file (ISO) containing the files necessary to create a bootable CD. A system with a CD/DVD burner is required to perform this function.

1. Insert a writable CD in the CD/DVD burner drive.
2. Record the downloaded image file onto the CD using a utility that is capable of burning ISO files.

   Note: You cannot simply drop the file on the CD and burn it. You must use software capable of recording ISO images onto CDs.

Creating a Bootable USB Memory Drive

The downloaded file contains the files necessary to create a bootable USB Memory Drive.

1. Insert a USB drive that is formatted as FAT (or FAT32).
2. Unzip the downloaded files.
3. Copy the files to the root directory of the USB Memory Drive.
4. Open a DOS command window
5. Change directory to the USB Memory Drive.
6. Execute the following command:

   `Syslinux –fma <USB drive letter>`

   Example: `Syslinux –sfma f:`

   This command erases any bootable methods that may be present on the USB drive and replaces it with the BIOS update process.

   If the resulting USB memory drive is not bootable, try the following command. This runs slower but is more effective.

   `Syslinux –sfma <USB drive letter>`

   Important: Do not run `syslinux` by double-clicking on it because it may affect the boot drive of the terminal being used to create the drive.

   Windows 7 Note: The above commands must be executed as administrator. Failure to run as administrator results in an MBR write failure. To open a command shell with administrator privileges perform the following:

   Start → **All Programs** → **Accessories** → **Command Prompt** → [Right-Click] → **"Run as"** → **Administrator**

BIOS Updating Procedures

1. Insert the media containing the BIOS update software in the 7610.
2. Connect a USB keyboard to the terminal.
3. Apply power to the terminal.
   - If you are using an external USB CD Drive select **USB:[***name of device***]**.
   - If you are using a USB Memory Drive select **USB:[***name of device***]**.
4. The terminal boots and displays the SPI/BIOS Update main menu.

   There are six options from the main menu to run the update program. Three run automatically and two are interactive. Option 1, the Automatic SPI and BIOS Update executes automatically in 10 seconds unless the up/down arrow is pressed.

   Automatic Method
   With the Automatic Method you may see a prompt to enter the DMI (Desktop Management Interface), which is the terminal *Class*/*Model*/*Serial* information. This happens if the program detects invalid DMI information in the current BIOS, or if you are replacing the processor board, which has no *Class*/*Model*/*Serial* information in the BIOS.

   Important: DMI information is mandatory.

   Interactive Method
   This method permits you to input/replace the *Class*/*Model*/*Serial* information that is stored in the BIOS.

   Note: DMI information that is currently stored in the BIOS is displayed during power up. Press **[Tab]** at the NCR Logo to remove the logo. Press **[Pause]** to freeze the screen. Press **[Esc]** to continue.

5. Make a menu selection and follow the screen prompts (Option 1 is recommended).

```
1 Update BIOS – No prompt for Serial/Model/Class unless invalid

***** Forced Update of Serial/Model/Class Information *****

2 Update DMI only – Serial/Model/Class update ONLY (no BIOS or SPI Update)

3 Update BIOS – Always prompts for Serial/Model/Class

***** For Service Personnel Only *****

4 Update of BIOS – Reset to Default Serial/Model/Class information
```

Option 1 – Update BIOS – No prompt for Serial/Model/Class unless invalid

This option automatically updates the BIOS.

1. Highlight Option 1 and press **[ENTER]**.
2. The Flash Program updates the BIOS and automatically reboots the terminal.

Option 2 – Update DMI only - Serial/Model/Class update ONLY (no BIOS or SPI Update)

This option lets you enter the DMI information only. The SPI and BIOS are not updated.

1. Highlight Option 2 and press **[ENTER]**.
2. At the prompt press **[ENTER]** to enter the Class/Model/Serial Number information (DMI). Follow the onscreen format instructions.

   Example: `7610-1000-8801` **[ENTER]**
   `54-19378230` **[ENTER]**
3. Press **1** to confirm the data and to continue.
4. Remove the BIOS Update media before the system boots.
5. System is ready for operation.

Option 3 – Update of BIOS – Always prompts for Serial/Model/Class

This option prompts for *Class*/*Model*/*Serial* information at the beginning of the program and then updates the BIOS.

1. Highlight Option 3 and press **[ENTER]**.
2. At the prompt press **[ENTER]** to enter the Class/Model/Serial Number information (DMI). Follow the onscreen format instructions.

   Example: `7610-1000-8801` **[ENTER]**
   `54-19378230` **[ENTER]**

3. Press **1** to confirm the data and to continue.
4. The Flash Program updates the BIOS and automatically reboots the terminal.

Option 4 – Update BIOS – Default Serial/Model/Class information

This option is for Service Personnel only. It updates the BIOS but leaves the *Class*/*Model*/*Serial* fields empty (erased). The DMI information is then entered when the board is installed in a terminal.

1. Highlight Option 4 and press **[ENTER]**.
2. The BIOS are updated and the system reboots.
3. Remove the BIOS Update media before the system boots.
4. System is ready for operation.

Chapter 6: Solid State Drive Optimization

Introduction

When you delete a file from your system the host only deletes a pointer in the OS file system, but does not physically erase the data from the drive. While the deleted data no longer appears valid to the OS, it still appears valid to the drive firmware. Since no run time is spent by the drive to physically erase the targeted data this makes the OS operation fast. In terms of performance this method may be advantageous for traditional hard disk drives; however, it provides an unnecessary constraint for solid-state drives (SSDs) because they offer higher levels of performance when they hold less data.

To remove this unwanted constraint, Intel provides the Intel® SSD Optimizer for its 34nm series of X25-M and X18-M solid-state drives. This feature gives the ability to retain *out of box* performance levels over the life of the drive.

Unlike traditional hard disk drives, it is advantageous to tell an SSD when you delete files. At some point every 4KB page has been written to once, and you have to start overwriting old existing data. Unlike spinning media, Flash media can not simply overwrite existing data and must first perform a 512KB block erase. To overwrite existing data, an SSD requires a longer read-modify-write operation which is why write performance is reduced as the drive fills.

System and SSD Requirements

All 34nm Intel® X25-M or X18-M solid-state drives running firmware version 02HA or later contain support for the ATA DATA SET MANAGEMENT (trim) command. Current implementation does not support multiple Intel solid-state drives configured as part of a RAID set.

When using the latest Microsoft Windows* 7 operating system with the Microsoft AHCI storage driver, the OS will contain native support to execute the ATA Data Set Management command on an Intel SSD without any user interaction required.

For users of Windows 7 using Intel® Matrix Storage Manager storage driver, or other operating systems such as Microsoft Windows XP or Vista*, Intel is offering the same ability for users to execute the ATA Data Set management command on their Intel SSD through the use of the Intel® SSD Optimizer tool. Instructions for using the Intel® SSD Optimizer can be found in the next section as well as the user manual found within the Intel® SSD Toolbox download.

The Intel® SSD Toolbox has the following installation requirements:

- Microsoft Windows* operating system: Windows XP, Windows Vista* or Windows 7 (32/64 bit).
- .NET Framework 2.0.

  Note: If your system does not have .NET installed, the tool will direct you to the appropriate place to obtain it.
- At least 10 megabytes (MB) of available space on the SSD.

  To determine whether the SSD has enough available space, use the following instructions:

  1. Double click **My Computer**
  2. Right click the SSD you want to check
  3. Click **Properties** to display the amount of free space
  4. Click **Cancel** to close the window
- Disk Defragmenter is turned off (Microsoft Windows Vista or Windows 7) or not running (Microsoft Windows XP). This program is not needed for SSDs and can reduce the life of your SSD.

System Configuration Requirements for the Intel® SSD Toolbox

- **Systems with Virtualization:** The Intel SSD Toolbox will not work on systems running in a virtualized environment as it cannot detect the SSDs.
- **SSD appears as a SCSI device:** If the SSD appears as a SCSI device, the Intel SSD Toolbox application will report an error connecting to the drive and no functionality within the tool will be available.

System Configuration Requirements for the Intel® SSD Optimizer

- **SSD Formatted with FAT32 file system:** The Intel SSD Optimizer will not work on SSDs formatted with file allocation system FAT32.
- **Disk Defragmenter Off:** Intel strongly recommends disabling Disk Defragmenter to prevent the program from running. If Disk Defragmenter runs while Intel SSD Optimizer is running, the Intel SSD Optimizer will complete successfully, but the Disk Defragmenter will hang and will need to be shut down manually.

Known Issues

The following list describes items you should consider before using the Intel SSD Toolbox or Intel SSD Optimizer.

- **RAID or Dynamic Disks**

  The Intel SSD Toolbox will not work when the SSDs are in a RAID or Dynamic Disk configuration.

  RAID Configurations - The tool will attempt various checks for RAID configurations. See the *SSDs with a RAID Configuration or Encryption* section to see the notification when the tool cannot determine whether the drive has RAID or encryption. The Intel SSD Optimizer will work on encrypted drives; however, there is no guaranteed way to determine in each case whether the drive has RAID or is encrypted, so the tool will prompt the user to confirm.

  Dynamic Disks – The Intel SSD Toolbox will not work with any form of Dynamic Disks and displays the configuration as **"No Partition"** in the **Select a Drive** box. For more information, please see the Microsoft Dynamic Drive FAQ at http://technet.microsoft.com/en-us/library/cc737048%28WS.10%29.aspx.

- **Microsoft Windows XP 64-bit or Windows Server 2003 64-bit Operating Systems without Microsoft KBR 942589 Hotfix Installed**

  If you run the Intel SSD Optimizer on one of the above named operating systems that does not have the Microsoft hotfix installed, the tool displays an error message stating the program has detected the presence of a Volume Shadow Copy Service data, even if none is present.

  Please see Section 4.0 for a thorough description of the problem and how to implement the hotfix from Microsoft. Once installed, the Intel SSD Optimizer will run successfully.

Setup

Complete the following steps before starting the installation process on the PC containing the SSD.

1. Disable the Background Disk Defragmenter and Auto-Layout.

   Windows XP

   To disable disk defragmentation and auto-layout in XP add the following registry keys to your run-time image:

   Disable Background disk defragmentation – Change the following:

   Key Name:HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Dfrg\BootOptimizeFunction\
   Name: Enable
   Type: REG_SZ
   Value: N

   Disable Background auto-layout – Create the following:

   Key Name: HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\
   CurrentVersion\OptimalLayout
   Value Name: EnableAutoLayout
   Type: REG_DWORD
   Value: 0

   Windows Vista/7

   To turn off the Disk Defragmenter program on computers with Microsoft Windows Vista or Windows 7 operating systems, use the following instructions:

   a. From **Start**, navigate to the **Control Panel** folder
   b. Click **System and Security**, and then **Administrative Tools**
   c. Double click on **Services**, then scroll down to **Disk Defragmenter**
   d. Set **Startup Type** to **Disabled**
   e. Go to the **Service Status** section, and then click **Stop**
   f. Click **OK** to save your settings

2. Download the Intel SSD Toolbox.

   a. Go to the Intel support website located at http://www.intel.com/go/ssdtoolbox.
   b. Save the tool to a folder on your drive. Similar to a zip file, the .msi file contains the following items:

      - Intel SSD Toolbox application software
      - License Agreement
      - READ ME file (.rtf format)
      - Intel SSD Toolbox User Guide (.pdf format)

3. Install the Intel SSD Toolbox.
   a. Double-click on the downloaded .msi file to start the Intel Solid-State Drive Toolbox Setup Wizard.
   b. Click **Next**.
   c. Click **Next**.
   d. After reading the Intel Software License Agreement, click **I Agree**. Then click **Next**.
   e. Either accept the default location or click **Browse** to identify where you want to store the installation folder. Then click **Next**.
   f. Click **Next** to confirm the installation of the Intel SSD Toolbox.
   g. Click **Close** to exit the installation wizard.

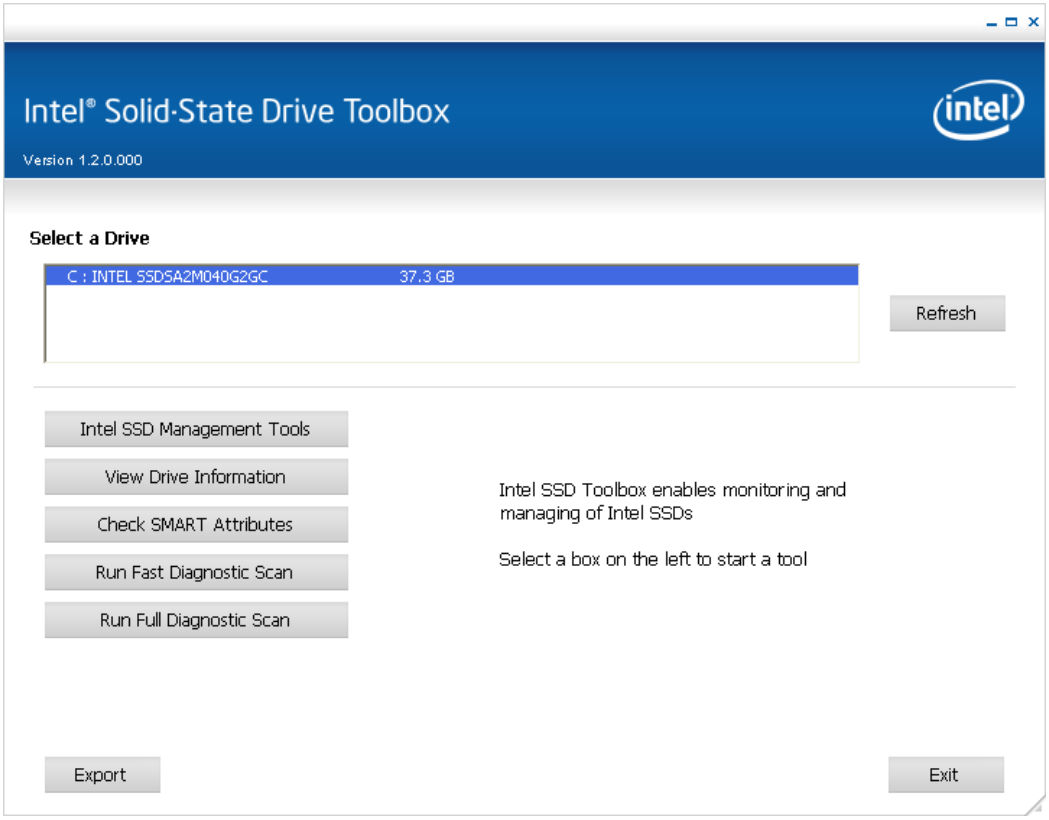
   Once the installation finishes, the Intel SSD Toolbox will be installed at the following default location: **Program Files\Intel\Intel SSD Toolbox**.

Toolbox Description

Main Screen

Start the Intel SSD Toolbox by double-clicking the Intel SSD Toolbox icon.

When the Intel SSD Toolbox opens, it displays the name and capacity of each drive on your system and tool options.

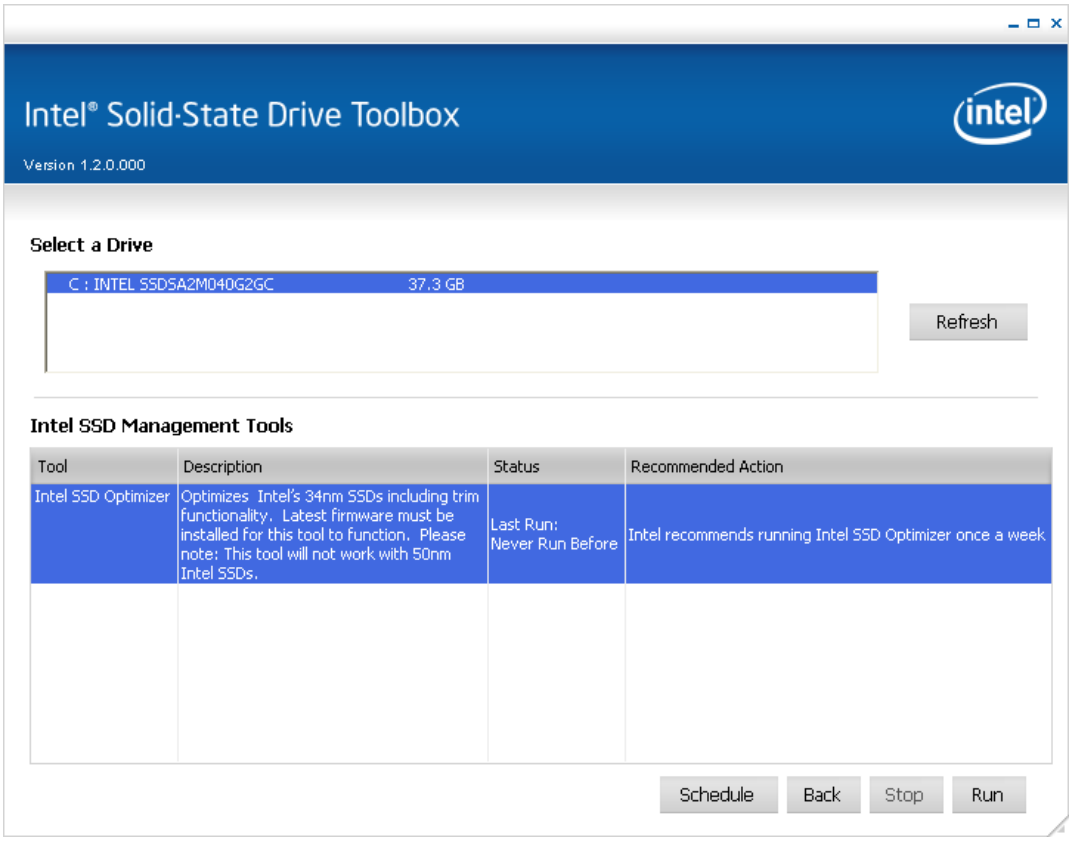


- **Intel SSD Management Tools** – Enables monitoring and managing the SSD.
- **View Drive Information** – Displays the model number, serial number and firmware number of the SSD. It also lists the ATA and SATA capabilities for the drive.
- **Check SMART Attributes** - Lists the SMART features and their respective thresholds, and, if necessary, indicates any action to take.
- **Run Fast Diagnostic Scan** – Analyzes the first 1.5 GB of the SSD to determine whether there are any READ or WRITE errors.
- **Run Full Diagnostic Scan** – Analyzes the complete SSD to determine whether there are any READ or WRITE errors or any bad blocks.
- **Refresh** – Rescans your computer, and displays the name and capacity of each drive found on your system.
- **Export** – Writes the drive information and SMART data to a .csv file on your system.
- **Exit** – Closes the Intel SSD Toolbox application.

Scheduling an Optimization Session

Use the *Intel SSD Management Tools* option to access or schedule the SSD Optimizer.

1. From the *Main Screen*, click on **Intel SSD Management Tools**. The following screen is displayed.



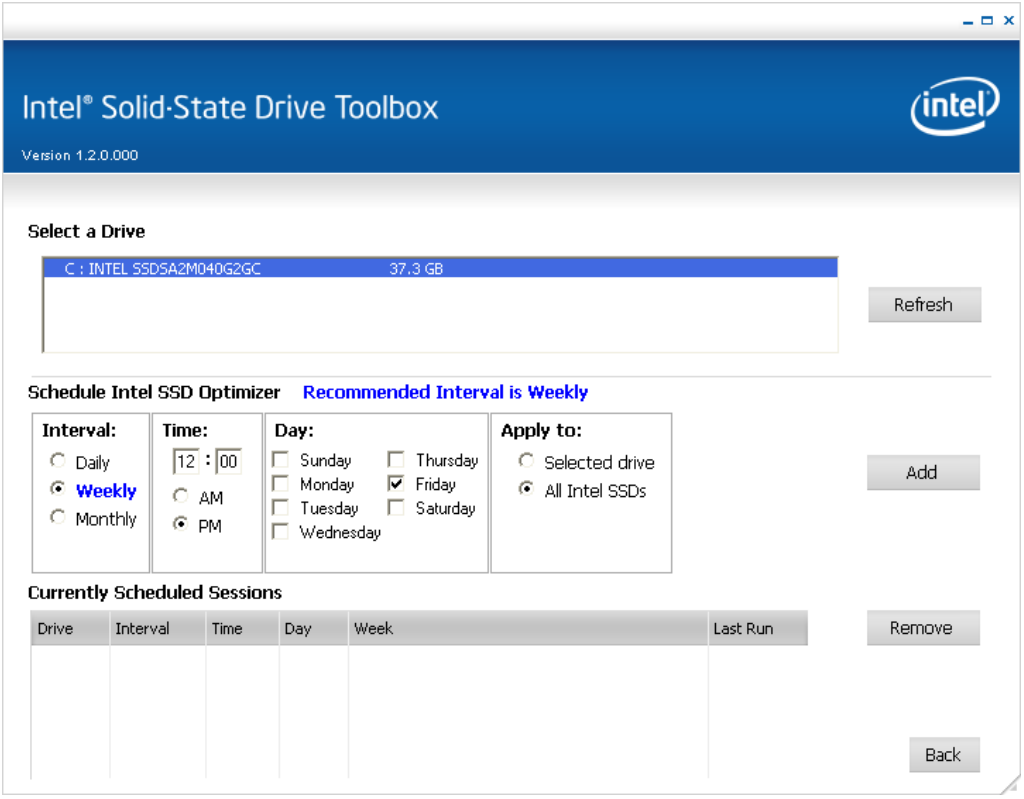
Screen Button Definitions

- **Schedule** – Defines when/how often you want to automatically run the Intel SSD Optimizer on the selected SSD.
- **Back** – Returns to the main screen of the Intel SSD Toolbox program.
- **Stop** – Halts the running of the Intel SSD Optimizer on a selected SSD.
- **Run** – Launches the Intel SSD Optimizer on a selected SSD.

2. Click **Schedule** to define a schedule.

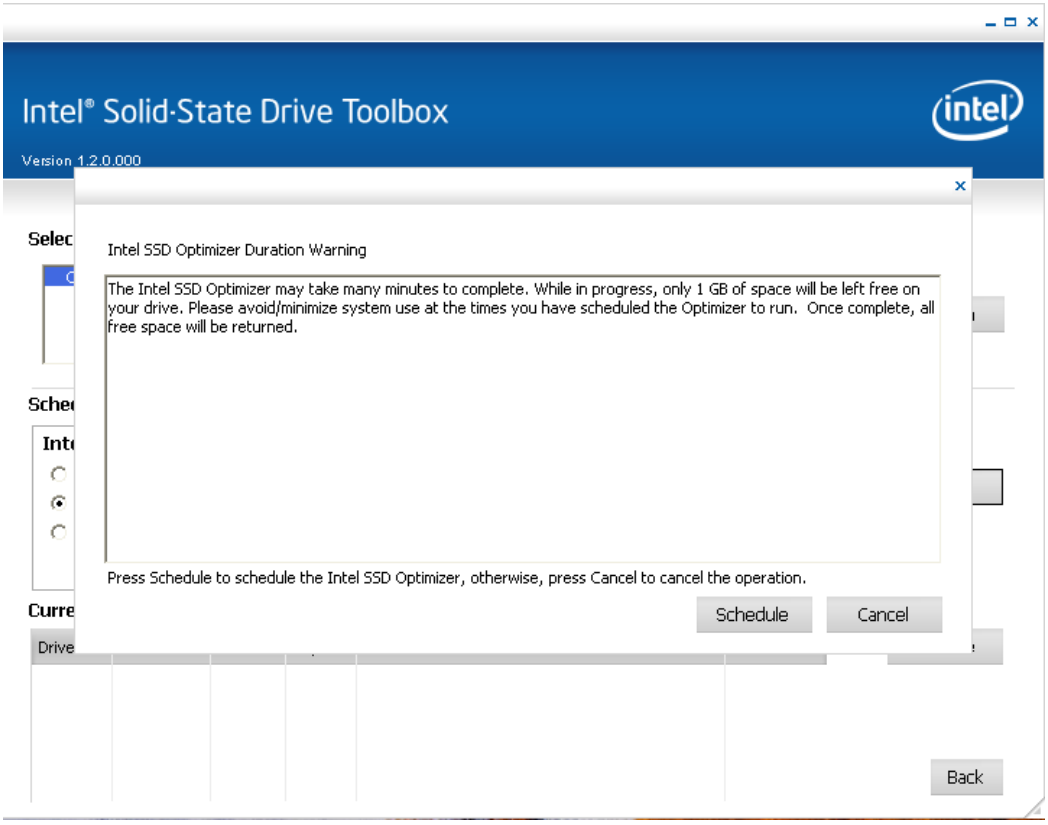
3. Define the schedule criteria.

   - **Interval** – Determines how often to run the tool. You can select Daily, Weekly or Monthly. Depending on the option you select, the screen will change to request additional scheduling information.
   - **Time** – Selects the time to run the tool.
   - **Day** – Selects the day to run the tool.
   - **Apply to** – Identifies whether the tool should be run only on a selected drive or on all SSDs in the system.
   - **Currently Scheduled Sessions** – Lists any scheduled launches.

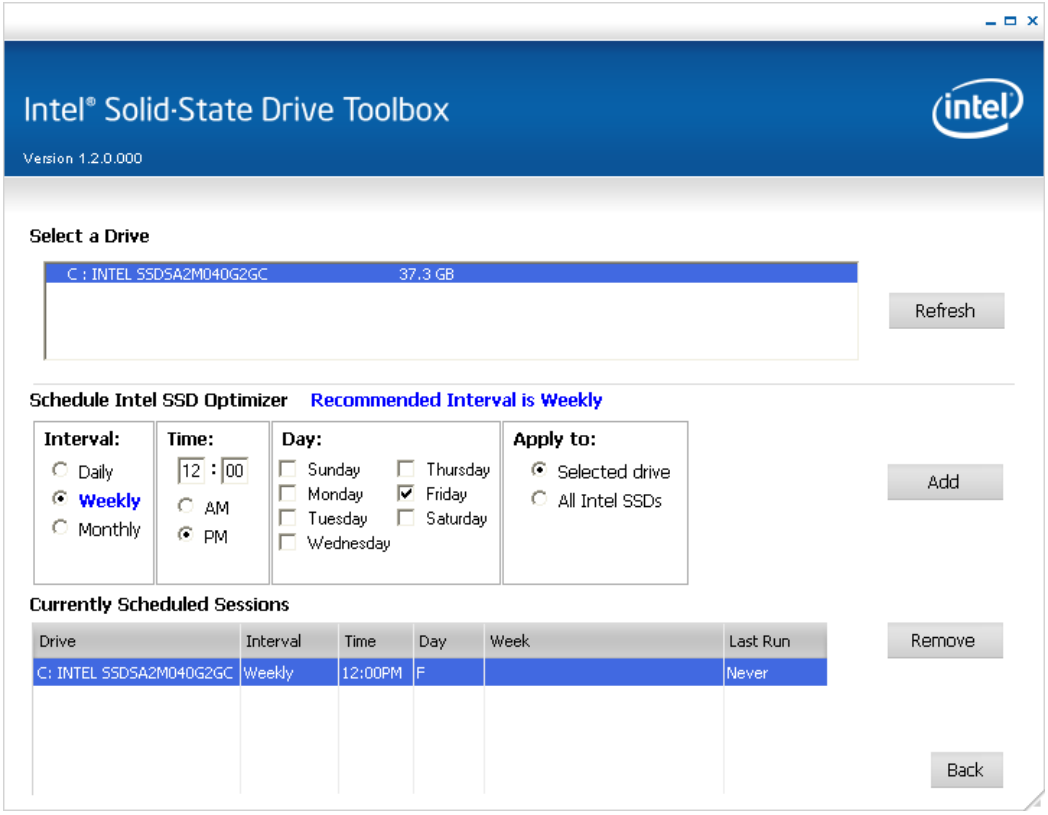


4. After you have entered the appropriate schedule information, click **Add**.

5. Click **Schedule** in the Information screen to add the newly defined session.



6. The tool will then display the new schedule in the *Currently Scheduled Sessions* section.

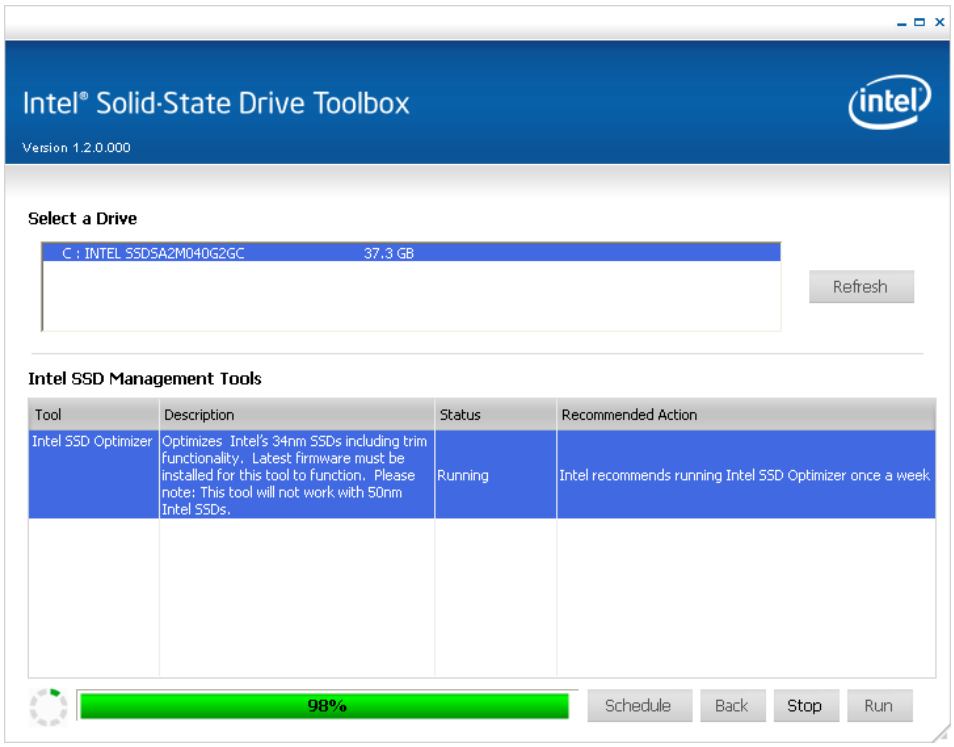


Scheduling Notes:

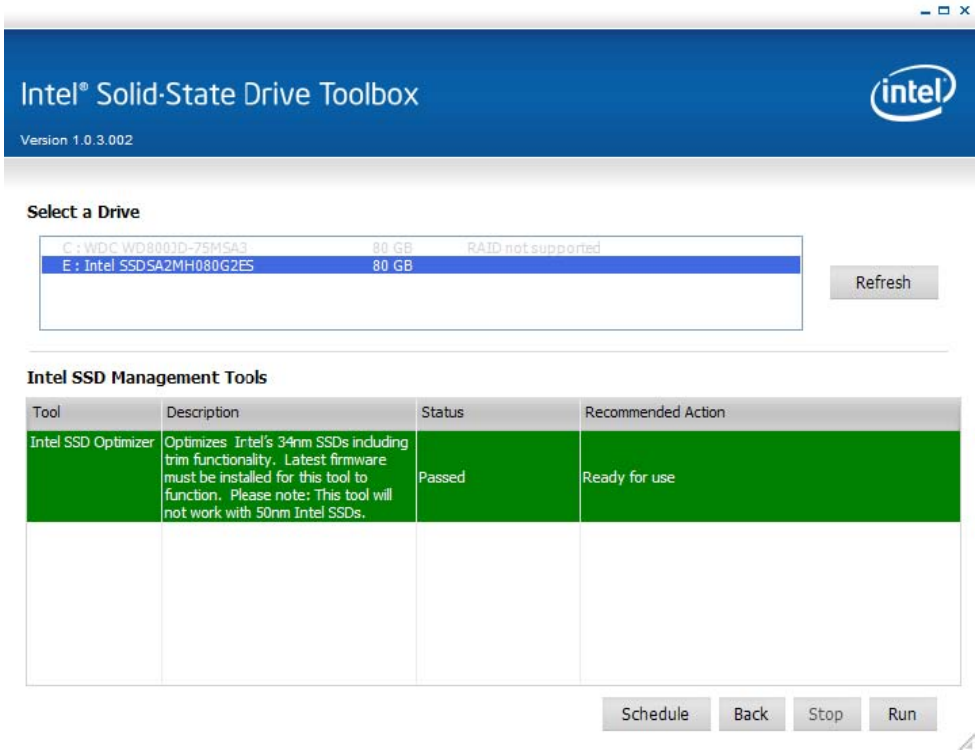
- Before you attempt to define a schedule, first run the Intel SSD Optimizer Tool in manual mode. Once the manual run is successful, then set an automated scheduled operation.
- The first time you schedule a session, the **Last Run** column displays **Never** since there were no previously scheduled runs. After a scheduled session finishes, the **Last Run** column will display the date of the latest successfully completed run for that drive. The **Schedule Intel SSD Optimizer** screen only displays the **Last Run** status for scheduled sessions, not manually initiated runs.
- Ensure that sessions are scheduled to run when the system is on. The tool does not wake up or turn on the system to run an Intel SSD Optimizer session.
- Avoid running the Intel SSD Optimizer when a backup is in session.
- If your system uses Microsoft Windows 7 and the standard Microsoft AHCI driver (the default setup for normal configurations without RAID), the Intel SSD Optimizer will work; however, you do not need to use the Intel SSD Optimizer because Microsoft Windows 7 implements the ATA Data Set Management Command (Trim) natively. You can use the other functions offered in the Intel SSD Toolbox.
- If your system uses Microsoft Windows 7 and the Intel Matrix Storage Manager version 8.x (which can be used in place of the Microsoft AHCI driver), then the Intel SSD Optimizer tool is required to enable the ATA Data Set Management Command (Trim).

Running the Scheduled Optimization Session

When the scheduled session starts, a progress bar appears in the task tray notifying the user that the Intel SSD Optimizer is running.

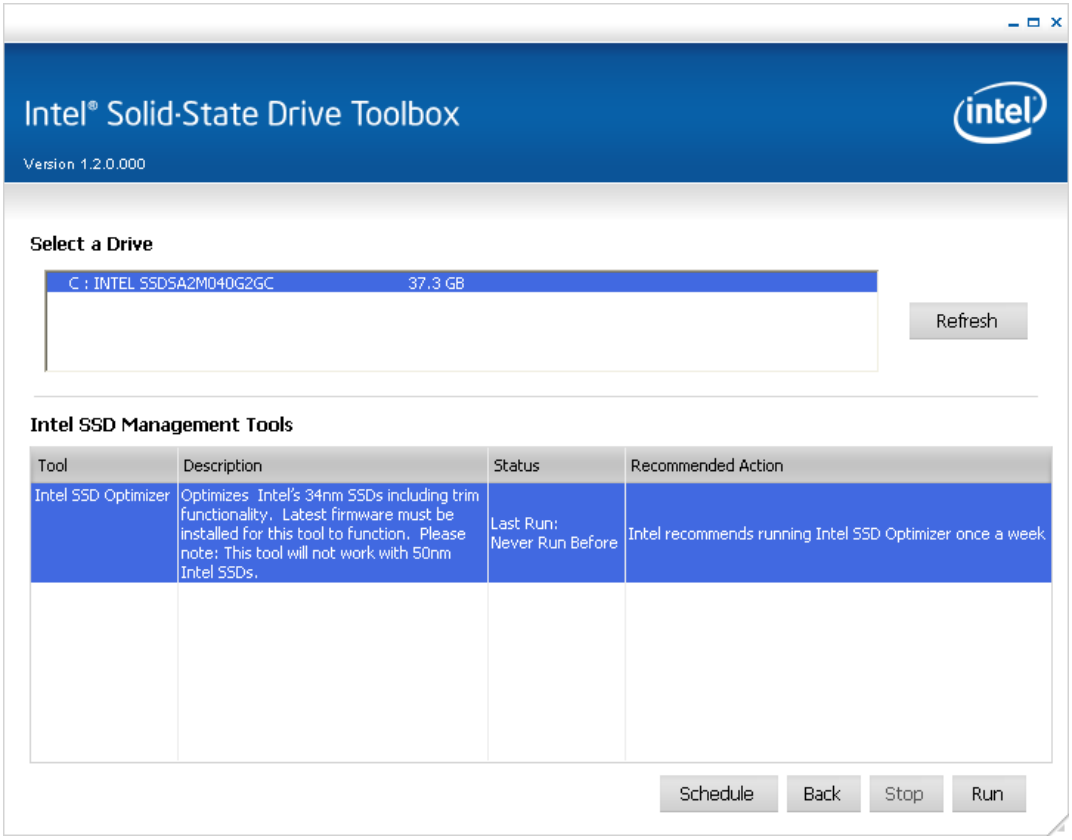


Upon completion the status of the operation is shown.



Manually Running an Optimization Session

1. From the *Main Screen,* click on **Intel SSD Management Tools**. The following screen is displayed.

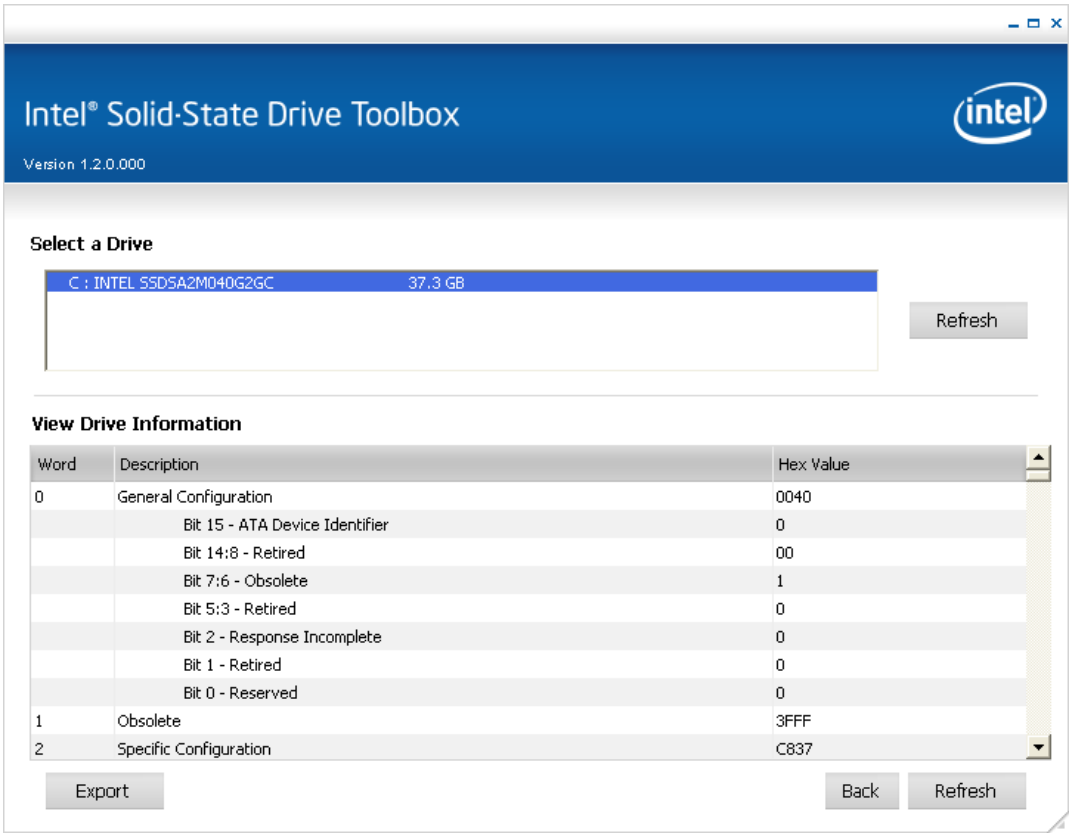


2. Click **Run**.

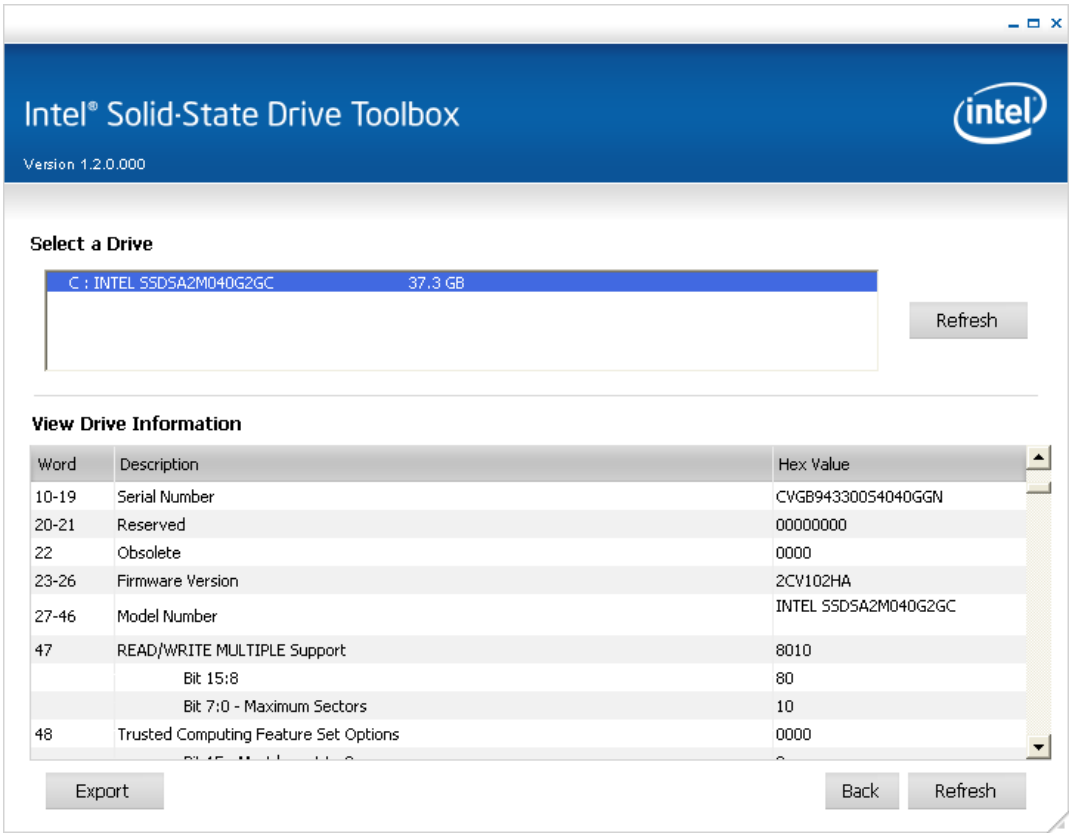
View Drive Information

Use this option to view the standard Identify Device information for the SSD.

1. From the *Main Screen,* click on **View Information**. The following screen is displayed.

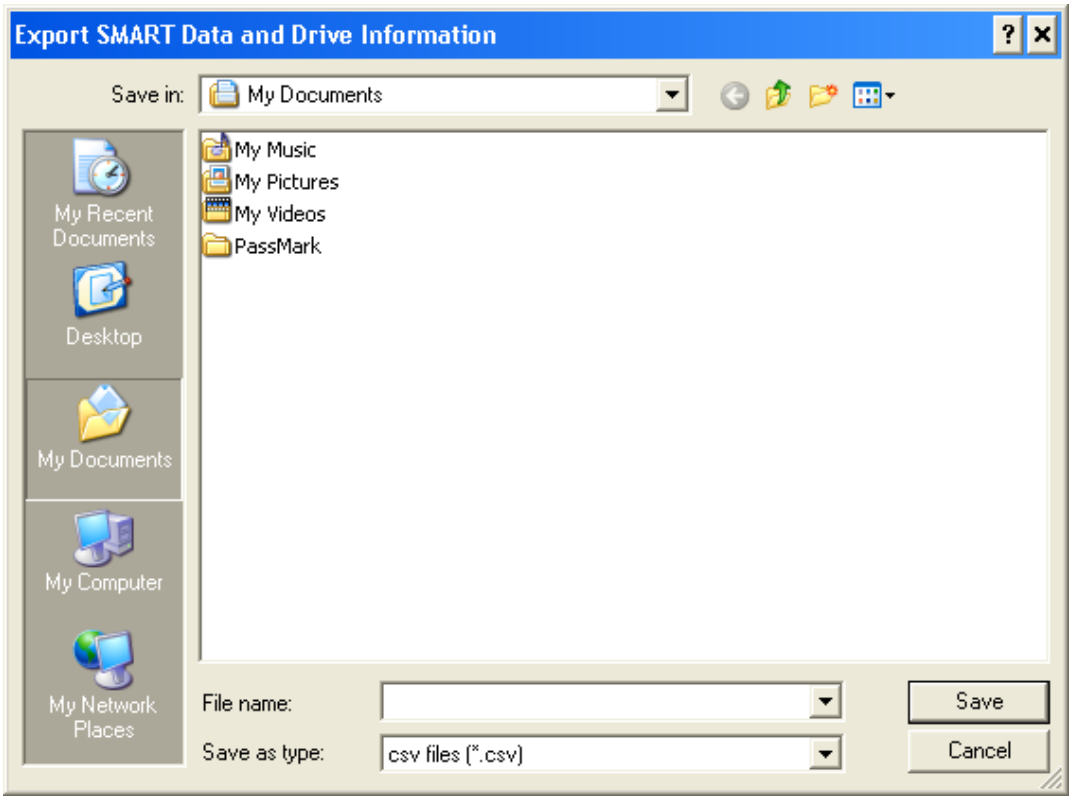


2. Scroll down the list to find the SSD information, such as Serial Number, Firmware Version, and Model Number.



Export

Use this function to write the drive information and the SMART data to a .cvs file. Browse to the desired location and click **Save** to write the drive information.



Back

Click **Back** to return to the Intel SSD Toolbox main screen.

Refresh

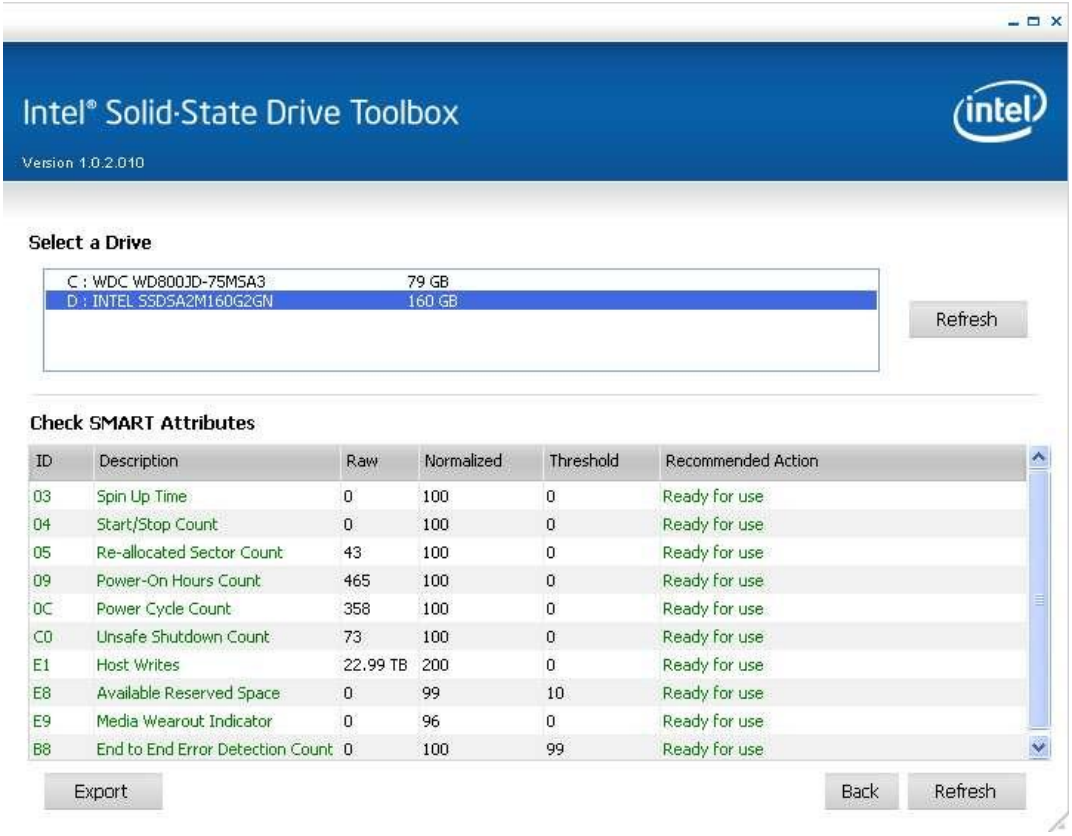
Use this function to reissue the ATA IDENTIFY DEVICE command and redisplay the information for the selected drive.

SMART Attributes

Each drive operates under a predefined set of attributes and corresponding threshold values, of which the drive should not pass during normal operation. Each attribute has a raw value (defined by the manufacturer) and a normalized value.

Use this option to view the standard Identify Device information for the SSD.

1. From the *Main Screen,* click on **Check SMART Attributes**. The following screen is displayed.



Spin Up Time

The average time it takes the spindle to spin up. Since a SSD has no moveable parts, this attribute reports a fixed raw value of zero (0) and a fixed normalized value of 100. Use the **Raw** value for this attribute.

Start/Stop Count

This type of event is not an issue for SSDs. However, hard disk drives can experience only a finite number of these events and, therefore, must be tracked. This attribute reports a fixed value of zero (0) and a fixed normalized value of 100. Use the Raw value for this attribute.

Re-Allocated Sector Count

This attribute shows the number of retired blocks since leaving the factory (also known as a grown defect count).

Power-On Hours Count

This attribute reports the cumulative number of power-on hours over the life of the device. Use the **Raw** value for this attribute.

Note: The On/Off status of the device initiated power management (DIPM) feature will affect the number of hours reported.

- If DIPM is turned "On", the recorded value for power-on hours does not include the time that the device is in a "slumber" state.
- If DIPM is turned "Off", the recorded value for power-on hours should match the clock time, as all three device states are counted: active, idle and slumber.

C – Power Cycle Count

This attribute reports the cumulative number of power cycle events (power on/off cycles) over the life of the device. Use the **Raw** value for this attribute.

C0 – Unsafe Shutdown Count

This attribute reports the cumulative number of unsafe (unclean) shutdown events over the life of the device. An unsafe shutdown occurs whenever the device is powered off without STANDBY IMMEDIATE being the last command. Use the **Raw** value for this attribute.

E1 – Host Writes

This attribute reports the total number of sectors written by the host system. The raw value is increased by 1 for every 65,536 sectors written by the host. Use the **Raw** value for this attribute.

E8 – Available Reserved Space

This attribute reports the number of reserve blocks remaining. The attribute value begins at 100 (64h), which indicates that the reserved space is 100 percent available. The threshold value for this attribute is 10 percent availability, which indicates that the drive is close to its end of life. Use the **Normalized** value for this attribute.

E9 – Media Wear Out Indicator

This attribute reports the number of cycles the NAND media has experienced. The normalized value declines linearly from 100 to 1 as the average erase cycle count increases from 0 to the maximum rated cycles.

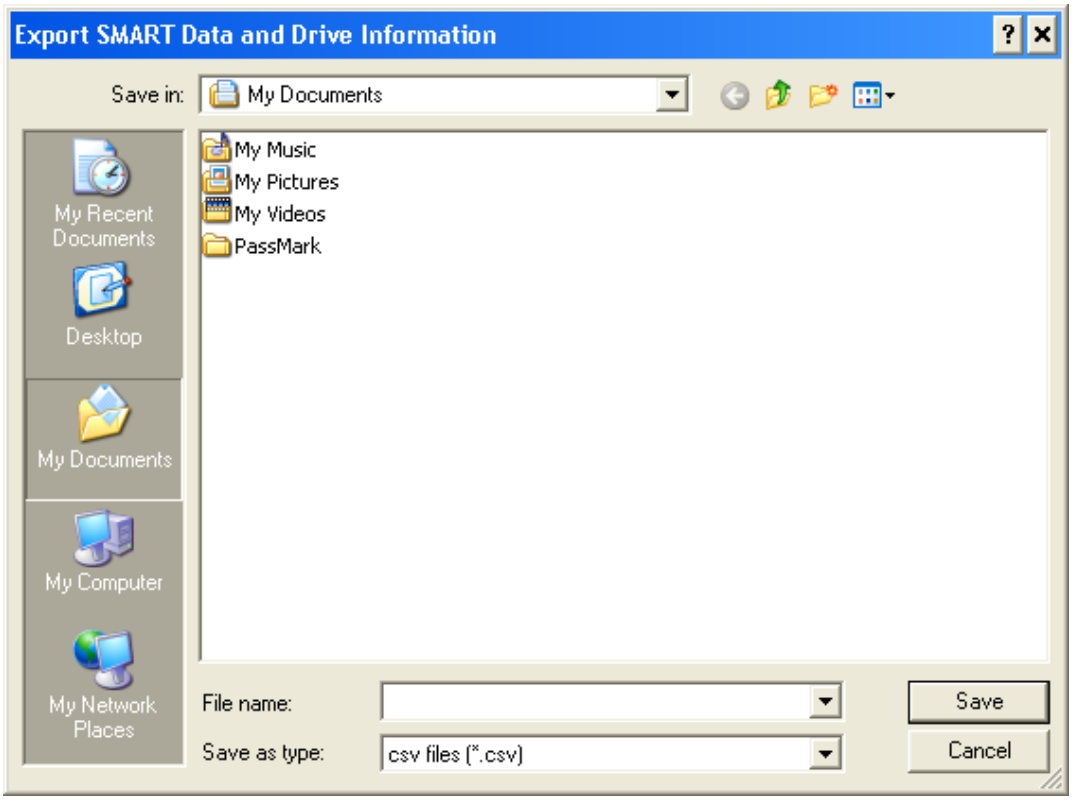
Once the normalized value reaches 1, the number will not decrease, although it is likely that significant additional wear can be put on the device. Use the **Normalized** value for this attribute.

B8 – End to End Error Detection Count

This attribute is only available for 34nm drives and counts the number of times errors are encountered during logical block addressing (LBA) tag checks on the data path within the drive. Use the Normalized value for this attribute.

Export

Use this function to write the drive information and the SMART data to a .cvs file. Browse to the desired location and click **Save** to write the drive information.



Back

Click **Back** to return to the Intel SSD Toolbox main screen.

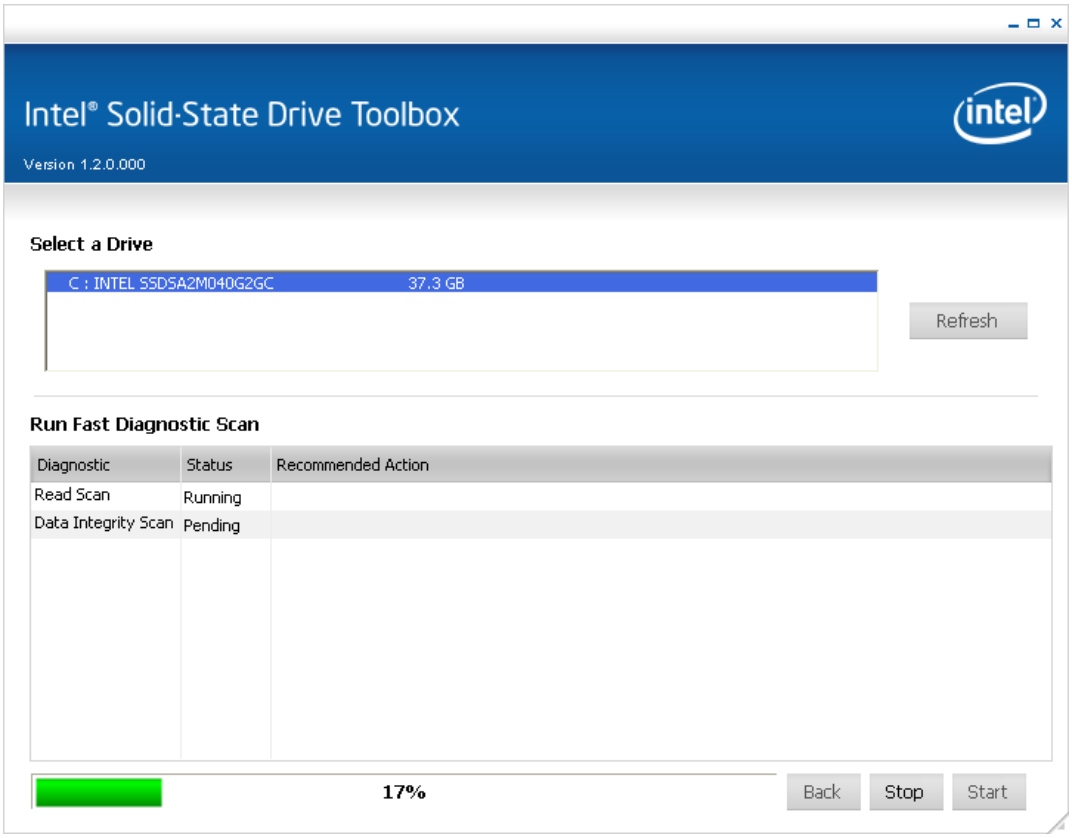
Refresh

Use this function to reload the SMART data.

Fast Diagnostic Scan

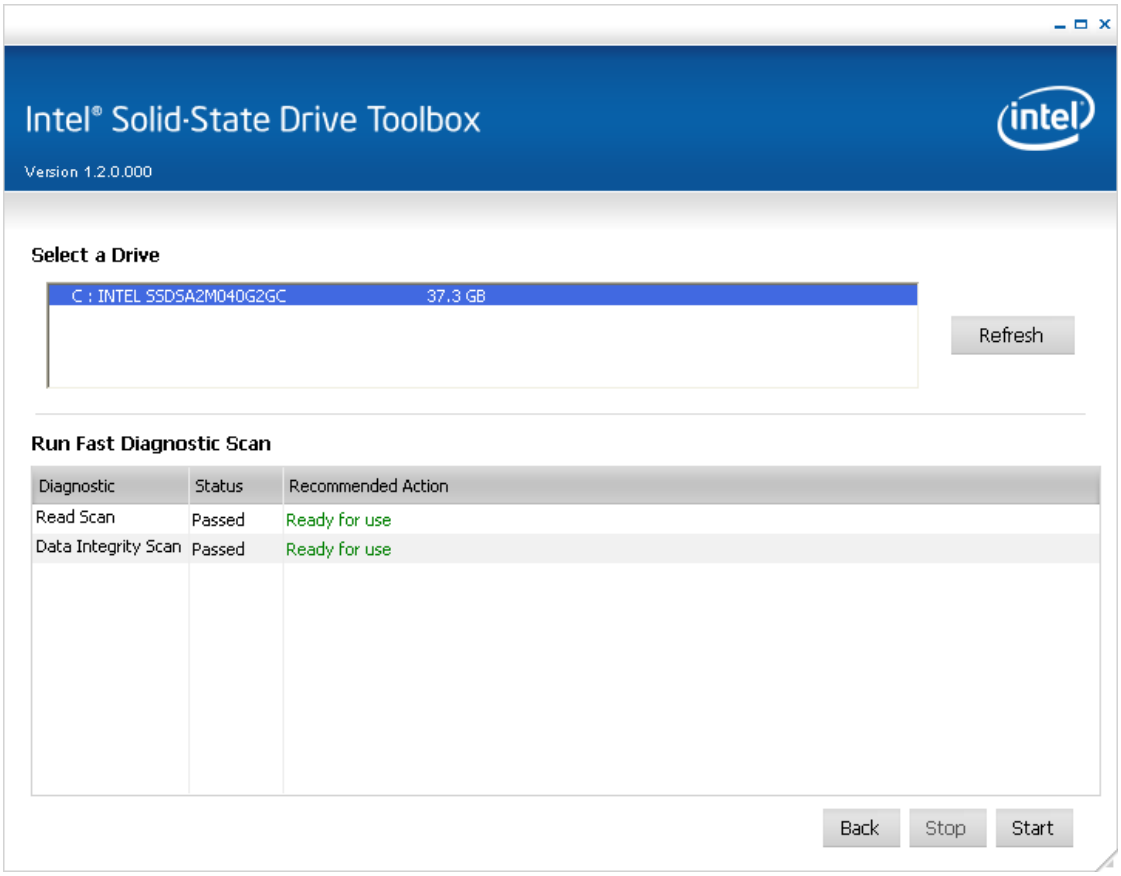
Use this option to perform a quick check on the health of the Intel SSD. After checking 1.5 GB of the drive for READ errors, the scan creates 1 GB of random data and then compares it for data integrity. The scan takes approximately three to five minutes to run.

1. From the *Main Screen*, click on **Run Fast Diagnostic Scan**. The following screen is displayed.
2. Click **Start** to launch the Fast Diagnostic Scan.



- **Diagnostic** – Lists the name of the available scans.
- **Status** – Reports the progress of the scan. Initially blank, the field is populated while running the scan.
- **Recommended Action** – Identifies whether the system can use the drive for processing. Initially blank, the field is populated after each scan finishes.

The results of the scan are indicated on the next screen. A successful scan is listed in the Recommended Action column if it is successful.



Error Messages

If the Fast Diagnostic Scan encounters a problem, the tool displays the corresponding error message and next step information under the **Recommended Action** heading.

Inadequate Amount of Free Space

The scanned drive needs more free space before attempting to run the Fast Diagnostic Scan again.

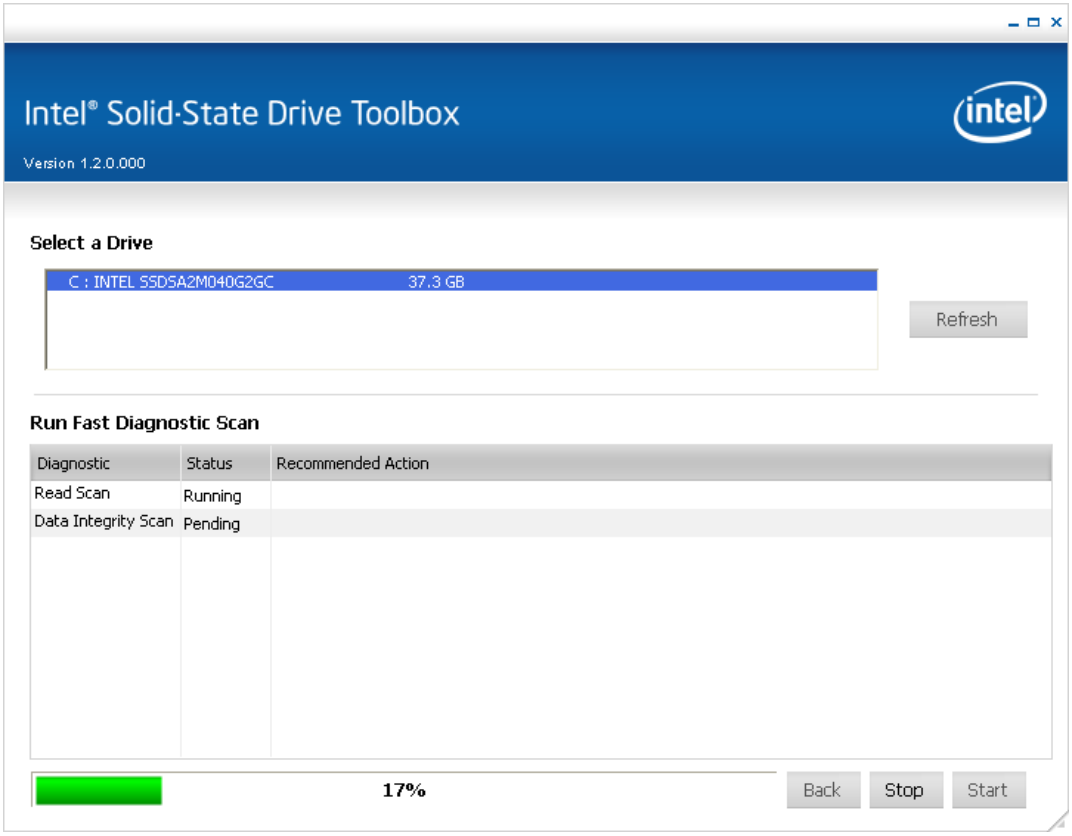
No Partition

The scanned drive does not contain a partition. For the Fast Diagnostic Scan to function properly, the scan requires a partitioned area to create and validate the one gigabyte (1 GB) of random data.

Full Diagnostic Scan

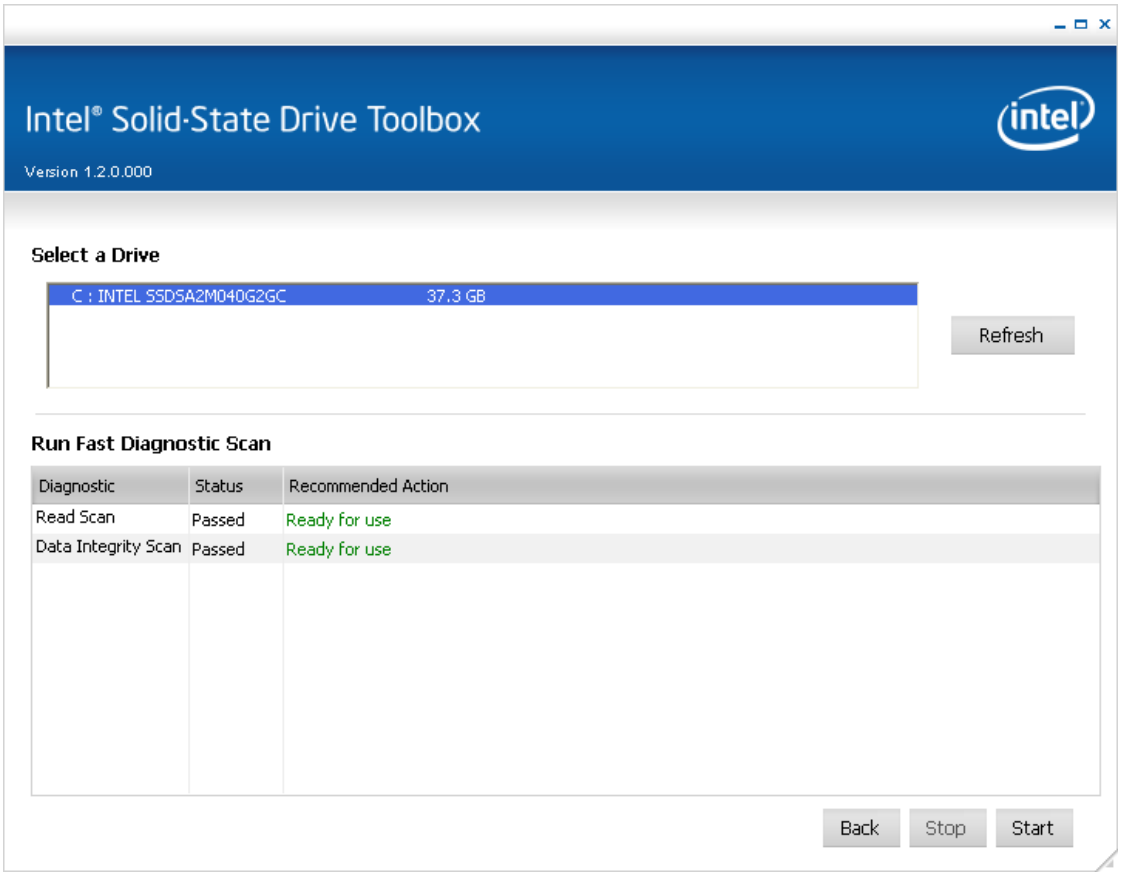
Use this option to perform an overall evaluation on the health of the Intel SSD. After checking every logical block address (LBA) for READ errors, the scan uses the free space to write random data and then reads it back to ensure data integrity. This scan can take an hour or more to run, depending on the amount of free space on the drive.

1. From the *Main Screen*, click on **Run Full Diagnostic Scan**. The following screen is displayed.
2. Click **Start** to launch the Full Diagnostic Scan.



- **Diagnostic** – Lists the name of the available scans.
- **Status** – Reports the progress of the scan. Initially blank, the field is populated while running the scan.
- **Recommended Action** – Identifies whether the system can use the drive for processing. Initially blank, the field is populated after each scan finishes.

The results of the scan are indicated on the next screen. A successful scan is listed in the Recommended Action column if it is successful.



Error Messages

If the Fast Diagnostic Scan encounters a problem, the tool displays the corresponding error message and next step information under the **Recommended Action** heading.

Inadequate Amount of Free Space

The scanned drive needs more free space before attempting to run the Full Diagnostic Scan again.

No Partition

The scanned drive does not contain a partition. For the Full Diagnostic Scan to function properly, the scan requires a partitioned area to create and validate the one gigabyte (1 GB) of random data.

Frequently Asked Questions

How often should I run the Intel® SSD Optimizer on my SSD? How long does it take to complete? Can overuse cause problems?

Intel recommends scheduling the Intel® SSD Optimizer to run on a weekly basis. Total execution time under Windows XP is very fast and in most cases will complete in a number of seconds. Windows Vista and Windows 7 execution times can take much longer, anywhere from a few minutes up to 30min or even longer in extreme cases. These longer run times are based on the number of system restore points that have been saved by the OS. There is no known risk of harm to the SSD due to continuous repeated use of the tool.

Does the Intel® SSD Optimizer work with my drive encryption software?

Yes, the Intel® SSD Toolbox works with encryption software. On Windows Vista* or Windows 7, a prompt will appear within the Intel® SSD Toolbox allowing the user to force the Intel® SSD Optimizer to execute if the user can verify that their Intel SSD is not part of a RAID array. Clicking "accept" will optimize the drive successfully. On Microsoft Windows* XP, it works with no additional user input required.

Can I use the Intel® SSD Optimizer if I have multiple Intel SSDs configured as part of a RAID set?

Current implementation of the Intel® SSD Toolbox does not support SSDs configured as part of an OS RAID set. Intel is looking at including support in future versions of the tool.

Does the Intel® SSD Optimizer delete OS level files?

No, the Intel® SSD Optimizer interprets files that have been deleted from the file system, but whose physical location on the SSD has yet to be cleared. It then actively passes that information to the SSD where the data is physically erased at the drive level.

Does the Intel® SSD Optimizer delete files that reside in my recycle bin?

No, files that reside in Windows recycle bin have not yet been marked for deletion by the OS file system and as a result are not deleted by the Intel® SSD Optimizer. When the recycle bin has been emptied by the user, those files are now physically deleted from the drive by the next Intel® SSD Optimizer run. Additionally, the "un-delete" applications function are not able to recover any data after an Intel® SSD Optimizer execution has taken place.

Will my 34nm Intel SSD see a performance increase immediately after running the Intel® SSD Optimizer?

Generally yes, however it will heavily depend on the prior state of the drive. If the drive is encountering slowing performance due to heavy usage, performance should quickly return to *out of box* levels after running the Intel® SSD Optimizer. However, if the drive has seen little usage prior to running the Intel® SDD Optimizer, you may not notice a substantial performance increase since the drive is already operating at or near optimal performance levels. Frequent use of the Intel® SSD Optimizer ensures optimal performance levels over the life of the drive.

If I never delete files from my system will I see a benefit from the Intel® SSD Optimizer?

While there should still be some benefit related to OS level cleanup of temp files, temp directories, and installers, the Intel® SSD Optimizer will result in higher levels of performance if unwanted files are deleted. In order to see the most benefit it is recommended that you actively delete any unwanted files from their system in addition to frequently running disk cleanup utilities.

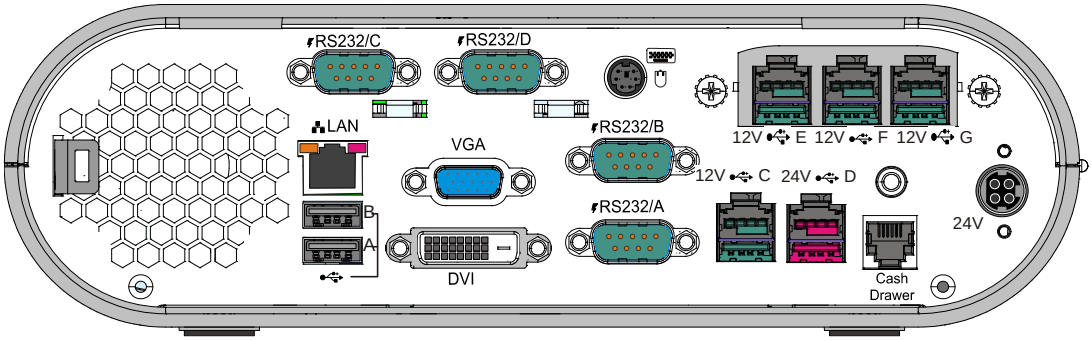
Is the Intel® SSD Optimizer supported under Linux?

Not at this time, however Intel is actively working with the Linux community to enable support for the Intel® SSD Optimizer in the Linux storage drivers. We expect support to be available soon; thus, we have no plans to create a version of the Intel® SSD Toolbox for Linux.

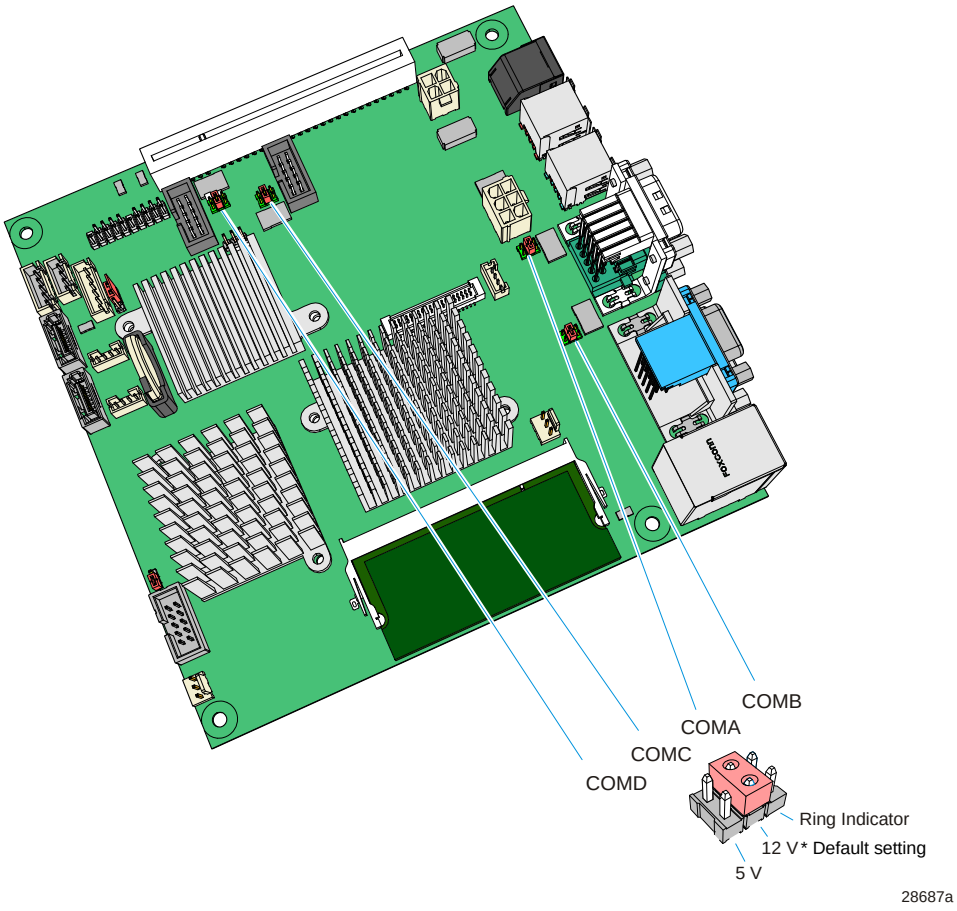
A

Appendix A: Powered Serial Port Settings

The serial ports on the 7600 can be configured as powered or not. The default setting for all the ports is 12 V powered. To change the settings open the Top cover and change the jumpers on the Motherboard using the illustrations below.



28688


COMB
COMA
COMC
COMD
Ring Indicator
12 V* Default setting
5 V
28687a

Appendix B: DOS Memory Settings

Upper Memory Usage

In order to get maximum UMB usage, the *EMM386.EXE* driver should be loaded in the *CONFIG.SYS* file with the following.

```
DEVICE=\DOS\EMM386.EXE NOEMS i=B000-B7FF i=D000-DFFF
```

Other memory range Considerations

- `B800 to BFFF` - Standard color graphics data area (off limits)
- `C000 to CEFF` - VGA BIOS area (off limits)
- `CF00 to CFFF` - PXE UNDI (4K)
- `E000 to FFFF` - PC BIOS area (off limits)

C

Appendix C: Disabling USB Ports for Security Purposes

In certain environments it may desirable to disable all USB ports to protect against malicious (or inappropriate) intent to upload software via a USB key fob or other means. The following procedure can be used to disable the ports.

BIOS Changes (1.2.2.0)

1. Attach a USB keyboard to a front USB port.
2. Power on the system.
3. Press **DEL** to access the BIOS Setup Utility.
4. Select **Chipset** → **South Bridge Configuration**.
5. Change the setting for *USB 2.0 Controller* to **Disabled**.
6. Press **[F10]** → **[Enter]** to save the changes and reboot.

Windows Operating System changes

1. Select **Control Panel** → **System Device Manager**.
2. Scroll down to and expand **Universal Serial Bus Controllers**.
3. There are four Intel Host Controllers.
   - *Universal Host Controller – 27C8:* Controls USB Ports A and B
   - *Universal Host Controller – 27C9:* Controls USB Ports C and D
   - *Universal Host Controller – 27CA:* Controls USB Ports E and F
   - *Universal Host Controller – 27CB:* Controls USB Ports G and H (includes the Front Panel port)

   Each of the Universal Host Controllers can be disabled to disable the corresponding pair of ports. For example:

   1. Highlight **Intel® N10/ICH7 Family USB Universal Host Controller – 27C8**.
   2. Select **Action** → **Disable** to disable USB ports A and B. Note that you must remove all USB devices from ports A/B for this to work.

Note: Ports can only be disabled in pairs, not individually.