



# **J2 650**

## **Integrated Touchscreen Computer**

### **System Manual**

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*August 2008*

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## Overview

The 650 from J2 is the most high performance integrated Point of Sale computer available to date. This amazingly versatile unit can be configured as either a low power fan less thin client terminal; as a midrange thick client terminal; or even as a Dual Core high speed server with RAID. Product versatility and reliability are the key strengths of this 650 system.

This ingenious integrated touch screen computer has special “all in the head” design built-in, which means it can be used as a counter top unit, a wall-mount or a pole-mounted computer. You will find that both the counter top base and VESA/ wall mount brackets are supplied as standard equipment with the 650.

There are many processor variants available, the 650 comes standard with an Intel 1.6 GHz Celeron 420 Conroe Core processor. This system board uses the Intel LGA775 socket and it can be upgraded or ordered with a wide range of single or dual core processors.

The 650 unit also has a very unique feature when using the 420 processor, this is called the “Green Mode”. This mode is set by a simple BIOS setup item, and when the unit is in this “Green Mode” the processor speed is reduced to 1GHz and fans are turned off. This, in effect, turns the 650 into a fan less system for thin-client use and also reduces the 650 power consumption by 25%, thereby reducing the 650 carbon footprint which is already very small.

Accessibility is key to machine maintenance and upgradeability, the following is a list of important 650 features:

1. Upgrades to the memory modules can be easily done by simply removing two screws on the back cover.
2. A complete motherboard upgrade can be carried out in less than 2 minutes.
3. The two quick change hard disk drives are easily accessible, housed on a slide-in drive bay that allows the drives to be hot swappable.
4. The footprint of the J2 650 is particularly compact making it ideal for the space conscious retailer.

The 650 offers thick or thin-client or server configurations which support standard Microsoft operating systems Vista, XP, WePOS, CE.NET and XPe, further demonstrating its versatility. The 650 is equally proficient with the many flavors of Linux.



## Specification

<b>Main board</b>	
CPU Support	Intel Desktop Processors LGA775, 1066 MHz FSB, 65W TDP max
	Intel 1.6 GHz Celeron 420 Conroe Core, Standard
Chipset	Intel Q965 North Bridge, Intel ICH8R South Bridge, HD Audio VIA1708B, Ethernet Realtek 8111C
System Memory	2 x 240-pin DDR2 DIMM 533/677/800 MHz sockets - up to 4 GB
Graphic memory	Share system memory 8MB~256MB
BIOS	AMI
<b>LCD Touch Panel</b>	
LCD Size	15" TFT LCD
Brightness	250 nits, adjustable in 8 steps to 25nits, auto adjust mode
Resolution	1024 x 768
Touch Screen	650RT Resistive 5 wire, 650ST SAW
Tilt Angle	0 ° ~ 90 °
<b>Storage</b>	
HDD	Two 2.5 SATA HDD bay, RAID Support, <i>Quick Change-hot swap</i>
Flash Memory	CF adapter <i>Quick Change</i>
<b>Internal Expansion</b>	
USB 2.0	Two, one normally used for 802.11n wireless card
<b>I/O Ports</b>	
USB	Four x in cable well / 1 x on left side
Serial	Three, DB9 ( COM 2 /COM 3 pin 9 with 12V by BIOS setting )
Parallel	One, DB25 in cable well
LAN	(10 /100/ 1000) One, RJ45 in cable well (Realtek 8111C)
2 <sup>nd</sup> Display	One, supports standard PC monitor or optional (J2 provided) secondary customer side display
Cash Drawer	2 x RJ 11 24V with status
DC In	1 Power in, 19VDC 7.1 amps
Audio Jack	One headset, one microphone-in, left side (VIA1708B)
Printer Power	+24 V 2.5 amps, supports most 24V POS printers, Power Cable included
Power LED	Located under front panel logo - green for on, amber for standby

<b>Power</b>	
Power Adapter	19VDC, 135W, 100-240 VAC, 50~60Hz, 2.2A
<b>Optional Peripheral</b>	
MSR	3 Track ( on PS2 port, <i>wedge type</i> )
iButton	Dallas Key iButton ( on PS2 port, <i>wedge type</i> )
2-in-1 MSR	MSR 3 track (PS2) / Finger Print (USB)
Second Display	optional 8.4", 10.4" or 12.1" 2nd display, with or without touch
Customer Display	Customer Side LCM display with 9mm 2 x20 characters, Black on White Characters,
Uninterruptable Power Supply	2 hour DC UPS, mounts in base of unit
Bar Code Scanner	1D and 2D hands-free scanner
<b>Mounting</b>	
Standard	Counter Top Base, Adjustable Viewing Angle 0-90°
Included	Wall Mount / VESA Mount Bracket
Optional	Pole Mount, Adjustable angle VESA, Swing-arm Mounts
<b>Environment</b>	
EMC & Safety	FCC, Class A, CE, LVD
Operating Temperature	0 ~ 40°C
Storage Temperature	-20 ~ 55°C
Operating Humidity	20% ~ 80% RH non-condensing
Storage Humidity	20% ~ 85% RH non-condensing
<b>Dimensions (W x D x H)</b>	370 x 250 x 340mm
<b>Weight</b>	7.45kg
<b>OS Support</b>	Microsoft Vista, Windows XP, WEPOS, XP Embedded, Windows CE 6.0 and Linux

\* This specification is subject to change without prior notice.



## Unique Features

The 650 truly has some unique features not hitherto seen on an integrated touch screen computer before. These features allow for a great deal of versatility in how the 650 can be configured and used. A quick list of unique features is as follows:

### Intel's Desktop Processor Socket LGA 775

By using the new generation of Intel's green processors and chipsets, a very wide range of processors can be used in the 650 system. From a Celeron single core processor running fan less at 1 GHz to a 2.667GHz Core 2 Duo with 1GHz FSB and 4MB cache, the performance range is truly unique.

Most POS computers use Intel's Mobile processor and chipset to keep heat and power down. This is fine but the performance is lower and the cost is higher for Mobile processor solutions. By taking advantage of J2 company's and partners' vast experience with notebook, desktop, and POS computer designs, we are able to combine features of all three for an optimal POS system design. The result is a POS system that can utilize a desktop chipset that draws very little power and generates a low amount of heat, similar to mobile chipsets and processors.

Notebook quality components are used in the processor, chipset, and power supply circuit, which allow greatly for reduced heat generation and minimal power usage. Additionally, the 650 takes full advantage of the low power features built into the Intel processor and chipset to further reduce heat.

### Hot Swappable RAID/ Dual Hard Drives

The 650 is the first integrated POS system on the market to offer a hot swappable RAID feature. The two internal 2.5 inch SATA hard drives can be configured as a RAID array which gives true fault tolerance to the hard drive subsystem. This has not been available on an integrated POS device before!

### Green Mode / Fan less Operation

By changing one setting in the BIOS, the 650 can be configured to function as a fan-less POS system. In this mode the standard 1.6GHz processor and chipset run in a reduced power mode which means that the two fans are off and the 650 is convection cooled. The system performance in green mode is greater than other fan-less POS systems on the market, with the 650 benchmarking near the same performance as a 1.3GHz Celeron M processor based system. This patent pending feature is unique to J2.

## **Automatic LCD Brightness Control**

Another innovative feature of the 650 is its use of a light sensor to control the LCD brightness. A light sensor is built into the unit and can detect when a room is darkened. It will automatically dim the LCD so that it is not too bright. This patent pending feature is also unique to J2.

## **UPS**

Not your ordinary UPS, the J2 650 UPS is a DC, not an AC UPS. The UPS fits conveniently into the base of the unit. Unlike an AC UPS the J2 UPS makes the 650 work more like a notebook computer. In addition to running the 650 for up to two hours, the UPS will run all the POS peripherals attached to the 650, including the printer. Because of the unique design of the J2 UPS and power supply, the need for special AC power conditioning devices is eliminated.

## **Printer Power Port**

The 24 volt Printer Power Port can power most POS printers on the market, including the popular Epson line of printers. When used along with the J2 UPS, if a power outage should occur, the POS terminal can still operate and print receipts for up to two hours. Also, when the 650 is turned off the printer is turned off also. This is very useful when the auto power on and off features of the 650 is used.

## **Cooling System**

Great attention was paid to the thermal solution of the 650; it is truly a unique feature. The 650 can run as a fan less or fan-cooled system. Because of the very wide range of processors supported, thermal loads can range from 20 watts to as high as 80 watts. The 650 was designed to handle these thermal loads while still being super quiet. Two smart fans are used in conjunction with an Embedded Controller (EC) to ensure that the fans run at the lowest possible speed while still providing proper cooling. Fan speed changes are controlled to produce the smallest acoustical signature possible. The 650 also includes a JAM-FAN mode. If the fan does not spin up when it should, the fan turns on to full power to dislodge any dust that may be jamming the fan! The 650 fans are the type used in Blade Servers and have a speed range from 2500~13500rpm at very high torque.

## **Versatility**

The word versatility is very much over used, but it is the correct word to describe the most unique feature of the 650. The combination of all the 650 unique features allows for the 650 to fit many roles. The 650 is not just one product, but a full product range all in one system. From fan less thin client to Core 2 Duo RAID Server - the 650 does it all.

# System

## Configurations

The 650 can be ordered or upgraded to many possible configurations. Selecting the right combination of memory, processor, hard drive(s) and software drivers can dramatically change the performance of the 650 system. For a lot of users the standard 650 1.6GHz processor and 512MB of memory is fine, but some applications require a lot more horse power.

J2 will be happy to help you determine what you may require from the 650 in the most cost effective way. More memory may be added to get the performance needed, or sometimes a dual core processor and dual HDD with RAID are needed. The 650 can do it all, low end to high end.

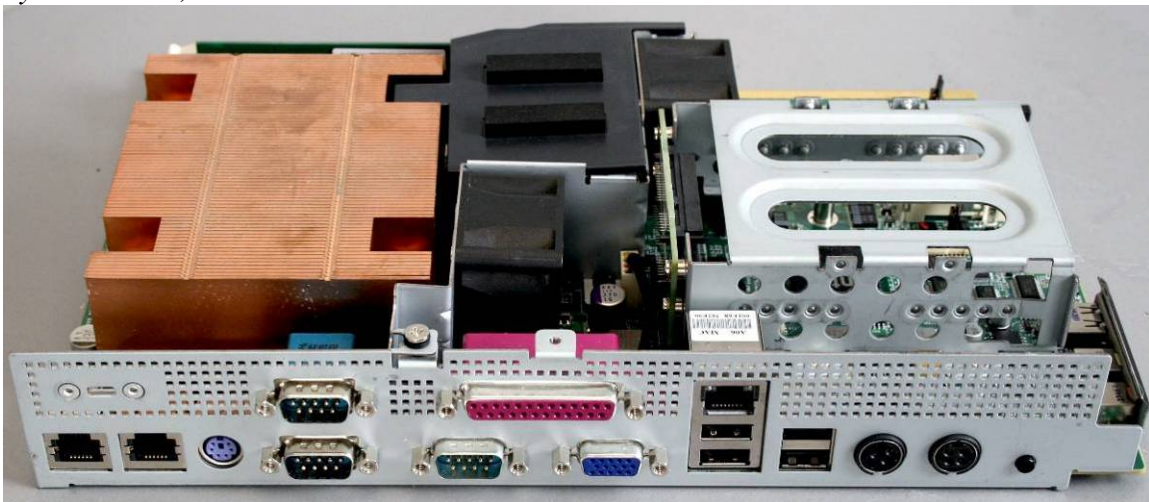
## Processor Support

The 650 supports a very wide range of Intel processors. Each provides a different price performance level. Celeron single core, Celeron dual core, Pentium dual core and Core 2 Duo with processor speeds from 1.6 GHz to 2.667 GHz are all supported by the 650.

The 650 comes standard with the Intel single core 1.6 GHz Celeron 420 Conroe Core processor but can be ordered with a different processor type. The processor can be easily upgraded by a qualified technician. The 650 uses the Intel defined LGA775 socket. Not all LGA775 socket processors work in the 650 so please see the supported processor list at the end of this section. Intel is constantly adding new processors so please check with J2 for any additions since publication of this manual.

The copper heat sink, cooling fans, and fan controller (*shown below*) are designed to keep everything running cool, quiet, and reliably with the supported processors.

*System Board, back view*



## Processors currently supported on the 650

CPU #	Description (all are desktop processors)	Cores	Speed	FSB	Cache	TDP	Type	Family	EB	Availability July 2008	Intel's Release Date
420	Celeron 440 Family	1	1.6GHz	800MHz	512KB	35W	65 nm	Conroe-L	No	Standard	7-Jun-07
430	Celeron 440 Family	1	1.8GHz	800MHz	512KB	35W	65 nm	Conroe-L	No	Good	7-Jun-07
440	Celeron 440 Family	1	2.0GHz	800MHz	512KB	35W	65 nm	Conroe-L	Yes	Good	7-Jun-07
E1200	Celeron Dual Core	2	1.6GHz	800MHz	512KB	65W	65 nm	Conroe	No	Good	20-Jan-08
E1400	Celeron Dual Core	2	2.0GHz	800MHz	512KB	65W	65 nm	Conroe	No	Good	20-Apr-08
E2140	Pentium Dual Core	2	1.6GHz	800MHz	1MB	65W	65 nm	Conroe-1M	No	Poor	22-Jul-07
E2160	Pentium Dual Core	2	1.8GHz	800MHz	1MB	65W	65 nm	Conroe-1M	Yes	Good	22-Jul-07
E2180	Pentium Dual Core	2	2.0GHz	800MHz	1MB	65W	65 nm	Conroe-1M	No	Good	6-Aug-07
E2200	Pentium Dual Core	2	2.2GHz	800MHz	1MB	65W	65 nm	Conroe-1M	No	Good	2-Dec-07
E2220	Pentium Dual Core	2	2.4GHz	800MHz	1MB	65W	65 nm	Conroe-1M	No	Good	2-Mar-08
E2240	Pentium Dual Core	2	2.6GHz	800MHz	1MB	65W	65 nm	Conroe-1M	No	Poor	30-Jun-08
E4300	Core 2 Duo	2	1.8GHz	800MHz	2MB	65W	65 nm	Conroe	Yes	OEM	21-Jan-07
E4400	Core 2 Duo	2	2.0GHz	800MHz	2MB	65W	65 nm	Conroe	No	Poor	22-Jul-07
E4500	Core 2 Duo	2	2.2GHz	800MHz	2MB	65W	65 nm	Conroe	No	Good	22-Jul-07
E4600	Core 2 Duo	2	2.4GHz	800MHz	2MB	65W	65 nm	Conroe	No	Good	21-Oct-07
E4700	Core 2 Duo	2	2.6GHz	800MHz	2MB	65W	65 nm	Conroe	No	Good	2-Mar-08
E6300	Core 2 Duo	2	1.886GHz	1066MHz	2MB	65W	65 nm	Conroe	No	Poor	27-Jul-06
E6320	Core 2 Duo	2	1.886GHz	1066MHz	4MB	65W	65 nm	Conroe	No	Poor	22-Apr-07
E6400	Core 2 Duo	2	2.133GHz	1066MHz	2MB	65W	65 nm	Conroe	Yes	OEM	27-Jul-06
E6420	Core 2 Duo	2	2.133GHz	1066MHz	4MB	65W	65 nm	Conroe	No	Good	22-Apr-07
E6600	Core 2 Duo	2	2.4GHz	1066MHz	4MB	65W	65 nm	Conroe	No	Poor	27-Jul-06
E6700	Core 2 Duo	2	2.667GHz	1066MHz	4MB	65W	65 nm	Conroe	No	Poor	27-Jul-06
E7200	Core 2 Duo	2	2.53GHz	1066MHz	3MB	65W	45 nm	Wolfdale-3M	-	Good	20-Apr-08
E7300	Core 2 Duo	2	2.667GHz	1066MHz	3MB	65W	45 nm	Wolfdale-3M	-	Good	10-Aug-08

### Notes:

Processors in **Red** = Best price points performance

Availability = Good Means, normally available from retail outlets

EB = Intel's embedded road map, available for seven years from release date.

Intel will include one of the E7X00 processors in the embedded road map but which one was not announced at the writing of this manual.

## I/O Ports

The 650 is an integrated design with all the electronics in the head. Most I/O ports are accessible in the cable well at the bottom of the unit. A cover plate is provided to cover the cables.

### *I/O Panel*



## Off / On Button

The Off / On button is located in the cable well, as shown. This button is located near the side to prevent accidental powering down by the user. The function of the button can be controlled by the OS. If the 650 hangs for some reason it can always be powered off by holding the Off / On button in for six seconds.

The 650 also supports the following: Restore on AC on power loss, Wake On LAN, and Wake On RTC alarm features to control the system power up. Please see the BIOS setup section of this manual and J2 white paper “Reducing Your Carbon Footprint in the POS Environment” (September 2008).

### *Off / On button Location*





## Hard Disks

Two 2.5 inch SATA hard drives (HDD) are supported. These drives can be configured as standard hard drives or as a RAID array. The SATA interface can support data transfer rates up to 3.0 Gb/s and supports AHCI and Hot Swapping of hard drives.

The HDDs can easily be accessed by removing a panel on the left side of the unit. HDDs can be installed or removed in seconds by removing one screw. A carrying tray (two of which are supplied with the 650) clips onto a new drive without tools. The drive can now easily be slid into the drive bay. In a RAID 1 configuration a drive can be hot swapped, removed, or inserted with the power on (see section on RAID setup).

*HDD access panel*



*HDD slide in-slide out drive bay*



## Compact Flash

The 650 has one Type I/II Compact Flash (CF) memory slot. This slot is only for IDE mode CF devices and is easily accessed on the left side of the unit. The CF card is mapped to a SATA port and supports PIO Mode 0-4. The CF card is normally used for thin client configurations using XPe, CE, WEPOS, or Linux operating systems.

*Compact Flash access panel*



## Touch Screen

The 650RT uses a five-wire touch screen rated at 35 million touches per point. The 650RT touch screen was designed to easily be changed, normally in less than ten minutes. The resistive technology is very responsive and is not affected by liquids, dirt, or other foreign matter, unlike IR or SAW touch screens. As with all J2 designed products using resistive touch screens, the 650 includes a water tight gasket for spill resistance.

The 650ST unit uses a Surface Acoustic Wave (SAW) technology touch screen. The SAW touch screen has no known failure mode-- it does not “wear out.” This screen is tempered glass and does not reduce the brightness of the LCD panel. When operating in a very high use environment, SAW is the recommended touch screen technology.

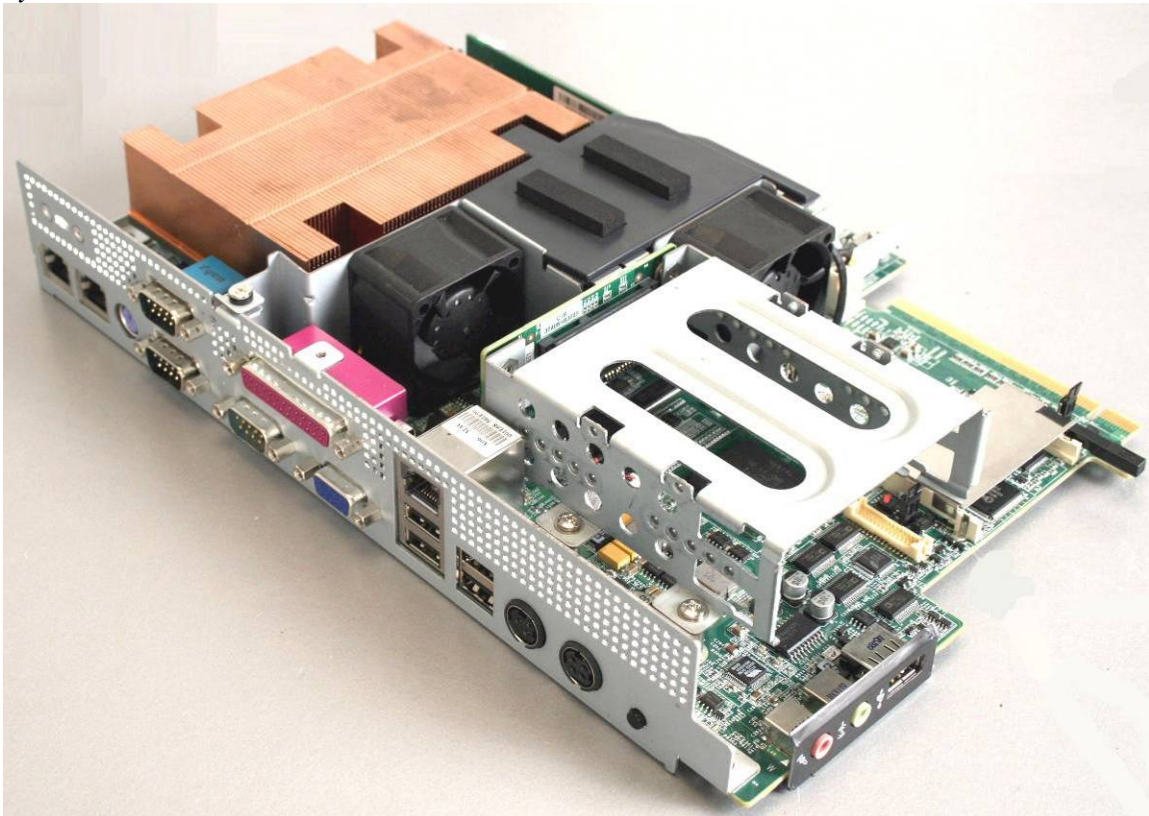
Depending on operating environment and usage, both the Resistive and SAW touch screens have strengths and weaknesses. J2 offers both touch screen technologies on the 650.

## System Board

POS computers typically have a desired lifespan of 10 years or longer, therefore product quality is of the utmost importance. The 650 electronics are built with high-end components to ensure reliability and long lasting product performance.

The system board is designed for quick replacement and only has one connection, an edge pin connector, to which all motherboard connections are made.

### *System board*



## LCD Display

The LCD display for the 650 is a 1024 x 768 resolution display with 16.2 Million colors. The brightness is rated at 250cd/m<sup>2</sup>. The Intel controller allows for the display to be rotated to 0, 90, 180 or 270 degrees without loss of performance.

The LCD brightness can be controlled in 8 steps, from 250 cd/m<sup>2</sup> to 25 cd/m<sup>2</sup>. The brightness can be controlled automatically by the 650 light sensor hardware or can be set to a fixed level.

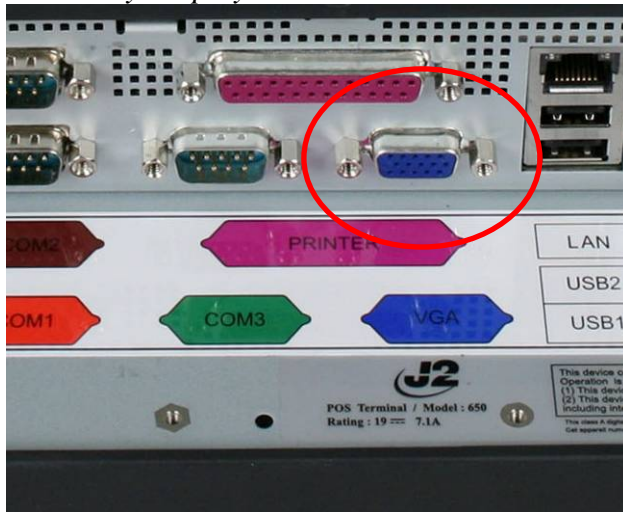


## Secondary Display Port

A secondary video display is supported on the 650 and can be set as the primary or secondary display. Secondary video displays can be configured as a Twin, Intel Dual Display Clone, or Extended Desktop. Most all monitor resolutions from 640 x 480 to 2560 x 2048 are supported via the Secondary Display Port. The secondary display can also be rotated 90, 180 or 270 degrees. A number of additional features are supported depending on the capabilities of the monitor.

The Secondary Display Port has an industry standard HD DB15 connector. When used with some J2 monitors the display can be powered by the 650 through this connector.

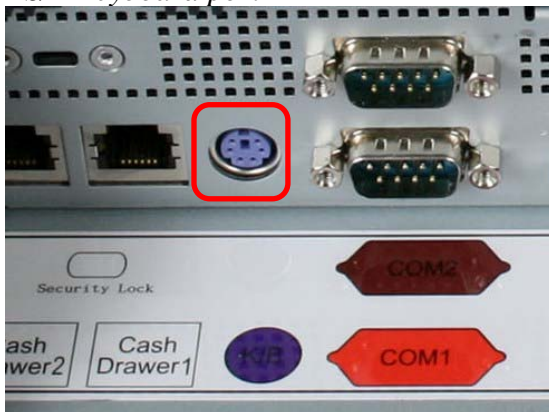
*Secondary Display Port*



## PS/2 Keyboard port

There is one PS/2 Keyboard port located in the connector well to support a PS/2 type keyboard or other PS/2 type device, such as a Barcode Scanner. The 650 MSR and iButton reader are also connected internally to a PS2 keyboard port and function as an external wedge MSR.

*PS/2 Keyboard port*



## Serial ports

The 650 has three external RS232 serial ports, two of which can be powered COM2 and COM3. The serial ports are standard PC RS232 ports with a DB9 male connector. The serial ports, in a normal configuration, are mapped to COM 1-3.

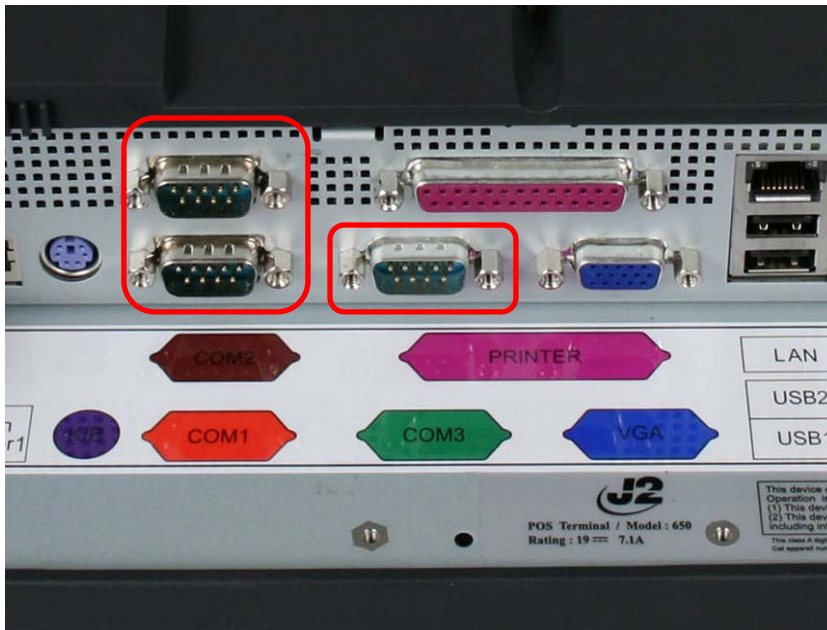
COM ports 2 and 3 can supply power to an external device when required, like the optional J2 Customer Display. Voltage, +12, is supplied on pin 9 (RI) of the DB9 connector. The maximum current is 500ma and is over-current protected. To enable the voltage supply for either COM ports 2 or 3 the BIOS setup must be changed. This function can be enabled in the Advanced Settings screen under Super I/O Configuration.

COM1 also supports RS422 and 485 signaling. This can be enabled in the Advanced Settings screen under Super I/O Configuration in the BIOS setup screen.

### *DB9 pin out serial ports*

Pin	RS232	RS422	RS485
1	DCD	TXD-	D-
2	RD	RXD+	
3	TD	TXD+	D+
4	DTR	RXD-	
5	GND	GND	
6	DSR		
7	RTS		
8	CTS		
9	RI		

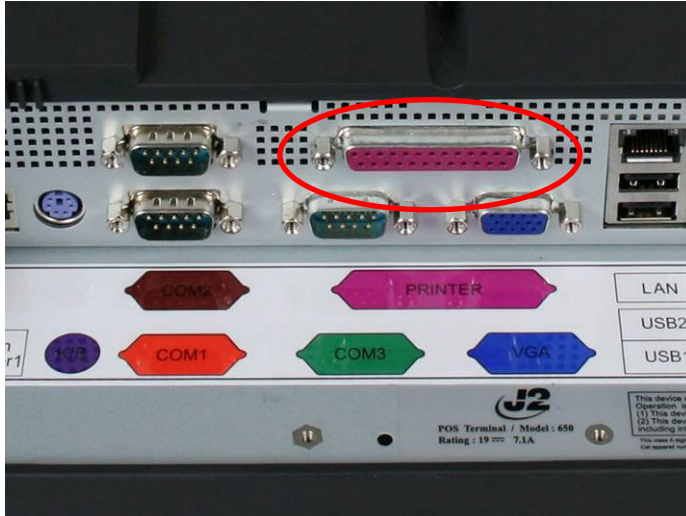
### *Serial Port*



## Parallel Port

The 650 has one Parallel Printer Port located in the connector well (*shown below*) which supports SPP, ECP and EPP printer modes. The mode can be changed in the BIOS setup.

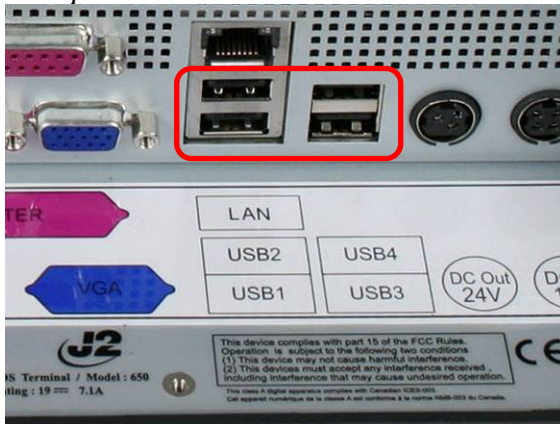
### *Parallel Port*



## USB ports

The 650 has five external and three internal USB 2.0 ports. Of the five external ports (*see below*) four ports are located in the cable well and one is located on the left side of the unit for easy access. The three internal USB ports are as follows: one can be used for the optional Finger Print Reader and is located on the MSR connecting point. The second internal USB port is used for the SAW touch screen controller in the 560ST unit; and the third internal USB port is designed for an optional internal 802.11n Wireless LAN card.

### *USB port Cable Well*

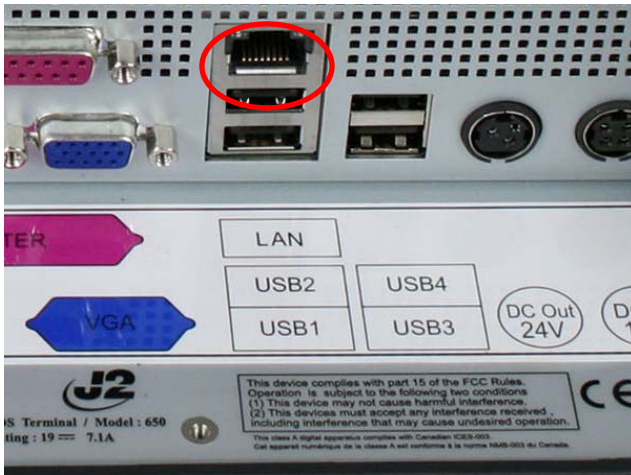


### *USB port left side*



## Ethernet Connection

The 650 uses the Realtek 8111C Gigabit Ethernet controller. The Ethernet connector is located in the cable well, *as shown below*. The Ethernet controller supports Wake on LAN, the BIOS supports a PXE boot ROM as well. There are two LEDs on the LAN connector: the Green LED lights up when the LINK signal is present and the Amber LED lights comes on when there is LAN activity.



## Kensington Security Slot

There are two Kensington Security Slots (lock slots) on the 650. (*Please see below*). One is located on the head in the cable well, and one is located on the inside of the base. The Kensington locks are normally used as a deterrent to prevent opportunistic theft. Most retail locks will work with the 650, however please check to see if a lock fits, as not all do.

*Kensington slot Cable Well*



*Kensington slot Base*





## Audio

The 650 uses the VIA1708B HD audio controller. There is one internal speaker. Both a microphone jack and a headset jack are located on the left side of the 650, *as seen below*, which allows for the connection of a microphone and headset or audio out to other devices.

### *Audio Jack Location*



## Printer Power Port

The Printer Power Port allows an industry standard POS printer to be powered from the 650 and eliminates the need for a separate external power supply for the printer. Only one AC power point will be needed to run the unit and the printer.

The Printer Power Port supplies 24 VDC 2.5 amps and 3.5amp surge current which will run most POS printers on the market. The power cable for this port is supplied standard with the 650 unit. The Printer Power Port will also supply power to a printer even when running on the optional UPS. When the 650 is powered down, then power to the printer is turned off. (*photos below*)

### *Printer Power Port*



### *Printer Power Port Cable*



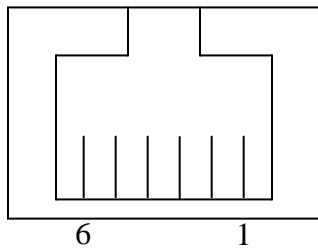
## Cash Drawer Ports

The 650 is equipped standard with two Cash Drawer ports. These ports are located in the cable well and use the industry standard RJ-11 connector and pin out (*illustrated below*).

### *Cash Drawer Ports*



### *Cash Drawer Pin Assignment*



Pin	Signal
1	GND
2	SOLENOID
3	STATUS
4	24V
5	NC
6	GND

The application may address the Cash Drawer port in a number of ways. They are:

- 1) Using the J2 supplied OPOS drivers for Vista, XP, WEPOS and XP Embedded.
- 2) Using the J2 supplied Virtual COM port for CE.NET, XP, WEPOS and XPe.
- 3) Direct access to the I/O port that controls the firing of the cash drawer and the I/O port for reading the drawer status.

The Virtual COM port driver is standard on Windows CE.NET and the cash drawer appears as COM5.

To open Cash Drawer One: Send a bell character to the COM5 serial port. (The bell character is the ASCII 07 hex character "Control G.")

To open Cash Drawer Two: Send an ESC character, then a bell character to the COM5 serial port. The open/close status of the drawer may be obtained by reading the status

bits of COM5, and the drawer open/close status will be reflected on the CTS and RI bits, either bit may be used. This virtual COM port driver is designed to work the same as most serial cash drawers so that drivers for a serial cash drawer should work if mapped to the correct COM port, normally COM5 in the 650 system.

The cash drawer can directly be accessed through two I/O ports, 280 hex and 281 hex. Port 280 hex is an output only port and fires the cash drawer when toggled. Port 281 hex is an input only port and reads the status of the cash drawer.

#### *Cash drawer I/O ports*

Port	Function	Set to One	Set to Zero
280 hex bit 4	Write	Normal state	Fire cash drawer 1 (once)
280 hex bit 5	Write	Normal state	Fire cash drawer 2 (once)
281 hex bit 0	Read	Drawer 1 is closed	Drawer 1 is open
281 hex bit 1	Read	Drawer 2 is closed	Drawer 2 is open

## Power Supply

The 650 uses a notebook type power supply that is normally mounted in the base of the unit. The power supply is rated with an output of 19 VDC 7.1 Amps and has an input rating of 100-240VAC at 50~60Hz 2.2Amps maximum. The power supply typically has an efficiency rating of 85% under light loads and 90% under heavy loading. The power supply connector is a four pin locking type that plugs into the system's power input connector located in the cable well.

#### *Power Input connector*



## Service

### Removing the Head from the Base

A countertop base is supplied standard with the unit. The base is easily attached to the unit by sliding the unit onto the base's mounting slots. One screw point is used to secure the base to the unit and is accessed from the bottom of the 650. To remove the base from the unit, first remove the Base Locking Screw at the bottom of the base as shown in the picture.

*Base Locking Screw*



To remove the base, pull it towards the bottom of the unit as shown in the picture. The unit will slide off its mount hooks. To reattach the base, align the mounting hooks and locking tab to the plastic slots and push up until secure. Secure the base with the locking screw.

*Slide off towards bottom of unit*



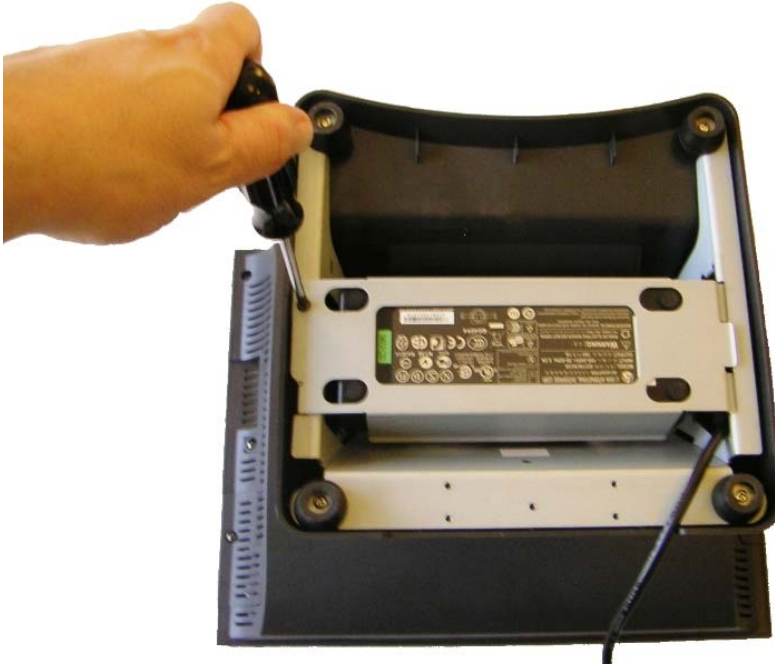


## Removing the Power Supply

The power supply is normally located in the counter top base. When using a wall mount bracket or the J2 UPS, the power supply would be external from the unit.

To remove the power supply from the base, one screw needs to be removed. With the screw removed the power supply and mounting bracket can be removed by sliding the bracket, then tilting the power supply and bracket up.

*Screw location*



## Wall Mounting Bracket

A wall mount/VESA adapter bracket is supplied standard with the 650 unit. This bracket allows the unit to be mounted to a wall or other surface. The wall mounting bracket is a one piece bracket with four mounting holes (plus VESA mounting holes: see next section). This mounting bracket would first be attached to the mounting surface, and then the unit would be slid on to the mounting bracket hooks. After the unit is secure the Locking Screw should be installed to ensure the unit cannot be accidentally knocked off the bracket.

*The units slides on to the mounting bracket hooks*



*Locking Screw location*



NOTE:

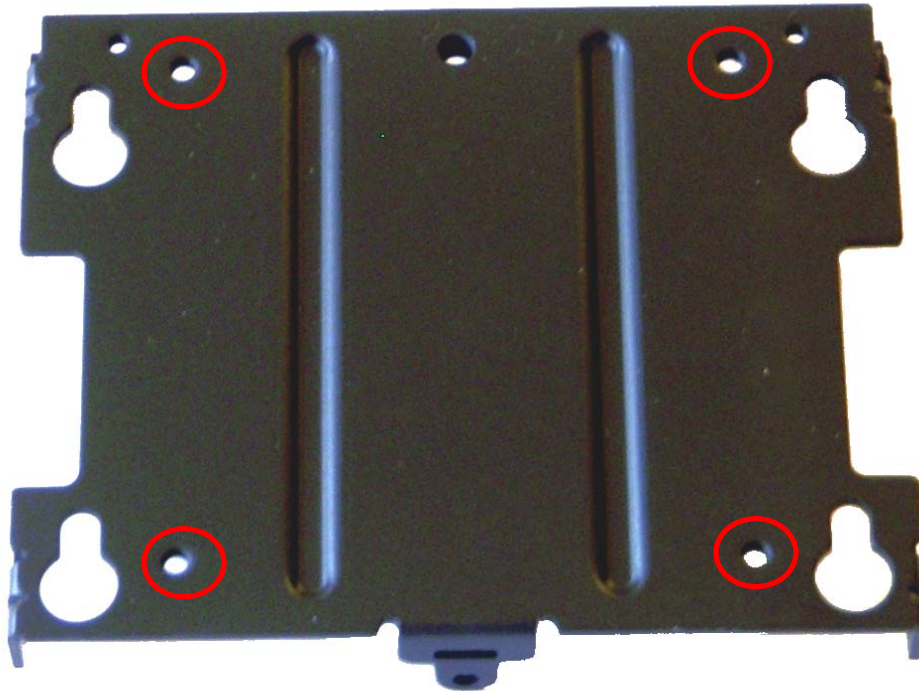
**Wall mounting screws are not supplied**, as different types of walls require different type of screws. Please be sure the mounting screws used can support the weight of the unit.

## VESA Mounting

The 650 unit also supports the industry standard 75mm VESA mounting. J2 offers a Pole Mount option that uses the VESA standard. There are also a number of third party vendors that make many different types of 75mm VESA mounts, allowing for a myriad of mounting options.

The VESA mounting pattern is supported via the wall mounting plate which has the 75mm mounting pattern as shown below. Four 4mm x 8mm screws are used (supplied) to secure the bracket to the VESA mounting bracket. After installing the J2 mounting bracket to the VESA bracket the 650 can then be slid on to the mounting bracket hooks. After the unit is fit to the mount, the locking screw should be installed to ensure that the unit is secure.

*Wall Mount Bracket / Mounting Holes 75mm VESA Pattern*



## Removing the Back Cover

The following steps show how to disassemble the 650 for servicing:

On a clean, **protected** surface, place the unit screen-side down. Remove the two cover screws as shown. Carefully lift the back cover as shown.

*Remove two screws as shown*



*Carefully tilt up the back cover*



Note: The 650 was designed so that the internals of the unit could be accessed without having to remove the mounting base or the mounting bracket of the unit.

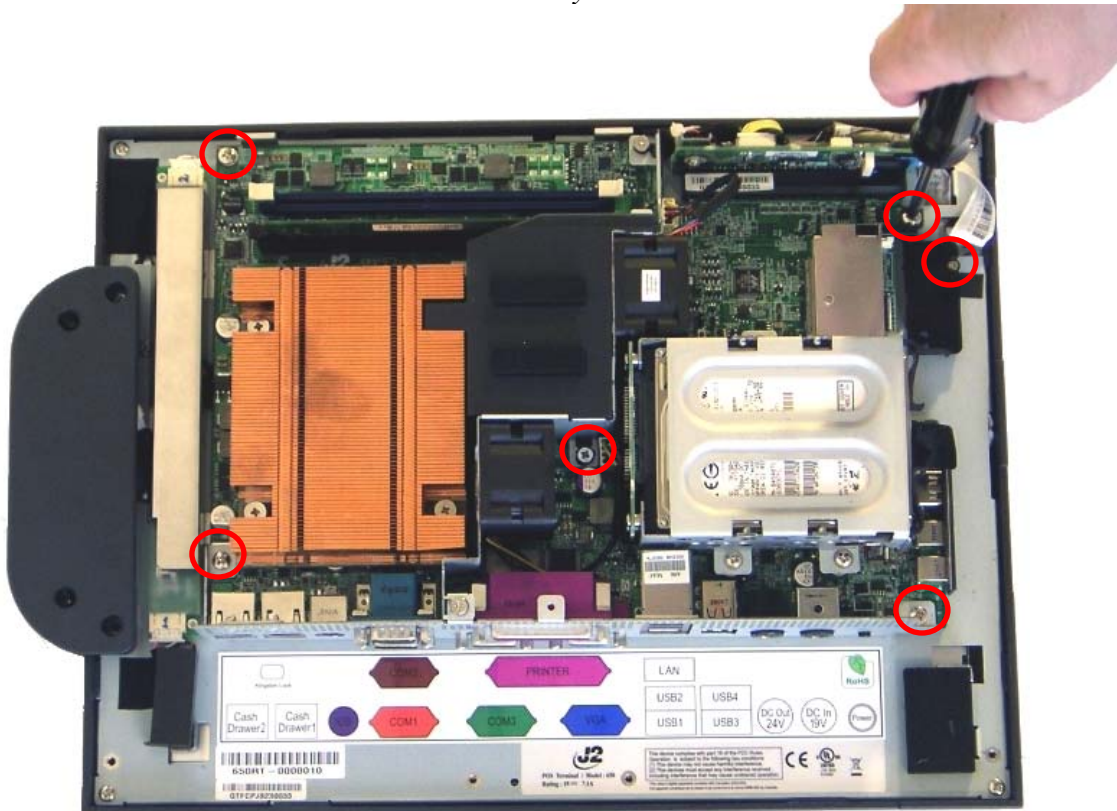


## Changing the System Board

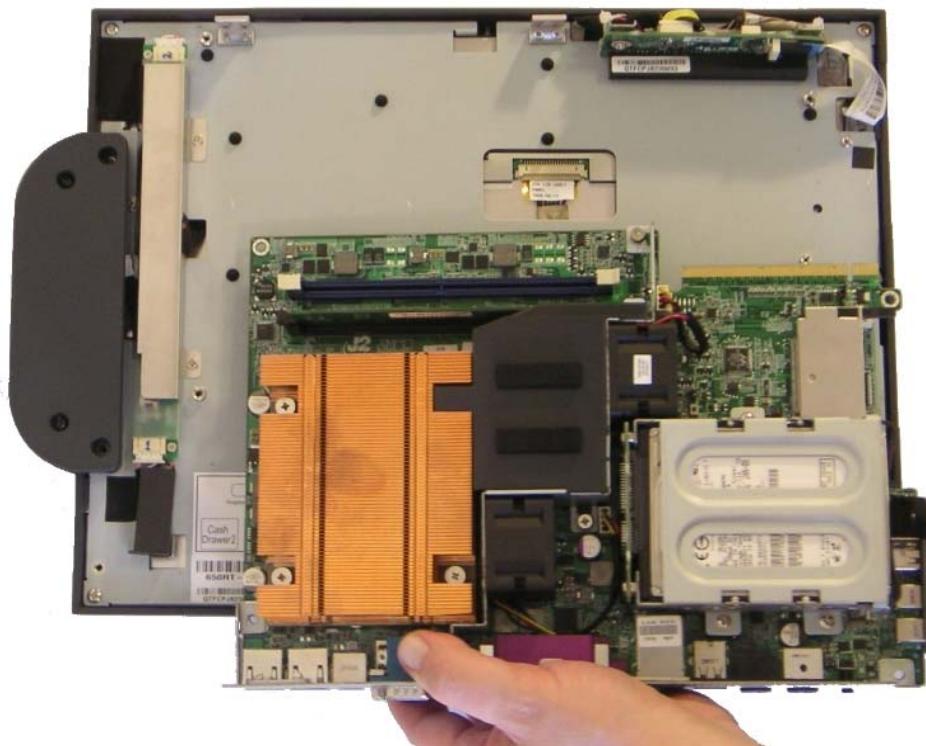
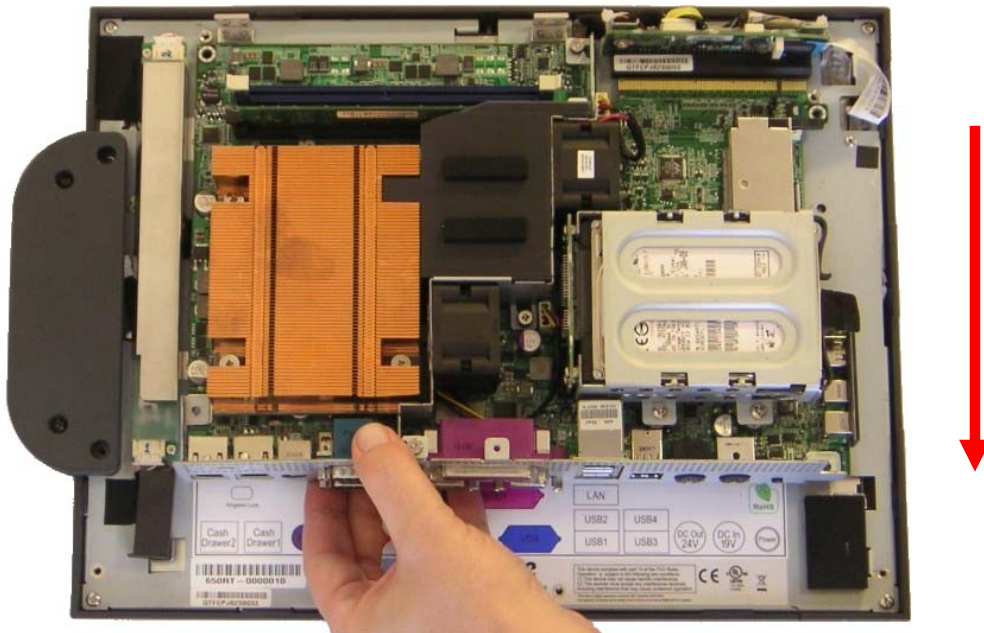
**\*Special Note:** An anti-static workplace with proper grounding is required when changing the System Board.

First remove the back cover. There are 5 screws that hold the system board in place that will need to be removed; the middle screw is the captive type and only needs to be loosened. The CF card guide also needs to be removed. (see photo below)

*Screw location System Board*



After the screws are removed the system board can be unplugged from its connector. While using the I/O bracket to pull on, slide the board out towards the bottom of the unit as shown.

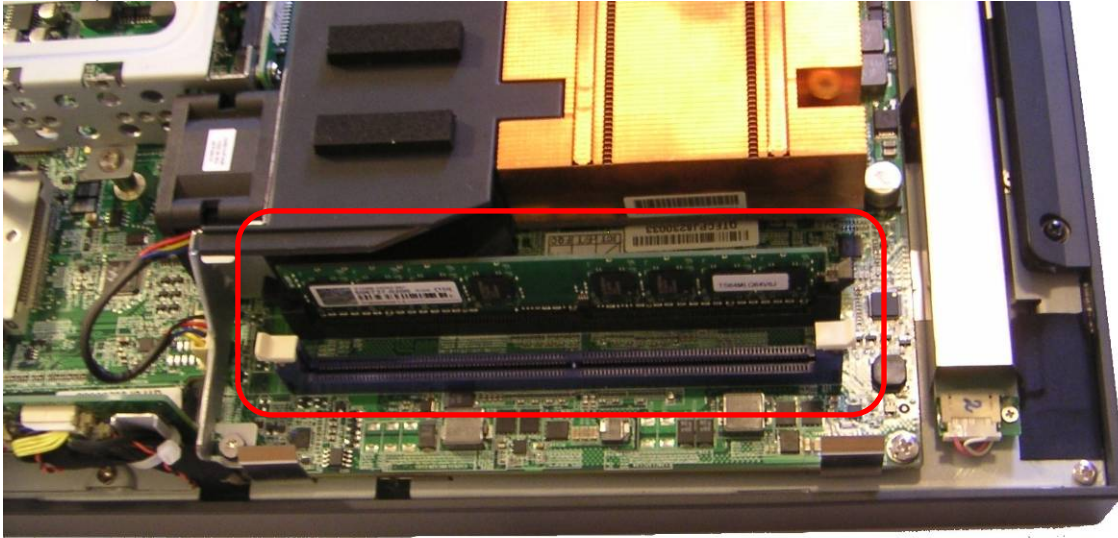


When reinstalling the system board make sure the locking tabs on the bottom of the board lock into their mating slots.

## Adding Memory

**Note:** An anti static workplace with proper grounding is required when adding memory. Remove the back cover. You can now access the two memory sockets; the order in which the memory is populated does not matter.

*Memory sockets*



## Changing the Processor

To change the processor, **first start by working in an anti-static workplace with proper grounding**. Remove the back cover by removing the two screws; now remove the black plastic fan duct (*as shown below*).

Loosen the four spring-loaded screws that secure the copper heat sink by loosening. Each screw about two turns at a time so that the pressure is removed from the socket evenly.

Once the screws are free you will now be able to remove the heat sink.

It will stick because of the heat sink compound, so take care to move it gently from side to side till it comes off. Set the heat sink aside, top side down.

You can now remove the processor from the socket. Push the locking lever down, push out from the locking tab, and move up as shown. Now carefully lift the cover up and you can remove the processor. **\*\*Be sure only to touch the edges of the processor and do not touch the processor pads of the socket pins. These socket pins are very easy to bend and damage to the socket is not covered by J2's warranty.**

The following Intel site has a good discussion of installing a LGA 775 processor:  
<http://www.intel.com/cd/channel/reseller/asmo-na/eng/299985.htm>



## Accessing the CF Card

*Remove screw as shown*



*Lift cover out of the way*



*Insert the Compact Flash card ensuring the card slides in on the guides*



When inserting the card ***do not force it***. Replace cover when installed.



## Accessing the Hard Drives

*Remove cover screw as shown*



*Remove cover*



*Remove or insert drive as needed*



The HDD may be hot swapped when in a RAID 1 configuration. In non RAID 1 configurations the unit should be powered down before changing a drive or data may be lost. No physical damage will happen to the HDD if inserted or removed with power on.

# BIOS Setup

## Entering the BIOS Setup

To enter the BIOS Setup, turn on or reboot the 650.

Press the DEL key after the BIOS sign-on screen appears and it has displayed **Initializing USB Controllers... Done**. It will display **Entering Setup...**

The main menu of the BIOS setup will be displayed; this can take a few seconds.  
If the supervisor password is set, you must enter it here.

The area on the right side of the screen displays a help window for the current screen or BIOS option.

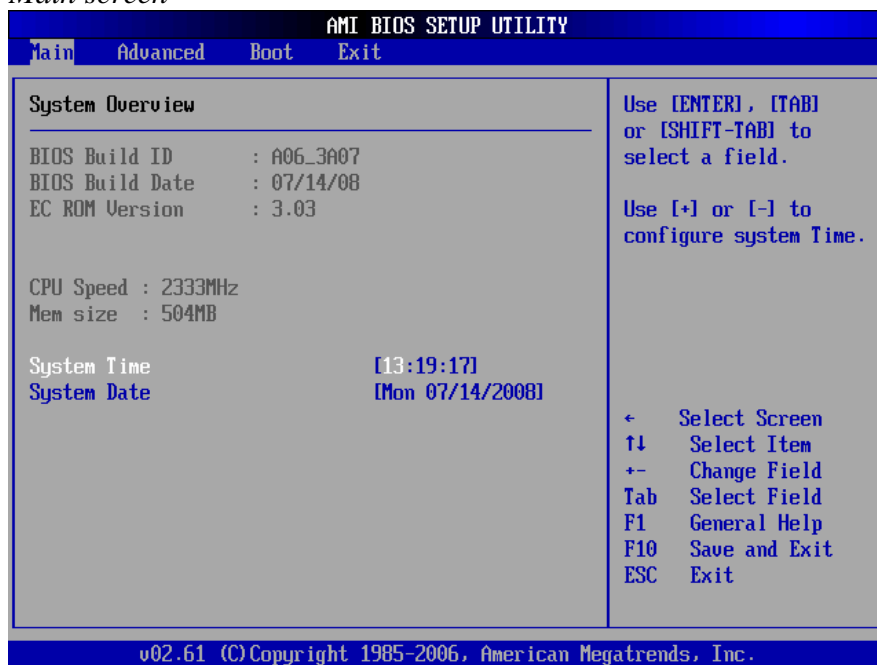
**Warning:** The BIOS setting should only be changed as required. Changing a setting or loading defaults may stop your system from working if it required a non-default setting.

>For example, in a system set up for RAID if you find you need assistance, please contact J2 for technical support.

## Main, System Overview

In this screen the CMOS time and date can be set. The time and date can also be set through the OS. This screen also displays the BIOS Build ID, BIOS Build Date, EC ROM Version, CPU type, CPU speed and DRAM memory size. The memory size will reflect the amount of system memory available minus the amount used by the graphics controller.

### Main screen



## Advanced Settings

This menu contains settings to control a number of system functions. The Hard Drive, Serial Port, Parallel port, USB, Green Mode, LCD Brightness Control, AC Power Loss, Second Display Power, LAN Remote Boot ROM, Logo Display, and Real Time Clock Wake on Alarm configurations are all set from this screen.

### Advanced Setting Screen

AMI BIOS SETUP UTILITY			
Main	Advanced	Boot	Exit
<b>Advanced Settings</b>		Configure the SATA device(s) .	
▶ SATA Configuration			
▶ SuperIO Configuration			
▶ USB Configuration			
Green Mode	[Disabled]		
LCD Brightness Control Mode	[Manual Mode]		
▶ Manual Mode Setting			
Restore on AC Power Loss	[Power Off]		
2nd Display D-SUB15 19V Out	[Disabled]		
Run PXE ROM	[Disabled]		
Display OEM Logo	[Disabled]		
		← Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit	
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## SATA Configuration

In this screen the SATA hard drives can be set to work in one of three modes, SATA, RAID or AHCI.

When set to SATA, the SATA drive works the same as a normal IDE HDD. This is the IDE compatible mode and default BIOS setting. The other two selections are RAID and AHCI modes. Please see the separate section in the manual for RAID Setup for further information on using RAID and AHCI modes.

### SATA Configuration Screen

AMI BIOS SETUP UTILITY	
Advanced	
<b>SATA Configuration</b> Configure SATA Ports as [SATA] ▶ SATA Port 1 [Not Detected] ▶ SATA Port 2 [Not Detected] ▶ Compact Flash(CF) [Not Detected]	<b>Options</b> SATA RAID AHCI  ← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
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When in SATA mode, hard drive type and size information and additional setup options can be accessed by selecting the drive and typing Enter. The hard drive submenu will now be displayed. This information is not available in RAID or AHCI modes.

### Drive Information Screen

AMI BIOS SETUP UTILITY	
Advanced	
<b>SATA Port 1</b> Device :Hard Disk Vendor :Hitachi HTS542580K9SA00 Size :80.0GB LBA Mode :Supported Block Mode:16Sectors PIO Mode :4 Async DMA :MultiWord DMA-2 Ultra DMA :Ultra DMA-6 S.M.A.R.T.:Supported  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]	Select the type of device connected to the system.  ← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
v02.61 (C) Copyright 1985-2006, American Megatrends, Inc.	

## Super I/O Configuration

This submenu allows for the setting of the serial ports I/O address, IRQ , mode (RS232, RS422, 485 port 1 only) and power (ports 2 and 3 only).

The I/O ports and IRQ settings are normally only changed to support legacy software. The Serial Port2/3 RI/12V would be changed to supply +12 volt power to pin 9 of the RS232 to power the J2 optional customer display or other peripheral device.

*Configure Super I/O Chipsets screen*

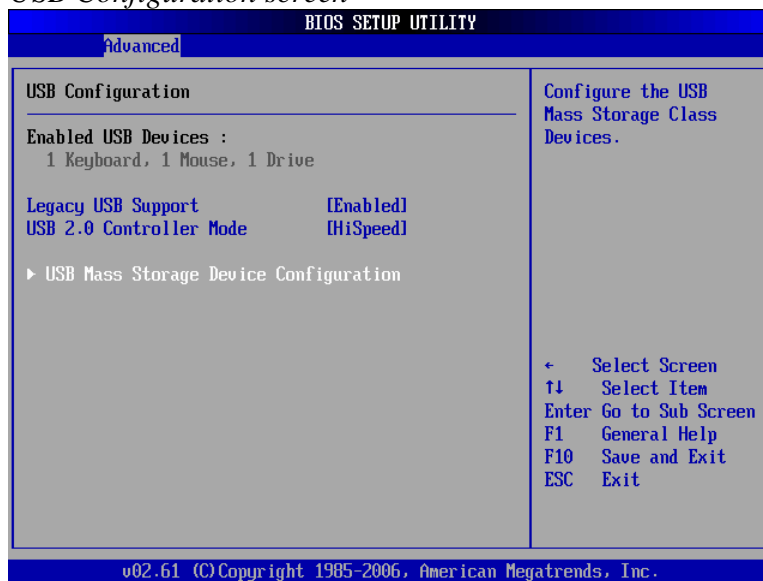
AMI BIOS SETUP UTILITY	
Advanced	
<b>Configure Super IO Chipsets</b>	<b>Select The IO Base Addresses of This Parallel Port.</b>
Parallel Port Address [378]	
Parallel Port Mode [SPP]	
Parallel Port IRQ [7]	
Serial Port1 Address [3F8]	
Serial Port1 IRQ [4]	
RS232/422/485 [RS232]	
Serial Port2 Address [2F8]	
Serial Port2 IRQ [3]	
Serial Port2 RI/12V [RING IN]	
Serial Port3 Address [3E8]	
Serial Port3 IRQ [5]	
Serial Port3 RI/12V [RING IN]	
	← Select Screen
	↑↓ Select Item
	+− Change Option
	F1 General Help
	F10 Save and Exit
	ESC Exit

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## USB Configuration

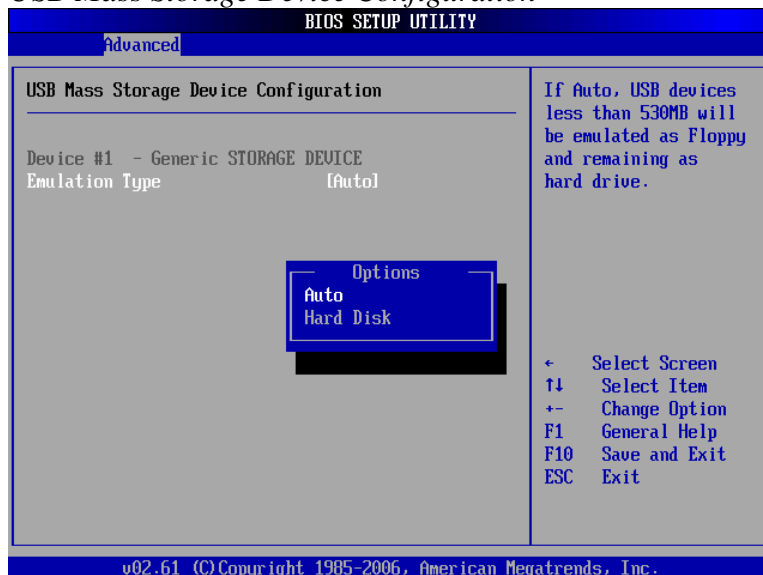
Here the function of the USB ports can be change or disabled. This is to support legacy operating systems, software and hardware and it also lists the USB devices connected to the system. This screen displays the total number of USB keyboards, USB mice or USB drives installed that will function in DOS.

### *USB Configuration screen*



By default any USB Mass Storage Device that is less than 530MB in size will boot up in DOS as drive **A**, and any device larger will boot up as drive **C**. By using the USB Mass Storage Device Configuration option set to Hard Disk the device will always boot as drive **C** no matter what size it is.

### *USB Mass Storage Device Configuration*



## Green Mode

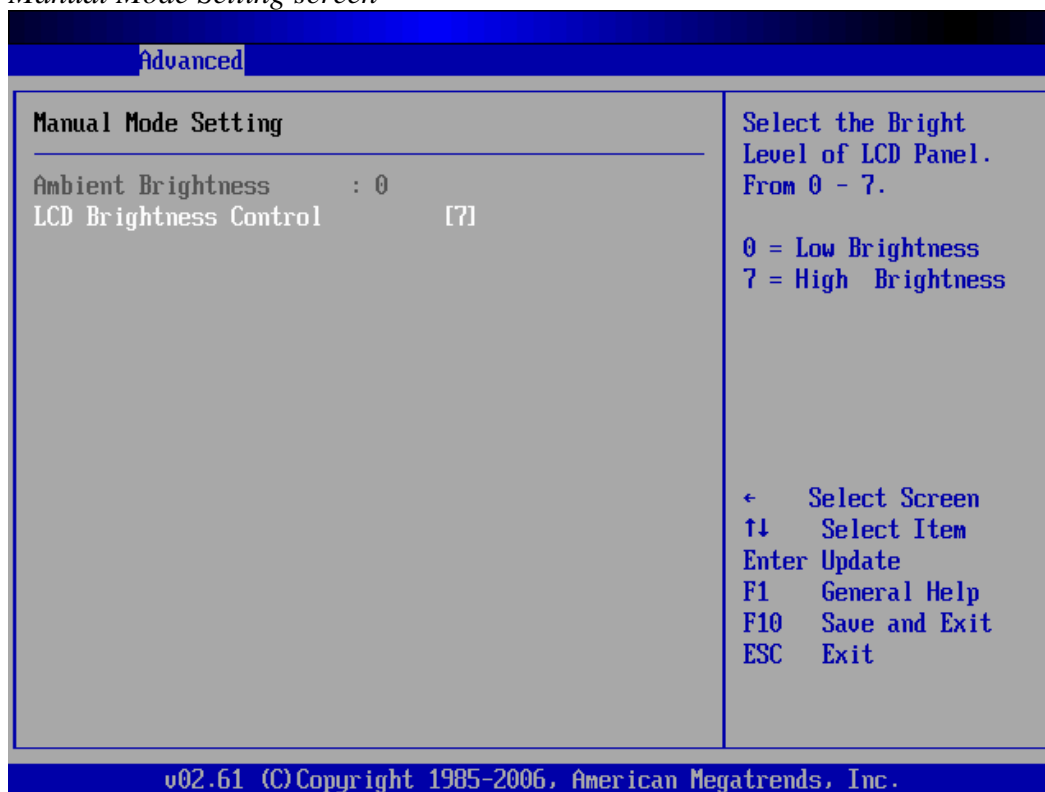
This feature is unique to the 650 system. This feature can be enabled or disabled with the default BIOS setting being disabled.

As described earlier in this manual, when the 650 is in Green Mode the system runs in reduced power mode. Further, when in Green Mode the 650 is running as a fan less system which means that it still has fans but they are turned off under normal operation conditions. The fans will turn on, however, if an over-heating condition is detected but will turn off once the 650 is again running within specification.

## LCD Brightness Control Mode / Manual Mode

The LCD display backlight brightness is set by this option. There are two modes: Manual and Auto. The default BIOS setting is Manual. This function is normally used when the 650 is located in a darkened environment where full brightness would be undesirable. In Manual Mode the brightness can be set to one of eight levels, 0 to 7, with seven being the default, the brightest backlight setting. The brightness range is from 250 to 25 cd/m<sup>2</sup>.

### Manual Mode Setting screen



## LCD Brightness Control Mode / Auto Mode

Another unique feature of the 650 is the LCD Brightness Control Auto Mode. In some situations a system may be located in an environment that is bright during the day and darkened at night. It would be impractical to have to change the brightness manually, so in most cases the system would just be left set to full brightness all the time.

With the LCD Brightness Control Auto Mode the system can automatically adjust the LCD brightness. When the background brightness lowers to a per-set point the system will automatically lower the LCD brightness. As the ambient light of the room increases, the system will then automatically adjust up the LCD brightness. This is done with hardware so that no software driver needs to be added to the system.

At the top of the Auto Mode Setting setup screen there are two values displayed, Ambient Brightness and Control LCD Brightness. The Ambient Brightness displays the current brightness detected by the light sensor located in the top middle of the front bezel of the 650. This is the number of lux the sensor detects. (If you cover the sensor you can see the value change after a few seconds.) The Control LCD Brightness is the level that the auto control currently has set the LCD backlight brightness, this value ranges from 0-7 with 7 being the brightest.

### *Auto Mode Setting screen*

Advanced	
<b>Auto Mode Setting</b>	
Ambient Brightness	: 0
Control LCD Brightness	: 0
Maximum Brightness	[ 500]
Maximum LCD Brightness	[7]
Minimum Brightness	[ 1]
Minimum LCD Brightness	[0]
Light Sensor Delay Counter	[ 5]
Ambient light level for full LCD brightness, use Ambient Brightness as a guide.	
← Select Screen	
↑↓ Select Item	
Enter Update	
F1 General Help	
F10 Save and Exit	
ESC Exit	
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There are five settings that control the auto brightness function; however the default settings should work for most installations. The five settings are:

**Maximum Brightness** - this sets the point where the light sensor will set the LCD brightness to the *Maximum LCD Brightness* value when reached. This value is in lux and is compared to the value read by the light sensor. Normally anything over 500 would be considered the brightness level that full LCD backlight brightness would be desired. The default is 500.

**Minimum Brightness:** sets the point where the light sensor must reach to set the LCD brightness to the *Minimum LCD Brightness* value. This is normally set to 1, which is the default value.

**Maximum LCD Brightness** is on a scale of 0-7 and sets the brightness of the LCD panel when the light sensor reaches the *Maximum Brightness* value. The default value is 7

**Minimum LCD Brightness:** This setting is on a scale of 0-7 and sets the brightness of the LCD panel when the light sensor reaches the *Minimum Brightness* value. Default value is 0.

**Light Sensor Delay Counter:** the number of seconds the system waits to change the value of the backlight after a change in the Ambient Brightness value. The value is in seconds and can be between 1-99. The default value is 5. This helps prevent shadows that momentarily cast on the light sensor from changing the LCD backlight brightness.

### Restore on AC Power Loss

The 650 has three options should AC power become lost and then restored. There is Power Off (stay turned off); Power On (turn on when AC restored); or Last State. The Last State setting will cause the unit to turn on if it was on when AC power was lost or it will stay off if the unit was off when AC power was lost.

### 2nd Display D-SUB15 19V Out

When using a J2 supplied secondary monitor it may get its power from the 650. If you have one of those monitors the power is enabled by this setting. The default value is “disabled”. NOTE: The pins used to supply power are normally not used on most PC monitors but damage can occur to some brands that have signals connected to these pins if this option is enabled. *So ensure that this setting is set to disabled when not using a J2 monitor.*

### Run PXE ROM

This setting enables the built-in PXE LAN remote boot rom. This allows the system to run as a diskless workstation, or to be able to download a drive image to a blank drive. When enabled, a message screen will appear and Shift-F10 can be typed to access the PXE ROM options.

Both Norton Ghost and Acronis disk image software can use the PXE boot ROM to download software images to the 650 hard drive. Both have been tested with the 650.

For a diskless 650 system there is good support in the Linux community for remote boot. Unfortunately the same cannot be said for the Windows environment.

Exception: XP Embedded *does* support remote boot, but with a number of limitations.

### Display OEM Logo

The BIOS can display two types of OEM logos on boot up. The default is a small J2 logo in the upper right hand corner. With this setting BIOS POST test messages can be seen during boot up. The second type which is enabled by this entry is a full screen J2 logo. When this logo is selected the BIOS POST messages cannot be seen. The BIOS setup can still be entered by typing the DEL key a few seconds after the logo appears.

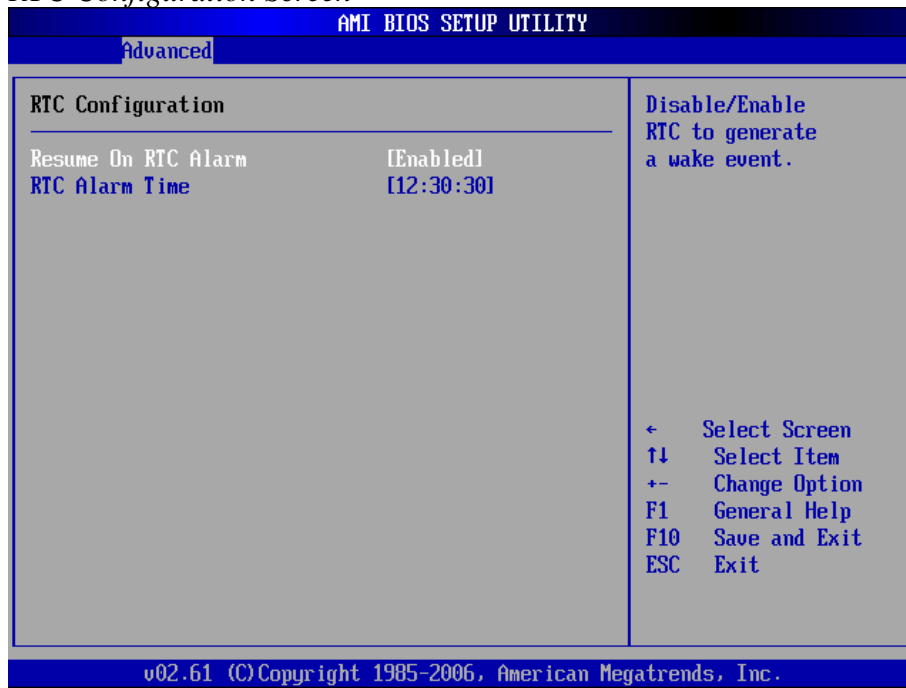
Customer logos can replace the J2 logos when required. The large logo file format is 640x480 with 256 colors bitmap file. The small logo file format is 128x96 in 16 color bit-map file. Please contact J2 regarding this, if required.

### RTC Configuration

The RTC has an alarm function that can be used to turn the 650 on at a preset time of day. This function is enabled by this setting. The wake up time can also be set here.

J2 also supplies a utility to set the wake-up time from Windows (XP Pro, XPe, WEPOS and CE). This is more versatile than the BIOS setting as it allows for more than one time of day to be set as well as days of the week to turn on.

### RTC Configuration Screen



### Wake On LAN

Wake On LAN has no BIOS setting and is always enabled.

### CMOS Clear

The 650 does not have a CMOS clear jumper. The BIOS has been designed so that there is no setting that can be changed to prevent entry into the CMOS setup. If you suspect that the CMOS memory may be corrupt, the CMOS memory can be cleared by disconnecting the CMOS battery for one minute. The CMOS battery is located under the hard drive bay.

### Boot Settings

If more than one bootable device is in the system the boot order can be set in this menu. If a bootable USB storage device is plugged in at boot up the 650 will boot from that device by default. If this is not desired the boot order can be changed here. A list of detected drives will be displayed with the current boot order.

In addition to the internal SATA drives and CF card, the 650 can also boot from a USB storage device which could be a USB Hard Drive, USB memory stick, USB CD/DVD or USB Floppy. USB storage devices with 530MB of storage or less boot as drive A; devices with more the 530MB boot as drive C.

There is a utility written by HP which can format almost any USB memory device to be bootable. Here is a link, it is free:  
<http://www.pcworld.com/downloads/file/fid,64963-page,1-c,downloads/description.html>

### *Boot Settings Screen*

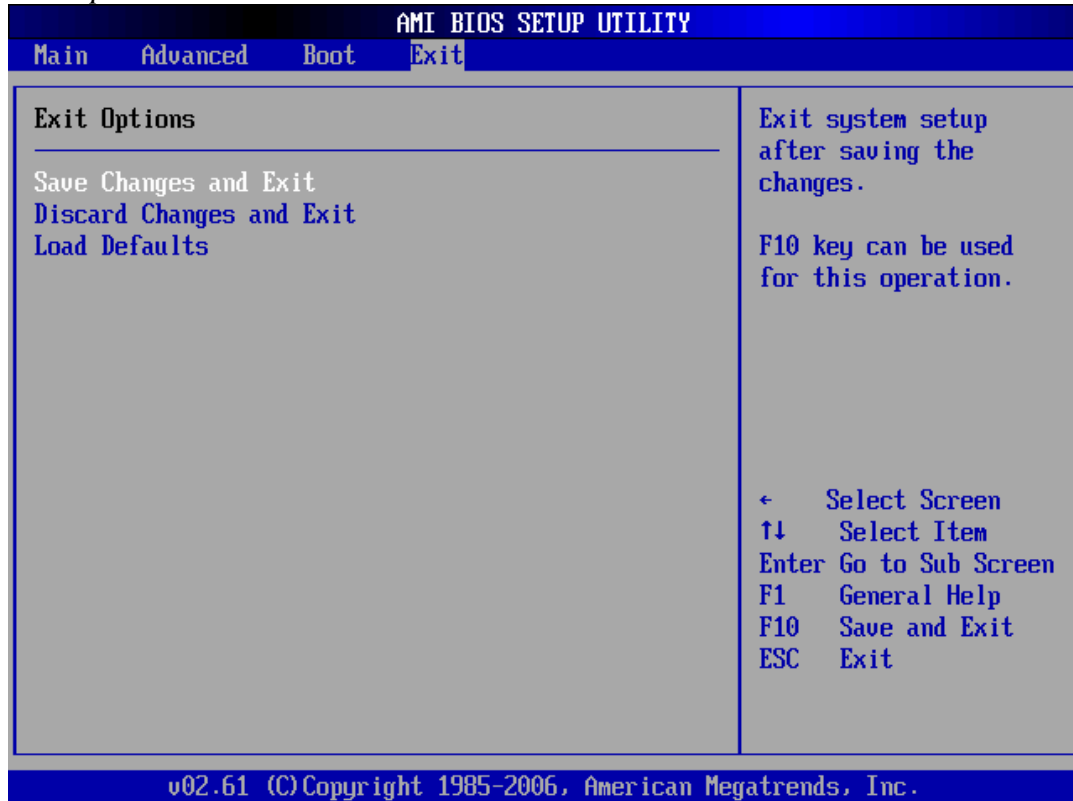
AMI BIOS SETUP UTILITY			
Main	Advanced	Boot	Exit
<b>Boot Settings</b>			
1st Boot Device	[USB:USB USB Flash ]		
2nd Boot Device	[SATA:PM-Hitachi HT]		
3rd Boot Device	[SATA:SM-FUJITSU MH]		
		Specifies the boot sequence from the available devices.	
		A device enclosed in parenthesis has been disabled in the corresponding type menu.	
		← Select Screen	
		↑↓ Select Item	
		+- Change Option	
		F1 General Help	
		F10 Save and Exit	
		ESC Exit	
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## Exit Options

After making any changes to the BIOS settings, the changes can be saved from this screen. Any changes can be discarded as well or the factory BIOS defaults can be loaded.

It should be noted that to save changes to the BIOS setup the F10 key can be typed from any screen to save the BIOS changes. It is not necessary to exit setup from this screen. To discard any BIOS setup changes you can type the ESC key from any screen to exit.

### *Exit Options Screen*



## Driver Installation / Vista, XP

### Chipset Driver Installation

The chipset driver is needed to get the full potential from the 650 chipset. It should be loaded before other drivers and first thing after booting XP or Vista. The drivers can be downloaded from the J2 web site:

<http://www.j2retailsystems.com/support/650/Chipset/>.

After extracting the drivers to a temporary folder, run **Setup**.

Just answer Next or Yes to all the screen prompts and the drivers will install.



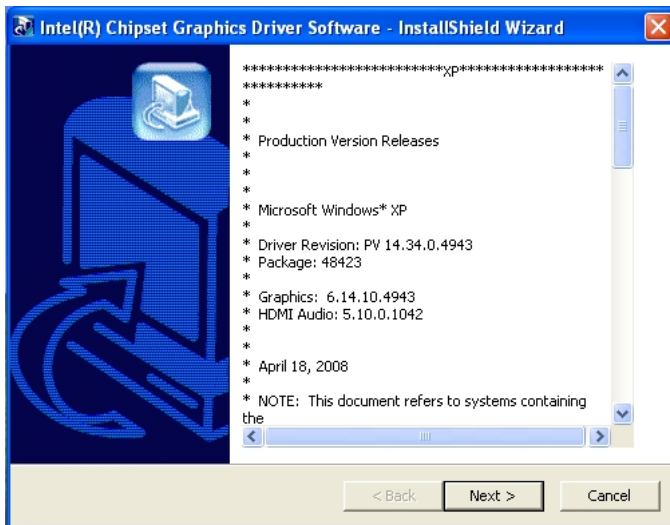
### Graphics Driver Installation

You can download the 650 graphics driver from the J2 web site at:

<http://www.j2retailsystems.com/support/650/Graphics/>.

This is an .exe file so just run it and answer Next or Yes to all screen prompts and the drivers will install. The last screen will ask if you want to reboot, answer Yes.



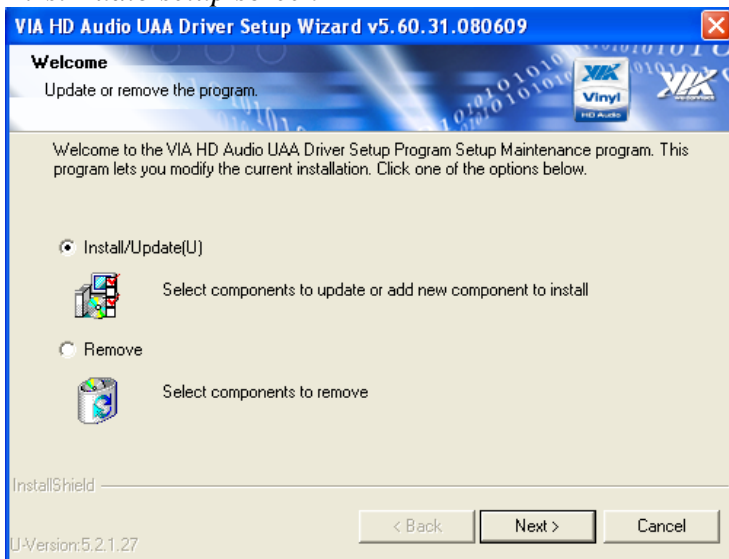


## Audio Driver Installation

The Audio Drivers can be downloaded from the J2 web site at:  
<http://www.j2retailsystems.com/support/650/Audio/>.

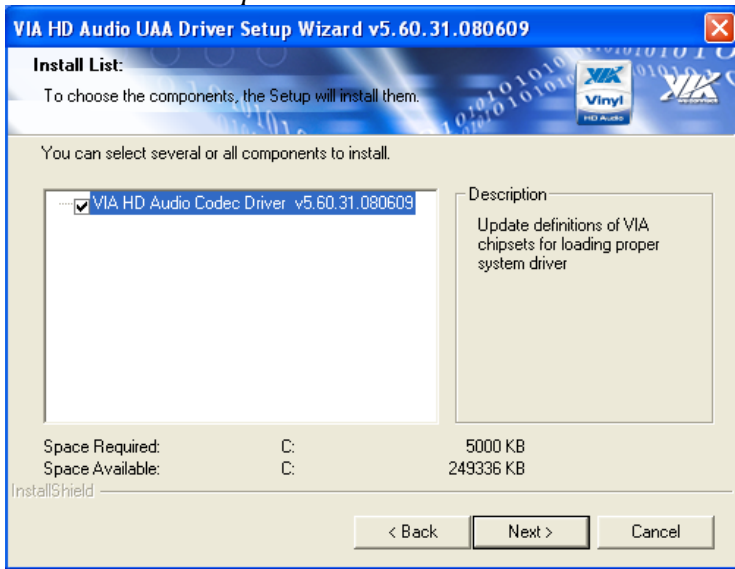
After extracting the driver to a temporary folder, run **Setup**, and then follow the instructions below:

### *First Audio setup screen*



Just click on Next to install the Audio driver.

### *Second Audio setup screen*



Check the Codec Driver box, and then click Next. Answer Next to any more dialog boxes, then Finish.

The system will need to be rebooted before the audio drivers take effect.

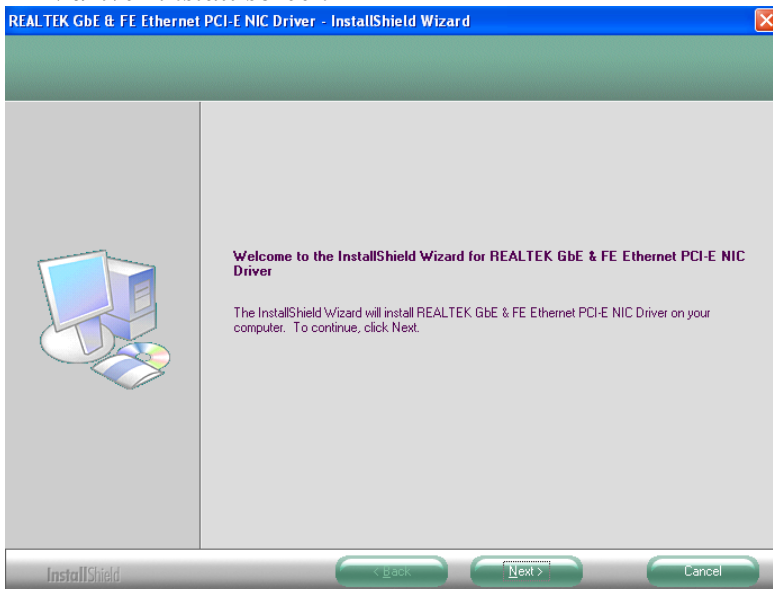
### **LAN Driver Installation**

The LAN drivers can be downloaded from the J2 web site:

:<http://www.j2retailsystems.com/support/650/LAN/>.

After extracting the driver to a temporary folder, run **Setup**. Just answer Next or Yes to all the screen prompts and the driver will install.

### *LAN driver install screen*

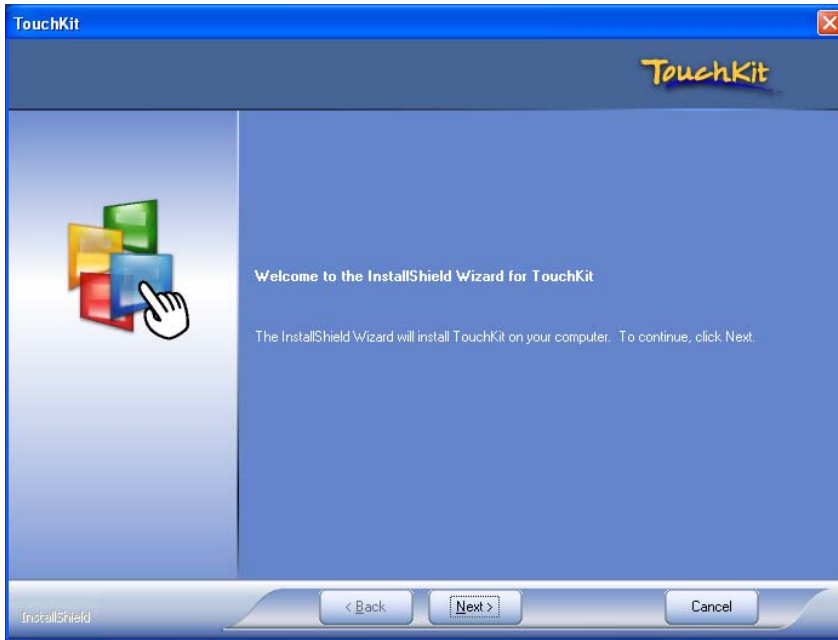


## Touch Screen Driver Installation

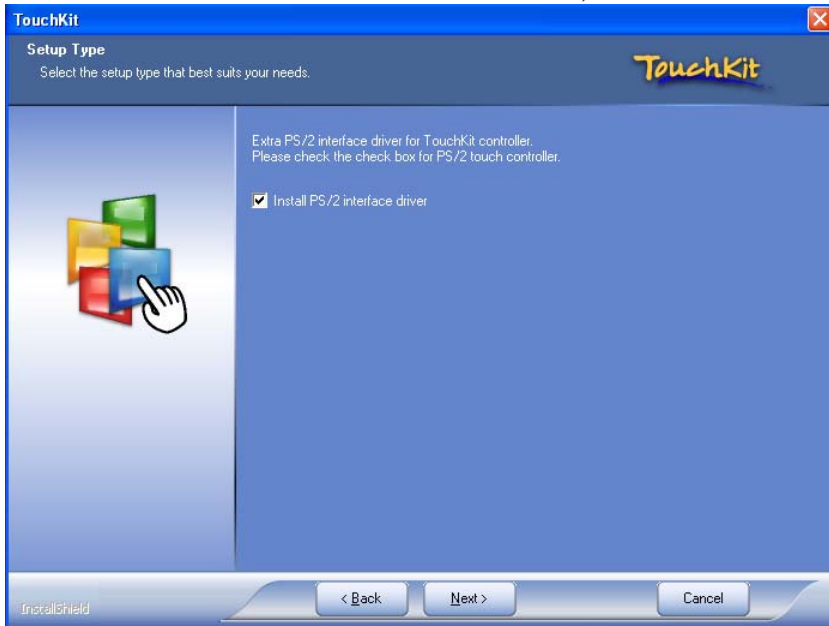
The Touch Drivers can be downloaded from the J2 web site at:  
<http://www.j2retailsystems.com/support/650/Touch/>.

After extracting the driver to a temporary folder, run **Setup**, and then follow the instructions below.

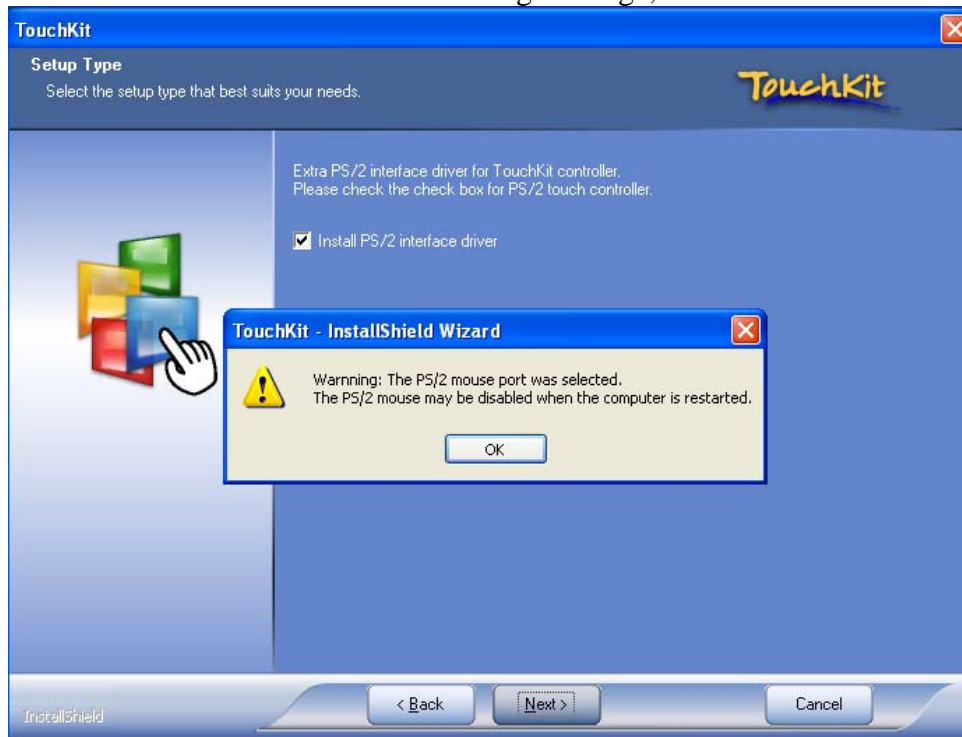
Click on Next on the first screen.



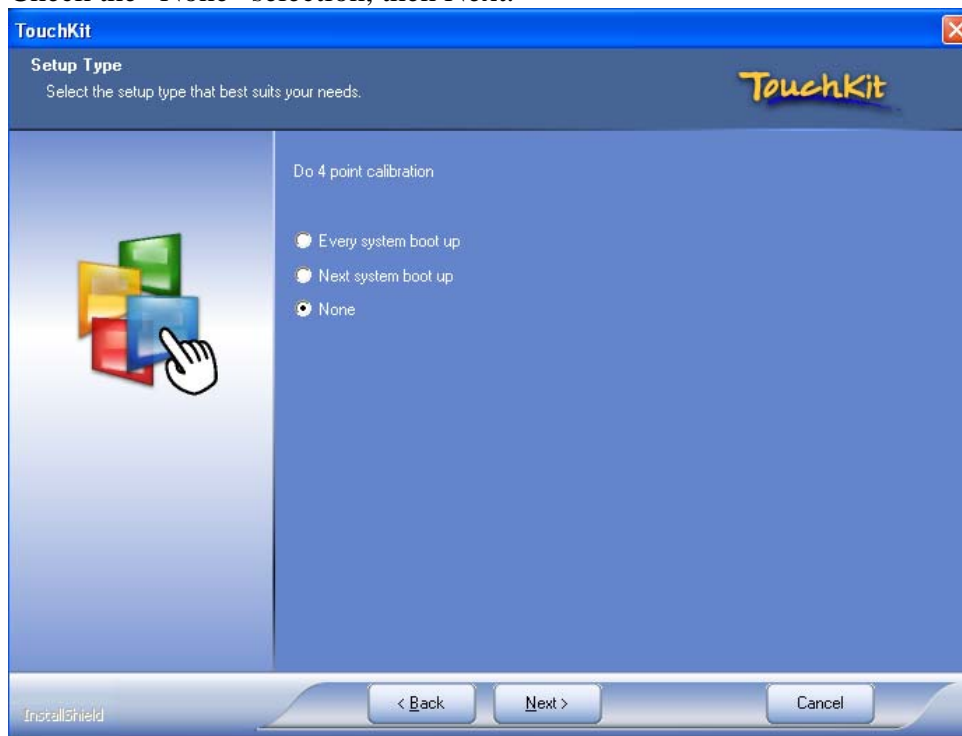
Check the box “Install PS/2 interface driver”, then click on Next.



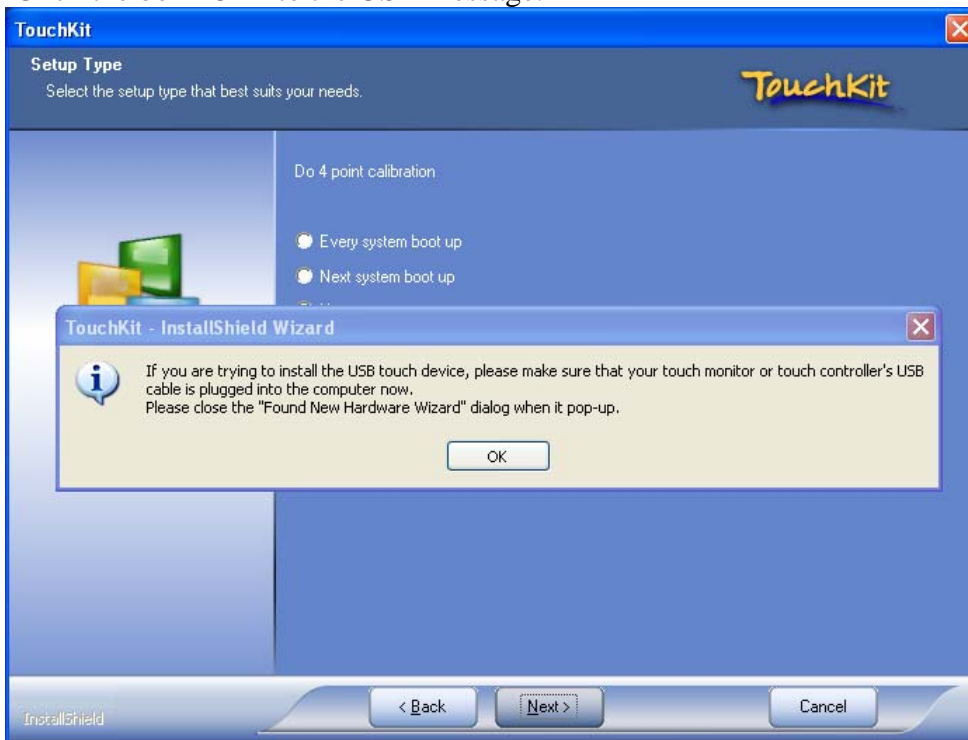
Click the box “OK” to the PS/2 Warning message, then Next.



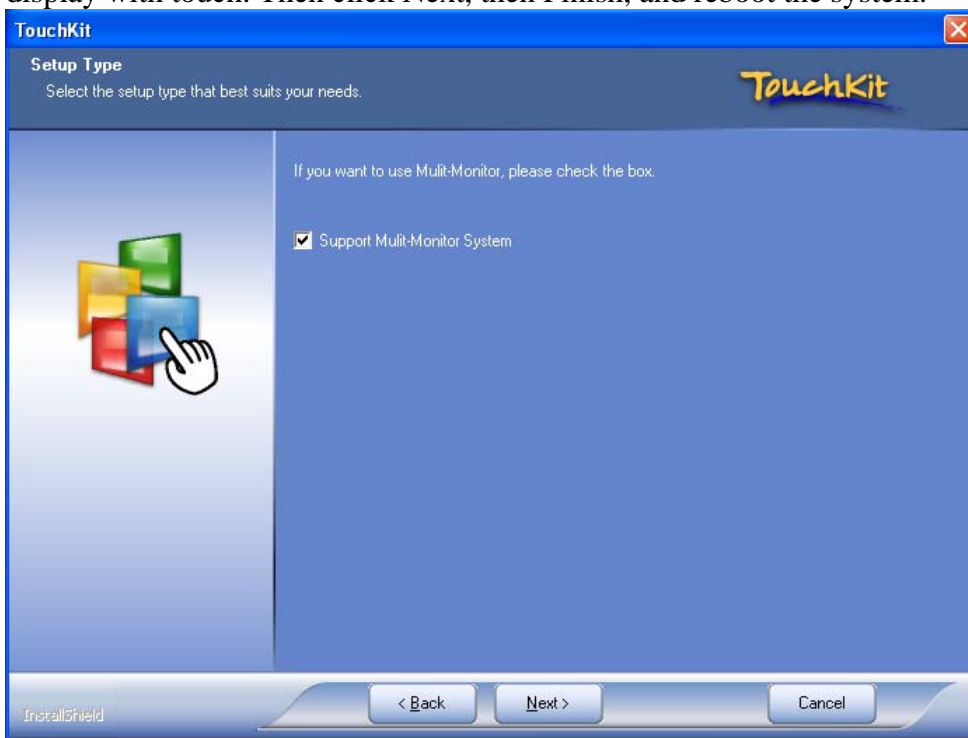
Check the “None” selection, then Next.



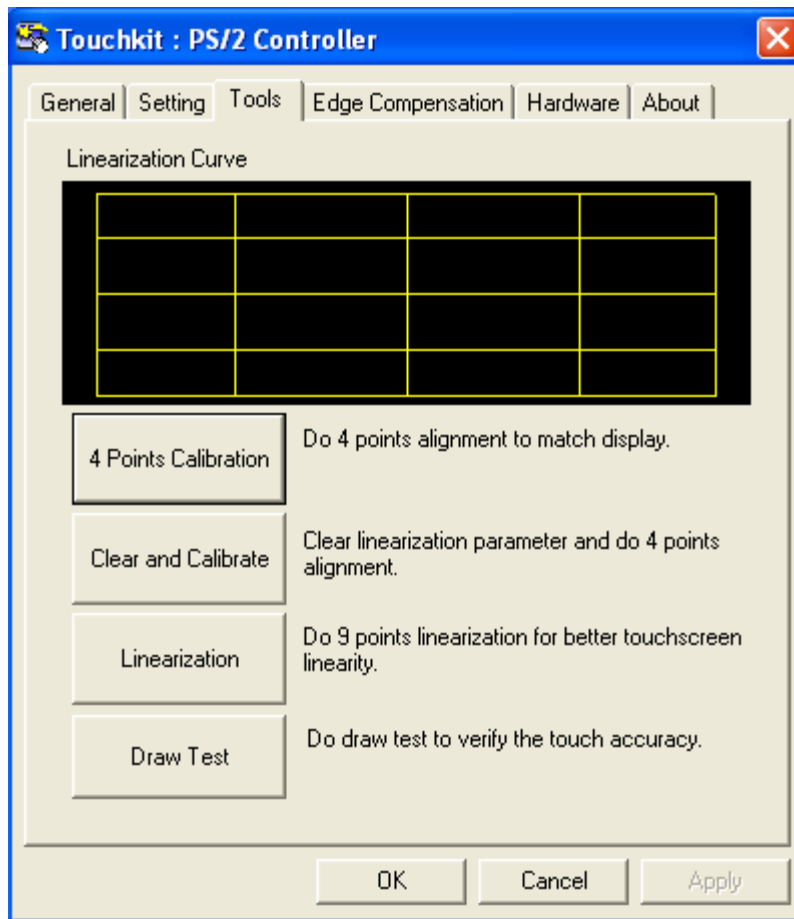
Click the box “OK” to the USB message.



UN-Check the box "Support Multi-Monitor system" *unless* you are using a second display with touch. Then click Next, then Finish, and reboot the system.



After the system has rebooted touch should be working but will need to be calibrated.  
**Click Start, All Programs, Touchkit, then Configure Utility.**  
The program will launch, then select the **Tools** tab.



Click on “4 Points Calibration” and the calibration screen will fill the screen. Use a touch screen stylus or your finger to touch each point till you hear a beep. After the fourth point is touched the calibration is complete. You can use “Draw Test” to test the calibration.

Normally the touch screen only needs to be calibrated once after the driver is loaded. Only a 4 point calibration is needed. Linearization is not required with this touch screen.



## **OPOS drivers**

The OPOS driver for the 650 supports the Cash Drawer ports, the optional MSR, the optional 2x20 character Customer Display, and the optional iButton reader.

The OPOS driver may be downloaded from the J2 web site at:

<http://www.j2retailsystems.com/support/650/>.

Just run the OPOS setup.exe file to install.

*Additional information to be added*

# J2 Health Monitor

## Overview

The J2 Health Monitoring software provides a common method for a user's software application to access the J2 system PC Health hardware, to check that the hardware is operating within specification. This easily allows applications to access hardware parameters, such as system voltages, processor and system temperatures.

The application does not need to access any hardware directly. All newer J2 touch screen computers are supported by this software. It can also be used as a standalone program for diagnostic purposes.

## Hardware Supported

The J2 Hardware monitor software currently supports the J2 POS computers models 520M2, 560RT, 560IR, 580 (all) and the 650 (all) versions. The program auto detects the system type. The number of registry keys will vary depending on the systems type. Other J2 hardware support will be added as needed.

## Operating System Supported

Windows Vista, Windows XP, XP Embedded, and WEPOS are supported, including the versions of XPE and WEPOS running on Compact Flash. There is a separate version of the program for Windows CE 5.0 and 6.0.

Linux is not supported by this program but J2 would be happy to provide the information to write a similar program for Linux.

## Hardware/Software Requirements


There are no special hardware requirements however the program only runs on J2 hardware mentioned above. The J2 Hardware Monitoring program does require .NET Framework 2.0 or higher to be installed.

## Installing Health Monitor

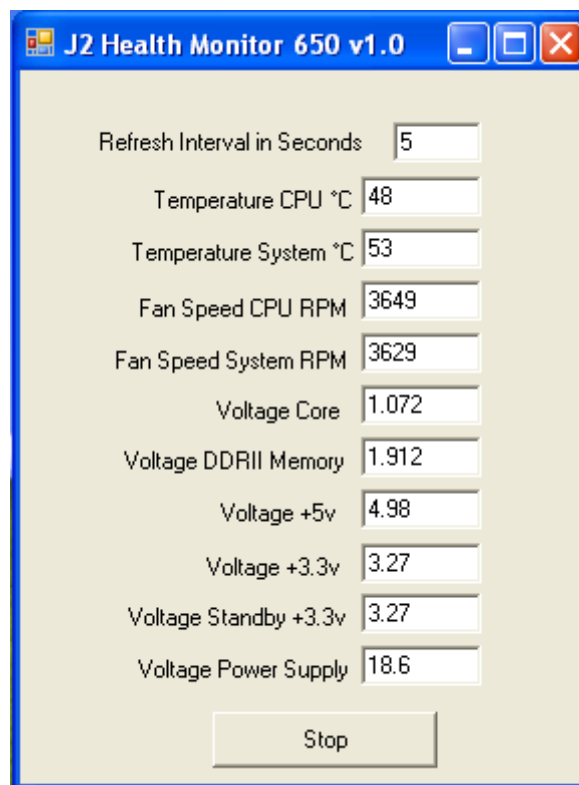
The J2 Health Monitor install program *Setup J2 Health.exe* is a self extracting program and will install the program under **Program Files\J2 Retail Systems\Health\**.  
(cont'd)

A copy will also be loaded in the **Startup** folder so the program loads on boot up. The program will create the registry keys it needs when it is run for the first time.

## Running Health Monitor

The program will run at startup and the icon  will appear in the taskbar tray. By clicking on the icon, a program window will open and the current hardware health values will be displayed. The refresh interval can be set in this program window.

The program can also be stopped by clicking the stop button. The program will restart when the system is rebooted unless removed from the startup folder.



## Theory of Operation

The J2 Health Monitor software is an application program that loads on system boot-up and runs in the background. At a predefined interval the software reads the health monitoring hardware and updates a set of registry keys with the current values. Any software application can read these registry key values to check the current status of the systems health monitoring hardware.

The registry was chosen to store the health values because different systems have different hardware values that are monitored. By using registry keys the software applications can just scan for the keys present to determine which values need to be monitored for that particular hardware. One example would be the J2 650 system that supports Intel's Core 2 DUO processors which have two CPU temperatures where other systems only have one. Additional registry keys are added for this second CPU core temperature. Minimum and maximum values for some keys are also stored in the registry so that the application can determine if a value is within J2's specification.

It is solely up to the user's software how to use this information. J2 makes no assumption as to how this information is used other than to say that if the hardware health values are within J2 specification the product is consider good. For example, people may make the wrong assumption that higher temperatures reduce product life, however this is not the case if the product is running within specification.

## Values Monitored

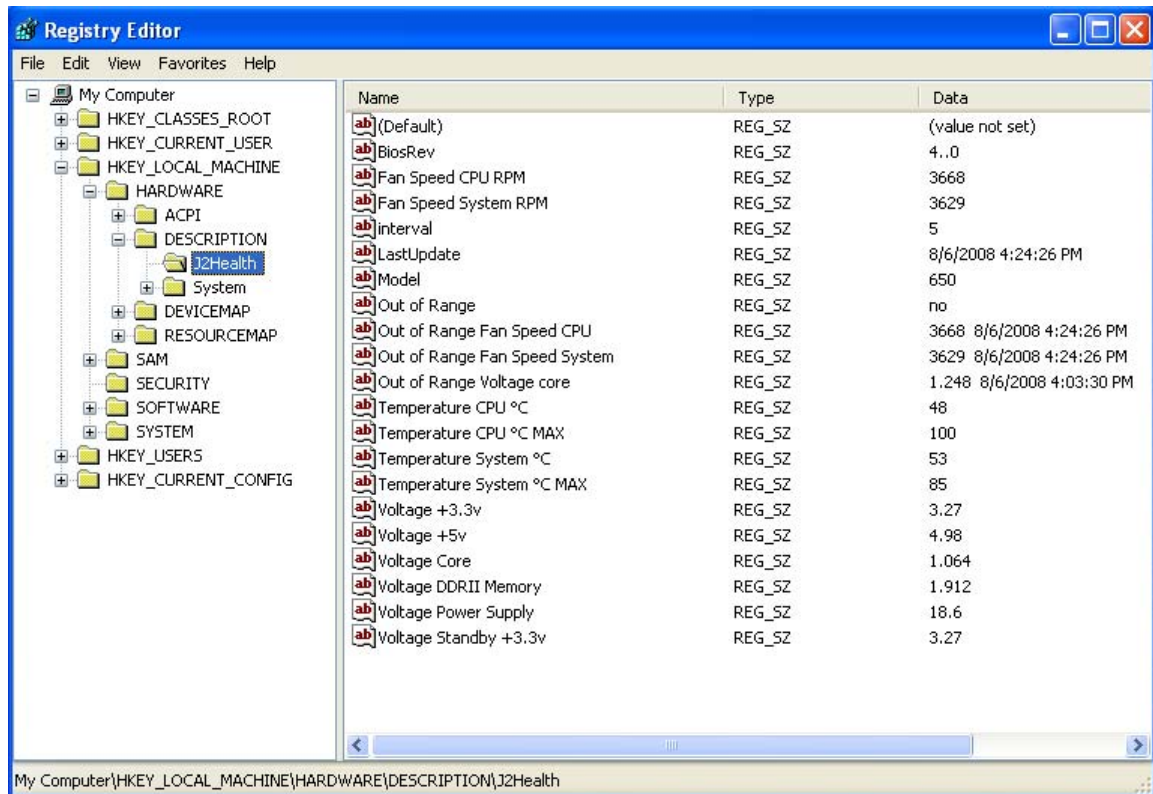
Most J2 POS hardware monitors all critical system voltages, fan speed, processor and system temperatures. The number of parameters monitored varies depending on the system. For instance the J2 580 monitors eight voltages where the J2 650 monitors six because the 650 only has six different voltages. Other parameters maybe monitored on future systems.

## Registry Keys

The registry key values are stored under

***HKEY\_LOCAL\_MACHINE\HARDWARE\DESCRIPTION\J2Health.***

Below is an example of the key values.



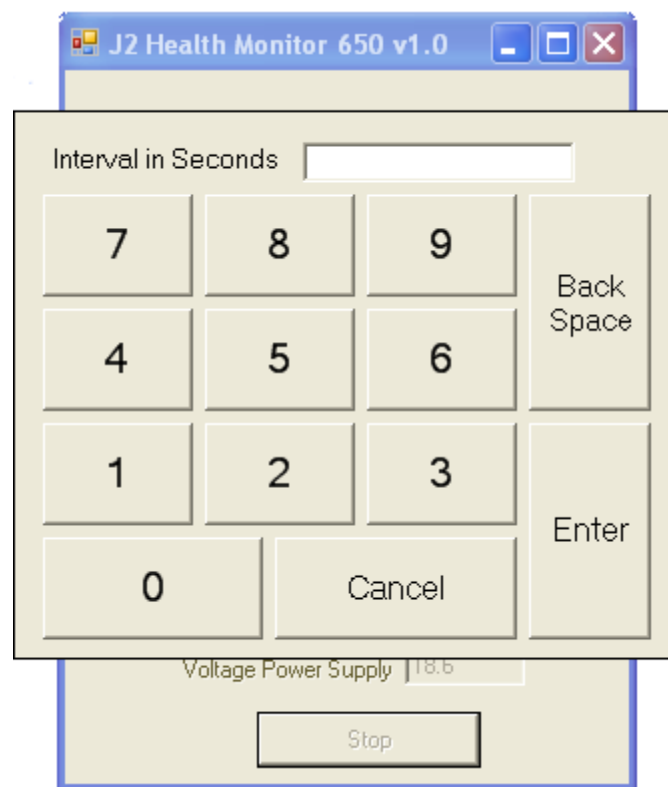
Registry keys that are followed with the letters ***MAX*** or ***MIN*** are the J2 recommended maximum or minimum value for the registry key with the same name.

Some values may only have a maximum or minimum value like ***Voltage Battery***, ***Temperature CPU*** because values at the other extreme no relevant meaning.

Voltages are assumed to have a minimum and maximum value of plus or minus 5% of the rated voltage. For example: for ***Voltage +3.3v*** the maximum voltage that should be read is 3.47v and the minimum value of 3.13v, are within J2's operating specification.

## Refresh Interval

The refresh interval controls how often the hardware monitor values are updated. This value can be set in the Health Monitor program window. Touch the area of the screen showing the current value and a touch keypad will pop up to allow you to change the interval as shown below. The value can also be changed by modifying the registry key: ***HKEY\_LOCAL\_MACHINE\HARDWARE\DESCRIPTION\J2Health\interval***. The value is the number of seconds between updates. The default value is 5 seconds.



## Applications

The J2 hardware monitoring software was designed to be used as a simple diagnostic tool by itself or in conjunction with a much more sophisticated program for local and remote system monitoring. Please contact J2 if you require additional features or functions not currently supported.

Support: [www.j2retailsystems.com](http://www.j2retailsystems.com)



# RAID

## RAID Overview

The 650 is unique in that it is the only integrated POS computer to currently implement an integrated RAID function. The 650 uses the Intel Matrix Storage Technology to allow the two internal 2.5 inch hard drives to be configured as a RAID array. The 650 supports RAID 0, RAID 1 and Intel Matrix RAID which combines the benefits of two RAID volumes in a single RAID array.

If you are not currently familiar with RAID arrays Intel has a good white paper on the subject at: <http://www.intel.com/design/chipsets/applnots/310855.htm>

There are a number of benefits to using the RAID feature.

**Protection** is one benefit. When using a RAID 1 array, data is protected by mirroring. The primary RAID volume is duplicated automatically on the second drive, a mirror image of the first. If one of the two hard drives fails the system will still keep working. The bad hard drive can be replaced while the system is running. This is called hot swapping or hot plug. The new drive will automatically be updated to a mirror image of the working drive.

**Performance** is another feature RAID can provide. When configured as a RAID 0 array the two drives in the RAID array are striped. With striping, data is split between two drives. This allows the 650 to read the data more than twice as fast as with a single drive. The performance can be more than twice as fast because the Intel RAID driver also uses the AHCI NCQ function built into the SATA drives.

**Protection and Performance** can be mixed using an Intel Matrix RAID configuration, whereby a RAID 1 and RAID 0 can be setup on the same RAID array. Mission critical data can be stored in the RAID 1 volume and data requiring performance can be stored on the RAID 0 volume.

## AHCI

AHCI stands for Advanced Host Controller Interface and is a feature of the SATA interface that allows for Hot Swapping and Native Command Queuing (NCQ). NCQ allows multiple commands to be sent to the hard drive at one time. The drive decides the best way to order the commands for the best performance from the drive. AHCI is enabled when RAID mode is selected in the BIOS setup.

To use AHCI drivers from Intel the BIOS must be set to RAID, *not AHCI*. The AHCI mode uses the same drivers as used for RAID. Follow the instruction for install the RAID drivers but set the HDD as a *Non-RAID Disk* in the RAID BIOS setup.

## Enabling RAID in the BIOS

The Intel manual for the Intel Matrix Storage Manager covers this same information given below in more detail and can be downloaded from the J2 web site. The documentation below is tailored for the 650 only.

Link: <http://www.j2retailsystems.com/support/650/RAID/>

Perform the following steps to enable the RAID option in the system BIOS:

1. Enter the BIOS Setup program by pressing the **DEL** key after the BIOS sign-on screen appears.
2. Select the **Advanced** menu, and then the **SATA Configuration** menu.
3. Switch the **Configure SATA Ports** option from SATA to **RAID**.
4. Press the **F10** key to save the BIOS settings and exit the BIOS Setup program.

## RAID Volume Creation

Perform the following steps to create a RAID volume:

1. When the Intel Matrix Storage Manager option ROM status screen appears during POST, press the **Ctrl** and **i** keys at the same time to enter the Intel Matrix Storage Manager option ROM user interface.
2. Select **Option 1: Create RAID Volume** and press the **Enter** key.
3. Use the up or down arrow keys to select the RAID level and press the **Enter** key.
4. Unless you have selected RAID 1, use the up or down arrow keys to select the stripe size and press the **Enter** key.
5. Press the **Enter** key to select the physical disks.
6. Select the appropriate number of hard drives by using the up or down arrow keys to scroll through the list of hard drives and pressing the **Space** key to select the drive. When finished, press the **Enter** key.
7. Select the volume size and press the **Enter** key.
8. Press the **Enter** key to create the volume. At the prompt, press the **Y** key to confirm volume creation.
9. Select **Option 4: Exit** and press the **Enter** key. Press the **Y** key to confirm exit.

## F6 Installation Method

**Note:** For this step you will need both a USB CD ROM and USB Floppy.

Drivers can be downloaded here: <http://www.j2retailsystems.com/support/650/RAID/>

*(continued on next page)*

Perform the following steps to install the Intel Matrix Storage Manager driver during operating system setup:

1. Press the **F6** key when prompted in the status line with the *Press F6 if you need to install a third party SCSI or RAID driver* message. This message appears at the beginning of Windows XP setup (during text-mode phase).  
**Note:** Nothing will happen immediately after pressing F6. Setup will temporarily continue loading drivers. You will then be prompted with a screen asking you to load support for mass storage device(s).
2. Press the **S** key to **Specify Additional Device**.
3. You will be prompted to *Please insert the disk labeled Manufacturer-supplied hardware support disk into Drive A:* When prompted, insert the floppy disk containing the following files: IAAHCI.INF, IAAHCI.CAT, IASTOR.INF, IASTOR.CAT, IASTOR.SYS, and TXTSETUP.OEM and press the **Enter** key.
4. After pressing Enter, you should be presented with a list of available SCSI Adapters. Select your controller from the list. The 650 uses the ICH8R driver.
5. The next screen should confirm your selected controller. Press the **Enter** key again to continue.
6. At this point, you have successfully F6'd in the Intel Matrix Storage Manager driver and Windows setup should continue. Leave the floppy disk in the floppy drive until the system reboots. Windows setup will need to copy the files from the floppy again to the Windows installation folders. Once Windows setup has copied these files again, you should then remove the floppy diskette so that Windows setup can reboot as needed.
7. During Windows setup, create a partition and file system on the RAID volume as you would on any physical disk.

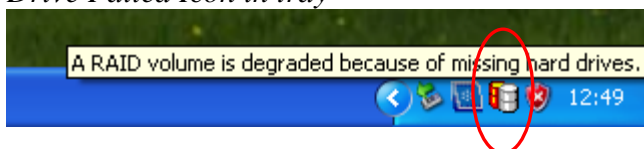
## Installing the Intel Matrix Storage Manager Software

Once XP is booted you can install the Intel Matrix Storage Manager by just running the [iata82\\_enu.exe](#) install program. Just answer “Next” to all questions and the software will install. The software should now be working. Please refer to Intel’s documentation for more information at [manual70.pdf](#).

## Hot Swapping RAID 1 drives

If a RAID 1 drive fails the Matrix Storage Manager will warn the user that a drive has failed. A small Icon appears as shown to indicate a drive has failed.

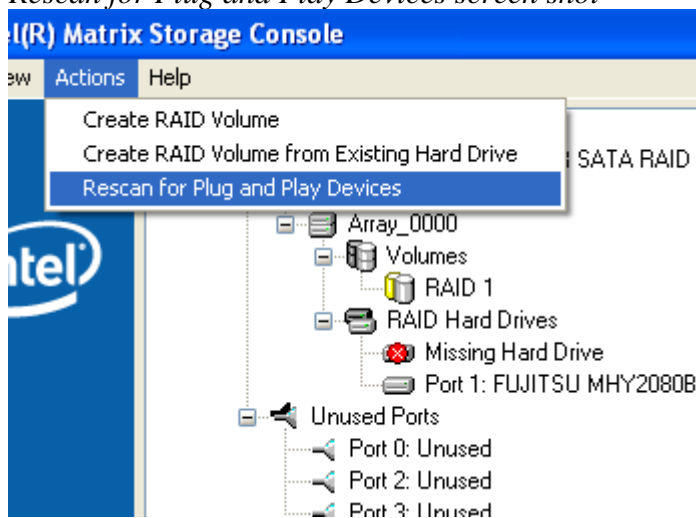
*Drive Failed Icon in tray*



If a hot spare is available, all that needs to be done is to swap the bad drive with the hot spare. Be sure to change the correct drive. SATA Ports 0 corresponds to the HDD 0, the top drive in the HDD bay and SATA Ports 1 corresponds to the HDD 1, the bottom drive in the HDD bay.

Power to the system does not need to be turned off, and the system will still operate. First remove the bad drive. After removing the bad drive insert the hot spare into the 650. In the Intel Matrix Storage Manager select Advance Mode, and under the Action tab select “Rescan for Plug and Play Devices”.

#### *Rescan for Plug and Play Devices screen shot*



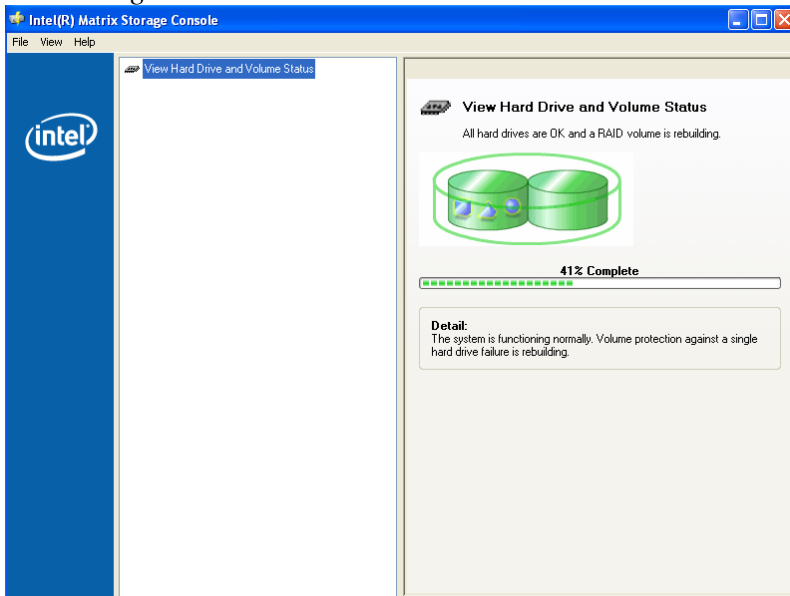
This will cause the drive to be detected by the driver.

#### *Drive detected*

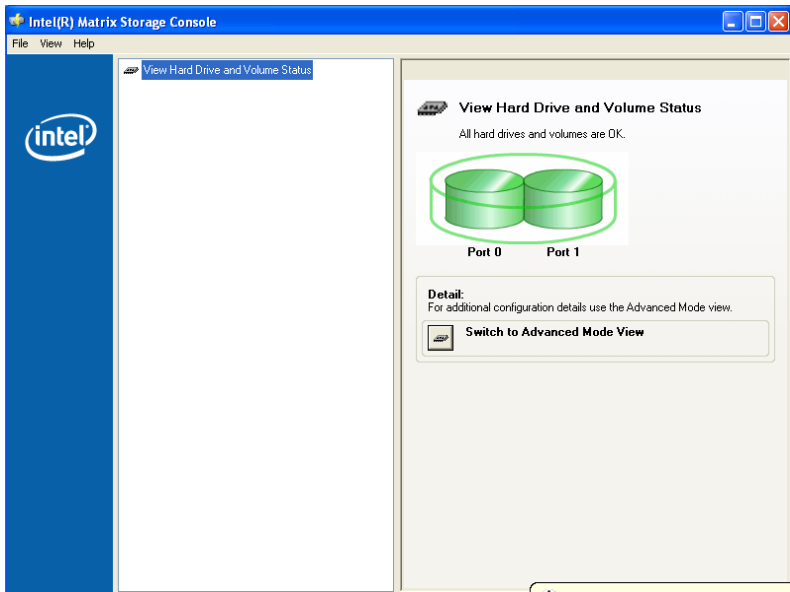


The RAID will now rebuild an image of the good drive to the hot spare.

### Rebuilding



### Rebuilt



The RAID has now mirrored the drive and the system is now protected for a drive failure.

**Note:** Please refer to J2's "Using RAID in a Point of Sale Environment" white paper for more information on using the 650 RAID function. (Available September 2008)

## Packing List

In addition to the foam packing inserts, the following contents should be found in the 650 shipping carton.

### Standard Items

1: System with Power Supply and AC cord



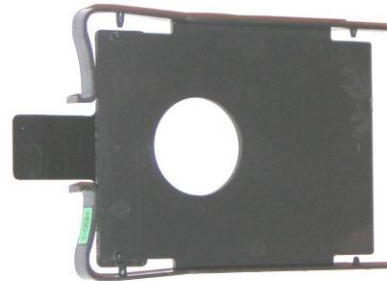
2: Accessory kit



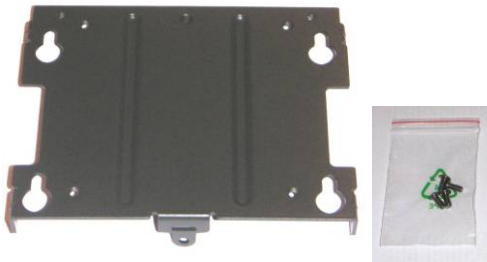
3: Cable Well cover



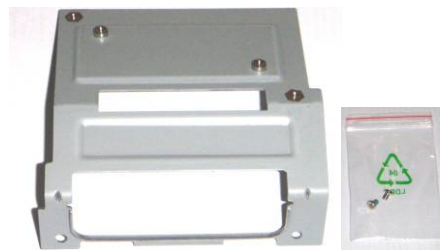
4: Hard Drive Mount Tray for 2<sup>nd</sup> Drive



5: Wall Mount/VESA bracket and Screws



6: WiFi option Mounting bracket / Screws



7: Printer Power Port Cable



8: COM Port Colored Coded Cable Labels





## 650 Optional Peripherals

### MSR

#### Overview

The 650 can be ordered with a 3 track MSR. The MSR mounts on the right side of the 650 and uses a front facing MSR slot. This allows the 650 unit to be placed side by side, or in tight spaces, and still be able to swipe the card. The MSR appears to the software as a wedge type MSR with all data from the MSR being sent to the keyboard port.

The MSR firmware and MSR settings can be changed and updated using the J2 MSR utility without removing the MSR from the unit.

*650 with front swipe MSR*



## Installing the 650 MSR

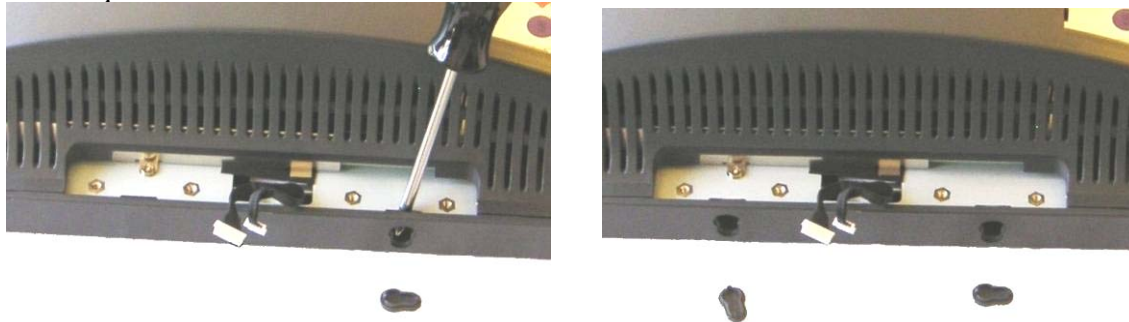
The 650 MSR is installed by first removing the MSR cover plate on the right back side of the unit. Remove the two screws, *as shown*.

*Remove MSR cover plate*



Two small plastic hole covers need to be removed, *as shown*.

*Remove plastic hole covers*



Connect the two cable pairs together as shown.



Slide the MSR in to its mounting groove being sure not to pinch the cable. Attach the MSR using the two screws at the locations, *shown below*.

*Mounting MSR*



You may now power up the 650 and the MSR should be working. For a quick test you can open *Notepad* and swipe a card, the information should appear in *Notepad*. You can now run the J2 MSR utility if you need any custom settings for the MSR.

## J2 650 MSR Utility

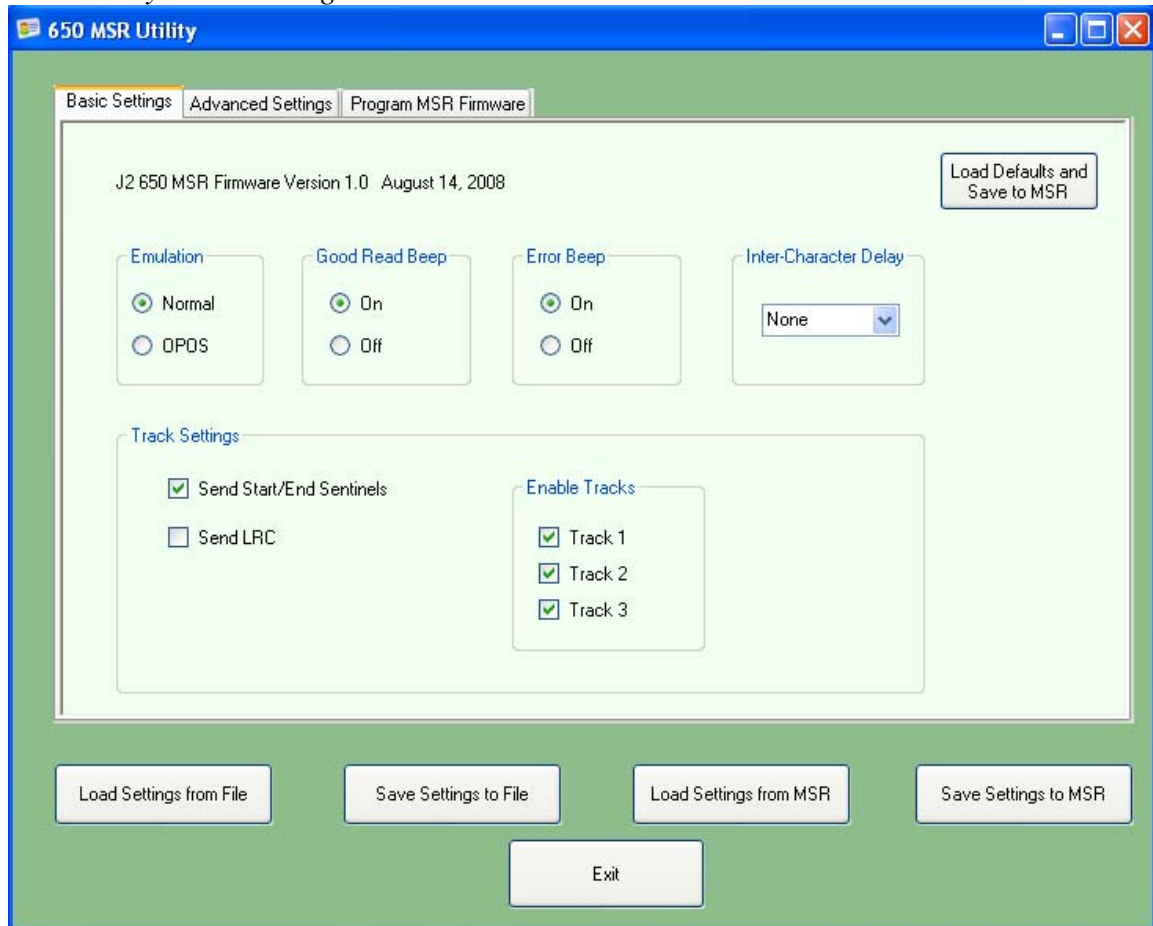
The 650 MSR configuration utility can be downloaded from the J2 web site at <http://www.j2retailsystems.com/support/650/>.

You may run the MSR utility from any folder you like.

## MSR Utility, Basic Settings

The most common MSR settings that need to be changed are located on this screen.

### *MSR Utility Basic Settings screen*



**Emulation:** Set to OPOS to use the J2 supplied OPOS driver, Set to Normal for other applications.

**Beep:** This setting will disable or enable the MSR beep tone on a good read. If even only one track is read without errors that track will be output and the MSR will beep once.

**Beep on Error:** This setting will disable or enable the MSR double beep tone on a bad read. No data is output on a bad read.

**Inter-Character Delay:** This sets the delay between characters sent by the MSR. The delay is set in milliseconds.

**Track Settings:** Enable or disable the sending of track data, sentinels and LRC here.

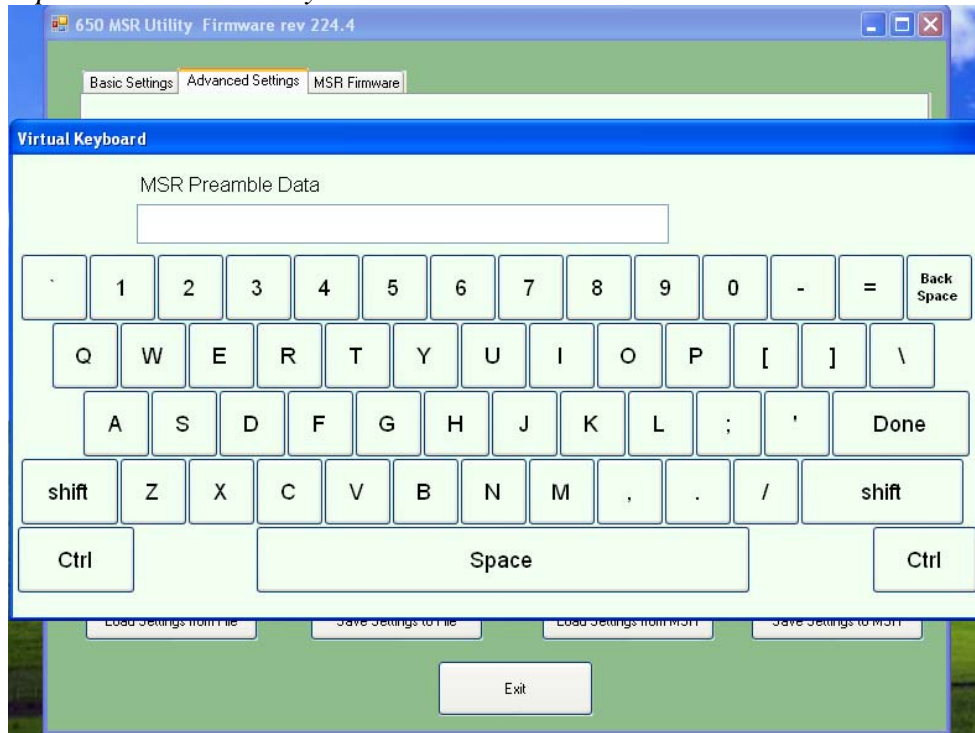
## Advanced Settings

Preamble and Postambles can be added here, in addition to track separators and end of data terminator.

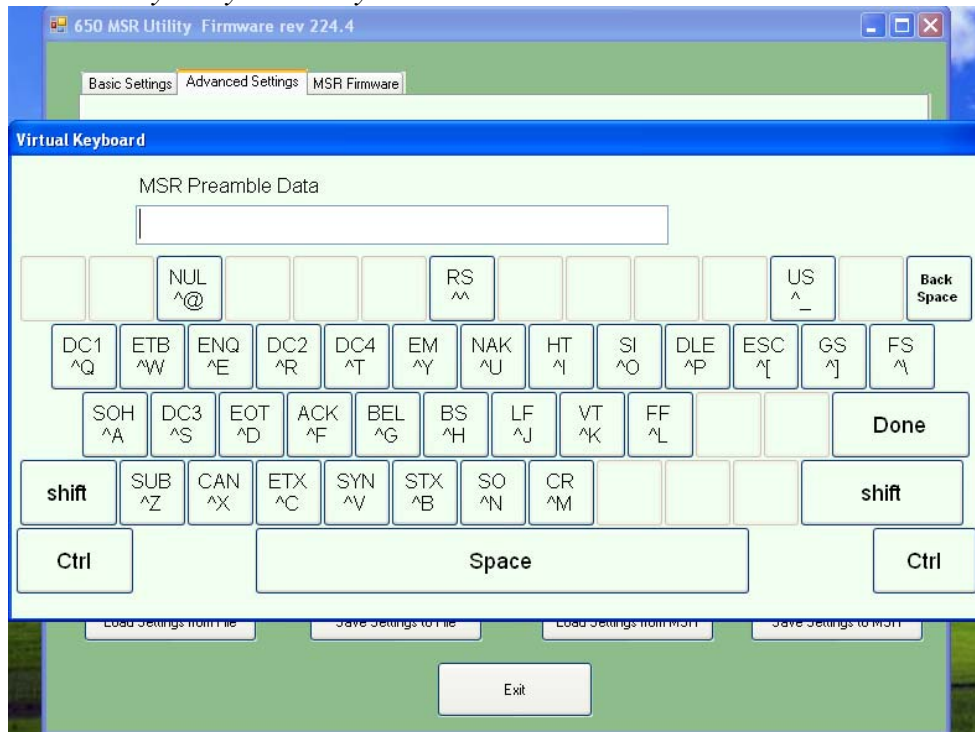
The screenshot shows the '650 MSR Utility' window with the 'Advanced Settings' tab selected. The window has a blue title bar and standard Windows window controls. Inside, there are three tabs: 'Basic Settings', 'Advanced Settings', and 'Program MSR Firmware'. The 'Advanced Settings' tab contains a section titled 'Msr Advanced Data' which is a light green box. Inside this box, there are ten text input fields arranged in two columns, each with an 'Edit' button to its right. The fields are: 'MSR Preamble', 'MSR Postamble', 'Track 1 Preamble', 'Track 1 Postamble', 'Track 2 Preamble', 'Track 2 Postamble', 'Track 3 Preamble', 'Track 3 Postamble', 'Track Separator', and 'End of Data Terminator'. Below the 'End of Data Terminator' field, there is a 'Clear Advanced Data' button. At the bottom of the window, outside the 'Msr Advanced Data' box, are five buttons: 'Load Settings from File', 'Save Settings to File', 'Load Settings from MSR', 'Save Settings to MSR', and 'Exit'.

Data may be entered using the touch screen keypad or keyboard. Valid characters are any printable character and all control characters.

### *Alphanumeric touch keyboard*



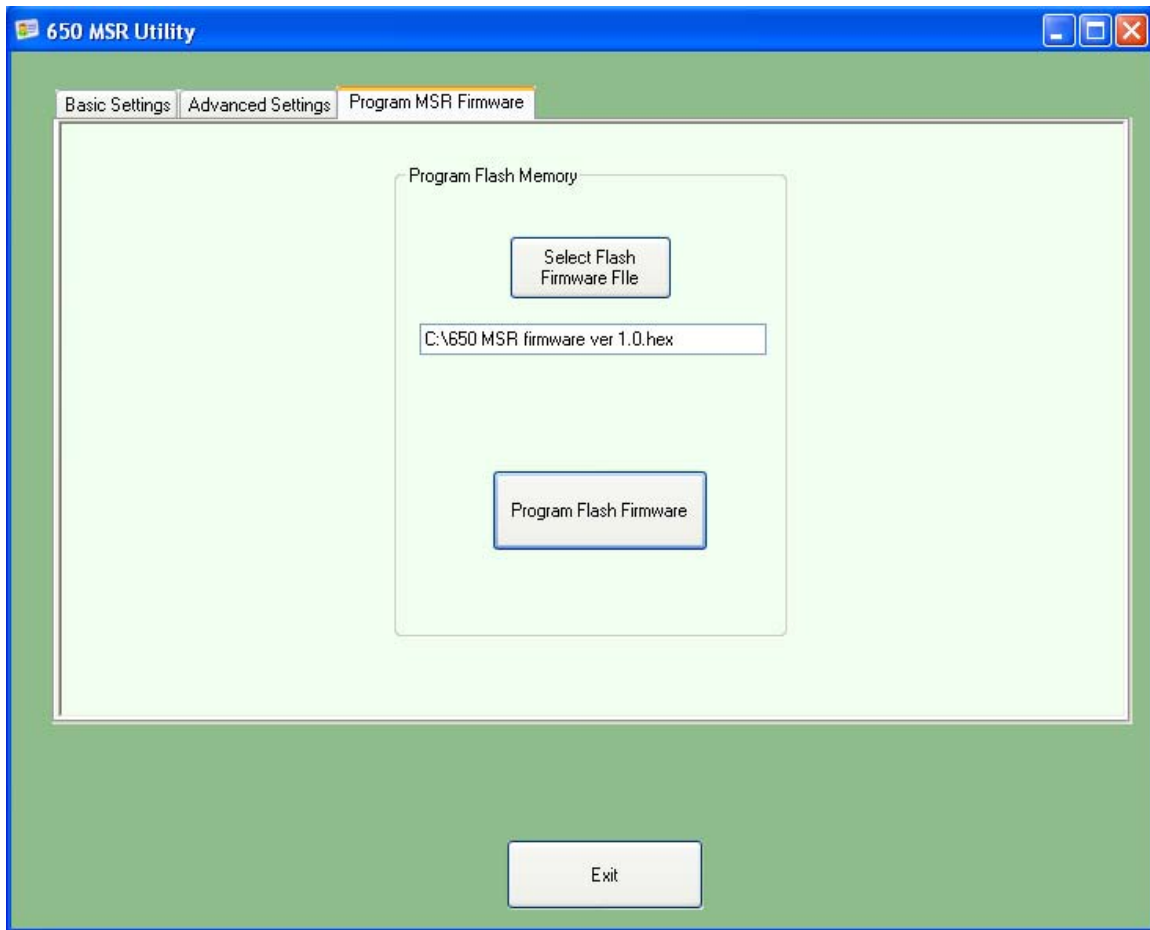
### *Control Key entry touch keyboard*





## MSR Firmware Update

The MSR firmware can be updated in-circuit using this utility. This is to allow options and features to be added to the MSR as required.



## 650 UPS

### Specifications

Batteries Run Time	2 Hours for the standard 650. Run time will vary depending on the processor used and application load
Power In	19 Volts DC
Power Out	13-16.8 Volts DC, 7.2 amps maximum
Data Interface	RS232 DB9 connector
Batteries Type	2 – 4 18650 cell Li-Ion pack with protection circuit
Battery Life	300 full discharge cycles
Charge Time	3 hours
Charger Type	Smart Microcontroller based
Software	XP Standard Generic UPS driver / J2 Smart UPS driver
Size	6" x 3.1" x 1.7" (152mm x 79mm x 43mm)

### Hardware

To install and use the J2 UPS module:

- 1: Remove the power supply adapter from the base of the unit.
- 2: Install the UPS module where the power supply was mounted.
- 3: Connect the power output jack of the UPS to the power in jack of the unit.
- 4: Connect the Serial cable of the UPS to the serial port you wish to use. \*
- 5: Connect the power supply adapter to the UPS power in jack.
- 6: Connect the power supply adapter to the mains power. \*\*
- 7: Configure the Windows UPS drive as shown.

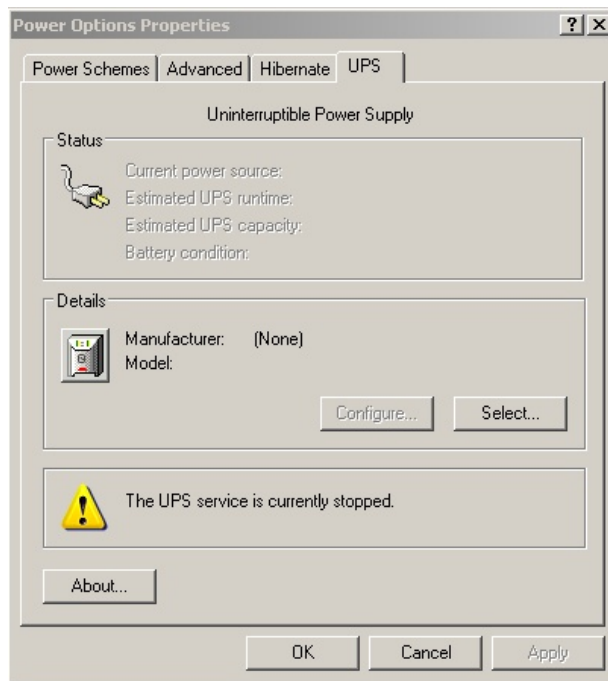
*Picture to be added here*

\* The serial port connection is not needed for Windows CE.

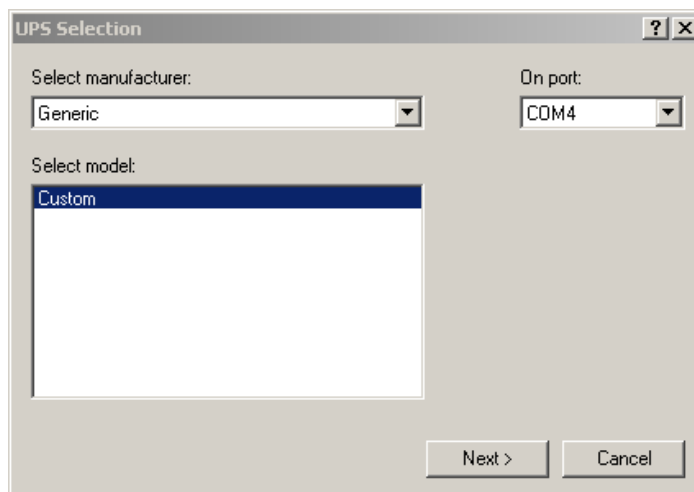
\*\* The mains power should be applied for 3 hours to fully charge the batteries. The unit may be running during this time but will take longer to charge.

## Software Setup in XP

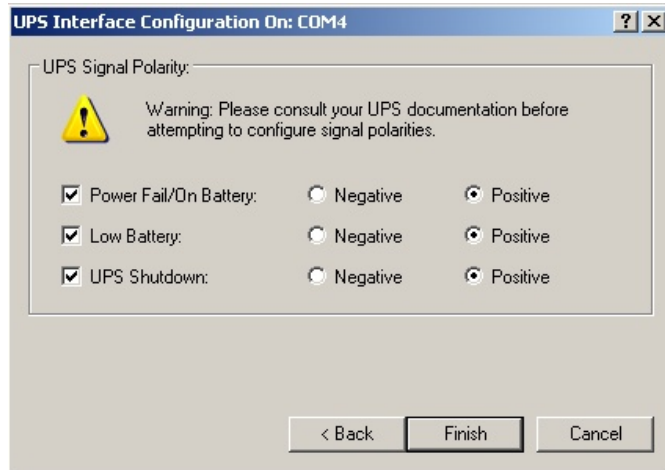
- 1: From the *START* button run *CONTROL PANEL*.
- 2: Double click *POWER OPTIONS*.
- 3: Select the *UPS* tab and click on *Select* under *Details*.



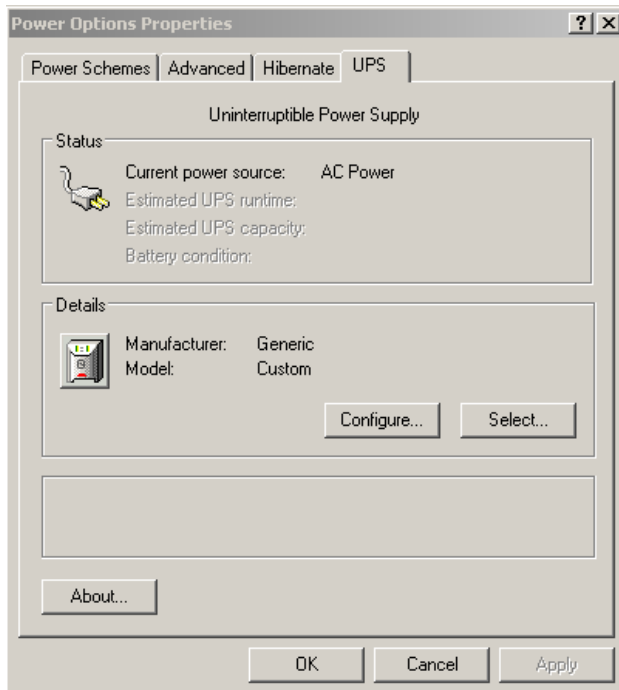
- 4: Under *Select manufacturer* select *Generic*. Select the COM port you wish to use in the *On port* drop down menu. Be sure this port is not used for anything else (printer) or the driver will not install. *Select model* should be *Custom*. Click *Next>*.



5: The default values for the *Interface Configuration* are what the J2 UPS uses so just click *Finish*.



6: When returned to the *Power Options Properties* window click *Apply* to save the configuration. It will take a number of second to configure. Once done the *Details* should show *Manufacture: Generic* and *Model: Custom* and the UPS and driver should be working. This can be quickly tested by removing the AC power to the unit. If everything is working the *Current power source:* should change to *On Battery*.



You may now exit the control panel, the UPS configuration is complete.

## STATUS LED

There is one green status LED on the UPS. This can be viewed when by looking into the top of the base as shown in the picture below.

*Picture to be added here*

The status LED can be used to determine what mode the UPS is running in. Please refer to the following table.

LED	Condition
On steady	Batteries fully charged, running on AC power
Blinking, mostly on	Batteries charging, running on AC power
Blinking, mostly off	Running on batteries
Blinking fast	Batteries almost discharged, system signaled to shut down
Off	Batteries discharged, UPS and system powered down

## Customer Display

To be added



## Secondary Video Display

To be added



## Fingerprint Reader / MSR

To be added



## **iButton / MSR**

To be added



## **RFID / MSR**

To be added

## **Laser Scanner**

To be added



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