# J2 680L Integrated Touchscreen Computer

## System Manual

*May 2012*

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## Change history

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## Overview

The J2 680 is the second generation of very high performance integrated Point of Sale computer from J2. Built on the features and capabilities for the J2 650 the J2 680 offers even higher performance and expanded I/O. The J2 680 retains all the versatility of previous generation system and adds Quad core processor options, expanded I/O support with PoweredUSB, Intel remote management, HDMI video, Multi-Touch, Zero Bezel design and retains RAID and other important feature of the previous generation.

This integrated touch screen computer like most J2 designs features an “all in the head” design, which means it can be used as a counter top unit, a wall-mount or a pole-mounted computer. In this one small package you have the highest speed available intergraded or non-intergraded POS computer currently available.

The J2 680 comes standard with an Intel 2.4GHz Dual Core Sandy Bridge processor but can also be order with a number of other processors including the very high end Intel i7 3.4GHz Quad Core processor. The J2 680 system board uses the Intel LGA1155 socket and supports a wide range dual and quad core processors.

Using the Intel Sandy Bridge processor with the Q67 chipset the J2 680 uses the latest high performance desktop solution in a very small footprint system. This solution provides for very high performance but with a very low carbon foot print. The Sandy bridge chipset is design only to draw as much power as need for any given operation greatly reducing the average power consumption for this level of performance.

Designed for easy machine maintenance and upgradeability, the following is a list of important 680 features:

1. Upgrades to the memory modules can be easily done by simply removing four screws on the back cover.
2. A complete motherboard upgrade can be carried out in less than 1 minute.
3. The two quick change SATA 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 680 is particularly compact making it ideal for the space conscious retailer.

The 680 supports the standard Microsoft operating systems, Windows 7, POSReady 7, Windows 7 Embedded, XP, POSReady 2009 and XP embedded. The 680 is equally proficient with the many flavors of Linux.

## Specification

| Main board | |
|---|---|
| CPU Support | Intel Sandy Bridge Desktop Processors, socket LGA1155<br>Intel Celeron Dual Core G530 up to Quad Core i7- 2600 3.4GHz |
| Chipset | Q67 |
| System Memory | 2 x 240-pin DDR3 DIMM 1333/1667MHz sockets - up to 16GB |
| Graphic memory | Share system memory 8MB~256MB |
| BIOS | AMI |
| **LCD Touch Panel** | |
| LCD Size | 15” TFT LCD |
| Brightness | 250 nits, adjustable in 8 steps to 25nits |
| Resolution | 1024 x 768 |
| Touch Screen | Multi-touch Project Capacitive or True Flat Resistive 5 wire |
| Tilt Angle | 0 ˚~ 90 ˚ |
| **Storage** | |
| HDD/SSD | Two 2.5 inch SATA 3.0 drives support for HDD or SDD<br>RAID 0 or 1, Quick Change-hot swap<br>160GB HDD or 16GB SSD standard |
| **External I/O Ports** | |
| USB | 6 total 2.0, 5 in cable well, 1 on side, 3 are PoweredUSB |
| Serial | Four DB9 RS-232 with power option |
| PoweredUSB | 2 +12V PoweredUSB and 1 +24V PoweredUSB |
| LAN | 10 /100/ 1000 Intel 82579LM Controller |
| 2nd Display | One VGA port and One DisplayPort<br>DisplayPort supports HDMI and DVI displays |
| Cash Drawer | 2 x RJ 11 24V with status |
| Power In | 19VDC 9.47 amps |
| Audio Jack | One headset, one microphone-in |
| Printer Power | +24 V 2.5 amps, supports most 24V POS printers |
| Power LED | Front bezel, green for on, amber for standby |

| Power | |
|---|---|
| Power Adapter | 19VDC, 180W, 100-240 VAC,50~60Hz, 2.5A |
| **Optional Peripheral** | |
| MSR | 3 Track |
| iButton | Dallas Key iButton |
| Fingerprint Reader | USB Digital Persona Fingerprint Reader |
| RFID | 125KHz RFID USB |
| 2-in-1 | MSR 3 track / Finger Print |
| 2-in-1 | MSR 3 track / iButton |
| Second Display | 4:3 displays, 8.4”, 10.4” or 12.1” with or without touch<br>16:9 displays, 10.1” or 14” with or without touch |
| Customer Display | 2x20 VFD |
| UPS | DC UPS, 0.5-1.5 hours run time |
| **Mounting** | |
| Standard | Counter Top Base, Adjustable Viewing Angle 0-90°<br>100mm VESA mounting point |
| Optional | Pole Mount, Adjustable angle VESA, Swing-arm Mounts, others |
| **Environment** | |
| EMC & Safety | FCC, Class A, CE, LVD |
| Operating Temperature | 0 ~ 40℃ |
| Storage Temperature | -20 ~ 55℃ |
| Operating Humidity | 20% ~ 80% RH non-condensing |
| Storage Humidity | 20% ~ 85% RH non-condensing |
| **Dimensions (W x D x H)** | 370 x 250 x325mm |
| **Weight** | 8.1kg |
| **OS Support** | Windows 7, POSReady 7, Windows 7 Embedded, XP, POSReady 2009, XP Embedded, version of Linux |

* This specification is subject to change without prior notice.

# Features

## Intel's Desktop Processor Socket LGA 1155

By using the latest generation of Intel's desktop processors and chipsets, code named Sandy Bridge, the J2 680 supports a very wide range of processors. 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 allows for reduced heat generation and minimal power usage. Additionally, the 680 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

Like the J2 650, the first integrated POS system on the market to offer a hot swappable RAID feature the J2 680 also supports this 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.

## PoweredUSB Ports / Power Port

Addressing the need for additional power ports the J2 680 supports two +12V and one +24V PoweredUSB ports. The J2 680 can take advantage of growing availably or PoweredUSB products on the market.

In addition to the three PoweredUSB port the J2 680 also support four powered serial ports, and VGA +12V power, a +24V printer power port and 3 standard 2.0 USB ports.

By using a combination of these powered ports most all additional external power supplies for devices like scales, scanner, "Chip and Pin" devices, scanners, secondary display and other can be eliminated. This save space and reduces cost, cables and powered consumption. Also in most installs this means only one AC power point is needed. In additional with J2 optional UPS all these devices will be powered during a power outage.

## UPS

Not your ordinary UPS, the J2 680 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 680 work more like a notebook computer. In addition to running the 680 for up one hour, the UPS will run all the POS peripherals attached to the 680, 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 one hour. Also, when the 680 is turned off the printer is turned off also. This is very useful when the auto power on and off features of the 680 is used. This also applies to the +24V PoweredUSB port (note, only one +24V port can be used at a time).

## Cooling System

Great attention was paid to the thermal solution of the 680, it is truly a unique feature. The 680 can run as a fan less or fan-cooled system. Because of the very wide range of processors supported, thermal loads can range from 5 watts to as high as 95 watts. The 680 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 680 fans are the type used in Blade Servers and have a speed range from 3500~10,000 rpms at very high torque.

## Fan-Off Mode

When using the i5 or lower performance processor the 680 can run in a fan-off configuration. In the mode the 680 is a fan-less convection cooled device. This fan less operation may be required for high dust or other special environments.

This feature is unique to J2 and was supported by the J2 650 “Green Mode”. With the J2 680’s “Fan-Off” mode power is also greatly reduced by the nature of the processor used reducing power consumption and thereby reducing the units’ carbon foot print.

## Versatility

The word versatility is very much over used, but it is the correct word to describe the most unique feature of the 680. The combination of all the 680 unique features allows for the 680 to fit many roles. The 680 is not just one product, but a full product range all in one system. From fan less thin client to Quad Core RAID Server - the 680 does it all.

# System

## Configurations

The 680 can be ordered or upgraded to many possible configurations. Selecting the right combination of memory, processor, hard or solid state drive(s), and software drivers can dramatically change the performance of the 680 system. For a lot of users the standard 530 2.4GHz dual core processor and 2GB of memory is fine, as this is already more powerful most all POS systems, but some applications may require more horse power. In this case the J2 680 could be configured with a quad core i5 or i7 processor.

J2 will be happy to help you determine what you may require from the 680 in the most cost effective way. More memory may be added to get the performance needed, or sometimes a quad core processor and dual HDD with RAID are needed. The 680 can do it all, low end to high end.

## Processor Support

The 680 supports a very wide range of Intel processors. Each provides a different price performance level. From Celeron dual core, Pentium dual core and -3, i5 and i7 dual a quad core with processor speeds from 2.4GHz to 3.4GHz are all supported by the 680.

The 680 comes standard with the Intel dual core 2.4 GHz G530 processor but can be ordered with a different processor type. The processor can be easily upgraded by a qualified technician. The 680 uses the Intel defined LGA1155 socket. Intel is constantly adding new processors so please check with J2 for any additions since publication of this manual.

The large 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 680

| Processor # | Intel's Family name | Clock Speed | Max Turbo Frequency | # of Cores | # of Threads | Cache | Embedded | Fan-off mode | G |
|---|---|---|---|---|---|---|---|---|---|
| G530T | Celeron | 2.0 GHz | Na | 2 | 2 | 2MB | No | Yes | |
| G530 | Celeron | 2.4 GHz | Na | 2 | 2 | 2 MB | No | No | |
| G540 | Celeron | 2.5 GHz | Na | 2 | 2 | 2 MB | Yes | No | |
| G620T | Pentium | 2.2 GHz | Na | 2 | 2 | 3 MB | 7 Year | Yes | |
| G620 | Pentium | 2.6 GHz | Na | 2 | 2 | 3 MB | No | No | |
| G630 | Pentium | 2.7 GHz | Na | 2 | 2 | 3 MB | No | No | |
| G630T | Pentium | 2.3 GHz | Na | 2 | 2 | 3 MB | No | Yes | |
| G840 | Pentium | 2.8 GHz | Na | 2 | 2 | 3 MB | No | No | |
| G850 | Pentium | 2.9 GHz | Na | 2 | 2 | 3 MB | Yes | No | |
| G860 | Pentium | 3.0 GHz | Na | 2 | 2 | 3 MB | No | No | |
| i3-2100 | i3 | 3.1 GHz | Na | 2 | 4 | 3 MB | No | No | |
| i3-2100T | i3 | 2.5 GHz | Na | 2 | 4 | 3 MB | 7 Year | Yes | |
| i3-2120 | i3 | 3.3 GHz | Na | 2 | 4 | 3 MB | Yes | No | |
| i3-2120T | i3 | 2.6 GHz | Na | 2 | 4 | 3 MB | No | Yes | |
| i3-2125 | i3 | 3.3 GHz | Na | 2 | 4 | 3 MB | No | No | |
| i3-2130 | i3 | 3.4 GHz | Na | 2 | 4 | 3 MB | No | No | |
| i5-2390T | i5 | 2.7 GHz | 3.5 GHz | 2 | 2 | 3 MB | 7 Year | Yes | |
| i5-2300 | i5 | 2.8 GHz | 3.1 GHz | 4 | 4 | 6 MB | No | No | |
| i5-2310 | i5 | 2.9 GHz | 3.1 GHz | 4 | 4 | 6 MB | No | No | |
| i5-2320 | i5 | 3.0 GHz | 3.1 GHz | 4 | 4 | 6 MB | No | No | |
| i5-2400 | i5 | 3.1 GHz | 3.4 GHz | 4 | 4 | 6 MB | Yes | No | |
| i5-2400S | i5 | 2.5 GHz | 3.3 GHz | 4 | 4 | 6 MB | No | No | |
| i5-2500 | i5 | 3.3 GHz | 3.7 GHz | 4 | 4 | 6 MB | No | No | |
| i5-2500S | i5 | 2.7 GHz | 3.7 GHz | 4 | 4 | 6 MB | No | No | |
| i5-2500T | i5 | 2.3 GHz | 3.3 GHz | 4 | 4 | 6 MB | No | Yes | |
| i7-2600 | i7 | 3.4 GHz | 3.8 GHz | 4 | 8 | 8 MB | Yes | No | |
| i7-2600S | i7 | 2.8 GHz | 3.8 GHz | 4 | 8 | 8 MB | No | No | |

1: Processor with green shading would be standard 680 products.
2: Processor with blue shading are available but may requires a minimum order quantity.
3: All processor shown above should work on the J2 680 but are not necessarily tested.
4: "7 Year" = support from Intel to J2 for 7 years, same as embedded products.

## I/O Ports

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 680 hangs for some reason it can always be powered off by holding the Off / On button in for six seconds.

The 680 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.

*Off / On button Location*

## Hard Disks

Two 2.5 inch SATA hard drives (HDD) or solid state drives (SSD) 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 6.0 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 680) fits 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*

## Zero Bezel Touch Screen

The 680PTC unit uses a Multi-Touch Projected Capacitive technology touch screen (PCT). The PCT touch screen has no known failure mode-- it does not “wear out.” This screen is made with tempered glass and does not reduce the brightness of the LCD panel. When operating in a very high use environment PCT is the recommended touch screen technology. The PCT touch screen will work with most gloves and stylus designed to work with tablet computers. The screen has a smooth glass surface that is reflective.

The 680TFR uses a five-wire touch screen rated at 35 million touches per point. The resistive technology is very responsive and is the traditional choice for a hospitality POS system. The screen has an anti-reflective plastic film surface.

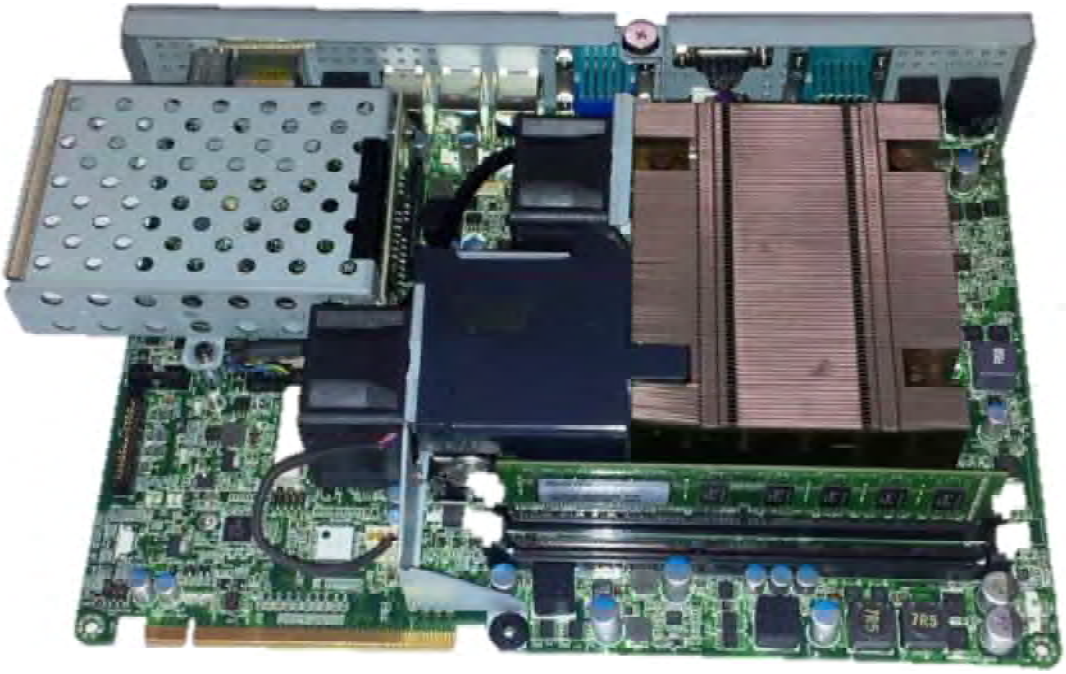
Both screens are fully spill proof, dust proof and can be cleared with and standard glass cleaner. The zero bezel, sometimes called true flat, design allow for this plus easy cleaning. The 680 touch screen was designed to easily be changed, normally in less than two minutes. Depending on operating environment and usage, both the Resistive and PCT touch screens have strengths and weaknesses. J2 offers both touch screen technologies on the 680.

## System Board

POS computers typically have a desired lifespan of 10 years or longer, therefore product quality is of the utmost importance. The 680 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 680 is a 1024 x 768 resolution display with 16.2 Million colors. The brightness is rated at 250cd/m$^2$. 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$^2$ to 25 cd/m$^2$. The brightness can be set to a fixed level in the BIOS or controlled by a utility supplied by J2.

## Secondary Video Port(s)

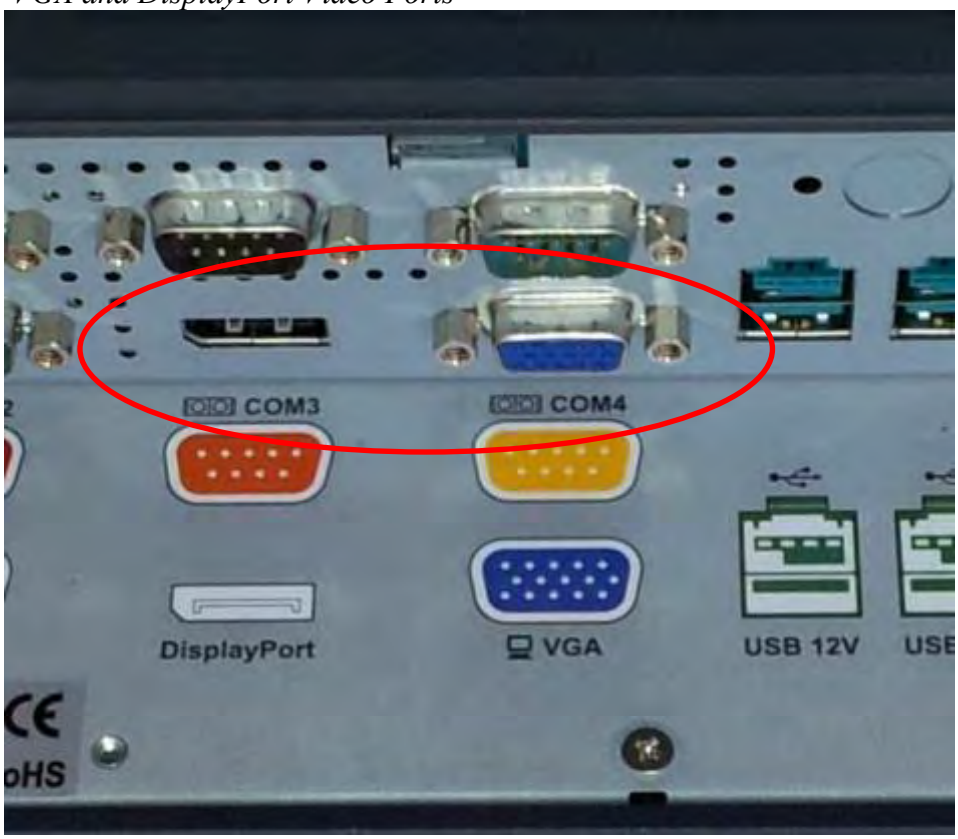
A standard PC VGA video port is supported on the 680 and can be set as the primary or secondary display The VGA video port has an industry standard HD DB15 connector. When used with some J2 monitors the display can be powered by the 680 through this connector.

The 680 also supports the newer digital video standard DisplayPort connector. This connector supports a DisplayPort monitor or a HDMI display or DVI monitor. When used with HMDI or DVI display a passive adapter cable is used.  When used with a HDMI display Audio is support via the same HMDI cable.

The 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.

Note that only one external video display is support at a time, either on the VGA video port or the DisplayPort video port.

*VGA and DisplayPort Video Ports*



## Serial ports

The 680 has four external RS232 serial ports, all of which can be powered. The serial ports are standard RS-232 ports with a DB9 male connector. The serial ports, in a normal configuration, are mapped to COM 1-4.

There also four internal serial ports one of which is used for the resistive touch controller and the other are reserved for other internal options.

COM ports 1-4 can supply power to an external device when required, like the optional J2 Customer Display. COM 1 can supply +5 volt and COM 2-4 supply +12 volts. The voltage is supplied on pin 9 (RI) of the DB9 connector. The maximum current is 1000ma and is over-current protected. A BIOS setting is used to enable the voltage on each port.

J2 does not normally recommend using the +5 volt option on COM 1 and is only there for some legacy devices. The problem is it easy for +5 volt device to be plugged into a +12 enable serial port by mistake which will burn out the +5 volt device. A good alternative to powering a +5 volt serial device, or any +5V device would be to use power from an unused USB port. Cables for this are readily available (see below).

*DB9 pin out serial ports*

| Pin | RS232 |
|---|---|
| 1 | DCD |
| 2 | RD |
| 3 | TD |
| 4 | DTR |
| 5 | GND |
| 6 | DSR |
| 7 | RTS |
| 8 | CTS |
| 9 | RI |

*Serial Port*

USB to +5V cable

## USB Ports

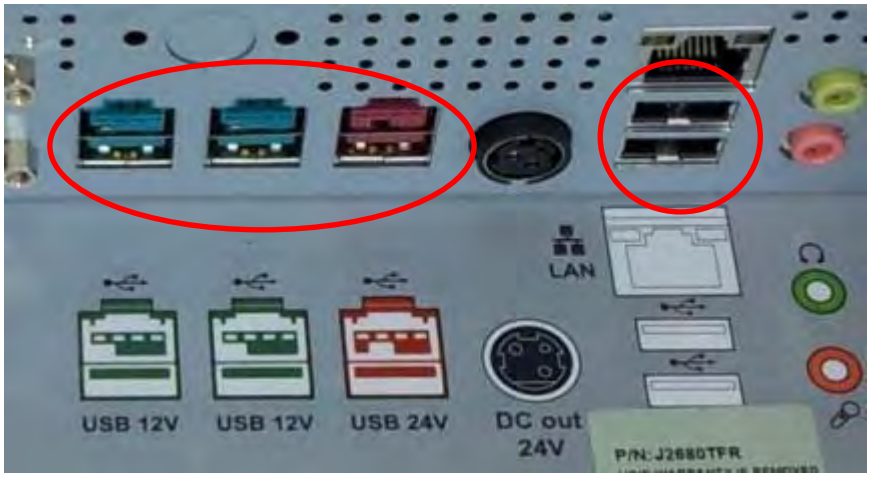
The 680 has six external and 4 internal USB 2.0 ports. Of the six external ports (*see below*) five ports are located in the cable well and one is located on the left side of the unit for easy access. The four internal USB ports are as follows:  one can be used for the optional Finger Print Reader and is located on the MSR connecting point. The second internal USB port is used for the PCT touch screen controller and the other internal USB ports is designed for other optional internal devices. All the J2 680 USB ports can supply 1000ma of power, 500ma more than the normal for the USB specification.

## PoweredUSB Ports

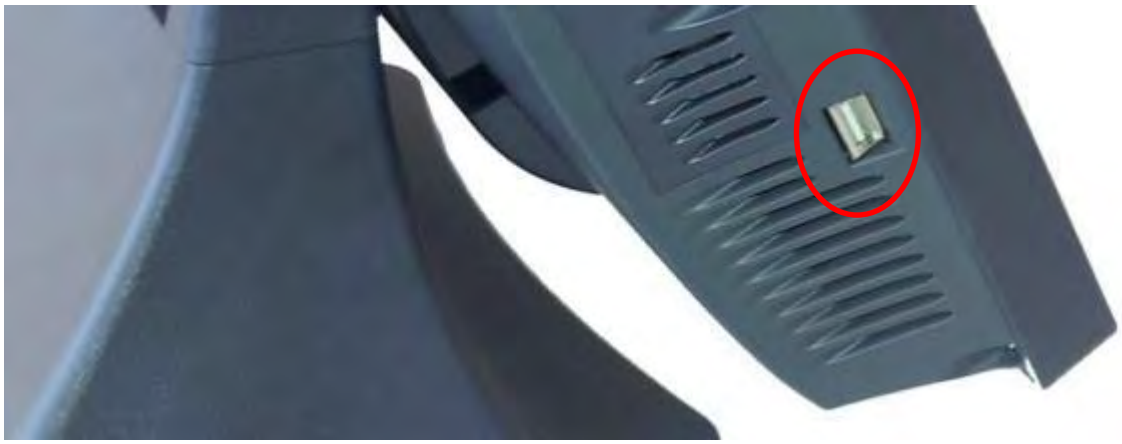
Of the 6 external USB 2.0 ports 3 are PoweredUSB ports. Located in the cable well are two +12V PoweredUSB ports and one +24V PoweredUSB port. These ports conform to the PoweredUSB standard.

It should be noted that these three ports can also be used as standard USB ports as well. Normal +5 USB devices will plug into the bottom half of the connector without a problem.

*USB Ports*




*Side USB Port*



## Ethernet Connection

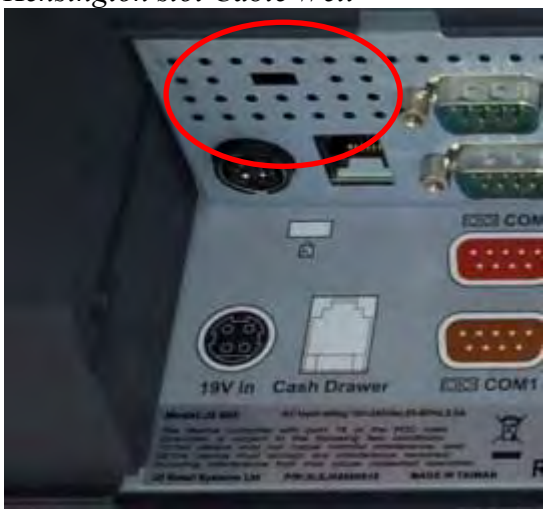
The 680 uses the Intel 82579LM Gigabit Ethernet controller. The Ethernet connector is located in the cable well, *as shown below*. The Ethernet controller supports Wake on LAN, the BIOS supports a PXE boot ROM as well. There are two LEDs on the LAN connector:  the Green LED lights up when the LINK signal is present and the Amber LED lights comes on when there is LAN activity. This Ethernet supports Intel AMT feature when used with the correct processor.

*Ethernet Connector*

## Kensington Security Slot

There is a Kensington Security Slot (lock slot) on the 680. (*Please see below*).
It is located on the head in the cable well. The Kensington locks are normally used as a deterrent to prevent opportunistic theft. Most retail locks will work with the 680, however please check to see if a lock fits, as not all do.

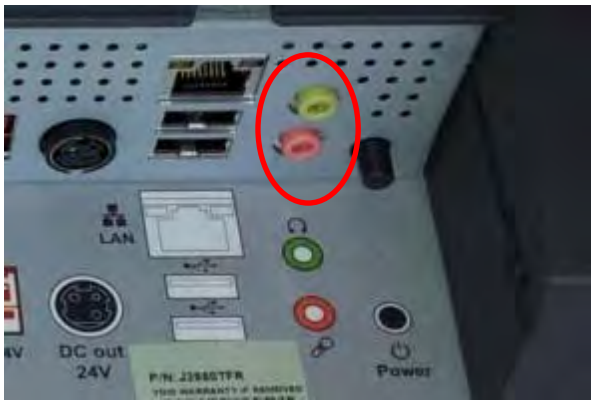
*Kensington slot Cable Well*



## Audio

The 680 uses the VIA1708B HD audio controller. There is one internal speaker.
Both a microphone jack and a headset jack are located in the cable well of the 680, *as seen below*, which allows for the connection of a microphone and headset or audio out to other devices. Audio is also output via the HDMI port when used.

*Audio Jack Location*




## Printer Power Port

The Printer Power Port allows an industry standard POS printer to be powered from the 680 and eliminates the need for a separate external power supply for the printer.

The Printer Power Port supplies 24 VDC 2.5 amps and 6.0 amp surge current which will run most POS printers on the market. The power cable for this port is supplied standard with the 680 unit. The Printer Power Port will also supply power to a printer even when running on the optional UPS. When the 680 is powered down, then power to the printer is turned off. This same power circuit is used by the +24 PoweredUSB port and normally only one +24V device is supported at one time.

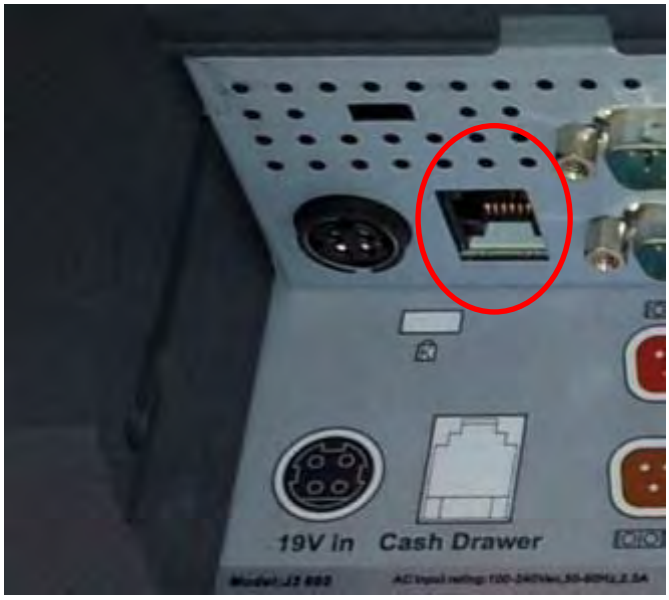
*Printer Power Port*

*Printer Power Port Cable*

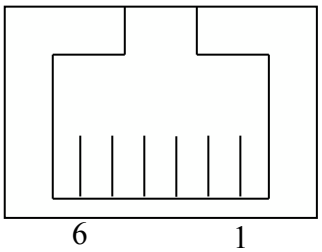
## Cash Drawer Port

The 680 is equipped with one Cash Drawer port that will support one or two drawers. This port is located in the cable well and uses the industry standard RJ-11 connector and pin out (*illustrated below*). This pin-out is the same as used by EPSON printers and cables for the EPSON printer normally work with the 680.

*Cash Drawer Ports*




*Cash Drawer 1 Pin Assignment*




| Pin | Signal |
|---|---|
| 1 | GND |
| 2 | CD1 SOLENOID |
| 3 | STATUS / STATUS CD1 |
| 4 | 24V |
| 5 | CD2 SOLENOID |
| 6 | GND / STATUS CD2 |

The application may address the Cash Drawer port in two ways:

1) Using the J2-supplied OPOS drivers for Windows.

2) Direct access to the I/O ports

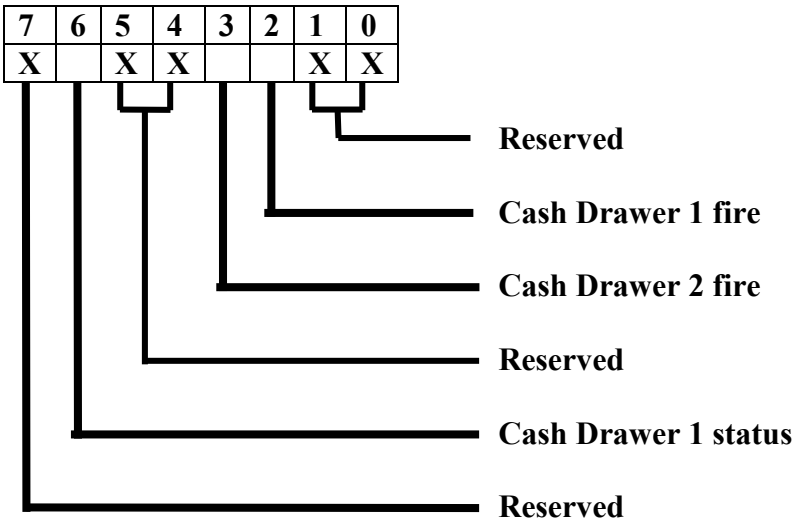
3) J2 supplied Virtual Serial Cash Drawer Emulator

**Cash Drawer Controller Register**

**The Cash Drawer Controller use one I/O address to control the Cash Drawer.**

**Register Location: 48Ch**
**Attribute: Read / Write**
**Size: 8bit**

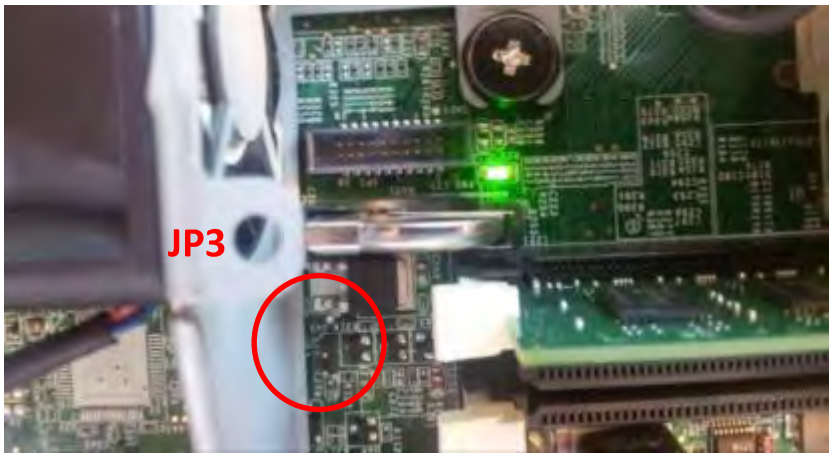
| BIT | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| Attribute | Read | | Reserved | | Write | | Reserved | |




The "Y" cable used to support two cash drawers on the one RJ-11 is the same as is used on Epson printers.

## CMOS Clear

The 680 CMOS can be cleared jumping JP3 pin 1-2 then removing the jumper.




## Power Supply

The 680 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 180 watts 19 VDC 9.47 Amps and has an input rating of 100-240VAC at 50~60Hz 2.5Amps maximum. The power supply has an efficiency rating IV. 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*

## Typical Power Consumption 680

The typical power consumption of the 680 is lower that most desktop computers. Using the latest generation on Intel's Desktop processors and chipset allows for much lower power consumption than previous generations of POS computer. This when coupled with proper system configuration can greatly reduce the systems total carbon foot print.

**Test conditions**

| | |
|---|---|
| Voltage: | 220VAC 50Hz, measured voltage 236 VAC |
| OS: | POSReady 7 |
| Heavy Load Program: | PassMark BurnInTest defaults values |
| Maximum load: | PassMark BurnInTest Max CPU Temp |
| Temperature: | 26c |

All system where tested in there standard hard drive configuration. Results are +/- 15%.

**J2 680 G850 2.9GHz Pentium**

| | |
|---|---|
| 1: Normal application including most POS software | 40 watts |
| 2: Very heavy load application | 57 watts |
| 3: Maximum load | 64 watts |
| 4: Normal POS app, back light off | 20 watts |
| 5: Standby, unit off, waiting for wake on LAN, RTC or power button | >4 watts |

# Service

## Removing the Head from the Base

The 680 is shipped with a counter top base which allows for the head to be adjusted from 0-90°.

To remove the integrated head from the base, fully loosen the thumbscrew located on the back of the unit under the hinge of the counter top base*, as shown below*. Then lift the head as illustrated:

*Loosen Thumb Screw*

*Slide Head up to remove*

## 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, three screws needs to be removed as shown.

*Screw locations*

## VESA Mounting

The 680 unit also supports the industry standard 100mm VESA mounting. The same mounting hard point used for the counter top base is used for VESA mounting. The four point that thread holes for 4mm screws.

100*mm VESA Pattern*

*Threaded Mounting point(s), 4mm screw*

## Optional Wall Mount Bracket Installation

The wall mount bracket has threaded mounting holes (*screws provided*) for the 75mm VESA standard; and unthreaded holes for the 100mm standard.

Using the 100mm hole pattern the bracket can be used by itself as a wall mount bracket. After installing the thumbscrew clip mount bracket to the wall, hang the J2 680 on the bracket.

Install screw to secure thumbscrew clip

The bracket slides on to the J2 680 mount posts, *as shown*. Normally the bracket would already be mounted to the wall or a VESA mount and the 680 would be hung on the bracket. Once in place the thumb screw would be tightened.

## Removing the Back Cover

The following steps show how to disassemble the 680 for servicing:

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

*Remove four screws where shown*

*Carefully tilt up the back cover to remove*

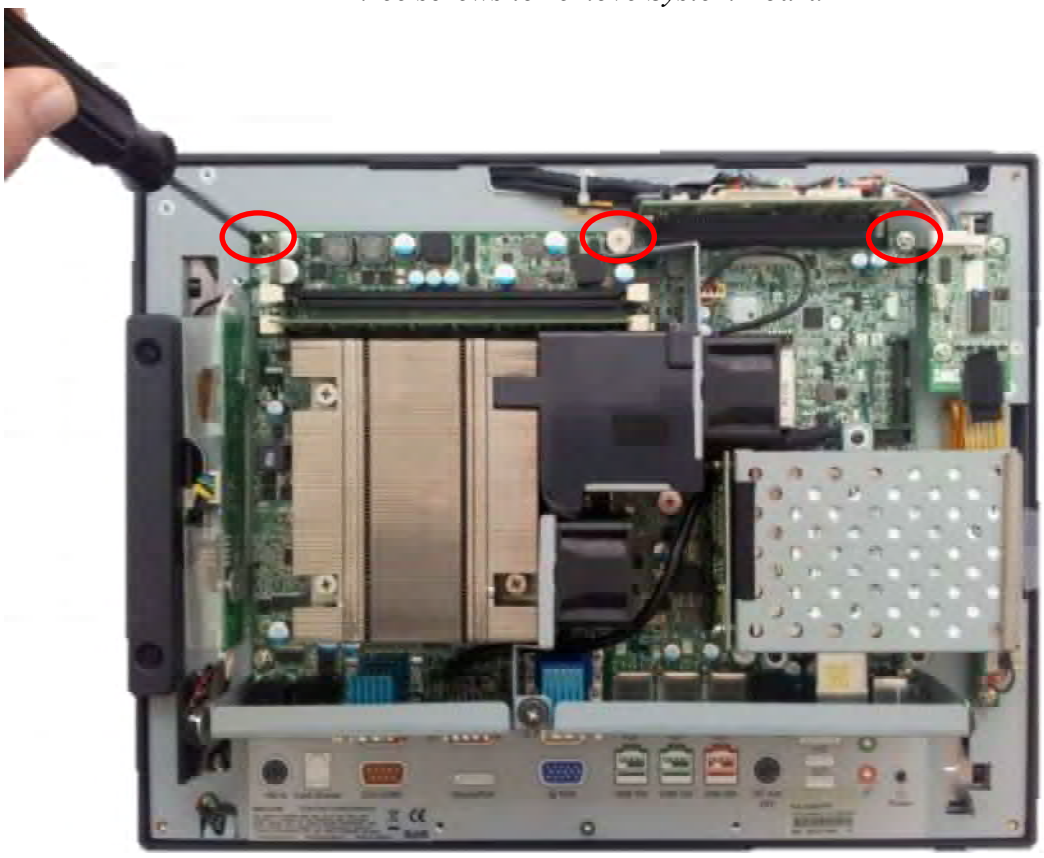
Note: The 680 was designed so that the internals of the unit could be accessed without having to remove the mounting base or the mounting bracket of the unit.

## Changing the System Board

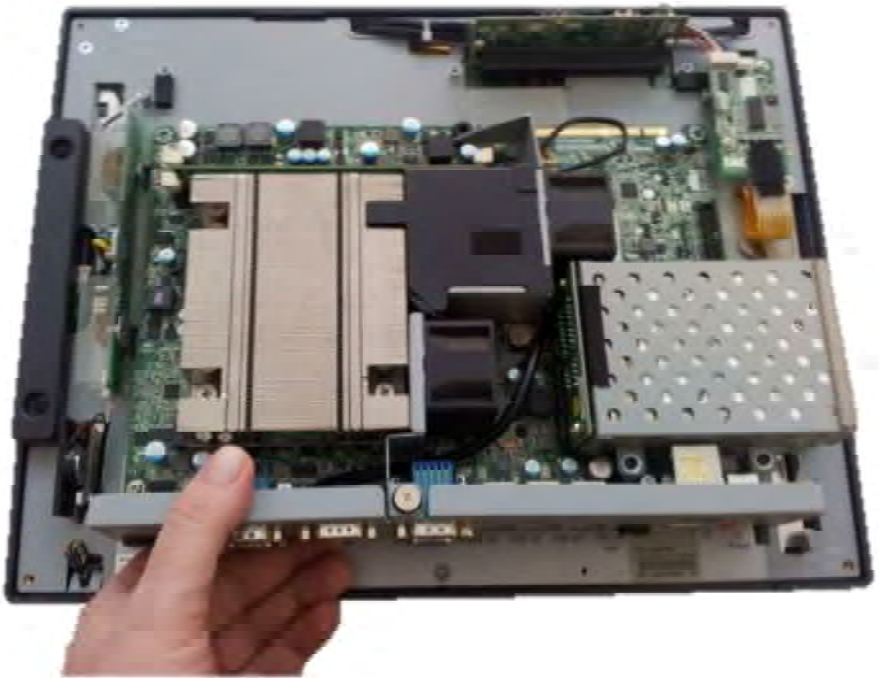
***Special Note**: **An anti-static workplace with proper grounding is required when changing the System Board.**

First remove the back cover. There are 3 screws that hold the system board in place that will need to be removed. (*see photo below*)

*Three screws to remove 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.



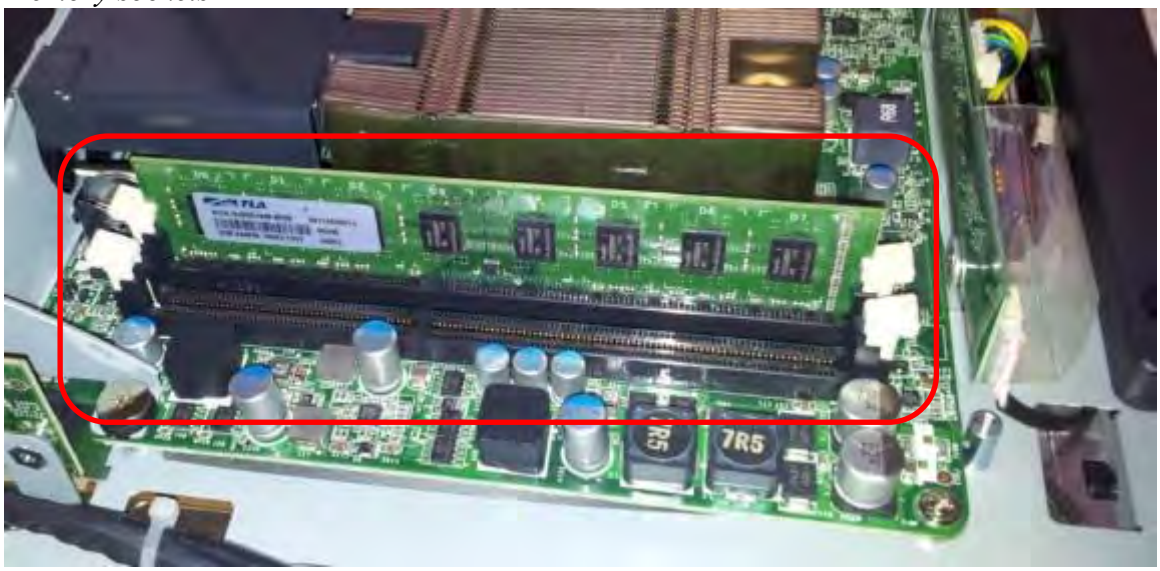
When reinstalling the system board make sure the locking tabs on the bottom of the board lock into their mating slots.

## 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.

The J2 680 supports up to 16GB of memory in two sockets. Memory type is 240 DIMM DDR3 1066/1333.

*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 four screws; now remove the black plastic fan duct.

Loosen the four spring-loaded screws that secure the processor 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 until 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 <u>is not covered by J2's warranty</u>.**

## Accessing the HDD/SDD Drives

*Remove cover screw then remove cover*

*Remove or insert drive as needed*

The HDD/SSD 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

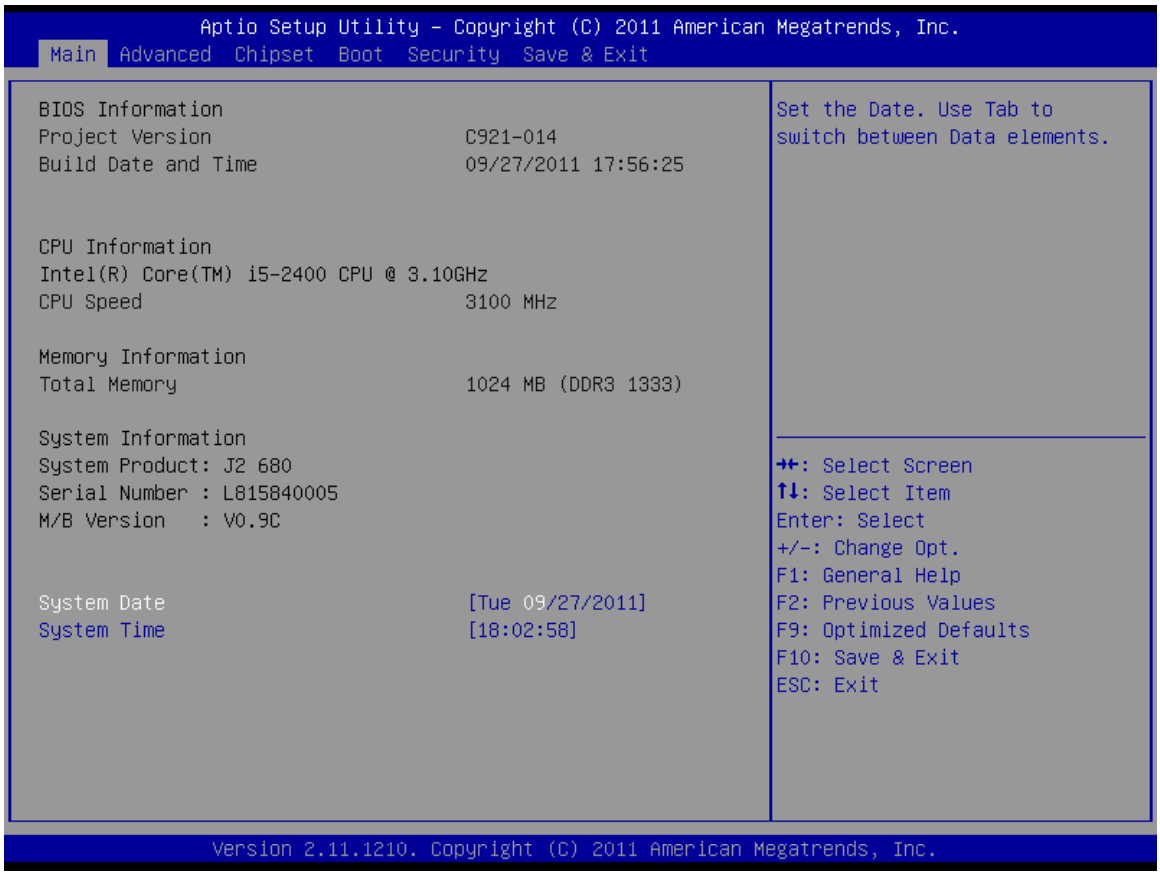
To enter the BIOS Setup, turn on or reboot the 680 and press the DEL key after the BIOS sign-on screen appears. The main menu of the BIOS setup will be displayed, this can take a few seconds. If the supervisor password is set, you must enter it here. The area on the right side of the screen displays a help window for the current screen or BIOS option.

BIOS setting should only be change by qualified personal as changing some setting can cause the system not to function properly.

## Main, System Overview

In this screen the system time and date are displayed and can be set. The time and date can also be set through the OS. This screen also displays the BIOS version (project), BIOS Build Date, CPU type, CPU speed and DRAM memory size, Product type, System Serial Number and mother board revision. The serial number of the mother board and the system are the same.

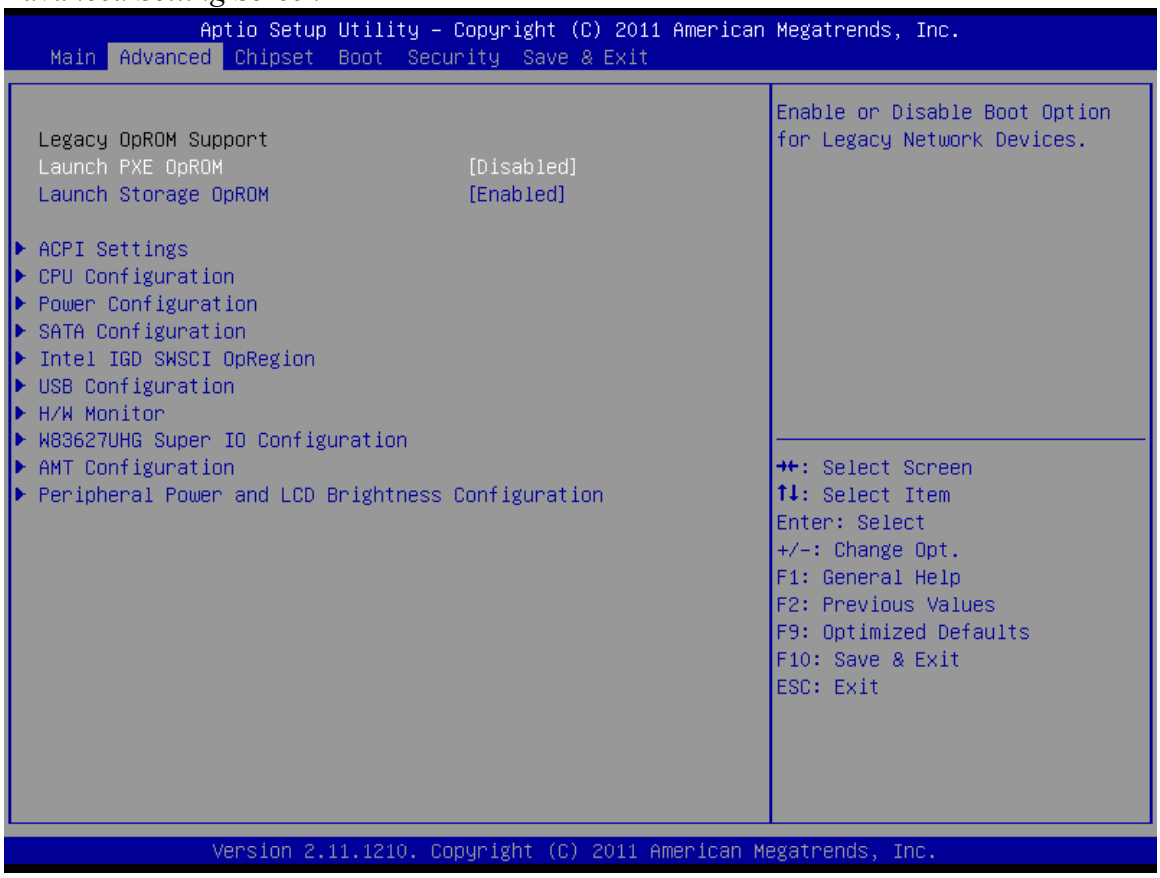
*Main screen*



## Advanced Settings

This menu contains settings to control a number of system functions. Most these settings are self-explanatory.

*Advanced Setting Screen*




## Launch PXE ROM

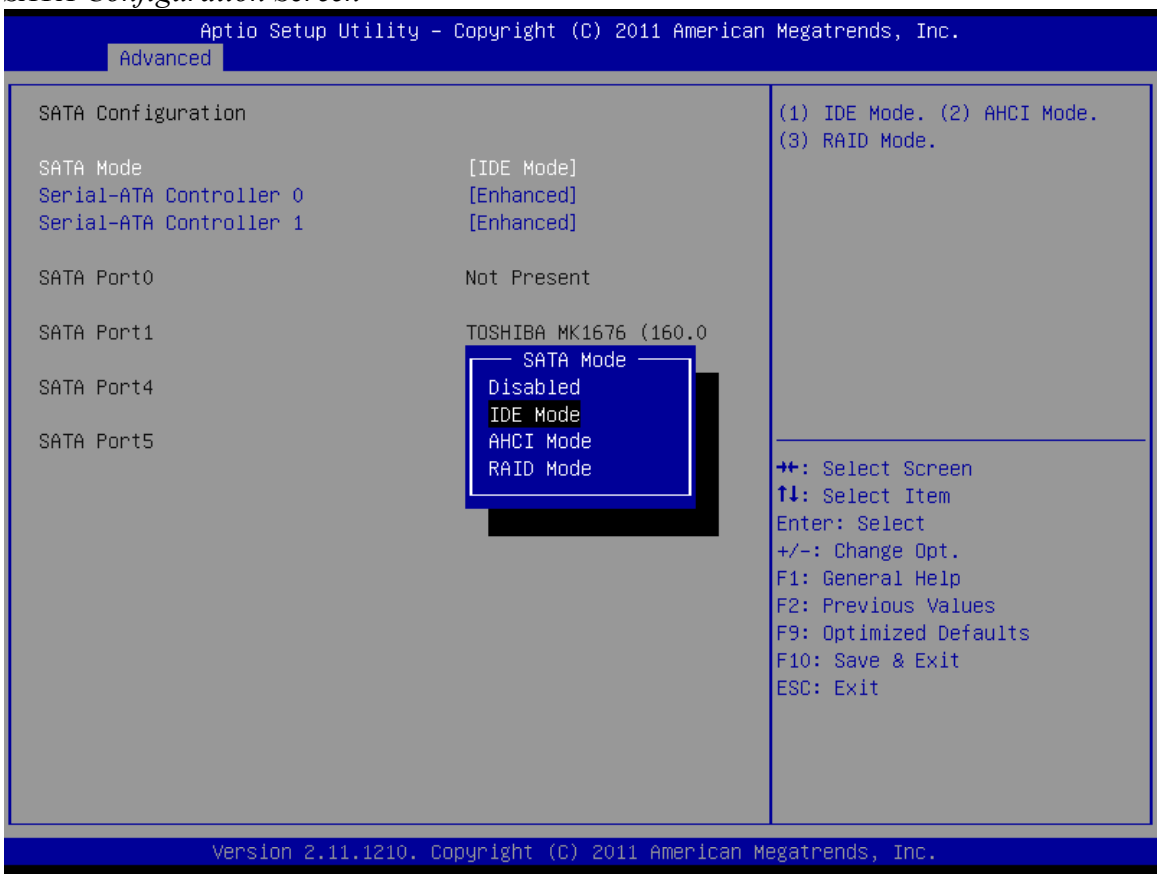
This setting enables the built- in PXE LAN remote boot rom. This allows the system to run as a diskless workstation, or to be able to download a drive image to a blank drive. When enabled, a message screen will appear and Shift-F10 can be typed to access the PXE ROM options. This option is located on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

## 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.

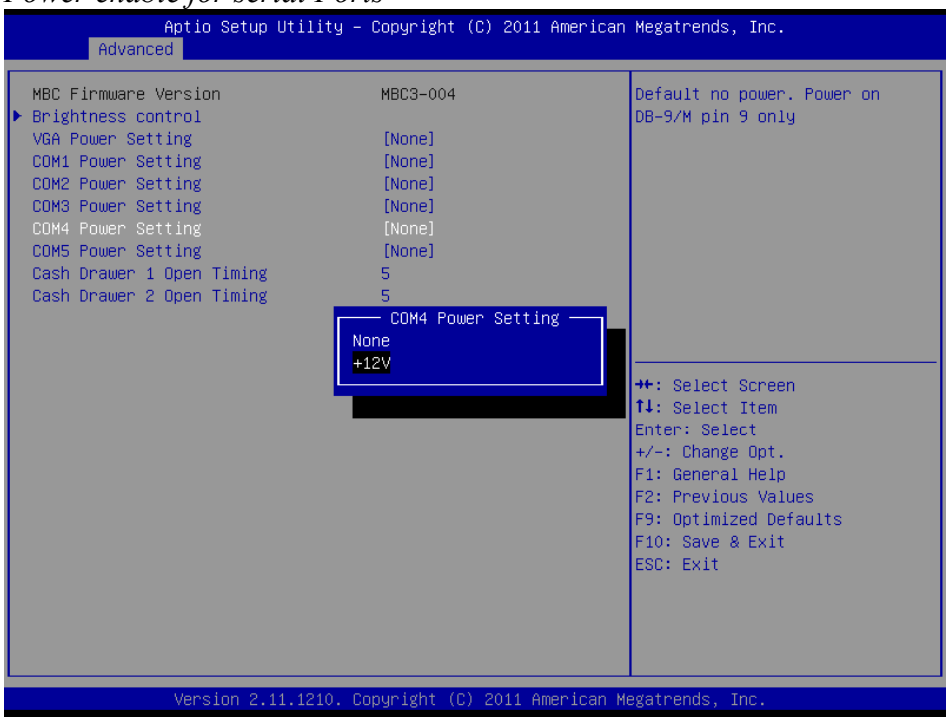
*SATA Configuration Screen*



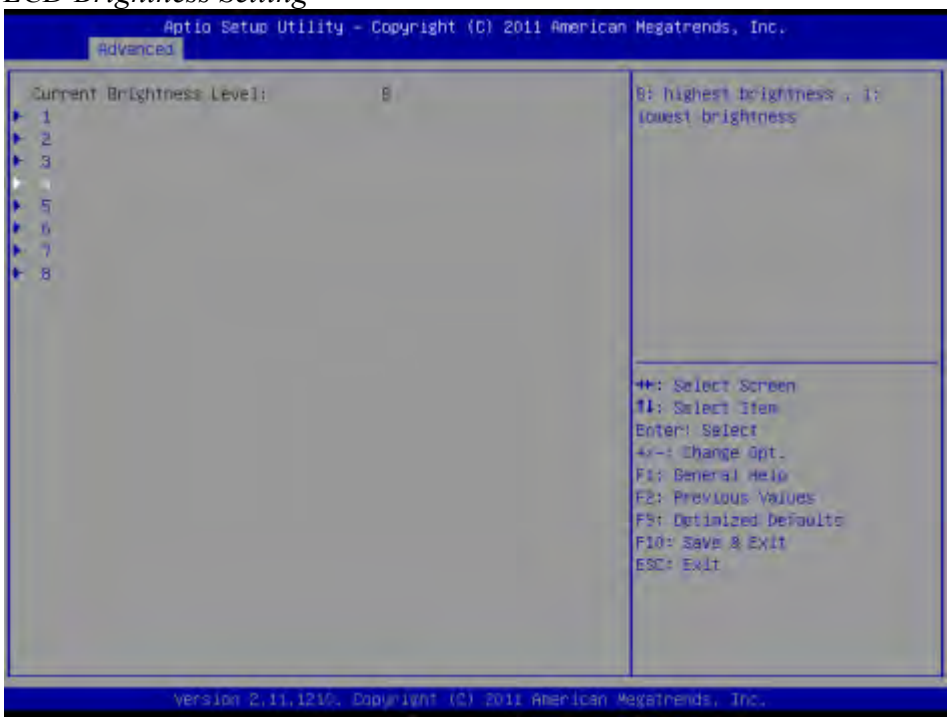
## Peripheral Power and LCD Brightness Configuration

This submenu allows for the enabling of power for the serial ports, default cash drawer pulse timing and default LCD brightness level and power for a J2 supplied VGA port monitor.

*Power enable for serial Ports*

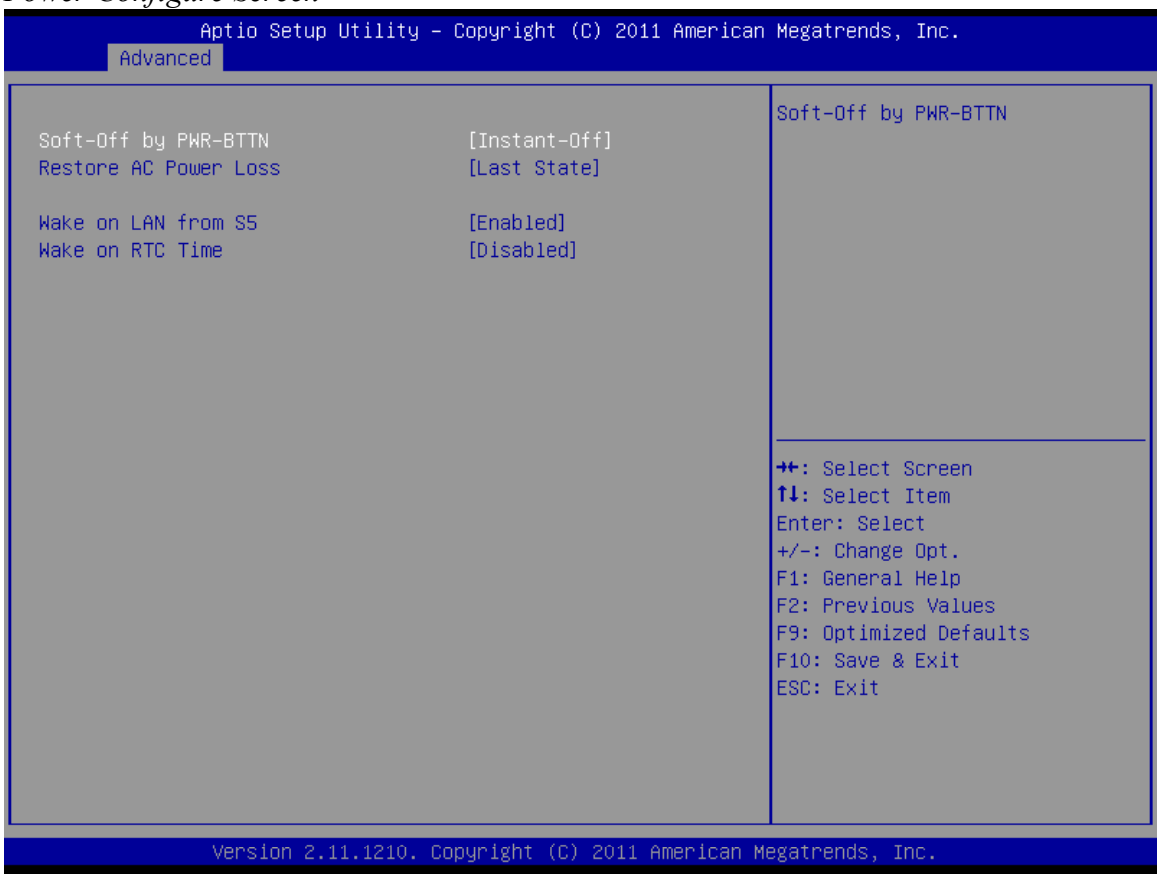



*LCD Brightness Setting*



## Power Configure Screen

*Power Configure Screen*




### Restore on AC Power Loss

The 680 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.

### Wake on LAN

Wake on LAN is enabled by default but can be disabled in this screen.

### RTC Configuration

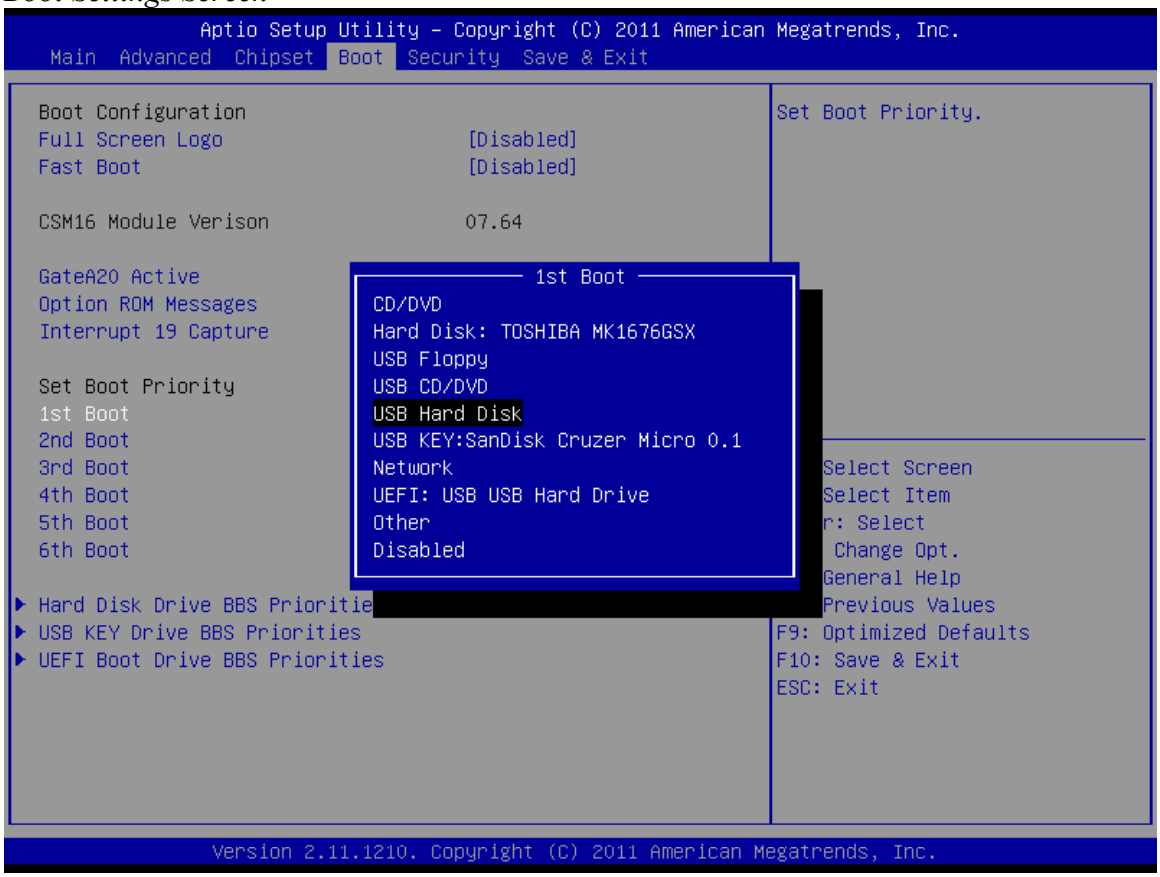
The RTC has an alarm function that can be used to turn the 680 on at a preset time of day. This function is enabled by this setting. The wake up time can also be set here.

J2 also has available a utility to set the wake-up time from Windows. 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.

## 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 680 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.

*Boot Settings Screen*




## 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 left 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.

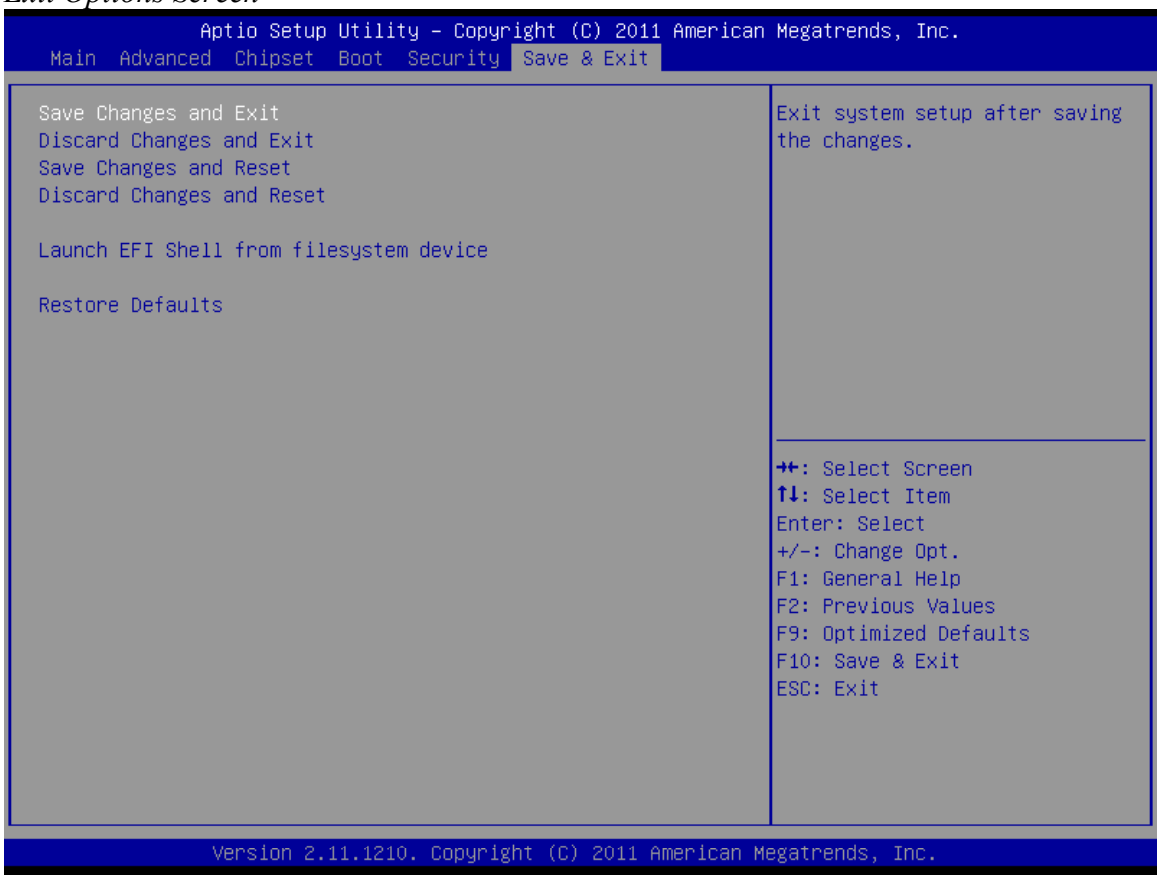
Customer logos can replace the J2 logos when required. Please contact J2 regarding this, if required.

## 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. Typing the F9 key at any time will load the "Optimized Values" which resets all BIOS setting to the factory defaults.

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, Windows

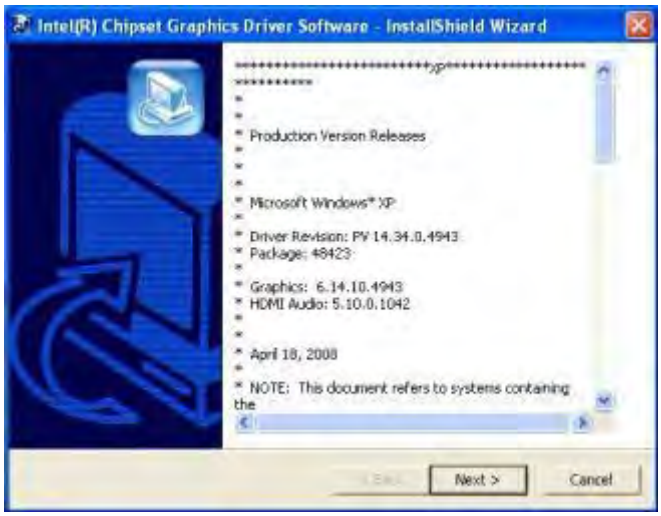
## Chipset Driver Installation

The chipset driver is needed to get the full potential from the 680 chipset. It should be loaded before other drivers and first thing after booting. The drivers can be downloaded from the J2 web site:
http://www.j2retailsystems.com/support/680/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 680 graphics driver from the J2 web site at:
http://www.j2retailsystems.com/support/680/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/680/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*

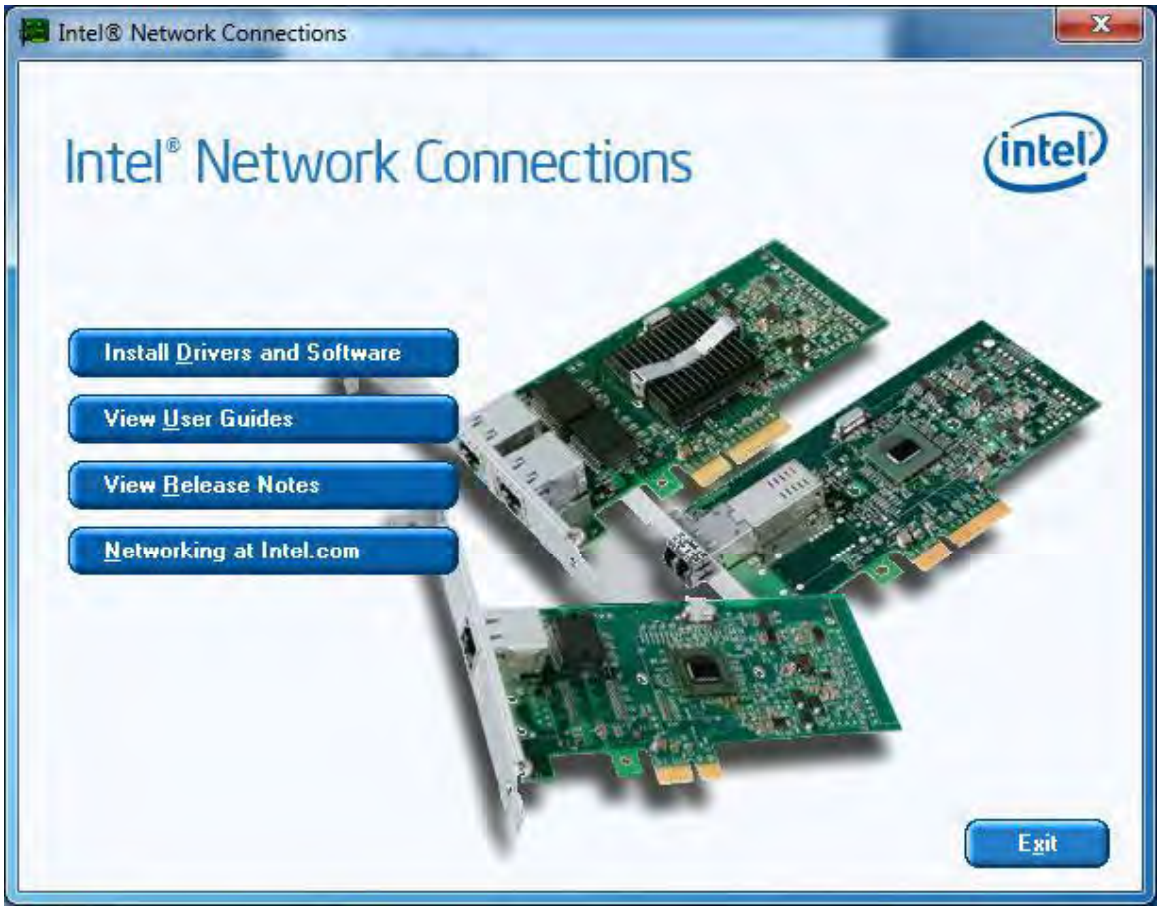
Check the Codec Driver box, and then click Next. Answer Next to any more dialog boxes, then Finish. The system will need to be rebooted before the audio drivers take effect.

## LAN Driver Installation

The LAN drivers can be downloaded from the J2 web site: http://www.j2retailsystems.com/support/680/LAN/.

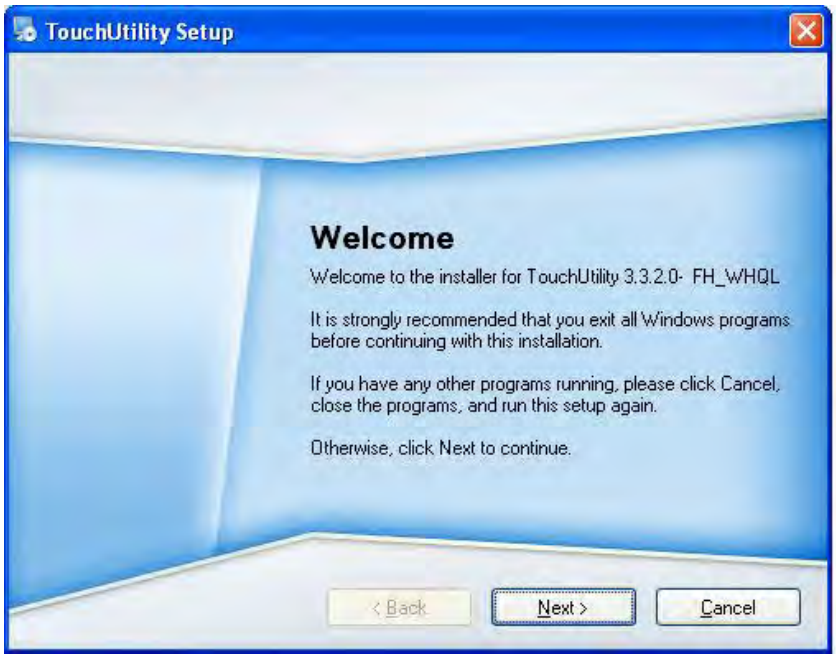
After extracting the driver to a temporary folder, run **Setup.** Just answer Next or Yes to all the screen prompts and the driver will install.

*LAN driver install screen*



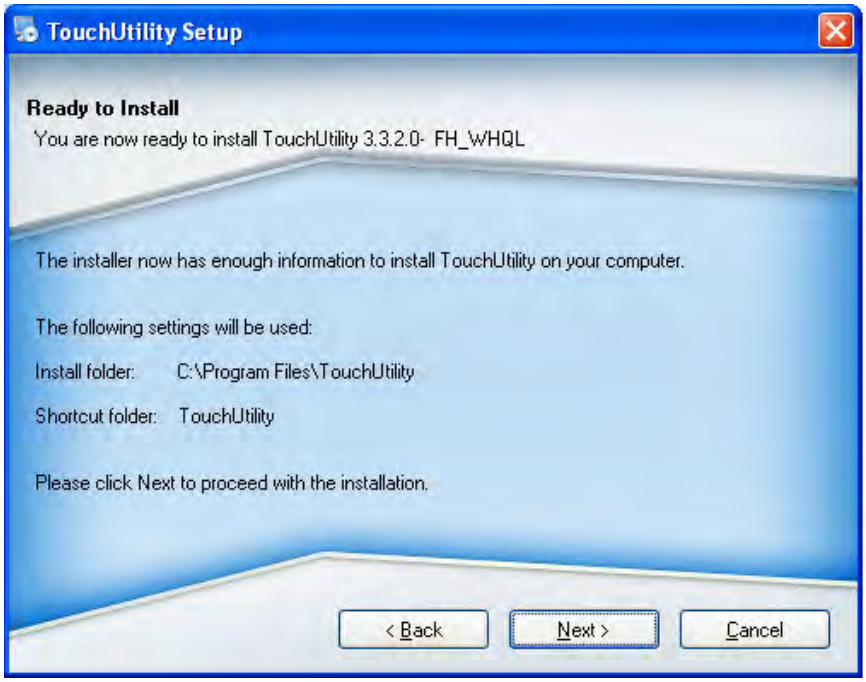
Resistive Touch Screen Driver Installation
The Touch Drivers can be downloaded from the J2 web site at:
http://www.j2retailsystems.com/support/680/Touch/.

When run, the diver will display a welcome screen, at this point just press next for the next few screens.

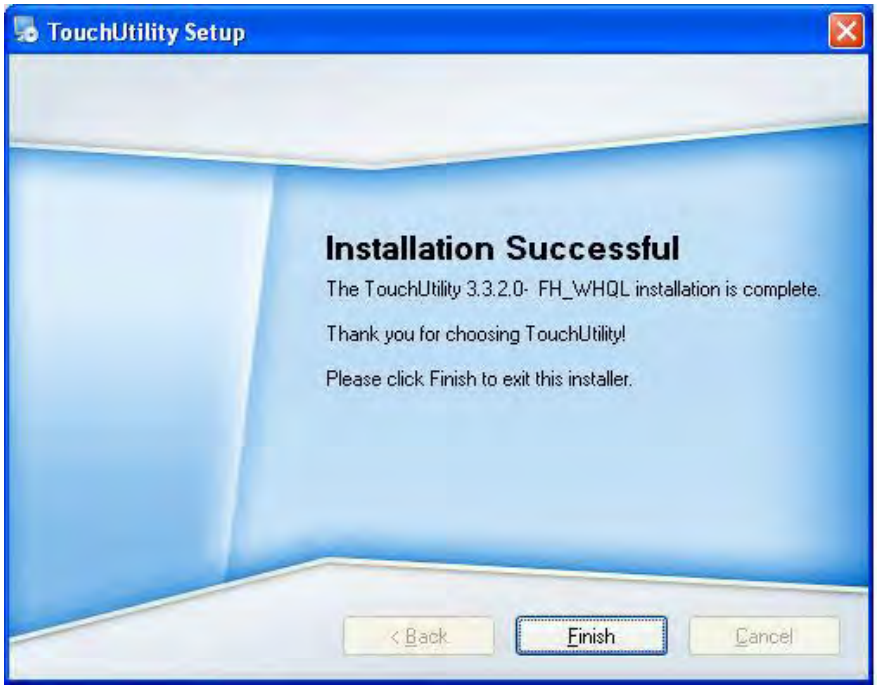



When you get to this screen check both RS232 and USB options and click next.

Just click till this screen and then click next and the driver will finish installing.




Click finish at the screen. The driver will then detect the port the touch screen is on (normally COM6) then ask you to reboot the system.

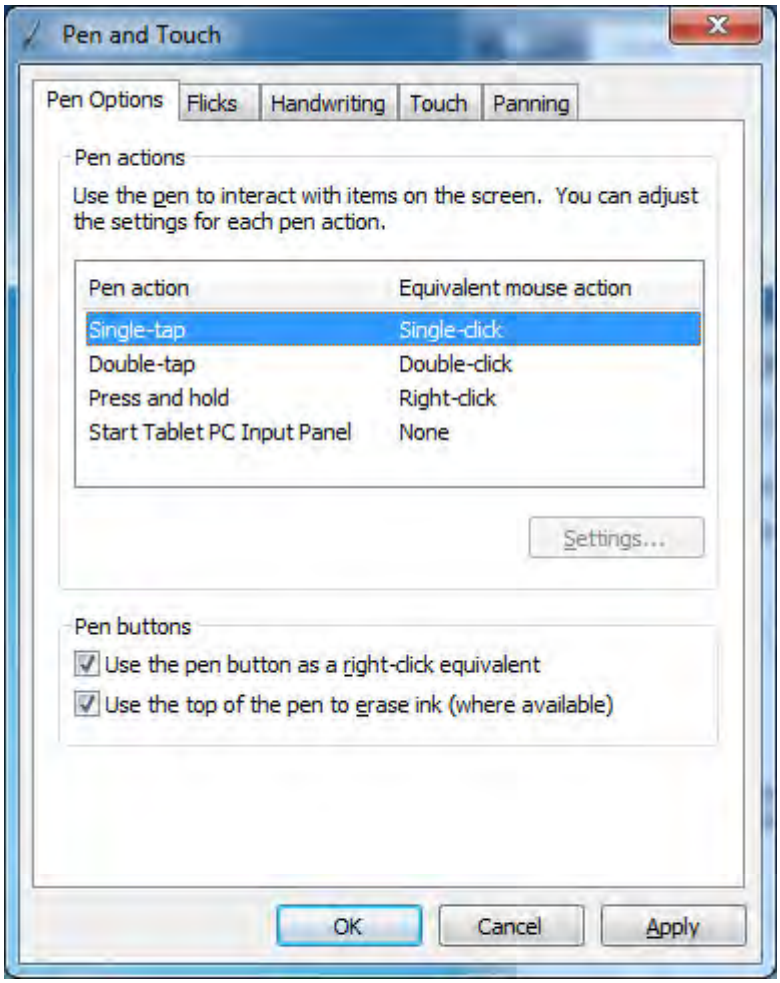



After rebooting the touch should be working. Calibration is not needed as this is done at the factory.

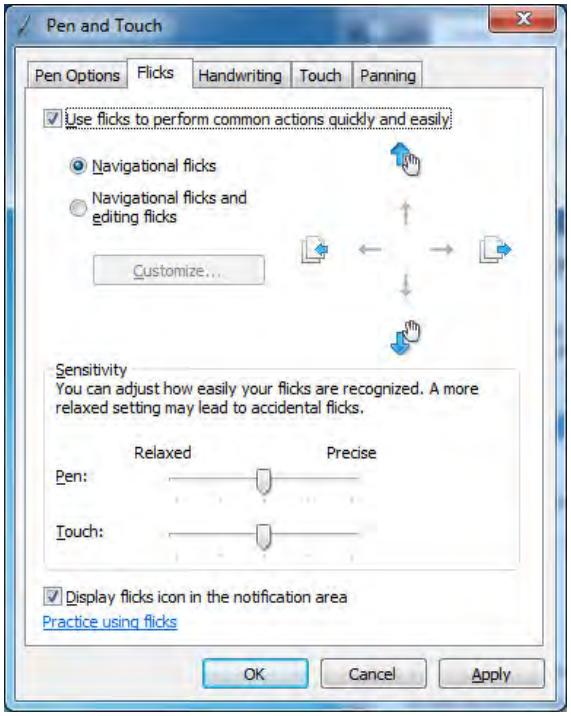
## Multi-Touch Projected Capacitive Touch Driver

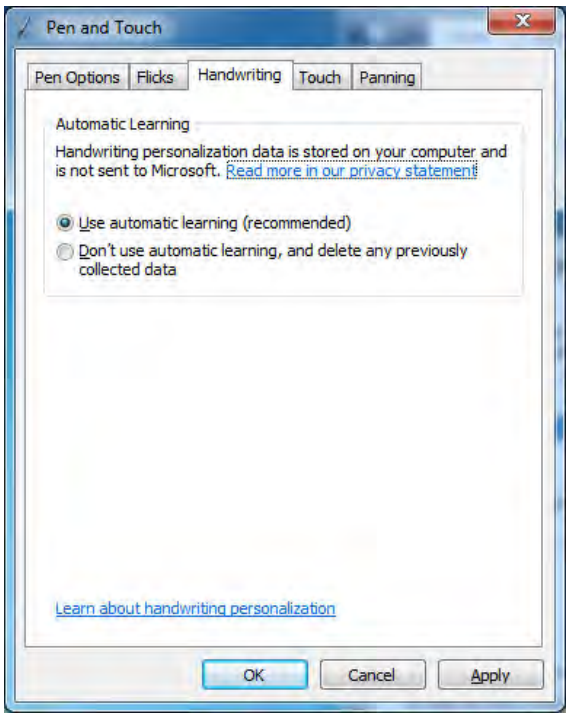
No touch driver needs to be loaded for the PCT touch screen because it uses the Microsoft built in pen and touch driver, No calibration is needed for the projected capacitive touch screen. The driver options can be accessed via the Windows control panel. The built in Windows pen and touch driver is present in XP, Vista and all versions Windows 7.

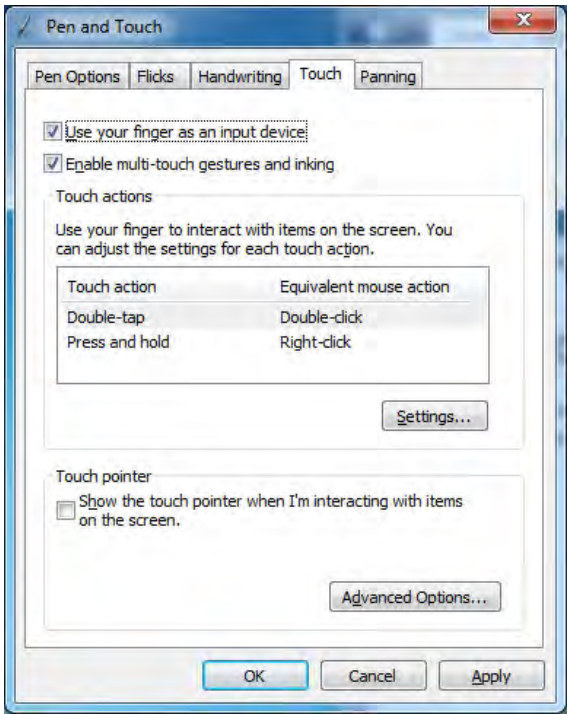
The first page of options allows for the change how your finger or stylus interacts with the screen. The sensitivity and function of touch to the screen can be changed here.

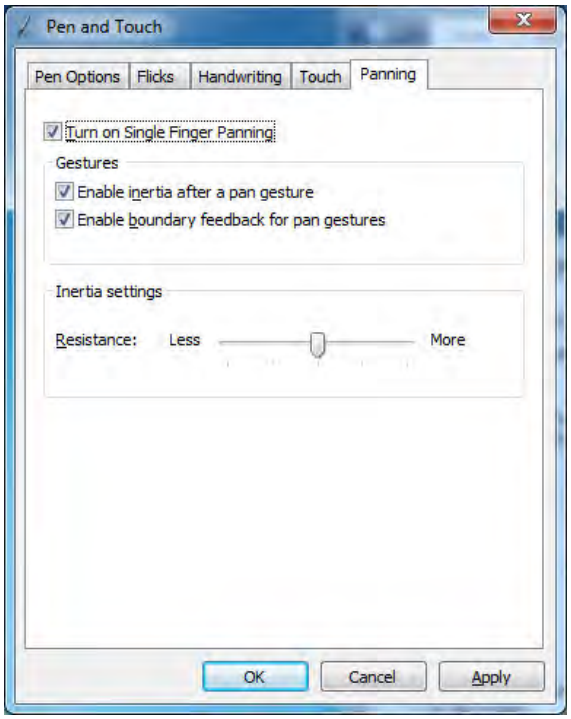


The other four option tabs are shown below for reference. They are self-explanatory in most case and additional information can be obtained through the Windows help function.



## Optional Multi-Touch Projected Capacitive Touch Driver

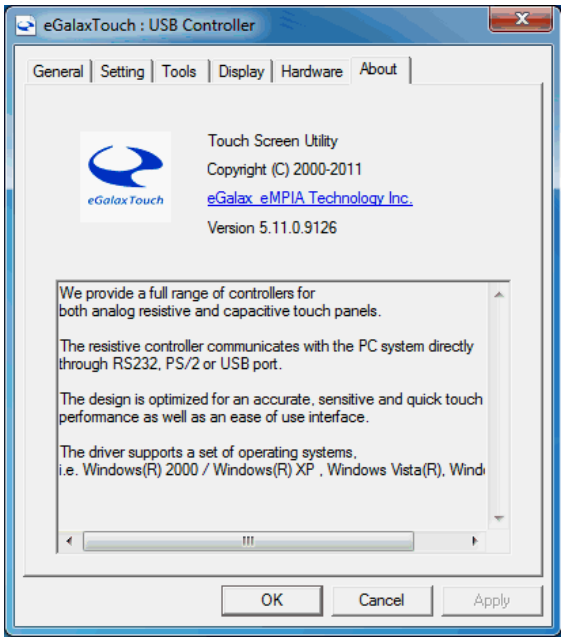
In addition to the Windows built in standard touch driver J2 also supplies and optional touch driver that is used when multi-monitor touch support is needed. This driver works with Windows XP and later version of Windows. The driver can be downloading from J2 web site.

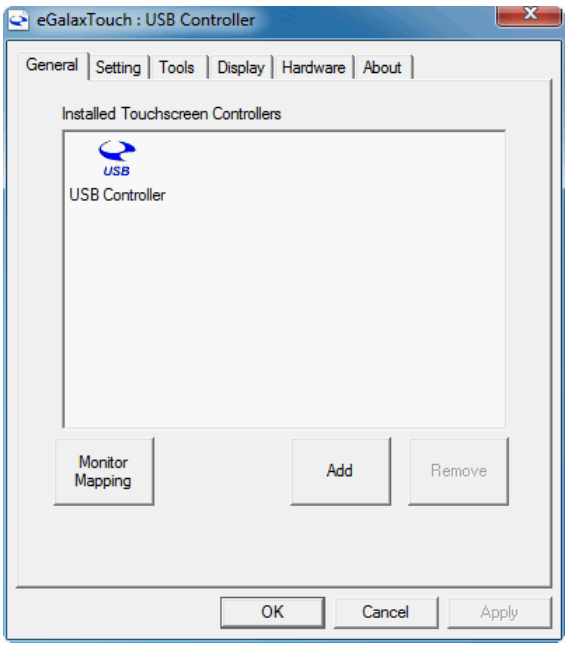
To install just extract the zip file where you wish to run it from and run setup. When asked to install PS/2 or RS-232 driver answer no, the PCT controller is a USB device. When the install is complete it will ask if you wish to do a 4 point calibration, answer no to this as the PCT screen does not need calibration. The touch will now be working.

The PCT touch configuration utility can be found in programs under eGalax Touch, Configuration Utility. This program allows for the configuration of the touch screen option.

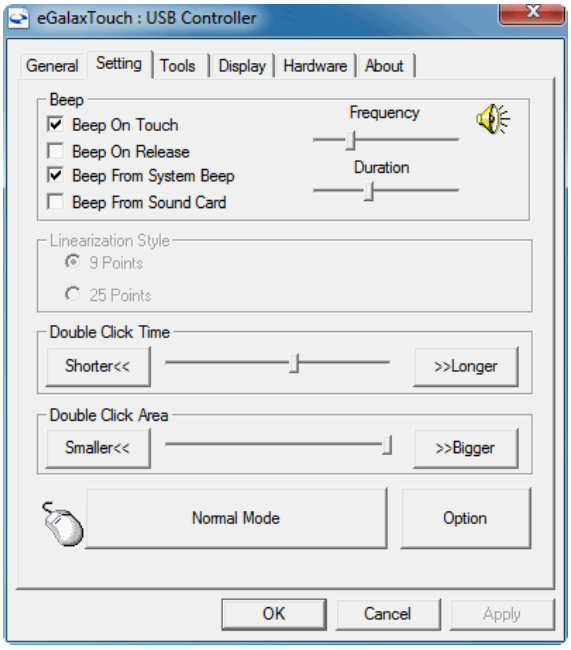
The "About" tab shows the current version of the touch screen plus has a link to the touch controller company's web site where the latest version of the driver can be found. A copy of the current version can also be found on J2's web page support page for the 680.

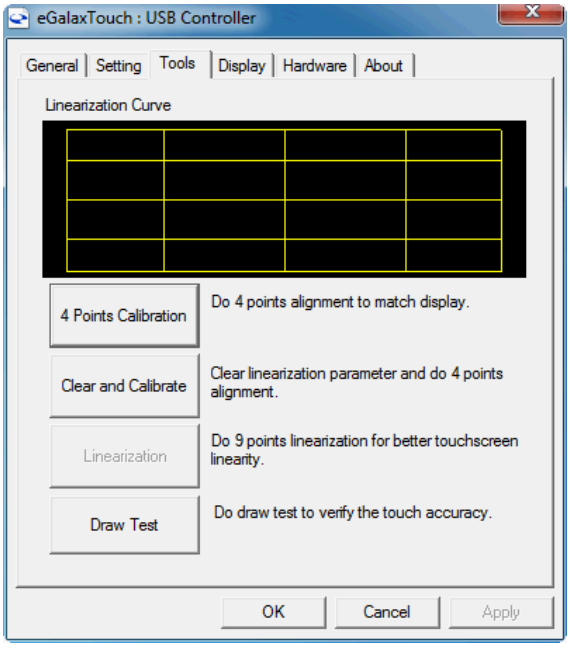
The "General" tab has the utility to set the monitor map when using multiple touch monitors.



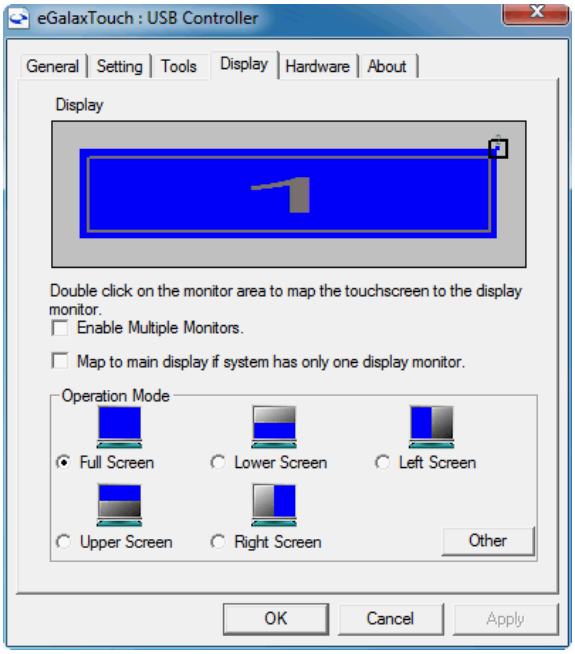



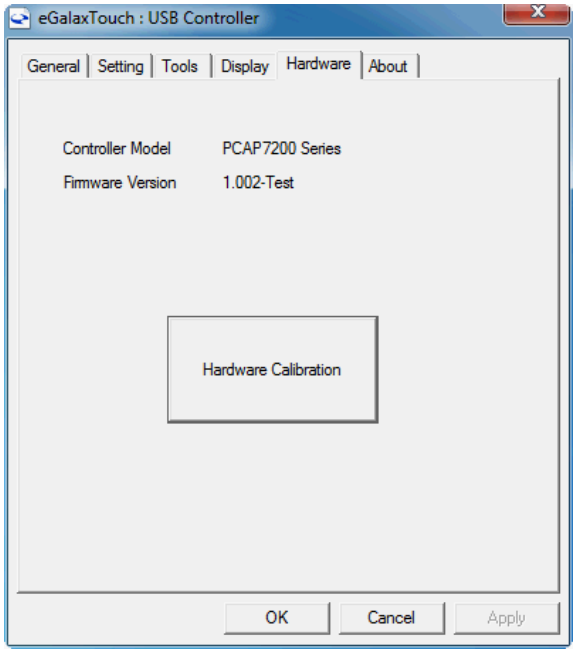
The “Settings” tab controls the touch on beep, double click function and right mouse button emulation. The “Tools” tab allows for a calibration which is not normally needed for a PCT screen. A draw test is provided to verily the operation and calibration of the touch screen.




The “Display” tab controls how multiple touch monitors are used if required. The Hardware tab display the current controller firmware version and a “Hardware Calibration” function that will reset the screen calibration back to factory values.



## OPOS drivers

The OPOS driver for the 680 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/680/.
Just run the OPOS setup.exe file to install.

# J2 Health

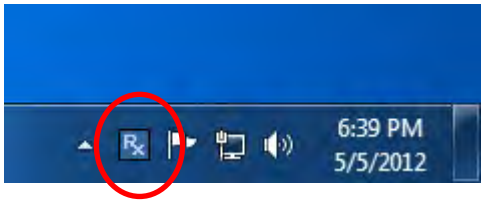
J2 has a standard program that works with all its POS products, called J2 Health. This program is used in either a standalone mode or in conjunction with J2 remote monitor/asset tracking software. The J2 Health program monitors different aspects of the POS hardware to ensure the hardware is running within specification. For the J2 680 it monitors critical system voltages, as well as system and CPU temperatures.

## Installation

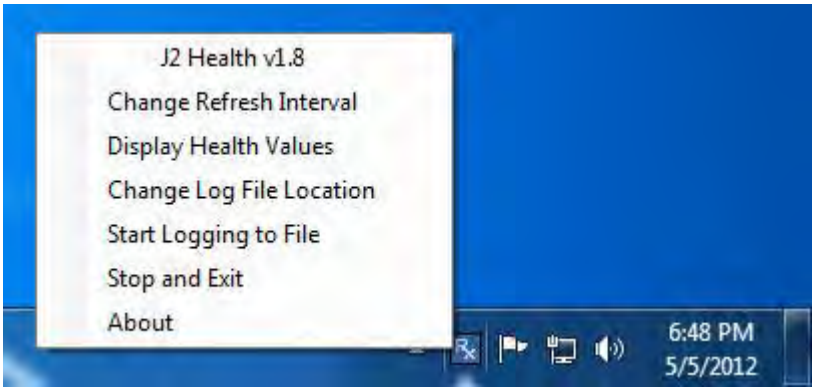
The utility can be downloaded from the J2 web site:
http://support.j2rs.com/Utilities/Health/ To install just unzip anywhere and run setup. Like other J2 utilities it can be uninstalled through the Windows control panel.

## Tray Icon

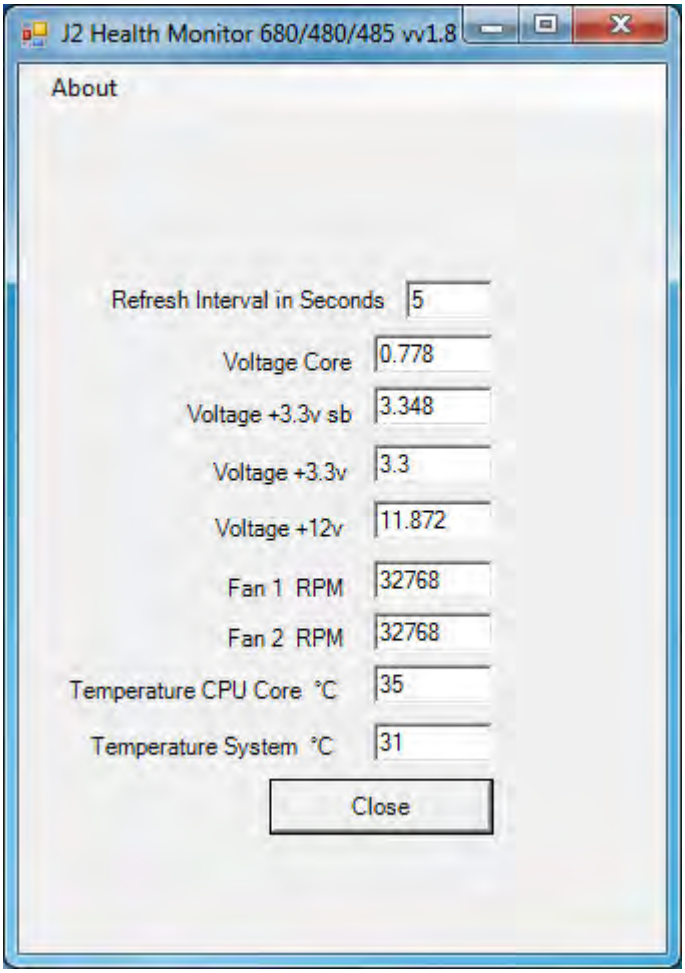
Once installed and the system has rebooted, J2 Health will be running in the background. The J2 health icon will appear in the task bar tray:




Right-clicking on this icon displays different Health options, *shown below*:




The current health values will display by clicking on “Display Health Values”.
*A sample screen is shown below:*




As can be seen above, when running on the J2 680 the J2 Health program displays critical system voltages and system and CPU Core temperatures. For other J2 POS systems, J2 Health may display more or less information. An example would be the J2 680 unit, which in addition to the above information would also display the fan speed of the two J2 680 fans.

## Logging to File

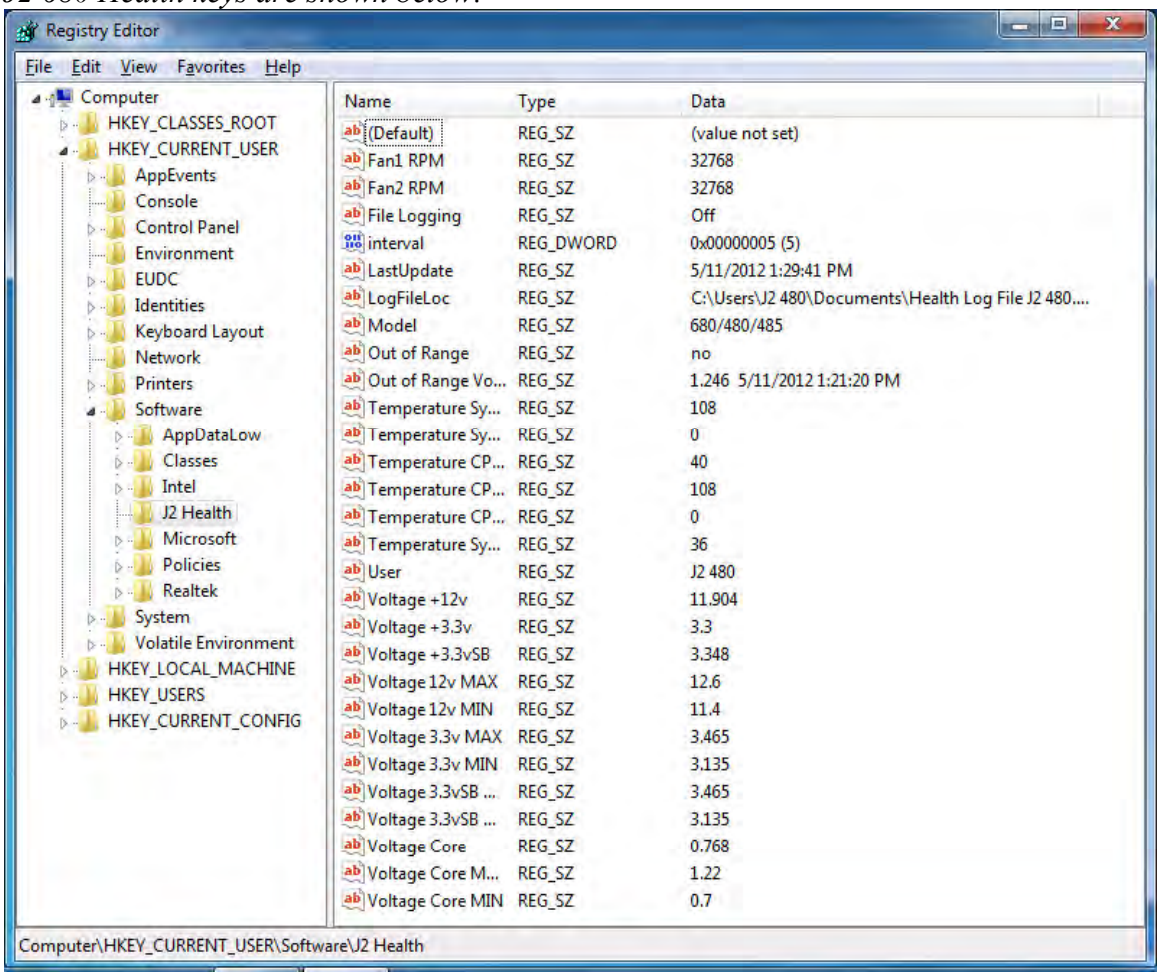
The J2 Health program can log the health data to a file in the csv text format for importing to other programs, like Excel. This can be handy for finding “time of day” related problems.

When logging is enabled, the tray icon Rx symbol will change to red to indicate logging in is taking place.

## Registry Entries

The J2 Health program creates registry entries for the different health values. Dynamic values are updated at the user defined interval, which is by default 5 seconds. Other software may use these registry entries to access the J2 health information.

*J2 680 Health keys are shown below:*




## J2 Remote Monitoring Software

J2 now offers a full remote monitoring and asset tracking solution that works in conjunction with J2 Health to ensure the highest uptime possible of your POS hardware. Please contact J2 sales for more information on this fully customizable, remote monitor solution.

For more information, please visit us at
http://www.j2retailsystems.com/newsarticle.php?news_id=57

# SMI BIOS Info Utility

The J2 SMI BIOS Info program allows for the reading of all populated BIOS DMI/SMI information. With some J2 products including the J2 680, this information also includes dynamic system health information. Normally this dynamic DMI health information BIOS is only supported on very high end servers. Now J2 brings this feature to POS hardware.

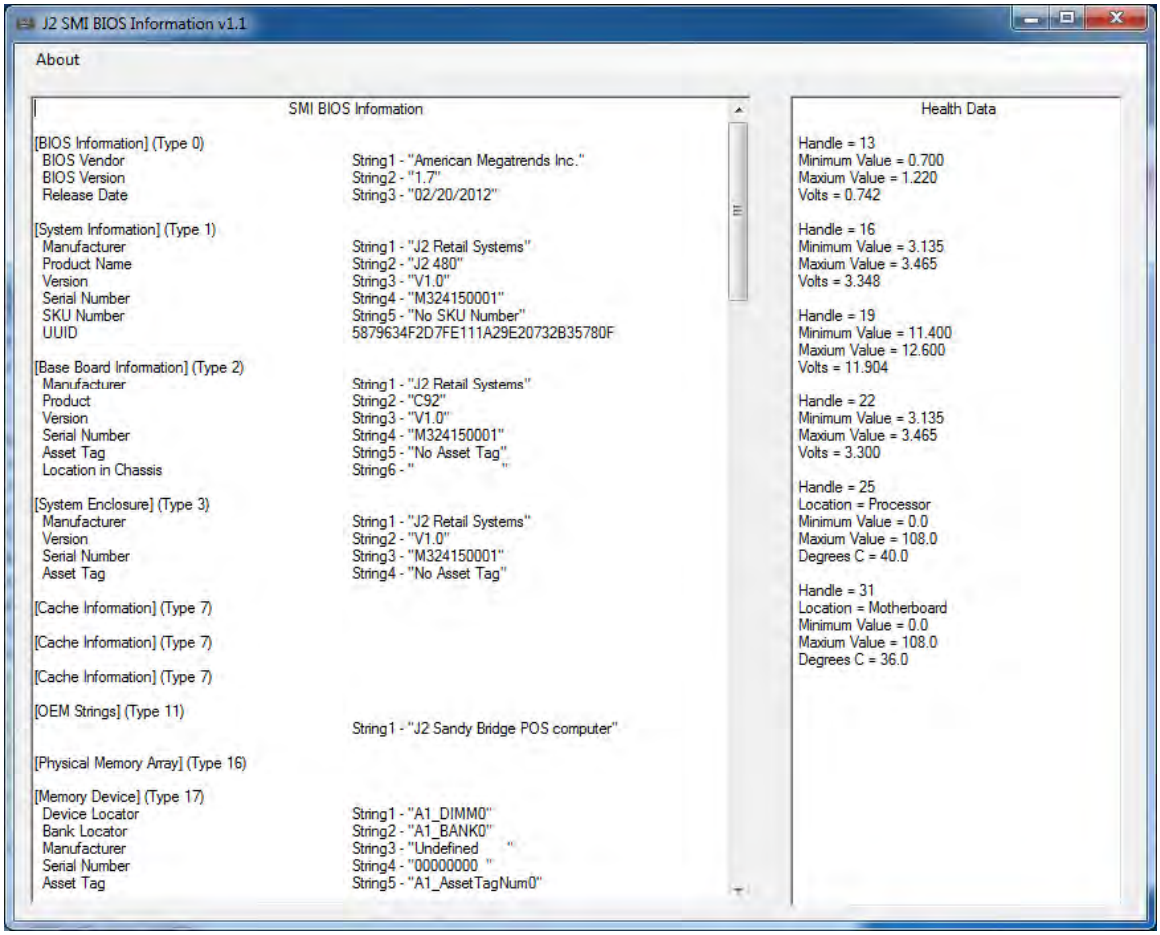
The J2 SMI BIOS Info program will run on any J2 POS hardware or for that fact on any PC hardware. It can display all DMI/SMI information on a formatted form.

## Installation

The utility can be downloaded from the J2 web site: http://support.j2rs.com/Utilities/
To install just unzip anywhere and run as you wish to run the utility form.

## Operations

Just click on the .exe file to run. The following screen will be displayed *(see below)*. Note that the health data will only display on newer J2 systems that support the dynamic DMI health BIOS.



# Cash Drawer Test Utility

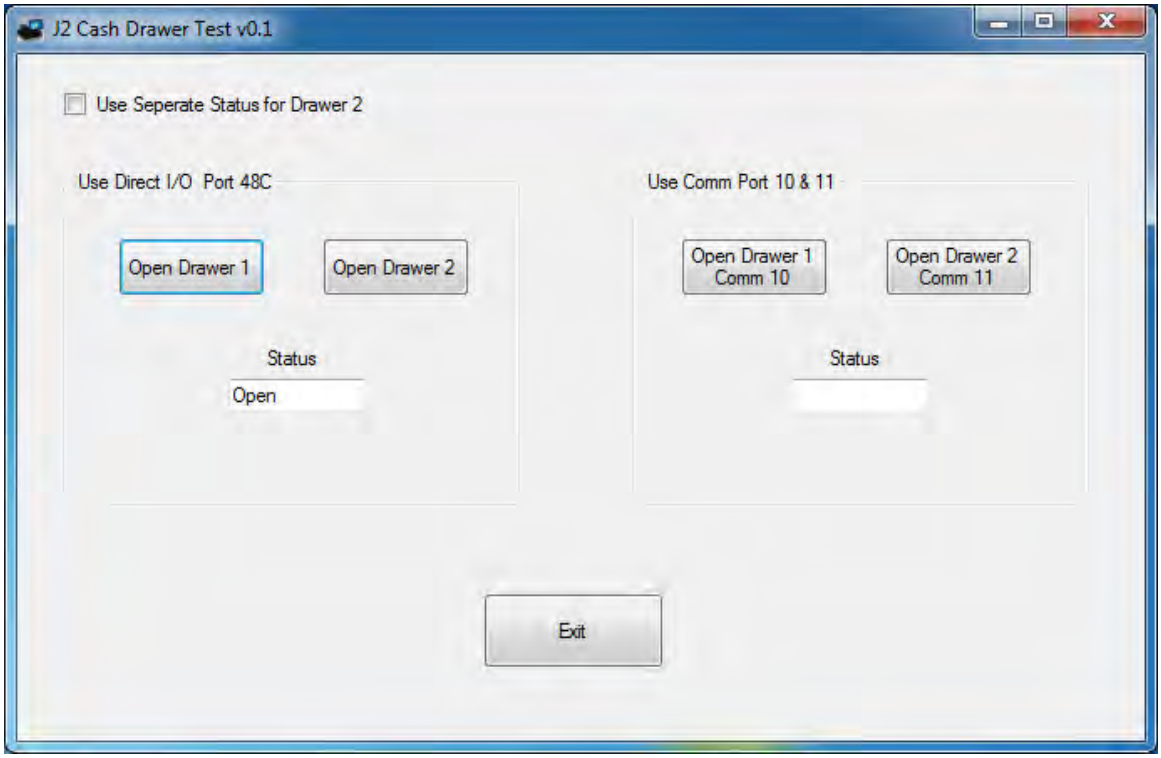
J2 has a generic cash drawer test utility that works on all J2 products, including the new J2 680 computer.

## Installation

The utility can be downloaded from the J2 web site: http://support.j2rs.com/Utilities/
To install just unzip anywhere and run as you wish to download the utility form.

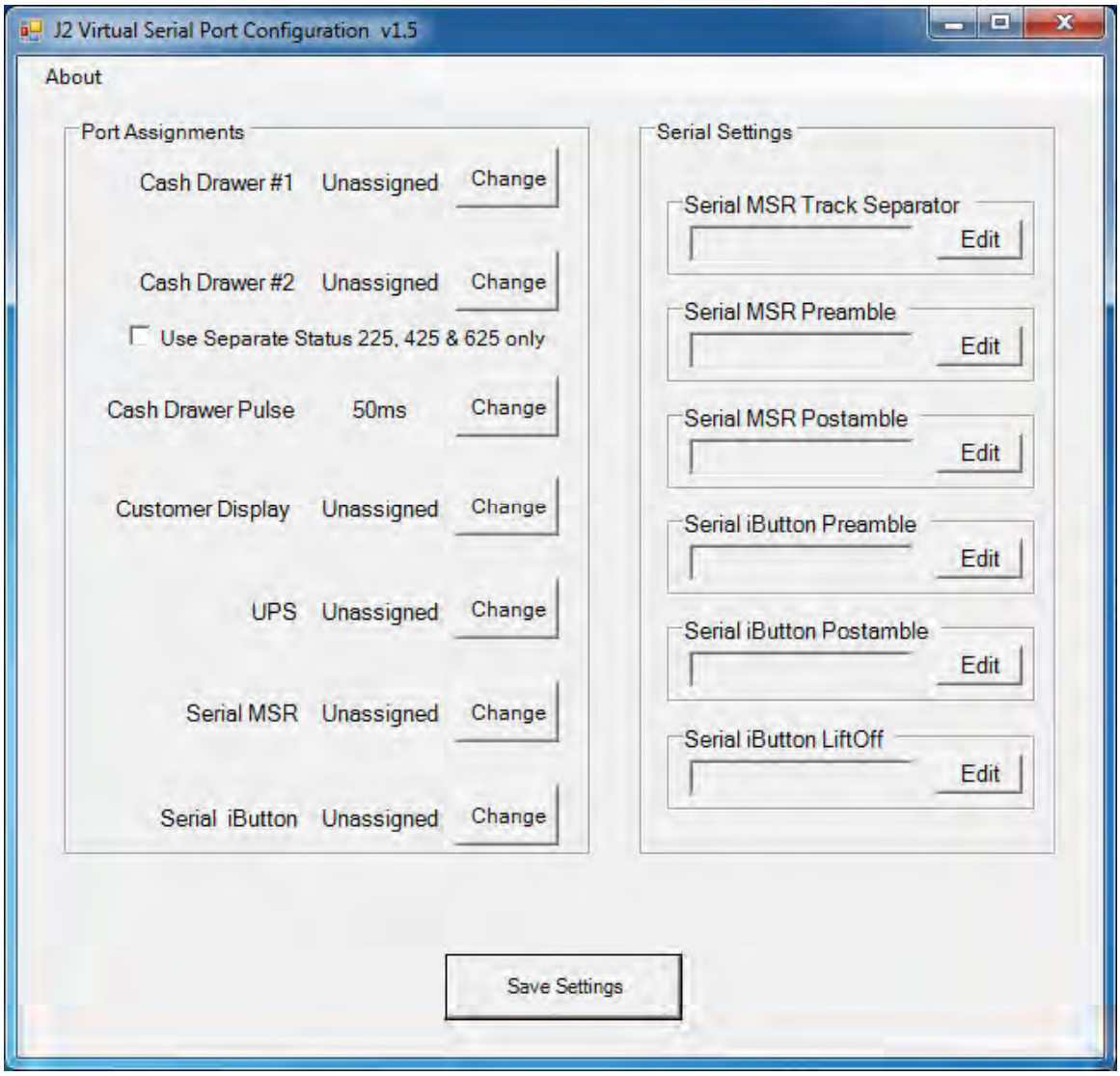
## Operation

Just run the cash drawer test from whatever folder it was installed into. Use the "Use Direct I/O Port 48c" setting to test the cash drawer(s). *(see example below)*




The "Use Comm Port 10 & 11" option is to test the cash drawer you set up using the J2 virtual serial ports program. The virtual serial port program must be installed with the cash drawer virtual serial ports set to Comm 10 & 11.

# J2 Virtual Serial Ports Drivers




Virtual serial ports can be used for the cash drawers, virtual 2x20 line display on the optional 10.1 LCD, Smart UPS, MSR and iButton.

To open virtual serial cash drawer send a bell character to the Com port it is assigned too. (The bell character is the ASCII 07 hex character “Control G.”) The open/close status of the drawer may be obtained by reading the status bits of its COM port. 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 a hardware serial cash drawer and will work with drivers for serial cash drawers.

# RAID

## RAID Overview

The 680 uses the Intel Matrix Storage Technology to allow the two internal 2.5 inch hard drives to be configured as a RAID array. The 680 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 680 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 680 only.

Link: http://www.j2retailsystems.com/support/680/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/680/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 680 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.

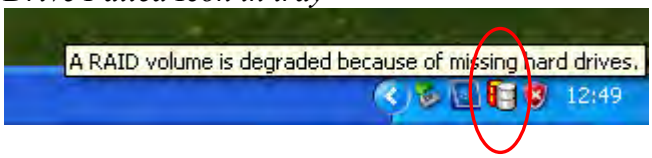
## Installing the Intel Matrix Storage Manager Software

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.

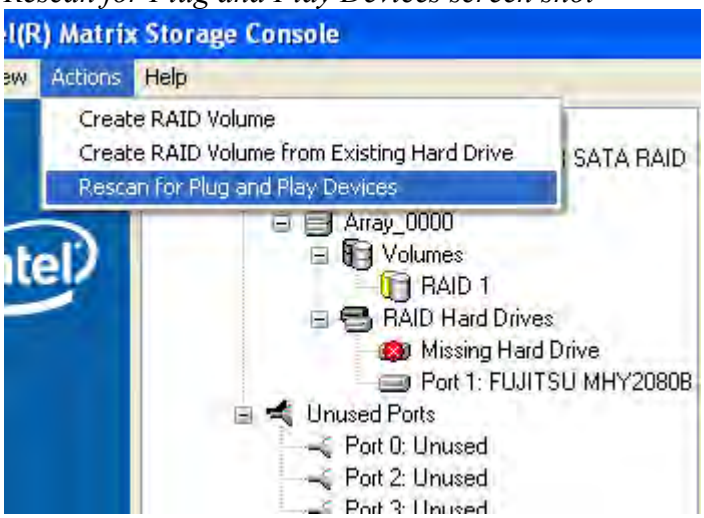
*Drive Failed Icon in tray*



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 680. 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*

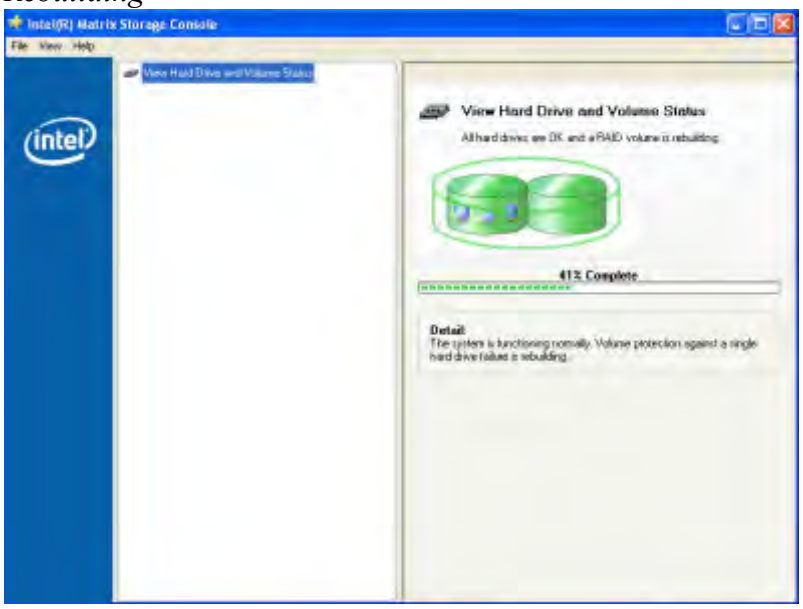



This will cause the drive to be detected by the driver.

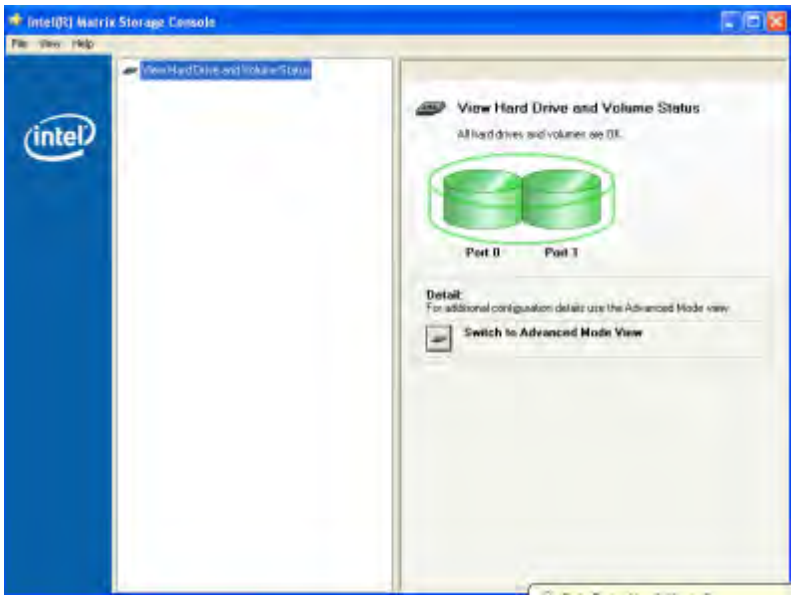
*Drive detected*

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 680 RAID function. (*Available September 2008*)

# Packing List

In addition to the foam packing inserts, the following contents should be found in the 680 shipping carton.

## Standard Items

1: System with Power Supply and AC cord

2: Cable Well Cover

3: Printer Power Port Cable

: COM Port Colored Coded Cable Labels

# 680 Optional Peripherals

## MSR

### Overview

The 680 can be ordered with a 3 track MSR. This MSR is the same as used on the J2 580/615/625/630 POS systems. The MSR mounts on the right side of the 680 and uses a front facing MSR slot. This allows the 680 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 configuration utility can be down loaded from J2 web site.

*680 with front swipe MSR*

## Installing the 680 MSR

The 680 MSR is installed by first removing the two rubber plugs for the option attachment point as shown below.

*Remove Rubber plugs*

Then remove the MSR cover plate on the right back side of the unit by removing the two screws, as shown.

*Remove MSR cover plate*

Connect the cable together as shown add secure the static ground wire with screw provided as shown.

*Attach cables*

Attach the MSR using the two screws at the locations shown below.

*Mounting MSR*

You may now power up the 680 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.

# Customer Display

## Overview

A 2 line by 20 character VFD customer side display is available optional for the J2 680. This customer display is the same as used on the J2 580/615/625/630 POS systems.

# Secondary Video Display

The J2 680 has the same options as available on the J2 580/615/625/630 POS systems. Secondary display of 10 inch, 12 inch 4:3 and 10.1 inch 16:9 displays are available.

## Fingerprint Reader / MSR

This option is the same as available on the J2 580/615/625/630 POS systems. This reader uses the Digital Personal module.

## iButton / MSR

This option is the same as available on the J2 580/615/625/630 POS systems.

## 680 UPS

Available Q2 2012

## RFID

Available Q2 2012

## Wall Mount Bracket

This option is the same as available on the J2 580/615/625/630 POS systems.
This bracket can be uses when not using a VESA mount.

## Pole Mount Options

The J2 680 has the same options as available on the J2 580/615/625/630 POS systems.

## European Office

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J2 House
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Warrington WA3 6RP
United Kingdom

44 (0) 1925 817003 Phone
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J2 Retail Systems Inc.
9251 Irvine Boulevard
Irvine
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(714) 669-3111 Phone
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## Australian Office

J2 Retail Systems Pty Ltd
Unit 6 83/85 Boundary Road
Mortdale NSW 2223
Australia

02 9584 5222 Phone
02 9584 1500 Fax

## Web site

http://www.j2retailsystems.com

**FCC Statement**

**This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.**

**This device complies with FCC radiation exposure limits set forth for an uncontrolled environment.**
**This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:**
**(1) this device may not cause harmful interference, and**
**(2) this device must accept any interference received, including interference that may cause undesired operation.**

**Caution!**
**Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.**