J2 485 Retail Point of Sale Computer

System Manual

Change history

Release May 19, 2012

Contents

Overview

The J2 485 is the high end exciting product offering of the new Retail Point of Sale computers. Built on the same features and capabilities of the J2 480, the powerful J2 485 offers additional storage and expansion options. The J2 485 uses the same system board as the J2 480, and has additional features, such as: built in power supply, DVD support, PCI-E or PCI expansion slot, and room for up to four HDD drives.

The J2 485 comes standard with an Intel 2.4GHz Dual Core Sandy Bridge processor, however it can also be ordered with a number of other processors, including the very high end Intel i7 3.4GHz Quad Core processor. The J2 485 system board uses the Intel LGA1155 socket and supports a wide range of dual and quad core processors.

Using the Intel Sandy Bridge processor with the Q67 chipset, the J2 485 uses the latest in the ultimate desktop solutions, providing very high performance with a very low carbon foot print. The Sandy bridge chipset is designed only to draw as much power as needed for any given operation, thereby greatly reducing the average power consumption for this superb level of performance.

Designed for easy machine maintenance and upgradeability, the following is a list of important J2 485 features:

1. Upgrades to the memory modules can be easily done without tools.
2. A complete motherboard upgrade can be carried out in less than 30 seconds.
3. The four quick change SATA hard disk drives are easily accessible, housed in slide-in drive bays that allow the drives to be hot swappable.
4. The footprint of the J2 485 is particularly compact, making it ideal for the space-conscious retailer.

The J2 485 supports the standard Microsoft operating systems: Windows 7, POSReady 7, Windows 7 Embedded, XP, POSReady 2009 and XP embedded. The 485 is equally proficient with the many flavors of Linux.

Specification

Main board	
CPU Support	Intel Sandy Bridge Desktop Processors, socket LGA1155 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
Storage	
HDD/SSD	Up to four 2.5 inch SATA 3.0 drives support for HDD or SDD RAID 0,1,5,10, Quick Change-hot swap 160GB HDD or 16GB SSD standard, other sizes available or optionally one 3.5 inch SATA HDD
DVD	SATA DVD/CD Optical driver R/W
External I/O Ports	
USB	12 total 2.0: 11 external, 1 internal;7 are Powered USB
Serial	Five DB9 RS-232 with power option
Powered USB	2 +12V Powered USB and 1 +24V Powered USB
LAN	10 /100/ 1000 Intel 82579LM Controller
PS/2	One Keyboard
Video out	One VGA port and One Display Port Display Port supports HDMI and DVI displays
Cash Drawer	2 x RJ 11 24V with status
Power In	19VDC 9.47 amps
Power Out	+24V Printer Power Port, +12V peripheral power
Audio Jack	One headset, one microphone-in
LEDs	Front bezel: green light on/ amber color for standby Blue LES for HDD/SSD activity
Expansion	One PCU-E or PCI expansion slot
Power	
Power Supply	Internal 180W, 100-240 VAC,50~60Hz, 2.5A
Optional Peripherals	
Touch screen monitor	Various options, please contact J2 for details
UPS	Internal DC UPS, 1-1.5 hours run time, Power Supply External

Environment	
EMC & Safety	FCC, Class A, CE, LVD
Operating Temperature	0 ~ 50c
Storage Temperature	-20 ~ 55℃
Operating Humidity	20% ~ 80% RH non-condensing
Storage Humidity	20% ~ 85% RH non-condensing
Dimensions (W x D x H)	38.5 x 28.0 x 11.5cm
Weight Unit	6.8 kg
Weight Shipping	9 kg
Shipping Box (W x D x H)	50 x 44 x 23cm
OS Support	Windows 7, POSReady 7, Windows 7 Embedded, XP, POSReady 2009, XP Embedded, version of Linux

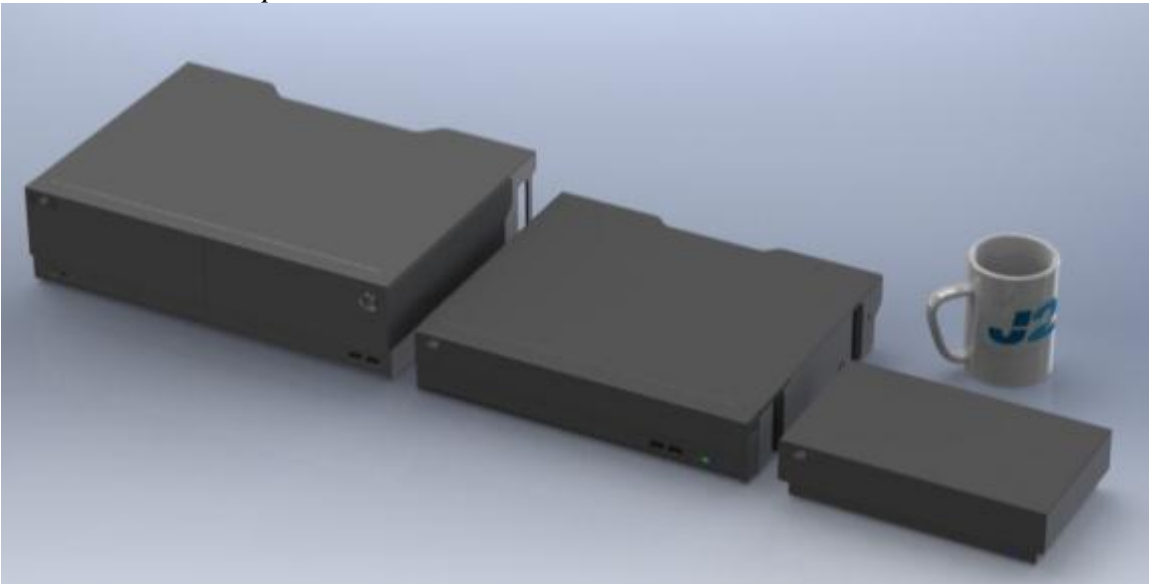** This specification is subject to change without prior notice.*

Front Panel J2 485

Rear Panel J2 485

J2 Retails POS Computers, the J2 485/480/425

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 485 supports a very wide range of processors. By taking advantage of J2's vast experience with notebook, desktop, and POS computer designs, we have combined the 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 circuitry, allowing for reduced heat generation and minimal power usage. Additionally, the J2 485 takes full advantage of the low power features built into the Intel processor and chipset to further reduce heat.

Hot Swappable RAID / Quad Hard Drives

Like the J2 650, the first integrated POS system on the market to offer a hot swappable RAID feature, the J2 485 also supports this feature. The four internal 2.5 inch SATA hard drives can be configured as a RAID array which gives true fault tolerance to the hard drive subsystem.

DVD/CD Optical Drive

The J2 485 supports standard one DVD/CD optical drive with read/write capability.

Powered USB Ports / Power Port

Addressing the need for additional power ports, the J2 485 supports six +12V and one +24V Powered USB port. The J2 485 can take advantage as well of the growing availability of Powered USB products on the market.

In addition to the three Powered USB ports, the J2 485 also supports five powered serial ports, VGA +12V power, a +24V printer power port, and four standard 2.0 USB ports.

By using a combination of all these powered ports, most all additional external power supplies for devices such as monitors, scales, "Chip and Pin" devices, scanners, and many others can be eliminated. This greatly saves space and reduces cost, cables and power consumption and in most installations this means that only one AC power point is needed. In addition, with the J2 optional UPS, all these devices will stay powered during a power outage.

UPS

Not your ordinary UPS, the J2 485 UPS is a DC, not an AC UPS. The UPS replaces the internal power supply. Unlike an AC UPS the J2 UPS makes the 485 work more like a notebook computer. In addition to running the J2 485 for up to one hour, the UPS will run all the POS peripherals attached to the 485, 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 J2 485 is turned off the printer is turned off also. This is very useful when the auto power on/off feature of the 485 is used. This also applies to the +24V Powered USB port.

Cooling System

Great attention was paid to the thermal solution of the J2 485; it is truly a unique feature. The 485 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 up to as high as 95 watts and the J2 485 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 J2 485 fans are the type used in Blade Servers and have a speed range from 3500~10,000 rpms running at very high torque.

Fan-Off Mode

When using the i5 or lower performance processors, the J2 485 can run in a fan-off configuration. In this mode the 485 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 485's "Fan-Off" mode, the power is also greatly reduced by the nature of the processor used, thereby reducing power consumption and further reducing the unit carbon footprint.

Versatility

The word versatility is the perfect choice word to describe the unique combination of desirable features designed in to the powerful new J2 485 retail unit. The 485 is not just one product, but a full product range contained all in one system. From fan-less thin client to Quad Core RAID Server - the robust J2 485 does it all, with great reliability.

System

Configurations

The J2 485 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 485 system. For many users the standard G530 2.4GHz dual core processor and 2GB of memory is perfect, as this is already more powerful than most all POS systems; however some applications may require more horse power. In this case the J2 485 could be configured with a quad core i5 or i7 processor.

J2 will be happy to help you determine what you require from the J2 485 to have the best performance for your customer needs. For example, more memory may be added, or sometimes a quad core processor and dual HDD with RAID can all be included. The J2 485 can do it all, low end to high end, and at a very reasonable and cost effective price.

Processor Support

The J2 485 supports a very wide range of Intel processor; 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, these are all supported by the 485.

The J2 485 comes standard with the Intel dual core 2.4GHz G530 processor, though it can also be ordered with a different processor type if desired. The processor can be easily upgraded by a qualified technician. The J2 485 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, back view, cover off

Processors currently supported on the 485

Processor #	Intel's Family name	Clock Speed	Max Turbo Frequency	# of Cores	# of Threads	Cache	Embedded	Fan-off mode	Graphics Speed MHz	VPro	Max TDP
G530T	Celeron	2.0 GHz	Na	2	2	2MB	No	Yes	650/1000	No	35 W
G530	Celeron	2.4 GHz	Na	2	2	2 MB	No	No	850/1000	No	65 W
G540	Celeron	2.5 GHz	Na	2	2	2 MB	Yes	No	850/1000	No	65 W
G620T	Pentium	2.2 GHz	Na	2	2	3 MB	7 Year	Yes	650/1100	No	35 W
G620	Pentium	2.6 GHz	Na	2	2	3 MB	No	No	850/1100	No	65 W
G630	Pentium	2.7 GHz	Na	2	2	3 MB	No	No	850/1100	No	65 W
G630T	Pentium	2.3 GHz	Na	2	2	3 MB	No	Yes	650/1100	No	35 W
G840	Pentium	2.8 GHz	Na	2	2	3 MB	No	No	850/1100	No	65 W
G850	Pentium	2.9 GHz	Na	2	2	3 MB	Yes	No	850/1100	No	65 W
G860	Pentium	3.0 GHz	Na	2	2	3 MB	No	No	850/1100	No	65 W
i3-2100	i3	3.1 GHz	Na	2	4	3 MB	No	No	850/1100	No	65 W
i3-2100T	i3	2.5 GHz	Na	2	4	3 MB	7 Year	Yes	650/1100	No	35 W
i3-2120	i3	3.3 GHz	Na	2	4	3 MB	Yes	No	850/1100	No	65 W
i3-2120T	i3	2.6 GHz	Na	2	4	3 MB	No	Yes	650/1100	No	35 W
i3-2125	i3	3.3 GHz	Na	2	4	3 MB	No	No	850/1100	No	65 W
i3-2130	i3	3.4 GHz	Na	2	4	3 MB	No	No	850/1100	No	65 W
i5-2390T	i5	2.7 GHz	3.5 GHz	2	2	3 MB	7 Year	Yes	650/1100	Yes	35 W
i5-2300	i5	2.8 GHz	3.1 GHz	4	4	6 MB	No	No	850/1100	No	95 W
i5-2310	i5	2.9 GHz	3.1 GHz	4	4	6 MB	No	No	850/1100	No	95 W
i5-2320	i5	3.0 GHz	3.1 GHz	4	4	6 MB	No	No	850/1100	No	95 W
i5-2400	i5	3.1 GHz	3.4 GHz	4	4	6 MB	Yes	No	850/1100	Yes	95 W
i5-2400S	i5	2.5 GHz	3.3 GHz	4	4	6 MB	No	No	850/1100	Yes	65 W
i5-2500	i5	3.3 GHz	3.7 GHz	4	4	6 MB	No	No	850/1100	Yes	95 W
i5-2500S	i5	2.7 GHz	3.7 GHz	4	4	6 MB	No	No	850/1100	Yes	65 W
i5-2500T	i5	2.3 GHz	3.3 GHz	4	4	6 MB	No	Yes	650/1250	Yes	45 W
i7-2600	i7	3.4 GHz	3.8 GHz	4	8	8 MB	Yes	No	850/1350	Yes	95 W
i7-2600S	i7	2.8 GHz	3.8 GHz	4	8	8 MB	No	No	850/1350	Yes	65 W

1: Processors with green shading would be standard J2 485 products.

2: Processors with blue shading are available but may require a minimum order quantity.

3: All processors shown above should work on the J2 485 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 at the back of the unit. The case extends over the cables to protect them when the computer is located against a wall. Cutouts in the case allow for routing of the cables in any direction.

I/O Panel

Off / On Buttons

The J2 485 has two power buttons, one in the front of the unit and one in the back of the unit. The front panel Off / On switch is slightly recessed to prevent accidental powering off. The function of the button can be controlled by the OS. If the 485 hangs for some reason it can always be powered off by holding the Off / On button in for six seconds.

The J2 485 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 Locations:

Front Panel LEDs

There are two front panel LED indicators, one green/amber LED and one blue LED. The blue LED is active when either the HDD/SSD are being accessed. The green/amber LED displays green when the unit is powered up, and shows amber when the unit is powered down, and AC power applied indicates either stand-by or sleep mode.

Hard Disks

Up to four 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 3.0GB/s and supports AHCI and Hot Swapping of hard drives.

Two of the four drive locations can be accessed from the front of the unit. With the front panel key in the unlocked position the drive access door can be opened and easily accessed with no tools. Just use the pull tab to slide the drives in and out

The other two drives can easily be accessed by removing the top cover of the unit. The cover can be removed without tools, *as shown later in this manual*. Once the cover is removed from the HDD/SSD, the locking tab is moved to the vertical position, please see *below:*

A carrying tray (four of which are supplied with the J2 485) fits onto a new drive without tools. The drive can easily be slid into the drive bay by using the plastic pull tab. In a RAID 1 configuration, a drive can be hot swapped, removed, or inserted with the power on *(see section on RAID setup)*.

System Board

POS computers typically have a desired lifespan of 10 years or longer, therefore product quality and endurance is of utmost importance. J2 485 electronics are built with high-end components to ensure outstanding reliability and long lasting product performance.

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

System board
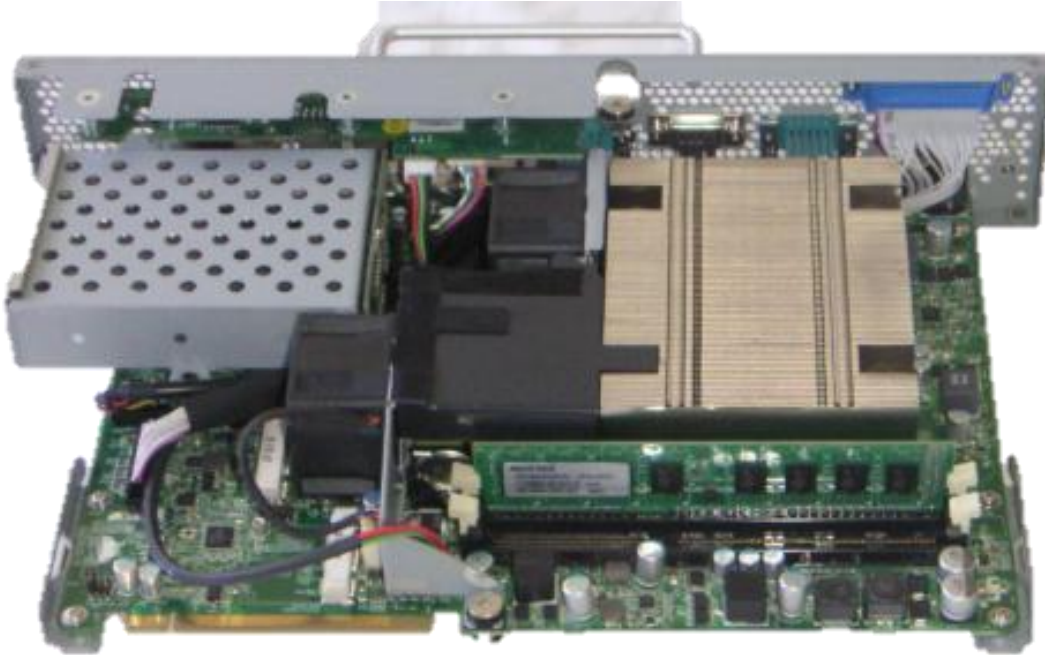
Video Ports

A standard PC VGA video port is supported on the J2 485 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 J2 485 through this connector.

The J2 485 also supports the newer digital video standard Display Port connector. This connector supports a Display Port monitor or a HDMI display or DVI monitor. When used with HMDI or DVI displays, a passive adaptor cable is used. When used with a HDMI display, Audio is supported 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 485 to 2560 x 2048 are supported.

Both ports can be used at the same time and either display can be configured as the primary display.

VGA and DisplayPort Video Ports (see below):
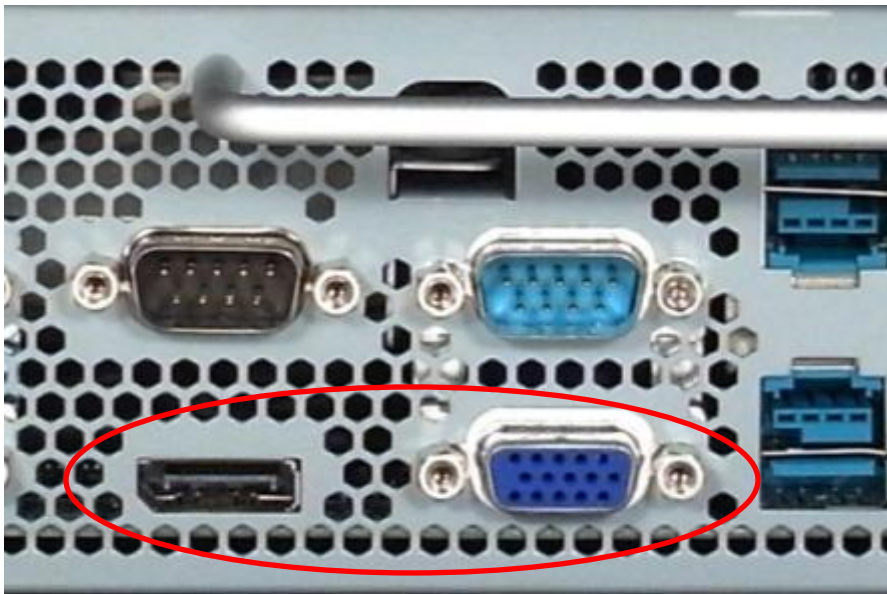
Serial ports

The J2 485 has five external RS232 serial ports, all of which can be powered. The serial ports are standard RS-232 ports with a DB9 male connector. I in a normal configuration, serial ports are mapped to COM 1-5.

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

COM ports 1-5 can supply power to an external device when required, like the optional J2 Customer Display. COM 1 can supply +5 volt and COM 2-5 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 it is only there for some legacy devices. The problem is that it is easy for a +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
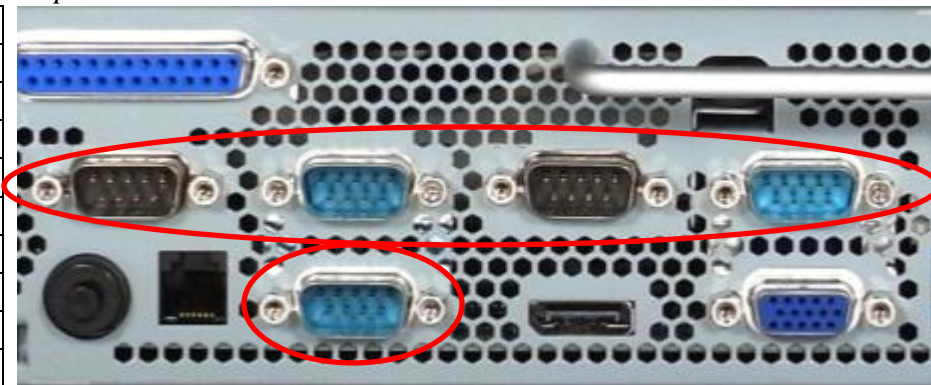
USB to +5V cable

USB Ports

The J2 485 has a total of eleven external and one internal USB 2.0 ports. Of the eleven external ports (*see below*) nine ports are located in the back of the unit and two are located on the front panel of the unit for easy access. The one internal USB port is designed for other optional internal devices. All the J2 485 USB ports can supply 1000ma of power, 500ma more than the norm for USB specification.

Powered USB Ports

Of the eleven external USB 2.0 ports, seven are Powered USB ports. Located in the back of the unit are six +12V PoweredUSB ports and one +24V PoweredUSB port. These ports conform to the Powered USB standard.

It should be noted that these seven 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
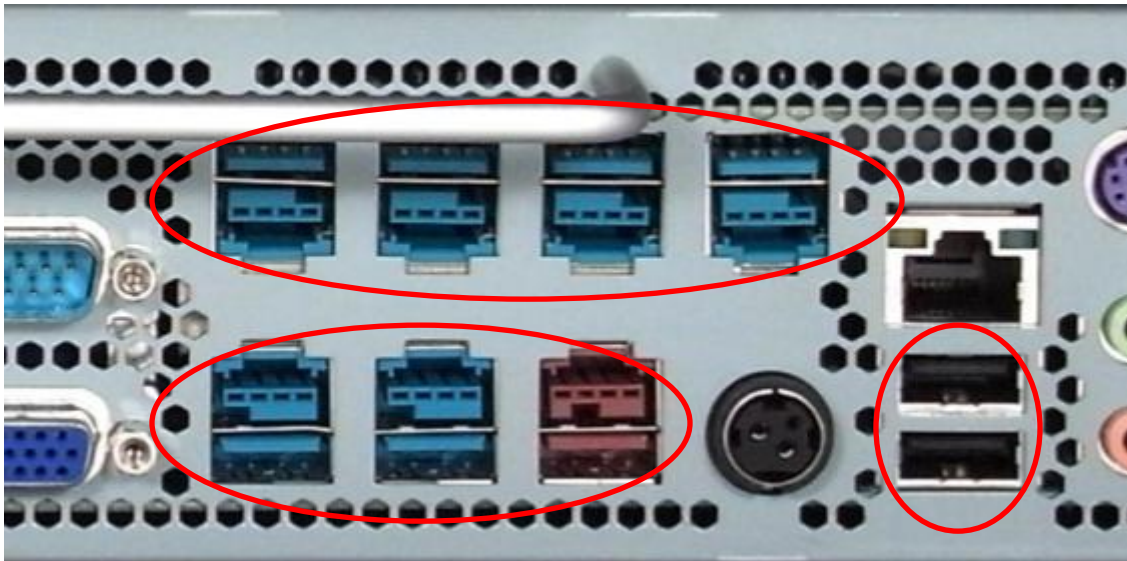
Front Panel USB Ports

Ethernet Connection

The J2 485 uses the Intel 82579LM Gigabit Ethernet controller. The Ethernet connector is located in the back of the unit (*shown below*). The Ethernet controller supports Wake on LAN, and the BIOS supports a PXE boot ROM. 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
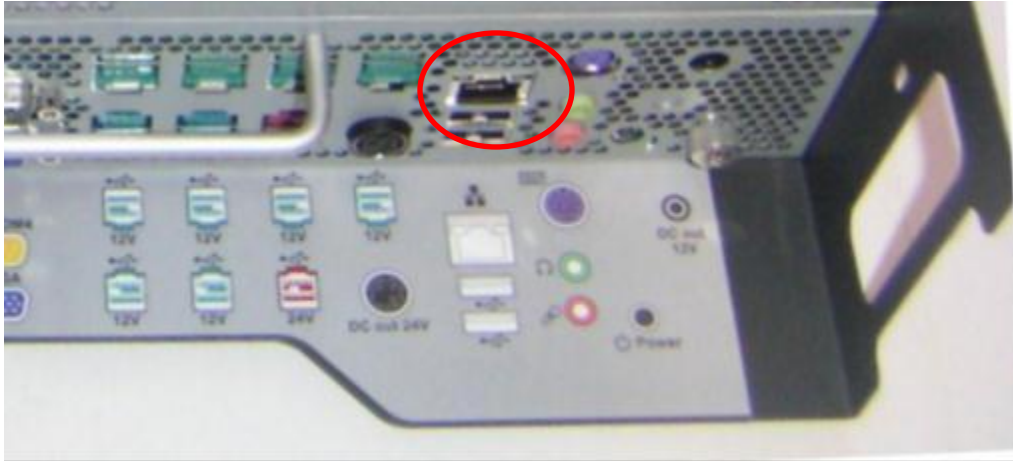
Audio

The J2 485 uses the VIA1708B HD audio controller and there is one internal speaker. Both a microphone jack and a headset jack are located in the back of the unit *(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
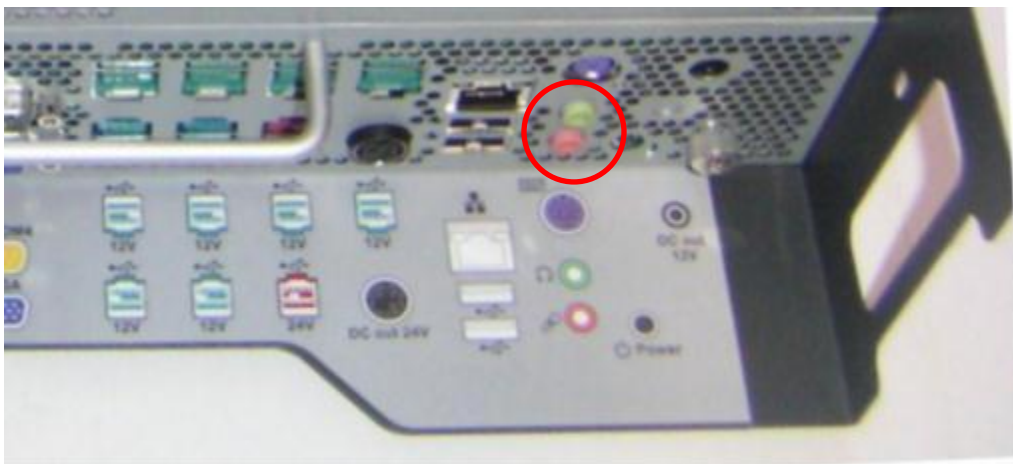
PS/2 Keyboard Port

The J2 485 supports one PS/2 port. This interfaces is commonly used for a hand laser scanner, but can also be used for any PS/2 Keyboard type device.

PS/2 Keyboard Port Location

Parallel Port

The J2 485 supports one parallel port. This is the standard PC type 8 bit port.
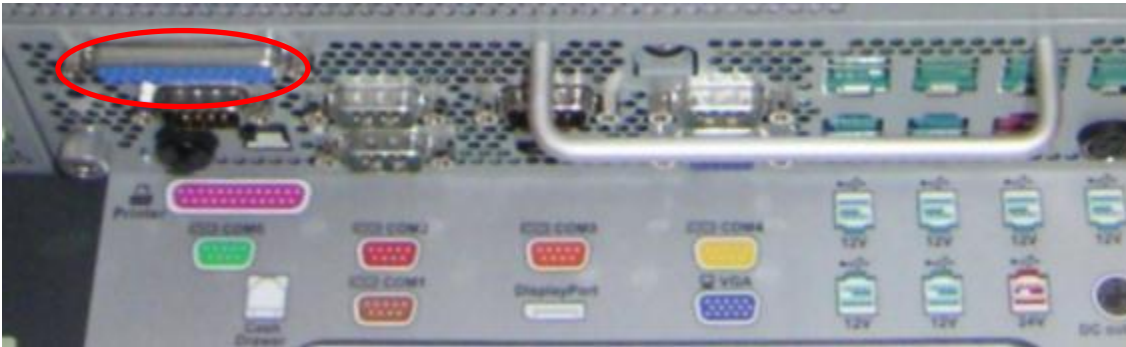
PCI-E Expansion Slot

The J2 485 supports one ¾ length PCI Express expansion slot. (Or alternatively it supports a PCI expansion with separate riser card.)
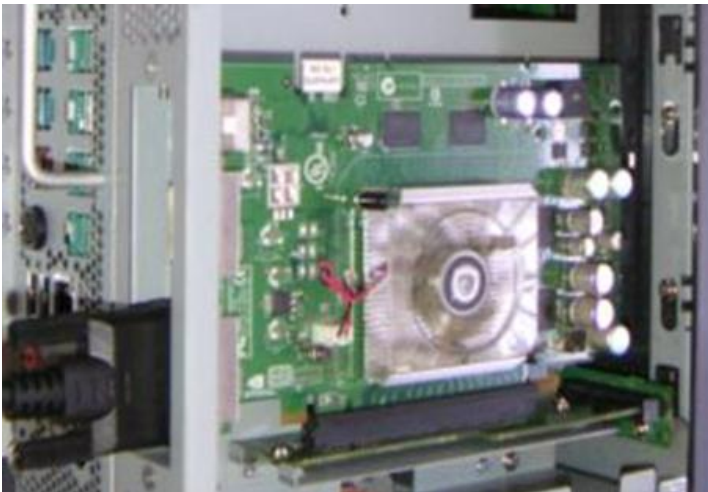
Printer Power Port

The Printer Power Port allows an industry standard POS printer to be powered from the J2 485, eliminating 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 J2 485 unit. The Printer Power Port will also supply power to a printer even when running with the optional UPS feature. When the J2 485 is powered down,the power to the printer is turned off. This same power circuit is used by the +24 Powered USB port and normally only one +24V device is supported at one time, unless it can be ensured that only one device prints at a time.
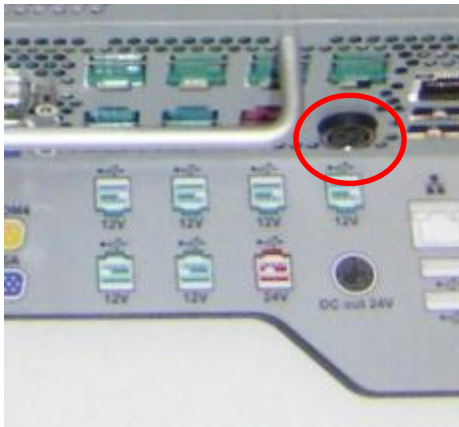
Printer Power Port   *Printer Power Port Cable*

Cash Drawer Port

The J2 485 is equipped with one Cash Drawer Port that will support one or two cash drawers. This port is located in the back of the unit 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 fine with the J2 485.

Cash Drawer Ports

Cash Drawer 1 Pin Assignment
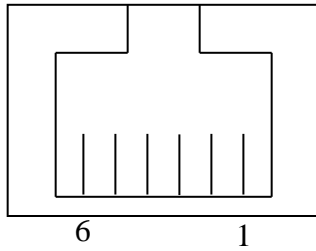
Pin	Signal
1	GND
2	CD1 SOLENOID
3	STATUS / STATUS CD1
4	24V
5	CD2 SOLENOID
6	GND / STATUS CD2

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

1) Using 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	

7	6	5	4	3	2	1	0
X		X	X			X	X

- **Reserved**
- **Cash Drawer 1 fire**
- **Cash Drawer 2 fire**
- **Reserved**
- **Cash Drawer 1 status**
- **Reserved**
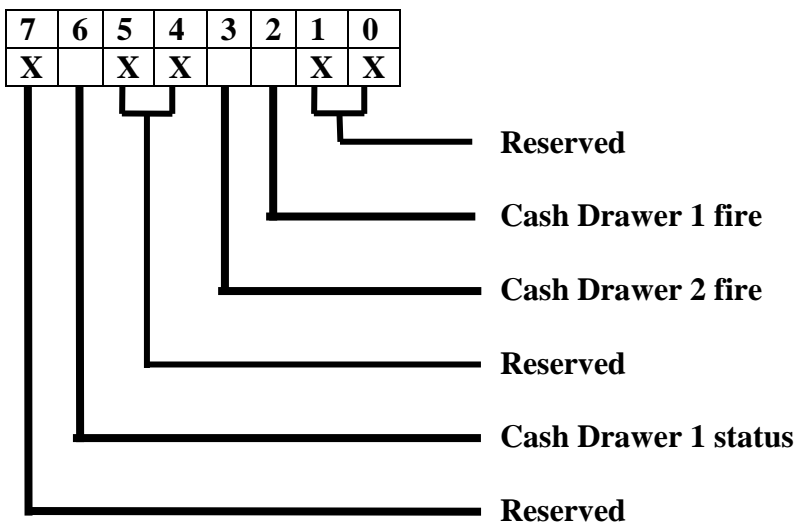
The "Y" cable used to support two cash drawers on the one RJ-11 is the same as the one used on Epson printers.

CMOS Clear

The J2 485 CMOS can be cleared by jumping JP3 pin 1-2, then removing the jumper.
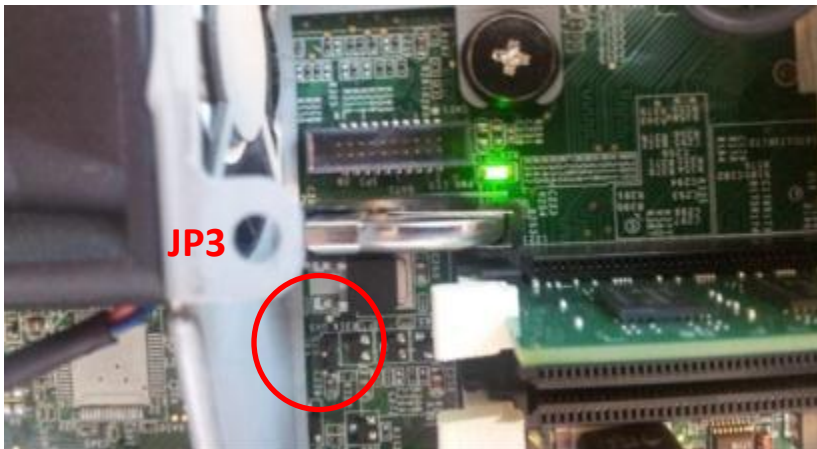
Power Supply

The J2 485 uses a built-in power supply rated with an output of 180 watts, and has an input rating of 100-240VAC at 50~60Hz 2.5Amps maximum. The power supply has an efficiency rating of IV.

Power Input connector
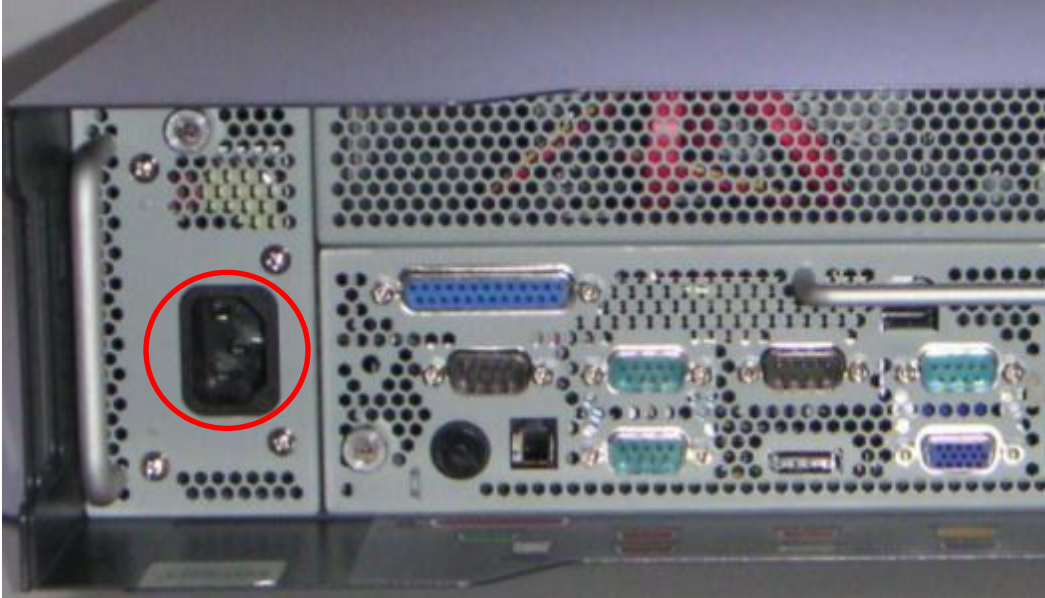
Kensington Security Slot

There are two Kensington Security Slots (lock slots) on the J2 485, located on both sides of the rear of the unit. (*Please see below*).   The Kensington locks are normally used as a deterrent to prevent opportunistic theft. Most retail locks will work with the J2 485 and can be located on the inside or the outside of the cable well. Note that when using the lock it will also lock the cover so that it cannot be removed.

Kensington Security Slot

Typical Power Consumption

The typical power consumption of the J2 485 is lower that most desktop computers. Using the latest generation Intel's Desktop processors and chipset allows for much lower power consumption than previous generations of POS computers. This superb combination, coupled with proper system configuration, greatly reduces the system 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 systems were tested in their standard hard drive configuration, results are +/- 15%.

J2 485 i5-2400 3.10GHz

1: Normal application including most POS software	20 watts
2: Very heavy load application	65 watts
3: Maximum load (J2 485 only, not including peripherals)	96 watts
4: Standby, unit off, waiting for wake on LAN, RTC or power button	>4 watts

Service

The J2 485 is designed to be fully and easily serviced - system updates, memory upgrades, or storage device swaps and/or upgrades can all be accomplished without using any tools!

Removing the System Board

To remove the System Board: loosen the two thumbscrews located on the back of the unit *(as shown below)*. Then simply use the handle to slide the system board out.
Note: **Proper anti-static procedures are required when handling the system board.**

Loosen Thumb Screws

Slide system board out by pulling on the handle

Removing the Power Supply

Warning! To remove the Power Supply first un-plug the AC power cord.
Then loosen the thumbscrew located on the back of the unit *(as shown below), and*
simply use the handle to slide the power supply out.

Removing the power supply by sliding out
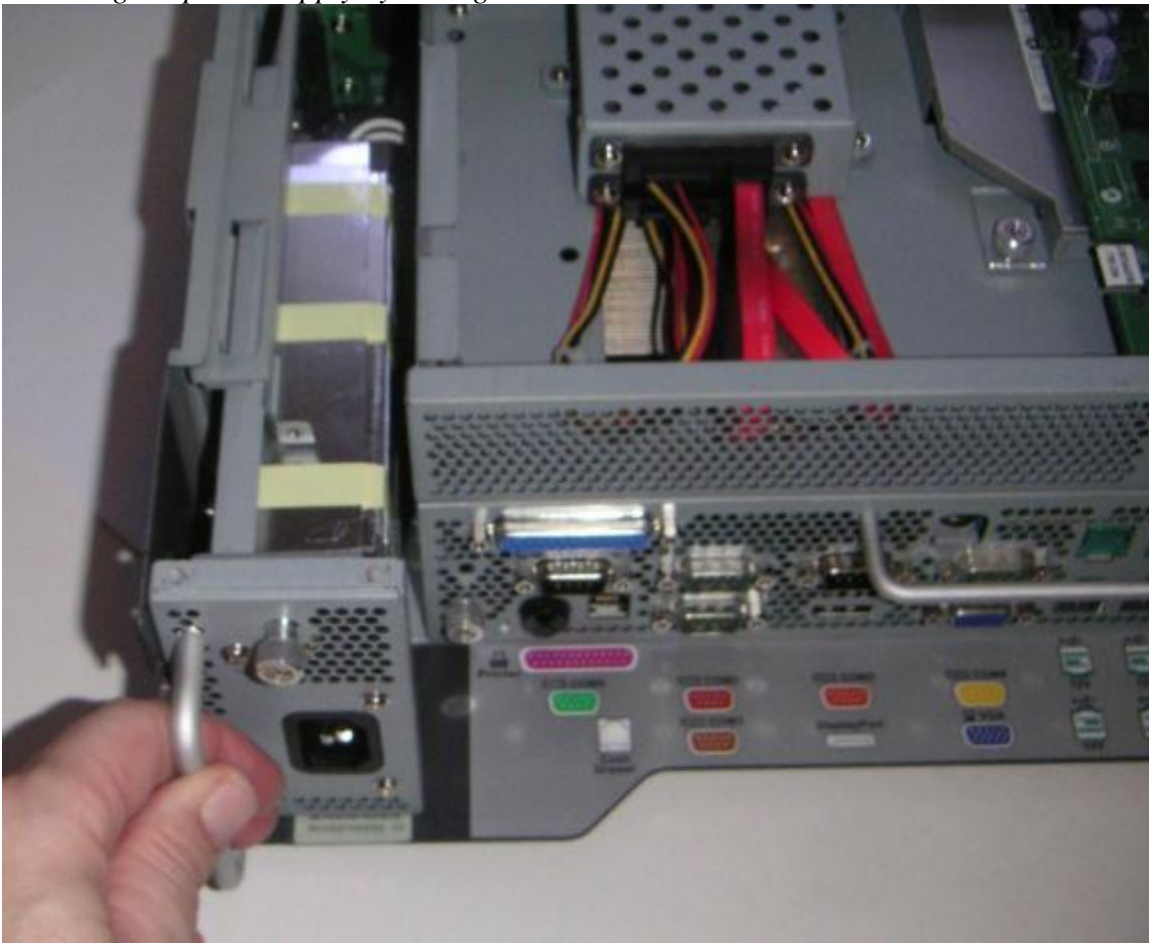
Removing Cover

The case cover for the J2 485 can easily be removed by just pressing the two cover latch buttons on the side of the unit. They just tilt the cover up from the rear of the unit, *as shown below:*

Side button(s)

Push side button in and lift

Lift cover from the rear and tilt up

J2 485 with cover off

When replacing the cover, simply press in the two front sides of the case so that the locking tabs engage.

Adding Memory

Note: **Proper anti-static procedures are required when handling the system board. To add memory,** slide the system board out of the unit. You can now access the two memory sockets, note that the order in which the memory is populated does not matter.

The J2 485 supports up to 16GB of memory in two sockets. Memory type is 240 DIMM DDR3 1066/1333.

Memory sockets
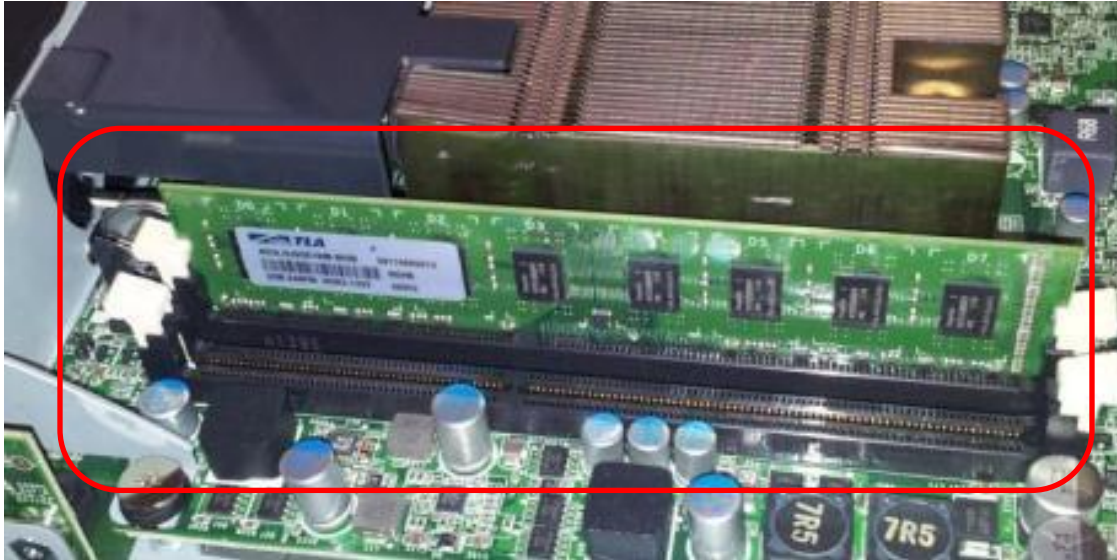
Changing the Processor

To change the processor, be sure to **first start by working in an anti-static workplace with proper grounding**. Remove the systems board from the system, now remove the black plastic fan duct.

Loosen the four spring-loaded screws that secure the processor heat sink by turning 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 it 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 warranty</u>.****

Adding / Removing DVD Drive

The DVD drive can easily be removed by first removing the J2 485 cover, and loosening the thumbscrew that is securing the DVD drive *(as shown below).* The drive can now slide out of the front of the unit.
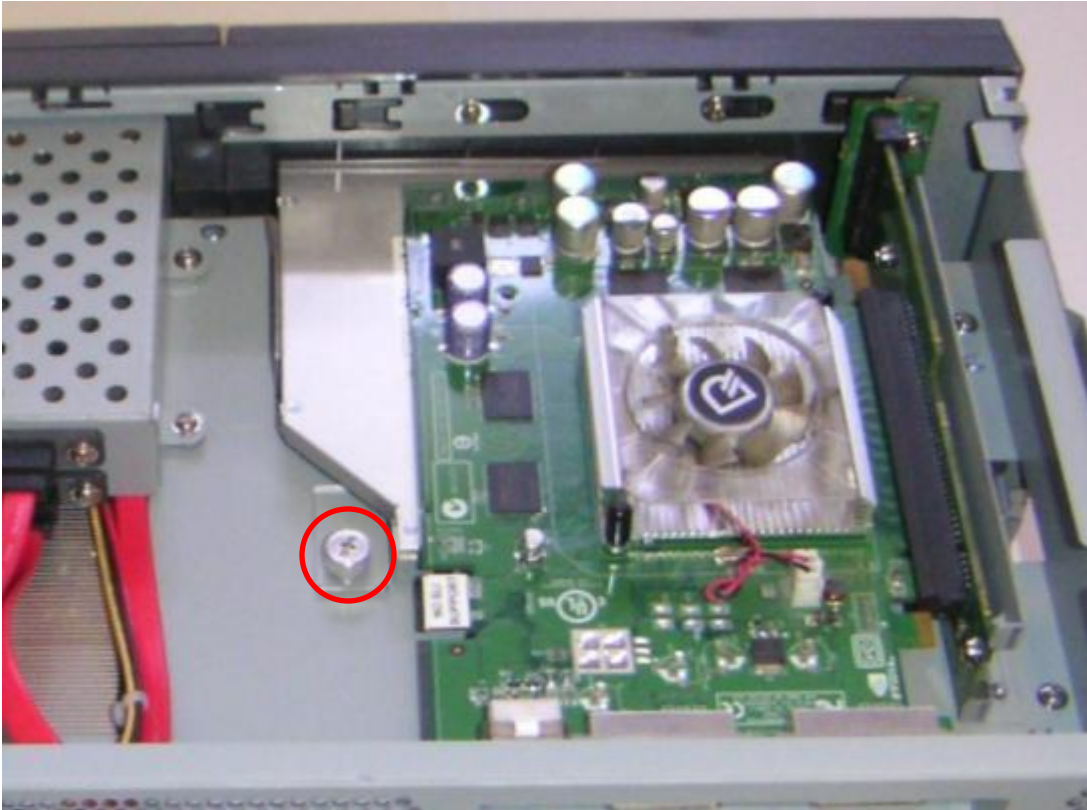
DVD Drive

BIOS Setup

Entering the BIOS Setup

To enter the BIOS Setup, turn on or reboot the J2 485 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 personnel, as changing some settings can cause the system to function improperly.

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

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Chipset  Boot  Security  Save & Exit

 BIOS Information                                      Set the Date. Use Tab to
 Project Version              C921-014                 switch between Data elements.
 Build Date and Time          09/27/2011 17:56:25


 CPU Information
 Intel(R) Core(TM) i5-2400 CPU @ 3.10GHz
 CPU Speed                    3100 MHz

 Memory Information
 Total Memory                 1024 MB (DDR3 1333)

 System Information
 System Product: J2 680
 Serial Number : L815840005                           →←: Select Screen
 M/B Version   : V0.9C                                 ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
 System Date                  [Tue 09/27/2011]         F1: General Help
 System Time                  [18:02:58]               F2: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Exit
                                                       ESC: Exit




              Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

Advanced Settings

This menu contains settings to control a number of system functions, most settings are self-explanatory;

Advanced Setting Screen

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
      Main  Advanced  Chipset  Boot  Security  Save & Exit

                                                                   Enable or Disable Boot Option
                                                                   for Legacy Network Devices.
      Legacy OpROM Support
      Launch PXE OpROM                     [Disabled]
      Launch Storage OpROM                 [Enabled]

    ▶ ACPI Settings
    ▶ CPU Configuration
    ▶ Power Configuration
    ▶ SATA Configuration
    ▶ Intel IGD SWSCI OpRegion
    ▶ USB Configuration
    ▶ H/W Monitor
    ▶ W83627UHG Super IO Configuration
    ▶ AMT Configuration                                         →←: Select Screen
    ▶ Peripheral Power and LCD Brightness Configuration         ↑↓: Select Item
                                                                Enter: Select
                                                                +/-: Change Opt.
                                                                F1: General Help
                                                                F2: Previous Values
                                                                F9: Optimized Defaults
                                                                F10: Save & Exit
                                                                ESC: Exit



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```

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 also 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 option. 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

```
         Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Advanced

  SATA Configuration                                  (1) IDE Mode. (2) AHCI Mode.
                                                      (3) RAID Mode.
  SATA Mode                     [IDE Mode]
  Serial-ATA Controller 0       [Enhanced]
  Serial-ATA Controller 1       [Enhanced]

  SATA Port0                    Not Present

  SATA Port1                    TOSHIBA MK1676 (160.0
                          ┌──── SATA Mode ────┐
  SATA Port4              │ Disabled          │
                          │ IDE Mode          │
  SATA Port5              │ AHCI Mode         │
                          │ RAID Mode         │
                          └───────────────────┘
                                                      ──────────────────────────
                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F9: Optimized Defaults
                                                      F10: Save & Exit
                                                      ESC: Exit



         Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```
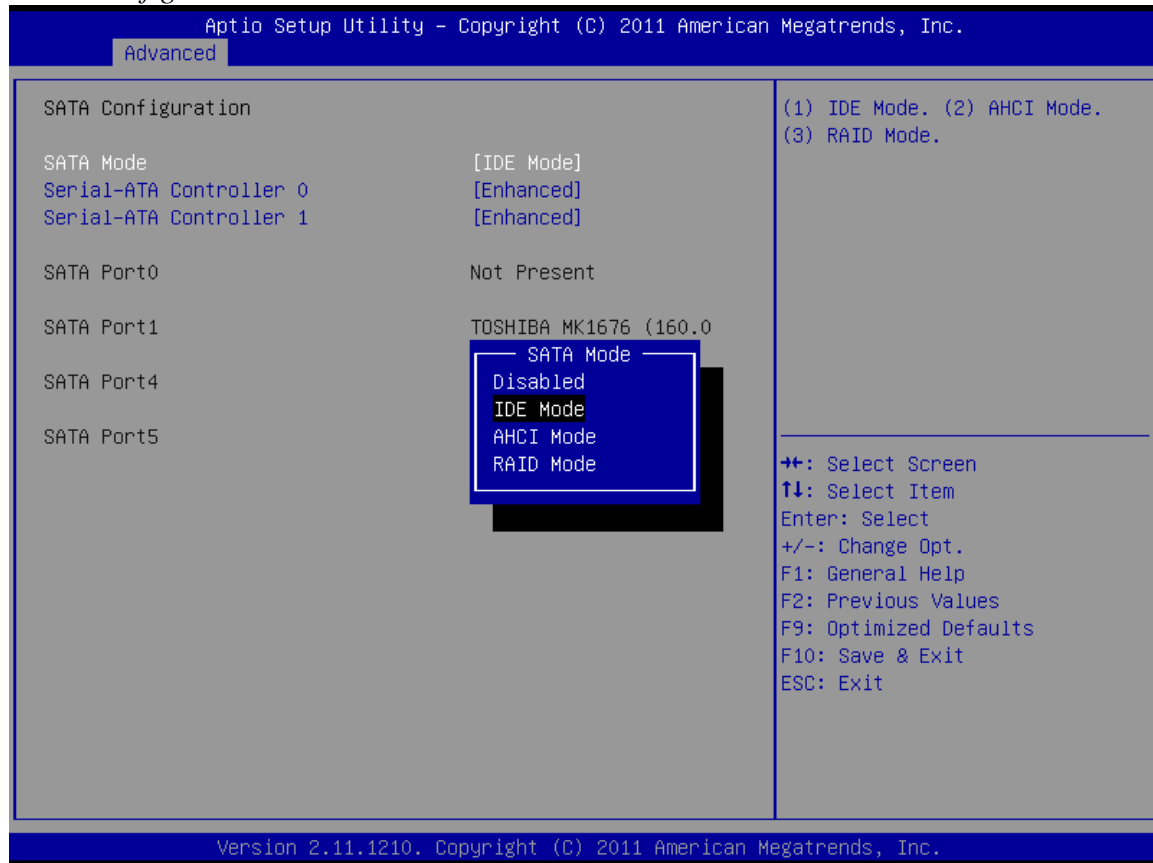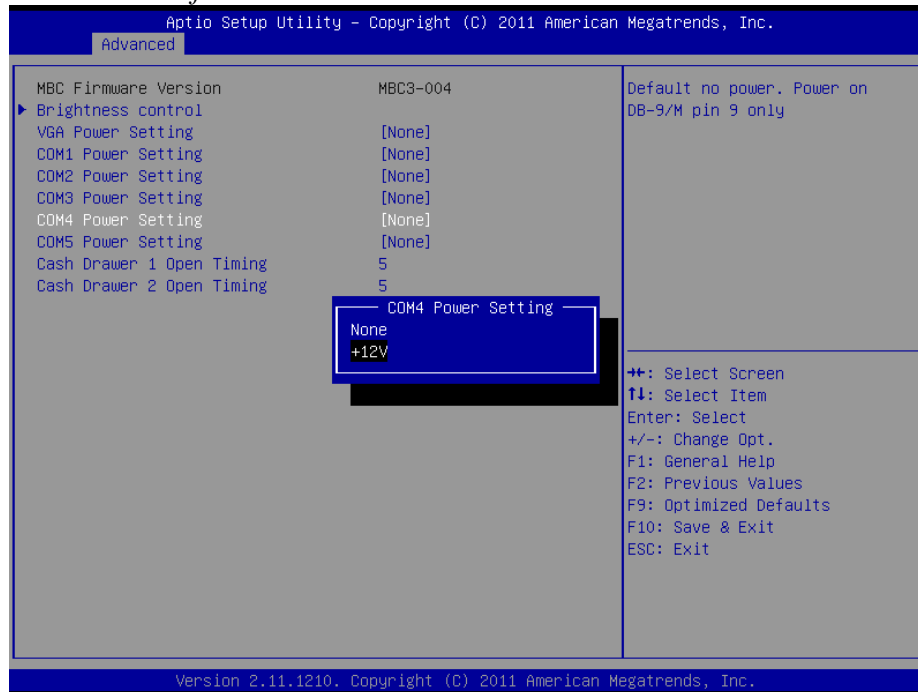
Peripheral Power and LCD Brightness Configuration

This submenu allows for the enabling of power for the serial ports, default cash drawer, pulse timing, and power for a J2-supplied VGA port monitor.
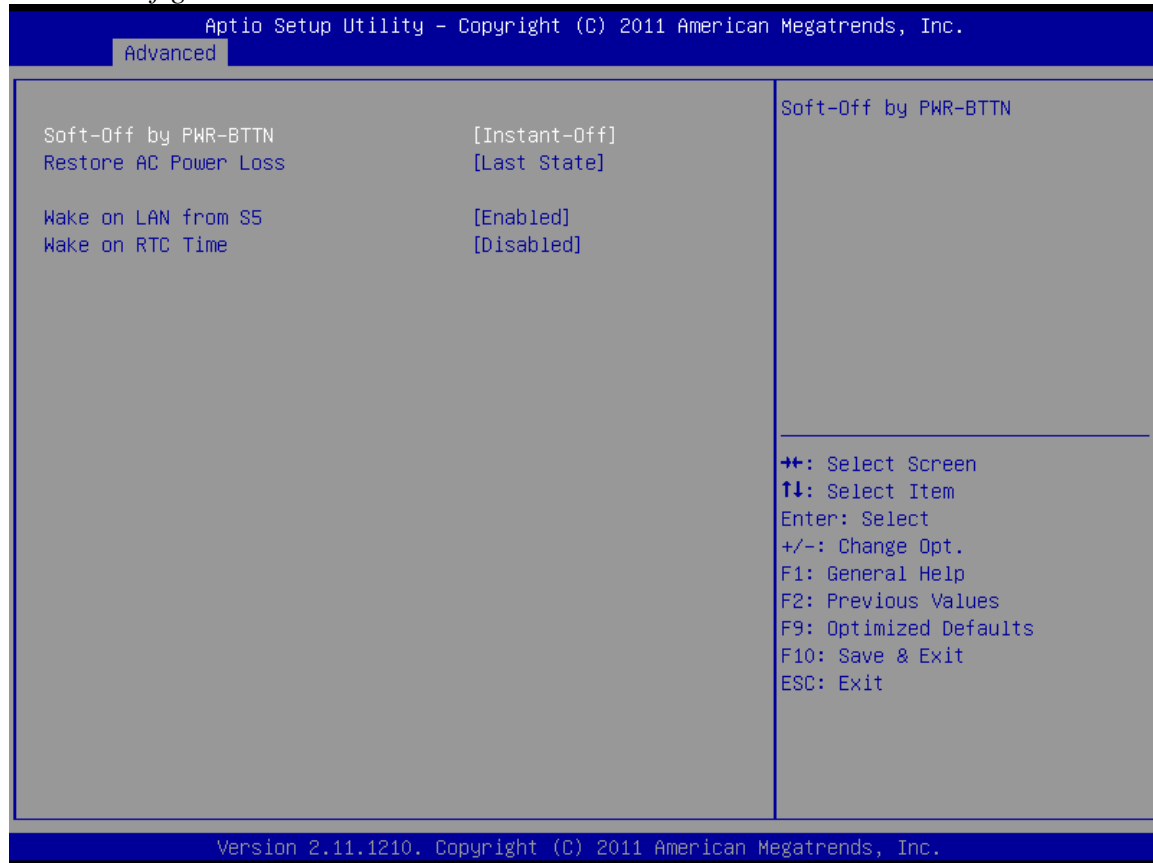*Brightness control is not used on the J2 485.*

Power enable for Serial Ports

```
                  Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
          Advanced

     MBC Firmware Version              MBC3-004                Default no power. Power on
   ▶ Brightness control                                       DB-9/M pin 9 only
     VGA Power Setting                 [None]
     COM1 Power Setting                [None]
     COM2 Power Setting                [None]
     COM3 Power Setting                [None]
     COM4 Power Setting                [None]
     COM5 Power Setting                [None]
     Cash Drawer 1 Open Timing         5
     Cash Drawer 2 Open Timing         5
                                ┌──── COM4 Power Setting ────┐
                                │ None                       │
                                │ +12V                       │
                                └────────────────────────────┘
                                                              →←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F9: Optimized Defaults
                                                              F10: Save & Exit
                                                              ESC: Exit



                  Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

Power Configure Screen

Power Configure Screen

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
        Advanced

                                                                    Soft-Off by PWR-BTTN
    Soft-Off by PWR-BTTN              [Instant-Off]
    Restore AC Power Loss            [Last State]

    Wake on LAN from S5              [Enabled]
    Wake on RTC Time                 [Disabled]




                                                                    →←: Select Screen
                                                                    ↑↓: Select Item
                                                                    Enter: Select
                                                                    +/-: Change Opt.
                                                                    F1: General Help
                                                                    F2: Previous Values
                                                                    F9: Optimized Defaults
                                                                    F10: Save & Exit
                                                                    ESC: Exit


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```

Restore on AC Power Loss

The J2 485 has three options should AC power become lost and then later 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 J2 485 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 a utility option available 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 if desired.

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 J2 485 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

```
         Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Main  Advanced  Chipset  Boot  Security  Save & Exit

   Boot Configuration                                      Set Boot Priority.
   Full Screen Logo              [Disabled]
   Fast Boot                     [Disabled]

   CSM16 Module Verison          07.64

   GateA20 Active            ┌──────────── 1st Boot ────────────┐
   Option ROM Messages       │ CD/DVD                           │
   Interrupt 19 Capture      │ Hard Disk: TOSHIBA MK1676GSX     │
                             │ USB Floppy                       │
   Set Boot Priority         │ USB CD/DVD                       │
   1st Boot                  │ USB Hard Disk                    │
   2nd Boot                  │ USB KEY:SanDisk Cruzer Micro 0.1 │
   3rd Boot                  │ Network                          │  Select Screen
   4th Boot                  │ UEFI: USB USB Hard Drive         │  Select Item
   5th Boot                  │ Other                            │ r: Select
   6th Boot                  │ Disabled                         │  Change Opt.
                             └──────────────────────────────────┘  General Help
 ▶ Hard Disk Drive BBS Prioritie                                    Previous Values
 ▶ USB KEY Drive BBS Priorities                                  F9: Optimized Defaults
 ▶ UEFI Boot Drive BBS Priorities                                F10: Save & Exit
                                                                 ESC: Exit




         Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

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 for this option.*

Exit Options

After making any changes to the BIOS settings, new information can be saved from this Exit Options 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, simplytype the ESC key from any screen to exit.

Exit Options Screen
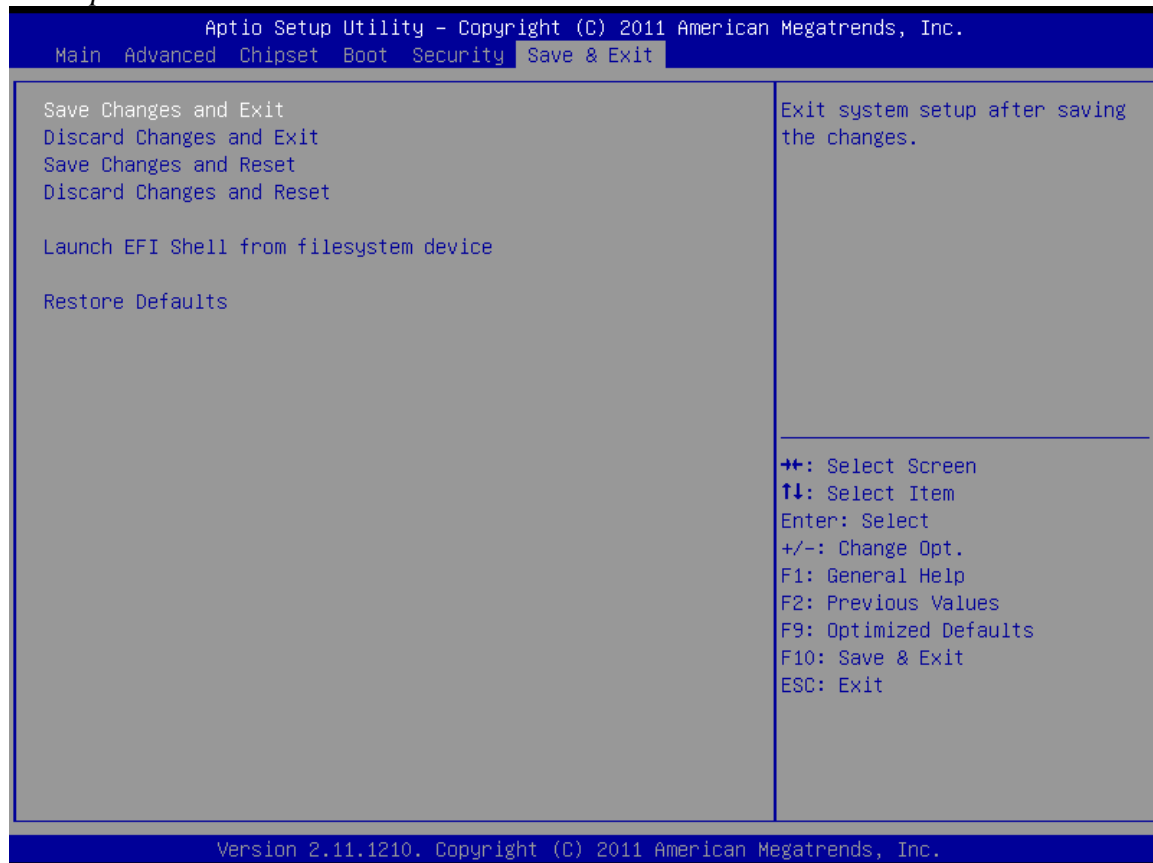
Driver Installation, Windows

Chipset Driver Installation

The chipset driver is needed to get the full potential from the J2 485 chipset. It should be loaded before other drivers and also first thing after booting. The drivers can be downloaded from the J2 web site:
http://www.j2retailsystems.com/support/485/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 J2 485 graphics driver from the J2 web site at:
http://www.j2retailsystems.com/support/485/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.
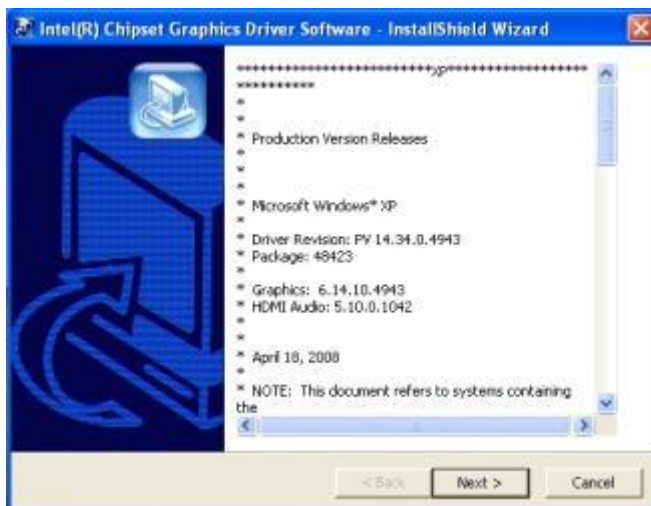
Audio Driver Installation

The Audio Drivers can be downloaded from the J2 web site at:
http://www.j2retailsystems.com/support/485/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/485/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
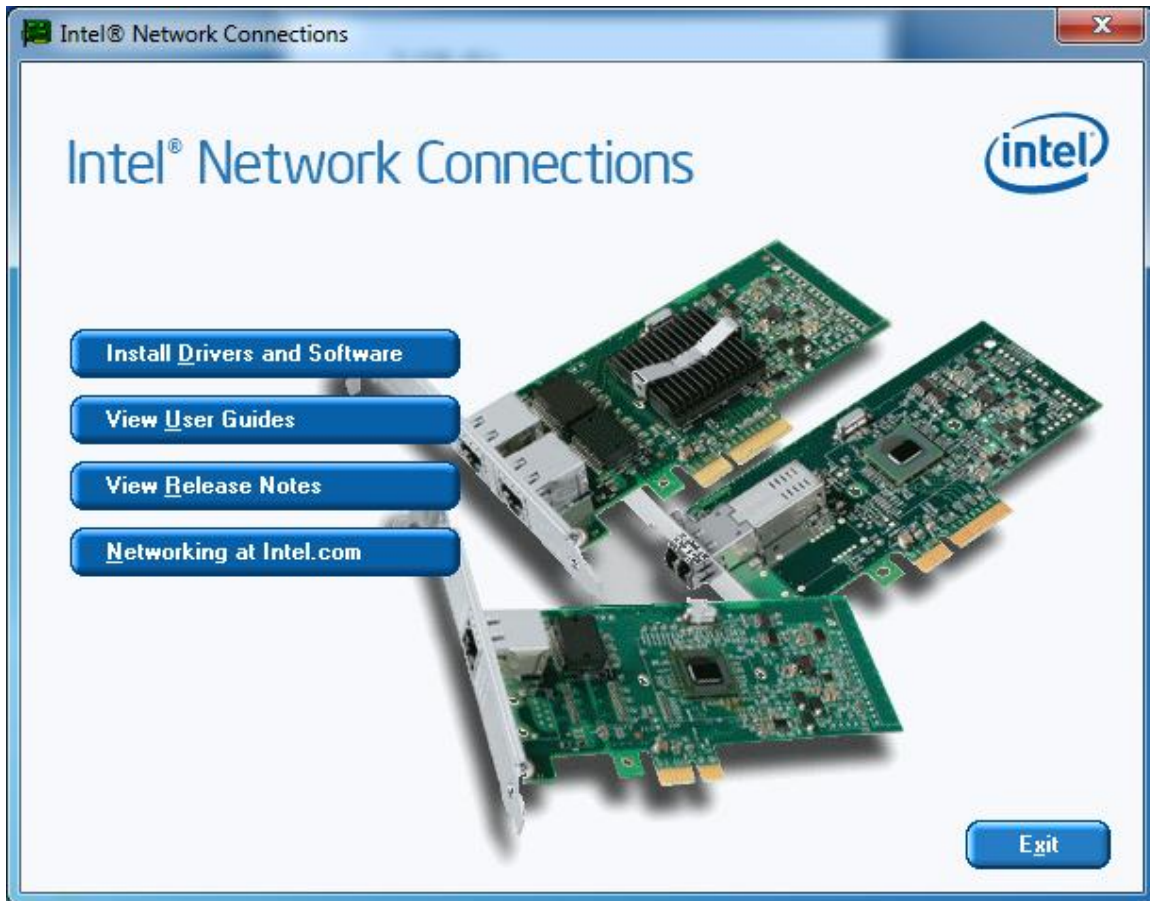
OPOS drivers

The OPOS driver for the J2 485 supports the following: Cash Drawer ports, optional MSR, 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/485/.
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 485 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:
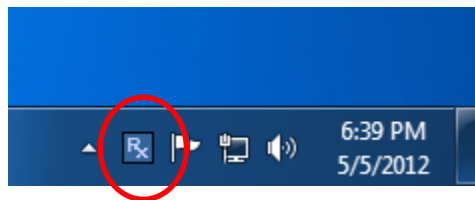
Right-clicking on this icon displays different Health options, *shown below*:
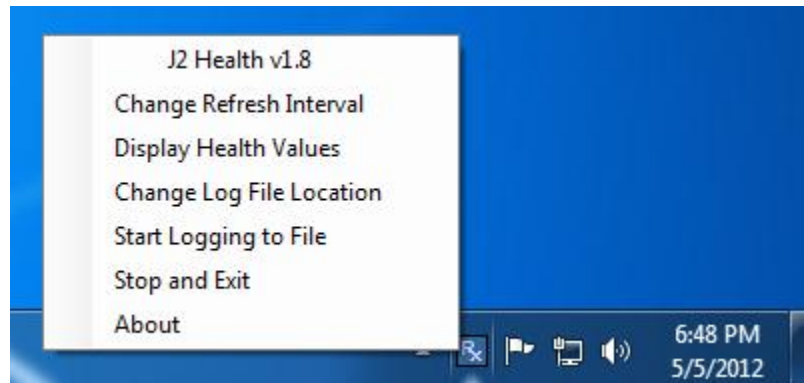
The current health values will display by clicking on "Display Health Values". *A sample screen is shown below:*
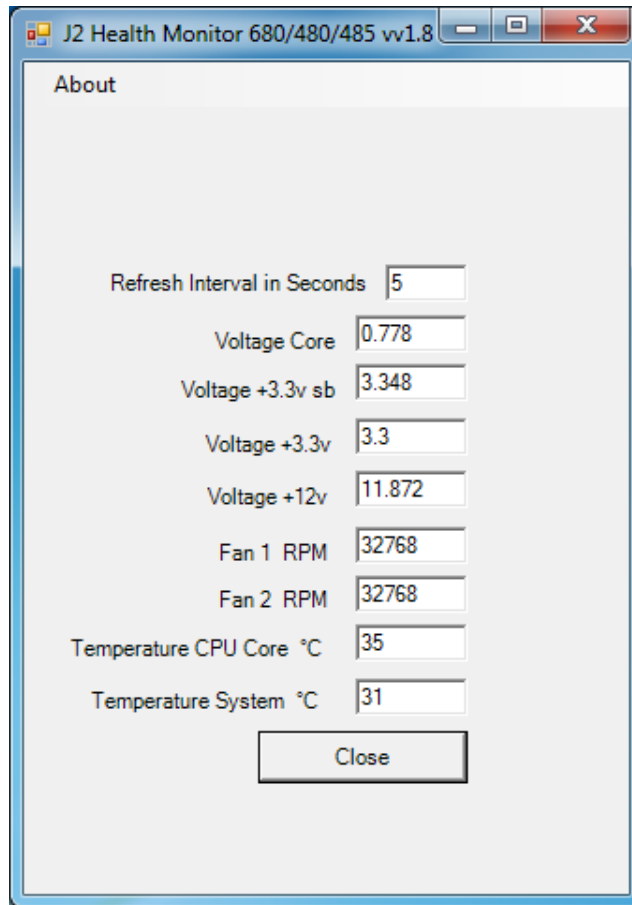
As can be seen above when running on the J2 485, the J2 Health program displays critical system voltages and system and CPU Core temperatures. For other J2 POS systems J2 Health may display more or less information. An example would be the J2 680 unit, which in addition to the above information, would 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 485 Health keys are shown below:
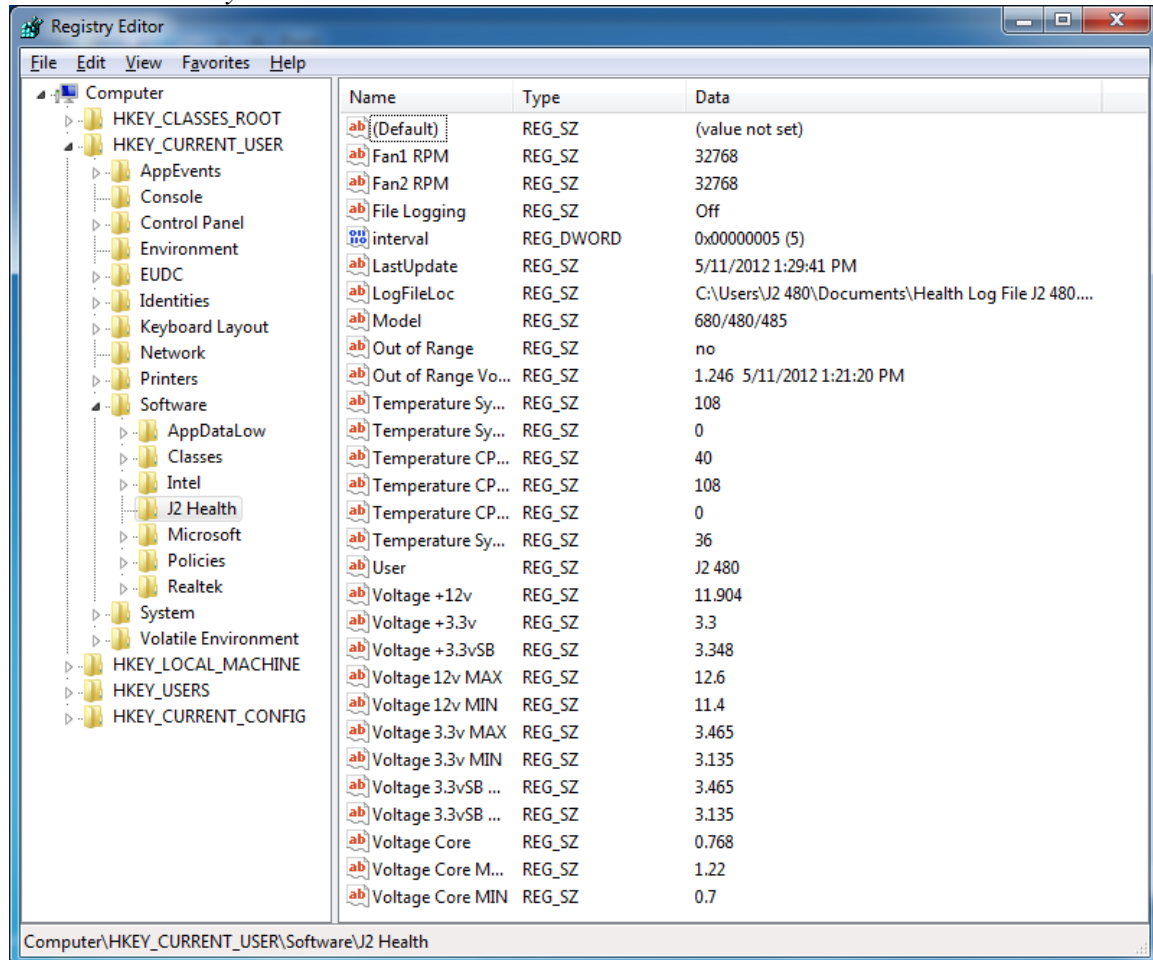
J2 Remote Monitoring Software

J2 now offers a full remote monitoring and asset tracking solution option 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 485, this information also includes dynamic system health information. Normally this key DMI health information BIOS is only supported on very high end servers. Now J2 Retail 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.
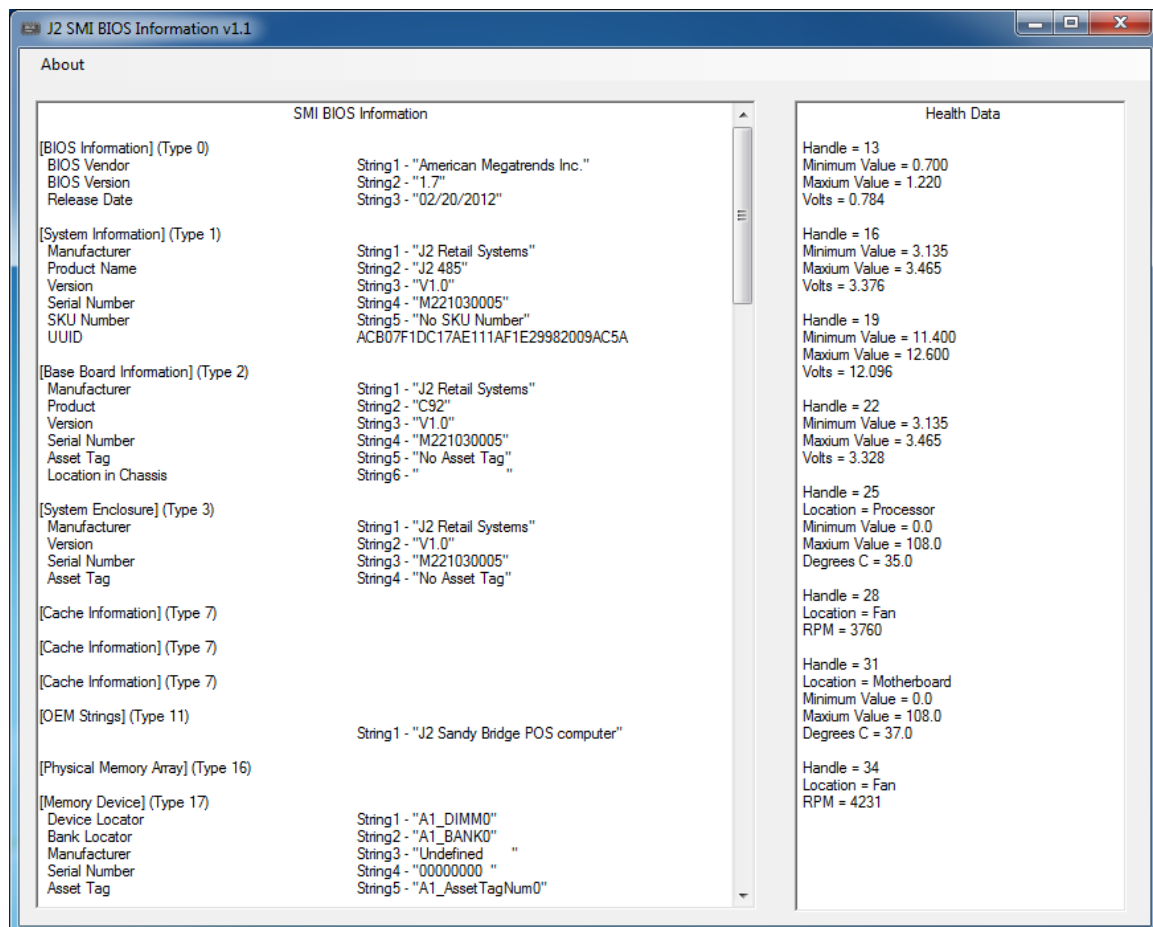
Cash Drawer Test Utility

J2 has a generic cash drawer test utility that works on all J2 products including the new J2 485 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:*
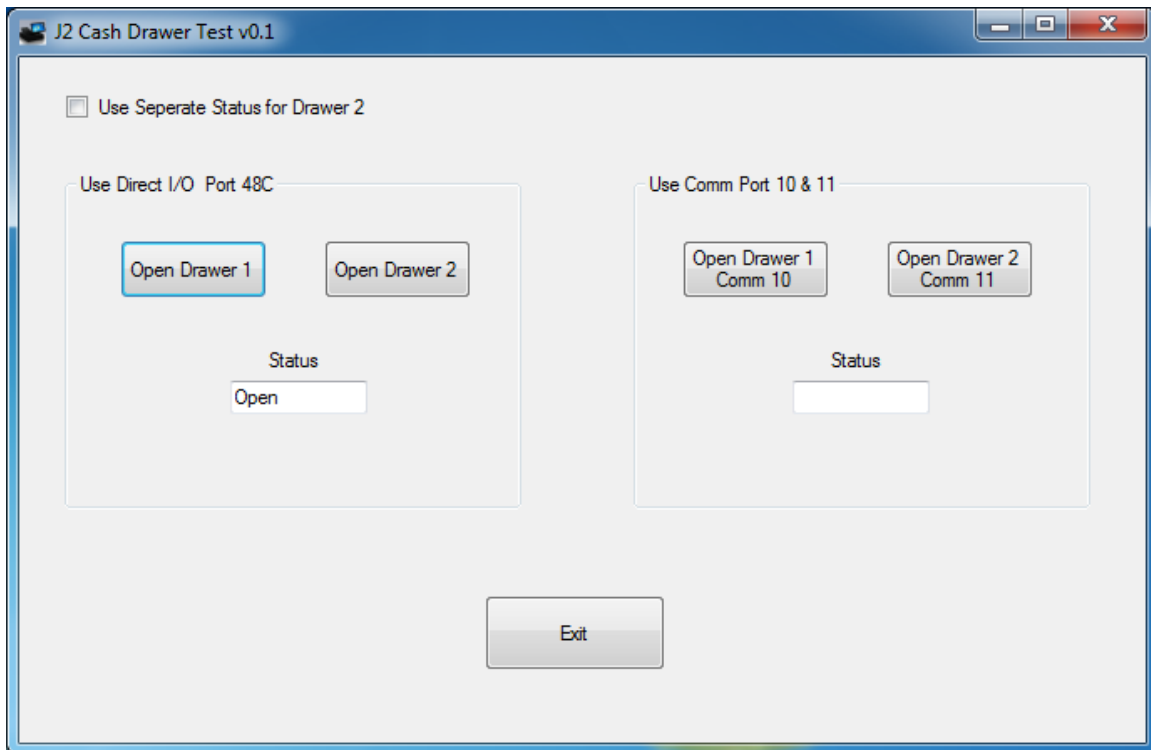
The "Use Comm Port 10 & 11" option is to test the cash drawer you set up using the J2 virtual serial ports program. The virtual serial port program must be installed with the cash drawer virtual serial ports set to Comm 10 & 11.

J2 Virtual Serial Ports Drivers
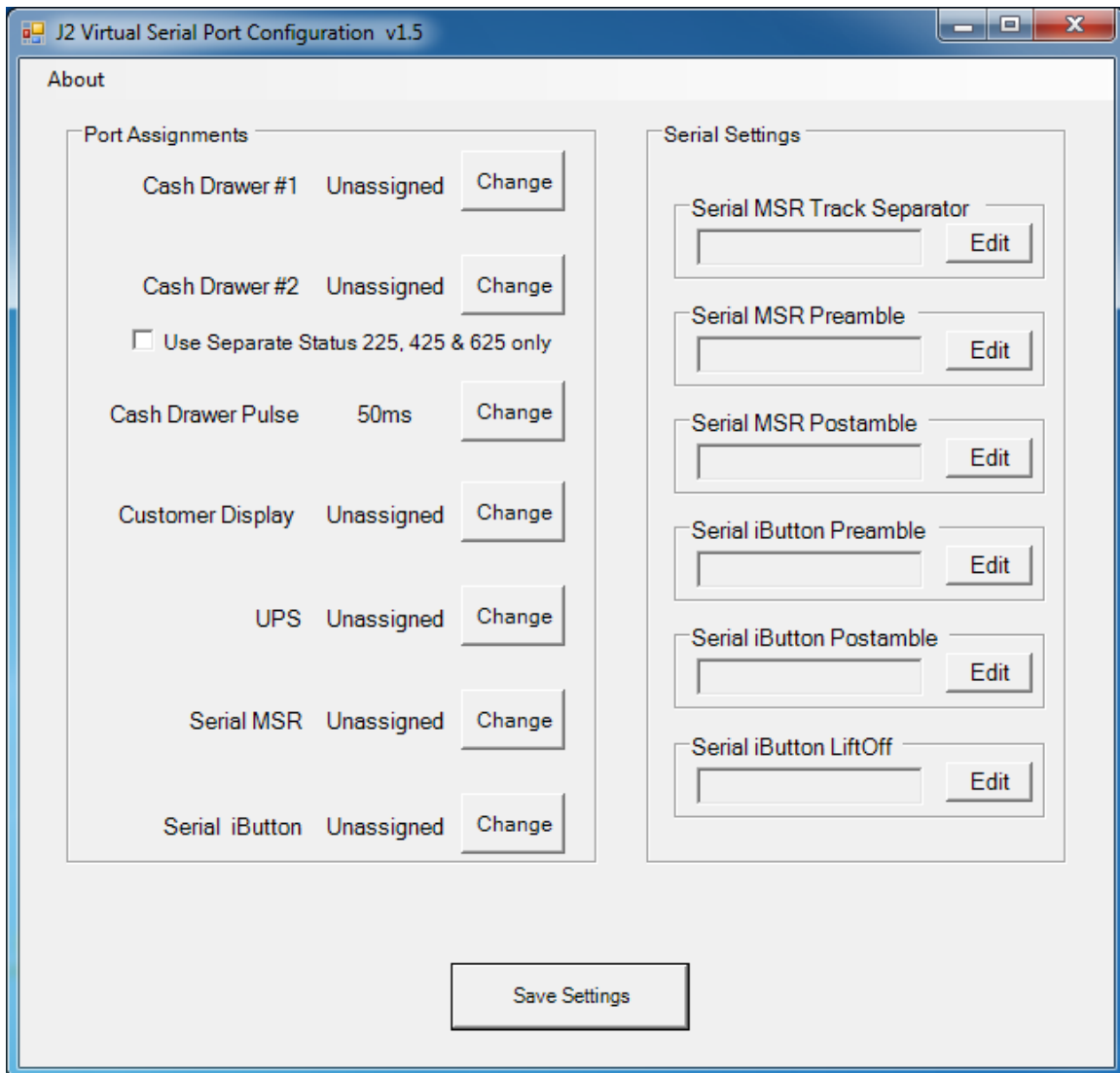
Virtual serial ports can be used for the cash drawers, virtual 2x20 line display on the optional 10.1 LCD, Smart UPS, MSR and iButton.

To open the virtual serial cash drawer, send a bell character to the Com port it is assigned to. (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 J2 485 uses the Intel Matrix Storage Technology to allow the two internal 2.5 inch hard drives to be configured as a RAID array. The J2 485 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 J2 485 to read the data more than twice as fast as with a single drive. The performance can be accomplished more quickly 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 instructions for installing the RAID drivers, however 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 J2 485 only.

Link: http://www.j2retailsystems.com/support/485/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 a USB Floppy.

Drivers can be downloaded here: http://www.j2retailsystems.com/support/485/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 J2 485 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 below,* to indicate a drive has failed.

Drive Failed Icon in tray
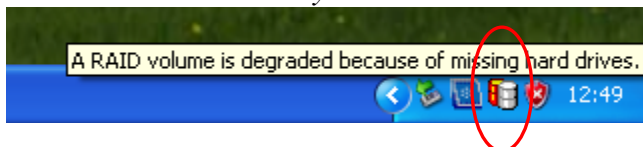
If a hot spare is available, all that needs to be done is to swap the bad drive with the hot spare. *Be sure to change the correct drive*.

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 J2 485. In the Intel Matrix Storage Manager select Advance Mode; and under the Actions tab select "Rescan for Plug and Play Devices".
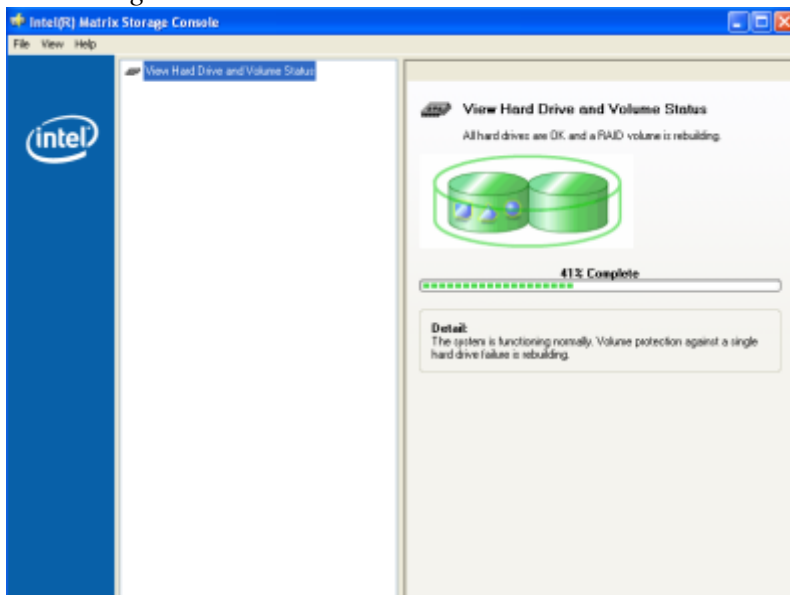
Rescan for Plug and Play Devices screen shot
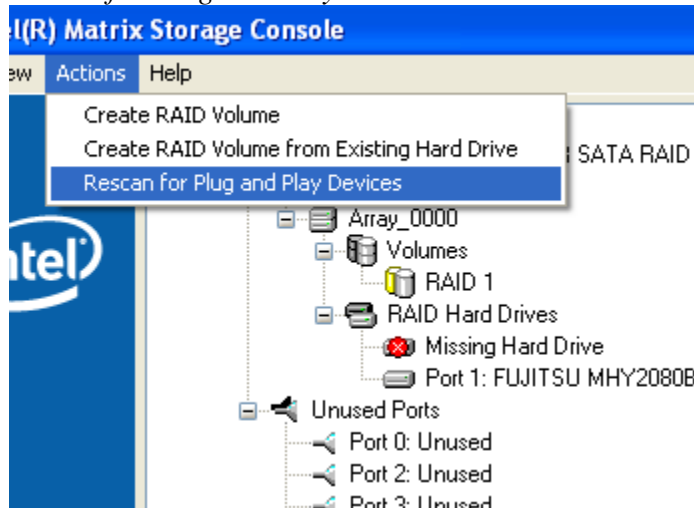
This will cause the drive to be detected by the driver.
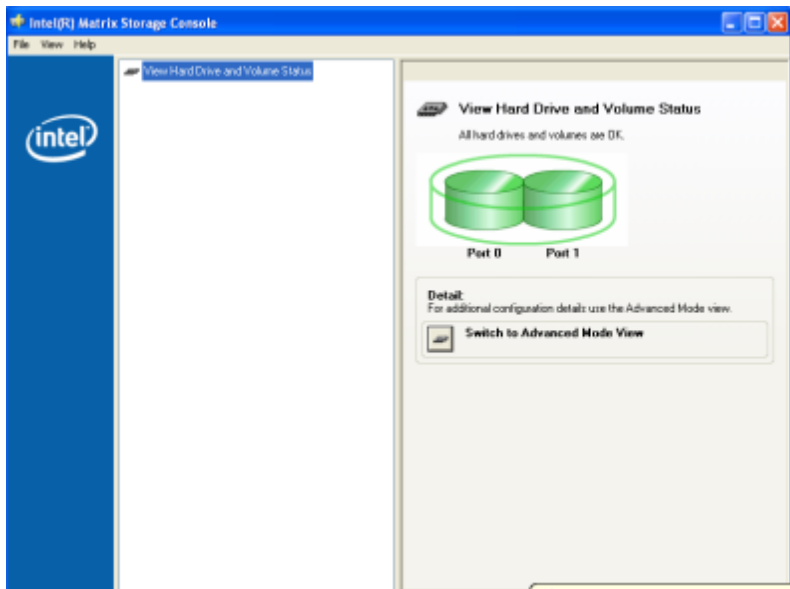
Drive detected

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 485 RAID function. (*Available September 2008*)

Contact Information

European Office

J2 Retail Systems Ltd.
J2 House
Clayton Road, Birchwood
Warrington   WA3 6RP
United Kingdom

44 (0) 1925 817003 Phone
44 (0) 1925 811989 Fax

USA Office

J2 Retail Systems Inc.
9251 Irvine Boulevard
Irvine, CA 92618
USA

(714) 669-3111 Phone
(714) 669-3133 Fax

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

Website

http://www.j2retailsystems.com