



J2 680 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 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 RAID 0 or 1, Quick Change-hot swap 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
2 nd Display	One VGA port and One DisplayPort 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 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° 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°C
Storage Temperature	-20 ~ 55°C
Operating Humidity	20% ~ 80% RH non-condensing
Storage Humidity	20% ~ 85% RH non-condensing
Dimensions (W x D x H)	370 x 250 x 325mm
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 availability of 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 to 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 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/m². 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/m² to 25 cd/m². The brightness can be set to a fixed level in the BIOS or controlled by a utility supplied by J2.

Secondary Video Port(s)

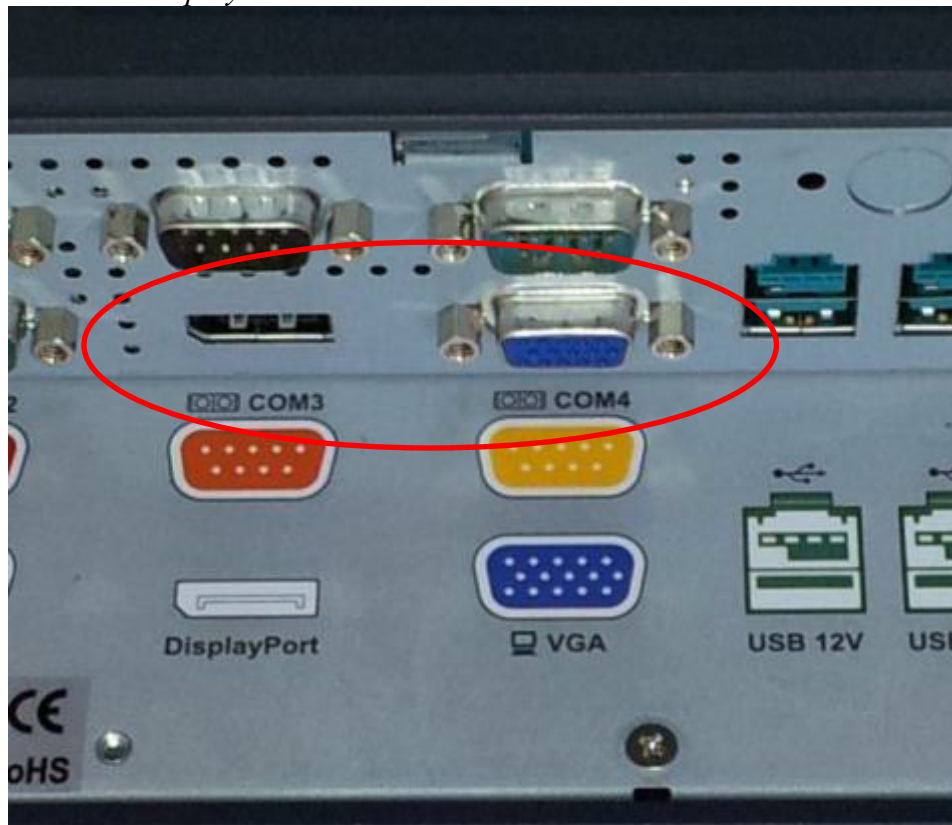
A standard PC VGA video port is supported on the 680 and can be set as the primary or secondary display. The VGA video port has an industry standard HD DB15 connector. When used with some J2 monitors the display can be powered by the 680 through this connector.

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 HDMI or DVI display a passive adapter cable is used. When used with a HDMI display Audio is support via the same HDMI 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 is easy for a +5 volt device to be plugged into a +12 volt enabled 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 Serial Port

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

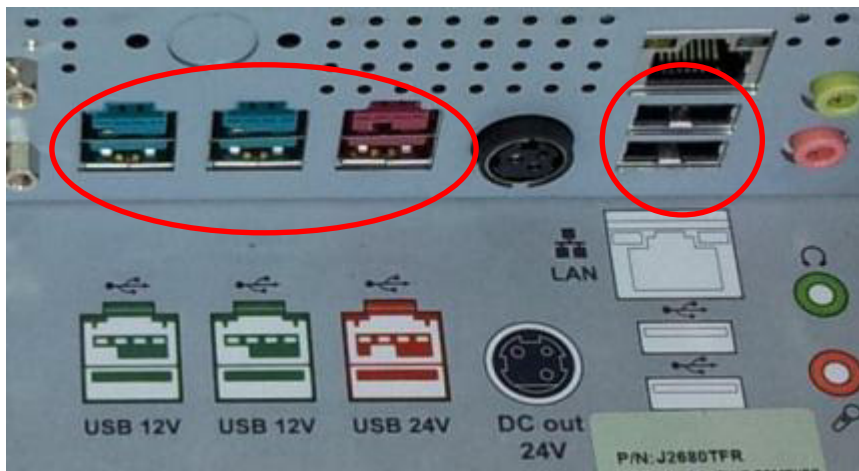
The 680 has six external and 4 internal USB 2.0 ports. Of the six external ports (*see below*) five ports are located in the cable well and one is located on the left side of the unit for easy access. The four internal USB ports are as follows: one can be used for the optional Finger Print Reader and 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 +24V PoweredUSB port and normally only one +24V device is supported at one time.

Printer Power Port



Printer Power Port Cable



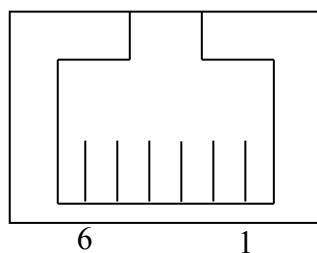
Cash Drawer Port

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.

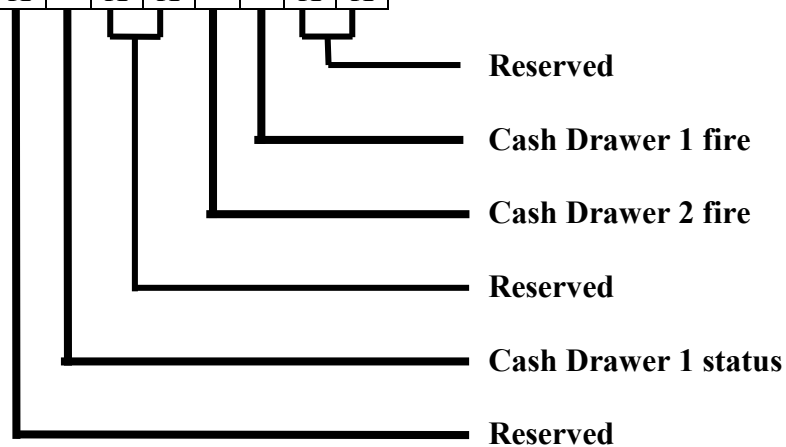
Register Location: 48Ch

Attribute: Read / Write

Size: 8bit

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

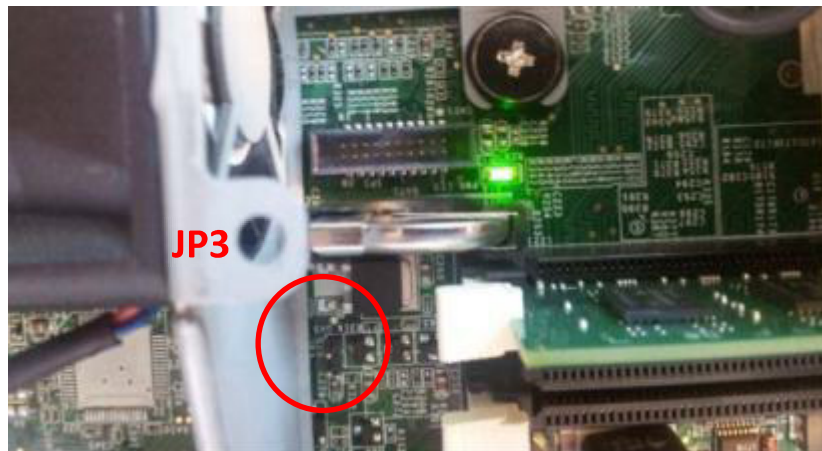
7	6	5	4	3	2	1	0
X		X	X			X	X



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 than 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.

100mm 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.