



J2 Universal Uninterruptible Power Supply for J2 POS Computers

Product Manual



December 2012

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Change history

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Overview

Retailers using touchscreen POS systems from J2 can now enjoy a breakthrough in UPS support that gives protection way beyond what is currently available. Whilst an external AC UPS can provide run times of 5-30 minutes, the J2 Universal UPS can support run times from 1.5-5 hours depending on the J2 systems used and configuration.

One big advantage of using the J2 UPS is that all peripherals powered by the J2 POS will still be powered when running on the UPS. When using the J2 680/680L this includes the printer. This enables retailers to continue trading as normal, including doing cash transactions and printing, with no corruption or loss of data. Before it runs out of power, the system will trigger a safe and timely shut-down. The UPS unit is competitively priced, making it an affordable and wise investment.

The J2 universal UPS will work with most all of J2 POS computer products. This includes the J2 225/480/615/625/630/680 and 680L. For the J2 6XX series the UPS mounts in the base of the unit where the power supply is normally mounted. When using the UPS option the power supply will be mounted external to the unit. For the J2 225 and the J2 480 the UPS will be mounted outside the unit.

Most UPS power supplies are AC power devices because the manufacturer does not know what is going to be plugged into their product. These are typically large and very heavy because they use sealed lead acid batteries. There are separate products for 220V and 110V and require full safety certification as AC devices. They are normally located under the counter of the register and take up a reasonable amount of room.

The J2 POS computers are more like a notebook PC in that only requires between 14 and 19 volts DC to operate. The J2 POS computer uses a separate DC power supply. The J2 UPS is a DC UPS, not an AC UPS. The J2 UPS uses LI-ION battery like those used in notebook computers rather than lead acid batteries like AC UPS. This make for a much more efficient and smaller UPS which allows for much longer run times.

Specification

Battery Run Times	
J2 225	5 hours
J2 625	4 hours
J2 615 / 630	3 hours
J2 480 / 680 / 680L	2 hours / with printer 1.5 hours
Power In	19 Volts DC
Power Out	19 ~ 14 VDC, 9.5 amps maximum
Data Interface	RS232 RJ45 connector, cable supplied for RJ25 and DB9
Batteries Type	2 x 4 cell 18650 cell Li-Ion pack with protection circuit optional one batter pack for J2 225/615/630 run time is 45% of run time with 2 battery packs
Battery Life	300 full discharge cycles
Charge Time	3 hours
Charger Type	Smart Microcontroller based
Software	XP Standard Generic UPS driver / J2 Smart UPS driver
Size	152mm x 80mm x 46mm (6" x 3.2" x 1.8")

Key Features

- Two to five hour plus of standby power
- Controlled system shut down with battery depletion
- Fast Charge times
- Small and light weight
- Low Voltage DC device, no shock hazard in wet environments
- Powers POS unit and peripherals and on the J2 680/680L/480 the printer too

Hardware Configuration

The J2 UPS comes with three cables, one 2 pin to 4 pin power cable and two serial data cables, one RJ45 to RJ45 and one RJ45 to DB9. The RJ45 to RJ45 cable is for use with the J2 225/615/625/630 POS systems. The RJ45 to DB9 is for use with the J2 480/680/680L POS systems.



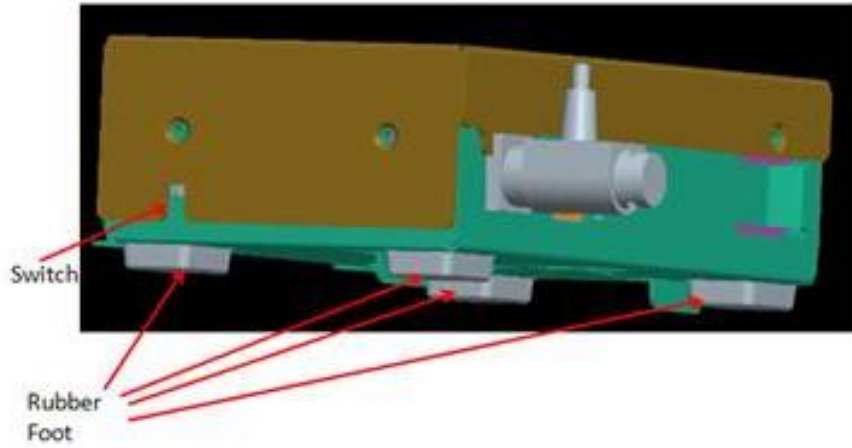
To install and use the J2 UPS in a J2 6XX series POS system is very simple.

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



The power supply will be used external to the unit when using the UPS option.

When using with the J2 225 or the J2 480 the UPS will be mounted external to the unit. Four rubber stick on feet come with the UPS for when used this way. Apply as shown.



The AC power should be applied for 3 hours to fully charge the batteries. The unit can be running during this time.

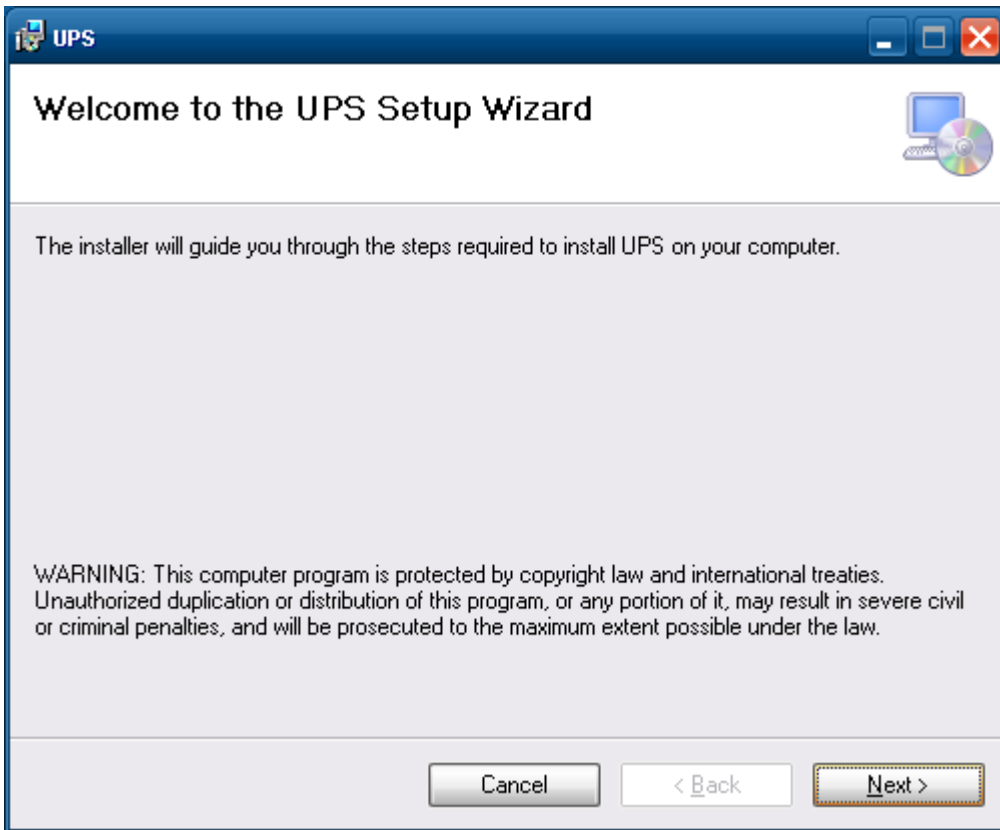
Be sure to turn the battery protect switch to on so the UPS can operate.

Software Configuration

The software for the J2 UPS will work on Windows XP, POSReady 2009, Windows 7, POSReady 7. It is designed to make sure the system does a proper shut down once the battery is fully discharged. It can also display the current state of the battery charge, configure shutdown options and other features.

To install the J2 Smart UPS driver download the driver from the J2 web site.
<http://support.j2rs.com/>

Run UPS Setup.msi to install the UPS driver. The following screen will appear.



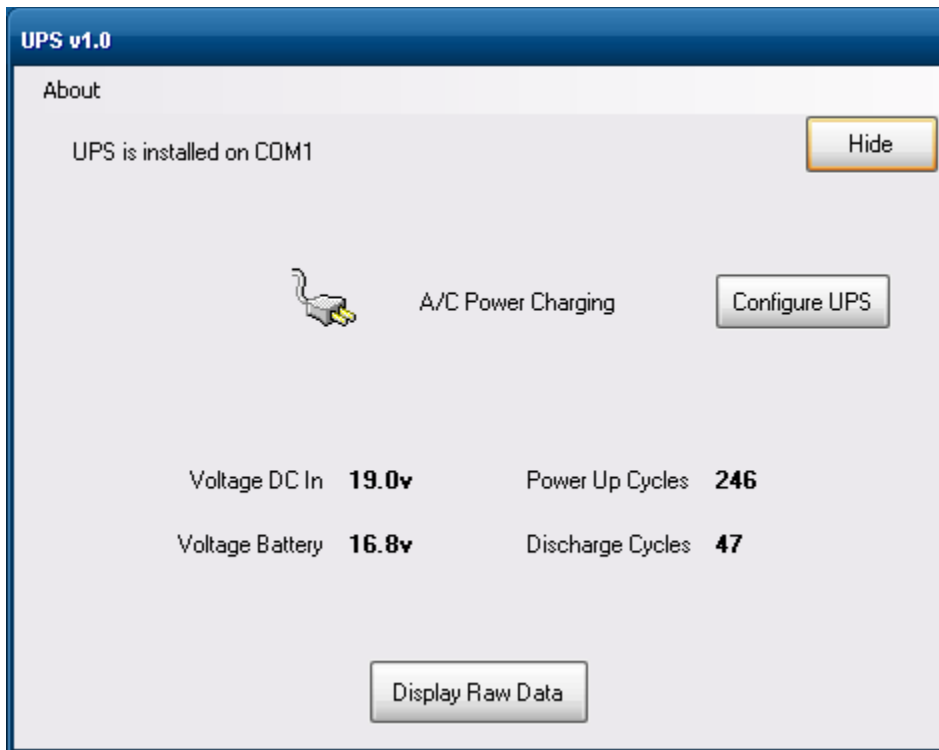
Just type next till this screen appears.



Use the drop down menu to select the Comm Port you have attached the UPS to. Next if you have a printer being powered from the UPS check the “Printer Powered by POS System” box. The standard configuration is now complete so click Okay. The J2 UPS will now be running and an AC plug icon will appear in the task bar tray as shown below.



If other configurations optional are need they can be accessed by left clicking the AC plug icon shown above. The UPS information screen will pop up as shown below.



By clicking on the Configure UPS button other UPS options can be configured. This includes:

- 1: Changing the Comm Port setting.
- 2: “Printer Powered by POS System” option setting
- 3: Have the UPS information screen pop up on power failure
- 4: Have the system shut down based on time rather the low battery (after a power fail)
- 5: Run a program when the power failure is detected

UPS Configuration Screen

UPS Configuration

Comm Port ▼

Printer Powered by POS System

Popup Main Window on Power Failure

Critical alarm

A critical alarm occurs when the UPS battery is almost exhausted or, optionally, after a specified time on battery power.

Minutes on battery before critical alarm:

When the alarm occurs, run this program:

Then the computer will shutdown

Tray Icon

When running on AC power an AC plug icon will display. If the cursor is over the icon it will display A/C Power in a text box.

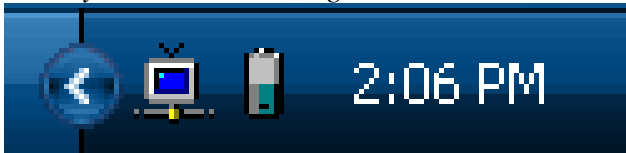


When there is a power failure the tray icon will change from an AC plug icon to a battery icon. The battery icon will also display the approximate battery charge level. If the cursor is positioned over the icon it will display the charge level in a text box.

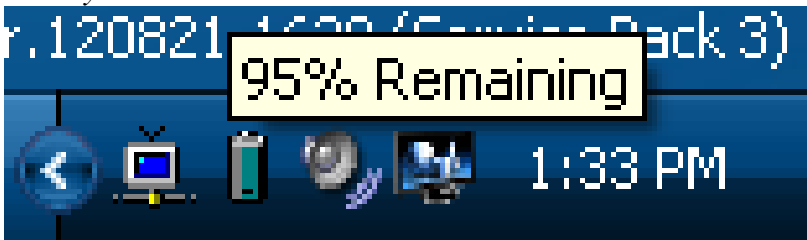
Battery icon at 95% charge



Battery icon at 55% charge



Battery icon with cursor over icon



The UPS information Screen

The UPS information screen shows the current status the UPS. It displays the Comm Port the UPS currently installed on, if the UPS is running on battery or AC line voltage, the DC voltage in from the power supply, current battery voltage, total power up /down cycles and total number of full battery discharges.



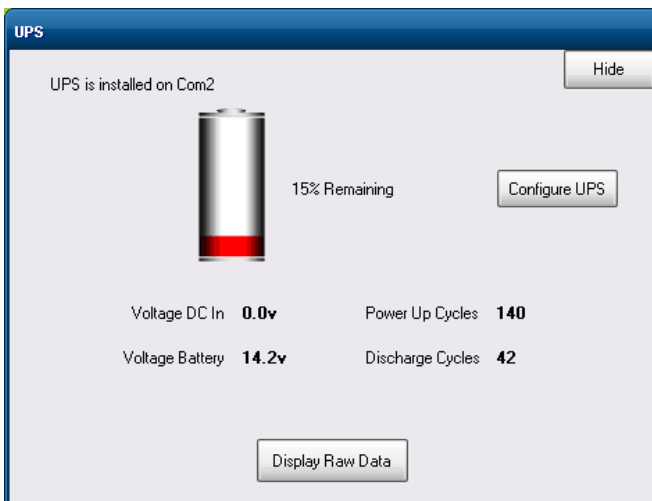
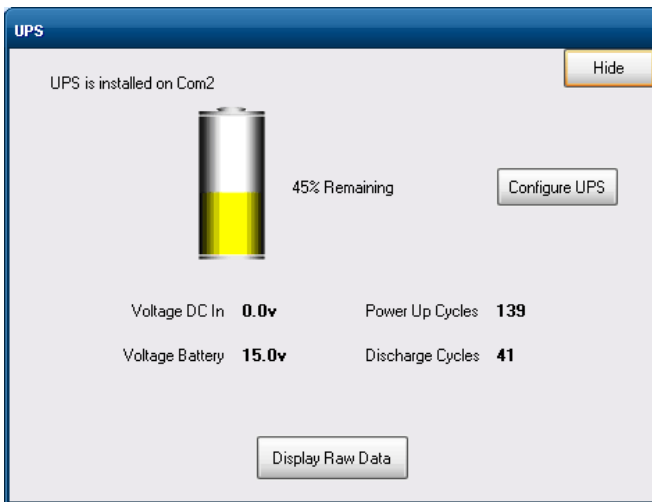
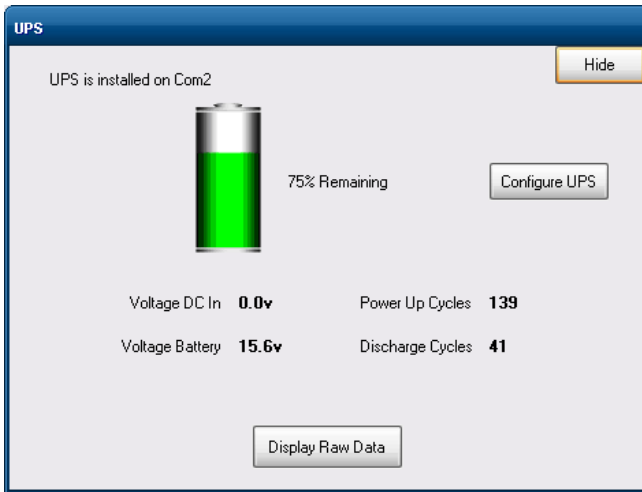
The “Power Up Cycles” shows how many power failures the UPS has experienced. This is not POS systems power up/down cycles but UPS power cycle. This is when DC power is removed from the UPS either by removing or losing AC power to the power supply or by unplugging the power in to the UPS. This is helpful for trouble shooting AC power line problems.

The “Discharge Cycles” shows the total number of full discharge cycles the batteries have experienced. The battery packs used in the J2 UPS are rated for 300 discharge cycles and should be changed after reaching more than 300 cycles. In normal operations this number should never get this high the UPS is very unlikely to experience this number of power outages in its life time.

The “Voltage DC In” show the current voltage from the power supply which should be between 18.5V and 19.5V.

The “Voltage Battery” shows the current battery voltage which should be at 16.8V when the UPS is full charged. When running on batteries this will slowly go down with the system shutting down when the voltage reached 13.7V.

When running on batteries UPS information screen shows the current charge level with a battery icon in 5% increment. The battery icon color will change from green to yellow then to red when all most full discharged as shown below.



The “Display Raw Data” button can be clicked to display all the information supplied by the UPS. This is normally used for test or diagnostic purposes.

The screenshot shows a software window titled "UPS" with a blue header. The main area is light gray and contains the following elements:

- Text: "UPS is installed on Com2" (top left) and a "Hide" button (top right).
- Battery icon: A vertical battery icon with a yellow fill level, labeled "70% Remaining".
- "Configure UPS" button: Located to the right of the battery icon.
- Status indicators:
 - Voltage DC In: **0.0v**
 - Power Up Cycles: **137**
 - Voltage Battery: **15.5v**
 - Discharge Cycles: **41**
- "Hide Raw Data" button: A prominent button with a yellow border and shadow, centered below the status indicators.
- Raw Data window: A white rectangular box at the bottom containing the following text:

```
J2 UPS Firmware Version V2.1
06/18/2012

Low Battery- = 1
AC Power Failure= 0
UPS Suspend = 1
LTC4007 -FLAG = 1
LTC4007 -LOBAT = 0
LTC4007 -CHG = 1
LTC4007 -FAULT = 1
LTC4007 SHDN = 0
LTC4007 ACP = 0
System Power ON = 1
Voltage DC In = 0.0V
Voltage Battery = 15.5V
Power Up Cycles = 137
Discharge Cycles = 41
```

Status LED

There is one green status LED on the UPS. This can be viewed by looking into the top of the base if installed on a J2 6XX series POS system.



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

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

RS-232 Pin Functions

Pin DB9	Name	Direction	Function
Pin 1	DCD	to POS	Low Battery
Pin 8	CTS	to POS	AC Power Failure
Pin 7	RTS	to UPS	UPS Shutdown
Pin 5	GND		Ground
Pin 2	RD	to POS	Receive Data
Pin 3	TD	to UPS	Transmit Data

All other RSR-232 pins are not used.

The RS-232 port is connected to the POS computer by a short cable. The pin numbers listed above are at the end of the cable. The cable is connected to the PCB by a 4 pin header. This pin out matches the connections defined by the default values of Windows XP generic UPS driver.

Electronic Design

There are three main elements to the UPS. They are the battery, the charger and system communications port. There are three external connections to the UPS which are:

- 1: Power In
- 2: Power Out
- 3: RS-232 connection

The charger and communications port are contained on a small circuit board in a case that houses the battery as well.

The charger control IC is designed specially to control the charging of the battery pack. One important function the charger controller does is to monitor the amount of current being used by the system and limits or stops battery charging to prevent the wall adapter from being overloaded.

The communication port is an RS-232 port that communicates with the POS system and the J2 smart UPS driver and receives commands from the driver.

The onboard microcontroller is the smart part in the smart UPS. It controls all the functions of the UPS. Its firmware memory may be reprogrammed through the RS-232 port. It has EEPROM on chip that stores status information.

Because the battery is always online and ready to be used any AC power line fluctuations that may have caused a glitch in the power to the unit are no longer a problem. The UPS will keep the unit running by switching to the battery then back to AC when power returns. Also the UPS will also track these AC power interruptions in an event log.

Battery Pack

The battery pack used for the J2 UPS contains a safety circuit to prevent hazardous conditions from occurring. This includes over charging, over discharging, over heating, over voltage and under voltage. No other battery pack but the one supplied by J2 should be used in the J2 UPS.

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