

# UPS Power Management Using Win98 and USB

*By Adam Stolinski  
Director of Advanced Technology*

## Technology Overview

### Microsoft Power Management

Microsoft has an important new power management capability built into Win98. It is implemented by Microsoft drivers under the new WDM32 (Windows Driver Model 32) layered driver architecture for Win98. Using the new PnP (Plug & Play) specification ACPI (Advanced Configuration & Power Interface) the new power management function provides for electrical power consumption control of external devices via Win98 O/S power policies.

These policies are set to achieve the goals of Microsoft's announced SIPC (Simply Interactive PC), OnNow and PC98 initiatives. Microsoft and Intel are seeking to have new PCs running Windows to be instantly available (no need to start or re-boot the O/S and wait while the system & applications load), while at the same time lowering the noise (fans & drive motors) by reducing the power consumed (heat generation) to a minimum without actually shutting the PC off. Receiving the "Designed for Win98" logo requires that devices conform to the power management specifications.

Microsoft has incorporated the Power Device Class (PDC) specification of the USB (Universal Serial Bus) consortium as their specification for conformance to achieve integration with the Microsoft WDM32 power management drivers.

### USB (Universal Serial Bus)

USB is an open standard specification (primarily sponsored by Microsoft and Intel along with others) to solve the limitations of current serial, parallel, mouse, keyboard & game ports. These ports do not allow multiple connections, hot plug-unplug and have slow communication transfer speeds. USB ports allow multiple connections, hot plug-unplug and have a very fast transfer speed. These characteristics are very important to the future ease of use by unsophisticated users with the increasing variety of multi-media devices attaching to the PC. It is the goal of the consortium to eventually replace the current variety of ports on PCs with only USB ports. This will provide a single uniform port for all devices (printers, modems, CD-ROM drives, video/audio recorders, etc.) with the ability to plug in and remove devices as needed without re-booting the system - and all at very high communication speed.

New PCs are being sold today with USB ports, while still keeping the old serial, parallel, etc. ports on the new PC due to the huge number of existing non-USB devices. Peripheral manufacturers are adding devices with USB ports, while still keeping versions of the old connection ports due to the huge number of existing non-USB PCs. Eventually (2 - 3 years), PCs will be made with only USB ports, and peripherals will only come with USB ports, but in the transition interval both old and new ports will be available.

It is very important to understand that USB is a "star" topology. A USB hub is necessary for USB devices to connect. The PC is the USB host and is inherently a hub, which means it can have multiple USB ports for connections. However, most peripherals are not a hub and have only one USB port. USB PC monitors and keyboards were expected to implement USB as a hub and provide the necessary additional ports for other external devices to connect. During this introductory transition phase (where the old "legacy" ports are still being provided) both cost and space are limiting the number of USB ports being put on the new PCs and monitors/keyboards. The result is that the user has a shortage of USB ports for additional USB devices. USB hubs will be available to users, at a cost, from third party vendors to provide more USB ports. Otherwise, the user will need to constantly swap USB devices in and out, depending on what application they are running.

# **MGE Product Offering for the New Technologies**

## **Connection & Functionality**

The advantages of the USB ports are lost on UPSs. UPSs are not plugged and un-plugged, and the primary USB advantage of much higher communication speed is not needed by a UPS. A USB port on a UPS is only needed when it is the only port available for connection. In fact, during the transition period, using a scarce USB port dedicated to an UPS will cause (not solve) problems for a user with more devices than ports.

The UPS needs to integrate with the power management drivers of the O/S, but the form of connection is not important. In fact, if a UPS could integrate with the O/S driver layers by using one of the legacy ports it is advantageous for the user. Many existing PCs will upgrade to Win98, but lack any USB ports. Also, as noted above, new PCs will have limited USB ports, but still have the legacy ports.

The ideal UPS for the launch of Win98 would be able to interface with the WDM32 power drivers by connecting with the legacy serial port, and this would be accomplished by interface drivers on the Win98 System CD without any intervention by the user. This is the MGE product offering.

## **MGE Win98 Product Description**

MGE has developed in cooperation with Microsoft the necessary WDM32 drivers to allow integration of our existing MGE UPS standard communication via an RS232 serial port on PCs running the new Win98 operating system. These drivers are slated for inclusion in the Win98 system CD. Microsoft strongly recommends all purchasers of the new Win98 to download the Updated Driver File when the user first installs Win98.

Within the Win98 O/S, a UPS will appear to the system as a battery. In the O/S power management policy, a desktop PC with a connected UPS then appears to the system to be the same as a notebook PC with an integrated battery. The same familiar Windows power usage policies settings for a notebook (battery alerts, percent charge and system shutdown) will then be utilized for the desktop/UPS. A new Power Management Panel is included in Win98 to allow users to customize the power policy settings. As the UPS is appearing to the O/S as a battery, only the minimum necessary UPS battery data is utilized by the system. This will be sufficient for the primary mission of a desktop UPS to be fulfilled. Auxiliary power from the UPS will support the PC (and critical peripherals) whenever utility power has failed, and the O/S will use its power policies to reduce power consumption and, when necessary, shutdown the system. All of this will be by Win98 drivers without any proprietary software from MGE.

## **MGE Personal Solution-Pac for Win98**

MGE has certified its Personal Solution-Pac (PSP) for Win98 and it is included in the Win98 System CD. (It is also on the Solution-Pac 98 CD shipping with every MGE UPS.) Any MGE UPS will be recognized by Win98 upon attaching to the serial port, and PSP will be automatically loaded by Win98 from the Win98 System CD.

While the Win98 WDM32 integrated drivers will satisfy 90% of the PC users, there will be some users who desire the more comprehensive monitoring/control of MGE's Personal Solution-Pac. By including PSP on the Win98 CD, MGE customers can have their choice of using the integrated power management of Win98 or the MGE Personal Solution-Pac (which includes control of PowerShare receptacles.)

MGE is cooperating with Microsoft for including more sophisticated UPS monitoring and controls in the upcoming Win/NT 5.0. As the O/S evolves with respect to power management, any additional UPS applications will become unnecessary. Until then, MGE will maintain its Solution-Pac suite of applications for those users desiring more comprehensive UPS information.

## **USB Connection by MGE UPS**

MGE has developed a USB slot card for its Pulsar EX and ESV+ lines of UPS. We do not plan to commercialize this card for our general catalog, however it will be available when required. The use of a USB connection is not only not required for implementing Win98 power management, as noted above, it is really not advantageous to the user during the transition period of the next few years. Given the choice of free integration with Win98 or purchasing a USB adapter, we fully expect that all users will choose the advantages of legacy port connection and full integration at no additional cost.

MGE is developing its future generation of UPSs to have USB connectors embedded in the UPS, to meet the time when only USB connectors will be available on PCs. MGE has the right product offering now, and will have the right product offering in the future.