POWER & YOUR PC

The power coming into a computer is the most critical component, and it may be one of the most overlooked. It is just taken for granted that it will always be there and working properly. A top of the line processor and ultra powerful video card do nothing if a system does not receive the ample, stable power it demands. Having quality components providing and regulating the power supplied to a computer is critical, and this brief overview looks at a few areas worth consideration.

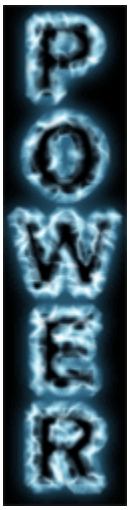
Power Supplies

Computer power supplies take the high (110V or 220V) AC voltages from an electrical outlet and convert it to the various lower DC voltages required for a system to operate. The typical voltages required inside a computer are 3.3V, 5V, and 12V, where the 3.3V and 5V lines are generally used to power circuitry, and the 12V line provides power to run items such as hard drives, optical drives, and cooling fans.

Power supplies are sold in terms of their total power output, in terms of wattage. Choosing the correct power supply means not only finding one that will provide enough power for all of the components connected to the system, but also one that is the correct size physically, has enough connections for typical drives and fans, and if necessary, that also has special connections for things such as Serial ATA drives and modern video cards.

Choosing a power supply with enough power shouldn't be much of a problem, as having more power than you need is never a bad thing. Just because a power supply is rated for 400W, or perhaps 600W, does not imply that it is drawing that at any given time. It just indicates the total power available to the various lines inside the computer. For those interested in getting a good idea of their minimum power requirements, this Power Wattage Calculator is a convenient reference. In addition to checking out the total wattage of a power supply, looking for strong amperage ratings on the 3.3V, 5V, and 12V lines is also recommended,

as power supplies with identical total power ratings may distribute the power to the various lines in different quantities.



Power supplies come in a few different physical sizes, but the most common are designed to fit the standard ATX and micro ATX (mATX) form factor cases. A typical ATX power supply, such as this Echo-Star 680W unit, measures 3.25” x 6” x 5.5” and features two cooling fans to not only cool the power supply, but to also help draw hot air out of the computer. A typical mATX power supply, such as this A-Power 320W unit, measures 2.5” x 5” x 4” and due to the smaller size features just one cooling fan. mATX cases are generally much smaller than ATX cases, and therefore have smaller power supplies, with generally lower power ratings, and fewer connectors.

The connectors on a power supply also deserve consideration. Most power supplies come with what looks to be an electric octopus of wires hanging off the back surface, and you need to make sure that somewhere in that tangled bundle are all of the connectors you need. The power

supply should at least have as many connections as the number of drives, cooling fans, and other items found in the case. Up until recently power supplies had a fixed number of connections, and if you needed more, you needed to use splitters to distribute the power to all the components. Modular power supplies, such as theUltra X-Connect 500W unit, are now available that eliminate that “electric octopus” all together, and allow the end user to connect just the cables they need. The flexibility of a modular power supply design not only lets you customize the connections to your needs, it also makes for a simple and tidy installation, since there are no extra wires dangling inside the case.

The selection of a high quality power supply may cost more money up front, but down the road it could wind up saving money. Many manufacturers now offer power supplies that consume less energy thanks to high quality internal components, advanced designs, and active power factor correction. These units are now able to provide the same power to the components in a computer, but due to increased efficiency, draw less power from the electrical outlet.

Surge Protectors

Surge protectors are intended to protect your electronics from a brief increase in voltage caused by such things as lightning, rolling blackouts, and heavy drawing electrical equipment. A surge protector reacts to divert the extra electricity to ground, and thus protects your expensive computer equipment from damage. A surge is any increase lasting three nanoseconds or longer, so a surge protector needs to react quickly. Most surge protectors also include a fuse (or breaker), and if the surge is too great to be handled without interruption, the fuse will blow. Although the fuse may be destroyed, it's a small loss compared to what it may have saved.

Surge protectors come in all shapes and styles. Some basic models can even be found at your local dollar store, but offer no more than a few outlets connected to a breaker. No serious protection is obtained, but many people just want more outlets, not protection.

More serious surge protectors will probably cost a bit more than a dollar,

but will offer some peace of mind that your equipment is actually being protected. In addition to protecting from electrical surges, some devices include extra features such as conditioning to filter out line noise and ports to protect other lines such as cable television, telephone, and networking.

The Fellowes Smart Surge Power Strip protects up to 10 devices from surges, as well as offering line conditioning and ports to protect your phone line. A highly appealing feature of such a surge protector is that 4 of the ports are designed to accept bulky AC adaptors. For those with surge protectors that weren't designed to be this user friendly, there is still hope in the form of Power Strip Saver Cables. Basically just 7 inch long extension cords, these items can come in very handy when trying to connect multiple AC adaptors to a more traditional surge protector.

Uninterruptible Power Supplies

Many people familiar with Uninterruptible power supplies (UPS) know that they can keep a computer up and running during a total power failure, but don't know what else they do. Most UPSes will also provide

protection from voltage surges and sags (when the voltage drops below normal), as well as protection from the possibility of a shift in the electricity's frequency.

UPSes come in two varieties, standby and continuous, although standby versions are far more common and less expensive. A standby UPS allows the devices connected to it to run from the normal electrical connection until a loss of power is detected, at which point it quickly (in a matter of milliseconds) switches to the battery backup of the UPS. A continuous UPS always has the devices connected to it running off of battery power, while the batteries are recharged by the normal electrical connection.

UPSes are sold in terms of their capacity, in terms of VA (voltage multiplied by amperage). This implies that devices connected to the UPS can draw a maximum of so much amperage at a specific voltage. A run time after a power failure is also generally specified for a UPS based on a full load being placed on the device.

Selecting a UPS needs to be based on the intended use… A smaller unit, such as the Fenton 600VA, would be adequate for powering a typical desktop computer, monitor, and smaller peripherals such as a printer and lighting for what they rate as 15-23 minutes at full load. If multiple systems need to be powered, or perhaps there are plans for future expansion that will add to the power demands, a larger unit such as the Tripp Lite 1500VA may be more appropriate. The first two units are intended to be set in close proximity to the devices to be powered, perhaps on the floor behind a desk, but if you are seeking to add a UPS to a server, there are also rackmount solutions such as the Opti-UPS 1100VA.

No matter the application, sizing a UPS may seem overwhelming. One manufacturer, APC, has created a handyUPS Selector Application which will take some of the guess work out of choosing the right UPS for any particular application.

Source: http://www.geeks.com/techtips/2004/techtips-09dec04.htm