

## 2.5.5 Power Protection Facts

The following table lists power conditions you should be familiar with:

Problem	Description
Surge	Overvoltage that lasts seconds
Spike	Overvoltage that lasts milliseconds
Sag	Undervoltage that lasts milliseconds
Brownout	Undervoltage that lasts seconds (lights dim)
Blackout	Complete power failure

The following is a description of devices used to prevent power problems:

Device	Description
Surge Suppressor	A surge suppressor conditions power so that overvoltages don't reach devices.
Surge Protector	<p>A surge protector protects against overvoltages by switching a device off before an overvoltage can damage it.</p> <ul style="list-style-type: none"><li>▪ A power strip provides multiple power outlets from a single plug-in, but is not necessarily a surge protector.</li><li>▪ Surge protectors can be destroyed by surges and lose their ability to protect.</li><li>▪ Consider using a surge protector with an indicator light to show whether it is working correctly.</li></ul>
Line Conditioner	A <i>line conditioner</i> modifies the power signal to remove noise and create a smooth alternating current (AC) signal.
Standby Power Supply (SPS)	A <i>standby power supply</i> is an offline device that switches over to provide power when an undervoltage occurs. If the switchover is not fast enough, the computer loses power.
Uninterruptible Power Supply (UPS)	<p>An <i>uninterruptible power supply</i> is an online device that is constantly providing battery power to the computer and being recharged by the wall outlet.</p> <ul style="list-style-type: none"><li>▪ There are two types of UPS systems:<ul style="list-style-type: none"><li>▪ An <i>online</i> UPS constantly powers the computer from the battery.</li><li>▪ An <i>offline</i> UPS powers the computer from the wall power. When the power fails, a switch inside the UPS switches to power the computer from the battery. This is the most common form of UPS.</li></ul></li><li>▪ UPS size is measured by the volt-amp (VA) rating. The capacity of the UPS determines the number of devices and how long the devices can run when power is interrupted.</li><li>▪ When purchasing a UPS, purchase one with enough battery power to power only critical devices such as the computer and a single monitor.<ul style="list-style-type: none"><li>▪ To reduce the amount of power required by the UPS, do not plug non-critical devices in to the UPS.</li></ul></li></ul>

- Laser printers require more power than most UPS systems are capable of providing. For this reason, you should not connect a laser printer to a UPS. If you must provide power to a laser printer, get a dedicated UPS for that device.
- A UPS is designed to provide enough power to shut a system down safely during an extended power outage. Most are not intended as long-term power solutions.
- The UPS connects to the power source (usually a wall socket), the computer plugs into the UPS, and the UPS is connected through a serial or USB port to the computer. Software on the computer uses this connection to monitor battery life and to detect when the regular power is lost. You can configure the software to shut the system down automatically when the battery charge reaches a certain level. You usually need to configure the following settings when working with UPS software:
  - Time to wait before sending a warning to clients
  - Time to wait before beginning a shutdown
  - Name of programs or commands to run during shutdown
- In addition to providing power when the power is lost, most UPS systems also condition the line and remove power spikes and sags.
- Most UPS devices sound an alarm when the AC power is lost. This alarm continues until AC power is restored, although many UPS devices have a switch to mute the alarm.

During certain conditions, such as an electrical storm or when the power supply is constantly going up or down, you might need to unplug the computer to protect it. Simply turning it off might still damage the components because some power remains supplied to the system. In the case of an electrical storm, keeping the system plugged in leaves it susceptible to power spikes.

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