Install an advanced power strip (advanced power strips) to reduce the continuous energy consumption of peripheral devices in computer work stations or entertainment centers. Select a tier 1, master-slave, adjustable load-sensing model. Decide on an appropriate master device for a station. Determine slave device eligibility, ensuring no functionality loss. Measure the low-power modes of the eligible slave devices to determine the advanced power strips cost-effectiveness in that station. Install advanced power strips where good economics dictate, confirming operation of the power strip and all attached devices.

Home performance contractors, recommend advanced power strips as part of a home performance assessment. Builders, recommend advanced power strips to your homebuyers as a way to increase and maintain energy savings.
Description

Miscellaneous electric loads (MELs), such as televisions, personal computers, game consoles, speakers, cable boxes, and printers, account for almost 10% of residential electricity use and are responsible for a growing portion of home energy consumption (DOE 2013), (EIA 2013). Such home devices continue to draw power when off but plugged into a main electrical outlet. Advanced power strips can provide energy use savings by terminating power to devices that otherwise stay in a low-power mode when they are not being used. There are many types of advanced power strips, and the right application will depend on consumer habits, preferences, and the components plugged into the power strip (NREL 2013), (Earle and Sparn 2012).

Tier 1 advanced power strips (discussed here) rely on a single master device being turned off by the user, as opposed to tier 2 advanced power strips, which can turn off both slave and master devices after a preset period of inactivity. Devices plugged into the slave outlets on a master-slave, load-sensing advanced power strip are shut down when the device plugged into the master outlet is turned off by the user. Thus, components plugged into the slave outlets receive no power when the master device is unused. This type of advanced power strip can be a cost-effective, owner-friendly solution for reducing MELs at entertainment centers (see Figure 1) and computer stations (see Figure 2).

The higher the continuous low-power draw, the more attractive is the advanced power strip economics. A minimum continuous power draw among slave components must be reached for an advanced power strip installation to be cost effective. The cost-effectiveness is further improved if the users’ habits are to leave peripheral electronics on, but the assumption is that unused devices are turned off but not unplugged.

Figure 1. Example of an entertainment center where an advanced power strip might be used with a television, DVD, game console, and speakers (image courtesy of BA-PIRC and Florida Solar Energy Center).

Figure 2. Example of a home computer station where an advanced power strip might be used with a computer, monitor, and speakers (image courtesy of BA-PIRC and Florida Solar Energy Center).

Determining the total continuous low-power draw for each station is warranted. However, consider the cost of electricity use
monitoring equipment (commonly available for $20) and the time requirement for inexperienced, low-volume contractors or owners. For help in gauging the energy-savings potential for many electronics, reference New York State Energy Research and Development Authority’s 2011 report containing power consumption data for active, standby, and off-power modes for many peripheral devices (Koser and Uthe 2011).

In a large retrofit program, master-slave, load-sensing advanced power strips commonly available for about $30 demonstrate good economics when the peripheral devices combined draw about 10 watts or more, continuously. (Sutherland et al. 2014). Note that not all peripheral electronics are good slave device candidates, as described below.

How to Determine Station and Device Eligibility

1. Choose the master device, typically a television or primary computer. This will be the single device controlled by the user, whose power state will determine the power state of the chosen slave device(s).

2. Determine which power cords control which devices. Access to the loads to be controlled is sometimes difficult—power cords are often behind furniture adjacent to a wall with poor access or located on power strips with no indication of which power cords belong to which device.

3. Determine acceptable slave device(s) to be plugged into the advanced power strips. Exclude any peripheral devices that will suffer functionality loss. These may include recording devices that are often programmed to record when the television is off, cable boxes with unacceptably long re-boot times, wireless printers that may be accessed from an outside station, and head-parking printers that may not park their heads appropriately if power is shut down from the outlet.

4. Total the continuous low-power draw for all slave devices to gauge economics. While off, plug each device individually into an energy use-measuring device and record wattage. Tally the continuous draw in the low-power mode for all slave devices to confirm that the power draw threshold is met.

Reaching the cost-effective power draw threshold can be difficult for three reasons:

- Many modern device models of DVD and CD players, sound systems, and amplifiers have little power loss in their low-power modes.
- Equipment such as wireless printers, printers with head-parking needs, modems, recording devices, video games, and satellite box devices may lose functionality when shut down by an advanced power strip. These electronics must be excluded from the continuous power draw tally because they cannot serve as slave devices.
- Co-located, independent devices such as audio playing equipment and televisions that the owner operates independently cannot serve as slave devices.

How to Set Up Master-Slave, Load-Sensing Advanced Power Strips

1. Plug the master and slave devices into the appropriate, well-labeled, strip outlets. The advanced power strips will typically have “always on” outlets available for surrounding equipment that are neither a master nor a slave.

2. If a current sensitivity adjustment exists, adjust until the slave devices properly detect when the master device is on and off. A light on the strip may indicate when the master load is cycled. Otherwise current sensing can be tested by turning the master device on and off and confirming that power to the slave outlet goes on and off, respectively.

3. Confirm proper, acceptable operation of all attached devices with the owner.
Ensuring Success

To ensure the advanced power strip set up is without functionality loss, speak with the owners to determine how all components are used and confirm acceptable operation after installation. Equipment such as wireless printers, printers with head-parking needs, modems, recording devices, video games, and satellite box devices may lose functionality when shut down by an advanced power strip.

When totaling the continuous load for peripheral electronics, consider that some devices have multiple low-power modes. Which low-power mode is used may determine if the continuous draw threshold is met. A video game device may have low-power modes of 2 and 10 watts, for example. Expected savings might only be achieved if the higher of these two modes is typically used in the current set up. Again, the installer and owner need to understand the low-power mode functions to consider functionality loss acceptability.

Identifying acceptable slave components and determining if the minimum continuous power draw threshold is met can be time consuming. Installation contractors who can identify probable acceptable and unacceptable components can greatly reduce the advanced power strip set up time.

The power strip itself has a continuous draw. An acceptable advanced power strips should consume less than 1 watt.

Contractors should seek owner motivation for, and understanding of, the advanced power strip proposition. Uninterested owners will be less tolerant of subtle work station or entertainment center changes (e.g., having to wait for a cable box to re-boot). And the educated consumer will be better able to properly adjust the advanced power strip set up in the likely event of a station reconfiguration or when adding new devices.
Climate

No climate-specific information applies.
Training

Right and Wrong Images

None Available
Compliance

The Compliance tab contains both program and code information. Code language is excerpted and summarized below. For exact code language, refer to the applicable code, which may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

No compliance-specific information applies at this time.
More Info.

Access to some references may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

Case Studies
None Available

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*Publication dates are shown for formal documents. Dates are not shown for non-dated media. Access dates for referenced, non-dated media, such as web sites, are shown in the measure guide text.

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