

P4400 KILL A WATT™ Meter

Congratulations! You are now the proud renter of a KILL A WATT™ watt meter. Obtaining your watt meter is the first step towards becoming more aware of the energy you consume on a daily basis.

Why should you care about your personal energy use?

- ✓ Penn State campuses consume a combined 300 million kilowatt hours (kWh) of electricity annually. This is the equivalent of the amount of electricity used by over 23,000 homes per year.
- ✓ The majority of Penn State's electricity is generated from coal.
- ✓ University Park energy consumption accounts for about 80% of the total energy consumption from all campuses.
- ✓ Although there have been reductions in energy usage, electricity costs for the University nearly doubled from the 2008 to 2009 rate due to the phase out of rate caps. Penn State's electricity bill totals \$2 million each month.

As a part of the Penn State community, we are all affected by these costs, as well as the environmental costs of intensive energy consumption from fossil fuels.

What exactly is a watt meter?

A watt meter is a device that enables a consumer to read directly how much power appliances are consuming. The P4400 KILL A WATT™ meter is a consumer power consumption of appliances and determines the actual cost of power consumed. This watt meter calculates total energy and cost, and also saves data when the unit is unplugged.



Watt meters can be borrowed from the Penn State University Libraries by visiting <http://tinyurl.com/PSULwattmeters>.

Operating Instructions

Step One:

Plug your watt meter into an electrical outlet. Then plug the appliance you wish to monitor into the face of the watt meter.

Step Two:

Read and understand the output of the watt meter. On the front of the meter you will see six buttons labeled **Volt**, **Amp**, **Watt/VA**, **Hz/PF** and **KWH/Hour**. When you press the buttons, the number that appears on the screen is expressed in the unit corresponding to that button.

Volt – The volt is a unit of electrical potential. The voltage of most household electric outlets in the U.S. is 120V.

Amp – The amp is a unit that measures electric current, telling us the number of electrons in motion through the outlet at any given second.

Watt/VA – Press this button once to see how many watts, or useful power, is being transferred to the appliance per second. (For example, incandescent light bulbs are typically 60 watts, meaning at any given second, 60 watts of power are required to illuminate the bulb.)

Press this button a second time to see the VA reading. The VA reading is equal to the product of the Volt and Amp readings. This number expresses the total power transferred by the electric conversation per second and will always be greater than the watt reading.

Hz/PF – Press this button once to display Hz, or Hertz, and twice to show PF, the Power Factor of the appliance. Hertz is a unit of frequency defined as cycles per second. Most electric power is generated at 50 or 60Hz. Power Factor is an expression of efficiency calculated by dividing the

watt reading by the VA reading (useful power divided by total power being drawn).

KWH/Hour – Press the pink button once to show the total energy consumed since the watt meter was plugged in. A kilowatt is equal to 1,000 watts. If a 60 watt light bulb is left on for 17 hours, it will consumer roughly 1 kWh of electricity (60 watts/1,000 = .06 kW x 17 hrs = 1.02 kWh).

Step Three:

Download the Office Electricity Calculator at <http://sustainability.psu.edu/watt-meters>.

This calculator allows you to enter the kWh and hour information collected from your watt meter and uses it to calculate electricity costs over the entire year, including nights and weekends.

- Or, using the units provided by the watt meter, you can calculate your total energy use and how much it costs. Energy is billed per kWh, so: Cost of electricity = kWh (the value obtained by pressing the KWH/Hours button once) x the price you pay electricity.
- Yearly cost = Watt reading / 1,000 x number of hours you use the appliance per week x 52 weeks in a year x the price you pay for electricity. (Note: Penn State pays \$.85/kWh)
- To calculate how much you will save by unplugging an appliance over a weekend and/or in off hours, plug the appliance into the face of the watt meter and then plug the watt meter into the wall. Leave it plugged in for the amount of time you wish to monitor. Savings = kWh reading x price you pay for electricity.
- To calculate the cost of electricity used in a week, leave the appliance plugged into the watt meter for an entire week of typical usage. For yearly cost, multiply weekly electricity usage in kWh x 52 x the price you pay for electricity.

For more information, please visit:
<http://sustainability.psu.edu/watt-meters>

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