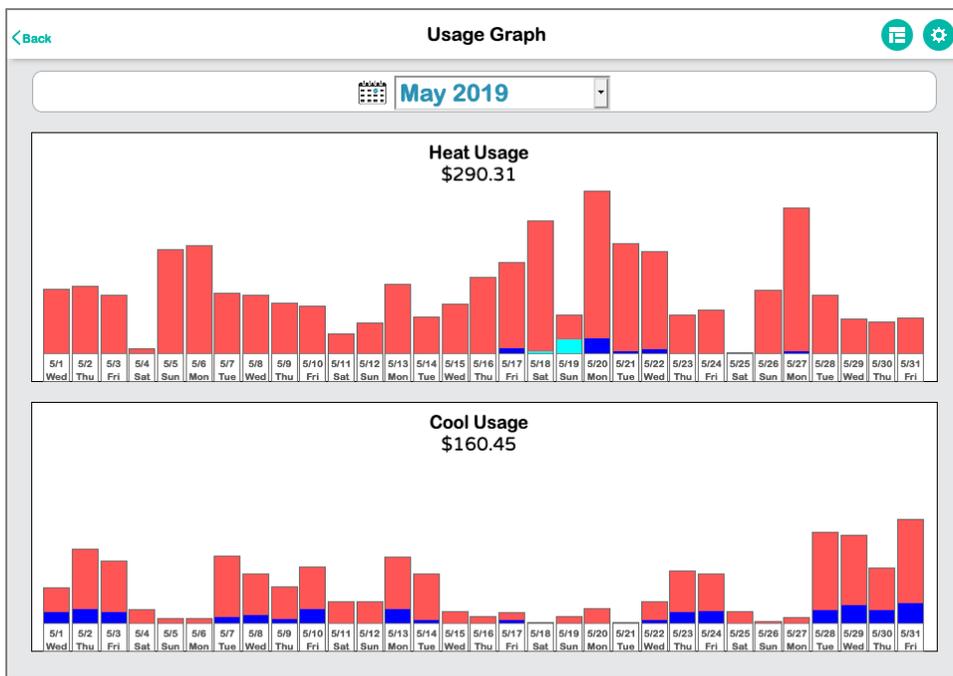




Understanding Your Energy Usage

Pelican Wireless Systems provides you with the ability to view historical energy consumption. This report is available from Pelican Web App main menu by selecting **Usage Graph**. The usage graph allows you to view historical energy consumption for hours, days or months.



Report Filters

Report filters allow you to define what data is displayed. This data can be viewed by group or individual thermostats. It also allows for a variety of display changes such as: month, day or hourly, start time and end time, and cost, run-time or usage. Refer to **Settings** and **Display** for details on how to use the Usage Graph filters.

Settings

Device Selection: All of the active HVAC units are listed. Placing a check next to any device will include that device in the graph.

Color Selection: The user can select different colors for each device. This will display stacked bars of different colors in the graph.

TECHNICAL BRIEF

Display

1. Resolution

- **Hours View** displays a single day's usage in 15-minute increments.
- **Days View** displays daily usage for a single month.
- **Months View** displays monthly usage for a year.

2. Type

- **Run Time** is measured in hours and minutes.
- **Energy Usage** is measured to power consumptions. If the HVAC unit uses electric heat (i.e., heat pump or electric coil) the unit of measure for Heat Usage will be in kilowatt per hour (kWh); otherwise, the unit of measure will be in therms (thm). The Cool Usage graph will display in kWh.
- **Energy Cost** is measured in dollars.

3. Duration

- Allows you to show the usage during a specified period of time by entering a start time and an end time.

Energy Calculations

The Pelican energy management system automatically calculates both power consumption and cost based on actual run time data and system configuration data.

Power Usage

Power usage is based on the measured run time multiplied by the user configured rate of consumption. For electrical consumption the formula is:

$$\text{kWh} = \text{kW} \times \text{h}$$

kWh = kilowatt hours

kW = (kilowatts) = Volts x Amperes x Power Factor / 1000

h = hours



The Pelican energy management system captures the actual number of minutes the HVAC unit is in use and divides by 60 to get hours (h). The kilowatt rate (kW) is configured for each HVAC unit under the Admin > Thermostat Setup window of the Pelican Web App. The Cooling Size and Heater Size fields should be set to the correct value for the HVAC unit. For the most accurate calculation, the kilowatts should be measured on each HVAC unit while it is in use and that value should be entered. Alternatively, the Pelican Web App will convert watts or tons to kilowatts. The conversion formulas are:

$$\text{kW} = \text{watts} / 1000$$

$$\text{kW} = \text{ton} / 1.2 \text{ (NOTE: This assumes an EER of 10)}$$

For natural gas or oil consumption, the formula is:

$$\text{Therms} = \text{Btu} / \text{hr} \times \text{h}$$

$$\text{Therms} = \text{units of energy}$$

$$\text{Btu/hr} = \text{British Thermal Units (Btu) the HVAC unit consumes per hour}$$

$$\text{h} = \text{hours}$$

The Pelican Wireless HVAC Energy Management Solution captures the actual number of minutes the HVAC heater unit is running and divides by 60 to get hours (h). The Btus are configured for each HVAC unit under the Admin > Thermostat Configuration > Power Consumption of the Pelican Web App. The Heat Size and Cool Size field(s) should be set to the correct value. For the most accurate calculation, the HVAC unit's Btu rating should be used. Alternatively, the Pelican Web App will convert tons to Btus. The conversion formula is:

$$\text{Btu} = \text{tons} \times 12,000\text{b}$$

Cost Calculations

The Pelican energy management system will display energy cost based on the configured energy rates charged by the local utility. The energy rates are entered into the system using the Admin > Site Settings > Utility Cost fields. The two fields should be entered: Cost / kWh and Cost / Therm. For the most accurate estimate, a recent utility energy statement should be consulted. The average Cost / kWh and Cost / Therm can be calculated by dividing the charged amount on the energy bill by the total energy usage on the bill.

Energy costs are simply the average rate charged multiplied by the energy consumed:

$$\text{Electrical Cost} = \text{kWh} \times \text{Cost} / \text{kWh}$$

$$\text{Gas/Oil Cost} = \text{Therms} \times \text{Cost} / \text{Therm}$$