

## Appendix B: Residential Component Educational Materials

### B.1 Effectiveness of BEMs: Tendril Information

Topic	Page
Tendril User Guide	B-2
Tendril Troubleshooting Guide	B-45
Tendril Set Point Thermostat User's Guide	B-51
About Your New Home Area Network	B-78
Tendril Frequently Asked Questions	B-79
Tendril Getting Started Guide	B-81

### B.2 Effectiveness of BEMs: Energy Efficiency Information

Topic	Page
Messages Posted on Tendril Devices	B-82
Energy Efficiency postcard mailed to all Chugach customers	B-83
SmartPowerAK Content	B-85
Energy Programs	B-85
Stop Losing Money	B-88
Links	B-90
Home Page	B-92
In the News	B-93
House Passes Caulkers Bill (5/6/2010)	B-93
New Guidelines for ENERGY STAR Homes (5/24/2010)	B-96
Akeneryefficiency.org (6/30/2010)	B-97
Consumer Behavior and Electricity Usage (7/26/2010)	B-98

### B.3 Comparison/Assessment of BEMs: Device Information

Topic	Page
Information and Tips for OpenPeak Device	B-103
OpenPeak Quick Start Guide	B-104
EnergyHub Dashboard System User Manual	B-105

### B.4 Appliance Power Meters: Device Information

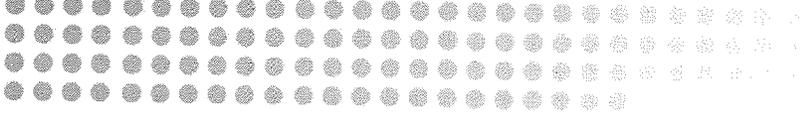
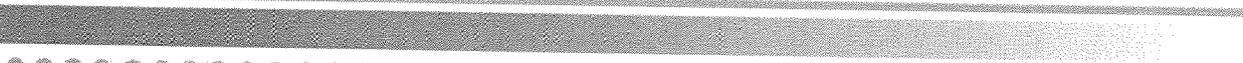
Topic	Page
Watts Up? Operator Manual	B-106
Kill A Watt Operating Manual	B-109



# Tendril Residential Energy Ecosystem

## User's Guide

TREE 1.6.0





---

## Table of Contents

Welcome to TREE .....	1
How Does The Tendril Residential Energy Ecosystem Work? .....	1
Additional Devices .....	2
Getting Help .....	2
Working with Transport .....	3
Working with Translate .....	4
Working with Insight .....	5
Navigating Insight .....	6
Viewing your Electricity Consumption .....	7
Viewing Messages .....	10
Configuring Audible Notification of Incoming Messages .....	10
Setting Custom Alerts .....	11
Configuring Insight's Appearance .....	12
Checking the Status of your TREE .....	16
Using Vantage .....	17
Interpreting Your Energy Consumption .....	19
Home Network .....	24
Home Network: Control Set Point Thermostat .....	25
Device Setup .....	28
User Profile .....	29
Upgrading your TREE .....	31
Over-the-Air Updates .....	32
Over-the-Internet Updates .....	32
Troubleshooting .....	33
Troubleshooting Transport .....	33
Troubleshooting Translate .....	36
Troubleshooting Insight .....	37
Important Consumer Information .....	38





## Welcome to TREE

---

- Tendril Vantage displays information through a Web-based interface or *portal* which helps you understand and manage energy information so you can control the energy consumption in your home. Through Vantage, you can register and manage your TREE components, review present consumption through a dashboard, view historical and comparison data and receive energy-related event messages.
- Tendril Transport provides the connectivity between the network of smart energy devices in your home and the network operations center, via the Internet.

### Additional Devices

Depending on your TREE configuration, you may use some of the following devices. For information on setting up these devices, see the *Getting Started* booklet provided with your kit.

- Tendril Relay extends the range of the signal from your smart meter to other TREE devices in your home.
- Tendril Translate receives energy consumption information from your meter and communicates it to other TREE devices in your home. Only certain kinds of meters (AMR) require a Translate.
- Tendril Set Point is a smart thermostat that helps you better understand and manage energy consumption in your home.

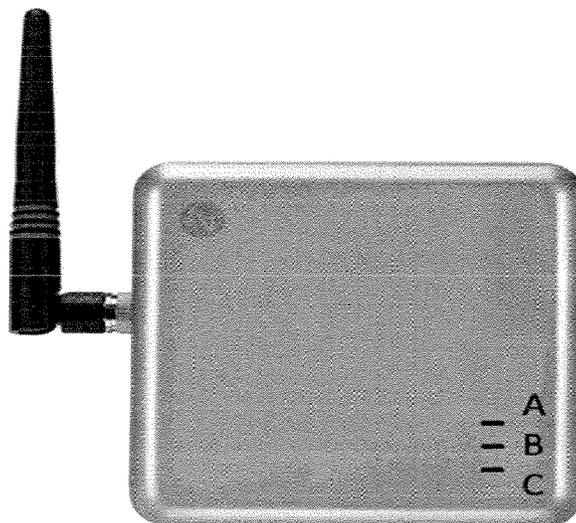
### Getting Help

Refer to the section on *Troubleshooting* to resolve issues you may be experiencing with any TREE devices. For assistance in setting up or using your Tendril Residential Energy Ecosystem, or to provide some general feedback, please contact Customer Support. Customer Support hours are from 8am until 5pm MST; questions submitted outside of business hours will be addressed the next business day.

- By phone: 866-364-4526
- By email: [support@tendrilinc.com](mailto:support@tendrilinc.com)

# Working with Transport

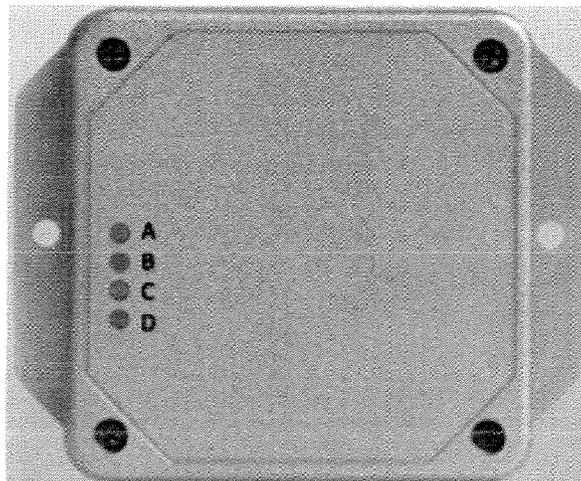
Transport facilitates the communication of energy related data such as present price and consumption information from a smart meter; regular consumption information for historical cataloging; and commissioning, registration, and diagnostics messages. Ideally, your Transport should be no farther than 40-50 feet from your Insight; however, if you do set up your devices more than 40-50 feet from each other, you may need a Tendril Relay wireless range extender to boost the signals between the devices. For information on LED functionality and troubleshooting, see the chapter on *Troubleshooting*. For ease of explanation, each LED *in this Guide* is labeled with a letter – A, B, or C (the actual LEDs on the device are *not* labeled). Refer to the section on *Working with Transport* for an illustration of this device and the location of the LEDs.



## Working with Translate

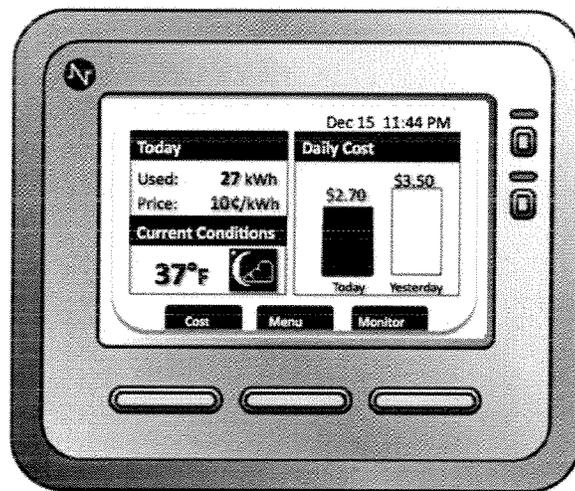
Translate receives energy consumption information from your AMR meter and communicates it to other TREE devices in your home. You can determine when Translate is communicating properly by looking at the LED lights on the front of the device. Each LED is labeled with a letter – A, B, C, or D. Note that this device may not be part of your TREE configuration; only certain types of meters require a Translate. For ease of explanation, each LED *in this Guide* is labeled with a letter – A, B, C, or D (the actual LEDs on the device are *not* labeled).

For information on LED functionality and troubleshooting, see the chapter on *Troubleshooting*.



## Working with Insight

The Tendril Residential Energy Ecosystem gives you a powerful resource to help you to manage your home energy costs. The ability to monitor and interpret your consumption data gives you the tools you need to make informed choices about your power use.



Insight Home Screen

Insight provides near real-time feedback on your energy consumption. With Insight, you can view your present usage (kW) and the associated cost per hour. In addition to present consumption, you can view your bill period-to-date usage and corresponding bill - how much you've already spent and how much your bill is estimated to be at the end of the billing period, based on your consumption history.

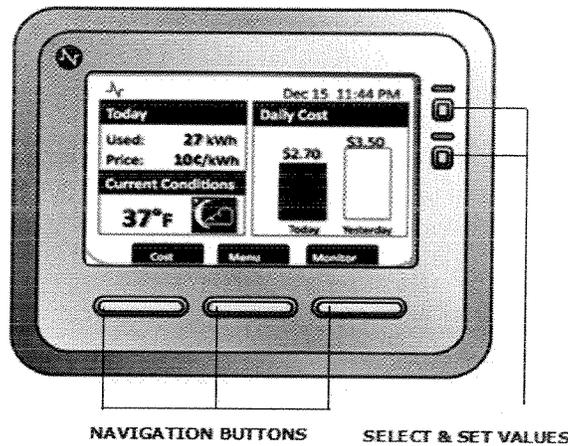
Through Insight, your energy provider can send you alerts, such as an upcoming change in pricing, providing an important tool to keep you informed.

This chapter will help you interpret the data you see and navigate Insight's screens, alerts, and options, as well as configure your Insight to meet your needs.

### Navigating Insight

Insight has two sets of buttons:

- The three buttons along the bottom of the device correspond to labels displayed on the Insight screen; click the button below a label to access that function or screen. The labels associated with the buttons change based on the current context of the screen.
- The two buttons on the right side of the device let you increment or decrement threshold values when you define alerts or enable/disable settings; you can also use these buttons to flip through available options for a given setting. Like the navigation buttons, the labels associated with these buttons change based on the current screen context.



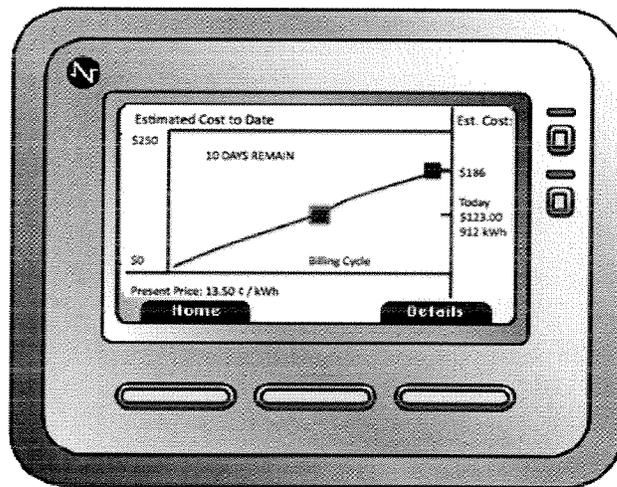
## Viewing Your Electricity Consumption

The first time you set up and register your Insight, the Home screen will be displayed. From this screen, you can review your present household consumption in terms of cost and actual consumption rate (kWh). You can also view your daily cost or compare today's consumption to yesterday's (after TREE gathers information from prior days). In addition, you can display the current climate conditions for your geographic area.

From the Home screen, you can access your Cost, Menu, and Monitor screens, which provide additional details about your energy consumption as well as the ability to change the alerts and settings for your TREE.

### Cost

From your Home screen, press Cost to display a graph indicating how much you've spent in your current billing cycle, as well as an estimate of what your bill will be for the current month, based on your consumption rate.

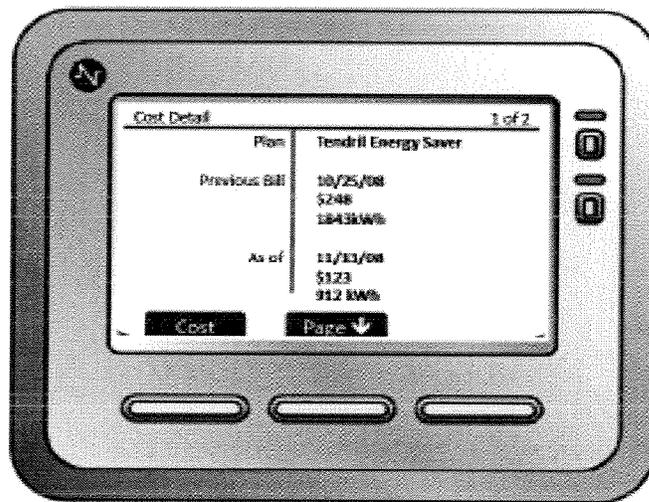


This screen includes the following information:

- Days Remain: The number of days left in your billing cycle.
- Estimated Cost: An estimation of your bill at the end of this billing period; this information is provided through a data file imported from your energy provider.
- Today: Consumption to date in the billing period (kWh) and your actual bill to date (\$), which is your consumption to date multiplied by the price. This information is recalculated and updated on your Insight every 25 minutes.
- Present Price: Your present cost of electricity.

## Working with Insight

From the Cost screen, press Details to display a comprehensive listing of energy cost information. This includes the name of your energy plan, price and usage information from your last bill, current price and usage to date, your estimated bill, and the number of days remaining in your billing cycle. To see all of information on the Details screen, press the Page button.



### Why doesn't my bill-to-date value in Insight match what is displayed in Vantage?

While Insight calculates your actual bill value throughout the day and updates its display every 25 minutes, Vantage updates this value when the data collected by TREE is reconciled with your energy provider's information systems. With the exception of the times that the data across the system is reconciled (approximately daily), this value will not be exactly the same in both Vantage and Insight.

### Menu

Insight's Menu screen lets you display message logs, change the settings on your Insight, and set the status of alerts. From the Home screen, click Menu to display a list of options you can adjust.



## Viewing Messages

Insight displays messages and notifications sent to you by your electricity provider. Messages are classified as critical or normal. When you receive a message, it appears on your Insight Home screen (messages also appear in the Dashboard of your Vantage portal). If the message is flagged as critical, the buttons on the right side of your Insight flash orange and the message does not clear from the Home screen until you acknowledge it, as indicated on the screen. You can also configure Insight to use audio alerts, which sound when a critical message is received.

If a noncritical message is received while a critical message is displayed, Insight puts the message in its log, but does not notify you that another message was received. If a second critical message is received while a critical message is displayed, Insight displays it on the Home screen and sounds the alert, if configured to do so, as soon as the first message is acknowledged.

Messages can be viewed from your Insight Message Log. The Message Log holds five messages. Messages are managed as first in, first out, meaning that if you have five messages in your log and receive a sixth, the oldest message is deleted from the log.

To access your messages from the Home screen, press Menu.

1. Use the down arrow to navigate to Message Log and press Select.
2. The Message Log opens. Use the left and right arrows to browse your stored messages.
3. Press Menu to return to the Home screen.

## Configuring Audible Notification of Incoming Messages

You can specify whether your Insight sounds an audio alert when any message is received, when only critical messages are received, or you can disable the audio alert for all messages.

Configure your audible alerts through the Settings menu.

1. From Home, press the Menu button.
2. From the Menu screen, display your Settings (already highlighted) by pressing Select.

3. Use the down arrow to scroll to Messages and press Select.
4. Use the up and down arrows on the right to scroll through the options.
  - Beep for critical messages only—Insight triggers a beep when it receives a message flagged as critical by the sender.
  - Beep for all messages—Insight triggers a beep when it receives any message.
  - Off—Insight does not beep when messages are received.
5. Press Save. The display prompts you to confirm the setting change. Press Y (top right button) to confirm the change or N (lower right) to cancel it. The display returns to the Alerts menu; press Menu to return Home.

## Setting Custom Alerts

Alerts provide a way for you to interact with your Tendril Residential Energy Ecosystem, especially as you experiment with how adjusting some of your behaviors, such as regularly cycling the pump in your pool, actually effects change in your overall consumption. You can decide what events are most important to you. For example, you can configure your Insight to notify you when your total household usage exceeds a specified threshold. Or, if you are more familiar with the amount due on your utility bill than the amount of kW consumed, you can configure your display to alert you if your forecasted monthly bill exceeds a threshold you specify.

Alerts can be set against the following types of conditions:

- Household Cost Per Hour
- Monthly Bill
- Household Usage
- Present Price

## Enabling an Alert

To set a notification threshold, open the Settings menu and select the event you want to monitor.

1. From Home, select Menu.

2. From the Menu, select Settings (already highlighted) by pressing Select. Press Select again.
3. Use the down arrow (middle button) to scroll to the type of setting you want to configure. Press Select (right button).
4. Use the + (top) and – (bottom) buttons on the right side of the display to set the value for which you want to trigger a notification.
5. When you have selected a value, use the down arrow (middle button) to enable the alert. Press Y (top button on right side of the display) to change Settings: Enable to Yes.
6. The Audio alert setting displays. Enable this option to have your Insight sound an audible alarm when the alert threshold is met. Use the down arrow (middle button) to highlight the audio alert setting. Press Y to change the setting to Yes.
7. Press Save. Insight prompts you to confirm the setting change. Press Y (top right button) to confirm the change or N (lower right) to cancel it. The display returns to the Alert settings menu.

## Configuring Insight's Appearance

Depending on where you place your Insight, you may want to modify the contrast between the text that appears and the background. You can also specify how you want to control Insight's backlighting.

### Controlling Backlighting

Backlighting is the screen light that appears when you interact with your Insight by pressing a button. You can specify the backlight to always be on, to always be off, to illuminate when you touch a button on Insight, or to pulse when a pre-determined event triggers an alert.

To configure your Insight's backlight:

1. From Home, press Menu.
2. Press Select to open Settings.
3. Use the down arrow to navigate to Backlight.
4. Press Select to display Backlight settings.
5. The Backlight Settings screen opens. Use the up and down arrow buttons on the right of your

display to navigate through the options. You may specify only one option for the backlighting behavior:

- **Backlight Alert**—You can set the backlight on the Insight to display colors based on proximity of defined alerts. Use the up and down arrows on the right side of the Insight to select an event, such as Household Cost Per Hour. Then, use the middle arrow (bottom of screen) to highlight the Pulse option. Press the up and down arrows on the right side to turn the Pulse alert on (Yes) or off (No).
  - **Pulse**—Indicates the colors will gradually increase and diminish in intensity. With the Pulse setting off, the colors will remain static as red, yellow, and green. Note that if you are more than 40% from your defined alert, the color will be green. From 40% to your alert, the color will be yellow. When the alert is exceeded, the color is red. The values set on the Alerts Menu (Menu—Settings—Alerts) determines these values.
  - **Backlight always on**—The backlight stays on until the setting is changed.
  - **Backlight always off**—The backlight stays off, even if you press one of Insight's buttons.
  - **Backlight on by button press**—Insight turns on the backlight when you press any of its buttons. When this option is selected, a field appears for you to specify how long the light stays on. Use the down arrow (middle button) to highlight the duration field and use the + (top right) and - (lower right) buttons to select the number of seconds you want the backlight to remain on after it is activated: 2, 5, 10, 20, 60.
6. Press Save if you want to save the changes you made. Insight prompts you to confirm your changes. Use the Y or N button to either save or discard your changes.
  7. If you want to discard your changes and leave the settings as they are, press Cancel.

### Setting Screen Contrast

Depending where you position your Insight in your home, you may want to adjust the contrast of its screen. Contrast represents the degree of difference between the darkest and lightest elements on a screen, in this case the text and the background.

Insight's contrast is configured through Settings.

1. From the Home screen, select Menu.

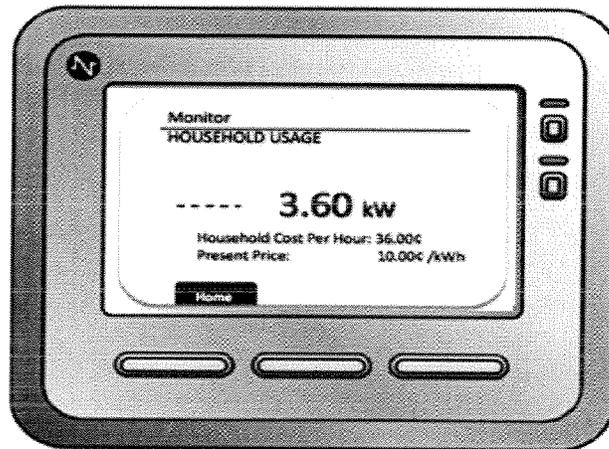
2. Settings is highlighted. Press Select.
3. Use the down arrow to scroll through the list of settings options until Contrast is highlighted. Press Select.
4. Use the buttons on the right side of your Insight to move the setting along the slider bar. Press + (top) to move it to the right and darken the screen and text; press – (bottom) to lighten the contrast. Experiment with the settings to get a feel for what works best in your home's lighting. The sample text on the screen provides a guide for how different text sizes and weights will look at each contrast setting.
5. Press Save to commit your changes. Insight prompts you to confirm your change. Select Y (top) to accept or N (bottom) to cancel your changes.

### Monitor

Insight's Monitor screen provides the same information shown on the Home screen, but highlights the consumption (in kW). In addition, the Monitor shows the present price of the electricity you are using.

A line of dots appears to the left of your present household usage. As Insight prepares to pull updated consumption information from your meter (as it does every 10 seconds), the number of dots decreases until the screen is refreshed with current information.

Note that some meters update this data infrequently, therefore, these values may remain relatively static.



## Checking the Status of your TREE



In addition to your usage data, the Insight Home screen provides information about the connectivity status of your home area network. The upper left corner displays symbols that indicate whether your devices are connected. Note that these symbols appear only on the Home screen. In the chart below, a "Y" indicates connectivity. For more information about these symbols, refer to the *Troubleshooting* section of this Guide.

Symbol displayed	Transport	Translate	Translate/Meter
	Y	Y	Y
	Y	Y	N
	Y	N	n/a
	N	Y	Y
	N	Y	N
	N	N	n/a

### What happens to Insight if I lose my Internet connectivity?

Your home area network continues to work, even if Internet connectivity via Transport is interrupted. Any updated user or pricing information that the energy provider's information systems may try to send to Insight won't be received until the connectivity is restored. However, Insight continues to collect consumption data from the meter and calculate billing information based on the information it last received.

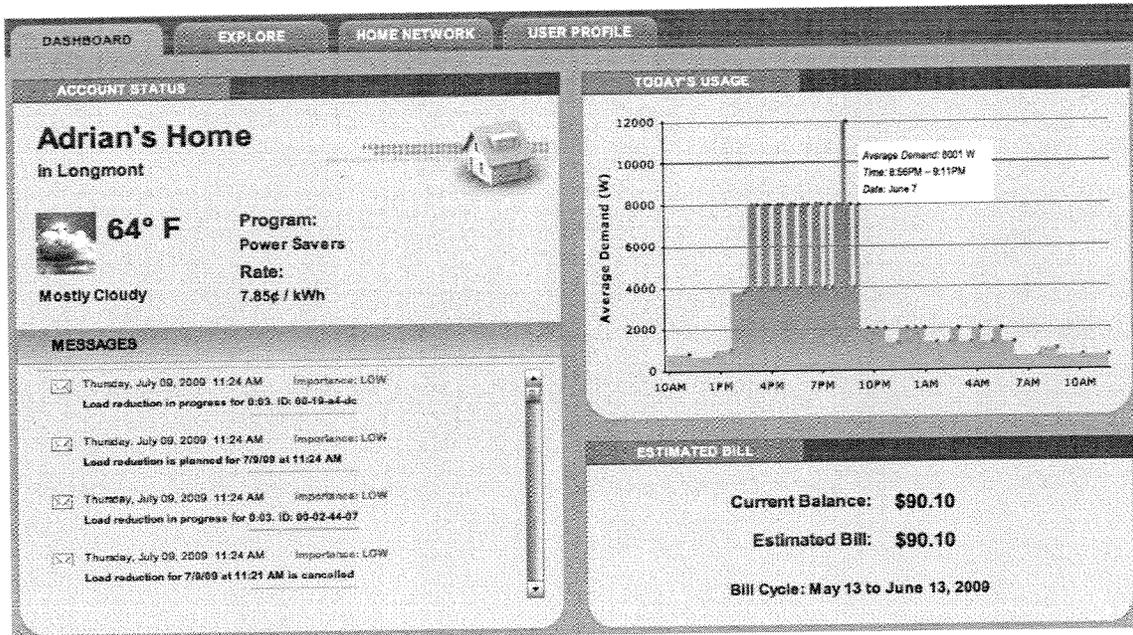
## Using Vantage

Vantage provides a consolidated view of your overall energy consumption as well as a set of charts to help you interpret energy usage patterns and forecast future consumption rates. Vantage also offers a Message window that displays alerts or notifications from your utility partner and your home area network. Because you can access Vantage via the Web, you can log in remotely and check in to see what's going on at home (remember to be aware of corporate firewall issues).

### Vantage is not a Web site

It is important to recognize that Vantage is not simply a Web site but a browser-based Internet *portal*. A portal is an interface that lets you run applications on the Web. This means that browser functions (such as Refresh, Forward, and Back) won't behave as they do on a typical Web site. To navigate within Vantage, use only the icons and links contained within its screens. Clicking your browser's Refresh or Back button will log you out of Vantage.

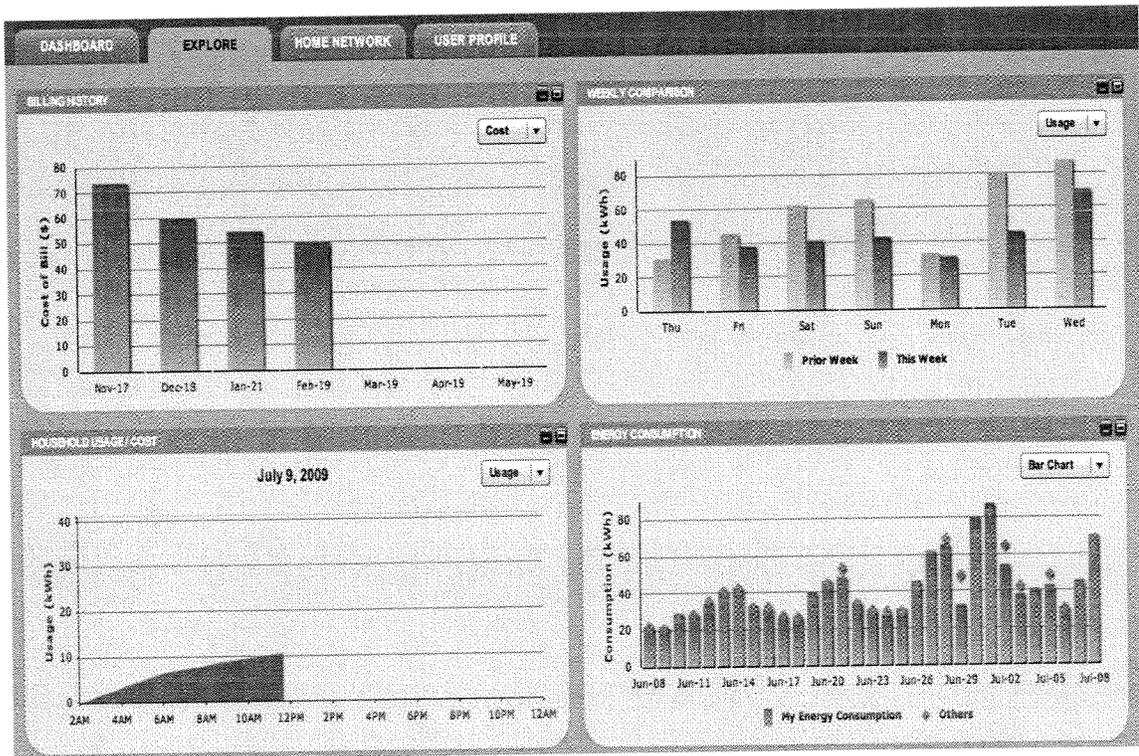
After you register your devices and log into Vantage, the Dashboard is displayed. From here, you can see your account status, displays your usage (average demand) for the current day, as well as your current estimated bill and balance for a given bill cycle. Vantage may display updated data on this page as frequently as every 25 minutes.



- Account Status displays your present rate (cost per kilowatt hour (kWh)), as well as your local weather report and any important messages about your account.
- Today's Usage costs (your average demand) are read directly from the meter, approximately every 25 minutes, via the Transport. When you first display the Dashboard, after registering your devices, this part of the screen may not contain any data until Transport updates your energy consumption information. When you roll your cursor over a point in the graph, Vantage displays detailed usage information for that time period.
- Estimated Bill is your current balance for a specific bill cycle.

## Interpreting Your Energy Consumption

The Explore tab lets you view your energy consumption in greater detail to help you better understand your consumption rates and patterns. You can view your consumption according to your Billing History, Weekly Consumption, Household Usage/Cost, and Energy Consumption.

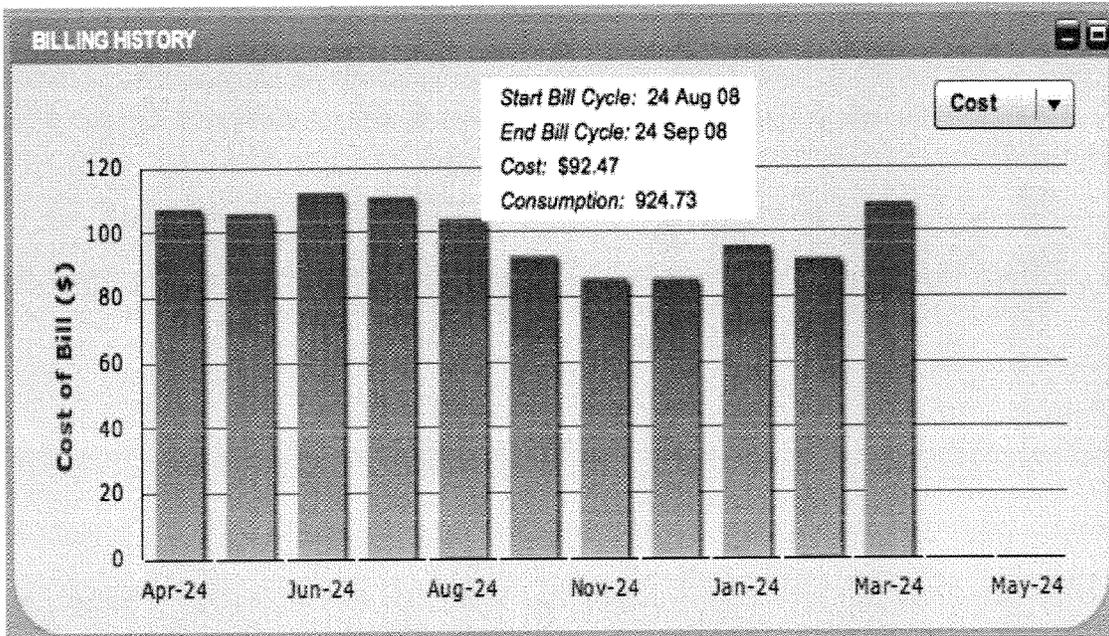


You can enlarge or minimize each of the four windows on the Dashboard by clicking the appropriate icon in the upper right-hand corner of each window. If you minimize a window, the other windows expand to fill the screen. You can also drag and drop each screen on this page to change the order.

On the Energy Consumption screen, you can display consumption detail for each hour in a single day by clicking on the bar for that day. The graph changes to an hourly display for the day you selected.

### Billing History

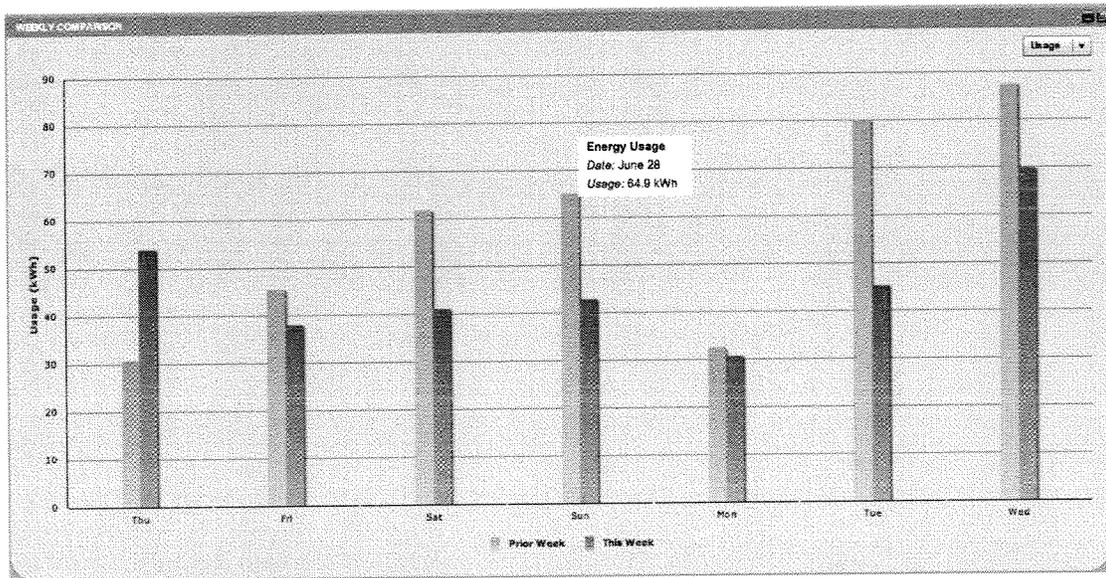
Billing history information is pulled into TREE from your utility provider's back-office systems. The Billing History window shows your actual bill for each of the last seven billing cycles.



- Hold your cursor over any graph bar to display the actual consumption and cost for that month.
- Display your billing history by cost or usage by selecting an option from the dropdown list in the upper right corner of the window.

### Weekly Comparison

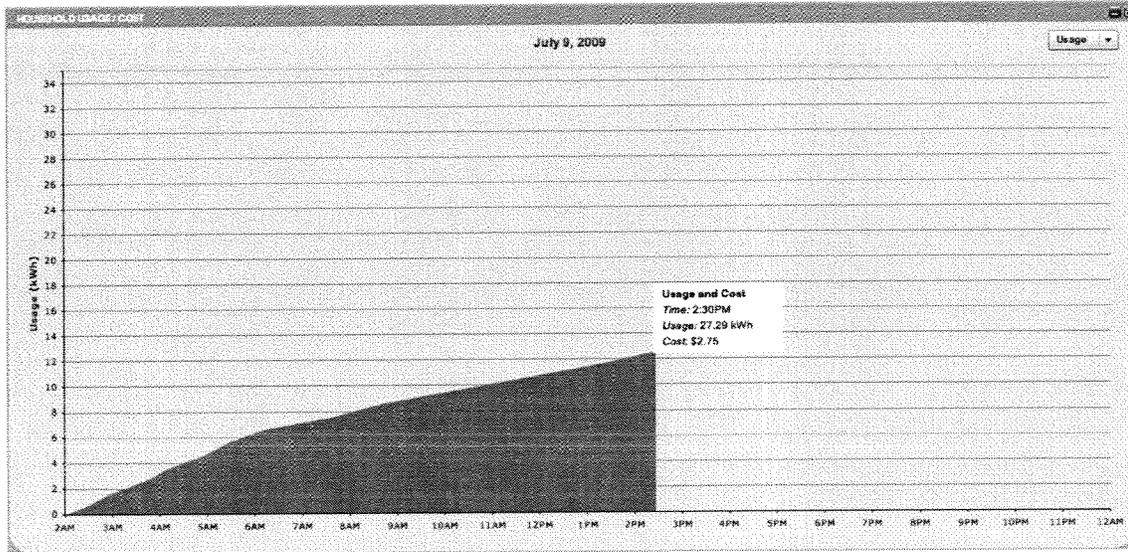
The Weekly Comparison window shows your current energy consumption compared to last week's energy consumption. The prior week's consumption is displayed in grey; this week's consumption is displayed in green. You can view seven days of energy comparison information at once.



- Hold your cursor over any graph bar to display the energy consumption for the associated date.
- Display your weekly comparison information by cost or usage by selecting an option from the dropdown list in the upper right corner of the window.

### Household Usage/Cost

The Household Usage/Cost window shows your energy consumption on an hourly basis. Data is read directly from the meter, every 25 minutes, via the Transport.

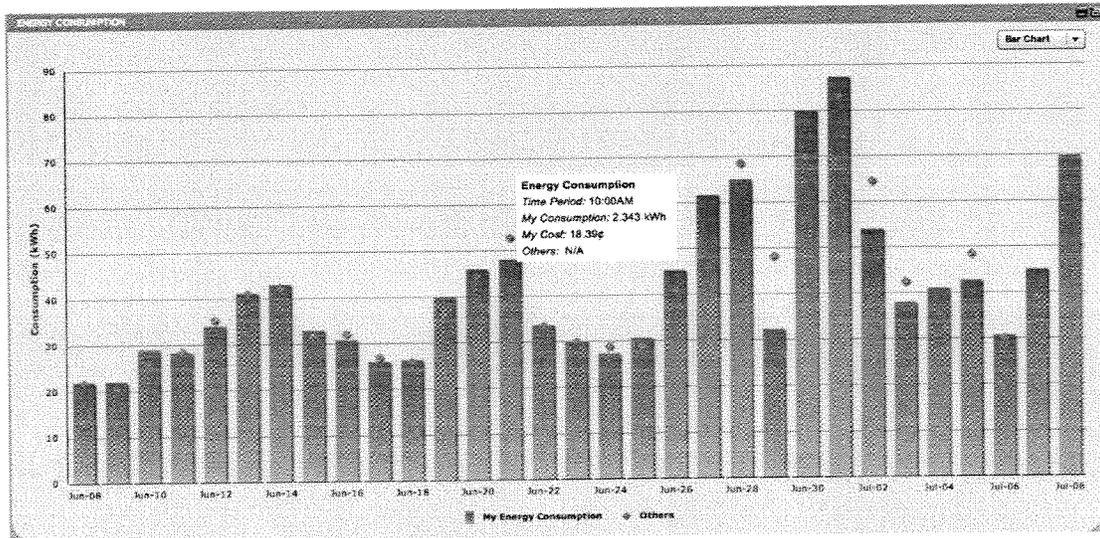


- Hold your cursor over a section of the graph to display your energy consumption and cost for the associated time period.
- Display your weekly comparison information by cost or usage by selecting an option from the dropdown list in the upper right corner of the window.

## Energy Consumption

The Energy Consumption graph shows your aggregate household usage in daily increments. This consumption data comes from information collected directly by TREE from your meter.

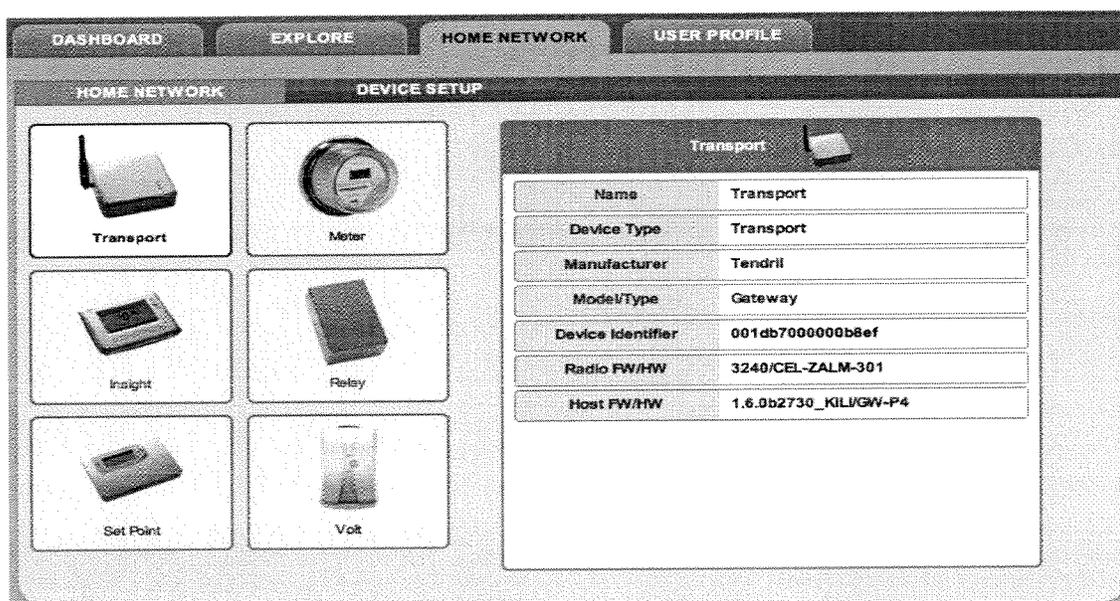
For some consumers, having a point of comparison provides useful context for understanding their electricity consumption. When you register your system, your energy consumption data is included in summary reports that compare your usage with that of similar households. This gives you the ability to view your consumption against the average total consumption for similar households. Comparisons are based on dwelling size, dwelling type, and your zip code. On the screen shown below, the energy consumption of other households is represented on the graph by the small gold diamonds.



- Hold your cursor over a section of the graph to display your energy consumption for the associated time period. If your consumption is being compared with the energy usage of others, that information will also be displayed.
- Display your energy consumption information as a bar chart or line graph by selecting the desired option from the dropdown list in the upper right corner of the window.

## Home Network

The Home Network window shows the devices in your home network as well as specific setup information for each device. Note that the screen shown below is an example; the actual devices displayed on your screen may vary.

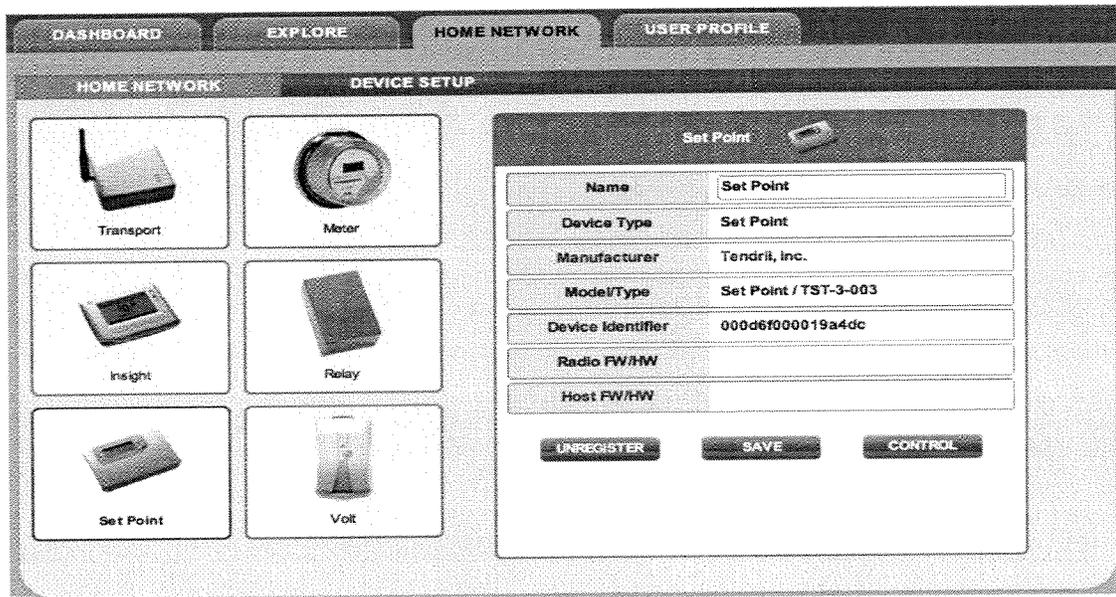


- Click a device on the left side of the window to display information about that device on the right side of the window.
- Click Device Setup at the top of the window to display information about device setup (see the next page for additional information).

## Home Network: Control Set Point Thermostat

From the Home Network page, you can control certain settings on your Set Point thermostat.

1. Click the Set Point thermostat graphic on the left side of the page. The settings for your thermostat display on the right side of the page.
2. Click Control to display the Control Set Point screen where you can create rules for cooling and heating, as well as manually control the thermostat.



There are three tabs on the Control Set Point page. The Heating and Cooling tabs both let you define rules that enable or disable heating and cooling based on the price of electricity.

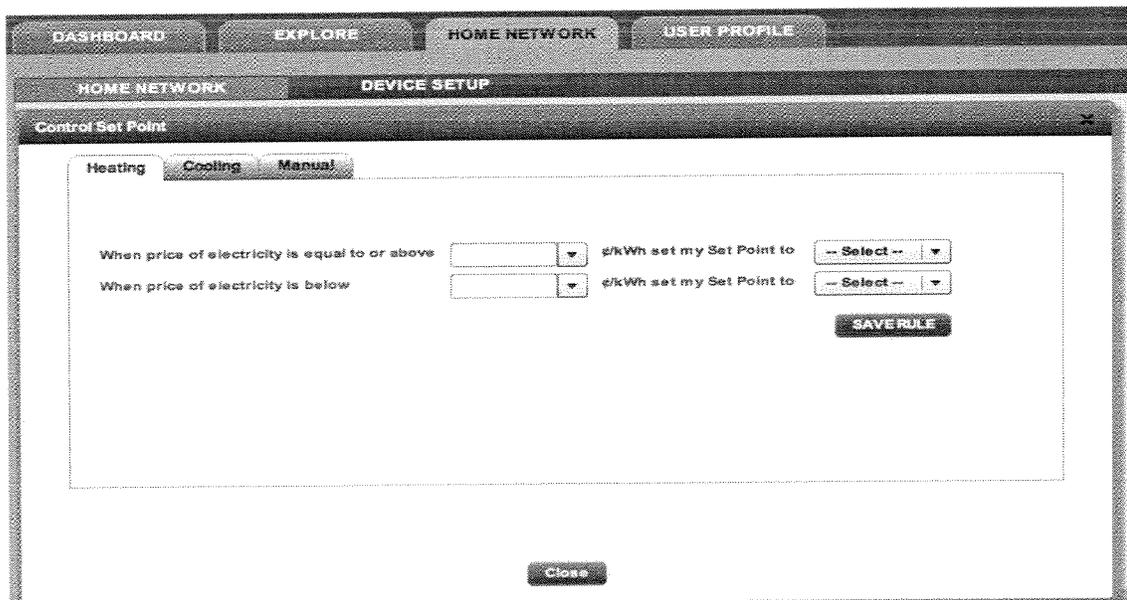
Perform these steps for both the Heating and Cooling tabs.

1. Select the price of electricity and the temperature for each rule from the dropdown list. Click **Save Rule** when you finish.

The word **Enabled** and a check box appear at the top of the screen.

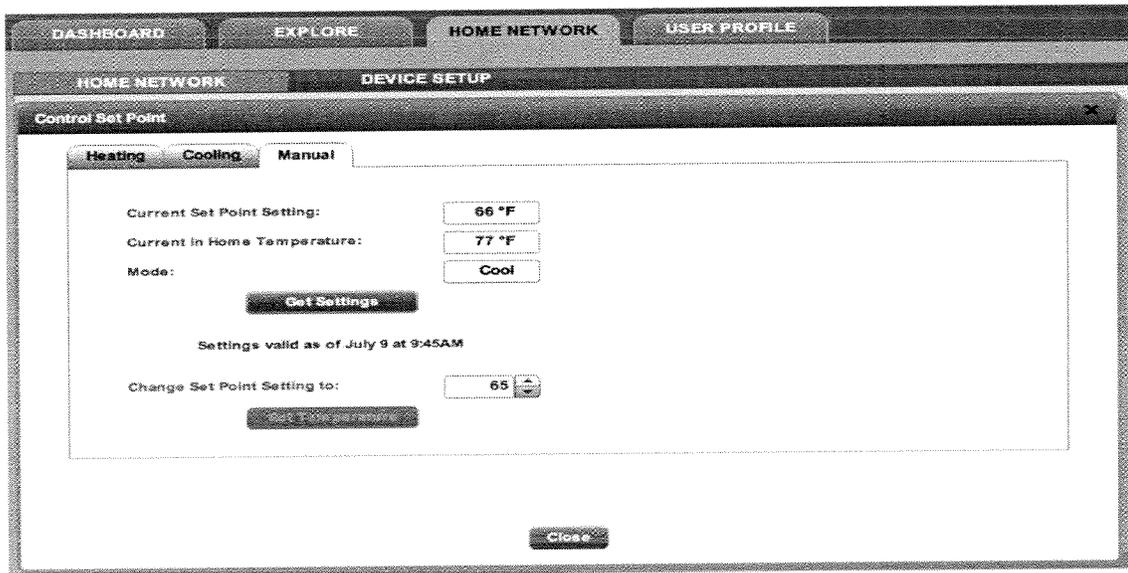
2. Click the box to check it and activate the rule(s) you created.
3. Click **Close** when you finish creating rules.

**Note:** The electricity price you set for the first rule must be higher than the price you select for the second rule.



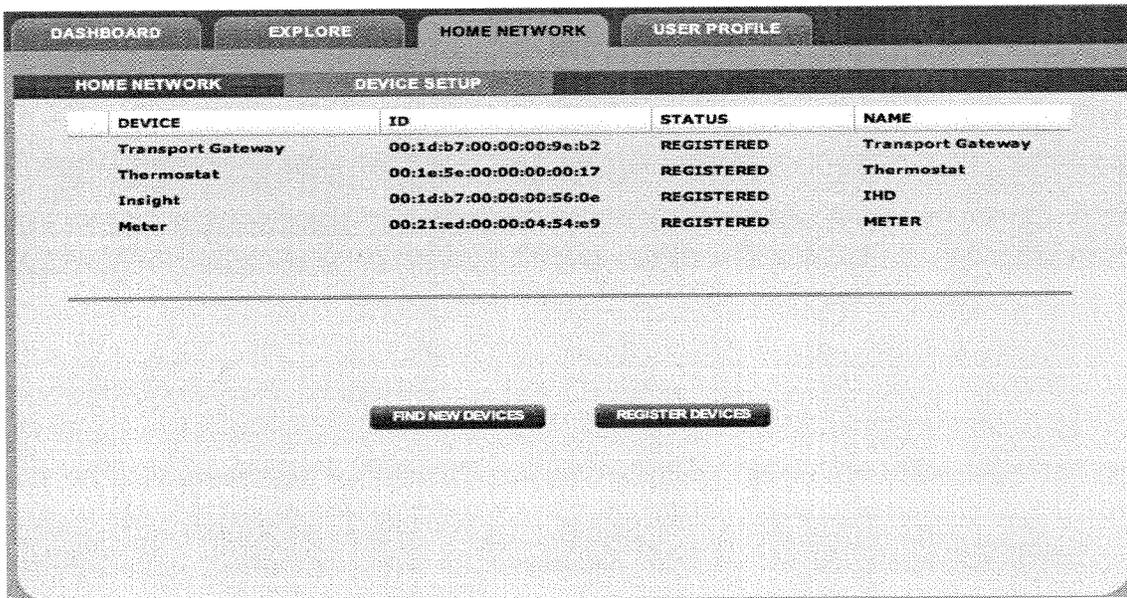
The Manual tab gives you the option of controlling your Set Point thermostat from within Vantage. This feature allows you to change your thermostat settings remotely, without having physical access to your Set Point.

1. Click **Get Settings** to display the current Set Point thermostat settings.
2. Use the up and down arrows to adjust the current temperature on the thermostat. Click **Set Temperature** to save your setting.
3. Click **Close** when you finish adjusting the thermostat.



## Device Setup

The Device Setup window displays a list of all registered devices. You can also find and register new devices on this window. For more information about registering devices, see the *Getting Started* guide supplied with your kit.



## User Profile

The User Profile window shows your account and usage settings that you entered when you created your TREE account. You can change your user profile information and click Update to save your new settings.

**ACCOUNT INFORMATION**

Account Holder: Jennifer Fawcett 4  
 Address: 2881 Kenyon Circle  
 Boulder, CO 80305  
 Rate Program: Power Savers  
 Email: jfawcett4@tendrillinc.com

**REQUIRED INFORMATION**

Dwelling Type: Single Family  
 Dwelling Size: Under 1000 Sq. Ft.  
 Cooling Configuration: Central AC  
 Heating Configuration: Central Gas Heat  
 Number of People in Household: 2  
 Do you have a Pool Pump? No

**OPTIONAL INFORMATION**

These scales will help us to customize the display of information in your portal

Rate the importance of seeing your energy use in Environmental terms

Not important | Neutral | Very important

Rate the importance of seeing your energy use in Economic terms

Not important | Neutral | Very important

UPDATE

What happens to Vantage if I lose my Internet connectivity?

Vantage displays information that is read from the meter by your Transport gateway. If Transport loses its connection with the operations center because of a power interruption or loss of Internet connectivity, it can't send meter readings. The overall consumption data is not lost, but you may see gaps in your hourly or daily charts for the time that the Gateway was not able to collect or send the data.

What's next?

You now have the information you need to manage and control your electricity consumption — and your bill. For tips and tricks on reducing your electricity usage and for more information about energy use in the home, check out *Smart Energy Made Easy*, a guide to energy consumption, available online at [www.tendrilinc.com/consumers/smart-energy-guide](http://www.tendrilinc.com/consumers/smart-energy-guide).

## Upgrading your TREE

From time to time, new features or enhancements for your TREE devices become available. Tendril has two ways to deliver new features and fixes to your in-home devices without having to physically touch them:

- Over the Air (OTA)
- Over the Internet (OTI)

A few things to note about remote updates:

- Meters aren't included in these upgrades.
- The Transport controls the download and distribution of updates.
- OTA updates are initiated and managed through Customer Support.



# Troubleshooting

Occasionally, one of your devices may lose connectivity with other devices or with your meter. The information provided in this section describes the possible issues that may arise and how to resolve them.

## Troubleshooting Transport

Transport uses LEDs to communicate information about its functionality and current state. These LEDs indicate whether Transport is operating properly and communicating information, or if there is a problem. The following table describes the function of each LED. For ease of explanation, each LED *in this Guide* is labeled with a letter – A, B, or C (the actual LEDs on the device are *not* labeled. Refer to the section on *Working with Transport* for an illustration of this device and the location of the LEDs.

Transport LED	Function
A	Power and Internet connectivity
B	Network communication
C	Reserved for future use

The following table describes the possible issues that may arise with Transport functionality.

Gateway States	LED A Behavior	LED B Behavior
<b>Internet Connectivity</b>		
Not powered-on/plugged in	Off	Off
Initial power-on	Green	Off
Checking for firmware updates	Orange	Off
Ready	Green	Off
<b>Home Device Networking Connectivity</b>		
Joining	Green	Flashing green
Joined	Green	Off
Not joined = Failure to join with meter	Green	Off
Connectivity lost to meter after a successful join	Green	Off
<b>OTI Process</b>		
OTI in progress	Orange while device checks for and applies firmware updates	Off

### Recommended Solutions

The following table provides recommended solutions to problems you may encounter with Transport. If these actions do not resolve the problem, contact support by phone (866-364-4526) or e-mail at: support@tendriline.com.

Issue	Action to take
Transport power plugged in – no LEDs are lit.	<ul style="list-style-type: none"> <li>• Check the power supply connection to the device.</li> <li>• Is the power supply pushed all the way into the device?</li> <li>• Is the power supply connected to a power outlet in the home?</li> <li>• Does a wall switch control the power outlet?</li> </ul>
Connecting to the Internet (LED A orange) for more than 20 minutes	<ul style="list-style-type: none"> <li>• Is the Transport plugged into your router?</li> <li>• Is the network cable pushed all the way into the device?</li> <li>• Do you have Internet connectivity to your residence? <i>Open a Web site on your computer to verify Internet connectivity.</i></li> </ul>
Not joined = Failure to join with meter  OR  Connectivity lost to meter after a successful join	<ul style="list-style-type: none"> <li>• Is your Transport registered? <i>Refer to the Getting Started guide supplied with your kit for registration information.</i></li> <li>• Has your Transport been moved from another location? <i>The Transport may be out of range of the meter or the Translate device.</i></li> <li>• Power-cycle (unplug/replug) the device.</li> </ul>

### Troubleshooting Translate

You can determine whether Translate is communicating properly by looking at the LED lights on the front of the device. For ease of explanation, each LED *in this Guide* is labeled with a letter – A, B, C, or D (the actual LEDs on the device are *not* labeled). The following table describes the functionality of each LED on the Translate. The columns labeled A, B, C, D correspond to the lights on the front of the Translate. Refer to the section on *Working with Translate* for an illustration of this device and the location of the LEDs.

Translate LED	Function
A -Red	Meter Signal Status
B-Green	Meter Communication Status
C-Red	Device Network Status Error
D-Green	Device Communication Status

#### Recommended Solutions

The following table provides recommended solutions to problems you may encounter with Translate. If these actions do not resolve the problem, contact support by phone (866-364-4526) or e-mail at: [support@tendrillinc.com](mailto:support@tendrillinc.com).

Note: If you move the device, wait 30 minutes for it to attempt to look for the meter signal before moving it again.

State	Actions to Take
Translate power is plugged in, but no LEDs are lit.	<ul style="list-style-type: none"> <li>• Check power supply connection to the device.</li> <li>• Is power supply pushed all the way into the device?</li> <li>• Is power supply connected to a power outlet in the home?</li> <li>• Does a wall switch control the power outlet?</li> </ul>
Only LED C is lit	Power-cycle the device.
LED A is lit	<ul style="list-style-type: none"> <li>• The device can't find the signal coming from the meter. Has the device been recently moved? <i>Try the original location of the device or move it to a new location. Avoid locations that are directly behind the meter.</i></li> </ul>
LED A is flashing	<ul style="list-style-type: none"> <li>• Has the device been recently moved? <i>Try the original location of the device or move it to a new location. Avoid locations that are directly behind the meter. Wait at least an hour before attempting another solution.</i></li> <li>• Tip the device on its side or move it closer to the meter.</li> </ul>

## Troubleshooting Insight

You can determine when Insight is working properly by looking at the symbols shown in the upper left corner of the display. Refer to the section on *Working with Insight* for an illustration of the possible symbols that may be displayed.

### Recommended Solutions

The following table provides recommended solutions to problems you may encounter with Insight. If these actions do not solve the problem, contact support by phone (866-364-4526) or e-mail at: support@tendrillinc.com.

<b>Status</b>	<b>Description/Actions to Take</b>
Insight plugged in, but no LEDs lit and there is no display.	<ul style="list-style-type: none"> <li>• Check the power supply connection to the device.</li> <li>• Is power supply pushed all the way into the device?</li> <li>• Is power supply connected to a power outlet in the home?</li> <li>• Does a wall switch control the power outlet?</li> </ul>
Solid square and half solid circle, or empty circle indicators are visible.	<ul style="list-style-type: none"> <li>• The Insight is experiencing communication problems.</li> <li>• Has the device been recently moved? <i>Try the original location of the device or move it to a new location. See the Recommended Solutions table in the Troubleshooting Transport section for additional actions to take.</i></li> </ul>
Empty square and solid circle indicators are visible.	<ul style="list-style-type: none"> <li>• Has the device been recently moved? <i>Try the original location of the device or move it to a new location. See the Recommended Solutions table in the Troubleshooting Transport section for additional actions to take and to confirm any issues with Transport.</i></li> </ul>
Empty square and half solid or circle indicators are visible.	<ul style="list-style-type: none"> <li>• The Insight is experiencing communication problems.</li> <li>• <i>See the Recommended Solutions tables for both the Translate and the Transport for additional information.</i></li> </ul>

## Important Consumer Information

---

### Important Consumer Information

FCC: WFH-GWY-8-003

IC: 7785A-GWYX8X003EH

### Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

### Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### FCC Interference Statement (Part 15.105 (b))

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To comply with FCC's and Industry Canada's RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

### RF Exposure (OET Bulletin 65)

To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20cm separation distance between the antenna and all persons.

### Industry Canada Statement per Section 4.0 of RSP-100

The term "IC:" before the certification / registration number only signifies that the Industry Canada technical specifications were met.

### Section 7.1.5 of RSS-GEN

Operation is subject to the following two conditions:

1. this device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.



---

Tendril Copyright

Copyright © 2009 Tendril Networks, Inc. All rights reserved. Tendril®, logo and combinations thereof, are trademarks. Other terms and product names may be trademarks of others. Disclaimer: The information in this document is provided in connection with Tendril products. No license, express or implied, to any intellectual property right is granted by this document or in connection with the sale of Tendril products. EXCEPT AS SET FORTH IN TENDRIL'S TERMS AND CONDITIONS OF SALE LOCATED IN TENDRIL'S STANDARD SOFTWARE LICENSE, TENDRIL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL TENDRIL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF TENDRIL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Tendril makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Tendril does not make any commitment to update the information contained herein. Tendril's products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.

This product employs or practices certain features and/or methods of the following U.S. Patents: 7,054,271; 6,249,516 and/or 6,044,062.

P20120-000



## Tendril Troubleshooting Guide

This guide explains how to resolve common issues when you set up and register Tendril devices.

### How Do I Change My Password?

At this time, a Tendril customer support representative must change your web portal password for you. To request a password change, please contact us by visiting [www.tendrilinc.com/support/contact-us](http://www.tendrilinc.com/support/contact-us). Or call 1-866-364-4526.

### How Do I Resolve a “Gateway ID Not Found” Message?

The Tendril Transport device sends information to and from your Home Area Network, and is pictured here.



During the registration process, you may receive a “Gateway ID Not Found” message, which refers to the Transport device. To resolve this issue:

- Make sure the Gateway ID you entered into the Vantage web portal matches the Gateway ID listed on the back of the Transport.
- Check whether both lights on the front of the Transport are green. If any lights are amber, the device is still checking for a firmware update from our servers, and the device cannot be registered. Wait for the lights to turn green. If your Transport lights never turn green, contact us at 1-866-364-4526.
- Check whether the Transport is plugged in, and connected to your router with an Ethernet cable. Press the cable’s end firmly into the port in the Transport, and do



the same with the end in the router. If you hear or feel a click, try the registration process again.

- Check your Internet connection on your computer. Are you able to access other websites? If not, power-cycle your router by unplugging the power cable and plugging it back in. Wait several minutes, then try and access the page. Try logging out and refreshing your browser before attempting to register again.
- Check the Ethernet port on the back of the Transport. You should see a green light and a flashing amber light. If you do not see those lights, check your router. Make sure it is plugged in and connected to your modem. If you have an Internet connection, you should see the green and amber lights on your router, like those on the Transport. If you do not see any lights, unplug the power cable from your Transport, and power-cycle your router by unplugging the power cable and plugging it back in. Wait several seconds, then plug the Transport back in. Check your Internet connection on your computer. If you still cannot access any websites, call your Internet service provider.

### What do the Colored Lights on the Translate Indicate?

The Tendril Translate device contains a collection of four lights that provide status information regarding the communication of the Translate with the Meter and your Home Area Network (HAN). At initial startup, each light/LED cycles its color for 1 second. When the Translate has two solid green lights, the HAN (ZigBee) network is formed and the Meter signal is being read.



The letters shown in the diagram are for your reference when you read the following table. The letters do not appear on the device itself.



Light/LED	State	Indication
A	Solid Red	Signal from Meter lost (for 1 hour)
A	Blinking Red	No signal found from the Meter (Blinks for 1 hour)
B	Blinking Green	Receiving signal from the Meter
C	Solid Red	Unrecoverable error
D	Blinking Green	Blinking until registered state (Meter ID received)
D	Solid Green	HAN Network formed and registered
C & D	Alternate Blinking Green and Red	An Over the Air (OTA) update is in progress.

### What if My Translate Has a Red Flashing Light?

The physical location of the Translate device in your home can affect its ability to receive a signal from the meter. To avoid this issue, follow these tips:

- Place the Translate in the same room, preferably on the same wall, as the meter. However, do not put the Translate directly behind the meter, or within three feet of the meter. Here’s why: the meter box blocks the signal directly behind the box, so placing the Translate too close will not allow it to pick up the signal.
- Allow several hours (2-8 hours) for the Translate to pick up the first signal from the meter.
- A red light on the Translate may begin to flash, which means it has not received a signal from the meter in an hour. This does not necessarily mean the location is bad. It simply means that the Translate has not begun to receive meter reads yet, but it might in another hour or so. Best practice: leave the Translate up overnight. If it is still flashing red the next day, try another location.
- The online portal needs several reads from the meter, via the Translate, before it can begin showing data and graphs. Leaving it up overnight sets good expectations: the



Translate will usually receive meter reads overnight, and the reads should then appear in the portal.

## How do I Adjust the Screen Contrast on the Insight?

The Tendril Insight device is an in-home display that lets you determine quickly your current household consumption and estimated monthly bill. The Insight is pictured here:



When you initially turn on your Insight in-home display and prepare to register and join it to your Home Area Network (HAN), the contrast setting may be too light or dark, making it difficult to read the text on the screen. If your screen appears hard to read, use the following steps to adjust the screen contrast.

- Press the bottom left button repeatedly to incrementally lighten your display.
- Press the bottom right hand button repeatedly to incrementally darken your display.

This technique only works prior to registration upon initial plug in, and your contrast settings are not saved. You can easily adjust and save contrast settings after registration by using the Insight menu options. (*Menu: Settings: Contrast*)

## How Do I Know If My Insight Joined the Right Network?

When a Tendril Insight device joins a Home Area Network (HAN), it automatically joins a unique channel number. In some cases, your Insight may join another HAN that is nearby. As a result, you cannot register your Insight on your HAN.



To verify that your Insight joined your HAN, compare:

- The EPAN ID that is printed on the back of your **Translate** device.
- The EPAN ID that is shown on your **Insight** in-home display.

If the EPAN IDs are the same, your Insight has joined your HAN and you may register it.

If the EPAN IDs are different, you can resolve this issue by pressing the two buttons on the upper-right corner of your Insight. The upper button increases the channel number, while the lower button decreases the channel number. Watch the display for each number that you try, and wait a few seconds to see if your Insight device successfully joined your HAN. Verify that the EPAN ID on the Insight matches the EPAN ID on the Translate device. You can then register your Insight on your online portal.

### What if My Insight Didn't Find Any Network?

If your Insight didn't find any network, it displays a message such as "Device FAILED to Join."

To fix this, use the two buttons on the upper-right corner of your Insight to try other channel numbers. The upper button increases the channel number, while the lower button decreases the channel number. Watch the display for each number that you try, and wait a few seconds to see if your Insight device successfully joined your Home Area Network (HAN).

If using a different channel number worked for your Insight and it has now joined a network, great! However you should still verify that your Insight joined your HAN, and not an adjacent HAN, as explained in the previous section. Verify that the EPAN ID on the Insight display matches the EPAN ID on your Translate device. You can then register your Insight on your online portal.

If you toggled through every channel number and your Insight still cannot find any network, please contact our Support team at 1-866-364-4526.



## What do the Insight Symbols Represent?

The Insight Home screen provides information about the connectivity status of your home area network (HAN). The upper left corner displays symbols that indicate whether your devices are connected. These symbols appear only on the Home and Monitor screens.

When devices are not connected, the Insight indicator light on the upper right hand side of the display flashes, signaling a communication error.

The following table explains the meaning of each Insight symbol.

Insight Symbol	Status	Insight Indicator Light (upper right)
	Insight communicating with Transport, Translate and Meter.	Off
	Insight cannot communicate with Translate.	Blinks on and off every .05 seconds.
	Translate cannot communicate with Meter.	Off
	Insight cannot communicate with Transport.	Blinks on and off every .05 seconds.
	Insight cannot communicate with Transport, and Translate cannot communicate with Meter.	Blinks on and off every .05 seconds.
	Insight cannot communicate with any of the devices.	Blinks on and off every .05 seconds.



# Tendril Set Point Thermostat

User's Guide

TREE Version 1.8

## Tendril Copyright Information

Copyright © 2010 Tendril Networks, Inc. All rights reserved. Tendril®, logo and combinations thereof, are trademarks. Other terms and product names may be trademarks of others. Disclaimer: The information in this document is provided in connection with Tendril products. No license, express or implied, to any intellectual property right is granted by this document or in connection with the sale of Tendril products. EXCEPT AS SET FORTH IN TENDRIL'S TERMS AND CONDITIONS OF SALE LOCATED IN TENDRIL'S STANDARD SOFTWARE LICENSE, TENDRIL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL TENDRIL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF TENDRIL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Tendril makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Tendril does not make any commitment to update the information contained herein. Tendril's products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.

This product employs or practices certain features and/or methods of the following U.S. Patents: 7,054,271; 6,249,516 and/or 6,044,062.

Updated: 2/23/10 2:29 PM

# Table of Contents

Tendril Set Point Overview .....	1
About this Guide.....	1
Using your Set Point Thermostat.....	2
Installing your Set Point Thermostat.....	2
About your Set Point Thermostat.....	2
Overview of Controls and Display .....	2
Controls .....	2
Display .....	3
System Mode Settings .....	5
Fan Settings .....	5
Basic Operations .....	5
Buttons and Icons .....	5
Lock/Unlock Keypad .....	7
Default Settings .....	7
Programming your Set Point Thermostat.....	7
Set/Change Date and Time .....	7
Program Schedules and Defaults.....	8
Set Program Schedule .....	10
Reset and your Program Schedule.....	10
Vacation and Temporary Overrides.....	10
Set Vacation Program Override .....	10
Set Temporary Temperature Override.....	11
Ramp Option.....	12
Configure your Set Point Thermostat.....	13
Change Temperature Units .....	13
Change Temperature Span.....	13
Change Fan Setting .....	14
Set Filter Life Span.....	14
Messages .....	14
View Active Messages.....	15
View Message History .....	15
Events .....	15
View Active/Pending Events.....	16
Set Event Rules.....	16
Reject an Event.....	17
View Event History .....	17
Energy Prices.....	18
View Energy Prices.....	18
Battery Care and Monitoring.....	19
Backlight.....	19
Verify Firmware Version .....	19
Configure Set Point to Work with TREE .....	19
Join the TREE Network .....	20
Register your Set Point Thermostat.....	21
Troubleshooting.....	23
Related Documents.....	24



## Tendril Set Point Overview

Tendril Set Point is a smart, Programmable, Communicating Thermostat (PCT). It works with Tendril Residential Energy Ecosystem (TREE) home area network to help you better understand and manage the energy consumption in your home.

Set Point is wired to compatible HVAC units, allowing you to adjust your home's temperature to optimize comfort and energy efficiency. You can use Tendril's preconfigured rules or define your own rules to adjust your energy consumption as costs and demand fluctuate.

Tendril Set Point puts you in charge of deciding how much energy you want to consume and when. It's easy to monitor your usage and save money by wisely allocating your resources.

**NOTE:** This device is optional and may not be included in your Home Area Network (HAN).

### About this Guide

This guide targets the consumer and details the Set Point thermostat features, controls, programs and settings.

 **Under no circumstances should anyone other than a qualified technician install or remove your Set Point Thermostat.**

**Note:** Tendril recommends that you regularly schedule HVAC maintenance on your heating and cooling equipment to keep your system operating at peak performance.

**NOTE:** For more information about all Tendril products and features, see the Related Documents section at the end of this guide.



## Using your Set Point Thermostat

### Installing your Set Point Thermostat

Tendril requires installation of your Set Point thermostat by a qualified technician.



**Under no circumstances should anyone other than a qualified technician install or remove your Set Point Thermostat**

### About your Set Point Thermostat

Your Set Point thermostat offers the following features:

- Four programmable daily temperature schedules for heating and cooling.
- Temporary over ride of programmed temperatures.
- Programmable vacation temperature schedules.
- Copy function for quick and easy customized programming of daily schedules.
- On-screen alerts to remind you to change/reset the filter and replace the batteries.
- Colored lights indicate various modes.
- Participation in utility-offered programs to manage consumption during peak energy demand periods.
- Viewing of messages, events and pricing programs from your utility company.

### Overview of Controls and Display

#### Controls

- System: used to move Set Point to Mode Selection.
- Fan: used to move Set Point from FAN AUTO to FAN ON.
- Scroll up: used to scroll up through menus or temperatures.
- Scroll down: used to scroll down through menus or temperatures.
- Reset: Power reset button reboots thermostat in case it should lock up.
- Buttons: Selects the function associated diagonally with the upper right corner of the button on the display.



## Display

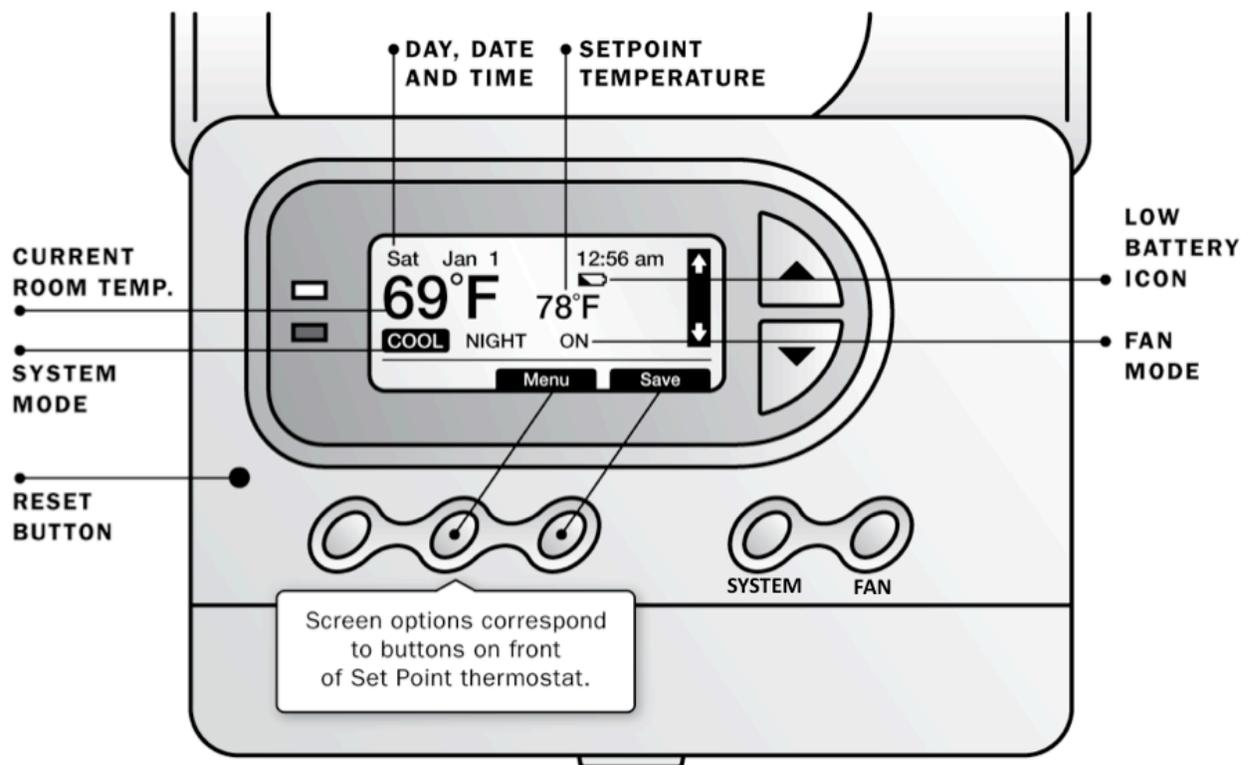
Set Point includes informational text on the main screen that indicates the various settings that have been entered or defaulted for your thermostat. The text includes such information as the current System mode, the daily schedule segment being run and the Fan setting. It can also indicate if you are operating in the auxiliary or emergency heat mode. The following information can be displayed:

- Modes: The mode indicator displays the mode in which the Set Point is operating. There are five.
  - **HEAT:** Sets the Set Point into heat mode.
  - **COOL:** Set the Set Point into cooling mode.
  - **AUX:** Sets the Set Point into auxiliary heat mode. This option is only available in heat pump systems equipped with auxiliary heating subsystems.
  - **EMER (Emergency Heat):** Sets the Set Point into emergency heat mode. This option is only available in heat pump systems equipped with emergency heating subsystems.
  - **Off:** Shuts of Heating Ventilating and Air-conditioning (HVAC) system.
- Program: The program indicator displays the daily schedule segment that is presently running on the Set Point. Each segment comes preset and can be customized for start time and temperature setting. There are four.
  - MORN (morning)
  - DAY
  - EVE (evening)
  - NIGHT
- System: Used to move Set Point to Mode Selection.
- Fan: Used to move Set Point from FAN AUTO to FAN ON.
- Fan: The fan indicator displays whether the Set Point has set the ventilation fan to Auto or ON.
- Screen Bars: Screen bars change as the function being used changes. Set Point is programmed as you wish by pushing the soft keys to the lower left of each screen bar to select the appropriate entry.
- Light Emitting Diodes (LED):
  - RED: Shows the Set Point is not joined to a network.
  - YELLOW: Shows the Set Point has a message waiting.



- Temperature Indicators:
  - Current: The current temperature for the area in which the Set Point is located.
  - Set point: The desired temperature the Set Point has been set to maintain.
- Day, Date, and Time indicators: Display the day, date, and time to which Set Point has been programmed.

These buttons and displays are labeled in the following drawing.



**Note:** The above screen is an example of typical display information. Depending on your Set Point thermostat configuration, slightly different information may be displayed on your unit. See the Basic Operations chart for an explanation of those icons that can be displayed on your Set Point.



## System Mode Settings

To change your **System** mode:

1. Press the **System** button on the front of the Set Point thermostat. This highlights the System mode indicator.
2. With the **System** mode indicator highlighted, use the  or  arrows to scroll through the different settings.
3. Press **Save** to save the new setting.

## Fan Settings

The Set Point thermostat has two fan settings:

- **ON:** Fan is always on
- **AUTO:** Fan automatically starts when the system (either heating or cooling) turns on.

To change the **Fan** setting:

1. Press the **Fan** button on the front of the Set Point thermostat.
2. With the Fan indicator highlighted, use the  or  arrows to scroll through the different settings.
3. Press **Save** to save the new setting.

## Basic Operations

### Buttons and Icons

The following table provides a description of each button, setting indicator, and icon on the Set Point thermostat.

Button / Setting	Description
	<ol style="list-style-type: none"><li>1. Increases temperature/date/time</li><li>2. Scrolls through and highlights Menu options</li></ol>
	<ol style="list-style-type: none"><li>1. Decreases temperature/date/time</li><li>2. Scrolls through and highlights Menu options</li></ol>
<b>HOME</b>	Displays main Set Point thermostat screen



Button / Setting	Description
<b>MENU</b>	Displays main menu
<b>SELECT</b>	1. Selects highlighted program 2. Confirms messages
<b>SYSTEM</b>	1. One press wakes up the system, a second press highlights the OFF/HEAT/COOL mode. 2. Synchronizes local time to GMT time
<b>FAN</b>	Initializes fan operation
<b>RESET</b>	Resets all settings to their default
<b>AUTO</b>	Fan runs when heating or cooling mode is activated
<b>ON</b>	Fan is always activated

Icon	Description
	Heat is activated
	A/C is activated
	Battery power is low; replace batteries.
	Thermostat is locked. The thermostat must be unlocked before any setting changes can be made.
	Time to replace your filter.
	Your thermostat has successfully joined a Zigbee network.



## Lock/Unlock Keypad

You can protect your thermostat settings from further changes after you have programmed your options by locking the keypad. When your thermostat keypad is locked, the lock  icon appears on the Home screen and none of the Set Point buttons work.

1. To lock your keypad, press the ▲ and ▼ arrows simultaneously. The lock icon appears on your display.
2. To unlock your keypad, press and hold the ▲ and ▼ arrows simultaneously until the lock icon disappears from your display.

## Default Settings

By default, your thermostat is provided with the following preconfigured settings and programs.

Function	Default
Program	Temporary and Vacation mode are not activated
Room temperature	70 °F (21 °C)
Clock	01/01/00 12:00am, Saturday
Units	Fahrenheit
System	Heat
Fan	Auto

## Programming your Set Point Thermostat

Your Set Point thermostat provides a seven-day programmable schedule of time and temperature for both heating and cooling. This allows you to set different temperatures at different times for those weekend days when the majority of your time is spent at home, and week days when your household members are at work and school.

## Set/Change Date and Time

Set Point thermostat has multiple time of day configurations:

- On initial connection to a power source, the default time of 12:00 am Saturday is shown regardless of the actual time or day. This is used as the starting point for the time of day until another of the following options is set.



- When registered with the TREE network, the correct time of day and date are automatically downloaded and displayed.
- The time can be manually set.

To manually set your time and date:

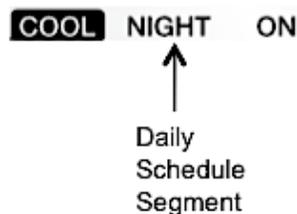
1. Press **Menu**.
2. Press the ▲ or ▼ arrow to navigate to **Smart Energy Setup** and press **Select**.
3. Press the ▲ or ▼ arrow to navigate to **Zigbee Setup** and press **Select**.
4. Press the ▲ or ▼ arrow to navigate to **Zigbee Time** and press **Select**.
5. **Local Time** is highlighted. Time is displayed as *hh:mm*.
6. Press **Select** to navigate to the hour setting. Press the ▲ or ▼ arrow to change the hour.
7. Press **Next** to navigate to the minutes setting. Press the ▲ or ▼ arrow to change the minutes.
8. Press **Next** to navigate to the date setting. The Date is displayed as *<month name>/dd/yyyy*. Press the ▲ or ▼ arrow to change the month. Repeat this step to change the date and year.
9. While the year is selected, press **Save** to save your settings.
10. When you complete all values for the date and time, the thermostat automatically returns to the main screen.

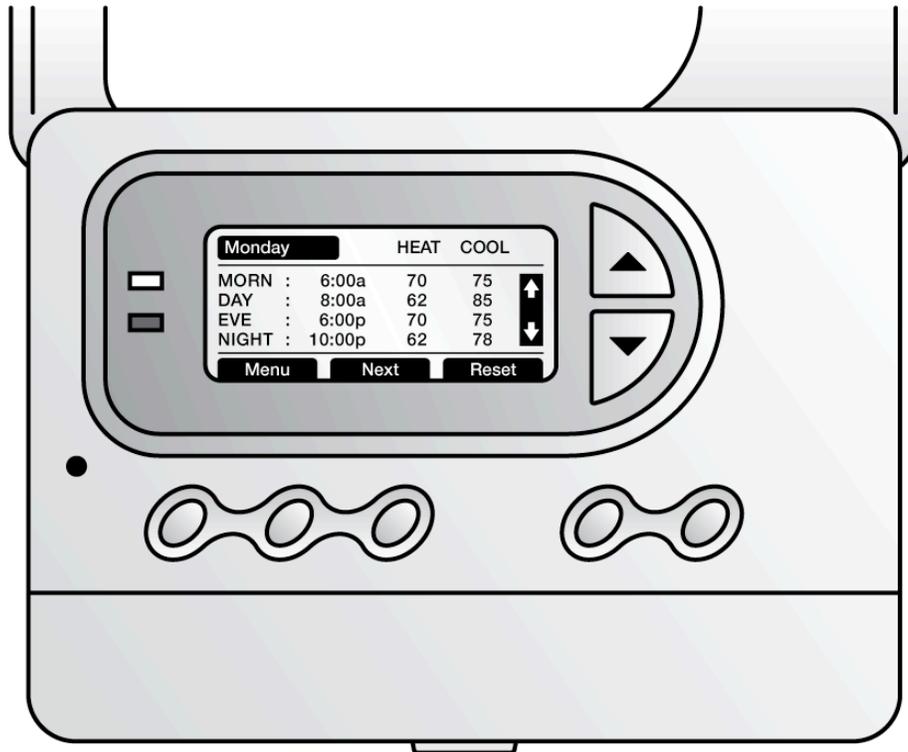
## Program Schedules and Defaults

Your Set Point thermostat is preconfigured with a default weekly program schedule and is ready for use. You can customize your schedule to fit your own needs. Set Point provides multiple daily scheduling segments including:

- Morning (MORN)
- Day
- Evening (EVE)
- Night

The daily schedule segment that is currently running on your Set Point is shown on the main screen.





### Default daily schedule segments

The following chart shows the daily programs that run on the Set Point thermostat by default. Preset programs help you save money and ensure optimal energy usage.

Day of Week	Sunday - Saturday		
Program	Time	Heat	Cool
MORN	6:00am	70° F (21.0° C)	75° F (24.0° C)
DAY	8:00am	62° F (16.5° C)	85° F (29.0° C)
EVE	6:00pm	70° F (21.0° C)	75° F (24.0° C)
NIGHT	10:00pm	62° F (16.5° C)	78° F (25.5° C)



## Set Program Schedule

To customize your daily temperature segments for heat and cool modes on the Set Point thermostat, use the steps provided below. The schedule allows for daily schedules in 4 different time segments.

1. Press **Menu**.
2. Press the ▼ arrow to navigate to **Program Schedule** and press **Select**.
3. Use the ▲ or ▼ arrow to navigate through the days of the week.
4. On any day, press **Next** to navigate to the time display.
5. Press the ▲ or ▼ arrow to change the program time at which the scheduled segment will begin.
6. Press **Next** to navigate to the Heat setting.
7. Press the ▲ or ▼ arrow to raise or lower the temperature.
8. Repeat steps 6 and 7 to set the Cool temperature.
9. Continue to press **Next** to move to the next schedule segment. (Morn, Day, Eve, Night)
10. When you have completed your settings, press **Save** to save your changes.

## Reset and your Program Schedule

Notice the Reset button in the bottom right of the screen. If you press Reset, the entire Program schedule will reset back to the preconfigured values listed in the chart above.

## Vacation and Temporary Overrides

You can override any schedule using the following two options.

- **Vacation:** Temporarily overrides program settings for the number of days you specify (up to 99 days).
- **Temp:** Temporarily overrides program settings. Settings will return to the programmed values at the next program boundary.

**Note:** You cannot permanently override the Set Point thermostat's default programs

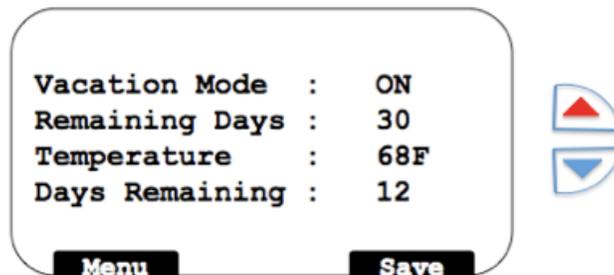
## Set Vacation Program Override

**Vacation Mode** is used for temporary, long-term override such as a vacation. The set temperature is held for a period of time up to 99 days. When 99 days have passed, Vacation mode is canceled and the system returns to the default daily segment schedules. When the Set Point thermostat is in Vacation mode, **VAC** is displayed on the Home screen.



To program your thermostat for vacation override:

1. Press **Menu**.
2. Press the ▼ arrow to navigate to **Vacation** and press **Select**.
3. In the resulting display, press **Select** to highlight the **OFF** value for the Vacation Mode.
4. Press the ▲ or ▼ arrow to toggle the Vacation Mode setting between **OFF** and **ON**.



5. Press **Save** to save your changes
6. Use the ▲ or ▼ arrows to navigate to the remaining two fields to be set and press **Select** to activate the value fields.
7. Press the ▼ arrow to navigate to set the appropriate value for each field.
8. Press **Save** after each value is set to save your settings.
9. Press **Menu** followed by **Home** to return to the Home screen.

Notice that the last field, Days Remaining, cannot be edited. This field automatically tracks the number of days remaining in your vacation program.

You can cancel your vacation program at any time by following the above steps and setting the Vacation setting to **OFF**.

### Set Temporary Temperature Override

**Temporary** override is the temporary change of the programmed temperature. Any temporary override will revert to the daily scheduled segment temperature when the next Set Point time increment is reached. When the Set Point thermostat is set to temporary override, **CUSTOM** is displayed on the Home screen.



To temporarily change the set temperature:

- When adjusting set temperature make sure the system mode is not set to **OFF**.
- Press the ▲ or ▼ arrow once and release to move the temperature up and down.
- If you hold either the ▲ or ▼ arrow for 2 seconds or longer, the Set Point thermostat will step through temperatures at a rate of 4 values per second; each “step” has units of 1°. This will change the temperature by 4° per second while either arrow is depressed.

## Ramp Option

Your Set Point thermostat has the ability to “ramp” up, or begin preheating /cooling your home so your specified temperature is reached by the daily scheduled segment time. For example: If your MORN schedule is set to heat your house to 70° at 6 a.m., the heat comes on before 6 a.m. so the temperature is 70° by the time you wake at 6 a.m. You can use the table below to estimate the amount of time your HVAC system will operate in ramp time prior to meeting your scheduled temperature.

The following table shows the difference between the scheduled temperature and the current temperature, and the amount of Ramp time required to reach the scheduled temperature.

Temperature difference: (Next scheduled temp. – Current displayed room temp.)	Ramp mode start time: (Time before start time of the next program)
Larger than or equal to 12°F (6.0°C)	120 minutes
11°F (5.5°C)	110 minutes
10°F (5.0°C)	100 minutes
9°F (4.5°C)	90 minutes
8°F (4.0°C)	80 minutes
7°F (3.5°C)	70 minutes
6°F (3.0°C)	60 minutes
5°F (2.5°C)	50 minutes
4°F (2.0°C)	40 minutes



3°F (1.5°C)	30 minutes
2°F (1.0°C)	20 minutes
1°F (0.5°C)	10 minutes
Less than or equal to 0°F (0°C)	Will not start

## Configure your Set Point Thermostat

**Note:** Press any button to *wake up* the Set Point thermostat prior to programming the unit.

### Change Temperature Units

You can switch between Fahrenheit (F) and Celsius (C) degrees for display on the Set Point thermostat.

1. Press **Menu** to display a list of options.
2. Press **Select** to choose the **Preferences** option.
3. Press the ▲ or ▼ arrow to change the temperature units from F to C.
4. Press **Save** to save your changes.
5. Press **Home** to return to the main screen.

### Change Temperature Span

Temperature span refers to the temperature change that the Set Point thermostat must measure before cycling the HVAC device under its control (furnace or A/C). The default value is 1° F. (0.5° C.).

- If your system is cycling too often, you can change the span to 2° F. (1° C.)
  - If your system is not cycling often enough, change the span to 0.5° F. (0.25° C.)
1. Press **Menu** to display a list of options.
  2. Press **Select** to choose the Preferences option.
  3. Press **Next** to navigate to the **Span** option.
  4. Press the ▲ or ▼ arrow to change the span setting.
  5. Press **Save** to save your changes.
  6. Press **Home** to return to the main screen.



## Change Fan Setting

The Fan setting determines the amount of time that the fan remains on beyond the point when the compressor has been shut off in cooling mode. The default is 60 seconds; you can change this to 0, 30, or 90 seconds

1. Press **Menu** to display a list of options.
2. Press **Select** to choose the Preferences option.
3. Press **Next** to navigate to the **Fan** option.
4. Press the ▲ or ▼ arrow to select the number of seconds your fan will remain running.
5. Press **Save** to save your changes.
6. Press **Home** to return to the main screen.

## Set Filter Life Span

You can set a life span for your filter by changing the counter from 0-999 hours; the default is 500. When the filter life span has expired, a filter icon displays on the Set Point thermostat screen.

1. Press **Menu** to display a list of options.
2. Press **Select** to choose the Preferences option.
3. Press **Next** to navigate to the **Filter** option.

There are two numbers displayed next to the **Filter** option.

- The first number represents the number of hours used since the filter was installed. To clear this number, press **Reset**.
  - The second number represents the number of hours at which you want to display a filter warning. Set this number using the ▲ or ▼ arrow. When the filter has been in use for the number of hours you entered, the filter warning icon displays.
4. Press **Save** to save your changes.
  5. Press **Home** to return to the main screen.

## Messages

The Set Point thermostat can display informational messages sent from your utility. These messages can be used to alert you of certain important notices or events such as an impending price change or load reduction.



## View Active Messages

When you receive a message from your utility company:

- A blinking yellow light displays on the left hand side of your Set Point thermostat.
- A **Message** button appears on your **Home** screen with the text *Message Waiting* displayed above the message button.

To view your active message:

1. Press the **Message** button to view the message.
2. If the message is tagged as critical, you must acknowledge the message by pressing the **Okay** button.

**Note:** Messages are also displayed on your Insight in home display and your personalized Vantage Web portal.

## View Message History

To view your messages:

1. Press **Menu**.
2. Press the ▼ arrow to navigate to **Smart Energy Setup** and press **Select**.
3. Press the ▼ arrow to navigate to **View Messages** and press **Select** to display messages.
4. Press the ▲ or ▼ arrow to page through multiple messages.

## Events

Set Point receives event notices from your utility company such as “load control” events. These events can reduce heating temperature or air conditioning temperatures for a short period of time. When an event is issued, the event notice is displayed on your Set Point thermostat. The display contains such information as:

- Event - The current state of the event (Active, Pending, Rejected, Accepted).
- Level - The level of criticality of the event from the Utility Company.
- Start Time - The time the event began.
- Duration - The length of time the event is active.
- Remaining - The amount of time remaining for the event.



## View Active/Pending Events

When you receive an active or pending event from your utility company:

- A yellow light displays on the left hand side of your Set Point thermostat.
    - If the event is pending, the light will remain blinking until you have acknowledged the event. Do this by pressing the Event button.
    - If the event is active, the light will remain solid yellow until the event has completed.
  - An **Event** button appears on your **Home** screen with the text *Event Active* or *Event Pending* displayed above the event button.
    - If you have multiple events queued, a bracketed number displays after the Event text indicating the number of events waiting to be executed. (Event [3])
1. Press the **Event** button to view the event.
  2. Press the **More** button to review additional details about the event on the next page.

## Set Event Rules

By default the Set Point is configured to accept all events sent to your thermostat. You can refine your event configuration by setting event rules.

To set your event rules:

1. Press **Menu**.
2. Press the ▼ arrow to navigate to **Smart Energy Setup** and press **Select**.
3. The **Event Rules** menu option is highlighted. Press **Select**.
4. Press the ▼ arrow to navigate through the different rule options:
  - **Accept All Events** - All issued events are automatically accepted.
  - **Reject All Events** - All issued events are automatically rejected.
  - **Accept All Mandatory** - Only those critical or mandatory events are automatically accepted.
5. Press **Save** to save your changes.
6. Press **Home** to return to the main screen.



## Reject an Event

Unless an event issued by your Utility Company is mandatory, you can reject, or opt-out of participation in the event.

To reject an event:

1. Press the **Event** button on the **Home** screen. The **Event** detail appears.
2. Press the **Reject** button in the bottom center of the screen.
3. A message appears asking you to confirm your action. Press **Yes** to continue, or **No** to cancel.
4. You are returned to the **Event** log with your **Event:** status updated to show **Rejected**.
5. You can easily choose to re-enter the event by selecting the **Accept** button at the bottom of the **Event** log screen. This option is available to you as long as the event is active.

You can also view and accept or reject Set Point events from the TREE Vantage Web portal. See the TREE Users Guide for more information.

## View Event History

You can view the most recent events from the event log at any time. To view your events:

1. Press **Menu**.
2. Press the ▼ arrow to navigate to **Smart Energy Setup** and press **Select**.
3. Press the ▼ arrow to navigate to **View Events** and press **Select** to display your events.
4. Press the ▲ or ▼ arrow to page through multiple events.

The **View Events** history log stores the last 5 events that have been issued to your Set Point.



## Energy Prices

Set Point can display pricing or rate plans from your utility company. You can use your Set Point thermostat to see the current price tier, the amount of KWh you have used and the name of the Rate plan in which you are currently enrolled.

### Pricing Programs

Some Utility Companies offer pricing programs to encourage you to save money by using the bulk of your energy when the demand is lower. Some examples of the typical pricing programs you might encounter are:

- *Fixed* – Energy prices are at a fixed rate per KWh and remain the same regardless of time or usage
- *Time of Use* - Energy rates change based on the day, time and season
- *Rebate Programs* – Rebates are offered if consumption is lower than a calculated baseline during high demand periods
- *Peak Pricing* – Rates increase during typical high usage periods.

### View Energy Prices

To access your energy price display:

1. Press **Menu**.
2. Press the ▼ arrow to navigate to **Smart Energy Setup** and press **Select**.
3. Press the ▼ arrow to navigate to **View Energy Prices** and press **Select** to display the pricing information
4. After a short delay, your thermostat automatically returns to the **Home** screen.

### Kilowatts and Kilowatt Hours

A kilowatt (kW) is a unit of measure for the amount of *power* being used. A kilowatt-hour (kWh) is the unit of measure for the amount *energy* used over a period of time. When you buy electricity you are charged by the kilowatt hour (kWh). When you use 1 kilowatt for 1 hour, you've used a kilowatt-hour.

Example: An electric heater with one heating element might use 1 kilowatt. Used for an hour, it would use 1-kilowatt hour. For this use, you would be charged for 1 kWh at the rate indicated on your utility bill.



## Battery Care and Monitoring

The Set Point thermostat must have access to an HVAC 24-volt supply to operate. The Set Point thermostat uses AA batteries to maintain date/time during a power failure, but not to operate the unit. This means that the Set Point will not be able to communicate with TREE while operating on batteries.

## Backlight

The backlight on your Set Point thermostat is activated when any key is pressed. The backlight turns on for 30 seconds. Pressing any other key press extends the lighting period for 30 seconds.

If the batteries are the only power supply, the backlight does not operate when the batteries are low. When 24 VAC power is connected, the backlight operates on AC power regardless of the battery level.

## Verify Firmware Version

If you need to check the firmware version of your Set Point thermostat, follow these steps:

1. Press **Menu** to navigate to the main menu page.
2. Press the ▼ arrow to navigate to **About This Device**.
3. Press **Select** to navigate to the device information page.
4. Press the ▼ arrow to navigate to the second page. The firmware version is displayed next to **Firm:** heading on the screen.

## Configure Set Point to Work with TREE

When you configure your Set Point thermostat to work with Tendril Residential Energy Ecosystem (TREE) home area network, you can access the Tendril Internet application (Vantage). From Vantage Web portal you can:

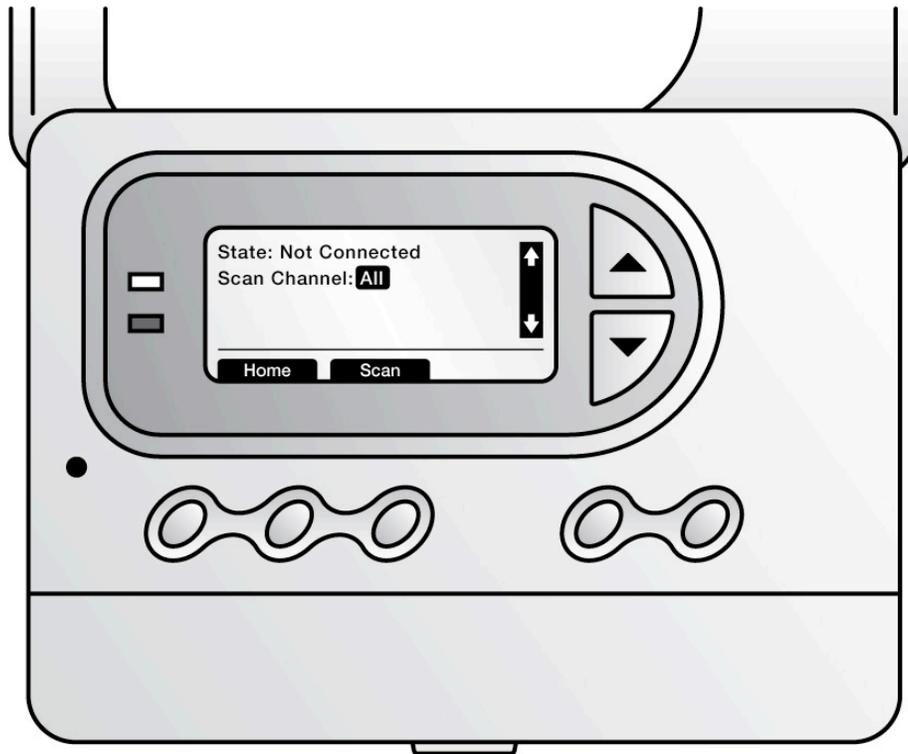
- Track your energy usage and cost.
- Configure and tune your thermostat settings.



## Join the TREE Network

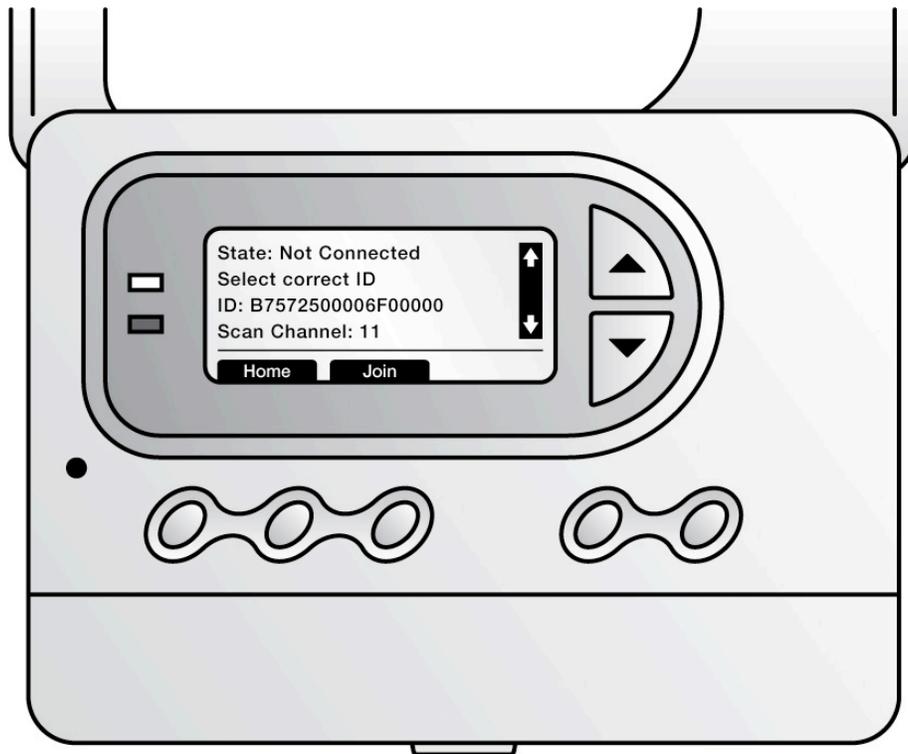
To configure the Set Point thermostat to work with TREE you must join and register the thermostat with the TREE home area network. (Zigbee Network)

1. Once installed, press **Join** to navigate to the Join Screen.
2. Press **Scan**. **The Set Point** will automatically find an available “channel” and join your home network. The message **Scanning...** displays while the Set Point thermostat locates your network. After it locates the network, an ID is displayed.





3. Press **Join** to join the displayed network. After a few seconds, the thermostat automatically returns to the main screen.



4. To verify the thermostat has successfully joined the network, look for the  icon in the upper right hand corner of your Home screen display.

### Register your Set Point Thermostat

After you have joined your Set Point to your network, you'll need to register it with your TREE (Tendril Residential Energy Ecosystem) so you can and track your energy resources.

**Note:** You must join your Set Point to the network before it can be registered.

To register:

1. In a browser, navigate to the Vantage Web portal. The name of the portal may be different, as determined by the utility. You can get the portal's Web address, or URL, from the utility.
2. Enter the user name and password provided and click Login.



**Note:** Vantage is a live application and cannot be controlled by the browser buttons. If you click Back or Refresh from your browser, you are logged out of Vantage. To navigate Vantage, use the icons and buttons displayed on each screen within the application.

3. Select the **Home Network** tab followed by the **Device Setup** tab.
4. On the lower portion of the screen click the **Find New Devices** button. When Vantage has located the thermostat, it appears in the lower portion of the screen.
5. Make sure there is a checkmark next to the Set Point. If it appears as Unregistered, click the **Register Devices** button.
6. Once registered, your Set Point thermostat moves to the upper portion of the screen and displays a registered state.

After registration, the thermostat automatically displays the correct time and is now ready for use with TREE. (Tendril Residential Energy Ecosystem) Refer to the TREE User Guide for information on logging in to the Vantage Portal.



## Troubleshooting

Refer to the following table to resolve Set Point issues you may encounter:

Symptom	Possible problem	Corrective action
Display is blank.	Power had not been restored to the HVAC system. Connections to the SETPOINT are not made or not tight.	Contact: Support Organization or Qualified Technician
Buttons are inoperative.	Keyboard has been locked out. Verify by looking for the LOCK icon on the Display.	See section: <i>Lock/Unlock Keypad</i>
Thermostat starts AC or furnace before it is scheduled.	Time is not set correctly. Ramp function is activated.	See sections: <i>Set/Change Date and Time</i> <i>Ramp Option</i>
House is too hot.	SETPOINT is not set to desired temperature.	See sections: <i>Set Program Schedule</i> <i>Set Temporary Temperature Override</i>
House is too cold.	SETPOINT is not set to desired temperature.	See sections: <i>Set Program Schedule</i> <i>Set Temporary Temperature Override</i>
House changes temperature at the wrong time.	Time is not set correctly. Ramp function is activated. Program schedule not set.	See sections: <i>Set/Change Date and Time</i> <i>Ramp Option</i> <i>Set Program Schedule</i>
Thermostat does not have the right time.	SETPOINT is not joined to the network. Time is not set correctly.	See section: <i>Set/Change Date and Time</i>



<p>Furnace does not turn off/on. AC does not turn on/off.</p>	<p>Set point is incorrect. Vacation settings are enabled.</p>	<p>Verify room temperature does not override set temperature. See section: <i>Set Vacation Program Override</i> Verify HVAC system is in good working condition.</p>
---	---	--

## Related Documents

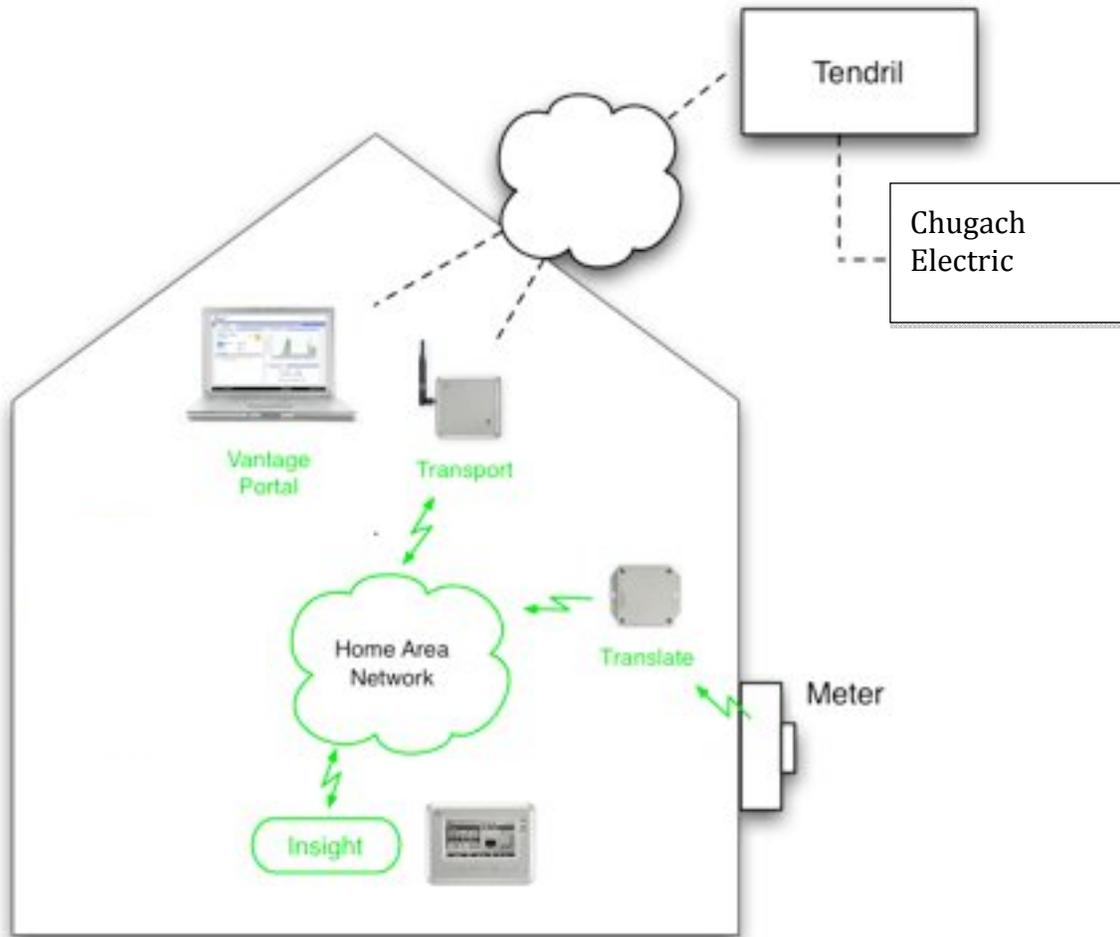
For more information about Tendril products and features, visit the Tendril documentation page at <http://docs.tendrildemo.com/tree/1.8/>.

From this location you can download documentation on any individual Tendril product, or choose to view the entire TREE User's Guide.

## About Your New Home Area Network

The Tendril TREE solution is designed to help increase your familiarity with your electricity used by showing you near real-time energy usage data with associated cost.

### How it works



\* Please note, the distance from the meter to the Translate might affect communication. Please reference the Getting Start Guide troubleshooting section for more information.

To generate the near real-time energy data, your meter updates the In-Home Display with energy consumption. Those updates are then added to the energy used total and the total cost. The results are displayed on your Insight as well as on the Vantage Portal.

The Vantage Portal will calculate and display up-to-date billing and consumption values every 15 minutes.

## FAQs

### **What is the Tendril Residential Energy Ecosystem?**

This system is the building energy monitor Chugach Electric is using in the Watt Buster research project about energy efficiency. The system consists of the following components:

- Tendril Translate – Receives energy consumption information from your electric meter and communicates it to other devices in your home.
- Tendril Transport – Plugs into your router or modem; can receive and send energy related data, including pricing and energy consumption data, via the internet.
- Tendril Insight – Provides near real-time information on your energy consumption, including your projected billing amount and cost per hour. It also receives messages from Chugach Electric.
- Tendril Vantage Web Portal – The Web Portal is similar to a Web site. Once the Tendril devices are installed and registered, participants can go to the portal for current and historical data about your energy consumption and other information.

### **How long will the research project last?**

The residential monitors will be placed through June. At the end of the project, participants must return their devices to Chugach Electric. At that time, Chugach will begin collecting and analyzing the data.

### **Who do I contact if I have questions?**

If you have questions, feel free to contact Chugach Electric by email at [wattbuster@chugachelectric.com](mailto:wattbuster@chugachelectric.com) or by phone at 563-7494. You can also contact Chugach Electric with questions using the Web form on this site.

Chugach Electric will post questions and answers as well as other information on this site.

### **Does accessing the Vantage portal require a particular Web browser or software?**

Yes, though most people have the required software. Compatible browsers for Mac users are Firefox and Safari (MAC OS X). For Windows, you need Explorer 7.0 or 6.0, or Firefox. You also need Adobe Flash Player 9 or greater.

### **How can I change my password for Vantage?**

You can change your password within the User Profile tab on the Vantage portal.

### **Why doesn't the bill estimate on the Insight display match my actual bill?**

The system estimates your bill based on current energy use. This projection is only approximate and does not include the normal monthly customer charge.

### **Does plugging these devices into my home open a security risk, particularly in that the Tendril Transport is plugged in behind my router's firewall?**

Plugging in the Transport, which provides the communication between the meter and devices in your home and the network operations center, does not pose any additional security risks. Traffic is only initiated via an outbound connection from the Transport to the network operations center and doesn't require inbound ports open on the firewall. Once the connection is established, two-way encrypted communication (1024-bit RSA encryption) between the network operations center, the Transport, the Tendril Insight and Tendril Translate occurs.

**How much energy do the devices use?**

The Insight (with backlight on) consumes 1.8 watts. The Transport and the Tendril Translate each consumes a maximum of 1.2 watts. At an electricity price of \$0.15 kWh, the maximum cost of running these devices monthly would be approximately \$0.20 and \$0.13 respectively.

**What is a Home Area Network?**

When you install and register your devices, you are setting up what amounts to a communications network among your devices, your meter and the Vantage web portal. We call this your Home Area Network, or HAN.

**Will running my Home Area Network (HAN) interfere with my use of the Internet?**

Running the HAN should not interfere with your Internet use. The HAN itself requires very little bandwidth. To access Tendril Vantage, you need a minimum connection of 256 kbps, which isn't an issue if you have the broadband connection required for this release of TREE.

**Will the HAN interfere with 900MHz devices running in my home?**

Because the radios used in the HAN operate in the 2.4 GHz band, the potential for interference is with other devices in the 2.4 GHz band. However, the HAN is designed to establish itself on a channel that is unoccupied by other devices, so instances of interference are rare and unlikely to be noticeable. In particular, 2.4 GHz cordless telephones should be immune to interference from the HAN, and under no circumstances will the HAN interfere with a microwave oven.

**Why doesn't the current consumption data shown on my Insight always match what I see through the Vantage?**

Your Insight is designed to provide you a near real-time view of your energy consumption. It reads directly from the smart meter in your home every 10 seconds. The Transport in your home collects readings and sends information up to the network operations center every 15 minutes. The network operations center is what pushes the data down to the Vantage for display in the various graphs and charts.

# Tendril Getting Started Guide

Provided as a hard copy only

<b>Messages</b>	<b>week used</b>
Know your peaks: What all is on?	4.1.10
When doing laundry, compare hot water to cold.	4.8.10
Run dishwasher only with full load	4.15.10
Phantom loads could be draining your wallet	4.21.10
Heated garage? Time to turn it off.	5.19.10
Watt meters available to borrow. Call 563-7366.	5.27.10
Clean your dryer filter after every load.	6.3.10
Use full load in clothes dryer.	6.10.10
Go to <a href="http://SmartPowerAK.com">SmartPowerAK.com</a> for news to use	6.18.10
Watt Buster trial ends June 30. Thanks!	6.25.10

# Grow your energy savings this summer.

Energy Efficiency is not just for cold weather. Wasted energy means money lost in summer months, too.

**CHUGACH**  
POWERING ALASKA'S FUTURE

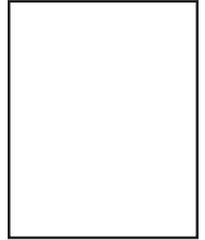


**Wasted electricity is costing you – even in summer.** While our heating bills may drop as the weather warms up, there are plenty of other sources of energy waste in spring and summer. Check out your home. You will likely find plenty of opportunities to **stop losing money**. Here's how:

- **Use natural light** whenever possible.
- **Replace incandescent bulbs with compact fluorescent bulbs (CFLs).** They use about one-quarter the energy of incandescent bulbs.
- **Install smart power strips** for all home electronics. Even when home electronics are turned off, they're on standby mode and that uses energy. Smart power strips have a switch, allowing you to safely turn equipment all the way off when not in use. Plus, smart power strips protect sensitive electronic equipment from power surges.
- **Lower the temperature on your hot water heater.** For most uses, a setting of 120°F provides comfortable hot water.
- **Wash laundry in cold water.** Heating water for laundry accounts for 85 percent of hot water heating bills.
- **Run the dishwasher only when it's full.** But don't overload it.
- **Take the temperatures of your refrigerator and freezer.** Too cold and they use extra energy. The fresh food compartment should be 37° to 40°F. The freezer section should be 5°F. Separate freezers for long-term storage should be kept at 0°F.
- **Investigate your home's energy hogs.** Borrow a Kill A Watt or Watts Up meter from Chugach to learn just how much electricity your appliances, computers and other plug-ins are using.



P.O. BOX 196300  
ANCHORAGE, AK 995519-6300



**FOR MORE IDEAS AND RESOURCES, GO TO [SMARTPOWERAK.COM](http://SMARTPOWERAK.COM).**

## **Energy Programs**

### **[Home Energy Rebate](#)**

Home owners pay upfront for energy ratings and energy efficiency improvements to qualify for a rebate.

### **[New Home Rebate](#)**

A rebate for the purchaser of a newly constructed 5 Star Plus home.

### **[Appliance Rebate](#)**

Alaskans with proven disabilities receive a rebate for purchasing certain Energy Star appliances.

### **[Energy Loans](#)**

Use for purchasing and improving homes.

### **[Weatherization](#)**

If you meet income guidelines, you may qualify to have your home weatherized at no cost.

### **[Energy Information](#)**

Find answers to your energy questions.

## Grants and loans

### [Energy Efficiency Interest Rate Reduction Program](#)

To promote the energy efficiency of existing and newly constructed homes, AHFC offers interest rate reductions to home buyers for properties meeting certain criteria.

### [Second Mortgage Program for Energy Conservation](#)

AHFC loan program allows owner-occupants to finance up to \$30,000 of energy improvements, choosing from a list of upgrades included with the energy audit of their home.

### **Weatherization Program**

AHFC program is available to Alaskans, either homeowners or renters, who meet certain [income guidelines](#) and provides weatherization services at no cost to qualified applicants. [http://www.ahfc.state.ak.us/iceimages/energy/weatherization\\_pgm\\_handout.pdf](http://www.ahfc.state.ak.us/iceimages/energy/weatherization_pgm_handout.pdf)

### **Home Energy Rebate Program**

AHFC program for homeowners who do not qualify for the Weatherization Program, but want to make their own energy-efficiency improvements to their home. There is also a rebate for new 5 Star Plus homes. Sign-up at [www.akrebate.com](http://www.akrebate.com) or contact the AK-REBATE Call Center at 1-877-AK-REBATE (1-877-257-3228).

[http://www.ahfc.state.ak.us/iceimages/energy/home\\_energy\\_rebate\\_factsheet\\_03.pdf](http://www.ahfc.state.ak.us/iceimages/energy/home_energy_rebate_factsheet_03.pdf)

### **Appliance Rebate for Alaskans with Disabilities**

Alaskans with disabilities can get rebates for Energy Star refrigerators, freezers, washers and dishwashers. Maximum one of each product type per participant.

[http://www.ahfc.state.ak.us/energy/appliance\\_rebates.cfm](http://www.ahfc.state.ak.us/energy/appliance_rebates.cfm)

### **Home Energy Efficiency Improvement Tax Credits**

Consumers who purchase and install specific products, such as energy-efficient windows, insulation, doors, roofs, and heating and cooling equipment in existing homes can receive a tax credit for 30% of the cost, up to \$1,500, for improvements "placed in service" starting January 1, 2009, through December 31, 2010. See EnergyStar.gov's [Federal Tax Credits for Energy Efficiency](#) for a complete summary of energy efficiency tax credits available to consumers. Also see <http://www.energysavers.gov/financial/70010.html>

### **Tax Deductions for Commercial Buildings**

A tax deduction of up to \$1.80 per square foot is available to owners or designers of new or existing commercial buildings that save at least 50% of the heating and cooling energy of a building that meets ASHRAE Standard 90.1-2001. Partial deductions of up to \$.60 per square foot can be taken for measures affecting any one of three building systems: the building envelope, lighting, or heating and cooling systems. These tax deductions are available for systems "placed in service" from January 1, 2006 through December 31, 2013. [http://www.energystar.gov/ia/business/comm\\_bldg\\_tax\\_incentives.pdf](http://www.energystar.gov/ia/business/comm_bldg_tax_incentives.pdf)

## **Second Mortgage Program for Energy Conservation**

### **How the Program Works:**

Borrowers apply to AHFC for financing to make energy improvements on owner-occupied properties. Borrowers select from the list of energy upgrades included with the energy audit of their home, performed by an [AkWarm<sup>TM</sup>-certified Energy Rater](#). All improvements must be completed within 365 days of loan closing. (Improvements not listed may not be included in the loan.)

For forms and instructions see the attached [Second Mortgage Program for Energy Conservation](#) (in PDF).

### **Program Note:**

*For borrowers participating in the [Home Energy Rebate Program](#); the rebate received will be applied toward the outstanding balance of the Second Mortgage Program for Energy Conservation. To schedule an energy rater to participate in the Rebate Program, visit our [online signup](#) or call 1-877-AKREBATE (1-877-257-3228).*

### **Additional Considerations:**

- The maximum loan amount is \$30,000.
- The maximum loan term is 15 years.
- The interest rate is the Taxable Program 15-year interest rate. [Go to Interest Rates](#)

### **Potential borrowers may:**

Apply directly to AHFC by calling 800.478.2432 (outside Anchorage but within Alaska) or 338.6100 (in the Anchorage area).

# What You Can Do

## Stop Losing Money at Home

Wasting energy is like pouring money down the drain. Cooperative Extension Service at UAF offers these free and low-cost steps to save energy and money. Even if you are on a limited budget, these measures can add up to big savings.

Cost to you: **FREE**

- Turn down the thermostat. For every degree you turn your home's thermostat down, you take about two percent off your energy bill. Lowering the thermostat five degrees at night and 10 degrees during the day when you're out can cut as much as 20 percent off your heating costs.

- Keep radiators and vents clear of furniture and drapes.
- Turn off the lights when leaving the room.
- Turn down the thermostat on the water heater to 120°F.
- Keep the refrigerator door closed.

- Clean the gasket on the refrigerator and freezer doors so they shut securely. Vacuum the coils underneath the refrigerator for efficient operation. A clean refrigerator or freezer works more efficiently.

- Check the temperature inside both refrigerator and freezer. If your (accurate!) thermometer says the refrigerator is colder than 36 or hotter than 40 degrees Fahrenheit, adjust the controls. If the freezer falls between zero and five degrees Fahrenheit, you're fine. Otherwise adjust the controls. If you go 10 degrees less than the minimum suggested levels, you can increase your energy use by up to 25 percent.

- Run your dishwasher on normal setting. Don't use special features such as pot scrubber.

- Use the shortest washing time possible, depending on how dirty the clothes. Washing longer than necessary wastes energy and wears out clothes.

- Set washer loads for "warm" or "cold" wash instead of hot. Extra dirty loads might need a cold water pre-soak. The only time a washer really needs hot water is for oily/greasy stains. The rinse water should always be cold since the temperature does not affect cleaning. Using cooler water gives you the added bonus of longer-lasting clothes.

- Clean the lint trap (and possibly even the vent pipe) on your clothes dryer.

Cost to you: **Less than \$5**

- Install foam gaskets under switch plates and outlets on exterior walls.
- Use plastic transparent window film on drafty windows.
- Use power strips for appliances and entertainment centers that have an instant-on or clock feature. Turn off when not in use.
- Stop leaks by replacing washers in sink faucet.
- Make a draft dodger by filling an old sock or fabric tube with sand and place against the bottom of exterior doors.

Cost to you: **Less than \$10**

- Use spray foam insulation around windows and door frames to seal leaks.
- Replace weather stripping around exterior doors.
- Replace door sweep on the bottom of door.

Cost to you: *Less than \$25*

- Install insulating blanket on water heater.
- Install new threshold under exterior doors.
- Install low-flow shower head.

## Who's Who in Energy Efficiency in Alaska

**Alaska Energy Authority (AEA)** – Renewable energy resource maps, reports, programs, planning, and financing information. Also oversees the Alaska Renewable Energy Grant Fund.

**Alaska Energy Network** - A public networking site that allows people interested in Alaska's energy matters to share information and connect with others, and to ask energy-related questions that get answered by experts.

**Alaska Energy Wiki** - Designed to provide information on energy technologies, energy opportunities, and energy projects in Alaska.

**Alaska Center for Energy and Power (ACEP)** – University of Alaska's research center for applied energy research to lower energy costs and develop economic opportunities throughout Alaska. The center also has a searchable database of energy research, including papers, presentations and reports.

**Alaska Housing Finance Corporation (AHFC)** – Residential energy efficiency and energy resources library, programs, and financing information. Includes home weatherization and energy efficiency grants and rebate programs in addition to low-interest financing.

**Cold Climate Housing Research Center (CCHRC)** - Research and development of cold-climate building techniques and technologies, including energy efficiency and micro-generation renewable energy technology.  
[www.energystar.gov/](http://www.energystar.gov/)

### **Energy Star**

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping us all save money and protect the environment through energy efficient products and practices.

**Green Star, Inc.** – Provides information and resources on energy efficiency and runs the GreenStar Award program, recognizing businesses and organizations that meet the high environmental standards set by the GreenStar award.

Renewable Energy Alaska Project (REAP) <http://alaskarenewableenergy.org/>

REAP is a coalition of Alaska utilities, businesses, conservation and consumer groups, Alaska Native organizations, and municipal, state and federal entities with an interest in developing Alaska's vast renewable energy resources. REAP's goal is to increase production of renewable energy in Alaska and bring the benefits of clean, economic and inexhaustible renewable power to Alaska.

## Shopping for an energy efficient appliance

Home appliances may look similar but they can vary a lot in terms of operating costs and energy efficiency. The more energy efficient an appliance is, the less it costs to run. Energy efficient models lower your utility bill and help protect the environment.

When you're in the market for a new appliance, follow these simple steps:

**Decide size and style.** Measure the space to be sure your new appliance will fit. Is there enough room to fully open the door or lid? Is there clearance for ventilation?

**Consider all the costs.** The purchase price is only part of what you'll pay. An energy efficient model that's more expensive can actually save you money because of lower energy costs.

**Ask about special offers.** Cash rebates, low-interest loans and other incentives are often available to encourage consumers to buy energy efficient appliances. Use Energy Star's Rebate Locator to find special offers.

[http://www.energystar.gov/index.cfm?fuseaction=rebate.rebate\\_locator](http://www.energystar.gov/index.cfm?fuseaction=rebate.rebate_locator)

**Read the Energy Guide label.** The label gives the appliance's estimated energy consumption, providing you with a basis for comparison with other models or brands.

**Check for the Energy Star logo.** Appliances with this logo are significantly more energy efficient than the average comparable model. The Energy Star program is operated jointly by the U.S. Department of Energy and the EPA.

For more information about buying energy efficient appliances, click here.

[http://www.eartheasy.com/live\\_energyeffic\\_appl.htm](http://www.eartheasy.com/live_energyeffic_appl.htm)

## Home renovators alert: House passes Caulkers bill

By JIM ABRAMS (AP) – May 6, 2010

WASHINGTON — Homeowners could collect thousands of dollars in Cash for Caulkers rebates for renovating their homes with better insulation and energy-saving windows and doors under a new economic stimulus bill the House passed Thursday. *(read more)*

The Home Star bill, passed 246-161, would authorize \$5.7 billion over two years for a program that supporters — mostly Democrats — said would have the added benefits of invigorating the slumping construction industry and making the earth a little cleaner.

"Home Star is that solid investment that's going to achieve that hat trick of energy savings for the homeowner, of moving toward a cleaner environment and of creating jobs here at home," said bill sponsor Peter Welch, D-Vt.

Republicans overwhelmingly opposed the bill, and they were able to attach a condition that it would be terminated if Democrats do not come up with a way to pay for it.

The measure has come to be dubbed Cash for Caulkers, a takeoff on the popular 2009 Cash for Clunkers initiative that rewarded people for replacing gas-guzzling vehicles with more fuel-efficient models.

President Barack Obama praised the House action, saying the bill "will help jump-start job growth and demand for new products created right here in America" as well as saving consumers money on energy bills.

The initiative is separate from an energy tax credit of up to \$1,500 that was included in last year's economic stimulus act. That credit for energy efficiency improvements runs through the end of this year.

Supporters estimate that 3 million households would make use of the new program, saving \$9.2 billion in energy costs over a 10-year period. They said it would create 168,000 jobs, mainly in the recession-hit construction industry.

"Nearly one in four workers in the home construction and services industry has been laid off," said Energy and Commerce Committee chairman Henry Waxman, D-Calif. "Passing Home Star says, 'Help is on the way.'"

Republicans were more skeptical, saying the price tag was too high

at a time of mounting federal debts.

"We are going to authorize \$6.6 billion of money we don't have so we can caulk homes?" asked House Republican leader John Boehner of Ohio.

"This is not a terribly bad bill, but it has one fatal flaw: It is not paid for," said Rep. Joe Barton of Texas, top Republican on the energy committee. Democrats argued that the issue of paying for the legislation will come later in the budgetary process, when Congress approves annual spending bills.

Republicans succeeded at the end of the debate in altering the bill to say it will be terminated if it is found to drive up the federal deficit, a provision that will force Democrats to come up with an offset. The Republicans also were able to alter the legislation so that the rebates would go directly to homeowners. In the original version, homeowners were to receive a discount or rebate from a retailer or contractor, who then would apply for payment from the government.

Waxman said Republicans picked up Democratic votes for that final GOP motion — 178 of 245 voting Democrats backed it — by including several "gimmicks" that could be used against lawmakers in future elections, such as a provision that contractors in the program must ensure that they don't have sexual predators on their payroll. He said some of the GOP-backed changes would be dealt with when the House and Senate work out a final version.

In debate on the bill, Republicans questioned whether the government can run the rebate program fairly and effectively. They said a \$4.7 billion weatherization program that was part of last year's economic stimulus act has been slow to provide grants to states.

The Cash for Clunkers program, too, had some problems. An Associated Press study last November found that the program was commonly used by people turning in old pickups for new trucks that got only marginally better gas mileage.

Under Home Star, rebates or discounts would be provided to homeowners at the time of sale. The retailer or contractor then would submit documentation to a processing office which would verify the information and forward the request to the Energy Department for payment.

To prevent fraud, the program would require licensing for all participating contractors and a certain percentage of projects would be inspected.

The bill has two parts: The Silver Star program provides upfront rebates of up to \$3,000 for specific energy-efficient improvements in homes, such as installing energy-efficient appliances or duct sealing, insulation or new windows or doors.

A Gold Star program would entitle people to up to \$8,000 when they conduct comprehensive energy audits and implement measures that reduce energy use throughout their homes by more than 20 percent. The bill has the backing of a wide spectrum of environmental and business groups.

"There is strong evidence that temporary, targeted incentive programs like Home Star can generate jobs, investment and economic growth," National Association of Manufacturers president John Engler said at a hearing in March.

With House passage, the bill moves to the Senate, where it most likely will be attached to the next jobs bill.

The legislation also would approve \$600 million over two years for grants to states for programs to replace mobile homes with more energy efficient models.

The original bill included \$6 billion for the rebate program plus the \$600 million for the state grants. The Republicans were able to remove \$324 million targeted for a Home Star loan program.

*The bill is H.R. 5019.*

*Add to Smart Power AK 5.24.10*

## **New Guidelines for ENERGY STAR Homes**

In case you missed it, the Environmental Protection Agency last month announced new more rigorous guidelines for new homes looking to earn the ENERGY STAR. Compared to the prior ENERGY STAR guidelines, the new requirements increase the energy efficiency of qualified homes by more than 10%, making them more than 20% more efficient than homes built to the 2009 International Energy Conservation Code (IECC). These guidelines will begin to go into effect in January, 2011, although some builders may choose to adopt the new requirements earlier.

[EPA Press Release](#)  
[More Information](#)

June 30, 2010

There's a new website on the block dedicated to all things energy efficiency. The new site, [akenergyefficiency.org](http://akenergyefficiency.org), launched in mid-June and will expand further in September. The site includes upcoming events, news, resources, and pages tailored to homeowners, business, professionals, teachers and youth. The Website was developed by the Alaska Energy Efficiency and Conservation Working Group, a partnership of more than 20 entities including state and federal programs, utilities, state legislative offices, local non-profits, university programs, private businesses and tribal organizations. The website will provide Alaskans with a simple, single point of entry into the broad world of energy efficiency and conservation.

What type of electric consumer are you? A multi-national study of consumer behavior in residential energy management says Americans fall into one of six categories: skeptics, pragmatics, cost-conscious, proactives, indifferents, and eco-rationals. Read more.

What type of electric consumer are you? A multi-national study of consumer behavior in residential energy management says Americans fall into one of six categories: skeptics, pragmatics, cost-conscious, proactives, indifferents, and eco-rationals. Read more.

## Consumer Behavior and Electricity Usage

Publisher: Intelligent Utility Daily (Author: Phil Carson)

July 14, 2010

Phil Carson, Editor-in-Chief

Intelligent Utility Daily

To the ongoing conversation on how consumers behave, what they think and how to engage them, let's add a new Accenture study.

In January, Accenture surveyed consumers in 17 countries, including the United States, seven European nations, China, Japan and South Korea on residential energy management attitudes, knowledge and practices.

"We wanted to step back from the smart grid and its technologies and survey customers and consumers on barriers to changing behavior around energy usage, because -- especially in North America -- utilities are responding to pressures from various stakeholders to reduce use," says Greg Guthridge, managing director for Accenture's retail and business services for utilities.

"Most utilities are already fairly sophisticated in dealing with the large commercial/industrial sector, but not so on the small- and mid-sized commercial and the entire residential mass market," he adds.

A broad-brush take on the findings among Americans:

Consumers do not fully equate electricity usage with its environmental impacts.

Though more than two-thirds say they know how to optimize electricity use, only one-third know of programs to do so.

Though most Americans identify their electric utility as the preferred source for such programs, few trust them.

Americans will manage use only if that saves money.

Americans can be grouped into one of six demographic groups: skeptics (31 percent), pragmatics (25 percent), cost-conscious (13 percent), proactives and indifferents (12 percent each) and eco-rationals (7 percent).

"It would be a mistake if utilities treat consumers as a single mass of undifferentiated audience,"

Guthridge says. "One size doesn't fit all. They need to offer differentiated services, options and messages. And those messages need to be fine-tuned."

Based on the survey results, Guthridge said, "Smart grid-enabled programs aimed at the mass market are probably a waste of money."

### Telco Parallels

Guthridge cited what he called a telco parallel. In the past, telcos treated the mass market as such. Today, the telcos are very sophisticated in offering differentiated services to various demographic market segments.

"The biggest surprise -- the headline message -- is the influence of 'control,'" says Guthridge. In other words, consumers are averse to utility control of their residential data and appliances.

"Consumers are still quite nervous about this and it's a growing trend," Guthridge says. "Energy providers and utilities need to really explain these programs. You can see growing resistance. We were surprised by the numbers. Consumers have a low level of trust in their utility and it's even lower in competitive markets.

"Why? We've concluded that lower trust in deregulated markets is due to changing prices," he continues. "Fluctuation in prices turns off consumers, who want stability."

According to the study, the vast majority of consumers, asked if they know how to conserve energy, said yes -- but they don't know of any programs offered by their utility.

"We think they confused general energy use -- including other utilities such as water and gas, and recycling programs -- with electricity usage," Guthridge says. "Most premises in North America continue to grow in energy usage. Consumers don't tie electricity usage to broader environmental impacts and confuse electricity use with other energy usage."

So, what's a beleaguered utility to do?

"We're suggesting more education," Guthridge said.

Who is best positioned to deliver that education?

"Based on our findings about trust in utilities, the utility or energy provider will not be effective on their own," Guthridge says. "They'd better partner with other groups, such as environmental organizations, government agencies and even 'big box' retailers. This would make education

more effective, swifter and less costly."

One startling finding: Consumers spend, on average, 6-9 minutes each year interacting with their utility. Four of the top five reasons are negative, Accenture found.

"It's not a high-value interaction," Guthridge noted.

Ideas for moving the needle: focus on educating those in receptive demographics, perhaps addressing children rather than adults.

One idea that's been cited in Intelligent Utility Daily is the notion that dynamic pricing programs should preserve one static rate for consumers who simply cannot or don't want to deal with changing rates.

"Regulators globally discuss a 'vanilla rate' option that doesn't disadvantage customers," Guthridge said. "But how do you limit use of that rate to only the disadvantaged? Fairness is an issue.

"In a sense, regulatory emphasis is on the opposite of our recommendation to differentiate the market -- regulators say everyone should be treated the same," he adds. "Thus, utilities will have to devise incentives for voluntary opt-in to differentiation. Not just with a stick, but with a carrot."

Of course, not everyone agrees with Accentures findings -- that utilities have a distant relationship with their customers. Others such as CoreBrand have argued that utilities oftentimes are connecting with their customers, which could give them the inside track on installing the new technologies to allow for smarter energy usage.

In any event, everyone agrees that more education is a must and that utilities are central to getting out the message. Joining forces is one way. But so is using their existing ties to the customers they already have.

Links to article:

<http://www.intelligentutility.com/article/10/06/consumer-behavior-and-electricity-usage>

or

<http://www.scoop.com/remote/article/include/172969719/53616c7465645f5f7a6a0500381653e1dab1b9a290ae7d88e5c2ac97c68b514f90370cf86cf42982>

Publishing Information:

[www.energycentral.com/centers/energybiz/ebi\\_list.cfm](http://www.energycentral.com/centers/energybiz/ebi_list.cfm)

Republished with permission from CyberTech, Inc. EnergyBiz Insider is published three days a week by Energy Central. For more information about Energy Central, or to subscribe to EnergyBiz Insider, other e-newsletters and EnergyBiz magazine, please go to [http://www.energycentral.com/centers/energybiz/ebi\\_list.cfm/](http://www.energycentral.com/centers/energybiz/ebi_list.cfm/)

## **Information & tips for OpenPeak device.**

Chugach has programmed your unit with current rates and electric meter information. The device is configured for a wired connection. If you prefer a wireless configuration, go to “Settings,” then “Network,” and select a wireless connection.

In order to display your electrical consumption, go to the Icon labeled “Electric.”



Electric

Once you select this icon, the device will begin receiving kwh consumption information from your electric meter and graphing the information. It will display the information in kwh or dollar amounts used. The device can display information in real time, monthly, daily or hourly format.

The device has an actual-to-budget option. Input your estimated monthly electrical budget and it will track what you have actually used compared to your budget.

Chugach is working with Google in hopes that before the month-long test is over, you will be able to view your electrical usage through Google Power Meter. With Google Power Meter, data from your electric meter will automatically upload to Google where it can be charted, graphed, and viewed online. Chugach will instruct you by e-mail as soon as this Google feature is available.

Numerous free applications are available through the “App Shop” icon on your OpenPeak device. You can customize the display to include your favorite applications. The free applications include YouTube, games, Google Talk, and Google Map.

If you have any questions regarding your device, please contact our office at 563-7366. Thank you for your continued interest in the Watt Buster project.

# OpenPeak Quick Start Guide

Provided as a hard copy only

# EnergyHub Dashboard System User Manual

Provided as a hard copy only

**FAQ: PLEASE SEE THE WEBSITE FOR AN UPDATED LIST.**

Q: Are non-sine wave loads measured accurately, such as those from solar powered inverters?

A: Yes, Watts up? measures both the current and voltage thousands of times per second so non-sine wave loads are measured accurately.

**SAMPLE CONSUMPTION AND COSTS FOR TYPICAL APPLIANCES**

Appliance	Wattage	Daily Cost	Monthly Cost	Annual Cost
Refrigerator	250 watts	\$ .25	\$7.50	\$90
Computer	60 watts	\$ .12	\$3.46	\$41
100 bulb on 12 hrs/day	100 watts	\$ .10	\$2.88	\$35

Sample consumption and costs for typical appliances (using an electricity rate of 8 cents per kilowatt hour)

**TECHNICAL SPECIFICATIONS**

- > 120 VAC, 60 Hz, 15 amps continuous
- > True RMS power measured and displayed
- > Accuracy is: +/- 3%, +/- 2 counts of the displayed value for loads above 10 watts  
Accuracy is: +/- 5%, +/- 3 counts of the displayed value for loads below 10 watts  
*Accuracy is of the displayed value, not the range. Some devices claim a smaller number for accuracy but it refers to the range. For instance, a specification of 0.2% of the range sounds good, but it is actually 3.6% of the display (.02 \* 1800 = 3.6), which is a worse accuracy.*
- > RS232 Interface (PRO). A USB to RS232 adapter is available
- > Mains supply voltage fluctuations not to exceed +/- 10% of the nominal voltage
- > Input is via 6' electric cord, output is via outlet on top of meter

**FOR UL RATING**

- > Indoor use only
- > Altitude up to 2000 meters
- > Temperature 50° C to 400° C
- > Installation Category II
- > Pollution Degree 2
- > Maximum relative humidity 80% for temperatures up to 310° C decreasing linearly to 50% relative humidity at 400° C.

**CLEANING**

Watts up? may be cleaned using a dry soft towel. Do not use liquids to clean. Do not disassemble. There are no spare parts. No preventative maintenance is required. If the case breaks or other physical damage is apparent, do not use.

**WARNING**

Watts up? is not a toy and is only intended for use by people over the age of 10. Never open the case. Shock hazard exists. Watts up? is not water resistant. As with all electronic equipment, avoid water and liquids. Do not touch Watts up? if it is wet. Watts up? is not repairable. If Watts up? is used in a manner not specified herein, the protection provided by Watts up? may be impaired.

**WARRANTY**

Watts up? is guaranteed for 12 months from date of purchase. If a problem arises, simply return the meter to the place of purchase, along with proof of purchase, for a new meter or credit. For technical assistance or repair, please call toll free: 877.WATTS01 (877.928.8701). Electronic Educational Devices believes it is everyone's responsibility to help the environment. In this effort, e.e.d purposefully uses recycled components wherever possible and minimizes extraneous packaging. We hope that using Watts up? helps people understand the costs involved with electricity, and thereby encourages conservation and participation in environmental issues.

Printed on recycled paper, 20% post consumer content  
Illegal to reproduce without written permission  
© 2002 by E. E. D., Incorporated.

**Electronic Educational Devices**  
2345 South Lincoln Street  
Denver, Colorado 80210  
www.doublelead.com



8/02 REV 7



**OPERATORS MANUAL**

POWER ANALYZER, WATT METER AND ELECTRICITY MONITOR

**watts up?**

**AND**

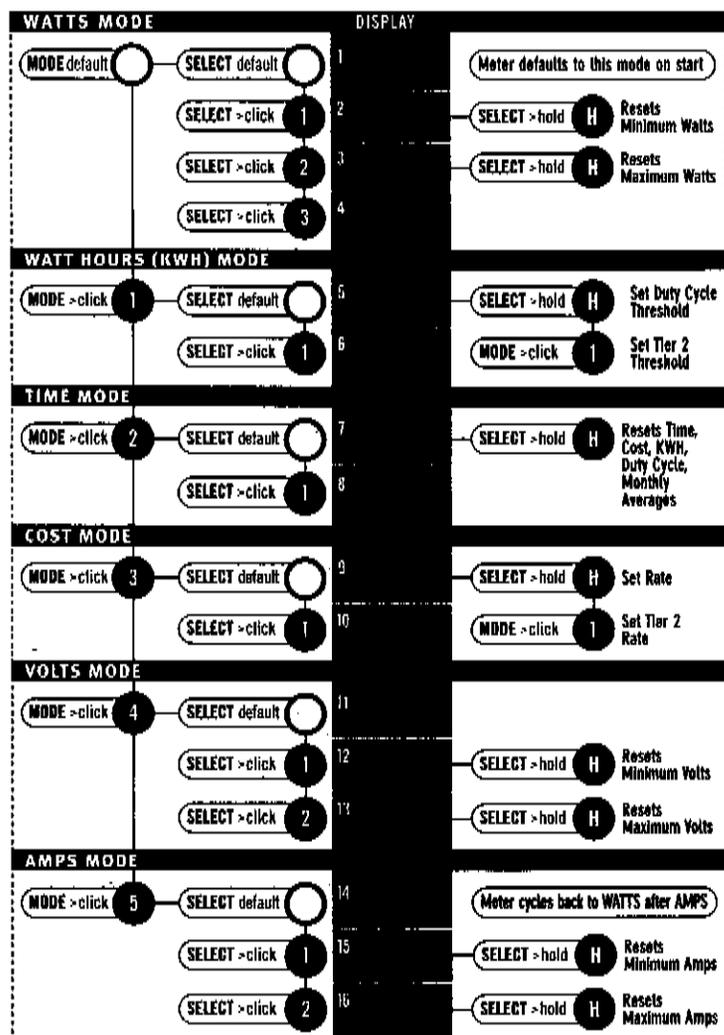
**watts up? PRO**

## OPERATORS MANUAL

Watts up? incorporates sophisticated digital electronics that enable precise and accurate measurements in an easy-to-use format. State-of-the-art digital microprocessor design utilizes high-frequency sampling of both voltage and current measurements for true power. Power factor is captured so even phase-shifted loads such as motors are accurately measured. Watts up?PRO downloads data to a PC for graphing and charting, and includes a payback calculator which automatically calculates the number of months to payback a new energy efficient appliance. Fast, intuitive and easy-to-use, Watts up? quickly and accurately measures any 120 VAC appliance.

### QUICK REFERENCE GUIDE

This quick reference guide lists all the displays. They are numbered 1-16, and are each described in more detail in the pages that follow.



Thanks for purchasing Watts up? It will help you understand the cost of your electricity, your power quality and how your appliances operate. Watts up? is easy-to-use, but to make sure you get the most out of your meter, skim through the entire manual so you understand all the capabilities of Watts up?.

### GETTING STARTED

1. Plug Watts up? into a standard 120-volt AC wall outlet.
2. Plug an appliance into Watts up?
3. Turn on the appliance.

You'll see a reading like "35.7 WATTS." Watts up? always displays WATTS mode when first plugged in. There are six "modes" on the Watts up? meter. Modes are the major values that the meter displays. The modes are: WATTS, WATT HOURS, TIME, COST, VOLTS, and AMPS. Each mode includes one or more detail readings. For example, when in the WATT mode, you can see detail about watts, such as the MINIMUM WATTS or the MAXIMUM WATTS. The six modes and their detail readings are shown on the quick reference guide. To learn more about each mode, refer to the sections that follow.

4. To cycle through modes, simply click the **MODE** button. Each time you click the **MODE** button, you'll cycle to another mode.
5. To cycle through details within a mode, simply click the **SELECT** button while in that mode.
6. To reset any reading, press and hold the **SELECT** button for one second.

Clicking the **MODE** button cycles the display through all 6 modes, always in the same order. If you get confused, simply click the **MODE** button repeatedly until you get to the WATTS mode. Or simply unplug Watts up? and plug it back in. The display will now be in the WATTS mode. Unplugging Watts up? also resets all the values except **RATE** and **THRESHOLD**.

### MODES

This section describes each mode and the detail you can see within each mode. The detail readings are accessed by clicking the **SELECT** button while in the respective mode. If the **MODE** button is clicked while viewing a detail reading, Watts up? exits the detail reading and displays the next mode. For example, if **MAXIMUM WATTS** is being viewed and the **MODE** button is clicked, then the **WATT HOUR** mode is displayed. There are sixteen displays total, and each is described below. Examples shown represent a 150 watt bulb turned on eight hours per day for two days.

#### WATTS MODE

Watts up? always turns on in WATTS mode.

150 WATTS

#### 1 CURRENT WATTS

When you turn on Watts up? or cycle to the WATTS mode, true RMS watts (the wattage currently being consumed) are automatically displayed. If nothing is plugged into Watts up?, the display reads zero (0).

0.0 WATTS

#### 2 MINIMUM WATTS

Click the **SELECT** button while in the WATTS mode. The display now shows the **MINIMUM WATTS** since Watts up? was plugged in or since the **MINIMUM** was last reset. This usually reads zero. It is used to determine the lowest wattage drawn for appliances that run continuously.

To reset the value after the appliance is on, press and hold the **SELECT** button for 1 second.

### 3 MAXIMUM WATTS

315 WATTS  
MAX

Click the **SELECT** button again. The display now shows the **MAXIMUM WATTS** since Watts up? was plugged in or since the **MAXIMUM** was last reset. This will read zero (or a small value, since there is often a surge when plugging Watts up? in) until an appliance is plugged in and turned on.

To reset the **MAXIMUM**, press and hold the **SELECT** button for one second.

1.00 PF

### 4 POWER FACTOR

Click the **SELECT** button again. The display now shows power factor for the appliance currently plugged in. **POWER FACTOR** is a number between zero and one, and it represents the phase angle shift between the voltage and current. To figure **POWER FACTOR**, Watts up? performs the following calculation: **RMS Watts/Apparent Watts**.

Click the **SELECT** button again. The display returns to the **WATTS** mode.

## WATT HOURS MODE

Click the **MODE** button.

24 KILOWATT  
HOURS

### 5 CUMULATIVE WATT HOURS

The display now indicates the cumulative **WATT HOURS** used since Watts up? was plugged in or **TIME** was last reset. Watt hours equal watts multiplied by time. For instance, a 150 watt bulb plugged in for 1 hour will consume 150 watt hours. In two hours, it will have consumed 300 watt hours. As the value increases, the display will automatically change units to **KILOWATT HOURS** (1 kilowatt hour (kwh) = 1000 watt hours).

MONTHLY  
AVG 36.0 KILOWATT  
HOURS

### 6 AVERAGE MONTHLY KWH

Click the **SELECT** button while in the **WATT HOUR** mode. The display now shows how many watt hours will be consumed each month. This is a pro-rated average, calculated since Watts up? was plugged in or **TIME** was last reset. The formula is:

$$\text{AVERAGE MONTHLY KWH} = (\text{watt hours}) / (\{\# \text{ of elapsed days}\} / (30 \text{ days}))$$

It is used to determine how much electricity is used per month.

Resetting the **TIME** will also reset the **MONTHLY AVERAGE**.

Click the **SELECT** button again. The display returns to the **WATT HOURS** mode.

## SETTING THRESHOLDS (WATT HOURS MODE)

### DUTY CYCLE WATTS THRESHOLD

100 WATTS  
DUTYCYCLE

**DUTY CYCLE** is the percent of time the appliance is above a threshold level. The default threshold is 100 watts, so the **DUTY CYCLE** will display the percent of time the appliance is above 100 watts. The threshold can be changed to any number between one and 1500 watts. To change the threshold, go to the **WATT HOURS** mode. Press and hold the **SELECT** button until the **SET, DUTY CYCLE, WATTS** symbols come on. **UP/DOWN** indicators will alternately flash. Click the **SELECT** button and the value will change in the direction of the arrow. Holding the **SELECT** button changes the value faster. Click the **MODE** button when the threshold is correct. The **TIER 2 THRESHOLD** is now displayed.

It is recommended that you reset the **TIME** (see below) after changing the **DUTY CYCLE THRESHOLD**, because the duty cycle value is a real-time calculation.

### TIER 2 KWH THRESHOLD

500 KILOWATT  
HOURS  
TIER 2

**TIER 2 THRESHOLD** is used to calculate secondary utility rates, described below in the **COST** section. To change the **TIER 2 THRESHOLD**, go to the **DUTY CYCLE THRESHOLD** and click the **MODE** button. The **SET, TIER 2, KILOWATT HOURS** symbols come on. **UP/DOWN** indicators alternately flash. Click the **SELECT** button and the value changes in the direction of the arrow. Holding the **SELECT** button changes the value faster. Click the **MODE** button when the value is correct. The default value is 500 kilowatt hours.

## TIME MODE

Click the **MODE** button again.

2:00 HOURS  
DAYS

### 7 ELAPSED TIME

The display now indicates the elapsed **TIME** since Watts up? was plugged in or **TIME** was last reset. The **TIME** is first displayed in minutes and seconds (i.e. 1:25 means one minute and 25 seconds), up to 20 minutes. At 20 minutes, the display changes to hours and minutes and the **HOURS** symbol turns on (i.e. 1:25 now means one hour and 25 minutes). At 20 hours, the display changes to days and hours, and the **DAYS** symbol turns on (i.e. 12:17 means 12 days and 17 hours). At 20 days, the display changes to days with a decimal point, and the **HOURS** symbol turns off (i.e. 22.7 means 22 days and 7 tenths. 7 tenths is about 16 hours and 45 minutes).

0:00 - 19:59 (Zero to 19 minutes, 59 seconds)	Display > no symbol
0:20 - 19:59 (20 minutes to 19 hours, 59 minutes)	Display > HOURS
0:20 - 19:25 (20 hours to 19 days, 25 hours)	Display > HOURS and DAYS
20.1 - 1999 (20 1/10 days to 1999 days. After 1999 days, start over at 1 second)	Display > DAYS

Press and hold the **SELECT** button for one second while in the **TIME** mode to reset the **TIME, WATT HOUR, COST, DUTY CYCLE** and **MONTHLY AVERAGE** values back to zero. These values, as well as **MINIMUMS** and **MAXIMUMS** are also reset when Watts up? is unplugged.

33 DUTYCYCLE

### 8 DUTY CYCLE

Click the **SELECT** button while in the **TIME** mode. The display now shows the **DUTY CYCLE** as a percentage (the number will be between zero and 100). **DUTY CYCLE** is the percent of time the appliance is above a threshold level. The default threshold is 100 watts, so the **DUTY CYCLE** will display the percentage of time the load is above 100 watts. The threshold can be changed to any number between one and 1500 watts.

For example, plug a refrigerator into Watts up?. The **DUTY CYCLE** will be the percent of time that the refrigerator compressor is running (if the threshold is set to more than the wattage of the refrigerator light bulb).

Click the **SELECT** button again. The display now returns to the **TIME** mode.

## COST MODE

Click the **MODE** button again.

\$.192

### 9 CUMULATIVE COST

The display now indicates the amount of money consumed since Watts up? was plugged in or **TIME** was last reset. Tenths of a cent are initially displayed, so ".001" means 1/10 of a cent. ".234" means 23 and 4/10s cents. "3.24" means three dollars and 24 cents.

# **Kill A Watt Operating Manual**

Provided as a hard copy only

## 10 AVERAGE MONTHLY COST

MONTHLY  
AVG \$ 2.88

Click the **SELECT** button while in the **COST** mode. The display now shows the cost per month for whatever is plugged in. This is a pro-rated average, calculated since Watts up? was plugged in or **TIME** was last reset. The formula is:

$$\text{AVERAGE MONTHLY \$} = (\text{cost}) / \{(\# \text{ of elapsed days}) / (30 \text{ days})\}.$$

This value will change quickly when something is first plugged in. For refrigerators and other appliances that turn on and off, wait until the value no longer changes for an accurate reading. This may take a few hours, or even longer depending on how often the appliance cycles on and off.

Click the **SELECT** button again. The display now returns to the **COST** mode.

## SETTING RATES (COST MODE)

SET  
RATE \$ 0.80

### RATE

The **COST** is calculated by multiplying the kilowatt-hours by the rate charged by the utility. Most rates range from 3 cents to twenty-five cents per kilowatt-hour, although they can be even higher. Call your utility or look on your utility bill and divide the cost for electricity by the number of kilowatt-hours consumed to determine your local rate. The default rate that Watts up? uses is 8 cents per kilowatt-hour. To change the rate in Watts up?, go to the **COST** mode. Press and hold the **SELECT** button until the **SET** and **RATE** symbols come on. **UP/DOWN** indicators will alternately flash. Click the **SELECT** button and the value will change in the direction of the arrow. Holding the **SELECT** button changes the value faster. The rate can be set for any amount between zero and \$2.00 per kilowatt-hour, in tenths of a cent increments. Click the **MODE** button when the rate is correct. The **TIER 2 RATE** is now displayed.

SET  
RATE TIER 2 \$ 1.00

### TIER 2 RATE

The **TIER 2 RATE** is displayed after the **RATE** (described above). Some utilities use more than one rate structure. Rates can be different based on the time of day, peak usage, or total usage. Watts up? has the capability to utilize a second rate based on total usage, which is called the **TIER 2 RATE**. However, because Watts up? only measures one outlet and not the entire house, most users find it unnecessary to use the **TIER 2**. The default **TIER 2 RATE** is ten cents per kilowatt-hour, and it can be changed the same way as **RATE** described above. The **TIER 2 RATE** is applied when the total usage is more than the **TIER 2 THRESHOLD**, described above in the **WATT HOURS** mode section.

The formula is: Total cost = (Rate) \* (kilowatt hours below Tier 2 threshold) + (Tier 2 rate) \* (kilowatt hours above Tier 2 threshold)

## VOLTS MODE

Click the **MODE** button again.

120  
VOLTS

### 11 LINE VOLTS

The display now indicates the **LINE VOLTAGE**.

MIN VOLTS 117

### 12 MINIMUM VOLTS

Click the **SELECT** button while in the **VOLTS** mode. The display now shows the **MINIMUM VOLTS** since Watts up? was plugged in or since the **MINIMUM** was last reset. This can be a good indication of the line quality serving the outlet.

To reset the value to zero, press and hold the **SELECT** button for one second.

## 13 MAXIMUM VOLTS

122  
VOLTS MAX

Click the **SELECT** button again. The display now shows the **MAXIMUM VOLTS** since Watts up? was plugged in or since the **MAXIMUM** was last reset. This value could represent voltage surges, which is when the voltage momentarily increases.

To reset the value to zero, press and hold the **SELECT** button for one second.

Click the **SELECT** button again. The display now returns to the **VOLTS** mode.

## AMPS MODE

Click the **MODE** button again.

125  
AMPS

### 14 CURRENT AMPS

The display indicates the **AMPS** being drawn by the appliance plugged into Watts up?.

MIN AMPS 0.0

### 15 MINIMUM AMPS

Click the **SELECT** button while in the **AMPS** mode. The display now shows the **MINIMUM AMPS** since Watts up? was plugged in or the **MINIMUM** was last reset. This will typically read zero. It is used to determine the lowest amperage drawn for appliances that run continuously.

To reset the value after the appliance is turned on, press and hold the **SELECT** button for one second.

263  
AMPS MAX

### 16 MAXIMUM AMPS

Click the **SELECT** button again. The display now shows the **MAXIMUM AMPS** since Watts up? was plugged in or the **MAXIMUM** was last reset. This will read zero (or a small value, since there is often a surge when plugging Watts up? in) until an appliance is plugged in and turned on.

To reset the value to zero, press and hold the **SELECT** button for one second.

Click the **SELECT** button again. The display now returns to the **AMPS** mode.

## WATTS UP? PRO

The **PRO** model stores the 16 values described above into memory, and time stamps the occurrence of any power cycle. The data can then be downloaded to a computer. The data is stored every second until 1000 records are stored. At that point, the sample rate doubles and the data is stored every 2 seconds. When 1000 records are stored, the sample rate doubles again to 4 seconds. The sample rate continues to double as needed so Watts up? **PRO** can record indefinitely. If Watts up? **PRO** is unplugged, or if power is lost, the data in memory is maintained and data will continue to be stored once power is restored.

The **PRO** model comes with a CD containing a software program that must be installed on a computer, and a download cable that connects to the computer serial port (an adapter serial port to USB is available - contact eed at doubleed.com or 877-928-8701). An extensive help file is available in the program to answer questions. To install the program, simply insert the CD into your computer's CD drive and follow the on-screen directions. If nothing happens, select **START**, then **RUN**, and select the file: wusetup.exe The install wizard will then start.