ECOP User Document

Version 1.0

Absolute Power & Control, LLC

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I. Introduction to the ECOP User Interface

a. What is ECOP?

ECOP, the name, stands for Energy Conservation Observation Platform. It is a modular, configurable, secure system for monitoring environmental variables that can help people learn how to better manage their systems. To interact with this product, users utilize a modern browser from their computer or web-enabled mobile device. The user interface is the visible part of ECOP and the purpose of this document is to acquaint you with its features and functionality. For more information on ECOP itself, visit our [website](#).

b. The ideas behind the ECOP User Interface

The ECOP user interface (UI) is designed to be easily accessible, informative without being overwhelming, and adaptive to future needs. These criteria allow us to provide a monitoring solution that can be used by many people without a need for much training, while still being able to add features that address more complex monitoring scenarios.

To make it easily accessible, we built it as a web application. This means, that if the user so chooses, they can access their system from anywhere in the world that has Internet access, with commonly available browsers. This accessibility puts them in a position to make the most of the data they are collecting using ECOP.

To make it informative, we have tried to keep the information as high-level as possible. For example, rather than showing a line graph of all of hourly measurements for all circuits in the summary view, we show a only the daily averages for the week, which gives a good feeling for how things are running in relation to normal for the system. If more detailed information about any circuit is needed, a quick navigation can provide it. The idea is to have a good view of system health at a glance, with the capability of getting to the details as needed.

To make it adaptive, we have built upon the modular design of the core ECOP system. The UI is designed so the pieces are like widgets that the user can move around to create a customized view of their data. Tabs can be reordered or hidden from view. New ECOP modules can include their own UI components that can be

dynamically added to the system[1].

Our ultimate goal is to have a user interface with enough
building blocks in it that any user can create a customized
monitoring dashboard that presents their information in a way
that makes sense to them. In this way, we have to just support
a basic platform's features and the user can compose the
application they need, the way they like it.

c. Document Conventions

Throughout this document we refer to 'the user' so as to imply a
reference to a single individual. For many situations this
could certainly be accurate. However, for some situations,
there may be more than one user, each with different
interactions with the system.

For instance, if you obtain your ECOP through a distributor and
have it installed professionally, the initial user of your
system will be the installer that performs the initial
configuration. That user will spend lots of time on the
Configuration tab creating Sensors, and Measurements and
checking their work against the physical equipment being
installed. After their work is complete, the owner of the
system will likely have little need to deal with Sensors or
Measurements. This is not to say that the owner can't do those
things, but it just to clarify that in some, possibly many,
situations they may not have to.

Another clarification should also be made, and it is that we
refer to 'the user' in the singular. ECOP has the ability to
allow access to any number of users, subject only to the limits
of the hardware to keep up with user requests. As will be noted
in the proper section below, this is completely under the
control of the initial owning user and how they manage the
accounts defined in the system.

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1 In the 1.0 version, the ability to move things is disabled for licensing
   reasons, but in a future release this will be activated, once we figure out how
   to manage licensing for these different modules.

II. ECOP Concepts

ECOP is built on a few simple concepts centered around measuring, monitoring, and control. This section discusses those concepts so the user can benefit from this background information while learning to use the system. These same constructs are used in the internal design of the system, so speaking with a user or an engineer will result in mostly the same terminology being used, which eases the support process should troubles arise, as well as easing communications about future features a user may request.

There are several parts involved when setting up ECOP, and they build upon each other cumulatively, from basic building blocks to complex ones, all used to produce meaningful Measurements. These pieces are defined by the person installing the system, and can be manipulated by the user to define the Measurements they want to track to achieve their monitoring goals. All of these concepts are present in the user interface and used to construct a custom monitoring solution for the environment at hand.

a. Units

Units could be more properly stated as 'units of measure'. These are the descriptive labels that give Measurements meaning. Storing the value '1.5' means very little unless it is known what '1.5' represents. Is it amperes, volts, or kumquats? Units are an important part of the design of ECOP and they are built in to every aspect of configuration, so users do not need to define them.

b. Sensors

Sensors describe the pieces of equipment that are attached to ECOP that provide information about the environment. This is one of the most important constructs because without these being accurately established, ECOP has no way of knowing what the incoming signals are supposed to represent. Properly set up Sensors are the most basic building block when configuring ECOP.

c. Readings

Readings are raw data values that ECOP obtains from Sensors, mostly. These have no real value as data until they are processed in a way that is appropriate to the source sensor. That appropriate context is achieved with proper Measurement definitions. Users do not directly create readings, but rather

'shuffle them around' to create the desired Measurements.

d. **Constants**

One caveat to the association of Readings and Sensors is that some Readings can be defined as constant values. This is appropriate when a formula requires a value that can change from installation to installation, or usage to usage, but is static for a single context in which it is used. These constant values are considered readings as well, but do not require a sensor to obtain.

e. **Formulas**

Formulas are used to create Measurements. They can take Readings, Constants, and even other Measurements as inputs and produce Measurements as outputs. The Formula is where the interpretation of Readings occurs. This implies that specific Formulas are applicable only for certain Sensor outputs, and that is completely correct. Sending mismatched Sensor output to a Formula will result in questionable output, often in aborted Measurements which means no tracked data. One of the main purposes of the ECOP UI is to eliminate the possibility of these mismatches as we will see shortly.

f. **Measurements**

Measurements are the heart and soul of ECOP - its sole purpose is to create, store, and analyze Readings obtained from Sensors that provide Measurements about the real world. All Measurements are tracked over time and recorded, and all Measurements are averaged over time and those averages are recorded. This gives the user the ability to analyze very fine-grained data as well as very long-term trends in the data.

g. **Thresholds**

Thresholds are user-defined watermarks set for Measurement values. A threshold can be set for a high end and low end value. If the value of a Measurement becomes greater than the high end setting or less than the low end setting of a Threshold, that Threshold is said to be 'broken' and an appropriate action can be taken. The default action in these cases is to create an alert that shows in the ECOP UI for as long as the Threshold remains broken.

h. **Actions**

Actions are activities that can be triggered by events in the system. At this time, the only trigger that can cause an action

is a broken or normalized Threshold and the only action that can be taken (aside from the default alert) is to send an email (which can also result is SMS/Text message). The list of possible actions are almost limitless, and other actions will be added as time and demand dictate, such as those that will allow controlling physical devices (valves, power switches, bells, etc) based on system conditions.

III. The ECOP Web User Interface (Web UI)

This is the help section for the user interface of ECOP, which provides detailed information on configuration and operation of the system. After all of the background information covered previously, it is likely that this section won't be needed at all. Still, it's nice to have a reference for all of the pieces that make up the user's window into their monitoring data.

The boring and nerdy description:

> The ECOP Web User Interface is an HTML5-based (HTML + CSS + JavaScript)application that runs in your web browser that uses JSON over HTTP to communicate with the ECOP hosted web API to render a feature rich user experience.

The normal user description:

> The ECOP Web User Interface provides the user access to all the information and data generated by the ECOP system and allows the user to change configuration from wherever they they may be using a modern web browser.

Some user features include:

1.   Configure Sensors and name Measurements.

2.   Define Measurements by matching Readings with Formulas.

3.   Set Thresholds and Actions

4.   Admire your hard work via Summary and Details views.

5.   Review the complete historical record of every Measurement

6.   Administer users allowed to access the system.

HOW TO ACCESS THE ECOP UI:

To access the ECOP User Interface you will need to start your favorite web browser. At this time ECOP is tested with Internet Explorer 9+, Firefox, Chrome, and various browsers on Android and iPhone mobile platforms.

In the Address bar type and press enter:

> https://<ipaddress>/ecop.ui/Main.htm

> <ipaddress> must be replaced with the IP ADDRESS set when the ECOP server was configured.

** Special Note: the URL above is case-sensitive. This
means that "/ecop.ui/Main.htm" must be typed exactly as
seen with a capital 'M' for Main.

The ECOP User Interface will load into the browser and you will
be presented with the main window with multiple Feature tabs
laid out horizontally across the top. Each Feature tab will
display its own content pane when active. The active Feature
tab is white while the inactive tabs are a muted gray.
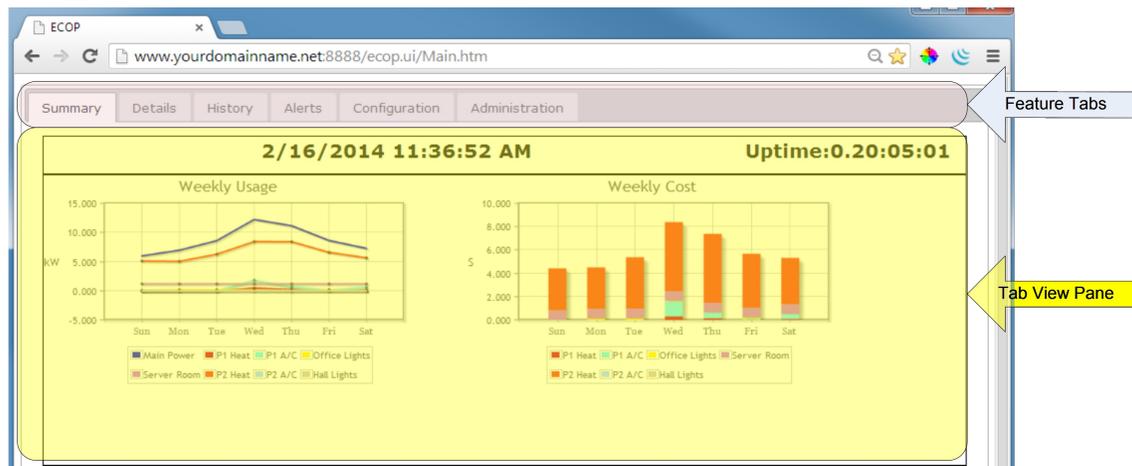
a. Summary Tab

Let's dive deeper into the Summary Tab as it is the tab that is
displayed by when the Web User Interface starts. The Summary
Tab displays some basic report information and the Measurements
defined by the user, in several forms:

1. Date Bar

2. Weekly Report

3. Daily Usage Report

4. Monthly Report

5. Yearly Report
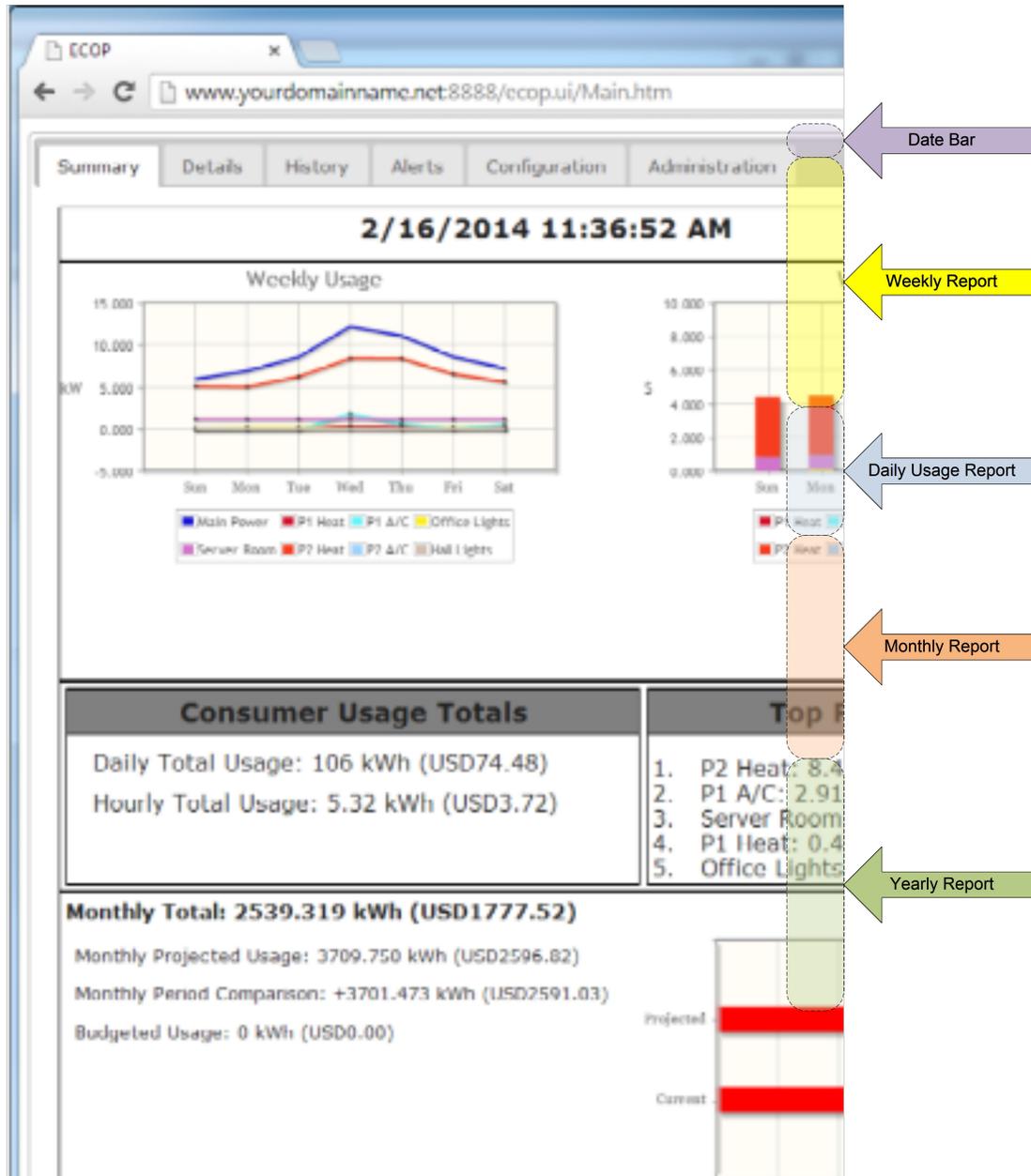
Date Bar

This section displays the Date and Time the report (Report Timestamp – **A**) was last refreshed and how long it has been since the system rebooted (System Uptime – **B**), and the outside temperature, if the system is so configured (Outside Temp – **C**, would be to the left of **A**).
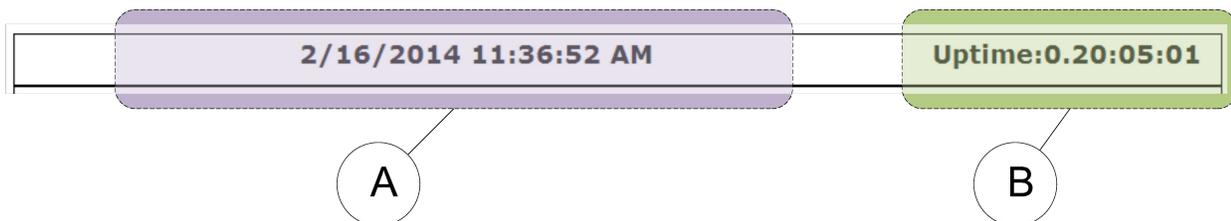
Weekly Report

This report consists of two charts. Each chart shows the weekly trend for power measurements. These charts are dynamically generated such that as you add new measurements, they will be reflected automatically on these charts. Note however that the data for these weekly charts is updated after the day's collection is complete, so a new Measurement will not be visible in these charts until after midnight that day.
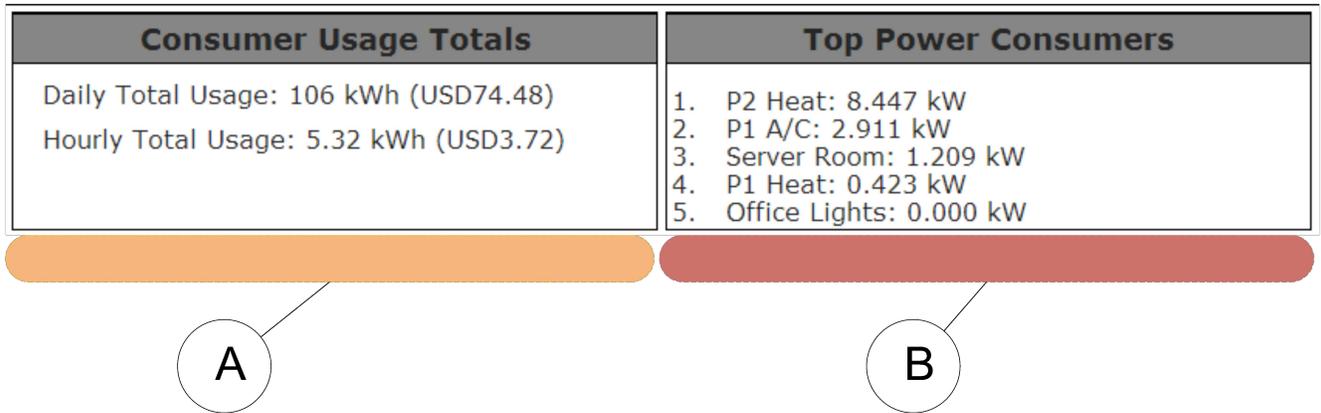
> **A** – "Weekly Usage" graph shows the average usage for each day of the week by measurement. The legend shows which color represents which measurement as defined when the Measurement was created.

> **B** – "Weekly Cost" is a graph of how much money each Measurement costs each day. These values are a function of the Measurement values and the cost/KW, which is set on the Configuration Tab discussed later.
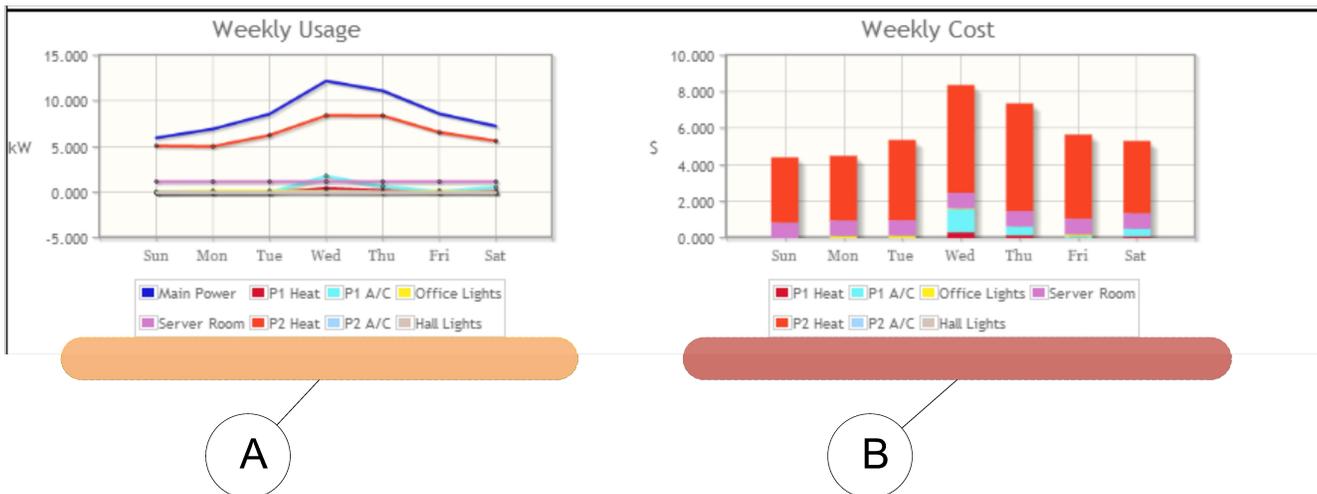
Daily Usage Report

These reports help the user better understand how much energy they have consumed so far this day and which Measurements are the largest consumers.

> **A** – "Consumer Usage Totals" describes the total power usage for the current day (so far) with its calculated cost. The same calculation is done for the current hour as well.

> **B** – "Top Power Consumers" describes the Measurements that are currently consuming the most power. This helps users better understand areas that may be addressed to bring about the largest savings.

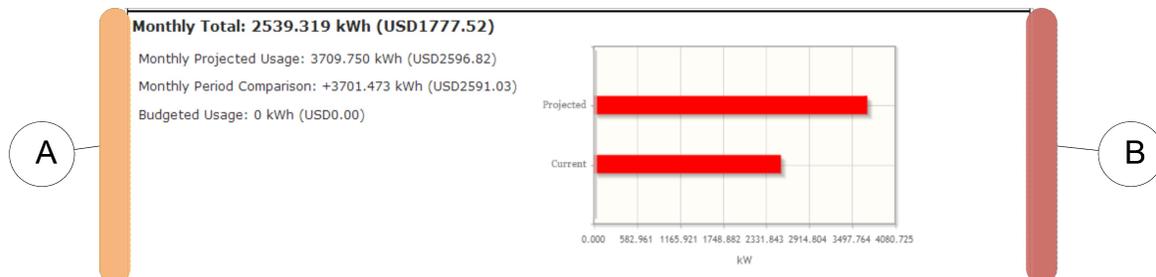| Consumer Usage Totals	Top Power Consumers
Daily Total Usage: 106 kWh (USD74.48) Hourly Total Usage: 5.32 kWh (USD3.72)	1. P2 Heat: 8.447 kW 2. P1 A/C: 2.911 kW 3. Server Room: 1.209 kW 4. P1 Heat: 0.423 kW 5. Office Lights: 0.000 kW

A   **B**

Monthly Report

This report is very useful in that it not only shows how much power has been consumed, but based on the rate of consumption it predicts how much power will be consumed by the end of the month. ECOP has a feature that allows you to set a "Power Budget" (see "Budgeted Monthly Usage (kWh)", defined on the Configuration Tab) and this section projects if consumption will remain under or exceed the budgeted consumption.

In this example, the budgeted usage is 0 kWh, thus all the monthly usage is over budget and the bar is red.

A – Numeric values for the current monthly total usage, monthly projected usage, the difference between the current month's usage and the previous month's, and the configured monthly bugdet.

B – Graphical display of the current monthly usage and the projected usage, analyized against the configured monthly budget. Red means over budget, blue and green mean within budget, and yellow means over 75% of budget.

Monthly Total: 2539.319 kWh (USD1777.52)

Monthly Projected Usage: 3709.750 kWh (USD2596.82)

Monthly Period Comparison: +3701.473 kWh (USD2591.03)

Budgeted Usage: 0 kWh (USD0.00)

Projected

Current

0.000   582.961 1165.921 1748.882 2331.843 2914.804 3497.764 4080.725

kW

A   **B**

Yearly Report

This report shows information on the yearly scale.

> **A** – Numerical values showing current yearly total usage, the projected yearly usage, and a comparison with the previous year's usage

> **B** – **G**raphical display showing usage by month for the current calendar year.
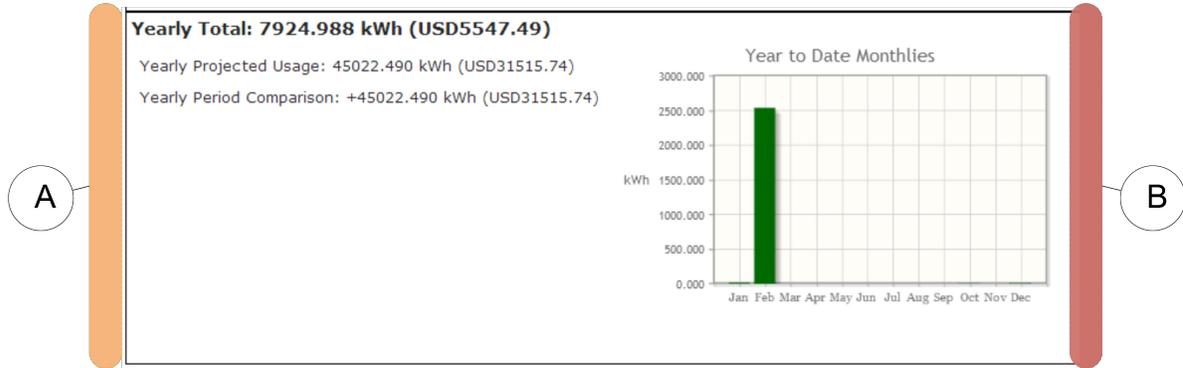
b. Details Tab

This Tab allows the user to drill into individual Measurements and observe how they behave over time. As Measurements are defined (see Configuration Tab - Measurements) and ECOP starts to record the values, the new Measurement will be visible on the Details Report Navigation Pane.

To change between measurements click the box with the Name of the Measurement to be viewed. The box is colored based on the color specified by the Measurement definition. Note in the example below that the Raw Graph is titled "Server Room" as the Server Room navigation box had been clicked.
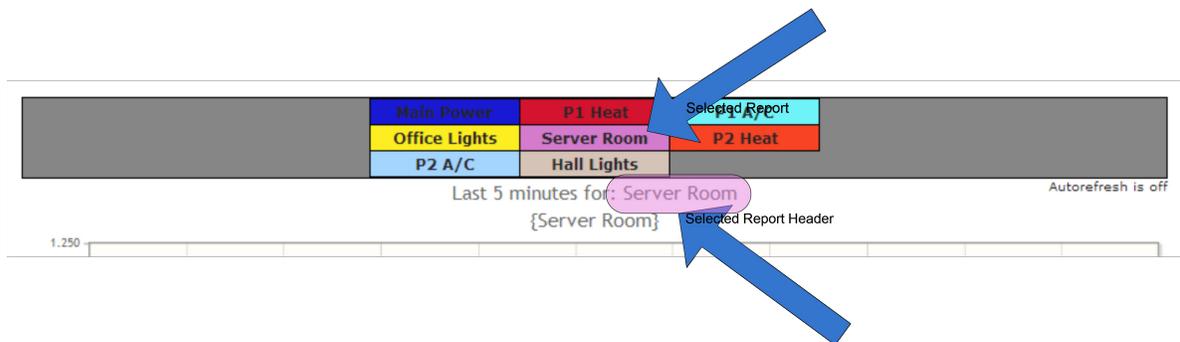
There are 4 graphs:

Last 5 Minutes

This graph shows the last 5 minutes of real live values for the selected Measurement.
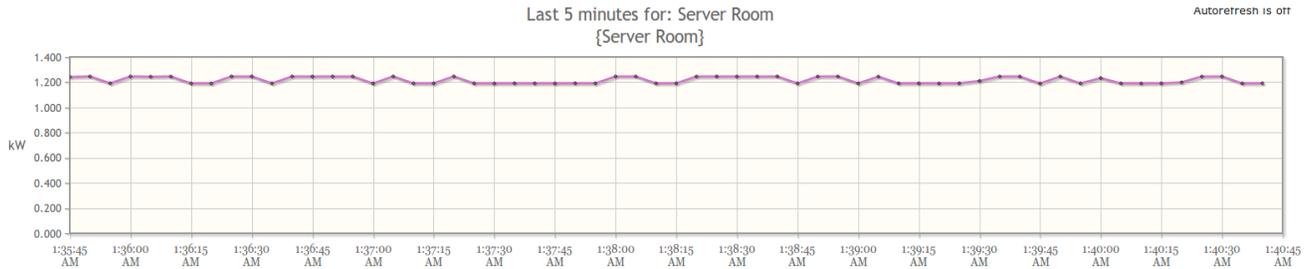

Last 6 Hours

This graph shows the last 6 hours of the 5-minute-average for the selected Measurement. Being a 5-minute-average, for power measurements, each point is an average value for 300 samples which gives a fairly detailed view of how a circuit behaves. Other types of measurements will have fewer samples in that time period.
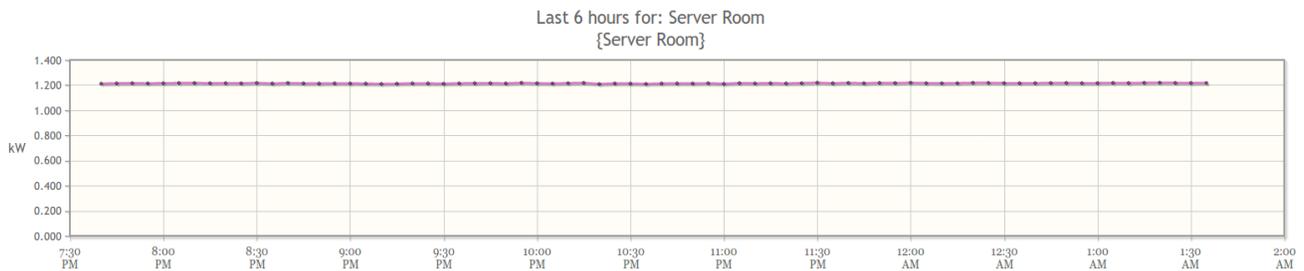

Last Day

This graph shows the average hourly values over the last full day for the selected measurement. For power measurements this means each data point is showing the user kWh, the same unit used on the monthly power bill.
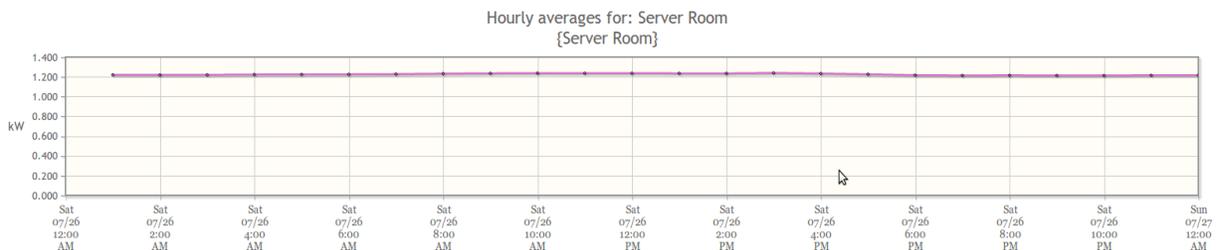
Daily

This graph shows the average daily values over the last 30 days for the selected measurement.

Daily averages for: Server Room
{Server Room}
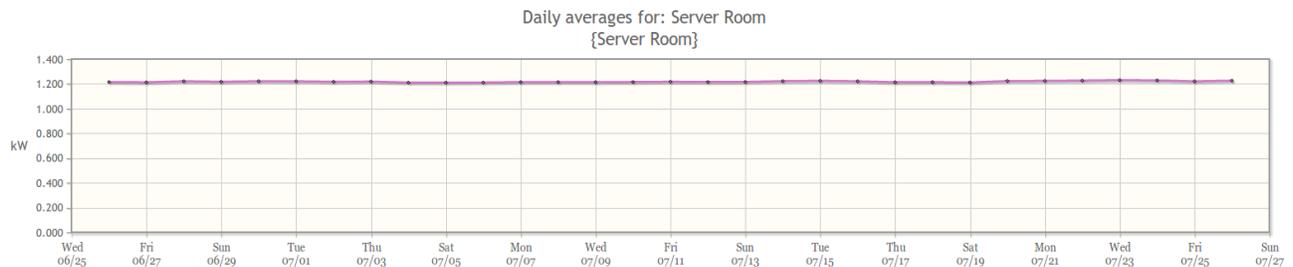
c. History Tab

This tab allows the user to review the entire history of each Measurement. It provides an index to all historical reports and this index is used to select data based on the week that the user wants to view.

Navigation

The index is displayed in reverse chronological order, newest reports first, and is organized by year and month. To view a given week, just select item in the index. The index will remember which nodes where expanded from session to session.

Report Header

The report header simply shows the day and date of the beginning of the selected index item.

Weekly Usage & Costs

This section shows graphical displays of the usage and costs for all power measurements. These same graphs are displayed on the Summary Tab for the current week. The usage graph shows average daily values for each measurement. The cost graph shows the cost per day for each measurement based on its measurement kWh usage and the cost/kWh setting (see Configuration Tab). The legends are active and allow the user to show or hide any or all items in the graph simply by clicking that item in the legend.

Weekly Source & Load Costs

This section shows tabular reports of the cost per measurement

distinctly for sources and for loads. In a traditional
residential situation, the sources will be the main power inputs
to the home, so these values should match very closely to the
overall power bill. The loads give a more detailed view of
usage in the system based on how measurements are defined. Each
column gives a daily subtotal across all items in the table and
each row gives a measurement subtotal for the week. The lower
right-hand cell is the final total.

Measurement Selector

This section allows the user to select a weekly detailed report
for a given measurement. This report will also show the Low,
High and Average values for the entire week. By selecting a
Measurement the graph is changed. This graph shows the average
hourly readings (ie: kWh) over the current week for the selected
Measurement. As the week progresses, hour by hour, this graph
fills in until at midnight on Saturday it rolls over to the next
week, empties out, and starts again.
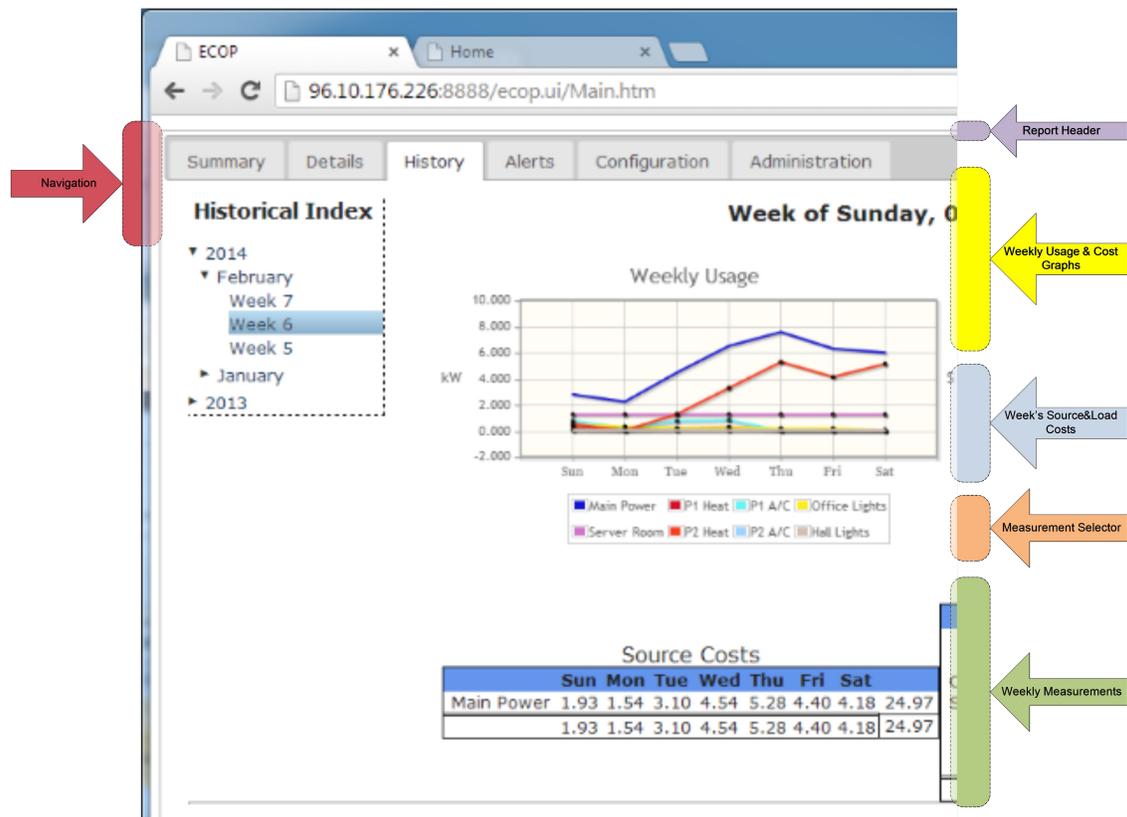
d. Alerts Tab

This tab allows the user to check up on the system as it
displays both system errors and user defined Thresholds.

What is an Alert?

An Alert is a report in the UI about some condition that was detected by the system. Nearly all Alerts are the result of some user-defined setting, such a Threshold crossing, but some can represent a system error (IE: something that failed on the ECOP system and must be fixed).

Thresholds are arbitrary water marks set by the user to trigger an Alert when it is crossed, or remove an Alert when the value normalizes again. These settings are established when a Measurement is created and can be altered at any time from the Configuration Tab (see below for more features related to Thresholds).

The Alert table has a Search feature. Should you have difficulty finding the alert you want to view, you can type in the Search text box. The Table will only show rows that match your text.

e. Configuration Tab

The Configuration Tab is where ECOP is customized to fit the environment in which it is installed. It allows the user to define Sensors, create Measurements, set Thresholds and Actions, and to set global system settings. This tab is broken up into sub-categories that are grouped on left with a vertical navigation bar. The selected sub-category will fill in data on the right in the Configuration Pane.
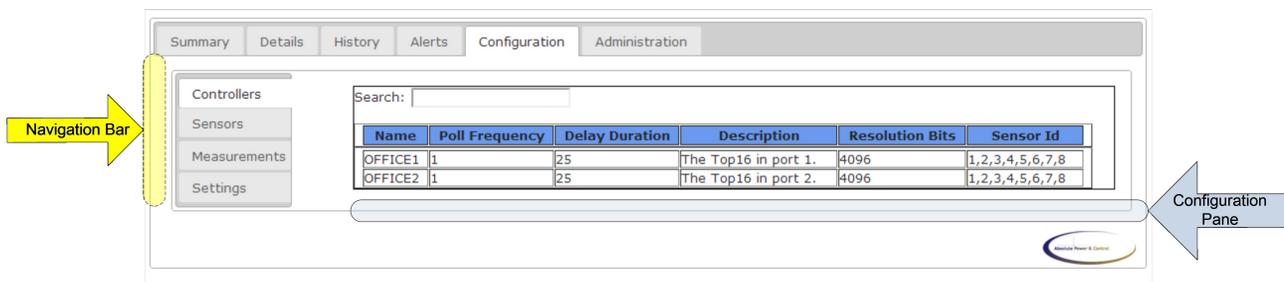
i. Controllers

This tab is a read-only view of the controllers attached to the ECOP system. At this time, the addition, removal and adjustment of the actual controllers are done directly on a terminal to the ECOP unit and are part of building an ECOP system based on the configuration that was ordered. See the Installer's Guide for more details.

Name: The name for the controller as configured by the builder

Polling Frequency: How often the ECOP server will take its readings from this controller

Delay Duration: How long the controller software delays when checking its polling cycle mark.

Description: Useful description of the controller

Resolution Bits: Used by the ECOP server to when converting Readings into Measurements. The number of bits determines the accuracy of the readings.

Sensor Id: Addressable identifiers for use when creating Sensors.

ii. Sensors

This tab is where the installer identifies the devices that have been wired up to ECOP. This set of inputs creates 'attachment points' to the physical world and provides the building blocks used to make Measurements. Without changing the physical wiring (adding, removing, or moving sensors), this data is unlikely to need to be changed after installation is finished and initial testing is completed.

Controller	Sensor ID	InUse	Description	Lower Output Limit	Upper Output Limit
1-Wire USB	17509995363815307000	true	Outside temp south side	0	85
HOME1	2	true	CT for fridge	0	20
HOME2	1	true	CT on office	0	20
OFFICE1	1	true	P1 Main Left	0	100
OFFICE1	2	true	P1 Main R	0	100
OFFICE1	3	true	P1 CB1 Heat	0	50
OFFICE1	4	true	P1 CB3 Heat	0	50
OFFICE1	5	true	P1 CB2 A/C	0	50
OFFICE1	6	true	P1 CB4 A/C	0	50
OFFICE1	7	true	Server room	0	20
OFFICE1	8	true	Hall Lights	0	20
OFFICE2	1	true	P2 Main L	0	100
OFFICE2	2	true	P2 Main R	0	100
OFFICE2	3	true	P2 CB1 Heat	0	100
OFFICE2	4	true	P2 CB3 Heat	0	100
OFFICE2	5	true	P2 CB2 A/C	0	50
OFFICE2	6	true	P2 CB4 A/C	0	50
OFFICE2	7	true	Office lights P1CB23	0	20

Search:

Action Bar Features
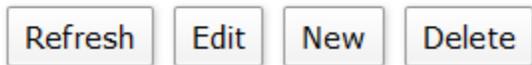
New Sensor

Click on **New** button on the Action Bar. Identify which input is being used to create the Sensor by selecting the name of the controller and the identifier for the sensor ID. For new Sensors that are to be used right away you'll want to be sure **In Use** is checked.   The **Sensor Range** limits are used for calculations on certain inputs to accurately determine the real value being read, specifically for power Measurements. Other inputs, such as temperature, do not require these values, but they can be

useful information even in those cases. Lastly, the
Description field allows a convenient way to track to which
physical location the Sensor is associated, such as which
circuit breaker the power sensor is on, or where in the
environment a water presence sensor has been placed.

Edit Sensor

Select an existing Sensor and click the **Edit** button. The
resulting form allows the user to alter any field of the
Sensor, just as when creating a new one.

Remove Sensor

Select an existing Sensor and click the **Remove** button. A
confirmation dialog will prompt you before the Sensor is
removed, after which that entity will be erased from the
system. This is typically only useful for mistakes while
configuring the system.

Refresh Sensors

Clicking the Refresh button will reload the table of
Sensors from the running service. It's not likely to be
needed, but can be useful in some situations where the UI
and the ECOP become disconnected for long periods of time.

iii.   Measurement Definitions

All of the previous setup is done to support the work
performed in this part of the Configuration UI – defining
Measurements. This tab is where the Sensors are used as
inputs to formulas to create the work product of ECOP:
Measurements.   Also, this is where user customization is
most prominent by providing specific names, descriptions,
colors, and symbols for each Measurement. All of these
inputs then affect the data when it is presented in the
other parts of the UI.

Refresh Edit New Delete

Measurement Definitions

Name	Description	Source	Color	Plot Style	Formula Name	Units Type	Category
Main Power	Combination of Panel1 and Panel2 Main inputs	true	1515d1	Circle	Amps to kW	Kilowatts	Main Power
P1 Heat	Combination of CB1 and CB3	false	d1112a	circle	Amps to kW	Kilowatts	HVAC
P1 A/C	Combination of Panel 1 CB2 and CB4 A/C	false	68f3f7	circle	Amps to kW	Kilowatts	HVAC
Office Lights	Lights in the main cubicle area	false	fced1c	circle	Amps to kW	Kilowatts	Power
Server Room	Server Room	false	d175cb	circle	Amps to kW	Kilowatts	Power
P2 Heat	Combination of Cb1 and CB3 Heat	false	f73d20	circle	Amps to kW	Kilowatts	HVAC
P2 A/C	Combination of CB2 and 4 A/C on panel 2	false	9ed2ff	circle	Amps to kW	Kilowatts	HVAC
Hall Lights	Hall lights CB21 on panel 1	false	d1bfb2	Circle	Amps to kW	Kilowatts	Power

Search:

Selecting a Measurement Definition will display the Sensors
that are mapped and how its Thresholds are defined.

Refresh Edit New Delete

Measurement Definitions

Name	Description	Source	Color	Plot Style	Formula Name	Units Type	Category
Main Power	Combination of Panel1 and Panel2 Main inputs	true	1515d1	Circle	Amps to kW	Kilowatts	Main Power
P1 Heat	Combination of CB1 and CB3	false	d1112a	circle	Amps to kW	Kilowatts	HVAC
P1 A/C	Combination of Panel 1 CB2 and CB4 A/C	false	68f3f7	circle	Amps to kW	Kilowatts	HVAC
Office Lights	Lights in the main cubicle area	false	fced1c	circle	Amps to kW	Kilowatts	Power
Server Room	Server Room	false	d175cb	circle	Amps to kW	Kilowatts	Power
P2 Heat	Combination of Cb1 and CB3 Heat	false	f73d20	circle	Amps to kW	Kilowatts	HVAC
P2 A/C	Combination of CB2 and 4 A/C on panel 2	false	9ed2ff	circle	Amps to kW	Kilowatts	HVAC
Hall Lights	Hall lights CB21 on panel 1	false	d1bfb2	Circle	Amps to kW	Kilowatts	Power

Selected Row →

Search:

Mapping Definitions for the selected measurement.

Mappings →

InputTag	Mapping Type	Constant	Source Element	SensorID	Description
Reading	Sensor	0		19	Office lights P1CB23

Search:

Threshold Definitions for the selected measurement.

Thresholds →

Active	Measurement Type	UpperBound	UpperBound Actions	LowerBound	LowerBound Actions
true	Measurement	1000	CriticalUpperThresholdBroken CriticalUpperThresholdNormal	-999	CriticalLowerThresholdBroken CriticalLowerThresholdNormal

Search:
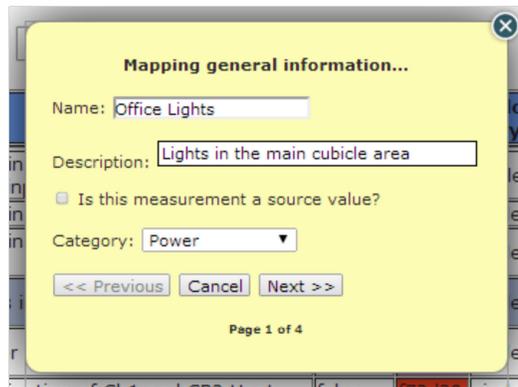
Action Bar Features

Refresh Edit New Delete

New Measurement Definition

Click on the **New** button on the action bar to bring up the Measurement editor.

Enter a **Name** that is descriptive of the Measurement being recorded, but be aware that long names can make the legends messy depending on how many Measurements there are. (The name can be altered later without affecting any previously collected data – it is just a display name.) Utilize the **Description** field to provide further detail of the Measurement definition. This value will show in most of the report locations that show the resulting measurements, but not in legends.   Answer the **Is this measurement a source value?** question, which will only be checked if the measurement is one of the power inputs (sources) to the building, such as the main feed lines, or alternative inputs such as an inverter for a solar array, or wind or hydro turbine. Provide a **Category** for the measurement, which will help in determining certain reporting layouts. If you are creating a Measurement Definition and the category isn't obvious from the drop down list, then leave it blank.

Click **Next** to choose the Formula used to calculate the measurement values from the Sensor reading(s).

This is where the real power of ECOP comes in, the mapping of physical things to logic that will measure them. Choose the Formula that matches the Sensor(s) you are using for this Measurement Definition, and then use the Sensor input table to provide sources for the inputs required for that formula.
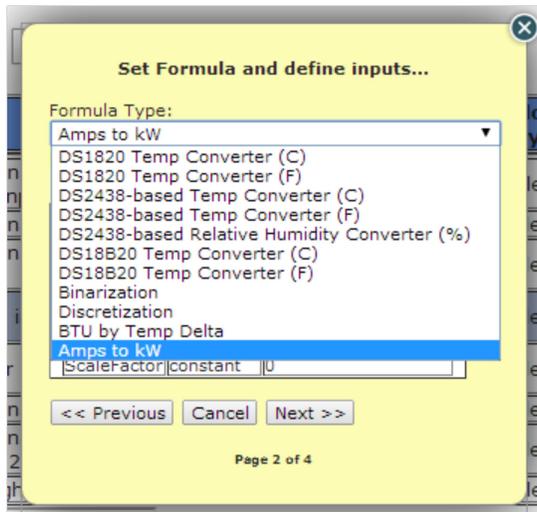
Each formula is different and requires specific inputs. The UI will automatically adjust the input list after the needed Formula is selected, then the user just maps the target Sensor(s) to the needed inputs.

For this example lets choose the "Amps to kW" formula.
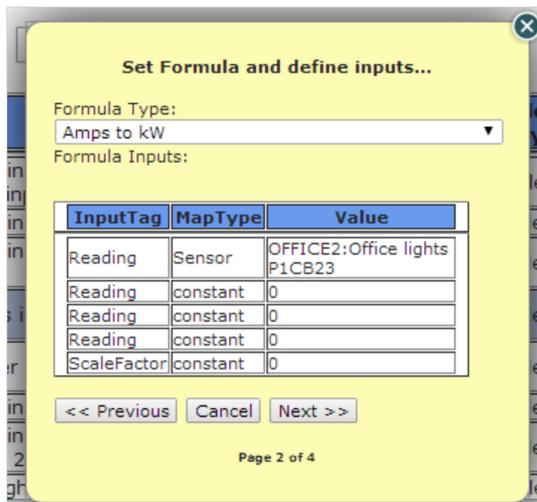
This formula allows you to assign a sensor for input. It can also sum in multiple power sensors to create an aggregate power measurement, such as if wanting to report on all lighting circuits. These additional values are set by clicking on the reading row and filling in data requested.

Some formulas require an input of some constant value, such as the rate at which a pump generates flow. In these cases, there will be an input row for with a specific name.

Example#1: Defining constant value of 123456 to be added to the Sensor reading:

Example#2: Defining the sum of multiple sensors. Here it is being used to sum both phases of the main source circuits in two different power panels (adding 4 sensors).

Some Formulas also allow measurement calibration by using an input called **ScaleFactor**. This value is always expressed as a percentage, not a fraction. For instance, if a measurement is found to be reading high by 10% then to make it accurate it must be adjusted **down** by 10%, so the

ScaleFactor would be 90. If the measurement needed to be adjusted **up** by 10% the ScaleFactor would be 110.

Click **Next** to define any Thresholds to be tracked for this Measurement Definition.

If so desired, ECOP can track the value of a measurement and warn if it strays from the boundaries that are set, both on the upper end and the low end (or just one). The user can decide the severity of the situation should any boundary be broken. A Threshold can also enabled or disabled with the provided check box at the top. Lastly, the user can choose to receive a message should any or all of these four conditions be met: upper threshold broken, upper threshold normalized, lower threshold broken, lower threshold normalized.

Using the appropriate email address, this feature can be use to send a text/SMS message to your mobile phone or pager. At this time, the email address(es) are established when the system is installed and are not very user-friendly to change. Once Thresholds are configured for the Measurement, click **Next**.

Here, you simply define some visual aspects of how the measurement will appear on the screen.

The **Plot Style** determines the symbol used for the measurement in line graphs, which can be helpful if more than one measurement have similar colors.
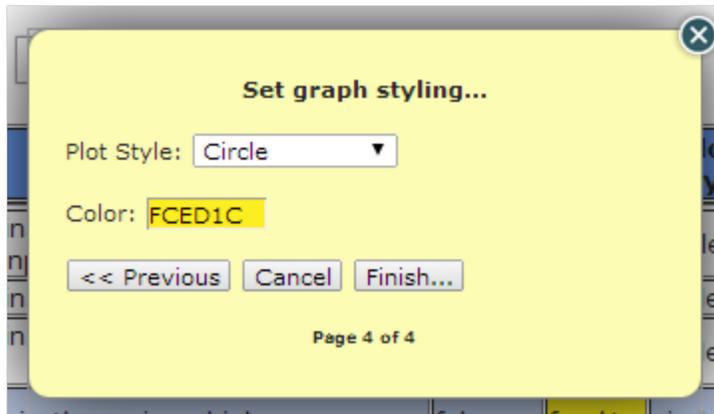
To alter the **Color,** click the colored box to bring up the color picker, select the desired color, then click outside of the picker to return to the form.
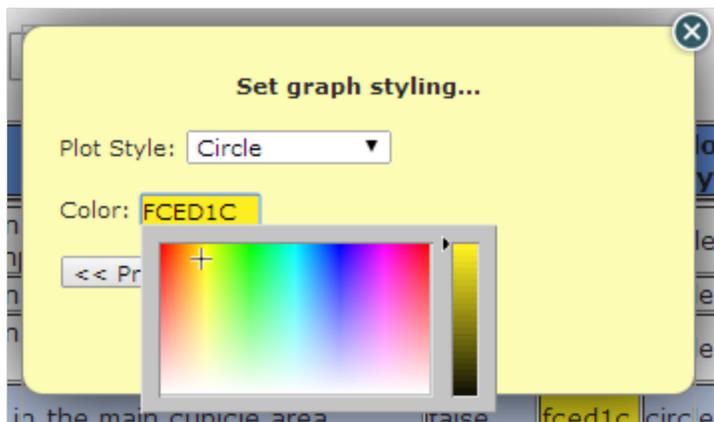
Use the **Finish** button to commit the new Measurement Definition to the system. Once that operation completes, the Measurement Definition is live and you should see measurements available for it in the **Details** tab momentarily.

Name	Description	Source	Color	Plot Style	Formula Name	Units Type	Category
Main Power	Combination of Panel1 and Panel2 Main inputs	true	d516d1	Circle	Amps to kW	Kilowatts	Main Power
P1 Heat	Combination of CB1 and CB3	false	d1112a	circle	Amps to kW	Kilowatts	HVAC
P1 A/C	Combination of Panel 1 CB2 and CB4 A/C	false	68f3f7	circle	Amps to kW	Kilowatts	HVAC
Office Lights	Lights in the main cubicle area	false	fced1c	circle	Amps to kW	Kilowatts	Power
Server Room	Server Room	false	d175cb	circle	Amps to kW	Kilowatts	Power
P2 Heat	Combination of Cb1 and CB3 Heat	false	f73d20	circle	Amps to kW	Kilowatts	HVAC
P2 A/C	Combination of CB2 and 4 A/C on panel 2	false	9ed2ff	circle	Amps to kW	Kilowatts	HVAC
Hall Lights	Hall lights CB21 on panel 1	false	d1bfb2	Circle	Amps to kW	Kilowatts	Power

Edit Measurement Definition

Select an existing Measurement Definition and click the **Edit** button. The resulting form allows the user to alter any field of the Measurement definition using the wizard, just as when creating a new one.

Remove Measurement Definition

Select an existing Measurement Definition and click the **Remove** button. A confirmation dialog will prompt you before the Measurement Definition is removed, after which that entity will be erased from the system. This operation can involve removing lots of data from the system, because removing a Measurement definition also removes all recorded measurements created using that definition. Because of this, it can take a fairly long time.

Refresh Measurement Definition

Clicking the Refresh button will reload the table of Measurement Definitions from the running service. It's not likely to be needed, but can be useful in some situations where the UI and the ECOP become disconnected for long

periods of time.

iv. Settings

Some configuration values specific to the installation location are needed for various system features to function properly for that location. Those values are managed on the Settings tab.

	Refresh	Edit			
Controllers					
Sensors	**Nominal Voltage**	**Cost/Kw ($)**	**Budgeted Monthly Usage (kWh)**	**Monitored Area (ft²)**	**Loop Pump (gal/min)**
Measurements	110	0.1	2000	0	0
Settings					

Action Bar Features

Edit Settings

To change any setting, click **Edit** to bring up the Settings form.

Click Edit

Refresh	Edit				
Nominal Voltage	**Cost/Kw ($)**	**Budgeted Monthly Usage (kWh)**	**Monitored Area (ft²)**	**Loop Pump (gal/min)**	
124	0.7	0	0	0	
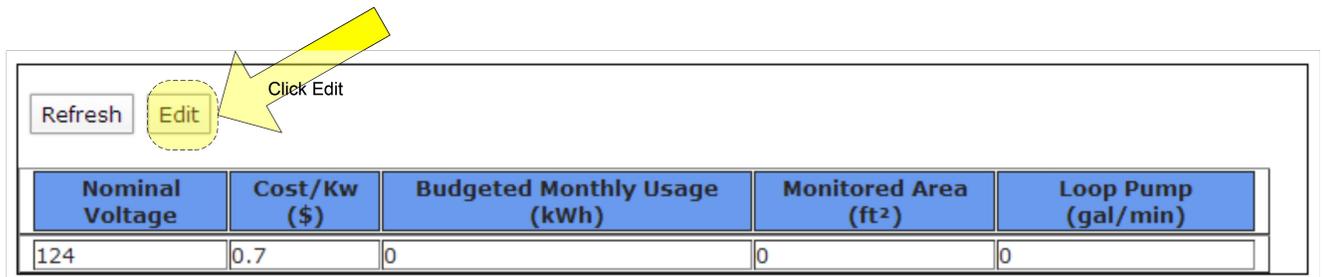
Simply alter the value of any setting in the wizard.

Nominal Voltage: 124

Cost / kW ($): 0.7

Budgeted Monthly Usage (kWh):
0

Monitored Area (ft²): 0

Loop Pump Rate (gal/min): 0

Cancel   Finish

After setting the values, click **Finish** to save the changes.

Nominal Voltage is used when calculating accurate power usage. It is not uncommon for homes to receive voltage + or - a few volts from the standard 110V expected from the power company. This setting allows the user to make adjustments for the difference and thereby obtain more accurate Measurements.

Cost/kW is used to determine energy costs and projected costs.

Budgeted Monthly Usage is use to show predictions of how the current usage level will affect an established budget.

Monitored Area and **Loop Pump Rate** are only useful for certain specialized features that do not apply, and are not available, to standard installations.

Refresh Settings

Clicking the Refresh button will reload the table of Settings from the running service. It's not likely to be needed, but can be useful in some situations where the UI and the ECOP become disconnected for long periods of time.

f. Administration Tab

This Tab is dedicated to features for maintaining ECOP's health and security. From a security perspective, this is a very important tab. It allows the owner to limit who can access their data, by managing existing user names and altering passwords.
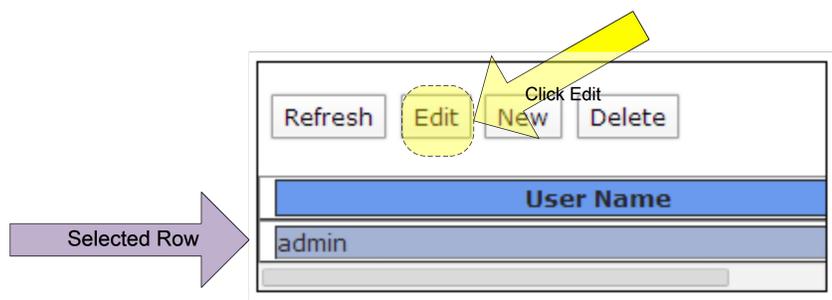
i. Users

The users tab is where the owner can define who can access the ECOP system and the password needed.
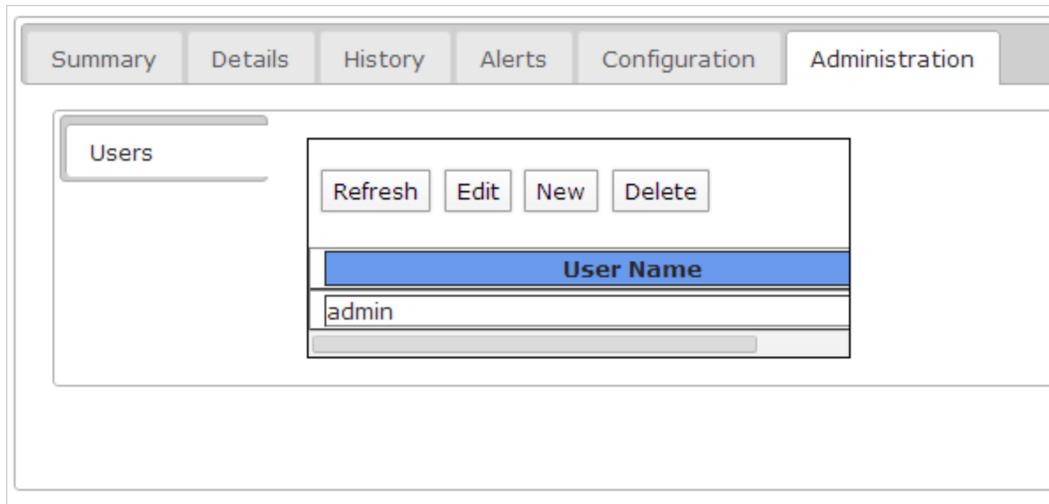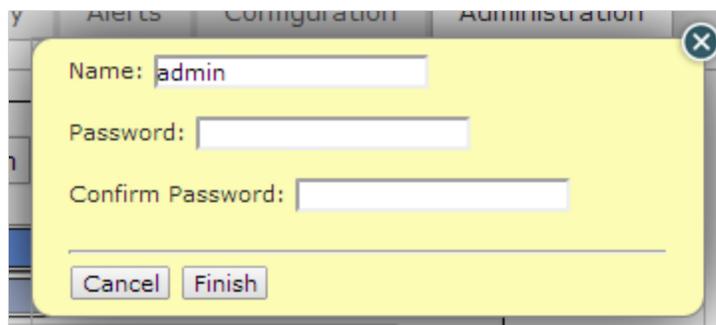
Action Bar Features

Edit:

To change a user's password or rename the account, you would use this option.

Clicking the Edit button, starts the user wizard, with the user's information pre-populated.


Simply update the fields and click **Finish**.

IMPORTANT NOTE:

It is VERY important to note that the password IS NOT

displayed. This is done on purpose to prevent an
authorized user of ECOP from learning another user's
password. Should you forget your password, use the 'admin'
user to reset your password to a new value. It is also
important to change the password for the 'admin' user from
the default value when the ECOP system is installed.

Add: This button will pop up a blank user wizard to allow the
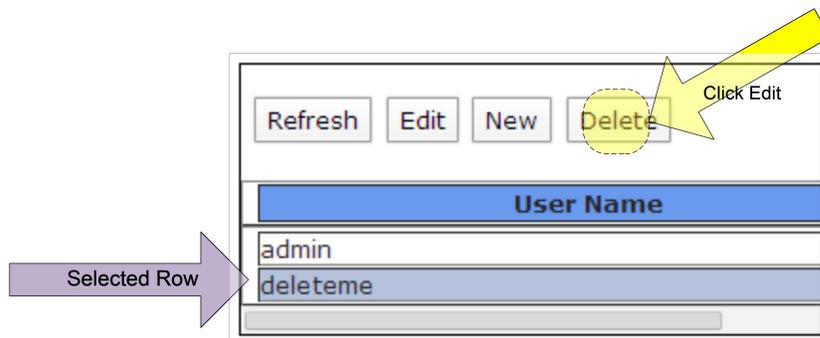user to create a new user account.
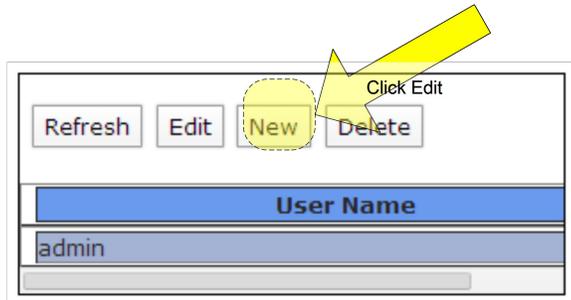
Fill in the fields as indicated.
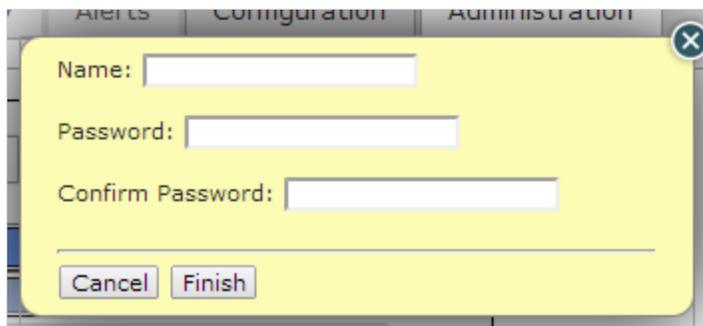
Click the Finish button when complete. The new user can
access the ECOP system by entering the NAME and password
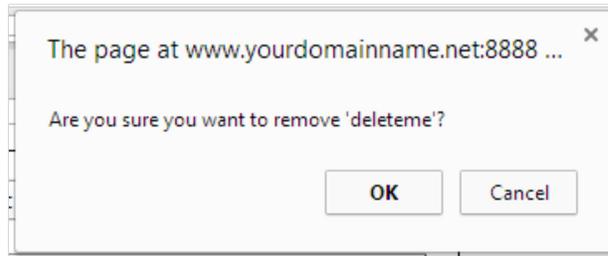provided to the wizard.

Delete: This button will remove a user's ability to access the
system.

Select the user in the table and click the Delete button.

A confirmation pop-up will be displayed verifying the removal of

the account.

Click the Cancel to quit the wizard WITHOUT making changes or
the OK to remove the user.

Refresh: This button allow the user to reload the table. This
is helpful if two or more users are making changes
simultaneously (which is NOT recommended).