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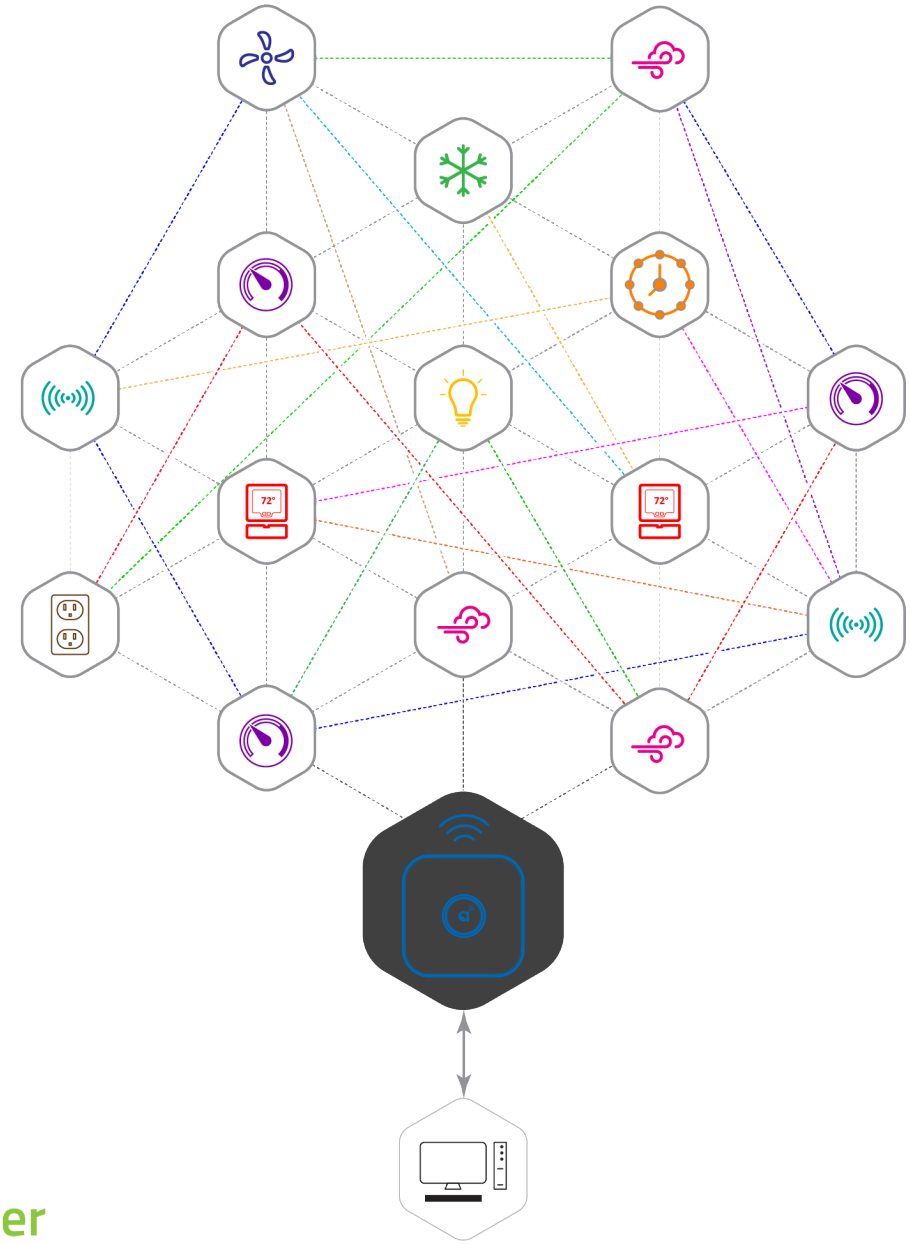
autani
building controls

User Guide

EnergyCenter®

Meter Management



EnergyCenter BY AUTANI

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1. MeterCenter Overview

The EnergyCenter® metering module enables wireless monitoring of power usage as reported by configured meters. Multiple meters can be wirelessly networked throughout a building or multiple buildings and information can be viewed for individual meters or a group of meters. A web-based interface is used to quickly and easily configure, program, and monitor meters.

Two types of meters are supported by the application:

- Veris digital meters report both energy usage and data about the electricity received from a utility company.
- Pulse meters only report energy usage and can be configured to measure either electricity or natural gas consumption. A pulse meter counts the number of pulses it receives and records them in 15-minute intervals. Pulses are then converted to units of electricity or natural gas consumed.

The meter management module uses graphs, charts, and reports to display actual and estimated data. Types of data include energy consumption and the related costs and pounds of CO_2 generated to produce that energy. The data can be used to analyze energy consumption for selected time periods, billing purposes, demand response planning, verification, and adjustment of energy management strategies.

NOTE: For more information, refer to the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

1.1. Navigating Through the MeterCenter

The following two tables provide site maps of meter-related portions of EnergyCenter®. The options on the left navigation bar appear in the tables as the column headings. The column lists are the meter-related tabs that appear when an option is selected.

Table 1: Site Map for Entering Meter Data or Selecting Options

Devices	Automation	Settings
▪ Dashboard ▪ Meters	Not applicable for meters	▪ Customer Information ▪ Contractor ▪ System ▪ Data Maintenance ▪ Energy ▪ Security ▪ Device Setup

Table 2: Site Map for Viewing Meter Data or Information

Groups	Energy	Alerts	Analysis > Reports	Help
Groups list display and System views	▪ Data display ▪ Chart	▪ Recent Alerts ▪ Alert Setup	▪ Analysis: Consumption Comparison ▪ Energy Consumption: Usage History ▪ Energy Consumption: Billing Report ▪ Digital Meters: Raw Data Report ▪ Devices: Device Inventory ▪ Devices: Detailed Device Inventory	▪ User Guide modules: □ Tasks Common to All Applications (Zigbee) □ Meter Management ▪ About

1.2. Configuring the MeterCenter

To utilize all the features of the meter management module, complete the steps summarized in the table below.

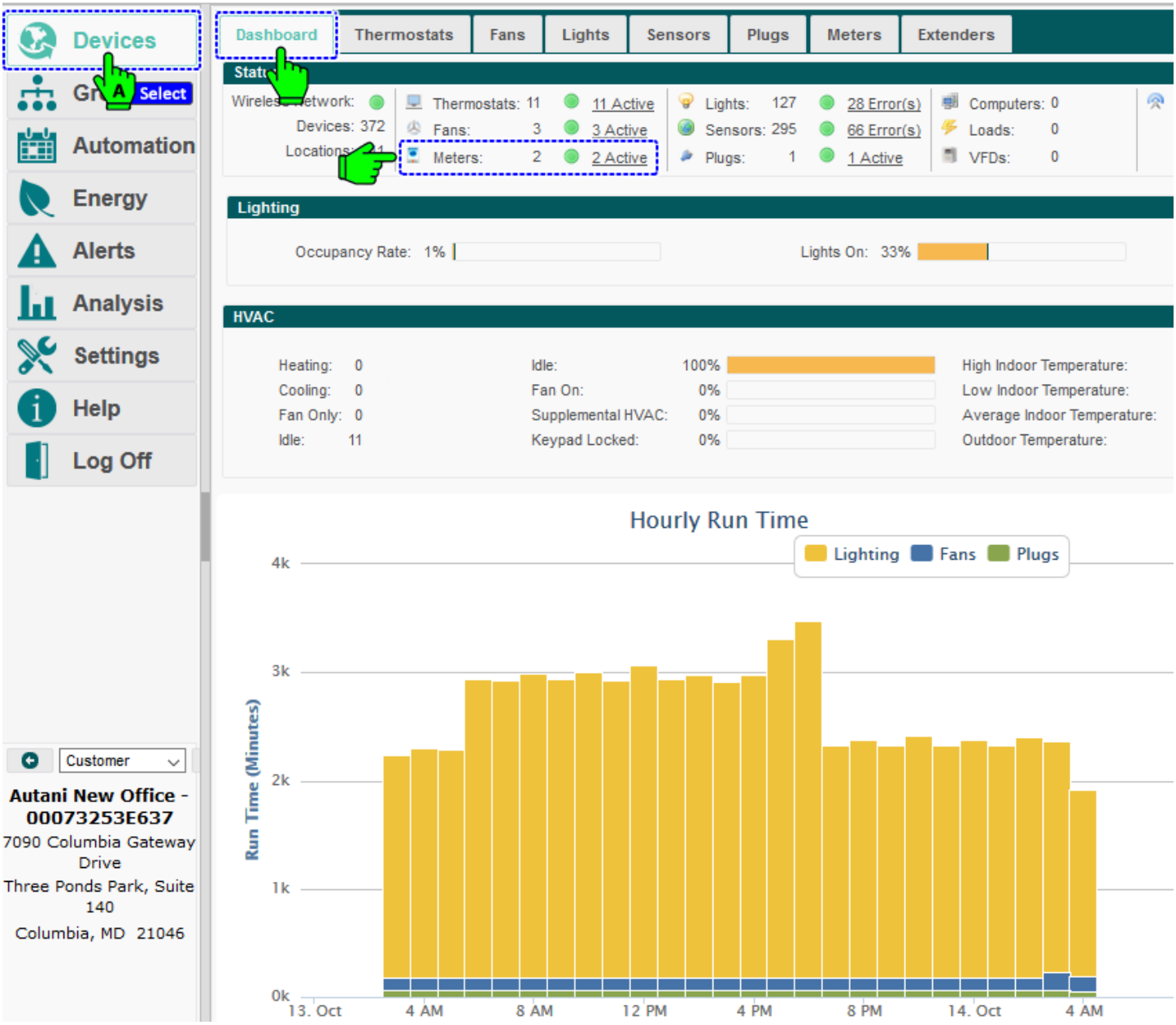
NOTE: Installation and configuration tasks are typically performed by the contractor that installs the system.

Table 3: Meter Management Setup Tasks

Task	Description	See
Complete hardware setup tasks	▪ Install meters ▪ Connect Autani transceivers to meters	Installation instructions that came with the meter and the Autani transceiver
Set up the network	▪ Initial steps for setting up the network using one of the following options: □ Remote access over the internet (preferred option) □ Local network access ▪ Establishing a static IP Address after first connection	See included documentation with Autani Manager.
Complete application commissioning tasks	Tasks needed to setup and commission the system, regardless of device-type, including: ▪ Entering customer and contractor information ▪ Creating user accounts ▪ Entering energy consumption data ▪ Entering utility billing rates ▪ Creating e-mail alert notifications	User Guide module entitled 'Tasks Common to All Applications (Zigbee)' in the Help section of EnergyCenter® software.
Define meter settings	▪ Define the type of meter: electric or gas ▪ For pulse meters, define the energy usage rate to use per pulse ▪ For Veris digital meters, thresholds can be set for voltage, power factor, frequency, electrical current, and demand	*3.0 Configuring Settings Specific to Pulse Meter.* *4.0 Configuring Settings Specific to Digital Meters.*

1.3. Viewing System Dashboard Data

Click **Devices** on the left navigation bar to view system summary information for the last 24 hours. If the **Dashboard** tab does not appear, see *Check the Power Connection*.



If the LED on the Autani Manager is not green:

1. Verify the Autani Manager is firmly plugged into the electrical outlet.
2. To make sure it is a working electrical outlet, test it:
    - Using a voltage meter
    - Connecting another device to the outlet, and testing that it turns on

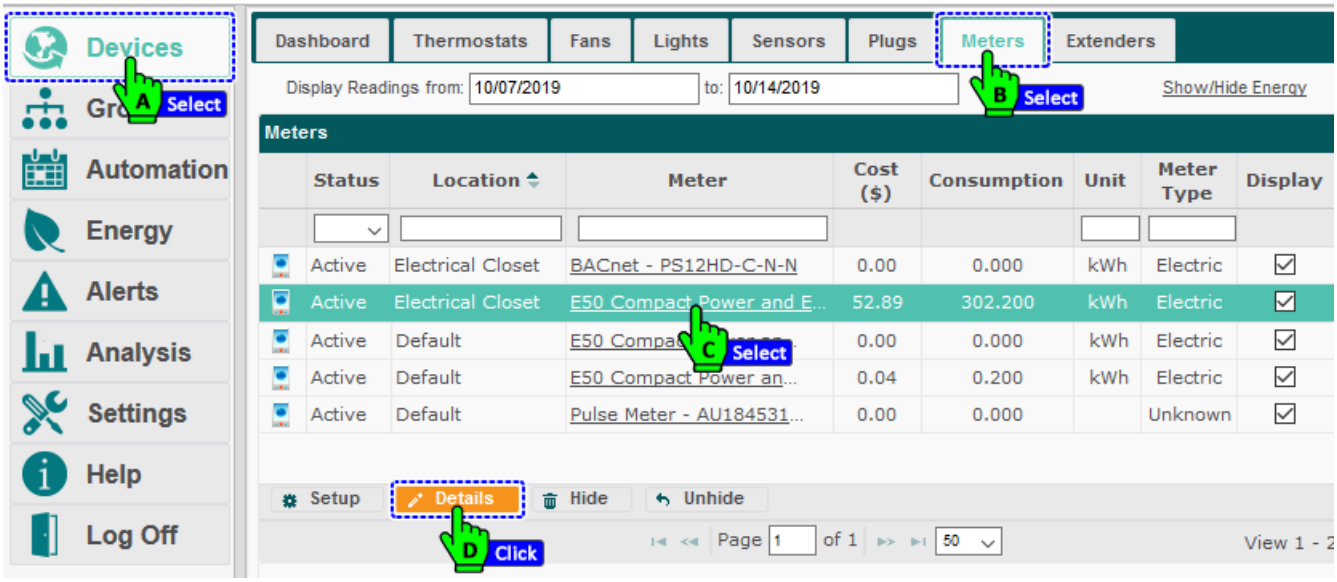
Dashboard does not appear in the troubleshooting section.

The **Dashboard** displays how many meters are in the system and their current status. To view additional detail on all meters, click the active status link next to the number meters or the **Meters** tab.

1.4. Using Meter Tabs

To access meter-related information:

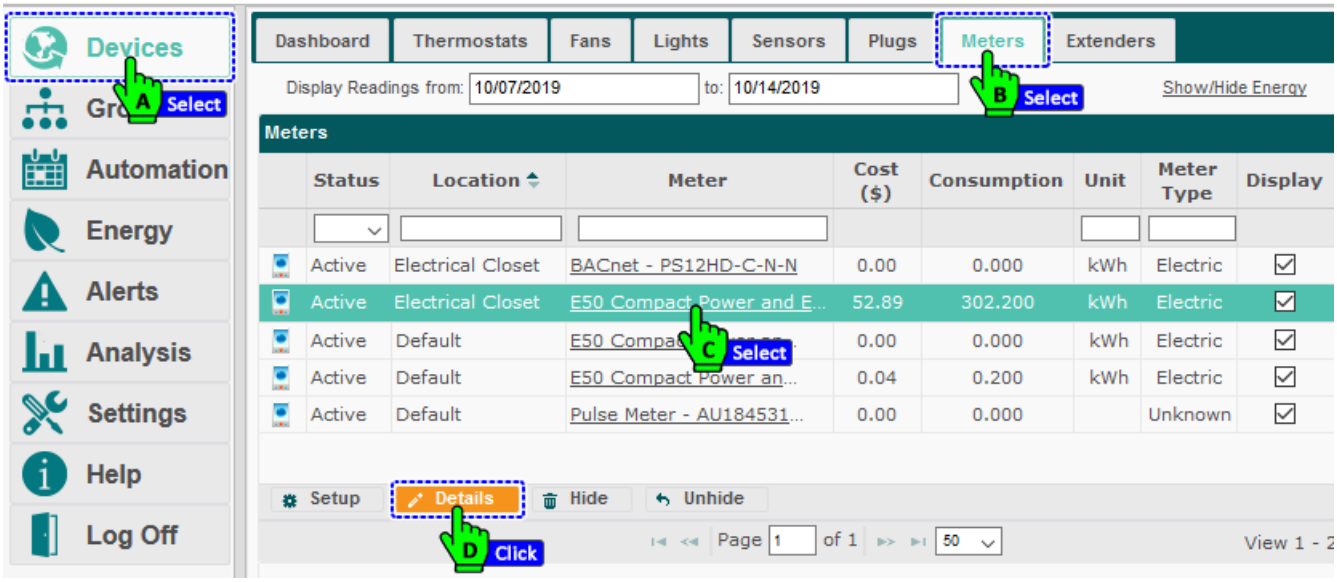
1. On the left navigation bar, click **Devices**.
2. Click the **Meters** tab. For specific information that appears on that tab, see *Viewing Summary Data for all Meters*.
3. To view additional information or enter metering-related data, click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



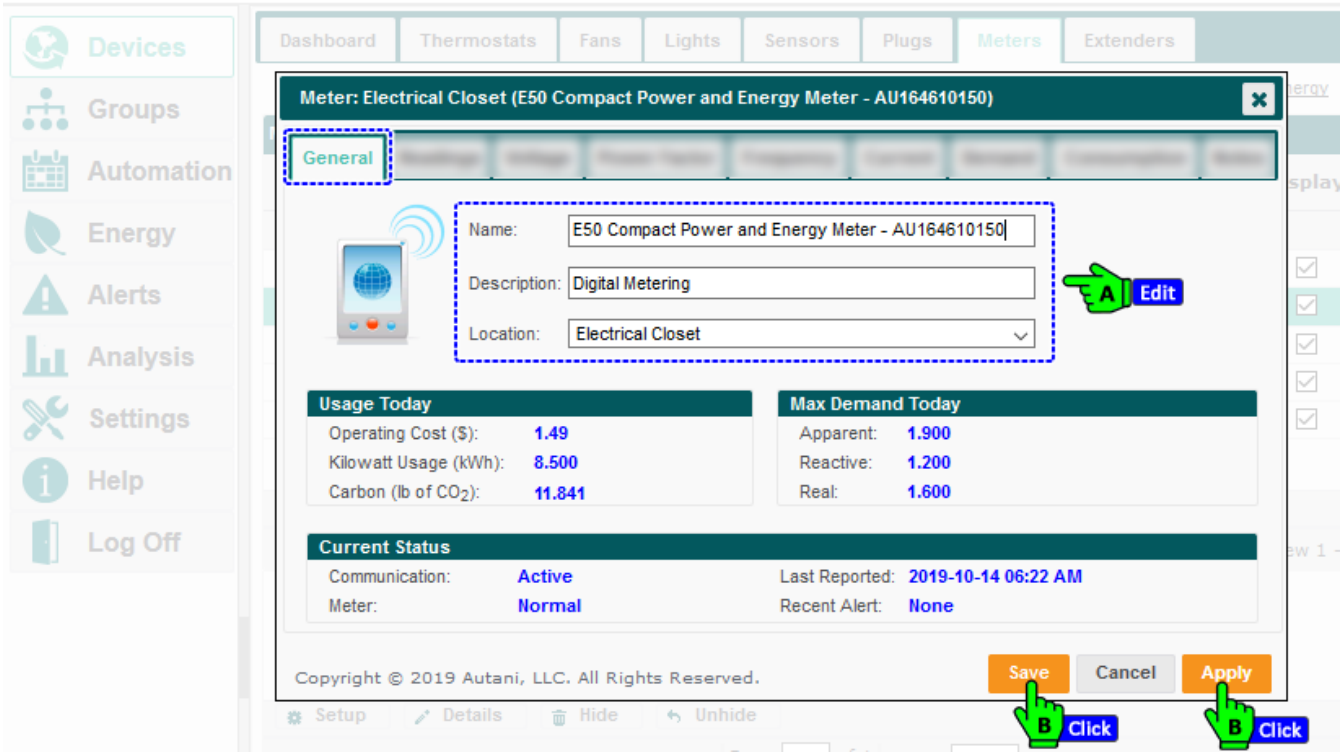
2. Using Common Meters Settings

2.1. Changing Meter Descriptive Information or Location Group

1. On the left navigation bar, click **Devices**.
2. Click the **Meters** tab.
3. Click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



4. Change general information as needed, including the name, description, and/or location group of the meter.
5. Click **Save** or **Apply**.



2.2. Viewing Summary Data for all Meters

To access information from configured meters:

1. On the left navigation bar, click **Devices**.
2. Click the **Meters** tab. The information in the following table is displayed.

NOTE: The spreadsheet format can be modified to quickly view needed information.

- Rows can be sorted by clicking a column heading.
- Rows can be hidden or redisplayed using the Hide and Unhide buttons.
- The width of a column can be changed by dragging the lines on either side of the column heading to the desired size.
- Columns can be hidden or displayed using the picker in the right-hand corner of a heading row

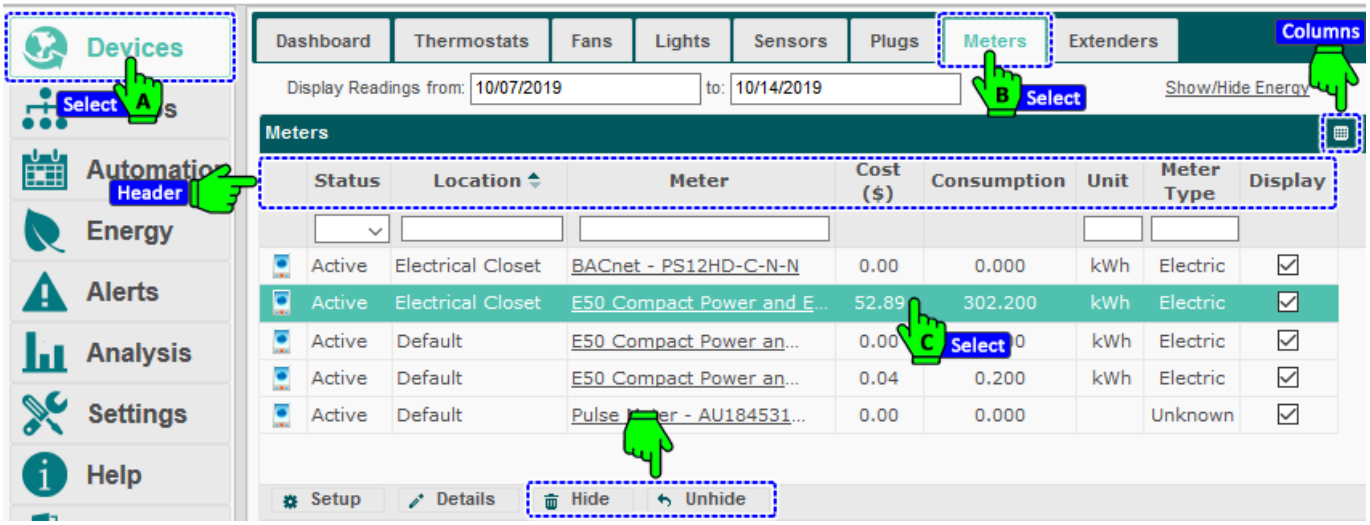


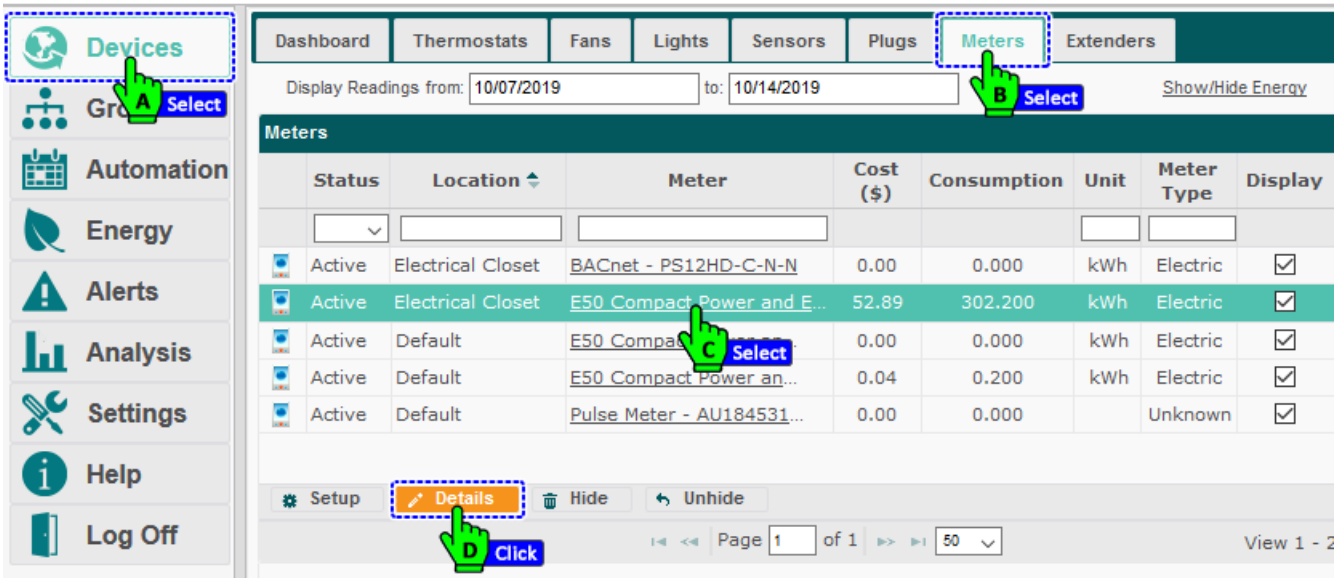
Table 4: Information on Meters Tab

Setting	Used To	Options
Status (with icon)	Display the communication status of each meter	▪ Active: No errors ▪ Warning: Meter error status message ▪ Error: The meter is not communicating with the Autani Manager over the autaniNet network.
Location	Indicate the location group to which each meter belongs **NOTE**: A fan can belong to only one location group.	▪ Assigned to the Default location group when a meter is first added to the network ▪ User can change ▪ Alphanumeric characters
Meter	▪ List the names of configured meters ▪ Provide link to open other tabs for meters	▪ User-defined ▪ Alphanumeric characters
Costs	Display the result of multiplying the utility rate for electricity by the kilowatt hours reported by the meter(s)	U.S. dollars and cents
Consumption	▪ Display the amount of energy consumed as reported by the meter(s) ▪ Displayed from midnight of the date specified until the most recent report for the current day	▪ kWh ▪ Veris digital meters only

Setting	Used To	Options
Unit	Specify the unit of measurement used for consumption data for electricity or natural gas	▪ kWh ▪ Therms
Meter Type	Specify whether the meter is measuring electricity or natural gas usage	▪ Electric ▪ Gas
Display	Select meters to display in the Daily Energy Usage graph on the bottom of the Meters screen **NOTE**: If the graph does not appear, click the Show/Hide Energy link in the upper right-hand corner of the screen.	
Serial Number	Displays the Serial # of the meter.	-
Model Number	Displays the Model # of the meter.	
Last Reported	Displays the time/date stamp of the last report from the meter to the Autani Manager.	
Carbon (lb)	Estimated carbon dioxide emissions per kilowatt hour of electricity consumed based on the electricity emissions conversion rate.	

2.3. Checking Detailed Status Data for an Individual Meter

1. On the left navigation bar, click **Devices**.
2. Click the **Meters** tab.
3. To view additional data, click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



4. The information in the following table appears.

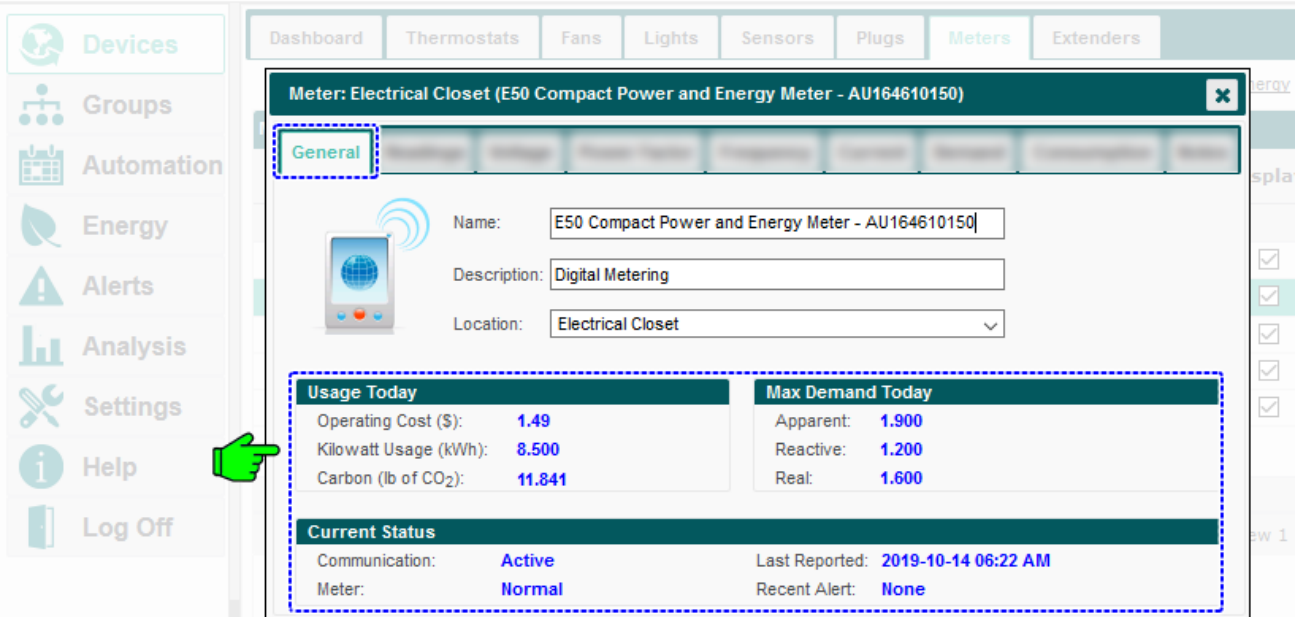


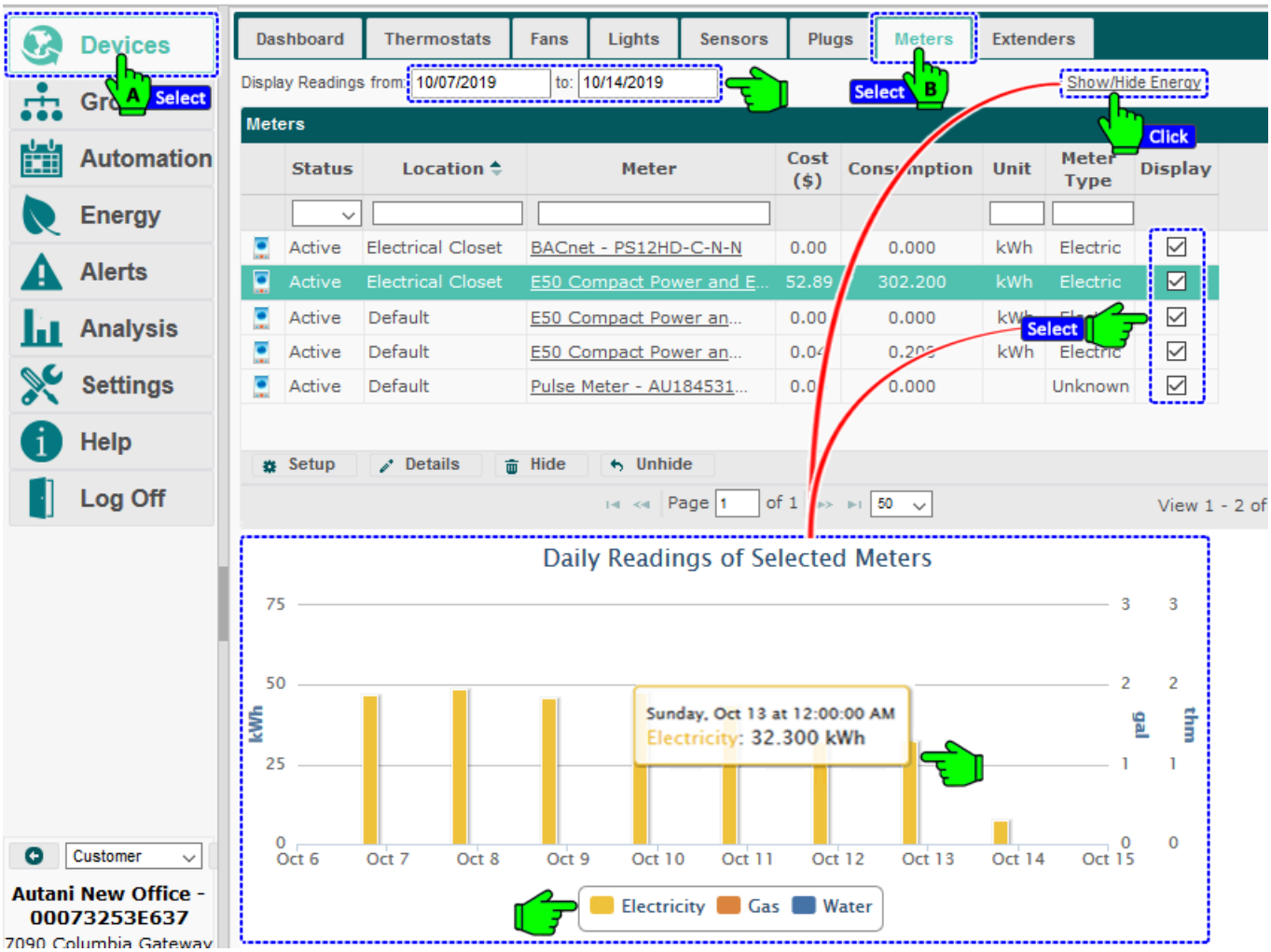
Table 5: Detailed Data for Individual Meters

Section	Setting	Description
Usage Today	Operating Cost ($)	Estimated cost of energy consumption per kilowatt hour based on the defined electricity or gas consumption rate
	Consumption (kWh or thm/h)	Number of kilowatt hours or therms per hour of energy consumption for the current day
	Carbon (lb of CO_2)	Estimated carbon dioxide emissions per kilowatt hour of electricity consumed based on the electricity emissions conversion rate
	*Meter Type (not available for digital meter)	Meter has been configured for **Electricity Metering** or **Gas Metering** or **Water Metering**.
Current Status	Communication	Communication status of meter ▪ Active: No errors ▪ Error: The meter is not communicating with the Autani Manager over the autaniNet network. ▪ Removed: Meter was removed from the system.
	Meter	Meter status and warning conditions for pulse meters: ▪ Normal ▪ Pulse Meter Not Configured: The pulse meter has been commissioned but not configured. Meter status and warning conditions for Veris digital meters: ▪ Normal ▪ Check Meter: A nonfatal problem has been detected on the meter, such as a measurement error. ▪ Tamper Detected: Tampering activity has been detected. ▪ Power Failure: Status during a power outage. ▪ Power Quality: A power quality condition, such as low or high voltage, has been detected. ▪ Leak Detected: Meter has detected a leak. ▪ Service Disconnected: The meter has been disconnected.

Section	Setting	Description
	Last Reported	Displays the time/date stamp of the last report from the meter to the Autani Manager.
	Recent Alerts	Displays the condition that triggers a meter warning or error
*Max Demand Today	Apparent	Displays the present Apparent power demand for the day
	Reactive	Displays the present Reactive power demand for the day
	Real	Displays the present Real power demand for the day

2.4. Viewing Daily Energy Consumption Chart for Selected Meters

1. On the left navigation bar, click **Devices**.
2. Click the **Meters** tab.
3. If the graph does not appear, click the **Show/Hide Energy** link in the upper right-hand corner of the screen. The default display is for the week ending with the current day.
4. To select a different date range for the graph, click in the **Display Energy Usage from** and **to** textboxes to access the calendar feature.
5. Select the checkboxes in the **Display** column for the meters to be included in the graph.
6. To view more exact information:
    a. Mouse over the displayed data
    b. Zoom in on a defined area of the chart by clicking and dragging the mouse to create a rectangular box. To return the view to its original size, click **Reset Zoom** in the upper right-hand corner of the chart.



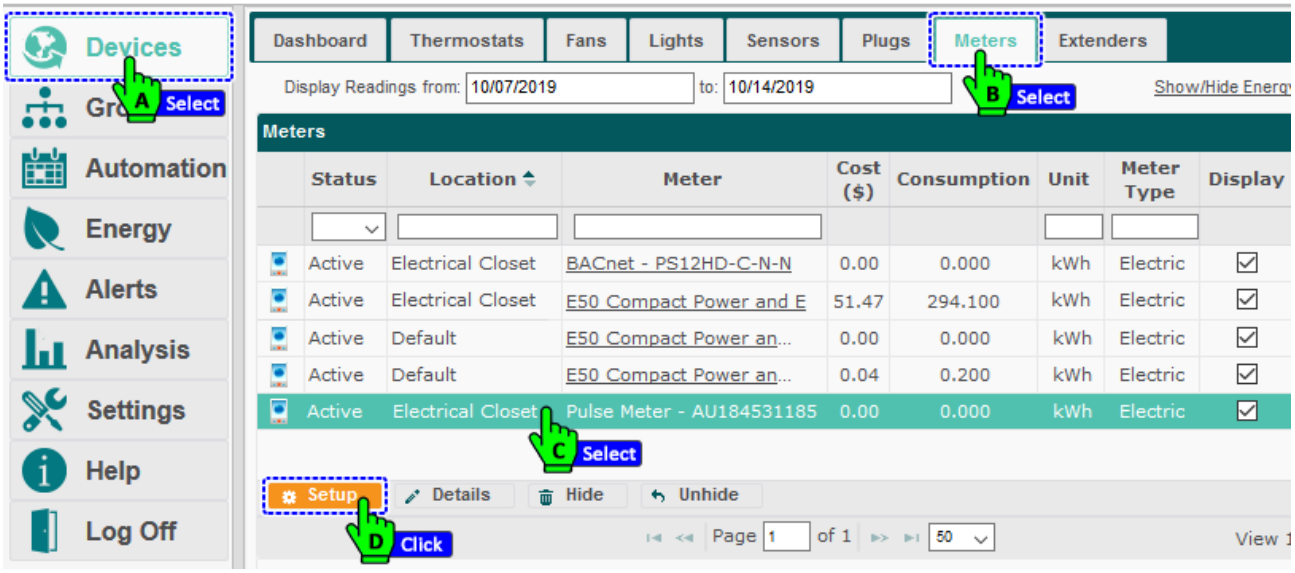
3. Configuring Settings Specific to Pulse Meters

Pulse meters must be configured to identify both the type of energy to be monitored and what each pulse represents.

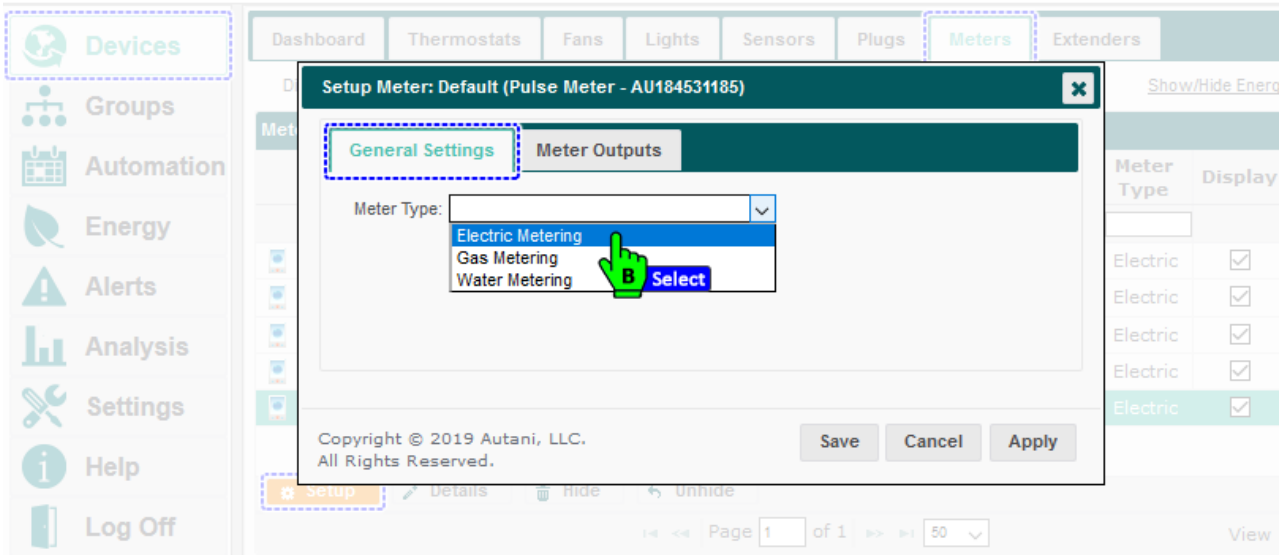
- For example, a pulse meter can be defined to monitor natural gas usage and one pulse can be defined to equal 0.01 therms.
- Pulse meters are typically configured by the technician during installation.
- Until a pulse meter is configured, a warning status is displayed.

To configure a pulse meter:

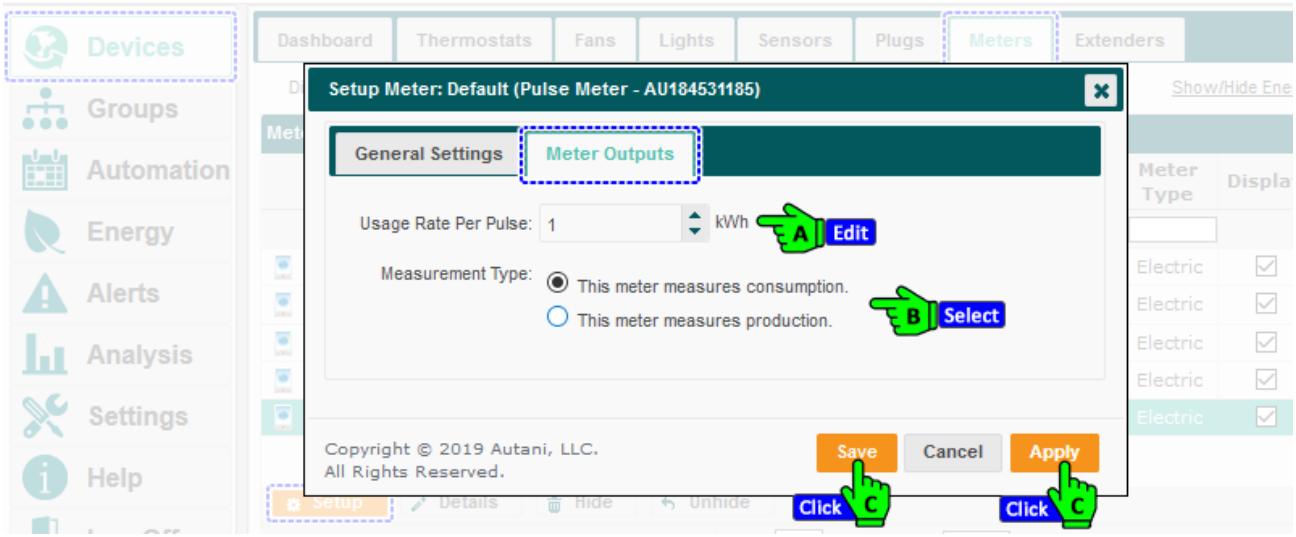
1. On the left navigation bar, click **Devices**.
2. Click the **Meters** tab.
3. Select the row of the pulse meter to be configured.
4. Click the **Setup** button.



5. From the **Meter Type** drop-down list, select **Electric Metering** or **Gas Metering** or **Water Metering**.



6. Click the **Meter Outputs** tab.



7. Use the **Energy Usage Rate Per Pulse** textbox to define the value for each pulse.
8. Choose a **Measurement Type**.
9. Click **Save** or **Apply**.

4. Configuring Settings Specific to Digital Meters

4.1. Understanding Digital Meter Reporting Features

Veris digital meters are programmed to report electricity-related data as well as energy consumption data. Meter Management can be used to:

- Display all the data that Veris digital meters report
- Create charts from the data
- Create alerts when power drops below designated minimum threshold values or exceeds designated maximum threshold values.

  NOTE: For information on how to create alerts, see the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

Multiple thresholds can be set for Veris digital meters to use when creating charts and alerts. Those thresholds include:

- Voltage
- Power Factor
- Frequency
- Current
- Demand

  NOTE: Digital meter thresholds are typically configured by the technician during installation.

In addition, the following energy types can be used to display consumption data: apparent, reactive, and real. For more information on types of energy, see the *Glossary*.

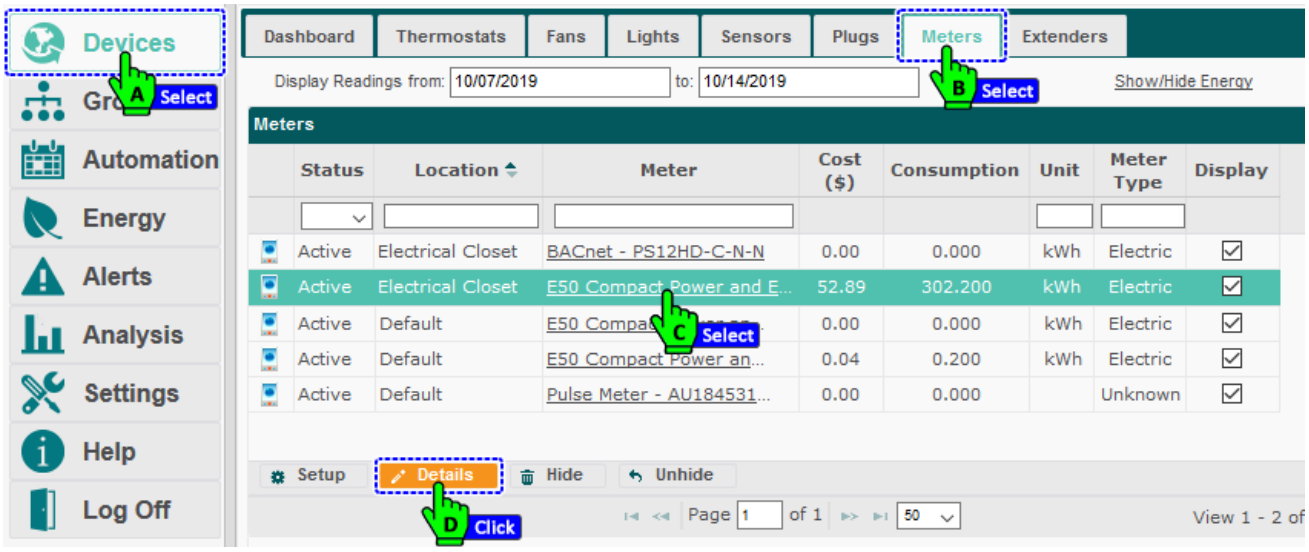
4.2. Monitoring the Readings Tab

The Readings tab serves as a dashboard of summary information available from Veris digital meters. The data displayed includes:

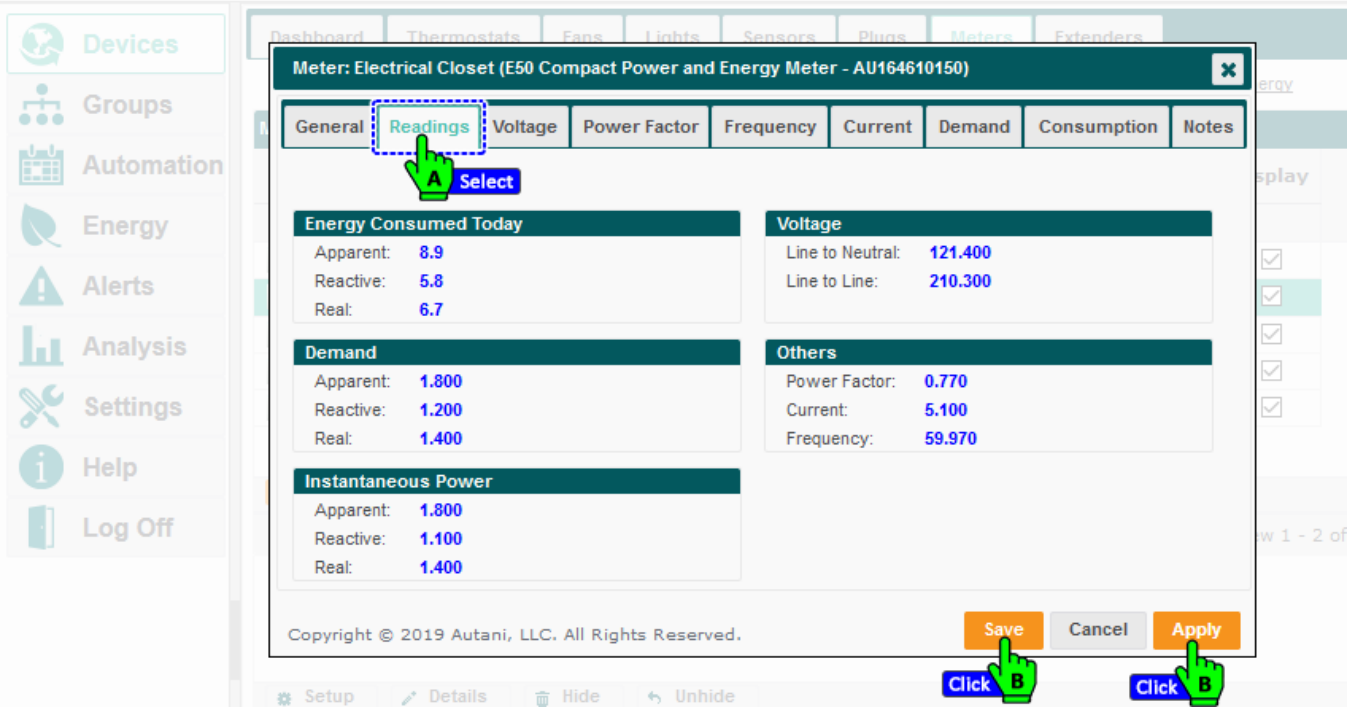
- Data for apparent, reactive, and real power in the following categories:
  - Energy Consumed Today
  - Demand
  - Instantaneous Power
  - Voltage
- Power Factor
- Current
- Frequency

To view Readings tab summary data:

1. On the left navigation bar, click **Devices** and, click the **Meters** tab.
2. Click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



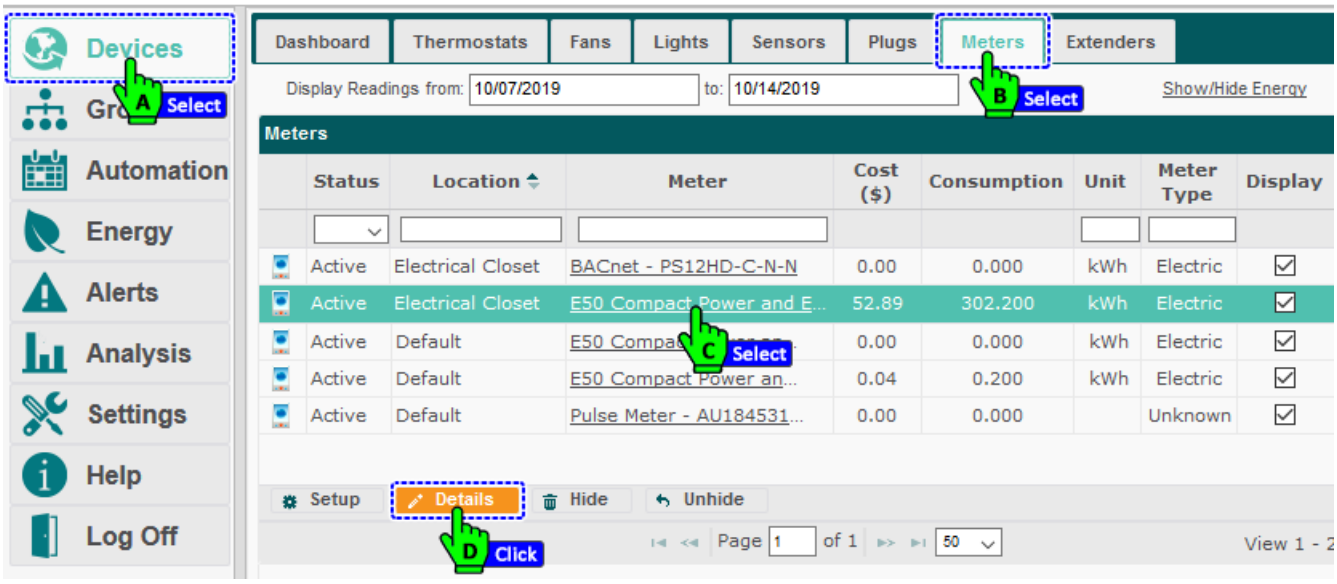
3. Click the **Readings** tab.



4.3. Using the Voltage Tab

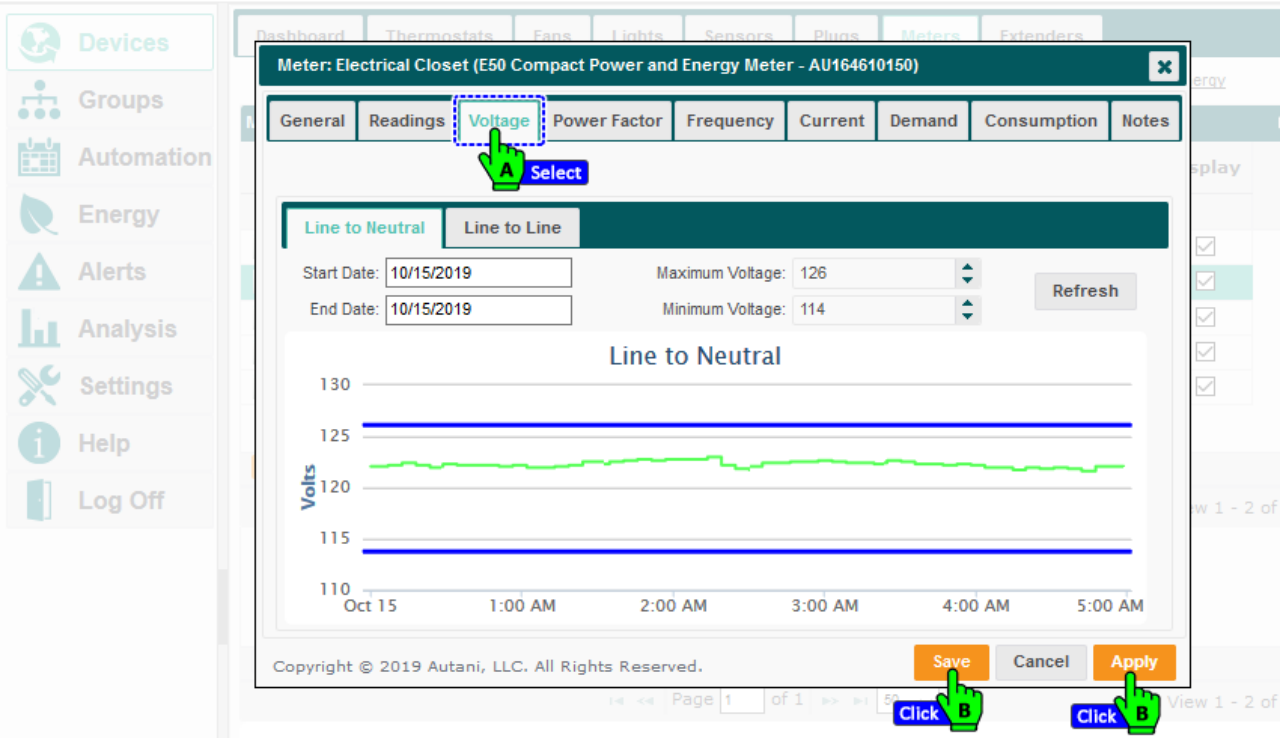
To monitor voltage fluctuations and set maximum and minimum voltage thresholds based on equipment specifications:

1. On the left navigation bar, click **Devices**, and click the **Meters** tab.
2. Click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



3. Click the **Voltage** tab.
4. Use the **Line to Neutral** tab that appears or click the **Line to Line** tab, as appropriate. Data for the current day appears.
5. To view more exact information:
    a. Mouse over the displayed data
    b. Zoom in on a defined area of the chart by clicking and dragging the mouse to create a rectangular box. To return the view to its original size, click **Reset Zoom** in the upper right-hand corner of the chart.

6. To create a graph using different options, make new selections, and then click the **Refresh** button.

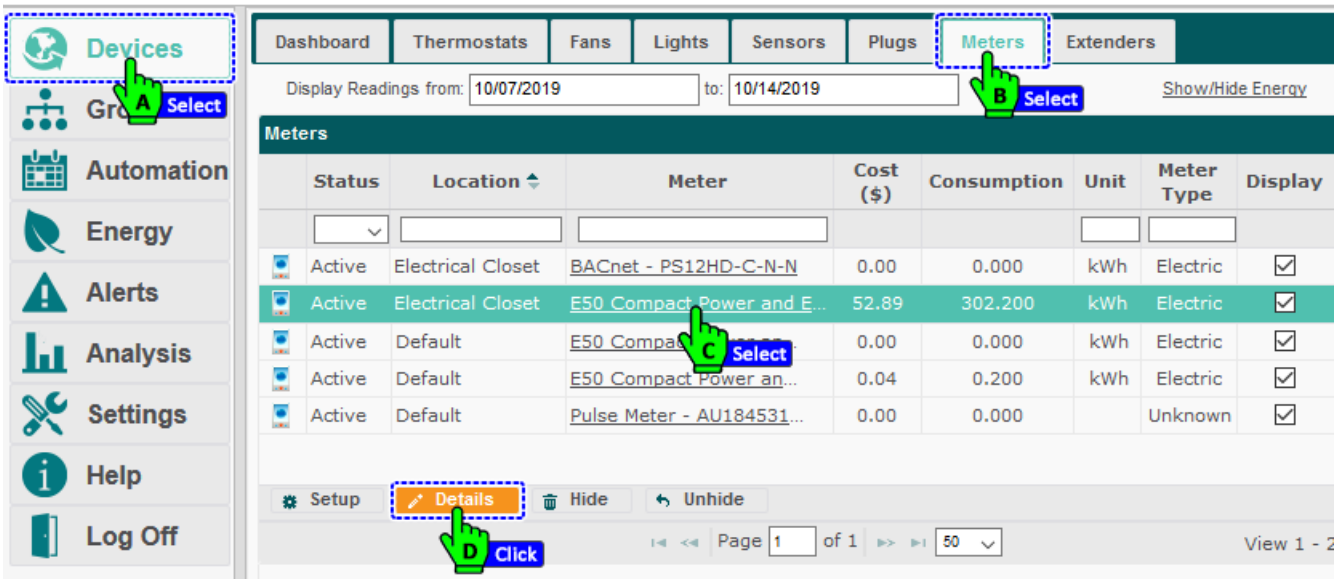


For information on how to set up e-mail alerts based on voltage thresholds, see the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

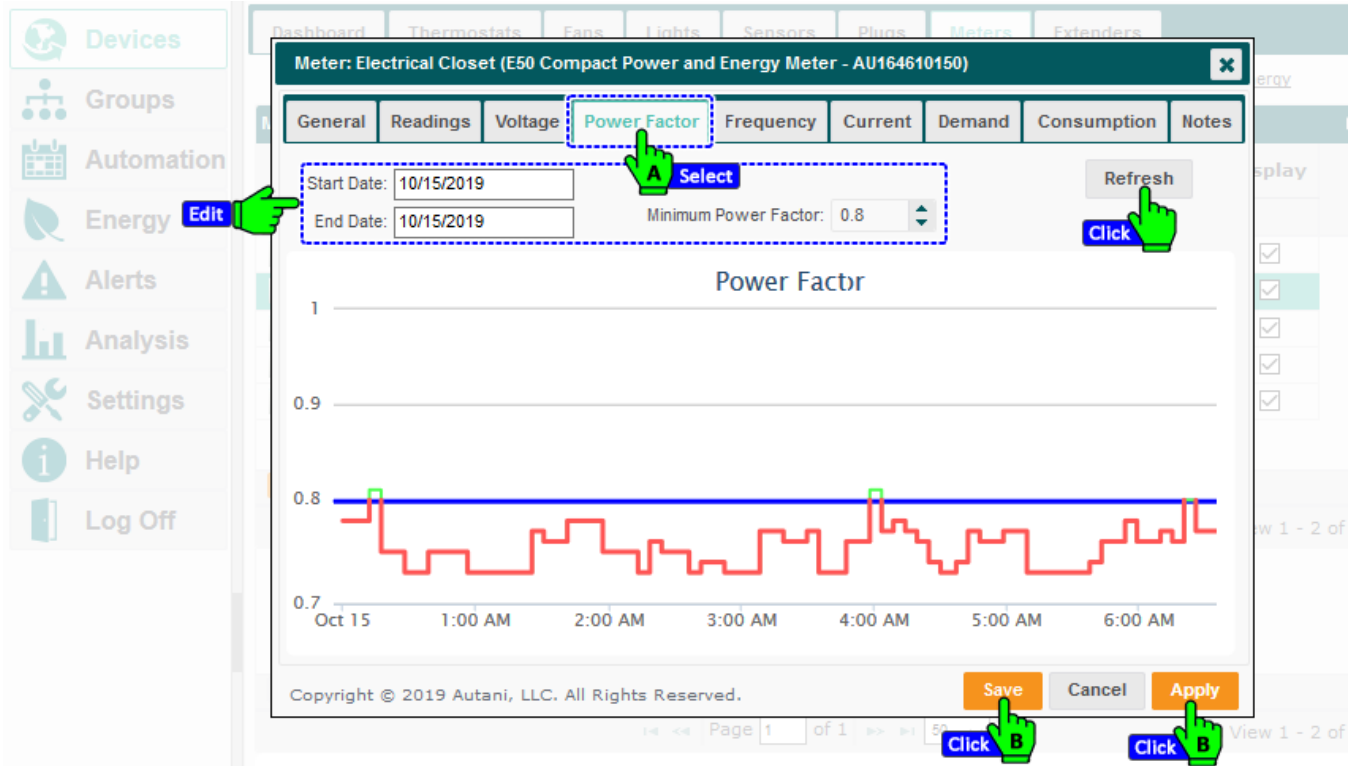
4.4. Using the Power Factor Tab

To monitor power factor fluctuations and set a minimum power factor threshold based on utility requirements:

1. On the left navigation bar, click **Devices**, and click the **Meters** tab.
2. Click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



3. Click the **Power Factor tab**. Data for the current day appears.



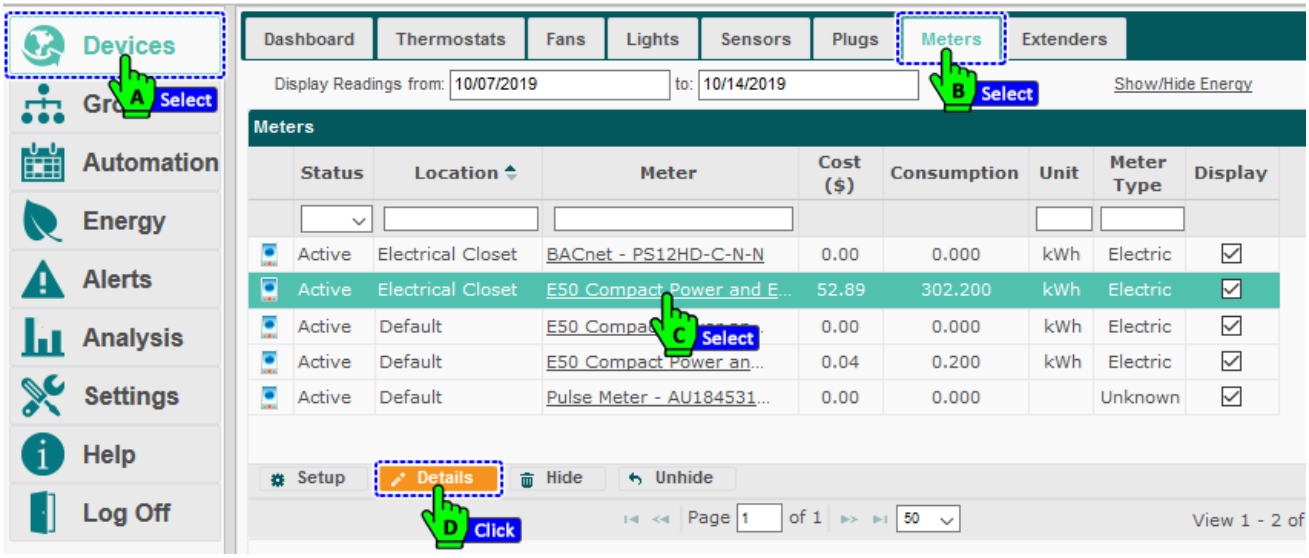
4. To view more exact information:
    a. Mouse over the displayed data
    b. Zoom in on a defined area of the chart by clicking and dragging the mouse to create a rectangular box. To return the view to its original size, click **Reset Zoom** in the upper right-hand corner of the chart.
5. To create a graph using different options, make new selections, and then click the **Refresh** button.

For information on how to set up e-mail alerts based on the power factor threshold, see the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

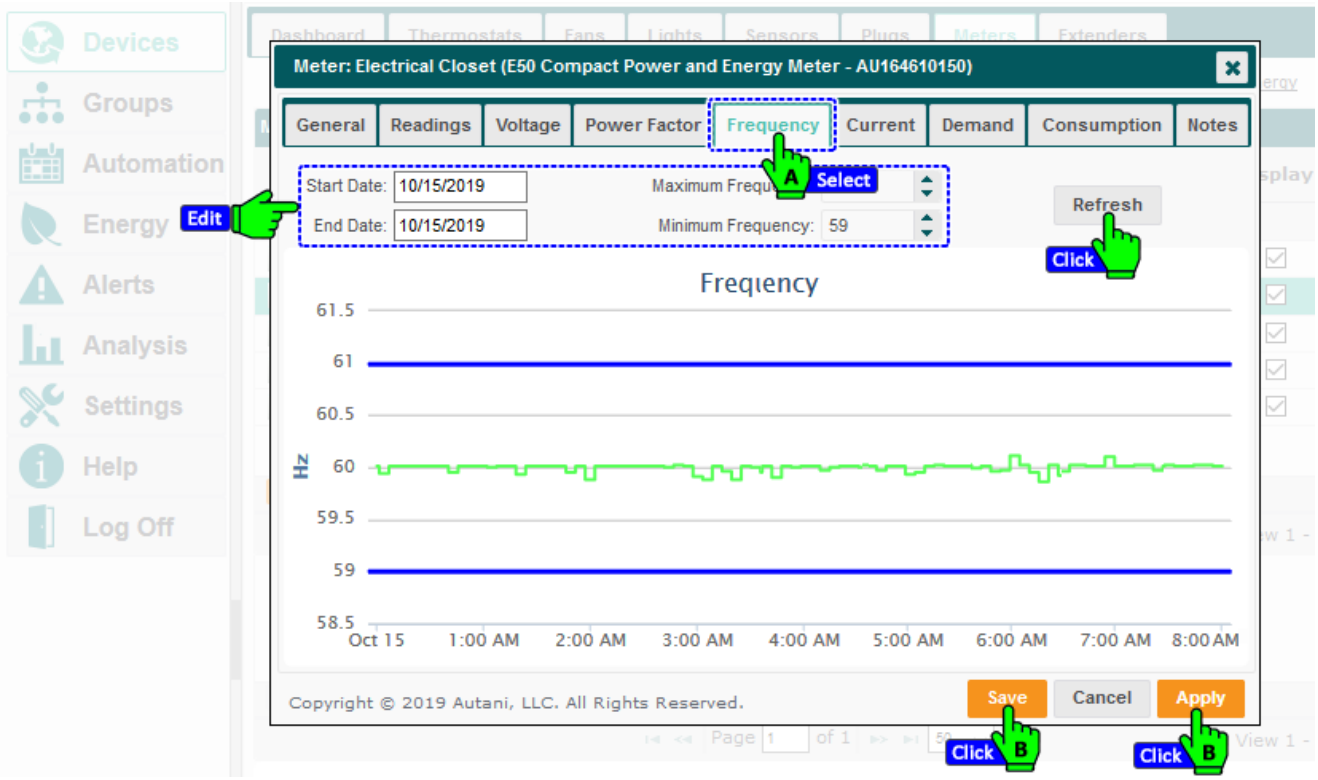
4.5. Using the Frequency Tab

To monitor frequency fluctuations and change maximum and minimum thresholds based on utility requirements:

1. On the left navigation bar, click **Devices**, and click the **Meters** tab.
2. Click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



3. Click the Frequency tab. Data for the current day appears.
4. To view more exact information:
    a. Mouse over the displayed data
    b. Zoom in on a defined area of the chart by clicking and dragging the mouse to create a rectangular box. To return the view to its original size, click **Reset Zoom** in the upper right-hand corner of the chart.

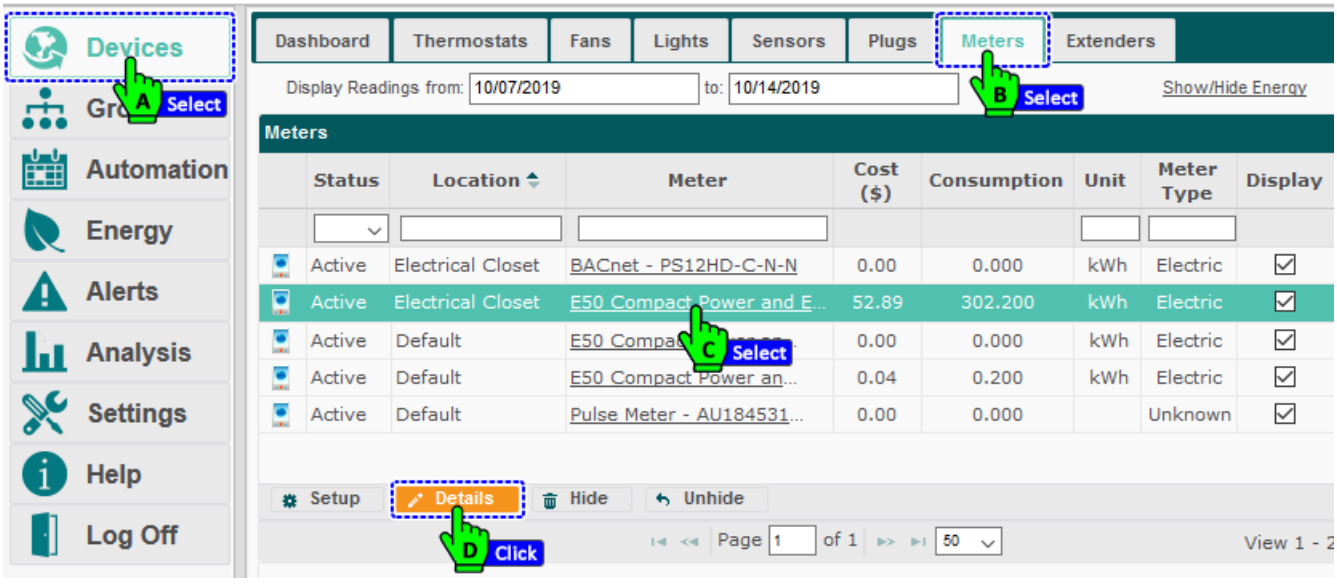


5. To create a graph using different options, make new selections, and then click the **Refresh** button.

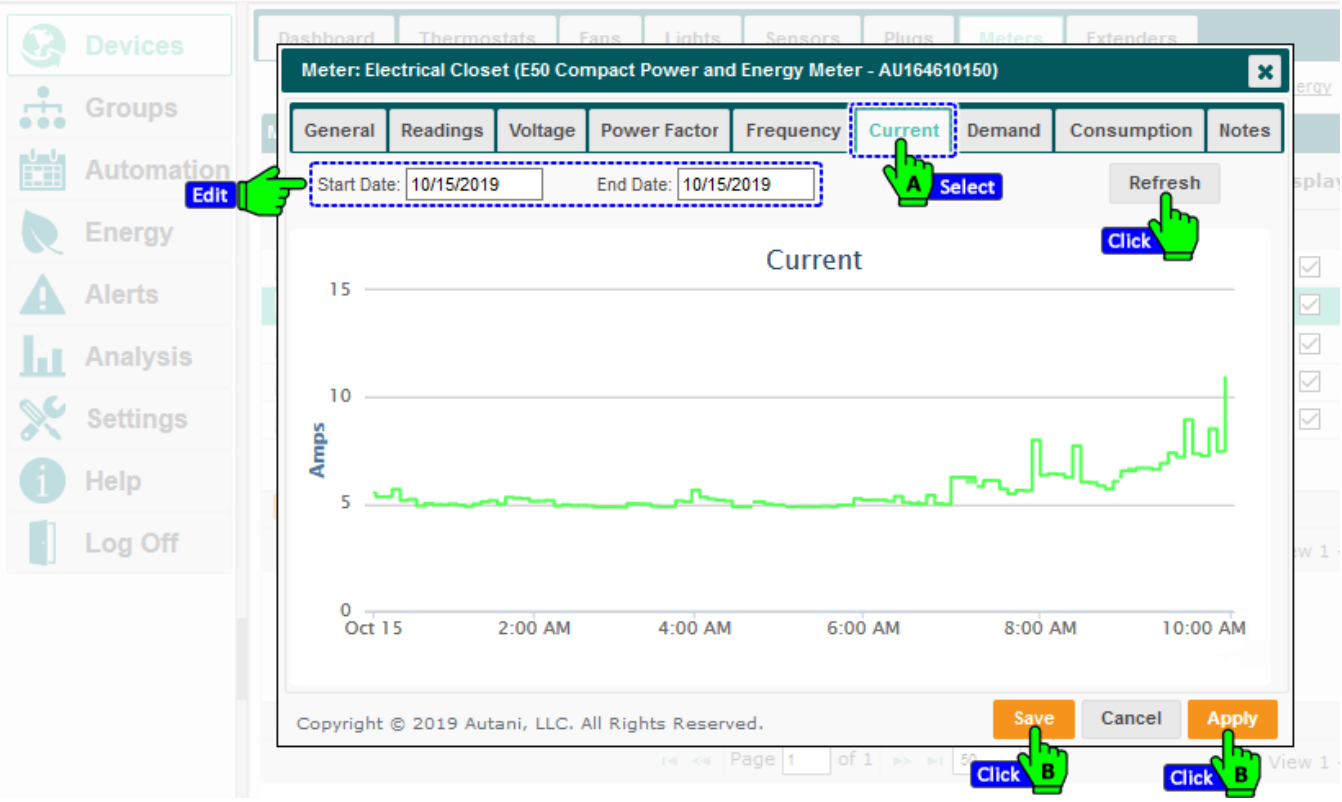
For information on how to set up e-mail alerts based on frequency thresholds, see the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

4.6. Monitoring Electrical Current

1. On the left navigation bar, click **Devices**, and click the **Meters** tab.
2. Click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



3. Click the **Current** tab. Data for the current day appears.

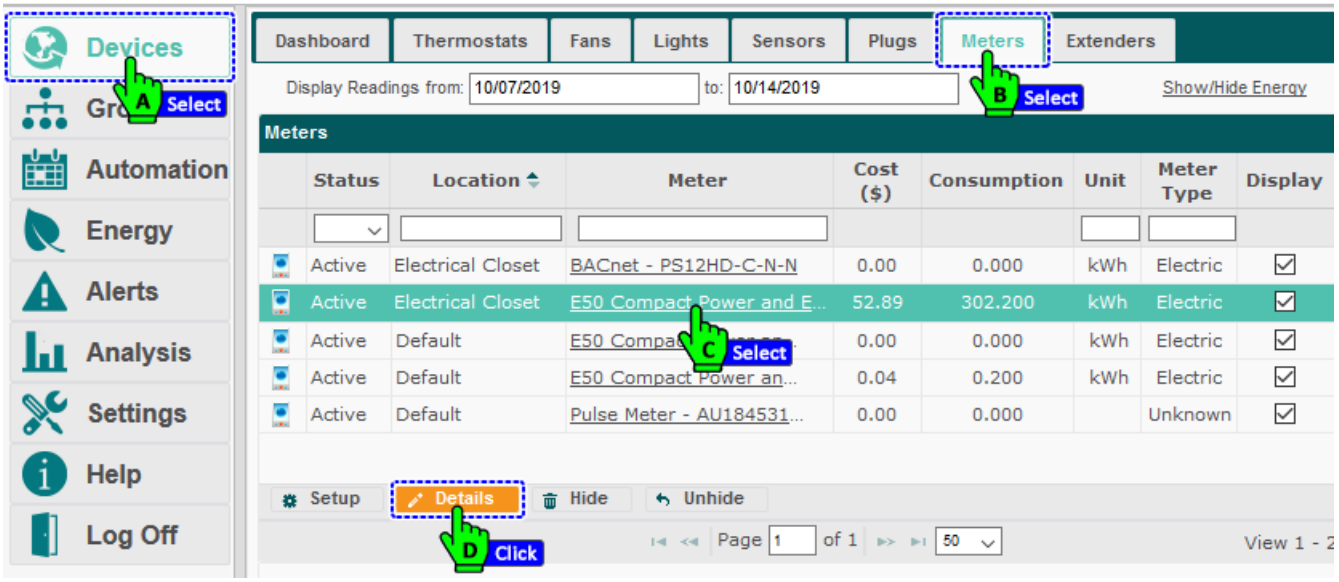


4. To view more exact information:
    a. Mouse over the displayed data
    b. Zoom in on a defined area of the chart by clicking and dragging the mouse to create a rectangular box. To return the view to its original size, click **Reset Zoom** in the upper right-hand corner of the chart.
5. To create a graph using different options, make new selections, and then click the **Refresh** button.

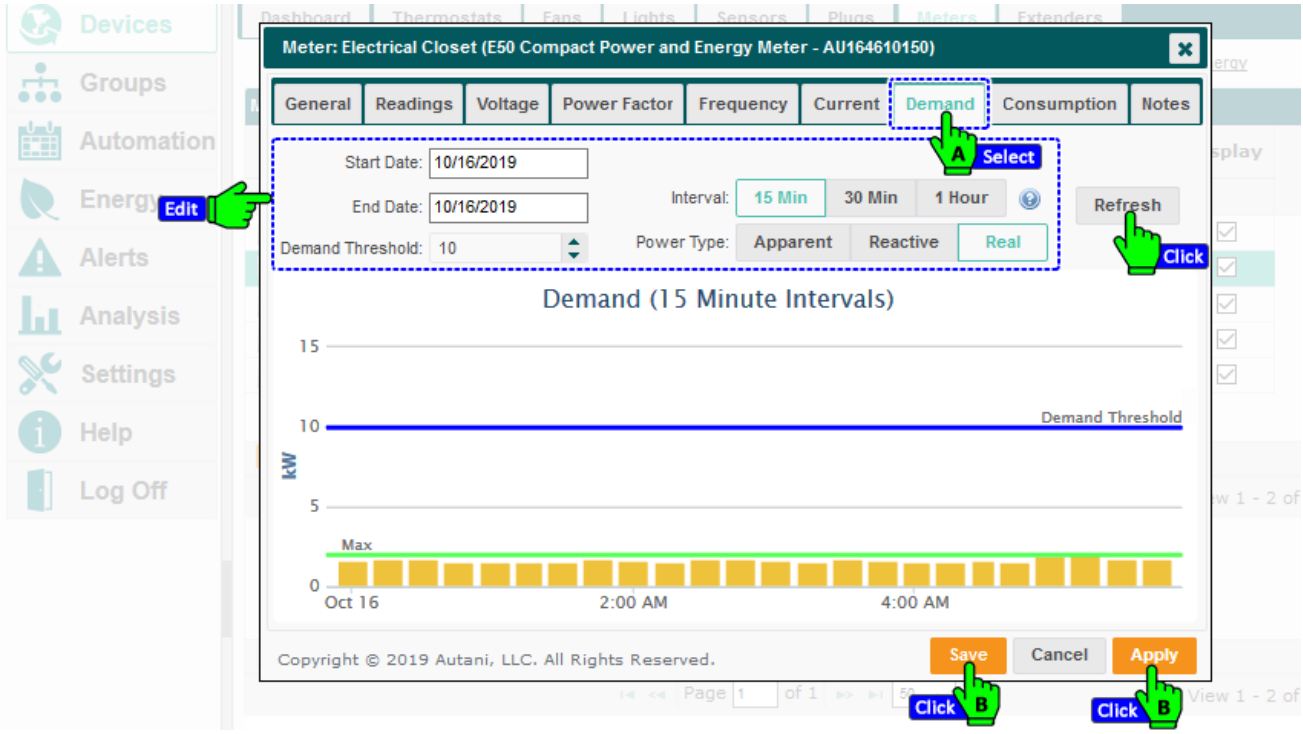
4.7. Using the Demand Tab

To monitor demand fluctuations based on different time intervals and power types and change the demand threshold:

1. On the left navigation bar, click **Devices**, and click the **Meters** tab.
2. Click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



3. Click the **Demand** tab. Data for the current day appears.



- For a single day, each bar in the graph represents demand for the selected **Interval** and **Power Type**. The highest demand value within a demand interval is displayed.
- For a date range, each bar represents maximum demand for the selected date range and **Power Type**. No interval demand data is available.
- For more information on power types, see the *Glossary*.

4. To view more exact information:
   a. Mouse over the displayed data
   b. Zoom in on a defined area of the chart by clicking and dragging the mouse to create a rectangular box. To return the view to its original size, click **Reset Zoom** in the upper right-hand corner of the chart.

5. To create a graph using different options, make new selections, and then click the **Refresh** button.

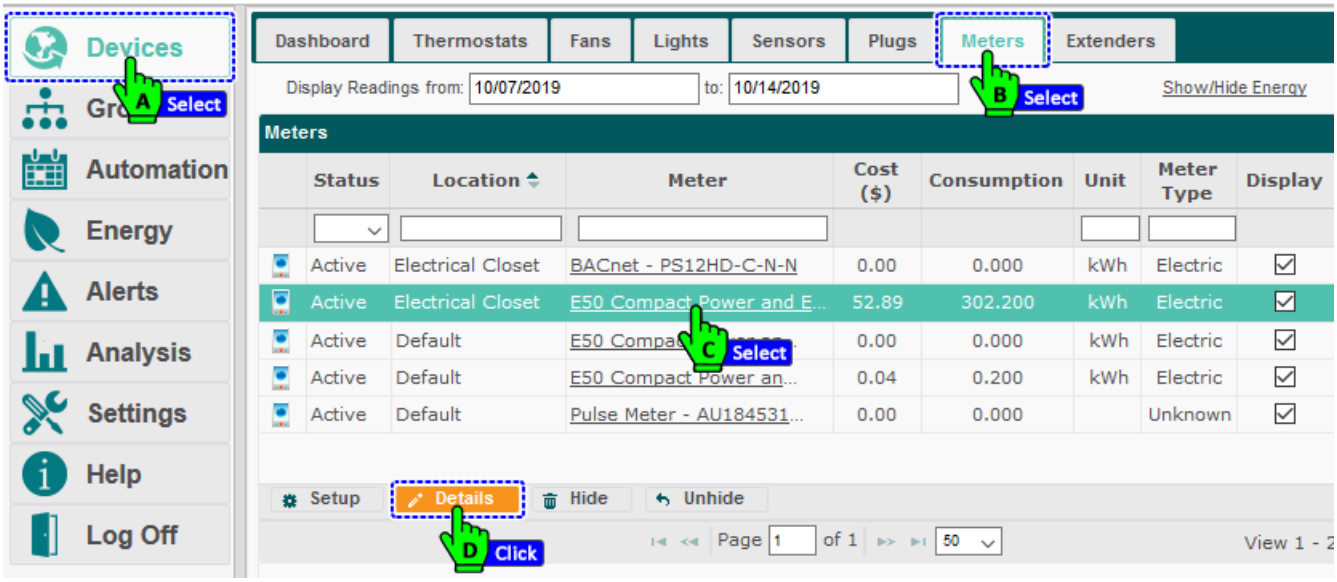
NOTE: For information on how to set up e-mail alerts based on the demand threshold, see the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

4.8. Viewing Consumption by Energy Type

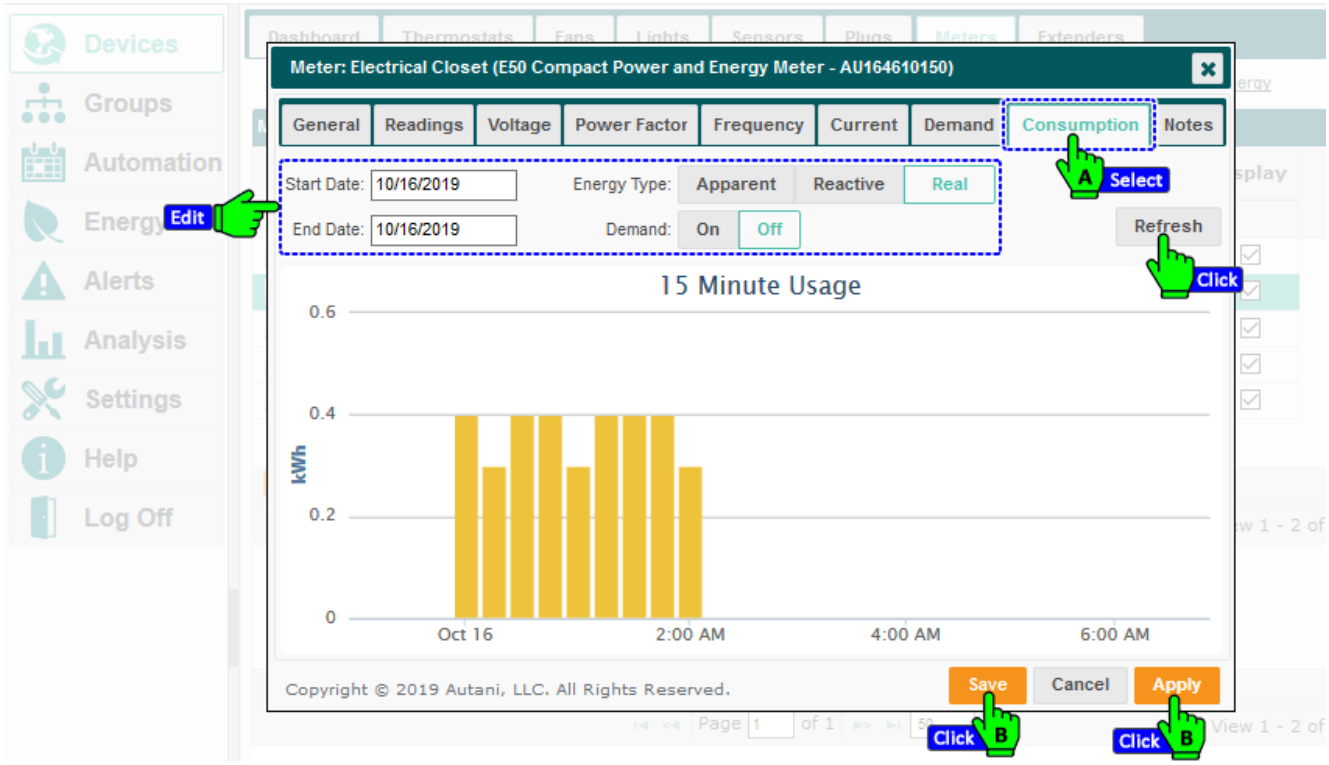
NOTE: Pulse meters do not transmit consumption data.

To view energy consumption reported by a Veris digital meter:

1. On the left navigation bar, click **Devices**, and click the **Meters** tab.
2. Click the name link of the meter, double-click the row of the meter, or click the row of the meter and then click the **Details** button.



3. Click **Consumption**. Data for the current day appears



4. To view more exact information:
    a. Mouse over the displayed data
    b. Zoom in on a defined area of the chart by clicking and dragging the mouse to create a rectangular box. To return the view to its original size, click **Reset Zoom** in the upper right-hand corner of the chart.
5. To create a graph using different options:
    a. Click in the text boxes next to **Start Date** and **End Date** to select a day or date range using the calendar.

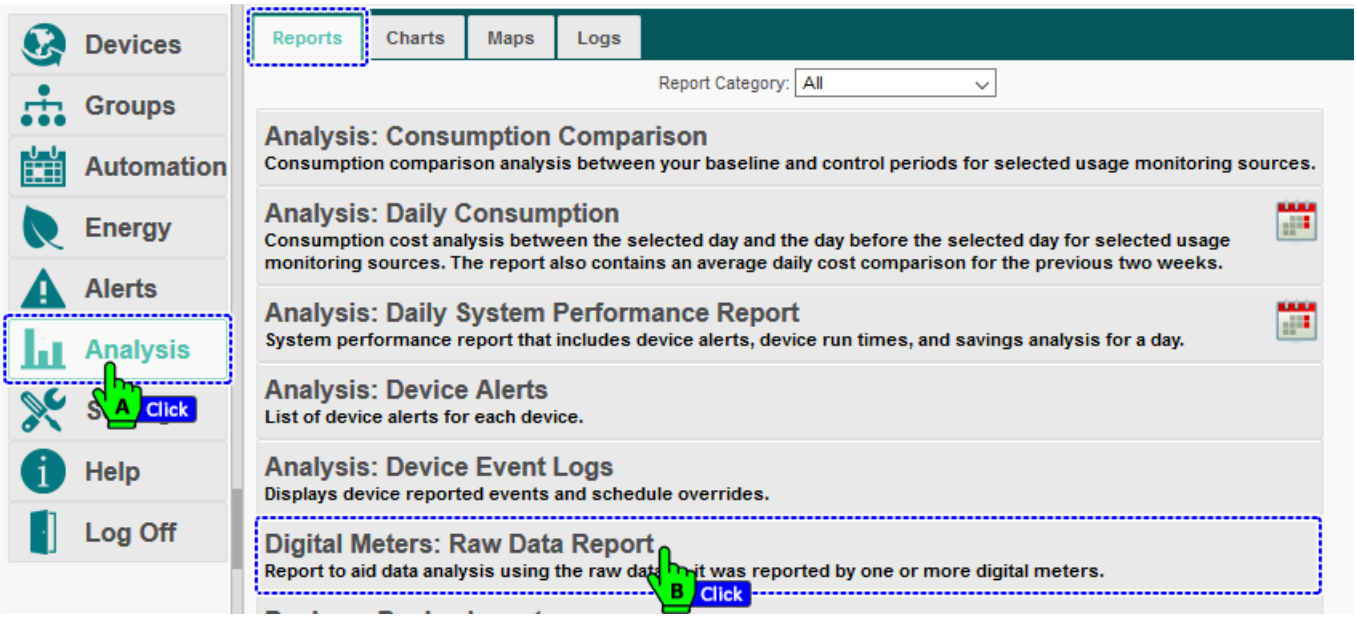
b. Click one of the Energy Type buttons: **Apparent**, **Reactive**, or **Real**.
NOTE: For more information on power types, see the *Glossary.*

c. Choose **Demand** type to be **ON** or **OFF**.

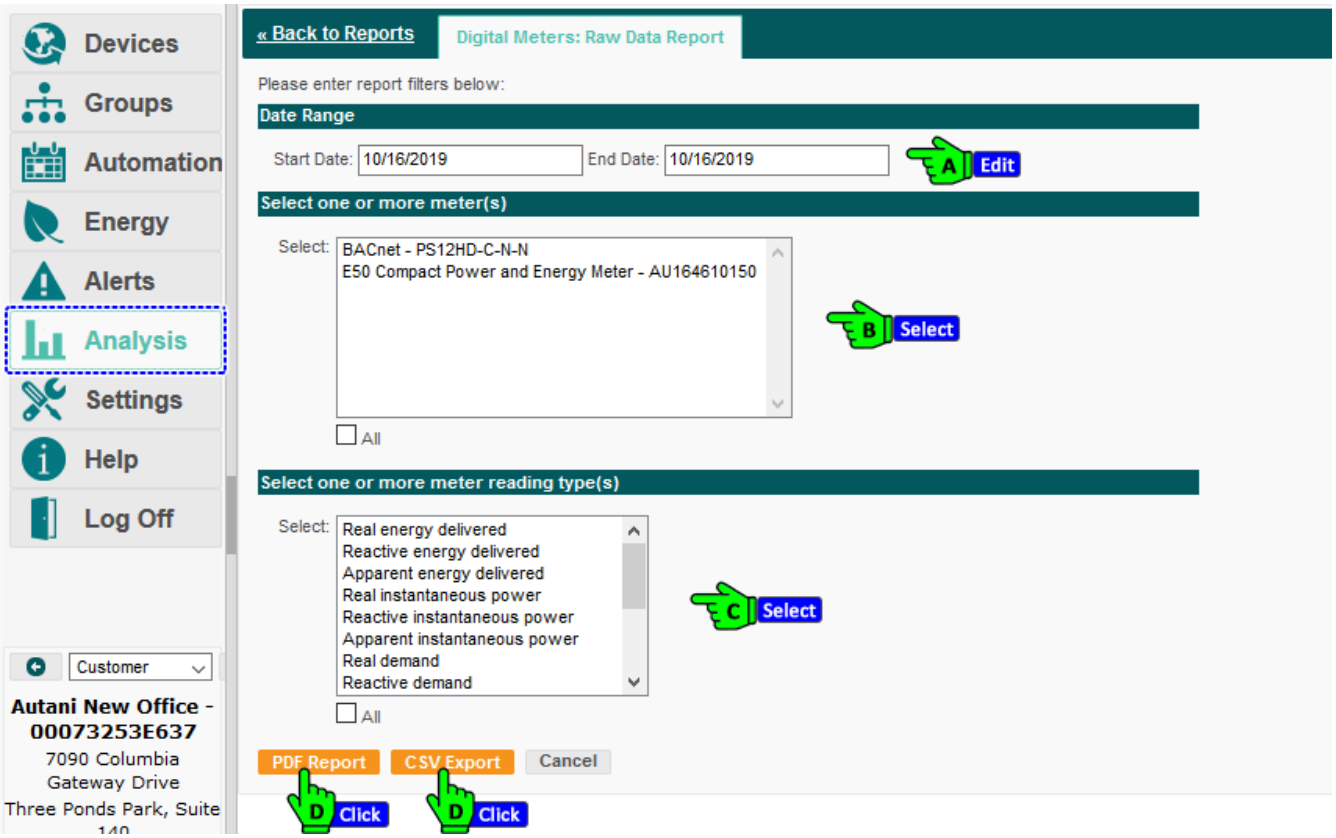
d. Click the **Refresh** button.

4.9. Creating a Raw Data Report

1. On the left navigation bar, click **Reports**.
2. Click **Digital Meters: Raw Data Report**.



3. Click in the **Start Date** and **End Date** textboxes to access the calendar, and select a date range.



4. Select one or all meters by:
    - Selecting a meter from the **Select** drop-down list
    - Selecting the All checkbox
5. Select one or all meter reading types by:
    - Selecting a meter from the **Select** drop-down list
    - Selecting the All checkbox
6. To generate the report and select a format, click the:
    - **PDF Report** button for a PDF to appear in another window of your browser
    - **CSV Export** button for the report to appear in your default spreadsheet program where it can be sorted.

5. Troubleshooting

5.1. Devices are Not Reporting Data

5.1.1. Device is in Error or Warning State

During initial setup, devices are in an error state until the mesh network is established. If the status does not change momentarily to Active, click **Alerts** on the left navigation bar to check the alert log.

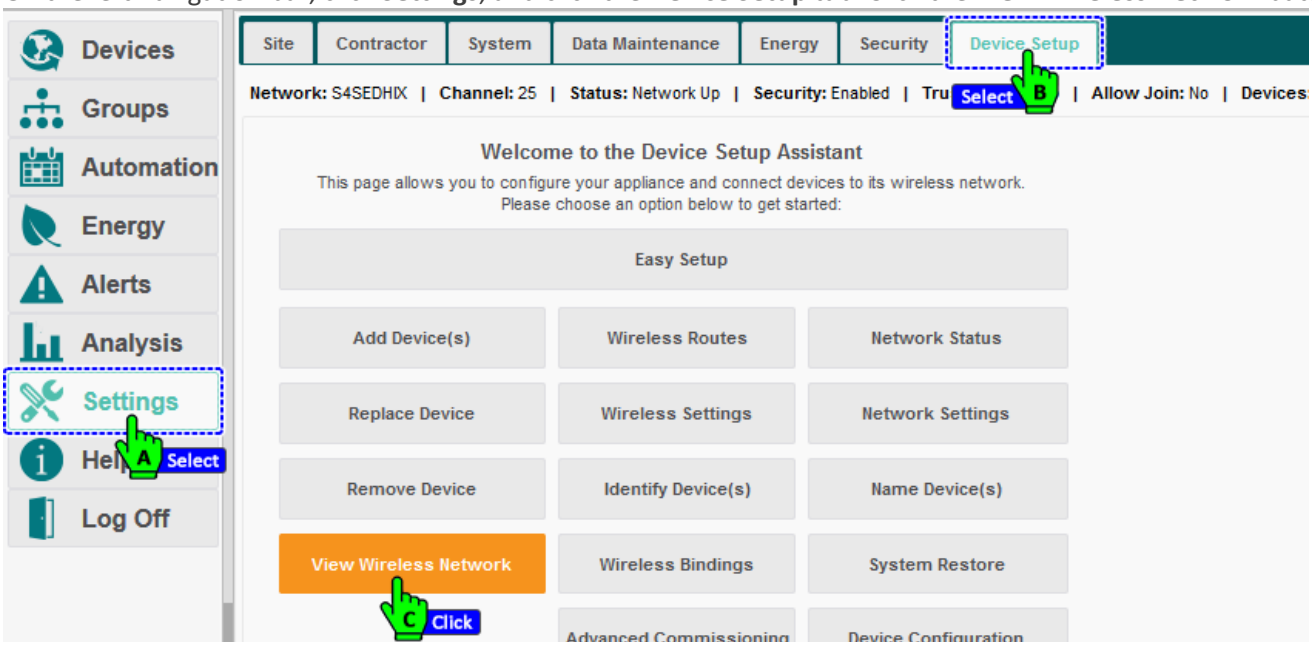
Table 6: Error and Warning Troubleshooting

Issue	Cause	Potential Solution
Error Status	Communication error	The meter is not communicating with the Autani Manager over the autaniNet network.
Pulse Meter Not Configured	The pulse meter has been commissioned but not configured.	See *Configuring Settings Specific to Pulse Meter*.

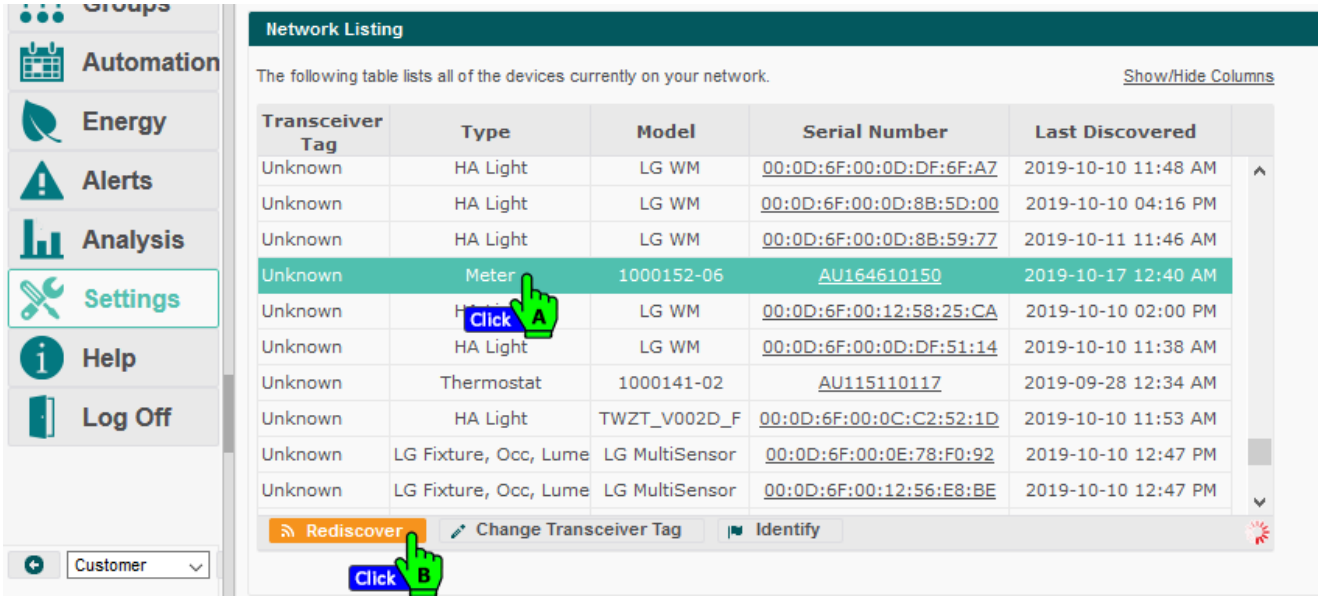
For an explanation of warning conditions, see the documentation that came with the meter.

5.1.2. Rediscover the Device

1. On the left navigation bar, click **Settings**, and click the **Device Setup** tab. Click the **View Wireless Network** button.



2. Click the row of the device to be rediscovered. Click the **Rediscover** button.



- The description in the Type column changes to “Discovering.”

Unknown	Discovering	1000152-06	AU164610150	Starting discovery...

- The time/date stamp in the Last Discovered column changes to “Starting discovery” in red.
- When the device has been rediscovered, the type of device reappears and the new date/time stamp is listed.

5.1.3. Check the Power Connection

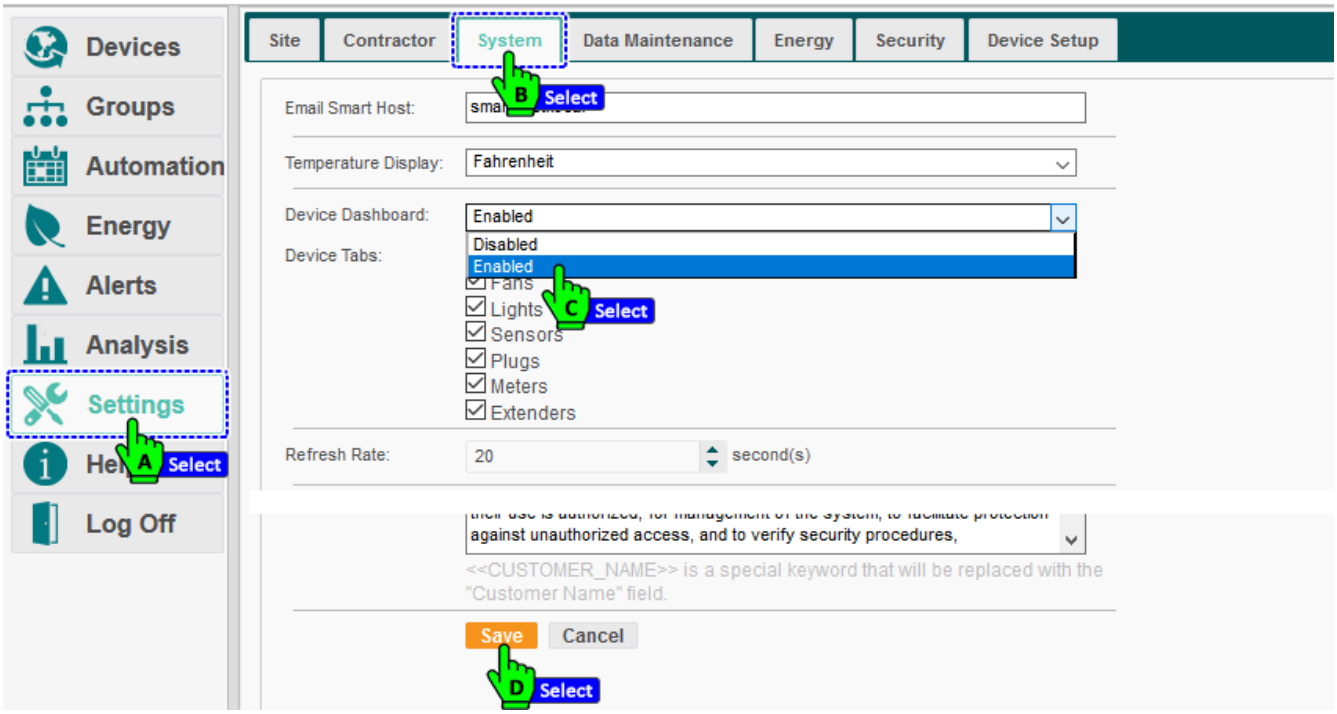
If the LED on the Autani Manager is not green:

1. Verify the Autani Manager is firmly plugged into the electrical outlet.
2. To make sure it is a working electrical outlet, test it:
    - Using a voltage meter
    - Connecting another device to the outlet, and testing that it turns on

5.2. Dashboard Does Not Appear

To enable the dashboard:

1. On the left navigation bar, click **Settings**.
2. Click the **System** tab.
3. From the **System Device** drop-down list, select **Enabled**.
4. Click **Save**.



5.3. Contacting Customer Support

For assistance after following the steps in Troubleshooting, contact Customer Support at:

- **Autani Support**
  Phone: 443.320.2233 x2
  Address: 7001 Columbia Gateway Drive, Suite 210, Columbia, MD 21046 USA
  Support/Commissioning Services: support@autani.com
- **Autani Sales**
  Phone: 443.320.2233 x1
  Sales/Quotations: sales@autani.com, quotes@autani.com
  General Inquiries: information@autani.com

Hours of Operation: Monday to Friday, 9am to 5pm, Eastern Standard Time

6. Appendix: Understanding Digital Meter Readings

6.1. Understanding Voltage Readings

Voltage is the energy that makes the electrical current flow in a circuit.

- Line-to-Line voltage is the voltage between any two phases of an AC generator.
- A 3-phase, Line-to-Neutral voltage is the voltage between a phase and the common neutral wire where the three phases are tied together.

⚠ Electrical systems are designed to use 110-120 volts or 220-240 volts. It is dangerous for equipment to receive a voltage higher than it is designed to use and the equipment will probably be damaged. If 240 volts are sent into a device designed for 110 volts, it may melt or even explode.

> **NOTE**: If equipment receives a lower voltage than it is designed to use, it may not work correctly but no dramatic failure is likely.

Meter Management can be used to control and monitor voltage by:

- Setting maximum and minimum voltage values based on equipment specifications
- Displaying voltage data to view fluctuations
- Creating a graphic representation of Line-to-Line or Line-to-Neutral voltage data

Alerts can be created to notify you if the voltage drops below your specified minimum threshold or exceeds your maximum voltage threshold. For information on how to set up alerts, see the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

6.2. Understanding Power Factor Readings

The Power Factor tab can be used to monitor how effectively power is being used.

Utility bills may include a significant additional charge when a customer's power factor is less than a pre-established limit. The extra charge is commonly called an "additional demand" charge.

Electric utility companies are concerned about the power factor because their wire losses and the sizes of their wires, protection equipment, and transformers are all dependent on it.

Power factor is a dimensionless number between 0 and 1 and is frequently expressed as a percentage, such as 0.5 pf = 50% pf. ideally, the power factor is 1, but it is often less than 1 for most electrical loads. For industrial consumers, the power factor may be 0.8 or lower.

Meter Management can be used to control and monitor power factor by:

- Setting a power factor threshold based on utility requirements
- Displaying power factor data to view fluctuations
- Creating a graphic representation of power factor data

For information on how to create alerts to notify you if the power factor drops below your specified threshold, see the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

6.3. Understanding Frequency Readings

An important indicator of the health of the electric power grid is the system frequency, the rate at which the flow of the alternating current (AC) changes direction (forward and backward) per second.

For example, in the United States and Canada, the power system is carefully controlled to maintain a frequency of 60 hertz (Hz).

Deviations in the frequency indicate an imbalance between supply and demand. Left unchecked, an imbalance between supply and demand can lead to a blackout. A change in frequency can be a key indicator of major, negative grid events, such as:

- A generator going off-line
- Major loads switching on or off
- An unscheduled interruption of power flow through transmission lines

Meter Management can be used to control and monitor frequency by:

- Setting frequency maximum and minimum thresholds based on the power grid that services your systems
- Displaying frequency data to view fluctuations
- Creating a graphic representation of frequency data

For information on how to create alerts to notify you if the frequency drops below your specified minimum threshold or exceeds your specified maximum threshold, see the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

6.4. Understanding Electrical Current Readings

Electrical current is the amount of electrical charge transferred per unit of time. An anomaly in the supply of electrical current creates an open circuit and electricity does not get to the "load."

Electrical currents are measured in amperes (amps). One ampere is approximately the amount of current that flows through a 100 watt bulb when it is turned on.

Meter Management can be used to:

- Monitor fluctuations in electrical current
- Create a graphic representation of electrical current fluctuations

6.5. Understanding Demand Readings

Electric utility bills are based on two components:

1. Energy consumed over the billing cycle
2. The highest average demand for energy during a short time period called a demand interval

Demand can vary significantly during a day due to many factors, including the equipment being used, the time of day, and outside temperature changes. Most utility companies use a demand interval of either 15 or 30 minutes.

Meter Management can be used to control and monitor demand by:

- Setting a demand threshold
- Displaying fluctuations in demand based on different time intervals and power types
- Creating a graphic representation of demand fluctuations

For information on how to create alerts to notify you if the current drops below your specified demand threshold, see the EnergyCenter® User Guide module entitled 'Tasks Common to All Applications (Zigbee)'.

7. Glossary

Table 7: Glossary

Term	Description	Unit of Measurement
Apparent Energy (or Apparent Power)	▪ Amount of power, or alternating current (AC), flowing in a circuit ▪ Used to: □ Measure energy drawn from the utility □ Heat generated when using specific equipment □ Size wires and circuit breakers	▪ Volt-Amps (VA) ▪ Computed by multiplying the current by the voltage
Current	Amount of electrical charge transferred per unit of time	Amperes (amps)
Demand	Maximum amount of electrical energy being consumed during a specific time period called a demand interval	The rate tariff charged by the electric utility company, depending on the power factor, in: ▪ Kilowatts ▪ Kilovolt amperes
Frequency	Rate at which the flow of an alternating current (AC) changes direction (forward and backward) per second	Hz
Kilowatt Hour (kWh)	Unit of energy equivalent to one kilowatt of power expended for one hour	Billing unit by electric utility company for energy delivered to its consumers
Power Factor	▪ Percentage of actual energy or power used compared to the energy flowing through the wires ▪ Ratio between real power and apparent power in a circuit	▪ A dimensionless number between zero and one □ In a purely resistive circuit, the power factor is one (perfect) because reactive power equals zero. □ In a purely inductive circuit, the power factor is zero because true power equals zero. ▪ Frequently expressed as a percentage (0.5 pf = 50% pf)
Real Energy (or Real Power or Active Power)	▪ Actual amount of energy present in a system ▪ Portion of power flow that results in the net transfer of energy in one direction ▪ Portion of delivered energy that generates heat in the wiring	Watts
Reactive Energy (or Imaginary	▪ Portion of power flow due to stored energy that returns to the source in each cycle and is needed for the transfer of real power over a network	▪ Abstract quantity ▪ Volt-amperes-reactive (VARs)

Term	Description	Unit of Measurement
Power or Wattless Power)	▪ Rate at which a reactive component stores energy in its magnetic field, and then returns it to the source ▪ Sometimes called imaginary power because it does not power a device but is necessary for other purposes, such as setting up magnetic fields in transformers ▪ Sometimes called wattless power because it does not represent energy loss and there is no heat dissipation	
Therms	Energy content a gas or liquid gives off in the form of heat when burned	Energy equivalent of burning 100 cubic feet of natural gas
Voltage	Energy that makes the electrical current flow in a circuit ▪ Line-to-Line voltage is the voltage between any two phases of an AC generator. ▪ A 3-phase, Line-to-Neutral voltage is the voltage between a phase and the common neutral wire where the three phases are tied together.	110-120 volts 220-240 volts

8. Index

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