Live-View Getting Started Guide
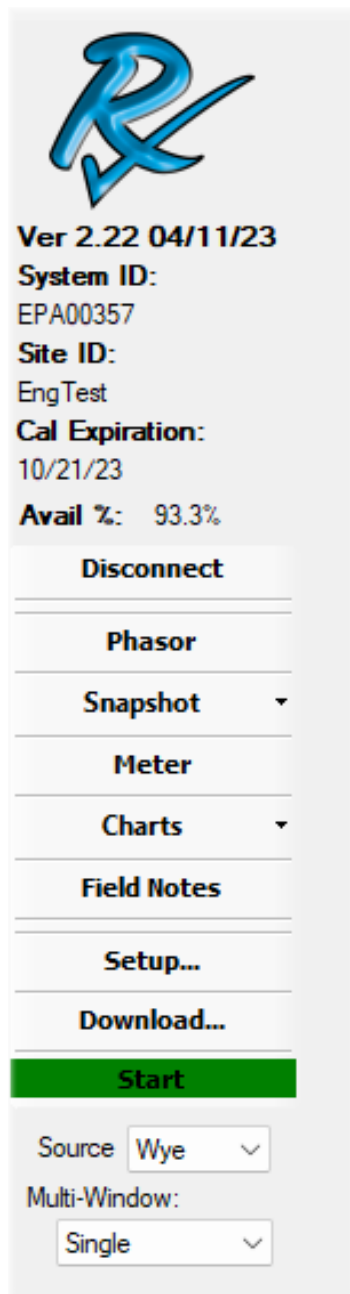
April 11, 2023

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Please refer to http://www.rxms.com/downloads/instructions/liveview/LiveViewGettingStarted.pdf
For current release

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Live-View® Getting Started Guide
Revised: April 11, 2023

Live-View Table of Contents

Main Menu Panel

The panel on the left serves as the main menu. Below the logo is the software revision, system identification, and the current site identification. Below that is a series of buttons which are described below.

Ver 2.22 04/11/23	**Live-View Software Revision**
System ID: EPA00357	**System Identification**
Site ID: EngTest	**Site Identification**
Cal Expiration: 10/21/23	**Calibration Expiration**
Avail %: 93.3%	**Storage Available**
Disconnect	**Connect/Disconnect**
Phasor	**Phasor Diagram**
Snapshot	**Snapshot**
Meter	**Meter Mode**
Charts	**Real Time Charts**
Field Notes	**Field Notes Table**
Setup...	**Monitor Setup Dialog**
Download...	**Download Dialog**
Start	**Start/Stop Monitoring**
Source Wye	**Power Source Settings**
Multi-Window: Single	**Multi-Window Settings**

Connect / Disconnect - Local
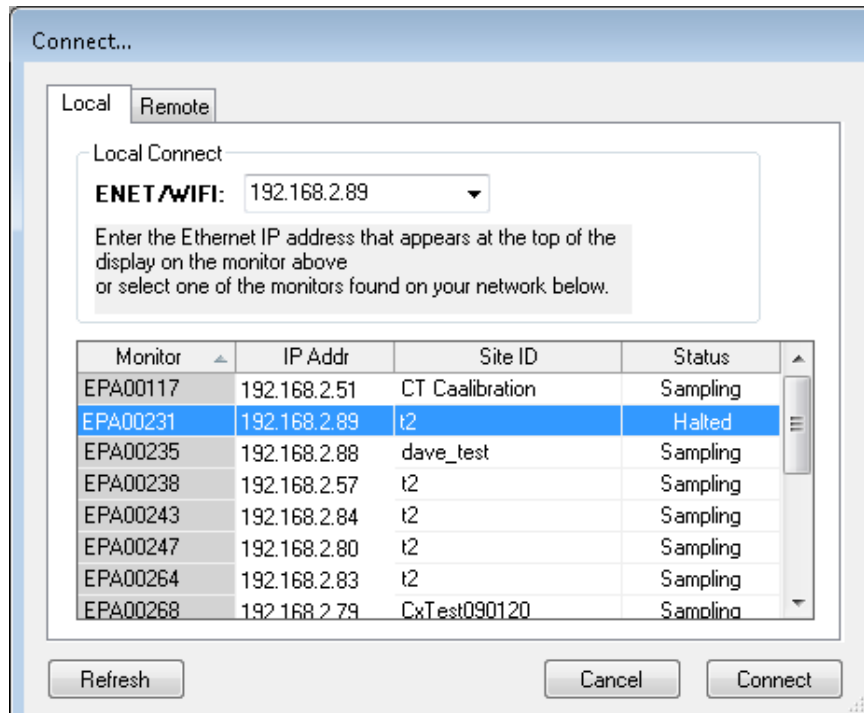
This window is used to establish communications with the Rx Monitoring power monitor. The other buttons in the Main Menu panel will be disabled (greyed out) until the user connects with the monitor.

Live-View communicates through TCP/IP, either through an Ethernet cable or WiFi. Click the Connect button to open the Connect dialog.

You can either enter the IP Address of the monitor, which appears at the top of the display on the monitor, or select one of the monitors Live-View found on the network, displayed in the list-box. Use the monitor serial number, ip address, or the monitors current Site ID to identify the monitor you are looking for. Click the Connect button to connect to the monitor. Click on the column heading to sort the list of monitors.

Click the Refresh button to rescan the network. If your monitor fails to appear in the list box or does not connect, check your cabling and your pc/laptop network settings.

Multiple instances of Live-View can be run to view multiple monitors simultaneously.

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Connect / Disconnect - Remote

This window is used to establish communications with the Rx Monitoring power monitor remotely. The monitor, when the Remote Access feature is enabled and connected to an internet capable network, will establish a secure interface with the Rx Monitoring Remote Access Server. Live-View connects to the monitor through the Remote Access Server using an Rx provided Username/Password.

Once connected, Live-View will display all the monitors that have ever connected to the Remote Access server with this user. For each monitor, the table displays the last time monitor communicated with the Remote Access server, the current Site ID, and the Sampling Status. If the monitor is not currently connected, it will display N/A (Not Available) for Site ID and Status.

Select a monitor from the list and either double-click the line or click the Connect button in the lower right to connet to the monitor.

Refer to the Monitor Setup - Network section on how to setup the monitor for Remote Access.

Calibration Expiration
Displays the Calibration Expiration Date. Please note, will display N/A if the software on the monitor is older and doesn't support this feature.

Storage Available
Displays the percentage storage remaining on the monitor.

Source
Specifies the power source that the monitor leads were hooked up to. This is used to determine how to compute Power in Meter Mode, Snapshot.

Wye - Three-Phase Wye, Split-Phase, Single Pole Single-Phase
Delta - Three-Phase Delta

Start/Stop Monitoring
This button starts and stops the sampling of the power monitor. A green Start button shows that the monitor is currently not sampling. Pushing it starts the sampling. A red Stop button shows that the monitor is currently sampling and pushing it stops the sampling.
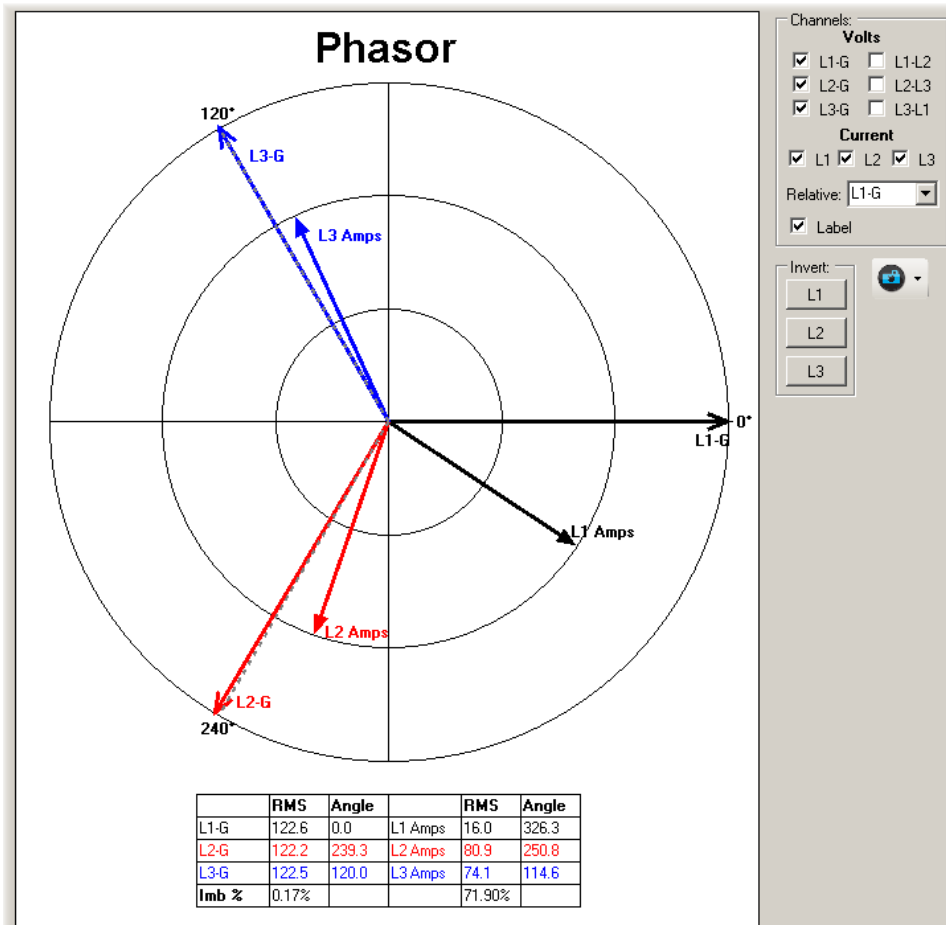
The monitor needs to be sampling for the Phasor, Snapshot, and Meter to display in real-time. The monitor needs to be stopped in order for the user to perform Setup.

Multi-Window Settings
Double displays the Meter and Phasor windows in a split window. Triple displays the Snapshot window at the top and Meter and Phasor split in the bottom window.

Phasor Diagram

The Phasor Diagram displays the phase angles of the Phase-Ground channels and the phase current channels.

Phasor

|	RMS	Angle		RMS	Angle
L1-G	122.6	0.0	L1 Amps	16.0	326.3
L2-G	122.2	239.3	L2 Amps	80.9	250.8
L3-G	122.5	120.0	L3 Amps	74.1	114.6
Imb %	0.17%			71.90%	

The phase angle for each of the Phase-Ground or Phase-Phase voltage channels relative to L1-Ground or L1-L2, is represented by a long line with an open arrow head. The phase angle of each current channel is represented by a shorter line with a closed arrow head. Use the check boxes to enable individual voltage or current channels. Use the Relative check box to display to phasors relative to L1-G or L1-L2.

The Phasor Diagram gives the user the option to invert each of the phase current channels. If the current is hooked up backwards, it will display 180 degrees relative to it's corresponding voltage. To correct for this, click the L1, L2, or L3 buttons to invert the current signal.

The Camera icon next to the Invert group gives the user the ability to capture the Phasor diagram, either to a Portable Network Graphics (PNG) file or to the windows clipboard. These can then be pasted into Microsoft Word or any other word processing software that takes graphical images. Click the down-arrow to select between Save to File or Save To Clipboard. Then click on the camera icon to perform the capture. This functionality is supported on nearly all the displays.

Snapshot

The Snapshot panel displays a snapshot of all ten voltage and five current channels in real-time.
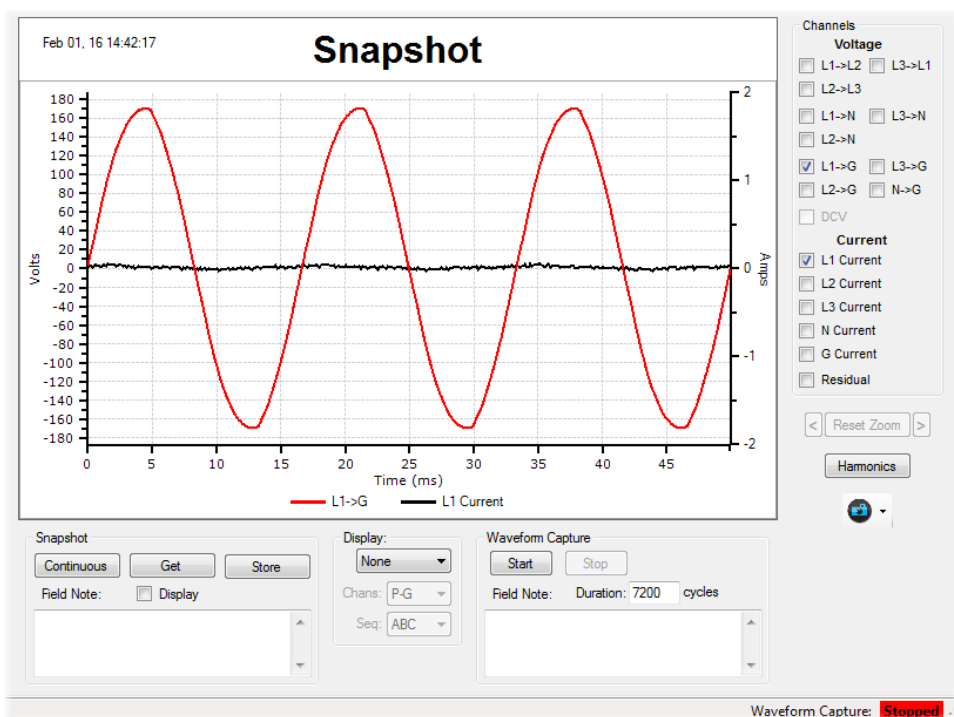
Choose which channels to display by selecting any of the voltage or current channels in the channels group. Residual refers to the sum of the three phase and neutral current channels. DCV enables DC Voltage if the Ground Current channel is configured for DCV. DC Current enables the DC Current channel if the Neutral Current channel is configured for DC Amps.

The Get button captures a single snapshot. Clicking the Continuous button puts Snapshot into continuous capture mode, displaying a snapshot at a one-second interval. Click the One-Shot button to return to One-Shot mode.
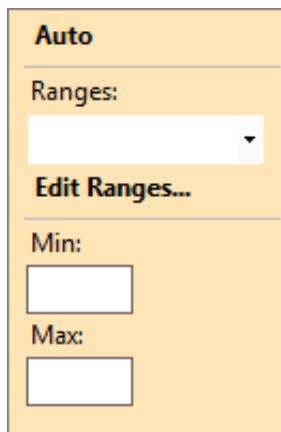
The user has the option to add a Field Note to the Snapshot. Enter the Field Note within the Field Note text box and check the Display. The field note will be displayed above the graph, under the title.

Use the Store button to record the currently displayed snapshot. A snapshot file and a snapshot event will be recorded on the monitor within the current site folder.

To Zoom, move the mouse to where you want to start the zoom, press and hold the left mouse button, move the mouse to where you want to end the zoom, and lift on the left mouse. Repeat to continue zooming in. Live-View will record each of your zoom settings. Use the left or right arrows to change the zoom setting. Click Reset Zoom to clear them.

The Harmonics button switches the display into harmonics mode.

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Vertical Axis Range

The vertical axis range for the Snapshot chart can be set by right-clicking on the desired axis. A popup menu will appear.
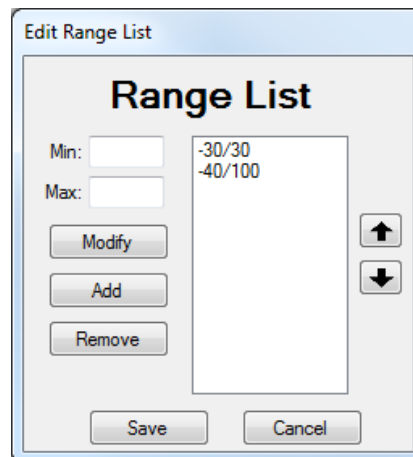
Auto - Auto ranges based on the content

Ranges - Combo-box with a list of user-defined min/max ranges

Edit Ranges... - Opens a dialog allowing the user to manage the min/max range list for this axis and chart

Min - Sets the minimum vertical axis limit

Max - Sets the maximum vertical axis limit

To add items to the list, enter valid Min and Max values and click Add. Values may be numerical values or a percentage relative to the displayed min or max. A Min of -5% will set the minimum range value to 5% below the minimum value displayed. A mix of values can also be used. A Min of 450 and a Max of +5% is also valid.

Remove items by selecting an item in the list and clicking Remove.

Modify existing items by first selecting the range to be modified in the list box, edit the Min or Max values, then clicking the Modify button.

The order of items in the list may be changed by selecting an item and clicking the up or down arrows to the right of the list or by clicking on an item and dragging it up or down to its new position.

Click Save to save changes. Cancel will revert the Range List back to what it was before the window was opened.

Display Mode
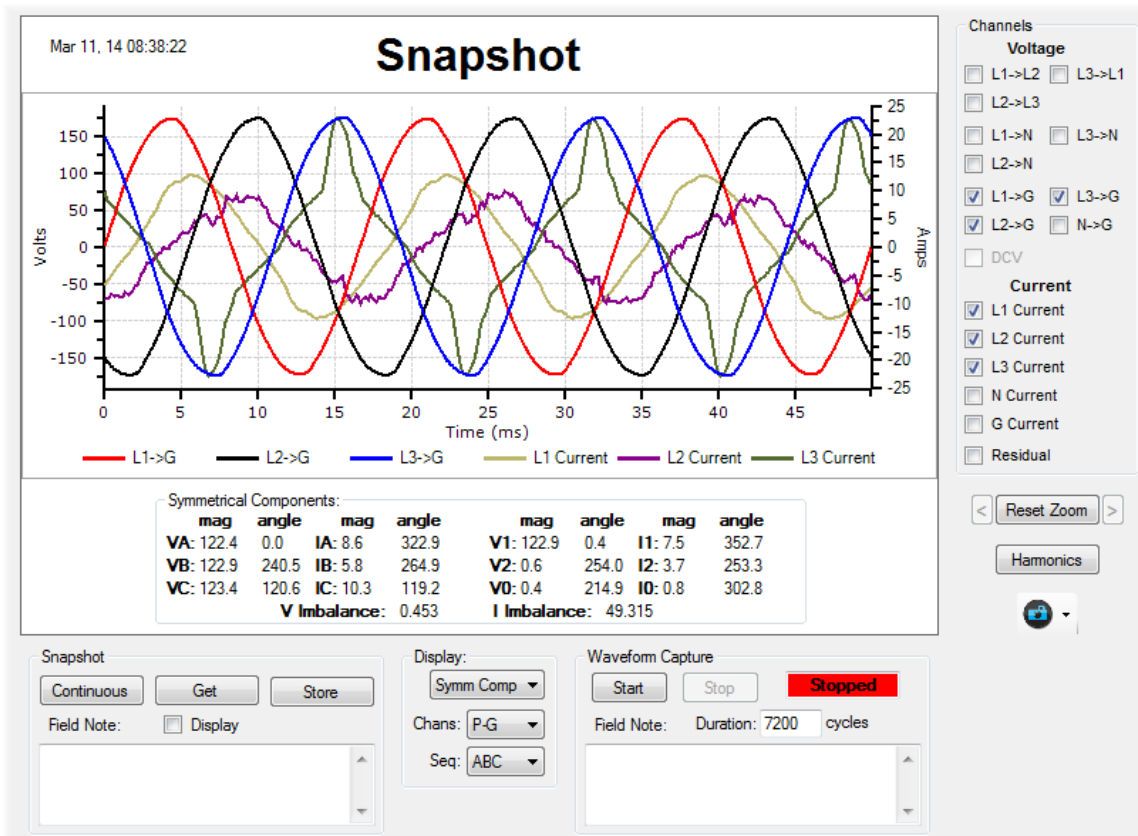Setting the Display Mode will display information about the snaphot in the footer of the chart.

Power
Power displays RMS Voltage and Current, Crest Factor for voltage and current, KVA, KW, KVAR, and Power Factor for each of the three phases computed from the data in the Snapshot capture.

The Source combo-box switches between Wye mode using the Phase-Ground channels or Delta using the Phase-Phase channels.

Snapshot — Mar 11, 14 08:38:22

Symmetrical Components:

	mag	angle		mag	angle		mag	angle		mag	angle
VA:	122.4	0.0	**IA:**	8.6	322.9	**V1:**	122.9	0.4	**I1:**	7.5	352.7
VB:	122.9	240.5	**IB:**	5.8	264.9	**V2:**	0.6	254.0	**I2:**	3.7	253.3
VC:	123.4	120.6	**IC:**	10.3	119.2	**V0:**	0.4	214.9	**I0:**	0.8	302.8
			V Imbalance:	0.453					**I Imbalance:**	49.315	

Channels

Voltage: L1->L2, L3->L1, L2->L3, L1->N, L3->N, L2->N, ☑ L1->G, ☑ L3->G, ☑ L2->G, N->G, DCV

Current: ☑ L1 Current, ☑ L2 Current, ☑ L3 Current, N Current, G Current, Residual

Reset Zoom | Harmonics

Snapshot: Continuous | Get | Store | Field Note: ☐ Display

Display: Symm Comp | Chans: P-G | Seq: ABC

**Waveform Capture:** Start | Stop | Stopped | Field Note: | Duration: 7200 cycles

Symmetrical Components

Symmetrical Components converts three unbalanced phases into three independent sources, which makes asymmetric fault analysis more manageable.

The display shows the fundamental magnitude and angle for each of the three phase-ground voltage and current channels, the magnitude and angle for the positive, negative, and zero sequence values, and the voltage and current imbalance values. All angles are displayed relative to the VA vector.

Use the Seq combo-box to change the phase sequence order to match what is being tested. Use the Chans combo-box to switch between Phase-Ground and Phase-Phase when computing Symmetrical components.
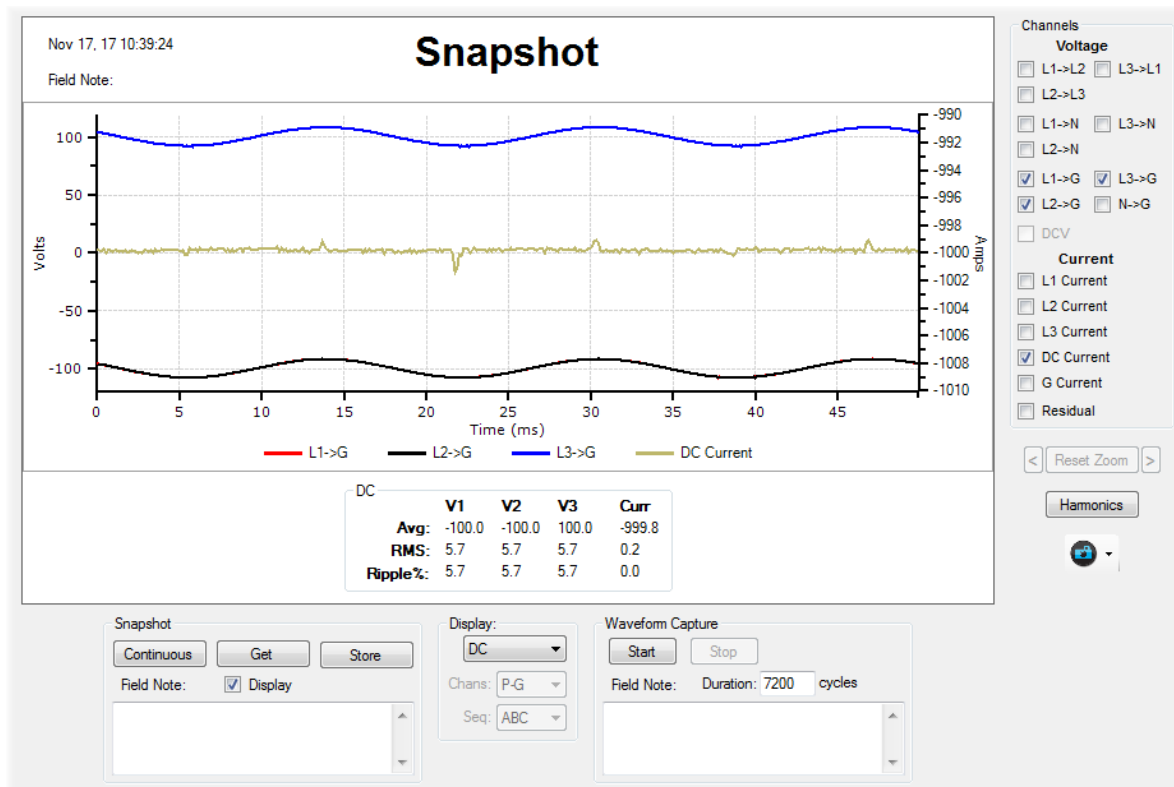
DC Volts and Amps

There is limited support for DC Volts and Amps within the Snapshot form. When DC is selected for the footer, the Average, RMS of the non-DC component, and Ripple % are displayed for V1, V2, V3, and DC Current.

DC current is supported when Neutral Current is configured as DCA 2000 or DCA 4000. Enable the DC Current channel to display to the channel. It must read at least 2 amps for the Ripple % to be displayed.

DC Volts is supported if the user hooks up the L1, L2 and L3 leads to the positive DC source and the Ground lead to the negative. Enable L1-G, L2-G, and L3-G channels to display the channel. The monitor must read at least 5 volts for the Ripple % to be displayed.

Waveform Capture

Provides the ability to manually trigger a Waveform Capture.
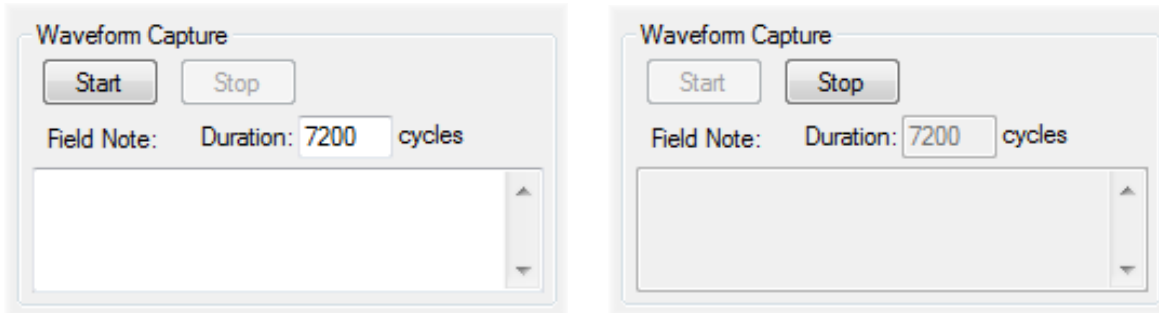
The monitor can be configured to automatically begin a Waveform Capture due to a Voltage Sag or Surge, or a change in current. This feature also gives the user the ability to manually start and stop the Waveform Capture.

The user begins recording by clicking the Start button. It will record the requested number of cycles, from 10 to 20,000, or until the user clicks Stop.

The Waveform Capture state is displayed on a status bar at the bottom of the window. It will be displayed no matter what form is selected. It will appear red if it is not recording and green with an elapsed time if it is. The state is represented whether it is started automatically or manually. The user may override an automatically started capture by clicking Stop.

Each time the user clicks the Start button, an entry is added to the Field Notes table. The user may enter a description of the test into the text box and a time stamped entry is added to the Field Notes when the user clicks the Start button.

Each time the user clicks Start or Stop, an entry is also added to the Event Log.

This feature is only available on Cx monitors and those with version 1.56 and later.

Harmonics

The Snapshot - Harmonics window displays the harmonics of the current snapshot in percent of fundamental, RMS, or in table form.
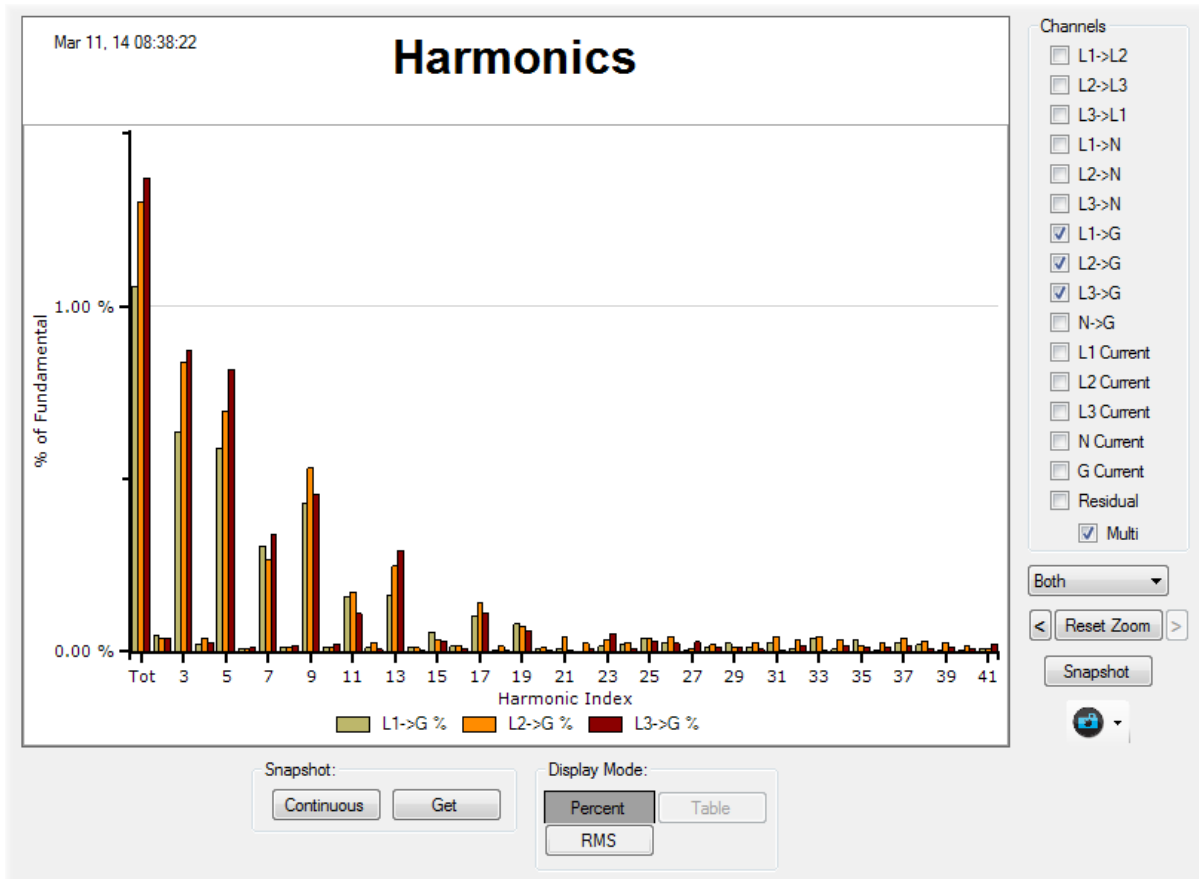
Choose which channels harmonic content to display by selecting any one of the voltage or current channels in the channels group. Click the Multi check box to display more than one channel at a time. Residual refers to the sum of the three phase and neutral current channels. N Current and G Current will be disabled if either port is configured for DC.

Below the chart, the Harmonic Distortion is displayed, showing the odd, even and total harmonic distortion.

The Percent button displays harmonics as a percent of the fundamental. The RMS button displays the harmonic content in RMS. The Table button displays the harmonic content, up the 63rd harmonic, in table format.

The Continuous/One-Shot button switches between continuous and one-shot snapshot modes. Use the Get button to get a new snapshot.

Use the combo-box to select Odd, Even, or Both harmonic content. The left most value shows the Total, Total Even, or Total Odd harmonic distortion, depending on this selection.

The Snapshot button switches the display back into snapshot mode.

Snapshots - DCW

This form displays DCW waveform data. This feature only appears if the monitor has a DCW probe configured in its peripheral list.
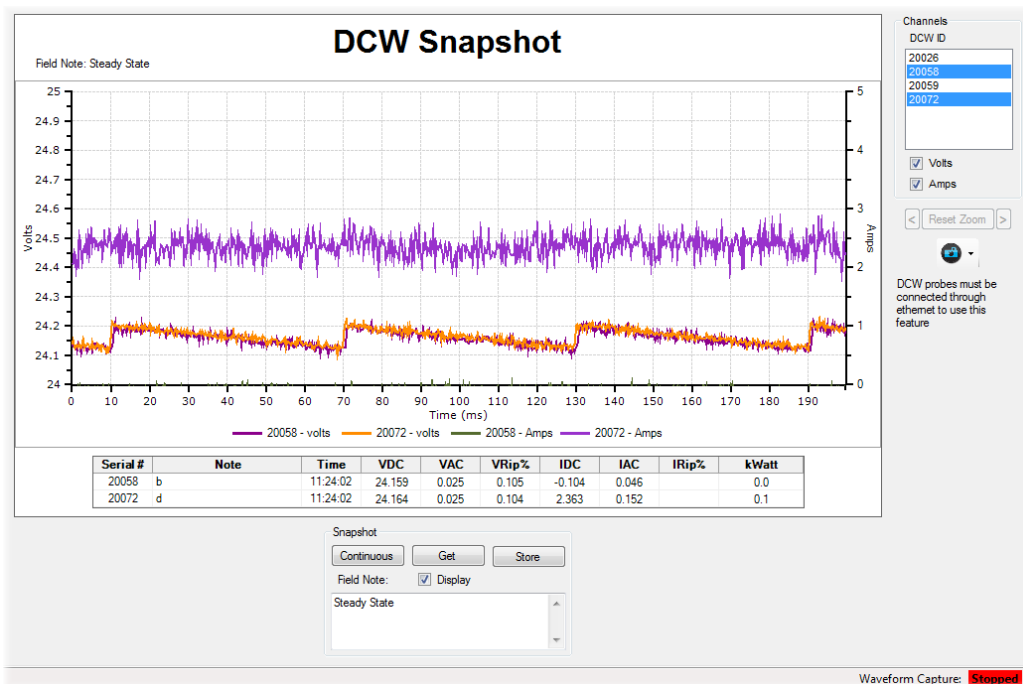
DCW Snapshots are 200 millisecond digital captures of the DC Voltage and DC Current channels on the DCW probe, captured at 3840 samples/sec. Due to bandwidth limitations, DCW Snapshots are only available in Live-View if the DCW Probe is hooked up to the monitor through ethernet.

The DCW ID selects which DCW peripherals to display and to operate on. Multiple DCW probes can be selected at a time by clicking on the serial number in the listbox. Please note that, due to network latency, the DCW Snapshot data on individual DCW probes may be delayed by up to several milliseconds.
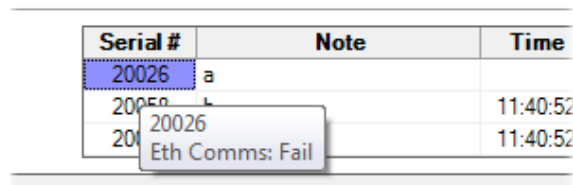- **Continuous/One-Shot** - Toggles how DCW Snapshots are displayed. Only those DCW probes that are selected in the DCW ID listbox are captured and displayed.
- **Get** - Gets a DCW Snapshot from the selected DCW probes.
- **Store** - Stores the selected DCW Snapshots onto the monitor. For each probe, the DC Volts and Amps data are stored, an event is added to the EventLog, and a Field Note entry is added.

Click on the Volts and Amps checkboxes to display DC Volts and DC Amps.

Below the chart, the following information is displayted:
- **Serial #** - Serial # of the probe.
- **Note** - User set Note field for each probe. Can be set in the Channels dialog on the Trending-Pe-
ripherals form.
- **Time** - This is the time that the DCW Snapshot data was read from the probe. DCW Snapshots
can be captured individually or at the same time, so keeping track of when it was captured is impor-
tant.
- **VDC** - The average voltage value over the 200ms period.
- **VAC** - The Root Mean Square voltage over the 200ms period with the VDC value removed.
- **VRip%** - The ratio of the RMS Volts to the DC Volts. The probe must read at least 2 volts DC to
display Ripple.
- **IDC** - The average current value over the 200ms period.
- **IAC** - The Root Mean Square current over the 200ms period with the IDC value removed.
- **IRip%** - The ratio of the RMS Current to the DC Current. The probe must read at least 10 amps
DC to display Ripple.
- **kWatt** - Computed kilowatt(VI) value over the duration of the snapshot.

Double-clicking on any of the numbers in the table toggles the number of digits displayed after the
decimal point.

Similar to Meter Mode, the communication status is represented in the Serial #. An ethernet com-
munication failure is displayed blue. Clicking on the serial number pops up additional information.
Meter Mode can communicate to the DCW probe either through wireless or ethernet but DCW
Snapshot must be connected through ethernet.

Meter Mode

The Meter Mode display shows measurements values in real time. The display is broken down into multiple sections; Volts, Current, Power, and if enabled, Peripherals.

Volts	L1-G	L2-G	L3-G	L1-L2	L2-L3	L3-L1	N-G
RMS	0.1	0.0	0.1	0.1	0.1	0.1	0.03
Min	0.0	0.0	0.0	0.1	0.0	0.1	0.02
Max	0.1	0.1	0.1	0.1	0.1	0.1	0.03
%THD							
Max							
AC Freq							
Min							
Max							

Current	L1	L2	L3	NEU	GND
RMS	0.0	0.0	0.0	0.0	0.0033329
Min	0.0	0.0	0.0	0.0	0.0027286
Max	0.0	0.0	0.0	0.0	0.0039780
%THD					
Max					

Power	L1	L2	L3	TOTAL
KVA	0.000	0.000	0.000	0.000
KW	0.000	0.000	0.000	0.000
KVAR	0.000	0.000	0.000	0.000
PA	75.5	-167	-34.5	
PF				
DPF				

Serial #	Note	VDC	VAC	VRip	IDC	IAC	IRip	kWatt
20000		250.0	0.0	0.0	993.6	1.7	0.2	248
20001		0.0	0.0		0.1	0.1		0
20005		250.0	0.0	0.0	993.5	1.7	0.2	248
20006		0.0	0.0		-8.3	6.1		0
40849		9.2	0.0	0.1	0.0	0.0		0
40911					-0.2			

Reset Min/Max

Peripherals
DC

The Volts section displays the RMS voltage and minimum and maximum values for the three phase-ground, three phase-phase, and neutral-ground channels. It also displays percent total harmonic distortion (%THD) and its maximum as well as the AC Frequency and it's Min/Max value for the three phase-ground channels. The Min and Max values display the minimum and maximum value since the monitor started sampling or since the Reset Min/Max button was pressed.

The Current section displays RMS amps, as well as minimum and maximum RMS amps for the three current channels, as well as neutral and ground current.

The Power section displays the apparent power (KVA), real power (KW), reactive power (KVAR), Phase Angle (PA), power factor (PF) and displacement power factor (DPF). The Power values are computed based on the Source setting, either Wye or Delta.

If the monitor is not started, the title will read "Meter - Not Logging". This is to serve as a reminder that, as long as the monitor is not started, it is not logging data. The monitor will automatically start after an hour of inactivity.

Serial #⏶	Note	VDC	VAC	VRip	IDC	IAC	IRip	kWatt
20013		0.00	0.01		-0.1	2.2		0
21001								
21 ~~21001~~		0.00						
21 DCV		0.00						
40 Comms: Fail								
40914					0.3			
8738								

The Peripherals section displays the current readings for each of the peripherals. Use the Peripherals drop down on the upper right to select which type of peripherals to display. Which columns appear will depend on the type of peripheral selected.

The Serial # value will show a non-white background if there is an issue with the probe.
Yellow - Battery is below 20%
Red - Battery is below 10%
Blue - Peripheral is not communicationg. Check the probe to ensure that it is properly plugged in, that the batteries are functional, and that the Wireless Host is properly plugged into the Aux Port of the monitor.

Clicking on the Serial # will display a popup displaying peripheral information; Serial #, Probe Type, Communication status, and Battery level if applicable.

Double-clicking on any of the numbers in the peripherals table toggles the number of digits displayed after the decimal point.

Charts

The Charts menu gives the user the ability to display RMS Volts, RMS Current, Peripherals, Power or Frequency strip charts.

The data displayed are the values from the Meter window, updated at a one-second interval, for up to one hour worth of data. The values displayed are NOT the values recorded on the monitor, not stored anywhere, and will be lost if the user disconnects from the monitor.

Use the camera icon to capture an image of the chart and save it either to a file or to the clipboard.

The user may place Annotations and Tooltips as well as horizontal and vertial rulers.

Zoom and Vertical Axis ranges are the same as for Snapshot.

Color Regions

This feature allows the display of colored regions in the chart, typically used for showing pass/fail regions within the plot.

To add a region, right-click on the chart and select Regions. It will bring up a Regions Setup dialog.

Regions are currently only available for the DC Volts, Temp/Hum, Dust, and Air Pressure Peripheral charts.
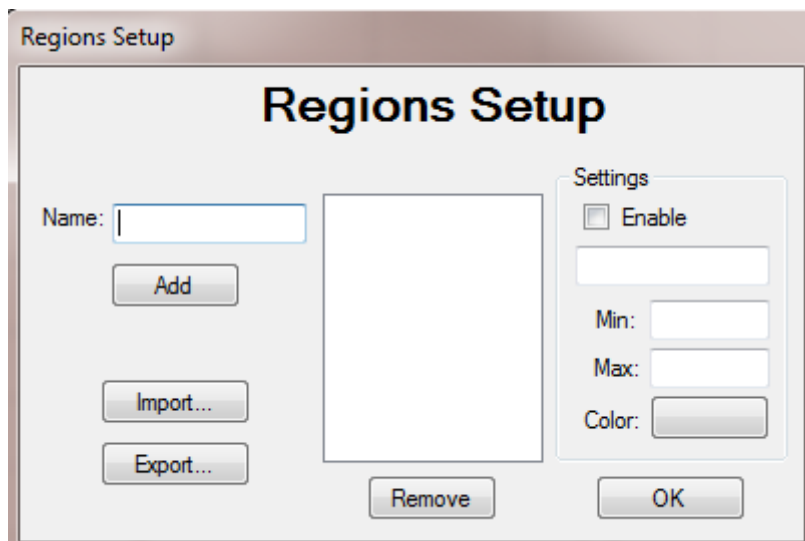
To add a region, enter the name in the Name text box and click Add. It will add it to the list in the center of the dialog. Select the region in the list to edit it's parameters. Click Remove to remove it from the list. Check Enable to hide/show the the region.

The name of the region is displayed in the text box on the right. To change the name, simply change it in this text box.

The region is bound on the vertical axis by the Min and Max values.

Select a color for the region by clicking the color button and it will bring up a color selector dialog. At the bottom of the dialog are typical green/red/yellow colors or you can select your own.

Order in the list is important as the charts are drawn top to bottom in the list. Any overlapping regions will be overwritten. To change the order, just drag-and-drop items in the list.

Use the Export button to save your current region settings for the current chart type to a file. Use the Import button to load previously exported regions

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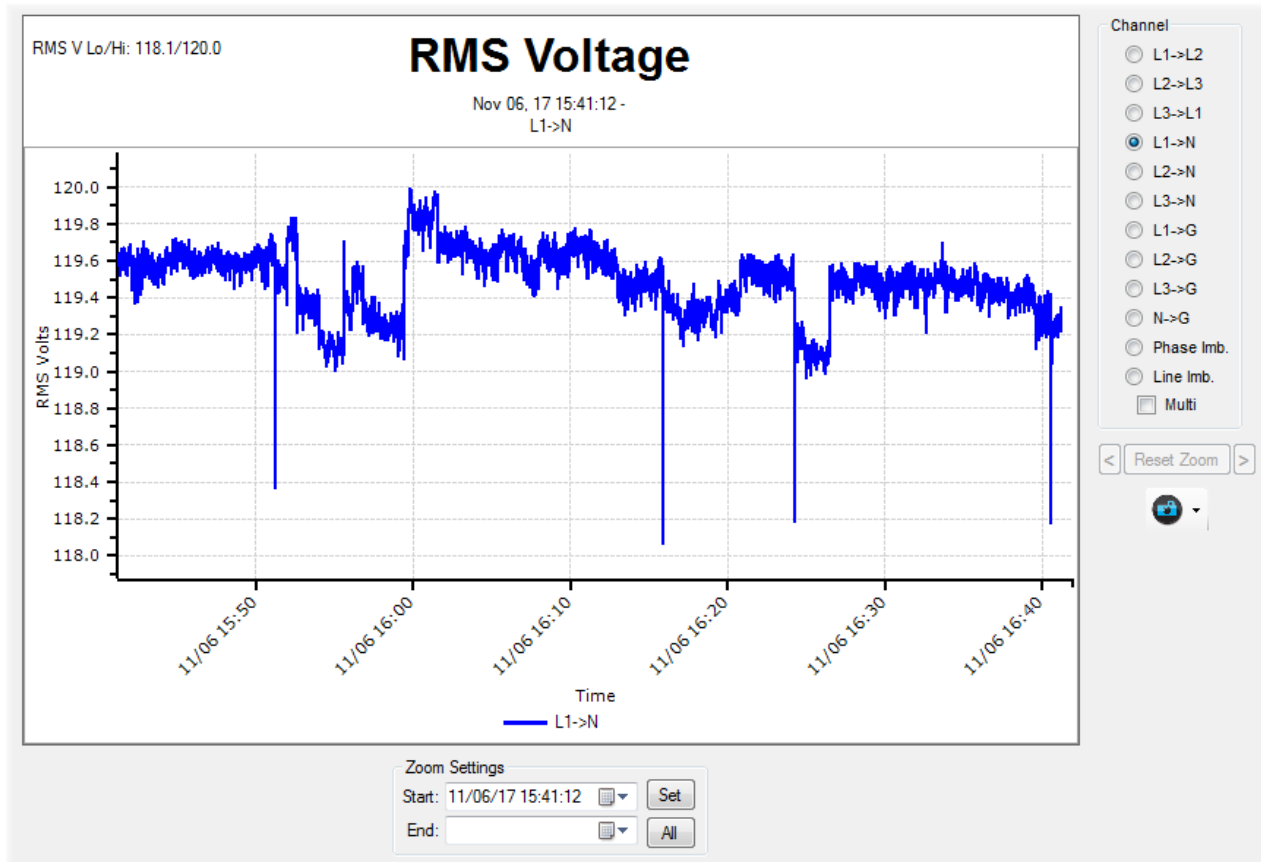
RMS Volts

The RMS Volts chart displays the RMS Voltage values at a one-second interval. The user may display individual channels or, if Multi is selected, multiple channels within the same chart.

The user may also display Phase or Line Voltage Imbalance but not in Multi channel mode. Phase Imbalance uses the three phase-phase channels and Line Imbalance uses the three phase-neutral channels to compute imbalance.

RMS Current
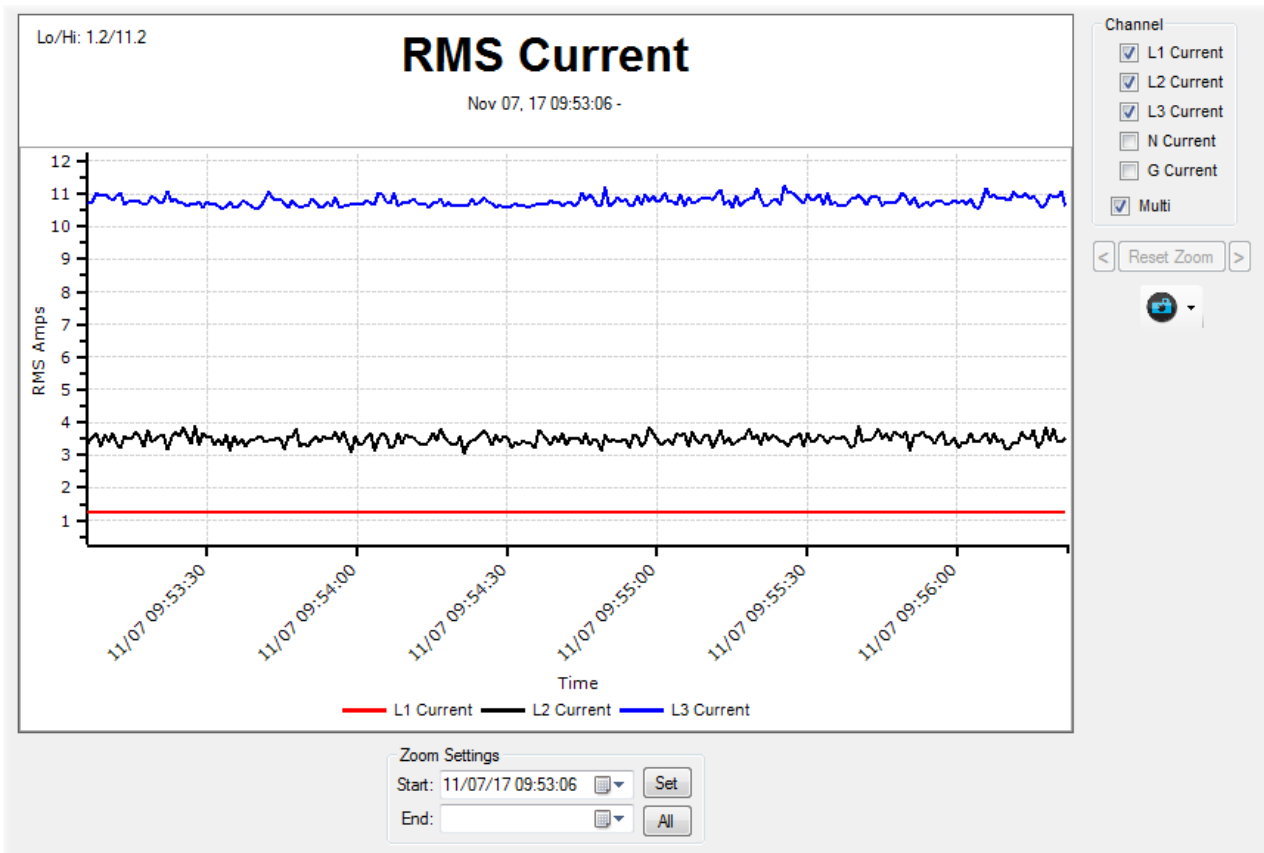
The RMS Current chart displays the RMS Current values at a one-second interval. The user may display individual channels or, if Multi is selected, multiple channels within the same chart.

Peripherals - Temp/Hum
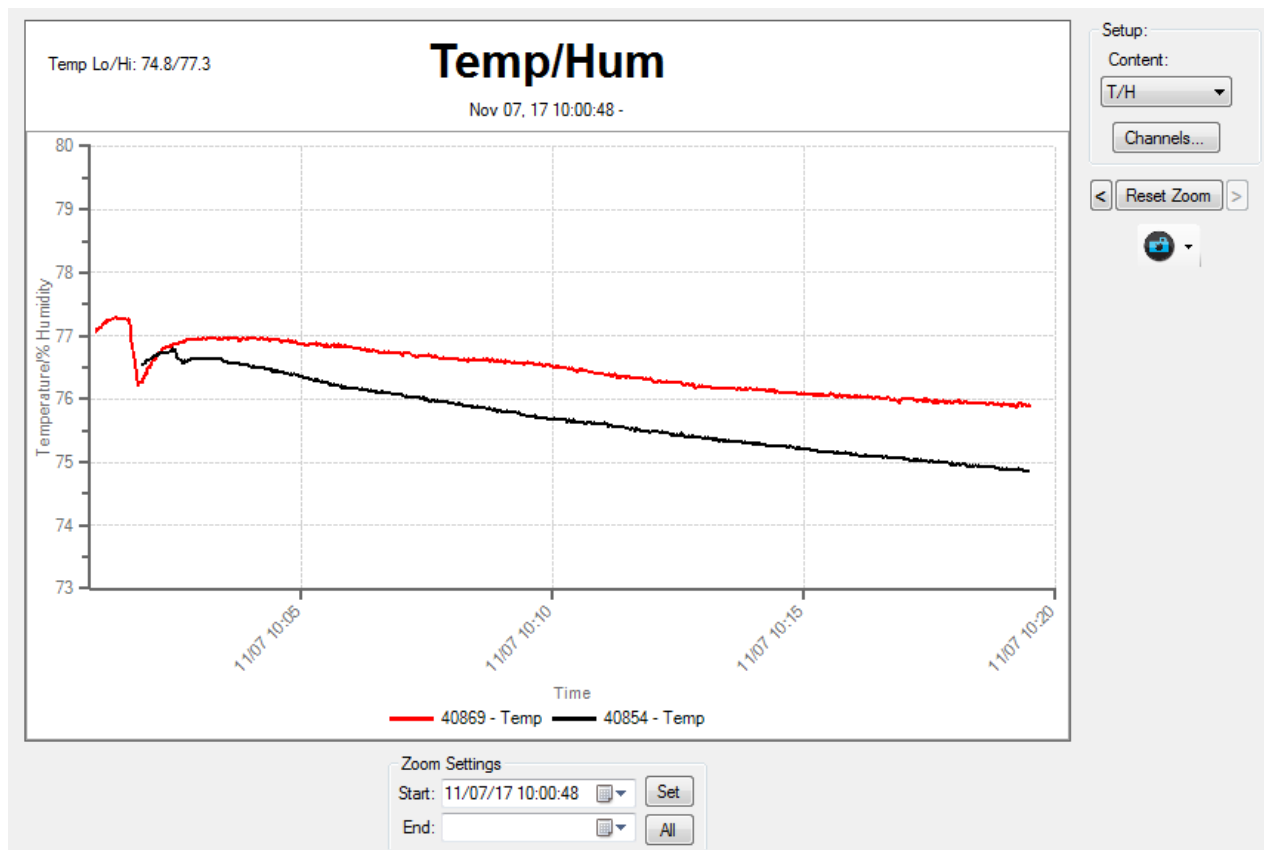
The Peripherals chart displays peripherals configured on the monitor. The chart updates at once a second but the probe is read at twice the configured log interval. A probe configured for a two minute log interval will only be read once per minute.

The lowest and highest values for the displayed channels and zoom appear in the upper left of the heading.

Click the Channels... button to select which channels to display.

The Temp/Hum Peripherals chart uses the Setup setting to display degrees °C/°F. The Type combo box changes the content of the chart. The type of charts determines what columns are displayed. Any settings not applicable to that peripheral will appear as a blank cell.

Any changes to the Note field will be applied to the setup of the monitor. Enabling/disabling channels does not affect which channels are logged by the monitor.

Use the Clear/Set all button to enable or disable all the channels.

Changes to the Peripheral Channels will appear as they are made.

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Peripherals - DC Volts

DC Lo/Hi: 199.7/199.7
AC Lo/Hi: 20.0/20.0

DC Volts

Oct 22, 18 16:33:45 -

Legend: 20000 - VDC | 20005 - VDC | 20000 - VAC | 20005 - VAC
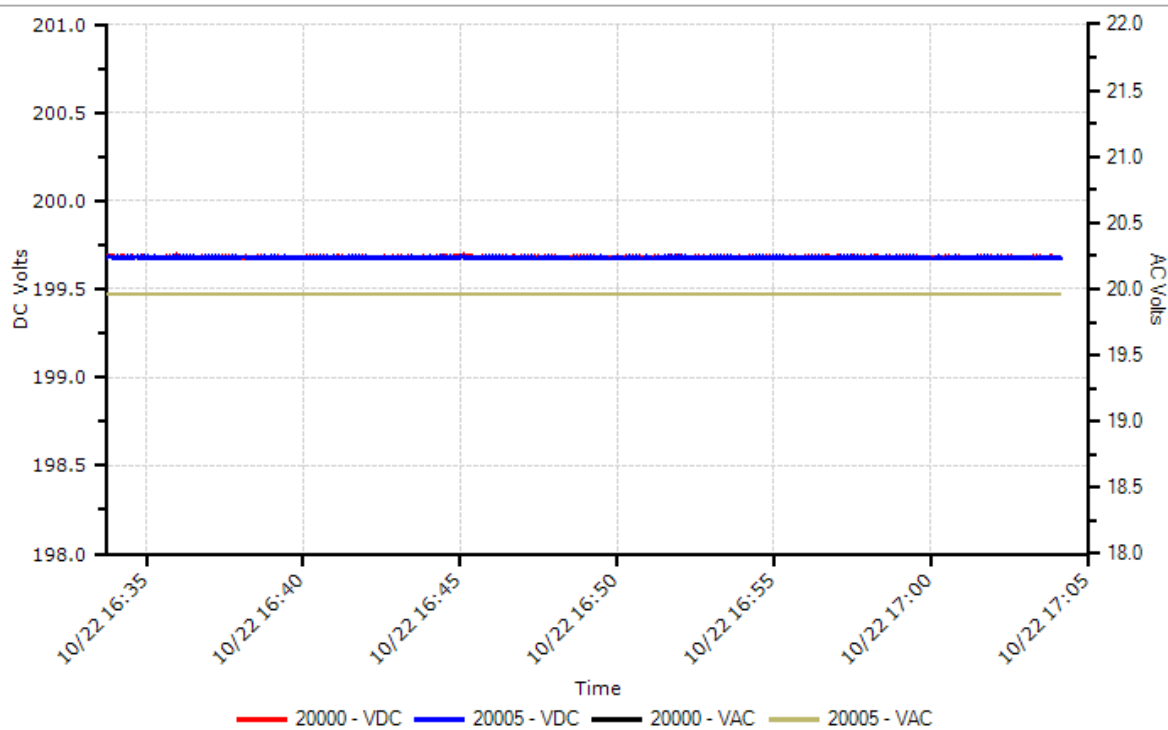
The DC Volts chart displays the DC Voltage for the Wireless DC, DCX, and DCW probes. DCW probes will also display the AC voltage and voltage ripple. AC Volts is defined as the computed RMS with the DC component removed. Ripple is the ratio of the DC to AC values, displayed as a percentage.

AC Volts (VAC) and Voltage Ripple (VRip) columns will only appear if there is a DCW probe in the peripheral list. Wireless DC and DCX probes will display empty cells in these columns as they do not support AC Volts or Ripple.

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Peripherals - DC Current
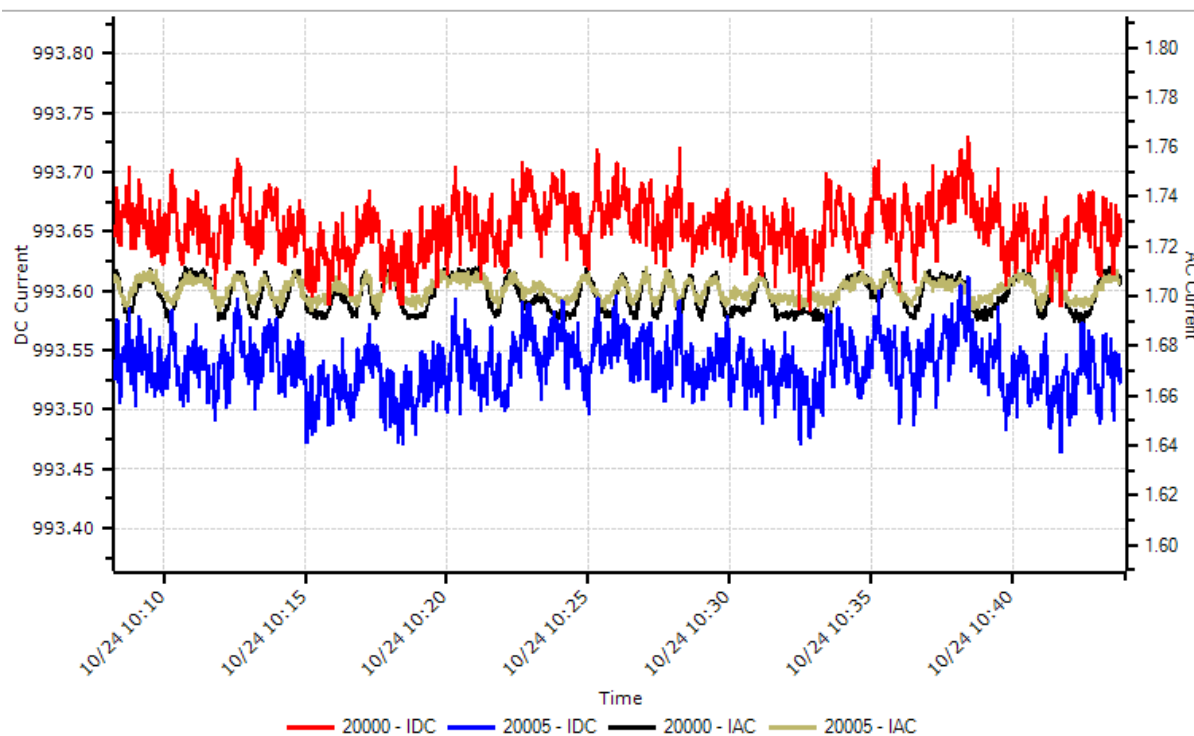
The DC Current chart displays the average DC current for the Wireless DC Current and DCW probes. DCW probes will also display the AC current and current Ripple. AC Current is defined as the computed RMS with the DC component removed. Ripple is the ratio of the DC to AC values, displayed as a percentage.

AC Current (IAC) and Current Ripple (IRip) columns will only appear if there is a DCW probe in the peripheral list. Wireless Current probes will display empty cells in these columns as they do not support AC current or Ripple.

Changes to the Peripheral Channels will appear in the chart as they are made.

Use the Multiplier (Mult) column to to apply a post-process multiplier to the current values displayed in the DC Current chart, DC Watts chart, and the Meter form. This multiplier does not effect the data recorded by the monitor and is only used for display purposes.
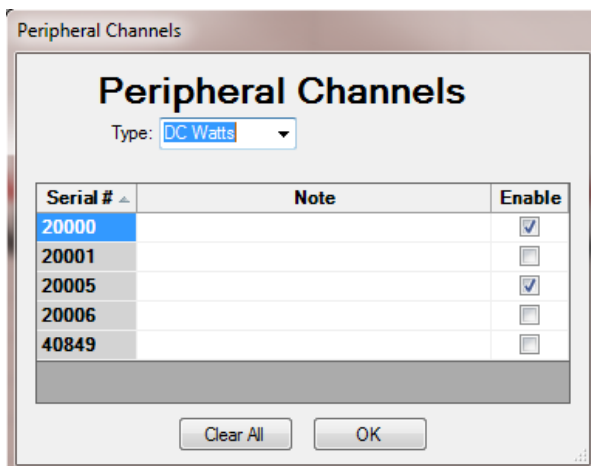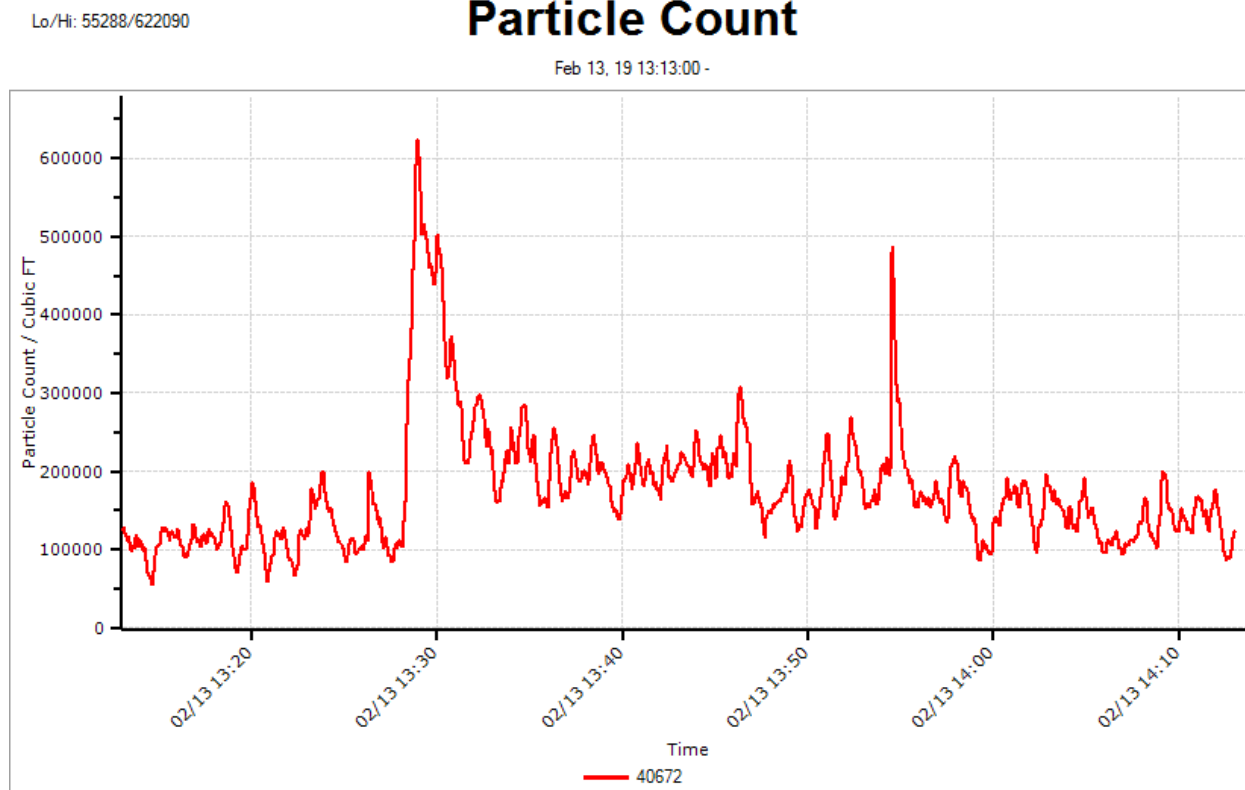
Peripherals - DC Watts
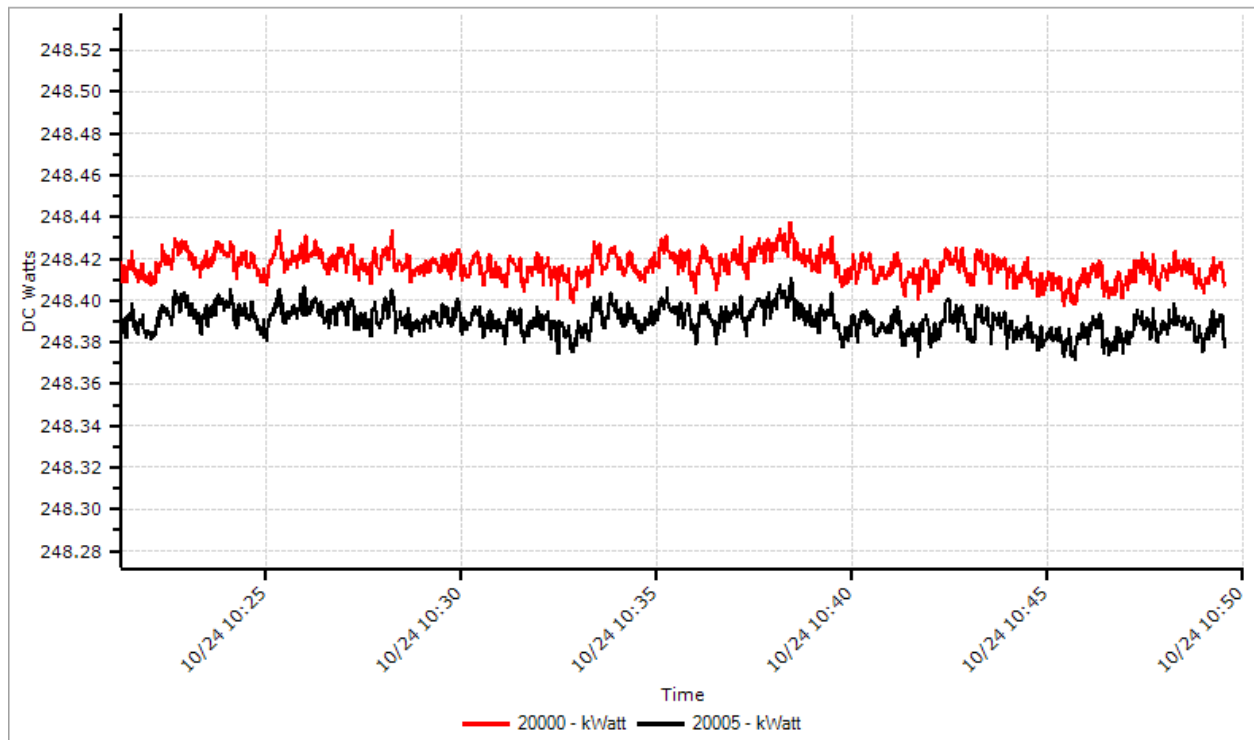
The DC Watts chart displays the DC kilowatt readings for each of the DCW probes configured on the monitor.
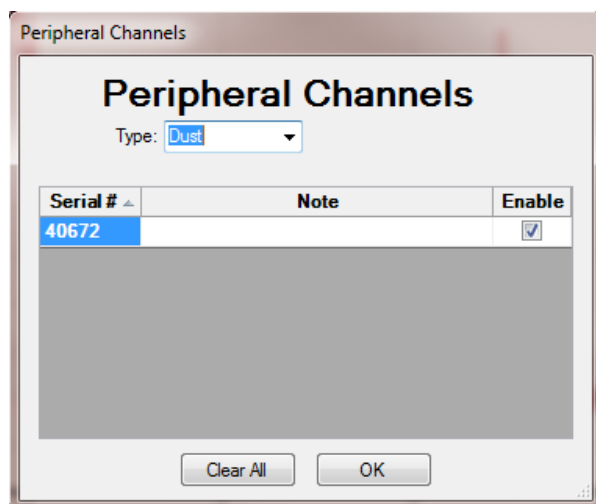

The DC Watts option will only be available if there is a DCW probe configured on the monitor.

To enable or disable the channels, click the Enable checkbox in the Channels window.

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Peripherals - Dust

Particle Count

Feb 13, 19 13:13:00 -

Lo/Hi: 55288/622090

The Dust chart displays the Dust Count readings for each of the Dust probes configured on the monitor.

The Dust option will only be available if there was a Dust probe configured on the monitor.
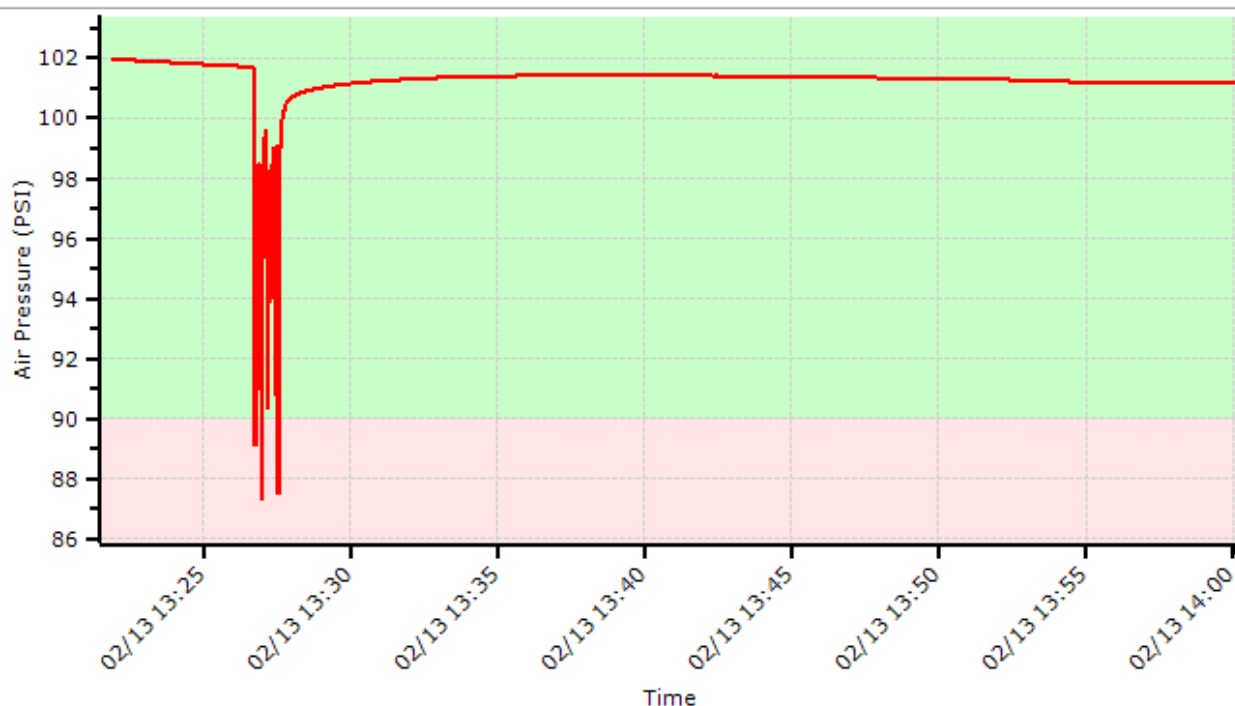
To enable or disable the channels, click the Enable checkbox in the Channels window.
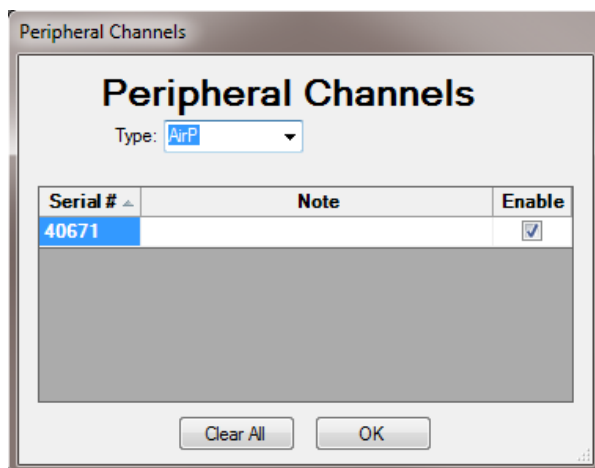
Peripherals - Air Pressure

The Air Pressure chart displays the Air Pressure readings, in PSI, for each of the Air Pressure probes configured on the monitor.

The Air Pressure option will only be available if there was an Air Pressure probe configured on the monitor.

To enable or disable the channels, click the Enable checkbox in the Channels window.

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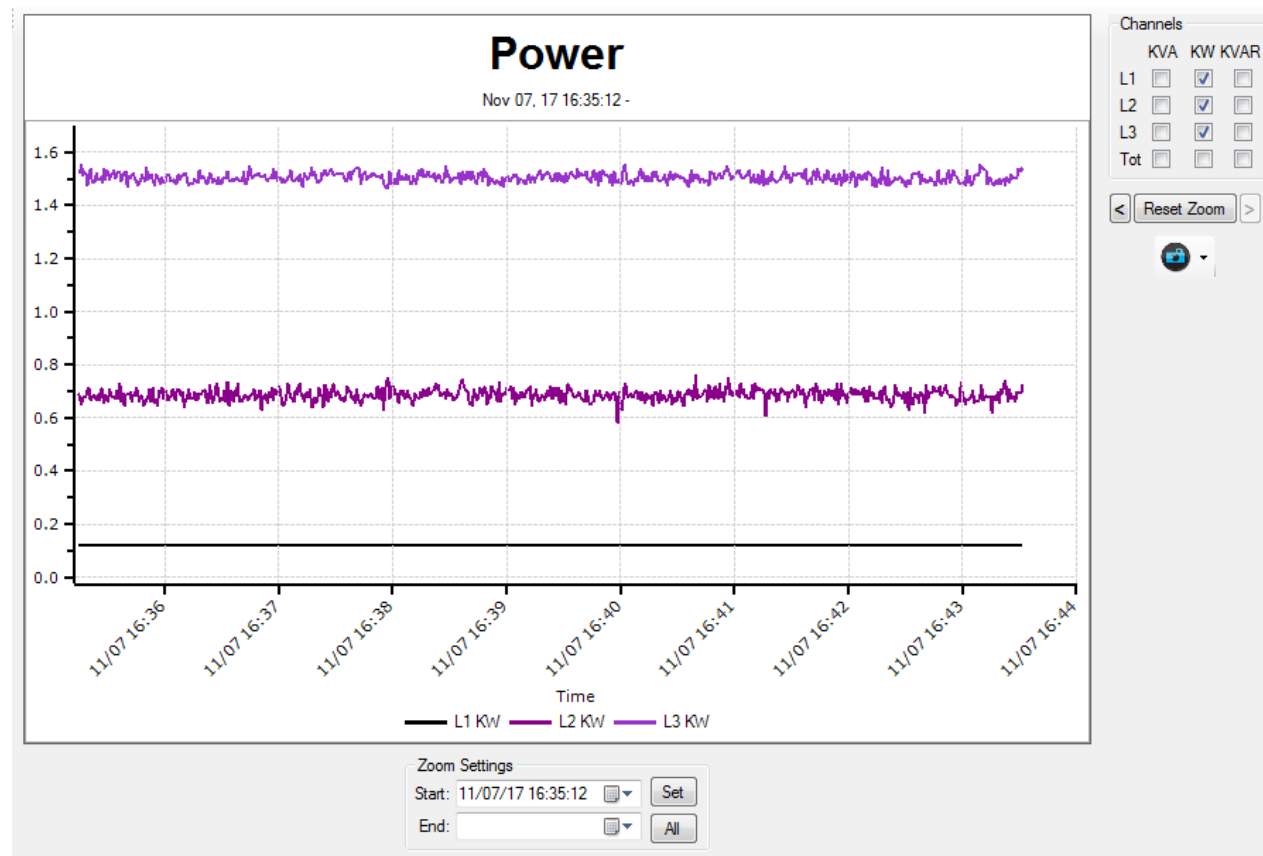
Power

The Power chart displays the Power readings at a one second interval.

The display can be configured to show KVA, KW, and KVAR for L1, L2, L3 and Total Power. How power is computed is set by changing the Source setting in the main menu to Wye, Delta, or Single. For Single mode, only Total power can be displayed.

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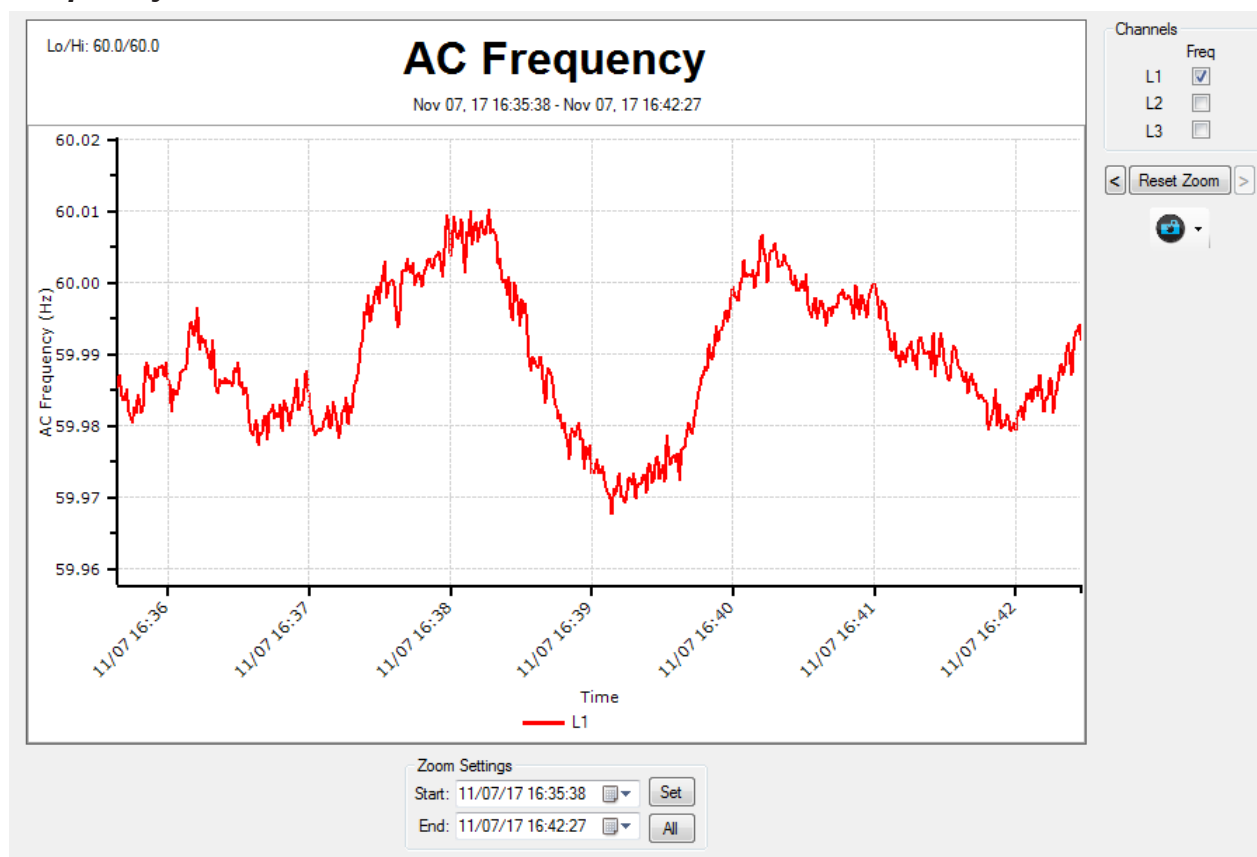
Frequency

The Frequency chart displays the AC Frequency readings at a one second interval. Use the checkboxes to select which of the three phases to display.

The Lo/Hi values in the heading display the lowest and highest values currently displayed.

Field Notes

The Field Notes page gives the user the ability to log notes as part of the site data.

Field notes can be entered into this log as part of a stored Snapshot, a manually triggered Wave-form Capture, or entered manually. Refer the Snapshot section for more details.

To enter Field Notes manually, select the Field Notes text box and enter your note. The Date/Time will automatically enter the current time. To change the Date/Time, select it and change it or click on the down arrow to open a calendar control.

Manually entered Field Notes do not have an event associated with them so that field will be blank.

The Field Notes can be an important factor. Care must be taken to provide enough information in the note so that it can be referenced when the power analysis is performed.

Monitor Setup

The Setup dialog gives the user the ability to configure the monitor. Setup is broken down into the following sections;

Site Management

Use the Site Management tab to review what site data is on the monitor as well as other site related options.
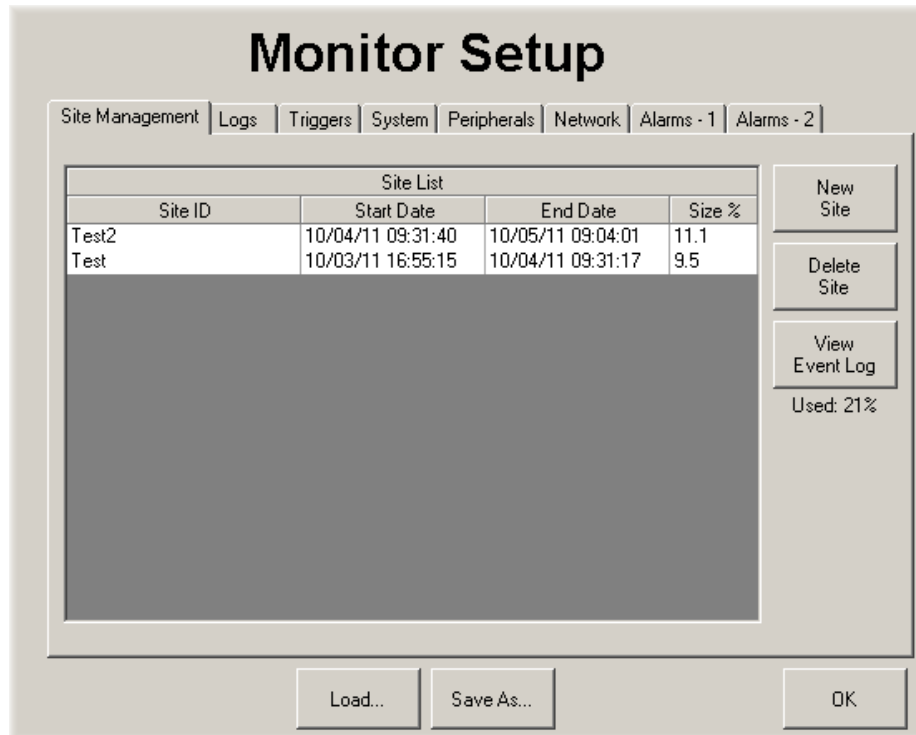
A Site is a collection of logs. The site logs are stored in flash memory in their own site folders. Creating a site creates a new site folder.

Site Management lists the sites on the monitor, the Start and End dates, as well as the percentage of total storage used. The total storage used is displayed below the View Event Log button.

The *New Site* button creates a new site folder and configures the monitor to store all logs to this folder. Site names are limited to 20 characters in length.

If Weekly Logs is enabled, the monitor will log data on a weekly basis, starting a new site at 00:00:00 Monday morning. Weekly logs can only be enabled while creating a new site, this is done by checking the Weekly Logs check box on the New Site popup.

The *Delete Site* button deletes the selected site folder.

The *View Event Log* Button downloads and send the selected site's event log to the associated .log file viewer on the host computer

Use the Save As... button to save the current monitor setup to a file on your computer. Use the Load... button to load a previously saved monitor setup.

Logs

The Logs tab is used to configure what to log and at what interval.

Log Rates

RMS Voltage / Current:	1 Second to 30 Minutes
AC Frequency:	1 Second to 30 Minutes
Peripherals:	4 Seconds to 30 Minutes
Power:	1 Second to 30 Minutes
Harmonics:	10 Seconds to 30 Minutes
THD:	10 Seconds to 30 Minutes
Phase Angle:	10 Seconds to 30 Minutes
Symm Comp:	10 Seconds to 30 Minutes

The Log Rates group allows the user to configure the log interval for RMS volts and current, AC frequency, all of the peripheral channels, power, harmonics and THD. The button to the right of the text box toggles between seconds and minutes.

Neg. Power allows the monitor to record negative power. Unchecked, power is recorded correctly even if one of the current probes is hooked up backwards. This should only be enabled when monitoring power generation.

Voltage and Current logging is done in a Min / Max / Average style every half cycle. The monitor produces a true RMS log entry at the specified log rate. Regardless of the rate, the monitor continues to collect the Minimum and Maximum every half cycle with no missed data.

Phase Angle logging records the Min / Max / Average of the angle between voltage and current phases for each cycle.

Symmetrical Component logging records the Min / Max / Average voltage and current imbalance, computed for each cycle, during the configured log interval. Use the Chans to switch between Phase-Phase and Phase-Ground channels. Use Seq to select the phase sequence to match the system under test.

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Periodic Snapshot

The Periodic Snapshot feature configures the monitor to record a Snapshot at some configurable interval, between 1 and 60 minutes.

For the Cx Plus monitor, the samples per cycle recorded is configurable. Select 256/128 for 256 s/cycle voltage and 128 s/cycle for current. This is the rate the Cx recorded snapshots at. Select 256, 512, or 1024 samples per cycle for voltage and current. The higher the sample rate, the more data is recorded affecting Survey Duration.

Est. Survey Duration

Shows a best and worst case estimate of how long the monitor could run before filling its logs. Below the duration is the worst case amount of available storage the Waveform Capture will consume as configured. If the voltage and current triggers are not set properly, the Waveform Capture will use much of the available storage. To improve worst case survey duration, reduce to the number of voltage and current trigger events or the maximum duration of the Waveform Capture.

Setup

The monitor gives the user the ability to download data to a flash memory stick by inserting it into the USB port on the monitor. The Reset on USB option will append the current date to the current site folder before downloading it to the USB stick, and then create a new site. If the user performs multiple Reset on USB downloads on the same day, a unique number is appended to the folder name.

The USB Download Zip/Copy option gives the user the ability to select which format to put the data on the USB stick. The Copy option copies the site data to a folder. The Zip option puts site data into a zip file before writing it to the USB stick. The Zip option increases the time to download, but makes the files easier to handle.

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Triggers

Use the Triggers tab to configure Waveform Capture and Transient triggers.

Waveform Capture Triggers

The Waveform Capture Triggers group is used to configure voltage and current triggers. The monitor keeps a running nominal rms for each voltage and current channel. When the monitor records an RMS voltage or current outside the configured triggers, the monitor logs a corresponding event in the event log and starts recording waveforms.

Volts

Sag and Surge events occur when a half cycle RMS voltage falls outside the triggers set by the *Sag Start* and *Surge Start* configuration. A Sag or Surge event ends when the RMS voltage returns to within the configured Sag or Surge End.

Phase, Neutral, and Ground Current Triggers

All Current Trigger events occur when a full cycle RMS current changes by the configured Change value from the running nominal. Use the Phase, Neutral and Ground to configure each of the current triggers. DC Volts and DC Amps trigger settings will be displayed if Neutral or Ground current are configured as DC.

Settle Time

Settle Time is the number of cycles the current must stabilize to end the Current Trigger event.

Limit

Each type of trigger has a Limit setting. Limit sets the maximum number of events to be recorded for that type of trigger. This count is reset whenever the monitor starts sampling, either after the monitor starts up or when sampling is started in LiveView. This is used to prevent the monitor storage from filling if the trigger settings are not properly set.

Renom

The Renom field is used by the monitor as the maximum duration for the given trigger, with Phase, Neutral and Ground Current using the same setting. When a trigger reaches this duration, the event is logged in the event log, the monitor determines a new nominal voltage or current, and logs a Re-Nominal event. Care should be taken when setting this option because this duration will end the Waveform Capture.

Waveform Capture

The Pre Buff field is how many cycles, up to 10, to include in the Waveform Capture before the capture was triggered.

The Max is the maximum number of cycles to be captured, from 10 to 2400 cycles or 40 seconds at 60 Hz.

End determines how the Waveform Capture stops recording. If Auto is selected, the monitor stops recording once all the triggers have cleared. For Max, the monitor stops once the configured Max cycles is recorded.

The Post Buff parameter is used for End-Auto and is the number of cycles, up to 200, to record after the last sag/surge/trigger clears. It also serves as a quiet time as any triggers occuring during the post buff will cause the Waveform Capture to continue recording until all triggers are cleared again.
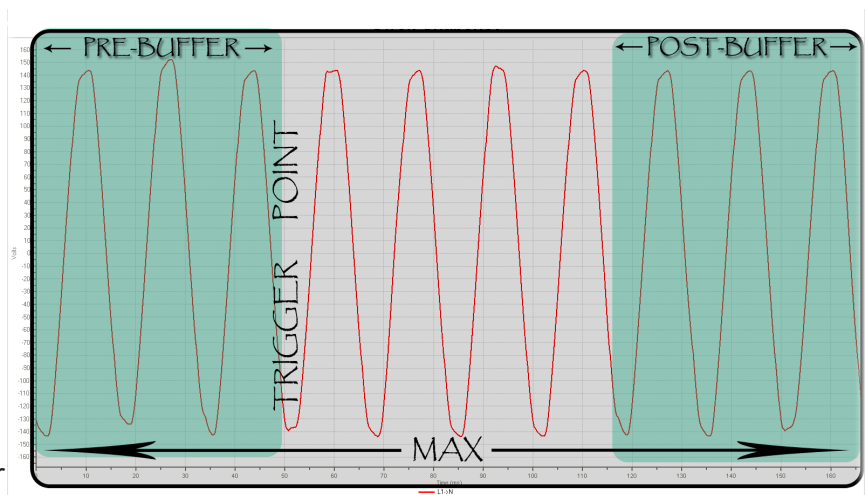
For the Cx Plus monitor, the Sampl/Cycle setting sets the capture samples per cycle. The higher the rate, the better the resolution of the recording. But it also increases the amount of data recorded so can affect the Survey Duration. Select 64, 128, or 256 samples per cycle. The Cx monitor records at a fixed 64 samples/cycle.

Transient Triggers

Transients are sub-cycle voltage events, triggered either by changes in the voltage shape or detected by the high-frequency sampler. Each transient event records two cycles of voltage and current data, as well as the high-frequency data if its triggered. The HF and shape triggers are based on a percentage of the running nominal voltage.

0 VRms refers to any channel whose nominal voltage is less than 10 volts. These trigger settings are an absolute voltage.

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System

Voltage multipliers, internal UPS time-out, PLL lock type and Current probes.

AC Frequency

The AC Frequency group configures how the monitor will detect input frequency.

Fixed Mode

The monitor uses only the configured AC Frequency either 50.0 or 60.0 Hz.

Auto 50/60 Mode

The monitor selects either 50.0 or 60.0 Hz if the input frequency on channel L1-L2 is within the configured *Band* setting. (Ex. If Band = 2Hz, if signal is 58Hz-62Hz Monitor sets to 60Hz) The *Time* setting is used as a hysteresis band, it waits that amount of time after AC frequency is in the *Band* range before setting the master sample frequency.

Auto Mode

The monitor "Syncs" to the incoming frequency on channel L1-L2, *Time* is used as the amount of time the signal must be stable before setting a master sample frequency. *Band* is used as the amount of frequency deviation from the master sample frequency before a new master sample frequency is calculated.

Time can be set from 10 seconds to 30 minutes. Auto Mode should only be used if frequency is known to change, such as a transfer to generator set. Sites with large THD or wave shape faults should not use this mode because of possible problems with frequency sync.

Full Cycle VRMS

This forces the monitor to compute and log Voltage RMS using a full AC cycle, otherwise it computes Voltage RMS every half cycle.

Medium Voltage

The Medium Voltage group is used to enable and configure support for Medium Voltage.

   Volt Mult
      Voltage ratio from the potential transformer.
   Curr Mult
      Current ratio from the current transformer.

Current Probes

The Current Probes group box is used to configure the type of current probes used for the phase, neutral, and ground current ports.

   200A Clamp-On
      This option is for a CT that produces 10mV/Amp. Rope probes used at this setting must output 10mV/Amp.
   10A Clamp-On
      This option is for a CT that produces 100mV/Amp. Rope probes used at this setting must output 100mV/Amp.
   3000A Rope
      This option is for a CT that produce a 1mV/Amp output from probes. Probes to be used on this setting must be set to 1mV/Amp.
   6000A Rope
      This option is for a CT that produce a 0.5mV/Amp output from probes. Probes to be used on this setting must be set to 0.5mV/Amp
   Gen-2 Rope
      This option is for a CT with no switch setting and requires no power or batteries.
   DCA 2000 (Neutral Channel Only)
      Configures the Neutral Current channel to use the 2000 Amp DC current probe.
   DCA 4000 (Neutral Channel Only)
      Configures the Neutral Current channel to use the 4000 Amp DC current probe.
   DC Volts (Ground Channel Only)
      Configures the Ground Current channel to record DC Volts.

Shutdown

Shutdown is the amount of time that the monitor will run on the internal UPS battery before shutting down. Values can range from 5 - 600 seconds.

Display

The fourth line on the monitor display can be configured.

   None - Displays a blank line.
   Phase Angle - Displays the angle between phase-ground voltage and current
   DC V/A - Displays DC Voltage and/or DC amps if configured.
   Tot KVA/KW - Displays Total KVA / KW.

Time

Use the Time group box to get and set the time and time zone on the monitor. The *Set* button will set the time on the monitor with the time from your PC so be sure your PC time is correct. The *Get* button will read the time from the monitor and the PC and update the text boxes for reference. Use the *Time Zone* to set the time zone of the monitor if it is different from your PC.

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Peripherals
Use the Peripherals tab to configure the monitors external probes

The Read Temp/Hum button is for a single wired temperature probe plugged into Aux Port 1

Make sure the Wireless Host is plugged into Aux port 1.

The Enable Wireless Check box changes the mode from a single wired temperature mode to the wireless mode.
Read is used to get the current values from the entered serial numbers
To add peripherals, enter the serial number in the text box and click *Add*.
Remove removes the selected line from the table.
Use the *Clear* button to remove all of the currently entered serial numbers.
Front Display selects which peripherals readings are to be displayed on the front panel of the monitor.
Temperature °F/°C selects Fahrenheit or Celsius when displaying temperature.
The *Note* field used to identify what the probe is connected to. The length can be up to 30 characters.

Peripheral Type: EPA1500
    EPA1500 (10 Satellites)
To add a peripheral, enter the serial number from the back of the probe. The *Read* button will attempt to communicate with each of the wireless probes, updating the Type and Reading values for each.

If you are having problems communicating with a wireless probe, make sure the wireless host is plugged into the AUX port, the wireless probe is powered, and it's LED is blinking. If the LED is off, check the power on the wireless probe. If the LED is solid, the probe is unable to communicate with the host, either because the wireless probe is too far away or because there is too much electronic interference.

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Peripheral Type: Cx Monitor
Cx Monitor (100 Satellites)

The Cx Monitor peripherals operate very differently.

To Connect:

Enter the serial numbers, from the back of probe and hit enter.

Turn each probe on by depressing the button at the top.

An LED in the switch will blink red a number of times and blink green when it has established communications with the monitor.

If it does not blink red or green or flickers red, check your batteries or outlet power.

If it does not blink green, make sure you entered the serial number correctly.

Once you have entered the serial number and confirmed that they are able to communicate with the monitor, click the *Read* button. This should display the readings and type of probe for each of the peripherals. Any that show a blank reading have not established or lost communication with the monitor. Turn the power off then back on to have the peripheral re-register with the host.

The wireless peripherals will auto-shutoff if they are unable to communicate with the monitor for more than five minutes.

On inti al startup so be sure to have the peripherals serial number in the wireless list and the monitor powered up before you turn them on.

Battery life is directly linked to peripheral log rates, at the minimum log rate (1 minute) the probes should last 2 weeks before batteries need to be changed.

Cx Monitor Peripheral Logic Path

x100 Probes For Cx Monitor
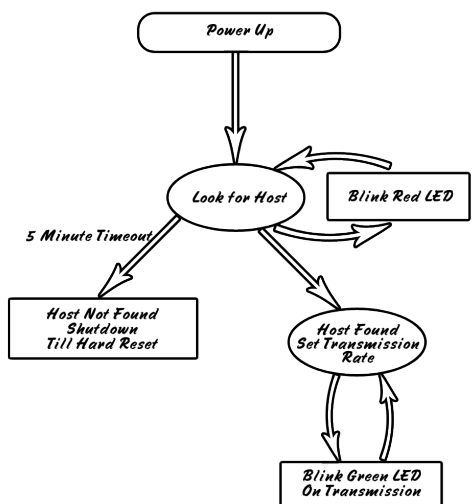
Network

Use the Network tab to setup the network configuration.

The ethernet port can be configured either for Automatic, using Dynamic Host Configuration Protocol (DHCP), or as a static IP address.

To configure the monitor to use DHCP, just select Automatic.

To configure the monitor for a static IP address, select Static and fill in the IP Address, Net Mask, and Gateway you get from your network administrator.

The Cx Monitor supports wireless networking through the ethernet port using WiFi adapters and Acces Points.

For documentation on how to connect to the monitor, refer to the https://filemanager.rxms.com/downloads/instructions/CxPlus_User_Manual.pdf for more details.

Network Time Protocol (NTP)

The Network Time Protocol allows the monitor to synchronize its clock with either a local or internet NTP server. A monitor can also be configured to be the NTP server.

Local Server
To use a local NTP server, the monitor must be connected to the network, either through WiFi or ethernet. Enter the IP address of the NTP server in the Server field.

Internet Server
To use an Internet NTP server, the monitor must be able to access the internet, either through WiFi or ethernet. Set the Server field to any publicly available NTP server, ie. pool.ntp.org.

Monitor NTP Server
A monitor can also be an NTP server. It must be powered up completely, displaying it's IP address, and connected, either through WiFi or ethernet, to each of the client monitors. The monitor acting as the ntp server would have NTP disabled. Set the Server field for each client monitors to the IP address of the server.

Sync...
The Sync... button will have the monitor attempt to synchronize with the configured NTP Server. If it times out, try increasing the Tmeout setting or checking your WiFi or ethernet connections.

Offset
The Offset button will display how much the clock on the monitor differs from the server.

If NTP is enabled, the monitor will automatically perform a synchronize each time it starts sampling.

Remote Access

This feature allows the monitor to be accessed remotely. By default, this feature is disabled. When enabled and connected to an internet capable network, the monitor establishes a secure connection to the Rx Monitoring Remote Access server. Live-View then connects to the Remote Access server and connects to the monitor. Refer to the Connect / Disconnect - Remote section for more details.

To enable, click the Enable checkbox and enter the Rx provided user. Click the Test button to see the status of the connection. This may take a few seconds. It will display Connected next to the Test button once the connection has been made or an error if something went wrong.

If you are currently remotely connected to the monitor and attempt to disable Remote Access, you will be warned that you will be disconnected and unable to reconnect.

Remote Access can also be enabled/disabled using the touch screen in the Settings page but does not allow the setting of the user, so it will only use the configured user.

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Alarms - 1

Use the Alarms tabs to setup alarm notification e-mails. The alarms feature sends an alarm notification e-mail when various alarm conditions occur.

The first Alarm Configuration tab is for enabling alarm monitoring and their triggers. The Alarm Monitoring Group enables/disables the various types of alarms. The Alarm Thresholds group sets the trigger point to generate an alarm notification.

The Quiet Time is the number of seconds the monitor must wait after the last alarm threshold is reached before sending an alarm notification e-mail. During a power interruption, a number of alarm thresholds may be reached. To avoid multiple e-mails, the monitor buffers the alarms until the quiet time is reached before sending the e-mail.

Alarms - 2

The second Alarm Configuration tab is used to configure the alarm notification e-mail.

Up to 10 e-mail recipients can be supported. Type the e-mail address in the text box and click the Add button. To remove recipients, select the e-mail address and click the Remove button. Each e-mail address can be a maximum of 64 characters.

In order to send the Alarm Notification e-mails, the monitor must be able to communicate with an e-mail server. The From field is who the e-mail is from, and the Server is the name or IP Address of the e-mail server. If the server requires a username/password, check Authentication Required and enter the Username and Password for the e-mail server.

Some email servers use a port other than the default port 25. Please refer to your e-mail service provider to find out what port they require.

If Alarms are enabled, the monitor will log all alarms in the site folder, even if no recipients are configured or if the monitor was unable to communicate with the e-mail server.

To test the current setup press the *Test* button.

The power monitor does not support encypted passwords or secure connections, so accounts from google or yahoo as well as other mail servers will not work with this protocol.

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Download

The Download button opens up a Download dialog which allows the user to download data from the monitor.
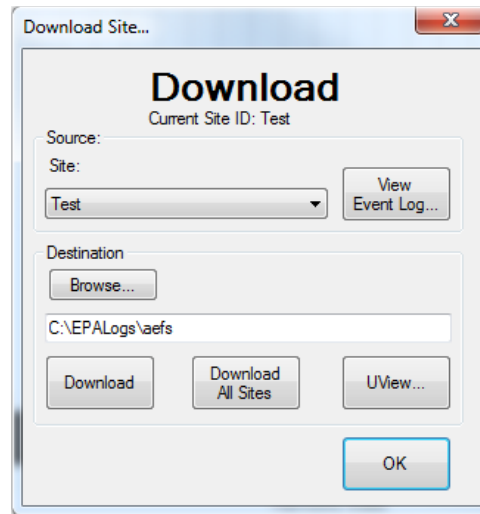
To Download the site data from the monitor, first select a site from the Site combo-box. Click the Event.Log button to view the event log file to confirm this is the desired data. Specify a destination folder on your PC, either by typing the path, or using the Browse... button and selecting the destination.

Once you've specified the site and destination folders, click the Download button to download the data. If the folder does not exist, it will prompt to create the folder.
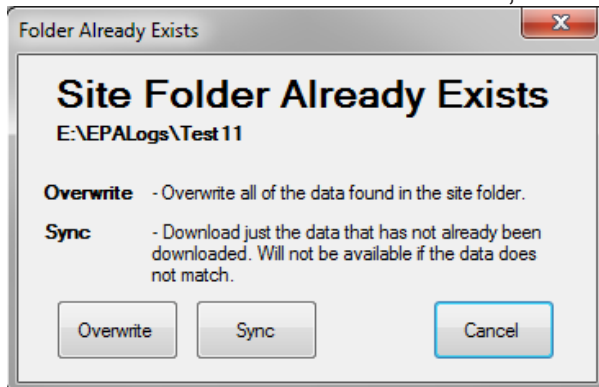
If there is data in the folder, it will check to see if it matches the site folder on the monitor. If it does, the user will be given to option to Sync the site data and only download the data since the last download. The user also has the option to overwrite the data in the site folder.

The Download All Sites button allows you to download all of the site data on the monitor. A folder with the site name will be created in the destination folder for each site downloaded.

Once the download is complete, use the U-View button to launch U-View.