

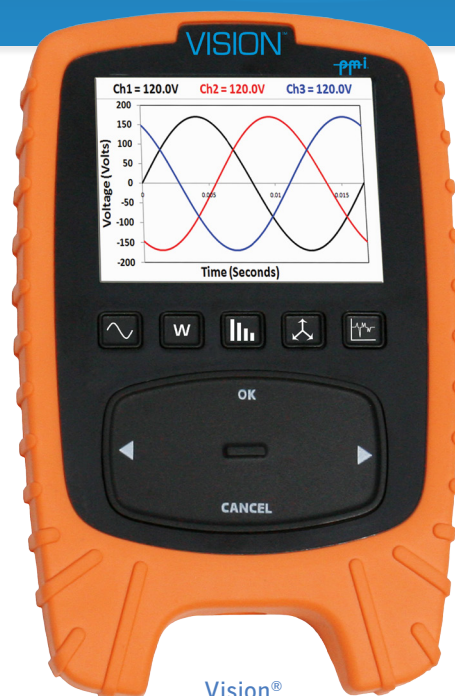
## VISION® WIRELESS POWER QUALITY RECORDERS

### FEATURES & BENEFITS:

The Vision combines PMI's leading-edge power quality recorder technology with a handheld, graphical meter. Use it to view real-time waveforms, make spot measurements, and take measurement snapshots, then leave it in place for full power quality logging.

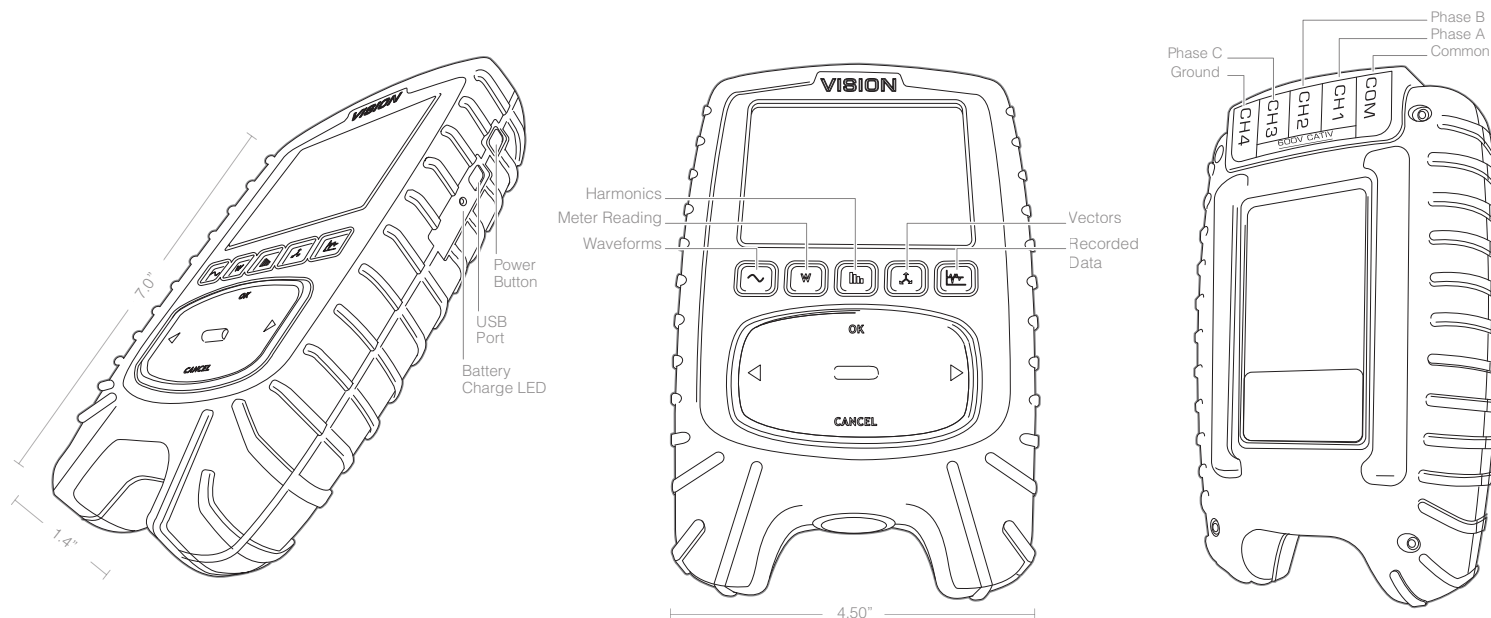
The Vision measures voltage, current, all power quantities, harmonics, and flicker. Includes a color graphical LCD display, data storage, and high speed USB. The Vision® recorder features:

- True RMS voltage and current measurement
- User-programmable waveform and transient capture
- Real-time graphical display of voltage and current waveforms, power, vectors, harmonics
- Viewing of all real-time data without disturbing or altering an in-progress recording session
- 16,666 samples per 60Hz cycle per voltage channel (VisionPro)
- 4,166 samples per 60Hz cycle per current channel (VisionPro)
- 0-600 Vrms (continuous) measurement,  $\pm 5$ kV peak transient capture
- 20 and 200A current range TLAR clamps; 100, 1000, and 5000A current range FlexCTs
- Up to 1GB memory
- Individual factory calibration and report ensures high accuracy and stability over a wide temperature range.



		VISIONLITE®	VISION®	VISIONPRO®
INPUTS	AC Voltage	0 to 600 RMS continuous per channel	0 to 600 RMS continuous per channel	0 to 600 RMS continuous per channel ( $\pm 5$ kV peak transients)
	AC Current	0 to 5000 amps	0 to 5000 amps	0 to 5000 amps
	Sample Rate	15,360 samples per second/channel; 256 samples per cycle	15,360 samples per second/channel; 256 samples per cycle	1 MHz Voltage (16666 samples/cycle), 250 kHz current (4166 samples/cycle)
CHANNELS	Voltage	3 channels	4 channels	4 channels
	Current	3 channels	4 channels	4 channels
MEASURED QUANTITIES PER CYCLE	RMS Voltage	Volts	Volts	Volts
	RMS Current	Amps	Amps	Amps
	Real Power	Watts	Watts	Watts
	Apparent Power	VA's	VA's	VA's
	Reactive Power	VARs	VARs	VARs
	Phase Angle	Degrees	Degrees	Degrees
	Power Factor	Watts/VA	Watts/VA	Watts/VA
	Displacement PF	cos (phase angle)	cos (phase angle)	cos (phase angle)
	Power Usage	kWh, kVARh, kVAh	kWh, kVARh, kVAh	kWh, kVARh, kVAh
ACCURACY	Voltage	0.33% of full scale	0.33% of full scale	0.33% of full scale
	Current	1.0% of full scale w/o probe	1.0% of full scale w/o probe	1.0% of full scale w/o probe
	Power	1.0% of full scale w/o probe	1.0% of full scale w/o probe	1.0% of full scale w/o probe
	Phase Angle	1.0° w/o probe	1.0° w/o probe	1.0° w/o probe
	Power Factor	$\pm 0.02$ w/o probe	$\pm 0.02$ w/o probe	$\pm 0.02$ w/o probe
	Displacement PF	$\pm 0.02$ w/o probe	$\pm 0.02$ w/o probe	$\pm 0.02$ w/o probe
SAFETY	Rating	IEC 61010-1, 600V CAT IV	IEC 61010-1, 600V CAT IV	IEC 61010-1, 600V CAT IV

		VISIONLITE®	VISION®	VISIONPRO®
<b>HARMONICS</b>	Voltage Current Measures	to the 51st to the 51st magnitude, phase, THD	to the 51st to the 51st magnitude, phase, THD	to the 51st to the 51st magnitude, phase, THD
<b>COMMUNICATIONS</b>	Type Standard	USB 2.0	Bluetooth® 2.0 Class 1 Wireless, USB 2.0	Bluetooth® 2.0 Class 1 Wireless, USB 2.0, 10/100MB Ethernet
<b>INFORMATION STORAGE</b>	Data Storage Significant Change Flicker	1 MB 500 records 500 records	16 MB 1000 records 1000 records	1 GB 1000 records 1000 records
<b>RECORD SETTINGS</b>	Interval Graphs  Significant Change Flicker Settings  Waveform Capture  Transient Capture	1 second to 4 hour interval. User selected, stop-when-full, or wrap around memory modes.  1V to 8V in 1V steps  User-defined, or conform to IEEE 1453/IEC 61000-4-15, and IEEE Std. 141  Voltage and current threshold, periodic capture, waveshapes, event cross triggers  N/A	1 cycle/second to 4 hour interval. User selected, stop- when-full, or wrap around memory modes  1V to 8V in 1V steps  User-defined, or conform to IEEE 1453/IEC 61000-4-15, and IEEE Std. 141  Voltage and current threshold, periodic capture waveshapes, event cross triggers  N/A	1 cycle/second to 4 hour interval. User selected, stop- when-full, or wrap around memory modes  1V to 8V in 1V steps  User-defined, or conform to IEEE 1453/IEC 61000-4-15, and IEEE Std. 141  Voltage and current threshold, periodic capture, waveshapes, event cross triggers  Peak voltage threshold
<b>POWER SUPPLY</b>	Requirements	Internal battery, USB charger	Internal battery, USB charger	Internal battery, USB charger
<b>ENVIRONMENTAL</b>		IP51 rating	IP51 rating	IP51 rating
<b>PHYSICAL DIMENSIONS</b>	Size Weight	7" L X 4.5" W X 1.4" H 1.2 lbs	7" L X 4.5" W X 1.4" H 1.2 lbs	7" L X 4.5" W X 1.4" H 1.2 lbs
<b>BATTERY</b>		5 hour run-time	10 hour run-time	10 hour run-time





Revolution®



Cell Revolution®

## REVOLUTION® WIRELESS POWER QUALITY RECORDERS 600V/5000A MAX

### FEATURES & BENEFITS:

Reduce fleet and labor costs with this small, rugged, lightweight recorder. Continuously view, analyze and retrieve data. The Cell Revolution allows you to retrieve data wirelessly from anywhere you have an internet connection. The included ProVision software lets you monitor real-time current, flicker, voltage, power and more from your desktop, or use a laptop, the PMI Field PC, or a PDA to monitor data from the field.

**600V CAT IV:** Allows use in a wide range of monitoring environments

**Pocket-size:** Can be installed inside meter bases, transformers, and panels

**Bluetooth® 2.0, Cell Phone Modem (optional) & Wi-Fi connection (optional):** Stay safe with wireless data behind closed panel covers

**USB 2.0, built in Ethernet Networking (Optional):** For permanent installations

### High sampling rate:

Captures high speed transients up to 5000V and 1 MHz.

**UL listed:** Increased user safety

**Large memory capacity:** Longer recording time and very high resolution wave capture.

**New Features:** E-mail & text alerts, network time sync.

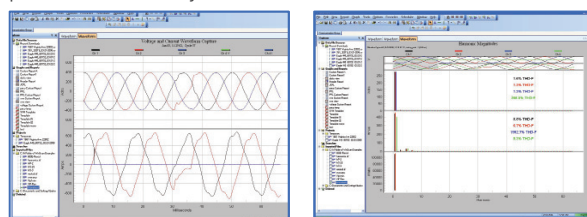
	<b>INPUTS</b>	AC Voltage	0 to 600 RMS continuous per phase (±5 kV peak transients)
		AC Current	0 to 5000 amps
		Sample Rate	1 MHz Voltage (16666 samples/cycle) 250 kHz current (4166 samples/cycle)
	<b>CHANNELS</b>	Voltage	4 channels
		Current	4 channels
	<b>MEASURED QUANTITIES PER CYCLE</b>	RMS Voltage	Volts
		RMS Current	Amps
		Real Power	Watts
		Apparent Power	VA's
		Reactive Power	VAR's
		Phase Angle	Degrees
		Power Factor	Watts/VA
		Displacement PF	cos (phase angle)
		Power Usage	kWh, kVARh, kVAh
	<b>ACCURACY</b>	Voltage	0.33% of full scale
		Current	1.0% of full scale w/o probe
		Power	1.0% of full scale w/o probe
		Phase Angle	1.0° w/o probe
		Power Factor	±0.02 w/o probe
		Displacement PF	±0.02 w/o probe
	<b>POWER FAIL OPERATION</b>	The recorder can operate without any input voltage for up to 30 minutes. This allows it to record down to 0 volts on all channels during power outages.	

<b>HARMONICS</b>	Voltage	to the 51st
	Current	to the 51st
	Measures	Magnitude, phase, THD
<b>COMMUNICATIONS</b>	Standard Options	Bluetooth® 2.0 Wireless, USB 2.0 Mobile Phone, Wi-Fi
<b>INFORMATION STORAGE</b>	Data Storage	16 MB (Standard); 128 MB, 512MB or 1 GB (Optional)
	Significant Change	1000 records
	Flicker	1000 records
<b>RECORD SETTINGS</b>	Interval Graphs	1 cycle to 4 hour interval, user selected, stop-when-full or wrap-around memory modes
	Significant Change	1V to 8V in 1V steps
	Flicker Settings	User-defined, or conform to IEEE 1453/ IEC 61000-4-15, and IEEE Std. 141
	Waveform Capture	Voltage and current threshold, periodic capture, waveshape, event cross triggers
	Transient Capture	Peak voltage threshold
<b>POWER SUPPLY REQUIREMENTS</b>	Voltage	60-600VAC Channel 1 to Common (47-63Hz)
	Power Consumption	5 Watts max, 15 VA max at 600V
<b>ENVIRONMENTAL</b>	Operating Temp	-20°F to +135° F
	Humidity	Less than or equal to 85%
	Shock	60 Hz to 2 kHz, acceleration 25G
	Vibration	10Hz to 60Hz, amplitude 1.8mm
	Max Altitude	2.0km (6560 ft), derated above 2.0km
<b>PHYSICAL DIMENSIONS</b>	Size	4.8" L x 3.35" W x 1.84" H
	Weight	less than 1 lb
	Case	NEMA 4X
<b>SAFETY</b>	IEC 61010-1, 600V CAT IV, UL listed	

## PROVISION SOFTWARE

ProVision® is the latest generation of PMI's popular, power quality analytical software for PCs. Virtually everything about ProVision's graphical user interface (GUI) has been redesigned—so it's not only easier to use, but also more flexible in the way it helps you to manage and report power quality data.

With ProVision's wireless communications features you can remotely initialize, schedule, download and manage multiple PQ recorders from within a single GUI. All recorder settings are viewable and configurable in real-time on your laptop or desktop PC. Once PQ data is downloaded to your computer, ProVision® gives you unprecedented control over the way it's viewed, managed and reported. You determine the way you want the software to search for and access your files. You choose your own scale, colors and font styles for viewing and printing. You can even insert your company logo to give reports and presentations a truly custom look.



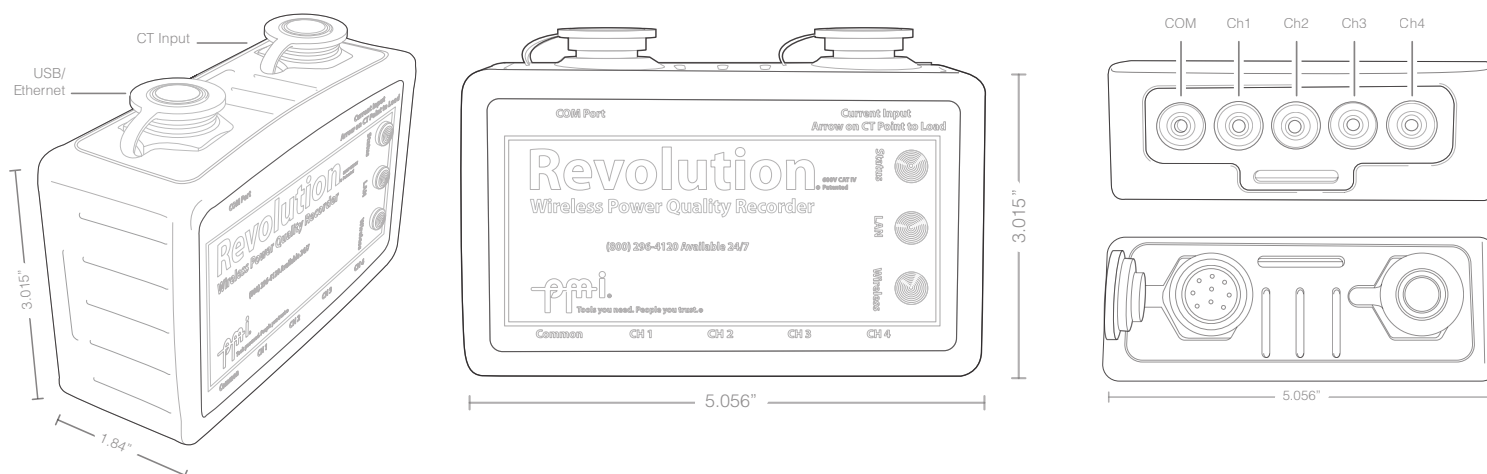
## WANT EVEN MORE FLEXIBILITY?

With ProVision® you can create and print your own standard and custom reports, or if you prefer, send PMI your data in digital form and our exclusive, Custom Report Service will prepare and print professional looking reports to meet your unique needs.

ProVision® transforms real-time and stored PQ data into an array of colorful charts and graphs that make it easy to track long-term trends and identify problems during triggered events:

- Event Change
  - Interval
  - Single Cycle Voltage Histogram
  - Significant Change
  - Power Outage
  - Flicker
  - Abnormal/Loose Neutral
- Voltage, Current & Power:
- Interval Graph
  - Out of Limits
  - Histogram Graph
  - Daily Profile Graph

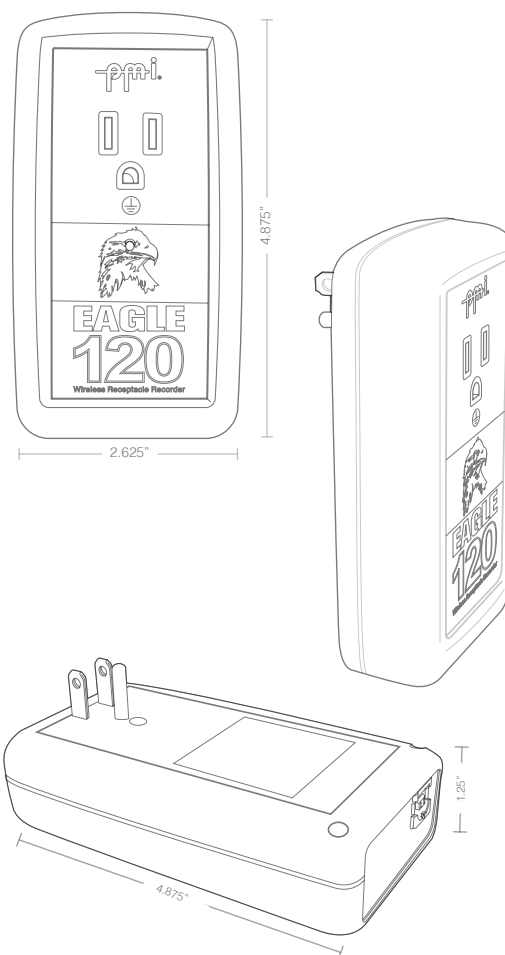
**ProVision**





## EAGLE 120

<b>INPUTS</b>	AC Voltage	60 to 140 VAC RMS Continuous, 0 to 240 VAC Peak, Neutral-Ground 0-75 VAC RMS
	AC Current	0 to 80 amps RMS (15 amps continuous)
	Sample Rate	256 samples/cycle/channel
<b>CHANNELS</b>	Voltage	2 channels
	Current	1 channel
<b>MEASURED QUANTITIES PER CYCLE</b>	RMS Voltage	Volts
	RMS Current	Amps
	Real Power	Watts
	Apparent Power	VA's
	Reactive Power	VARs
	Phase Angle	Degrees
	Power Factor	Watts/VA
	Displacement PF	cos (phase angle)
	Power Usage	kWh, kVARh, kVAh
<b>COMMUNICATIONS</b>	Type	USB, Bluetooth® Wireless (optional)
<b>INFORMATION STORAGE</b>	Interval Graphs	1.2 MB (Standard) 6.9 MB (with memory option)
	Significant Change	1000 records
	Flicker	1000 records
	Waveform Capture	256 KB (standard) 1.7 MB (with memory option)
<b>RECORD SETTINGS</b>	Interval Graphs	1 cycle to 4 hour interval. User selected, stop-when-full, or wrap around memory modes
	Significant Change	1V to 8V in 1V steps
	Flicker	User-defined, or conform to IEEE1453/ IEC61000-4-15, and IEEE Std. 141
	Waveform Capture	Voltage and current threshold, periodic capture
<b>ENVIRONMENTAL</b>	Operating Temp	-20°F to +135° F
	Shock	60 Hz to 2 KHz, acceleration 25G
	Vibration	10Hz to 60Hz, amplitude 1.8mm
<b>ACCURACY</b>	Voltage	0.33% of full scale
	Current	1.0% of full scale
	Power	1.0% of full scale
	Phase Angle	1.0°
	Power Factor	±0.02
	Displacement PF	±0.02
<b>PHYSICAL DIMENSIONS</b>	Size	4.9" L x 2.7" W x 1.25" H
	Weight	0.5 lbs
<b>HARMONICS</b>	Voltage	to the 51st
	Current	to the 51st
	Measures	magnitude, phase, THD





## GUARDIAN



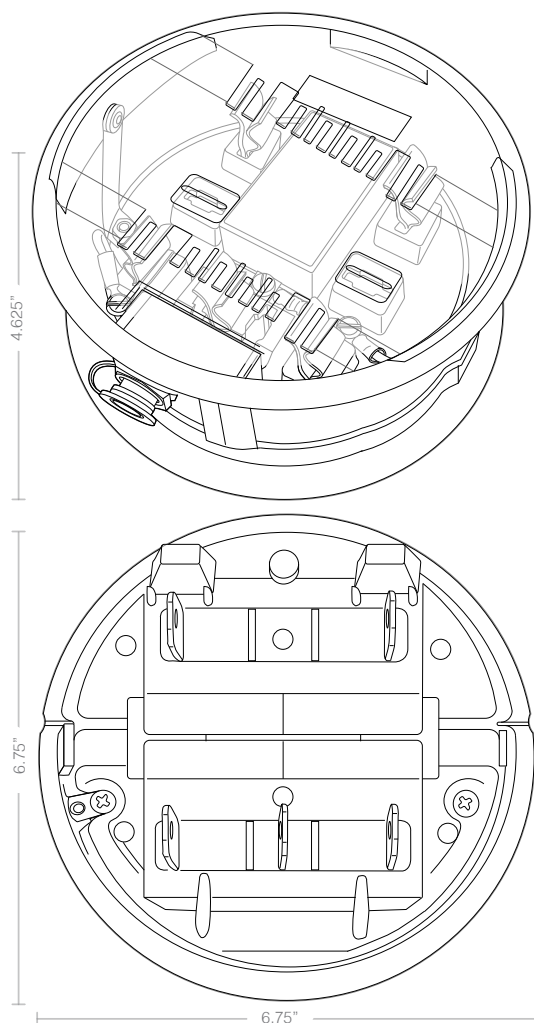
## iVS-2SX+



## iVS-3S

<b>INPUTS</b>	AC Voltage	0 to 150 volts continuous per channel	0 to 140 VAC RMS continuous	0 to 600 VAC continuous
	AC Current	200 amps RMS	200 amps RMS	200 amps RMS (Forms 12S, 14S, 15S, 16S, 17S) 25 amps (Forms 6S, 8S, 9S)
	Sample Rate	256 samples/cycle/channel	128 samples/cycle/channel	128 samples/cycle/channel
<b>CHANNELS</b>	Voltage	2 channels	2 channels	2 or 3 channels, depending on form
	Current	2 channels	2 channels	2 or 3 channels, depending on form
<b>MEASURED QUANTITIES PER CYCLE</b>	RMS Voltage	Volts	Volts	Volts
	RMS Current	Amps	Amps	Amps
	Real Power	Watts	Watts (Optional)	Watts
	Apparent Power	VA's	VA's	VA's
	Reactive Power	VARs	VARs (Optional)	VARs
	Phase Angle	Degrees	Degrees (Optional)	Degrees
	Power Factor	Watts/VA	Watts/VA (Optional)	Watts/VA
	Displacement PF	cos (phase angle)	cos (phase angle) (Optional)	cos (phase angle)
	Power Usage	kWh, kVARh, kVAh	kWh, kVARh, kVAh (Optional)	kWh, kVARh, kVAh
<b>ACCURACY</b>	Voltage	0.33% of full scale	0.33% of full scale	0.33% of full scale
	Current	1.0% of full scale	1.0% of full scale	1.0% of full scale
	Power	1.0% of full scale	1.0% of full scale	1.0% of full scale
	Phase Angle	1.0°	1.0°	1.0°
	Power Factor	±0.02	±0.02	±0.02
	Displacement PF	±0.02	±0.02	±0.02
<b>HARMONICS</b>	Voltage	to the 51st	to the 31st (Optional)	to the 31st
	Current	to the 51st	to the 31st (Optional)	to the 31st
	Measures	magnitude, phase, THD	magnitude, THD	magnitude, THD
<b>COMMUNICATIONS</b>	Type	Bluetooth® Wireless, USB	RS232 port	RS232 port
	Remote	Cell modem option	n/a	n/a
	Data Rate		4,800 to 28,800 baud	4,800 to 38,000 baud
<b>INFORMATION STORAGE</b>	Interval	6.9 MB	2.1 MB	2.1 MB
	Graphs			
	Significant Change	1000 records	1000 records	1000 records
	Flicker	1000 records	1000 records	1000 records
	Waveform Capture	1.7 MB	384 KB (Optional)	384 KB

		GUARDIAN	iVS-2SX+	iVS-3S
<b>RECORD SETTINGS</b>	Interval Graphs	1 second to 4 hour interval user selected, stop-when-full, or wrap around memory modes	1 second to 4 hour interval user selected, stop-when-full, or wrap around memory modes	User selected, stop-when-full, or wrap around memory modes Significant Change
	Significant Change	1V to 8V in 1V steps	1V to 8V in 1V steps	1V to 8V in 1V steps
	Flicker Settings	User-defined, or conform to IEEE 1453/ IEC 61000-4-15, and IEEE Std. 141.	User-defined, or conform to IEEE Std. 141.	User-defined, or conform to IEEE Std. 141.
	Waveform Capture	Voltage and current threshold, periodic capture	(Optional) voltage and current threshold	Voltage and current threshold
<b>POWER SUPPLY</b>	Power Consumption	Less than 2.5 watts	Less than 2.5 watts	Less than 2.5 watts
	Operating Temp	-20°F to +135° F	-20°F to +135° F	-20°F to +135° F
	Shock	60 Hz to 2kHz, Acceleration 25G	60 Hz to 2kHz, Acceleration 25G	60 Hz to 2kHz, Acceleration 25G
<b>PHYSICAL DIMENSION</b>	Vibration	10 Hz to 60 Hz, Amplitude 1.8 mm	10 Hz to 60 Hz, Amplitude 1.8 mm	10 Hz to 60 Hz, Amplitude 1.8 mm
	Size	4.625" x 6.75"	4.625" x 6.75"	4.625" x 6.75"
	Weight	3.6 lbs	3.6 lbs	3.6 lbs
<b>POWER FAIL OPERATION</b>	Can operate without any input voltage for up to 30 minutes. This allows it to record down to 0 volts on all channels during power outages.			



## GUARDIAN

- 2 channels of AC voltage from 0-150 continuous per phase
- 2 channels 200 amps RMS current
- 256 samples/cycle/channel sampling rate
- Voltage and current harmonics to the 51st
- Measures all power functions
- Captures waveforms
- Bluetooth® wireless, USB, cell phone modem (optional) communications
- Up to 6.9 MB memory

## iVS-2SX+

- A budget oriented single-phase meter socket power quality recorder.
- 2 channels AC voltage from 0-140 continuous per phase
- 2 channels up to 200 amps RMS current
- 128 samples/cycle/channel sampling rate
- Harmonics and waveform capture (optional) to the 31st
- Measures real, reactive, and apparent power
- Up to 2.1 MB memory

## iVS-3S

- The only ten function three-phase meter socket power quality recorder available today.
- 2 or 3 channels AC voltage from 0-600 VAC
- 2 or 3 channels 200 amps RMS current (Forms 12S, 14S, 15S, 16S and 17S), or 25 amps (Forms 6S, 8S, and 9S)
- 128 samples/cycle/channel sampling rate
- Voltage and current harmonics to the 31st
- Captures waveforms
- Measures all power functions
- Up to 2.1 MB memory

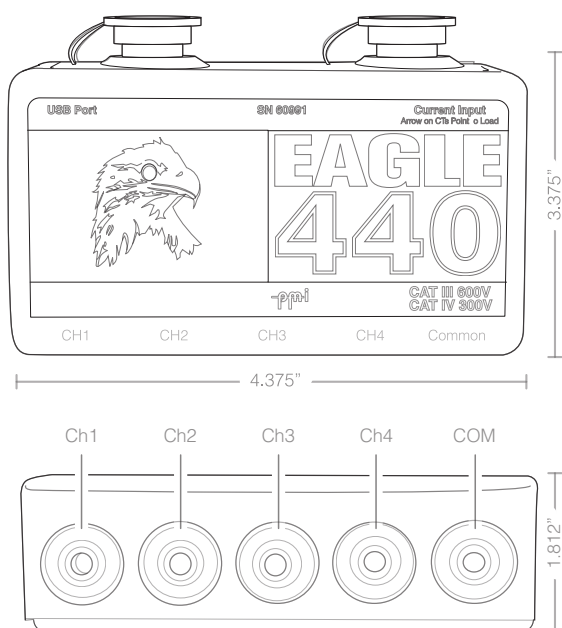


## EAGLE 220, 330, 440® 2, 3, & 4 CHANNEL WIRELESS PQ RECORDERS

### FEATURES

The Eagle series of recorders is the smallest full function power quality recorder available today.

- 2,3, and 4 channels of AC voltage from 0-600 VAC
- 2,3, and 4 channels of 0-5000 amps current with probes
- 15,360 samples/second/channel; 256 samples per cycle sampling rate
- Voltage and current harmonics to the 51st
- Records all power functions
- Waveform Capture
- Physical dimensions 4.375" x 3.375" x 1.812"
- Bluetooth® wireless communications
- Up to 6.9 MB memory
- IEC 61010, 600 V CAT III safety rating
- UL listed



INPUTS	AC Voltage	0 to 600 VAC
	AC Current	0 to 5000 Amps with CT probes
	Sample Rate	15,360 samples per second/channel; 256 samples per cycle

CHANNELS	Voltage	2, 3, or 4 channels
	Current	2, 3, or 4 channels

MEASURED QUANTITIES PER CYCLE	RMS Voltage	Volts
	RMS Current	Amps
	Real Power	Watts
	Apparent Power	VA
	Reactive Power	VARs
	Phase Angle	Degrees
	Power Factor	Watts/VA
	Displacement PF	cos (phase angle)
	Power Usage	kWh, kVARh, kVAh

ACCURACY	Voltage	±0.33% of full scale
	Current	±1.0% of full scale w/o probe
	Power	±1.0% of full scale w/o probe
	Phase Angle	±1.0° w/o probe
	Power Factor	±0.02 w/o probe
	Displacement PF	±0.02 w/o probe

SAFETY	Pollution Degree 2	600V CAT III
	UL Listed	UL/IEC 61010

HARMONICS	Voltage	to the 51st
	Current	to the 51st
	Measures	magnitude, phase, THD

COMMUNICATIONS	Bluetooth® Wireless, USB
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INFORMATION STORAGE	Interval Graph	6.9 MB
	Significant Change	1000 records
	Flicker	1000 records
	Waveform Capture	3.75 MB





## EAGLE 220, 330, 440®

RECORD SETTINGS	Interval Graphs	1 cycle to 4 hour interval. User selected, stop-when-full, or wrap around memory modes
	Significant Change	1V to 8V in 1V steps
	Flicker	User-defined, or conform to IEEE 1453/IEC 61000-4-15, and IEEE Std. 141
	Waveform Capture	Voltage and current threshold, periodic capture
POWER SUPPLY REQUIREMENTS:	Voltage	60-600VAC Channel 1 to Common (47-63Hz)
	Power Consumption	1.5 Watts max, 9VA max at 600VAC
ENVIRONMENTAL	Operating Temp	-22°F to +131° F
	Humidity	Less than or equal to 85%
	Shock	60 Hz to 2 KHz, acceleration 25G
	Vibration	10 Hz to 60 Hz, amplitude 1.8mm
	Max Altitude	2.0 km (6560 ft), derated above 2.0 km
PHYSICAL DIMENSIONS	Size	4.375"L x 3.375"W x 1.812"H
	Weight	less than 1 lb
	Case	NEMA 4X
POWER FAIL OPERATION	Specifications	These recorders can operate without any input voltage for up to 2 hours. This allows it to record down to 0 volts on all channels during power outages.



## EAGLE 440 PQ KIT

- Eagle 440
- Flex 4/12 (set of four twelve inch Flex CTs)
- Flex 4/24 (set of four twenty-four inch Flex CTs)
- TLAR 4 (set of four 20/200A TLARs)
- Loaded Eagle 120 receptacle power quality recorder



## EAGLE 200 METER KIT

The Eagle 200 meter kit is the perfect solution to monitoring power quality at the meter base. The Eagle 200 is sized to allow monitoring in large capacity 400 Amp single-phase meter bases.

- 2 channels AC voltage, 0-300 VAC
- 2 channels of current, 0-1000 amps
- Voltage and current harmonics to the 51st
- Physical dimension 5 3/8" x 3 1/8" x 1 1/2"

The Eagle 200 meter kit includes:

- Eagle 200 two channel power quality recorder
- FCT 2/12 (set of two twelve inch Flex CTs)
- Soft-sided nylon carrying case.

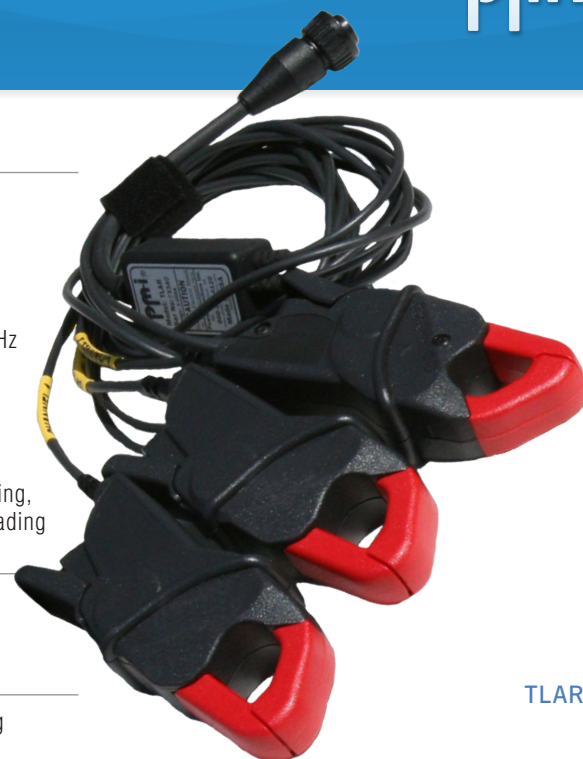
### ULTRA SLIM FLEX CTs

<b>ELECTRICAL SPECIFICATIONS</b>	Switchable Ranges	1 to 100A, 1 to 1000A, 1 to 5000A
	Operating Limit	1 to 5000A
	Controls	Range is chosen from the recorder, PC, or PDA software.
	Power Source	Power is supplied by connection to PMI recorder. No external battery or other power source is required.
	Linearity	±0.05%
	Phase Shift	≤ ±0.5% at 50 to 60 Hz
	Frequency Range	8Hz to 10kHz
	Crest Factor (mid range)	100A and 1000A scale: 3.0 5000A scale: 1.6
	Position Sensitivity	±1.5% 1 in from connector
<b>PMI RECORDER CAPABILITY</b>	iVS-3/600E may require firmware upgrade.	
<b>MECHANICAL MATERIALS</b>	Sensor Jacket	Polyurethane UL94V0
	Connector	FR Polypropylene UL94V0
	Cable Jacket	Polyurethane UL94V0
<b>ENVIRONMENTAL</b>	Operating Temperature	-20 to 135° F (-29 to 57° C)
	Altitude Operating	0 to 2000m, derated above 2000m
	Case Protection	Sensor and Module IP65 per IEC 529
<b>PHYSICAL DIMENSIONS</b>	Min. Bending Radius	1 in (25.4 mm)
	Sensor Diameter	.310 in (7.9 mm)
	Connector Diameter	1.07 in max (27.2 mm)
	Sensor Output Cable Length	48 in (1.2 m)
<b>ACCURACY</b>	± 1% of full scale	
<b>WORKING VOLTAGE</b>	Sensor	600V AC to earth
	Module	600V AC to earth
<b>SAFETY</b>	Double Insulated	
	Sensor	600V CAT IV
	Module	600V CAT III
	Pollution Degree 2	



Ultra Slim Flex CTs

		TLAR	TLARS
<b>ELECTRICAL SPECIFICATIONS</b>	Current Ranges	20A, 200A AC	20A, 200A AC
	Operating Limit	200A Continuous	200A Continuous
	Frequency Range	40 to 10kHz	40 to 10kHz
	Working Voltage	600 VAC max	600 VAC max
	Influence of conductor position in jaw	0.5% of reading at 50/60Hz	0.5% of reading at 50/60Hz
	Influence of adjacent conductor	1.50%	1.50%
	Influence of frequency	40Hz to 1kHz: 3% of reading, 1kHz to 10kHz: 12% of reading	40Hz to 1kHz: 3% of reading, 1kHz to 10kHz: 12% of reading
<b>PHASE SHIFT</b>	1-20A	≤ 3 degrees	≤ 3 degrees
	20-80A	≤ 2 degrees	≤ 2 degrees
	80-200A	≤2.5 degrees	≤2.5 degrees
<b>ACCURACY</b>	20A scale	1 to 20 A: 1.5% of reading ±0.1A	1 to 20 A: 1.5% of reading ±0.1A
	200A scale	1.5% of reading ±0.5A	1.5% of reading ±0.5A
<b>SAFETY</b>	Rating	UL 61010B-1 IEC 61010-1 600V CAT III	IEC 61010-1 600V CAT III
<b>PMI RECORDER CAPABILITY</b>	10A range only with iVS-3/600E and ViPs with SNs lower than 61000, otherwise adjustable 20A/200A range		
<b>ENVIRONMENTAL</b>	Operating Temp	14 to 131° F -10 to 55° C	14 to 131° F -10 to 55° C
	Operating Relative Humidity	10-35° C 85% RH	10-35° C 85% RH
	Case Protection	Probes - IP40, Enclosure - IP65	Probes - IP40, Enclosure - IP65
<b>PHYSICAL DIMENSIONS</b>	Maximum Conductor Size	0.78 in (20 mm), bus bar 20 x 5 mm	0.59 in (15 mm)
	Probes	5.47 x 2.00 x 1.18 in (139 x 51 x 30 mm)	5 x 1.67 x 0.93 in bus bar 15 x 17 mm
	Enclosure	2.36 x 1.38 x 0.67 in	2.36 x 1.38 x 0.67 in
	Weight	TLAR+200/3 -0.75 lb TLAR+200/4 -1.00 lb	TLAR+200/3 -0.75 lb TLAR+200/4 -1.00 lb
	Probe Leads	4 ft, 600V rating	4 ft, 600V rating
	Output Cable	9 in, 600V rating	9 in, 600V rating



TLAR



TLARS





## FIELD PC® RUGGEDIZED & WIRELESS

### Rugged Design:

Durable and can operate in extreme conditions

### Full Communications Package:

Standard Bluetooth® with USB and RS-232 connectivity (cell phone and Wi-Fi optional)

### Backlit Touch-Screen LCD:

Readable in sun light and poor light conditions

### Software Loaded:

Total package for out-of-box power quality monitoring, data storage and management

### Memory Expansion:

56 MB standard, expandable to 8 GB using Compact Flash and SD card

### Multiple Range Options:

30 feet built-in wireless Bluetooth® range with optional CF expansion to 100 feet

### Operating System:

Microsoft® Windows Mobile® Version 6.0

### Included Software:

ProVision™ Mobile, Microsoft® Internet Explorer® Mobile, Microsoft® Office Mobile [Word Mobile, Excel® Mobile, PowerPoint® Mobile, Microsoft® Outlook® Mobile (Inbox, Calendar, Contacts, Instant Messaging, Tasks, Notes, Spell, Checker)], Microsoft® ActiveSync®, 4.5 for desktop computer, Terminal Services Client, Microsoft® Windows Media®, Player 10 Mobile, Calculator, Games, Pictures and Videos (image, and video viewer), Voice Recorder, Handwriting Recognition

### Processor:

Intel® XScale® PXA270, 520 MHz  
64 MB low-power RAM

### Storage:

Internal solid-state 256 MB Flash

### Display:

3.5" (89 mm) QVGA active matrix color, TFT, Transflective (outdoor viewable) LCD, with LED backlight; 240 x 320 pixels

### Touchscreen:

Sealed, resistive, pressure sensitive

### CF & SD Slots:

Compact flash (Type I or Type II)  
Secure Digital (SD or SDIO); CF card slot provides 3.3 volts; User accessible, sealed

### Keyboard:

Four-way directional button  
Standard key functions  
LED backlit keys

### Physical Size:

Dimensions: 6.5" Length x 3.5" Wide x 1.7" Thick,  
(165 x 89 x 43 mm), 17 oz. (482 g).

### Case

Magnesium case with elastomer, overmold

### Operating Temperature:

-22° to 122° F  
(-30° to 50° C)

### Storage Temperature:

-22° to 140° F  
(-30° to 60° C),  
Sealed rating IP67

Water Proof,  
Dust-proof,  
Water, Humidity,  
sand and dust

### MIL-STD-810F:

Vibration,  
altitude, shock,  
high temperature, Low  
temperature, temperature  
shock

### Shock Absorbency:

Multiple drops onto concrete from 5 ft

### Batteries:

Intelligent, rechargeable Li-Ion Battery, pack 14 working-hr (nom.), operates for, more than 20 hours on one charge, charges in 4 to 6 hours, internal circuitry, sealed against moisture when Battery is, removed, change without tools

### Communications Module:

9-pin D-sub connector, USB Host (Mini A), USB Client (Mini B), 12 VDC jack for, power input and Battery charging, modular; field replaceable

### Wireless Communications:

Built in Bluetooth® (Class 2  
10 meter max), [Optional Bluetooth® Card (Class 1  
100, meter max)]; Wi-Fi expansion card; wireless, cellular supported].

### Internal Clock:

Battery-backed real time clock keeps time and date when battery is removed.

### Enunciators:

External power/charge LED and notification LED; Other enunciators on system tray, Standard

### Accessories:

Rechargeable Li-Ion battery, wall charger, (universal voltage), USB sync cable, captured full-size stylus, hand strap, screen protector, quick start guide, Microsoft® Getting Started CD, user documentation CD, Screwdriver

### Certifications:

FCC Class B, CE Mark, RoHS







## BOOMERANG

The Boomerang is a single-phase voltage monitor with an integrated cell phone modem. Available in a Form 2S meter socket adapter, or standalone box configuration, the Boomerang works with the Canvass web-based data analysis software to provide a complete voltage picture.

The Boomerang collects RMS voltage data on a one second basis. Every 30 minutes, most recent 1800 one-second RMS values are sent to the PMI data center, for storage in the Canvass database. With this system, all data collection is performed continuously by the Canvass database – no data is stored in the Boomerang, and no recording download operation is required by the user. The data is always available via Canvass, automatically. As soon as the Boomerang is installed, it links with Canvass – no user setup is required at all. The latest realtime readings are always available via the Canvass interface.

### SPECIFICATIONS:

Measured Quantities	1 second RMS voltage frequency
Input range	80-300V RMS
Accuracy	0.50%
Resolution	0.1V
Communication	GSM cell modem (AT&T)
Temperature range	-22F to 130F

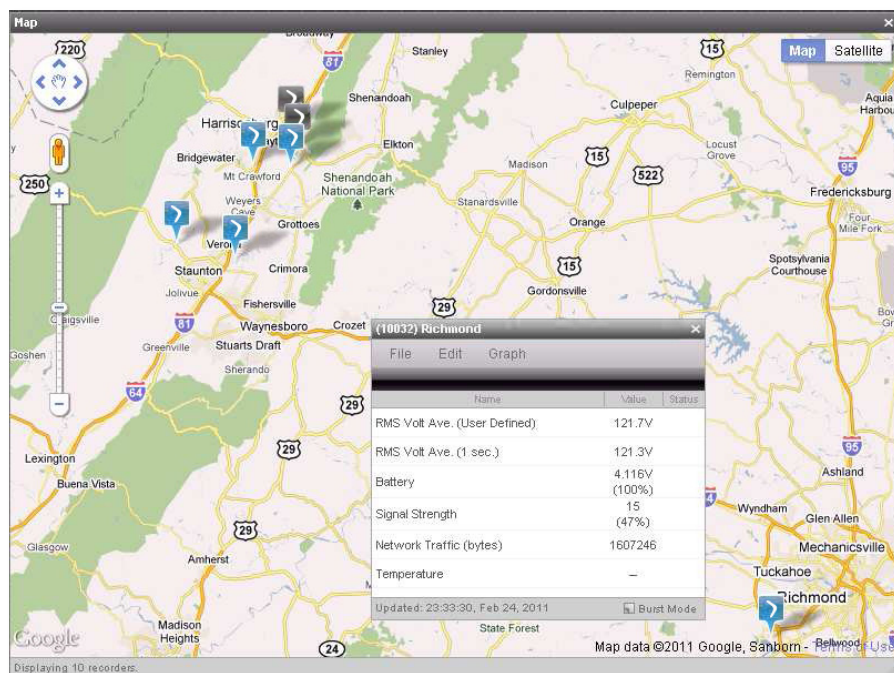
### COMPLETELY PROGRAMMABLE

The Boomerang can also be programmed to send e-mail or SMS text message alerts, based on programmable voltage thresholds, or power outages. These alerts are also stored in the Canvass database, for analysis later.

In addition to the Canvass data link, the Boomerang also includes a DNP3 TCP link. This can be set up to work with a SCADA system. The DNP3 interface includes analog points for RMS voltage, frequency, and modem signal strength, and fully configurable event thresholds for voltage triggers. Events can be polled, or reported via unsolicited report by exception.

## CANVASS WEB SOFTWARE

The Canvass system includes a database in the PMI data center, and web-based data analysis software. All Boomerang data is available any time, all from a web browser. To get started, load <http://canvass.powermonitors.com> in a browser.



After logging in, a map of Boomerangs will be displayed. Active Boomerangs are displayed in blue, inactive ones in grey. A Boomerang in an alert condition (due to voltage threshold exceedance) are shown in orange. Click on a Boomerang to display its status window.

The Boomerang status window shows the latest real-time readings. Two RMS types are shown: the one-second RMS value, and a user-defined average voltage (e.g. a 5 minute average voltage). In addition, status information such as internal battery voltage, modem signal strength, and total cell network traffic are displayed.

The menus in the status window are used for graphing and device setup.

### GRAPH OPTIONS

Under Graph, there are three graph types displayed: Stripchart, Histogram, and Daily Profile.

These graphs are all generated from the data in the Canvass database, using the one-second RMS voltage information.

Choosing "Stripchart" will generate a new window, as shown in Figure 3. The default stripchart graphs the last four hours of data, using 1 second RMS values.

### STRIPCHART

The stripchart start and stop times can be changed to several built-in values (e.g. the last week, last month, etc.) or adjusted to any custom date range. The graph can include all data ever recorded by the Boomerang – there's no limit to the size of the graph, and since Boomerang is continuously sending data to the database, there's no gaps in the data, or start or stop time in a recording.

Figure 1. After logging into <http://canvass.powermonitors.com>, click on a boomerang to display its status window.



Figure 2. Graph options for displaying RMS voltage data.

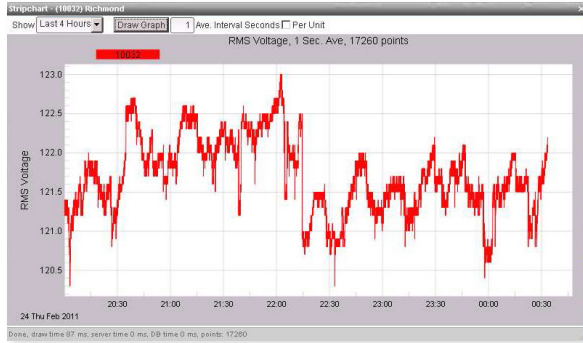


Figure 3. Stripchart display

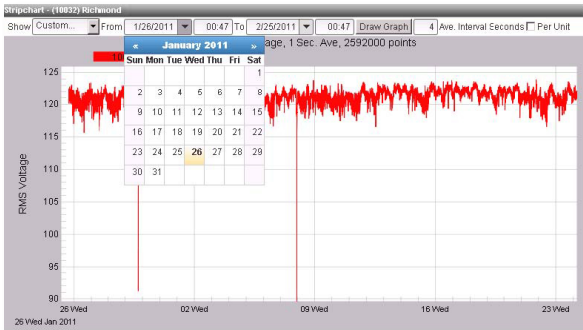


Figure 4. Stripchart start and stop times can be adjusted.

All the graph types also feature an adjustable averaging interval. By default, the graphs use the raw one second RMS voltage values. This interval is adjustable for each graph. For example, a 5 minute interval may be used, to smooth out sags, if long-term average voltage is desired. Just enter the averaging interval in the input field at the top of the graph, and click "Draw Graph" to redraw the plot.

## FULL ZOOM CONTROL

Full zoom controls are also available. Just click in the graph, hold down the left mouse button, and draw a zoom window on the graph (just like ProVision and Winscan). The graph will zoom to the desired extent. Some of the hotkeys utilized in ProVision also work with Canvass:

**U** Undo a zoom level.

**Z** Undo all zoom.

And here is a new one:

**O** Double the current time span.

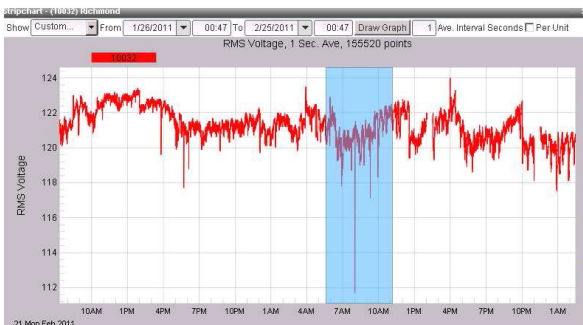


Figure 5. Full zoom control

The "T" hotkey toggles the Boomerang list on the right side. This pulls up a list of all Boomerangs in the group. Click Off or On displays or hides other Boomerang traces on the graph. This makes it very easy to compare voltages at different locations, and find correlations across a distribution system.

## HISTOGRAM

The Histogram graph displays the number of seconds the voltage was at each voltage level (shown in Figure 7).

Adjustable parameters include a log plot, interval average size, and

how many days to include in the histogram. As with the stripchart, the T hotkey toggles the Boomerang list, allowing the selection of multiple Boomerangs, but it also can display statistics from the histogram. The "Stats" checkbox determines whether the Boomerang list or stats list is displayed. The "Weekdays" checkbox enables just weekdays only (no weekends), or all days of the week.

## DAILY PROFILE GRAPH

The Daily Profile graph show the "average" 24 hour period, for the selected timestamp. Below, a 30 day profile is shown. Each 15 minute block in the 24 hour period is average across all days, and these 15 minute blocks are graphed, to show the typical daily trend. As with the Histogram graph, the timestamp, averaging interval, and weekdays-only parameters are adjustable.

## STANDARD DEVIATION

The "Std. Deviation" checkbox enables the graphical display of the standard deviation for each 15 minute block. This is shown as shaded bars, and indicates how much the voltage varied within that block. In the graph on the right, the voltage varied the most between 9am and 5pm, which is also the period with the lowest average voltage.

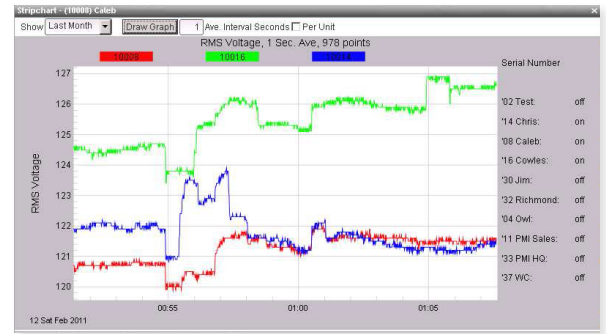


Figure 6. The 'T' hot key toggles the Boomerang list.

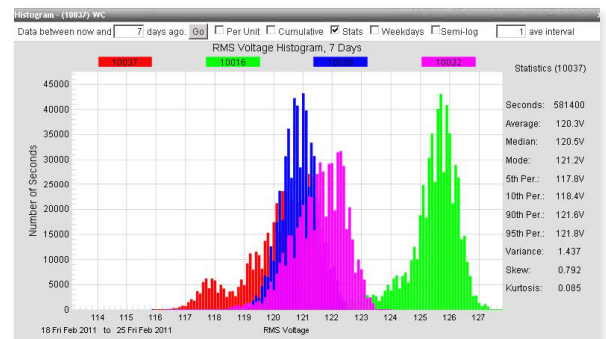


Figure 7. Histogram display

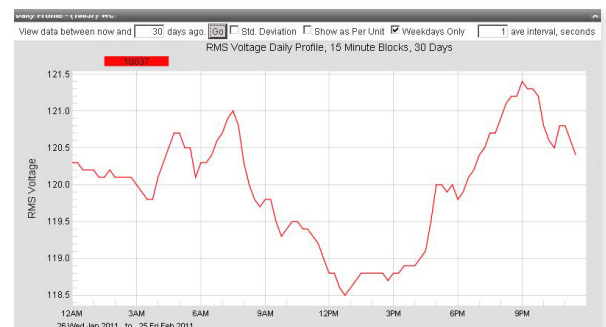


Figure 8. Daily profile graph

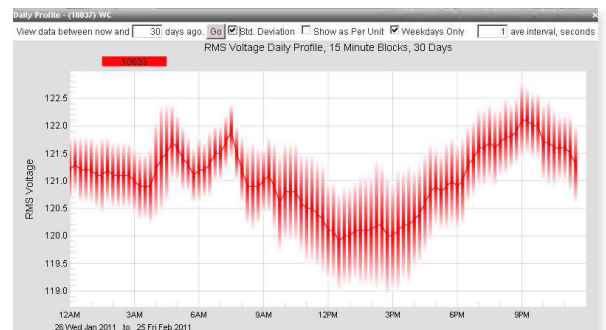


Figure 9. Standard Deviation