

Classic Charge Controller



MPPT Controllers



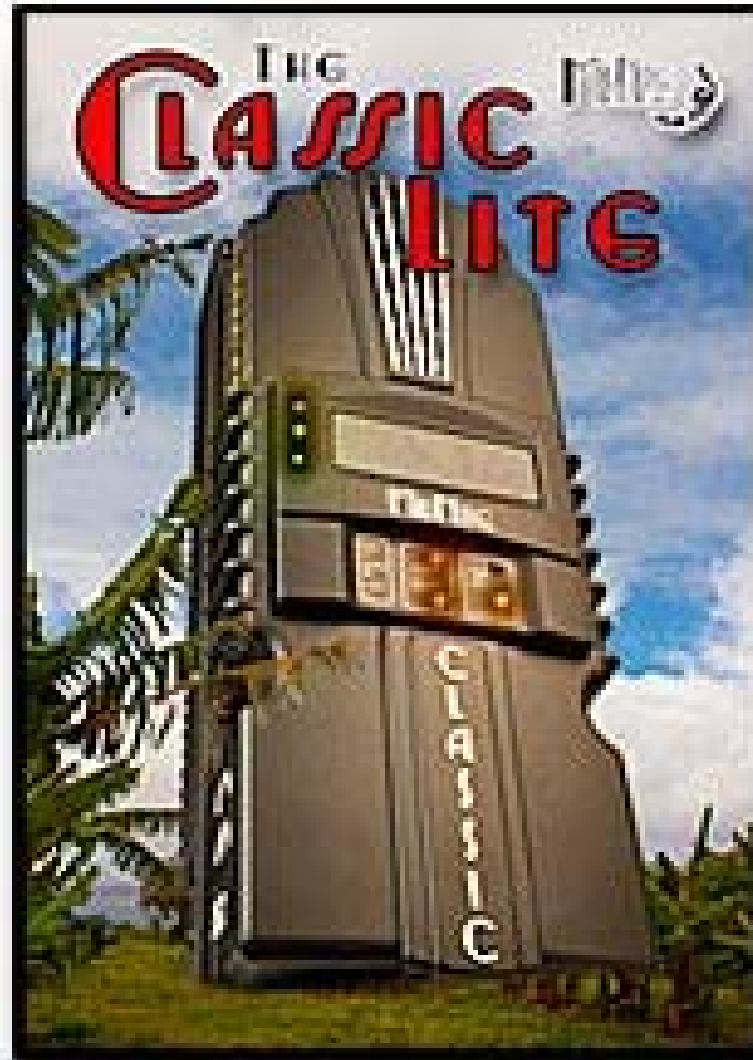
The MidNite Classic

Six years in
the making

The world's
most
sophisticated
MPPT
controller



The
Classic
Lite.
96 amps
for the
price of
60!



The MidNite Classic

- Incorporates things we have learned by producing tons of controllers
- MPPT for wind turbines, Solar and Hydro
- Worlds only arc fault detecting controller
- Built in DC-GFP saves money
- HyperVOC mode extends cold temperature VOC capability
- Ethernet, USB and RS232 interface standard
- Two aux outputs/inputs
- High voltage versions available 150, 200 and 250VDC
- Wizard driven set up insures compatible module mix
- User upgradeable firmware
- Graphical display vs. alpha numeric
- Stores 380 days of data
- Graphs of data available on the display and PC and internet
- Time, date and location settings
- Voice is being added to the display Summer 2012
- Ethernet output allows easy Wi-Fi hook up
- Display is re-locatable up to 1000 feet

Classic vs. Lite comparison

MIDNITE SOLAR'S STANDARD CLASSIC AND CLASSIC LITE COMPARISON CHART - July 19, 2012									
	Standard Classic					Classic Lite			
Model	150	200	250	250KS		150	200	250	250KS
Rated Amps	80-96	65-74	55-60	35-56		80-96	65-74	55-60	35-56
Max Operating Voltage	150	200	250	250		150	200	250	250
Max VOC ¹	198	248	298	298		198	248	298	298
Max Battery Voltage	72	72	72	120		72	72	72	120
Solar	●	●	●	●		●	●	●	●
Wind	●	●	●	●		●	●	●	●
Hydro	●	●	●	●		●	●	●	●
List Price	\$850	\$850	\$950	\$950		\$700	\$700	\$800	\$800
Cost Per Watt - 48 Nominal Battery V	\$0.19	\$0.22	\$0.30			\$0.16	\$0.18	\$0.25	
Cost Per Watt - 120 Nominal Battery V				\$0.19					\$0.16
Digital Display	●	●	●	●					
Internet and Ethernet Ready ²	●	●	●	●		●	●	●	●
Ground Fault Detector	●	●	●	●		●	●	●	●
Arc Fault Detector	●	●	●	●					
Graphical Display	●	●	●	●					
Free User Upgradable Firmware	●	●	●	●		●	●	●	●
MNGP Multiple Display Support ³	●	●	●	●		●	●	●	●
Aux Output	2	2	2	2		2	2	2	2
Five Year Warranty	●	●	●	●		●	●	●	●
Oscilloscope Display	●	●	●	●					
DIP Switches For Programming						●	●	●	●
Substantially Made In USA	●	●	●	●		●	●	●	●
Partial Shading Indicator ²	●	●	●	●		●	●	●	●
Bonus Amps Based On Voltage	●	●	●	●		●	●	●	●
ModBus Communications	●	●	●	●		●	●	●	●
HyperVOC Extended VOC Limit	●	●	●	●		●	●	●	●
Free PC & Internet Software	●	●	●	●		●	●	●	●
380 Days Data Logging ²	●	●	●	●		●	●	●	●
8 Built In Data Logging Params	●	●	●	●					
11 Software Data Logging Params ²	●	●	●	●		●	●	●	●
Graphing Capabilities ²	●	●	●	●		●	●	●	●

¹ This number is based on the max operating voltage (MOV) of the unit plus nominal battery voltage (NBV) up to 48v. The difference between MOV and NBV + MOV is the HyperVOC Extended VOC range.

² With PC and provided software.

³ The Classic MNGP display and/or a secondary display can monitor many controllers. The MNGP display can be removed from the Classic and used remotely.

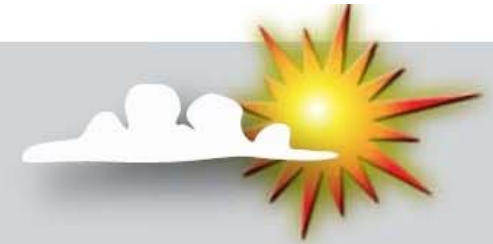
⁴ Available Sept. 2012 for the Lite with provided software.

Date gathered by APRS World

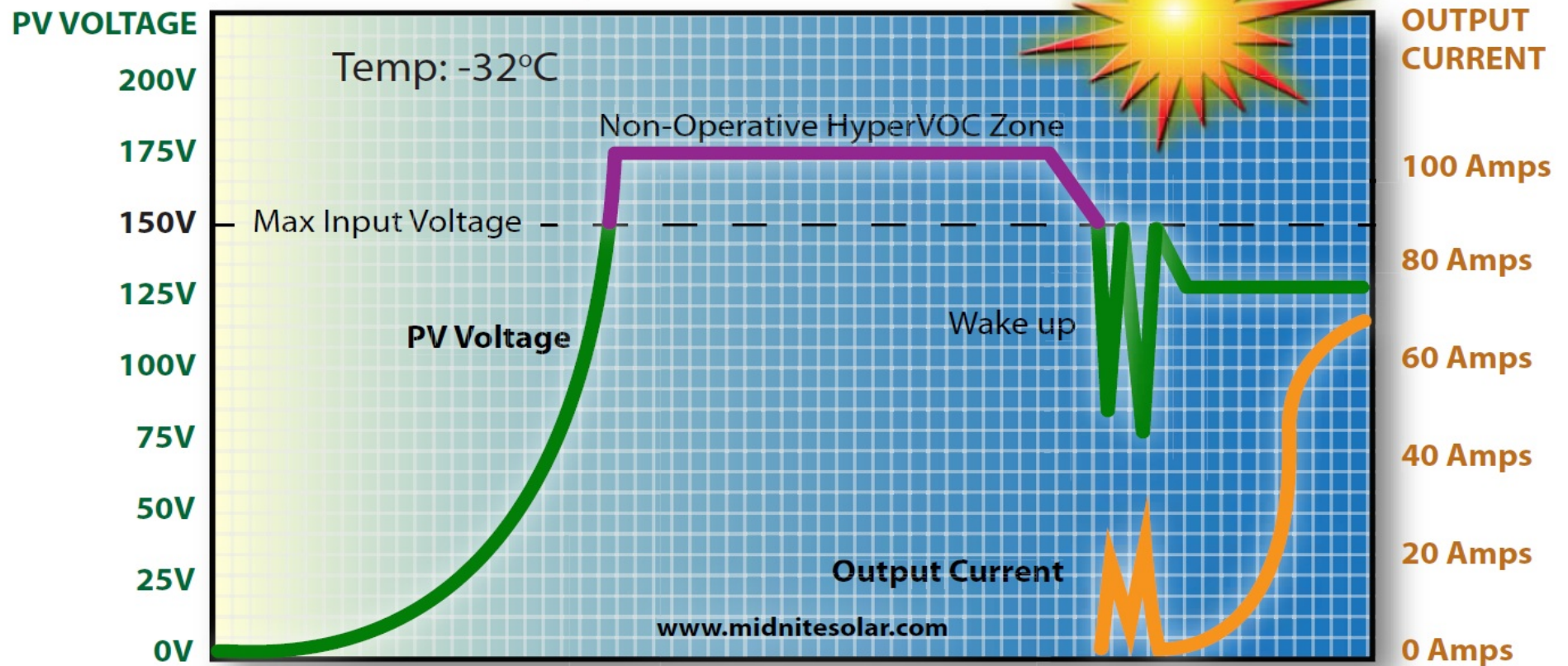
	MidNite Classic 150	Outback FM-60	Xantrex XW 60 MPPT
Day 1	2,163 Wh	1,956 Wh	2,084 Wh
Day 2	3,852 Wh	3,534 Wh	3,446 Wh
Day 3	3,924 Wh	3,728 Wh	3,380 Wh
Day 4	5,025 Wh	4,665 Wh	4,617 Wh
Day 5	817 Wh	658 Wh	791 Wh
Day 6	818 Wh	664 Wh	786 Wh
Day 7	4,598 Wh	4,090 Wh	3,276 Wh

HyperVOC

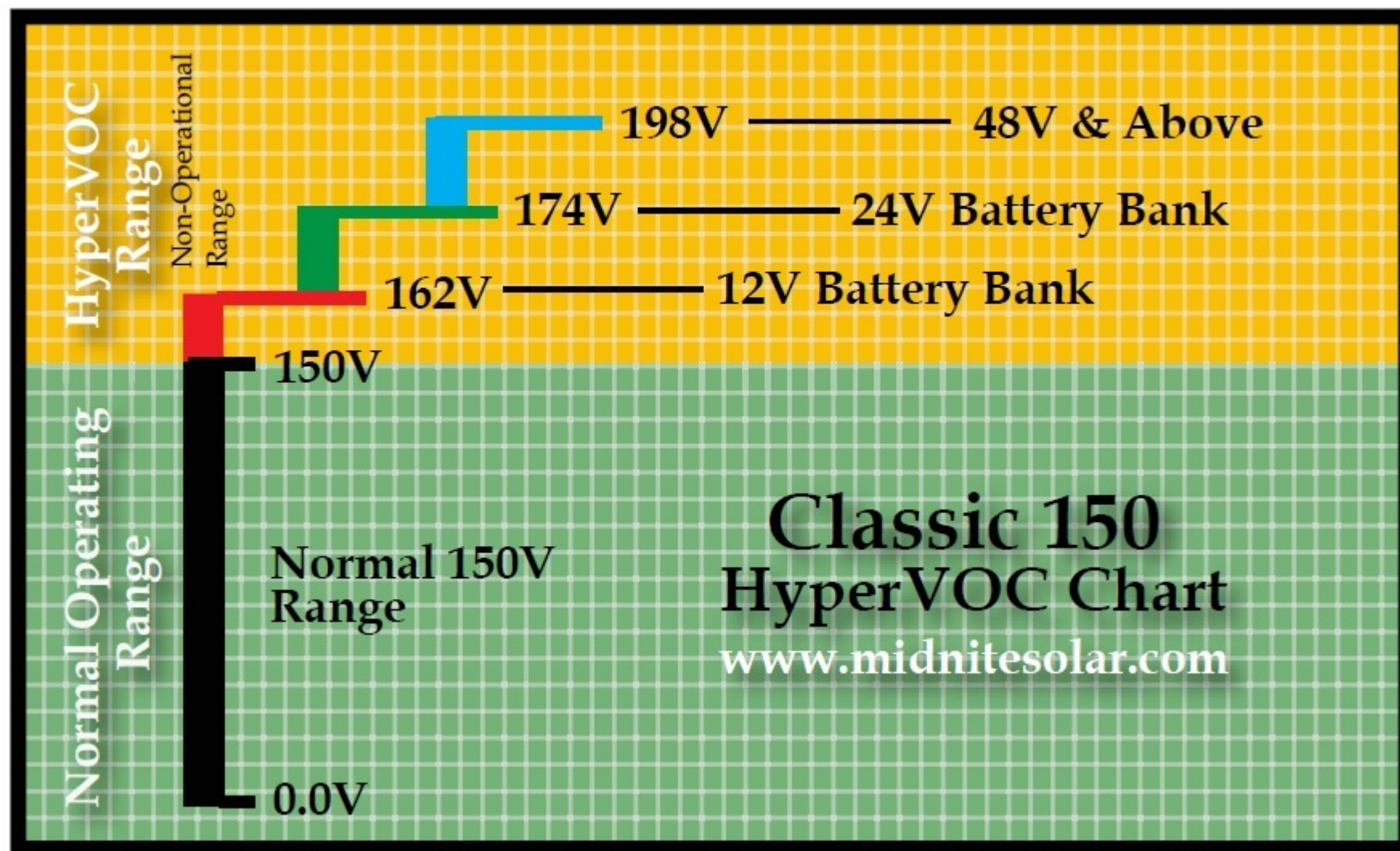
-32°C



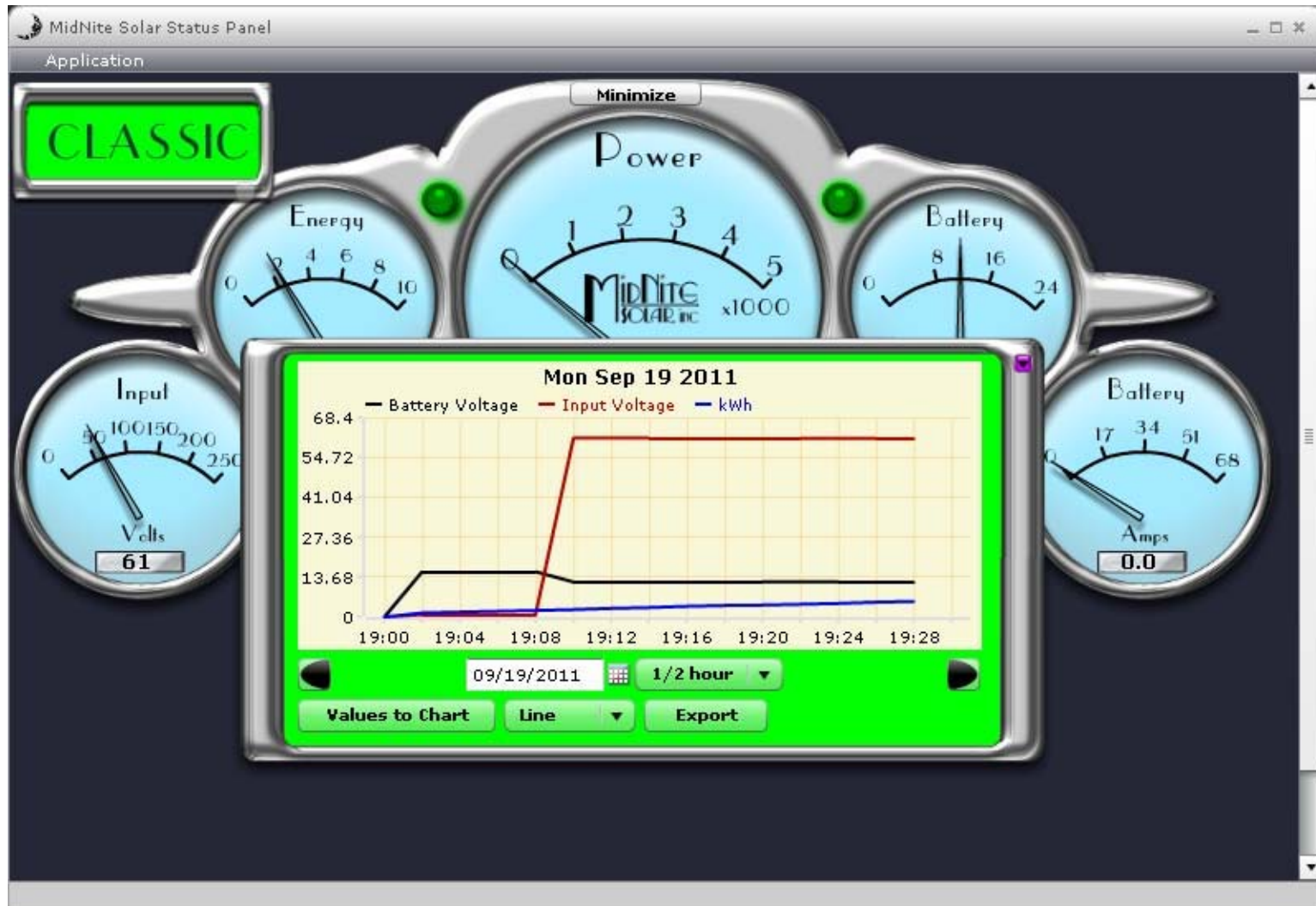
MidNite Solar Inc
www.midnitesolar.com



HyperVOC Charts for the Classics 150



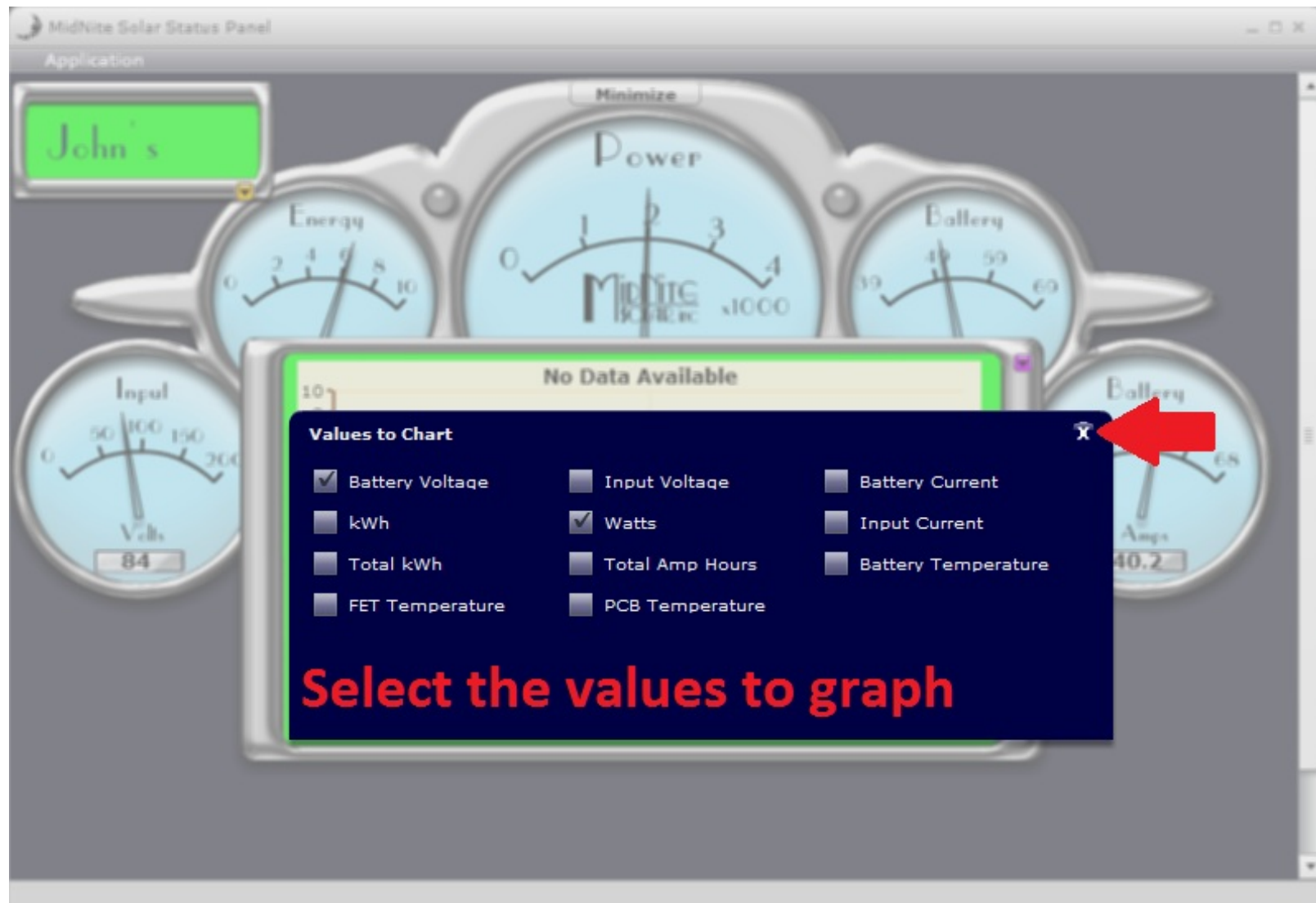
Graphs and data are displayed on your PC using the “local app” or over the internet on “www.mymidenite.com”



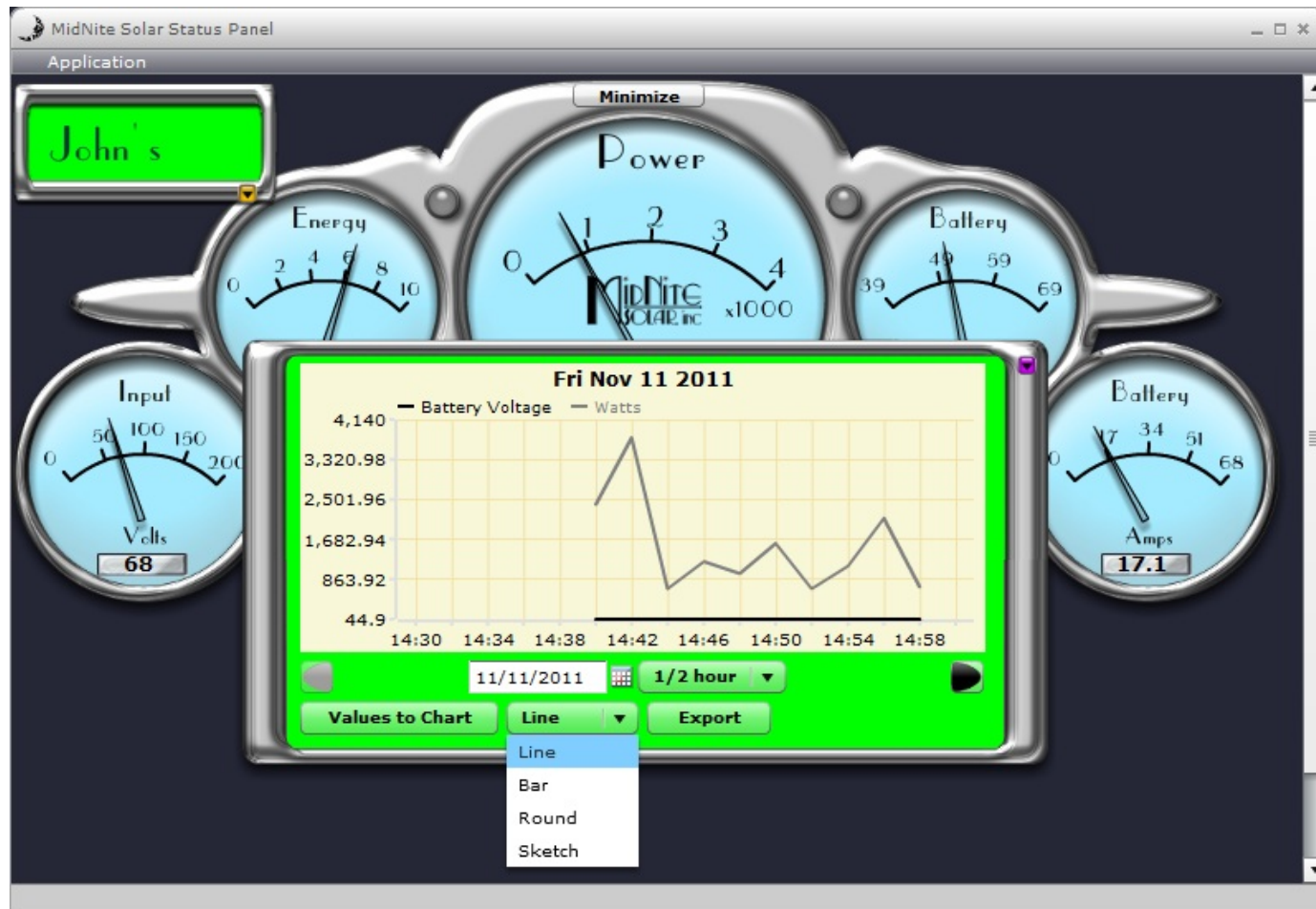
Bar graph screen



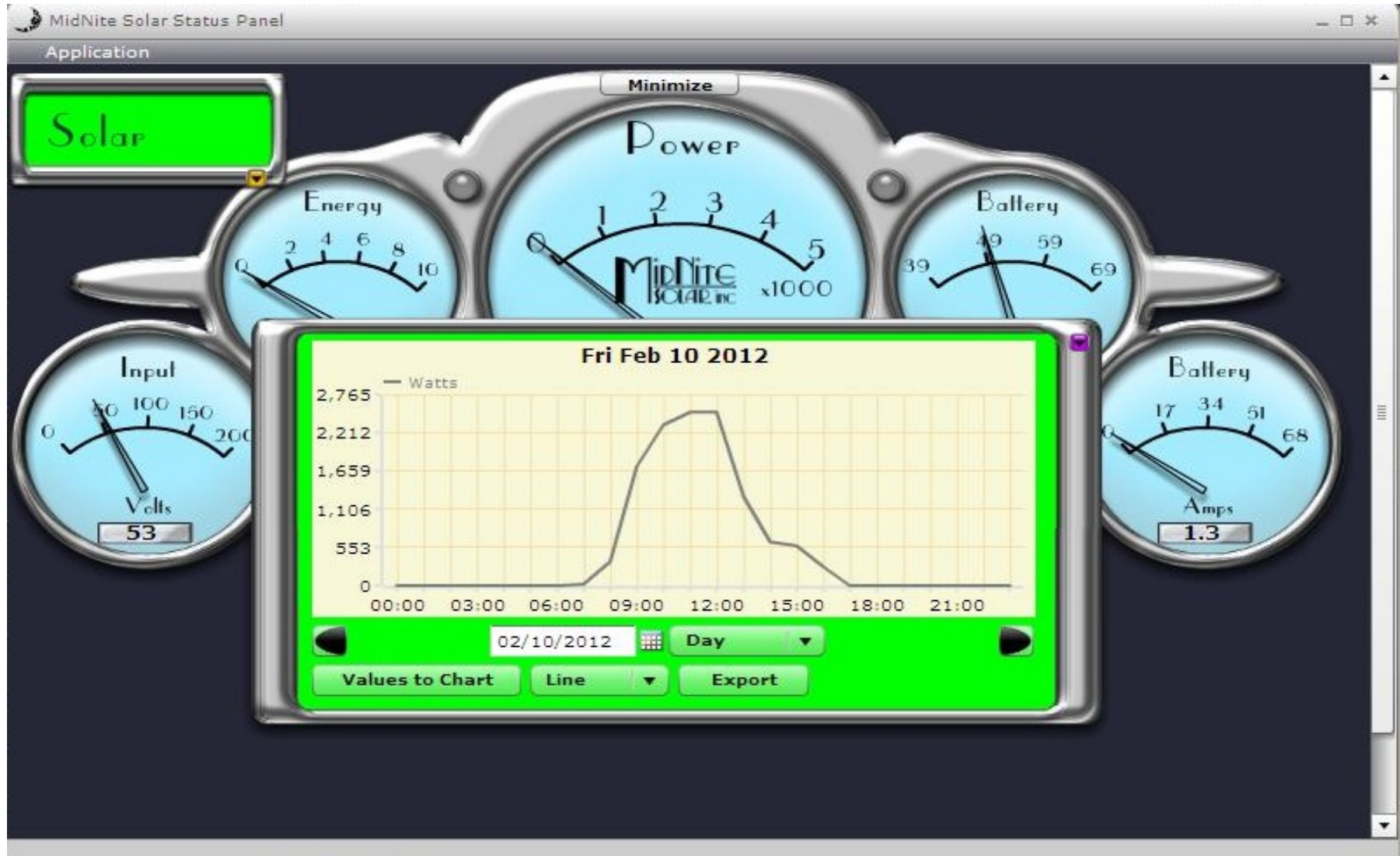
Data that we can Graph with the App



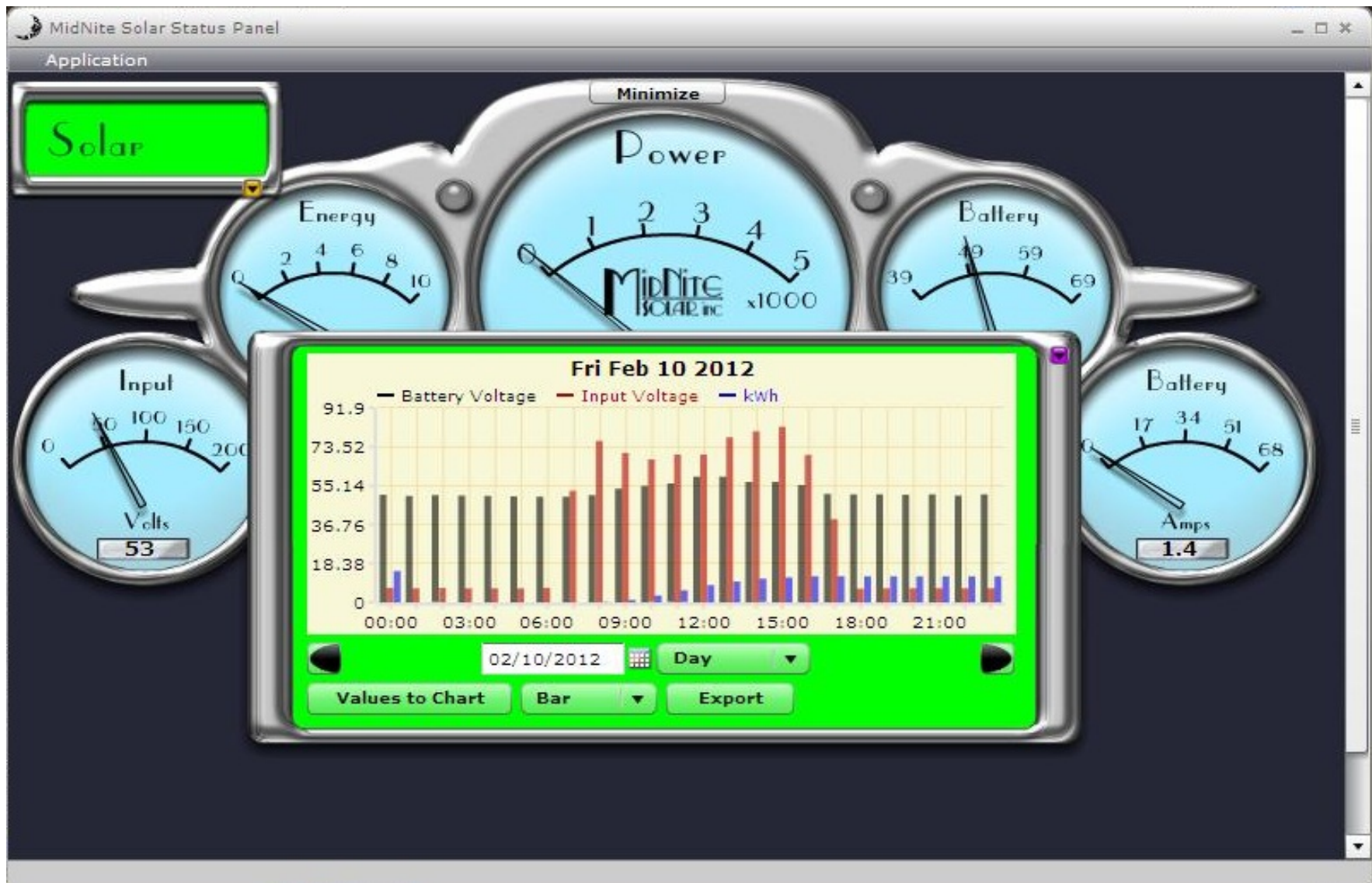
Selecting the style of Graph



Wattage for a 24hr period



More Graphing options.



2 way communications as well.



Data Logging and Graphing

The Classic logs **380 days** of data in its Daily logs.

The Classic logs data every 5 minutes in its Recent logs allowing you to view the last 24 hours.

The Classic also has graphing of this logged data available on screen as well.

New string
sizing tool
helps design
the array.
The sizing tool
also helps
determine the
best Classic
model number
to use

CLASSIC SIZING TOOL

PV Module Data

Power:	220	Watts
VOC (Open Circuit Voltage):	37.6	Volts
VMP (Maximum Power Point Voltage):	30.6	Volts
ISC: (Short Circuit Amperage)	8.22	Amps
IMP (Maximum Power Point Amperage):	7.87	Amps
VOC Temp Coef %:	0.33	C°
VMP Temp Coef %:	0.45	C°

Environmental Data

Coldest Ambient Temperature:	-30	C°
Hottest Ambient Temperature:	40	C°
Nominal Battery Volts:	48	Volts

PV Array

Number Of Modules In Series:	5	
Number Of Parallel Strings:	4	
Total Modules	20	
Rated PV Array Power:	4400	Watts
Anticipated Array Power @ 40C:	4103	Watts
Rated PV Array Current:	31.48	Amps
Battery Charging Current @ 57.6 V:	76.4	Amps
VMP (Maximum Power Point Voltage) :	153	Volts
VOC (Open Circuit Voltage):	188	Volts
VMP @ -30 C°:	191	Volts
VOC @ -30 C°:	222	Volts

Charge Controller Selection

	Classic150/Lite	Classic200/Lite	Classic250/Lite	Classic250KS
Max Operating Voltage	150	200	250	250
Max Non operating VOC (HyperVOC) @ 48V Nominal Battery Voltage	198	248	298	298
Maximum Number Of Modules In Series	3	4	5	5
Max Number Of Modules In Series (Using HyperVOC)	4	5	6	6
Max Allowable Output Current Per Classic	76	65	55	50
Based On This Current Configuration				
Max Allowable Wattage Per Classic	4438	3796	3212	2900
Based On This Current Configuration				
Present PV Array Wattage Of This Configuration	4400	4400	4400	4400

Design Check

Max VOC	TOO HIGH	MARGINAL (HyperVOC)	OK	OK
Temperature The Classic Will Enter HyperVOC	N/A	6 C°	-75 C°	-75 C°
Array Power (Wattage)	OK	EXCESSIVE	EXCESSIVE	EXCESSIVE
Classics Required	1	1.2	1.4	1.6

NOTE: MidNite Solar recommends a second controller be added after 1.2

WARNING: MidNite Solar makes no representation, warranty or assumption of liability regarding the use of the String Calculator. This tool uses data provided by other parties (such as PV module specs) and makes calculations based on assumptions which may or may not prove to be valid.

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The MidNite Solar Forum

midnitesolar.com



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Show new replies to your posts.
February 11, 2012, 12:17:55 PM

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News:
Our new Surge protection Device is now ETL listed in all 3 models

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midnitesolar.com

General Category Unread Posts

	General FAQ'S Moderator: Halfcrazy	6 Posts 3 Topics	Last post by Vic in Re: Battery manufacturer... on December 19, 2011, 06:20:13 PM
	MidNite Solar "Power Time" A series of videos documenting MidNite Solar's product line Moderators: Halfcrazy, Rob	3 Posts 2 Topics	Last post by Halfcrazy in MOVED: Distributors/ res... on February 02, 2012, 08:21:23 AM
	General Discussion Moderator: Halfcrazy	326 Posts 32 Topics	Last post by boB in Re: Ice melting feature ... on February 02, 2012, 09:30:26 AM
	System Design and Layout Moderator: Halfcrazy	93 Posts 13 Topics	Last post by Vic in Re: Request for efficien... on January 02, 2012, 10:36:06 AM

Charge Controllers and Clippers Unread Posts

	Charge controller and Clipper FAQ'S Moderator: Halfcrazy	42 Posts 20 Topics	Last post by Robin in Re: What is Hyper VOC??? on December 16, 2011, 11:01:18 PM
	Classic charge controller Moderator: Halfcrazy	1496 Posts 175 Topics	Last post by Halfcrazy in Re: Feature or bug? on Today at 09:39:40 AM
	Clipper's Moderator: Halfcrazy	101 Posts 7 Topics	Last post by Halfcrazy in Re: Status of Clipper on November 09, 2011, 05:45:10 AM

MidNite Solar Monitoring software Unread Posts

			
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Breaker sizing can be confusing

- PV input needs to be 1.25% larger than SOC
- Output sized for max output current (no derating)
- Breakers are there to protect wiring, not electronics
- The Midnite website has a page on breaker sizing that takes into consideration all variables
- The Wizard can help select proper breaker sizing too
- Call our tech support and talk to Tom or Ryan

228 VDC is the MPPT here



SolarFest 2011 - Vermont



Eight Classics by the Solar Stone



Cabot Lodge, Canada



Parallel operation

- Parallel is in development now.
Communications is via telephone cable
- No Hub required
- Available in about one week
- All MidNite controllers in the field can be upgraded to allow parallel operation by downloading new firmware

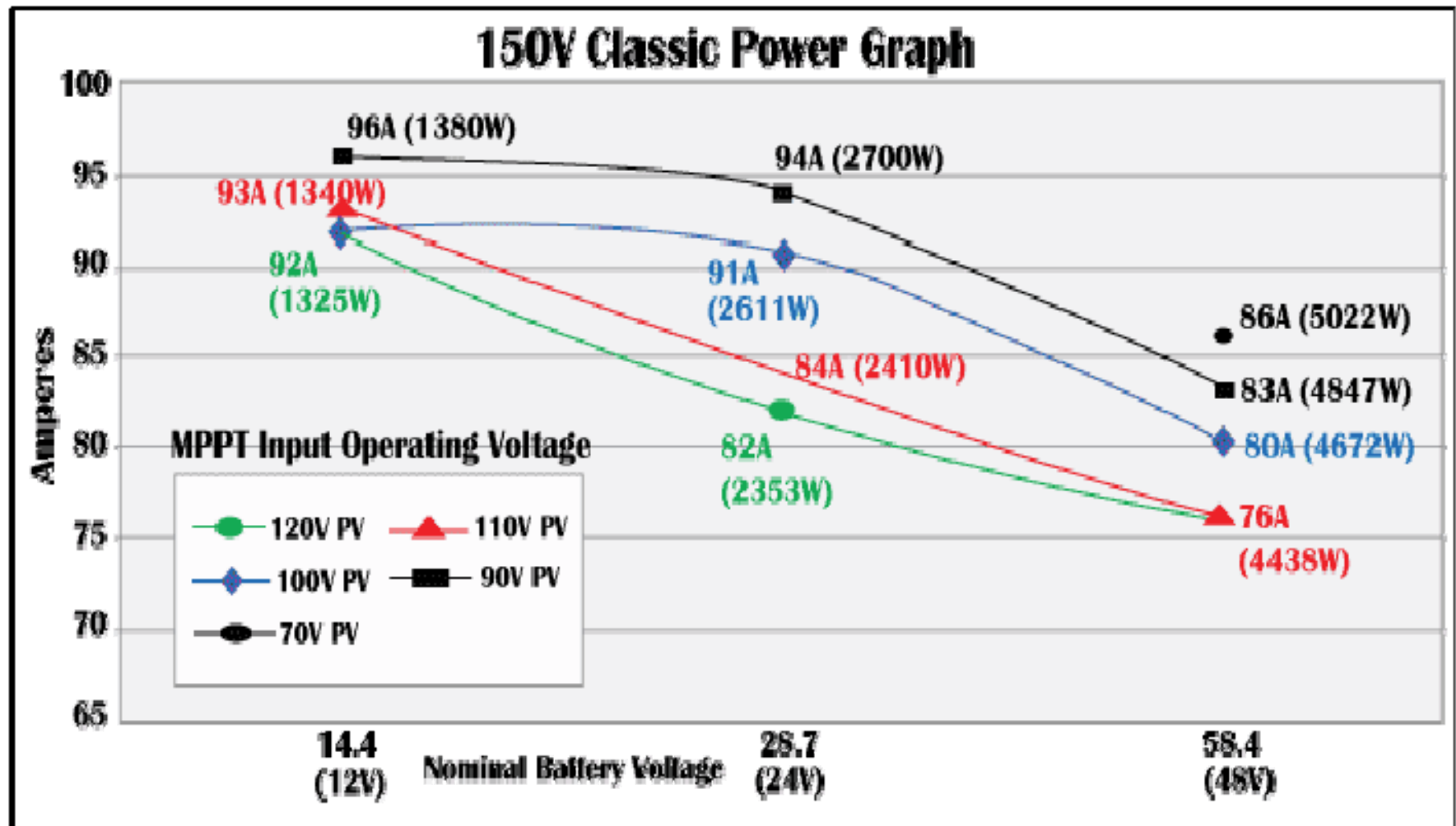
An installation in OZ



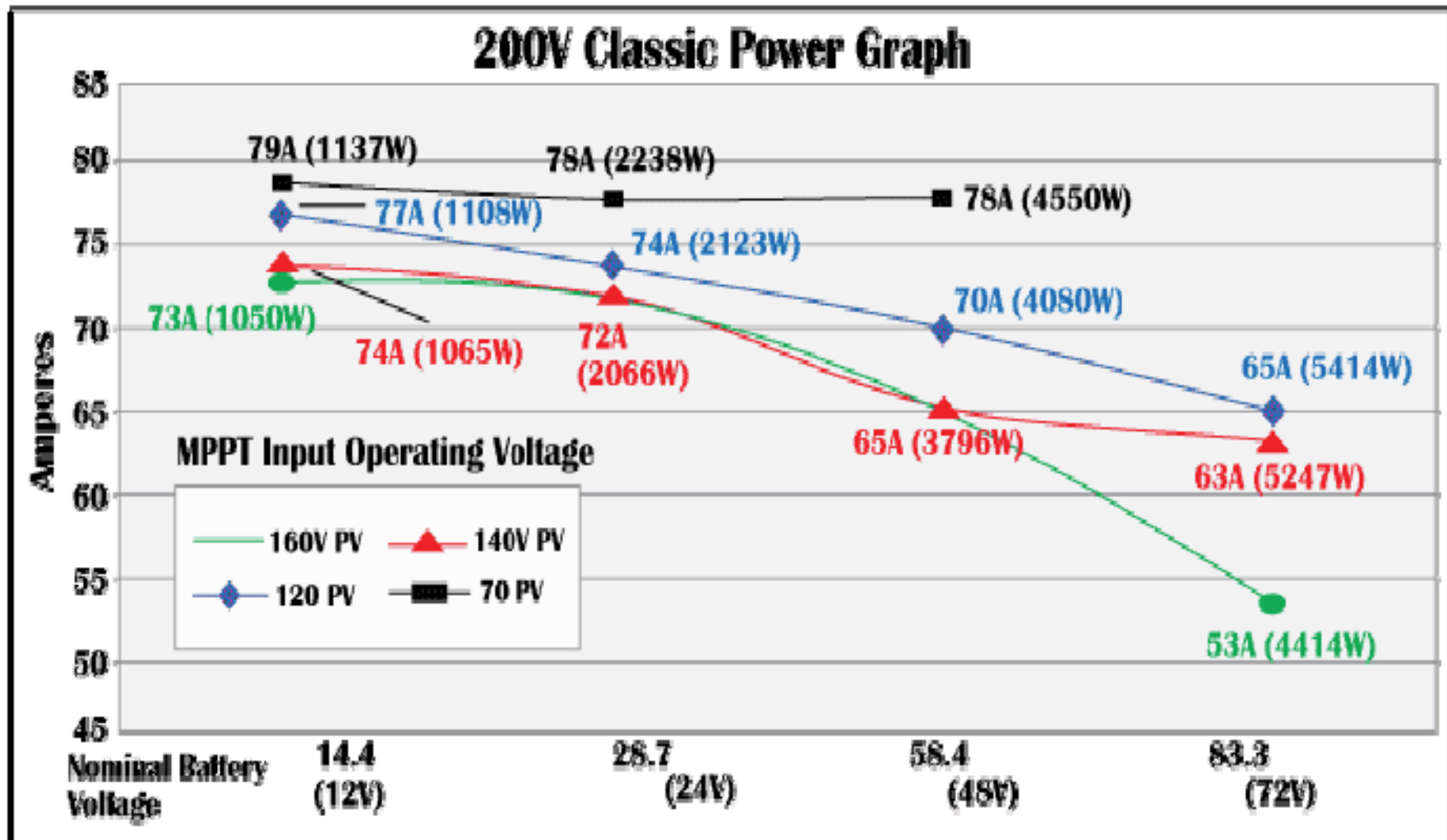
An Island off the East Coast (30 Classics)



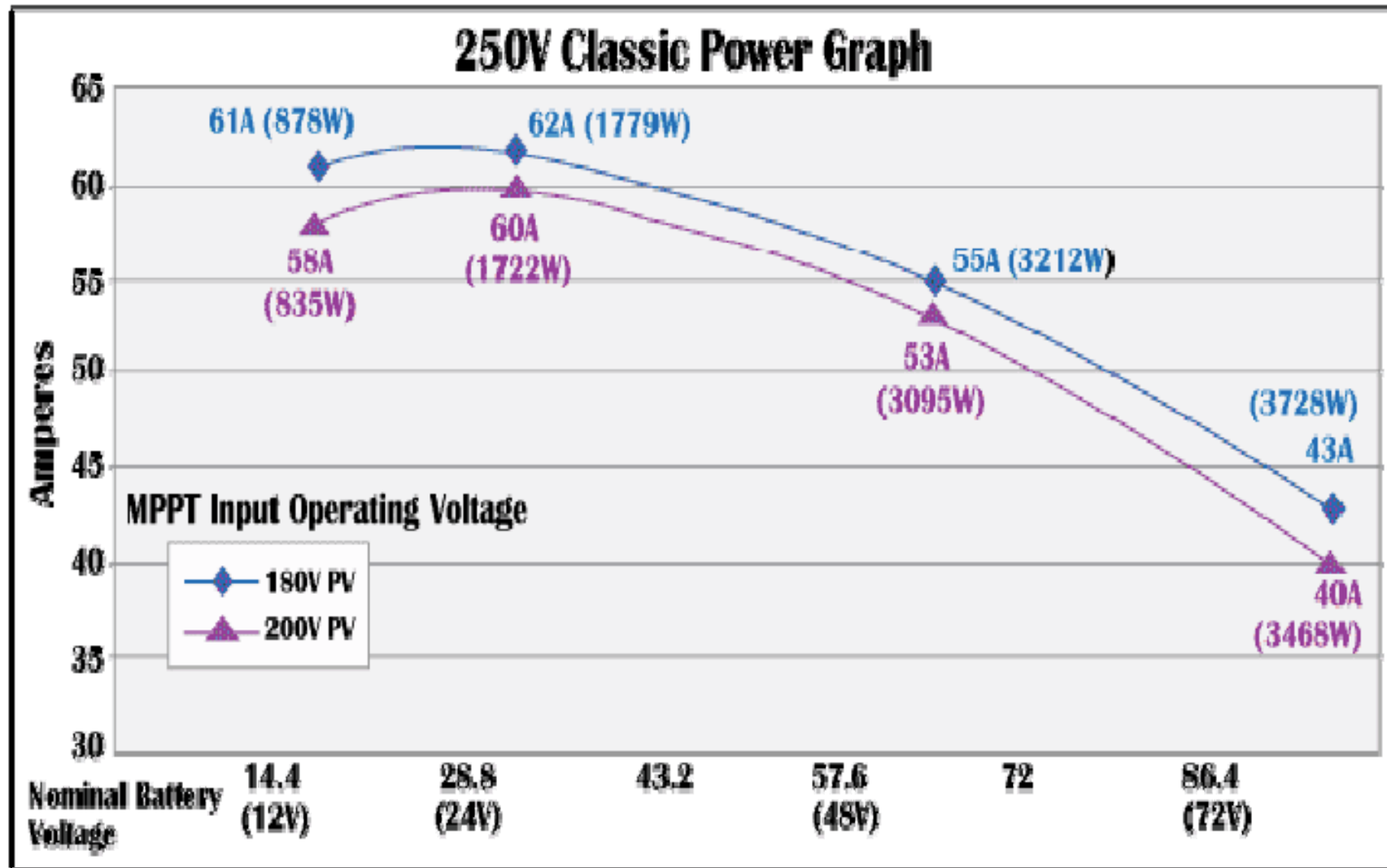
Classic 150 power graph



Classic 200 power graph

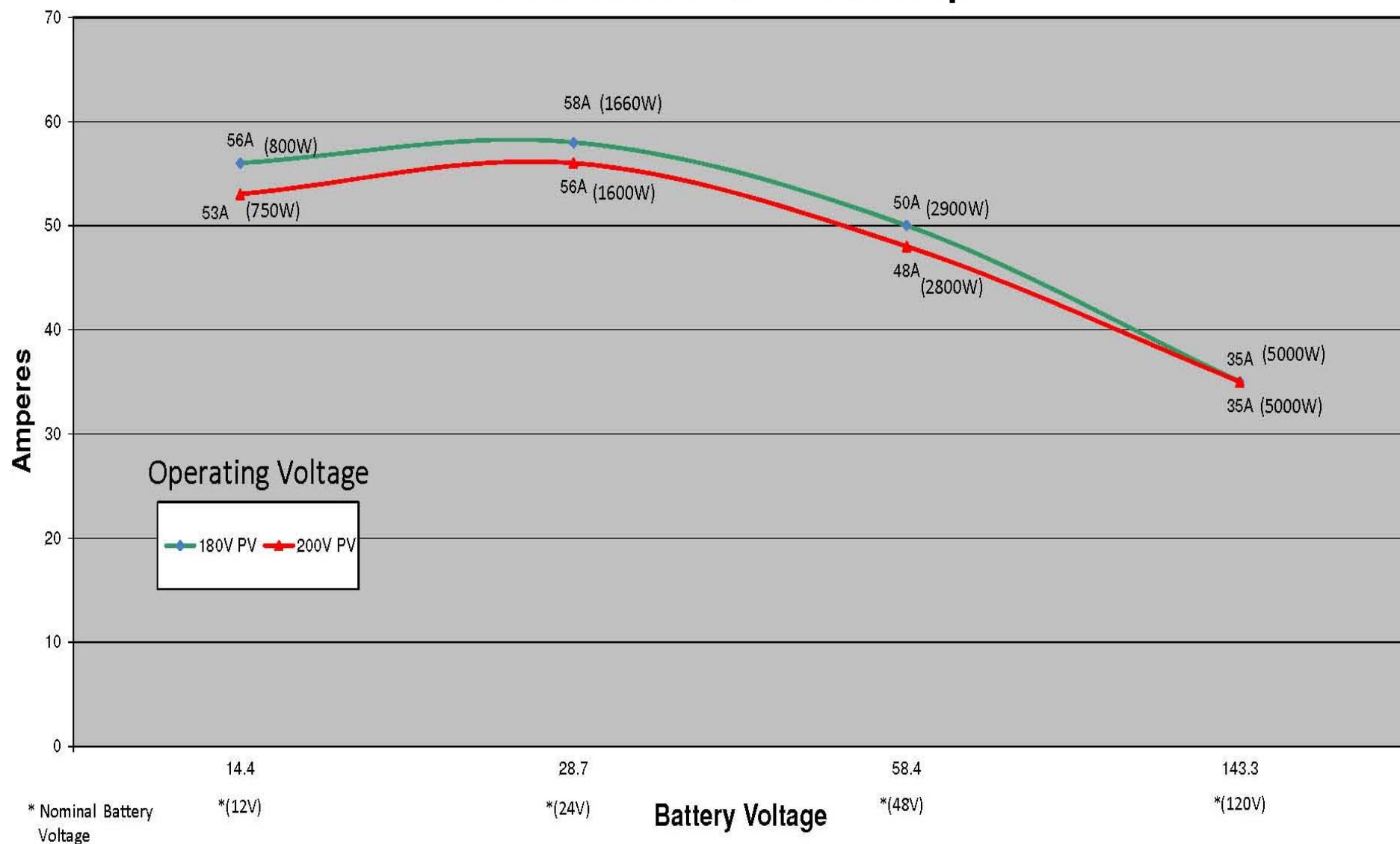


Classic 250 power graph



Classic 250KS

250VKS Classic Power Graph

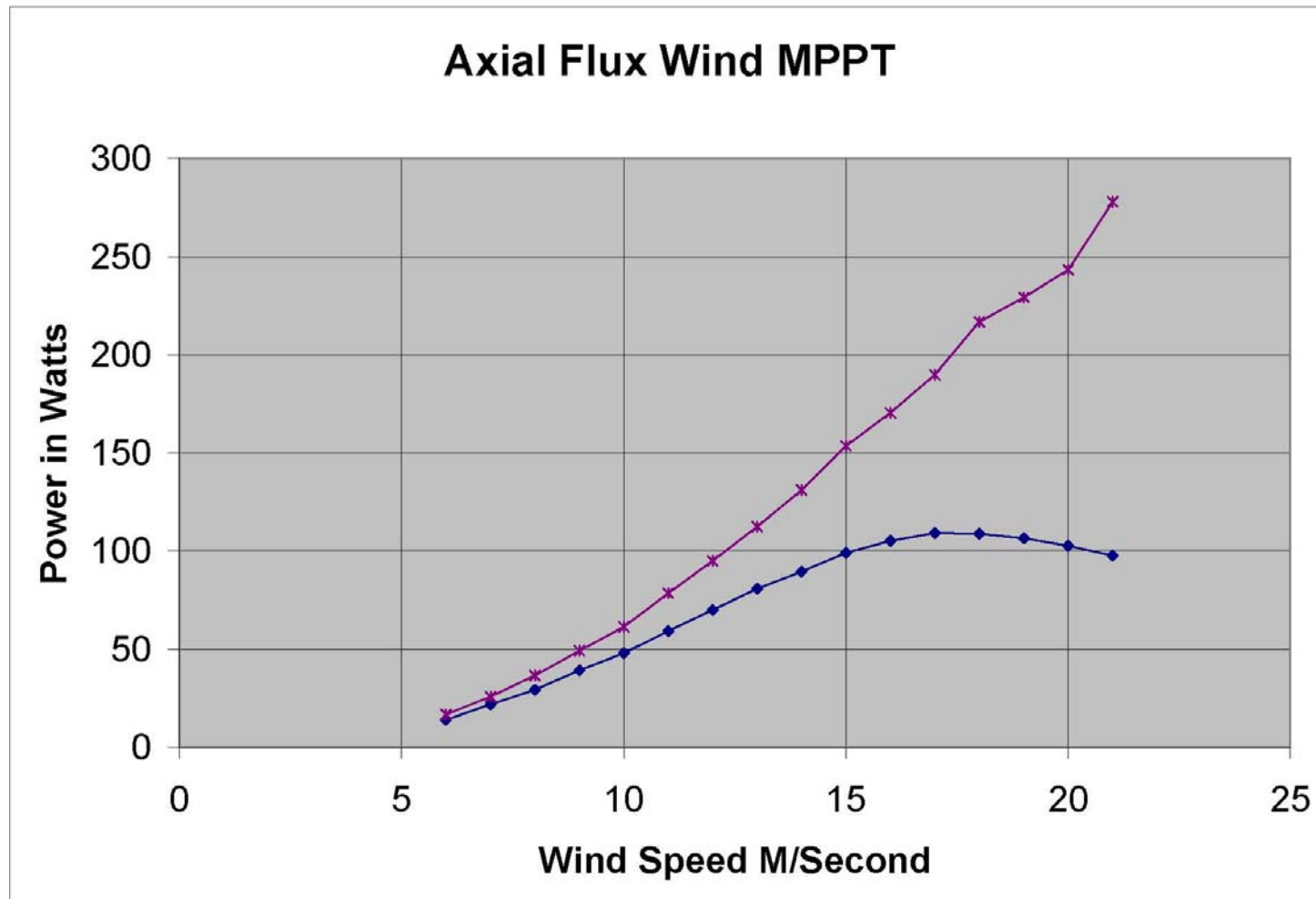


Top line = MPPT on wind turbine

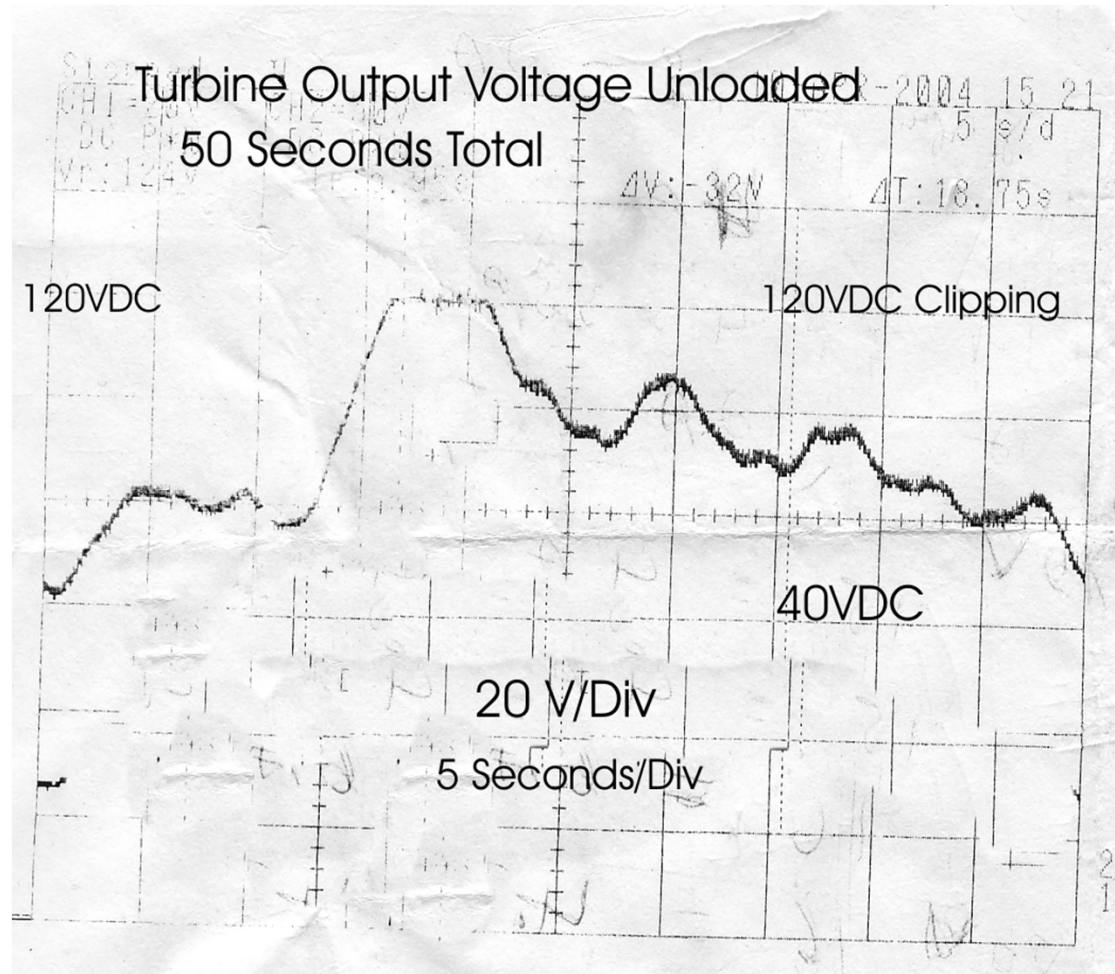
Bottom line = battery connected turbine

This graph is made from actual data – lots more power

The Classic for wind can double or triple turbine output power



This scope photo shows the wind turbine output being clipped at 120VDC.



The MidNite Clipper



Clippers

- What is a Clipper?
- A Clipper is a voltage limiter that connects up a dump load across a wind turbine or a hydro system. It does not connect the dump load across the battery as all other dump loads presently do.
- The dump load is controlled by a PWM signal to maintain a controlled load on the turbine.

Clippers

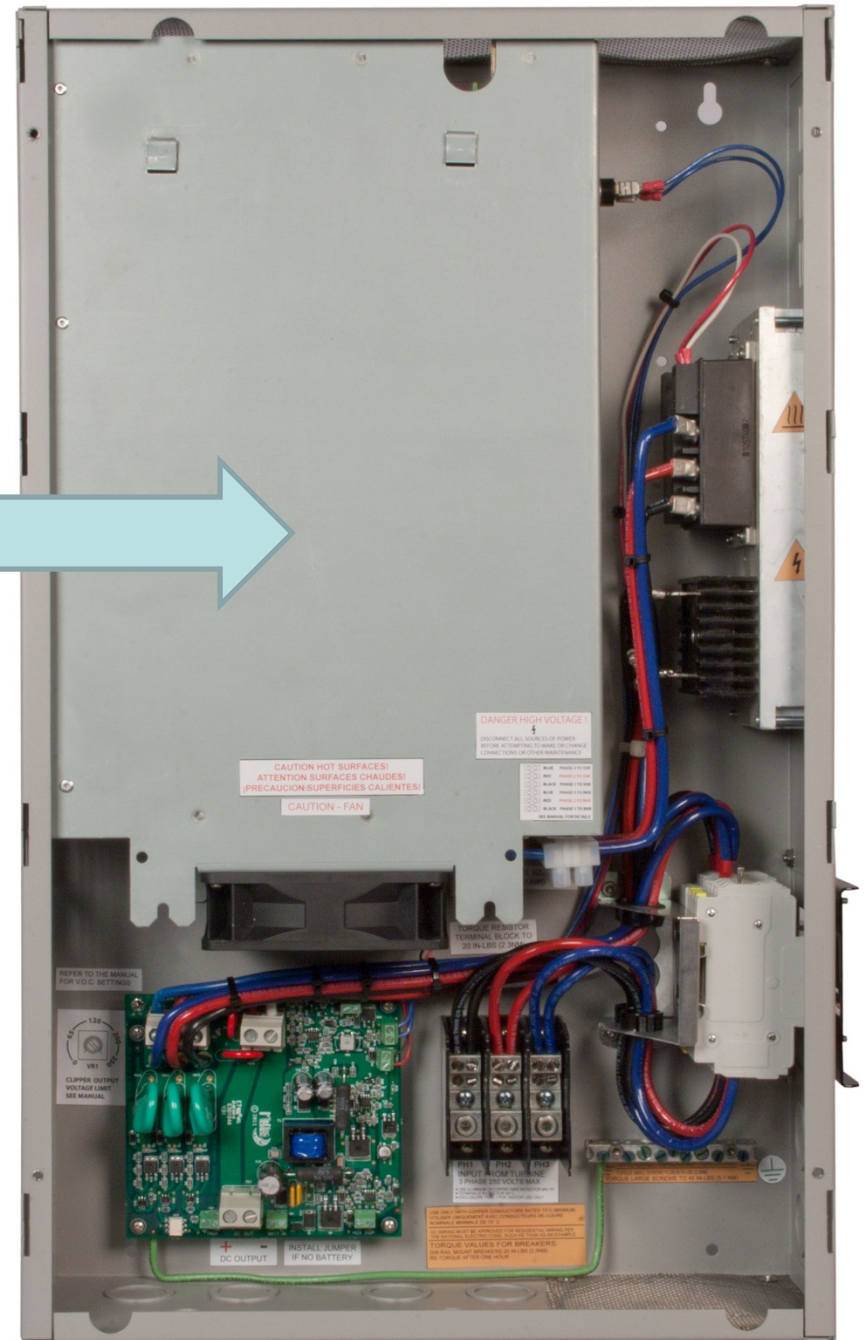
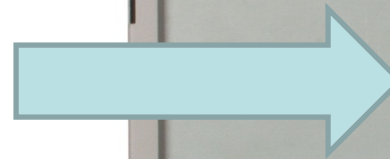
- Why do you need a Clipper?
- When the Classic is done charging the batteries, it will cease to put current into the battery. This effectively is like cutting the input to the Classic.
- When the turbine can no longer put power into the batteries, it would free wheel.
- Turbines do not like to free wheel.
- They spin very fast, make noise and throw blades. None of these are good things.

Clippers

- When the Classic is done charging batteries, it sends a signal to the Clipper to hold the batteries at a certain voltage for a while. Then it loads the turbine down further to float the batteries. It does this by lowering the output voltage of the turbine. This saves wear and tear on the turbine because it is turning slower. It also makes much less noise.

The MidNite Clipper

Dump load can
be replaced in
the field if
required to
match the
turbine



Look for
Rosie to
come
alive in an
upcoming
Classic
video



The Classic

**Most Powerful MPPT Charge Controller
In North America *With Arc Fault Detection***

The Classic MPPT Charge Controller is standing the renewable energy industry on its ear. The Classic substantially increases the flexibility, features and range currently found on MPPT controllers. Being the first MPPT controller that has Arc Fault Detection, the Classic is the safest controller available. With the Classic models ranging from 62 to 96 Amps, why would you want any other controller?

MidNite has doubled its factory floor space for production of the Classic, which means the Classic is the only major charge controller made totally in America.



The MidNite status panel allows users to monitor and control all aspects of the Classic input and output from any location with an Internet connection.

- 150, 200 and 250V operating voltages.
- 12-72V battery charging standard with models up to 120V battery bank
- Built in DC-GFP and Arc Fault Detector
- Solar, wind and hydro MPPT modes
- Set up Wizard with voice help screens
- Wizard walks you through:
 - Battery hook up
 - PV array sizing and hook up
 - Wind turbine program selection
 - Wire sizing & Voltage drop calculations
 - Breaker selection
 - PV combiner selection
 - Sunrise and sunset program set up
 - Voice enabled help & data output
- Ethernet, USB and RS232
- Remote and local displays possible
- 20 megs of data logging
- Exclusive hyperVOC™ extended VOC limits

MidNite SOLAR

CLASSIC

www.midnitesolar.com

In
Development:
Classic/Clipper
in a rainproof
casting for the
US Army.
This utilizes a
completely
solid state
Clipper.
A consumer
version will
also be
available



Midnite Solar has begun producing instructional videos on our products. We use MidNite employees for these videos, They are not solar professionals so sometimes the results are quite humorous.



We now have over a dozen short videos on the Classic alone. These videos walk you through the different features and menus of the classic. After viewing our videos, you will feel comfortable using the Classic.



Disconnecting combiners now shipping 4 to 16 strings



MNPV6 Disco combiner Micro

Combines three strings of Enphase inverters



The MidNite kitty

