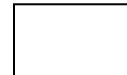




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## Classic MPPT product overview (Development status update)



As with many solar energy projects, the Classic is still in development as of this writing, so things can change. This update depicts our goals. We feel all of these goals are achievable, but no guarantees yet. The software will continue to progress and add features for the next few months. Each Classic can easily have the software upgraded via e-mail or our website downloads, so feature enhancements and bug fixes can be accomplished very quickly. Testing of wind performance will be very limited at first until the Classic load diversion package is available. This is a companion to the Classic controller that will be required for most wind turbines. It operates unlike any existing load diversion available today. Existing load diversion products cannot be retrofitted for use with the Classic.

The MidNite Solar Classic MPPT controller is destined to be the type of product that will truly change our industry. We have a very aggressive list of features that insures the Classic will be the most sought after controller ever. While other companies are playing catch up to boB Gudgel's MX60, boB is once again raising the bar in performance.

The following list of features is intended to help us gather industry input on planned and yet to be discussed features. Some of these features will certainly be modified based on

your valuable input.

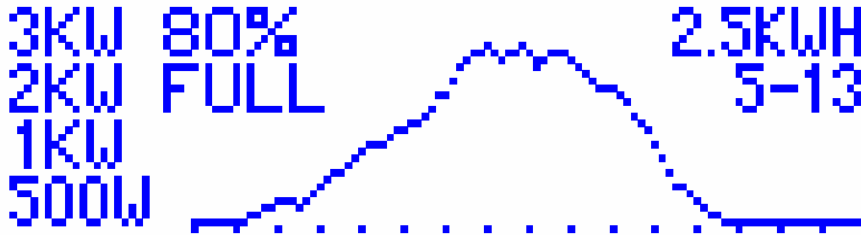
One of our best features is how it works with wind turbines. There are no MPPT's available for wind at present. Some turbines can be run unloaded and some will need a clipper diversion load that applies a load to the wind turbine to avoid damage to the turbine or the Classic.

The wind aspect of the Classic is the trickiest. It is also the kind of design challenge that us engineers love to tackle. For boB, making a great solar MPPT controller is pretty easy at this point based on the success of his MX60 design. The Classic will ship with many wind turbine model numbers already programmed in, however it is not possible for MidNite to test and program for every turbine. This necessitates that the Classic have a learning mode built in. If the model number of the specific turbine is not found in the set up menu, then the learning mode will be selected. The mechanics of how this learning mode works is proprietary and very complicated to say the least. The part of the software that governs wind MPPT is very different than that of solar. Clouds don't move as fast as gusts of wind! Wind turbines also do not have a VOC. The voltage just keep on climbing as the wind blows harder until various types of protection kick in to keep from self destruction.

## **Features:**

1. Upgradeable firmware. Due to the nature of wind turbines, we plan on releasing upgraded firmware code on our website each time a new wind turbine is verified. The process will be as simple as downloading the code into a laptop and then transferring to the Classic via the RS232 or the USB port. Yes, both are standard on each Classic. We will also support Mac. This feature is not found on any present day charge controllers.
2. Separate modes for Wind, Solar and Hydro. During set up you select the applicable mode. A set up program prompts the user for information regarding the system that will be used by the Classic or networked Trimetric later on. At least two different battery status monitor companies plan on interfacing with the Classic. The set up program already knows the system voltage but asks you to verify it. It then runs you through a series of questions that result in battery bank size, PV array size, VOC, area temperature, wind turbine mfr and model number etc. The set up program will even let you know if the PV string has too high a voltage for your area and will suggest either adding a Clipper circuit, reducing modules in each string or changing to a higher voltage version of the Classic. The set up program will also let you know how many Classics are required to run in parallel for wind turbines or solar arrays if that info exceeds the power rating of the Classic. Hydro set up is similar to Wind. This feature is not found on any present day charge controllers.
3. Parallel operation. Yes! The Classic will parallel with other Classics to act as one large controller. This means you can parallel the inputs as well as the outputs. Parallel operation does not require a Hub. This feature is not found on any present day charge controllers.

4. Remote Control: Each Classic is shipped with a dummy remote that houses a bulk and float led. The dummy remote looks exactly like the real thing so when more than one Classic is installed, they will all look the same even though there may be only one real remote. The real remote has a graphical interface rather than alpha numeric and may be located as far as 1000 feet away. The graphics will allow for some pretty interesting displays. Here is an example of one possible screen.



This screen creates the graph shown in ten minute intervals. So, every ten minutes, it draws one more dot on the screen. Each horizontal dot along the bottom designates one hour. The 80% full is fed to the remote from a new version of the popular Bogart Engineering Trimetric, Pentametric or other battery status monitor if installed. The top right is a running total of KWH or amp hours produced during the day. That number will be updated every ten minutes also. The date is shown below KWH numbers. The Classic/remote stores many days worth of these graphs. This information is available for downloading to a PC. The best thing about the Remote display is that the basic Classic is not saddled with the expense of a display. This feature is not presently available on any MPPT charge controllers. Inside each Classic are pots for adjusting Bulk and Float as well as voltage selection like was done on the Trace C-40.

5. Networking: Multiple Classics can be networked together using a normal 6 conductor phone cord or possibly Cat3 cable. No Hub required. As the Classic family grows, you will be able to network and even parallel 30 amp Classics with a 60 amp unit. Networking with a Bogart or other amp hour meters will improve the charging system parameters due to increased information. The Classic Remote will also be able to help program the Trimetric meter for ease of set up. This feature is not found on any present day charge controllers.

6. Aux outputs: There are two aux outputs. One dry contact relay with a 1 amp rating (internally protected from over current). The other is a 12V output that can also be configured as an input; there will be numerous ways to program these inputs and outputs. Your comments are valuable here. One use will be to hook up an anemometer to the input. This feature is not found on any present day charge controllers.

7. High voltage version: A 200 volt version (and possibly higher) will be available shortly after the initial 150 volt versions. 250 volt din rail mount breakers are in development that will go up to at least 100 amps. This feature is not found on any present day charge controllers.

8. Environment: Each Classic comes with snap on covers that allow the unit to be ether sealed from salt air like in Hawaii or vented for more boring climates. For instance in Arizona you would want to have the unit configured as a vented controller for higher output power and cooler operation. The Classic will operate very well in extremely hot or cold environments. This feature is not found on any present day charge controllers.

9. Automatic power save mode at lower power levels greatly improves low power performance. Relay clicking is minimized also. This feature is not found on any present day charge controllers. Controllers can spend as much as 20% of their time in this mode.

10. An installer reimbursement program is planned to qualified installers. **Restrictions apply!** This is not a fake future discount program, but a real check sent out to the installer under certain circumstances. This program is not found with any present day charge controllers.

11. Languages: since the firmware is downloadable, we will be offering the menus in numerous languages. Translators welcome! This feature is not found on any present day charge controllers. The menu text will be available via our website for translators use.

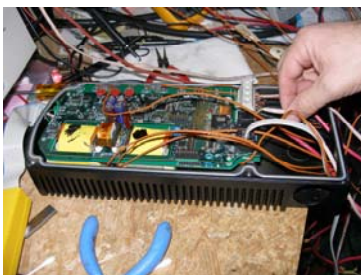
12. Boost or Buck: MPPT controllers take a high voltage and buck it down to the battery voltage. What if you want to go the other direction and charge a 24 volt battery from a 12 volt battery? No problem. The Classic can be configured as a boost converter too. This feature is not found on any present day charge controller.

13. Battery voltage range: The battery voltage supported on the basic Classic is from a 12V to possibly 72V battery bank. 72 volts is becoming a standard for basically golf carts on steroids. 72 volts is not supported by any present day MPPT charge controllers.

14. Instructions: We have heard the industry loud and clear to make the menu structure simple. Every attempt will be made to do so. Most users make an attempt to read the instructions, however we realize that sometimes this stuff is just too hard to digest. We will be making a DVD video that walks you through each and every detail of the Classic, the setup, operation hook up etc. Our video probably won't win an Oscar, but it should get a user past the intimidation factor should opening the manual become necessary. We are breaking new ground here too.

15. Cosmetics: The Classic is just about the coolest looking product in the industry. The use of solid model technology makes fancy castings and injection molded parts possible at no more cost than simple sheet metal ones. In fact, the Classic would have been much larger, more costly and with lesser performance had it been done with sheet metal and extruded aluminum heat sinks. The COOLNESS factor of the Classic just leaves all other present day charge controllers in the dust. The guys at MidNite have had a major impact at improving cosmetic features (as well as performance) of renewable energy equipment at Trace, Xantrex, OutBack, Magnum Energy and now Midnite. We are continuously breaking new ground on the cosmetics front. We hope you like Art Deco! Midnite conducts training throughout North America and will exhibit at numerous major energy fairs, so if you get the chance please stop by for a first hand look at the Classic.

Thank you,  
Robin Gudgel



Classic undergoing thermal power testing in the lab. Unfortunately the first castings have ejector pin marks (holes) directly underneath the FET power transistors, so we are not yet able to tell how much power the Classic is good for . Even with that, it was impressive though.

