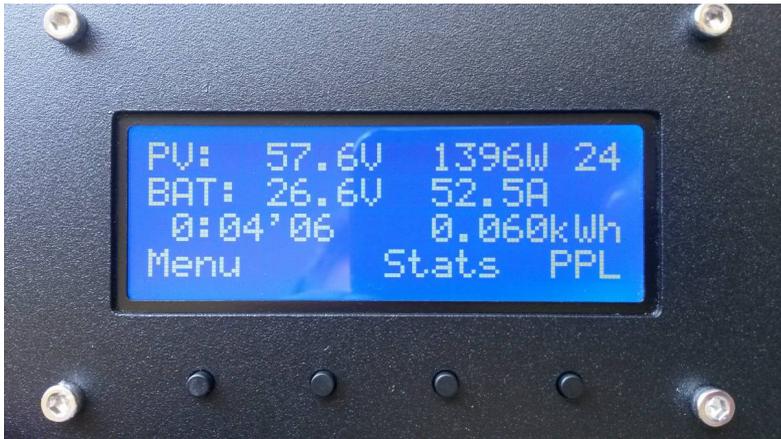


WRND MPPT

ProSeries

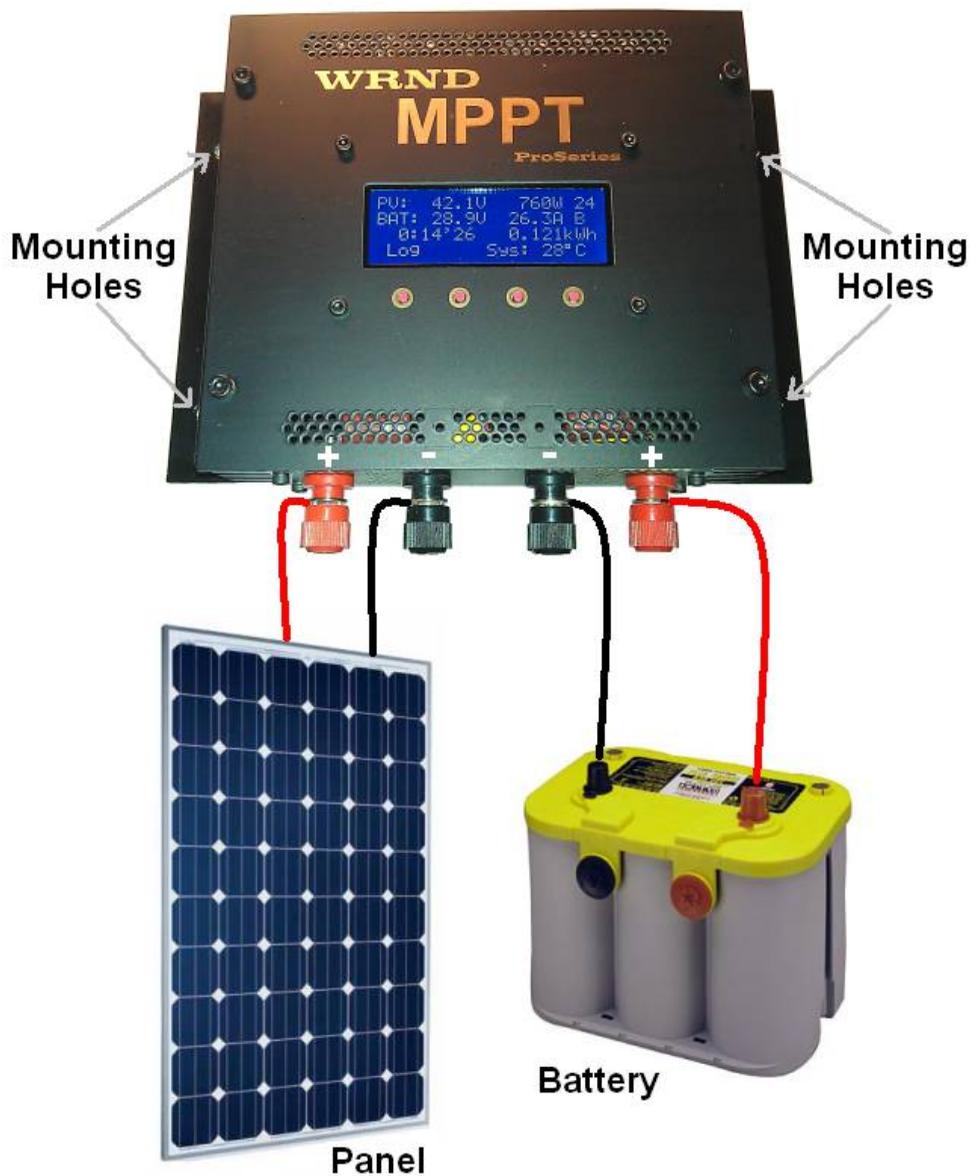


USER MANUAL

TABLE OF CONTENT

INSTALLATION.....	3
CHARGING STAGES.....	5
START-UP SCREEN.....	6
HOME SCREEN.....	7
MAIN MENU.....	8
LOG HISTORY.....	9
STATISTICS.....	9
SETTINGS.....	11
SETTING: FLOAT CHARGING.....	11
SETTING: BOOST CHARGING.....	12
SETTING: EQUALIZE CHARGING.....	13
CHANGE CODE.....	14
WARRANTY.....	17

INSTALLATION



Use the four mounting holes to fix the MPPT in an upright position allowing for convection cooling across the fins. Also, be sure not to block any of the fins or vents of the MPPT. An internal temperature sensor will protect the MPPT from overheating, but performance may be limited if the MPPT is not allowed to vent to the surrounding area.

Disconnect any form of charger or load from the battery and allow it to settle for 2 minutes. Use a multi meter to verify that the battery are near its nominal voltage. The MPPT will automatically select the nominal system voltage at start-up as either 12V or 24V for the 12/24V product range or 12V, 24V, 36V or 48V for the 12/24/36/48V range of products. The MPPT selects the nominal voltage according to the following table:

Nominal 12V system if battery is less than 18.0V

Nominal 24V system if battery is between 18.0V and 31.4V

Nominal 36V system if battery is between 31.5V and 41.9V

Nominal 48V system if battery is more than 42.0V

Connect the battery to the terminals marked 'BATTERY' on the MPPT. Positive (+) to the red terminal marked with + and the negative (-) to the black terminal marked with - .Be sure to use the correct size lugs and supplied washers. Also tighten the terminals properly to prevent damage or a fire hazard due to loose connection. The MPPT should now power up.

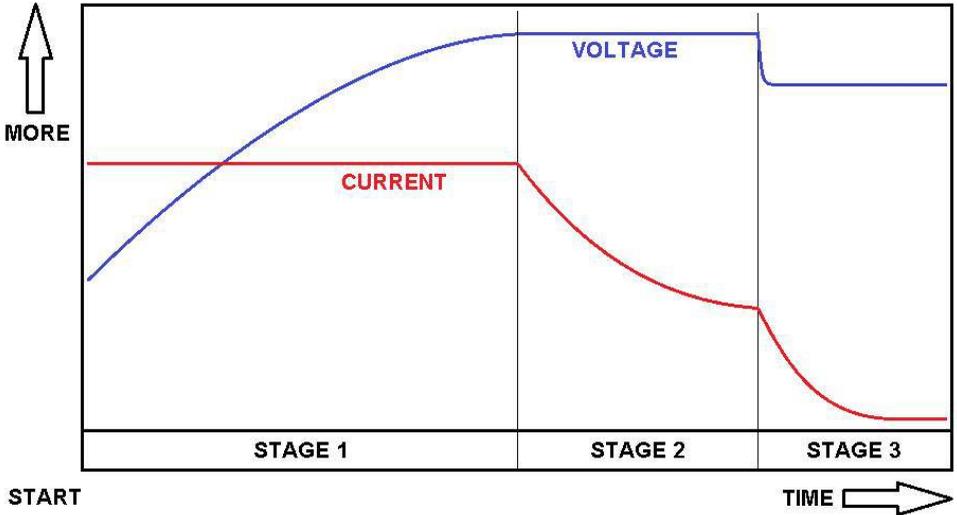
WARNING! DO NOT REVERSE THE POLARITIES!

Connect the panel to the terminals marked 'PANEL' on the MPPT. Positive (+) to the red terminal marked with + and the negative (-) to the black terminal marked with - . Be sure to use the correct size lugs and supplied washers. Also tighten the terminals properly to prevent damage or a fire hazard due to loose connection.

WARNING! DO NOT REVERSE THE POLARITIES!

If there is input from the panel(s) the MPPT will start tracking. Note: This may take a minute or two.

CHARGING STAGES



The WRND MPPT charge controllers employ three basic charging stages:

Stage 1 – Bulk charging ('PPT' or 'PPL' indicated on LCD)

Stage 2 – Boost or Equalize charging ('Bst' or 'Equ' indicated on LCD)

Stage 3 – Float charging ('Flt' indicated on LCD)

NOTE: The unit will often jump back and forth between Stage 1 and Stage 2/3. This happens during the change over time between charging stages, when variable loads are connected to the battery bank or on cloudy days (variable input from the solar panels)

Stage 1 (bulk charge) is entered as soon as the sun rises and provides sufficient energy to the solar panels to start charging. During this stage the MPPT function is used to track and supply the maximum available current to the battery. About 80% of the total charge is replaced during this stage.

Stage 2 (Boost or equalize charging) commences when the battery voltage reaches preset values (see 'SETTING' section in this document). The unit will limit the current to the battery in order to maintain a constant battery voltage during this stage.

Stage 3 (Float charging) is entered after a preset boost/equalize time or current is reached and the battery is considered to be almost fully charged. This stage is to maintain the batteries in a charged state without overstressing them.

START-UP SCREEN



When power is connected to the unit it should briefly display a start-up screen similar to the one above. The model number in this instance is WMP2404A which indicates this unit is a 12/24V, 40A unit. This code will be different for other models according to the following table:

WMP2404A – 12/24V, 40A
WMP2406A – 12/24V, 60A
WMP2408A – 12/24V, 80A
WMP2410A – 12/24V, 100A
WMP2412A – 12/24V, 120A

WMP4803A – 12/24/36/48V, 30A
WMP4806A – 12/24/36/48V, 60A
WMP4809A – 12/24/36/48V, 90A
WMP4812A – 12/24/36/48V, 120A

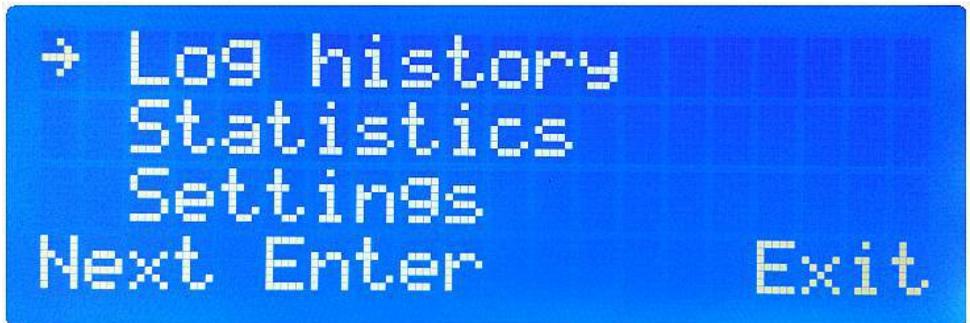
HOME SCREEN



- 1) **PANEL VOLTAGE** (Shown above as 'PV: 33.3V'): Is the voltage of the PV panel as measured at the PV terminals of the MPPT. This reading will display '---' if the voltage is less than the battery voltage.
- 2) **POWER** (Shown above as '245W'): Displays the power (in Watt) being converted from the panels into the batteries and is calculated as the battery voltage x the battery current.
- 3) **SYSTEM SELECT** (Shown above as '12'): Indicates the nominal voltage of the battery or battery bank connected to the MPPT. The MPPT auto selects the system voltage at start-up.
- 4) **BATTERY VOLTAGE** (Shown above as 'BAT: 13.0V'): Indicates the voltage of the battery as measured at the battery terminals of the MPPT.
- 5) **BATTERY CURRENT** (Shown above as '18.9A'): Displays the charging current supplied to the battery under charging conditions.
- 6) **TIMER** (Shown above as '0:00'41'): Indicate the amount of time the MPPT received power from the panels during a particular day. If no power is received the timer will stop running until the power increases again. This allows the user to see the exact time of sun exposure during a given day. If no power is received for 30 consecutive minutes the 'Drk' will appear at the state indicator to indicate 'Day end' and all value will be reset on the next detection of input voltage (start of next day).
- 7) **KILOWATT HOUR COUNTER** (Shown above as '0.002kWh'): Display the amount of kWh throughput for the current day.

- 8) 'Menu': Indicates the function of the button below it and will enter the main menu if pressed.
- 9) 'Stats': Is a short cut key to the STATISTICS menu.
- 10) STATE INDICATORS (Shown above as 'PPL'):
- Off – No input voltage, power circuit in off state
 - PPT – Power Point Tracking (Searching for maximum power point)
 - PPL – Power Point Locked in
 - Bst – Boost charging
 - Flt – Float charging
 - Equ – Equalize charging
 - IMx – Preset maximum charging current reached.
 - OvL – Over voltage / current condition (OverLoad), wait 1 minute
 - Drk – Indicates the day end / solar panels dark
 - Low – Battery voltage to low for charging (power circuit turns off)
 - Tmx – Over temperature (allow unit to cool down, check ventilation)

MAIN MENU



Press the 'Menu' key on the home screen to enter this menu. This key will now read 'Next'. Press 'Next' to go to the next item down the list or until the menu exits back to the main screen.

Press the 'Enter' key to select an item on the menu.

Press the 'Exit' key to return to the main screen.

If no key is pressed for 60 seconds the MPPT will automatically return to the home screen. This applies to all menus.

LOG HISTORY

Shown below: the run time ('0h04'), maximum solar panel power ('PV 248Wmx'), maximum battery voltage ('Bat 13.1Vmx'), minimum battery voltage ('12.2Vmin'), kWh ('0.011kWh') and ampere hour charge ('0.9Ah') for the current day is automatically saved before the start of a new day and stored to the top of the log history. The log contains entries for the last 31 consecutive days. The information in the log is retained even if the MPPT loses power.



To recall an entry go to: MENU > LOG HISTORY

Use the 'Menu' key to return to the menu.

Use the '<<<' key to recall newer entries.

Use the '>>>' key to recall older entries.

Use the 'Exit' key to return to the home screen.

STATISTICS

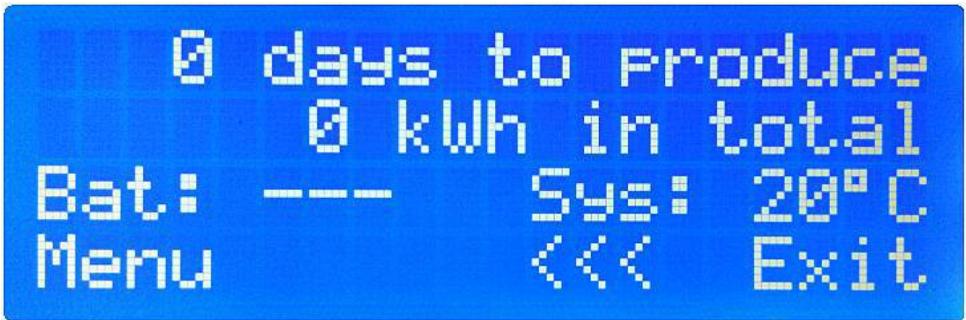
There are two statistics screens that can be accessed by pressing the 'Stats' key on the home screen or by going to: MENU > STATISTICS.

The first screen gives the maximum solar panel power (shown below as 'PV 248Wmx'), maximum and minimum battery voltages (shown below as 'Bat 13.1Vmx 12.9Vmin'), maximum current into the battery (shown below as '19.0Amx') and the ampere hour charge (shown below as '0.7Ah') for the current day.

These value can be reset at any time but note that this information will be permanently lost.



The second screen gives the total days the MPPT has completed along with the total kWh for those days. These values can not be reset and will be retained even if the MPPT loses power. Also indicated on this screen is the battery and system temperature. If there are no battery temperature sensor installed this reading will be '---'



Use 'Menu' to return to the menu.

Press 'Reset' key to reset these values.

Use the '>>>' key to go to the second statistics screen.

Use 'Exit' to return to the home screen.

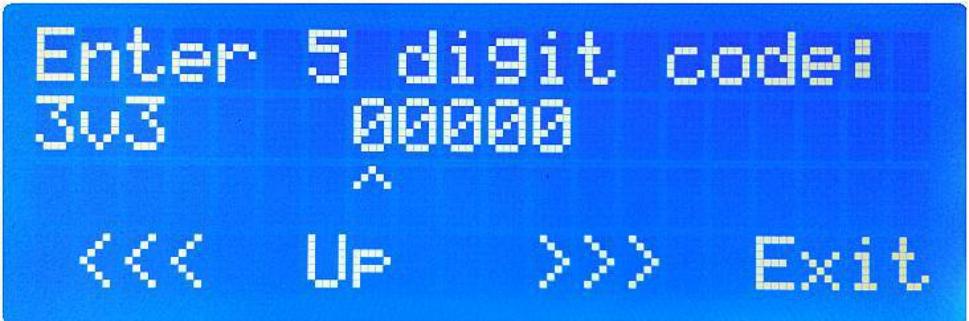
Use the '<<<' key to go to the second statistics screen.

SETTINGS

Various operating parameters may be set by the user in order to achieve optimum system performance. These parameters are contained in the settings menu. To access this menu go to: MENU > SETTINGS.

The user will now be prompted to enter a 5 digit code the **default code is 00000** (all zeros). If the code was changed by the user please use that code. (To change the code see section: CHANGE CODE below.)

Also indicated, as reference, is the software version in use (shown below as '3v3')



Press the '>>>' key to go to the next digit until the last digit is reached. Then press it one more time to submit the code. If the code is correct the settings screen will appear as seen below. If not the user will be prompted to enter the code again.

Press the '<<<' key to go to the previous digit.

Press the 'Up' key to change the digit value.

Use 'Exit' to return to the home screen.

SETTING: FLOAT CHARGING

The float voltage setting (shown below as 'Float volt 13.9V') is the voltage limit used during the float charging stage (see section: CHARGING STAGES) and may be set by the user according to their particular battery requirements (please consult the battery user manual or contact the battery manufacturer).

The current limit is the maximum charging current the unit will supply to the battery. This setting should be set according to the battery connected. Refer to the battery's manual or contact the supplier for this value if necessary. If this limit is reached an 'IMx' will be displayed at the state indicator on the home screen.

At this limit the battery will decrease the current in order to maintain this voltage level. If the battery is below this limit the battery will be charged at the maximum possible current. The state indicator will display 'Flt' to indicate this limit has been reached.

The battery temperature limit protects the battery from overheating due to charging. In order for this to work a optional battery temperature sensor needs to be installed. It is only necessary to install this sensor in certain instances. For more information please contact WRND.



Press the NEXT key to select the menu function to change.

Press the + key to increase the value.

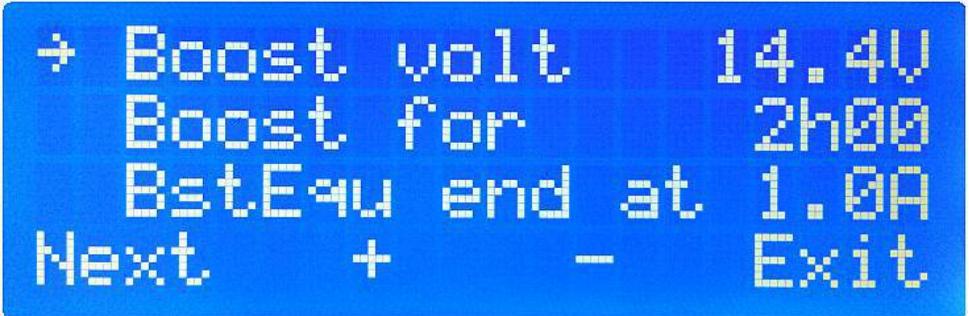
Press the – key to decrease the value.

Press 'Exit' to return to the home screen.

SETTING: BOOST CHARGING

In order to fully charge the battery the charge voltage needs to be sufficient. However, keeping the charge voltage unnecessarily high could cause gassing to occur. Once the batteries are charged it is best to only maintain them at a float voltage (see previous section).

The boost charging setting determines the parameters used to fully charge the battery on a daily basis. Boost charging will commence once the battery voltage reaches the limit set below as 'Boost volt 14.4V'. The unit will maintain this voltage for a given time (shown below as 'Boost for 2h00') or until the minimum charging current (shown below as 'BstEqu end at 1.0A') is reached. NOTE: This charging current limit is also used for equalize charging (see next section). When the timer runs out or the minimum charging current is reached the unit will revert to float charging (see previous section).



Press the 'Next' key to select the menu function to change.

Press the '+' key to increase the value.

Press the '-' key to decrease the value.

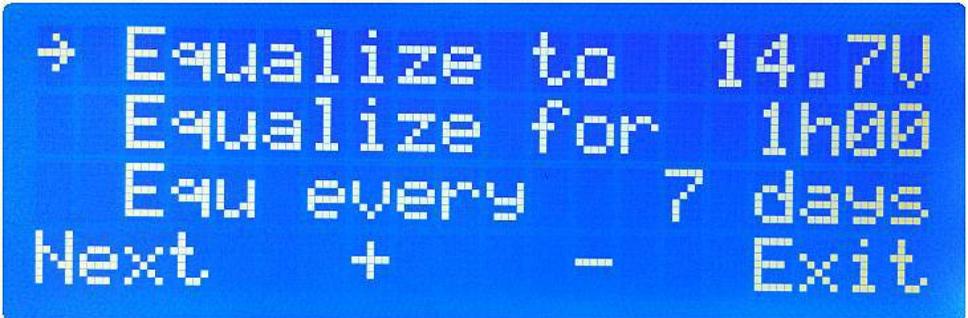
Press 'Exit' to return to the home screen.

SETTING: EQUALIZE CHARGING

In order to extend the life of the batteries it is necessary to equalize the cells inside it periodically. This is done by increasing the battery voltage beyond the normal charging conditions for a limited time. Refer to the battery manual or contact the battery supplier for the specific settings for the connected battery. To cancel this function set the equalize voltage to the same value as the boost limit referred to in the BOOST CHARGING SETTINGS section above.

Equalization will not be done every day. This is determined by the day interval setting (shown below as 'Equ every 7 days'). On the equalize day the battery charging limit will be increased to the equalize voltage (shown below as 'Equalize to 14.7V'). Once this voltage is reached a count down timer is started.

The amount of time the unit charges in equalize mode is defined and shown below as 'Equalize for 1h00'). When the count down is done the equalization routine is complete and MPPT will revert to using the boost or float charging limit.



Press the 'Next' key to select the menu function to change.

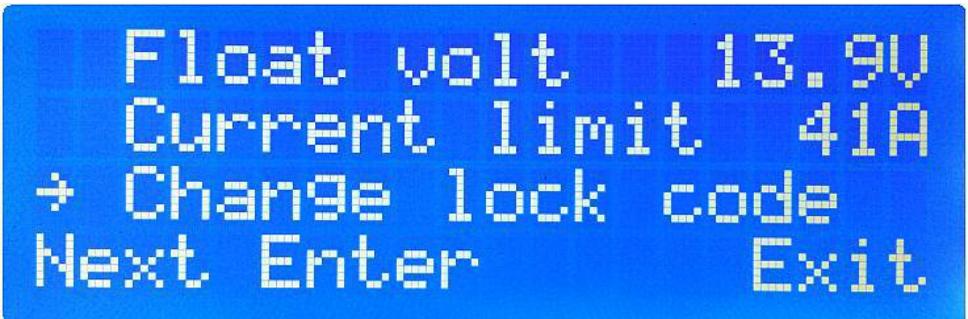
Press the '+' key to increase the value.

Press the '-' key to decrease the value.

Press 'Exit' to return to the home screen.

CHANGE CODE

To change the lock code go to: MENU > SETTINGS > CHANGE LOCK CODE and press the 'Enter' key.



The user will now be prompted to enter the new 5 digit code.

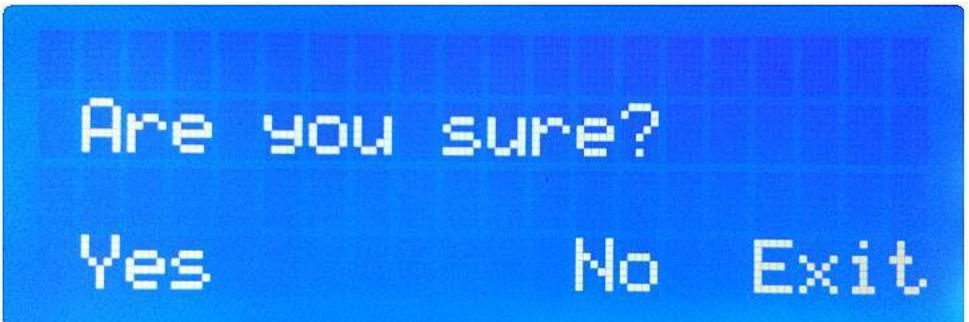


Press the UP key to change the digit value.

Press the >>> key to move to the next value.

Press the <<< key to move to the previous value.

Once the user has entered the new code press the >>> key to until prompted:



Press 'Yes' to accept and save the new code.

Press 'No' to go back to the change code lock screen.

Press 'Exit' to return to the home screen with out changing the code.

NOTE: Once the code is changed the previous code will no longer work. Be sure to record the new code and keep it safe for future reference. If the new code is lost the MPPT will have to be sent back to WRND to reset – all information will be lost. This service and all costs involved will be for the account of the user.

Thank you for your purchase
Enjoy the product

WARRANTY

Two Year Limited Warranty

WRND Manufacturing cc (“WRND”) provides a two-year (2) limited warranty (“Warranty”) against defects in materials and workmanship for its ProSeries MPPT Charge Controller (“Product”). The term of this Warranty begins on the Product(s) initial purchase date, or the date of receipt of the Product(s) by the end user, whichever is later. This must be indicated on the invoice, bill of sale, and/or warranty registration submitted to WRND. This Warranty applies to the original WRND Product purchaser, and is transferable only if the Product remains installed in the original use location. The warranty does not apply to any Product or Product part that has been modified or damaged by the following:

- Installation or Removal;
- Alteration or Disassembly;
- Normal Wear and Tear;
- Accident or Abuse;
- Corrosion;
- Lightning;
- Repair or service provided by an unauthorized repair facility;
- Operation or installation contrary to manufacturer product instructions;
- Fire, Floods or Acts of God;
- Shipping or Transportation;
- Incidental or consequential damage caused by other components of the power system;
- Any product whose serial number has been altered, defaced or removed;
- Any other event not foreseeable by WRND.

WRND’s liability for any defective Product, or any Product part, shall be limited to the repair or replacement of the Product, at WRND’s discretion. WRND does not warrant or guarantee workmanship performed by any person or firm installing its Products. This Warranty does not cover the costs of installation, removal, shipping (except as described below), or reinstallation of Products or parts of Products.

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