# Return Serial Number Sheet to NeoVolta Inc.

Technical Support: **NeoVolta at (858) 226-4936 Mon-Fri, 8am-5pm PST**

**Return this Filled in Sheet to NeoVolta: Office@NeoVolta.com or Text (858) 218-5942**

**Installer (Company): _____**

| Installed Component | Serial Number |
|---|---|
| NV14 (left side by disconnect) | |
| Inverter (left side by green push button) | |
| WiFi logger (on logger and box) | |
| Battery 1 (upper left) NV14 | |
| Battery 2 (lower left) NV14 | |
| Battery 3 (lower right) NV14 | |
| | |
| NV24 (left side of cabinet) | |
| NV24 Battery 4 (bottom shelf) | |
| NV24 Battery 5 (top shelf) | |

**Homeowner Information:**

**Name (First and Last): _____**

**Phone Number: _____**

**Email: _____**

**Street Address: _____**

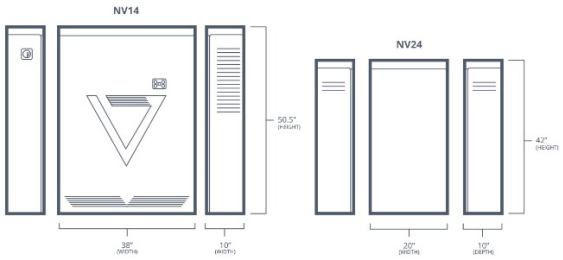
**City, State, and Zip Code: _____**

**Date Installed: _____**

**Installed Inside or Outside? _____**

**Zero Export to CT? _____** **Battery Reserve %?_____**

# NeoVolta NV14 and NV24 Quick Install Instructions




## PHYSICAL INSTALL OF NV14 and/or NV24

- Determine location of NV14 and/or NV24 unit and Critical Load Subpanel.
    - The NV14 needs **4 inches** of clearance on the left side (Disconnect assess) and **4 inches** of clearance on the right side for heat exhaust.
    - If installing NV24, it needs to be no closer than Four inches and no further than two feet from the NV14 (left, right, or opposite side of wall).
- NV14 (570 pounds) and/or NV24 (270 pounds) must be mounted on solid foundation (concrete, pavers, etc.) to support the weight. Do not mount off of the ground.
- Add tandem 2-pole 40 Amp breakers to the main service panel and connect to the NV14 Utility Grid Input PASS THROUGH using conduit/wire. No breaker, simply two positive 120 V and one neutral to the passthroughs. Add the MSP ground connection to the upper right ground bar inside the NV14. You can pull the Current Transformer (CT) wires through this same conduit.
- Connect AC solar to the NV14 PV AC breakers OR connect DC solar to the PV1 / PV2 DC inputs.
    - **Up to 9,200 W AC PV, 10,000 W DC PV, and/or up to 10,000 W combined AC and DC PV.**
    - **For DC Solar (two MPPS with 5000 W, 500 V, and 26-Amps max each)**
- Install provided Eaton sub panel and provided tandem 2-pole 40 Amp input breakers.
- Once solar is installed, pull up to FOURTEEEN 15 and/or 20 Amp breakers (120V) from the main service panel to the new Eaton Subpanel utilizing no more than 32 Amps total. Installers can pull more circuits IF they conduct an Amp study. You must consider any start up Amps for all motors/compressors/pumps. These circuits will be powered via the NV14, grid on or off. Corresponding Neutral wires must be located and moved to the Subpanel or a ground loop will occur and circuits will be damaged upon grid outage.
- Once Critical Load breakers are pulled, connect the NV14 AC Load Output breaker to the critical load subpanel input breaker using appropriate conduit (two positives, one neutral and one ground).
- Level the cabinet by adjusting the cabinet legs. This will assist with installing the cabinet cover.

## INSTALLING BATTERIES

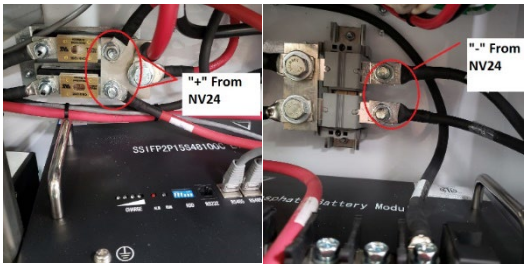
- Take batteries out of their boxes. Change the white toggle pin settings as follows:

- NV14 **Battery One** Set with the **pin one up**, the rest down (LCD position 2). Place under the inverter.
- NV14 **Battery Two** Set with **pin two up**, the rest down (LCD position 3). Place in the bottom left space.
- NV14 **Battery Three** Set with **pins one and two up**, the rest down (LCD position 4). Remove the hold down bracket and install in the upper left space. Replace the bracket.

- NV24 **Battery Four** Set with the **pin three up,** the rest down (LCD position 5). Place in the upper position.
- NV24 **Battery Five** Set with **pins one and three are up**, the rest down (LCD position 6). Place in the lower position.

## IF Installing the NV24:

- Connect the included NV24 NEGATIVE Battery bracket to the NV14 RIGHT side NEGATIVE Terminal Block.
- Connect the included NV24 POSITIVE Battery Cables to the Upper and Lower NV14 POSITIVE Terminals. See Picture:
- Connect the NV24 ground to the bottom right ground bar inside the NV24.
- Connect the 10-foot communications cable to the NV24 bottom battery and connect the other end to the NV14 upper left battery via the RS485 ports.




## For ALL Batteries

**- Remove zip ties holding the Positive, Negative, and Communications cables together.**
- Connect all NEGATIVE cables to the Negative battery terminals.
- Connect all POSITIVE cables to the Positive battery terminals.
- Install the COMMUNICATIONS cables into the Battery RS485 ports.
- The NV24 10-foot ground connects to the NV14 ground terminal block.
- The NV24 10-foot COMMUNICATIONS cable connects from the lower NV24 battery Communication port to the Upper LEFFT NV14 battery Communications port.
- The Battery under the Inverter connects to the Inverter with installed Communications cable coming out of the lower part of the Inverter.

**Turn on ALL Batteries. Use the provided paperclip and hold down the reset button for one second until battery lights come on. Batteries are on with the Green lights are on.**

- Replace upper battery retaining brackets for the NV14. For the NV24, there are upper/lower recessed tabs that should be pulled out to secure the upper/lower batteries.

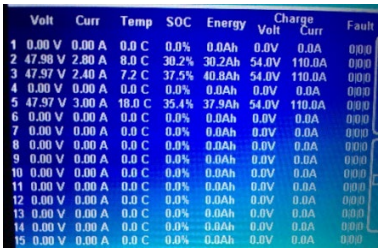
## COMMISSIONING THE SYSTEM

- Turn NV14 tandem 2-pole 40 Amp Main Service Panel breakers on.
- Turn on NV14 AC/DC disconnect switch (90 degrees clockwise) on upper left outside of the unit.
- Turn on NV14 inside inverter disconnect switch and press ON the green inverter button.
- The system takes 3 minutes 22 seconds to wake up.
- You should see green AC (grid connection) and Normal LED lights above LCD screen.
- Flip the Critical Load Output Breaker up/on. Flip the critical load sub panel tandem 40 Amp input breaker ON and then each 15/20 Amp breaker one at a time.
- Flip the AC Solar and/or DC input breakers / fuse blocks up/on.
- Meter all inputs and output for 120/240 V.

- Press The Battery icon on the main LCD screen.


Press on the Li-BMS in the lower right

You should see three lines of info for the NV14 (lines 2, 3 & 4. Five lines on info for the NV24 (lines 2, 3, 4, 5, & 6). This assures that the batteries are communicating. If this information is not correct, then try resetting the communications cables into the batteries.




# Sending Battery Power to the Main Service Panel (MSP) Option

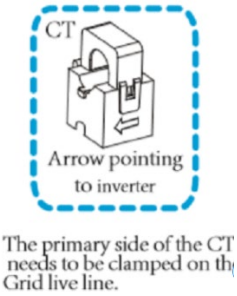
Many utility companies charge more for energy between 4 pm and 9 pm (Time-of-Use) or charge more when Tier thresholds are exceeded.

The NV14 inverter automatically discharges battery power to the provided critical load sub-panel after 4 pm when there is no longer sufficient solar to satisfy those loads.

As of May 2022, the inverter can also discharge battery power to the MSP after 4 pm via provided Current Transformers (CTs). This option will further reduce Utility dependance but will also discharge battery power faster. This is accomplished in 2 steps, described below:

Step 1 A: Add the TWO provided Current sense Transformers (CTs) to the MSP L1 and L2 input feeds:

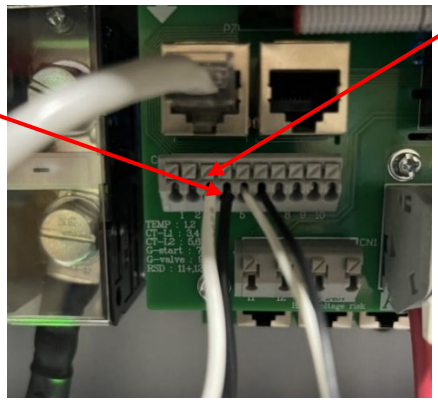
- * 100A CTs work with 200A MSP or smaller. Larger MSPs require either 200A or 300A CTs (FREE).



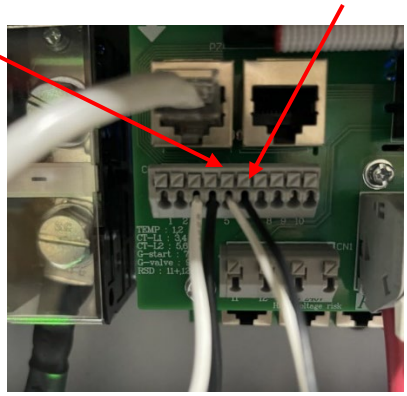

*100A CT arrows point towards the customer loads. 200A/300A CT arrows point towards the Utility.

Step 1B: Keep CT 1 and CT 2 white and black wires paired. The wires are 10-feet in length. Feed these wires through the grid connection conduit to the NV14.

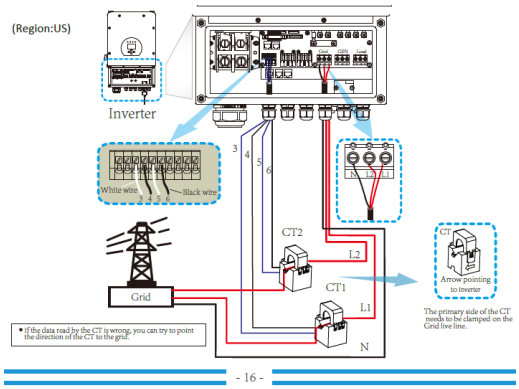
Step 1 C: Open the bottom cover of the inverter (four hex bolts). Just below the Battery communications RS485 connection is a bank of CT mode clamps. Connect CT 1 white wire to pin THREE and CT 1 black wire to pin FOUR by depressing the grey plastic input tensioner.



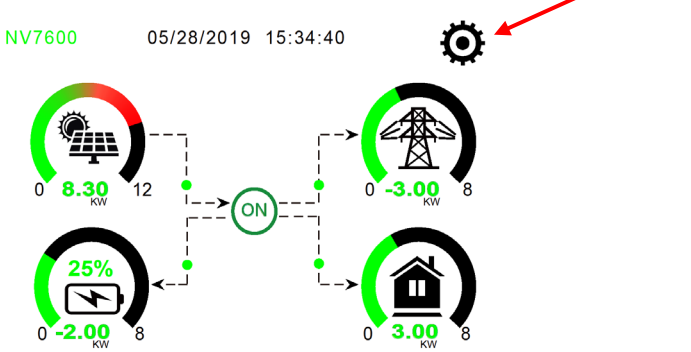
Connect CT 2 white wire to pin FIVE and CT 2 black wire to pin SIX by depressing the grey plastic tensioner.



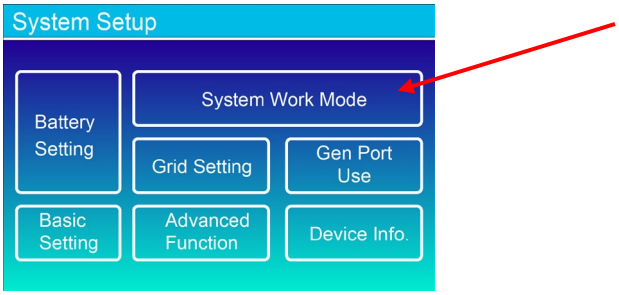
Wiring Diagram for these connections:




Step 2 programming the inverter: Step 2 A: Go to the Settings Pages by pressing on the System Set Up Menu Icon:



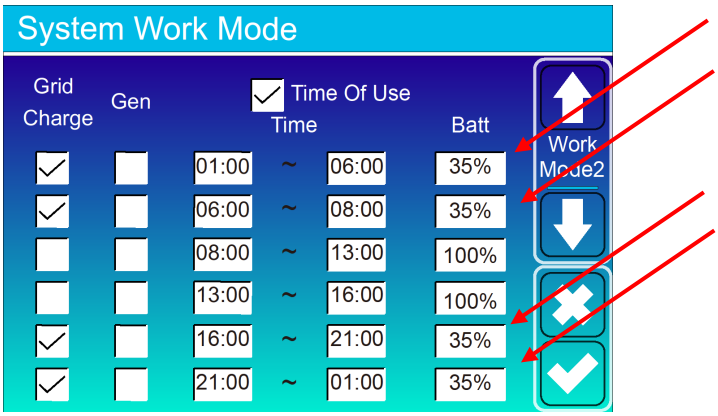
*Step 2 B: Press System Work Mode:*




Step 2 C: Go to System Work Mode. The system is preset to "Zero Export to Load." Press on "Zero Export to CT" so that the circle fills in. Then press the large check mark in the lower right corner:


Step 2 D: Go to System Work Mode. Ensure that changes saved. If they did, then press the down arrow on the right side of the LCD screen. You are on System Work Mode page 2. Systems are preset with Battery discharging to 20% daily. By sending battery power to the MSP you will greatly increase usage of the battery. It is recommended that you limit discharge to 30% or 40% if the customer is concerned with grid outage. If you allow the battery depletion to 20% minimum, then if the grid goes down there will be no power available for the critical loads. The customer will be in black out until the grid returns or until solar recharges the battery to 23% for the NV14 or 22% for the NV14 plus NV24.

Recommend the following changes:

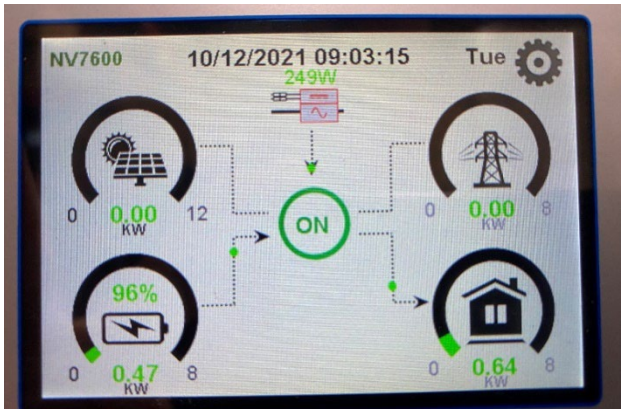



Setting 35% next these times means that the battery will be allowed to discharge as needed (critical loads and MSP) to 35% remaining. If the grid goes down, then the battery will discharge to the Critical load Sub-Panel only to 20%. This allows time for the grid to return or for solar to come on.

If the grid goes down, then the battery will discharge to the critical load sub-panel down to 20%. At 20% with grid off and no solar, the customer will be in a full blackout. The inverter will stay on and will send a 240 V pre-charge to an AC Solar System or 48 V pre-charge to a DC Solar System. When the Solar System reaches 125V, solar production will occur. When the battery recharges to 23% (NV14) (22% for the NV14 plus NV24), the critical load sub-panel will again be powered.

Step 2 E: Press the ESC escape button under the LCD screen. You are on the Main Screen.

Now look at the main display to see how power will flow from the battery to supplement what is being generated by solar for the load demand. If the CTs are working correctly, you will still see Home Loads. If Home Loads show 0.00 KW or more than 8 KW, then the CTs are incorrect. If the loads are as expected, then ask the customer to turn on a 240V load that is still in the MSP (electric over or Air Conditioner). If the loads go up an additional 4 KW (or as expected), then the CTs are correct. Ask the customer to turn that 240V load off.
Warning: Do not make CTs wire connections/adjustments IF the CTs are turned on. This will burn up the CT head.




Please advise NeoVolta if "Zero Export to CT" is being used via the Serial Number sheet that is to be returned to NeoVolta.

* Once CTs are working correctly, reinstall the inverter lower cover via four hex bolts.

## ** Detailed CT Testing

The following supplemental addresses installation of CTs that allow battery power to be sent to the Main Service Panel (MSP) loads after 4 pm (or during higher rate periods).

- NeoVolta CTs MUST be used.
- Two CTs must be installed in between the Utility and the MSP input breaker.
- 200A CTs arrows point towards the UTILITY and can be used on any size MSP.
- CTs have 10-feet of wiring (white/black lines). If additional length is needed, then you can splice additional communications wire in between the CT heads and inverter input connections. The original CT wire must be used to connect into the inverter.
- **CTs must be OFF when doing any wiring work.**

**Common Scenarios and Testing**: Install CTs and turn them on via Settings, System Work Mode, set "Zero Export to CT," and then tap the big check in the lower right corner of the screen. Then tap the ESC escape button to return to the main graphics page:
** For testing: Turning on a 240V MSP load is an electric oven, an all-electric clothes dryer, an air conditioner, etc.

**Testing Expectations:**
Critical Loads installed and NO additional Solar in the MSP:

- Read what the home loads are registering.
- ** Ask the homeowner to turn on an MSP 240V load.
- Read what the home loads are. They should be 2-4 KW higher than before.
- If the LCD reading does not look correct, then either the CTs are too small for that MSP, they are oriented the wrong way, the wiring is incorrect, or they are not seated correctly into the inverter pins.
- Once the system is reading correctly, ask the homeowner to turn the 240V load off. Readings should return to similar previous amounts.

Critical Loads AND additional Solar in the MSP:

- With additional AC solar landed into the MSP, the home loads will read 0.00. This is because the CTs register that solar is powering the entire home and there is no "load" requiring the battery.
- To test, turn off the additional solar in the MSP via MSP breakers.
- ** Follow the steps above to test.
- Once successful, then remember to turn the MSP AC solar back on.

NO Critical Loads and NO additional Solar in the MSP:

- With no critical loads, the home loads will show 0.00 when the solar is on.
- Solar should be charging the battery and/or being returned to the MSP.
- ** Follow the steps above to test.

NO Critical Loads AND additional Solar in the MSP:

- With no critical loads, the home loads will show 0.00 when the solar is on.
- This is because the CTs register that solar is powering the entire home and there is no "load" requiring the battery.
- To test, turn off the additional solar in the MSP via MSP breakers.
- ** Follow the steps above to test.
- Once successful, then remember to turn the MSP AC solar back on.

**Remember, when doing any wiring work, the CTs MUST be turned off.** When testing CTs, you should not see extravagant numbers like 15 KW going to the grid or to loads. These unrealistic numbers mean that the CTs are installed incorrectly or there is a CT wiring issue.

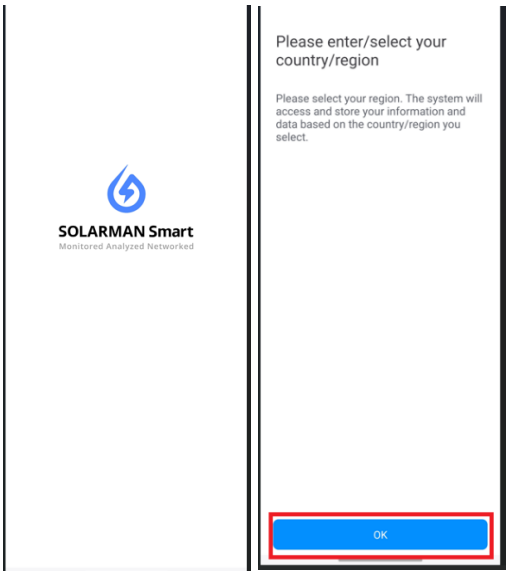
# SOLARMAN SMART Connection for iPhones and Android Phones

- Connect the WiFi logger antenna with bracket to the 6’ extension cable. Connect the extension cable to the DB9 connection at the top left side of the NV14. Antenna COM light is on/steady and Ready is flashing.
- Customer load the Solarman SMART App on their smart phone:

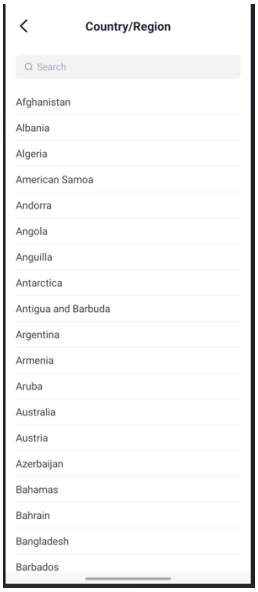
App Store: Solarman SMART Google Play Store: Solarman SMART

**Installer CAN use their smart phone so long as you use Solarman SMART and that you log OUT prior to leaving site. Once complete, give the phone/email and password info to the customer. Make sure the customer is logged in and understands the App. Give the customer the Solarman SMART App User Guide.

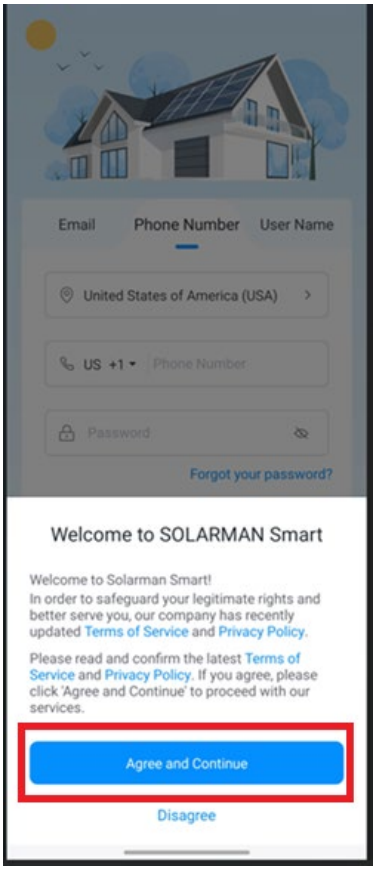
**STEP 1:** - Open the App. It will inform you to select your country/region. Tap “OK”.



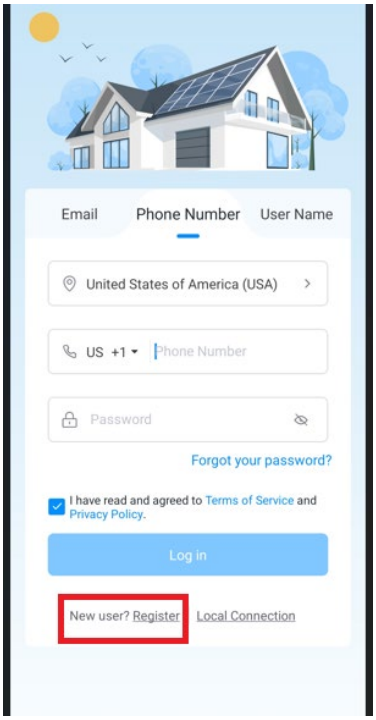

**STEP 2:** - Type in your country/region in the Search bar or scroll down to select your country/region.



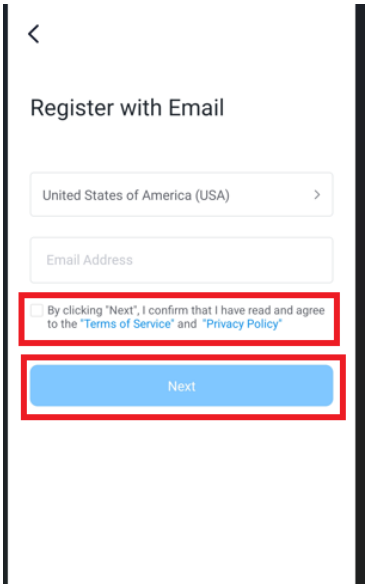
**STEP 3:** - SOLARMAN Smart will display a welcome message. Tap “Agree and Continue”.



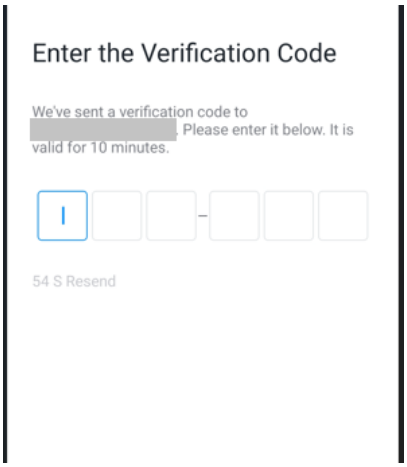

**STEP 4:** - Click on “Register”.



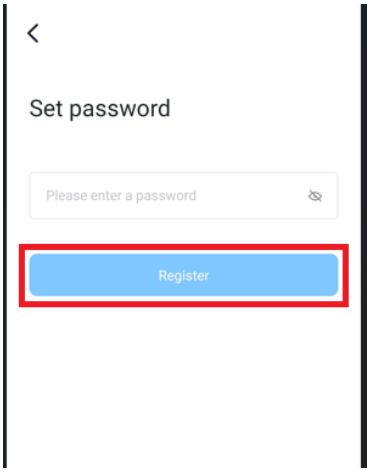
**STEP 5:** - SOLARMAN Smart will display **Register with Email**. Email is preferred. Enter the email address. Select the checkbox. Tap “Next”.



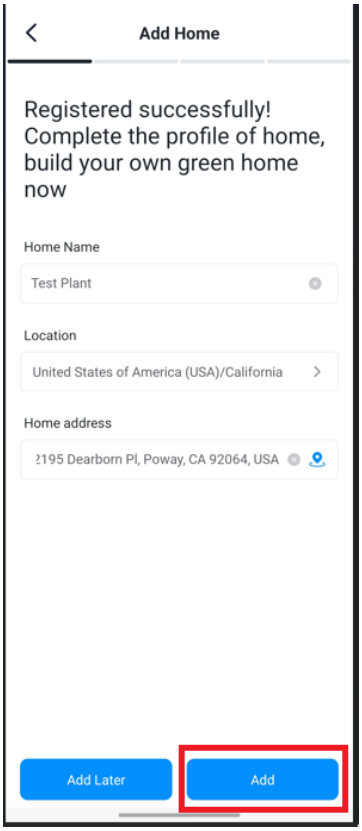

**STEP 6:** The customer's inbox will receive a verification code. Input the Verification Code.



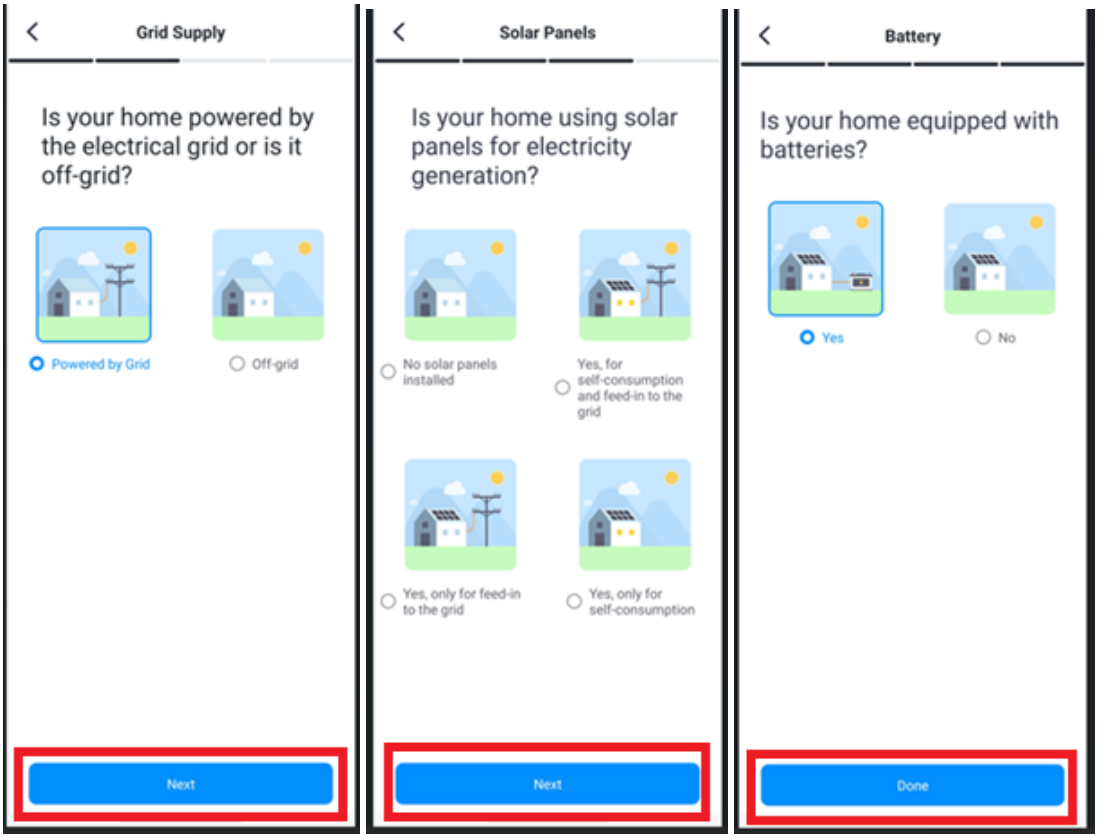

**STEP 7:** Enter a password. Password should be simple 6-8 letters and numbers. NO Special Characters. Tap “Register”.



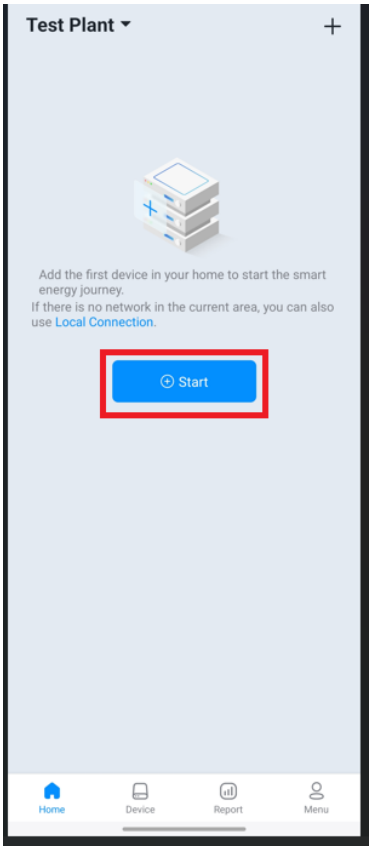
**STEP 8:** Enter the name of the site under **Home Name**. USE First and Last name of the customer. The **Location** will auto-populate with the selection from STEP 2. **Home address** should auto-populate with the address, if not please enter the address. Tap “Add”.



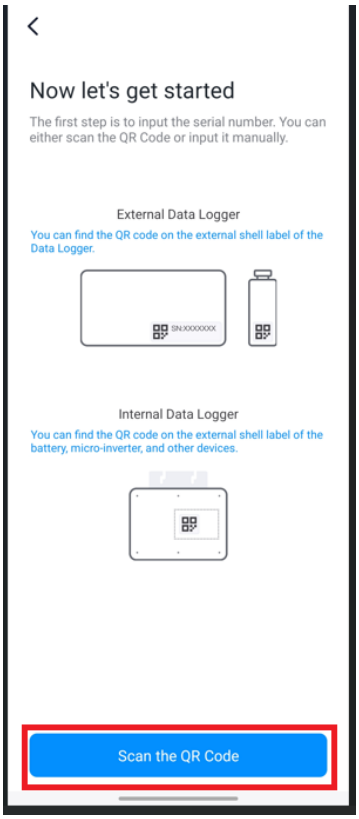

**STEP 9:** It will provide a series of prompts regarding the system’s configuration. Select the option that best fits the system’s configuration being installed. Tap “Next” or “Done” after each prompt.



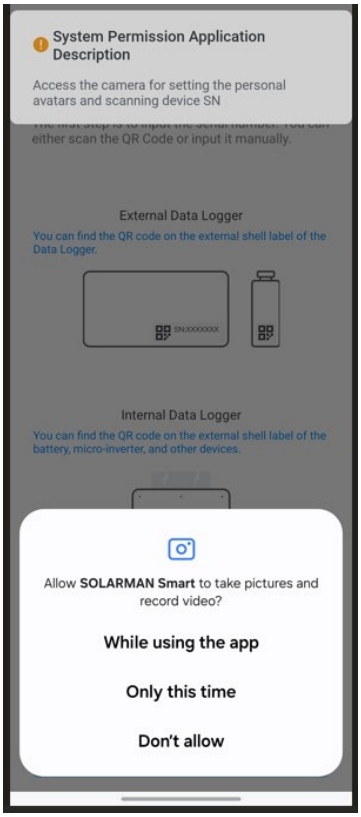
**STEP 10:** It will show the site name at the top. Tap “Start”.




**STEP 11:** Input the logger (antenna) serial number by either scanning the QR code or entering it manually. To scan, tap “Scan the QR Code”.

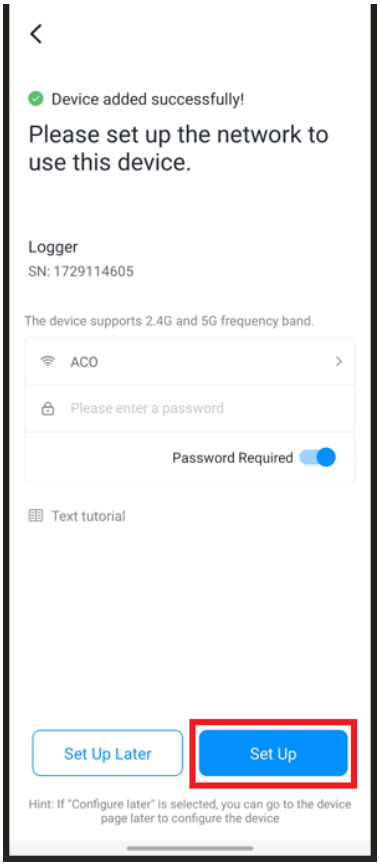


**STEP 12:** The camera will open requesting access to the camera to take a photo of the (Antenna) Logger QR code.  Logger SN can also be manually entered, but you will also have to manually enter the passcode.

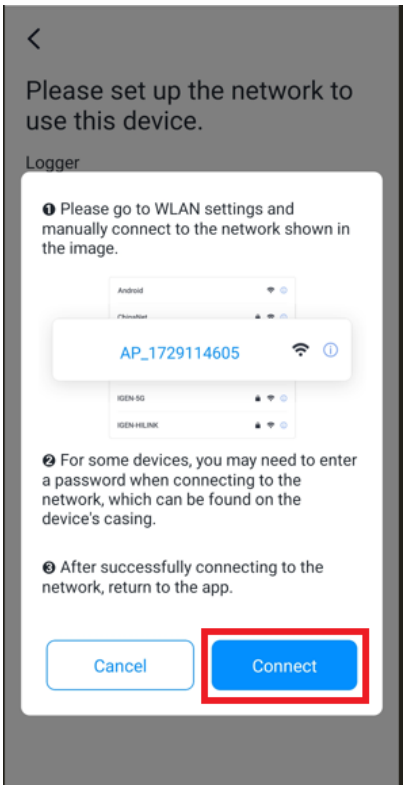



**STEP 13:** In the background Solarman will display “Device added successfully!” It will provide a prompt for the network configuration. Tap “Connect”.

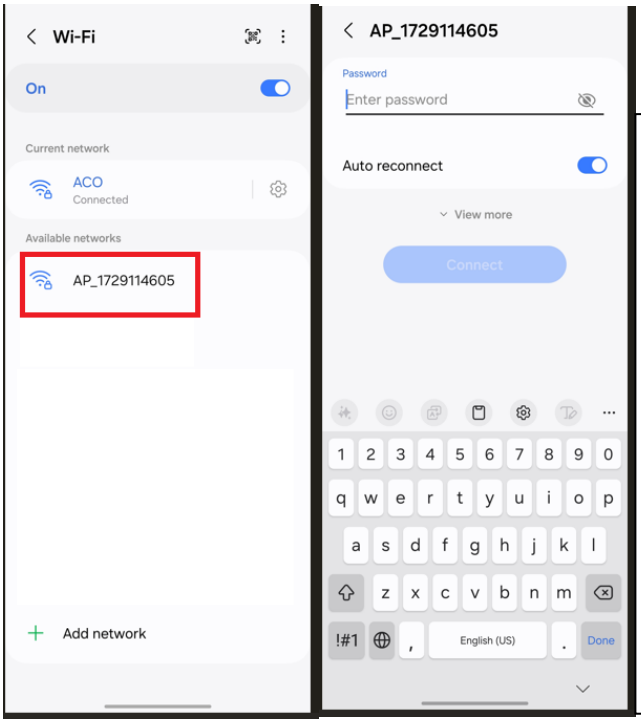
**STEP 14:** Enter the network name and password. Tap “Set Up”.




**STEP 15:** Go to the WLAN settings to connect to the logger. It will show up as AP_*LoggerSerialNumber*. Tap “Connect”.



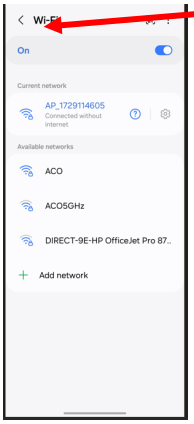
**STEP 16:** Go to the WLAN settings to connect to the logger. It will show up as AP_*LoggerSerialNumber*.



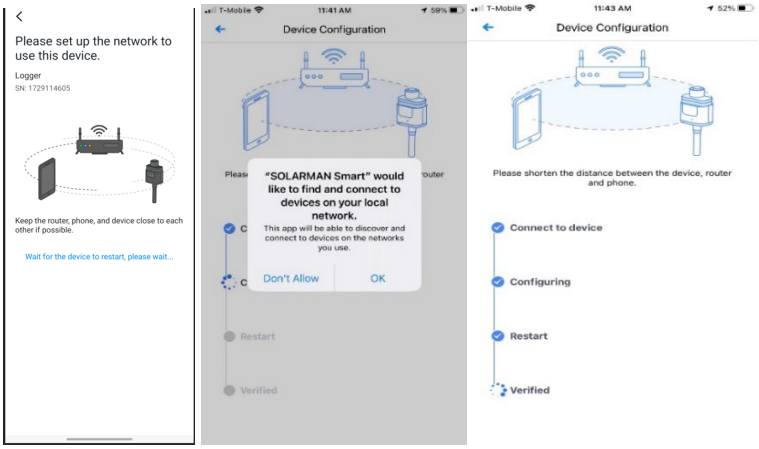

Go to Phone Settings-WLAN, find the right "AP_XXXXXXXX" network, select it. If it asks for a password, you can find PWD:xxxxxxxx on the logger.

Tap “Connect”.

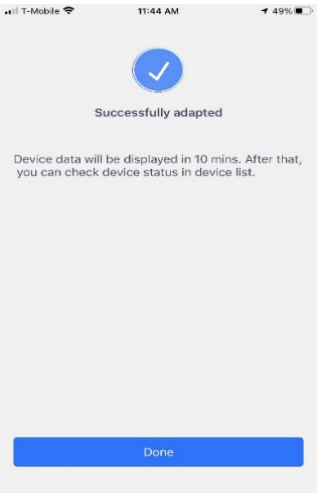
**STEP 17:** The WLAN settings should show it is Connected without internet. Tap the back arrow and exit from the WLAN settings.



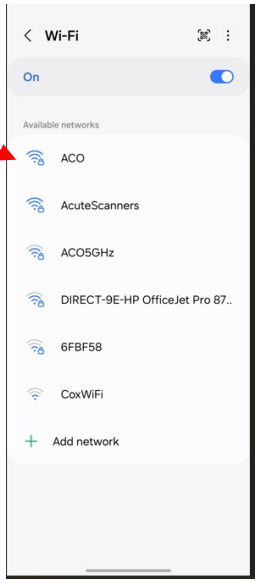

**STEP 18:** Go back to the Solarman App. It is connecting. Please keep the phone in between the logger and the Wi-Fi router (position yourself halfway between the Wifi router and the NV14). The logger will automatically go through these connection steps:



**STEP 19:** Once the Logger is connected, select “DONE.” Immediately go back to phone Settings and re-select the customer's WiFi Router.



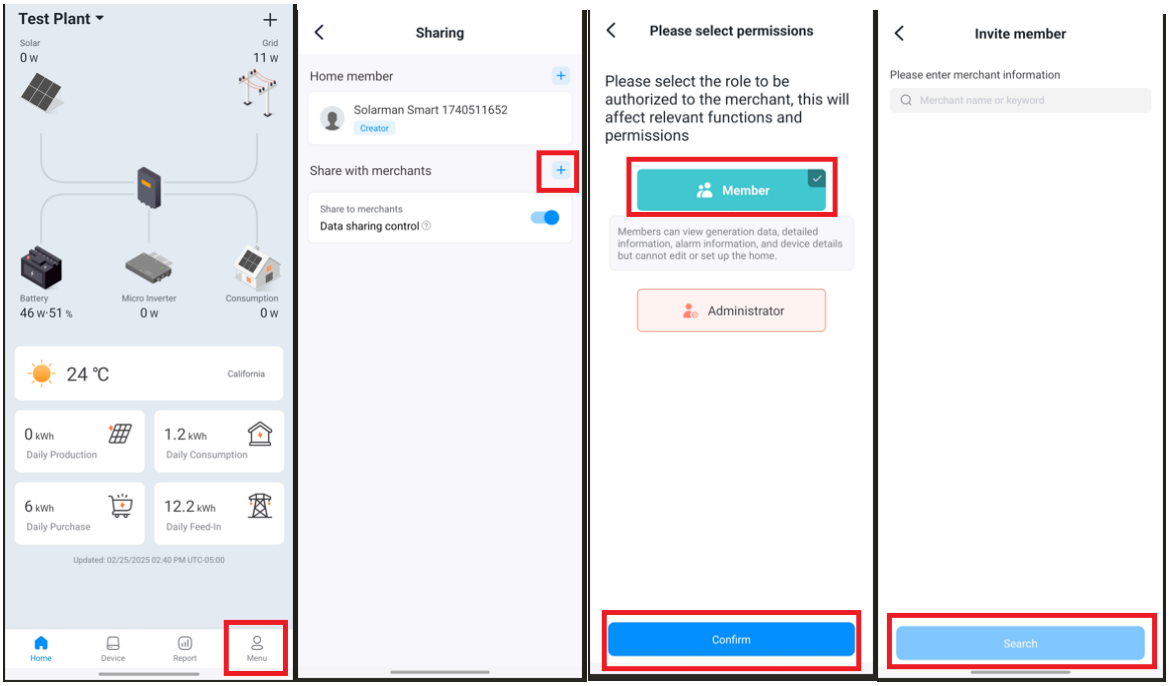

Reconnect phone to customer WiFi Router.

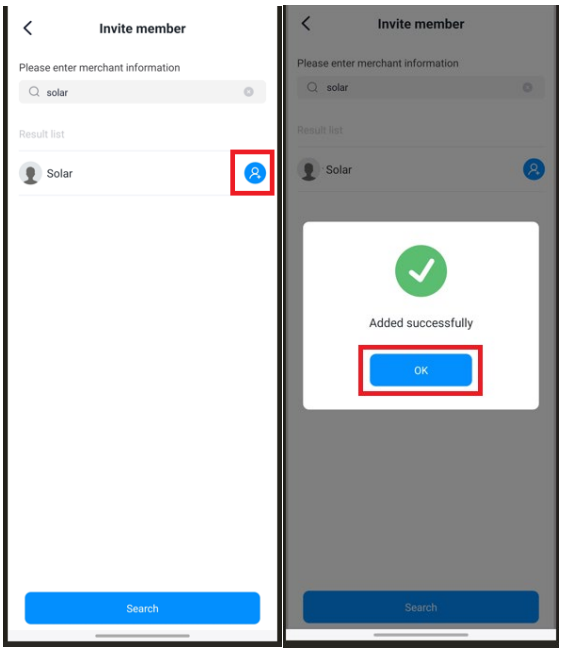



**STEP 20:** Set your company as a **Member. Administrator should be reserved for NeoVolta.**

Open Solarman and tap “Menu”. Tap the “+” sign next to “**Share with merchants**”. Select **Member** and Tap “Confirm”. Search by typing “Your Company Name” into the search bar. Tap “Search”. Once your company name appears tap the icon on the right next to your Company name. A pop-up message will appear “Added successfully”, tap “OK”.

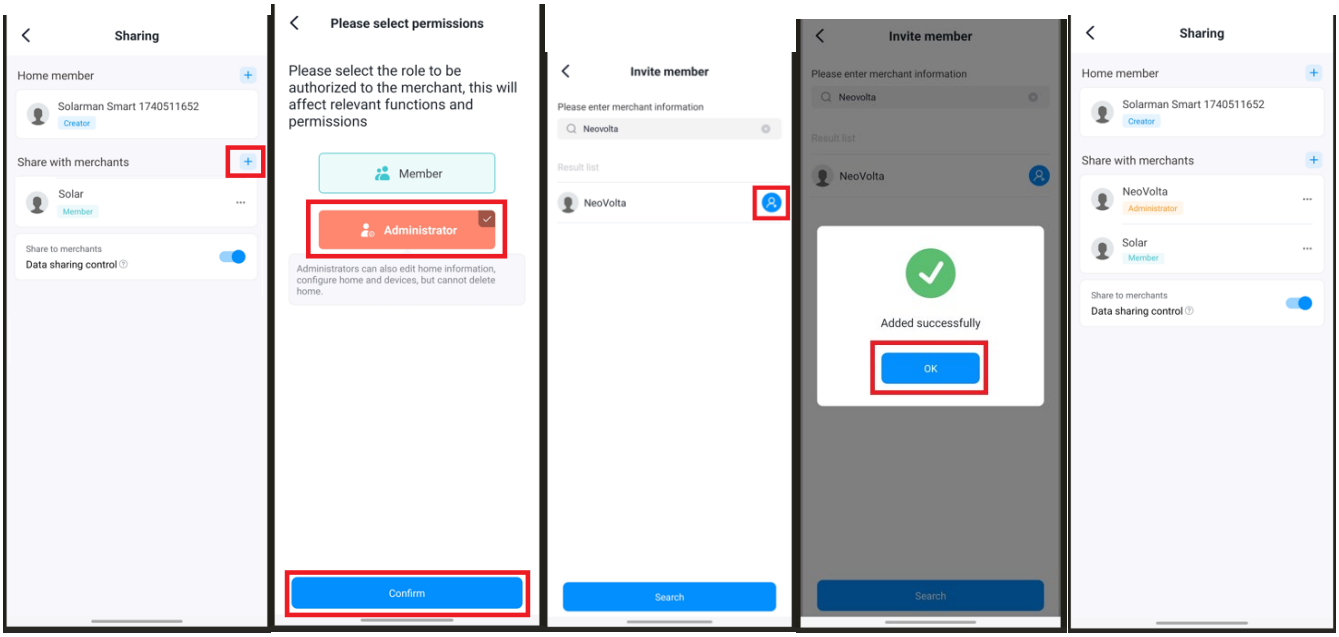
**You can share permissions with another Company or Utility by going through the same procedure in Step 20.**






**STEP 21:** Set NeoVolta as an **Administrator**.

Although the app will allow adding more than 1 administrator, it will not function properly. There should only be 1 administrator. Tap the "+" sign next to "**Share with merchants**". Select **Administrator** and Tap "Confirm". Search by typing "NeoVolta" into the search bar. Tap "Search". Once NeoVolta appears tap the icon on the right next to it. A pop-up message will appear "Added successfully", tap "OK".




**STEP 22:** You should see three lights on the WiFi stick logger.

- COM light should be steady green (good communications with the system).

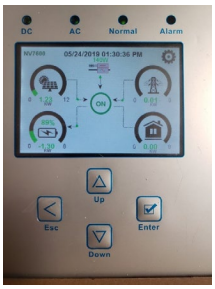
- NET light should be steady green (good communications with WiFi router in home (if it is not steady, then use a 10' cable to move WiFi stick logger to location with better signal (higher up).

- Ready light should be flashing green (meaning information is passing via the WiFI router).

- Once the App fully builds (10-minutes), then mount the Antenna(logger) to the home approximately one foot above the left side of the system. Use provided cable stays to secure the communications cable and tuck excess cable behind the system.

YOU ARE DONE!!!

(The App typically builds the battery info first, then Home info, then Grid info, then AC/ DC solar last)




You want this screen to be present when you install the cover. Press the ESC button to get to main page.

Put the cover on with included bolts. Level the cabinet to assist with easier cover installation. Remember to tighten the opposite corners first, then the remaining opposite corners, then the middle bolts. Make sure that the White bolt cover caps are accessible as the Installer will place White caps into the access holes once City/County Inspections have passed.

# Generator Options

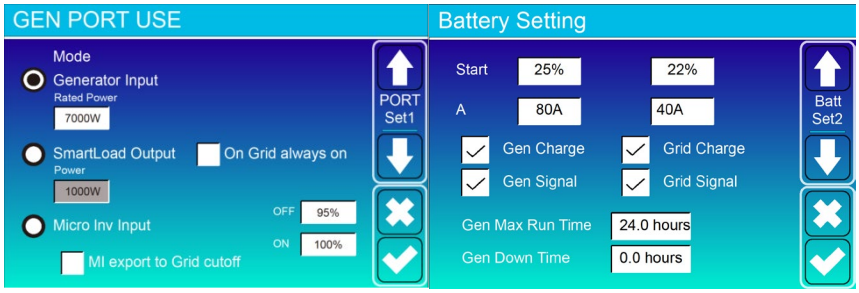
Generator can be up to 8,000 Watts, no higher, and MUST be 240 Volts. Should be “Inverting” type.

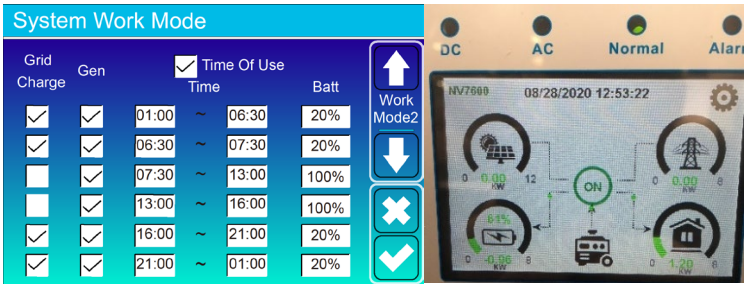
**Option 1 FOR AC SOLAR: AC 240 Volt Generator option Powering the Critical Load Sub-Panel ONLY:**

- You can install a **manual transfer switch** in between the NV14 and the Critical Load Sub-Panel. Menards has a GE 100 Amp switch Model Number: TC10323R for $123.71: GE 100-Amp 240-Volt Outdoor Non-Fused Emergency Power Transfer Switch at Menards®
- The NV14 Load Output connects to one side of the switch and the Generator connects to the other side of the Manual Transfer Switch. This configuration powers the Critical Load Sub-Panel but will **NOT charge the battery**. This decreases battery usage/consumption when the generator is on, especially during prolonged outages (Public Safety Power Shutoff). Customer must turn manual transfer switch on/off and start/stop the generator.

**Option 2 FOR DC SOLAR: AC 240 V Generator option with DC PV Powering Critical Load Sub-Panel AND battery (cannot be combined with AC PV input):**

- For DC PV Only. The generator can be connected to the NV14 AC PV input. When the generator is running, it will power the Critical Load Sub-Panel and will recharge the battery. However, there are presently a few restrictions/degradations. *
    - * The Critical Load Sub-Panel MUST be asking for a minimum of 250 Watts of power. Otherwise, the inverter does not recognize the generator.
    - * The maximum Amperage that the battery will allow is 80 Amps, meaning the battery will charge at a rate of 4,000 Watts per hour or less depending upon what Amps you set.
    - This option requires settings changes:
        - Select “Gen Port Use.” Then select “Generator Input” and set the size of the generator in Watts (or just set 8,000 W). Then press the big check in the lower right corner.
        - Battery Settings page 2. Need to check both Gen Charge, Gen Signal and make Gen Amps 80 A. Then press the big check in the lower right corner.
        - You also need to select Gen Charge on the System Work Mode page 2, which will allow the generator to charge the battery whenever it is operating.



**Generator Auto-Start capability:**

- A Generator Auto-Start capability exists for systems sold from NeoVolta after 1 May 2021.
- This capability only exists for Option 2 (above): AC Generator connected to the NV14 AC PV input (DC Solar ONLY).
- Ideal settings: Allow battery to discharge to 30% nightly and then switch to the grid. If the grid goes down, then the battery will continue discharge to preset 20%. Setting the generator to start at 25% means that the generator will auto-start if/when the battery system reaches 25% remaining capacity.
- Once Option 2 instructions have been achieved, then connect the two generator auto-start wires and connect them to Function Port pins 7 & 8 in the lower compartment of the inverter (shown yellow wires).

## Emergency Stop Installation and Testing

Starting February 1, 2025, systems will include a new Emergency Stop (E-Stop) function.

This capability eliminates the need for disconnects for inside garage or other locations where Authorities Having Jurisdiction (AHJs) have such requirements. Activation of the E-Stop button will terminate all power connections to the NeoVolta inverter (battery, solar (AC and/or DC), and critical loads. This E-Stop is not a substitute where a lockable disconnect is required by the AHJ or in the Electric Service Requirements (ESR) per the Utility.

Installers must use a UL certified and NEMA Type 3R rated E-Stop. NeoVolta stocks these E-Stop buttons and can provide 10 feet of appropriate wiring upon request. The NeoVolta supplied E-Stop comes with (1) each normally open (NO) and normally closed (NC) contact.

### Installation Process

- Per most AHJs, the E-Stop shall be located within 3 feet of the Main Service Panel.
- Connect the E-Stop to the NeoVolta NV14 cabinet via conduit and two 14-gauge wires.
- Conduit Types: EMT, PVC, Metallic Flex, Non-Metallic Liquid Tight/Flex.
- Conduit Size: There are (3) knockouts on the E-Stop Box (1) on three side of the box. The knockout size is M20 which converts to approximately a three quarter (¾") opening.
- For "Push/NC" wiring to keep the system on, in Normal Mode, insert the wires into terminals 1 and 2 (Image 2) in the E-Stop (This is the normally closed (NC) side of E-Stop. This means that the inverter will operate as normal when the E-Stop Button is pushed in. To disengage the E-Stop shutdown of any rapid shutdown transmitter and/or the inverter, a clockwise turn of the RED button/knob is needed. There are arrows showing the direction of the turn, as well.
- To wire the E-Stop, open the bottom panel of the inverter via the 4 hex bolts, insert the wires through a comms opening in the bottom of the inverter and push the wires in to the ports. (1) wire per port.
- Under the battery communications port and under the ports where you connect the Current Transformers, there are four RSD ports (Image 1).
- These are 12V connections. They are labeled B & B. Connect either of the 14-gauge wires to connections B & B.
- Connected wires should look like Image 1 below.
- If additional wire length is needed, then you can splice additional 14-guage wire up to a maximum length of 100 feet. This is a 12 Volt circuit.

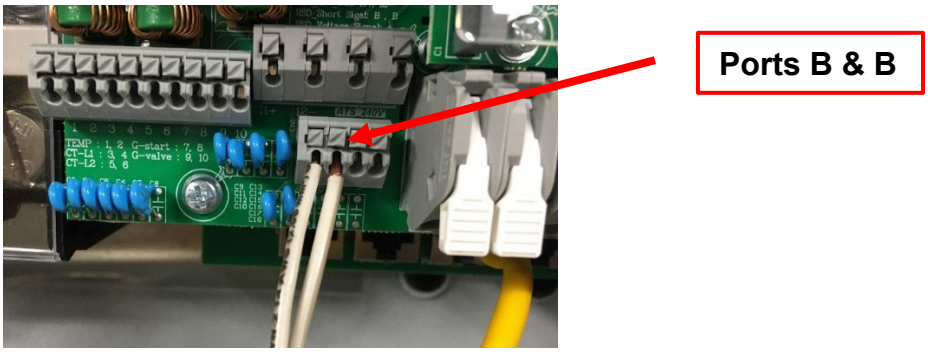



Image 1. E-Stop wires in B Ports

The E-Stop button should be mounted to the home within 3 feet of the MSP. You will need to wire the E-Stop and connect the conduit.

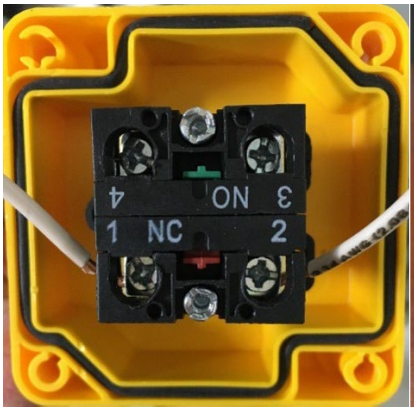



Image 2: Wiring to NC side of E-Stop


Image 3: E-Stop Button/Knob

The Stop Button should be set "IN" and the NeoVolta inverter should have normal power readings and the Normal Light should be on when the E-Stop is wired correctly.

**TESTING:** Disengage the Stop Button (clockwise turn and the button pops out 3/8 inch). You should hear the NV14 inverter click, the Alarm light will come on, there will be an **F22 (Tz_EmergStop_Fault)** Error Code (Image 4) in the center of the LCD screen, and there will be no power going into or coming out of the inverter (no AC or DC solar, no grid/utility, no loads, and no battery). Test complete, reset the E-Stop Button (counterclockwise and in). The Inverter will return to normal operations within 2 minutes (Normal light, no alarm light, center of the screen will show ON, and power will be restored.

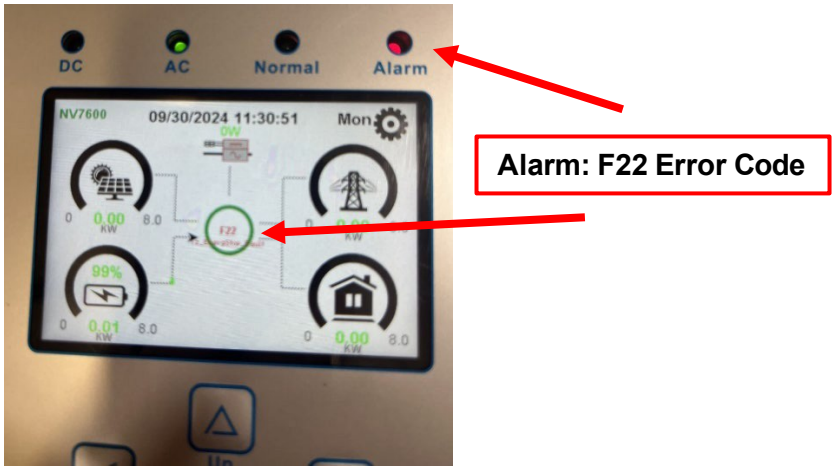



Image 4: F22 Error Code