FranklinWH Commissioning Guide

App Version 2.8.0

aGate X (aGate 1.1, SKU AGT-R1V1-US; aGate 1.3, SKU AGT-R1V2-US;
aGate 1.3.1, SKU AGT-R1V3-US)
aPower X (SKU APR-05K13V1-US)
aPower 2 (SKU APR-10K15V2-US)
aPower S (SKU APRS-10K15V1-US)

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Please read this document carefully to ensure the best reliability of the product and your warranty eligibility. For further information about the warranty, please refer to the ***FranklinWH Limited Warranty***.

This document is intended for use by professional installation and maintenance service providers only and no statements, information or recommendations in this document constitute any express or implied warranty.

Please read this document carefully before installing or using the FranklinWH System. Failure to follow any instructions or warnings in this document may result in damage to the equipment, personal electric shock, severe injury, or even death.

Product Information

The FranklinWH System is composed of aPower, aGate and other electrical and software components.

FranklinWH Energy Storage Inc. (FranklinWH) reserves the right to make any improvements to the product, and the contents in this document shall be subject to updates without further notification.

All images and pictures provided in this manual are only for demonstration purposes and may differ in detail from the product based on the product version.

Feedback

If you have any questions or comments, please send us an email at: *service@franklinwh.com*

Disposal of Scrapped Products

Scrapped products (including their internal chemicals and electrical materials) should not be disposed of with household wastes. Please refer to your local laws and regulations regarding disposal.

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Safety Statements

Please read this entire document to ensure the proper use of the FranklinWH System. The FranklinWH hardware are electrical devices. Please strictly follow the safety instructions in this manual during operation, failure to do so may result in equipment malfunction, electrical shock, serious injury or death, and may also void the warranty.

This document is intended only for FranklinWH personnel and certified installers.

DANGER

- Do not directly touch any exposed metal surfaces other than the aGate case.
- During commissioning, use insulated gloves or devices to perform operations and measurements to prevent electrical shock damage.

Commissioning Guidance

This manual describes the process for commissioning each aGate. If there are multiple aGate panels installed on a single home, the commissioning steps must be repeated for each aGate on site.

Before commissioning

Download the FranklinWH App

The FranklinWH App is required to configure the system parameters during the commissioning process.

To download the FranklinWH App, you can visit the App Store or Google Play:

App Store Google Play

Note: *Installation service providers and customers use the same FranklinWH App, but they access different functions based on the type of account.*

This manual only applies to the FranklinWH App v2.8.0

For the latest information, please visit https://www.franklinwh.com/support.

Inspect the system before power-on

Tools needed: multimeter, network cable tester.

aGate Inspections				
General				
1	Are there foreign objects in the aGate?	☐ Yes	☐ No	
2	Are there bare wires near the installation site?	☐ Yes	☐ No	
Grid				
1	Are the grid input power cable fastening bolts properly tightened?	☐ Yes	☐ No	
2	Are the grid output power cable fastening bolts properly tightened?	☐ Yes	☐ No	
Do	Are the Neutral and Ground lines short connected at the bonding jumper bar?	☐ Yes	☐ No	
4	Is the grid breaker OFF?	☐ Yes	☐ No	
aPower				
1	Are the aPower input cable fastening bolts properly tightened?	☐ Yes	☐ No	
2	Is the aPower breaker OFF?	☐ Yes	☐ No	
Solar				
1	Are the solar input cable fastening bolts properly tightened?	☐ Yes	☐ No	
2	Is the solar breaker OFF?	☐ Yes	☐ No	
Smart Circuits (If present)				
1	Are the Smart Circuits cable fastening bolts properly tightened?	☐ Yes	☐ No	
2	Are the Smart Circuits breakers OFF?	☐ Yes	☐ No	
Generator (If present)				
1	Are the generator input cable fastening bolts properly tightened?	☐ Yes	☐ No	
2	Is the generator breaker OFF?	☐ Yes	☐ No	
Communications				
1	Confirm the aGate is properly connected to the network①	☐ Network Cable	☐ Wifi	☐ 4G
		☐ Eth1 (Debug) ☐ Eth2	-	-
		☐ ETH		
2	Is there communication between aGate and aPower(s)?	☐ CAN port	-	

3	Are the wireless module and USB cables connected?	☐ Yes		☐ No	
aGate power switch					
1	Is the aGate power switch OFF?	☐ Yes		☐ No	
aPower inspections					
1	Are all aPower power switches OFF?	☐ Yes		☐ No	
2	Are all aPower output cables tightly fastened?	☐ Yes		☐ No	
3	Where is the CAN matching terminal installed?②	☐ 1st aPower	☐ 2nd aPower	☐ 3rd aPower	Other
Measurements					
1	Check that the CAN cable is wired according to the 568B standard using a cable tester③.	☐ Yes		☐ No	
2	Measure and check that there is no short connection on **grid input** lines L1, L2, and N.	☐ Yes		☐ No	
3	Measure and check that there is no short connection on **generator** input lines L1, L2, and N.	☐ Yes		☐ No	
4	Measure and check that there is no short connection on **load** output lines L1, L2, and N.	☐ Yes		☐ No	
5	Measure and check that there is no short connection on **aPower AC** output lines L1, L2, and N.	☐ Yes		☐ No	

Caution:

If any of the above check results is "No," except for ① and ②, please solve the abnormal item and check again.

① *If using a network cable, it must be connected to the aGate Eth2 (aGate X 1.1: AGT-R1V1-US) or ETH (aGate X 1.3/1.3.1: AGT-R1V2-US; AGT-R1V3-US) port.*

② *When multiple aPower units are working in parallel, it is necessary to remove the excess CAN matching terminals from all aPower units except for the one on the last aPower.*

③ *Incorrect cable sequence of the CAN may lead to system damage.*

Turn off all AC power to the aGate

EPO plug

aGate 1.1 (AGT-R1V1-US)
Internal

aGate 1.3 (AGT-R1V2-US) /
aGate 1.3.1 (AGT-R1V3-US)
Internal

aPower X aPower 2 aPower S

① aGate power switch ③ aPower breakers ⑤ Backup breaker ⑦ Generator breaker
② Solar breaker ④ Smart Circuits breaker ⑥ Grid breaker ⑧ aPower switch

1. Ensure that the grid breaker, generator breaker (optional), solar breaker, smart circuits breakers (optional), backup breaker (optional), and aPower breaker on aGate are all in the **OFF** position.
2. Ensure that the aGate power switch is in the **ON** position.
3. If an EPO switch is purchased and installed, set it to **ON**. If no EPO switch is installed, the factory-installed EPO terminal remains in its original configuration.
4. Press the aPower button switch on the right side of each aPower to confirm that the switch is mechanically **ON**, and the power indicator on the aGate turns **ON**.

   NOTE: *During the commissioning, the app will receive device fault information due to abnormal system operation, which can be ignored.*

Commissioning

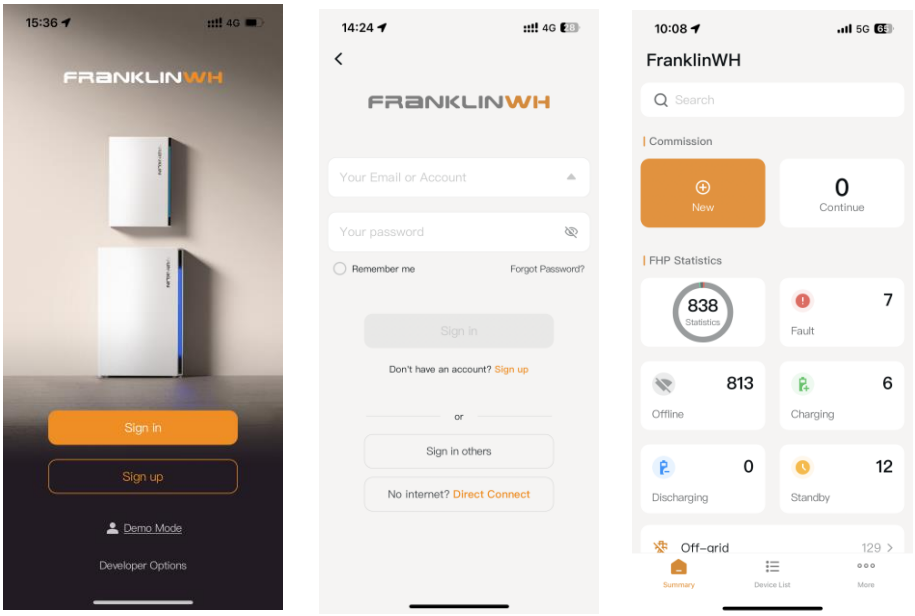
NOTE

The images provided in this document are for demonstration purposes only. Depending on product version, details may appear slightly different.

Basic Configuration

Step 1. Begin the commissioning.

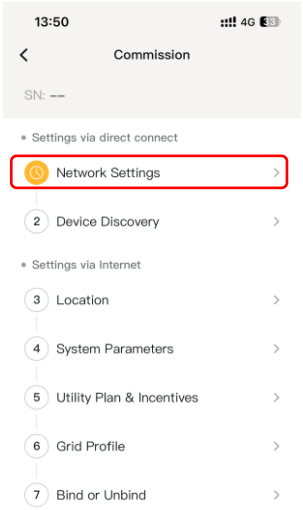
Sign in to the FranklinWH App with the installer account. If continuing a previous commissioning, tap **Continue**. Otherwise, tap **New** to begin a new commissioning.



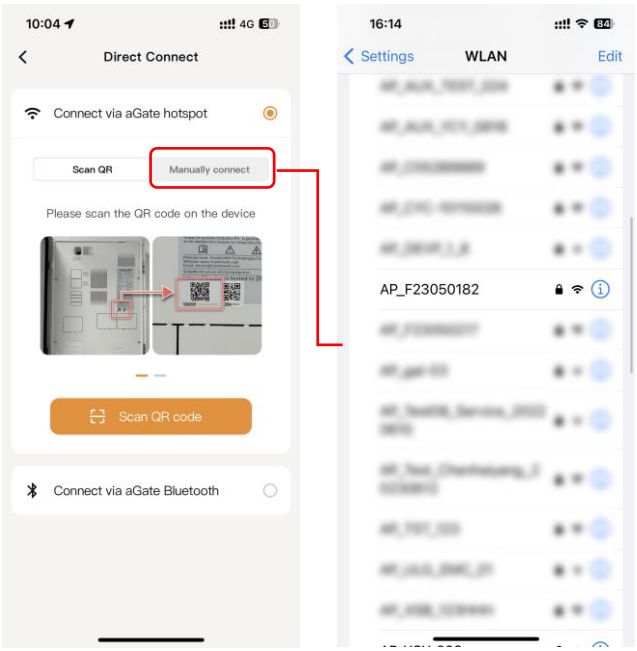
Note: *If you wish to see a demonstration system rather than the actual parameter configuration, tap* ***Demo****, then select* ***Homeowner*** *or* ***Installer*** *to access the sample parameter configurations.*

Step 2. Network Settings.

Tap **Network Settings** on the Commission page. There are two options for system direct connect: aGate hotspot or Bluetooth.

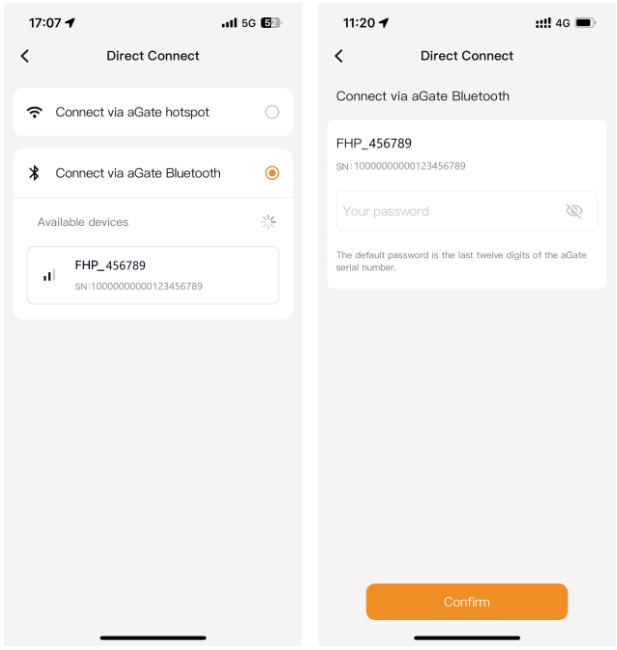


The default connection method is to scan the equipment QR code to connect to the aGate hotspot. Alternatively, you can tap **Manually Connect** to access your phone's Wifi settings. Select the aGate hotspot network, which is named with AP and the last nine digits of SN (e.g., AP_F23050182), and connect the app.



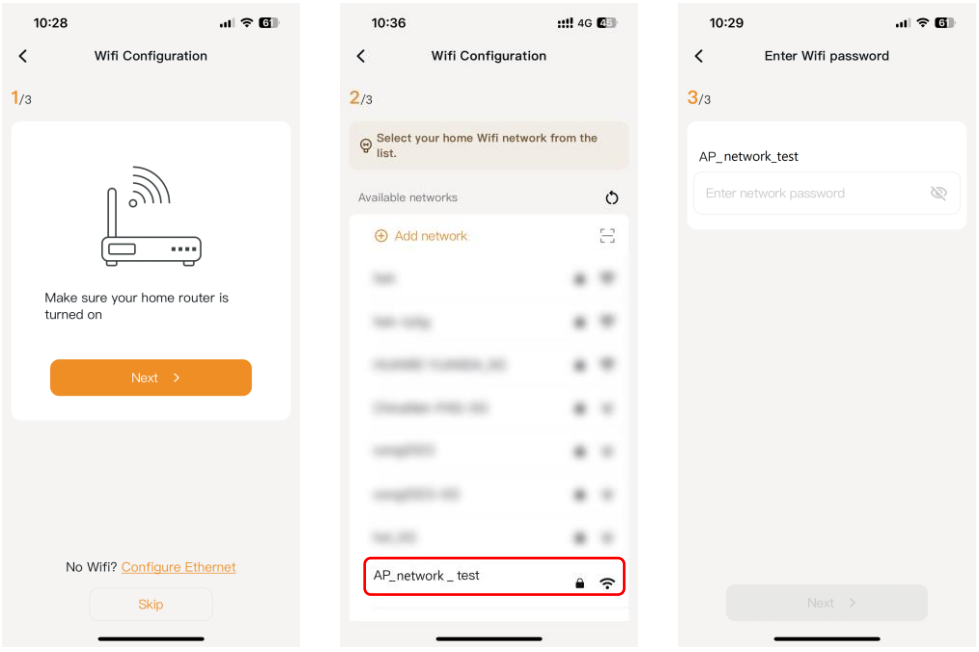
If the aGate hotspot is not available, you may search near the aGate for available Bluetooth. Select the aGate Bluetooth connection named with the system and the last six digits of the aGate SN (e.g., FHP_456789), then connect to the aGate with Bluetooth pairing.

Note: *This feature is supported for the aGate 1.3 (SKU AGT-R1V2-US) and 1.3.1 (SKU AGT-R1V3-US). Previous versions of aGate are not supported.*

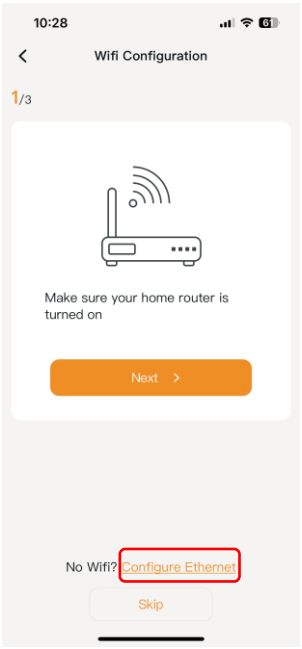


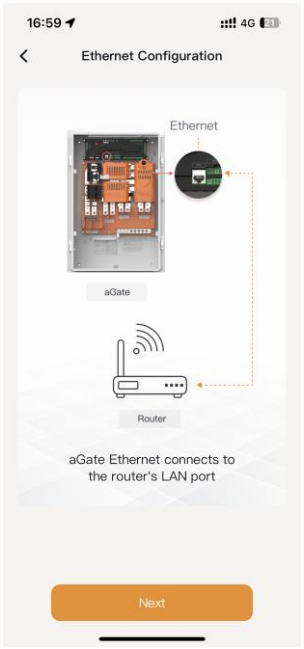
NOTE: *Users may remotely modify the password on the FranklinWH App and, if forgotten, retrieve the password via email.*

After finishing the system direct connect, follow the instructions to proceed with connecting to the home router's Wifi.

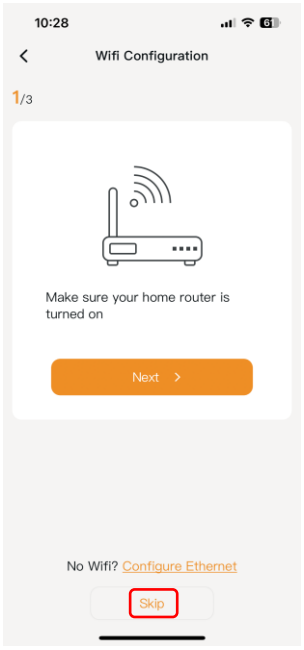


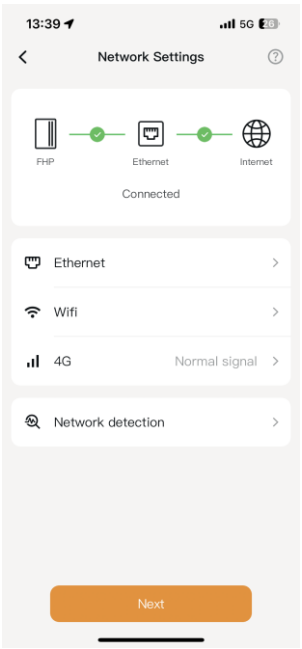
If there is no home Wifi, you can tap **Configure Ethernet** to connect to the Internet through the router's LAN port.





Or tap **Skip** on the **Configure Wifi** page (4G is connected by default).

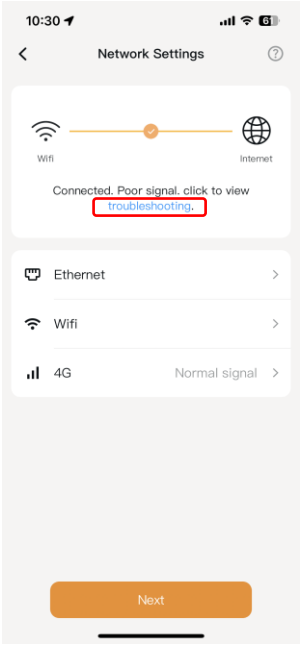




NOTE: *A Wifi or Ethernet connection is preferred to the 4G cellular network, as 4G is easily affected by the carrier services and weather conditions.*

Sometimes the phone will drop the connection with the aGate after the Wifi connection has been successfully established. The mobile app will prompt to reconnect. Please follow the instructions and reconnect your mobile phone to the aGate.

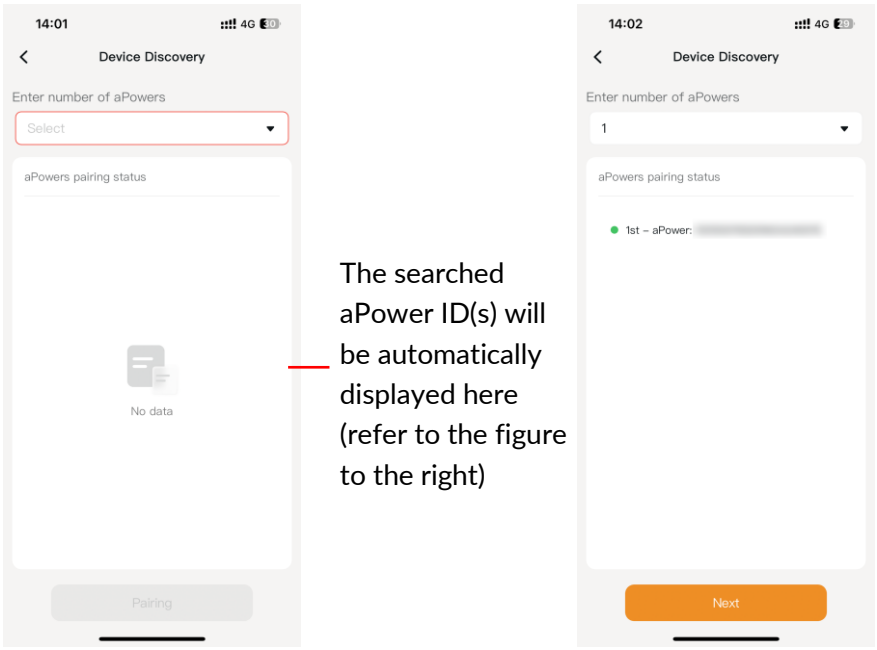
After network configuration, you can tap on **troubleshooting** to view recommended solutions.



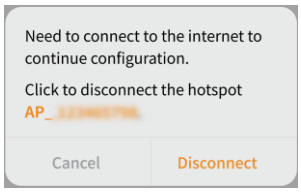
Step 3. Device Discovery.

On the **Device Discovery** page, select the number of aPower units, then tap **Pairing** bar to start searching.

When the aPower batteries have been accurately identified, tap **Next** to save the configuration.

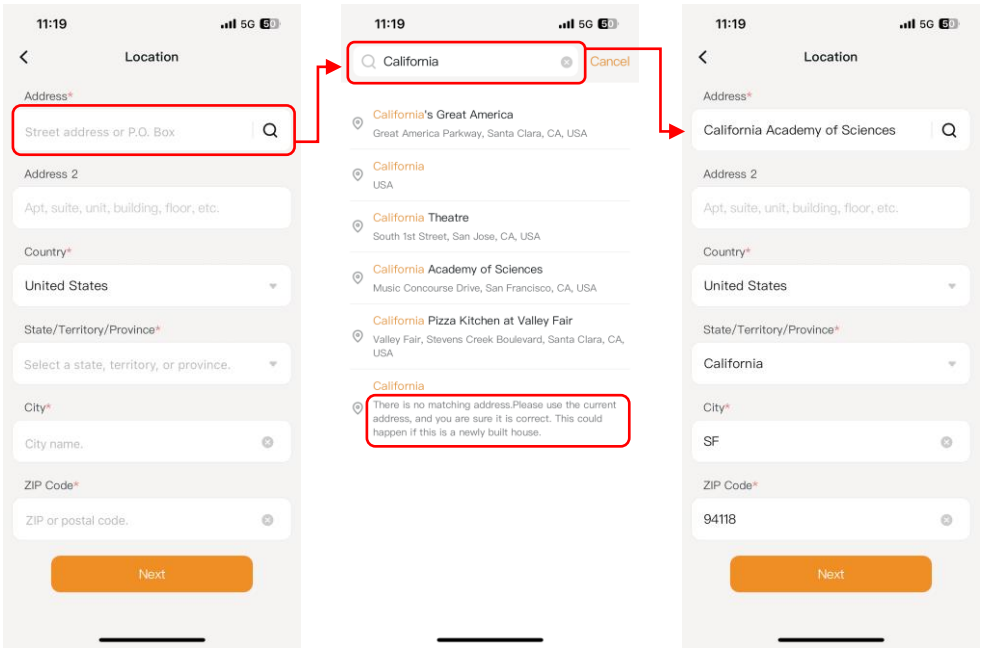


A popup will prompt you to connect to the internet, tap **Disconnect** to access your phone's Wifi settings, then switch the app from the aGate hotspot to the internet, and continue the configuration.



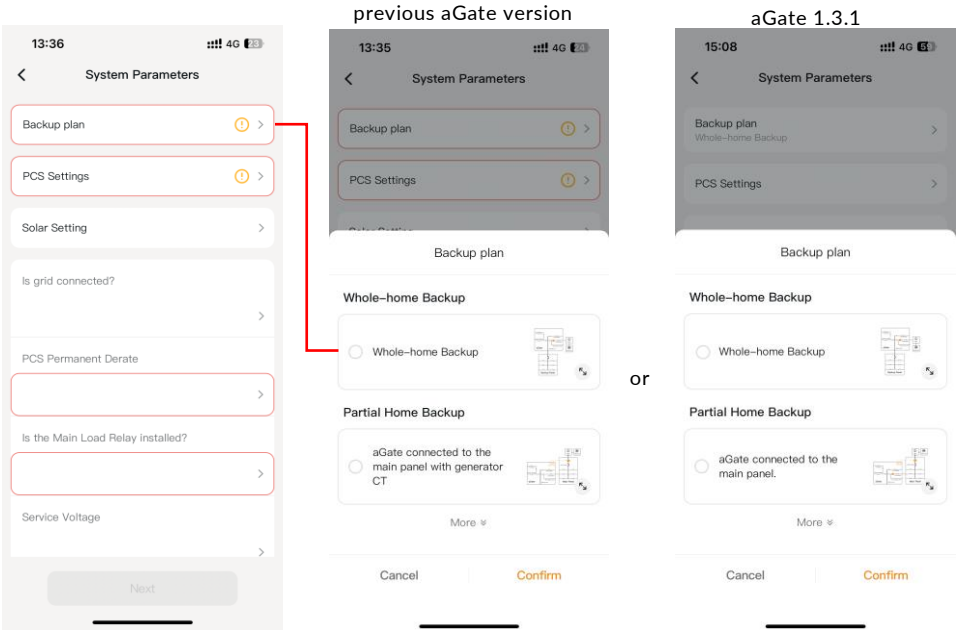
Step 4. Location.

On the **Location** settings page, tap the **Address** bar (left image) and the search form (middle image) appears. Input the address and the search will attempt to match the address. If the correct address displays, tap on it to fill in the fields (right image). If there is no match, tap on **There is no matching address...** at the bottom of the address list, then enter the correct address information in the appropriate fields.



Step 5. System parameters.

On the **System Parameters** page, tap **Backup plan** to select the type of system configuration.



Note: *The backup plan must be configured first; otherwise, the PCS and Solar settings cannot be performed.*

PCS Settings

Grid Import & Export: These settings determine how the FranklinWH System imports energy from and exports it to the grid.

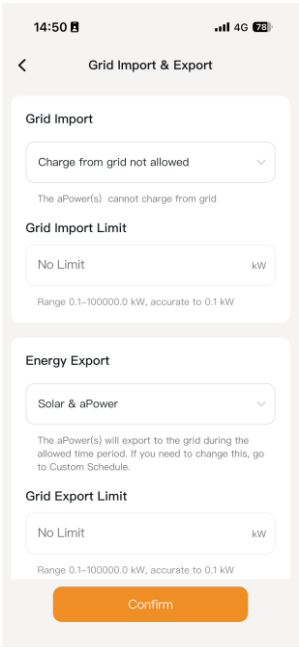
- **Grid Import:** Default is **Charge from grid not allowed**. Enable when you're allowed to charge from the grid. The aGate will use the grid to charge the batteries in Time of Use mode during off-peak or super-off-peak periods. When disabled, the aPowers will only be charged from solar.

  If Grid Import is selected to **Charge from grid allowed**, set the **Grid Import Limit** value.

- **Energy Export:** If **Solar & aPower** is selected, set the **Grid Export Limit** value based on utility requirements and site conditions. In Time of Use mode, your system will send solar and stored battery energy to the grid during on-peak periods.

  If **Solar Only** is selected, the aPower batteries will not export to the grid.

Note: *In states such as California, regulations prohibit batteries from discharging to the grid if the grid was used to charge the batteries.*



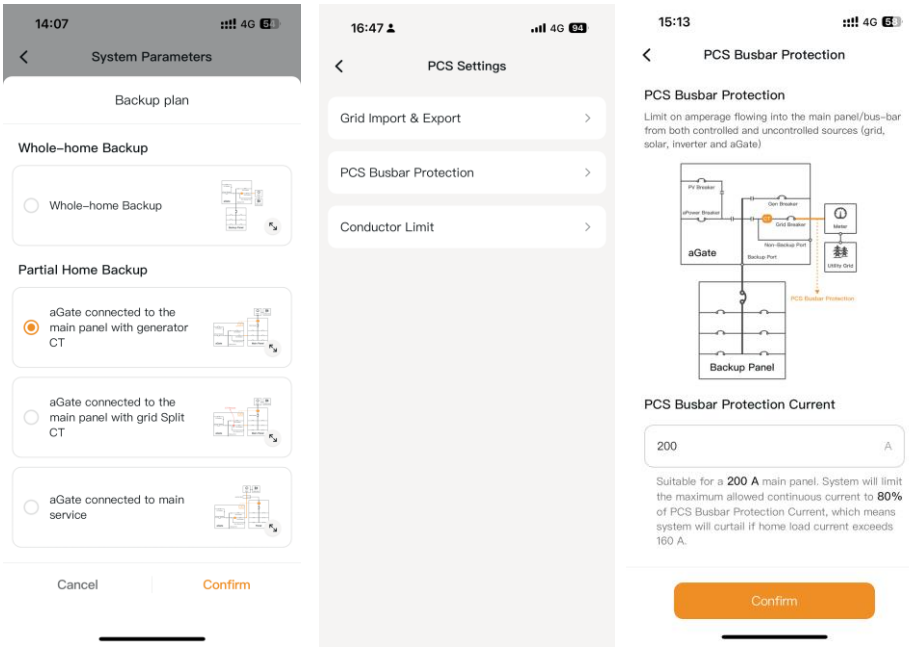
Tap **Confirm**.

PCS Busbar Protection: Limit on amperage flowing into the main panel/bus-bar from both controlled and uncontrolled sources (grid, solar, inverter and aGate).

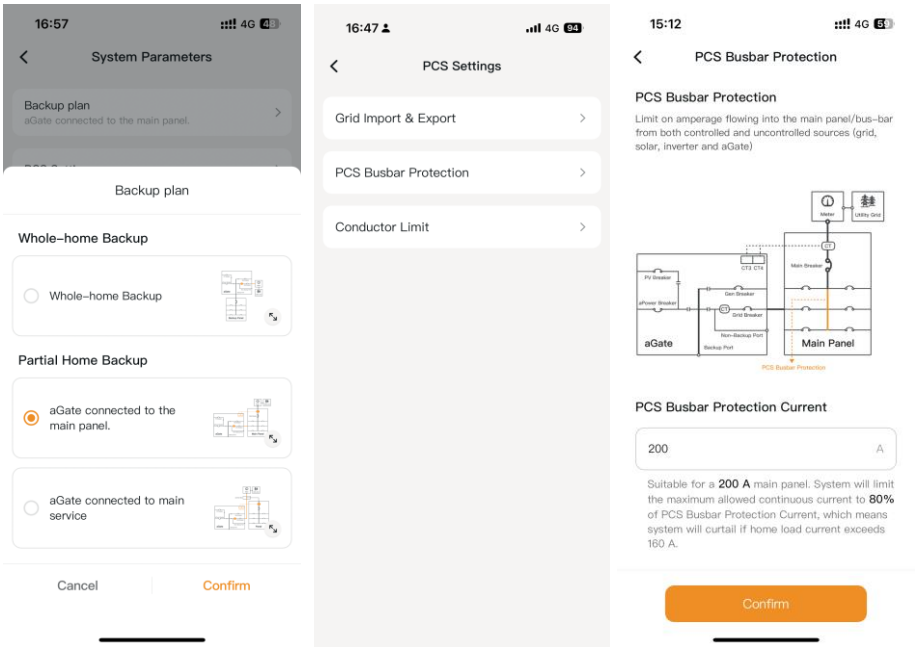
Set the PCS Busbar Protection Current value. The app will limit the maximum allowed continuous current to 80% of PCS Busbar Protection Current.

Note: *When whole-home backup is selected, the PCS bus protection field will appear on the* ***PCS Settings*** *page. For partial-home backup, the field will appear only if a previous aGate version is connected to the main panel with a generator CT, or if the aGate 1.3.1 is connected to the main panel.*

previous aGate version



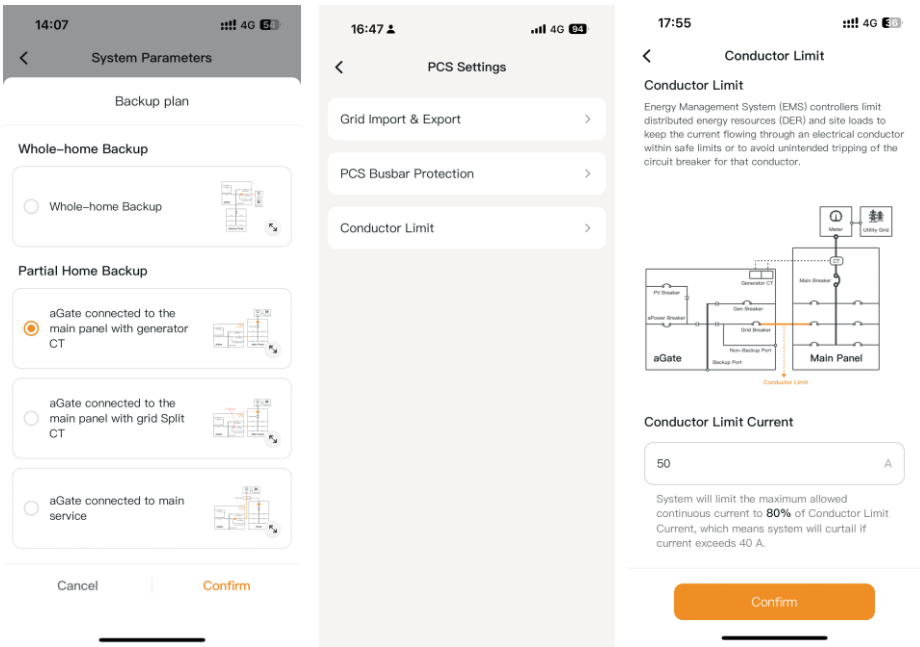
aGate 1.3.1



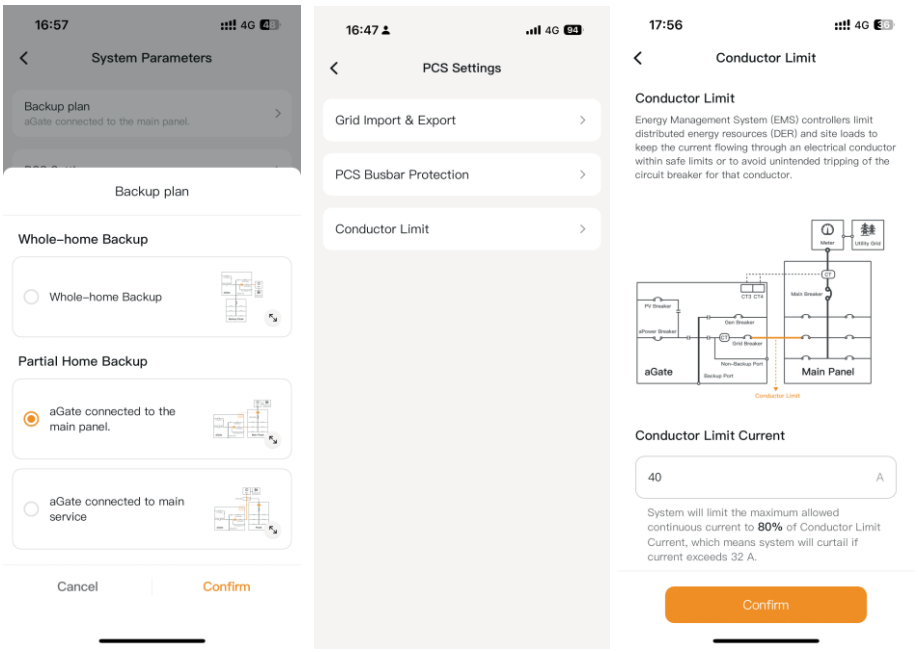
Conductor Limit: Energy Management System (EMS) controllers limit distributed energy resources (DER) and site loads to keep the current flowing through an electrical conductor within safe limits or to avoid the unintended tripping of the circuit breaker for that conductor.

Note: *The Conductor Limit field appears only if partial-home backup is selected and a previous aGate version is connected to the main panel with generator CT, or if the aGate 1.3.1 is connected to the main panel.*

previous aGate version



aGate 1.3.1

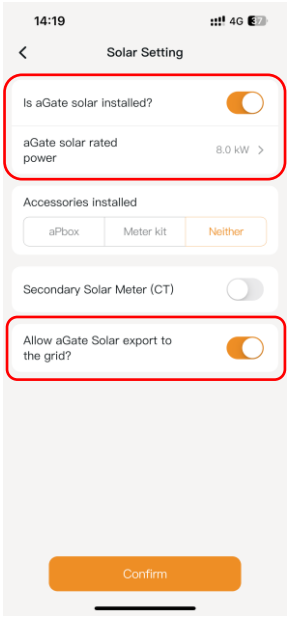


Solar Settings

Tap **Solar Settings** to enter solar system information based on the local configuration.

Is aGate solar installed: Enable if solar is connected to the aGate. Then set **aGate solar rated power** value of the installed system including the rated power of each solar accessory.

Allow aGate Solar export to the grid: Enable this if the aGate solar power is allowed to be exported.

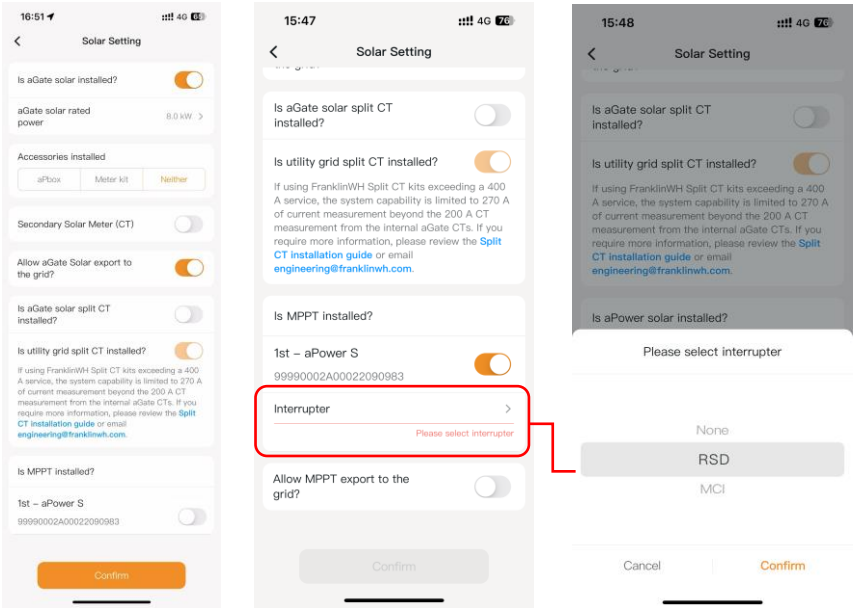


aPower S only

Is MPPT installed: Identify the aPower S unit connected to DC PV using the aPower S serial number. Enable this setting if DC PV is connected.

Interrupter: Indicates if the PV Interrupter is connected. This device enables rapid shutdown of solar panels (NEC 690.12) for firefighter safety. Select the appropriate model if connected.

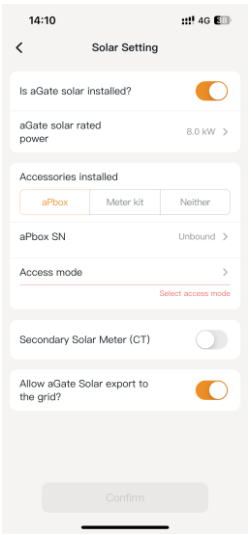
Allow MPPT export to the grid: Enable this if the DC PV is allowed to be exported.



aPbox Configuration

If an aPbox is connected, press **aPbox** to activate it and to access the aPbox configuration as needed.

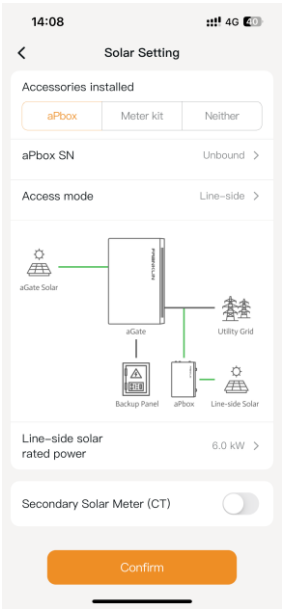
Select the appropriate access mode according to the requirements. Currently there are three access modes available: Load-side, Line-side and Solar Meter Upstream.

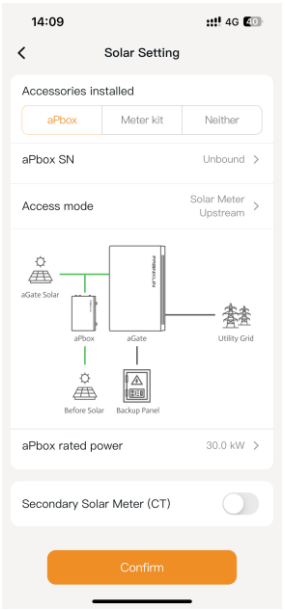


When the aPbox access mode is **Load-side**, select **Load-side solar quantity** and then set the **Solar rated power** value. Enable if the load-side aPbox solar power is allowed to be exported to the grid.

When the aPbox access mode is **Line-side**, set a **Line-side solar rated power**.

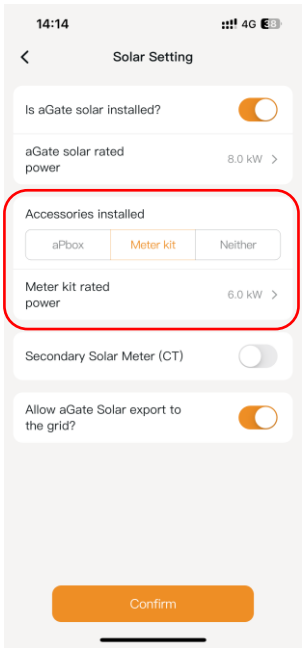
When the aPbox access mode is **Solar Meter Upstream**, set the **aPbox rated power**.





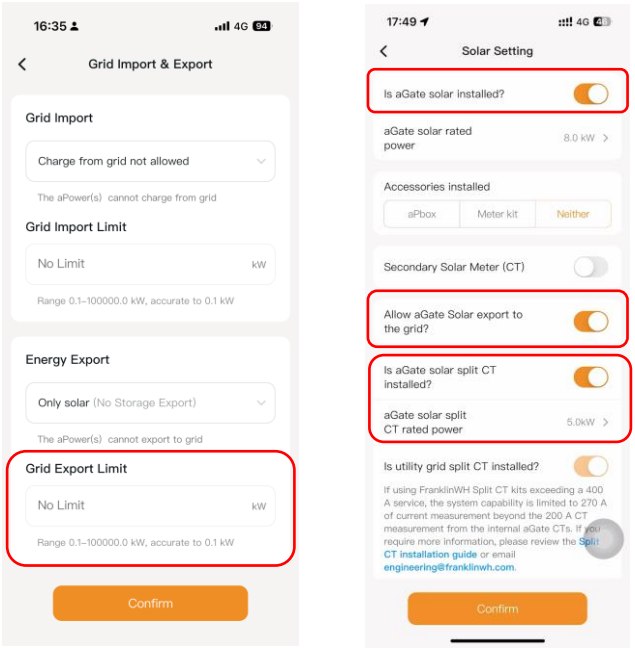
Meter Kit Configuration

If a meter kit is connected, press **Meter kit** to activate it and to access the meter kit configuration to set the **Meter kit rated power**.



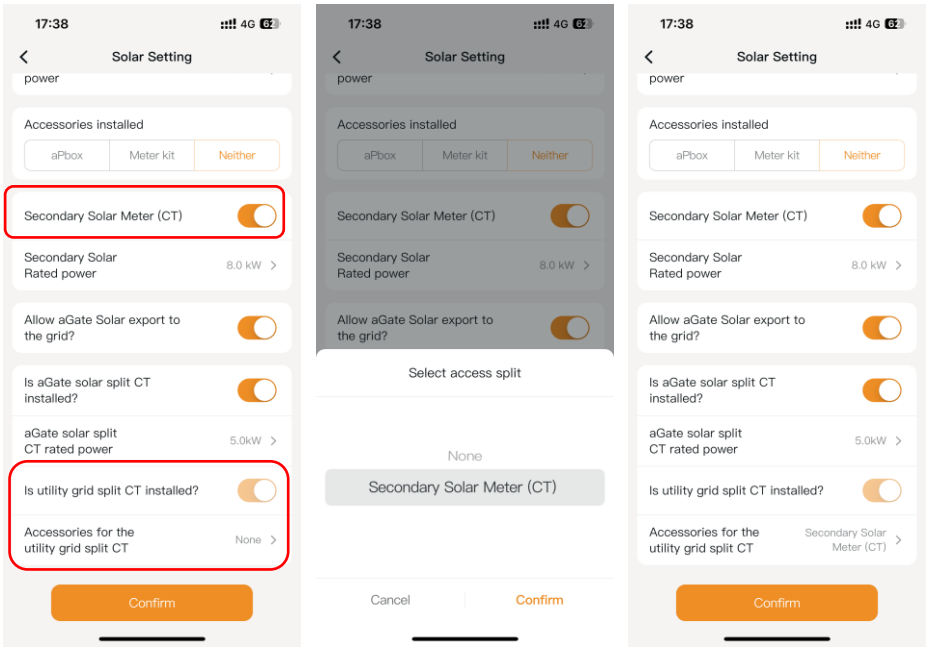
Split CT Configuration for aGate X 1.3 and aGate X 1.3.1

If **Is aGate solar installed** and **Allow aGate Solar export to the Grid?** are enabled, and there is no limit on grid export in the **PCS Settings** page, then **Is aGate solar split CT installed?** can be enabled. If done, then set **Split CT rated power**.



Is utility grid split CT installed: Automatic activation of the split CT is connected to the utility grid only when partial home backup is selected.

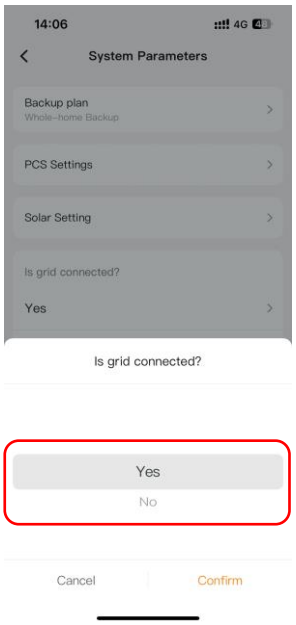
***Note: Accessories for the Utility Grid split CT** option will only appear if both the Utility Grid split CT and the Secondary Solar Meter (CT) are installed and enabled. Then, tap to select the access split method.*



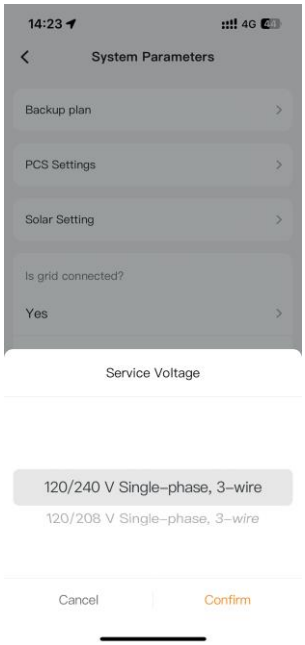
Configure the system's grid-related parameters

➢ **aPower X, aPower 2 and aPower S**

On the **System Parameters** page, select the system's grid connection status from the option box. If the system is connected to the grid, choose **Yes**.



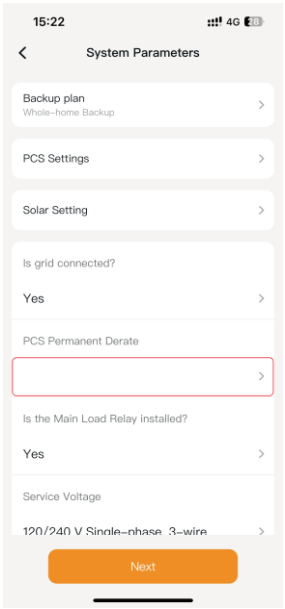
Configure the **Service Voltage.**

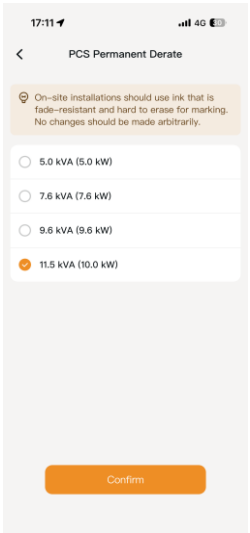
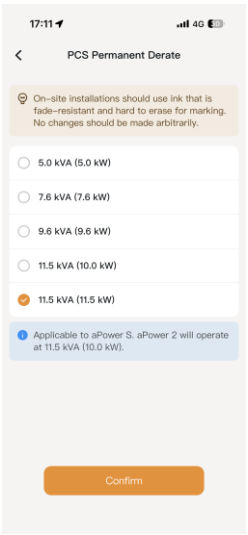


➢ **aPower 2 and aPower S**

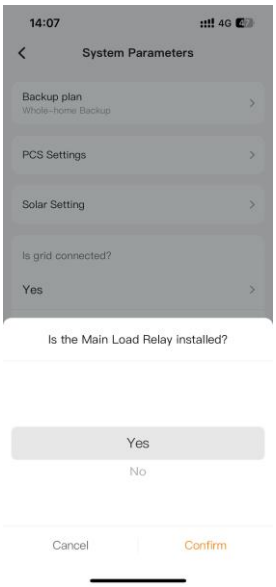
Sets the rated output power of all aPowers connected to the specific aGate.

Note: *In both on-grid and off-grid modes, all aPowers output is set to the PCS permanent derate value configured during system commissioning. The PCS derate feature applies to both charging and discharging rates.*



Mixed Combination Scenarios	Only aPower X	aPower X and aPower 2	Includes aPower S mixed scenarios
Options	Unsupported setting		 ***Notes:*** *When mixing aPower X, aPower 2 and aPower S, if 11.5 kVA (11.5 kW) is selected, aPower S will operate at its rated output of 11.5 kW. aPower 2 will continue to operate at its rated output of 10 kW, and aPower X will always operate at its rated output of 5 kW.*

If the Main Load Relay is installed in the aGate, choose **Yes**.



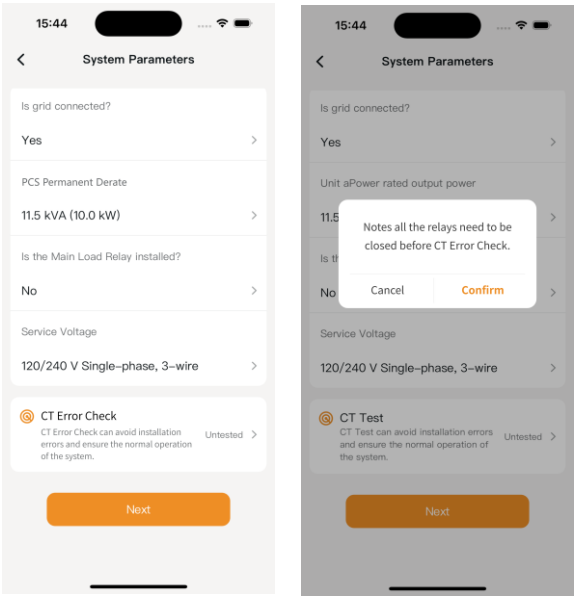
Note: *This feature is supported in aGate 1.3 and 1.3.1.*

CT Error Check

CT Error Check helps correct installation errors for external CTs and ensures the FranklinWH System operates correctly. All relays must be closed before starting the check. The CT Error Check tests all external CTs connected to all aGates and Meter Adapter Controllers in the system.

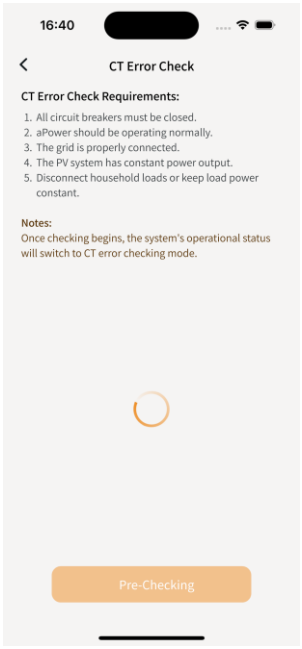
Note: *If the aGate system firmware is v1.3, the CT Test option will not be available. Complete the commissioning, wait for the firmware upgrade, and then re-enter commissioning for the CT Test and verify the PCS settings after the upgrade.*

Once the check process begins, the system's operational status will switch to CT Error Check mode.

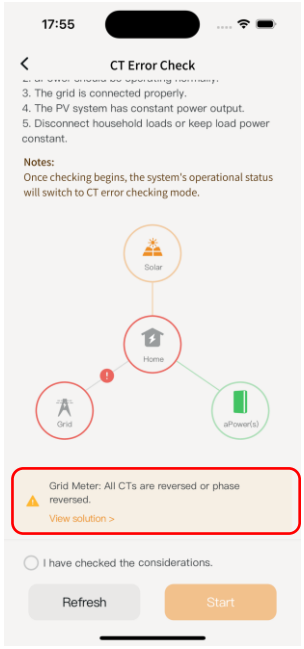


a) CT Pre-Check.

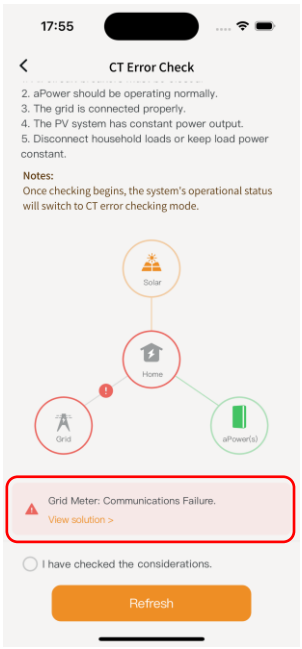
Upon entering **CT Error Check**, the system will automatically perform a pre-check. Please review the relevant requirements before the formal check.



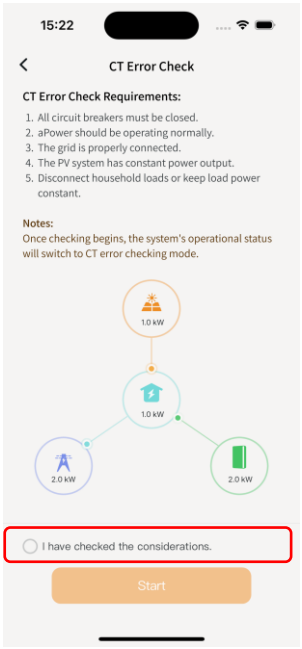
If a problem is detected, proceed to troubleshooting.



or



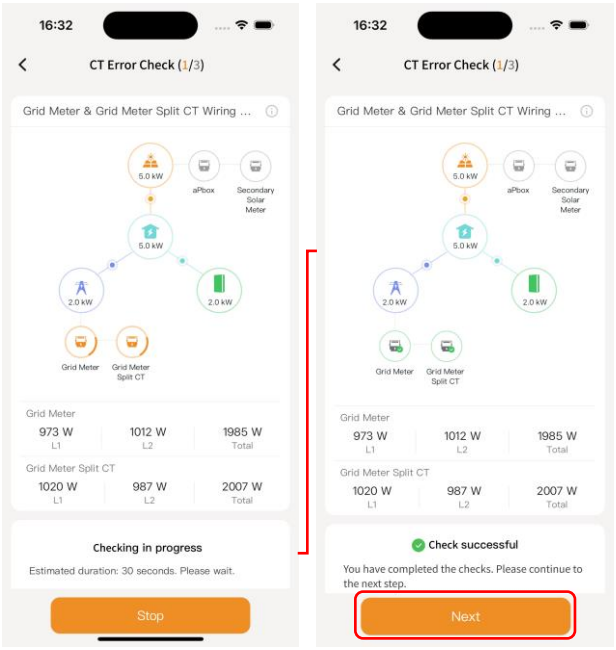
After the pre-check is complete, check the radio button and tap **Start** to begin the CT Error Check.

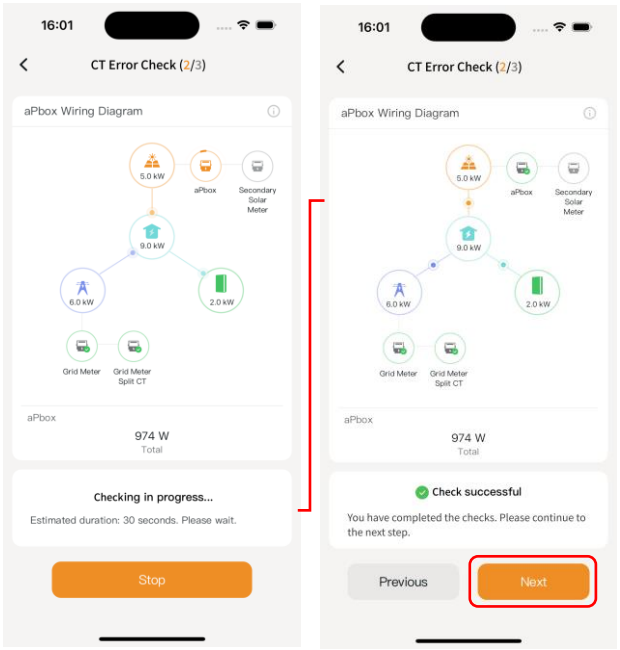


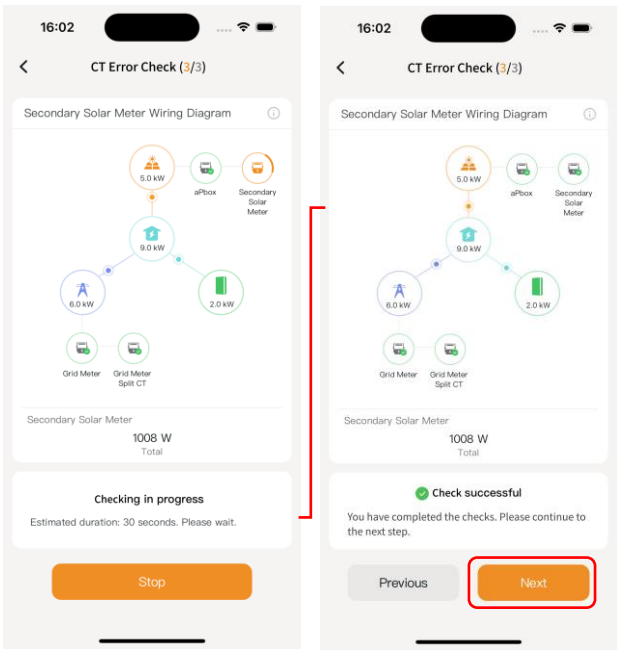
b) CT Error Check.

During CT Error Checking, the system will automatically recognize the CTs to be checked and display the number and current step in the page title.

The system will check the CTs sequentially. When a step is completed, the installer will need to confirm and tap **Next** to go to the next step until the CT Error Check process is complete.

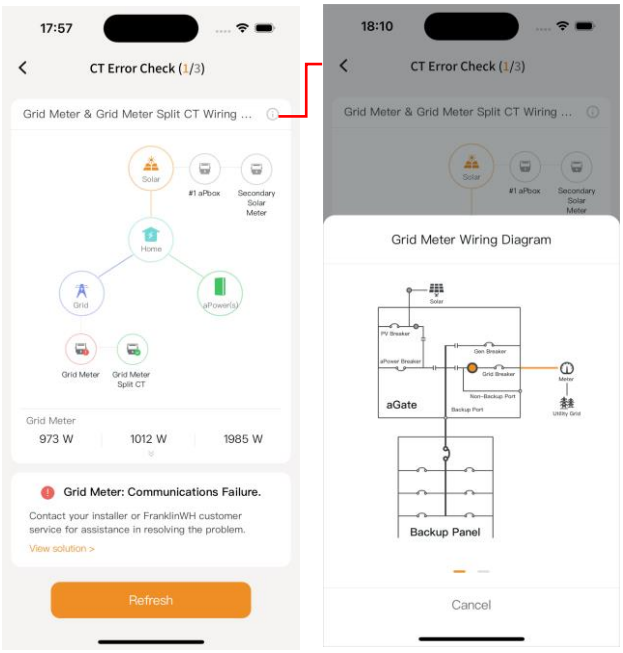



16:01
CT Error Check (2/3)
aPbox Wiring Diagram
5.0 kW
aPbox
Secondary Solar Meter
9.0 kW
6.0 kW
2.0 kW
Grid Meter
Grid Meter Split CT
aPbox
974 W
Total
Checking in progress...
Estimated duration: 30 seconds. Please wait.
Stop
16:01
CT Error Check (2/3)
aPbox Wiring Diagram
aPbox
974 W
Total
Check successful
You have completed the checks. Please continue to the next step.
Previous
Next

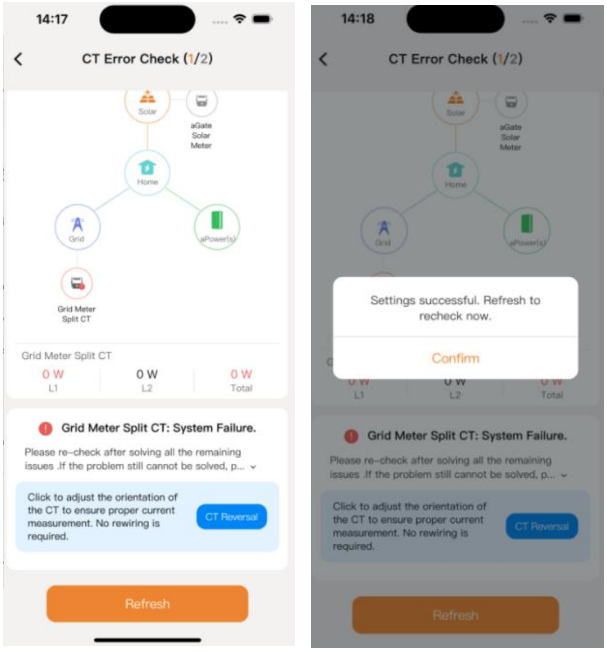

16:02
CT Error Check (3/3)
Secondary Solar Meter Wiring Diagram
5.0 kW
aPbox
Secondary Solar Meter
9.0 kW
6.0 kW
2.0 kW
Grid Meter
Grid Meter Split CT
Secondary Solar Meter
1008 W
Total
Checking in progress
Estimated duration: 30 seconds. Please wait.
Stop
16:02
CT Error Check (3/3)
Secondary Solar Meter Wiring Diagram
Secondary Solar Meter
1008 W
Total
Check successful
You have completed the checks. Please continue to the next step.
Previous
Next

During CT Error Checking, click the button to the right of the CT name being checked to view the CT's location on the example wiring diagram.

If a problem is detected during the process, tap **View solution** to view troubleshooting recommendations. Tap **Refresh** to continue the process after resolving the problem.

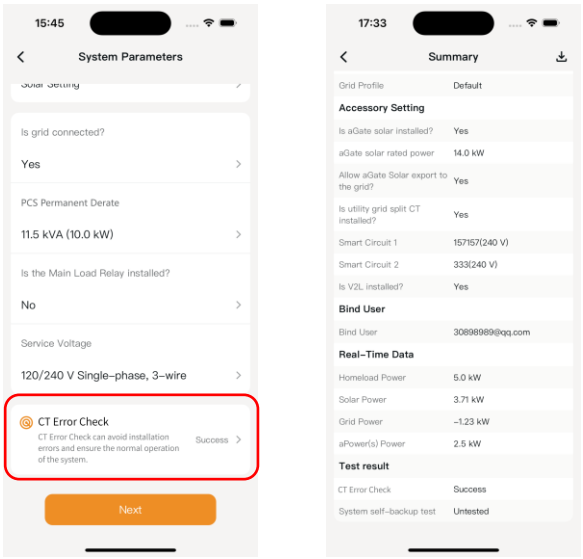


If the **CT Reversal Error** pop up appears during commissioning, click **CT Reversal**. The FranklinWH software will reverse the measurements to reflect the accurate CT readings.



c) CT Error Check process completion.

After the CT Error Check is completed, the CT Error Check status on the System Parameters page will be updated to **Success**. The CT summary report page will be displayed.

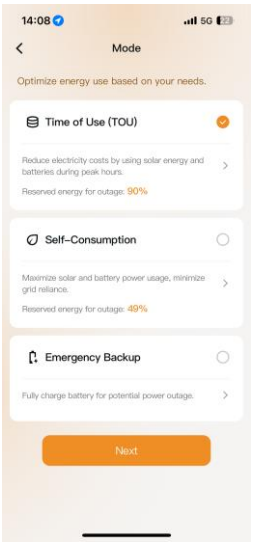


Tap **Next** to finish System parameters and move on to the next step.

Step 6. Utility Plan & Incentives.

Mode

On the **Mode** page, select the system operating mode, such as Emergency Backup, Self-Consumption, or Time of Use, to optimize energy usage according to your needs.

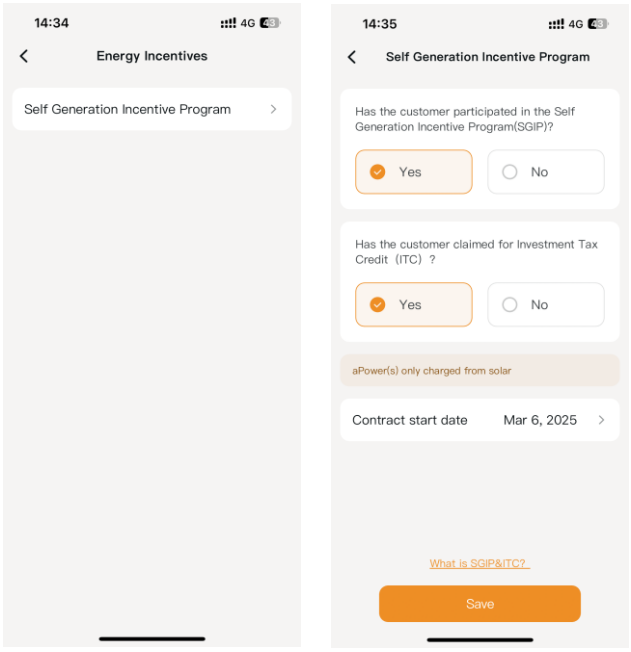


Tap **Next**.

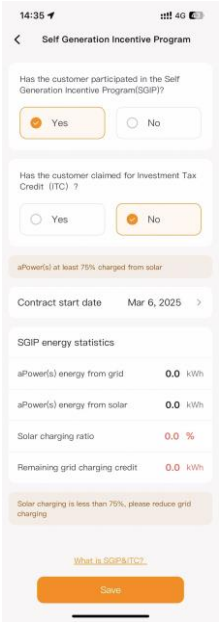
Note: *The Self-Consumption option will only appear in the mode selector if you have PV connected to the aGate.*

Energy Incentives

Self Generation Incentive Program: These fields will appear when the aGate is in California. Tap the **Self Generation Incentive Program** bar. Select **Yes** if participating in SGIP, ITC, or both. If participating in both SGIP and ITC, the battery will charge only from solar. Then, set the **Contract start date**.

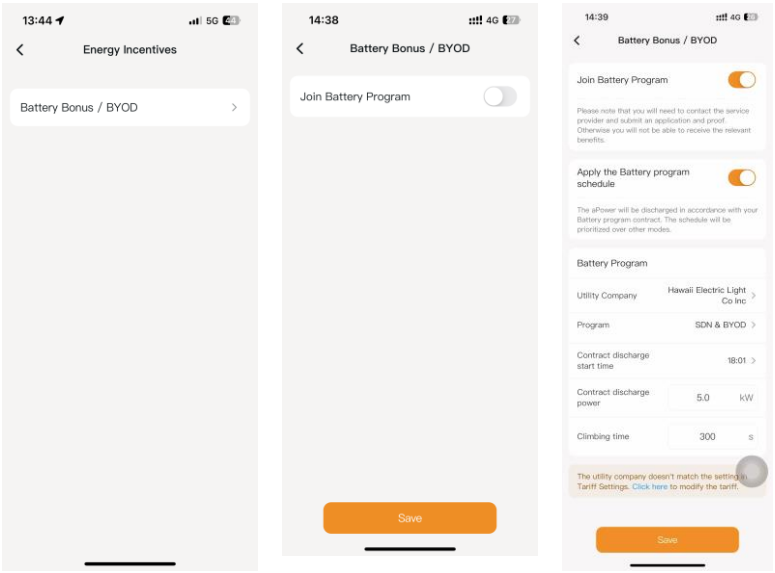


If only participating in SGIP, you can also view detailed **SGIP energy statistics** information.



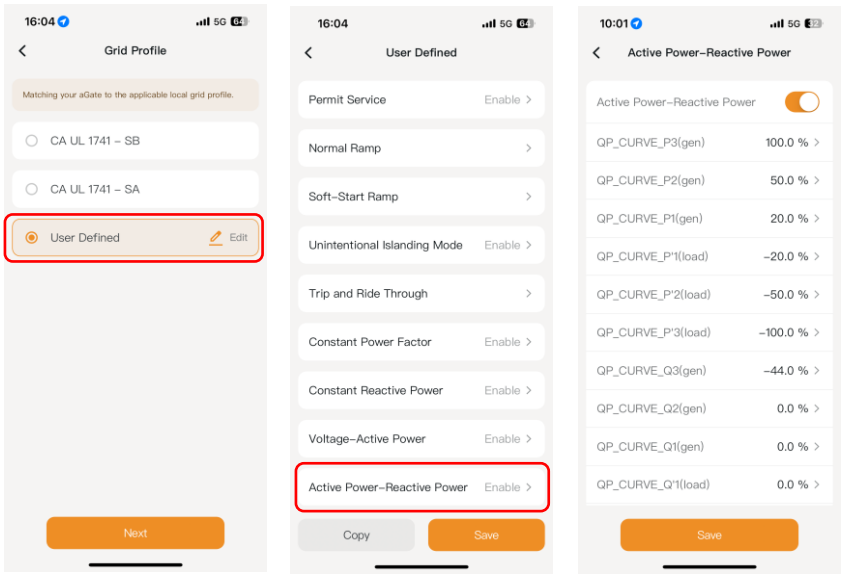
Battery Bonus/BYOD: The fields will appear when the aGate location is in Hawaii. Tap the **Battery Bonus/BYOD** bar. If the customer is participating in Battery Bonus, slide to enable this setting. Then, set **Utility Company**, **Program**, **Contract discharge start time**, **Contract discharge power,** and **Climbing time** based on the battery bonus contract.

Note: *Enable the* ***Apply the battery bonus schedule****, and the aPower batteries will discharge according to the battery bonus contract. This schedule will take precedence over other modes.*



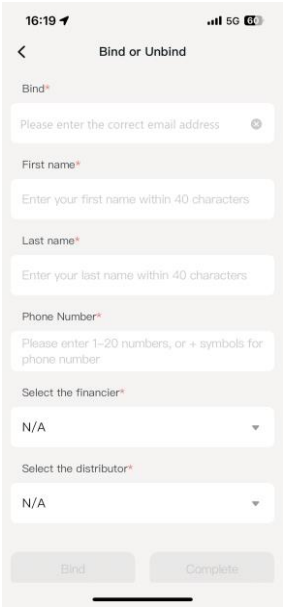
Step 7. Grid Profile.

Select an applicable local grid profile. If the local grid profile is not available, tap **Edit** in the **User Defined** bar to set the parameters. On the **User Defined** page, you can set parameters for active or reactive power. By default, active power is enabled.



Step 8. Bind or Unbind.

Enter the new customer email, first name, last name and phone number. Select the financer of this project and the distributor from which the FranklinWH System was purchased. Then tap **Bind** and **Complete**.



NOTE

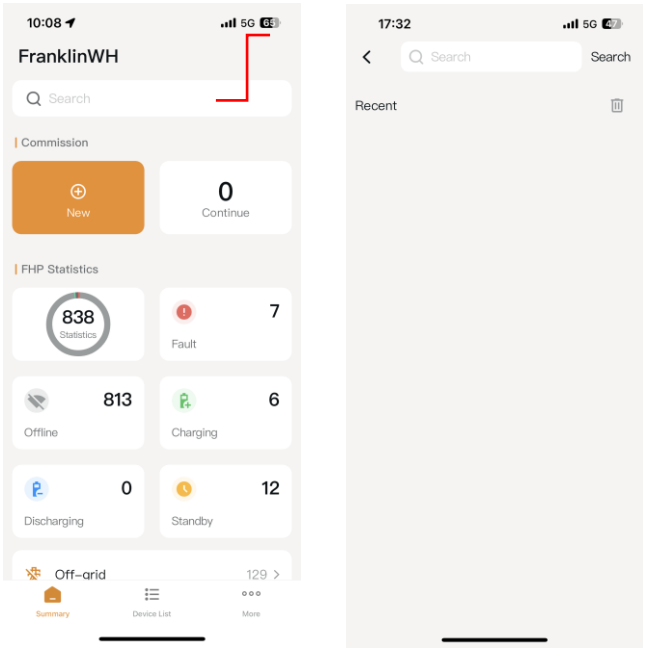
- If there is not a contractual requirement to select financer and distributor, then select **N/A** in each field.
- If the customer needs to change the bound account, tap **Commission** > **Bind or Unbind** > **Unbind** > **Complete**, then rebind.

Optional Components Configuration

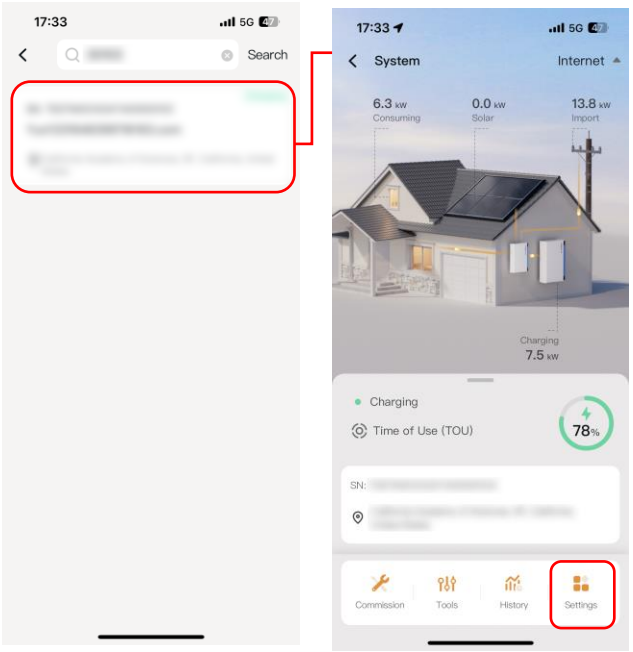
The FranklinWH System has three optional components: the Smart Circuits Module and Generator Module, additions to the aGate, and the aPbox, a separate box to control PV and other electrical power inputs.

Bind the installed components

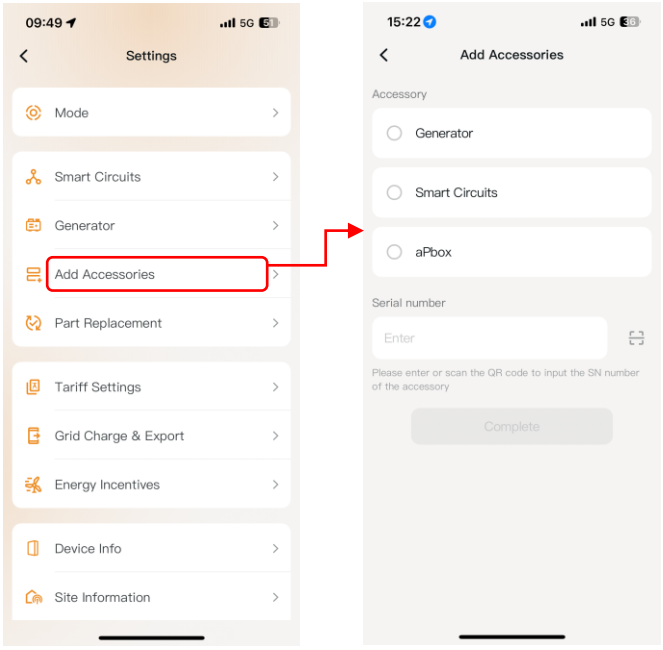
Step 1. Search for the serial number of the aGate for which the Smart Circuits Module, for example, is to be installed in the Search Device box.



Step 2. Tap on the search result to access the system and select **Settings**.

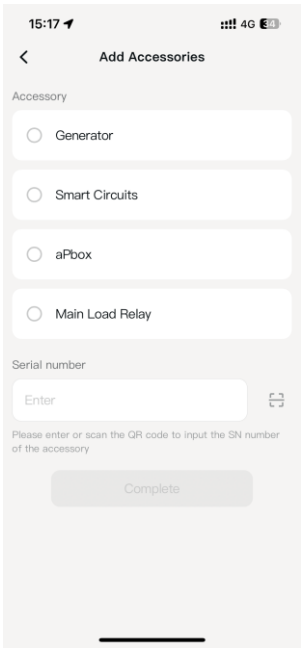


Step 3. On the **Settings** screen, tap **Add Accessories**, then select the corresponding accessory. Scan the equipment QR code or manually input the **SN**. Tap **Complete**.



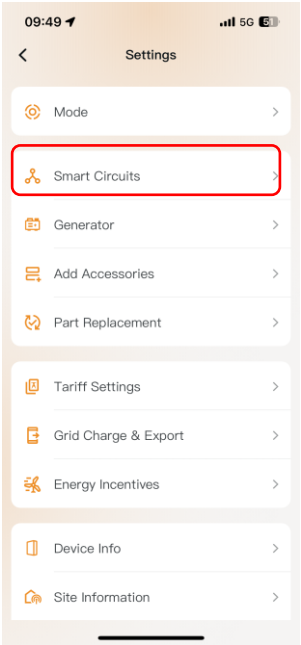
Step 4. Repeat the previous steps to bind the Generator module and the aPbox.

Note: *Binding the Main Load Relay is only supported for aGate 1.3 and 1.3.1.*

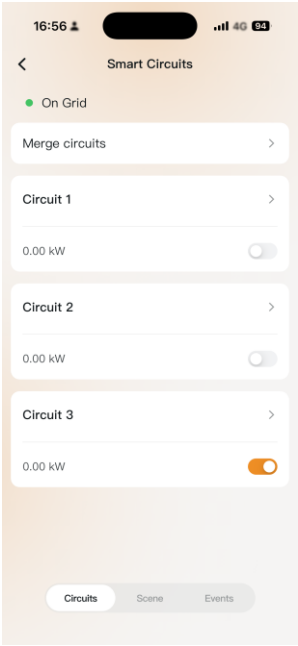


Set the Smart Circuits Module Parameters

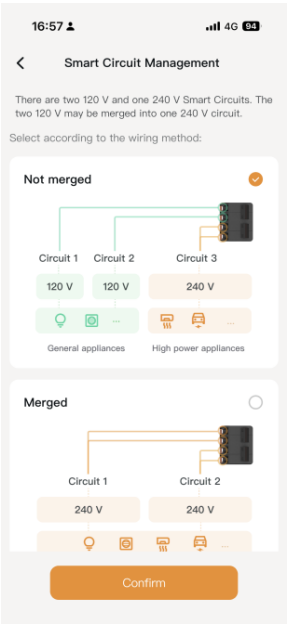
Step 1. On the **Settings** screen, tap **Smart Circuits**.



Step 2. The bar at the bottom of the **Smart Circuits** page contains three icons: **Circuits**, **Scene**, and **Events**. Tap the icon for the component you want to view to access its details.



Step 3. The **Circuits** tab displays all Smart Circuits by default.



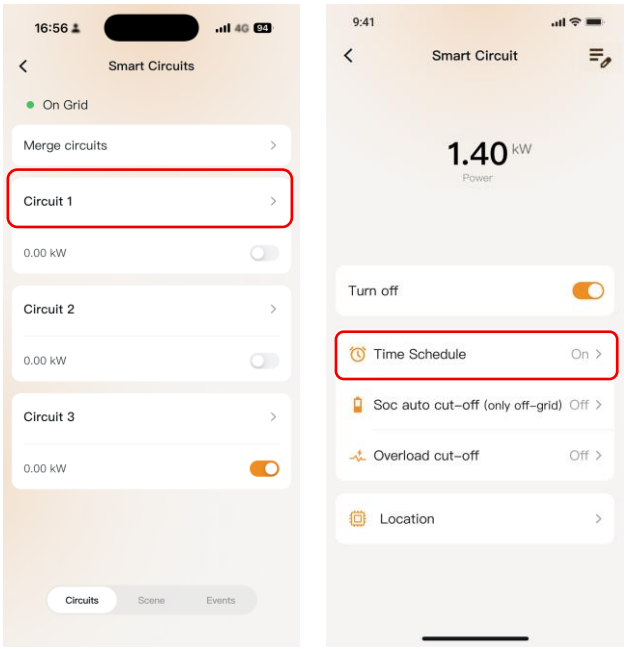
Merge circuits: If Smart Circuit 1 and Smart Circuit 2 share the same 2-pole switch, select the appropriate option to merge them, and then tap **Confirm**.

> **NOTE**
>
> Circuits must remain in agreement with the physical electrical wiring.

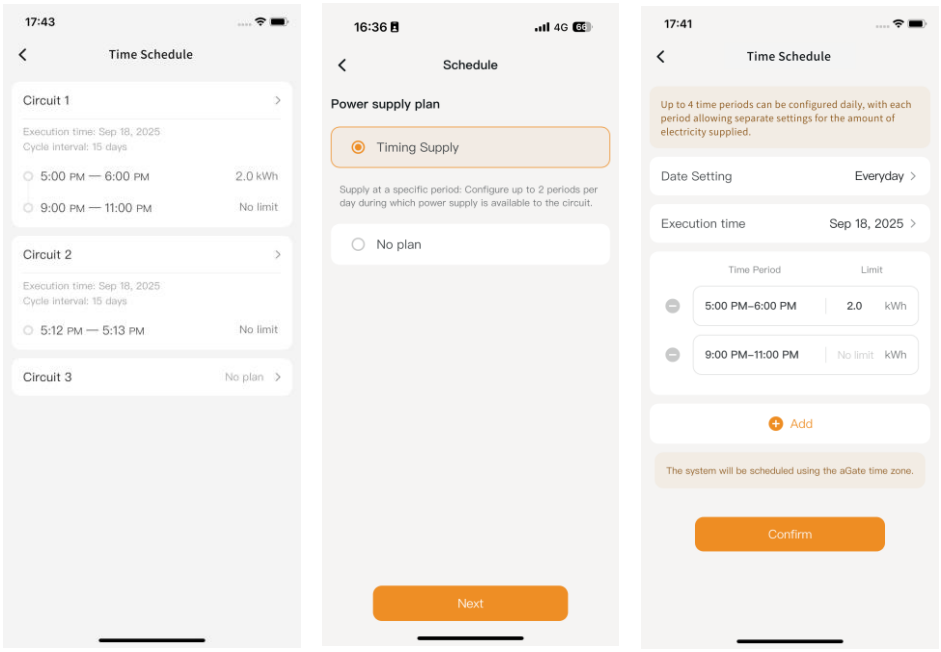
Customize settings for the circuits

Turn on/off: Tap the slider to manually turn the circuit on or off.

Time Schedule: Customize the time period or electricity consumption to automatically turn the circuit on or off.

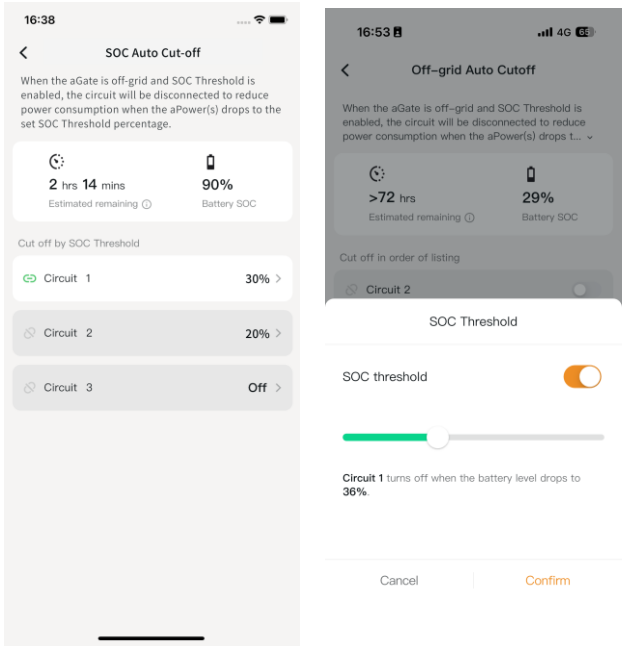


You can set the cycle interval and execution time, allowing the system to work intelligently and meet the customer's power consumption requirements.

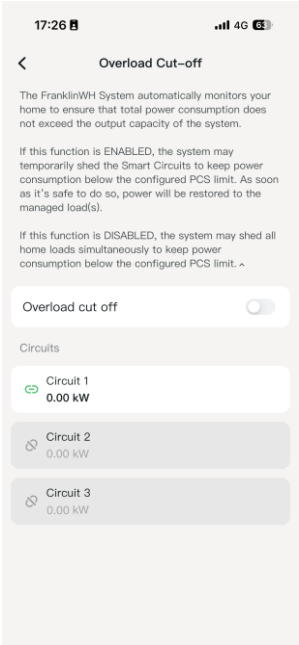


SOC Auto Cut-off (only off-grid): Extend backup hours by automatically disconnecting circuits in sequence based on battery SOC during a grid outage.

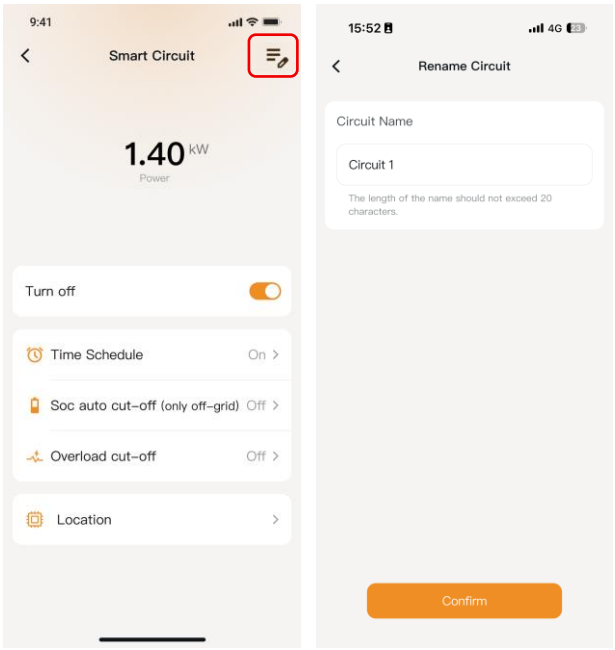
When the aPower battery capacity drops to the set SOC Threshold, each Smart Circuit will be automatically disconnected to reduce power consumption.



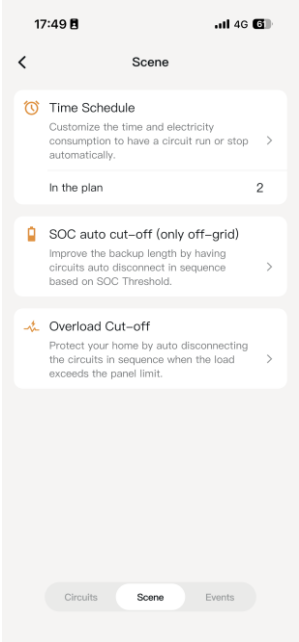
Overload Cut-off: If the load exceeds the main panel's capacity, the system will automatically disconnect circuits to prevent overload damage.



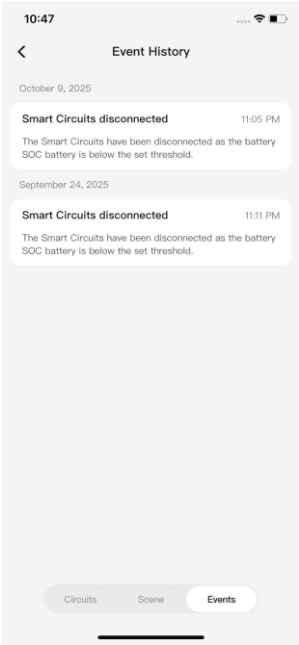
Name: Tap the **Edit** button on the top right, then tap **Name** to rename the circuit. Each circuit name may be up to 20 characters.



Step 4. Tap the **Scene** tab to view the full list of available scenes. You can also set the Time Schedule, SOC Auto Cut-off (only off-grid), and Overload Cut-off scenes for the circuit.



Step 5. Tap the **Event** tab to view the circuit disconnected event logs.

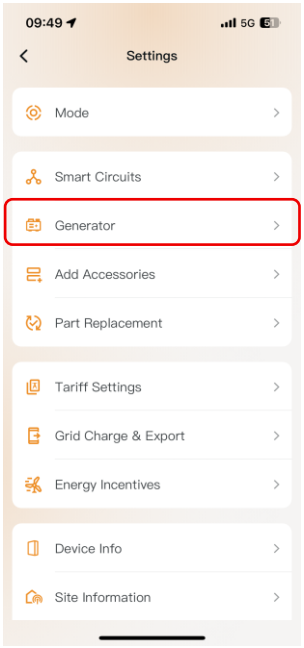


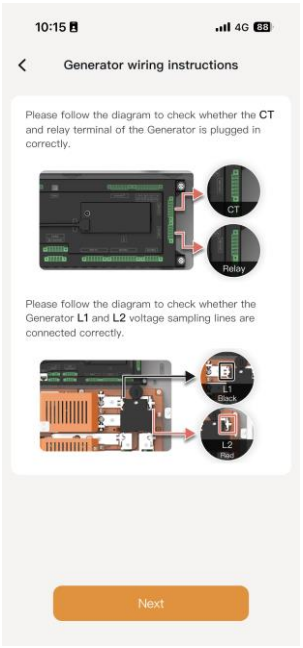
Set the Generator Parameters

Step 1. On the **Settings** screen, tap **Generator**.

Step 2. After reading the Generator feature description, tap **Installation**.

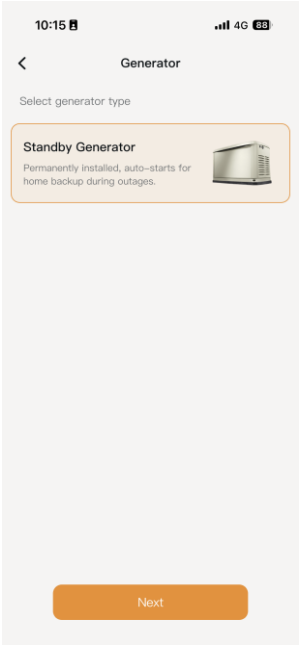
Step 3. Check the generator CT, relay, and L1/L2 voltage sampling connections as per wiring instructions.





Tap **Next**.

Step 4. Select generator type.



Step 5. Set the generator parameters.

NOTE

The generator connection settings in **Start control type** should not be changed without authentication and must keep in agreement with the actual electrical connections and wiring of the FranklinWH System.

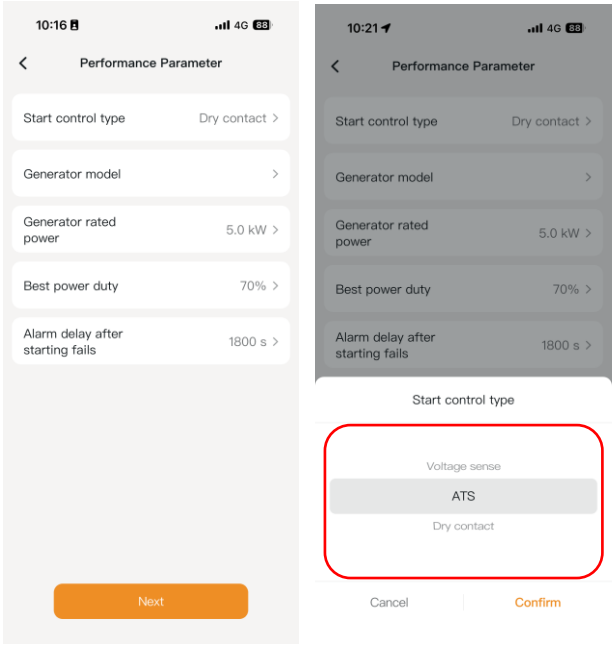
Starting control type: Select the generator start type.

Generator model: Please refer to the model number on the generator nameplate.

Generator rated power: Refer to the value on the generator name plate.

Best power duty: Set the best duty efficiency point of the generator (70% by default). Please refer to the generator manual or consult the generator supplier for the optimal setting.

Alarm delay after start failure: Set the delay period for the generator to be started. If generator startup fails, the system will push a message to the customer.



Tap **Next**.

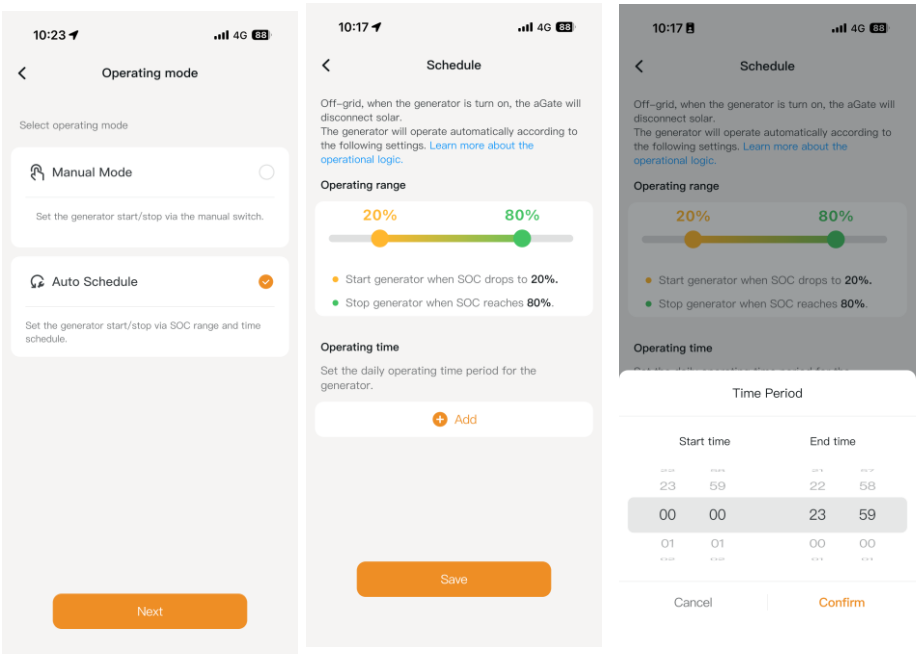
Step 6. Set the generator's operating mode.

Manual: Default is manual. Customers may manually start or shut down the generator.

Auto Schedule: Check the **Auto Schedule** option. The generator will run according to the set time periods or battery state of charge.

a. Set your preferred **Operating Range** by adjusting the slider at the top of the screen. In off-grid mode with the operating mode set to Auto Schedule, the generator will start when the SOC of the aPower batteries connected to the same aGate fall to or below the SOC low limit, and it will automatically shut down when the SOC of the same batteries reaches the upper limit.

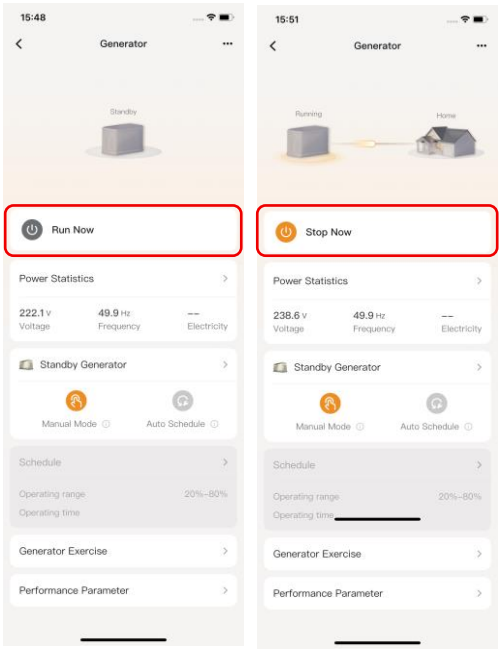
b. Tap the plus icon (as shown) to the operating time period. The system allows up to 3 non-overlapping periods (00:00-23:59 allowed for each) with an interval of at least 1 minute.



Tap **Save**.

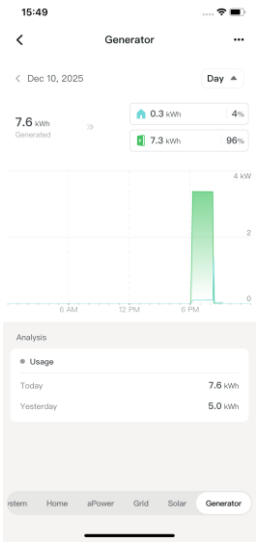
Step 7. Once all previous setup steps are complete, a pop-up will prompt you that the installation was successful. The page will automatically redirect to the generator home screen.

Manual Mode: In Manual Mode, the automatic schedule will be disabled. To start or stop the generator, tap the **Run Now** or **Stop Now** button.



Auto Schedule Mode: In automatic mode, the manual buttons on the interface will be disabled, and the generator will operate according to the configured schedule.

Tap **Power Statistics** to view the generator's power output statistics.



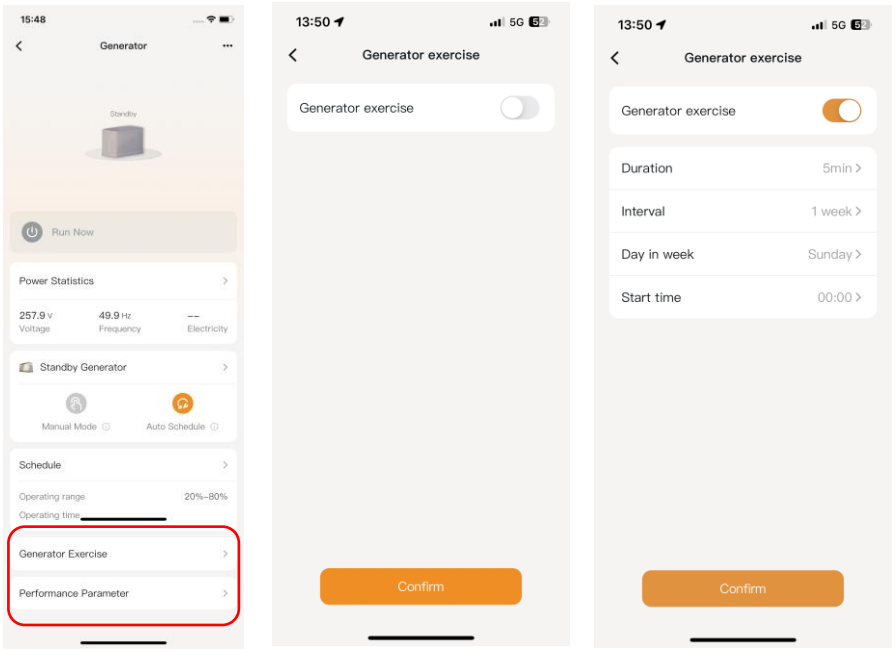
Tap **Generator exercise** and turn on **Generator exercise** slider to enable parameter setting.

Duration: Set the exercise duration.

Interval: Set the exercise interval period.

Day in week: Set the day in week for the exercise.

Start time: Set the exercise start time.



Tap **Performance Parameter** to set up the generator parameter as instructed in Step 5 above.

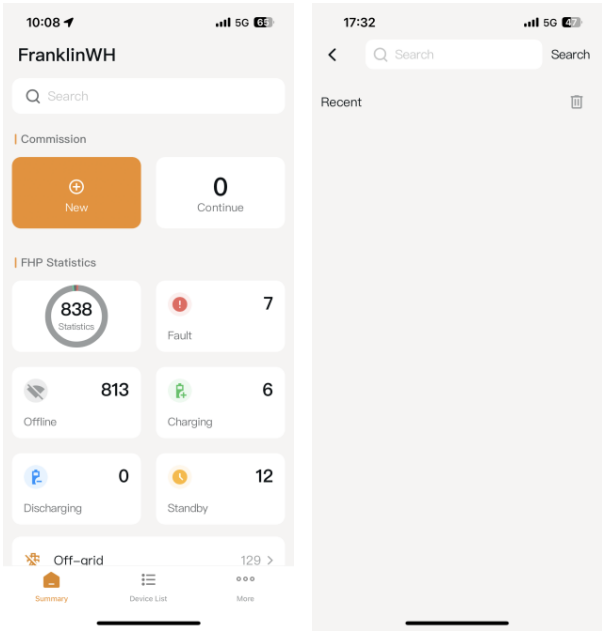
Vehicle to Load

Vehicle to load (V2L) is a feature on some electric vehicles (EVs) that lets them use their stored energy to power external devices, such as electrical power tools and a variety of consumer devices.

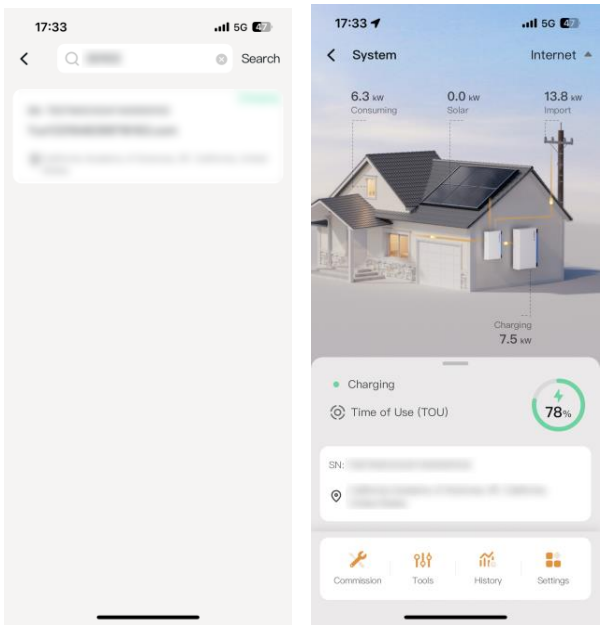
Typically, EVs do not use a significant portion of their battery's capacity in day-to-day travel. V2L technology lets consumers get more from a vehicle, even when it is turned off, improving consumer value. If this feature needs to be enabled, follow these steps:

Note: *This feature is supported for the aGate 1.3 (SKU AGT-R1V2-US) and 1.3.1 (SKU AGT-R1V3-US). Previous versions of aGate are not supported.*

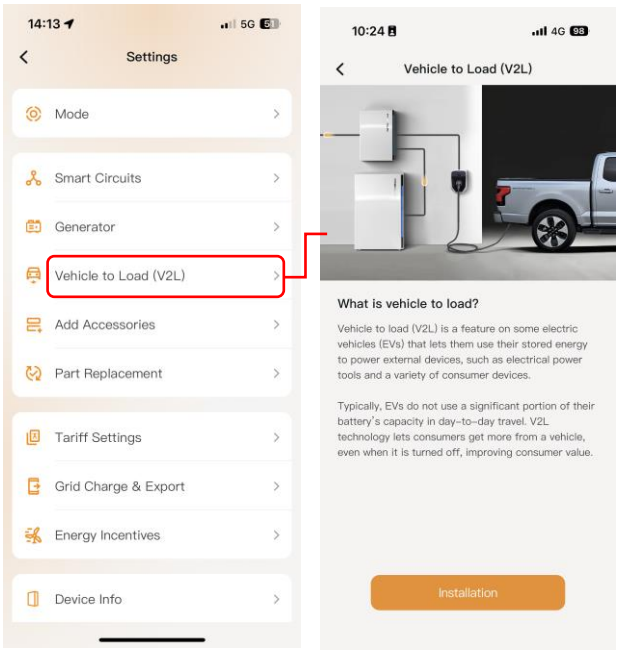
Step 1. Search for the aGate serial number for which the V2L function needs to be commissioned in the **Search Devices** box.



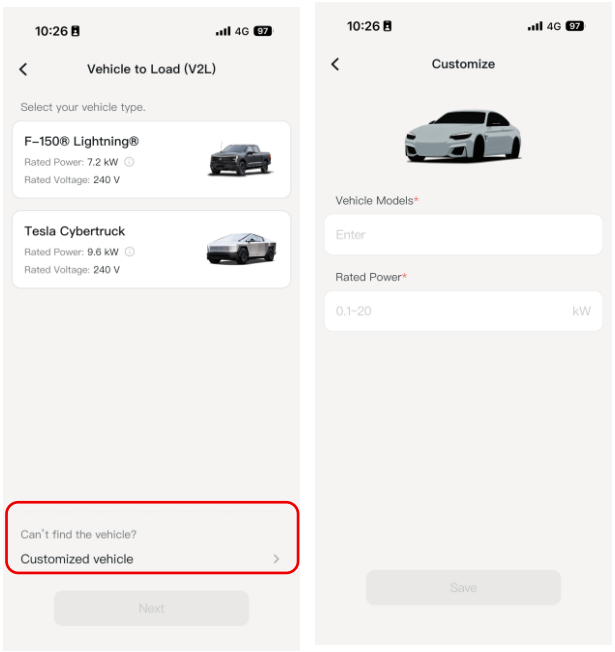
Step 2. Tap on the search result to access the system and select **Settings**.



Step 3. On the **Settings** screen, select **Vehicle to Load** > **Installation** for V2L configuration.

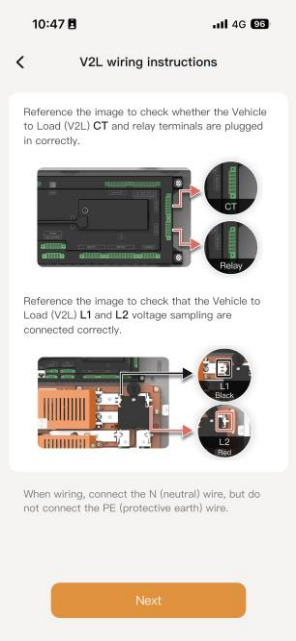


Step 4. Select your vehicle type from the options provided, then tap **Next**.

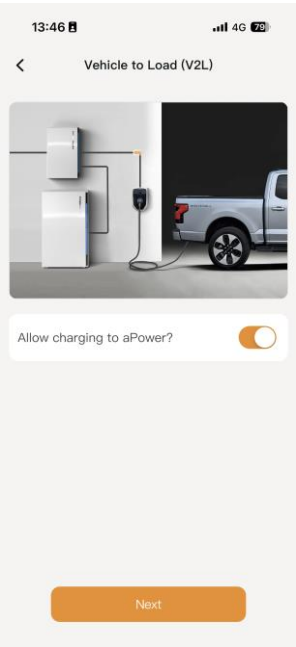


If your vehicle type isn't listed, tap **Customized vehicle** to enter your vehicle model and rated power.

Step 5. After reading the V2L wiring instructions, tap **Next**.



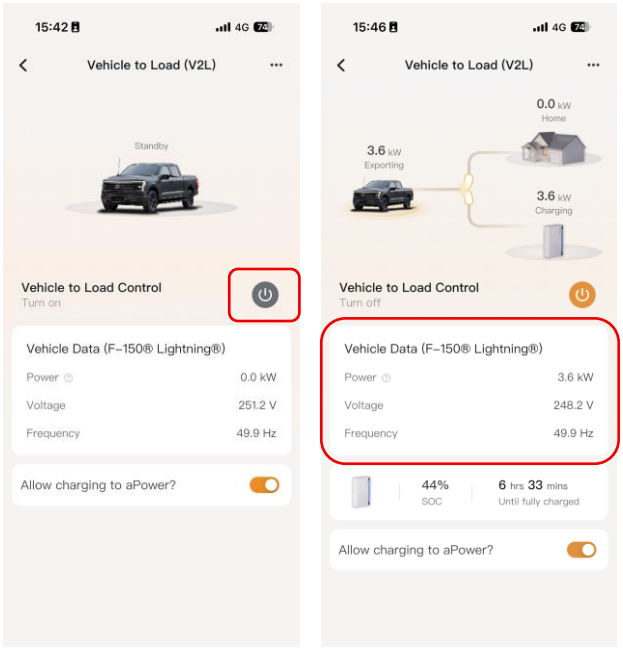
Step 6. Enable the charging slider if you allow the vehicle to charge the aPower. Then tap **Next**.



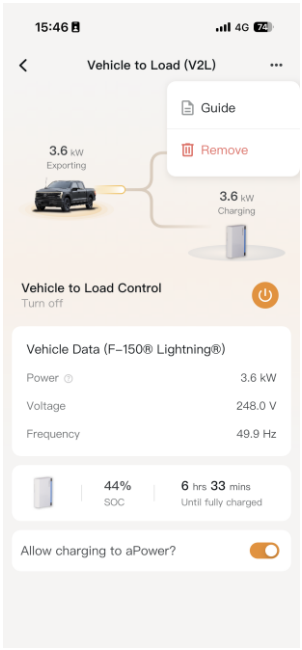
Step 7. Tap the button next to **Vehicle to Load Control** to turn the V2L feature on or off.

On the dashboard, you can also view the current vehicle power, voltage, and frequency.

When the vehicle is charging the aPower, the aPower's SOC and estimated time to full charge will be displayed.



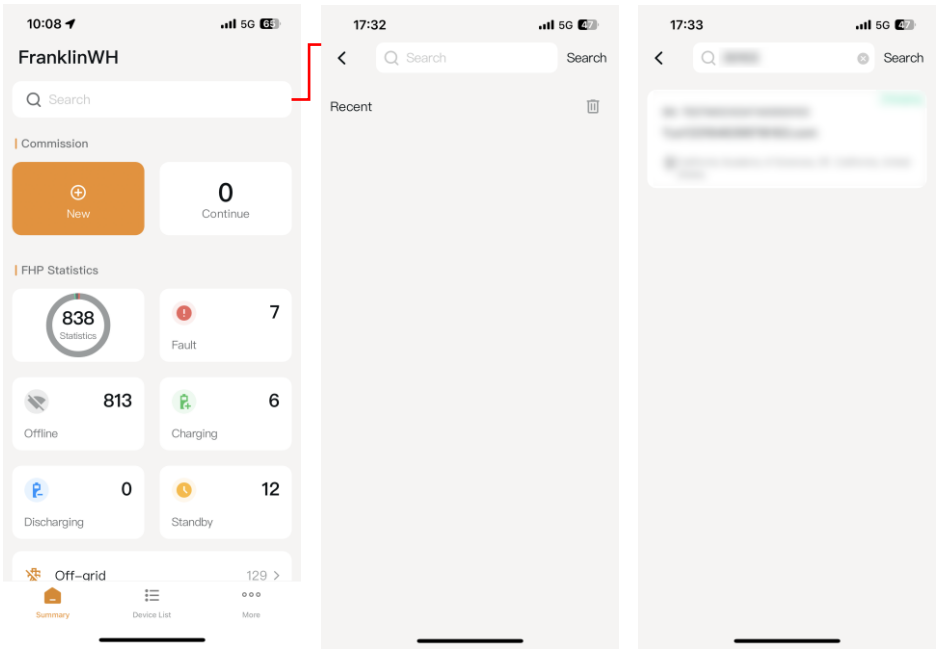
If you need to change the vehicle connected to the system, stop the V2L feature by tapping the button next to the **Vehicle to Load Control** text, then tap the three dots in the top right, select **Remove**, and add a new vehicle.



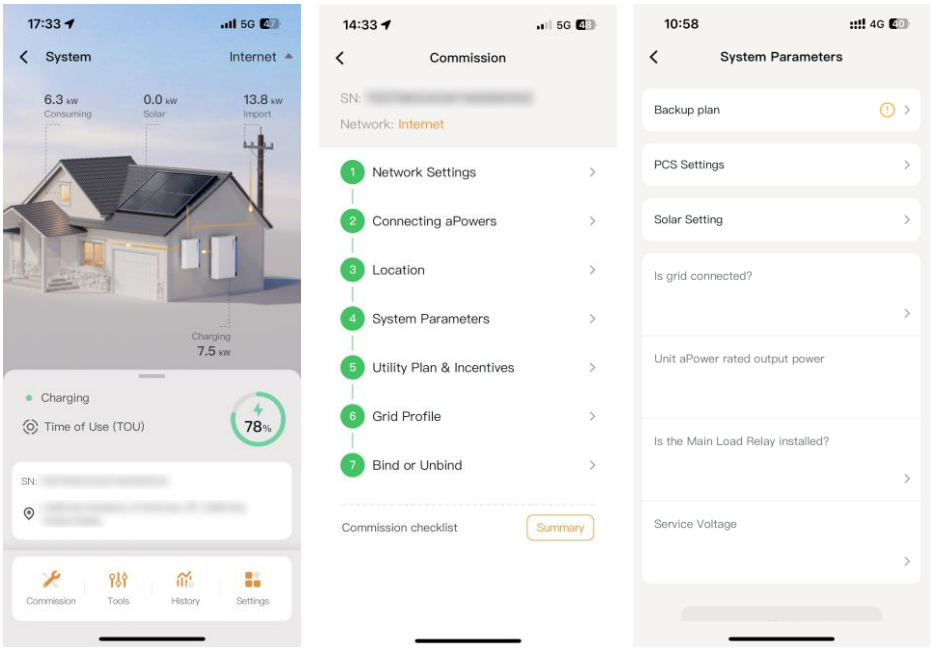
Set the aPbox Parameters

If an aPbox is installed, then follow the instructions below to configure the aPbox parameters.

Step 1. Search for the aGate serial number to which the aPbox is to be commissioned in the **Search Device** box, and then click.



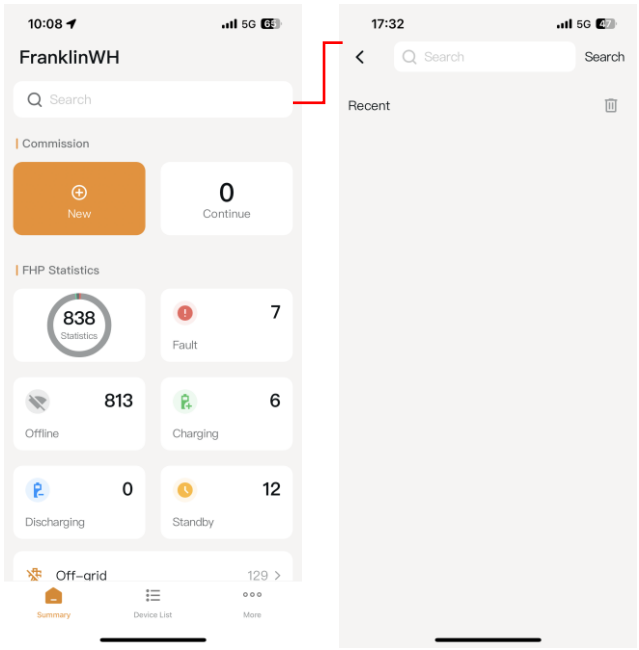
Step 2. Tap on **Commission** in the menu, then select **System Parameters**, following the instructions as described in the **aPbox Configuration** above.



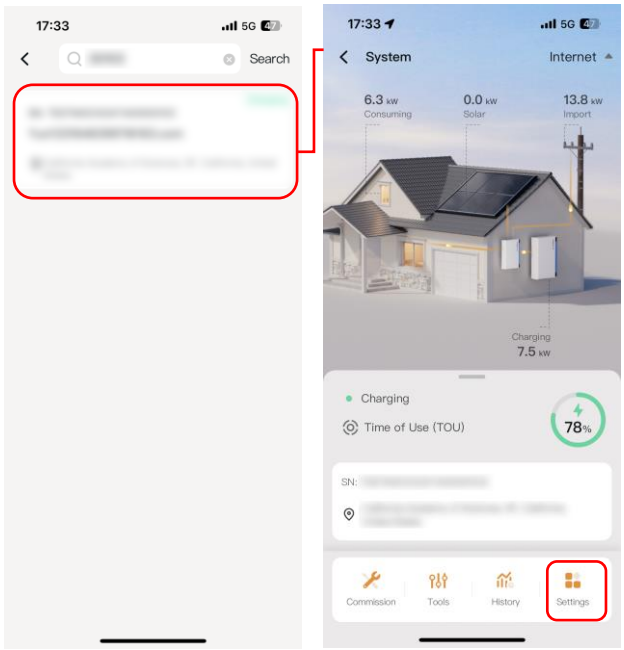
Part replacement

If a part needs to be replaced, perform the physical replacement and then follow the instructions below to register it in the app. Note that each aPower and aPbox is associated with a specific aGate X. Steps 1-2 are to identify the correct aGate X. Only after that does the specific part replacement registration begin.

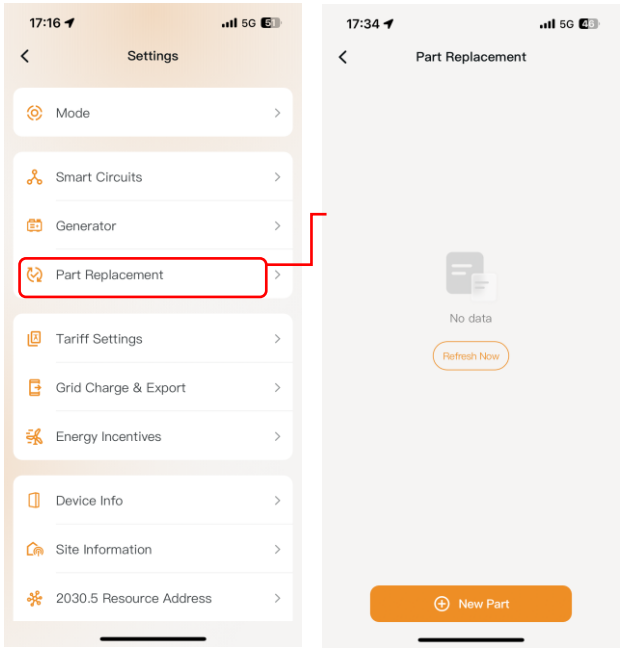
Step 1. Search, in the Search Device box, for the serial number of the aGate in which the part has been replaced.



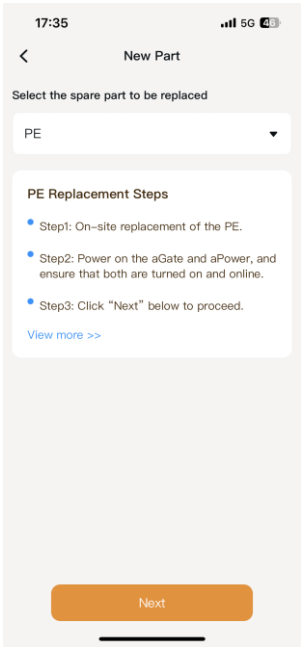
Step 2. Tap on the correct aGate and select **Settings**.



Step 3. On the **Settings** screen, select **Part Replacement**, then tap **New Part**, at the bottom of the page.

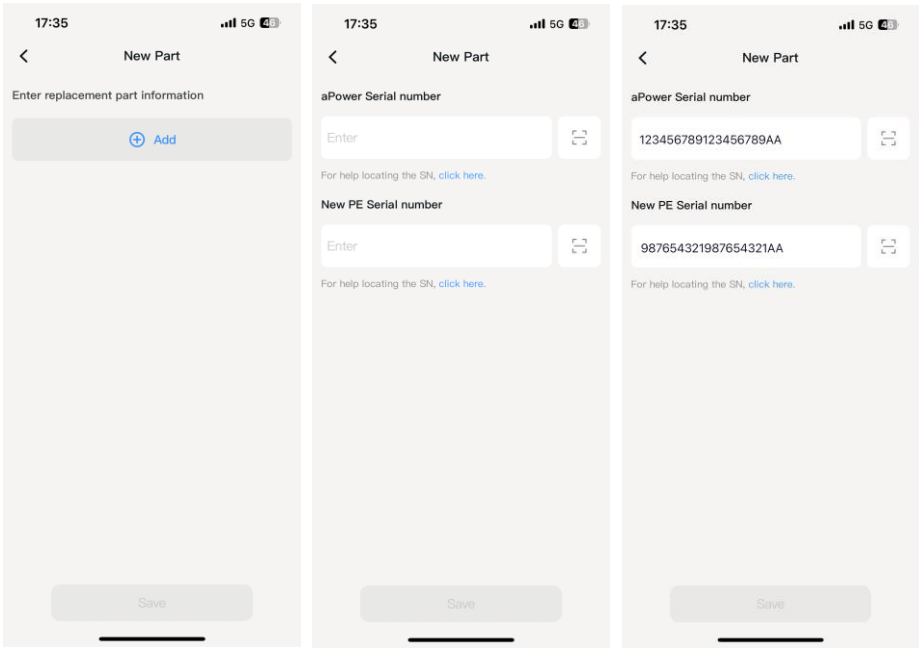


Step 4. This version defaults to PE for the part to be replaced. Tap **Next** to enter replacement part information.



If the aGate system version is not supported, you will be prompted to upgrade. Only after upgrading the version can you proceed.

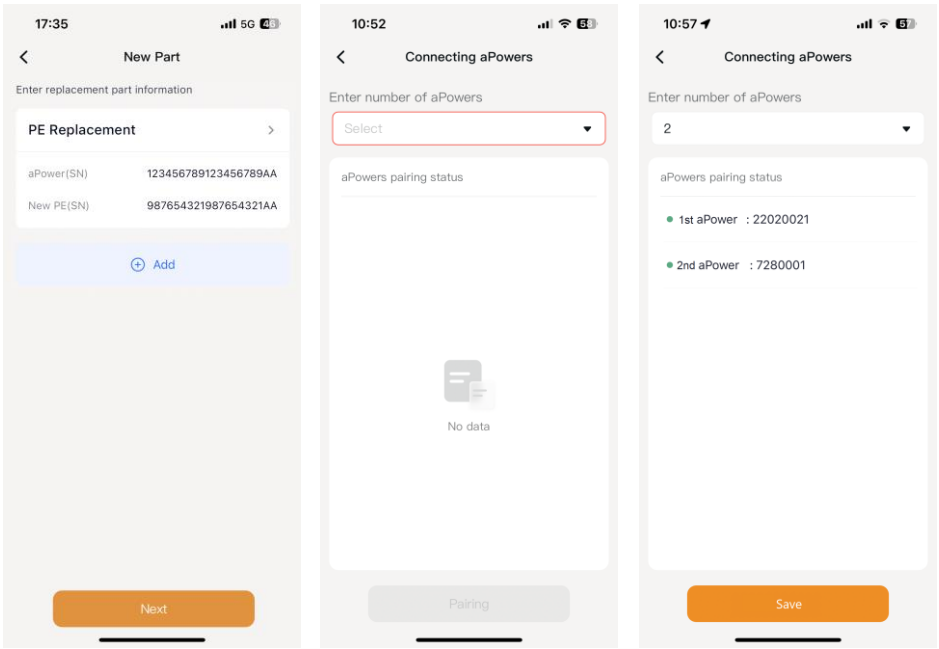
Step 5. Tap **Add**, scan the aPower and part QR code, or manually input the aPower and part SN. After adding the information, tap **Save**.



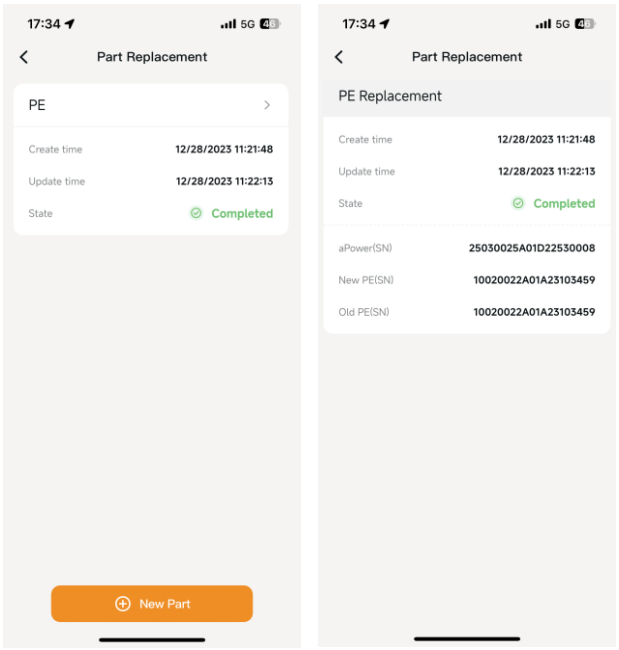
Step 6. After the information is added, tap **Next** to enter the **Connecting aPowers** page.

On the **Connecting aPowers** page, select the number of aPower units, then tap **Pairing** search.

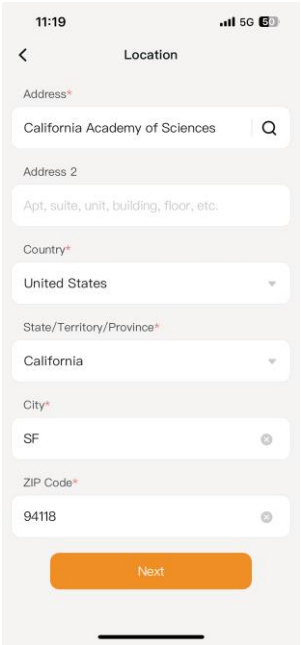
When the aPower batteries have been accurately identified, tap **Save**.



Step 7. On the **Parts Replacement** page, you can view the details of the replaced parts.

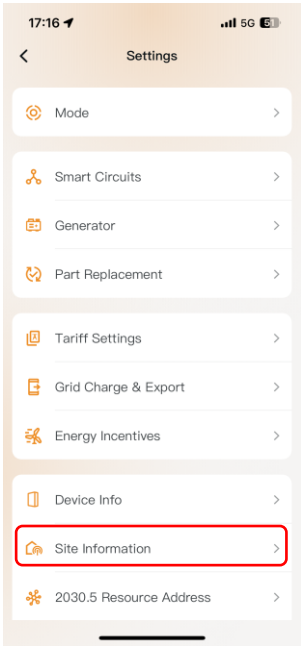


Step 8. Please re-enter the **Location** page. The system will automatically trigger an update to ensure the firmware is synchronized to the latest version after the parts are replaced.



After commissioning

Upload site pictures when the commissioning has been completed.



Follow the instructions below to ensure the system is completely de-energized.

Step 1. Ensure that the aGate grid breaker, generator breaker (optional), solar breaker, Smart Circuits breakers (optional), and aPower breaker are all in the OFF position.

Step 2. Turn off the aGate power switch.

Step 3. Press the switch on the right side of all aPowers to confirm that they are turned OFF (switch is flush with the case).

Step 4. Turn the EPO switch (if installed) back to the ON position or reconnect the EPO plug, and wait for one minute before continuing.

Functional Validation

Checklist

Startup Steps and Measurements.

Tools	Multimeter				
Before startup	Account	1	Has the user signed into the mobile app?	☐ Yes	☐ No
	Networking	1	Is the family network working properly?	☐ Yes	☐ No
		2	Is the 4G LTE package selected?	☐ Yes	☐ No
	Switches	1	Is the power switch on the side of each aPower OFF?	☐ Yes	☐ No
		2	Is the grid breaker on the aGate OFF?	☐ Yes	☐ No
		3	Is the generator breaker (if installed) on the aGate OFF?	☐ Yes	☐ No
		4	Are the Smart Circuits breakers (if installed) on the aGate OFF?	☐ Yes	☐ No
		5	Is the solar breaker on the aGate OFF?	☐ Yes	☐ No
		6	Is the aGate power switch OFF?	☐ Yes	☐ No
		7	Is the aPower breaker on the aGate OFF?	☐ Yes	☐ No
		8	Are all other switches (e.g.: Combiner Box breakers) between the aGate and aPowers OFF?	☐ Yes	☐ No
	Indicating LED	1	Are LED strips on all the aPower units OFF?	☐ Yes	☐ No
		2	Is the aGate power indicator OFF?	☐ Yes	☐ No

<table>
<tr><td rowspan="13">Startup</td><td rowspan="13">Off-grid startup</td><td colspan="4">Step: Turn on the aGate power switch.
Turn on the aPower breaker on the aGate.
Turn on all other switches between the aGate and the aPower unit(s).
Turn on the aPower switches on the side of each aPower.
NOTE: If there are multiple aPower batteries in the FranklinWH System, their aPower switches need to be turned on in sequence. Check whether the FranklinWH App reports any alarm for each activation.</td></tr>
<tr><td>1</td><td>Does the aPower LED flash and then stay solid after the aPower switch is turned on?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td>2</td><td>Does the aGate power indicator on the aGate turn on after the aPower batteries are switched is ON?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td>3</td><td>Is the aGate hotspot found by the mobile phone?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td>4</td><td>Is the voltage of non-backup load port L1 to N 120 V ± 2 V in the aGate?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td>5</td><td>Is the voltage of backup load port L1 to N 120 V ± 2 V in the aGate?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td>6</td><td>Is the voltage of non-backup load port L2 to N 120 V ±2 V in the aGate?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td>7</td><td>Is the voltage of backup load port L2 to N 120 V ± 2 V in the aGate?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td>8</td><td>Is the voltage of non-backup load port L1 to L2 240 V ± 2 V in the aGate?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td>9</td><td>Is the voltage of backup load port L1 to L2 240 V ± 2 V in the aGate?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td colspan="4">Step: Turn on the breakers between family loads and aGate</td></tr>
<tr><td>10</td><td>Do family loads (such as light bulbs) work properly?</td><td>☐ Yes</td><td>☐ No</td></tr>
<tr><td>11</td><td>Is the mode on the FranklinWH App set as off-grid, battery backup?</td><td>☐ Yes</td><td>☐ No</td></tr>
</table>

	On-grid	1	Is the L1 to N input voltage at the grid breaker on the aGate 120 V ± 10 V?	☐ Yes	☐ No
		2	Is the L2 to N input voltage at the grid breaker on the aGate 120 V ± 10 V?	☐ Yes	☐ No
		3	Is the L1 to L2 input voltage at the grid breaker on the aGate 240 V ± 20 V?	☐ Yes	☐ No
		Step: Turn on the grid breaker on aGate			
		1	Does the mode shown on the FranklinWH App agree with the mode set during installation?	☐ Yes	☐ No
		2	Are the Grid, Home, and FranklinWH icons lit in the app?	☐ Yes	☐ No
	Solar only without grid power	**Step: Turn off the grid breaker on the aGate** **Turn on the Solar breaker on the aGate**			
		1	Is the output voltage at the solar breaker 240 Vac?	☐ Yes	☐ No

Caution:

If the above check result is "No," except for Networking 2 (4G), please solve the abnormal item and check again.

① *The total power of family loads should not be greater than the total power of aPower units, with the absence of grid power and solar production.*

② *If there is any large electrical load, such as air conditioners or electric motors, when the system is working in the off-grid mode, please turn off such loads first and restart them after the FranklinWH System has successfully started.*

③ *After the system has been activated, please turn off the power switch on the side of aPower and wait for 10 seconds before turning it back on.*

Validation

On-grid/Off-grid Switching

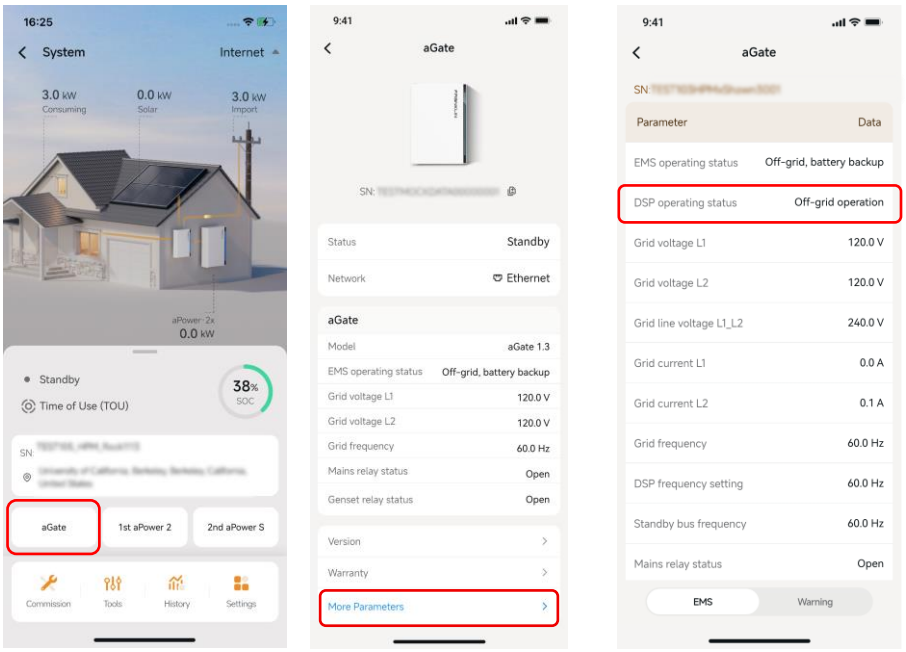
Switching from Off-grid to On-grid

Step 1. Turn off the grid breaker and solar breaker on the aGate.

Step 2. Log into the FranklinWH App on the installer account.

Step 3. Search for the aGate serial number for which the on-grid/off-grid switching is to be verified in the Search Device box, and then click into.

Step 4. Off-grid Startup: Check whether the system is running in **Off-grid operation**. If it shows that the FranklinWH System is working in **Off-grid operation**, then the system is working properly. Otherwise, it means the system is malfunctioning and has not been normally started (If there is an abnormality, please confirm whether the installation process is completed, and whether the grid breaker is successfully turned off).

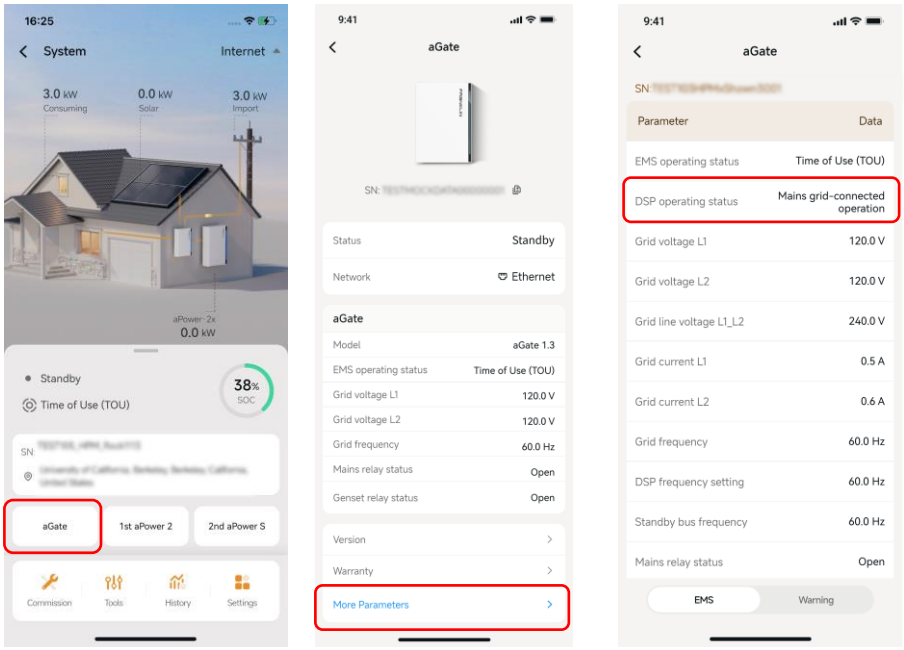


Step 5. Proceed with the following operations after the system is working properly in off-grid mode:

1) Measure with a multimeter and check whether the voltage between L1 and L2 on the Backup load terminal is 240 Vac.

2) If the output voltage is at a normal level, turn on the grid breaker, and FranklinWH will switch to on-grid operation in 5 minutes. On the app, the grid icon will display an energy-flow animation. Household loads will not experience any interruption during the transition.

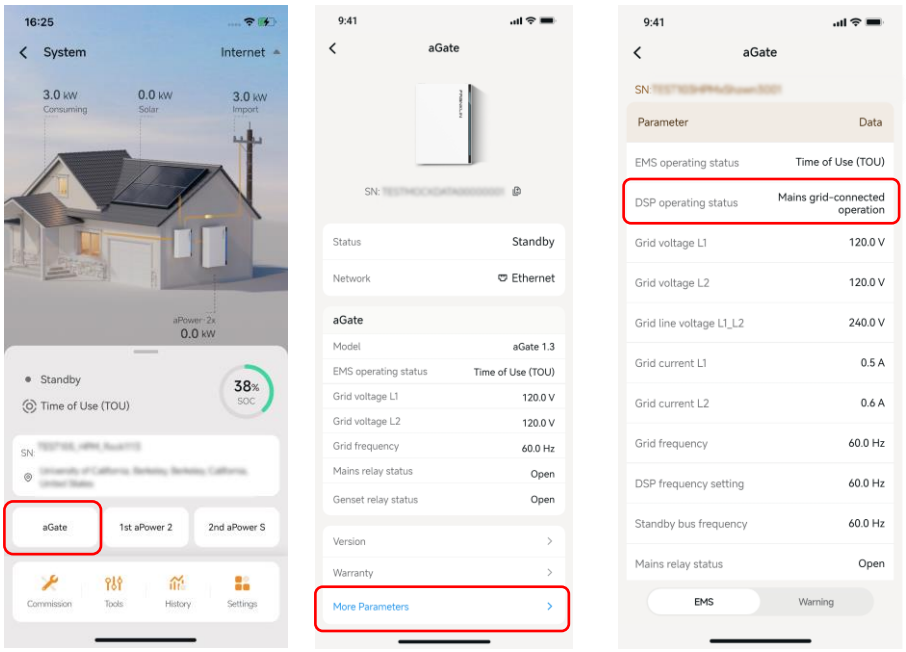
3) Check the EMS information to determine if DSP operating status is **Mains grid-connected operation**.



Switching from On-grid to Off-grid

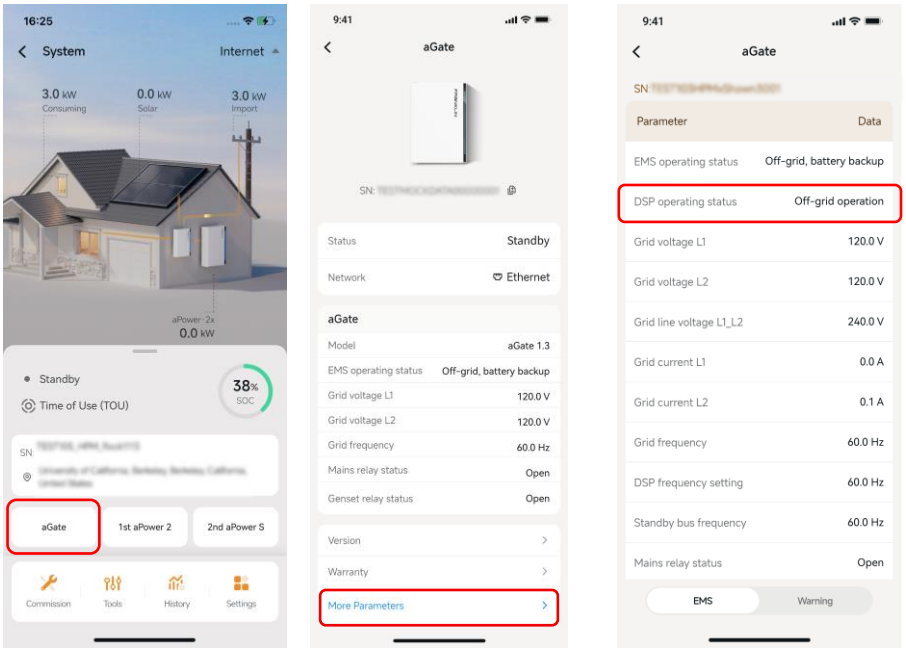
Step 1. After the system starts off-grid, turn on the grid breaker and system will switch to on-grid operation in 5 minutes.

Step 2. The grid icon will display an energy flow animation, and system mode will become the default mode as set in the grid package. Check the aGate details in the app to see if the DSP operating status is **Mains grid-connected operation** (If there is an abnormality, please confirm whether the installation process is completed, and whether the grid breaker is successfully turned on).



Step 3. After the system is connected to the grid, turn off the grid breaker to switch the system to off-grid operation. Household loads will not experience any interruption during the transition.

Step 4. In the app, the grid disconnect will be prompted on the energy flow chart. DSP operating status should be **Off-grid operation**.



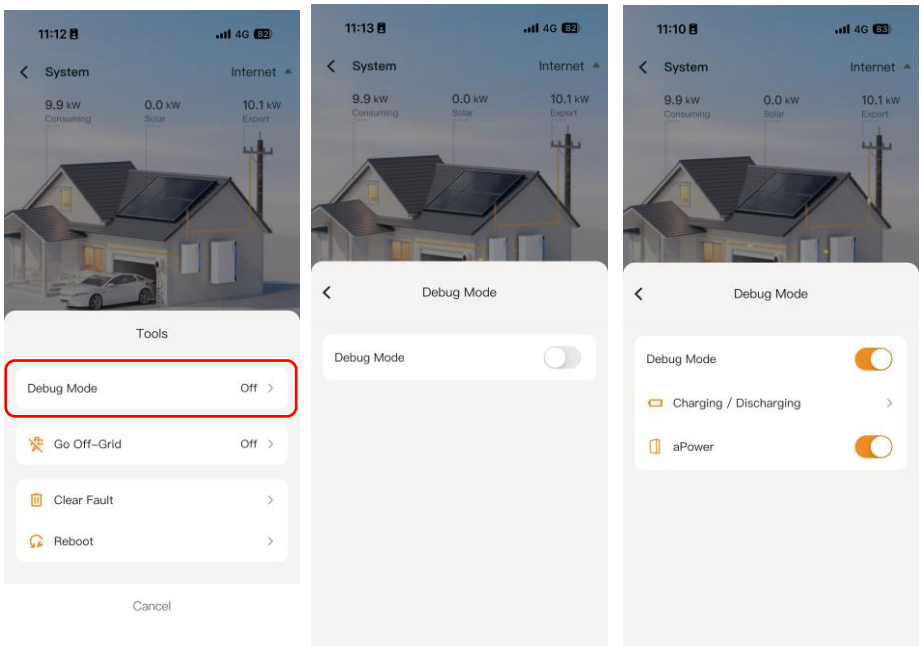
If you need to manually enable **Go Off-Grid**, please refer to the Go Off-Grid section.

Tools

Debug mode

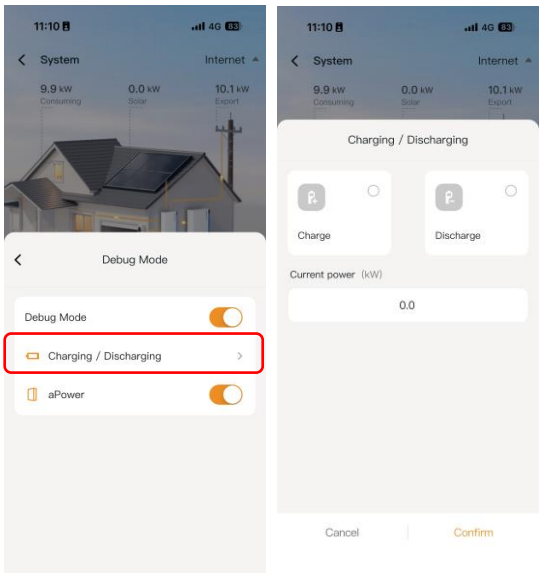
Step 1. Tap on **Tools** in the menu.

Step 2. Enable the **Debug Mode** function.



Charging/Discharging

Go into **Charging/Discharging** mode, this mode is to check if there are any abnormal situations in the process of **Charging/Discharging**.



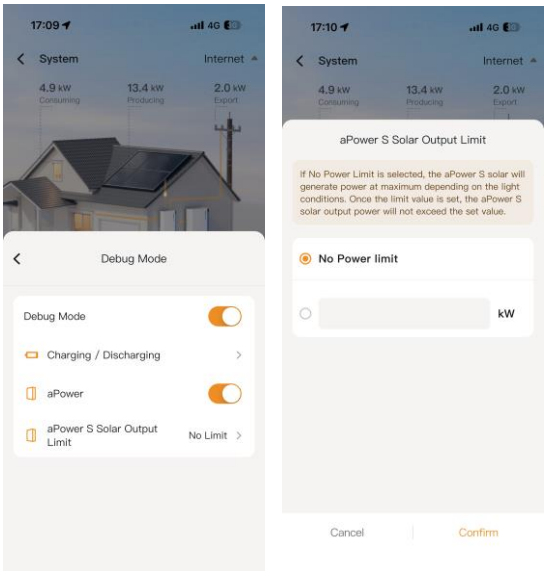
aPower ON/OFF

Use aPower ON/OFF button to check if it can turn aPower on/off.

aPower S Solar Output Control

If no limit is set, the aPower solar system will generate power at maximum capacity based on sunlight conditions. Once the limit value is set, the solar output will not exceed the specified value.

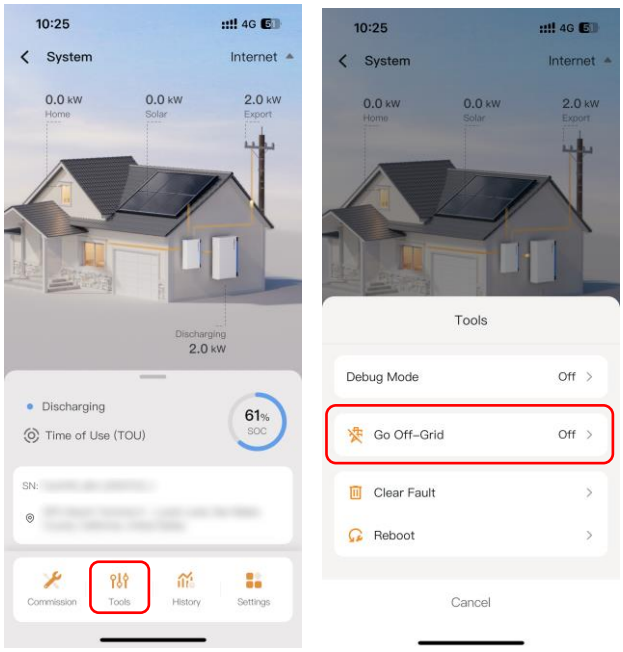
Regardless of whether a limit value is set, aPower will further restrict solar output power based on its own acceptance capacity.



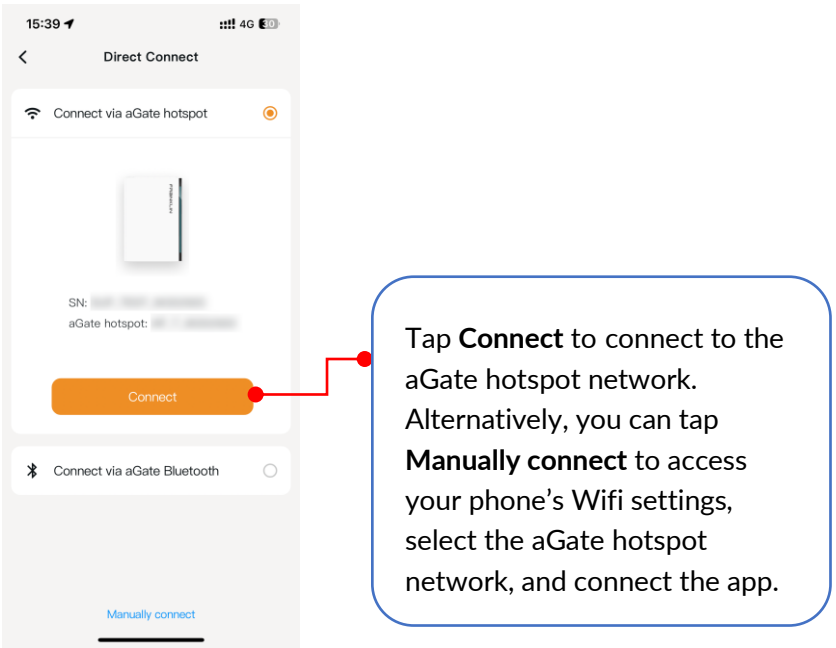
Go Off-Grid

Enable **Go Off-Grid** to confirm and to turn off the grid relay and switch the FranklinWH System to off-grid operations.

Step 1. Turn on the grid breaker and the system will switch to on-grid operations within 5 minutes. After the system is connected to the grid, tap **Tools** > **Go Off-Grid** enable button.



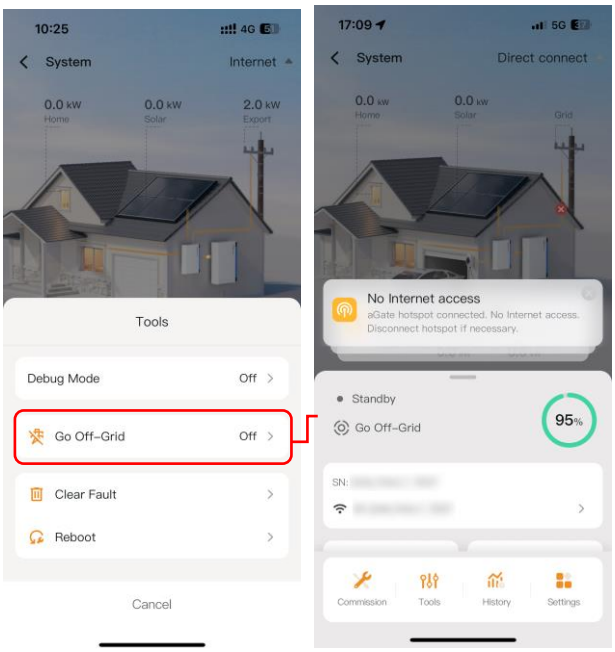
Step 2. Connect the app to the aGate hotspot or Bluetooth.



Step 3. Tap **Tools** and enable **Go Off-Grid** to confirm and turn off the grid relay, switching the system to off-grid operations. Household loads will not experience any interruption during the transition.

WARNING

Despite the grid being **OFF** in the FranklinWH App, the status does not mean the relay has been physically disconnected. It is important to test the circuit status to avoid serious injury during the commissioning process.



Clear Fault and Restart

Clear Fault: This operation will clear the secondary DSP fault, PE general fault, and BMS non-locking fault.

Restart: This operation will restart the whole system but may cause a power shut down when off-grid.

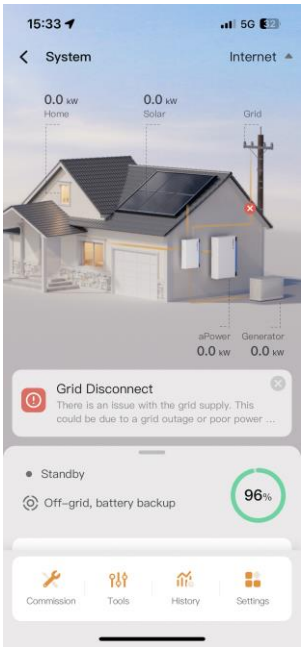
Verify the Display

Step 1. FranklinWH System Condition: Off-grid with load.

Step 2. Sign in to the FranklinWH App on the installer account.

Step 3. Search for the aGate serial number for which the display is to be verified in the **Search Device** box, and then click.

Step 4. Access the energy flow chart.



Step 5. Check the following:

1	Is the load power consumption of the load displayed?	☐ Yes	☐ No
2	Is the energy flow chart working properly?	☐ Yes	☐ No
3	Does the SOC (percentage) of each aPower shown on the chart agree with the LED strip levels?	☐ Yes	☐ No
4	Does the working mode shown on the app agree with the grid package set in the installation process?	☐ Yes	☐ No
5	Is every aPower showing online in the app?	☐ Yes	☐ No
6	Does the number of aPower units shown agree with the number addressed automatically in the installation process?	☐ Yes	☐ No

Solar Functions

Off-grid Solar Functions

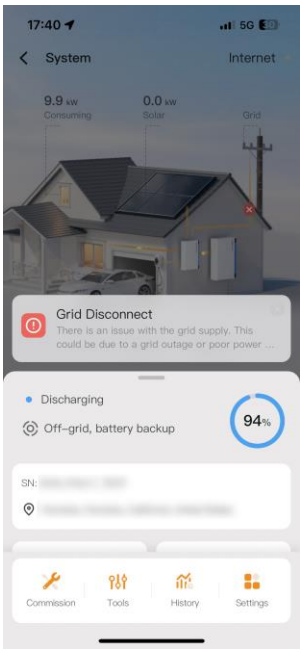
Step 1. Sign in to the FranklinWH App on the installer account.

Step 2. Search for the aGate serial number for which the solar functions are to be verified in the Search Device box, and then click into.

Step 3. After the system starts off-grid, the app should show **off-grid**, **battery backup mode**.

Step 4. Turn on the solar breaker and use a multimeter to measure if there is 240 Vac at the solar input terminals. If 240 Vac voltage is measured at both ends of the input breaker of the solar system, it means that the solar relay has been normally turned on, and it is only necessary to wait for the solar system to output power. If the 240 Vac voltage is not measured, it means that the solar relay is not operating normally.

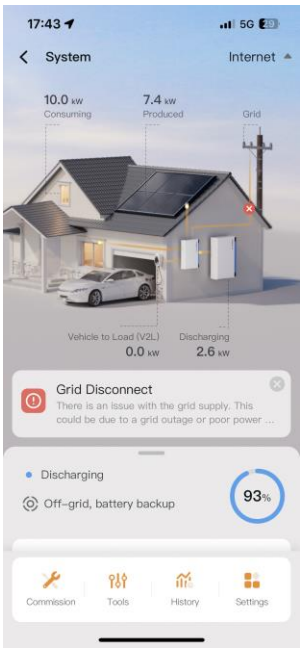
- When the system is working normally in off-grid mode, turn on the solar breaker. Before the solar system is successfully started, the Solar icon on the energy flow chart in the app will show 0.0 kW, as shown below.



- When the system is working normally in off-grid mode and the solar relay has been turned on, if there is still sunshine the solar system will start in 5 minutes. Please check whether the Solar icon on the energy flow chart in the app shows the solar system power information, as shown below.

NOTE

When photovoltaic power generation exceeds consumption, battery capacity, and what can be sold back to the grid, the solar system will be disconnected. This is normal.

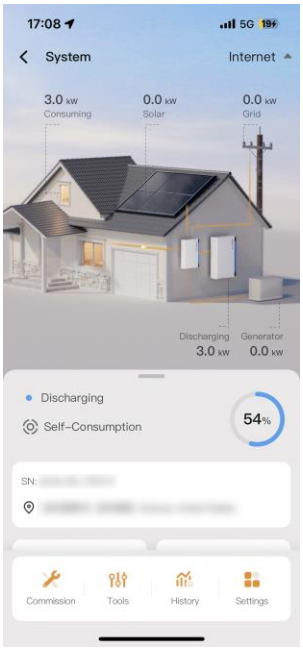


On-grid Solar Functions

Step 1. Turn on the grid breaker, connect to the grid.

Step 2. When the system is working normally in on-grid mode, turn on the solar breaker and use a multimeter to measure if there is 240 Vac at the solar input terminals. If 240 Vac voltage is measured at both ends of the input breaker of solar system, it means that the solar relay has been normally turned on, and it is only necessary to wait for the solar system to output power. If the 240 Vac voltage is not measured, it means that the solar relay is not operating normally.

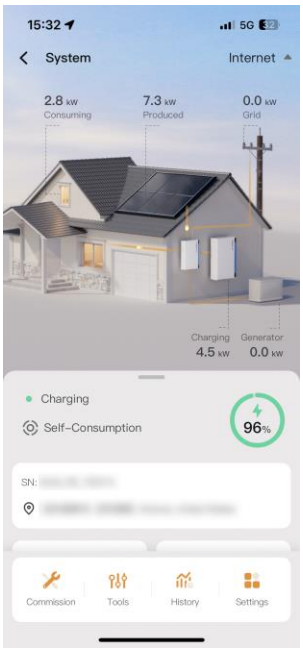
- With the system working normally in on-grid mode, turn on the solar breaker. Before the solar system successfully started, the Solar icon on the energy flow chart in the app (Shown in the installer account) will show 0.0 kW, as shown below.



- When the system is working normally in on-grid mode and the solar relay has been turned on, if there is still sunshine the solar system will start in 5 minutes. Please check whether the Solar icon on the energy flow chart in the app shows the output power.

NOTE

When the selected package does not allow feedback to the grid, the photovoltaic power will be disconnected when there is over-generation power that is too heavy. This is normal.



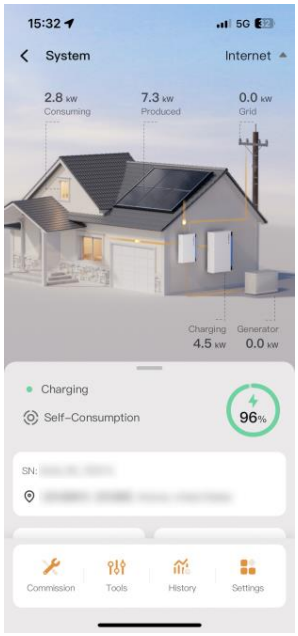
Smart Circuits Control Relay

After the Smart Circuits Module has been installed in the aGate and added to the system in the FranklinWH App, commissioning will be needed to be performed to test and confirm that the Smart Circuits Module is working properly. The commissioning process is as follows:

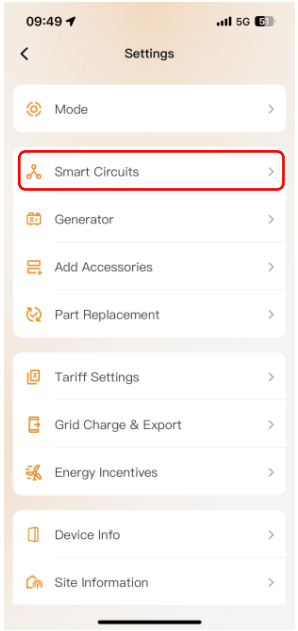
Step 1. Sign in to the FranklinWH App on the installer account.

Step 2. Search for the aGate serial number for which the Smart Circuits Module is to be commissioned in the **Search Device** box, and then click.

Step 3. Tap on **Settings** in the menu.



Step 4. Tap on **Smart Circuits**.

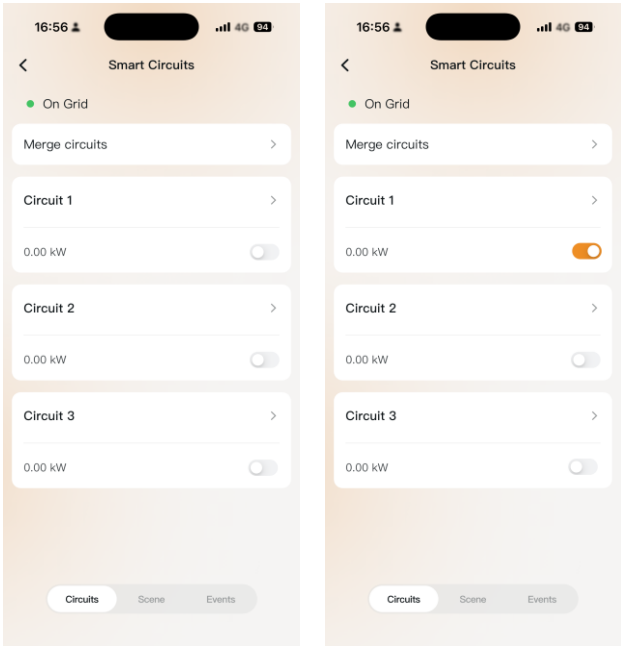


Step 5. Measure the voltage between both Circuit 1 and Circuit 2's individual output terminals and neutral, and the voltage between the L2 output terminals of Circuit 3 and neutral.

Turn on the Smart Circuits breakers and use a multimeter to measure voltages between the Circuit 1 and Circuit 2 output terminals and neutral, and the voltage between the L2 output terminals of Circuit 3 and neutral. If they are 0 volts, the system is working normally.

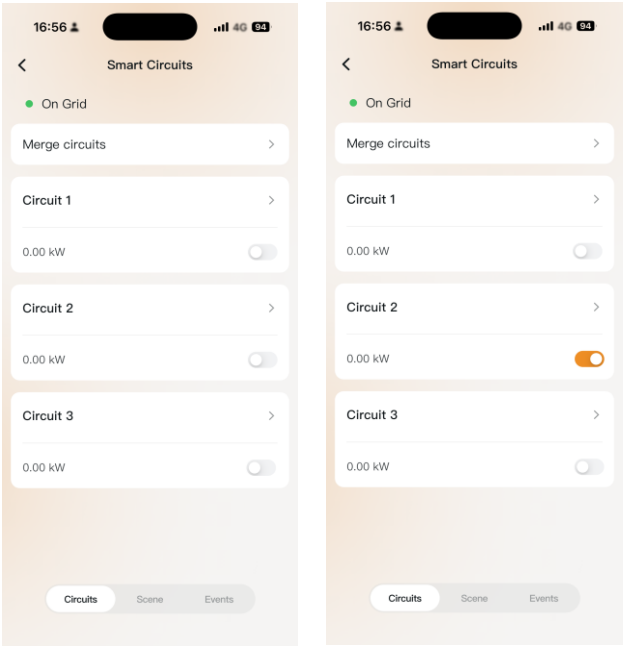
Step 6. Measure the voltage between the Circuit 1 output terminal and neutral.

The Circuit 1 switch button should be in a gray (OFF) state, by default. Turn on the Circuit 1 switch on your mobile app and use a multimeter to measure the voltage between Circuit 1 and neutral. If the voltage is 120 Vac, it means that the Smart Circuit relay has been successfully turned on. Otherwise, it means that the Smart Circuit relay is either in the open position or working abnormally.



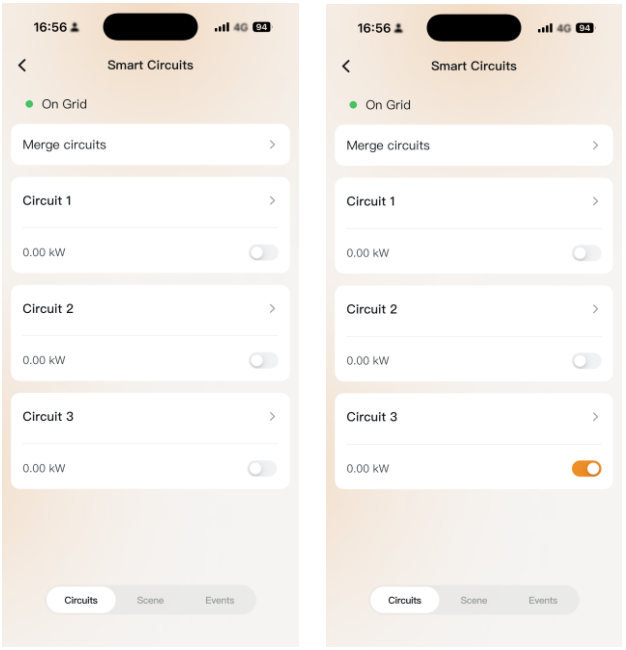
Step 7. Measure the voltage between Circuit 2 and neutral.

The Circuit 2 switch should be in the gray (OFF) state, by default. Turn on the Circuit 2 in the app and use a multimeter to measure the voltage between Circuit 2 and neutral. If the voltage is 120 Vac, it means that the Smart Circuit relay has been successfully turned on. Otherwise, the Smart Circuit relay is in the open position or working abnormally.



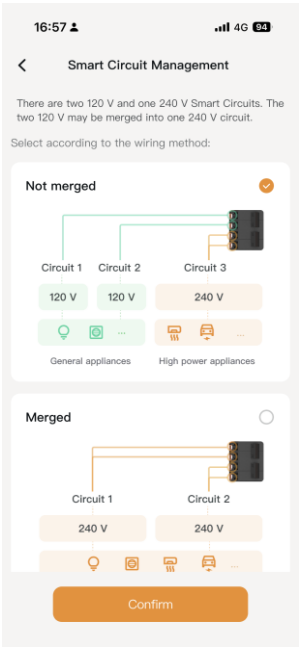
Step 8. Measure the voltage between the L1 and L2 output terminals of Circuit 3.

The Circuit 3 button should be in the gray (OFF) state, by default. Turn on the Circuit 3 switch on the mobile app, and measure voltage between L1 and L2 output terminals of Circuit 3. If the voltage is 240 Vac, it means that the Smart Circuit relay has been successfully turned on. Otherwise, the Smart Circuit relay is in the open position or working abnormally.



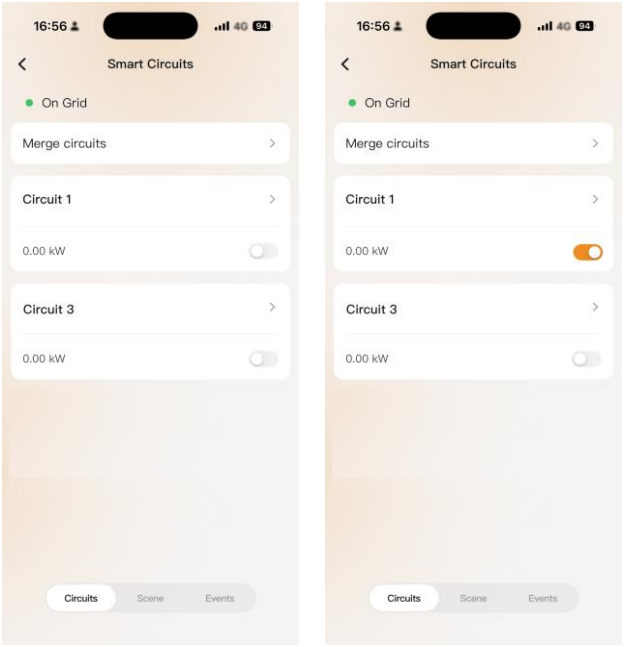
Step 9. Enable the circuits merge function.

Access the **Smart Circuits** Management page and enable circuits merge, as shown below.



Step 10. Measure the voltage between the L1 and L2 output terminals of Circuit 1 after merging.

Use a multimeter to measure voltage between L1 and L2 output terminals of Circuit 1 (this refers to Circuit 1 and Circuit 2 merged as a single circuit). If the voltage is 240 Vac, it means that the Smart Circuit relay has been successfully turned on. Otherwise, the Smart Circuit relay is in the open position or working abnormally.

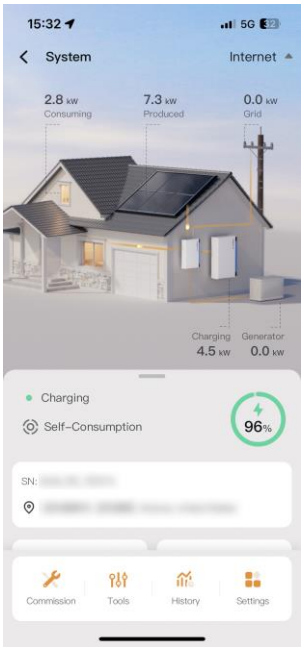


Generator Module

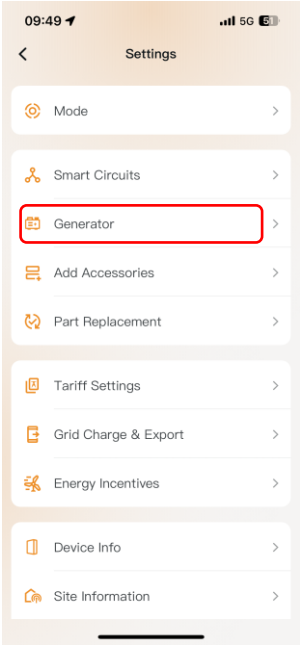
Step 1. Sign in to the FranklinWH App on the installer account.

Step 2. Search for the aGate serial number for which the Generator Module is to be commissioned in the **Search Device** box, and then click.

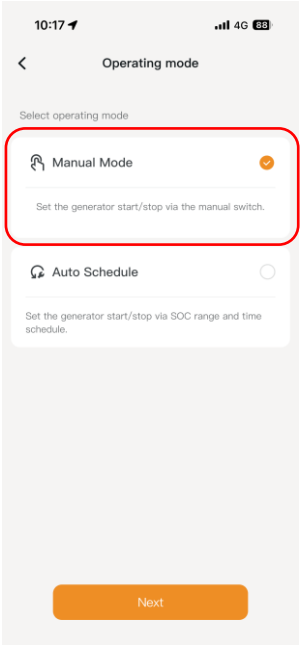
Step 3. Tap on **Settings** in the menu.



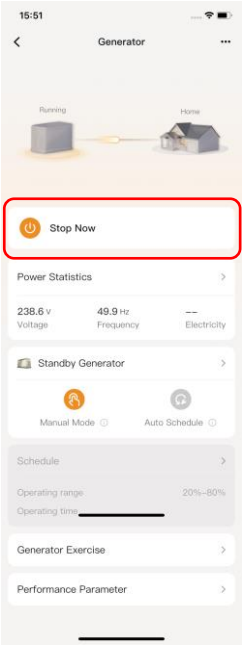
Step 4. Tap on **Generator**.



Step 5. Set the **Operating Mode** to **Manual**.



Step 6. Start up and shut down the generator manually, checking whether the generator is started and stopped as appropriate. If the generator is started and shuts down normally following the instructions, it means that the Generator Module is working properly.



aPbox Functions

PV on the load side of the FranklinWH System

Off-grid aPbox Functions

Step 1. Sign in to the FranklinWH App on the installer account.

Step 2. Search for the aGate serial number for which the aPbox functions is to be verified in the Search Device box, and then click.

Step 3. After the system starts off-grid, the app should show **off-grid**, **battery backup** mode.

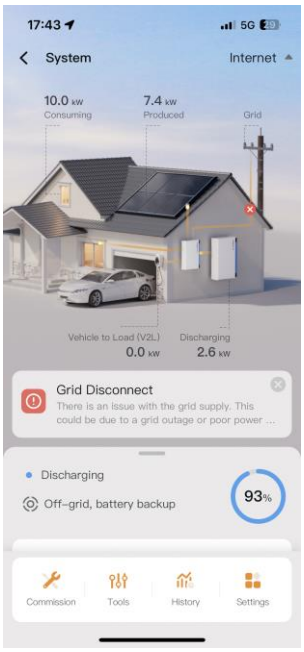
Step 4. Turn off the solar breaker (in the aGate), turn on the upstream switch and use a multimeter to measure if there is 240 Vac at the L1 to L2 of TB2 (TB2 port in the aPbox). If 240 Vac voltage is measured at the L1 to L2 of TB2, it means that the contactor has been normally turned on, and it is only necessary to wait for the solar system to output power. If the 240 Vac voltage is not measured, it means that the contactor is not operating normally.

- When the system is working normally in off-grid mode, turn on the breaker at the cable inlet of the aPbox. Before the solar system is successfully started, the solar icon on the energy flow chart in the app will show 0.0 kW, as shown below.

- When the system is working normally in off-grid mode and the contactor has been turned on, if there is still sunshine, the solar system will start in 5 minutes. Please check whether the solar icon on the energy flow chart in the app shows the solar system power information, as shown below.

NOTE

When the selected package does not allow feedback to the grid, the photovoltaic power will be disconnected when there is over-generation power that is too heavy. This is normal.

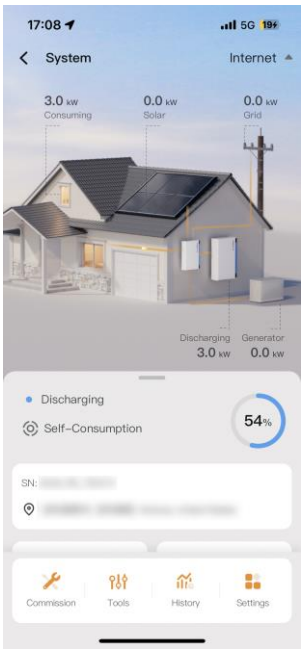


On-grid aPbox Functions

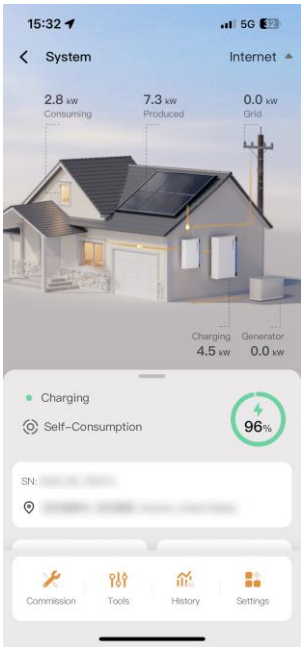
Step 1. Turn on the grid breaker, connect to the grid.

Step 2. When the system is working normally in on-grid mode, turn on the upstream switch and use a multimeter to measure if there is 240 Vac at the L1 to L2 of TB2. If 240 Vac voltage is measured at the L1 to L2 of TB2, it means that the contactor has been normally turned on, and it is only necessary to wait for the solar system to output power. If the 240 Vac voltage is not measured, it means that the contactor is not operating normally.

- When the system is working normally in on-grid mode, turn on the breaker at the cable inlet of the aPbox. Before the solar system is successfully started, the solar icon on the energy flow chart in the app will show 0.0 kW, as shown below.



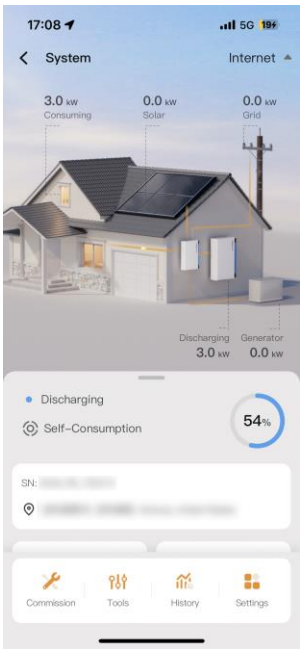
- When the system is working normally in on-grid mode and the contactor has been turned on, if there is still sunshine, the solar system will start in 5 minutes. Please check whether the solar icon on the energy flow chart in the app shows the output power.



PV on the line side of the FranklinWH System

Turn on the upstream switch and use a multimeter to measure if there is 240 Vac at the L1 to L2 of TB2. If 240 Vac voltage is measured at the L1 to L2 of TB2, it means that the contactor has been normally turned on, and it is only necessary to wait for the solar system to output power.

When the grid is working properly, turn on the breaker at the cable outlet of the aPbox. Before the solar system is successfully started, the solar icon on the energy flow chart in the app will show 0.0 kW, as shown below.



Final Inspection

Step 1. Sign in to the FranklinWH App on the homeowner account.

Step 2. Check whether the devices are working properly.

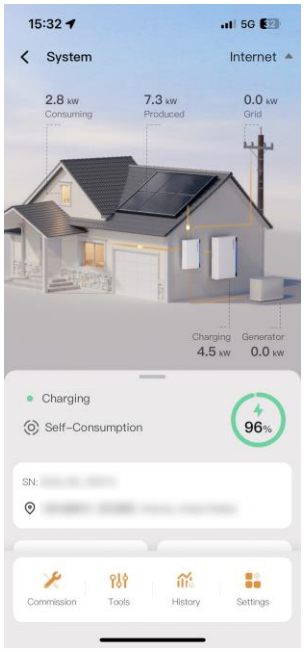
Consuming: When the home loads are connected, the values at the top of the screen indicate your home energy usage whenever any equipment is online.

aPower: The values at the top of the screen show aPower's charging and discharging. When your aPower is charging, a negative value is displayed. When your aPower is discharging to power your home or exporting energy to the grid, a positive value is displayed.

Solar: If a solar system is connected and running properly, the Solar icon will show the solar system power information, and the connection will show an energy-flow animation.

Grid: If the system is on-grid and the grid is working properly, the values at the top of the grid icon will show the energy totals for imports and exports, and the connection will show an energy-flow animation.

Generator: If a generator is connected and running properly, the value below the generator image will show the generated energy total, and the connection will show an energy-flow animation.



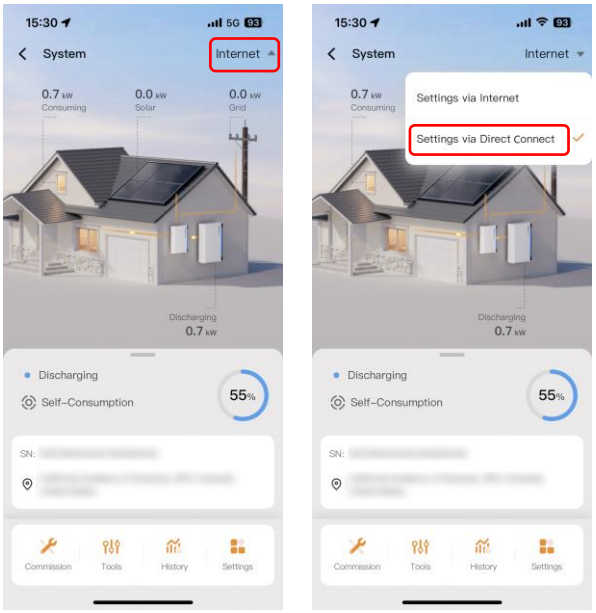
Step 3. The system commissioning is completed. For detailed user guide, please refer to ***FranklinWH User Manual*** and ***FranklinWH App User Manual***.

Appendix:

Internet/Direct Connect Switching

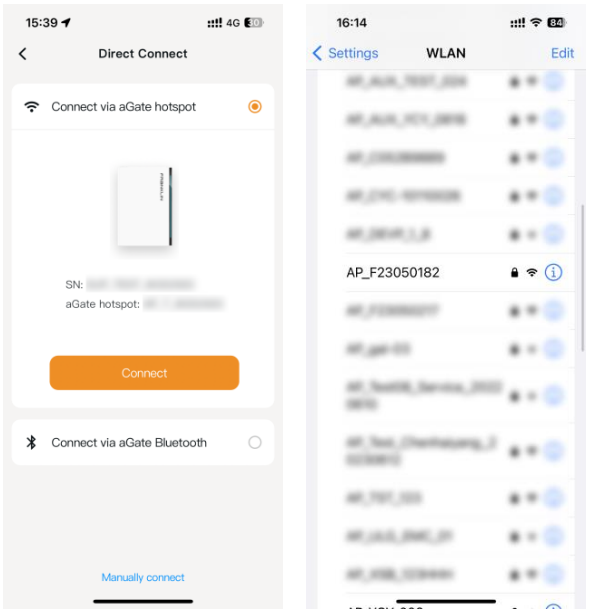
- Switching FranklinWH App connectivity from the Internet to the aGate direct connect.

Step 1. Select **Settings via Direct Connect**.

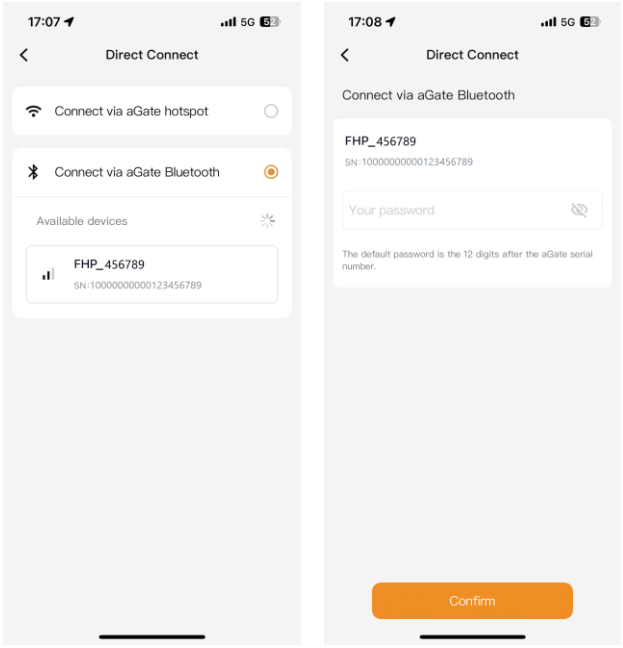


Step 2. There are two options for system direct connect: via the aGate hotspot or Bluetooth.

The **Connect via aGate hotspot** option is set by default. Tap **Connect** to connect to the aGate hotspot network. Alternatively, you can tap **Manually connect** to access your phone's Wifi settings, select the aGate hotspot network, and connect the app.

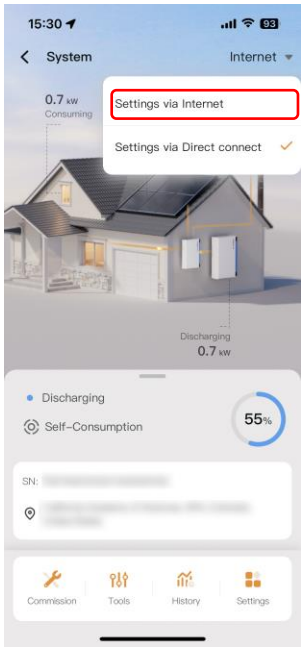


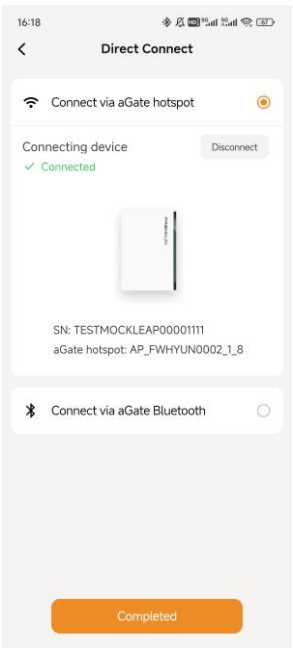
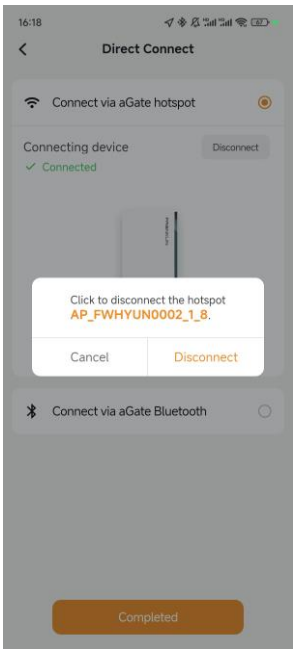
If the aGate hotspot is not available and you search for an available Bluetooth near the aGate, it is possible to connect via aGate Bluetooth. Select the aGate Bluetooth named with FHP_SN, where the SN is the last six digits of the aGate serial number (e.g. FHP_456789) and connect the app to the aGate Bluetooth for pairing.



- Switching from the Direct connect to the Internet.

  Step 1. Select **Settings via Internet**.



Step 2. Connect to the internet.

Tap the **Disconnect** button in the upper right corner. A pop-up prompt will appear. Tap **Disconnect** again to disconnect the aGate hotspot and connect to the internet.