

NEM Plus Compliant Franklin Home Power System Installation Guide

Background

The Hawaiian Electric Cos. launched Net Energy Metering Plus (NEM+) on October 12, 2018, only available to NEM customers. It allows customers to add battery storage as well as extra panels to their rooftop solar systems without affecting their NEM status – as long as the new equipment doesn't export power to the grid.

This program benefits NEM customers whose energy demand routinely exceeds the supply provided by their rooftop solar or other renewable distributed energy resource (DER) system. It also benefits NEM customers who are considering renovations or purchases that increase electricity use, such as electric vehicles.

There are no program capacity limits or queues, so there are no deadlines to meet. The only pre-requirement for participation is an active NEM agreement.

This document is a guide on how to install a Franklin Home Power System (FHP) with non-export functionality to meet the NEM Plus non-export requirements.

For more information on NEM Plus from Hawaiian Electric, go to:

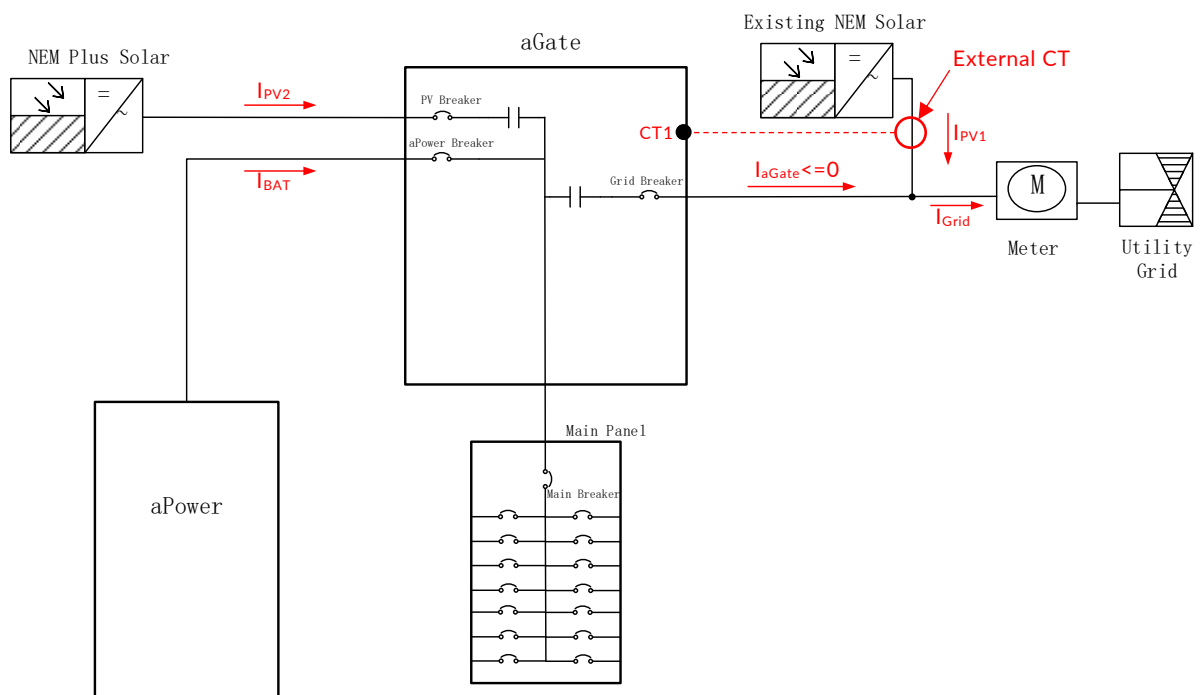
<http://www.hawaiianelectric.com/nemplus>

Installing FHP and additional solar panels to an existing NEM solar system on the line side of the main panel

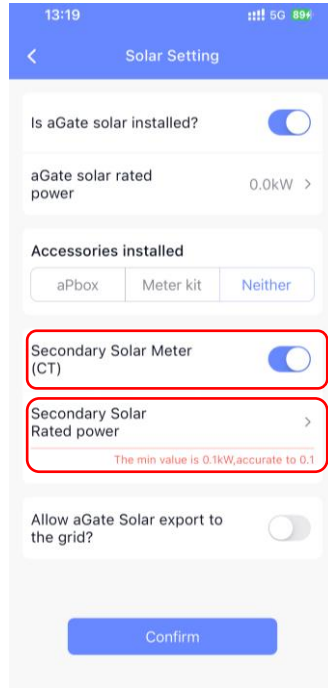
When installing a NEM Plus FHP system and additional solar panels at a site with an existing NEM system interconnected on the line-side of the main panel, follow these configuration instructions.

- Step 1** Follow the FHP system installation recommendations provided in the *Franklin Home Power Installation Guide*.
- Step 2** Connect the new NEM Plus solar output into the aGate PV breaker, and connect the main backup panel into the aGate backup port.
- Step 3** If the cable length between the existing NEM Solar and the aGate is less than 130 ft (40 m), only an external CT installation is needed, See [Appendix A: External CT installation Details](#) for more information.

The diagram below provides an example of system layout and metering.



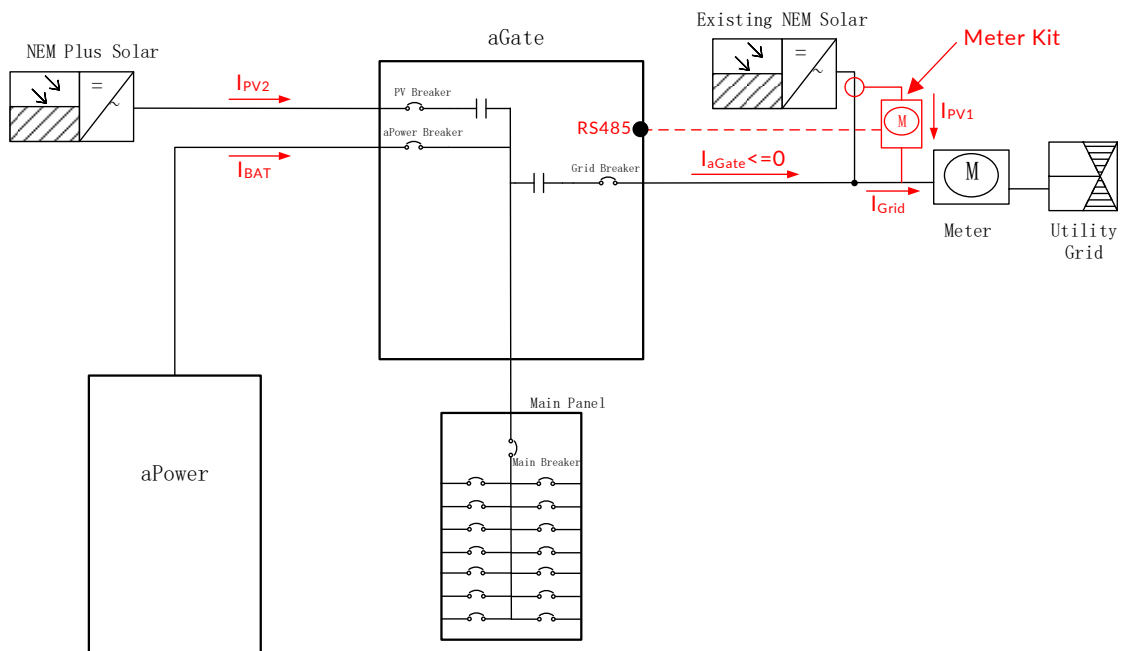
Enable the **Secondary Solar Meter (CT)** and set the **Secondary Solar Rated power** as the existing NEM solar rated output during commissioning **Solar Setting** tab.



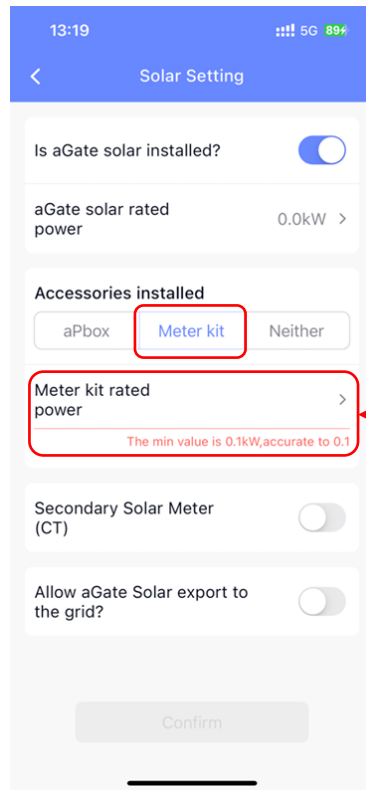
Enter the existing NEM solar rated power.

Step 4 If the cable length between the existing NEM solar installation and the aGate is greater than 130 ft (40 m), an external Meter Kit installation is required, See [Appendix B: Meter Kit Installation Details](#) for more information.

The following diagram provides an example of system layout and metering.



Select **Meter Kit** and set **Meter Kit rated power** as the existing NEM solar rated output during commissioning **Solar Setting** tab.



Enter the existing NEM solar rated power.

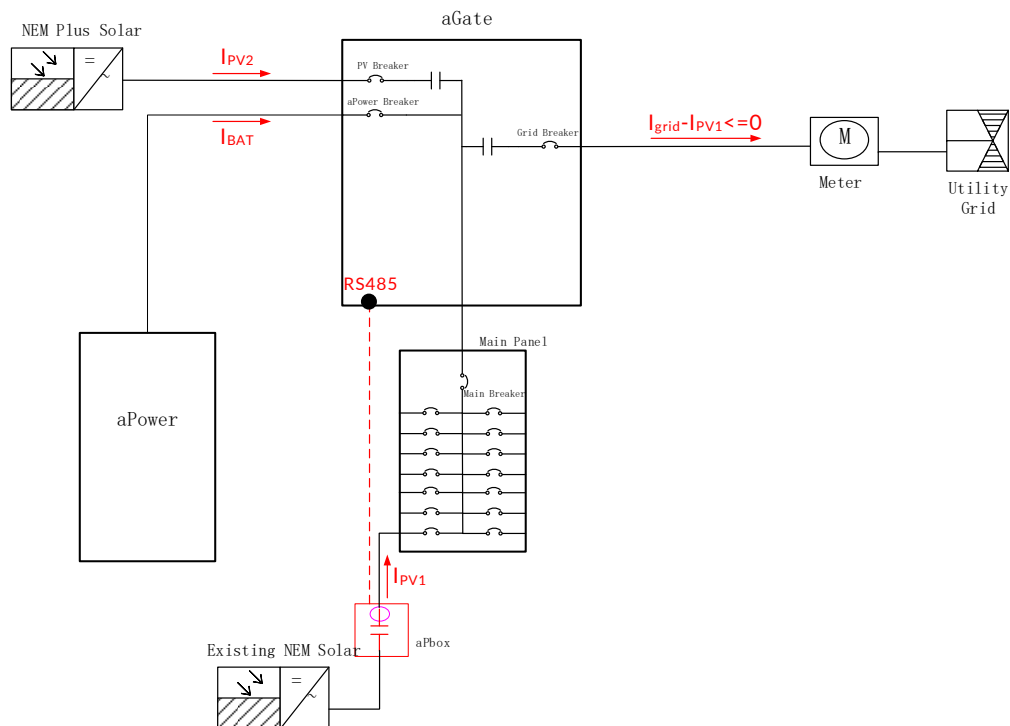
Installing FHP and additional solar panels to an existing NEM solar system on the load side of the main panel

When installing a NEM Plus FHP system and solar panels at a site with an existing NEM system interconnected on the load-side of the main panel, follow these configuration instructions.

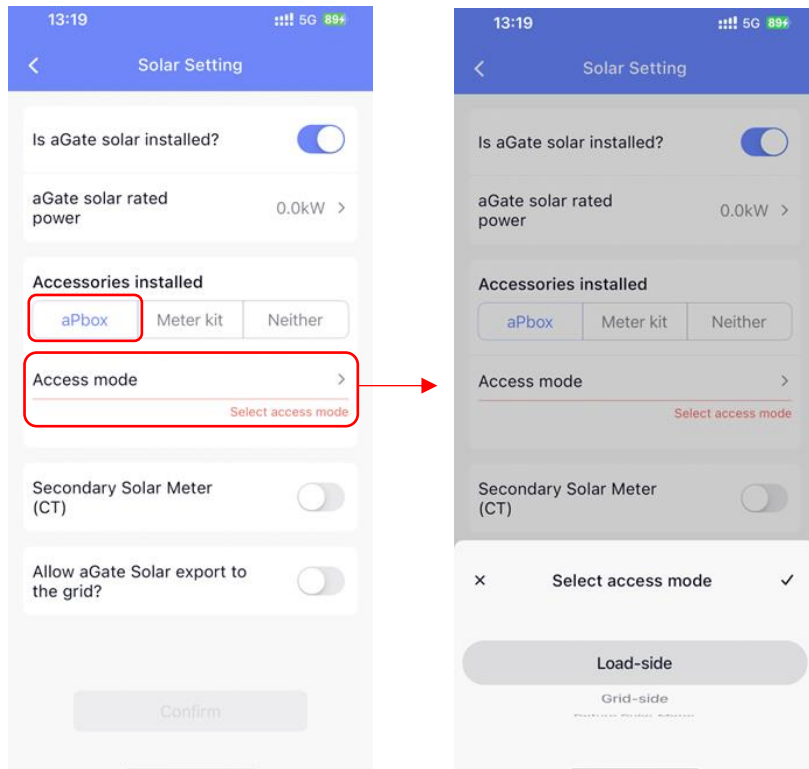
- Step 1** Follow the FHP system installation recommendations provided in the *Franklin Home Power Installation Guide*.
- Step 2** Connect the new NEM Plus solar output into the aGate PV breaker, and connect the main backup panel to the aGate backup port.

Install an aPbox between the existing NEM solar system and the backup panel to monitor and control that PV production. For aPbox installation recommendation, refer to the *aPbox Installation and Operations Manual*.

The following diagram shows an example system layout and metering.



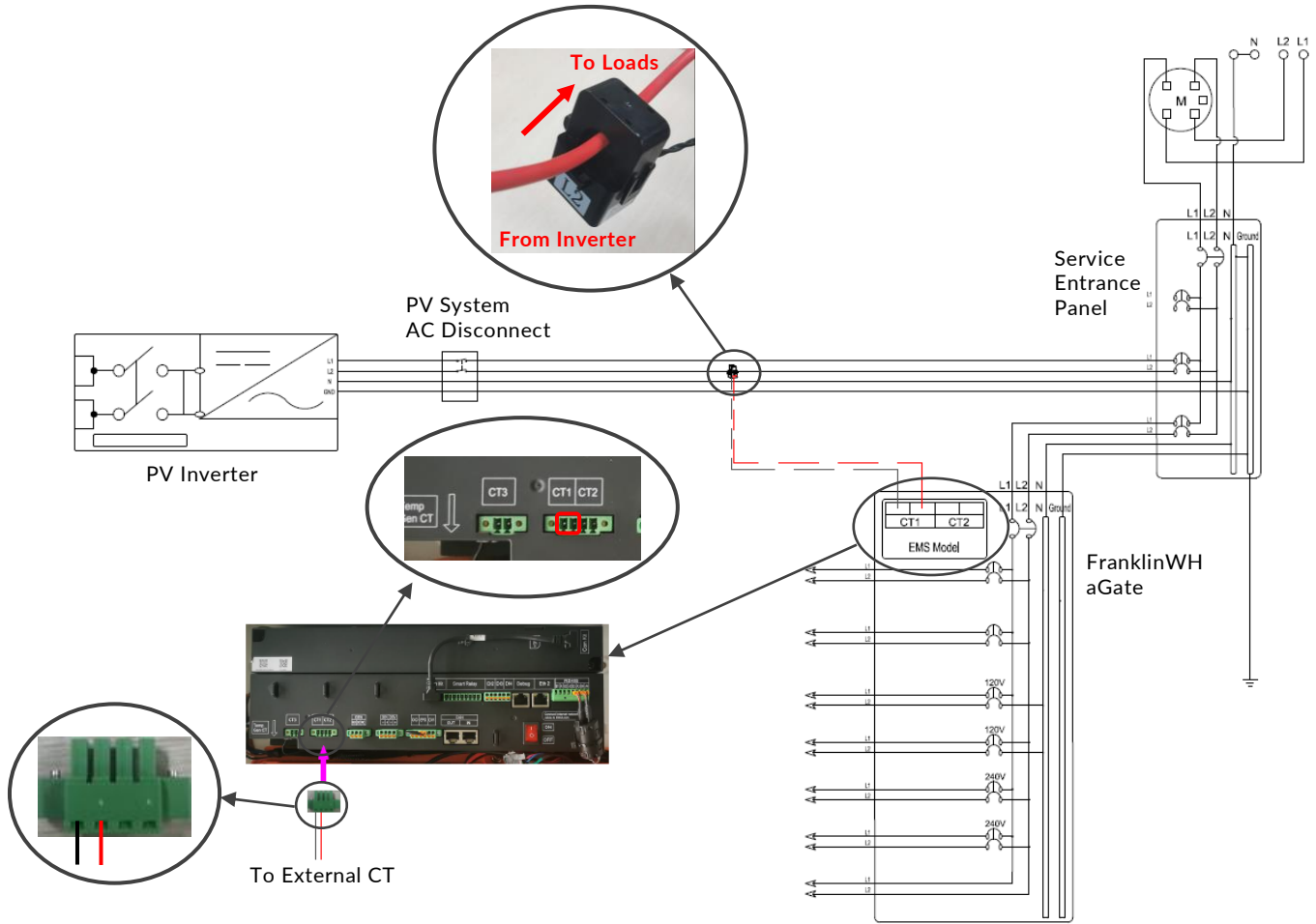
Step 3 Select **aPbox** and set **Access mode** where the aPbox is placed during commissioning under **Solar Setting** tab.



Appendix A: External CT Installation Details

If the cable length between the existing NEM Solar and the aGate is less than 130 ft (40 m), only an external CT installation is needed. Install the external CT on line 2 of the existing NEM system with current flow pointing towards loads.

Due to the full support of external CTs by the aGate's EMS, the external CT only needs to be plugged into the CT1 interface of the EMS as shown in the figure below.



NOTE:

1. The factory CT cable has a length of 50 ft (15 m). If it is not sufficient, an extension cable is required. It is recommended to use 20 AWG or larger twisted pair conductors.
2. The external CT should be installed in a NEMA 3R type enclosure for protection.
3. The external CT used here must be the FWH Split CT Kit available from distribution.

Appendix B: Meter Kit Installation Details

If the external Meter Kit installation is required, follow the steps below.

Power down the system, turn off the upstream and downstream circuit breakers and lock them. Wait at least 5 minutes before performing work.



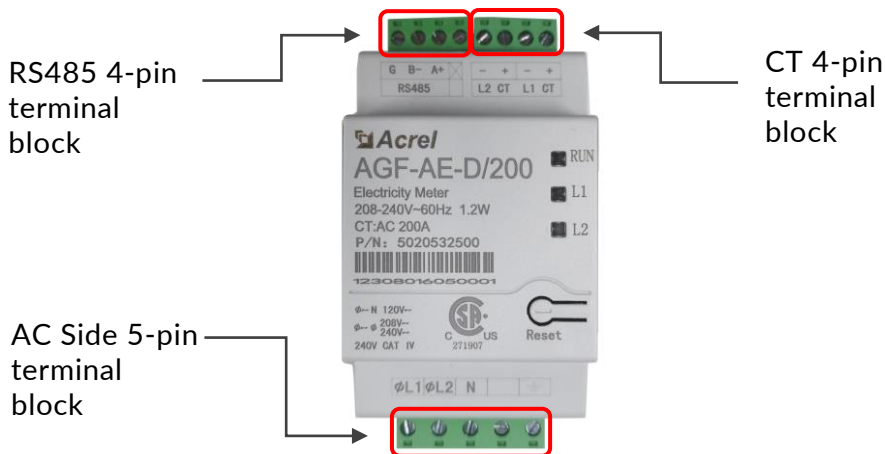
NOTE:

All electrical installations shall comply with all national and local electrical codes. Recommended Wire size and service entrance panel OCPD rating as shown in the table below.

Type	Specifications
AC Wire	12-14 AWG stranded wire, 600 V, type THHN, MTW, or THWN
RS485 Wire	16-20 AWG
OCPD Rating	15 A

The length of the communications cables between the Meter Kit and the aGate shall not exceed 328 feet (100 meters).

- Step 1** Install the meter in a NEMA 3R type enclosure on a 35 mm din rail. This can be an existing enclosure on site if there is sufficient room.
- Step 2** Plug the three green terminal blocks into Meter and connect the wires to the corresponding ports as shown in the figure below. Connect the wires from the Grid side to the AC side 5-Pin terminal block, the CT wires to the CT 4-pin terminal block, and the RS485 twisted pair cable to the RS485 4-pin terminal block. Ensure that the lines match the symbols printed on the meter front label and verify the connections.



- Step 3** Install Meter Kit on line 1 and line 2 of the existing NEM system with current flow pointing towards loads.
- Step 4** Wire A+, B- terminals on the Meter to RS485 A1 and B1 terminals on the aGate EMS module respectively.
- Step 5** Connect the Meter feeder conductors to the service panel protected by over current protection devices.
- Step 6** Verify Meter Kit feeder conductors L1, L2 phasing is same as L1, L2 to aGate feeder.

The image below provides common installation information as reference.

