



AC-Coupling existing NEM PV generation to Powerblocks emergency backup circuit.

The KumuKit Powerblocks energy storage system includes a feature called AC-Coupling that allows a portion of PV generation to be installed into the emergency backup circuit and be available to charge the batteries even in the event of a grid outage.

This feature allows a **maximum of 5 kilowatts (5 kW)** of on-site PV generation to be automatically switched between “grid synced” and “battery synced” depending on current conditions of the utility grid. This portion of PV generation can now serve a dual purpose by creating energy savings when the grid is up, while also being available to charge the batteries during a grid outage.

Any **new** PV generation up to the maximum amount will described above, by default, will be AC-Coupled and available to charge the battery during a grid outage. This portion of PV generation will be connected to a special AC-Coupled input which allows for a direct connection to the backup charging circuit during a grid outage.

Any **existing** PV generation by default, will not be AC-Coupled and will not be available to charge the battery during a grid outage. There is an option to relocate a portion of this existing PV generation in an indirect connection to the backup charging circuit to assist in battery charging during a grid outage. See Illustration #1 on page 2.

If the size of your new PV generation is significantly less than the 5 kW maximum allowed to be AC-Coupled, then you may want to consider moving a portion of your existing PV generation to make up any difference and assist in keeping that batteries charged during a grid outage. The sole benefit of this option is to allow more PV generation to assist in charging the batteries during a grid outage. It does not affect the day to day operation of the PV generation under normal grid operation.

Example:

New PV generation system size: 2.5 kW.

Existing PV generation system size: 5 kW.

Since the KumuKit Powerblocks energy storage system allows up 5 kW's of PV generation that can be AC-Coupled, you now have an option of relocating up to 2.5 kW's of your existing PV generation to meet the maximum limit. This relocated portion now serves a dual purpose along with the new PV generation. The remaining 2.5 kW's of the existing PV generation will remain grid-synced and operate as it did before.

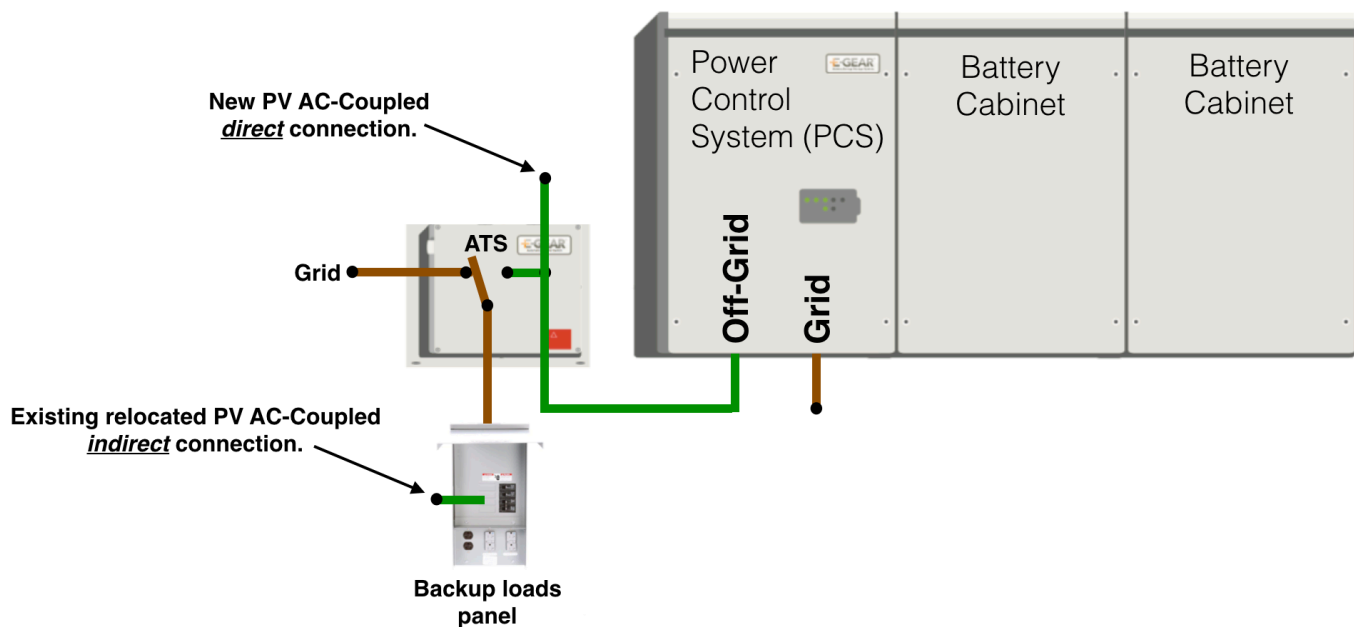


Illustration #1: Direct and indirect PV AC-Coupled generation connections

Items to consider when choosing this option:

- 1) The portion of your existing PV generation that will be relocated to the supplied backup loads panel will be located along with any backup loads. An additional feature of the backup panel includes the ability to disable backup circuit power draw when the battery reaches a minimum state of charge. This additional feature prevent the batteries from hitting lower battery limits that would prevent operation of the energy storage system. It is important to note that any relocated portion of existing PV generation to this backup panel has an indirect connection to the backup circuit and will not be available for charging the battery when the backup circuit is disabled under this condition. Only the new NEM Plus PV generation portion that has a direct connection will be available to charge the batteries directly if the backup loads panel has been disabled. The existing PV generation will be available to assist in battery charging once the battery state of charge has been increased above the minimum level by the direct connected PV generation.
- 2) If you have an existing KumuKit, then we are able to perform this work while still maintaining any warranty coverages. Additional charges apply for the relocation of existing PV generation to the backup loads panel connection.
- 3) If your existing PV system was installed by a 3rd party contractor that is no longer in business to support existing warranties, then we are able to perform this work but may void certain warranty coverages. Hawaii Energy Connection will need to perform modifications to the existing PV system, but assumes no liability on system hardware or installation workmanship of the existing PV system. Additional charges apply for the relocation of existing PV generation to the backup loads panel connection.
- 4) If your existing PV system was installed by a 3rd party contractor that is still in business, or if the system is 3rd party financed (leased, PPA, etc...) then **we are not able to perform this work** due to existing warranty coverage and ownership rights issues. You may consider requesting the modification to be performed by your original contractor.