



## TECHNICAL NOTE

### TOPIC: Sunny Island 4548-US, 5048-US, 6048-US :: Grid Backup with Generator :: Digital Input

#### REFERENCE

Supplemental information to SI4548-US, SI5048-US and SI6048-US Technical Description section 14.3 Generator and Grid. North American/US models only.

#### TECHNICAL BACKGROUND

When using the Sunny Islands in a Grid Backup system with a Generator the system installer is responsible for setting up the DIGIN or Digital Input. The purpose of the DIGIN or Digital Input is to signal to the Sunny Island that there is a backup generator available when the public utility power is lost. This allows the Sunny Island to call for a generator with a two wire start. Along with calling for a remote start generator, it will provide reverse power protection in order to prevent any renewable energy current from back feeding to the generator. This function of the Sunny Island gives the installer more flexibility in the design and installation of a Grid Backup system.

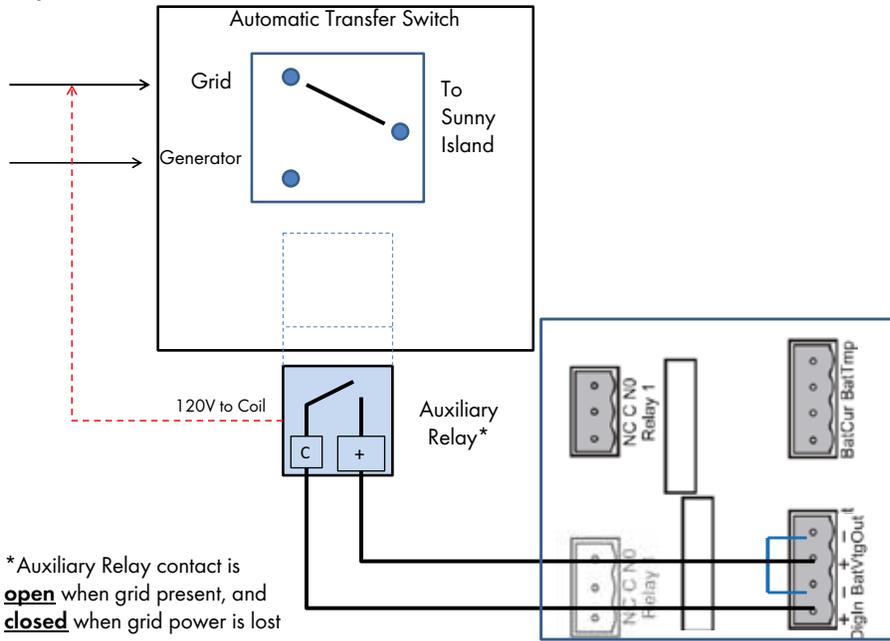
The Sunny Island has one AC external source connection labeled AC2 Grid/Generator. With only one external connection, the Digital Input is used to distinguish between the Generator or Grid voltage. When the Digital Input has an open circuit the Sunny Island operates under grid parameters and can then feed extra current back to the grid. When the Digital Input has a closed circuit the Sunny Island recognizes that a generator is available. When the generator is recognized, the Sunny Island will no longer back feed any power through its AC2 connection towards the generator. This will protect the generator by the GnRvPwr or Generator Reverse Power function of the Sunny Island.

When using a backup generator the installer must provide a means of switching from Grid to Generator. This can be performed by utilizing an automatic transfer switch (ATS) or a manual transfer switch. When possible, using an ATS makes for a seamless transition between generator and grid and does not require any customer interaction.

In order to wire the DIGIN circuit, the installer must use a Single Pole Single Throw Normally Closed (NC) or Single Pole Double Throw relay/contacter with a 120V coil. A NC relay/contacter will be closed when there is no voltage applied to its coil. An ATS may be equipped with a relay inside its enclosure. The installer will wire the DIGIN circuit to the NC position in order for this circuit to remain open when the grid is present and close when the grid is absent. However, if an auxiliary relay is not available, the installer will need to purchase an external relay/contacter with a 120V coil or 240V coil. The voltage for the coil must be provided from the grid side of the transfer switch. In the event of a grid outage, the voltage will no longer be applied to the coil, and the contact will close.

The DIGIN signal in the Sunny Island occupies two auxiliary connections. They are located near the multifunction relay connections inside on the bottom right hand side of the circuit boards in the Sunny Island. The connections that will be utilized are the BatVtg+ and BatVtg- along with the Digin+ and Digin-. To wire the circuit, take a small jumper and place it between the BatVtg- and Digin -. Next, wire the BatVtg+ to the NC contact of the "external relay/contacter." ( This is the contactor provided externally, or in your ATS.) Then, wire the Digin+ to the C or common connection on the external relay. Treat this circuit as a communication circuit, and do not run this in parallel to AC voltage and current cables. Running this circuit parallel to AC voltage and current conductors may cause interference in the signal and give the Sunny Island an incorrect signal. The voltage should not be present to the relay when the grid is down. For external relays, pull voltage from the grid side of the transfer switch.

Figure 1



If there are additional questions or if further clarification is needed, please refer to the inverter manual or contact the SMA Service Line at +1 877 697 6283.

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