

Using Solar as Primary Power Source During Enhanced AC Support Mode with CSW

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Application Note

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DANGER

RISK OF FIRE, ELECTRIC SHOCK, EXPLOSION, AND ARC FLASH

This Application Note is in addition to, and incorporates by reference, the relevant product manuals for each product in the Conext series. Before reviewing this Application Note you must read the relevant product manuals. Unless specified, information on safety, specifications, installation, and operation is as shown in the primary documentation received with the product. Ensure you are familiar with that information before proceeding.

Failure to follow these instructions will result in death or serious injury.

Objective

This application note explains how to accomplish using solar energy (PV system) as a priority source of power in an enhanced AC support mode with Conext™ SW (CSW). Power from the PV system is used to supply the loads during the day and charge the batteries. The batteries will be maintained in a charged condition by the PV system unless there is a grid outage or the PV is prevented from charging the batteries due to shading or other factors.

Use Case Scenario

The Enhanced Grid Support operating mode is recommended for DC-coupled, grid-tie systems (including backup) where the application requires maximum availability of backup power. This operating mode also promotes battery health by maximizing battery energy replenishment while reducing occurrences of partial state of charge. Prolonged periods of partial state of charge can reduce battery life.

Enhanced AC support mode with CSW automatically supplies PV power to the loads. This mode of operation is used to keep the batteries completely charged as possible.

This application requires a DC-coupled CSW inverter with one or more Xanbus-enabled MPPT solar charge controllers (such as MPPT 60-150 or MPPT 80-600).

Procedure

Using the SCP or the ComBox

1. Install the CSW unit as directed in its installation guide¹.
2. Install the MPPT solar charge controller/s as directed in their installation guides².
3. Set the CSW charger for 2-stage charging.
4. Set the MPPT solar charge controllers (MPPT 60-150 or MPPT 80-600) for 3-stage charging.
5. Set the CSW for enhanced AC support mode.
 - a. Set **AC Supp Mode** to **Enabled** under Advanced Settings.
 - b. Set **EnhancedACSup** to **Enabled** under Advanced Features which automatically sets the AC support voltage to a value that is conducive to enhanced AC support mode.
 - c. Set **Load Shave** to **Enabled** (or **Disabled**) separately.

What to Expect

In the morning, the PV system begins 3-stage charging of the batteries at bulk stage and power from the grid passes through the CSW to the loads.

When the MPPT solar charge controller transitions to absorption stage, the PV system will begin to supply power to the loads. Depending on the size of the loads, the PV system may supply all or part of the load requirement.

Once the MPPT solar charge controller switches to float stage, all PV system power will be able to supply the loads.

Expect that in all cases (including the case scenario in this Application Note), that the CSW will draw a minimum of 2 A from the grid to prevent any power flowing back into the grid from the CSW.

Prioritization

When the CSW is configured for enhanced AC support mode, the MPPT solar charge controller/s have priority over the CSW to charge the batteries using 3-stage charging (see step 4).

If PV energy is reduced (like in a cloudy day) to the point that battery voltage drops to float voltage level, then the CSW scales back AC support (that is, draws less power from battery storage). This process continues until no power is being delivered by the batteries and will only return to AC support when PV power becomes available.

1.Document part numbers for CSW 230V (975-0636-01-01) and CSW 120/240V (975-0638-01-01).
2.Document part numbers for MPPT 80-600 (975-0540-01-01) and MPPT 60-150 (975-0400-01-01).