

# Using Solar as Primary Power Source During Enhanced Grid Support Mode with XW+/XW

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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 Grid Support mode with Conext™ XW+ (including XW). 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 Grid Support mode with XW+ (including XW) automatically supplies PV power to the loads and any surplus power can be sold back to the grid. This mode of operation assures the batteries are kept as completely charged as possible.

This application requires the use of an XW+ (including XW) inverter and one or more MPPT solar charge controllers (MPPT 60-150 or MPPT 80-600).

## Procedure

### Using the SCP or the ComBox

1. Install the XW+ (including XW) as directed in its installation guide<sup>1</sup>.
2. Install the MPPT solar charge controller/s as directed in their installation guides<sup>2</sup>.
3. Set the XW+ (including XW) 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 XW+ (including XW) for enhanced Grid Support.
  - a. Set **Grid Support** to **Enabled** under Advanced Settings.
  - b. Set **Grid Supp Volts** to **> 65 VDC** (for 48-volt systems) which puts the inverter in enhanced grid support mode.

**NOTE:** The **65 VDC** setting does not affect any other settings but simply tells the inverter to use the information supplied by the MPPT solar charge controller to determine the amount of surplus power that is available.

**NOTE:** For the 24-volt XW, set the **Grid Supp Volts** to **> 35 VDC**. Similarly, the setting does not affect any other settings but simply tells the inverter to use the information supplied by the MPPT solar charge controller to determine the amount of surplus power that is available.
  - c. Set **Se11** to **Enabled** under Grid Support settings to allow surplus power to be sold back to the utility grid.

## 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 XW+ (including XW) 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 supply the loads.

Consequently, if the loads do not require the entire PV system power, the surplus power can be sold to the utility grid.

Expect that in all cases (including the case scenario in this Application Note), that the XW+ (including XW) will draw a small amount of power from the grid unless of course, the inverter is selling power to the grid.

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1.Document part numbers for XW+ (975-0714-01-01), XW+ NA (975-0239-01-01), XW and XW NA(975-0239-01-01\_Rev-F).  
2.Document part numbers for MPPT 80-600 (975-0540-01-01) and MPPT 60-150 (975-0400-01-01).

### **Prioritization**

When the XW+ (including XW) is configured for enhanced grid support mode, the MPPT solar charge controller/s have priority over the XW+ (including XW) 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 XW+ (or XW) scales back grid 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 grid support when PV power becomes available.