

## **V2.07 Build 04(July, 2017)**

### **Bug Fixes**

- When the battery type is set to “Lithium Ion” or charge cycle is set to “External BMS”, if the battery is over discharged for 8 seconds, Fault 71 will be reported.
- Fixed issue where the bulk charge current doesn’t reflect the user set value.
- Fixed issue where when the battery voltage is lower than the recharge voltage within the peak load shave TOD (Time of Day) window, the charger stays in idle (no charging) after the unit exits the TOD.

## **V2.06 Build 02 (Mar, 2017)**

### **Bug Fixes**

- Added Fault 90 “BMS Disconnected.”

## **V2.03 Build 08 (Apr, 2016)**

### **New Features**

- Fixed Power Factor
  - Allows the power factor to be set to a value in the range of 0.80 lagging to 0.80 leading.
- External Load Transfer Switch
  - Drives an external relay by using the 12V signal from the Auxiliary Port.
- Multi-Cluster AC Coupling
  - Enables AC Coupling in a multi-cluster XW system.
- SoC Based Battery Balance
  - Uses the State of Charge from Battery Monitors to determine how to balance the batteries.

### **Changes to Features and Settings**

Several features and set-points were adjusted including the following:

- Added an additional entry condition for AC Coupling, when the battery voltage is 2V higher than the Equalize Voltage.

- Set the Default Low Battery Cut Off Voltage value to 44V.
- Reduced the Default High Battery Cut Off Voltage from 70V to 65V. (Note: A warning may be raised when Equalizing the battery, which is expected behavior.)
- Set the Under-Frequency limit for both AC Inputs to 44Hz.
- Now, settings will be saved when the unit enters Standby and when any settings are changed while the unit is already in Standby. This addresses the issue with the F55 EEPROM Fault.

### Bug Fixes

Several bug fixes were completed including the following:

- Fixed issue with F55 EEPROM Fault.
- Fixed issue where the F63 AC Overload Fault could not be cleared when the load was below the nominal load rating for the unit.
- Fixed issue where Inverter Load Sharing was not working properly with large inductive loads.
- Fixed issue where the XW would not qualify the AC Input when the unit was AC coupled to an RL unit.
- Fixed issue where the XW would not acknowledge when the BTS was disconnected from the Battery Monitor.
- Fixed issue where no fault would be reported when a Li-Ion BMS (Battery Management System) lost connection to the Xanbus network.
- Fixed issues with External BMS Charging.

### V2.01 Build 22 (Aug, 2015)

#### Changes

- Adjusted the factory default control parameters for AC coupling.
- Improved the control stability for parallel operation in multi-unit mode.
- Reduced the transformer temperature power de-rating threshold from 115°C to 110°C.

#### V2.01 Build 8 (Nov, 2014)

##### Changes

- Add Transient Over-voltage (TOV) protection feature as per Hawaiian Electric Companies (HECO) grid-interconnection requirements.
- Increase the sell power tolerance. Add Xanbus commands for charge voltage and current settings & Grid-tie mode maximum sell current.
- Improve the current share in parallel inverter mode operation. Extended the Aux trigger range of "High battery Voltage" to 48v ~ 70v.
- Limits change in Grid Voltage Support. Add "rPO" display message in "Remote Shut Down Mode."
- Add Xanbus Reactive Power Control (VDE 4105 compliance) on XW+5548-120V-60Hz model.

#### V2.00 Build 5 (Jan, 2014)

##### New Features

- AC Coupling
  - AC Coupling feature can be enabled or disabled from a user interface tool if the unit is configured as a system master.
  - AC Coupling will be activated under following conditions:
    - a) Whenever the "reversed current (>3.0 Adc)" on any unit that is connected to the system is detected by the system master; and
    - b) The battery voltage is charged up to 57.6V or higher by any solar inverter(s) connected to the system; and
    - c) The master unit is operating at inverter mode.
  - When AC Coupling mode is active, the system master will shift the output frequency upwards based on the battery voltage, up to a maximum value of Nominal Frequency + 1.95 Hz.
  - When AC Coupling mode is active, the battery will be charged from the AC bus. And the charging voltage will be regulated by the system master.
  - AC Coupling mode will be exited when the conditions listed in a), b) and c) above are not met, with a five-minute delay.

- Battery Energy Balancing
  - Battery Energy Balancing feature can be enabled or disabled from a user interface tool.
  - Battery Energy Balancing mode will be activated under following conditions:
    - a) When the system (single-phase or three-phase) utilizes multiple (equal or more than two) battery banks; and
    - b) The battery voltage is 54.0V or higher; and
    - c) The battery voltage difference between any two battery banks is larger than 2.0V
    - d) The unit is operating at inverter mode.
  - When Battery Energy Balancing mode is active, the units (master and slaves) connected to the system will adjust their output to balance the battery energy.
  - When AC Coupling mode is active, the battery will be charged from the AC bus. And the charging voltage will be controlled by the system master.
  - The Battery Energy Balancing mode will be exited when all the conditions listed above are not met.
- Multi-Cluster with External Contactor
  - Multi-Cluster feature only supports three-phase system.
  - Multi-Cluster feature requires that the system be wired with an external contactor and with an electrical configuration that supports the Multi-Cluster feature.
  - Multi-Cluster feature can be enabled or disabled from a user interface tool.
  - Multi-Cluster feature supports inverter (grid forming), charging and grid-tie sell mode through AC1 port.
  - In Multi-Cluster mode, if a failure on the external contactor is detected, the system will stop the operation and goes to a FAULT state (F72). When F72 is cleared from the front panel or a user interface, the unit will go to inverter mode.
- Multi-Battery DC Inputs
  - Multi-Battery feature allows the system to be supplied from multiple battery banks. A maximum of four battery banks is recommended.
  - Multi-Battery feature allows the system to use multiple battery temperature sensors. One sensor for each bank is recommended.
- VDE\_AR\_N 4105 Compliance (Not supported)

- VDE-AR-N-4105 is the grid-connection standard for GERMANY, but is generally the base line standard for grid-interactive PV devices in Europe. Most European country standards can be met through a sub-set of VDE 4105.
  - VDE\_AR\_N4105 Compliance Implementation contains two sections of functionalities: Grid Frequency Support (GFS) and Grid Voltage Support (GVS).
  - Grid Frequency Support (GFS) regulates the active power of the unit to response the frequency change.
  - Grid Voltage Support (GVS) regulates reactive power of the unit to response the voltage change.
  - Either GFS or GVS can be enabled or disabled from a user interface tool.
- Battery Monitoring System (BMS)
  - The software allows the system to accept battery data (voltage, current, temperature, SOC, etc.) from an external monitoring device which is connected to the system through a communication channel.
- Li-ion Battery Charging
  - Li-ion battery changing feature allows lion battery banks to be connected to an XW Upgrade system, through which the lion battery banks can be charged.
  - The Constant Current (CC) mode and Constant Voltage (CV) mode are supported. The charger settings can be configured over the network communication.

## Bug Fixes

- Bug Description: In Grid Support Sell mode operation, the actual sell current to the grid has an error of about 0.5A, which is 1A less than the set value. For instance if the set current is 20A, the measured grid current is ~19A. The set sell current accuracy has been improved in the new build.  
Bug Status: Fixed.
- Bug Description: The XW+ system get phase configuration fault (F70) in the case when the AC source has a reversed/wrong phase sequence. With the new build, the XW+ continues in inverter mode without qualifying the wrong AC sequence.  
Bug Status: Fixed. Changed Fault 70 (F70) to Warning 70 (W70).

- Bug Description: When any Phase Master unit in a three-phase system experiences an inverter fault, all units in the system should cease inverter operation. However, the non-faulting units will continue attempting to enter invert mode and will cycle between briefly entering Invert mode and non-invert states.

Bug Status: Fixed.