

Troubleshooting Reference

Types of Faults and Warnings

The various types of fault and warning messages behave differently, and give you the option to treat them differently when they appear. For more information about the types of fault and warning messages, see “Types” on page 5–8 and “Types of fault messages” on page 5–12.

Warning Reference Table

Table 6-1 Warning reference table

Warning number	Message	Type	Cause	Action
W250	The selected value failed to change. Try again.	Automatic	A temporary communication problem stopped the System Control Panel changing a value that you entered.	Try changing the value again.
W251	Please confirm equalization process.	Manual	You have selected the Equalize command on the inverter/charger menu.	Press Enter to begin equalizing batteries or Exit to return to the inverter/charger menu.
W252	Please confirm: Restore device’s default settings.	Manual	You have selected the Restore Defaults command.	Press Enter to restore default settings or Exit to cancel.
W254	Put system in Safe mode to change setting.	Manual	The setting you are changing can only be changed when the system is in Safe mode.	Put the system in Safe mode, change the setting, then return the system to Operating mode.
W255	System clock not set. Set correct time.	Manual	On initial startup, the clock needs to be set. The system will not operate correctly until it is.	Set the clock to the correct time.
W256	No network connection. Check connection to device.	Manual	The System Control Panel has lost communications with another device on the network.	Check network connection between the System Control Panel and the device.

Table 6-1 Warning reference table

Warning number	Message	Type	Cause	Action
W257	New device detected. Check device settings.	Manual	You have connected a new device to the network or reconnected a disconnected device.	Acknowledge the message and check that the device is properly configured.
W501	SCP has fixed a memory problem and restored default settings.	Manual	The System Control Panel encountered an internal memory problem upon startup. To remain operational, the System Control Panel restored its default settings.	Acknowledge the warning and reset configurable settings if necessary.

Fault Reference Table

Table 6-2 Fault reference table

Fault number	Message	Type	Cause	Action
F500	Internal failure. Service required.	Manual	The silicon serial ID number has failed and the System Control Panel has gone into Safe mode.	Reset the System Control Panel. If problem persists, call customer service.
F501	Internal failure. Service required.	Manual	The System Control Panel has suffered a non-volatile memory failure.	Reset the System Control Panel. If problem persists, call customer service.
F503	Internal failure. Service required.	Manual	The real-time clock in the System Control Panel has failed.	Reset the System Control Panel by putting it in and taking it out of Power Save mode. If problem persists, call customer service.
F504	Network not available. Check connection, clear fault.	Automatic	The System Control Panel has lost communications with the network because of a faulty connection or electronic signal disruption.	Check connection between the System Control Panel and the network.
F505	Internal failure. See guide.	Manual	A controller fault has occurred and the System Control Panel has gone into Safe mode.	Reset the System Control Panel. If problem persists, disconnect and reconnect network cables, or put it in and take it out of Safe mode.

General Troubleshooting Guidelines

This section will help you narrow down the source of any problem you may encounter. Please read the following troubleshooting steps:

1. Check for a Warning or Fault message on the Conext System Control Panel or a Fault code on the inverter information panel. If a message is displayed, record it immediately.
2. As soon as possible, create a detailed record of the conditions at the time the problem occurred. These details should include, but not be limited to, the following:
 - Loads the Conext XW+ was running or attempting to run.
 - Battery condition at the time of failure (for example battery voltage or temperature) if known.
 - Recent sequence of events (for example, charging had just finished, utility grid had failed but the inverter did not start up).
 - Any known unusual AC input factors such as low voltage or unstable generator output.
 - Extreme conditions which may have existed at the time (for example, temperature or moisture).
3. Attempt the solution corresponding to the Warning or Fault message in Table 4-3 on page 4-12 or Table 4-6 on page 4-19.
4. If your inverter information panel or Conext SCP is not displaying a Fault light, check the following list to make sure that the present state of the installation allows proper operation of the unit. See also “Inverter Troubleshooting” on page 4-4 and “Battery Charger Troubleshooting” on page 4-7.
 - Is the Conext XW+ located in a clean, dry, adequately ventilated area?
 - Have the AC input breakers opened? If so, your pass through load may have exceeded the rating of one or more of the input breakers.
 - Are the battery cables adequately sized and short enough? See the *Conext XW+ Installation Guide* for more information.
 - Is the battery in good condition and are all DC connections tight?
 - Are the AC input and output connections and wiring in good condition?
 - Are the configuration settings correct for your particular installation?
 - Are the display panel and the communications cable properly connected and undamaged?
 - Are the battery temperature sensor and its cable properly connected and undamaged?
5. Contact Customer Service for further assistance. Please be prepared to describe details of your system installation and provide the model and serial number of the unit. See page ii for contact information.

Inverter Applications

The Conext XW+ performs differently depending on the AC loads connected to it. If you are having problems with any of your loads, read this section.

Resistive Loads

Resistive loads are the easiest and most efficient to drive. Voltage and current are in phase, which means they are in step with one another. Resistive loads generate heat in order to accomplish their tasks. Toasters, coffee pots, and incandescent lights are typical resistive loads. It is usually impractical to run larger resistive loads—such as electric stoves and water heaters—from an inverter due to their high current requirements. Even though the inverter may be able to accommodate the load, the size of battery bank will limit inverter run time.

Motor Loads

Induction motors (AC motors without brushes) require up to six times their running current on startup. The most demanding are those that start under load (for example, compressors and pumps). Of the capacitor start motors (typical in tools such as drill presses and band saws), the largest you can expect to run is 1 horsepower. Universal motors are generally easier to start. Check that the Locked Rotor Amps (LRA) rating of the motor load does not exceed the maximum surge current rating of the inverter. Since motor characteristics vary, only testing will determine whether a specific load can be started and how long it can be run.

If a motor fails to start within a few seconds or loses power after running for a time, it should be turned off. When the inverter attempts to start a load that is greater than it can handle, the inverter may shut down from an AC overload fault.

Problem Loads

Very Small Loads

If the power consumed by a device is less than the threshold of the search mode circuitry, and search mode is enabled, the inverter will not run. Most likely the solution will be to disable *Search* mode or lower the sense threshold. (See “Using Search Mode” on page 3–9.)

Fluorescent Lights and Power Supplies

Some devices cannot be detected when scanned by search mode circuitry. Small fluorescent lights are the most common example. Some computers and sophisticated electronics have power supplies that do not present a load until line voltage is available. When this occurs, each unit waits for the other to begin. To drive these loads, either a small companion load like a light bulb rated for more than the *Search Watts* setting must be used to bring the inverter out of search mode, or the inverter may be programmed to remain on by disabling search mode (See “Using Search Mode” on page 3–9).

Clocks

You may notice that your clocks are not accurate. Some of the clocks on your appliances may reset when the Conext XW+ is in search mode. Disabling search mode will resolve this issue (See “Using Search Mode” on page 3–9).

Searching

When the inverter is in search mode, it may fail to start some loads even though the rated wattage on the load is more than the Search Watts setting. Disable search or apply an additional load (companion load) to make the inverter exit search mode.

Inverter Troubleshooting

To determine the cause of an inverter error condition, refer to the troubleshooting table below for possible solutions.

Table 4-1 Troubleshooting Common Problems

Problem	Possible cause	Solution(s)
Unit will not power on (no LEDs are on) and the inverter information panel is blank or off.	Unit was turned off using STARTUP/ SHUTDOWN button on front panel.	Turn the unit on again.
	DC voltage on the inverter’s DC terminals is incorrect.	Check the battery voltage, fuses or breakers and DC cable connections to the inverter. If the DC voltage on the inverter’s DC terminals is correct, have unit serviced.
Unit goes into invert mode and starts producing AC output, but stops quickly (several attempts made).	Excessive load on output.	Reduce loads.
	Unit is in over-temperature protection and needs to cool down.	Stop inverting by putting the inverter into Standby mode, and then allow the unit to cool and increase ventilation. If necessary, replace the foam air filter on the bottom of the unit.
	Remote Power Off signal is present.	Release or reset the Remote Power Off switch.

Problem	Possible cause	Solution(s)
<p>No AC power output.</p> <p>The inverter information panel displays Sch.</p>	<p>Open AC output breakers or fuses and bad output wire connections.</p> <p>Inverter is disabled. Re-enable inverter.</p>	<p>Check the Load AC Voltage status on the SCP Meters screen and check AC voltage on the inverter AC Out terminal block.</p> <p>If the Meters screen shows correct AC voltage but there is no AC voltage on the inverter AC Out terminal block, check for loose connections on the inverter terminal block. If connections are not loose, the inverter may need to be serviced.</p> <p>If there is correct AC voltage on the Meters screen and on the inverter AC terminal block, check for open AC output breakers or fuses and bad output wire connections.</p> <p>If AC voltage on the Meters screen or inverter AC terminal block is incorrect, have unit serviced.</p>
<p>No AC power output.</p> <p>INVERT LED is flashing.</p>	<p>AC load too small for search mode circuit to detect.</p>	<p>Reduce Search Watts setting, increase load above Search Watts setting, or disable Search on the Setup menu.</p> <p>If the AC1 LED is on, check inverter output connections and voltage.</p>
<p>Low AC power output or low surge power.</p> <p>INVERT LED is on.</p> <p>AC inductive loads are not running at full speed.</p>	<p>Insufficient DC current being provided to the inverter to operate the AC loads.</p>	<p>Check the battery voltage, fuses or breakers and cable connections.</p> <p>Make sure the battery bank is sufficient (check for low DC voltage while running the load).</p> <p>Make sure the cable length and size is correct (see the <i>Conext XW+ Installation Guide</i> for correct cable). Tie the battery cables together to reduce inductance.</p> <p>Apply a load greater than 100 W or disable Power Save (see Table 3-12, “Advanced Features Menu” on page 3-47).</p>

Problem	Possible cause	Solution(s)
Inverter goes into invert mode and starts producing AC output and then stops or does not start at all.	<p>Search Watts setting is too low or high.</p> <p>Potential problem loads for search mode:</p> <ul style="list-style-type: none"> • Incandescent lights have a higher starting wattage when the filament is cold than the continuous rating of the bulb. • Fluorescent bulbs draw little power until the mercury vapor begins to conduct enough current to light the tube. • Other loads: Some appliances draw power even when turned off: TVs with instant-on circuits and VCRs, for example. 	<p>If the search sensitivity is set higher than the combined loads, then connect an auxiliary load to bring the inverter out of search mode before the appliances can be turned on.</p> <p>If the sensitivity is set lower than the combination of the loads, the loads will remain on and excess battery drain will occur since the inverter won't ever idle.</p> <p>Another solution is to turn the item off at the wall, use an extension cord with a rocker switch, a switch at the outlet, or an appropriate circuit breaker.</p>
The utility grid is not dropping out, but the unit is disconnecting from the grid.	The AC voltage or frequency provided to the inverter input is outside the AC Setting voltage or frequency range.	Adjust the AC1 voltage and frequency settings (see "AC Input Settings" on page 3-22). Raise the high voltage and frequency settings, and lower the low voltage and frequency settings. If Grid support is enabled, these limits are overridden by the default anti-islanding AC parameters.
The inverter connects to the grid and can charge normally. In a grid interactive mode (Grid Support enabled), the unit is experiencing excessive anti-islanding faults during periods of high sell amperage.	The impedance of the AC connection to the inverter is too high for the power being sold to the grid. The impedance may be on the high end if the installation is too far from the utility point of common connection or if the wires are too small between the Conext XW+ and the main service panel.	Measure the grid voltage at the service panel (meter base). It is important to measure L1-N, L2-N, L1-L2, and N-Ground. If these measurements are not within the voltage range for sell mode (see Table A-1 on page A-2), contact your utility for resolution. If these measurements are within the voltage range for sell mode (see Table A-1 on page A-2), the most likely event is that the AC wiring between the inverter and the meter base is not sized appropriately. It should be sized for a 1 to 1.5% maximum voltage drop. Alternately, the Max Sell Amps can be reduced until the unit stops disconnecting.

Battery Charger Troubleshooting

To determine the cause of a charger error condition, refer to the troubleshooting solutions below to resolve the situation.

Problem	Possible Cause	Solution
AC1/AC2 LED is on, but will not start charging (allow 40 seconds to synchronize).	1) Charger is disabled on the Setup menu.	1) Enable the charger.
	2) Charger Block is enabled and the Conext XW+ is inside of the charger block time window.	2) Disable Charger Block if you need to override this feature.
	3) The Conext XW+ is load shaving.	3) Check the load shave settings. If the load draw from the grid exceeds Load Shave Amps, the charger will not operate.
	4) Charger is set for 2-stage charging and has completed a full charge cycle.	4) No action required. The charger comes on when the battery reaches the ReCharge Volts setting. Otherwise use the Force Chg setting on the device setup menu to force a bulk or float charge.
	5) Battery voltage is below 40 V and AC source could not be qualified.	5) Recharge the batteries with an external battery charger or replace the batteries.
	6) Gen support is enabled and the draw from the loads exceeds the Gen support amps setting.	6) Temporarily disable Gen support mode, or reduce loads below Gen Support Amps setting.

Problem	Possible Cause	Solution
<p>AC1 or AC2 LED is flashing, but will not start charging</p> <p>(allow 40 seconds to synchronize).</p>	<p>AC voltage and frequency at the AC input terminal are within nominal range, but the inverter output is not yet synchronized to the AC source. There are four possible causes:</p> <ol style="list-style-type: none"> 1) The inverter may already be synchronized to another AC source. 2) The AC voltage or frequency applied to the input is outside of the acceptable range of the inverter. 3) AC voltage and frequency at the AC input terminals are within acceptable range, but the inverter is not yet synchronized to the AC source. 4) A split phase unit may be connected to two legs of three-phase service. 	<ol style="list-style-type: none"> 1) The inverter is operating normally. 2) Adjust the AC acceptance settings (see “AC Input Settings” on page 3–22) or possibly service an unstable generator. 3) For 120 V/240 V units, measure voltage in four places on the input of the inverter: L1-N, L2-N, L1-L2, and N-Ground. These readings must be approximately 120, 120, 240, and 0 respectively. Make sure these readings are within the tolerance for AC acceptance and are stable for at least 60 seconds. See Table 3-5 on page 3–22. 4) Connect the split phase unit to split phase power; use an isolation transformer to create a separately derived neutral; or acquire three or six units, convert them to single phase, and then connect a three-phase system to the three-phase source.

Problem	Possible Cause	Solution
Charger amperage drops off before full charging has finished (no Fault LED).	AC frequency at the AC input terminal may be out-of-tolerance (too high or low) or the AC voltage may be outside the <code>Hi AC Volt</code> or <code>Lo AC Volt</code> settings. AC input voltage approaching the low disconnect level.	Check the settings on the <code>AC Settings</code> menu. Check for the correct AC voltage or frequency at the AC input terminal. If the AC source is a generator, adjust the AC voltage or frequency accordingly. Increase the difference between the <code>Hi AC Volt (AC1)</code> and <code>Lo AC Volt (AC1)</code> settings to allow synchronization.
	The charge settings are incorrectly configured for your battery type.	Select the correct battery type or configure a <code>Custom</code> battery type.
	Ambient temperature may be high, causing unit to overheat and ramp down the charging.	Cool the unit down or check for anything preventing air flow around the unit.
	Battery bank has one or more bad cells or inadequate wiring.	Check tightness of battery connections and interconnections. Replace battery.
	Battery Management System on Lithium Ion battery has interrupted charging.	Consult with battery manufacturer for battery compatibility.
Charger stops before full charging (or equalization) has finished. Fault LED flashes and AC output drops momentarily.	Cold temperature around batteries with battery temperature sensor (BTS) installed may be causing unit to reach <code>High Batt Cut Out</code> setting.	Disconnect BTS during charging or increase <code>High Batt Cut Out</code> setting.

Problem	Possible Cause	Solution
Charger output is low.	Loose or corroded battery connections.	Check and clean all connections.
	Loose AC input connections.	Check and tighten AC wiring connections.
	Worn out batteries.	Replace batteries.
	Battery cables too small or too long.	Refer to cable and battery recommendations in the <i>Conext XW+ Installation Guide</i> .
Batteries being charged above the bulk/float settings.	If a BTS (Battery Temperature Sensor) is installed, it may be in a cold area or have fallen off the batteries.	Inspect the BTS. Reduce Batt Temp Comp on Custom Battery Settings menu.
	Another DC charging source may be on the batteries.	
	Battery bank size too small relative to charger output.	Increase battery bank size or decrease max charge rate. Note: To bring batteries that are cold to the correct state of charge may require charging at a higher voltage. This may be normal BTS operation. Unplug the BTS and determine if your voltage returns to the bulk/float voltage.

Faults and Warnings

When a fault or warning message appears on the Conext SCP, you can acknowledge the message to clear the screen. To acknowledge a fault or warning message, press the Enter button. This action does not clear the fault or warning condition - consult Table 4-3 and Table 4-6 for suggested actions after you have acknowledged the message. Refer to the *Conext System Control Panel Owner's Guide* for more information on faults and warnings.

Warning Messages

Warning messages appear on the Conext SCP to alert you to an impending system change. You can view the 20 most recent warning messages using the Conext SCP's warning log, accessible from the `View Device Info` menu. Each warning has a time stamp to let you know the date and time that the warning appeared.

If several warning messages occur before you can acknowledge or clear them, they are displayed together on a warning list. This list contains messages from every Xanbus-enabled device, not just the Conext XW+. You can select a message and view its details from warning list.

To view a message from a warning list:

1. On the list, use the up arrow or down arrow button to highlight the message you want to view.
2. Press Enter. The complete message appears.

After viewing the message, you can return to the warning list by pressing Exit or continue to the menu for the device that caused the warning by pressing Enter. Each time you return to the list after viewing a complete message, the viewed message is removed from the list.

If you have left the warning list, you can view warnings at any time from the `System Settings` menu.

To view a warning list:

1. On the `Select Device` menu, highlight `System` and press Enter.
2. On the `System Settings` menu, highlight `View Warning List`.
3. Press Enter.

Warning Types

There are two types of warnings: automatic and manual. When the Conext XW+ detects a warning condition, it displays a warning message on the Conext SCP. Table 4-2 describes how their behavior differs and how you can respond to them when they appear on the Conext SCP.

Table 4-2 Warning Types and Behavior

Warning type	Behavior
Automatic warning	Clear automatically if the warning condition that generated the message goes away. You can also acknowledge automatic warnings without waiting for them to clear automatically.

Table 4-2 Warning Types and Behavior

Warning type	Behavior
Manual warning	<p>Require you to acknowledge them before you can proceed with configuring or operating the Conext XW+. Manual warnings are usually in the form of a Yes/No question that you may acknowledge by pressing the Enter button on the Conext SCP for Yes and the Exit button for No.</p> <p>Refer to the <i>Conext System Control Panel Owner's Guide</i> for more information.</p>

Table 4-3 provides descriptions of the warning messages and solutions.

Table 4-3 Warning Messages

Warning Number	Conext System Control Panel Message	Warning Type	Cause	Solution
W44	Battery Over Temperature	Automatic	Battery Over Temperature Warning. Battery temperature is over 50 °C (122 °F).	Check battery voltage and battery cable connections. Stop charging, if necessary. Check for excessive ambient temperature and adequate ventilation in the battery compartment
W45	Capacitor over temperature	Automatic	DC Bulk Capacitor over temperature (100 °C/ 212 °F)	Ensure adequate ventilation around the Conext XW+. Reduce the AC loads.
W48	DC Under Voltage	Automatic	Battery voltage is below 47 V.	Check for the correct battery voltage at the inverter's DC input terminals. Check for an external DC load on the batteries. Check condition of batteries and recharge if possible or reduce your Low Batt Cut Out setting.
W49	DC Over Voltage	Automatic	Battery voltage is above 68 V.	<p>Turn off or check additional charging sources to batteries. Check battery cables.</p> <p>Check for the correct battery voltage at the inverter's DC input terminals. Ensure your DC source is regulated below your high battery cut out or increase your High Batt Cut Out setting.</p>

Table 4-3 Warning Messages

Warning Number	Conext System Control Panel Message	Warning Type	Cause	Solution
W57	FET1 Over Temperature	Automatic	<p>Internal temperature is over 85 °C (185 °F).</p> <p>AC input voltage may be too high while charging.</p> <p>Operating too large of a load for too long while inverting.</p> <p>Ambient temperature may be high.</p> <p>Inverter cooling fan may have failed.</p> <p>Inverter airflow intake may be blocked.</p> <p>Charging setting is too high based on ambient temperature around inverter.</p>	<p>Check for high input AC voltage.</p> <p>Remove excessive loads.</p> <p>Let inverter cool down and try restarting.</p> <p>Hold a piece of paper to inverter vents to check the fan. If the fan has failed, have the inverter serviced.</p> <p>Increase clearance around the inverter or unclog the fan air intake.</p> <p>Lower the Max Charge Rate setting.</p>
W58	FET2 Over Temperature	Automatic	See W57.	See W57.
W63	AC Overload	Automatic	Excessive load on the AC output.	Check for loads above the inverter's capacity. Turn off some loads if necessary.
W64	AC Overload	Automatic	See W63.	See W63.
W68	Transformer Over Temperature	Automatic	See W57.	See W57.

Table 4-3 Warning Messages

Warning Number	Conext System Control Panel Message	Warning Type	Cause	Solution
W70	Synchronization Warning	Manual, AC input is not qualified	<p>1. An AC input voltage phase is lost or out of the AC range in the three-phase.</p> <p>2. AC input voltage phases are not synchronized with Conext 3-phase system.</p>	<p>1. Check the AC voltage presence of each phase at the AC input terminals for each Conext XW+.</p> <p>2. Inspect the three-phase wiring to have the correct phase sequence: XW-Phase-A, XW-Phase-B, XW-Phase-C with the same AC input sequence to each unit.</p>
W94	Remote Power Off	Automatic	The unit has been turned off with a Remote Power Off switch.	No action required. The unit stops inverting or charging immediately, and shuts down after five seconds. If the unit is configured as a master, it signals other network devices to also shut down.
W95	Equalize Abort	Manual	Equalization terminated abnormally because of interrupted AC input.	Wait until AC input (utility grid) returns to in-tolerance condition.
W96	Cannot Equalize	Manual	<p>The selected battery type should not be equalized.</p> <p>AC input is not qualified or the charge setting is not adequate.</p>	<p>Change battery type if your batteries should be equalized. Gel or AGM batteries should not be equalized.</p> <p>Check for presence of AC. Make sure Charge and Equalize are enabled. Verify the Conext AGS trigger is set to Stop Float. If Stop V is enabled, then the voltage level should be above the Eqlz Voltage level.</p>
W97	Battery temperature sensor failure	Automatic	Battery Temperature Sensor Shorted	Replace battery temperature sensor.
W500	Lost network connection	Automatic	Lost network connection	Check network cables.

Table 4-3 Warning Messages

Warning Number	Conext System Control Panel Message	Warning Type	Cause	Solution
W501	Inv/Chg is trying to fix a memory problem	Manual	Non-volatile memory warning	Normal operation may return or may go to fault. Turn Conext XW+ off and on to resume normal operation.

Fault Messages

When the Conexx XW+ detects a fault condition, the fault is displayed on the Conexx System Control Panel. The Conexx XW+ also illuminates the Fault light on the Conexx System Control Panel and inverter information panel. A fault affects the operation of the unit. See “Fault Types” on page 4–17 for an explanation of the different fault types.

You can view the 20 most recent fault messages on the Conexx System Control Panel by selecting Fault Log from the Device Info menu in the Conexx XW+ Setup Menu.

If several faults occur before you can acknowledge or clear them, they are displayed together on a fault list. This list contains messages from every Xanbus-enabled device, not just the Conexx XW+. You can select a message and view its details from the fault list.

To view a message from a fault list:

1. On the list, use the up arrow or down arrow button to highlight the message you want to view.
2. Press Enter. The complete message appears.

After viewing the message, you can return to the fault list by pressing Exit or continue to the menu for the device that caused the fault by pressing Enter. Each time you return to the list after viewing a complete message, the viewed message is removed from the list.

If you have left the fault list, you can view faults at any time from the System Settings menu.

To view a fault list:

1. On the Select Device menu, highlight System Settings and press Enter.
2. On the System Settings menu, highlight View Fault List and press Enter.

Fault Types

There are three types of fault messages: automatic faults, manual faults, and escalating automatic faults. Table 4-4 describes how they differ in their behavior and how you can respond to them when they appear on the Conext System Control Panel.

Table 4-4 Fault Types and Behaviors

Fault type	Behavior
Automatic faults	Clear automatically if the fault condition that generated the message goes away. You can also acknowledge automatic faults without waiting for them to clear automatically. It is not possible to clear a fault if the cause of the fault is still present.
Manual faults	Require you to clear them by: <ul style="list-style-type: none"> selecting Clear Faults on the Main Conext XW+ menu or on the menu for the Xanbus-enabled device that generated the fault (if the fault condition still exists, the fault message reappears). correcting the condition that caused the fault.
Escalating automatic faults	Clear automatically if the fault condition goes away, just like an automatic fault. However, if an escalating automatic fault occurs several times within a defined time period, the escalating automatic fault becomes a manual fault, requiring user intervention. For example, if an AC Overload fault occurs three times in five minutes, it will no longer clear itself and become a manual fault. Then you must identify the problem, correct the fault condition, and clear the fault.

Inverter Operation After Faults

Conext XW+ operation changes when a fault occurs. How the operation changes depends on the operating state of the unit when the fault occurred—inverting, charging, grid or generator support, AC bypass, and so on—and on which fault has occurred.

Table 4-5 Inverter Operation After Faults

Faults	State when Faults Occur	Action After Faults
F1, F2: AC Output	Inverting	Unit stops inverting and waits for nominal AC output voltage level, or a manual clear from user.
F17 to F22: Relay Welded	Inverting	Unit stops inverting and waits for user to clear fault.

Table 4-5 Inverter Operation After Faults

Faults	State when Faults Occur	Action After Faults
F23 to F40: Anti-Islanding	Grid Support (Peak Load Shaving or Selling)	Unit moves to AC bypass and waits for nominal grid conditions to return for a minimum of five minutes.
F41, F42: Aux power supply voltage	Unit has qualified AC input.	Unit shuts down and waits for nominal AC output voltage level, or a manual clear from user.
F44: Battery Over Temp F45: Capacitor Over Temp	Any state.	If inverting, the unit shuts down and waits for the temperature to return to nominal value. If in any of the AC-interactive states (charging, peak load shaving, sell, gen support), the unit goes into AC bypass mode until the temperature returns to the nominal value. If the unit is not in AC bypass, it shuts down until the temperature returns to nominal value. After these faults clear, the unit returns to its previous operating state.
F47 to F49: DC Under Voltage and Over Voltage	Unit is inverting or has qualified AC input and is preparing to charge.	If inverting, the unit shuts down and waits for nominal voltage. If operating with a qualified AC source, the unit charges if charging is enabled, or remains in AC bypass if charging is disabled.
F63 to F65: AC Overload	Inverting or Grid Support	Unit stops inverting and waits to qualify AC. Unit waits for user to manually clear fault.

Table 4-6 provides descriptions of the fault messages and solutions. If you are unable to resolve the problem after referring to this table, contact your dealer or Customer Service.

Table 4-6 Fault Messages

Fault Number	Message	Fault Type	Cause	Solution
F1	AC Output Under Voltage	Escalating Auto Fault. Must occur 3 times in 2 minutes before becoming a manual fault.	AC under voltage shutdown at 108 V. The inverter has shut down to protect the loads.	Clear the fault and attempt restart. If problem persists, call customer service.
F2	AC Output Over Voltage	Escalating Auto Fault. Must occur 3 times in 30 seconds before becoming a manual fault.	AC over voltage shutdown at 135 V. The inverter has shut down to protect the loads.	Clear the fault and attempt restart. If problem persists, call customer service.
F17	Relay(s) Welded	Manual	The AC1 L1 transfer relay is bad or an AC source was wired directly to the AC output.	Disconnect the inverter's output wiring. If error continues, have unit serviced.
F18	Relay(s) Welded	Manual	AC1 L2 transfer relay is bad or an AC source was wired directly to the AC output.	See F17.
F19	Relay(s) Welded	Manual	AC2 L1 transfer relay is bad or an AC source was wired directly to the AC output.	See F17.
F20	Relay(s) Welded	Manual	AC2 L2 transfer relay is bad or an AC source was wired directly to the AC output.	See F17.
F21	Relay(s) Welded	Manual	An unidentified transfer relay is bad or an AC source was wired directly to the AC output.	See F17.
F22	Relay(s) Welded	Manual	An unidentified L1 transfer relay is bad or an AC source was wired directly to the AC output.	See F17.

Table 4-6 Fault Messages

Fault Number	Message	Fault Type	Cause	Solution
F23	AI Over Frequency	Automatic	Over-frequency anti-islanding, caught by the AC qualification limit.	No action required. The inverter stops selling and disconnects from the grid. When the fault clears, a five-minute timer begins counting down. The inverter does not sell again until grid voltage and frequency are within range for five minutes.
F24	AI Under Frequency	Automatic	Under-frequency anti-islanding, caught by the AC qualification limit.	See F23.
F25	AI Over Frequency	Automatic	Over-frequency anti-islanding.	See F23.
F26	AI Under Frequency	Automatic	Under-frequency anti-islanding.	See F23.
F27	AI L1 Over Voltage	Automatic	Over-voltage anti-islanding, fast disconnect, 135 VAC.	See F23.
F28	AI L2 Over Voltage	Automatic	See F27.	See F23.
F29	AI L1L2 Over Voltage	Automatic	Over-voltage anti-islanding fault, caught by the qualification limit, voltage difference between L1 and L2.	See F23.
F30	AI L1L2 Over Voltage	Automatic	Over-voltage anti-islanding, fast disconnect, 270 V.	See F23.
F31	AI L1 Over Voltage	Automatic	Over-voltage anti-islanding, slow disconnect, 130 V.	See F23.
F32	AI L2 Over Voltage	Automatic	Over-voltage anti-islanding, slow disconnect, 130 V.	See F23.
F33	AI L1L2 Over Voltage	Automatic	Over-voltage anti-islanding, slow disconnect, 260 V.	See F23.
F34	AI L1 Under Voltage	Automatic	Under-voltage anti-islanding, slow disconnect, 108 V.	See F23.

Table 4-6 Fault Messages

Fault Number	Message	Fault Type	Cause	Solution
F35	AI L2 Under Voltage	Automatic	See F34.	See F23.
F36	AI L1L2 Under Voltage	Automatic	See F34.	See F23.
F37	AI L1 Under Voltage	Automatic	Under-voltage anti-islanding, fast disconnect, 66 VAC.	See F23.
F38	AI L2 Under Voltage	Automatic	See F37.	See F23.
F39	AI L1L2 Under Voltage	Automatic	Under-voltage anti-islanding fault, caught by the qualification limit, voltage difference between L1 and L2.	See F23.
F40	AI L1L2 Under Voltage	Automatic	Under-voltage anti-islanding, fast disconnect, 132 V.	See F23.
F41	APS Under Voltage	Escalating Auto Fault. Must occur 3 times in 30 seconds before becoming a manual fault.	Auxiliary power supply under-voltage shutdown	Clear the fault and attempt restart. If problem persists, call customer service.
F42	APS Over Voltage	Escalating Auto Fault. Must occur 3 times in 30 seconds before becoming a manual fault.	Auxiliary power supply over-voltage shutdown	Clear the fault and attempt restart. If problem persists, call customer service.

Table 4-6 Fault Messages

Fault Number	Message	Fault Type	Cause	Solution
F44	Battery Over Temperature	Automatic	Battery over- temperature shutdown at 60 °C.	<p>Clear the fault and attempt restart. Stop charging, check battery voltage and temperature. Check for excessive ambient temperature and adequate ventilation in the battery compartment.</p> <p>Note: Shutdown temperature is above 60 °C. Recovery occurs at 50 °C where the XW will be enabled again.</p>
F45	Capacitor Over Temperature	Automatic	Capacitor over-temperature shutdown at 105 °C.	Clear the fault and attempt restart. Ensure adequate ventilation around the Conext XW+. Reduce AC loads.
F46	Controller fault	Manual	Controller fault	Service required.
F47	DC Under Voltage	Automatic	DC under-voltage shutdown (immediate) occurs if DC voltage is below 32 V. The fault clears and the inverter restarts when DC voltage reaches V+4 V.	Check for the correct battery voltage at the inverter's DC input terminals. Check for an external DC load on the batteries. Check condition of batteries and recharge if possible.
F48	DC Under Voltage	Automatic	DC under-voltage shutdown occurs if DC voltage is below voltage level.	See F47.
F49	DC Over Voltage	Escalating Auto Fault.	DC over-voltage shutdown. Occurs if DC voltage is above 70 V. The fault can occur when batteries are disconnected at the DC breaker while the Conext XW+ is operating.	Clear the fault and attempt restart. Ensure battery voltage is below 58 VDC at Conext XW+ terminals. Check all other charging source outputs, battery cables. Ensure that batteries are connected, or that your DC source is regulated below your high battery cut out or increase your Hi Batt Cut Out setting.

Table 4-6 Fault Messages

Fault Number	Message	Fault Type	Cause	Solution
F52	EEPROM Error	Manual		No action. Clear fault and resume operating or configuring the unit. If the fault persists, have the unit serviced.
F53	EEPROM Error	Manual		See F52.
F54	EEPROM Error	Manual		See F52.
F55	EEPROM Error	Manual		See F52.
F56	EEPROM Error	Manual		See F52.
F57	FET1 Over Temperature Shutdown	Automatic	<p>Internal temperature is over 105 °C.</p> <p>AC input voltage may be too high while charging.</p> <p>Operating too large of a load for too long while inverting.</p> <p>Ambient temperature may be high.</p> <p>Inverter cooling fan may have failed.</p> <p>Inverter airflow intake may be blocked.</p> <p>Charging setting is too high based on ambient temperature around inverter.</p>	<p>Fault clears when temperature drops to 75 °C.</p> <p>Check for high input AC voltage.</p> <p>Remove excessive loads.</p> <p>Let inverter cool down and try restarting.</p> <p>Hold a piece of paper to inverter vents to check the fan. If the fan has failed, have the inverter serviced.</p> <p>Increase clearance around the inverter or unclog the fan air intake.</p> <p>Lower the Max Charge Rate setting.</p>

Table 4-6 Fault Messages

Fault Number	Message	Fault Type	Cause	Solution
F58	FET2 Over Temperature Shutdown	Automatic	See F57.	See F57.
F59	GOCFG process failed	Manual	Auto-configuration process failed.	Retry the “Copy From” procedure, or configure the unit manually.
F63	AC Overload	Escalating Auto Fault. Must occur 3 times in 5 minutes before becoming a manual fault.	Excessive load on the AC output.	Check for loads above the inverter’s capacity. Turn off some loads if necessary. To clear the fault: Turn off the unit by holding the power button for 5 sec. Disconnect the Conext XW+ from the battery bank for 20 sec.
F64	AC Overload L1	Escalating Auto Fault. Must occur 3 times in 5 minutes before becoming a manual fault.	Excessive load on the AC output.	See F63
F65	AC Overload L2	Escalating Auto Fault. Must occur 3 times in 5 minutes before becoming a manual fault.	Excessive load on the AC output.	See F63.
F66	System Configuration Fault	Automatic	Multi-Unit Configuration settings are incorrect.	Ensure only one unit is configured as the master. Ensure each unit has a unique Device Number, and that connections have been configured correctly. Ensure there is only one primary charger. See “Connections Menu” on page 3–43.
F67	Watchdog Error	Manual		Service required.

Table 4-6 Fault Messages

Fault Number	Message	Fault Type	Cause	Solution
F68	Transformer Over Temperature	Automatic	The transformer temperature is over 140 °C.	The fault clears when the transformer temperature falls to 125 °C. Ensure adequate ventilation around the Conext XW+. Reduce AC loads.
F69	External Sync Failed	Manual		Check connections and cable on external AC sync port. In a single-inverter system, nothing must be plugged into the AC sync port. Clear fault and try again. If these steps fail, the unit requires service.
F70	Check Phase Configuration	Automatic	The unit cannot qualify its AC input because of an incorrect three-phase installation. For example, phase B and phase C are reversed, either through miswiring or incorrect Connections and Inverter Mode settings.	<ol style="list-style-type: none"> 1. Make sure that only one unit on each phase is configured as the master. Make sure each unit has a unique Device Number and that Inverter Mode and Connections have been configured correctly. See “Three-Phase Configuration” on page 3-41 and “Connections Menu” on page 3-43. 2. Disconnect all units and make sure that the three-phase wiring is correct.
F71	Battery Discharge Over Current	Manual	There is an excessive load on the Li-Ion battery. (The fault applies only to Li-Ion batteries.)	Change the default threshold of the max battery discharge current limit or reduce the load.
F72	External AC Contactor Malfunction	Manual	The External AC Contactor was not set as expected.	Check why the AC contactor has failed. Check for fusing of coil, wiring and connections. Verify that the AC contactor has power.
F500	Silicon Serial ID Failure	Manual	Silicon Serial ID Failure	Service required.

Faults and Warnings

Under certain conditions, the Xantrex XW AGS generates a fault or warning message. These messages appear on the Xantrex XW System Control Panel.

Acknowledging messages

When a fault or warning message appears, it will remain on the screen until it is acknowledged by pressing Enter on the Xantrex XW System Control Panel. This action removes the message from the screen, but does not clear the condition that caused the fault or warning.

Consult Table 5-25 and Table 5-26 for recommendations for resolving the fault after it has been acknowledged.

Warnings that are in the form of a Yes/No question can be acknowledged by pressing Enter for Yes and Exit for No.

Self-clearing warnings

If unacknowledged, some warnings may clear themselves if the condition that generated the message goes away. For example, if the Xantrex XW AGS fails to start the generator, warning message W202 appears. However, if the generator starts on the next start try, the message goes away.

Clearing faults

To clear active Xantrex XW AGS faults, highlight Clear Faults on the Xantrex XW AGS menu and press Enter.

Multiple faults and warnings

If several fault or warning messages occur before they can be acknowledged or cleared, they are displayed together on a fault list or a warning list. These lists contain messages from every Xantrex Xanbus-enabled device, not just the Xantrex XW AGS. Message details can be selected and viewed from the fault list or warning list.

To view a message from a fault list or warning list:

1. On the list, use the arrow buttons to highlight the message to be viewed.
2. Press Enter.

The complete message appears.

To return to the fault list or warning list, press Exit.

To continue to the menu for the device that caused the fault or warning condition by pressing Exit.

Each time you return to the list after viewing a complete message, the viewed message is removed from the list.

If you have left the fault list or warning list, you can view them at any time from the System Settings menu.

To view a fault list or warning list:

1. On the Select Device menu, highlight System and press Enter.
2. On the System Settings menu, highlight View Fault List or View Warning List.
3. Press Enter.

Warning Messages

Table 5-25 provides details and suggests action for Xantrex XW AGS warnings.

Table 5-25 Xantrex XW AGS Warning Messages

Warning Number	Message	Self-clearing?	Cause	Action
W200	Generator was stopped manually.	No	Generator was stopped by an external Manual Off switch.	Acknowledge the warning. To resume automatic starts and stops, change the Xantrex XW AGS mode to [Automatic].
W201	Generator was started manually.	No	Generator was started by an external Manual On switch	Acknowledge the warning. To resume automatic starts and stops, change the Xantrex XW AGS mode to [Automatic].
W202	Unable to start generator. Xantrex XW AGS will try again.	Yes	The Xantrex XW AGS tried, but could not start the generator.	No action required. The Xantrex XW AGS will try to start the generator again until it reaches the maximum number of start tries.

Table 5-25 Xantrex XW AGS Warning Messages(Continued)

Warning Number	Message	Self-clearing?	Cause	Action
W203	Manual Off: Max generator run time reached. Reset GenMode.	No	The generator has run for its maximum allowable time. The Xantrex XW AGS has stopped the generator and changed the GenMode to [ManualOff].	Acknowledge the warning. Return the Xantrex XW AGS to the desired GenMode [Automatic or ManualOn]. Ensure generator has fuel and is supplying the required power for battery charging and loads.
W205	Generator started by its switch. Use its switch to stop.	Yes	The generator was started, but not by the Xantrex XW AGS.	Check your generator. Stop it using the switch or control panel on the generator.
W206	Mismatched triggers. Enable stop trigger or disable start trigger.	No	You have set a start trigger, but not a corresponding stop trigger.	Acknowledge warning and set a stop trigger.
W207	Mismatched triggers. Enable start trigger or disable stop trigger.	No	You have set a stop trigger, but not a corresponding start trigger.	Acknowledge warning and set a start trigger.
W208	Automatic start and stop triggers not enabled. Configure triggers.	No	You are attempting to enter Automatic Mode without setting triggers.	Acknowledge warning and set start and stop triggers.

Table 5-25 Xantrex XW AGS Warning Messages(Continued)

Warning Number	Message	Self-clearing?	Cause	Action
W209	Gen external stop. Start gen via its control panel.	Yes	The generator has stopped, but not by the Xantrex XW AGS. The generator may have run out of gas, or may have been shut off by a switch on the generator.	Check the generator's fuel level and mechanical condition, then start the generator manually (using the switch or control panel on the generator) to clear the warning.
W250	The selected value failed to change. Try again.	No	You have tried to change the Gen Type without putting the system into Standby first.	Put the system into Standby, change the Gen Type, then return the system to Operating mode.
			You have tried to set the "Exercise Dur" for longer than "Max Run Time," or "Max Run Time" for less than "Exercise Dur."	Ensure that "Max Run Time" is set for longer than "Exercise Dur."
W500	Network connection lost. Check connections.	Yes	The Xantrex XW AGS has lost communications with the network because of a faulty connection or electronic signal disruption.	Check connection between the Xantrex XW AGS and the network.
W501	Xantrex XW AGS has fixed memory problem and restored default settings.	No	The Xantrex XW AGS encountered an internal memory problem upon startup. To remain operational, the Xantrex XW AGS restored its default settings.	Acknowledge the warning and reset configurable settings if necessary.

Fault Messages

When the Xantrex XW AGS detects a fault condition, it stops the generator. The red Fault light also comes on, and the Xantrex XW System Control Panel displays a fault message.

The Xantrex XW AGS remembers the GenMode that it was in at the time it detected the fault. After you have cleared the fault, the Xantrex XW AGS returns to its last known GenMode.

Table 5-26 Xantrex XW AGS Fault Messages

Fault Number	Message	Self-clearing?	Cause	Action
F200	Exceeded max number of start tries. Check gen, clear fault.	No	The Xantrex XW AGS has tried and failed to start the generator. To prevent draining the start battery, the Xantrex XW AGS will suspend further start attempts.	Check the generator's fuel level and start battery condition. Consult generator manual. Clear fault on System Control Panel screen to allow retry.
F201	Unable to stop gen. Stop gen via its control panel.	No	The Xantrex XW AGS has lost contact with the generator or the generator did not stop after the Xantrex XW AGS sent it a stop signal.	Change the Xantrex XW AGS mode to Manual Off. If this fails to work, stop the generator with the external stop switch. Check generator. Return Xantrex XW AGS to automatic mode to resume automatic starts and stops.
F203	Manual Off: Gen stopped by ext sensor. Reset GenMode.	No	An external sensor connected to the Xantrex XW AGS has stopped the generator and put the Xantrex XW AGS into Manual Off mode.	After the sensor connected to the external shutdown has deactivated, clear the fault and reset the Xantrex XW AGS to the desired mode.

Table 5-26 Xantrex XW AGS Fault Messages

Fault Number	Message	Self-clearing?	Cause	Action
F500	Serial Number Failure, Service Required.	No	The silicon serial ID number has failed and the Xantrex XW AGS has gone into Standby.	Call your dealer or Schneider Electric.
F501	Memory Failure. Service Required.	No	The Xantrex XW AGS has suffered a non-volatile memory failure.	Call your dealer or Schneider Electric.
F505	Internal Failure. Service Required.	No	A controller fault has occurred and the Xantrex XW AGS has gone into Standby.	Clear the fault. If the fault persists, call your dealer or Schneider Electric.

Troubleshooting

Table 4-1 lists possible problems that might arise when using the charge controller.


Table 4-1 Charge controller problems

Problem	Possible Cause	Solution
Battery voltage is exceeding bulk and float settings in cold weather and not reaching settings in hot weather.	The BTS is compensating charging voltages based on battery temperature.	No problem. This is the intended operation.
The charge controller's Error/Warning (red) LED is on or flashing.	An active fault, error, or warning is present on the charge controller.	See "Viewing Active Faults, Errors, and Warnings" on page 3-4 to determine which alarm is active on the charge controller. The tables in this section provide detailed information on why various alarms could be occurring on the charge controller.
Battery equalization was enabled but did not occur.	The charge controller must complete a bulk/absorption cycle before it can initiate an equalization cycle.	See "Equalizing Batteries" on page 3-12 for information on equalization charging. See "Viewing Status Information on the Charge Controller" on page 3-2 for information on determining the status of the equalization cycle.
BTS information does not show up on the charge controller's Meters screen on the SCP.	The BTS reading is only shown on the Meters screen if the BTS is physically connected to the device you are viewing on the SCP. All devices share BTS information, but they only report the information to the SCP if they have the BTS plugged into their BTS port.	Navigate to the Meters screen on the SCP for the device that has the BTS connected to it.

Table 4-1 Charge controller problems

Problem	Possible Cause	Solution
Thermal derating is indicated on the SCP.	<p>A. The charge controller is operating in a high ambient temperature environment at high power levels.</p> <p>B. The fans are not working properly.</p>	<p>A. The charge controller is specified to operate at full output power up to 45 °C. Derating occurs at temperatures above this level.</p> <p>B. Make sure that you have not blocked the ventilation holes at the top and bottom of the charge controller and that you have provided sufficient clearance for proper ventilation of the charge controller. Check the active fault list and the historical fault log on the SCP to see if the charge controller has registered any faults or errors related to fan operation.</p>
The charge controller's Error/ Warning (red) LED is on, and the SCP indicates an input over voltage error (F9) for the charge controller.	The PV panels are producing voltage levels that are outside the operating specifications for the charge controller. This is likely due to the panels experiencing extreme cold temperatures for the region.	This condition will correct itself when the panels warm up and the voltage decreases to within operating specifications. If it occurs regularly, then the installation likely has too many PV panels in series and might need reconfiguration to lower the voltage to the charge controller. See "Electrical Specifications" on page A-2 for details on the charge controller's operating range.
The charge controller's On/ Charging (green) LED is flashing.	The charge controller is outputting charge current.	No problem. This is intended operation. See "Viewing Status Information on the Charge Controller" on page 3-2 for LED status information.
The SCP turns off completely after sunset.	The SCP is powered by the output of the charge controller, and it has been configured to turn off the Xanbus power supply during the night.	See "Reducing Tare Loss" on page 2-16 for more information on disabling certain power supplies at night to reduce night time tare losses.
The charge controller's Error/ Warning (red) LED is on, and the SCP is blank.	The network power supply fault ("F82" on page 3-7) has been triggered and has disrupted power to the SCP.	Remove power to the charge controller by opening the PV and battery disconnects long enough for the red and green LEDs to turn off. Restore power by closing the PV and battery disconnects, and then confirm that the SCP resumes operation. Contact customer service if the problem is not resolved.

PV Charge Control Troubleshooting

 **DANGER**

HAZARD OF ELECTRIC SHOCK, BURNS, FIRE, AND EXPLOSION

This chapter includes hazardous tasks to be performed only by qualified personnel equipped with appropriate personal protective equipment and following safe electrical work practices. Review the “Important Safety Instructions” beginning on page vii before proceeding.

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

Table 3-1 lists possible problems that may arise with the unit.

Table 3-1 PV Charge Control Problems

Problem	Possible Cause	Solution
Uneven output current between multiple units.	A. Solar arrays are supplying different amounts of current to each unit. B. Charging set points are not all set the same. C. Excess voltage drop in wiring causing controllers to measure the battery voltage differently and regulate accordingly. D. Chargers are in constant voltage (absorption) mode and therefore are limiting their output current to maintain the present battery voltage. In this situation, some units will produce more output current than others.	A. Check array output, but consider that this could be a normal operating condition if the arrays are located in different locations and/or point in different directions. B. Set controllers to the same settings. C. Check wiring. Upgrading or shortening the wire run may be required. D. No need for intervention as this is a normal operating condition.
The Xantrex XW SCP LCD shows a ground fault and the unit has stopped operating.	A ground fault has caused the ground fault protection fuse to blow, or a normally ungrounded array contains a ground fault.	See “Replacing the Ground Fault Protection Fuse” on page 3–4 or “Ground Faults in a Normally Ungrounded Array” on page 3–5.
The unit’s Error/Warning (red) LED is on or flashing.	An active fault, error, or warning is present on the unit.	See “Viewing Active Faults, Errors, and Warnings” in the Xantrex XW MPPT 80 600 Operation Guide to determine which alarm is active on the unit. The tables in this section provide detailed information on why various alarms could be occurring on the unit.

Table 3-1 PV Charge Control Problems

Problem	Possible Cause	Solution
The unit's Error/Warning (red) LED is on, and the Xantrex XW SCP indicates a ground fault (F56) for the unit.	A ground fault has caused the ground fault protection fuse to blow, or a normally ungrounded array contains a ground fault.	See "Replacing the Ground Fault Protection Fuse" on page 3–4 or "Ground Faults in a Normally Ungrounded Array" on page 3–5.
The unit's Error/Warning (red) LED is on, and the Xantrex XW SCP indicates an output under voltage error (F11) for the unit.	A. The default configuration for the unit is a 48 V battery bank, and you have installed the unit on a 24 V battery bank. B. The batteries you have installed are dead or undercharged.	A. Use the Xantrex XW SCP to configure the unit for 24 V operation. See "Configuring Battery Characteristics and Battery Charging" in the Xantrex XW MPPT 80 600 Operation Guide for more information. B. Check the battery voltage to see if the batteries are within operating specifications. If necessary, replace them with new batteries, or use a device capable of performing dead battery charging.
The unit does not show up on the Xantrex XW SCP or it drops off the network periodically.	A. Network terminators have not been installed at both ends of the Xantrex Xanbus network. B. The total network length exceeds the maximum length specification.	A. Install a terminator at each far end of the network. See "Network Components" on page 2–17 for more information. B. See "Network Layout" on page 2–18 for more information.
The unit does not produce any power.	A. No PV input voltage. B. PV input voltage is not within operating range.	A. Change the PV disconnect switch from the off position to the on position. B. Make sure that the PV panels are configured to provide voltages within the unit's operating voltage window.
All of the unit's LEDs are off and the unit does not show up on the Xantrex XW SCP.	A. No battery connection to the unit. B. The unit is miswired. C. Failed unit.	A. Change the battery disconnect from the off position to the on position. B. Check all connections and correct the wiring if voltage is not present on the unit's battery terminals. C. If you have verified there is at least 20 V present on the unit's battery terminals yet the On/Charging (green) LED remains off, contact customer service.

Table 3-1 PV Charge Control Problems

Problem	Possible Cause	Solution
The unit's On/Charging (green) LED is flashing.	The unit is outputting charge current.	No problem. This is intended operation. See "Viewing Status Information on the Xantrex XW MPPT 80 600" in the Xantrex XW MPPT 80 600 Operation Guide for LED status information.

Replacing the Ground Fault Protection Fuse

DANGER

HAZARD OF ELECTRIC SHOCK

If a ground fault is indicated, normally grounded PV conductors could be ungrounded and energized. Before working on any portion of the array or wiring, make sure that portion of the array is de-energized by blanketing, use of disconnects, or other safe working procedures and by testing for voltage before beginning work.

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

The ground fault protection fuse blows when a significant leakage current flows between the PV array and earth ground, or when the system has been installed with deficient wiring. Before replacing the fuse, it is important to have qualified service personnel, such as a certified electrician or technician, determine the cause of the ground fault and effect repair.

To replace the ground fault protection fuse:

1. Make sure the PV and battery disconnect switches are open and the unit is de-energized.
2. Remove the wiring compartment cover, as described on page 2–5.
The ground fault protection fuse is located behind the wiring terminals.
3. Remove the blown fuse and replace it with a new AC/DC midget cartridge, DC-rated 600 VDC, 1 A (Littelfuse KLKD 1 or equivalent). Be careful not to damage the fuse clips, circuit board, and surrounding components.
4. Replace the wiring compartment cover.
5. Clear the fault and reset the system by removing and then reapplying both PV and battery power.

Ground Faults in a Normally Ungrounded Array

DANGER

HAZARD OF ELECTRIC SHOCK

If a ground fault is indicated, normally grounded PV conductors could be ungrounded and energized. Before working on any portion of the array or wiring, make sure that portion of the array is de-energized by blanketing, use of disconnects, or other safe working procedures and by testing for voltage before beginning work.

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

On a normally ungrounded (floating) array, the ground fault protection system indicates a fault when a short circuit or lower than normal resistance exists between the array and ground. Before resetting the fault and attempting to restart the system, it is important to have qualified service personnel, such as a certified electrician or technician, determine the cause of the ground fault and effect repair.

To mitigate a ground fault in a normally ungrounded array:

1. Make sure the PV and battery disconnect switches are open and the unit is de-energized.
2. Search or troubleshoot for a ground fault on the PV array (for example, a broken PV panel or pinched PV wire).
3. Clear the fault and reset the system by removing and then reapplying both PV and battery power.

Faults

Table 3-4 lists all possible faults. Faults are conditions that indicate that the charge controller might have incurred permanent damage or that user intervention is required before the charge controller will operate again. If one of these faults occur, the charge controller might also need to be serviced before it can be fully operational again.

Table 3-4 Fault messages

Display Text (Description)	Fault ID	Definition
AuxPSFlt (Auxiliary power supply fault)	F54	More than two auxiliary power supply errors (F26) have occurred within one minute. Damage to the charge controller is possible, so the fault will not clear until an operator clears it manually using the SCP.
GroundFlt1 (Ground fault, type 1)	F56	A PV ground fault has been detected. The ground fault message clears after system power is removed, the ground fault is corrected, the GFP fuse is replaced by qualified personnel (negative or positive grounded systems only), and system power is restored. See the Xantrex XW MPPT 80 600 Solar Charge Controller Installation Guide for more information.
GroundFlt2 (Ground fault, type 2)	F83	A problem with the hardware circuitry used to detect ground faults exists. Contact customer service for assistance.
InputOVFlt (Input over voltage fault)	F74	Input voltage has exceeded 600 VDC. Damage to the charge controller is possible, so the fault will not clear until an operator clears it manually using the SCP.
FanOVFlt (Fan over voltage fault)	F75	Fan voltage has risen above 13.8 V. The fan will cease operating, but the charge controller will continue operating though it will probably experience power derating. The fault will not clear until an operator clears it manually using the SCP.
OutputOCFlt (Output over current fault)	F78	Three fast output (F71) or slow output (F73) over current errors have occurred within 30 seconds. The fault will not clear until an operator clears it manually using the SCP.
FanOCFlt (Fan over current fault)	F79	More than two Fan Errors have occurred within 30 seconds. The fan will cease operating, but the charge controller will continue operating though it will probably experience power derating. The fault will clear itself when the operator toggles power to the charge controller.

Table 3-4 Fault messages

Display Text (Description)	Fault ID	Definition
FanUVFlt (Fan under voltage fault)	F80	Fan voltage has fallen below 3.5 V. The fan will cease operating, but the charge controller will continue operating though it will probably experience power derating. The fault will not clear until an operator clears it manually using the SCP.
FanUCFlt (Fan under current fault)	F81	Fan current has fallen below 0.5 A for 100 milliseconds. The fan will cease operating, but the charge controller will continue operating though it will probably experience power derating. The fault will not clear until an operator clears it manually using the SCP.
NetPSFlt (Network power supply fault)	F82	<ul style="list-style-type: none"> A short circuit or an overload condition has been detected on the Xanbus network power supply. An over voltage event has been detected on the Xanbus network power supply. <p>The network power supply will be turned off, and loss of Xanbus communication is possible. The fault will not clear until an operator clears it manually. The operator might have to power cycle the charge controller if no other devices are present on the Xanbus network to provide network power to run the SCP.</p>

Errors

Table 3-5 lists all possible errors. Errors are situations where the charge controller has stopped itself from operating because of a problem.

Table 3-5 Error messages

Display Text (Description)	Error ID	Definition
CapOTErr (Capacitor over temperature error)	F2	Output capacitor temperature has risen above 100 °C (212 °F) for 5 seconds. The error clears itself when the capacitor temperature falls below 90 °C (194 °F) for 30 seconds. This error should not normally occur. If it is triggered multiple times, the charge controller must be serviced.
BattOTErr (Battery over temperature error)	F4	Battery temperature has risen above 60 °C (140 °F) for 30 seconds. The error clears itself when the battery temperature falls below 55 °C (131 °F) for 30 seconds.
AmbOTErr (Ambient over temperature error)	F5	Ambient temperature inside the charge controller has risen above 80 °C (176 °F) for 5 seconds. The error clears itself when the ambient temperature falls below 65 °C (149 °F) for 30 seconds.

Table 3-5 Error messages

Display Text (Description)	Error ID	Definition
InputOVerErr (Input over voltage error)	F9	Input voltage has exceeded the input over voltage shut off value, which is dependent upon temperature measured on the heatsink (Vin High Threshold in Figure 3-2 on page 3–10). The error clears itself when the input voltage falls below the input over voltage restart value (Vin Restart Threshold in Figure 3-2 on page 3–10).
OutputUVImmErr (Output under voltage immediate error)	F10	Output voltage has fallen below 15.8 VDC. The error clears itself when the voltage rises above 19.0 VDC for 1 second.
OutputUVerErr (Output under voltage error)	F11	24 V System: Output voltage has fallen below 18.0 VDC. The error clears itself when the voltage rises above 19.0 VDC for 1 second. 48 V System: Output voltage has fallen below 36.0 VDC. The error clears itself when the voltage rises above 38.0 VDC for 1 second.
AuxPSErr Auxiliary power supply error	F26	Auxiliary power supply is not within its expected operating range. The error clears itself after 1 second and the auxiliary power supply will attempt to restart.
HsOTErr (Heat sink over temperature error)	F55	Heat sink temperature has risen above 90 °C (194 °F) for 5 seconds. The error clears itself when the heat sink temperature falls below 80 °C (176 °F) for 30 seconds.
SetupErr	F69	Multiple charge controllers connected to the Xanbus network have the same device number. The error will clear when the operator changes the device numbers of the duplicate charge controllers. The device number can be changed in the Multi Unit Config screen of the SCP.
OutputOVerErr (Output over voltage error)	F70	24 V System: Output voltage has risen above 33.0 VDC for 1 second. The error clears itself when the voltage falls below 32.0 VDC for 1 second. 48 V System: Output voltage has risen above 65.0 VDC for 1 second. The error clears itself when the voltage falls below 64.0 VDC for 1 second.
OutpFastOCErr (Fast output over current error)	F71	Output current has risen above 117.5 ADC. The error clears itself after 5 seconds. If the error is triggered three times in a span of 30 seconds, then it must be cleared manually.
OutpSlowOCErr (Slow output over current error)	F73	Output current has risen above 90.0 ADC for 10 milliseconds. The error clears itself after 5 seconds.

Table 3-5 Error messages

Display Text (Description)	Error ID	Definition
FanOCErr (Fan over current error)	F76	Fan current has risen above 1.6 A for 20 milliseconds. The error clears itself when fan current falls below 1.0 A for 1 second.
InputOCErr (Input over current error)	F77	PV current has risen above 25 ADC. The error clears itself after 5 seconds.

Warnings

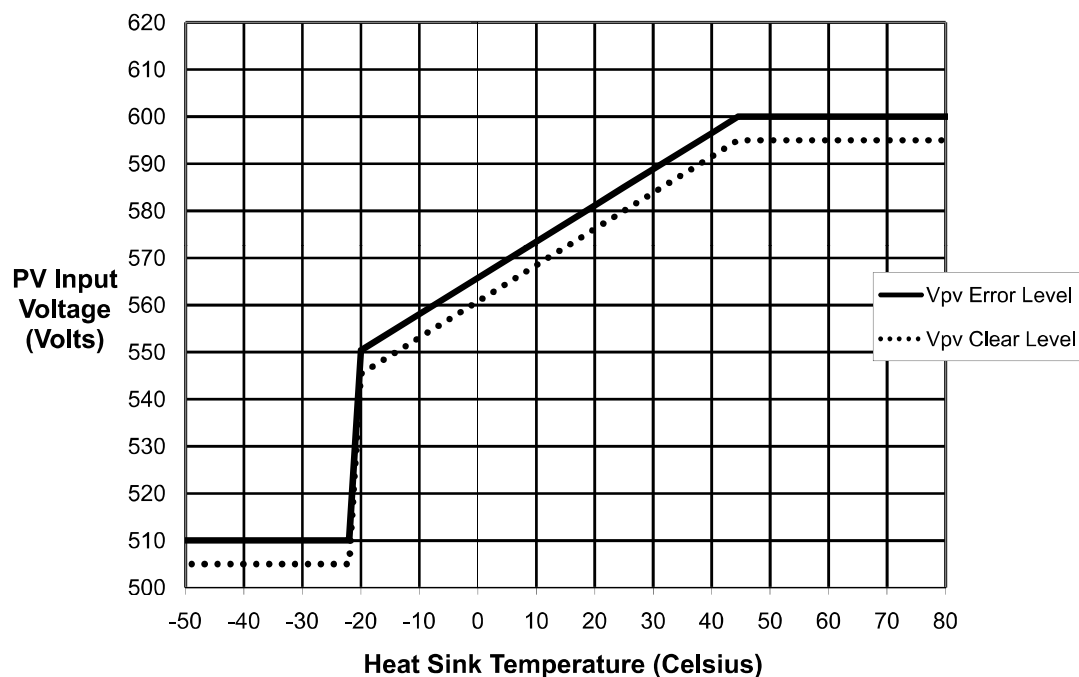
Table 3-6 lists all possible warnings. Warnings indicate that one of the charge controller's operating parameters is approaching the specified limits for the device.

Table 3-6 Warning messages

Display Text (Description)	Warning ID	Definition
BattOTWrn (Battery over temperature warning)	W4	Battery temperature has risen above 50 °C (122 °F) for 10 seconds. The warning clears itself when the battery temperature falls below 45 °C (113 °F) for 10 seconds.
AmbOTWrn (Ambient over temperature warning)	W5	Ambient temperature inside the charge controller has risen above 70 °C (158 °F) for 10 seconds. The warning clears itself when the ambient temperature falls below 65 °C (149 °F) for 10 seconds.
BattUTWrn (Battery under temperature warning)	W9	Battery temperature has fallen below -20 °C (-4 °F) for 10 seconds. The warning clears itself when the battery temperature rises above -10 °C (14 °F) for 10 seconds.
Input over voltage warning (InputOVWrn)	W11	This warning follows the same curve as the Input over voltage error, but it triggers 10 V lower. The warning clears itself when the voltage falls to the input over voltage restart value – 15 V for 1 second. The input over voltage restart value is Vin Restart Threshold in Figure 3-2 on page 3–10.

Table 3-6 Warning messages

Display Text (Description)	Warning ID	Definition
OutputUVWrn (Output under voltage warning)	W12	<p>24 V System: Output voltage has fallen below 20.0 VDC for 10 seconds. The warning clears itself when the voltage rises above 21.0 VDC for 10 seconds.</p> <p>48 V System: Output voltage has fallen below 40.0 VDC for 10 seconds. The warning clears itself when the voltage rises above 42.0 VDC for 10 seconds.</p>
OutputOVWrn (Output over voltage warning)	W34	<p>24 V System: Output voltage has risen above 31.5 VDC for 10 seconds. The warning clears itself when the voltage falls below 30.5 VDC for 10 seconds.</p> <p>48 V System: Output voltage has risen above 63.0 VDC for 10 seconds. The warning clears itself when the voltage falls below 61.0 VDC for 10 seconds.</p>
HsOTWrn (Heat sink over temperature warning)	W35	Heat sink temperature has risen above 85 °C (185 °F) for 10 seconds. The warning clears itself when the heat sink temperature falls below 80 °C (176 °F) for 10 seconds.

**Figure 3-2** Over voltage protection

Viewing Fault, Error, and Warning Logs

The SCP displays fault, error, and warning logs stored on the charge controller.

Table 3-7 History menu items

SCP Device Menu	Item	Description
Setup > View Device Info	View Fault Log	Displays a log of the faults and errors.
Setup > View Device Info	View Warning Log	Displays a log of the warnings.

- To view the fault and error logs, go to Setup > View Device Info > View Fault Log.
- To view the warning logs, go to Setup > View Device Info > View Warning Log.

Press the down arrow to view all the entries in the log. The entries are listed chronologically, with the most recent fault, error, or warning at the top of the list. The fault, error, or warning number, date, and time are displayed. Press Enter to view details for a particular entry, including the name. The twenty most recent entries are stored.

Viewing Harvest Logs

The SCP displays the daily, monthly, and yearly performance logs stored on the charge controller.

NOTICE

To record monthly and yearly logs, the charge controller must be connected to a Xanbus network real-time clock source. If you want monthly and yearly logs to be created and stored, make sure the charge controller is attached to the Xanbus network with one of the following:

- Xantrex XW Hybrid Inverter/Charger
- SCP
- Gateway

Table 3-8 Harvest logs menu items

SCP Device Menu	Item	Description
Setup > Harvest Logs	Daily Logs	Displays a log of the charge controller's amp-hour and kilowatt-hour production for the day as well as the peak power output and time in float for the day.
Setup > Harvest Logs	Monthly Logs	Displays a log of the aggregate total for amp hours and kilowatt hours produced during the month as well as the peak power output and time in float for the month.
Setup > Harvest Logs	Yearly Logs	Displays a log of the aggregate total for amp hours and kilowatt hours produced during the year as well as the peak power output and time in float for the year.

Daily Logs

To view the daily logs, go to Setup > Harvest Logs. From the `Daily Logs` screen, press Enter. Press the down arrow button to scroll through the daily logs, starting with the current date. The charge controller stores up to 62 daily logs. After 62 days, the oldest daily log is overwritten.

Monthly Logs

To view the monthly logs, go to Setup > Harvest Logs. From the `Monthly Logs` screen, press Enter. Press the down arrow button to scroll through the monthly logs, starting with the current month. The charge controller stores up to 24 monthly logs. After 24 months, the oldest monthly log is overwritten.

Yearly Logs

To view the yearly logs, go to Setup > Harvest Logs. From the `Yearly Logs` screen, press Enter. Press the down arrow button to scroll through the yearly logs, starting with the current year. The charge controller stores up to 12 yearly logs. After 12 years, the oldest yearly log is overwritten.

Equalizing Batteries

Equalization charging is the process of deliberately charging a battery or battery bank at a high voltage for a set period of time. Equalize charging remixes the electrolyte, helps to remove sulfate buildup on the battery plates, and balances the charge of individual cells.

Make sure to read all cautions and warnings regarding equalization charging batteries before allowing an equalization charge to occur.