# Conext<sup>™</sup> XW Inverter/Charger

Service Guide





# Context XW Inverter/Charger

Conext XW 6048 (865-1000-01, 865-1035-61) Conext XW 4548 (865-1005, 865-1040-61) Conext XW 4024 (865-1010, 865-1045-61)

Service Guide

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Contact Information https://solar.schneider-electric.com

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As soon as you open your product, record the following information and be sure to keep your proof of purchase.

Serial Number

Product Number

Purchased From \_\_\_\_\_

Purchase Date

# About This Guide

## Purpose

The purpose of this Service Guide is to provide troubleshooting and servicing information for the Conext XW Inverter/Charger.

### Scope

The Guide provides safety guidelines, as well as information about troubleshooting and servicing the Conext SW Inverter/Charger.

### Audience

The Guide is intended for Customer Service personnel and Authorized Service technicians. The information in this manual is intended for qualified personnel. Qualified personnel have training, knowledge, and experience in:

- Installing electrical equipment and PV power systems (up to 1000 V).
- Applying all applicable installation codes.
- Analyzing and reducing the hazards involved in performing electrical work.
- Selecting and using Personal Protective Equipment (PPE).

## Organization

This Guide is organized into the following chapters.

Chapter 1, "Troubleshooting" covers normal troubleshooting guidelines for the Conext SW Inverter/Charger. It lists the warning and fault codes that can appear on the System Control Panel (SCP), their cause and how to repair them.

Chapter 2, "Circuit Board Removal Instructions" covers procedures on how to replace the circuit boards inside the Conext XW Inverter/Charger. It describes the tests to be performed after the repairs are made to make sure the Conext SW Inverter/Charger works properly. It has a list of field replaceable parts and their part numbers so you can order replacements.

## **Conventions Used**

The following conventions are used in this guide.

# 

DANGER indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

## 

WARNING indicates a potentially hazardous situation, which, if not avoided, can result in death or serious injury.

# 

CAUTION indicates a potentially hazardous situation, which, if not avoided, can result in moderate or minor injury.

## NOTICE

NOTICE indicates a potentially hazardous situation, which, if not avoided, can result in equipment damage.

# Abbreviations and Acronyms

AC	Alternating Current	LED	Light Emitting Diode
AGS	Automatic Generator Start	SCP	System Control Panel
BOS	Balance of System	VAC	Volts, Alternating Current
DC	Direct Current	VDC	Volts, Direct Current
PV	Photovoltaic	DSP	Digital Signal Processing
EMI	Electromagnetic Interference	PWM	Pulse Width Modulation
FET	Field Effect Transistor	А	Amperes
BTS	Battery Temperature Sensor	GND	Ground

## **Related Information**

You can find more information about Schneider Electric as well as its products and services at www.schneider-electric.com.

About This Guide

# **Important Safety Instructions**

# READ AND SAVE THESE INSTRUCTIONS -DO NOT DISCARD

# 

## ELECTRICAL SHOCK AND FIRE HAZARD

- Servicing of the inverter/charger must be done by qualified personnel to ensure compliance with all electrical codes and regulations.
- Read all instructions, cautionary markings, and all other appropriate sections of this guide before operating, troubleshooting, and performing maintenance on the Conext Conext XW.
- Exercise extreme caution at all times to prevent accidents.
- Do not cover or obstruct the ventilation openings.
- Do not mount in a zero-clearance compartment. Overheating may occur.
- Charge only lead-acid batteries.
- Do not expose the inverter/charger to rain or spray.
- Disconnect and lockout all the AC and DC sources before servicing. Servicing includes maintenance, cleaning or working on any of the circuits connected to the inverter/charger. See the following note.
- Do not operate the inverter/charger if it has been damaged in any way before, during, and after servicing.
- Do not operate and service the inverter/charger with damaged or substandard wiring. Wiring must be done by qualified personnel to ensure compliance with all applicable installation codes and regulations.

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

**NOTE:** Turning off the inverter mode using the Inv Enable switch on the front panel, disabling the inverter and charger functions using the System Control Panel (SCP), and putting the inverter/charger in the Standby mode will not avoid the possibility of an electrical shock hazard.

## 

## EXPLOSION AND FIRE HAZARD

- Charge only properly rated (such as 24 V or 48 V) lead-acid (GEL, AGM, Flooded, or lead-calcium) rechargeable batteries as other types of batteries may explode.
- Do not work in the vicinity of lead-acid batteries. Batteries generate explosive gases during normal operation.
- Do not install and/or operate in compartments containing flammable materials or in locations that require ignition-protected equipment.

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

## NOTICE

#### DAMAGE TO INTEGRATED CIRCUITS

To reduce the potential for static electricity damage to the integrated circuits (IC) on the boards, make sure you are grounded at all times while working on or handling the circuit boards. Ground yourself by either:

- Using a grounded wrist strap.
- Touching a metal part of the inverter/charger that is not powder coated such as sheet metal parts.

Failure to follow these instructions can result in damage to equipment.

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# Troubleshooting

Chapter 1 contains information and procedures to help you troubleshoot the Conext XW Inverter/Charger.

The following topics are covered:

- Troubleshooting Procedure
- Faults and Warnings
- Visual Inspection

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- Opening the Unit
- Troubleshooting Flowcharts
- DSP Sensing and Control Board Troubleshooting
- AC EMI and Relay Board Troubleshooting
- Networking & Fan Control Board Troubleshooting
- Power Bridge Troubleshooting
- Warning Messages
- Fault Messages

# Troubleshooting Procedure

#### To troubleshoot the unit:

- Start by performing the procedure given in the Troubleshooting chapter of the XW Hybrid Inverter/Charger Operation Guide. Also see "Faults and Warnings" on page 1–2 for information on how to use the codes that appear on the SCP (system control panel) to help in troubleshooting. A list of warning and fault codes and suggested causes and actions are given in "Warning Messages" on page 1–28 and "Fault Messages" on page 1–33.
- 2. If the above procedure does not identify the problem, conduct a visual inspection of the of the unit, it's batteries, connections, circuit breakers, etc. as described in "Visual Inspection" on page 1–6.
- If the visual inspection does not identify the problem, then remove the unit's covers to inspect and troubleshoot the various components as described in "Opening the Unit" on page 1–7 and "Troubleshooting Flowcharts" on page 1–10.

## NOTICE

### DAMAGE TO ICs

To reduce the potential for static electricity damage to the ICs (integrated circuits) on the boards, make sure you are grounded at all times while working on or handling the circuit boards. Ground yourself by either:

- Using a grounded wrist strap.
- Touching a metal part of the unit that is not powder coated such as the sheet metal parts of the unit.

## BATTERY POLARITY REVERSAL

When connecting the battery to the unit, you must make sure the polarity is correct. Reversed DC polarity will damage the DSP (digital signal processor) sensing and control board. This damage is not covered by the warranty.

#### Failure to follow these instructions can result in damage to equipment.

# Faults and Warnings

When a warning or fault message appears on the Conext XW 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, so see "Warning Messages" on page 1–28 and "Fault

Faults and Warnings

Messages" on page 1–33 for suggested actions after you have acknowledged the message. Refer to the *Conext XW System Control Panel Owner's Guide* for more information on faults and warnings.

# Warning Messages

Warning messages appear on the Conext XW SCP to alert you to an impending system change. You can view 20 most recent warning messages using the Conext XW 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 Conext Xanbus-enabled device, not just the Conext XW Series Inverter/ Charger. 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.

# 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 SCP.

Table 1-1 describes how the warning types differ in their behavior and how to respond to them when they appear on the SCP. To know what type of warning it is, see "Warning Messages" on page 1–28.

Warning type	Behavior
Automatic warning	Clears 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 1-1	Warning	Types and	Behavior
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#### Troubleshooting

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

 Table 1-1
 Warning Types and Behavior

#### 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 and press Enter.

## **Fault Messages**

When the Conext XW Series Inverter/Charger detects a fault condition, the fault is displayed on the Conext XW System Control Panel. The Conext XW Series Inverter/Charger also illuminates the Fault light on the Conext XW System Control Panel and inverter information panel. A fault affects the operation of the unit. See "Fault Types" on page 1–5 for an explanation of the different fault types.

You can view the 20 most recent fault messages on the Conext XW System Control Panel by selecting Fault Log from the Device Info menu in the Conext XW Series Inverter/Charger 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 Conext XW Series Inverter/Charger. You can select a message and view its details from the fault list.

#### To view a message from a fault list:

 On the list, use the up arrow or down arrow button to highlight the message you want to view and press Enter to display the complete message.

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 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, manual, and escalating automatic. Table 1-2 describes how fault detection messages differ in their behavior and how you can respond to them when they appear on the SCP. To know what type of fault it is, see "Fault Messages" on page 1–33.

Fault Detection type	Behavior
Automatic	Clears automatically if the fault condition that generated the message goes away. You can also acknowledge automatic fault detections without waiting for them to clear automatically.
Manual	<ul> <li>Requires you to clear them by:</li> <li>pushing the Clear Fault button on the Conext XW or on the device that generated the fault detection (if the fault condition still exists, the fault detection message reappears), and</li> <li>correcting the condition that caused the fault.</li> </ul>
Escalating automatic	Clears automatically if the fault condition goes away, as in an automatic fault detection. However, if an escalating automatic fault detection occurs several times within a defined time period, the escalating automatic fault detection becomes a manual fault detection, and requires user intervention. For example, if three fault detections occur in one minute, it will no longer clear itself but becomes a manual fault detection. Then you must identify the problem, correct the fault condition, and clear the fault detection or reset the device.

 Table 1-2
 Fault Types and Behaviors

# Visual Inspection

## Introduction

As a first step, make sure you have the latest version of the firmware installed. The XW series has firmware tools to help you to troubleshoot and diagnose problems. The unit records the history of system faults and warnings to help you troubleshoot.

To update the firmware, you will need the Conext Combox. See the XW Configuration Guide for instructions. Download firmware from http://download.schneider-electric.com/library/downloads

If the interface panel and fault codes and a visual inspection doesn't give you the information to fix your problem, then you will have to open the unit and troubleshoot the individual boards as described in "Opening the Unit" on page 1–7 and "Troubleshooting Flowcharts" on page 1–10.

#### Visually troubleshooting the XW:

Note: If you having communication problems, the connectors on the networking & fan control board or the communication cables may be corroded (see Figure 1-8 on page 1–22). Inspect both the unit's connectors and the cables for corrosion and if any is present, remove it.

- 1. Check for a warning or fault code message on the SCP and the front panel indicator lights. If a message is displayed, record it immediately.
- 2. Record the conditions at the time when the problem has occurred, at the earliest. The details required are as follows:
  - Firmware revision of the Conext XW.
  - Type of loads the Conext XW was running or attempting to run.
  - Battery condition at the time of fault detection (battery voltage or temperature, for example), if known.
  - Recent sequence of events (for example, charging had just finished, AC generator had stopped but the inverter is not ON).
  - 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 indicated in these guidelines.
- 4. If your inverter front panel or SCP is not displaying a Fault detection light, check the following list to make sure that the present state of the installation allows proper operation of the unit. Read these guidelines carefully.
- □ Is the Conext XW located in a clean, dry, and adequately ventilated area?

Opening the Unit

- 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 Installation Guide for more information.
- □ Is the battery in good condition and are all the 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?
- □ Is the battery temperature sensor and its cable properly connected and undamaged?
- Contact customer service for assistance and describe the details of your system installation and provide the model and serial number of the unit. See the front and/or back of the manual for contact information.

# Opening the Unit

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# ELECTRICAL SHOCK HAZARD

Before removing the unit's covers, power the unit down and disconnect all loads and power sources before proceeding to prevent the covers from touching live parts. Once the covers are removed the power can be turned back on, or a DC power supply attached, for troubleshooting. Remove all sources of power prior to attempting any modifications or repairs to the unit.

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

## **Tools required**

- Phillips #2 screwdriver.
- Digital Multi Meter capable of measuring AC and DC voltages and continuity values.
- A DC power supply with an output of 50 VDC and 1 A is recommended but not required for powering the unit during troubleshooting.

### **Common failures**

90% of all XW faults display visible damage. After opening the covers carry out the following visual inspection to catch the most common malfunctions:

- On the power bridge (see Figure 1-9 on page 1–25), the FETs (field effect transistors) have over current damage as shown by black, soot-like deposits on the power bridge. Replace the board (see "Replacing the AC EMI and Relay Board" on page 2–5).
- When the unit is powered by either AC or DC power, on the DSP sensing and control board both LEDs (light-emitting diodes) D24 and D25 are on (see Figure 1-6 on page 1–14). If one or both LEDs are off, replace the board (see "Replacing the DSP Sensing and Control Board" on page 2–3).
- On the AC EMI and relay board (see Figure 1-7, "AC EMI and relay boards" on page 1–17), if the relays have black, soot-like deposits inside them, replace the board (see "Replacing the AC EMI and Relay Board" on page 2–5). This type of damage is usually caused by an overcurrent event. Make sure you have correctly rated AC and DC circuit breakers connected to the power sources.

#### To remove the front covers:

Note: You do not have to remove the unit from it's mounting position to remove the covers.

- 1. Remove the seven screws holding the two front covers to the unit.
- 2. Remove the four screws holding the interface panel to the unit.
- 3. Remove the two front covers and, if required, the interface panel.

### Opening the Unit



Figure 1-1 Removing the front covers

# **Troubleshooting Flowcharts**

The three troubleshooting charts in this section are meant to guide you through the troubleshooting procedure after you remove the unit's covers.



Figure 1-2 XW Troubleshooting flow chart #1



Figure 1-3 XW Troubleshooting flow chart #2



Figure 1-4 XW Troubleshooting flow chart #3

# XW Inverter/Charger Interior Layout

The arrangement of components inside the XW Inverter/Charger is shown in Figure 1-5 (60 Hz unit shown).



Figure 1-5 XW inverter/charger interior

# DSP Sensing and Control Board Troubleshooting

For instructions on replacing this board, see "Replacing the DSP Sensing and Control Board" on page 2–3.

# DSP Sensing and Control Board Layout

The DSP sensing and control board LEDs are shown in Figure 1-6. For a description of them, see Table 1-3.



Figure 1-6 DSP sensing and control board LEDs

DSP Sensing and Control Board Troubleshooting

Designation	Function		
D1	+15 V Network Power Supply (Xanbus)		
D2	+5 V Network Power Supply (Xanbus)		
D16	+1.9 V DSP Power Supply		
D24	+5 V DSP Power Supply		
D25	+15 V Main Power Supply		
D26	Neutral Relay Control Signal		
D27	AC2 (Gen) Relay Control Signal		
D28	AC1 (Grid) Relay Control Signal		
D45, D46, D48, D50	PWM Control Signals		

 Table 1-3
 DSP sensing and control board LED description

# DSP Sensing and Control Board Troubleshooting Instructions

 Table 1-4
 DSP sensing and control board troubleshooting

Symptom	Procedure		
DC power is present on the unit, but the front display panel is blank.	NOTE: Before turning on DC power, make sure that the battery polarity on the DC input is correct. If it isn't, correct it before turning on the DC power. Failure to do this will damage the DSP sensing and control board. The warranty does not cover this type of damage.		
	<ol> <li>With the power on, on the control panel, press the ON/OFF button for 2 seconds.</li> </ol>		
	<ol> <li>All the LEDs on the DSP sensing and control board should turn on. If they don't, continue with this procedure.</li> </ol>		
	3. Turn off all AC and DC power sources.		
	4. Verify the cable connecting the interface panel to the DSP sensing and control board is properly connected and is in good condition.		
	<ol> <li>Use a multimeter to measure the power bridge's Fuse F1's resistivity (see "Power Bridge Troubleshooting" on page 1–25). If it is open, turn off all power to the unit and replace both the power bridge and the DSP sensing and control board.</li> </ol>		
	6. Turn on DC power.		
	<ol> <li>If the interface panel still does not turn on see if the DSP sensing and control board's LEDs D24, D25, D16, D1 and D2 are on. If any are off, turn off all power to the unit and replace the DSP sensing and control board.</li> </ol>		
	<ol> <li>If LED D25 is off when all the other LEDs on the board are on, there is no firmware loaded onto the control board. Load the firmware.</li> <li>Download firmware from http:// download.schneider-electric.com/library/ downloads. To load the firmware, you will need to use the Conext Combox. See the XW Configuration Guide for instructions.</li> </ol>		

# AC EMI and Relay Board Troubleshooting

For instructions on replacing this board, see "Replacing the AC EMI and Relay Board" on page 2–5.

# AC EMI and Relay Board Layout

Important parts of the AC EMI and relay board for both 50 Hz and 60 Hz units are shown in Figure 1-7.



# 60 Hz Units

# 50 Hz Units

Figure 1-7 AC EMI and relay boards

# AC EMI and Relay Board Troubleshooting

 Table 1-5
 AC EMI and relay board troubleshooting

Symptom		Procedure		
No AC Output on L2, but voltage is present and		On the unit's interface panel, enable inverter mode.		
within limits on AC Output L1.	2.	On the DSP sensing and control board, see if LED D26 is on (see Figure 1-6 on page 1–14). If it isn't on, replace the control board.		
	3.	On the AC EMI and relay board, measure the voltage across terminals X3 and X4. It should be 115 VAC to 120 VAC. If the voltage is less than 50 VAC, then:		
	•	• Verify the transformer wires X3 and X4 are properly connected to the terminal block and that the wire leads are free from contamination. Repair as needed and retest the voltage.		
		• If the voltage is still out of range, disable Inverter mode and turn off the AC and DC input circuit breakers. Measure the continuity between transformer leads X3 and X4. It should be less than 1 Ohm. If it higher, there is a fault inside the transformer and call customer service for a replacement unit.		
		• If the continuity is less than 1 Ohm, replace the AC EMI and relay board.		
	4. If t VA ac VA	If the voltage across X3 and X4 is greater than 50 VAC, but less then 115VAC, measure the voltage across terminals X1 and X2. It should be 230 VAC to 240 VAC.		
		• If it is less than 180 VDC, then verify all four terminals (X1 to X4) are properly connected and torqued. If they are, replace the AC EMI and relay board.		
		• If the voltage is within specifications, verify that the terminals to the AC EMI and relay board are properly connected and torqued (3.2-3.6 Nm).		

AC EMI	and Relay	Board	Troubleshooting
	,		0

Symptom	Procedure	
	5.	If the voltage across X3 and X4 is between 230 VAC to 240 VAC:
		• Verify that the X1 wire is connected to the terminal block's X1. Confirm this for the wires on the terminal block's X2, X3 and X4 connectors.
		<ul> <li>Measure the voltage across AC load terminals L2 to N. If no voltage appears or it is outside specifications (115 VAC to 120 VAC), replace the AC EMI and relay board.</li> </ul>
		<ul> <li>If the terminals are properly connected, replace the AC EMI and relay board.</li> </ul>
The unit shuts down	1.	Turn off all AC and DC power going to the unit.
because of AC output	2.	Turn off the load circuit breaker.
under voltage.	3.	Measure the resistance between the AC1's (Grid) L1 and N terminals. If it measures as open, replace the AC EMI and relay board (likely a blown relay). The normal reading is 1.0 to 1.3 KOhms.
	4.	If the connectivity is within specifications, verify that the ribbon cable connecting AC EMI and relay board to the DSP sensing and control board is properly connected and is in good condition. If it is, replace the AC EMI and relay board.
The unit shuts down	1.	Turn off all AC and DC power going to the unit.
because of AC output over voltage.	2.	Turn off the load circuit breaker.
	3.	Verify that the ribbon cable connecting AC EMI and relay board to the DSP sensing and control board is properly connected and is in good condition. If it is, replace the AC EMI and relay board.

## Troubleshooting

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Symptom	Pro	cedure
There is no AC output voltage in AC pass-thru mode when the unit transfers to AC1 (GRID). There is no charger output.	1.	Turn on all AC and DC power to the unit. Wait for the unit to transfer to AC pass-thru mode.
	2.	On the DSP sensing and control board, see if LED D28 is on (see Figure 1-6 on page 1–14). If it
		is on and the unit does not transfer to AC1 (Grid), turn off all power connected to the unit and replace the AC EMI and relay board.
	3.	If LED D28 is off:
		<ul> <li>Verify that the ribbon cable connecting the DSP sensing and control board to the AC EMI and relay board is properly connected and is in good condition. If after doing this LED D28 turns on, but then turns off, turn off all power connected to the unit and replace the DSP sensing and control board.</li> <li>If LED D28 is still off, turn off all power</li> </ul>
		connected to the unit and replace the DSP sensing and control board.
There is no AC output voltage in AC pass-thru mode when the unit transfers to AC2 (GEN). There is no charger output.	1.	Open the AC1 circuit breaker or set AC2 as the priority and turn on DC power to the unit. Wait for the unit to transfer to AC pass-thru mode.
	2. O D •	On the DSP sensing and control board, if LED D27 (see Figure 1-6 on page 1–14) is:
		• ON: Verify that the ribbon cable connecting the control board to the AC EMI and relay board is properly connected and is in good condition. If it is, turn off all power connected to the unit and replace the AC EMI and relay board.
		• OFF: Turn off all power connected to the unit and replace the DSP sensing and control board.
	3.	If the LED D27 turns off but then later turns back on, turn off all power connected to the unit and replace the DSP sensing and control board.

AC EMI and Relay Board	Troubleshooting
------------------------	-----------------

Symptom	Procedure
There is visible damage to the AC EMI and interface board.	The voltage sensing transformer is protected from high voltages and AC spikes. If you see damage, it may be a manufacturing defect.
	Damage to the AC EMI and interface board can be caused by:
	• High voltages resulting from improper installation (such as connecting the inverter to 2 lines in a 3-line system).
	<ul> <li>The total load attached to the unit draws more than the rated continuous current as given in the specifications section of the <i>XW Hybrid Inverter/Charger Operation Guide</i>. See that AC input and output circuit breakers are installed and do not have a rating greater than 60 A.</li> <li>Install firmware equal to or greater than v1 07.</li> </ul>

# Networking & Fan Control Board Troubleshooting

For instructions on replacing this board, see "Replacing the Networking & Fan Control Board" on page 2–9.

# Networking & Fan Control Board Layout

Important parts of the networking & fan control board are shown in Figure 1-8. For a description of selected LEDs and connectors, see Table 1-6 and Table 1-7.



Figure 1-8 Networking & fan control board LEDs and fan connectors

 Table 1-6
 Networking & fan control board LED description

Designation	Function
D11	+15 V Network Power Supply (Xanbus)
D25	+5 V Network Power Supply (Xanbus)
D37	Fan Power Supply

 Table 1-7
 Networking & fan control board connector description

Designation	Function
JF1	Fan Connector

## Networking & Fan Control Board Troubleshooting Instructions

Table 1-8         Networking & fan control board troubleshooting	
--	--

Symptom	Pro	cedure
The unit turns on, but it does not show up on the System Control Panel (SCP).	1. 2.	Turn off all AC and DC power going to the unit. See if there is corrosion on the ports or the connectors and if there is, remove it. If only one port is used, connect to the second port to see if only one port failed.
	3.	Turn on DC power to the unit.
	4.	Connect an SCP to the DSP sensing and control board's Xanbus JB8 connector. If the device:
		• Does not appear on the SCP, turn off all power connected to the unit and replace the DSP sensing and control board.
		• Appears on the SCP, verify that the ribbon cable connecting the DSP sensing and control board to the networking & fan control board is properly connected and is in good condition. If it is, turn off all power connected to the unit and replace the networking & fan control board.

## Troubleshooting

The fan does not turn on	The fan speed is based on the unit's internal temperature. If the unit is not hot, the fan will be off or running slowly. Perform this fan on/off test to see if the fan works properly. If the fan does not work, replace the fan.		
	1.	Turn off all AC and DC power to the unit.	
	2.	On the control board, unplug the temperature sensor connected to JT1.	
	3.	Apply a short across the JT1 terminals.	
	4.	Unplug the fan cable by unplugging the connector connected to the black/red wire.	
	5.	Turn on DC power to the unit.	
	6.	On the networking & fan control board, if LED D37 is:	
		• ON: Turn off DC power and replace the networking & fan control board.	
		• OFF: Verify that the ribbon cable connecting the DSP sensing and control board to the networking & fan control board is properly connected and is in good condition. If it is, go to the next step.	
	7.	If LED D37 on the networking & fan control board is on, reconnect the fan cable and see if the fan works. If it is not working, replace the fan.	
The unit has a fault F69 when it is in inverter mode.	1.	Turn off all AC and DC power to the unit.	
	2.	Verify that the ribbon cable connecting the DSP sensing and control board to the networking &	
The Aux output does not work.		fan control board is properly connected and is in good condition. If it is, turn off all power connected to the unit and replace the networking	
The Remote Power Off (RPO) does not work.		& fan control board and the DSP sensing and control board.	
# Power Bridge Troubleshooting

For instructions on replacing this board, see "Replacing the Power Bridge" on page 2–6.

# **Power Bridge Layout**

Important parts of the power bridge are shown in Figure 1-9.



Figure 1-9 Power bridge

# Power Bridge Troubleshooting Instructions

Note: Before troubleshooting the power bridge, make sure the unit has successfully completed the power up diagnostic test. This is shown when all of the control panel status LEDs are on and on the DSP sensing and control board, LEDs D24 and D25 are on (See Figure 1-6 on page 1–14).

Generally, if the power bridge has malfunctioned, it leaves visible damage (black marks, open capacitors, etc., or you can smell burned components).

#### Troubleshooting

Symptom	Pro	cedure
No AC output and an AC	1.	Turn off all AC and DC power going to the unit.
under voltage fault	2.	Turn on DC power.
appears when the inverter	3.	Enable the unit's invert mode.
13 011.	4.	On the DSP sensing and control board, see if LEDs D45, D46, D48 and D50 are on when the unit is in invert mode (see Figure 1-6 on page 1– 14). If any LED is off, turn off all power connected to the unit and replace the DSP sensing and control board.
	5.	If all of the LEDs are on, turn off all power connected to the unit and replace the power bridge.
There is a loud hum when	1.	Turn off all AC and DC power going to the unit.
the unit is in invert mode.	2.	Turn on DC power.
The unit may or may not show a fault.	3.	On the DSP sensing and control board, see if LEDs D45, D46, D48 and D50 are on when the
The unit will not sustain large loads.		14). If any LED is off, turn off all power connected to the unit and replace the DSP sensing and control board.
	4.	If all of the LEDs are on, turn off all power connected to the unit and replace the power bridge.

#### Table 1-9 Power bridge troubleshooting

Symptom	Pro	cedure
There is high power	1.	Turn off all AC and DC power going to the unit.
consumption in invert	2.	Disconnect all loads.
mode when there is no	З.	Turn on DC power.
1044.	4.	Enable invert mode.
	5. Me 75\ •	Measure the DC input power. If it is greater than 75W, on the power bridge:
		• Verify that the small electrolytic capacitors (C2, C3, C11, C14, C32, C35, C40, C44) are properly soldered onto the power bridge. If any capacitor has a faulty solder joint, turn off all power connected to the unit and replace the power bridge.
		• If all of the capacitors are properly soldered, call customer service for a replacement XW unit.

essages
Σ
Warning

Table 1-10 provides descriptions of the warning messages and solutions. If you are unable to resolve the problem after referring to this table, contact your dealer or Customer Service.

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	Solution	Check battery voltage and battery cable connections. Stop charging, if necessary. Check for excessive ambient temperature and adequate ventilation in the battery compartment	Ensure adequate ventilation around the Conext XW. Reduce the AC loads.	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.
	Cause	Battery Over Temperature Warning. Battery temperature is over 50 °C (122 °F).	DC Bulk Capacitor over temperature (100 °C/ 212 °F)	Battery voltage is below 47 V (48 V systems) or 23.5 V (24 V systems).
sages	Fault Type	Automatic	Automatic	Automatic
: warming mes	Message	Battery Over Temperature	Capacitor over temperature	DC Under Voltage
	Fault Number	W44	W45	W48

	Solution	Turn off or check additional charging sources to batteries. Check battery cables.	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.	<u>م</u>	Check for high input AC voltage.	Remove excessive loads.
	Cause	Battery voltage is above 68 V (48 V systems).		Internal temperature is ove 85 °C (185 °F).	AC input voltage may be too high while charging.	Operating too large of a load for too long while inverting.
ages	Fault Type	Automatic		Automatic		
: Warning mess	Message	DC Over Voltage		FET1 Over Temperature		
Table 1-10	Fault Number	W49		W57		

Table 1-10 : Warning messages

	Solution	See W57.	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.	Wait until AC input (utility grid) returns to in-tolerance condition.
	Cause	See W57.	The unit has been turned off with a Remote Power Off switch.	Equalization terminated abnormally because of interrupted AC input.
)	Fault Type	Automatic	Automatic	Manual
þ	Message	Transformer Over Temperature	Remote Power Off	Equalize Abort
	Fault Number	W68	W94	W95

Table 1-10 : Warning messages

Table 1-10 : Warning messages

_	_	_	_	
Fault Number	Message	Fault Type	Cause	Solution
96M	Cannot Equalize	Manuai	The selected battery type should not be equalized.	Change battery type if your batteries should be equalized. Gel or AGM batteries should not be equalized.
			AC input is not qualified or the charge setting is not adequate.	Check for presence of AC. Make sure Charge and Equalize are enabled. Verity the Xantrex XW AGS trigger is set to Stop Float. If Stop V is enabled, then the voltage level should be above the Eqlz Voltage level.
797	Battery temp sensor failure.	Automatic	Battery Temperature Sensor Shorted	Replace battery temperature sensor.
W500	Lost network connection	Automatic	Lost network connection	Check network cables.
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.

Figure 1-11 referring to	provides descr this table, conta	riptions of the fault mes: act your dealer or Custc	sages and solutions. If you arr omer Service.	e unable to resolve the problem after
Table 1-11	: Fault messa	des		
Fault				
Number	Message	Fault Type	Cause	Solution
Ē	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	AC1L2 transfer relay is bad or an AC source was wired directly to the AC output.	See F17.

Fault Messages

Table 1-11	: Fault messa	ges		
Fault				
Number	Message	Fault Type	Cause	Solution
F19	Relay(s) Welded	Manuai	AC2L1 transfer relay is bad or an AC source was wired directly to the AC output.	See F17.
F20	Relay(s) Welded	Manual	AC2L2 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.
			- -	

Troubleshooting

	Solution	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.	See F23.	See F23.	See F23.	See F23.	See F23.
	Cause	Over-frequency anti- islanding, caught by the AC qualification limit.	Under-frequency anti- islanding, caught by the AC qualification limit.	Over-frequency anti- islanding.	Under-frequency anti- islanding.	Over-voltage anti-islanding, fast disconnect, 135 VAC.	See F27.
ges	Fault Type	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic
: Fault messa	Message	Al Over Frequency	Al Under Frequency	Al Over Frequency	Al Under Frequency	AI L1 Over Voltage	AI L2 Over Voltage
Table 1-11	Fault Number	F23	F24	F25	F26	F27	F28

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Table 1-11	: Fault messaç	Jes		
Fault Number	Message	Fault Type	Cause	Solution
F29	Al 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	Al 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.
F35	AI L2 Under Voltage	Automatic	See F34.	See F23.
F36	AI L1L2 Under Voltage	Automatic	See F34.	See F23.

Troubleshooting

	_	)		
Fault Number	Message	Fault Type	Cause	Solution
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.

Fault	operator M	Eault Time		Soli dijon
	INICOORDE		Cause	2014(101
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.
F44	Battery Over Temperature	Automatic	Battery over- temperature shutdown at 60 °C.	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.
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.

Message DC Under Voltage	Fault Type Automatic	Cause DC under-voltage shutdown (immediate) occurs if DC voltage is below 16 VDC (24 V system) or 32 VDC (48 V system). The fault clears and the inverter restarts when DC voltage reaches V <sub>LBCO</sub> +4 V system) and V <sub>LBCO</sub> +4 V (48 V system)	Solution 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.
e	Automatic	DC under-voltage shutdown occurs if DC voltage is below LBCO voltage level.	See F47.

Table 1-11	: Fault messa(		_	
Fault Number	Message	Fault Type	Cause	Solution
F49	DC Over Voltage	Escalating Auto Fault.	DC over-voltage shutdown. Occurs if DC voltage is above 35 VDC (24 V) or 70 VDC (48 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 29 VDC (24 V) or 58 VDC (48 V) 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.
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.

	Solution	See F52.	See F52.	Fault clears when temperature drops to 75 °C.	Check for high input AC voltage.	Remove excessive loads.	Let inverter cool down and try restarting.	Hold a piece of paper to inverter vents to check the fan. If the fan has failed, have the inverter serviced.	
	Cause			Internal temperature is over 105 °C.	AC input voltage may be too high while charging.	Operating too large of a load for too long while inverting.	Ambient temperature may be high.	Inverter cooling fan may have failed	
ges	Fault Type	Manual	Manual	Automatic					
: Fault message:	Message	EEPROM Error	EEPROM Error	FET1 Over Temperature	Shutdown				
Table 1-11	Fault Number	F55	F56	F57					

#### Fault Messages

		)		
Fault Number	Message	Fault Type	Cause	Solution
F57	FET1 Over Temperature	Automatic	Inverter airflow intake may be blocked.	Increase clearance around the inverter or unclog the fan air intake.
	Shutdown		Charging setting is too high based on ambient temperature around inverter.	Lower the Max Charge Rate setting.
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.
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

	ution	Check the AC voltage presence of th phase at the AC input terminals each Conext XW.	nspect the three-phase wiring to the correct phase sequence: -Phase-A., XW-Phase-B, XW- ase-C with the same AC input utence to each unit.	vice required.
	Sol	1. C eac for	2. I tth XW Pha	Ser
	Cause	<ol> <li>An AC input voltage phase is lost or out of th AC range in the three-phase.</li> </ol>	<ol> <li>AC input voltage pha are not synchronized w Xantrex XW 3-phase system.</li> </ol>	Silicon Serial ID Failure
)	Fault Type	Manual, AC input is not qualified		Manual
	Message	Synchronizat ion Fault		Silicon Serial ID Failure
2	Fault Number	F70		F500

1–44

# 2

# Circuit Board Removal Instructions

Chapter 2 contains information and procedures to help you replace the printed circuit boards in the Conext XW Inverter/Charger. It describes the post-troubleshooting testing to make sure your unit works correctly. It contains a list of field replaceable parts so you can order replacement parts.

The following topics will be covered in this chapter:

- Introduction
- Replacing the DSP Sensing and Control Board
- Replacing the AC EMI and Relay Board
- Replacing the Power Bridge
- Replacing the Networking & Fan Control Board
- Replacing the DC/EMI Input Filter
- Replacing the Interface Panel
- Testing the Unit
- Field Replaceable Parts

# Introduction

# **Tools Required**

- D Phillips #2 screwdriver
- □ If removing the DC/EMI input filter, a Phillips #2 screwdriver long (12in/30cm)
- Adjustable wrench or 7/16 inch and 9/16 inch wrenches
- Torque wrench
- Cutter for cutting cable ties and replacement cable ties
- Multimeter that measures AC and DC voltages

# **General Procedure**

Note: You do not have to remove the unit from it's mounting position.

#### The general steps to replacing any board are:

- 1. Disconnect or turn off all power sources attached to the unit.
- 2. Disconnect or turn off all loads attached to the unit.
- 3. Remove the unit's two front covers and the interface panel (See"Visual Inspection" on page 1–6).
- 4. Remove the old board.
- 5. Install the new board.
- 6. Test the unit's operation with the new board and troubleshoot as needed (See "Testing the Unit" on page 2–14).
- 7. Replace the unit's two front covers and the interface panel.

# **Disconnecting Power**

Note: You do not have to remove the unit from it's mounting position.

#### To disconnect power from the unit:

- 1. Turn off the system's DC circuit beaker.
- 2. Turn off the system's AC circuit breaker.
- 3. Turn off and disconnect all loads attached to the unit.

# Replacing the DSP Sensing and Control Board

#### 0 UNG 6: Remove mounting screws 3: Remove wires from current sensor AN AND IN MARKING THE AND A 6: Remove mounting 4: Remove 4 screw ribbon cables 5: Remove 2 connectors 6: Remove mounting 2: Remove transforme screw wires from bus-bar

# Removing the DSP Sensing and Control Board

Figure 2-1 Removing the DSP sensing and control board

#### To remove the DSP sensing and control board:

- 1. If present, cut and remove the cable ties around the transformer wires running through the current sensor.
- 2. Disconnect the two transformer wires running through the current sensor from the bus-bar.

#### NOTICE

#### EQUIPMENT DAMAGE

Make sure you label which wires go through the current sensor and which do not. If the wrong wires are run through the current sensor, the inverter could be damaged.

# Failure to follow these instructions may result in damage to equipment.

- 3. Disconnect the four ribbon cables attached to the DSP sensing and control board. If there is adhesive applied to the ribbon cable connectors, first break the adhesive then disconnect the cables.
- 4. Disconnect connectors JT1 and JC7.
- 5. Remove the four mounting screws attaching the board to the unit.
- 6. Remove the board.

# Installing the New DSP Sensing and Control Board

#### To install the new DSP sensing and control board:

- 1. Attach the new board to the unit with the four mounting screws.
- 2. Route the two transformer wires though the current sensor.
- 3. Reconnect the four ribbon cables to the DSP sensing and control board.
- 4. Reconnect connectors JT1 and JC7.
- 5. Reconnect the two transformer wire to the bus-bar.
- 6. Put new cable ties around the transformer wires.

#### Replacing the AC EMI and Relay Board

### Replacing the AC EMI and Relay Board



Figure 2-2 Removing the AC EMI and relay board

#### NOTICE

#### EQUIPMENT DAMAGE

This board is located in a confined space. Make sure you do not damage it or other components when removing and installing the board.

Failure to follow these instructions can damage equipment.

# Removing the AC EMI and Relay Board

#### NOTICE

#### EQUIPMENT DAMAGE

Make sure you label which wires go to which terminal block. Incorrect wiring could damage the unit.

#### Failure to follow these instructions can damage equipment.

#### To remove the AC EMI and relay board:

- 1. Disconnect the AC Load, Gen and Grid wires from the AC EMI and relay board's Input/Output terminal blocks.
- 2. Disconnect the ribbon cable attached to connector JR1.
- 3. Disconnect the four transformer wires X1 to X4 connected to the AC EMI and relay board's terminal blocks.
- 4. Remove the seven mounting screws attaching the board to the unit.

Circuit Board Removal Instructions

5. Remove the board.

# Installing the New AC EMI and Relay Board

#### To install the new AC EMI and relay board:

- 1. Attach the new board to the unit with the seven mounting screws.
- 2. Reconnect the ribbon cable to connector JR1.
- 3. Reconnect the four transformer wires X1 to X4 to the AC EMI and relay board's terminal blocks. Torque them to the specification given on the board.
- Reconnect the AC load, gen and grid wires to the AC EMI and relay board's Input/Output terminal blocks. Torque them to the specification given on the board.

# Replacing the Power Bridge



# Removing the Power Bridge

Figure 2-3 Removing the power bridge

#### To remove the power bridge:

#### NOTICE

#### EQUIPMENT DAMAGE

Make sure you label which wires go to which bus-bar. Incorrect wiring could damage the unit.

#### Failure to follow these instructions can damage equipment.

- 1. Disconnect the ribbon cables attached to connectors JC1 and JB10.
- 2. Disconnect the two sets of transformer wires.
- 3. Disconnect the bridge from the bus-bar.
- 4. Remove the two mounting screws attaching the power bridge to the unit.
- 5. To remove the board, slide it sideways to remove the unit's mounting lip from the heat sink's mounting strip and then lift the board up.

# Installing the New Power Bridge

Before installing the new power bridge, inspect the silicon strip on the side of the hole and make sure it is present and is in good shape.



Circuit Board Removal Instructions

Figure 2-4 Installing the power bridge

#### To install the new power bridge:

1. Place the new power bridge into the unit.

Make sure the unit's mounting strip fits into the notch in the power board's heat sink and the opposite side of the board is seated to fit in to the silicon strip on the other side.

- 2. Attach the power bridge to the unit with the two mounting screws.
- 3. Reconnect the power bridge to the bus-bars. Torque at 7 Nm.
- 4. Reconnect the transformer wires to the power bridge. Torque at 7 Nm.
- 5. Reconnect the ribbon cables to JC1 and JB10 on the power bridge.



# Replacing the Networking & Fan Control Board

Figure 2-5 Removing the networking & fan control board

# Removing the Networking & Fan Control Board

#### To remove the networking & fan control board:

1. Disconnect any external cables attached to the AC SYNC, XANBUS, BTS and AUX connectors.

Make sure you label which wires go to which connector to avoid mis-wiring.

- 2. Disconnect the ribbon cable attached to connector JU1.
- 3. Disconnect the four screws attaching the board to the unit.
- 4. Remove the fan control connector.
- 5. Remove the board.

# Installing the New Networking & Fan Control Board

#### To install the new networking & fan control board:

- 1. Carefully slide the board's connectors into the slot in the unit's sheet metal.
- 2. Attach the new board to the unit with the four mounting screws.
- 3. Reconnect the ribbon cable to connector JU1.
- 4. Reconnect the external cables.

# Replacing the DC/EMI Input Filter

# Removing the DC/EMI Input Filter

# NOTICE

# EQUIPMENT DAMAGE

This board is located in a confined space. Make sure you do not damage it or other components when removing and installing the board.

Failure to follow these instructions can damage equipment.

#### Replacing the DC/EMI Input Filter

#### To remove the DC/EMI input filter:

1. Disconnect the screws from the bus-bar (five screws).



Circuit Board Removal Instructions

2. Disconnect the two screws connecting the DC terminals.



- 3. With the long Phillips screwdriver, disconnect the 4 screws attaching the board to the unit.
- 4. Remove the power board. See section "Removing the Power Bridge" on page 2–6 for details.
- 5. Remove the DC/EMI input filter board.

# Installing the New DC/EMI Input Filter

#### To install the new DC/EMI input filter:

- 1. Attach the new board to the unit with the four mounting screws.
- 2. Reconnect the two screws connecting the DC terminals. Torque at 21.7 Nm.
- 3. Reconnect the bus-bar with the five screws. Torque at 7 Nm.

Replacing the Interface Panel

Replacing the Interface Panel



Figure 2-6 Removing the interface panel

# Removing the Interface Panel

#### To remove the interface panel:

- 1. Unscrew the panel from the unit.
- 2. Disconnect the cable connecting the panel to the DSP Sensing and Control board.
- 3. Remove the metal shield on the back of panel.

Circuit Board Removal Instructions

4. Disconnect the cable from connector J1.

# Installing the New Interface Panel

#### To install the new interface panel:

- 1. Reconnect the cable to connector J1.
- 2. Replace the metal shield to the back of the panel.
- 3. Connect the cable connecting the cable to the DSP Sensing and Control board.
- 4. Attach the panel to the unit.

# Testing the Unit

# 

# HAZARD OF ELECTRIC SHOCK AND FIRE

High currents and heat levels are produced inside the unit during testing. Keep clear of the unit and avoid any contact while testing.

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

# NOTICE

# EQUIPMENT DAMAGE

Make sure the battery polarity is correct when attaching the battery to the unit. Incorrect battery polarity will damage the unit. This type of damage is not covered by the warranty.

Failure to follow these instructions can damage equipment.

# Test Setup

The test setup is shown in Figure 2-7:



Figure 2-7 XW test setup

# Inverter Mode Test

This tests for a basic level of functionality in the power bridge, transformer, DSP sensing and control board and AC EMI and relay board. If it doesn't pass this test, troubleshoot the unit again and retest. If extra troubleshooting fails, contact customer service for advice.

#### To run the inverter mode test:

- 1. Verify the DC input voltage is within the following ranges:
  - XW6048/XW4548: 42 VDC to 60 VDC
  - XW4024: 23 VDC to 30 VDC
- 2. Turn on the DC circuit breaker.
- Switch the unit into Inverter mode.
   Make sure the Inverting LED on the interface panel is on.
- 4. Record the following measurements:

Load	VDC	VAC
0% Load		
50% Load		
100% Load		

- 5. Verify the output voltage regulation is:
  - 110 VAC to 125 VAC for 120 VAC/60 Hz units
  - 220 VAC to 250 VAC for 240 VAC/60 Hz units
  - 210 VAC to 233 VAC for 230 VAC/50 Hz units

If the voltage is outside of the range, replace the unit.

 Use the XW Configuration tool to verify the VDC and VAC measurements. If the voltages do not match (tolerance VDC:1% and VAC: 2%), replace the unit. 7. Switch the unit out of Inverter mode and remove the load.

# Transfer and Charger Test

This tests that the AC1 and AC2 paths on the AC EMI and relay board are working correctly. If it doesn't pass this test, troubleshoot the unit again and retest. If extra troubleshooting fails, contact customer service for advice.

#### To run the transfer and charger test:

- 1. Verify the AC input is within the following ranges:
  - 120VAC/60Hz: 100 VAC to 130 VAC (L1-N)
  - 240VAC/60Hz: 200 VAC to 260 VAC (L1-L2)
  - 230VAC/50Hz: 200 VAC to 260 VAC (L-N)

If the voltage is outside of the range, replace the unit.

- Turn on the AC input circuit breaker.
   Make sure the Grid or Gen LED on the DSP sensing and control panel is on.
- Switch the unit into Charging mode.
   Make sure the Charging LED on the DSP sensing and control panel is on.
- 4. Record the following measurements:

Load	VDC	IDC	VAC	IAC
0% Load				
50% Load				
100% Load				

- 5. Verify the absorption charging voltage is:
  - 56.6 VDC to 57.8 VDC for XW6048/XW4548 (depending on battery type)
  - 28.3 VDC to 28.9 VDC for XW4024 (depending on battery type)

If the voltage is outside of the range, replace the unit.

- 6. Use the XW Configuration tool to verify the measurements. If the readings do not match (tolerance VDC:1%), replace the unit.
- 7. Switch the unit out of Charging mode.

# Field Replaceable Parts

Table 2-1 lists the description and part numbers for all the Conext XW field replaceable units so you can order replacement parts.
Table 2-1	Field re	placeable	parts	descrip	ption and	service	part	number
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Service	
Number	Description
0J-0299	ASSY POWER BRIDGE XW6048 SERVICE PART
0J-0300	ASSY POWER BRIDGE XW4548 SERVICE PART
0J-0301	ASSY POWER BRIDGE XW4024 SERVICE PART
0J-0302	XW ASSEMBLY INTERFACE PANEL SERVICE PART
0J-0303	PCA DC EMI INPUT FILTER XW SERVICE PART
0J-0304	PCA DSP SENSING & DSP Sensing and Control XW 6048 120/240V SERVICE PART
0J-0305	PCA DSP SENSING & DSP Sensing and Control XW 4024 120/240V SERVICE PART
0J-0306	PCA DSP SENSING & DSP Sensing and Control XW 4548 120/240V SERVICE PART
0J-0315	PCA DSP SENSING & DSP Sensing and Control XW6048 230V SERVICE PART
0J-0316	PCA DSP SENSING & DSP Sensing and Control XW4024 230V SERVICE PART
0J-0317	PCA DSP SENSING & DSP Sensing and Control XW4548 230V SERVICE PART
0J-0307	PCA AC EMI & RELAY XW 6048 SERVICE PART
0J-0308	PCA AC EMI & RELAY XW 4024 SERVICE PART
0J-0309	PCA AC EMI & RELAY XW 4548 SERVICE PART
0J-0310	PCA AC EMI & RELAY EURO XW SERVICE PART
0J-0311	PCA NETWORKING & FAN DSP Sensing and Control XW SERVICE PART
0J-0312	ASSY FAN WIRE XW SERVICE PART

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