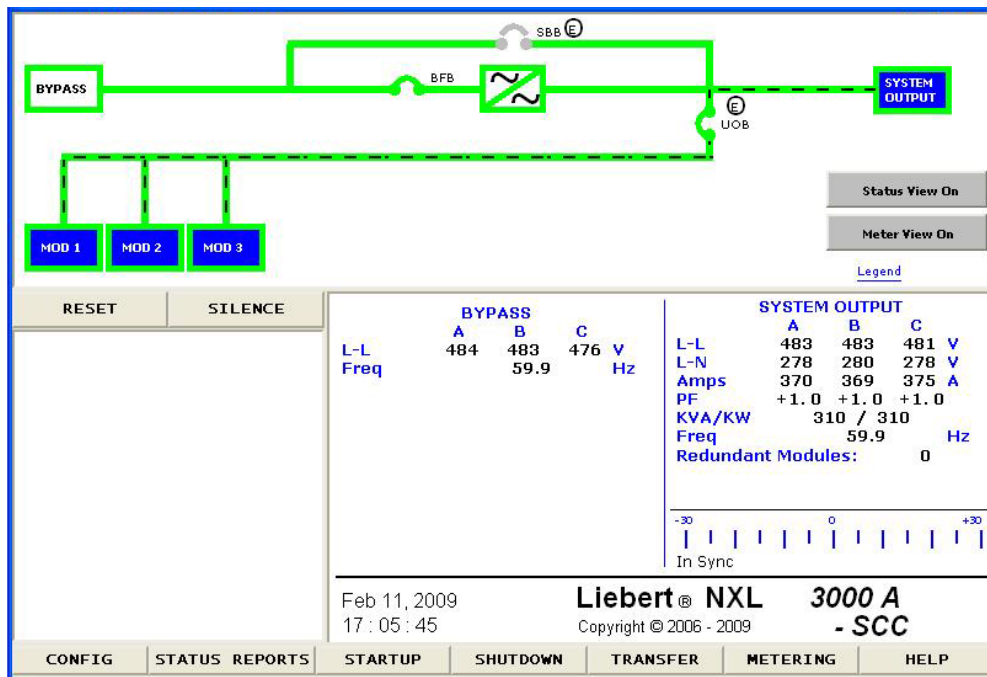


Liebert® NXL™ System Control Cabinet

Operation Manual – 250-750kVA, 60Hz,



CONTACTING EMERSON NETWORK POWER FOR SUPPORT

Contact Emerson Network Power Liebert Services for information or repair service in the United States at 1-800-LIEBERT (1-800-543-2378).

For repair or maintenance service outside the 48 contiguous United States, contact Liebert Services, if available in your area. For areas not covered by Liebert Services, the authorized distributor is responsible for providing qualified, factory-authorized service.

Have the following information available before calling Liebert Services:

Part Numbers: _____

Serial Numbers: _____

Amp Rating: _____

Date Purchased: _____

Date Installed: _____

Location: _____

Input Voltage/Frequency: _____

Output Voltage/Frequency: _____

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and maintenance of your Liebert NXL UPS and batteries.



WARNING

Risk of electric shock. Can cause equipment damage, injury or death.

Exercise extreme care when handling cabinets to avoid equipment damage or injury to personnel. Refer to separate installation manual for equipment handling information and installation procedures.

In case of fire involving electrical equipment, use only carbon dioxide fire extinguishers or others approved for use in electrical fire fighting.

Extreme caution is required when performing maintenance. Service and maintenance work must be performed only by properly trained and qualified personnel and in accordance with applicable regulations as well as with manufacturers' specifications.

AC voltage will remain on the system bypass, the UPS output terminals and the static bypass switch, unless associated external circuit breakers are opened.

Check for voltage with both AC and DC voltmeters prior to making contact.

When the system is under power, both the operator and any test equipment must be isolated from direct contact with earth ground and the cabinet chassis frame by using rubber mats.

Some components within the cabinets are not connected to the chassis ground. Any contact between floating circuits and the chassis is a lethal shock hazard. Exercise caution that the test instrument exterior does not make contact, either physically or electrically, with earth ground.

This equipment contains circuitry that is energized with high voltage. Only test equipment designated for troubleshooting should be used. This is particularly true for oscilloscopes. Always check with an AC and DC voltmeter to ensure safety before making contact or using tools. Even when the power is turned Off, dangerously high voltage may exist at the capacitor banks.

Observe all battery precautions when near the battery for any reason.

ONLY properly trained and qualified service personnel should perform maintenance on the UPS system. When performing maintenance on any part of the equipment under power, service personnel and test equipment should be standing on rubber mats. The service personnel should wear insulating shoes for isolation from direct contact with the floor (earth ground).

One person should never work alone. A second person should be standing by to assist and summon help in case an accident should occur. This is particularly true when work is performed on the battery.

1.0 INTRODUCTION

The Liebert NXL Switchgear provides continuous, high-quality AC power to your business-critical equipment, such as telecommunications and data processing equipment. The Liebert NXL UPSes will supply power that is free of the disturbances and variations in voltage and frequency common to utility power, which is subject to brownouts, blackouts, surges and sags.

If maintenance or repair of the UPS is necessary, the load can be switched without interruption in service to the maintenance bypass.

2.0 OPERATION

The Liebert NXL Control for Switchgear is equipped with a microprocessor-based display touchscreen designed for convenient and reliable operation. The display is driven by an easy-to-follow, menu-prompted software.

2.1 Features

The Liebert NXL interface display enables the operator to perform such tasks as:

- Quickly check operational status
- Monitor the power flow through the UPS system and all meter readings
- Execute operational procedures
- Check status reports and history files
- Adjustment of programmable parameters (access limited by security access function)

The touchscreen is a white-background display with multicolor text. The display turns on automatically, but after 15 minutes of inactivity the backlight will go out and the display will appear very dim. Touching the screen will reactivate the backlight; the backlight will again be active for 15 minutes. If any screen other than the mimic screen is accessed, that screen will be displayed for 5 minutes without any interaction. If there is no activity for 5 minutes, the display will revert to the basic mimic screen.

Figure 1 Main display screen, typical

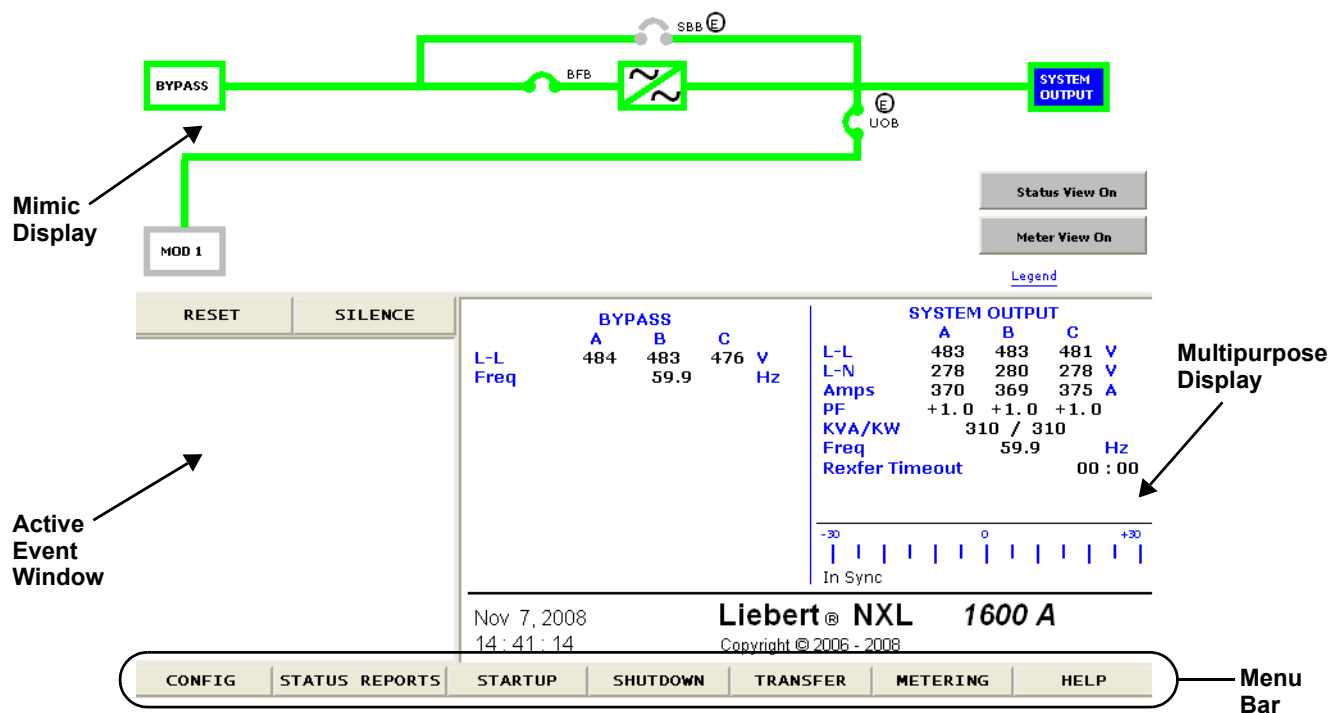
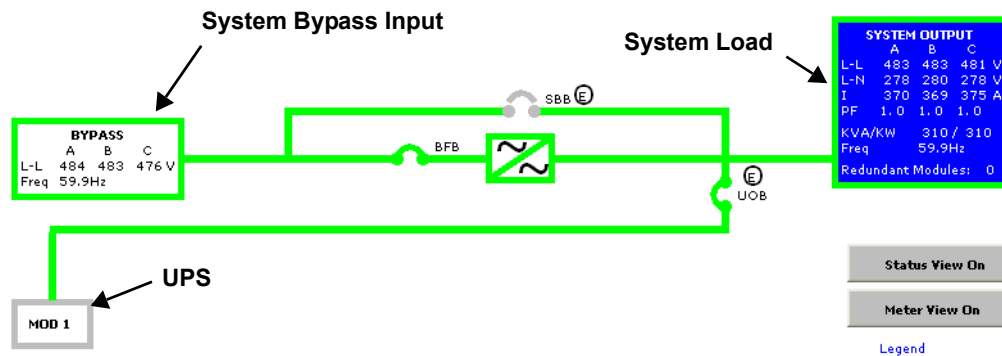


Figure 2 Mimic display



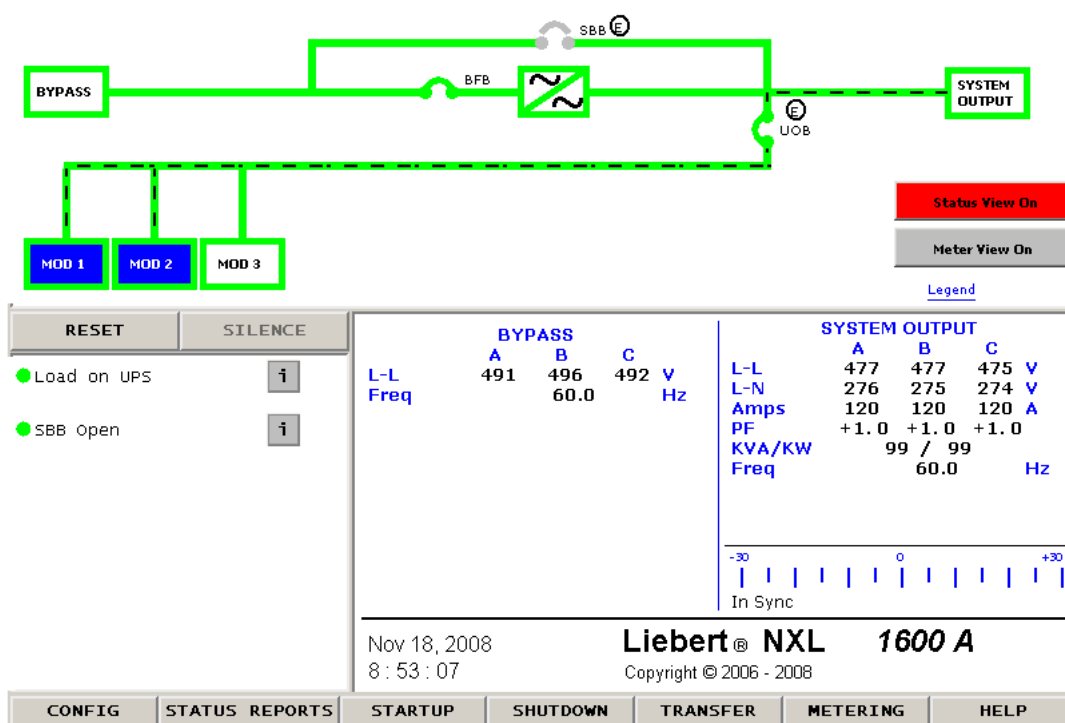
System Bypass Input—Displays the bypass input voltage and the bypass input frequency. The bypass circuit breaker (BFB) is to the right of this block. The circuit breaker status is shown as open or closed.

System Load—Displays the output line voltage, phase voltage, current, kVA, kW, power factor, frequency and number of redundant UPSs.

UPS—Shows whether System Load is support by UPSs

- Green outline—The UPS module inverter is ready
- Blue Fill—The UPS is supporting the load

Figure 3 Monitor/mimic display example: Normal power flow

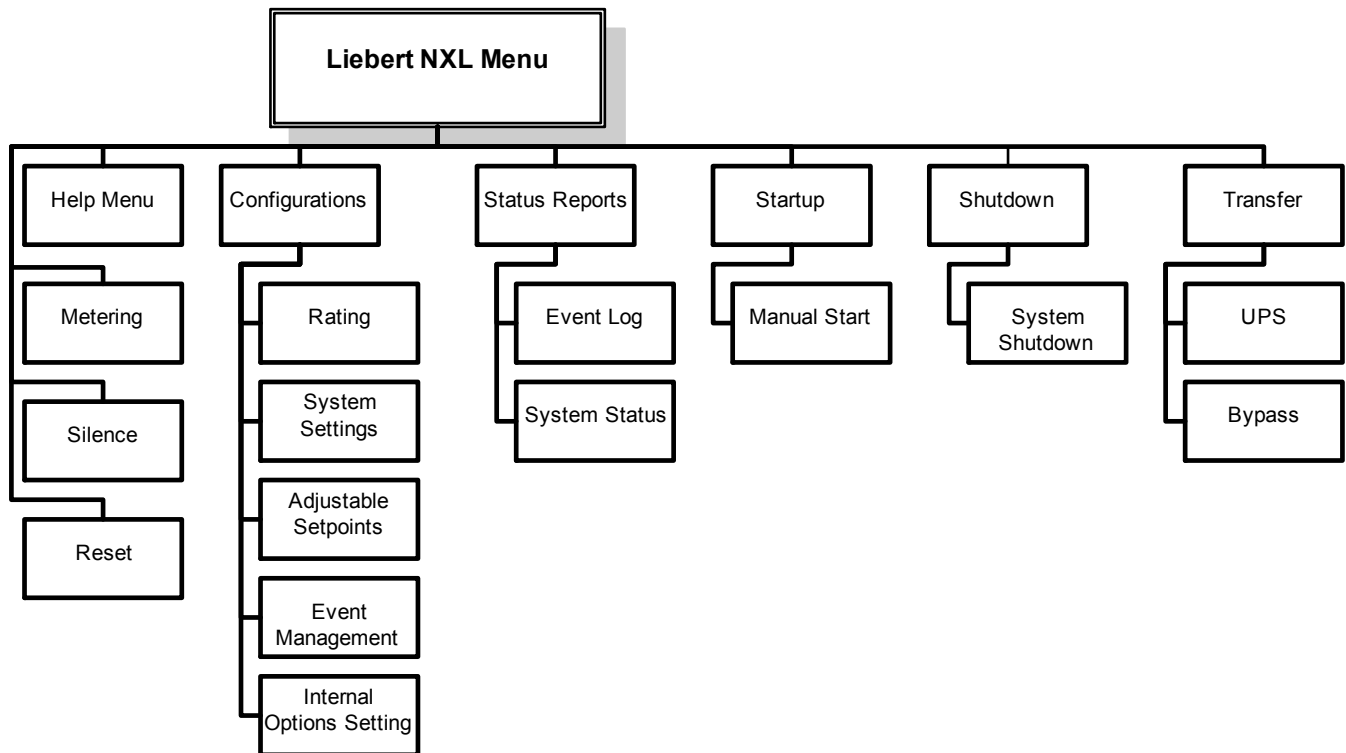


2.2 Touchscreen Navigation

2.2.1 Main Display Screen

Several menu items can be accessed from the main display screen (see **Figure 1**). These menu items are detailed in subsequent sections.

Figure 4 Menu tree



2.2.2 Configurations Menu

Rating

This menu item will display a popup showing the following parameters (see **Figure 5**). These parameters are entered during commissioning when the UPS is installed.

- Nominal Bypass Voltage
- Nominal Output Voltage
- Nominal Source Frequency
- Nominal Output Frequency
- Configuration Type
- Number of Modules
- System Amp Rating
- Unit Model
- Unit Serial
- Order Number 1
- Order Number 2
- Service Telephone Number
- Site ID Number
- Tag Number

Figure 5 Rating Parameters

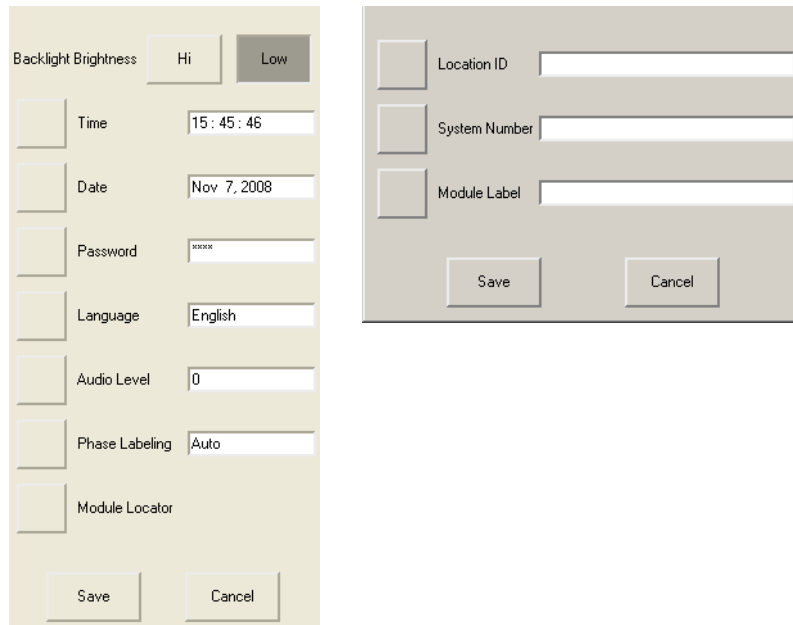
User Settings

System Settings

These display settings can be changed from the touchscreen. Press the box to the left of each parameter to bring a popup window that will allow the parameter to be changed.

- Backlight Brightness—High or Low (default: Low)
- Time (24hr format)—Adjust Hour, Minute or Seconds
- Date (MM DD, YYYY format)—Adjust Month, Day or Year
- Password – Reset the password (4 characters, alphanumeric, case-sensitive)
- Language—English, Chinese, French, Spanish, German, Italian, Portuguese
- Audio level—Range 1 to 10 (default: 5)
- Phase labeling—Auto, ABC, RST, XYZ, RYB, RWB, UVW, 123, L1L2L3 (default: Automatic)
- Module Locator
 - Location ID—Alphanumeric
 - System Number—Alphanumeric
 - Module Label—Alphanumeric

Figure 6 System Settings parameters



Adjustable Setpoints

These warning and alarm settings can be changed from the touchscreen. Press the box to the left of each parameter to bring a popup window that will allow the parameter to be changed.

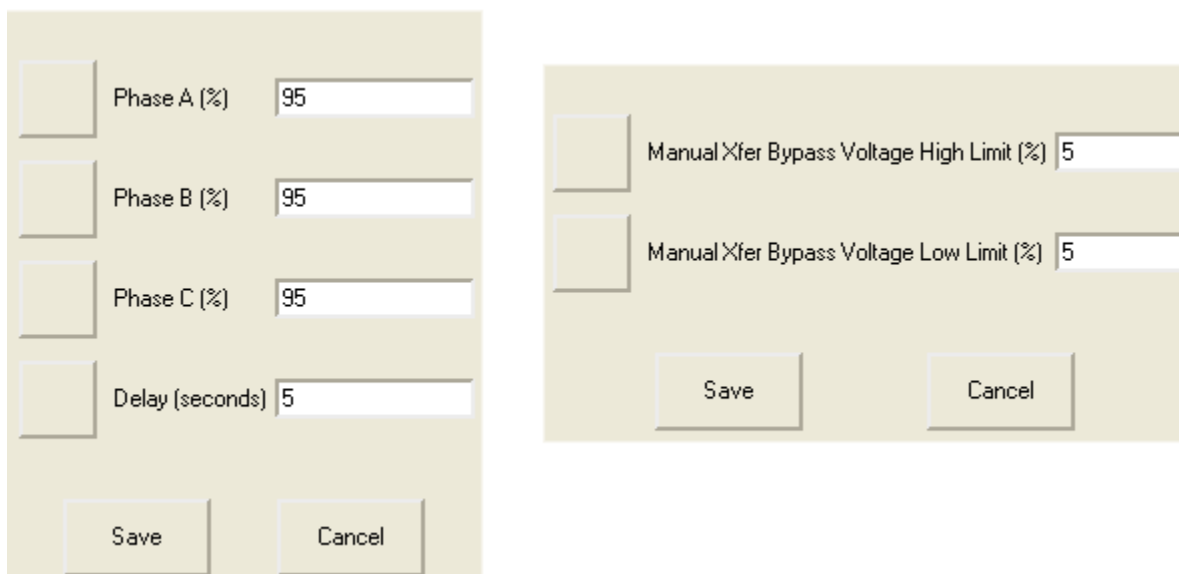
Max Load Alarm

- Phase A (%)—10% to 105% (default: 95%)
- Phase B (%)—10% to 105% (default: 95%)
- Phase C (%)—10% to 105% (default: 95%)
- Delay (second)—0 to 60 (default: 5 seconds)

Manual Xfer Bypass Voltage Limits

- Manual Xfer Bypass Voltage Low Limit (%)—1% to 20% (default: 5%)
- Manual Xfer Bypass Voltage High Limit (%)—1% to 15% (default: 5%)

Figure 7 Adjustable setpoints parameters



2.3 Event Management

This menu item permits changing how the Liebert NXL handles Alarms, Faults and Status information. Each event can be configured for the following:

- Latch (yes/no)—Event stays active in the event window, even if the fault condition has been cleared, until user acknowledges it by pressing the “Reset” button.
- Audible (yes/no)—Will set Audible alarm when event occurs
- Event log (yes/no)—Will display event in Event log when it occurs



NOTE

*You must press **Save** for the changes to take effect.*

See **Table 4** for a list of alarms, fault and status messages.

Figure 8 Typical Event Management Parameters

Alarms	Latch	Audible	Event Log
Auto Restart Fail	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>
Auto Rexfer Failed	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>
BFB Open	<input type="button" value="No"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>
BPSS Ovid Exceeded	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>
Byp Overload Ph A	<input type="button" value="No"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>
Byp Overload Ph B	<input type="button" value="No"/>	<input type="button" value="Yes"/>	<input type="button" value="Yes"/>

Alarms Faults Status Save Cancel

2.4 Status Reports Menu

This menu accesses the events records.

- Event Log—Up to 1024 time/date stamped events are captured in the log. The oldest record will be overwritten with a new record once the buffer reaches 1024 events.
- System Status
 - Total Operating Hours—Total number hours the Switchgear has been operational

2.5 Startup Menu

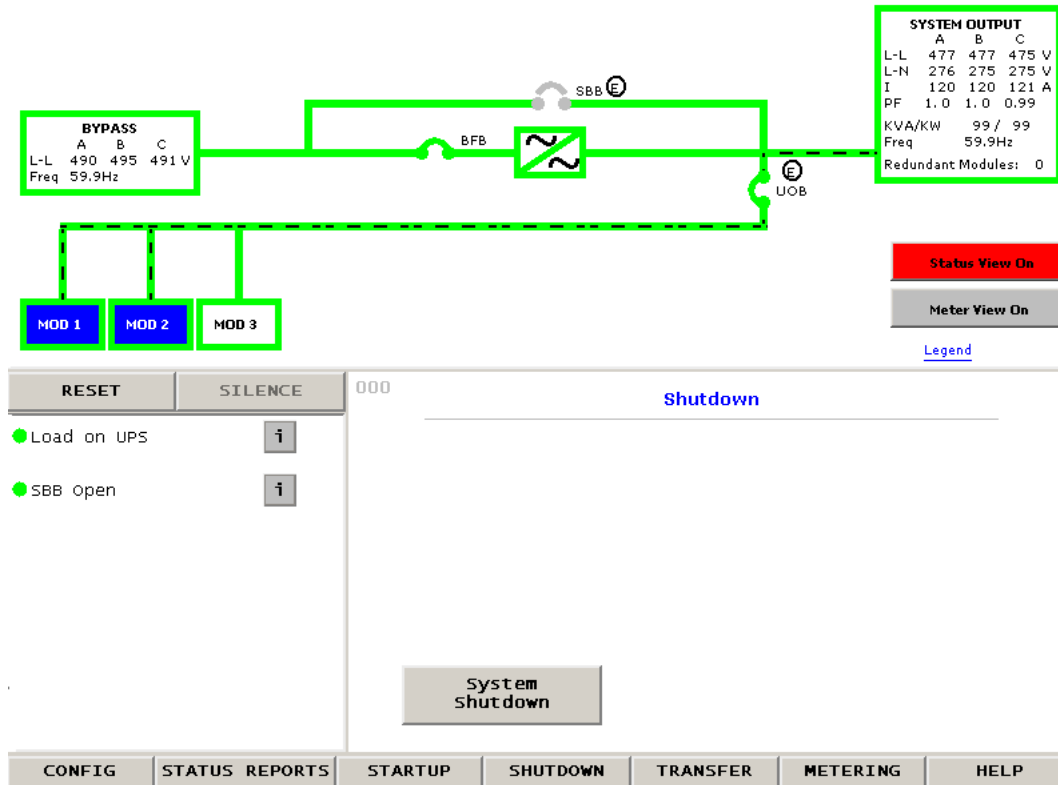
This menu is used to start the system and individual devices.

Manual—This will begin the UPS startup. See **2.15 - Manual Procedures** for details.

2.6 Shutdown Menu

This menu permits shutting down the system.

Figure 9 Shutdown menu



System Shutdown—Open UOB breaker and open all system bypass breakers. This can shutdown the system completely.

NOTICE

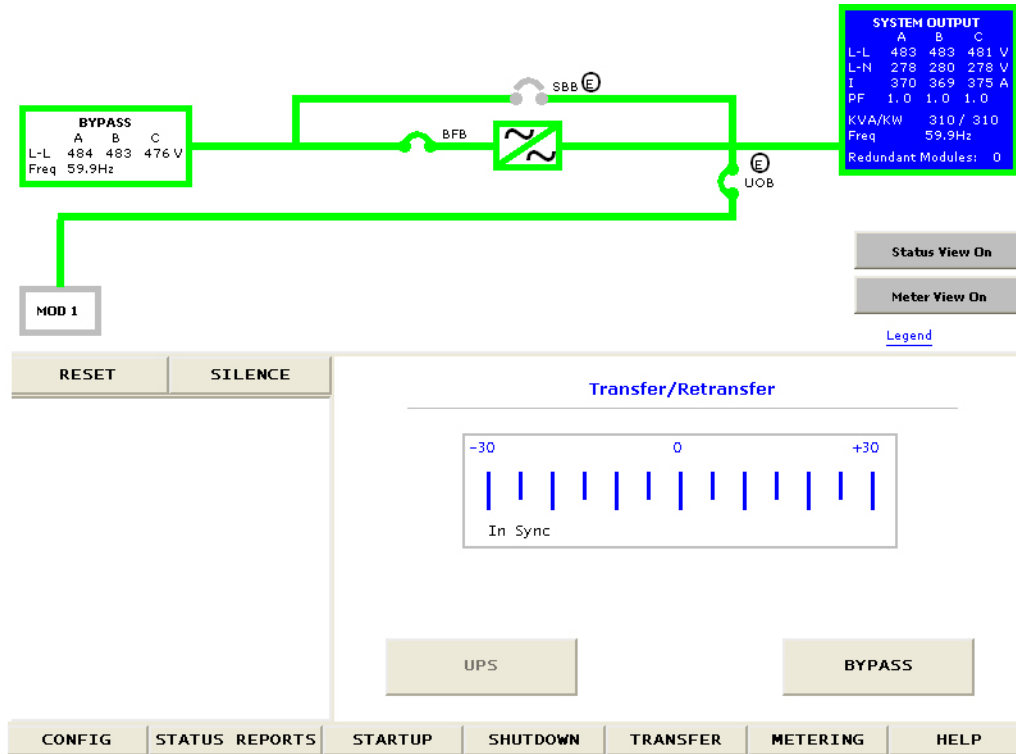
Risk of equipment damage. This command will result in the load being shut down.

Several popup windows are displayed when the system is about to be shut down. To shutdown the system, an operator must press OK. See 2.15 - Manual Procedures.

2.7 Transfer Menu

This menu permits switching between UPS and Bypass mode. A graph in the multipurpose window shows if the UPS is in synch with the bypass. If the UPS and bypass are in synch, pressing **Bypass** will switch the UPS to Bypass mode. Pressing **UPS** will switch back to Normal (Inverter) Mode (see **Figure 10**).

Figure 10 Transfer/retransfer commands



2.8 Metering

This button will place the metering tables in the multipurpose window.

2.9 Help

This button will display the help menu.

2.10 Reset

This button will reset any non-active latched events.

2.11 Silence

This button will silence the audible alarm.

2.12 Status View

This button will show the following status of each module in the system

Comms—

- Normal (UPS connected to System cabinet),
- Failed (UPS not communicating to System Cabinet)

Events—

- None (UPS has no active events).
- Alarms (UPS has an Alarm),
- Fault (UPS has Fault)

Inverter Ready—

- NO (UPS Inverter is off)
- Yes (UPS Inverter is ready to take load)

Output Volts—

- Normal (UPS Output voltage is OK)
- Marginal (UPS Output Voltage is not OK)
- Fail (UPS Output voltage is outside of range)

Output State—

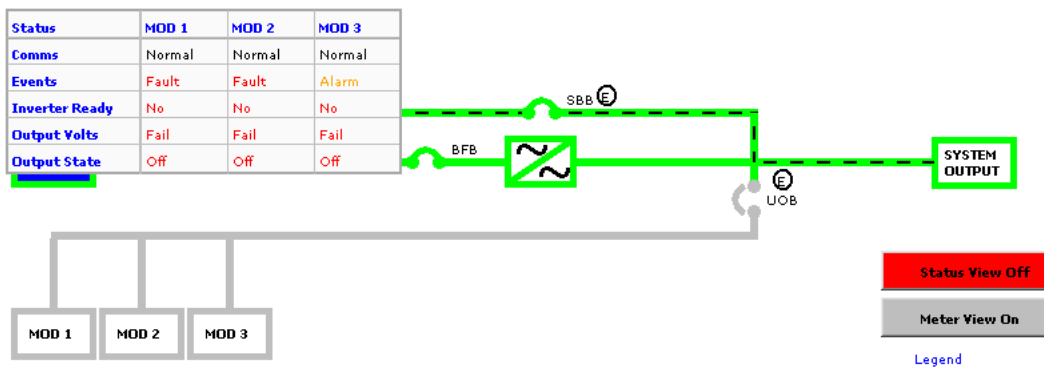
- Normal (UPS is in Normal Mode)
- Off (UPS Inverter is off)



NOTE

The Status View will be red if one of the UPSs has a fault.

Figure 11 Status view

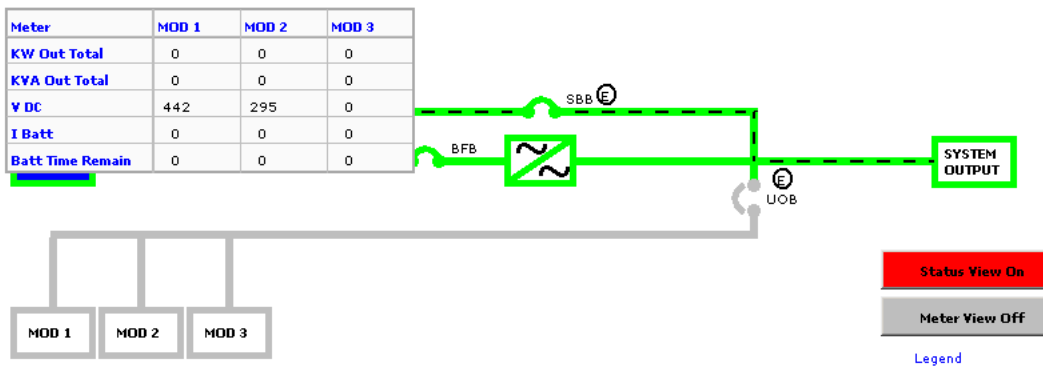


2.13 Meter View

This button will show the following meter of each module in the system

- KW Out Total
- KVA Out Total
- V DC
- I Batt
- Batt Time Remaining

Figure 12 Meter View



2.14 Modes of Operation

This section illustrates the flow of power through circuit breakers, switches and UPSs during various modes of operation. The same modes of operation apply to all configurations of the Liebert NXL. High-lighted (thick) lines in the diagrams indicate power flow and power availability.

These illustrations do not show an alternate power source (generator) and automatic transfer switch (external to the UPS) that might be present at your installation.

2.14.1 Load on System Bypass

The system could be in this mode of operation during either initial startup or system shutdown and isolation of UPS's for maintenance.

NOTICE

Risk of equipment damage. When the critical load is being supplied power from the bypass line, it is exposed to utility failure and fluctuations.

2.14.2 OK to Transfer

The OK to Transfer status message will be displayed when the System bypass and UPS's output power are both available, their voltage, frequency and phase synchronization are matched within specifications. An alarm message may be displayed to indicate Load On Bypass. If no alarm is displayed, the operating status is Load On UPS.

When the **OK to Transfer** message is displayed, the load can be manually transferred from the UPSes to System bypass or the load can be manually retransferred from the System bypass to the UPSes.

To perform a manual transfer, Use the Load Transfer Procedures screen. Refer to **2.15.3 - Load Transfer Procedures**.

The control logic will initiate an automatic transfer to bypass if an overload condition exceeds the system current versus time window or if a UPS fault is detected. The control logic may initiate an automatic retransfer to the UPS system when the system is recovering from overloads lasting less than five minutes. Refer to **2.17 - Automatic Operations**.

2.14.3 Input Power Failure—Load on Battery

If the utility AC power source fails or is outside the acceptable range, the battery plant becomes the power source for the UPS module inverters. The UPS's continue to supply power to the critical load and also to the UPS's controls.

Use the Battery Time screen at the UPS modules to monitor the present battery voltage compared to the shutdown value. The time the battery can sustain the load depends on the size of the load and the size and condition of the battery plant.

Alarm messages that indicate battery status are Battery Discharge, Low Battery and Battery Shutdown. The voltage limits for these alarms are displayed on the UPS module Alarm Limit Settings screen. These limits were selected for your installation by Liebert Services during initial startup. The battery block in the UPS module Monitor/Mimic Display indicates Charge or Discharge and the current in amperes.

2.14.4 Emergency Module Off—Optional

The Local Emergency Module Off (LEMO) mode will transfer the critical load to the bypass line and remove power from all UPS module components except the controls, bypass circuit breaker and the static switch.

The Emergency Module Off control is a guarded pad next to the display touchscreen.

Lift the cover and press the pad. The load will be transferred to bypass. Refer to **2.16 - Shutdown Procedures**.

2.14.5 Remote Emergency Power Off—Optional

The Remote Emergency Power Off control is a user-provided switch located remotely from the system. It usually is installed in the same room as the critical load equipment. This mode can also be initiated by an automatic contact closure in the same external circuit as the manually operated switch.

When the Remote Emergency Power Off switch is operated, all system circuit breakers are opened, including the bypass circuit breaker. All power is removed from the load. Typically, the REPO circuit also opens the circuit breakers that provide power to the bypass lines and the controls. Refer to **2.16 - Shutdown Procedures**.

2.15 Manual Procedures

The Liebert NXL Multi-Module System is designed to function while unattended by an operator. Many important functions are handled automatically by the system control logic, as explained in **2.17 - Automatic Operations**. Other procedures must be performed manually.

Manual procedures available to the operator include System Startup, Load Transfers and System Shutdowns. These procedures are performed by using the touchscreen and some manually operated circuit breakers and switches.

The touchscreen lists all steps required for each manual procedure. This section lists step-by-step controls to operate and conditions to observe in the following manual procedures:

- **System Startup**—including initial startup, recovering from battery shutdown and recovering from shutdowns for emergencies or maintenance.
- **Load Transfers**—including transfers from UPS's to System bypass and retransfers from System bypass to the UPS's.
- **System Shutdowns**—including shutdowns for maintenance and emergency shutdowns.



NOTE

The following procedure assumes that the UPS installation inspection and initial startup have been performed by Liebert Services. A Liebert-authorized representative must perform the initial system startup to ensure proper system operation.

2.15.1 System Startup Procedure



CAUTION

The following procedure provides power to the critical load distribution system. Verify that the critical load distribution is ready to accept power. Make sure that personnel and equipment are ready for the critical load distribution system to be energized.

During startup, power is supplied to the critical load through the system bypass line while the UPS systems are being energized. Depending on the reason for the system shutdown, power may be present in the bypass line. To determine this, check the Monitor/Mimic Display screen after control power is available.

1. Before you apply power to the system, verify that these circuit breakers are open:
 - Bypass Circuit Breaker (BFB)
 - Optional Unit Output Breaker (UOB).
 - Optional System Bypass Breaker (SBB).
 - Optional Maintenance Bypass Breaker (MBB)
 - Optional Maintenance Input Breaker (MIB)
 - All UPS breakers (CB1 & CB2).



NOTE

Not all systems will have the breakers listed above. Review the system configuration to see if what breakers are in the system.



NOTE

If the system was shut down in response to an "Emergency Off," there may be alarm messages on the touchscreen that describe system conditions before (or at the time of) the shutdown. Some or all of the alarm conditions may have been resolved. To clear these alarm messages, turn off control power. Wait at least 10 minutes for the control power circuitry to de-energize completely. After 10 minutes, turn control power back on and wait two minutes before continuing.



WARNING

Risk of electrical shock and high short circuit current. Can cause equipment damage, personal injury and death.

If the UPSes have been shut down for maintenance, verify that all of the UPSes system doors are closed and latched. All test equipment must be removed from the system. All electrical connections must be secure.

2. Power must be provided to the System controls so the operator can use the display touchscreen and so the system logic can function properly. The display touchscreen may be used to monitor system status, even when the UPS modules are not operating. This will be the usual condition unless you are recovering from a maintenance shutdown.
3. If the bypass line is not supplying the load, energize the bypass line by closing the external breaker feeding the System Bypass. The display touchscreen should start up.
4. On the SCC HMI screen, press the "Start-Up" then "Manual Start" menu buttons.
5. **If MBB is installed:** The "Close MBB" message appears in the multipurpose window. Close the MBB breaker.
6. **If SBB is installed:** The "Press OK to issue SBB close command" message will appear. Press "OK"
7. The "Close BFB" message appears in the multipurpose window. Close the BFB breaker.
8. **If MIB is installed:** The "Close MIB" message appears in the multipurpose window. Close the MIB breaker.
9. **If MBB is installed:** The "Open MBB" message appears in the multipurpose window. Open the MBB breaker.

10. Startup each UPS

- a. The "Close CB1" message will appear. Close CB1
- b. The "Press OK to Issue Rectifier On Command" message will appear. Press "OK."
- c. This will start the UPS rectifier.
- d. The "Press OK to Issue Inverter On Command" message appears. Press "OK."
- e. The motorized Module Output Breaker (CB2) will close. The rectifier will be On and the Inverter will be on standby.
- f. The "Close MBD" will appear. Press "OK" to manually closed MBD breaker. Pressing skip will allow you to complete the startup without batteries connected. You can close the MBD breakers after startup is completed.

**NOTE**

The battery charge current may increase quickly, but then should slowly decrease. If the system is recovering from a battery shutdown or an input power failure, the UPS rectifier will be recharging the battery. Recharge current can be more than 100 Amps. The maximum allowable recharge current for your unit will depend on the kVA rating and your factory-set battery recharge current limit.

- g. The "Press OK to Issue Transfer Command" message appears. Press "Skip."

11. When enough UPS modules have been started-up that can support the load, the SCC HMI screen will display the "Press OK to system transfer to UPS Inverter Command" message. Press "OK." This will put the load on the UPS inverters.

**NOTE**

When the load is transferred to the UPS's, the following happens:

- *UOB breaker will close (if installed)*
- *SBB breaker will open (if installed)*
- *CB2 breakers in all UPS modules will close*
- *System Bypass Static Switch will turn off.*

**WARNING**

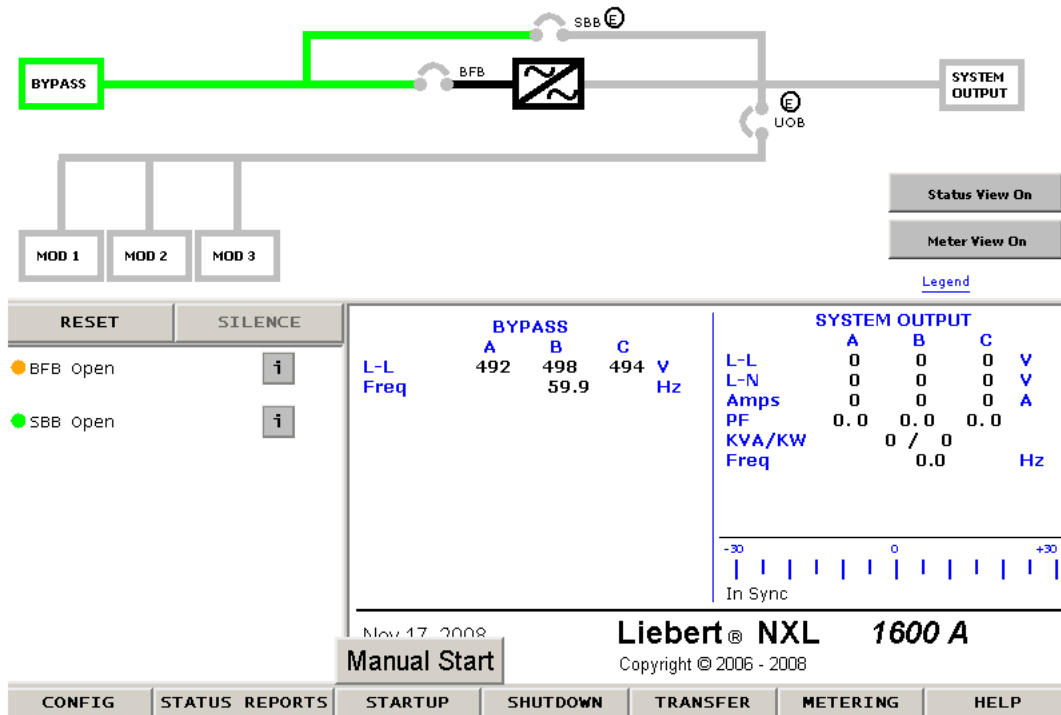
Risk of electric shock, explosive reaction, hazardous chemicals and fire. Can cause equipment damage, personal injury and death.

Do not use equalize charging with valve-regulated, lead-acid batteries. Refer to the battery manufacturer's manual, available on the manufacturer's Web site, for specific information about equalize charging.

NOTICE

Risk of equipment damage. If any abnormal situation occurs during this startup procedure, open the input circuit breaker and investigate the problem. Call Liebert Services if help is required.

Figure 13 Startup commands



2.15.2 Adding a UPS to a System

To add a UPS to the System after the System is already running, startup the UPS as described in 2.15.1 - System Startup Procedure, Step 10.

2.15.3 Load Transfer Procedures

Changing the load from the UPS's to the System bypass is called a transfer. Changing the load from System bypass to the UPS's is called a retransfer. Note that the System control logic can initiate automatic transfers and retransfers. Refer to 2.17 - Automatic Operations.

Transfer Procedure

1. Press the “Transfer” menu button on the touchscreen.
2. The Transfer/Retransfer screen will appear in the multipurpose window (see Figure 10).
3. If the UPSes’ output are with synchronization with the bypass, press the “Bypass” button. This will transfer the load from UPSes to Bypass.

Retransfer Procedure

1. Press the “Transfer” menu button on the touchscreen.
2. The Transfer/Retransfer screen will appear in the multipurpose window (see Figure 10).
3. If the UPSes’ outputs are with synchronization with the bypass, press the “UPS” button. This will transfer the load from System Bypass to the UPSes.

2.16 Shutdown Procedures

2.16.1 UPS Module Shutdown Procedure

Perform a Module Shutdown Procedure when you want to remove power from a UPS module.

Read all warnings in the *UPS Operation and Maintenance Manual, SL-25425*, before performing any maintenance on your Liebert NXL UPS. These warnings and cautions must be observed during any work on the UPS.



NOTE

Service and maintenance work must be performed only by properly trained and qualified personnel and in accordance with applicable regulations as well as with manufacturers' specifications.

Use the module Monitor/Mimic Display to determine the operating condition of the UPS module.



NOTE

This shutdown turns Off the inverter and the rectifier and trips all battery breakers.

1. Press the "Shutdown" menu button on the touchscreen.
The Shutdown screen will appear in the multipurpose window.
2. Press the "UPS" button. This brings up a warning dialog box.
3. Press OK to shut down the UPS.



NOTE

If removing the UPS would result in overloading the other UPSes, the "Shutdown" will not be available.

2.16.2 System Shutdown Procedure

Perform a System Shutdown Procedure when you want to remove power from the entire system.

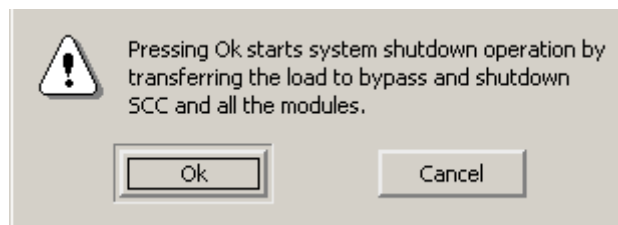


NOTE

This shutdown will shutdown all the UPS's and opens the System Bypass. This procedure will shut down the load.

1. Press the "Shutdown" menu button on the display touchscreen.
The Shutdown screen will appear in the multipurpose window (see **Figure 9**).
2. Press the "System" button. This brings up a warning dialog box (see **Step 14**). This will open UOB breaker (if installed) and transfer the load to System Bypass.

Figure 14 System shutdown popup



3. **If MBB & MIB are not installed:**
 - a. Press OK to transfer the load to System Bypass and the following warning Dialog box will appear (see **Figure 15**).



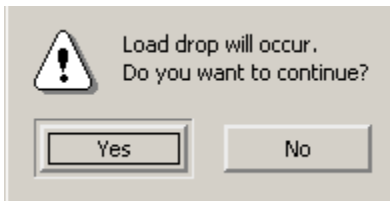
NOTE

Pressing OK will result in the load being dropped.

- b. Press OK to open the System Bypass. This will turn off the System Bypass Static Switch and open SBB breaker (if installed) or;

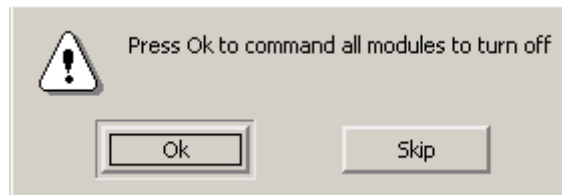
- c. Press "No" to leave the load on System Bypass.

Figure 15 System shutdown popup con't



4. **If MBB & MIB are installed**
 - a. The "Verify Maintenance Bypass source, then close MBB" message appears in the multipurpose window. Close the MBB breaker.
 - b. The "Open MIB" message appears in the multipurpose window. Close the MIB breaker.
 - c. System Bypass Static Switch will turn off and SBB breaker (if installed) will open.
5. The "Press Ok to command all modules to turn off" message appears in the multipurpose window (see **Figure 16**).
 - a. Press "OK" to have all the UPS module turned off
 - b. Press "Skip" to leave the UPS modules running.

Figure 16 System shutdown popup con't



2.17 Automatic Operations

The Liebert NXL system is designed to function while unattended by an operator. The system control logic monitors the performance of the system, the availability of power sources and the current required by the critical load.

The system control logic:

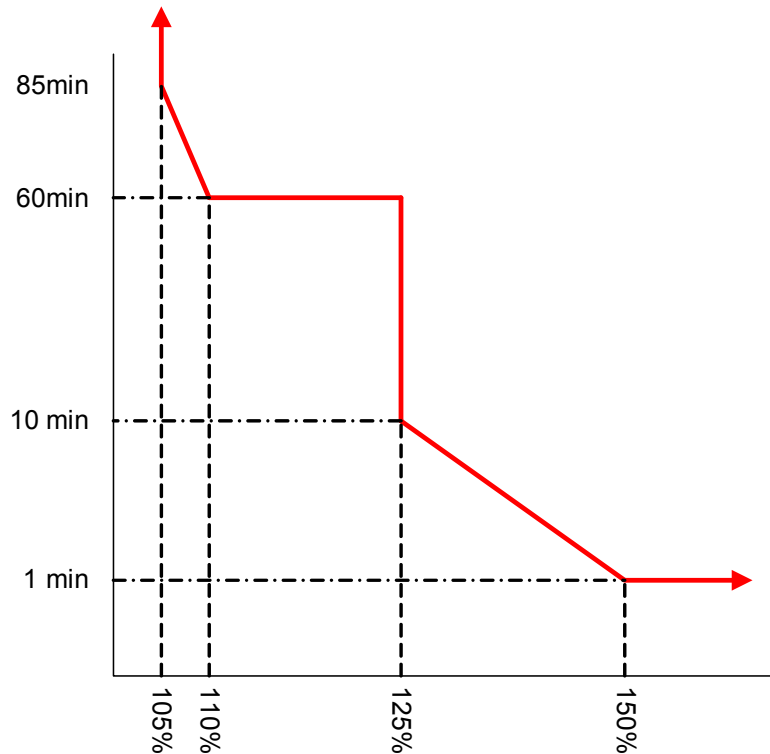
- Determines what overload conditions can be sustained without a transfer to bypass.
- Initiates an automatic transfer to bypass to sustain an overload or when selected faults occur.
- Can initiate an automatic retransfer to the UPS after an overload has been cleared.
- Initiates an automatic transfer to bypass and emergency module shutdown when specified UPS faults occur.

2.17.1 Overloads (Without Transfer)

The UPS system is capable of sustaining full output voltage ($\pm 2\%$ of the nominal voltage) for overload conditions that remain within (under) the current versus time curve of overload capacity (**Figure 17**). Note that the time scale is not linear.

Whenever an overload condition occurs, you should determine the cause of the overload. If an overload condition exceeds the overload capacity, the UPS system initiates an automatic load transfer to the System bypass.

Figure 17 Current-versus-time curves of overload capacity



2.17.2 Automatic Transfers to Bypass (Overload Condition)

The UPS system will initiate an automatic load transfer to the System bypass if an overload condition exceeds the current-versus-time curve of overload capacity or if specified UPS system faults occur.

The Overload Transfer and Output Undervoltage alarm messages will initiate an automatic transfer to System bypass and the Load On Bypass message will be displayed. The active event window will display the Automatic Transfer to Bypass message. Other UPS system faults will initiate an automatic transfer to bypass followed immediately by the shutdown and isolation of the UPS system. Refer to **2.17.3 - Automatic Transfers to Bypass, UPS System Faults**.

In an automatic transfer to bypass the output and bypass circuit breakers do not overlap as they do in a manual transfer. The static bypass switch is fired (closed), the output circuit breaker is opened (UOB), and the bypass circuit breaker (SBB) is closed. Bypass power is supplied to the critical load through the static bypass switch during the short time while both circuit breakers are open.



NOTE

A load transfer to the bypass line will be completed whenever an automatic transfer to bypass is initiated. If the OK to Transfer condition is present, the load transfer will be uninterrupted. If the Static Switch Unable alarm message is present for any reason, the automatic transfer will be interrupted for 40 to 120 milliseconds. Because of the reliability of the UPS components, an interrupted load transfer is a very unlikely occurrence.

2.17.3 Automatic Transfers to Bypass, UPS System Faults

For specified UPS system faults, the control logic will initiate an automatic transfer to System bypass followed immediately by a shutdown and isolation of the UPS system. The UPS output, battery (MBD) and input circuit breakers are open.

The following UPS system faults will initiate an automatic transfer to bypass:

- DC Overvoltage Shutdown
- Hardware Shutdown
- Inverter Fault
- Low-Battery Shutdown
- Output Overvoltage
- Overload Shutdown
- Overtemperature Timeout
- Rectifier Fuse Blown
- Reverse Power

Refer to **Table 4** for more information about these alarm messages.



NOTE

A load transfer to the bypass line will be completed whenever an automatic transfer to bypass is initiated and the bypass line is available. If the OK to Transfer condition is present, the load transfer will be uninterrupted. If the Static Switch Unable alarm message is present for any reason, the automatic transfer will be interrupted for 40 to 120 milliseconds. Because of the reliability of the UPS components, an interrupted load transfer is a very unlikely occurrence.

Some installations may include a Remote Emergency Power Off mode that can be initiated automatically by a contact closure in the critical load equipment. Refer to **2.14.5 - Remote Emergency Power Off—Optional**.

2.17.4 Automatic Retransfers to UPS

The following critical bus conditions must be present to initiate an automatic retransfer of the critical load from the bypass source to the UPS inverter:

1. Critical load was initially transferred to the bypass source due to a system overload only. A manual retransfer from bypass is required if the transfer to bypass was caused by any condition other than output overload.
2. Overload has since dropped below 100% of the rated load.
3. Both the UPS's Input and the Battery (MBD) circuit breakers have remained closed since the overload transfer.
4. OK to Transfer signal received from the control logic for at least 10 seconds, within 5 minutes of the system overload transfer. A manual retransfer from bypass is required for overloads lasting 5 minutes or more.
5. Cyclic-type overloads, which occur up to five (select range is 0 to 5) times in 60 minutes, are automatically returned to the inverter for each event including the Nth overload.



NOTE

If you do not want the UPS system to initiate any automatic retransfers, this can be set during the initial commissioning or by calling your local Liebert Services representative.

3.0 OPTIONS



NOTE

These items must be enabled by service before they become functional. If a feature is disabled, the feature will not be available and the menu item will not be displayed.

3.1 Input Contact Isolator Board

The Input Contact Isolator Board (ICI) provides a Liebert NXL module interface for up to eight external user alarm or message inputs to be routed through the NXL's alarm network. The eight contacts are normally open dry contacts. When a contact closes, an event is triggered.



NOTE

Up to two (2) ICI's can be installed in a Liebert NXL.

The Input Contact Isolator options are configured through the Input Contact Isolator dialog box, which is accessed from the Internal Option Settings under Config dialog box on the HMI touchscreen display. The Input Contact Isolator dialog box contains eight choices to match the eight channel input board. You can label each button to identify the event associated with the contact. When the dialog box is accessed, each button flashes to display the Input Contact Isolator number and the user entered label. This label also appears in the Display Panel when an event related to an Input Isolator Connector is triggered.

The Input Contact Isolator dialog box allows you to:

- Label the input contact assignments for your setup.
- Set the delay for an external event triggering an alarm.
- Review the isolator contact assignments, once the labels are entered.

The delay allows setting the number of seconds that a condition must exist before it will trigger an alarm. To configure the Input Contact Isolator relays:

1. Press **Internal Option Settings** from the **Config** menu.
2. Press which Input Contact Isolator to be configured. The Input Contact Isolator dialog box is displayed.

Figure 18 Input contact isolator dialog box

Channel	Custom	Pre-assigned	Contact Name	Delay	Delay Value
Ch #1	Custom	Pre-assigned	Input Contact 11	Delay	0.0
Ch #2	Custom	Pre-assigned	Input Contact 12	Delay	0.0
Ch #3	Custom	Pre-assigned	Input Contact 13	Delay	0.0
Ch #4	Custom	Pre-assigned	Input Contact 14	Delay	0.0
Ch #5	Custom	Pre-assigned	Input Contact 15	Delay	0.0
Ch #6	Custom	Pre-assigned	Input Contact 16	Delay	0.0
Ch #7	Custom	Pre-assigned	Input Contact 17	Delay	0.0
Ch #8	Custom	Pre-assigned	Input Contact 18	Delay	0.0

Buttons: Save, Cancel

- Assignment—Custom, Pre-assigned (default: “Input Contact” XY)
 - Delay, sec—0 to 99.9 (default: 0)
 - Message—Custom: 0-19 characters
3. xxxxTo assign labels for each channel:
 - a. Press **Pre-assigned** for default labels on Channels 1-6 (See **Table 1**)
 - b. For Custom labels
 1. Press **Custom** to unique labels.
 2. Click on **Input Contact XX** button. A keyboard is displayed to allow naming alarms.
 3. Enter the name of the alarm set for that input. For example, a fan problem could be indicated by naming the button FAN.
 4. Press OK on the keyboard to keep your label.
 4. Press **DELAY**.
 - a. A keypad is displayed prompting you for a delay time, in seconds, for a condition to exist before the alarm is triggered.
 - b. Enter the delay value. The range for the values are from 0 (zero) to 99.9 seconds.
 - c. Press OK on the keypad to keep your setting. The value you entered is displayed in the field adjacent to the corresponding input contact.
 5. Repeat **Steps 3** and **4** for each input contact.
 6. Press **SAVE** after you have configured all input contacts.
Be sure to press Save even if you have accessed this dialog only to change a setting.
 7. This information is not saved if control power is removed.

Table 1 Input Contact Isolator Board pre-assigned values

Channel Number	ICI #1 Pre-Assigned Label	ICI #2 Pre-Assigned Label
1	Reduced Rect ILimit	Stop Battery Charge
2	Reduced Batt ILimit	Stop Battery Charge
3	Stop Battery Charge	Stop Battery Charge
4	Inhibit Rect Restr	Stop Battery Charge
5	Inhibit Byp Restr	Stop Battery Charge
6	Inhibit Inv Restr	Stop Battery Charge

3.2 Programmable Relay Board

The Programmable Relay Board (PRB) provides a means to trigger an external device when an event occurs in the Liebert NXL. Each PRB has eight channels. Each channel has two sets of Form-C dry contacts, rated at either 1A @ 30VDC or 250mA @ 125VAC.

Any alarm/event can be programmed to any channel or channels. Up to four (4) events can be programmed to a relay. If multiple events are grouped to one relay, group the events logically to simplify troubleshooting when an event is triggered. The same alarm/event can be programmed to more than one channel. Up to two Programmable Relay Boards can be installed in the Liebert NXL for a total of 16 channels. Programming is performed through the HMI touchscreen display.



NOTE

Up to two (2) PRB's can be installed.

Table 2 Programmable Relay Board pinout

Terminal Block	Channel	Pin No.	Closed	Normally Closed	Normally Open		
TB1	CH1	A	1-3	1	2	3	
		B	4-6	4	5	6	
	CH2	A	7-9	7	8	9	
		B	10-12	10	11	12	
	CH3	A	13-15	13	14	15	
		B	1-3	1	2	3	
TB2	CH4	A	4-6	4	5	6	
		B	7-9	7	8	9	
	CH5	A	10-12	10	11	12	
		B	13-15	13	14	15	
	TB3	CH6	A	1-3	1	2	3
			B	4-6	4	5	6
CH7		A	7-9	7	8	9	
		B	10-12	10	11	12	
TB4	CH8	A	13-15	13	14	15	
		B	1-3	1	2	3	

N.O. = Normally Open; N.C. = Normally Closed; C = Common

Note: Pin 16 not used on TB1, TB2, and TB3.

3.2.1 Configuring the Programmable Relay Board Settings

1. Press **Internal Option Settings** from the **Config** menu.
2. Press which Programmable Relay Board will be configured. The Programmable Relay Board dialog box is displayed.
3. Press the Relay channel
4. Press up to four (4) events. Selected events will show up under Relay 1 Assignment.

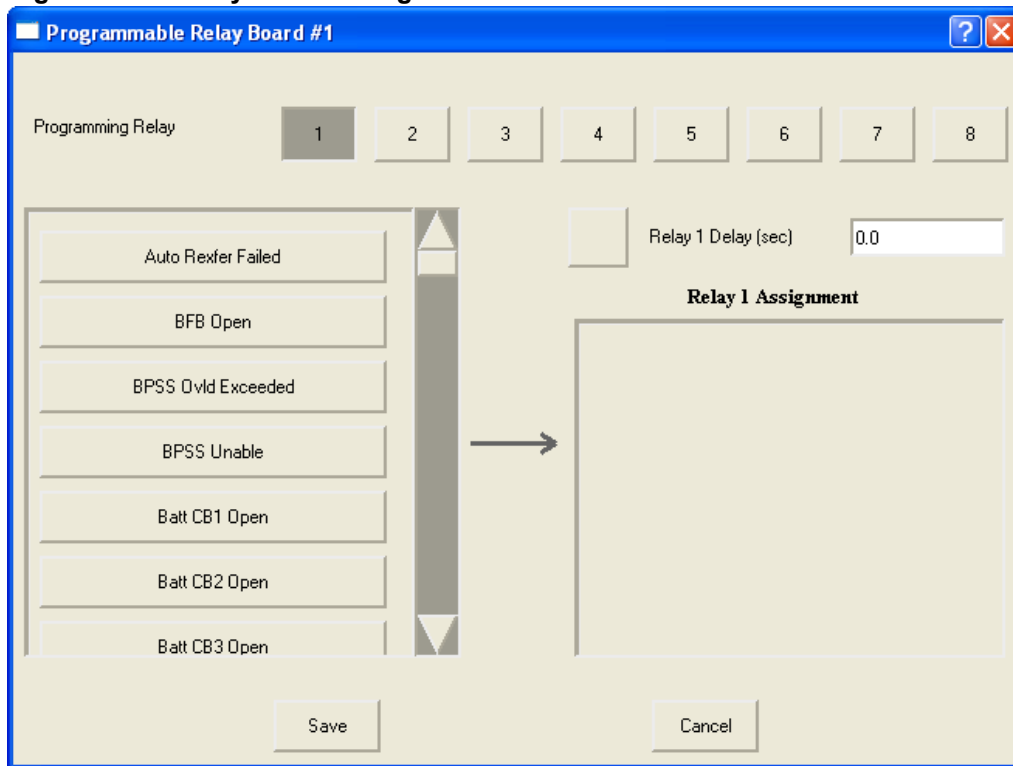


NOTE

To deselect an event, click on the event.

5. Repeat **Steps 3** and **4** for each relay.
6. Press **SAVE** to keep the settings.

Figure 19 Programmable relay board dialog box



- Assignment—0 to 4 event (default: 0)
- Delay, sec—0 to 99.9 (default: 0)

3.3 Remote Alarm Status Panel (RAS)

The Remote Alarm Status Panel (RAS) uses LED status indicators that allow the operator to monitor the UPS.

The main purpose of the Remote Alarm Status Panel option is to report the status of the load and the UPS. To interpret the LED indicators, see **Table 3**.

Table 3 RAS indicators

LED Name	LED Color	Meaning
Load on UPS	Green	The load is fully protected and no alarm conditions are present. The UPS is supplying uninterrupted power to the load.
Load on Bypass Alarm	Red	Power to the load is bypassing the UPS. The UPS is no longer supplying power to the load.
Battery Discharge Alarm	Red	The battery is providing power to the UPS.
Low Battery Reserve Alarm	Red	Battery capacity is low and has reached the low-battery alarm setting.
Overload	Red	System load has exceeded the system rating.
Ambient Overtemp	Red	UPS inlet cooling air temperature has exceeded the specified limits.
System Summary Alarm	Red	An alarm has occurred at the UPS.
New Alarm Condition	Red	A second alarm has occurred at the UPS. The New Alarm Condition LED lights when the UPS Alarm Condition LED has been triggered and has not been reset.

The RAS also includes:

1. An audible alarm
2. Lamp Test/Reset push button to test the LED indicators
3. Audio Reset push button to silence an audible alarm

3.3.1 Lamp Test/Reset Push Button

The Lamp Test/Reset push button is used to verify that each LED indicator is in working condition and to reset an LED indicator that has been triggered by a condition at the load or UPS.

To test the LEDs, press the Lamp Test/Reset push button. This lights all of the LED indicators for visual inspection.

If an LED indicator does not respond to the lamp test, contact your local Emerson Network Power representative for assistance.

To reset an activated LED, press the Lamp Test/Reset push button after having received and corrected the associated alarm condition.

3.3.2 Audio Reset Push button

The Audio Reset push button is used to silence an audible alarm that has been triggered and reset the alarm to activate on the next alarm condition.

After correcting the alarm condition, press the push button to reset the audible alarm.

3.4 Load Bus Sync

Load Bus Sync—Enable/Disable (default: disable). Refer to SL-30105, available at the Liebert Web site, www.liebert.com, for details of LBS operation.

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APPENDIX A - UPS ALARM AND STATUS MESSAGES

Table 4 shows alarm and status messages as they appear in Liebert NXL's touchscreen and in the history log, along with a description and recommended actions, if any.

If the recommended action fails to correct the condition, contact your factory-authorized service provider.

The "Service Telephone Number" can be found by pressing "CONFIG," "Ratings," "More>>" on the menu bar.

Table 4 Liebert NXL alarm and status messages

Event Message	Event Definition	Recommended Action
Auto Restart Fail	An Automatic Restart was enabled but has failed to complete. With Automatic Restart enabled, the unit automatically restarts after an End of Discharge (EOD) event. This alarm means that one of the auto restart requirements was true, but failed before the restart sequence completed. For example, one conditional requirement for Automatic Restart to occur is that the Rectifier Input Voltage must be within acceptable limits. If, during the restart sequence, the input voltage drops out of tolerance, the Automatic Restart will fail. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Press "SILENCE" to silence the audible alarm. Check the active events to determine the status of the UPS. If "Auto Restart Fail" is the only alarm present, attempt a manual start of the unit by pressing "Startup," "Manual Start," then following the prompts to attempt to place the unit back online. If the manual start fails, or if there are other alarms present that won't clear, contact your factory-authorized service provider.
Auto Rerfer Failed	The condition that caused an automatic transfer to bypass failed to clear within a specified time delay. An example of a recoverable transfer (one which the controls may attempt to recover from automatically) is an overload that exceeded the overload time curve.	Press "SILENCE" to silence the audible alarm. Press "RESET" to attempt to clear active events. This does not clear the "Auto Rertransfer Failed" alarm. If all other alarm conditions clear, attempt a manual transfer back to Inverter by pressing "Transfer," "UPS." If the transfer is successful, press "RESET" to clear this alarm from the Active Event Window. If the UPS fails to transfer and the active messages do not explain the reason, contact your factory-authorized service provider.
Batt CB "#" Open	Battery Circuit Breaker "#" is open. This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal. (The Liebert NXL has eight battery circuit breakers.)	Press "SILENCE" to silence the audible alarm. Check the status of Battery Circuit Breaker "#". If it is open, the alarm is normal. If Battery Circuit Breaker "#" is closed, contact your factory-authorized service provider.

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Batt Discharging	<p>The UPS is on battery. The most common reason for going to battery is a loss of rectifier input power (power outage). This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Observe the One-Line Display. If the input line is orange, black, or gray, the battery discharging condition is normal. If the input line on the One-Line Display is green, check the Active Event Window for potential fault conditions that could explain why the UPS is on battery. An example of this could be "Rectifier Fault." Monitor the UPS during the battery discharge. The display shows the discharge curve of the battery. When the Battery Voltage Line touches the End of Discharge Line, the UPS shuts down. Check the bypass line on the One-Line Display. If the line feeding the Static Bypass Switch (BPSS) is green, the unit can be transferred to bypass by pressing "Transfer," "Bypass" to transfer the load to the bypass source. Note that transferring to bypass could expose the load to an outage if the bypass source fails. If the battery is discharging because of a fault such as "Rectifier Fault" in the Active Event Window rather than an actual power outage, transfer to bypass if available, and contact your factory-authorized service provider.</p>
Batt Equalizing	<p>The batteries are being equalized. Battery equalization stops automatically based on the Equalize Time Setting. This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal.</p>	<p>In normal operation, no user response is required. Equalize charge can be terminated at any time by pressing "Battery Management," "Manual Battery Equalize," "Stop."</p>
Batt Ground Fault	<p>Detected battery ground current exceeds the trip setting. A possible symptom that could cause this alarm is a leaking battery. This alarm has a higher detection setpoint than "Battery Ground Fault Current Warning," and if present, means that the Battery Ground Fault Current is excessive. This alarm could cause Battery Breakers to trip if the "Battery Ground Fault Trip Enable" setting is enabled.</p>	<p>Press "SILENCE" to silence the audible alarm. Are any Battery Circuit Breakers tripped? Perform a visual inspection of the batteries in the tripped string(s). Look for signs of leaking battery acid or excessively corroded battery terminals. If there are no visible signs of defective batteries, press "RESET" to try and clear the alarm. Close any open breakers one at a time, pressing "RESET" after each one to see which string is causing the alarm. The string reporting the fault, when online, will not allow the alarm to reset. Once the location is identified, or if the battery string tests are inconclusive, contact your factory-authorized service provider.</p>

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Batt Ovtemp Limit	<p>One or more of the Battery Temperature Sensors is reporting a temperature above the limit setpoint.</p> <p>There are two user-adjustable Battery Temperature Setpoints: Battery Over Temperature Warning and Battery Overtemperature Limit. The temperature in one or more battery compartments has risen above the limit setpoint.</p> <p>Depending on user settings, the controls may trip the battery breaker associated with the over temperature condition.</p>	<p>Press "SILENCE" to silence the audible alarm. Observe the One-Line Display. To identify which battery cabinet is reporting the temperature condition, press the "Battery Box" on the One-Line Display to cycle through each battery compartment or string. The temperature display is located under the voltage reading in the Battery Box.</p> <p>If the Common Battery Disconnect and/or the individual battery cabinet or string reporting the over temperature condition is tripped, check the following settings.</p> <p>Press "User Settings," "Battery Management," "Battery Temperature" to check the current Battery Temperature Setpoints. If none of the Battery Boxes on the One-Line Display exhibit a temperature in excess of the temperature setpoint in the user settings, contact your factory-authorized service provider.</p> <p>If the overtemperature limit is being reported correctly, investigate potential causes such as faulty air conditioning, or air flow blockage and resolve. Otherwise, contact your factory-authorized service provider.</p>
Batt Ovtemp Warning	<p>One or more of the Battery Temperature Sensors is reporting a temperature above the warning setpoint.</p> <p>There are two user adjustable Battery Temperature Setpoints: Battery Over Temperature Warning and Battery Overtemperature Limit. This alarm means the temperature in one or more battery compartments has risen above the warning setpoint.</p> <p>This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal</p>	<p>Press "SILENCE" to silence the audible alarm. Observe the One-Line Display. To identify which battery cabinet is reporting the temperature condition, press the "Battery Box" on the One-Line Display to cycle through each battery compartment or string. The temperature display is located under the voltage reading in the Battery Box.</p> <p>Press "User Settings," "Battery Management," "Battery Temperature" to check the current Battery Temperature Setpoints. If none of the Battery Boxes on the One-Line Display exhibit a temperature in excess of the temperature setpoint in the user settings, contact your factory-authorized service provider.</p> <p>If the overtemperature warning is being reported correctly, investigate potential causes, such as faulty air conditioning or air flow blockage and resolve. Otherwise, contact your factory-authorized service provider.</p>
Batt Self Test	<p>The UPS is performing a battery self test. The battery self test terminates automatically at the end of the test.</p> <p>Battery test settings are adjustable and can be accessed by pressing "Config," "User Settings," "Batt Mgt," "Battery Test."</p> <p>This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal.</p>	<p>During normal operation, no user response is required.</p> <p>The battery test can be terminated at any time by the user by pressing "Batt Mgt," "Manual Battery Test," "Stop."</p>
Batt Sensor Fail	<p>The controls are sensing a failed Battery Temperature Sensor.</p> <p>If a sensor reports a value outside the normal operating range of the sensor, it is considered failed.</p> <p>This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm.</p> <p>Try to identify which sensor has failed by observing the temperature reading inside the Battery Box on the One-Line Display. Cycle through all connected batteries by pressing the Battery Box on the display. Contact your factory-authorized service provider.</p>

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Batt Temp Imbalance	With more than one Battery Temperature Sensor installed, the controls are detecting too great a temperature difference between the individual sensors.	Press "SILENCE" to silence the audible alarm. To attempt to identify which sensor is reporting an inconsistent temperature or an overheating battery, observe the temperature reading inside the Battery Box on the One-Line Display. Cycle through all connected batteries by pressing the Battery Box. If it appears this alarm is due to a specific cabinet or battery string being warmer than the others, verify through investigation whether the string is actually getting warmer than the others, or if the sensor appears to be reporting incorrectly. Contact your factory-authorized service provider.
Batt Test Failed	An Automatic or Manual Battery Test Failed. The battery "Test Duration" is adjustable. The battery test fail criteria were met before the end of the timed battery test. For example, there must be at least 25% load to run the battery test. If, during the battery test the load drops below 25%, the test fails.	Press "SILENCE" to silence the audible alarm. Contact your factory-authorized service provider.
Batt Test Inhibit	The conditions required to perform an automatic battery test are not met. When the battery test is inhibited, the system delays the test for 7 days. If conditions are satisfied after 7 days, the UPS performs the battery test at that time. Examples of conditions required to run the automatic battery test are at least 20% load, all battery breakers closed, normal operation, etc.	Check the Active Event Window and investigate other events to further analyze. If there are other active events in the Active Event Window, press "RESET" to clear the events. Check the One-Line display to verify the UPS is online. Check the Module Output Meter and verify the kW load is between 20%-100%. Press the Battery Box on the One-Line Display and verify all battery strings show at least 90% charged and all battery breakers are closed. If the issue cannot be resolved, contact your factory-authorized service provider.
Batt Test Passed	The Battery Test passed.	None.
BFB Open	The Backfeed Breaker is open. The Backfeed Breaker feeds the Static Bypass Switch (BPSS). The physical location of the breaker depends on unit configuration. It may be located in the UPS, or it may be located external to the UPS. The purpose of the Backfeed Breaker is to prevent leakage current through the bypass circuit during an outage. This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal.	This status message is informational. If the breaker was not opened intentionally, or if the breaker is actually closed and this message is active, contact your factory-authorized service provider.
BPSS Ovid Exceeded	The Bypass Static Switch (BPSS) was turned off due to an extended overload. While the BPSS can sustain an overload greater than the Inverter and for a longer period of time, there are still limits on the amplitude and duration of overload that the BPSS can handle. This alarm indicates the overload was greater in amplitude and time than the BPSS can handle, and therefore shut off to prevent damage to the equipment.	Press "SILENCE" to silence the audible alarm. If CB3 is available (visible if present on the One-Line Display), close it to restore power to the load. DO NOT ATTEMPT TO CLOSE CB3 UNTIL THE SOURCE OF THE OVERLOAD IS IDENTIFIED AND ISOLATED. Once the overload source is isolated, restart the UPS by pressing "Startup," "Manual Start" and follow the prompts. If the overload condition does not clear, or the overload is cleared but the UPS does not restart, contact your factory-authorized service provider.
BPSS Unable	A problem has been detected in the Bypass Static Switch.	Press "SILENCE" to silence the audible alarm. Press "RESET" to attempt to clear the fault. Contact your factory-authorized service provider.

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Breaker Close Fail	<p>This is a summary event that informs the user that a circuit breaker that was either signaled to close or was manually closed failed to report a closed status.</p> <p>The Breaker Close Fail event indicates a mismatch between the expected state of a breaker and the reported state of the breaker.</p>	<p>Press "SILENCE" to silence the audible alarm.</p> <p>Check the One-Line Display and the Active Event Window to determine which breaker or switch is open.</p> <p>If the open breaker cannot be reset or closed, or if all breakers are closed but the One-Line Display does not agree, or the alarm cannot be cleared, contact your factory-authorized service provider.</p>
Breaker Open Fail	<p>This is a summary event that informs the user a circuit breaker that was either signaled to open or was manually opened failed to report an open status.</p> <p>The Breaker Open Fail event indicates a mismatch between the expected state of a breaker and the reported state of the breaker.</p>	<p>Press "SILENCE" to silence the audible alarm.</p> <p>Check the One-Line Display and the Active Event Window to determine which breaker or switch that should be open is still closed.</p> <p>If a breaker that should be open shows closed, or if the breaker in question actually is open but the fault is still present, attempt to clear the fault by pressing "RESET."</p> <p>If the event does not reset, contact your factory-authorized service provider.</p>
Byp Overload Ph A	<p>The critical load is greater than 110% while the UPS is on bypass. The controls may shut the unit down if the overload condition does not clear within the allotted time. Allotted time is variable, and is inversely proportional to the amplitude of the overload, i.e., the greater the amplitude of the overload, the less time the unit continues to support the load.</p> <p>This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm.</p> <p>Observe the calculated load percentage on A phase displayed on the Module Output Meter. If the A phase steady state load percentage exceeds 110%, perform the following:</p> <p>If Maintenance Bypass is available, follow Standard Operating Procedures to transfer the load to Maintenance Bypass.</p> <p>If Maintenance Bypass is not available but the system has an Internal Bypass Breaker (CB3 on the One-Line Display), close CB3. Note that depending on the severity of the overload, the possibility exists that CB3 could trip if the overload exceeds the breaker rating.</p> <p>Investigate the overload condition.</p> <p>If the Module Output Meter does not indicate an overload condition, perform the previous steps and contact your factory-authorized service provider.</p>
Byp Overload Ph B	<p>The critical load is greater than 110% while the UPS is on bypass. The controls may shut the unit down if the overload condition does not clear within the allotted time. Allotted time is variable, and is inversely proportional to the amplitude of the overload, i.e., the greater the amplitude of the overload, the less time the unit continues to support the load.</p> <p>This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm.</p> <p>Observe the calculated load percentage on B phase displayed on the Module Output Meter. If the B phase steady state load percentage exceeds 110%, perform the following:</p> <p>If Maintenance Bypass is available, follow Standard Operating Procedures to transfer the load to Maintenance Bypass.</p> <p>If Maintenance Bypass is not available but the system has an Internal Bypass Breaker (CB3 on the One-Line Display), close CB3. Note that depending on the severity of the overload, the possibility exists that CB3 could trip if the overload exceeds the breaker rating.</p> <p>Investigate the overload condition.</p> <p>If the Module Output Meter does not indicate an overload condition, perform the previous steps and contact your factory-authorized service provider.</p>

Table 4 Lieberty NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
ByP Overload Ph C	<p>The critical load is greater than 110% while the UPS is on bypass. The controls may shut the unit down if the overload condition does not clear within the allotted time. Allotted time is variable, and is inversely proportional to the amplitude of the overload, i.e., the greater the amplitude of the overload, the less time the unit continues to support the load.</p> <p>This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Observe the calculated load percentage on C phase displayed on the Module Output Meter. If the C phase steady state load percentage exceeds 110%, perform the following:</p> <p>If Maintenance Bypass is available, follow Standard Operating Procedures to transfer the load to Maintenance Bypass.</p> <p>If Maintenance Bypass is not available but the system has an Internal Bypass Breaker (CB3 on the One-Line Display), close CB3. Note that depending on the severity of the overload, the possibility exists that CB3 could trip if the overload exceeds the breaker rating.</p> <p>Investigate the overload condition.</p> <p>If the Module Output Meter does not indicate an overload condition, perform the previous steps and contact your factory-authorized service provider.</p>
Bypass Breaker (CB3) Close Fail	The bypass circuit breaker has failed to respond to a close signal.	
Bypass Breaker (CB3) Open Fail	The bypass circuit breaker has failed to respond to an open signal.	
Bypass Line Fail	The bypass source is not present.	
Bypass Not Avail	<p>This summary event indicates a problem with the detected bypass voltage. If bypass is not available, transfers to bypass are disabled. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Observe the One-Line Display. The bypass power line feeding the static switch is green when bypass power is within normal operating range. If the line feeding the static switch is orange, gray, or black, bypass voltage is out of tolerance. Also check the bypass voltage readings on the Bypass Meter. When the bypass returns to normal, this alarm clears automatically. If all indications checked above are normal and the alarm is still present, contact your factory-authorized service provider. If there is a problem indicated with the bypass voltage, investigate and resolve the issue. Examples of conditions that could cause this alarm: Unstable generator voltage; or, Bypass Feeder Breaker tripped.</p>
Bypass OF/UF	<p>The bypass frequency has exceeded the bypass frequency limit of ± 5 Hz of nominal. If this alarm is active, transfers to bypass are disabled. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Check the frequency on the Bypass Meter. If the frequency is outside the synchronization range, investigate and resolve the issue.</p> <p>This alarm is commonly the result of an uncalibrated generator, or power anomalies on the utility feed. Check bypass power for nominal limits.</p> <p>If bypass frequency appears normal, contact your factory-authorized service provider.</p>
Controller Error	<p>This is a summary event that indicates a DSP communication error.</p> <p>The Controller Error event is a fault condition that indicates a loss of communications in the controls.</p>	<p>Press "SILENCE" to silence the audible alarm. Press "RESET" to attempt to reset the fault. Contact your factory-authorized service provider.</p>

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Controls Comm Fail	<p>The Controls Communication Failure event indicates a loss of communications between the Controls and Human Machine Interface (HMI). The Controls Communication Failure event is displayed when the HMI detects a loss of communication with Controls on the Controller Area Network (CAN).</p> <p>An infrequent occurrence that resets immediately is probably not serious.</p>	<p>If the alarm does not clear, or if the alarm condition returns, contact your factory-authorized service provider.</p>
Controls Reset Required	<p>This alarm means one or more critical settings have been changed by user during UPS operation. The change(s) will not take effect until after a UPS Controls reset. This operation should only be performed by an authorized service personnel. This alarm is cleared after UPS Controls reset.</p>	<p>Press "SILENCE" to silence the audible alarm.</p>
DC Link Gnd Fault -	<p>The negative DC Bus has a ground fault. The UPS controls monitor the DC Bus negative half for a voltage imbalance caused by current flow to ground. This fault means excessive ground current is detected.</p> <p>In normal operation, with the batteries connected, the most likely cause of a current path to ground is a leaking battery.</p> <p>If your system includes an optional Battery Ground Fault Monitor, check if the Battery Ground Fault message is present also.</p>	<p>Press "SILENCE" to silence the audible alarm. Press "RESET" to clear the fault. Perform a visual inspection of the batteries. Look for signs of leaking battery acid or excessively corroded battery terminals.</p> <p>If there are no visible signs of defective batteries, open one Battery Breaker. Press "RESET" and see if the condition clears. If the condition clears, you have isolated the problem to that battery string. If the condition will not clear, repeat the test with each connected battery string.</p> <p>Once the location is identified, or if the battery string tests are inconclusive, contact your factory-authorized service provider.</p>
DC Link Gnd Fault +	<p>The positive DC Bus has a ground fault. The UPS controls monitor the DC Bus positive half for a voltage imbalance caused by current flow to ground. This fault means excessive ground current is detected.</p> <p>In normal operation, with the batteries connected, the most likely cause of a current path to ground is a leaking battery.</p> <p>If your system includes an optional Battery Ground Fault Monitor, check if the Battery Ground Fault message is present also.</p>	<p>Press "SILENCE" to silence the audible alarm. Press "RESET" to clear the fault. Perform a visual inspection of the batteries. Look for signs of leaking battery acid or excessively corroded battery terminals.</p> <p>If there are no visible signs of defective batteries, open one Battery Breaker. Press "RESET" and see if the condition clears. If the condition clears, you have isolated the problem to that battery string. If the condition will not clear, repeat the test with each connected battery string.</p> <p>Once the location is identified, or if the battery string tests are inconclusive, contact your factory-authorized service provider.</p>
EMO Shutdown	<p>An Emergency Module Off (EMO) command has been detected. The EMO signal means the front panel EMO button was pressed. A Remote EMO would display the "REMO Shutdown" alarm. In response to an EMO, the UPS transfers to Bypass and shuts off.</p>	<p>Press "SILENCE" to silence the audible alarm. Resolve the issue that precipitated the EMO. For safety, the UPS latches an EPO event. To clear the latch, press the EMO Reset pushbutton on the External Interface Board (EIB). Verify the EMO is cleared by pressing "RESET" and observing that the EPO alarm in the Active Event Window is gone. Restart the UPS by pressing "Startup," "Manual Start," and follow the prompts.</p>

Table 4 Liebert NXL alarm and status messages (*continued*)

Event Message	Event Definition	Recommended Action
EPO Shutdown	The UPS shuts down in response to an active Emergency Power Off (EPO) command.	<p>Press "SILENCE" to silence the audible alarm. Resolve the issue that precipitated the EPO. For safety, the UPS latches an EPO event. There are two ways to clear the latch:</p> <ol style="list-style-type: none"> 1. Press the EPO Reset pushbutton on the External Interface Board (EIB). 2. From HMI front panel display, press OK button when " Press OK to Reset EPO Latched signal" message is displayed in a dialog box. <p>Verify the EPO is cleared by observing the EPO alarm in the Active Event Window is gone. Restart the UPS by pressing "Startup," "Manual Start," and follow the prompts.</p>
Equip Ovtemp	This summary event indicates the UPS is nearing an over temperature condition. Depending on which sensor is reporting the high temperature, the UPS may do one of three things once the limit is reached: shut down, transfer to bypass, or transfer to battery operation. This is a potentially serious event.	<p>Investigate possible causes for a rising temperature condition, such as loss of air conditioning, airflow obstructions, etc. If the ambient temperature is high due to loss of air conditioning and cannot be addressed immediately, perform the following:</p> <ol style="list-style-type: none"> 1. Press "Transfer," "Bypass" to transfer the UPS to bypass. 2. Press "SILENCE" to silence the audible alarm. 3. Wait at least 15 minutes, then attempt to reset the alarm by pressing "RESET." 4. If the alarm clears and proper cooling has been restored to the UPS, press "Transfer," "UPS" to transfer back to UPS. <p>If this alarm is present and no external factors are affecting proper cooling of the UPS, contact your factory-authorized service provider.</p>

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
<p>Equip Ovtemp Limit</p>	<p>This summary event occurs when one or more internal temperatures have exceeded the maximum temperature setpoint. This is the second of two over temperature alarms. The first, "Equipment Overtemperature Warning," sets when the detected temperature is near the limit. The controls react to this condition in various ways, depending on which sensor is reporting the over temperature condition.</p>	<p>Press "SILENCE" to silence the audible alarm. Check the One-Line Display for system status:</p> <ol style="list-style-type: none"> 1. UPS Off <ol style="list-style-type: none"> a. If external Maintenance Bypass is available, close the Maintenance Bypass Breaker (MBB) to restore power to the load. Do not attempt to restart the UPS without first contacting your factory-authorized service provider. b. If external Maintenance Bypass is not available, but the CB3 option is visible on the One-Line Display, verify the bypass line is green and close CB3 to restore power to the load. Contact your factory-authorized service provider. 2. UPS On Bypass <ol style="list-style-type: none"> a. Verify the bypass line is green. If it is not, contact your factory-authorized service provider immediately and prepare to shut down the load. b. If external Maintenance Bypass is available, close the Maintenance Bypass Breaker (MBB) to place the load on Maintenance Bypass. Do not attempt to re-transfer to UPS without first contacting your factory-authorized service provider. c. If external Maintenance Bypass is not available, but the CB3 option is visible on the One-Line Display, close CB3. Do not attempt to re-transfer to UPS without first contacting your factory-authorized service provider. 3. UPS On Battery <ol style="list-style-type: none"> a. Verify the bypass line is green. If it is not, contact your factory-authorized service provider immediately and prepare to shut down the load. b. If the bypass line is green, press "Transfer", "Bypass", to transfer the load to bypass. c. If there is a CB3 present on the One-Line Display, close CB3. If CB3 is not present and external Maintenance Bypass is available, close the MBB to place the load on Maintenance Bypass. If both CB3 and Maintenance Bypass are present, first close CB3, then close the external MBB. If CB3 or external Maintenance Bypass is not available, shut down the UPS by pressing "Shutdown", "UPS" and contact your factory-authorized service provider.

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Excess Auto Rexfers	<p>The UPS has re-transferred too many times and is now locked on bypass.</p> <p>The UPS attempts to perform an automatic transfer back to Inverter, if the reason for the transfer to bypass is determined by the controls to be automatically recoverable; for example, a temporary overload.</p> <p>The number of times the UPS attempts to recover from an automatic transfer to bypass is limited. When the number of transfers exceeds the number allowable (default is 5 transfers per hour), the UPS remains on bypass, and display this message.</p> <p>An example of a condition that could cause this alarm is cycling load to the UPS where the peak load exceeds the overload settings. The UPS transfers on the overload, re-transfers to Inverter, then the overload returns. Once this occurs 5 times within one hour, the user must manually transfer the UPS back online.</p>	<p>Press "SILENCE" to silence the audible alarm.</p> <p>Press "RESET" to clear any active faults or alarms. Provided there are no alarms or faults still present that could prevent a transfer, press "Transfer," "UPS," to transfer back to Inverter.</p> <p>If the transfer is successful, press "RESET" to clear the alarm. Otherwise, contact your factory-authorized service provider.</p>
Excess Paralleling	<p>When the controls detect a high amplitude, short duration overload condition on the output, the static switch is turned on momentarily in parallel with the Inverter to attempt to clear the condition. If the fault clears, the controls turn off the static switch and the load remains on Inverter. This fault condition indicates the UPS pulse paralleled too many times and is now locked on bypass (auto re-transfers to Inverter are inhibited).</p>	<p>Press "SILENCE" to silence the audible alarm.</p> <p>Check the Module Output Meter and verify the output currents are normal, the kVA/kW percentages are less than 100%, and the Rexfer Timeout is 00:00.</p> <p>Verify the Inverter box on the One-Line Display is green.</p> <p>Investigate any other active alarms or faults before attempting to clear this fault.</p> <p>Press "RESET" to clear the fault.</p> <p>If the Event Window is clear, press "Transfer," "UPS" to transfer the load back to Inverter.</p> <p>If the "UPS" button is grayed out, or pressing the "UPS" button does not transfer the unit back to Inverter, or if the UPS immediately transfers back to bypass, contact your factory-authorized service provider.</p>
Fuse Fail	<p>This is a summary event that indicates a fuse has opened. There are several fuses that can cause this fault.</p> <p>The Fuse Failure event is caused by one or more fuses reporting a failed status. The UPS may or may not transfer to bypass as a result of the failed fuse.</p>	<p>Press "SILENCE" to silence the audible alarm.</p> <p>Check the One-Line Display and other indicators to determine the state of the unit and take appropriate action.</p> <p>Contact your factory-authorized service provider.</p>
Inlet Ovtemp	<p>The air flowing into the UPS is too warm.</p> <p>This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm.</p> <p>Check the Inlet Air Temperature on the One-Line Display and verify the reading is accurate, i.e. is the room temperature warmer than normal?</p> <p>If the room temperature is warmer than normal, investigate and resolve the issue.</p> <p>If the room temperature is normal, and the Inlet Air Temp reading on the One-Line Display is higher than normal, contact your factory-authorized service provider.</p>

Table 4 Lieberty NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Inp Phase Rotation	<p>The correct input phase rotation should be clockwise, or A-B-C. This alarm indicates the sensed input phase rotation is counter-clockwise. If this alarm occurs on an operational unit, it typically indicates upstream work was performed (input side) and the input wiring was connected incorrectly.</p> <p>This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Verify correct phase rotation at the input. If the phase rotation is correct, contact your factory-authorized service provider.</p>
Input Contact XY	<p>The displayed text for this alarm is dependent on settings.</p> <p>In response to this alarm, the user may see 1 of 4 possible messages:</p> <ol style="list-style-type: none"> 1. No message but the help icon (lowercase "i") is present; 2. A custom message programmed by the user; 3. "Input Contact XY" if the contact is unconfigured; 4. "Reduced Rect ILimit" if the contact is programmed as Pre-assigned. <p>If this event is active, an external signal is wired into Channel Y of Input Contact Isolator #X.</p> <p>If the display shows Case 1 above (blank message), it means the contact channel is set to default but the default message was erased.</p> <p>If the display shows Case 2, the user-programmed event is active and the displayed text is customer defined.</p> <p>If the display shows Case 3, the contact is active but was not pre-programmed (default condition).</p> <p>If the display shows Case 4, the controls force the Rectifier into Reduced Input Current Limit operation (this limits the amount of current available to charge the battery - typically during generator operation).</p> <p>This alarm message is self-clearing. When the condition is no longer present, the message and any control activity tied to the alarm will revert to normal.</p>	<p>Check the wires landed on Input Contact Isolator #X. If the signal is not active, or no wires are present, contact your factory-authorized service provider.</p>
Input Contact Interface #1 Communication Failure	<p>Input Contact Interface #1 has failed to communicate in a timely fashion.</p>	
Input Contact Interface #2 Communication Failure	<p>Input Contact Interface #2 has failed to communicate in a timely fashion.</p>	
Input Current Imbal	<p>The detected input currents are not balanced. This latching alarm indicates a potential problem in the input filter. The controls automatically open the filter contactor in response to this condition. The filter contactor must be manually closed once it opens in response to this alarm.</p>	<p>Press "SILENCE" to silence the audible alarm. Press "RESET" to attempt to clear the alarm condition.</p> <p>If the alarm clears, press "Startup," "Device Control," "Close Trap" to manually close the filter contactor.</p> <p>If the contactor remains closed, check the Input Meter and verify the input currents are balanced. If the contactor re-opens and the "Input Current Imbalance" returns, silence the alarm, leave the filter contactor open, and contact your factory-authorized service provider.</p>

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Input Current Limit	An active Input Current Limit alarm means the detected input current (RMS) exceeds the limit setpoint (default is 125%). This may be normal depending on various operating conditions, such as input voltage level, output load level, and whether the batteries have recently discharged. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Press "SILENCE" to silence the audible alarm. Observe the meters on the One-Line Display for input voltage level, battery charge/discharge current, and output load percentage kW. Investigate any abnormal readings. If the reason for the alarm cannot be determined, contact your factory-authorized service provider.
Input Disconnect (Q1) Open	The rectifier disconnect device indicates that it is in the open position.	
Input Disconnect (Q11) Open	The externally mounted input isolator indicates that it is in the open position.	
Input Filter Cycle	The Input Filter Disconnect is locked open. The Input Filter Disconnect Cycle counter has exceeded the setpoint. The Input Filter Disconnect opens automatically as determined by the disconnect settings, or because of an unusual condition. An example of a setting would be to automatically open the filter disconnect under light load conditions to improve the input power factor. An example of an unusual condition would be unbalanced currents on the input, possibly because of a suspect component in the filter itself.	Press "SILENCE" to silence the audible alarm. Attempt to manually close the disconnect by pressing "Startup," "Device Control," "Close Trap." If the condition which caused the filter disconnect to lock open is still present, it re-opens. If the disconnect cannot be manually closed or the alarm cannot be cleared, contact your factory-authorized service provider.
Input Not Avail	This summary alarm means there is a problem with input power. It is not acceptable to the Rectifier. If the unit is running normally when this event occurs, the UPS goes to battery. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Press "SILENCE" to silence the audible alarm. Examine the One-Line Display. The Rectifier input line feeding the Input Breaker should be green. If not, investigate source power to the UPS. If input power is good, and this alarm is active, contact your factory-authorized service provider.
Internal Comm Error	This is a summary event caused by an interruption in communication between the controls and a device on the Controller Area Network (CAN). The Internal Communication Error event indicates a loss of communications between the controls and an external device. The Internal Communication Error is displayed when the controls detect a loss of communication to a device on the Controller Area Network (CAN). An infrequent occurrence that resets immediately is probably not serious.	Press "SILENCE" to silence the audible alarm. Press "RESET" to clear the alarm. If the alarm cannot be reset, or if the alarm condition returns, contact your factory-authorized service provider.
Inv Overload Ph A	An overload condition is active on A phase. A phase load condition exceeds 105%. A countdown timer is displayed on the One-Line Display in response to this alarm, and indicates the time remaining until a transfer to bypass occurs. The length of time remaining until transfer is directly proportional to the severity of the overload. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Press "SILENCE" to silence the audible alarm. Check the Module Output Meter and note the A phase load percentage. If possible, reduce A phase loading. If the steady state load remains above 105%, allow the UPS to transfer to bypass and contact your factory-authorized service provider. If the displayed load percentage is less than 100% and the alarm is still active, contact your factory-authorized service provider.

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Inv Overload Ph B	<p>An overload condition is active on B phase. B phase load condition exceeds 105%. A countdown timer is displayed on the One-Line Display in response to this alarm, and indicates the time remaining until a transfer to bypass occurs. The length of time remaining until transfer is directly proportional to the severity of the overload.</p> <p>This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Check the Module Output Meter and note the B phase load percentage.</p> <p>If possible, reduce B phase loading.</p> <p>If the steady state load remains above 105%, allow the UPS to transfer to bypass and contact your factory-authorized service provider.</p> <p>If the displayed load percentage is less than 100% and the alarm is still active, contact your factory-authorized service provider.</p>
Inv Overload Ph C	<p>An overload condition is active on C phase. C phase load condition exceeds 105%. A countdown timer is displayed on the One-Line Display in response to this alarm, and indicates the time remaining until a transfer to bypass occurs. The length of time remaining until transfer is inversely proportional to the severity of the overload.</p> <p>This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Check the Module Output Meter and note the C phase load percentage.</p> <p>If possible, reduce C phase loading.</p> <p>If the steady state load remains above 105%, allow the UPS to transfer to bypass and contact your factory-authorized service provider.</p> <p>If the displayed load percentage is less than 100% and the alarm is still active, contact your factory-authorized service provider.</p>
Inv Ovld Exceeded	<p>This message is displayed in response to an overload on one or more output phases. When an overload occurs, the controls display a countdown timer that displays the time remaining until a transfer to bypass occurs. The length of the timer is inversely proportional to the amplitude of the overload. When the timer reaches zero, the UPS transfers to bypass and populates the Active Event Window with this alarm.</p> <p>This fault is non-latching. When the underlying condition is no longer present, this fault and any control activity tied directly to this fault reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Observe the load percentages for each phase on the Module Output Meter. If the load is less than 100%, attempt to transfer back to Inverter by pressing "Transfer," "UPS."</p> <p>If the transfer is successful, investigate the reason for the overload and take appropriate action.</p> <p>If the transfer is unsuccessful, contact your factory-authorized service provider.</p>
Inverter Fault	<p>This summary event indicates a potentially serious problem in the Inverter. The controls react to an Inverter fault in different ways depending on the root event that caused the fault. If bypass is available, the controls transfer to static bypass.</p> <p>A restart may or may not be possible</p>	<p>Press "SILENCE" to silence the audible alarm. Check the One-Line Display to determine the state of the UPS. If both the Rectifier and Inverter are shut off, press "RESET" to attempt to clear any latched alarms or faults.</p> <p>Attempt a restart by pressing "Startup," "Manual Start," and follow the prompts to place the UPS back in service.</p> <p>If the startup fails, contact your factory-authorized service provider.</p> <p>If the Rectifier and Inverter appear to be running, press "RESET" to attempt to clear any latched alarms or faults, then attempt a transfer by pressing "Transfer," "UPS." If the transfer is successful, contact your factory-authorized service provider.</p> <p>If the transfer is unsuccessful, contact your factory-authorized service provider.</p>
ISS SCR Shorted	<p>The controls have detected voltage on the Inverter (Line side) side of the Inverter Static Switch.</p> <p>This indicates that an SCR is shorted. With the Output SCRs turned off, there should be no voltage present inside the UPS.</p> <p>This is a non-recoverable fault, and inhibits normal start up of the UPS.</p>	<p>Press "SILENCE" to silence the audible alarm. Turn off Control Power to clear the event. Wait 5 minutes before re-applying Control Power.</p> <p>If the fault fails to clear, contact your factory-authorized service representative.</p>

Table 4 Lieberty NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
LBS Inhibited	With LBS operation enabled, conditions required to allow LBS operation are not met. Voltage or Frequency differences sensed by the LBS control are preventing the ability of LBS to function correctly. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Press "SILENCE" to silence the audible alarm. Check both Systems and verify normal operation: <ol style="list-style-type: none"> Both Systems running online on inverter; Neither System in Maintenance Bypass; No Bypass, Input, or Synchronization errors present on either system. If the cause of the alarm cannot be determined by checking both Systems, contact your factory-authorized service provider.
LBS Operating	Load Bus Synchronization (LBS) is enabled and is active. This status message informs the user that one system in an LBS system has lost its synchronization source (usually its own Bypass) and is now synchronized to the other system by the LBS controls. This status message is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Under normal circumstances, none. If this message is active, and there is no clear reason why the LBS circuit should be active, contact your factory-authorized service provider.
Leading Pwr Factor	With a load of 80% or greater, the controls have calculated the output Power Factor to be less than .95 leading. Leading Power Factors result in wasted energy. If the Power Factor is less than .95 leading, the UPS output is de-rated to compensate for output losses. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Press "SILENCE" to silence the audible alarm. Check the Output Meter readings and verify the Output Power Factor. If the displayed power factor is less than .95 leading, and the load is greater than 80%, reduce the load or investigate. Contact your factory-authorized service representative.
Load on Bypass	The load is being supplied by bypass.	None.
Load on Maint Byp	The load is on Maintenance Bypass.	None.
Low Batt Capacity	One or more battery circuit breakers are open. This alarm applies if the system includes more than one battery circuit breaker, and at least one is closed, but one or more are open. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Press "SILENCE" to silence the audible alarm. To clear this alarm, verify all battery breakers are closed. Investigate any open breakers.
Low Batt Shutdown	The Battery has reached End of Discharge (EOD). There is no longer enough energy left in the battery to run the Inverter with the current load. If bypass is available, the UPS attempts to transfer the load to bypass at EOD.	Press "SILENCE" to silence the audible alarm. Once power is restored, attempt a normal restart of the UPS. If the restart fails, contact your factory-authorized service provider.
Low Battery Warning	The battery is nearly depleted, and the unit shuts down very soon. The Low Battery Warning setpoint is adjustable under User Settings. This alarm means the calculated time remaining on battery is now less than the Low Battery Warning setpoint. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Check to see if bypass is available by observing the One-Line Display. Acceptable bypass voltage is indicated by a green power line feeding the Static Bypass Switch (BPSS) box. If bypass is available, press "Transfer," "Bypass" to transfer to bypass. If the bypass is qualified, the UPS transfers to the bypass source. If bypass is not available, prepare to shut down critical loads, or remove non-essential loads in order to extend battery run time so that critical loads may be shut down in an orderly manner.

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Low Power Factor	<p>The output power factor is low. The output power factor is less than 70% leading or lagging. A simplified explanation of power factor is the ratio of energy being supplied to energy being used by the load. For a given load, the current output of the UPS goes up as power factor decreases.</p> <p>This results in the UPS output being derated. For example, study the following: Load = 100 kw @ 480V $\text{amps} = \text{kw} \times 1000 / \text{volts} \times \text{power factor} \times 1.73$ (square root of 3) $100\text{kw} \times 1000 = 100000$ $480\text{volts} \times .9\text{PF} \times 1.73 = 747.36$ $100000/747.36 = 133.8$ amps Now, replace the .9 power factor (typical computer load power factor) with .7 power factor: $100\text{kw} \times 1000 = 100000$ $480\text{volts} \times .7\text{PF} \times 1.73 = 581.28$ $100000/581.28 = 172$ amps The load remains the same, but the current required to supply it is roughly 30% higher. The extra current is wasted energy that can result in nuisance trips of breakers, overheating of cables, and other unwanted conditions. The UPS cannot control the output power factor. This alarm is notification to the</p>	<p>Press "SILENCE" to silence the audible alarm. Evaluate the load on the UPS. For more information, contact your factory-authorized service provider.</p>
Main Control Fault	<p>The UPS has transferred to Bypass due to a loss of communications with the Main Controller. All Transfers, Startup, Shutdown, and Metering screens are locked out. The Controls attempt to reestablish communications but will not return the load to inverter automatically.</p>	<p>Press "SILENCE" to silence the audible alarm. Contact your factory-authorized service provider. If communications are reestablished, the One-Line Display will be restored; however, Liebert does not recommend attempting to return the load to inverter until a service visit has been made and action taken to determine why the fault occurred. Action will involve resetting the UPS controls by removing and then reapplying control power. Therefore, it will be necessary to utilize maintenance bypass, either by closing the optional CB3 internal bypass breaker, or by closing the optional external Maintenance Bypass Breaker (MBB). Liebert does not recommend the user, or operator, attempt this without first speaking with an authorized service associate from Liebert.</p>
Maintenance Bypass Breaker (MBB) Open	<p>The maintenance bypass breaker indicates that it is in the open position</p>	
Man Rexfer Inhibit	<p>This summary event means the conditions required to perform a manual transfer to Inverter (online) are not met (Inverter must be in sync with bypass). This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal.</p>	<p>The condition clears from the Active Event Window when manual re-transfers are enabled. A possible reason for this condition is an unstable generator. If the generator frequency is not stable, or not at 60 Hz, the Inverter may have difficulty maintaining or acquiring synchronization with the bypass source. To check the synchronization of the Inverter to bypass, click "Transfer" and observe the synchroscope. A non-sync condition is indicated by a varying phase angle error, rather than a stable "0" degree indication. If the unit is not on generator, and the bypass voltage otherwise appears normal, contact your factory-authorized service provider.</p>

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Manual Xfer Inhibit	<p>This summary event means the conditions required to perform a manual transfer to bypass are not met (Inverter must be in sync with bypass).</p> <p>This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal</p>	<p>The condition clears from the Active Event Window when manual transfers are enabled.</p> <p>A possible reason for this condition is an unstable generator. If the generator frequency is not stable, or not at 60 Hz, the Inverter may have difficulty maintaining synchronization with the bypass source.</p> <p>To check the synchronization of the Inverter to bypass, click "Transfer" and observe the synchroscope. A non-sync condition is indicated by a varying phase angle error, rather than a stable "0" degree indication.</p> <p>If the unit is not on generator, and the bypass voltage otherwise appears normal, contact your factory-authorized service provider.</p>
Max Load Alarm Ph A	<p>The user adjustable maximum load alarm threshold was exceeded. This is a "notification only" type alarm, meaning the UPS takes no action other than sounding an audible alarm based on this setpoint. The setting allows the user to monitor the load status of the UPS.</p> <p>For example, if the current load on Phase A is 50%, the user can set this setpoint to 80% and an alarm is received if the added load exceeds 80%. The alarm may also be configured with a delay, to prevent nuisance alarms due to cycling loads. The alarm is self-clearing. Once the load level decreases to less than 95% of the level setting, the alarm clears.</p>	<p>Press "SILENCE" to silence the audible alarm. Check the kW load % displayed for A phase. To check the setpoint for the alarm, press "Config," "User Settings," "Adjustable Setpoints," "Max Load Alarm."</p> <p>Compare the setpoint to the displayed load percentage. If the load percentage displayed is correct and the value exceeds the setpoint, raise the setpoint to clear the alarm, or reduce the load below the setpoint.</p> <p>Contact your factory-authorized service provider.</p>
Max Load Alarm Ph B	<p>The user adjustable maximum load alarm threshold was exceeded. This is a "notification only" type alarm, meaning the UPS takes no action other than sounding an audible alarm based on this setpoint. The setting allows the user to monitor the load status of the UPS.</p> <p>For example, if the current load on Phase B is 50%, the user can set this setpoint to 80% and an alarm is received if the added load exceeds 80%. The alarm may also be configured with a delay, to prevent nuisance alarms due to cycling loads. The alarm is self-clearing. Once the load level decreases to less than 95% of the level setting, the alarm clears.</p>	<p>Press "SILENCE" to silence the audible alarm. Check the kW load % displayed for B phase. To check the setpoint for the alarm, press "Config," "User Settings," "Adjustable Setpoints," "Max Load Alarm."</p> <p>Compare the setpoint to the displayed load percentage. If the load percentage displayed is correct and the value exceeds the setpoint, raise the setpoint to clear the alarm, or reduce the load below the setpoint.</p> <p>Contact your factory-authorized service provider.</p>
Max Load Alarm Ph C	<p>The user adjustable maximum load alarm threshold was exceeded. This is a "notification only" type alarm, meaning the UPS takes no action other than sounding an audible alarm based on this setpoint. The setting allows the user to monitor the load status of the UPS.</p> <p>For example, if the current load on Phase C is 50%, the user can set this setpoint to 80% and an alarm is received if the added load exceeds 80%. The alarm may also be configured with a delay, to prevent nuisance alarms due to cycling loads. The alarm is self-clearing. Once the load level decreases to less than 95% of the level setting, the alarm clears.</p>	<p>Press "SILENCE" to silence the audible alarm. Check the kW load % displayed for C phase. To check the setpoint for the alarm, press "Config," "User Settings," "Adjustable Setpoints," "Max Load Alarm."</p> <p>Compare the setpoint to the displayed load percentage. If the load percentage displayed is correct and the value exceeds the setpoint, raise the setpoint to clear the alarm, or reduce the load below the setpoint.</p> <p>Contact your factory-authorized service provider.</p>
MBD Open	<p>The Module battery disconnect is open. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Check the status of Module Battery Disconnect (MBD). If it is open, the alarm is normal. If the Module Battery Disconnect is closed, contact your factory-authorized service provider.</p>

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Multiple Fan Fail	This summary event is active when more than one fan has failed.	Press "SILENCE" to silence the audible alarm. Press "RESET" to clear the alarm. If the alarm will not clear, contact your factory-authorized service provider.
On Gen Active	The UPS input source is generator. An external signal is being used to inform the UPS when the power source is generator rather than utility, and the signal is active. This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal.	Under normal conditions, no user action is required. If the UPS is not actually on generator and this message is active, contact your factory-authorized service provider.
Outlet Ovtemp Limit	The difference between the inlet air temperature and the outlet air temperature is too great. This alarm means excessive heat is being generated internally resulting in a higher than normal exhaust air temperature. If the Bypass is within limits, the UPS reacts to this alarm by transferring to Bypass and shutting off the Inverter. This alarm is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Press "SILENCE" to silence the audible alarm. Check the Inlet Air Temperature on the One-Line Display and verify the reading is accurate, i.e. is the room temperature warmer than normal? If the room temperature is warmer than normal, investigate and resolve the issue. If the room temperature is normal, and the Inlet Air Temp reading on the One-Line Display is higher than normal, contact your factory-authorized service provider.
Output Fault	This summary event occurs when the detected system output exceeds acceptable limits in either voltage or frequency. If the UPS was on Inverter at the time of the event, the UPS transfers to bypass provided the bypass voltage is available. If the UPS was on bypass at the time of the event, the UPS shuts down rather than allowing unacceptable voltage to reach the load.	Press "SILENCE" to silence the audible alarm. Check the Active Event Window and investigate other events to further analyze. Press "RESET" to attempt to reset any latched events. Check the One-Line Display to determine the system status (on UPS, Bypass, or Off). Check the input and bypass (dual input only) and observe the One-Line color. Green indicates good power present, orange means power is present but outside nominal range, and gray means power is not present. If the load is off and the input voltage is ok, attempt to restart the UPS by pressing "Startup," "Manual Start," and follow the prompts. If the Input Meter indicates input or bypass is not available, investigate and resolve the power problem. If the load is on bypass and all alarms are reset, press "Transfer," "UPS," to attempt to transfer back to Inverter. If the issue cannot be resolved, contact your factory-authorized service provider.

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Rectifier Fault	<p>This summary event indicates a potentially serious condition in the Rectifier circuit. The controls respond to this by turning off the Rectifier, opening the input filter contactor, and placing the UPS on battery operation. This fault is non-latching. When the underlying condition is no longer present, this fault and any control activity tied directly to this fault reverts to normal.</p>	<p>Observe the One-Line Display and the Active Event Window for current UPS condition - On Battery? Observe the color of the Bypass Line on the One-Line Display. If green, bypass is available. This is significant, because if the batteries fail, the UPS transfers safely to the bypass line.</p> <p>If the UPS is on battery, and the bypass line on the One-Line Display is not green, contact your factory-authorized service provider immediately and prepare to shut down as the UPS turns off once the batteries are depleted. Press "SILENCE" to silence the audible alarm.</p> <p>Press "RESET" to attempt to clear the fault condition. If the Rectifier Fault clears, press "Startup," "Manual Start," "Rectifier" to attempt to restart the Rectifier.</p> <p>If this is successful, observe normal operation of the Rectifier, indicated on the One-Line Display by a green outline around the Rectifier box, and normal DC Bus voltage on the DC Bus Meter. If the Rectifier starts normally, attempt to close the input filter contactor by pressing "Startup," "Device Control", "Close Trap".</p> <p>If the UPS is not on battery, but transferred to bypass, contact your factory-authorized service provider.</p> <p>If the Rectifier Fault was cleared by pressing "RESET", but the fault returns as soon as a Rectifier restart is attempted, contact your factory-authorized service provider.</p>
Redundant Fan Fail	This alarm indicates a fan has failed	<p>Press "SILENCE" to silence the audible alarm. Contact your factory-authorized service provider.</p>
Regen Active	<p>Regeneration Mode is a service mode that is normally controlled by the service technician. Regeneration Mode Status or Alarm messages are generally intended for the service person. This status message informs the user the UPS is in Regeneration Mode.</p> <p>This status message is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Under normal circumstances, none.</p> <p>If this message is active, and there is no clear reason why the UPS is in Regeneration Mode, contact your factory-authorized service provider.</p>
Regen Failure	<p>Regeneration Mode was initiated and terminated because of an abnormal condition. Once Regeneration Mode is active, any condition, for example an Inverter Overload, other than the user manually stopping Regeneration Mode, causes this message to appear.</p> <p>Regeneration Mode is a service mode that is normally controlled by the service technician. Regeneration Mode Status or Alarm messages are generally intended for the service person. This status message informs the user the UPS is in Regeneration Mode.</p> <p>This status message is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.</p>	<p>Press "SILENCE" to silence the audible alarm. Press "RESET" to attempt to clear the alarm. If Regeneration Mode was not manually initiated by service, or if this alarm will not reset, contact your factory-authorized service provider.</p>

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Regen Terminated	Regeneration Mode is a service mode that is normally controlled by the service technician. Regeneration Mode Status or Alarm messages are generally intended for the service person. This status message informs the user that Regen Mode is no longer active. This status message is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Under normal circumstances, none. If this message is active, and there is no clear reason why the UPS was in Regeneration Mode, or if the command to terminate Regeneration Mode was not issued, contact your factory-authorized service provider.
Remote Off BPSS	The Static Bypass Switch (BPSS) was turned off by an external signal. This indicates an external signal forcing the BPSS to remain off is active. This type of signal is wired into an Input Contact Isolator and the specific channel is assigned as Remote Off BPSS. This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal.	Check the state of the Remote Off BPSS signal. If this signal is not active, or if no signal wires are present, contact your factory-authorized service provider.
Remote Off Inv	The Inverter was turned off by an external signal. This indicates an external signal forcing the Inverter to remain off is active. This type of signal is wired into an Input Contact Isolator and the specific channel is assigned as Remote Off Inverter. This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal.	Check the state of the Remote Off Inverter signal. If this signal is not active, or if no signal wires are present, contact your factory-authorized service provider.
Remote Off Rect	The Rectifier was turned off by an external signal. This indicates an external signal forcing the Rectifier to remain off is active. This type of signal is wired into an Input Contact Isolator and the specific channel is assigned as Remote Off Rectifier. This status message is self-clearing. When the condition is no longer present, the message and any control activity tied to the status event reverts to normal.	Check the state of the Remote Off Rectifier signal. If this signal is not active, or if no signal wires are present, contact your factory-authorized service provider.
REPO Shutdown	The UPS shuts down in response to an active Remote Emergency Power Off (REPO) command.	Press "SILENCE" to silence the audible alarm. Resolve the issue that precipitated the REPO. For safety, the UPS latches an REPO event. There are two ways to clear the latch: 1. Press the Reset pushbutton on the External Interface Board (EIB). 2. From HMI front panel display, press OK button when " Press OK to Reset EPO Latched signal" message is displayed in a dialog box. Verify the REPO is cleared by observing the REPO alarm in the Active Event Window is gone. Restart the UPS by pressing "Startup," "Manual Start," and follow the prompts.
Restart in Process	Automatic Restart is in progress. This message clears when the Automatic Restart sequence is complete.	To complete the Automatic Restart, follow the prompts on the display.
Restart Inhibited	Automatic Restart of the UPS is not allowed because of an external signal. Automatic Restart Inhibit is active when signaled from an external source. The signal is wired into Input Contact Interface (ICI 1).	Investigate and resolve the external signal forcing the UPS to remain off. If you do not have an ICI, or if there are no external off signals input to the UPS, contact your factory-authorized service provider.

Table 4 Liebert NXL alarm and status messages (continued)

Event Message	Event Definition	Recommended Action
Service Code Active	This event is for informational purposes, and informs the user that Service Code is currently running. This status message is self-clearing. When the condition is no longer present, the alarm and any control activity tied to the alarm reverts to normal.	Under normal circumstances, none. If this message is active, and Service Code is not loaded, contact your factory-authorized service provider.
Temp Sense Fail	An equipment temperature sensor is reporting an invalid temperature. The controls ignore temperatures from a failed sensor.	Press "SILENCE" to silence the audible alarm. Press "RESET" to clear the alarm. If the alarm cannot be reset, or if the alarm condition returns, contact your factory-authorized service provider.
Xfer to Byp Failed	An event (such as an Inverter fault) caused an attempted automatic transfer to bypass and the transfer failed. The controls detect the Static Bypass Switch (BPSS) failed to assume the load and the Inverter was off.	Press "SILENCE" to silence the audible alarm. Check the Event Log by pressing "Status Reports," "Event Log" to investigate why the UPS tried to transfer to bypass and why the BPSS failed. If CB3 is available (as displayed on the One-Line Display), close CB3 to restore power to the load. Press "RESET" to attempt to clear any latched alarms or faults. If conditions appear normal, attempt to restart the UPS by pressing "Startup," "Manual Start" and follow the prompts. Contact your factory-authorized service provider.

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SL-25514_REV0_02-09

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