



Liebert®

NXL™ Power-Tie Controls

Operation and Maintenance Manual

The information contained in this document is subject to change without notice and may not be suitable for all applications. While every precaution has been taken to ensure the accuracy and completeness of this document, Vertiv assumes no responsibility and disclaims all liability for damages resulting from use of this information or for any errors or omissions. Refer to other local practices or building codes as applicable for the correct methods, tools, and materials to be used in performing procedures not specifically described in this document.

The products covered by this instruction manual are manufactured and/or sold by Vertiv. This document is the property of Vertiv and contains confidential and proprietary information owned by Vertiv. Any copying, use or disclosure of it without the written permission of Vertiv is strictly prohibited.

Names of companies and products are trademarks or registered trademarks of the respective companies. Any questions regarding usage of trademark names should be directed to the original manufacturer.

Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures. Visit <https://www.VertivCo.com/en-us/support/> for additional assistance.

TABLE OF CONTENTS

CONTACTING VERTIV FOR SUPPORT	INSIDE FRONT COVER
IMPORTANT SAFETY INSTRUCTIONS	1
1.0 INTRODUCTION	2
2.0 OPERATION	3
2.1 Features	3
2.2 Mimic Screen	4
2.3 Metering Screen	4
2.4 Operations Screen	6
2.4.1 Startup	6
2.4.2 Move Load	8
2.4.3 Maintenance Bypass	9
2.5 Config Screen	10
2.5.1 Ratings (Read Only - Based on System Type)	10
2.5.2 Identification	11
2.5.3 Setpoints	12
2.5.4 Breakers (Read Only - Based on System Type)	14
2.5.5 Options	15
2.6 Events Screen	18
2.7 Reports Screen	18
3.0 OPERATION	19
3.1 Start the Liebert NXL Power-Tie System	19
3.1.1 Full System Startup	19
3.1.2 Adding a System	20
3.2 Transfer Loads Between UPS Systems	20
3.2.1 Types of Load Transfers	20
3.2.2 Conditions to Transfer Loads	20
3.2.3 Load Transfer Procedure	21
3.3 Maintenance Bypass Transfer	22
4.0 OPTIONAL CONTINUOUS TIE OPERATIONS	23
4.1 Conditions to Transfer Loads	23
4.2 Load Transfer Procedure	23
5.0 SPECIFICATIONS	24

FIGURES

Figure 1	Main display screen, typical	3
Figure 2	Metering display	5
Figure 3	Liebert NXL Power-Tie operation display	6
Figure 4	Liebert NXL Power-Tie system startup display	7
Figure 5	Move Load screen.....	8
Figure 6	Maintenance Bypass transfer screen.....	9
Figure 7	Ratings screen	10
Figure 8	Identification screen	11
Figure 9	Setpoints screen	12
Figure 10	Change password screen	13
Figure 11	Change backlight setting	13
Figure 12	Change date and time screen	13
Figure 13	Breakers screen	14
Figure 14	Options screen	15
Figure 15	Control wiring, Programmable Relay Board	16
Figure 16	Programmable Relay Board dialog box.....	17
Figure 17	Events screen	18
Figure 18	Reports screen	18
Figure 19	Typical Mimic screen with load transfer.....	21
Figure 20	Typical Mimic screen with load on Maintenance Bypass.....	22

TABLES

Table 1	Programmable Relay Board pinout	16
Table 2	Alarms available for Programmable Relay Board.....	18
Table 3	Liebert NXL Power-Tie Control specifications	24

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during operation and maintenance of your Liebert NXL Power-Tie equipment. Read this manual thoroughly, paying special attention to the sections that apply to your installation, before working with the unit. Retain this manual for use by operating personnel.

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 the installation manual, SL-25520, for equipment handling information and installation procedures. The manual is available at the Liebert Web site: www.liebert.com

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 manufacturer's 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 both AC and DC voltmeters 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 while it is under power, service personnel and test equipment should be standing on rubber mats. 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 Power-Tie system provides manually initiated, uninterrupted transfers of a critical load bus between two or more UPS systems.

This permits one UPS and its associated distribution system to be shut down for maintenance while another UPS continues supplying power to the load without transferring the load to bypass, protecting the load from fluctuations in the utility power supply.

The Liebert NXL Power-Tie is designed to operate in these modes.

- Normal—Each critical load is fed from its respective UPS system and the tie breakers are open. Each inverter is synchronized to its respective bypass source. Each load is supplied by its inverter, with its bypass available.
- Momentary Tie—The critical loads and the two UPSs are momentarily paralleled through a tie breaker. Both UPSs are on-line and the bypass source of one UPS is selected as the primary sync source. One of the UPS systems is selected to be isolated from the critical load.
 - A momentary tie is typically between multiple UPS systems when all UPS systems are on inverter.
 - The Liebert NXL Power-Tie allows a UPS system on inverter to be momentarily tied with another UPS system on bypass. The UPS system on bypass will be the primary sync source.
- Combined Loads—Both critical loads are running on one selected UPS system through the tie breakers with that UPS system's bypass available as the alternate source. The other UPS system is not connected to any critical load.

2.0 OPERATION

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

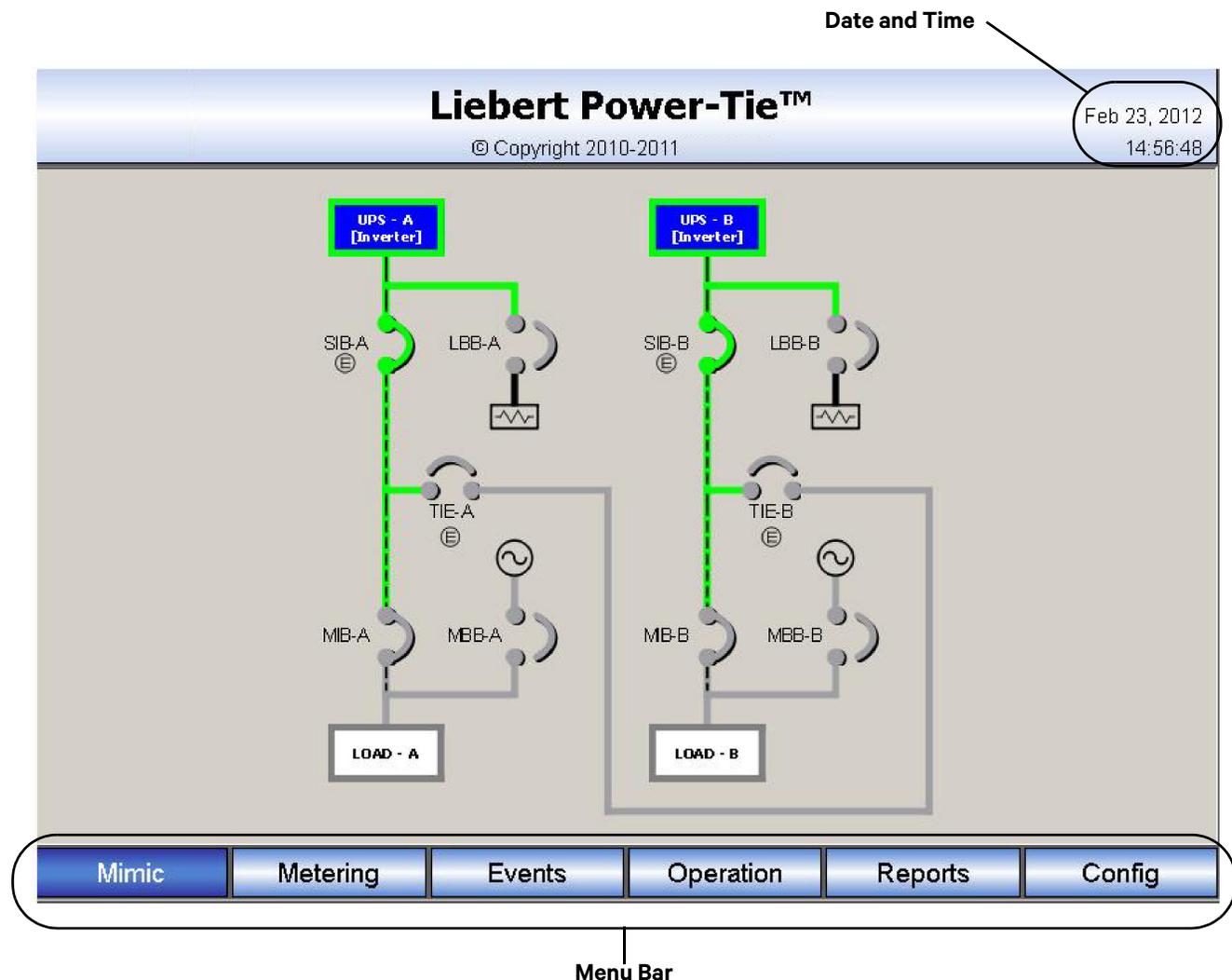
2.1 FEATURES

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
- Adjust programmable parameters (access limited by security access function)

The touchscreen has a white background and multicolor text. The display turns on automatically, but after 15 minutes of inactivity the backlight will go out and the display will dim. Touching the screen will reactivate the backlight, which 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



2.2 MIMIC SCREEN

This screen is the default view. It shows the status of the breakers in the Liebert NXL Power-Tie system, the status of each UPS and the current power flow.

Breaker Status

- SIB: System Isolation Breaker
- TIE
- MIB: Maintenance Isolation Breaker (optional)
- MBB: Maintenance Bypass Breaker (optional)
- LBB: Load Bank Breaker (optional)



NOTE

If a breaker is not present in the system, it will not be displayed on the HMI screen.

UPS Systems Status

- [Inverter]: UPS System is on Inverter
- [Bypass]: UPS System is on Static Bypass
- [Maint]: UPS System is on Maintenance Bypass

Current Power Flow

- Green: Normal
- Orange: Marginal
- Gray: Absent
- Black: Unknown

2.3 METERING SCREEN

The Metering screen displays these parameters for each system (see **Figure 2**):

- UPS System
 - Output Voltage
 - Output Amps
 - Output kW
 - Output kVA
 - Available Capacity, kW
 - Available Capacity, Amps
- Load
 - Voltage
 - Amps
 - kW
 - kVA
- Maintenance Bypass (if installed)
 - Voltage

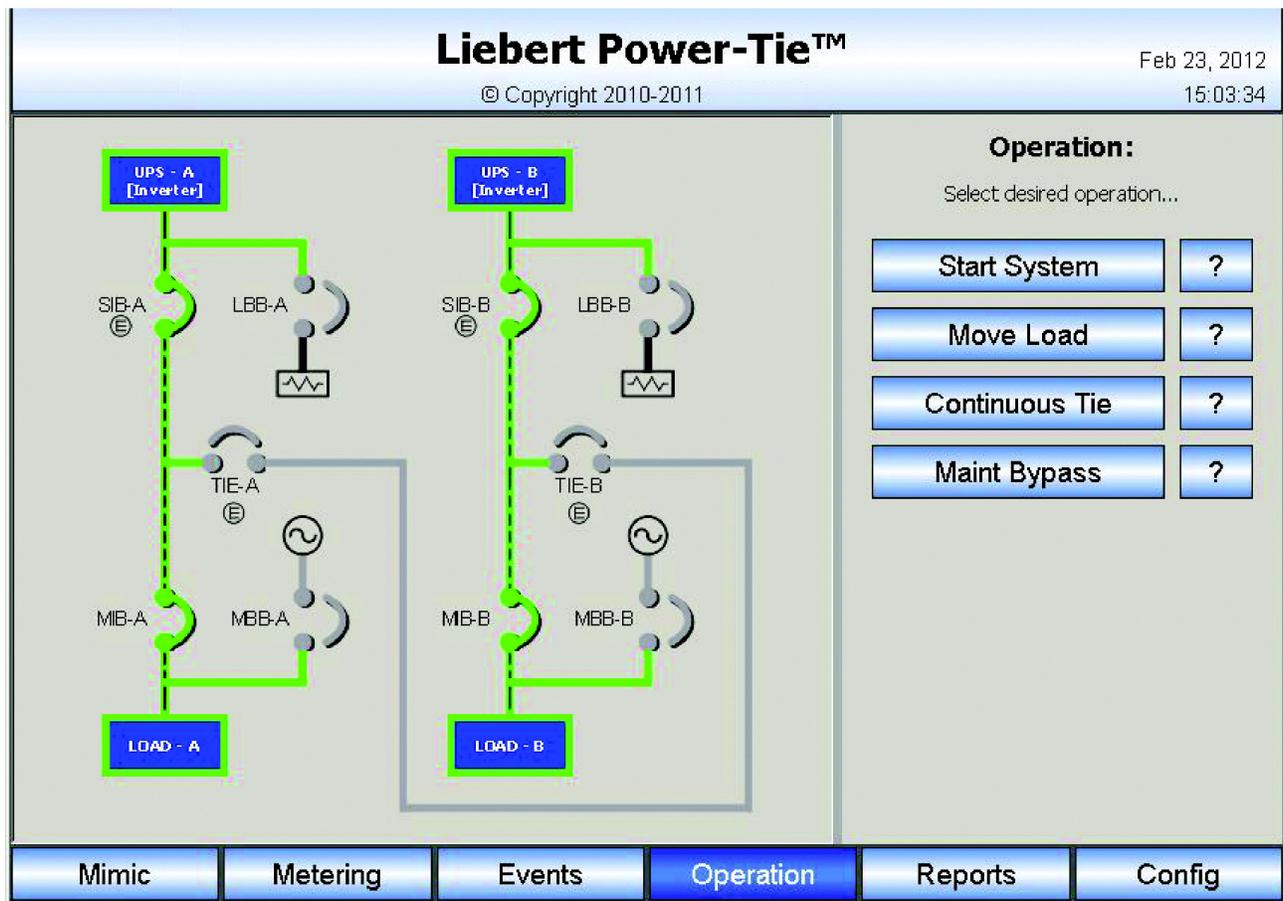
Figure 2 Metering display



2.4 OPERATIONS SCREEN

This screen allows the Liebert NXL Power-Tie system to start up, transfer load between UPS systems and transfer the load to Maintenance Bypass (if available).

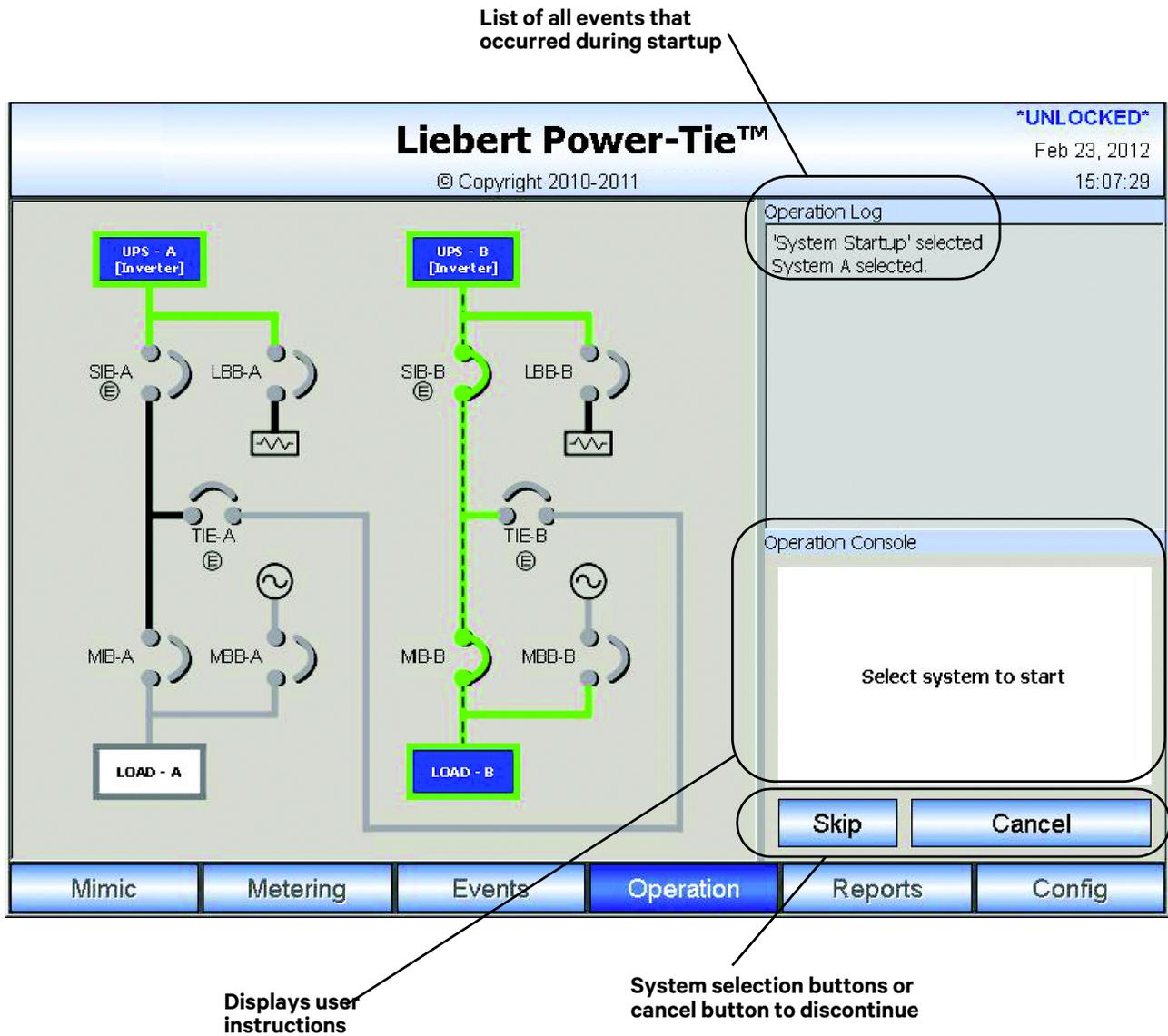
Figure 3 Liebert NXL Power-Tie operation display



2.4.1 Startup

This screen is used to start the Liebert NXL Power-Tie system (see **Figure 4**).

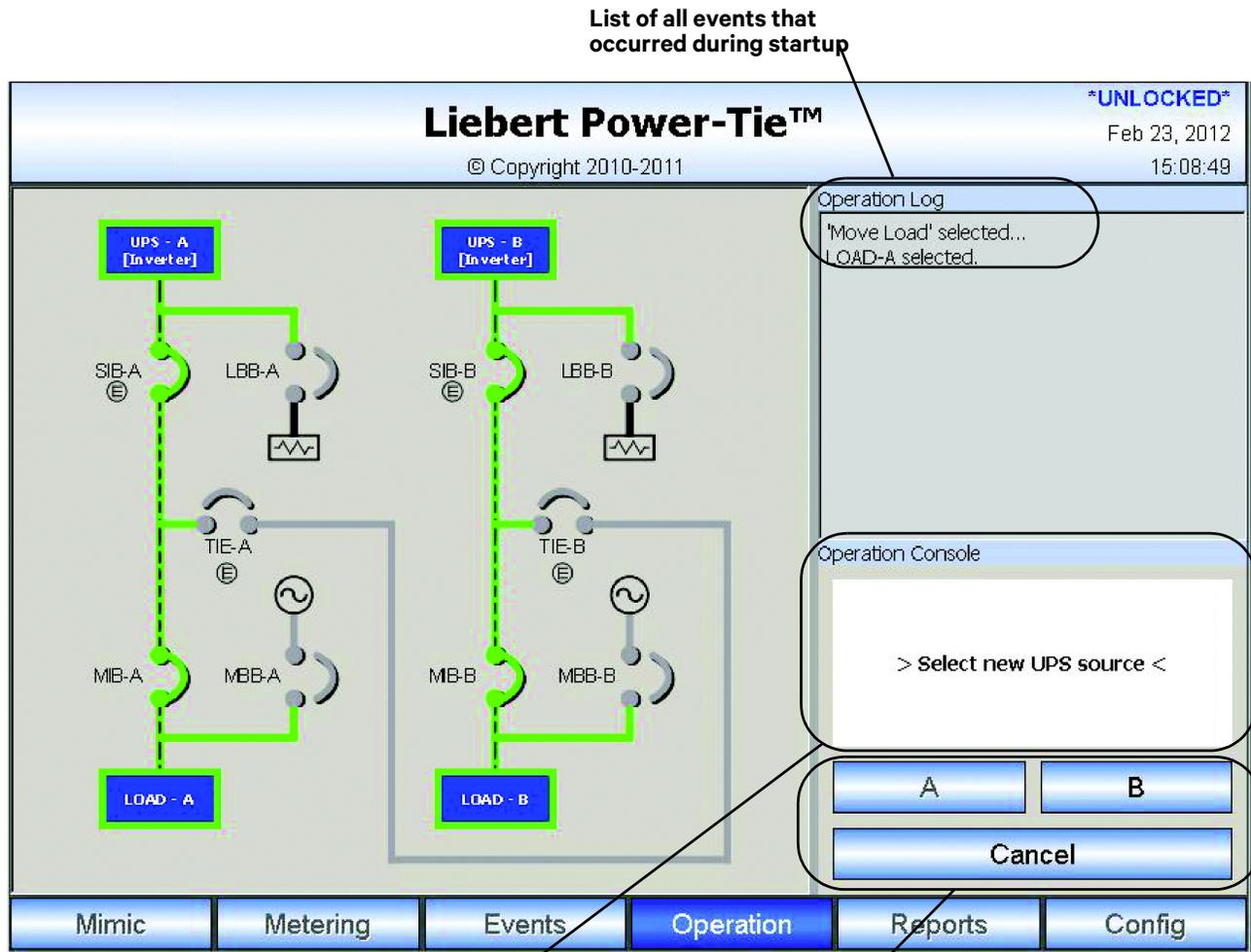
Figure 4 Liebert NXL Power-Tie system startup display



2.4.2 Move Load

This screen is used to transfer the load between UPS Systems (see **Figure 5**).

Figure 5 Move Load screen



List of all events that occurred during startup

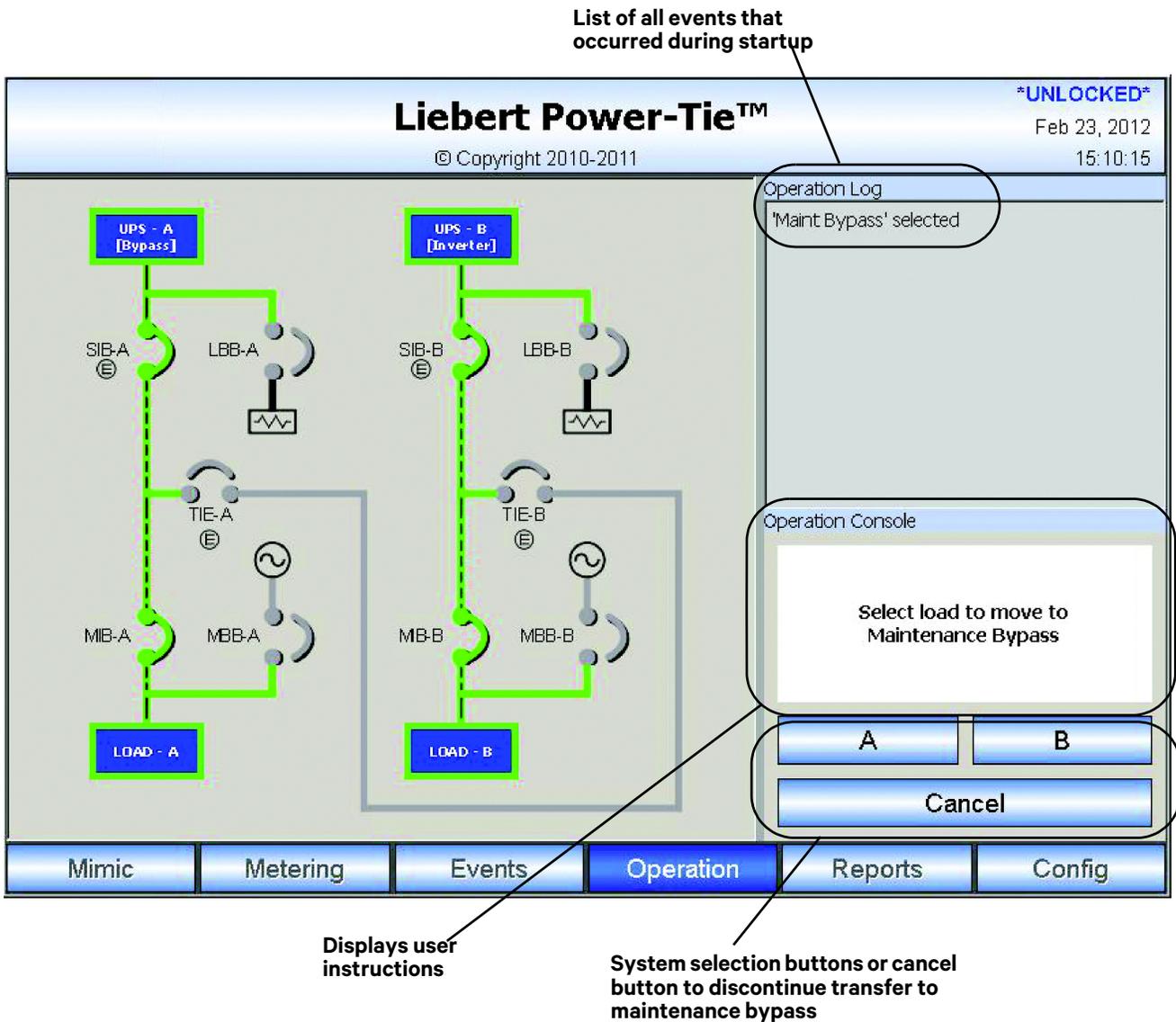
Displays user instructions

System selection buttons or cancel button to load move

2.4.3 Maintenance Bypass

If Maintenance Bypass is available, this screen may be used to transfer the load to Maintenance Bypass.

Figure 6 Maintenance Bypass transfer screen



2.5 CONFIG SCREEN

This screen allows configuring parameters for the Liebert NXL Power-Tie system. Pressing the Login button allows the user to enter the password and unlock all user available inputs. See **2.5.3 - Setpoints** for details on entering the password.

2.5.1 Ratings (Read Only - Based on System Type)

- System Type
- Rated Source Voltage
- Rated Source Current
- Rated Source Frequency

Figure 7 Ratings screen

The screenshot displays the 'Liebert Power-Tie™' configuration interface. At the top, the title 'Liebert Power-Tie™' is centered, with the date 'Feb 23, 2012' and time '15:11:16' on the right, and the copyright notice '© Copyright 2010-2011' below the title. A 'Login' button is located on the right side of the header. The main content area is a table with two columns: 'Setting' and 'Value'. The 'Ratings' section is expanded, showing the following data:

Setting	Value
System Type	Star
Rated Source Voltage	480
Rated Source Frequency	60.0
Rated Source Current	1600

Below the Ratings section, other expandable categories are listed: Identification, Setpoints, Breakers, Options, and Firmware Versions. At the bottom of the screen, a navigation bar contains buttons for Mimic, Metering, Events, Operation, Reports, and Config.

2.5.2 Identification

- System Module Number (Read Only)
- Cabinet A Serial Number (Read Only); see Note 1 below
- Cabinet B Serial Number (Read Only); see Note 1 below
- Cabinet A Location—Up to 33 alphanumeric characters (default: blank); see Note 2 below
- Cabinet B Location—Up to 33 alphanumeric characters (default: blank); see Note 2 below
- Order Number (Read Only); see Note 1 below
- Order Number (Read Only); see Note 2 below
- Service Telephone Number (Read Only)
- Site ID Number (Read Only)
- Tag Number (Read Only)



NOTE

1. If more than two systems are installed, all systems will be displayed.
2. After items have been entered, the Accept button must be pressed.

Figure 8 Identification screen

Setting	Value
⊕ Ratings	
⊖ Identification	
System Model Number	40PSAAA16MA
Cabinet A Serial Number	D123456
Cabinet B Serial Number	D567890
Cabinet A Location	DATA CENTER 2
Cabinet B Location	DATA CENTER 2
Order Number 1	12345
Order Number 2	67890
Service Telephone Number	1-800-LIEBERT
Site ID Number	
Tag Number	
⊕ Setpoints	
⊕ Breakers	
⊕ Options	
⊕ Firmware Versions	

Buttons on the right: Logout, Accept, Reject

Bottom navigation bar: Mimic, Metering, Events, Operation, Reports, Config

2.5.3 Setpoints

- User Password: Up to five alphanumeric characters; the default is *NXL* (refer to **Figure 10**)
- Backlight Brightness: Low/High; the default is *Low* (refer to **Figure 11**)
- Time & Date: Time displayed as hours, minutes and seconds (hh:mm:ss); date displayed as month, day and year (refer to **Figure 12**)
- Number of UPS Systems Installed (Read Only)



NOTE

After all items have been entered, press the Accept button to save the changes.

Figure 9 Setpoints screen

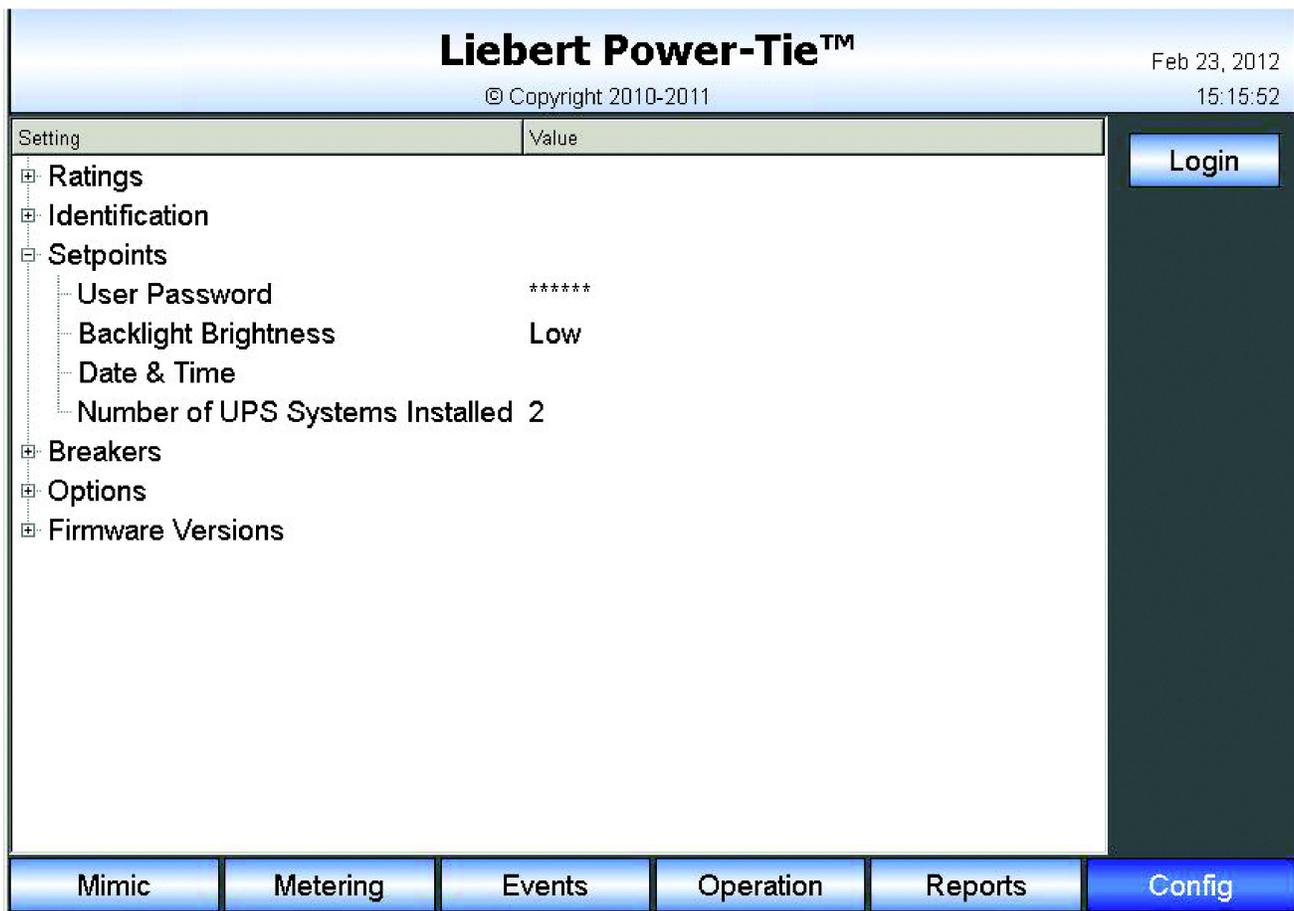


Figure 10 Change password screen



Figure 11 Change backlight setting



Figure 12 Change date and time screen



2.5.4 Breakers (Read Only - Based on System Type)

- Has SIB - Yes/No
- Has TIE - Yes/No
- Has MBB - Yes/No
- Has MIB - Yes/No
- Has LBB - Yes/No
- SIB is Electrically Operated- Yes/No
- TIE is Electrically Operated- Yes/No
- MBB is Electrically Operated- Yes/No
- MIB is Electrically Operated- Yes/No
- LBB is Electrically Operated- Yes/No

Figure 13 Breakers screen

The screenshot shows the 'Liebert Power-Tie™' configuration interface. At the top, it displays the title 'Liebert Power-Tie™', the date 'Feb 23, 2012', and the time '15:17:07'. Below the title bar, there is a 'Login' button. The main area is a table with two columns: 'Setting' and 'Value'. The 'Breakers' section is expanded, showing the following settings and values:

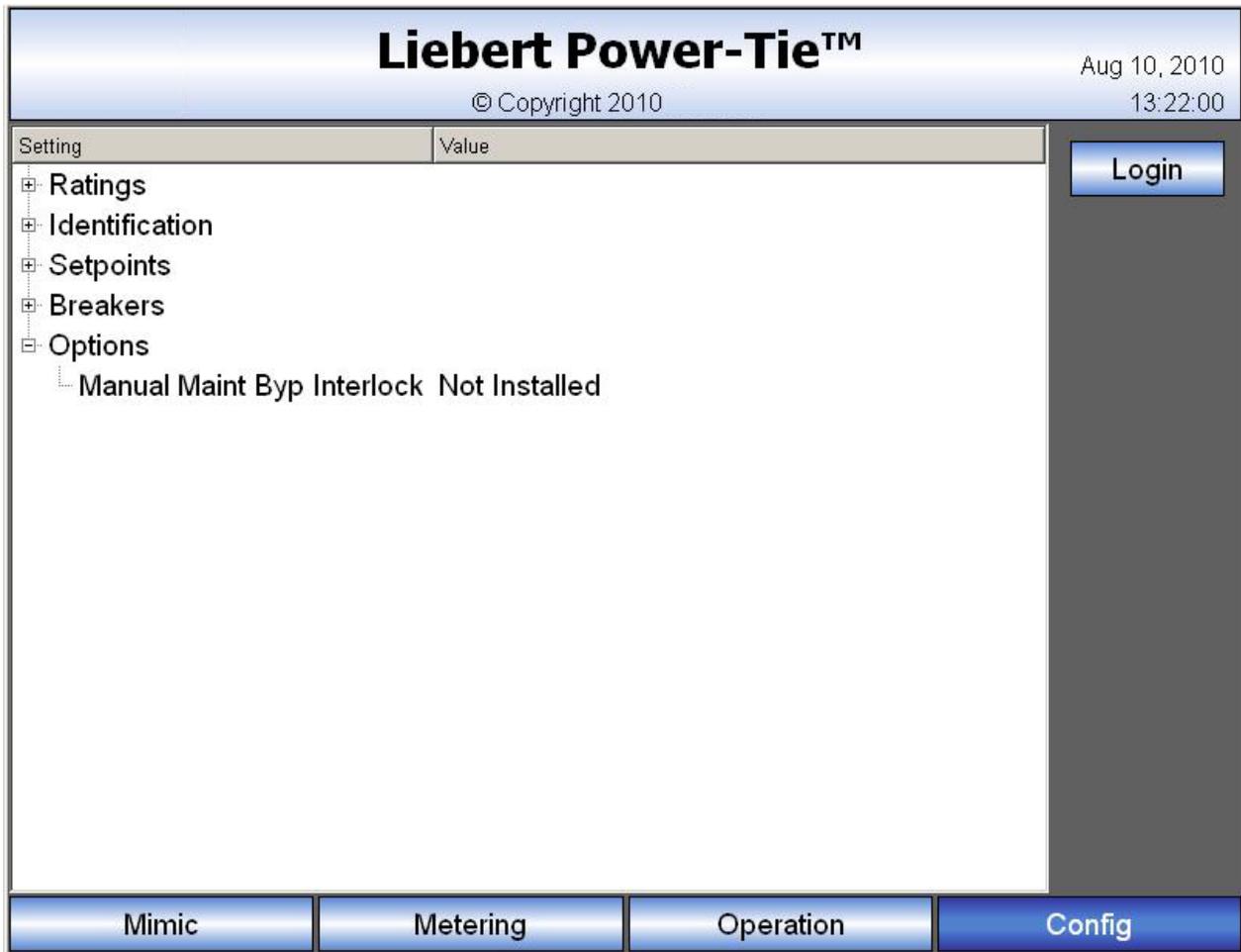
Setting	Value
Has SIB	Yes
Has TIE	Yes
Has MBB	Yes
Has MIB	Yes
Has LBB	Yes
SIB is Electrically Operated	Yes
TIE is Electrically Operated	Yes
MBB is Electrically Operated	No
MIB is Electrically Operated	No
LBB is Electrically Operated	No

At the bottom of the screen, there is a navigation bar with buttons for 'Mimic', 'Metering', 'Events', 'Operation', 'Reports', and 'Config'.

2.5.5 Options

- Manual Maint Byp Interlock Options (Read Only - Based on System Type) - Installed/Not Installed

Figure 14 Options screen



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 Form-C dry contacts rated at 1A @ 30VDC or 124VAC @ 0.45A.

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 two PRB's can be installed in a Liebert NXL.

Figure 15 Control wiring, Programmable Relay Board



1. Customer control wiring connection points are terminals 1 through 15. (Pin 16 not used on J71, J72, and J73.)
2. Programmable Relay Board option includes eight signal channels with two Form-C dry contacts per channel (see **Table 1**).
3. All control wiring (by others) must be run separate from power wiring. Control wiring runs should not be combined in the same conduit.
4. Contact ratings: 1A @ 30VDC

Table 1 Programmable Relay Board pinout

Terminal Block	Channel	Pin No.	Common	Normally Closed	Normally Open	
J71	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
J72	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
	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	
TB3	CH8	A	13-15	13	14	15
		B	1-3	1	2	3
J74						

Pin 16 not used on J71, J72 and J73.

Configuring the Programmable Relay Board Settings

1. Press Config button.
2. Press Login and enter password.
3. Expand the Options menu.
4. Press which Programmable Relay Board will be configured.
The Programmable Relay Board dialog box is displayed.
5. Press which relay to program.
6. Press up to four events. Selected events will show up under the Relay assigned in **Step 5**.
Optional: can set delay (in seconds) how long the Programmable Relay Board will send out event after it is set.

Figure 16 Programmable Relay Board dialog box

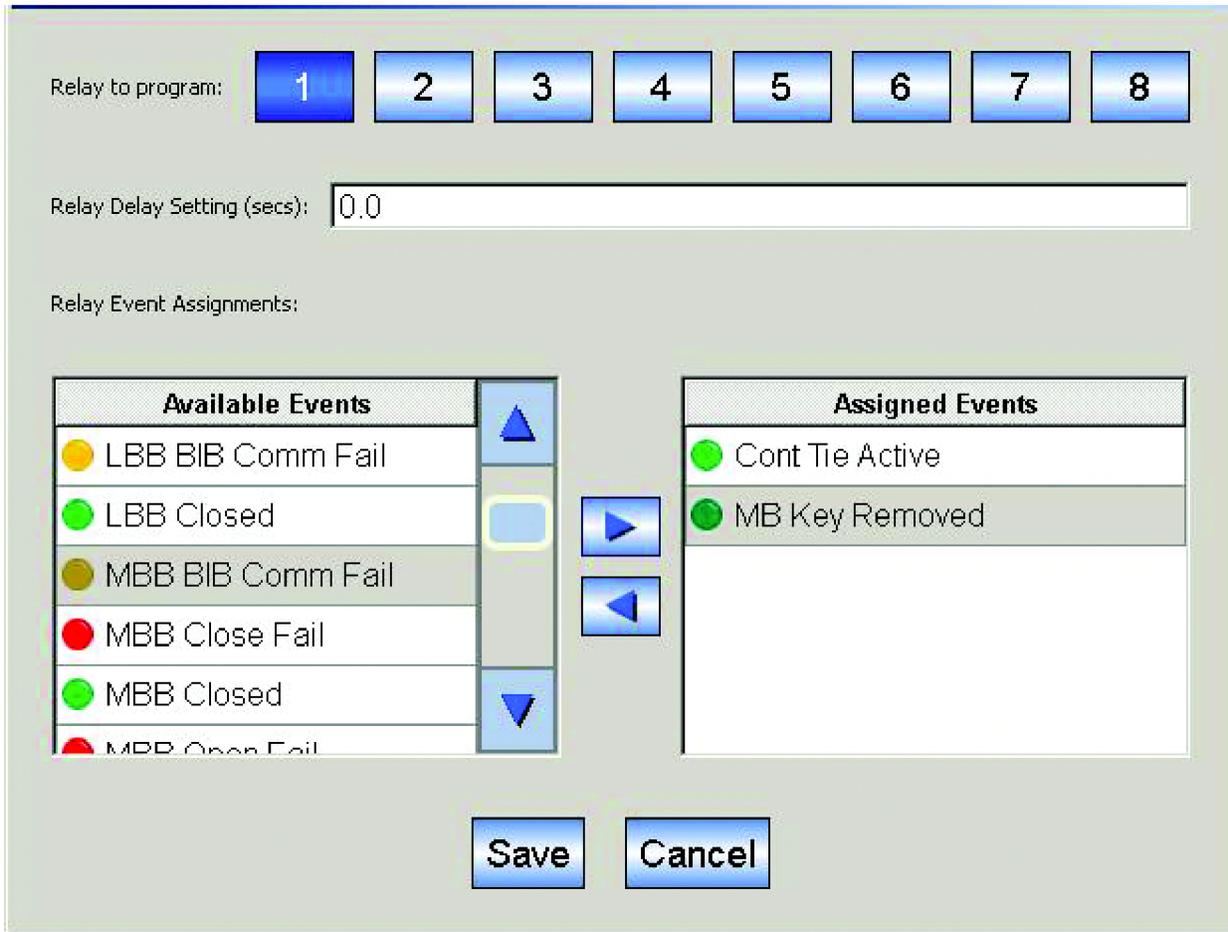


Table 2 Alarms available for Programmable Relay Board

Description	
DSP Communication Failure	PIMC Communication Failure
External Interface Board (EIB) Communication Failure	Power-Tie to Power-Tie Communication Failure
HMI Communication Failure	Power-Tie to UPS Communication Failure
Input Contact Interface (ICI) 1 Comm Fail	Primary Sync Source
Input Contact Interface (ICI) 2 Comm Fail	Programmable Relay Board 1 (PRB) Comm Failure
LBB Breaker Interface Board (BIB) Communication Failure	Programmable Relay Board 2 (PRB) Comm Failure
LBB Open / Closed	PTC Communication Warning -CAN Bus
Maintenance Bypass Key Removed	SIB Breaker Interface Board (BIB) Communication Failure
MBB Breaker Interface Board (BIB) Communication Failure	SIB Close Fail
MBB Close Fail	SIB Open / Closed
MBB Open / Closed	SIB Open Fail
MBB Open Fail	TIE Breaker Close Fail
MIB Breaker Interface Board (BIB) Communication Failure	TIE Breaker Interface Board (BIB) Communication Failure
MIB Close Fail	TIE Breaker Open / Closed
MIB Open / Closed	TIE Breaker Open Fail
MIB Open Fail	UPSC Communication Failure

2.6 EVENTS SCREEN

This screen will display any events currently active on each system. If there is an active event, a red dot will appear on the main Events menu button.

Figure 17 Events screen



2.7 REPORTS SCREEN

This screen will display all events that have happened on each system. This screen will display which system had the event, description of event, date of event, time of event.

Figure 18 Reports screen



#	Sys	Description	Date	Time	Type	ID	Data
---	-----	-------------	------	------	------	----	------

3.0 OPERATION

3.1 START THE LIEBERT NXL POWER-TIE SYSTEM

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.



NOTE

Not all systems will have the breakers listed in 2.2 - Mimic Screen. Review the system configuration to see whether all breakers installed in the system are displayed.



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 2 minutes before continuing.

WARNING

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

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

3.1.1 Full System Startup

1. Before applying power to the system, verify that these circuit breakers are open:
 - SIB
 - TIE
 - MBB
 - MIB
 - LBB
2. Start the UPS system and place it in Bypass mode.
3. On the Liebert NXL Power-Tie HMI screen, press the “Operation” and then the “Start System” menu buttons.



NOTE

A password is required to execute the commands in this procedure to prevent unauthorized changes (see 2.5.3 - Setpoints).

4. Select the system being energized.
5. If MBB is installed: When prompted on the HMI display, close the MBB breaker.
6. If MIB is installed: When prompted on the HMI display, close the MIB breaker.
7. When prompted on HMI display, close the SIB breaker.
8. If MBB is installed: When prompted on HMI display, open the MBB breaker.
This UPS system can now be transferred to Inverter (Normal Mode)
9. Repeat **Steps 2** through **9** for all the systems to be energized.

3.1.2 Adding a System

If adding a new system that is not currently energized, follow the steps in **3.1.1 - Full System Startup**.

If adding a system that is on Maintenance Bypass:

1. On the Liebert NXL Power-Tie HMI screen, press the “Operation” then “Start System” menu buttons.



NOTE

*A password is required to execute the commands in this procedure to prevent unauthorized changes (see **2.5.3 - Setpoints**).*

2. Select the system being energized.
3. If MIB is installed: When prompted on the HMI display, close the MIB breaker.
4. When prompted on HMI display, close the SIB breaker.
5. If MBB is installed: When prompted on the HMI display, open the MBB breaker.
This UPS system can now be transferred to Inverter (Normal Mode)

3.2 TRANSFER LOADS BETWEEN UPS SYSTEMS

The Liebert NXL Power-Tie can transfer a load from one UPS System to another smoothly.

3.2.1 Types of Load Transfers

- From System on Inverter to System on Inverter
- From System on Bypass to System on Inverter
- From System on Inverter to System on Bypass
- Shared load from one system to another system (i.e., System B is carrying Loads A and B. Can transfer Loads A and B to System A in one step)

3.2.2 Conditions to Transfer Loads

The following conditions must be present before a load transfer can be performed:

- At least one UPS system involved in the transfer must be on Inverter (Normal Mode).
- The MBB breaker must be open and MIB closed on both systems involved in the load transfer.
- The system taking the load must have enough capacity to accept the transferred load without overloading.

If these conditions are not present, the Load Transfer buttons will not be active.

3.2.3 Load Transfer Procedure

Following these steps to execute any of the transfers in **3.2.1 - Types of Load Transfers**.

1. On the Liebert NXL Power-Tie HMI screen, press the “Operation” then “Move Load” menu buttons.

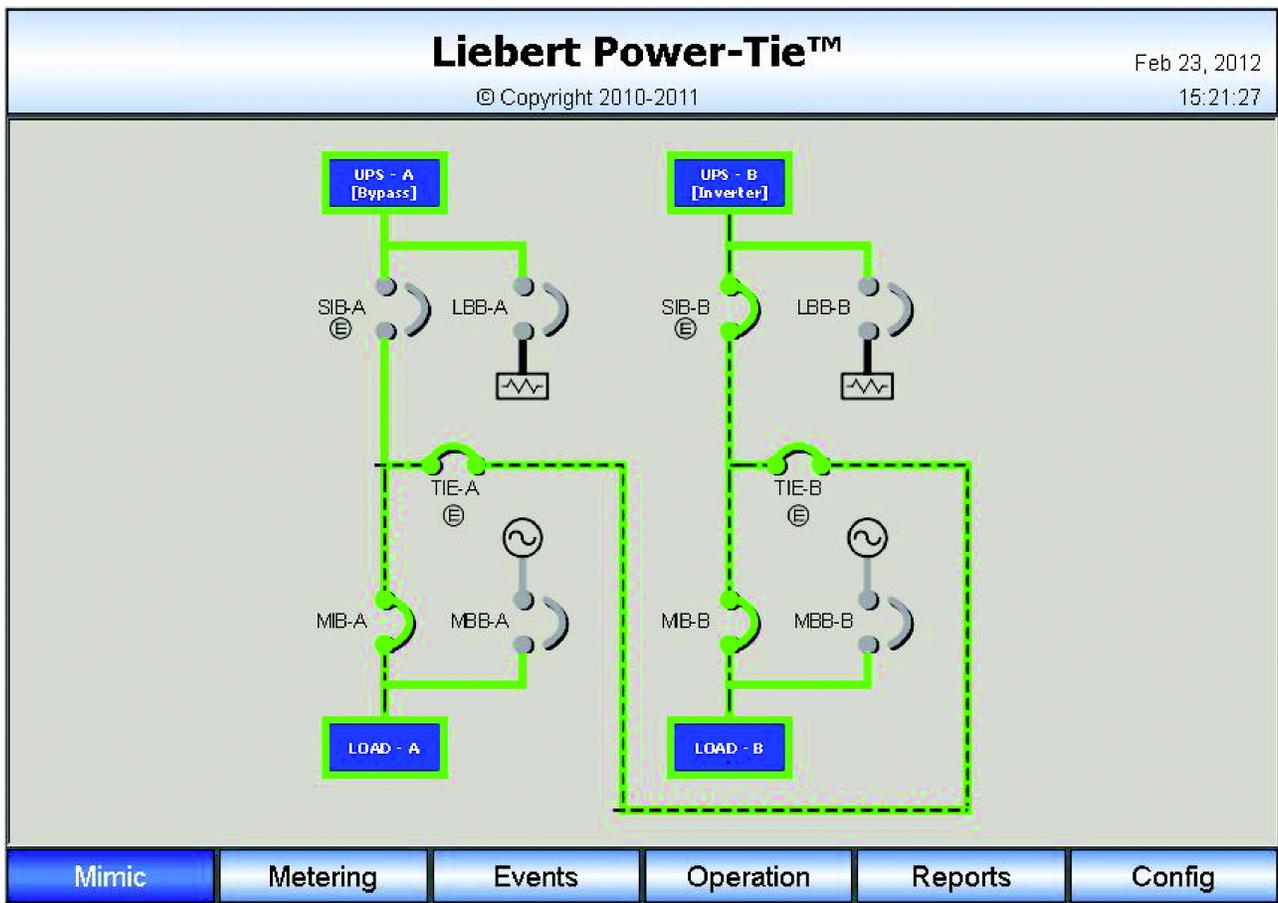


NOTE

A password is required to execute the commands in this procedure to prevent unauthorized changes (see 2.5.3 - Setpoints).

2. Select to load to be moved.
3. Select the system that will supply power to the load.
During this step, one TIE breaker will close. The two UPS systems will synchronize to each other. Depending on how far out of synch the two sources are, this step may take several seconds to complete.
4. When prompted on the HMI screen, Press “Move Load” or press “Cancel” to return the system to its previous state.

Figure 19 Typical Mimic screen with load transfer



3.3 MAINTENANCE BYPASS TRANSFER

If the Liebert NXL Power-Tie System has a Maintenance Bypass, the following steps will transfer the load from the UPS system to its Maintenance Bypass

1. For the system being transferred to Maintenance Bypass, verify the UPS system is in Bypass mode.
2. On the Liebert NXL Power-Tie HMI screen, press the “Operation” then Maint Bypass menu buttons.

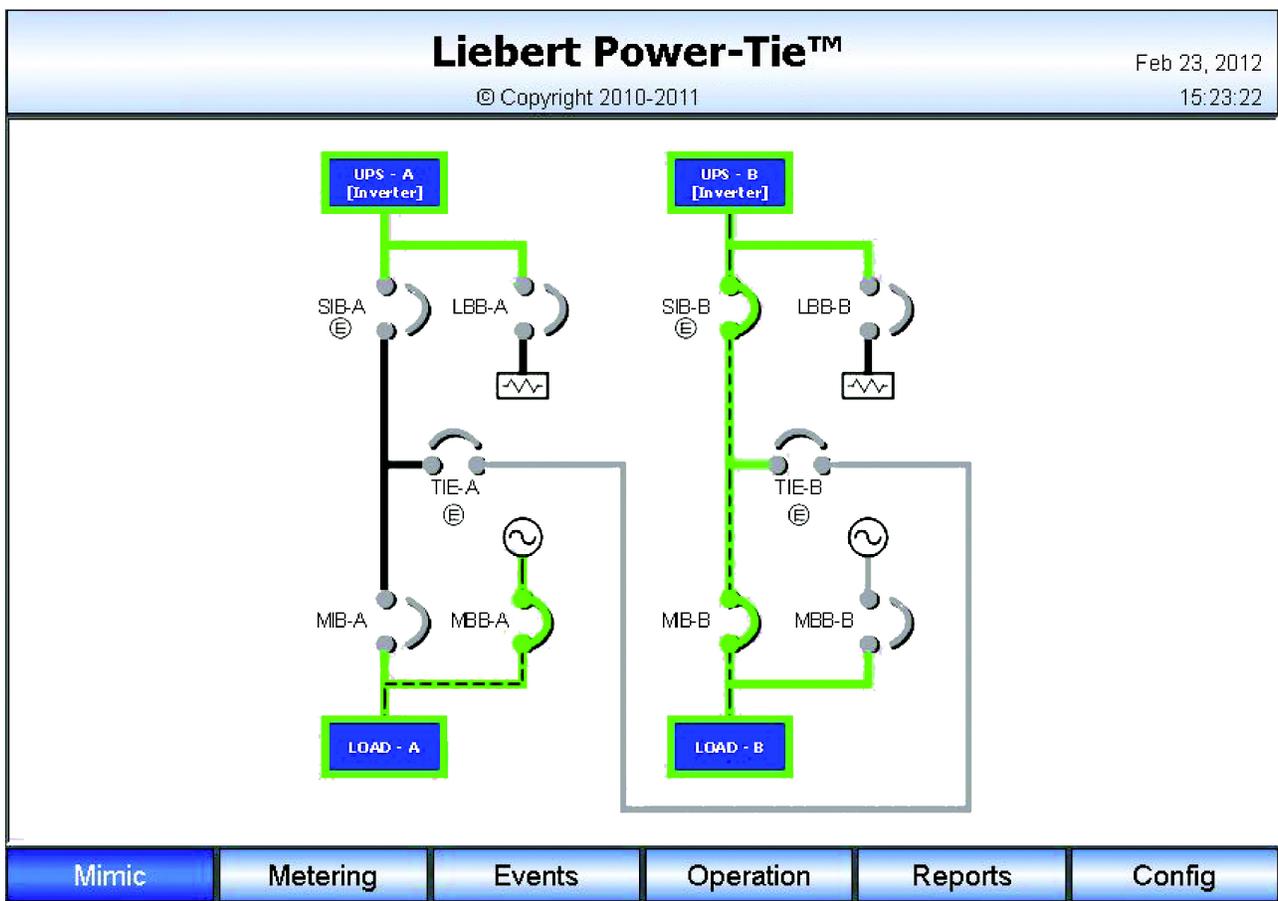


NOTE

A password is required to execute the commands in this procedure to prevent unauthorized changes (see 2.5.3 - Setpoints).

3. Select the load to be moved.
4. When prompted on the HMI screen, close the MBB.
5. When prompted on the HMI screen, open the MIB.

Figure 20 Typical Mimic screen with load on Maintenance Bypass



4.0 OPTIONAL CONTINUOUS TIE OPERATIONS

The Liebert NXL Power-Tie can connect two systems so they will share each other's load.



NOTE

This feature must be installed. If this feature is not installed, this feature will not appear on screen. For further information or to have this feature installed, contact your Vertiv representative.

4.1 CONDITIONS TO TRANSFER LOADS

The following conditions must be present before a load transfer can be performed:

- Both UPS systems involved in the transfer must be on Inverter (Normal Mode).
- The MBB breaker must be open and MIB closed on both systems involved in the load transfer.

If these conditions are not present, the Load Transfer buttons will not be active.

4.2 LOAD TRANSFER PROCEDURE

Following these steps to connect two systems.

1. On the Liebert NXL Power-Tie HMI screen, press the Operation then Continuous Tie menu buttons.



NOTE

*A password is required to execute the commands in this procedure to prevent unauthorized changes (see **2.5.3 - Setpoints**).*

2. Select the first system that will be tied together.
3. Select the second system that will be tied together.
During this step, one TIE breaker will close. The two UPS systems will synchronize to each other. Depending on how far out of synchronization the two sources are, this step may take several seconds to complete.
4. When prompted on the HMI screen, Press Move Load" or press Cancel to return the system to its previous state.

5.0 SPECIFICATIONS

Table 3 Liebert NXL Power-Tie Control specifications

Environmental Parameters	
Storage Temperature Range, °F (°C)	-13 to 158 (-25 to 70)
Operating Temperature Range, °F (°C)	32 to 104 (0 to 40) (UPS)
Relative Humidity	95% or less Non-Condensing (Operating and Non-Operating)
Maximum Altitude Above mean sea level, ft (m)	4920 (1500) (as per IEC 62040/3) - 1% Max kW derate / 328 rise between 4921-9842 (100m rise between 1500-3000m)

Notes



