Liebert® GXT4™ UPS 120V/208V 500VA-3000VA

User Manual

EMERSON
Network Power

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WARNING

Observe all cautions and warnings in this manual. Failure to do so may result in serious injury or death.

Refer all UPS and battery service to properly trained and qualified service personnel. Do not attempt to service this product yourself.

Opening or removing the cover may expose you to lethal voltages within this unit even when it is apparently not operating and the input wiring is disconnected from the electrical source.

Never work alone.

SAVE THESE INSTRUCTIONS

This manual contains important safety instructions that must be followed during the installation and maintenance of the UPS and batteries. Read this manual thoroughly before attempting to install or operate this UPS.

UPS Safety Notes

This UPS contains no user-serviceable parts except the internal battery pack. The Off/Bypass push button does not electrically isolate internal parts. Under no circumstances attempt to gain internal access other than to replace the batteries due to risk of electric shock or burn. Do not continue to use the UPS if the front panel indications are not in accordance with these operating instructions or if the UPS performance alters in use. Refer all faults to your local dealer, Emerson Network Power representative or Emerson Network Power Channel Support.

This UPS has an internal battery, and the output receptacles of the UPS may carry live voltage even if the UPS is not connected to utility input power.

Before moving or rewiring this UPS, disconnect utility input power and the battery and make sure that the UPS is completely shut down. Otherwise, the output terminal may carry live voltage, presenting an electric shock hazard.

To ensure human safety and normal UPS operation, the UPS must be properly grounded before use.

When the UPS is connected to an IT power distribution system, a short-circuit protection device must be installed on the neutral line.

Install and use the Liebert GXT4 in the following environments:

- Temperature: 32°F - 104°F (0°C - 40°C), relative humidity: 0% ~ 95% non-condensing
- Out of direct sunlight
- Away from heat sources
- Stable surface, not subject to vibrations or shocks
- Away from dust and other particulates
- Away from corrosive substances, salts and flammable gases

Keep the air inlet and outlet of this UPS unobstructed. Poor ventilation will increase the internal temperature of the UPS and can adversely affect the UPS and its batteries.

Keep liquid and foreign objects away from the UPS.

In case of fire, use a dry chemical fire extinguisher to put out the fire. Using a fluid fire extinguisher may cause electric shock.

This UPS is not intended for use with life support and other designated critical devices. Maximum load must not exceed that shown on the UPS rating label. This UPS is designed for data processing equipment. If uncertain, consult your local dealer or Emerson representative.

This UPS is not for use in a computer room as defined in the standard for the Protection of Electronic Computer/Data Processing Equipment, ANSI/NFPA 75.

The Liebert GXT4-3000RT120™ was tested under 30A branch circuit in accordance with the National Electrical Code, ANSI/NFPA 70. To reduce the risk of fire, connect only to a circuit provided with 30A maximum branch overcurrent protection.

The Liebert GXT4-3000RT208 was tested under 20A branch circuit in accordance with the National Electrical Code, ANSI/NFPA 70. To reduce the risk of fire, connect only to a circuit provided with 20A maximum branch overcurrent protection.

Battery Safety

CAUTION

Do not dispose of batteries in a fire. The batteries may explode.

Do not open or mutilate the batteries. Released electrolyte is toxic and is harmful to skin and eyes.

Dispose of used batteries according to the instructions.

CAUTION

A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working on batteries:

- Remove watches, rings and other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If it is inadvertently grounded, remove the source of the ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if grounds are removed during installation and maintenance (applicable to a UPS and a remote battery supply not having a grounded supply circuit).

ELECTROMAGNETIC COMPATIBILITY—The Liebert GXT4 complies with the limits for a CLASS A DIGITAL DEVICE, PURSUANT TO Part 15 of FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation. Operating this device in a residential area is likely to cause harmful interference that users must correct at their own expense.

The Liebert GXT4 series complies with the requirements of EMC Directive 2004/108/EC and the published technical standards. Continued compliance requires installation in accordance with these instructions and use of accessories approved by Emerson.

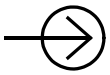
Information for the Protection of the Environment

UPS Servicing: UPS makes use of components dangerous for the environment (electronic cards, electronic components). The components removed must be taken to specialized collection and disposal centers.

GLOSSARY OF SYMBOLS

Risk of electrical shock

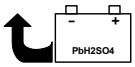
Indicates caution followed by important instructions



AC input

AC output

Requests the user to consult the manual



Indicates the unit contains a valve-regulated lead acid battery

Recycle

DC voltage

Equipment grounding conductor

Bonded to ground

AC voltage

WEEE

1.0 PRODUCT DESCRIPTION

The Liebert GXT4 is a compact, online uninterruptible power system (UPS) that continuously conditions and regulates its output voltage. The Liebert GXT4 is designed to supply microcomputers and other sensitive equipment with clean sine wave input power.

Upon generation, AC power is clean and stable. However, during transmission and distribution it is subject to voltage sags, spikes and complete failure that may interrupt computer operations, cause data loss and damage equipment.

The Liebert GXT4 protects equipment from these disturbances. The Liebert GXT4 continuously charges its batteries from utility power, enabling it to supply power to connected loads, even when utility power fails.

This sections describes the UPS, its features, models, appearance and components, operating principles and operating mode.

1.1 Features

- Intelligent battery management to extend the battery life
- LCD for user-friendly operation and local monitoring and configuration of operational parameters
- Controllable outlet groups
- Flexible network management with Liebert MultiLink™ software
- Fan fault self-inspection and automated diagnostic function
- Intelligent fan operation, automatically changing rotation speed depending on system requirements, to decrease power consumption and noise
- Input circuit breaker to ease recovery from overloads
- Safety approval from UL and cUL
- Communication options: USB port, Liebert IntelliSlot® port and terminal block communication
- Dry contacts for remote monitoring
- Input power factor greater than 0.99
- Output voltage selection function

1.2 Available Models

Eight UPS models are available.

Table 1 UPS models, power ratings

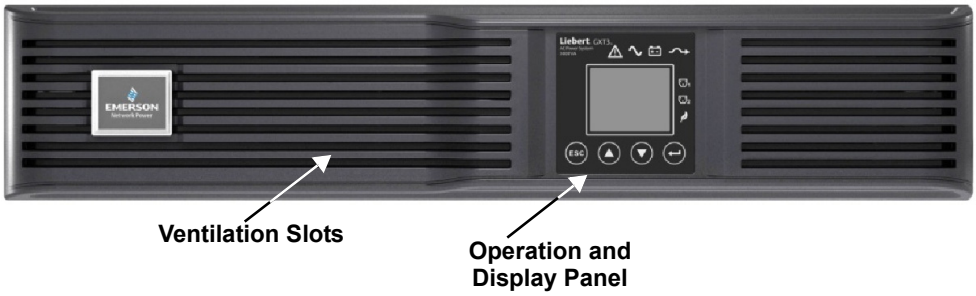
Model	Nominal Power Rating
GXT4-500RT120	500VA/450W
GXT4-700RT120	700VA/630W
GXT4-1000RT120	1000VA/900W
GXT4-1500RT120	1500VA/1350W
GXT4-2000RT120	2000VA/1800W
GXT4-3000RT120	3000VA/2700W
GXT4-3000RT208	3000VA/2700W

1.3 Appearance and Components

1.3.1 Front Panel and Controls

The Liebert GXT4 rack/tower models in various power ratings have the same general appearance, controls and features (see **Figure 1**). The various rack/tower and minitower models differ largely in the type of receptacles each has.

Figure 1 Liebert GXT4 rack/tower models—front view



1.3.2 Rear Panel Features

The rear panel of the Liebert GXT4 has these features:

- Liebert IntelliSlot® Port
- USB port
- Input Circuit Breaker
- Input Receptacle
- General Output Receptacles
- Programmable Output Receptacles
- Cable Strain Relief Attachment Hole
- External Battery Connector
- Cooling Fan
- RS-232 port
- Terminal Block Communication
- Output Circuit Breakers (only on 3000VA models)

Figure 2 Rear panel components—Liebert GXT4 120V rack/tower, 500, 700, 1000VA model

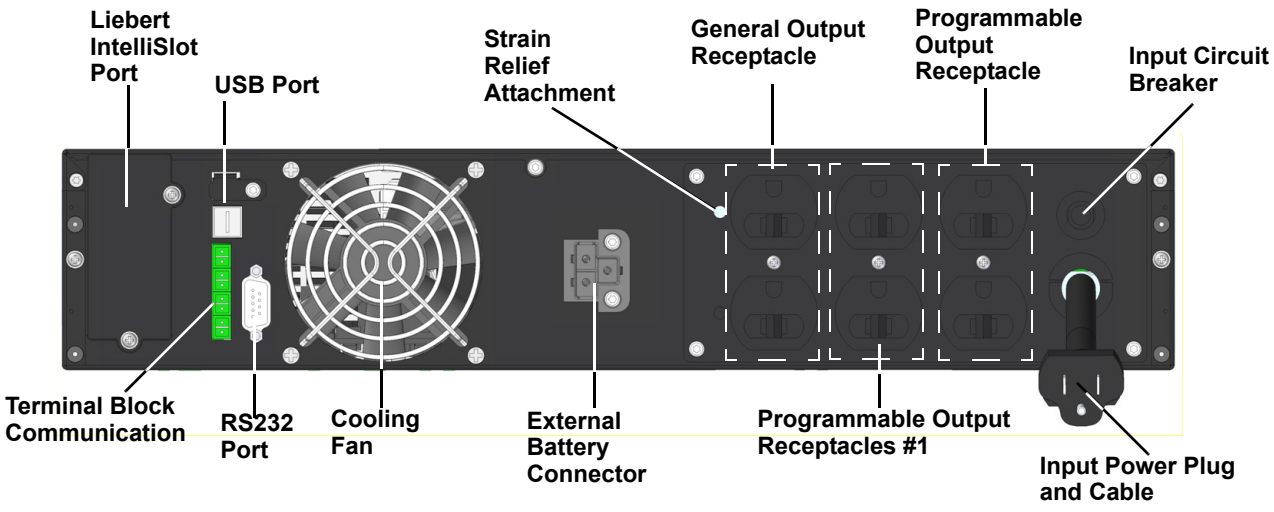


Figure 3 Rear panel components—Liebert GXT4 120V rack/tower, 1500VA model

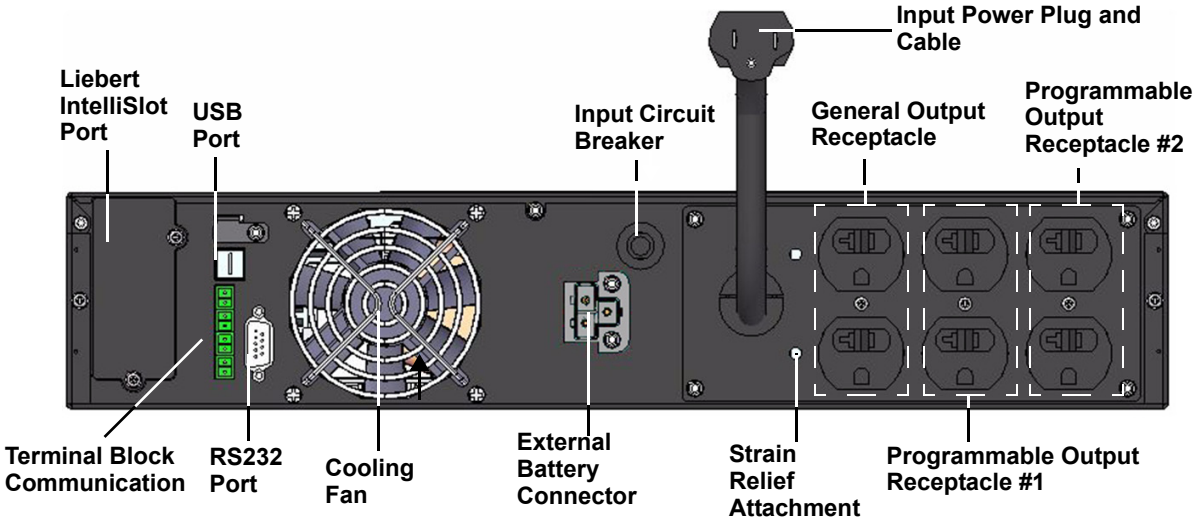


Figure 4 Rear panel components—Liebert GXT4 120V rack/tower, 2000VA model

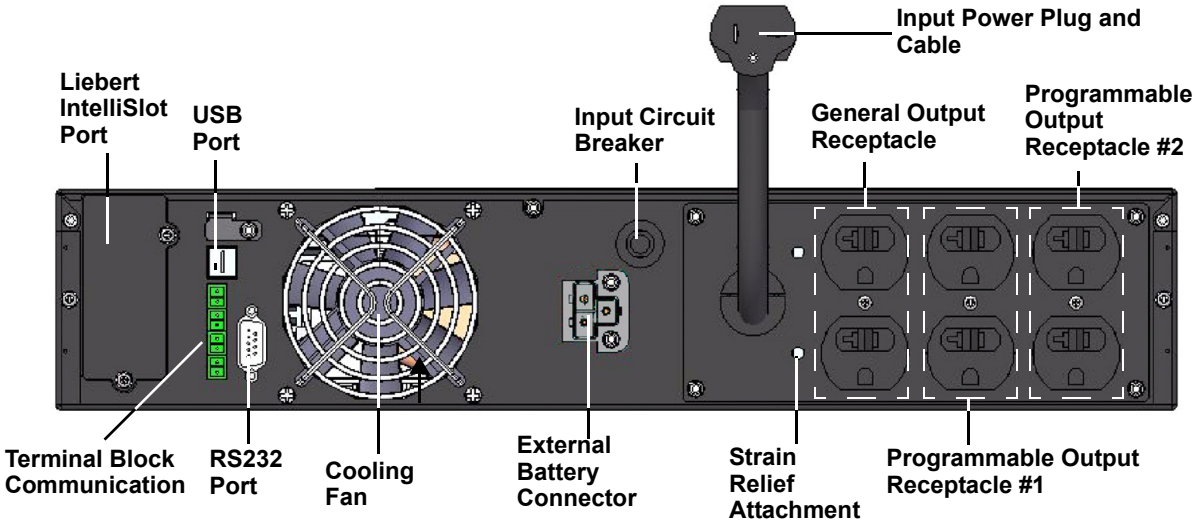


Figure 5 Rear panel components—Liebert GXT4 120V rack/tower, 3000VA model

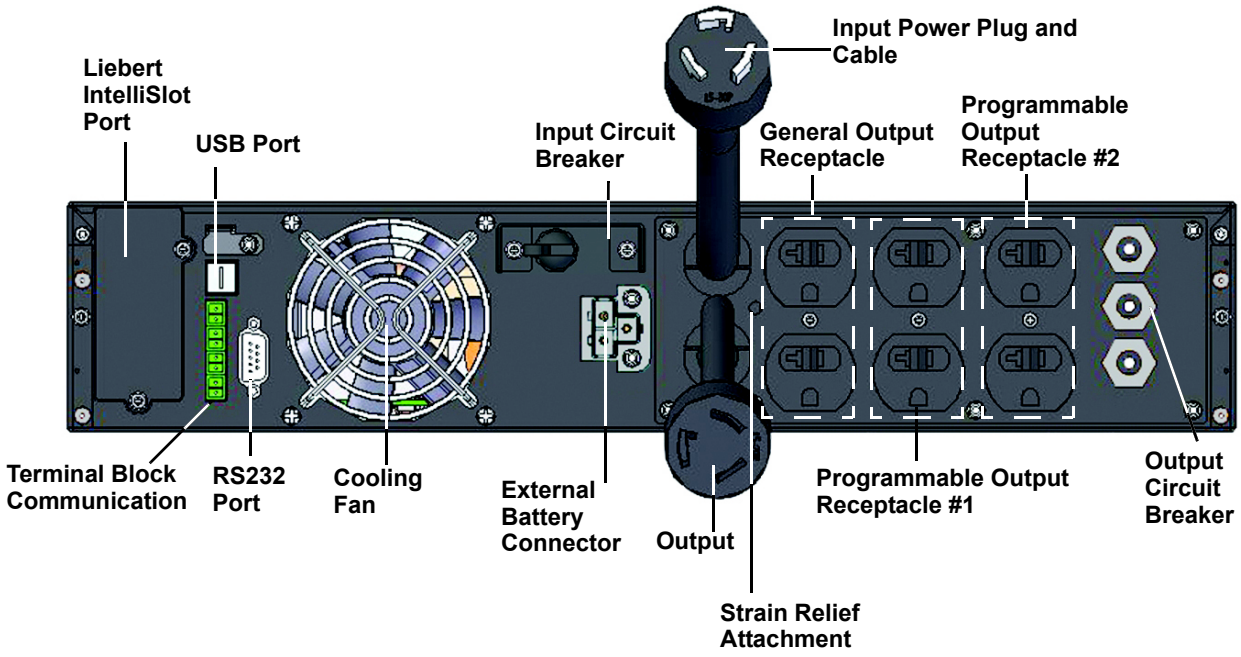
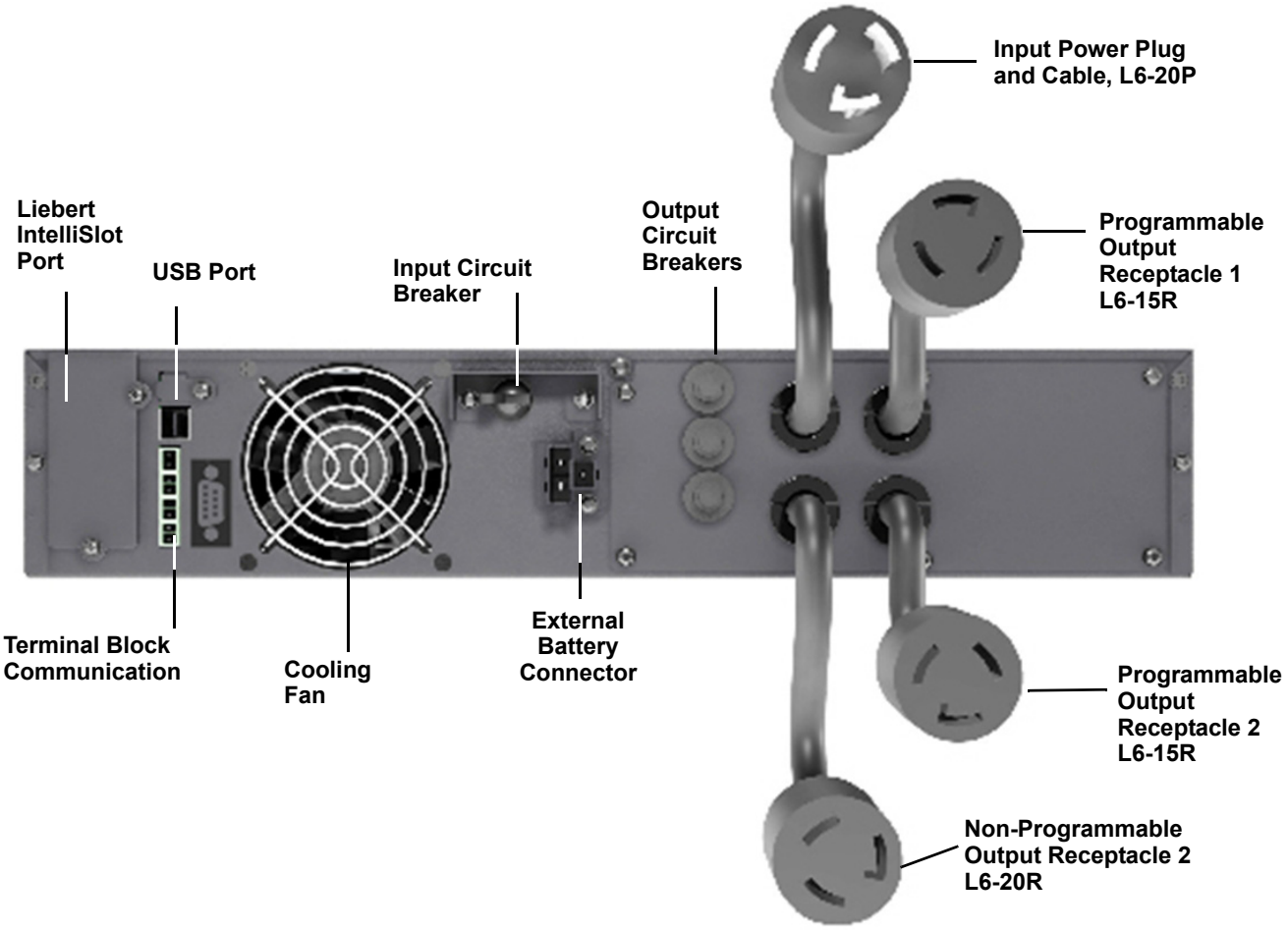


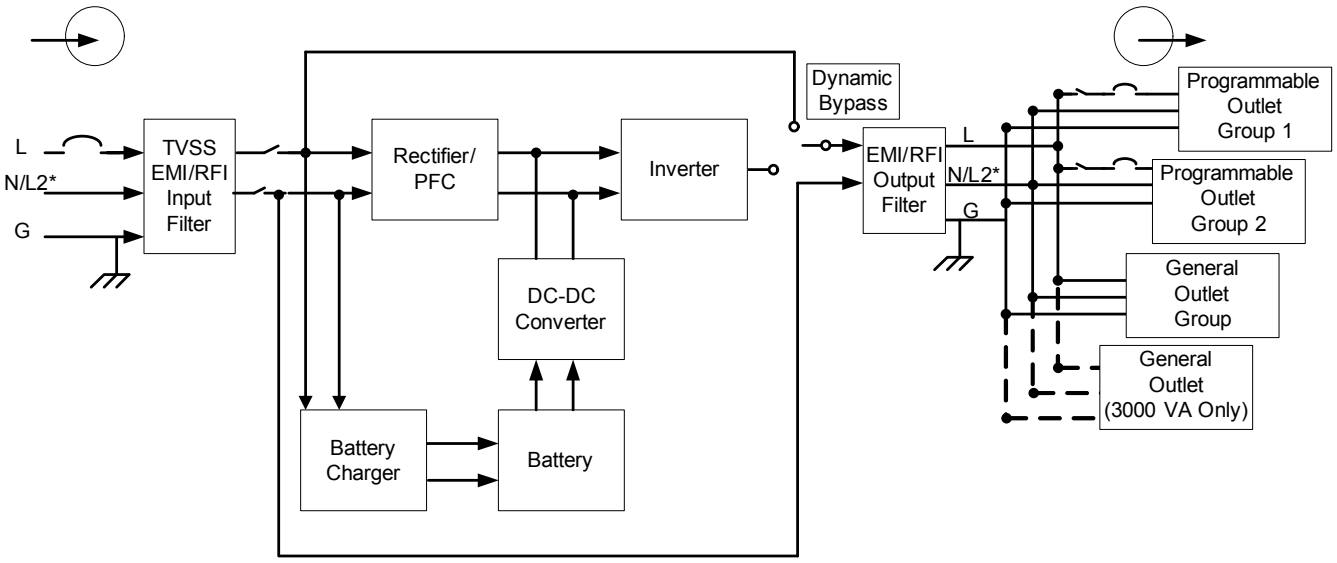
Figure 6 Rear panel components—Liebert GXT4 208V rack/tower, 3000VA model



1.4 Major Components

The operating principle of the UPS is illustrated in **Figure 7**.

Figure 7 Operating principle diagram



** NOTE: ONLY the GXT4-3000RT208 model (208V) requires L2 (L6-20P).*
All other models covered in this manual are 120V L-N wired

The UPS is composed of utility input, TVSS and EMI/RFI filters, rectifier/PFC, inverter, battery charger, DC-to-DC converter, battery, dynamic bypass and UPS output.

Transient Voltage Surge Suppression (TVSS) and EMI/RFI Filters

The Liebert GXT4 has surge protection and filters that protect the connected load from power surges, electromagnetic interference (EMI) and radio frequency interference (RFI). These features can minimize any surges or interference present in the utility power. The filters also prevent surges or interference generated by the UPS from adversely affecting devices connected on the same branch as the UPS.

Rectifier/Power Factor Correction (PFC) Circuit

In normal operation, the Liebert GXT4's rectifier/power factor correction (PFC) circuit converts utility power to regulated DC power for use by the inverter while ensuring that the wave shape of the input current used by the UPS is near ideal. Extracting this sinewave input current achieves two objectives:

- Efficient power use by the UPS
- Reduced reflected harmonics

This results in cleaner power being available to other devices in the building not being protected by the Liebert GXT4.

Inverter

In normal operation, the Liebert GXT4's inverter utilizes the DC output of the PFC to produce precise, regulated sine wave AC power. When utility power fails, the inverter receives DC power from the DC-to-DC Converter. In either operation mode, the UPS inverter is online, continuously generating clean, precise, regulated AC output power.

Battery Charger

The battery charger utilizes energy from the utility power and precisely regulates it to continuously float charge the batteries. The batteries are being charged whenever the Liebert GXT4 is plugged in, even when the UPS is not turned On.

DC-to-DC Converter

The DC-to-DC converter raises the DC voltage from the battery to the optimum operating voltage for the inverter. This allows the inverter to operate continuously at its optimum efficiency and voltage, thus increasing reliability.

Battery

The Liebert GXT4 uses valve-regulated, nonspillable, lead acid batteries. To maintain battery design life, operate the Liebert GXT4 in an ambient temperature of 32°F to 77°F (0°C to 25°C).

Optional external battery cabinets are available to extend battery run times.

Dynamic Bypass

The Liebert GXT4 provides an alternate path for utility power to the connected loads in the unlikely event of a UPS malfunction. Should the Liebert GXT4 have an overload, overtemperature or UPS failure condition, the UPS automatically transfers the connected loads to bypass.

NOTE
The bypass power path does not protect the connected loads from disturbances on the utility.

1.5 Operating Mode

The UPS operation modes include the following: Mains (AC) Mode, Bypass Mode, Battery Mode, Battery Recharge Mode, Active ECO Mode and Frequency Converter Mode.

Refer to **9.0 - Specifications** for details about the operating mode indicators and control buttons.

1.5.1 Mains Mode

During Mains Mode, the mains provides input power to the Liebert GXT4. The filters, PFC circuit and inverter process this power to provide high-quality sine wave power to connected loads. The UPS maintains the batteries in a fully charged state.

1.5.2 Manual Bypass Mode

Manual Bypass Mode occurs when the unit is manually placed in internal bypass by navigating the LCD display menu to select *3 Control > 1 Turn On & Off > Turn UPS Bypass*. Bypass operation is indicated by an audible alarm and illuminated amber bypass indicator. (If other indicators are illuminated, refer to **7.0 - Troubleshooting**). During Bypass Mode, mains power bypasses the inverter and provides energy to the connected load.

NOTICE

Risk of loss of power to the connected load. Can cause equipment damage.

Turning Off the UPS in Bypass Mode will result in loss of output power to the connected load.

1.5.3 Battery Mode

The Liebert GXT4 enters Battery Mode when mains power fails or is outside acceptable limits. The battery system supplies power through the DC-to-DC converter to the inverter to generate clean AC power for the connected loads.

When the Liebert GXT4 enters Battery Mode, the UPS sounds a half-second beep at 10-second intervals. When approximately 2 minutes of run time remains, the beeps sound every 5 seconds to warn that the battery is getting low (this Low Battery Warning is user-configurable).

In Battery Mode, the battery indicator will illuminate and the LCD will show the prompt *utility power not available*.

Press either the Up or Down button once, then press the Enter button to clear the prompt and silence the audible alarm. Once the alarm prompt has been acknowledged, the screen showing the estimated battery run time and battery capacity will be visible. Refer to **7.0 - Troubleshooting**.

For approximate battery run times, refer to **Table 17**.

NOTICE

Risk of loss of power to the connected load. Can cause equipment damage.

Turning Off the Liebert GXT4 when it is in Battery Mode will result in loss of output power to the connected load.

If the UPS is turned Off manually, it must be manually restarted after mains power returns.

If the UPS is turned Off by a communication signal or because the batteries are depleted, it will operate as set in the configuration program for Auto-Restart (Refer to **5.2.1 - Configuration Program**).

1.5.4 Battery Recharge Mode

Once mains power is applied to the Liebert GXT4, the Battery Charger begins charging the batteries.

1.5.5 Frequency Converter Mode

All models of the Liebert GXT4 are capable of frequency conversion. Frequency Conversion Mode can be selected using the configuration program. Allowable frequency operating modes include:

- Auto Sensing - 50Hz or 60Hz – Bypass Enabled
- Auto Sensing - 50Hz or 60Hz – Bypass Disabled
- Frequency Converter - 50Hz – Bypass Disabled
- Frequency Converter - 60Hz – Bypass Disabled

NOTE

The default for all models of the Liebert GXT4 is "Auto Sensing - 50Hz or 60Hz – Bypass Enabled."

CAUTION

Risk of electric shock. Can cause injury or death.

Never touch the AC input receptacle while the UPS is operating. Voltage may still be present even when the AC input indicator is Off.

1.5.6 Active ECO Mode

All Liebert GXT4 models can operate in Active ECO Mode. In this mode, the connected equipment is powered through the bypass path to increase efficiency, reducing the electrical costs.

Active ECO mode keeps the rectifier and inverter operating, allowing the inverter to remain synchronized to bypass. This synchronization allows the transfer of the connected equipment to UPS inverter power almost seamlessly if bypass power falls outside the user-set limits. Once bypass power returns within the acceptable parameters, the UPS will return to Active ECO Mode operation.

The default setting is Active ECO Mode Off.

2.0 INSTALLATION

2.1 Unpacking and Inspection

Unpack the UPS and conduct the following checks:

- Inspect the UPS for shipping damage. If any shipping damage is found, report it to the carrier and your local dealer or your Emerson representative immediately.
- Check the accessories included in packaging list. If there is any discrepancy, contact your local dealer or your Emerson representative immediately.

2.2 What's Included

- Terminal Block Communication Terminals
- Compact Disk with:
  - Liebert MultiLink® Shutdown Software
  - Configuration Program
  - User Manual
- USB Cable—one, 1.2m (3.9 ft.) long
- RS-232 Cable—one, 2m (6-1/2 ft) long
- Cable Strain Relief—two pieces
- Rack mounting hardware, including screws, handles and mounting rail kit (not included with model numbers ending with an "E")
- Plastic tower stand sets—two (four pieces)
- Warnings, Safety Instructions booklet and WEEE recycling sheet (ISO 14001 compliance))

NOTE

The GXT4 External Battery Cabinet shipping package includes one battery cabinet, two spacers for tower configuration and one DC power cable and rack mounting hardware, including screws, handles and mounting rail kit (not included with model numbers ending with an "E").

2.3 Preparation for Installation

2.3.1 Installation Environment

- Install the UPS indoors in a controlled environment, where it cannot be accidentally turned Off. The installation environment should meet the specifications listed in **9.0 - Specifications**).
- Place it in an area of unrestricted airflow around the unit, away from water, flammable liquids, gases, corrosives, and conductive contaminants. Avoid direct sunlight.

NOTE

Operating the Liebert GXT4 in temperatures above 77°F (25°C) reduces battery life.

Installation Clearances

Maintain at least 4 inches (100mm) clearance in the front and rear of the Liebert GXT4. Do not obstruct the air inlets on the front panel and rear panel of the UPS; blocking the air inlets reduces ventilation and heat dissipation, shortening the service life of the Liebert GXT4.

2.4 Mechanical Installation

The Liebert GXT4 may be installed as a tower or in a rack, depending on space and use considerations. The Liebert GXT4 may be used alone, as a single UPS, or with up to four battery cabinets.

NOTE

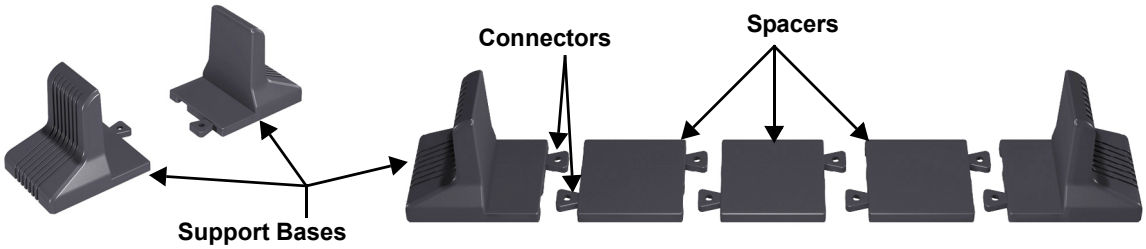
When installing the UPS or making input and output connections, comply with all relevant safety codes and standards

2.4.1 Tower Installation

To install the Liebert GXT4 as a tower:

1. Take out support bases from the accessories (see **Figure 8**).

Figure 8 Support bases



2. If optional Liebert external battery cabinets will be connected to the Liebert GXT4, take out the spacers shipped with the battery cabinet.
3. Connect the spacers and the support bases as shown in **Figure 8**. Each Liebert GXT4 needs two assembled support bases, one in the front and one in the rear.
4. Adjust the direction of the operation and display panel and logo on the Liebert GXT4.
   a. Remove the front plastic bezel cover as shown in **Figure 9**.

Figure 9 Remove the front plastic bezel cover

   b. Pull the operation and display panel gently, rotate it 90 degrees clockwise and snap it back into position, as shown in **Figure 10**.

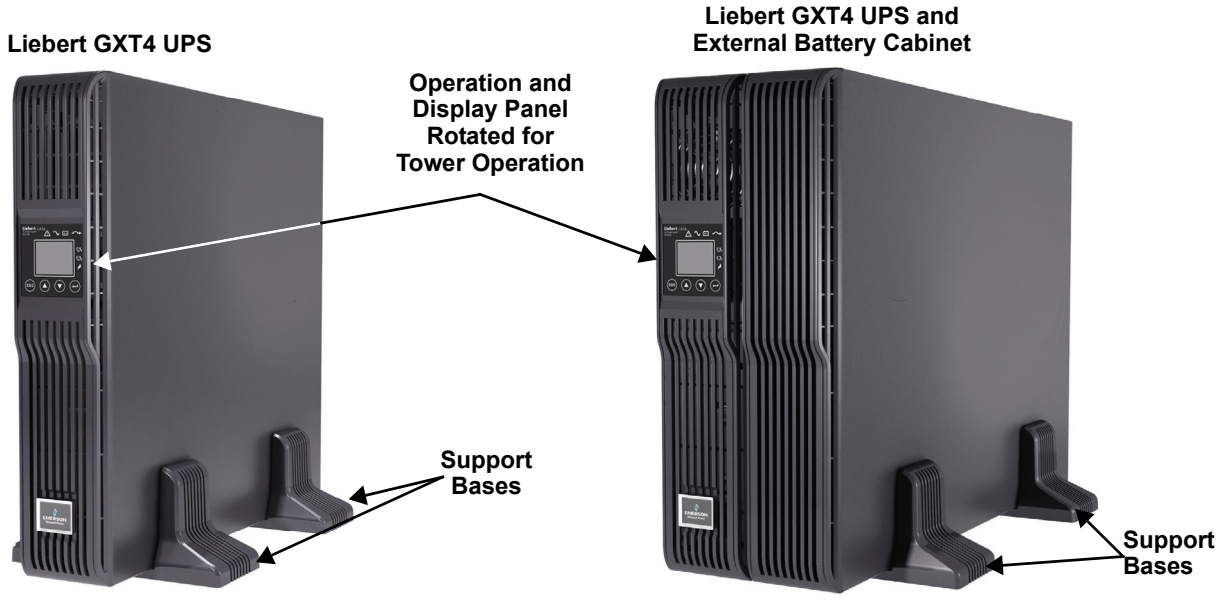
Figure 10 Rotate the operation and display panel

c. Pull the logo on the front plastic bezel cover gently, rotate it 90 degrees clockwise and snap it back into position. The rotated front plastic bezel cover is shown in **Figure 11**.

d. Replace the front plastic bezel cover on the Liebert GXT4. At this point, the UPS operation and display panel and logo have been rotated 90 degrees clockwise, which provides upright viewing for users.

5. Place the Liebert GXT4 and any battery cabinets on the support bases. Each Liebert GXT4 needs two support assemblies, as shown in **Figure 11**.

Figure 11 Tower installation



2.4.2 Rack Installation

The Liebert GXT4 UPS and external battery cabinets (EBC), when installed in a rack enclosure, must be supported by a shelf or rack-mount rails. The Liebert GXT4 UPS and EBC units ship with all required hardware to allow rack-mount installation (not included with model numbers that end in "E"). Because different rack-mount options install differently, refer to the installation instructions provided with the rack mount kit being used.

2.5 Cable Connection

The Liebert GXT4 rear panel has an input cable and plug, output receptacles and output cable(s) (Output cables are on GXT4-3000 models only). Refer to **1.3.2 - Rear Panel Features** for details. The battery cables are supplied with the battery cabinet.

2.5.1 Connecting to AC Mains and Loads

NOTE

Ensure that all the loads are turned Off.

Prepare an input power supply that is properly protected by a circuit breaker in accordance with national and local electrical codes. The wall receptacle must be grounded.

Emerson recommends installing an upstream circuit breaker of the same series as the Liebert GXT4's input circuit breaker.

The specification of input circuit breaker on the rear panel of UPS is given in **Table 2**..

Table 2 Input circuit breaker specification

Model	Rated Circuit Breaker
GXT4-500RT120	8A
GXT4-700RT120	10A
GXT4-1000RT120	10A
GXT4-1500RT120	15A
GXT4-2000RT120	20A
GXT4-3000RT120	30A
GXT4-3000RT208	20A

Liebert GXT4 models 700-1500VA and 2000VA have three groups of outlets as shown in **Figure 2**. One group is always On; the other two groups may be controlled with either programmed responses or over an SNMP network. The 3000VA GXT4 UPS has four groups of outlets: two groups are not controlled (always On), and two groups may be controlled with either programmed responses or over an SNMP network.

Verify that the equipment is plugged into the appropriate outlets if any outlets will be controlled with these features.

1. Plug equipment into the appropriate output receptacles on the rear of the Liebert GXT4.

NOTE

1. *Do not overload any output receptacle.*
2. *Output cable length should not exceed 10m (32.8 ft).*

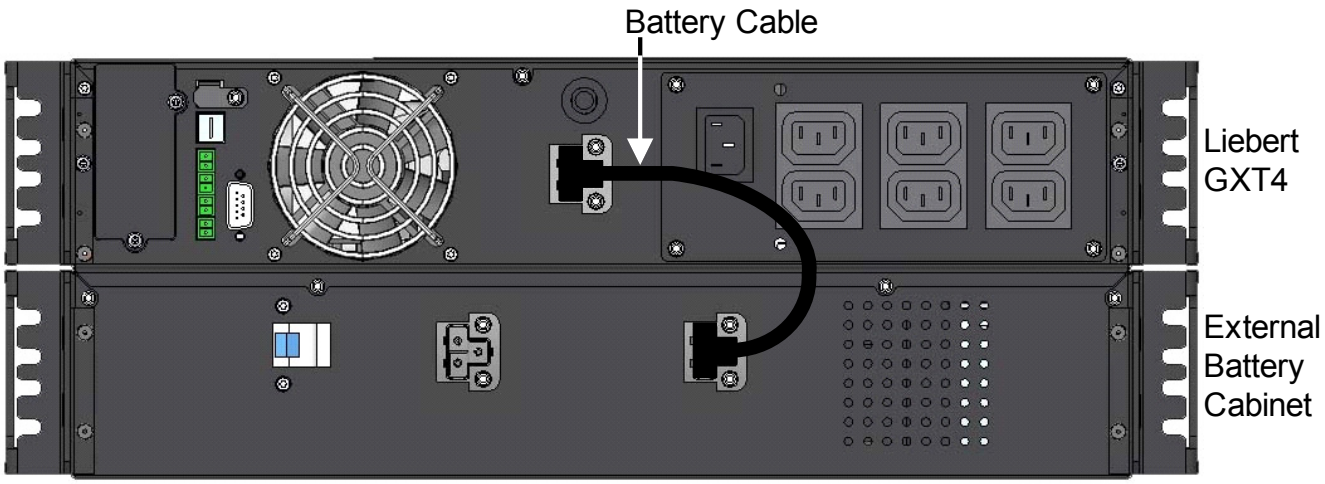
2. Plug the input receptacle of the Liebert GXT4 into the input power connection.
3. Install the two cable strain relief fixtures to secure either the input or output cables to prevent accidental disconnection.
   a. Insert one end into the provided holes on the rear of the unit.
   b. Place the power cord(s) inside the loop.
   c. Tighten the loop around the cables.

Figure 12 Cable strain relief

2.5.2 Connecting Battery Cables

1. Switch Off the input breaker of the battery cabinet.
2. Take out the battery cable included with the battery cabinet.
3. Connect one end of the battery cable to the external battery connector on the rear panel of the UPS, and connect the other end to any battery port on the rear panel of the battery cabinet.
4. Switch On the battery breaker on the rear of the external battery cabinet.
5. Use the Configuration Program included with the UPS to specify the number of external battery cabinets connected to the Liebert GXT4. See **Table 17** for approximate battery run times.

Figure 13 Battery cable attachment



2.6 Connecting Communication Cables

Communication cable connection includes: USB and cables for option cards.

2.6.1 Connecting USB Communication Cables

1. Take the USB communication cables out of the accessories bag.
2. Insert one end of the USB communication cable to the USB port on the rear panel of the Liebert GXT4 (see **Figures 2** and **1.4**).
3. Insert the other end of the USB communication cable to the USB port of the computer.

2.6.2 Installing the Optional Liebert IntelliSlot® Card and Communication Cables

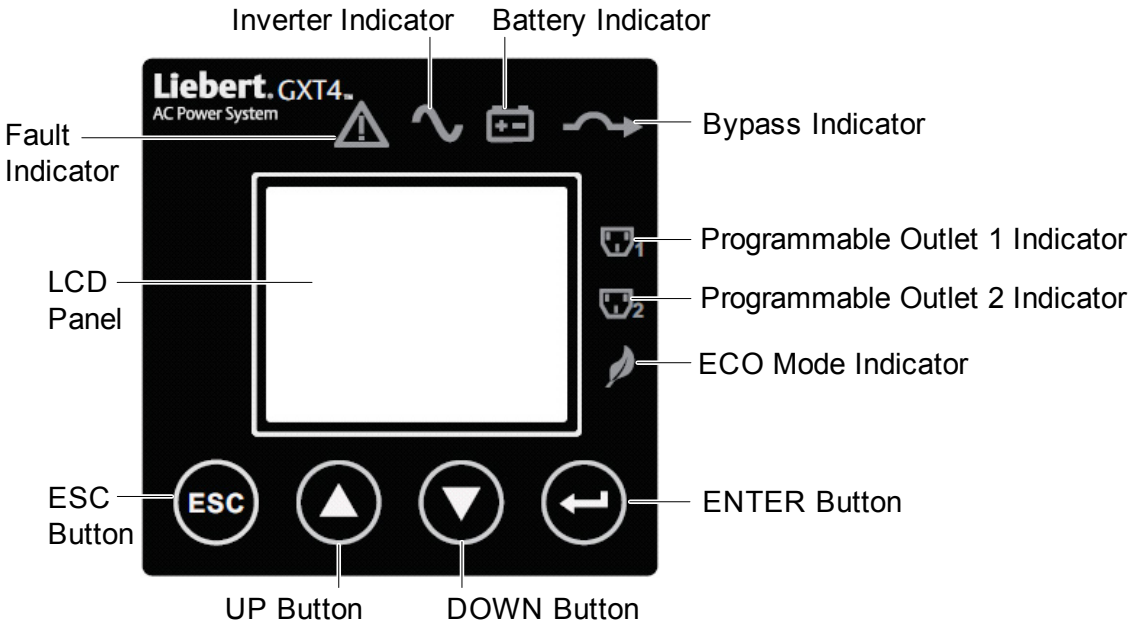
1. Remove the protective cover of the Liebert IntelliSlot port on the Liebert GXT4 and set it aside.
2. Insert the Liebert IntelliSlot card into the Liebert IntelliSlot port and secure it with screws.
3. To connect any cable associated with a Liebert IntelliSlot card, refer to the user manual provided with the card.

To configure and use the Liebert IntelliSlot communication card, refer to the card's user manual. Manuals for the various Liebert IntelliSlot cards are available at Liebert's Web site: **www.liebert.com**

3.0 OPERATION AND DISPLAY PANEL

This chapter describes the Liebert GXT4 controls, particularly the operation and display panel on the front of the Liebert GXT4. The panel has four control buttons, seven LED indicators and a liquid crystal display (LCD), as shown in **Figure 14**.

Figure 14 Operation and display panel



3.1 LED Indicators

The seven LED indicators on the front of the operation and display panel are:

- Inverter
- Battery
- Bypass
- Programmable Outlet1
- Programmable Outlet2
- ECO Mode
- Fault

Figure 14 shows the indicators' locations; their descriptions and functions are shown in **Table 3**.

Table 3 LED indicators

LED Indicators	LED Color	Description
Inverter	Green	On when the inverter is supplying power
Bypass	Amber	On when the load is supplied by the mains through automatic/manual bypass
Battery	Amber	On when the load is supplied by the battery
Fault	Red	On when an error has occurred within the UPS
Programmable Outlet1	Green	On when programmable Outlet1 is On
Programmable Outlet2	Green	On when programmable Outlet2 is On
ECO Mode	Green	On when the UPS is in ECO Mode

3.2 Control Buttons

The four control buttons on the front of the operation and display panel are:

- ESC
- Up
- Down
- Enter

Figure 14 shows the buttons' locations; their descriptions and functions are shown in **Table 4**.

Table 4 Control buttons

Control Buttons	Description
ESC Button	Pressing this button returns to the previous menu or aborts any change in the input data field before confirming.
Up Button	Pressing this button can move the cursor up or increase the value displayed in the input data field. When a menu is displayed on several screens, pressing the button can scroll up.
Down Button	Pressing this button can move the cursor down or decrease the value displayed in the input data field. When a menu is displayed on several screens, pressing the button can scroll down.
Enter Button	Pressing this button can enter the next level menu or confirm the parameter setting value.

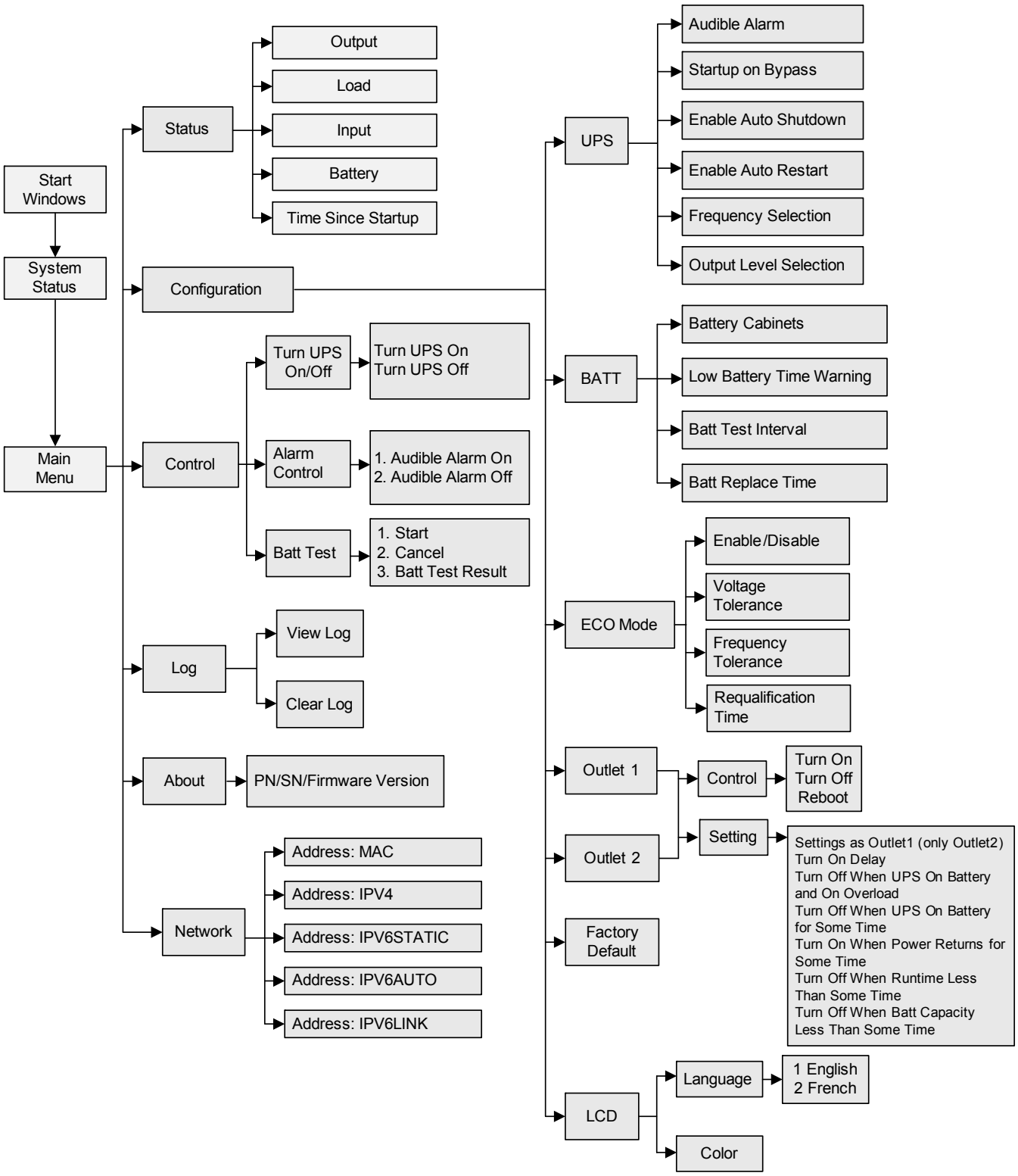
3.3 LCD

The LCD panel shows the UPS status and enables changes to the UPS settings by assisting in navigating through the Liebert GXT4's menu (see **3.4 - Menu Structure**).

3.4 Menu Structure

The menu structure of the LCD is shown in **Figure 15**.

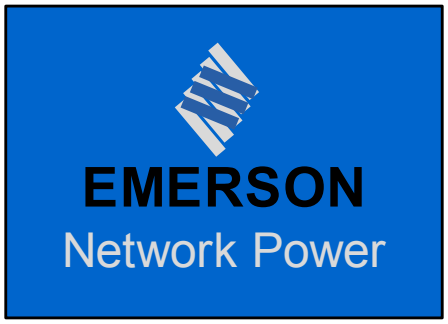
Figure 15 Menu structure



3.4.1 Startup Screen

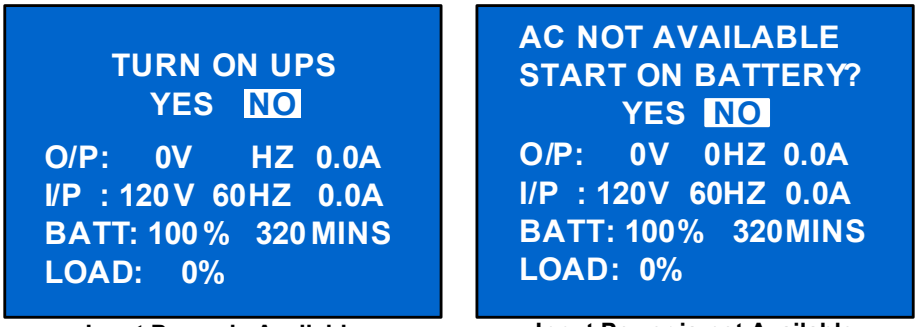
When the Liebert GXT4 is starting up, it initiates a self-test and displays the screen shown in **Figure 16** for about 10 seconds.

Figure 16 Startup screen



After about 10 seconds, the LCD shows one of the On screens in **Figure 17**; the screen shown depends on whether input power is available.

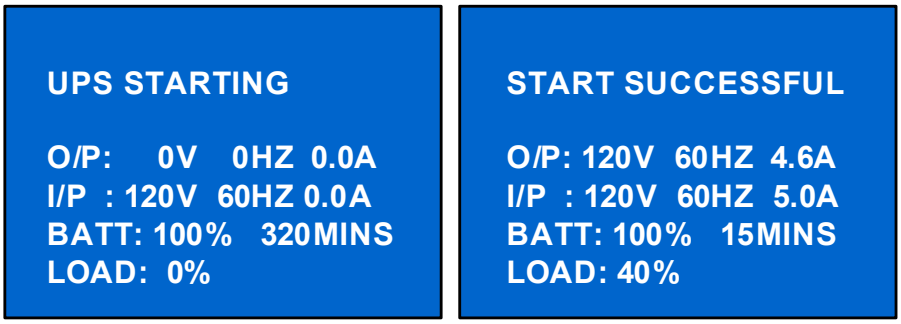
Figure 17 Startup screens



Input Power is Available | Input Power is not Available

To turn On the UPS, press either the Up or Down button to select *YES* and press the Enter button. The UPS will start up, the LCD will display *UPS STARTING* and then *START SUCCESSFUL* after the UPS is turned On, as shown in **Figure 18**.

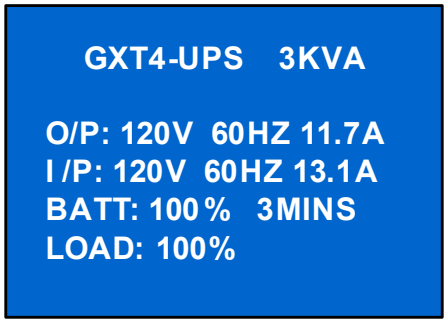
Figure 18 Starting and Start Successful screens



3.4.2 Default Screen

Press any button in the START SUCCESSFUL screen to enter the default interface, shown in **Figure 19**.

Figure 19 Default screen



Values shown will vary according to installation and configuration.

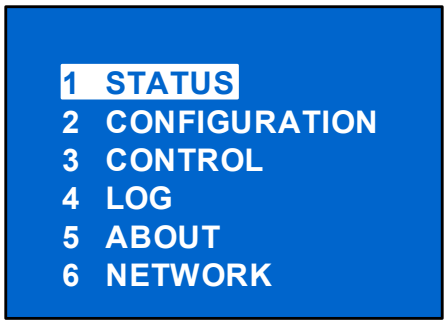
In the default screen, the LCD shows the UPS model, output parameters, input parameters, battery capacity with run time estimate and load percentage. The UPS operation mode (online /inverter, ECO, Battery or Bypass) will be indicated by the LED indicators.

If no control button (ESC, Up, Down, Enter) is pressed for 2 minutes, the LCD will enter the screen saver mode (backlight turns off). It will remain off until a control button is pressed.

3.4.3 Main Menu Screen

Press the Enter button in the default screen to enter the MAIN MENU screen, as shown in **Figure 20**.

Figure 20 Main Menu screen

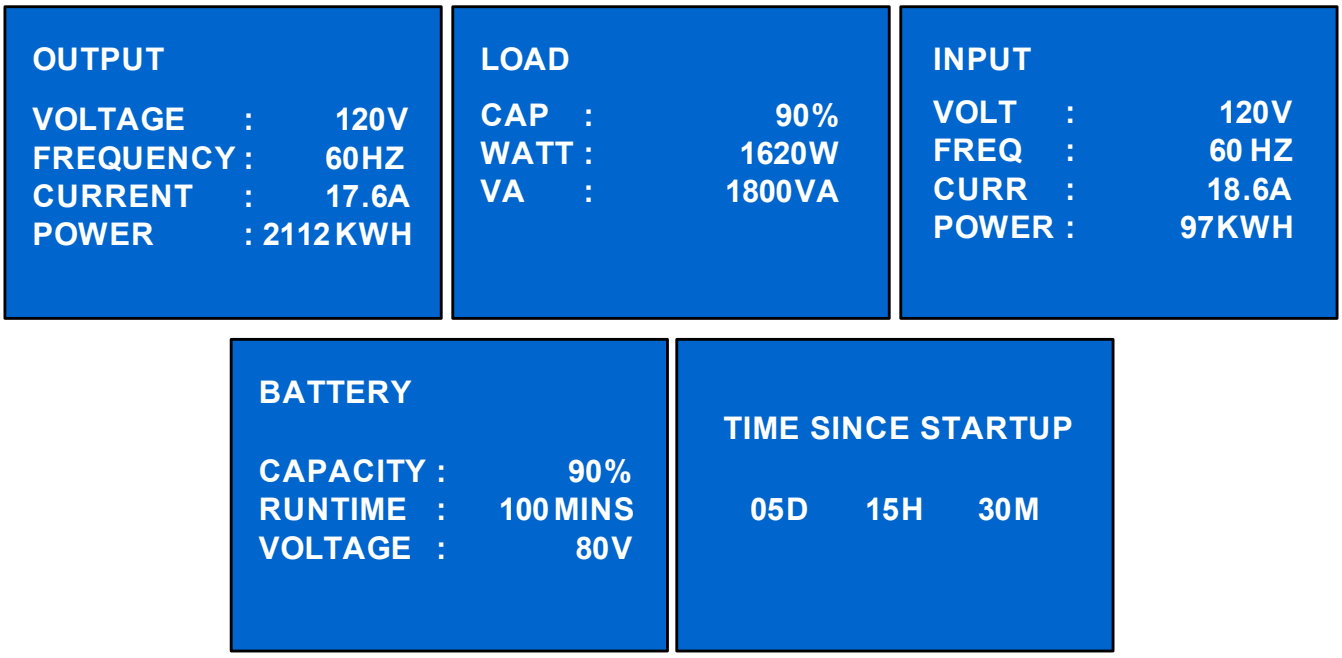


To select a submenu, press the Up or Down button to move the cursor to the required item, then press the Enter button to enter its submenu or set its parameter.

STATUS Screen

In the MAIN MENU screen, select *STATUS* to enter the Status Screen, displaying OUTPUT, LOAD, INPUT, BATTERY and TIME SINCE STARTUP, as shown in **Figure 21**.

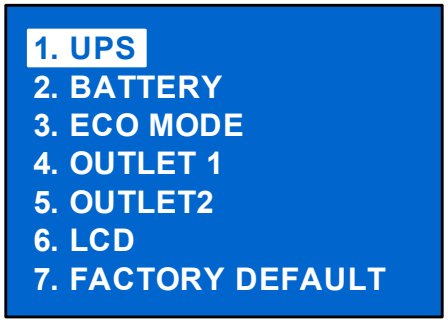
Figure 21 Status screens



CONFIGURATION Screen

Select *MAIN MENU* > *CONFIGURATION* to enter the Configuration menu. This menu has seven submenus, as shown in **Figure 22**.

Figure 22 CONFIGURATION screen

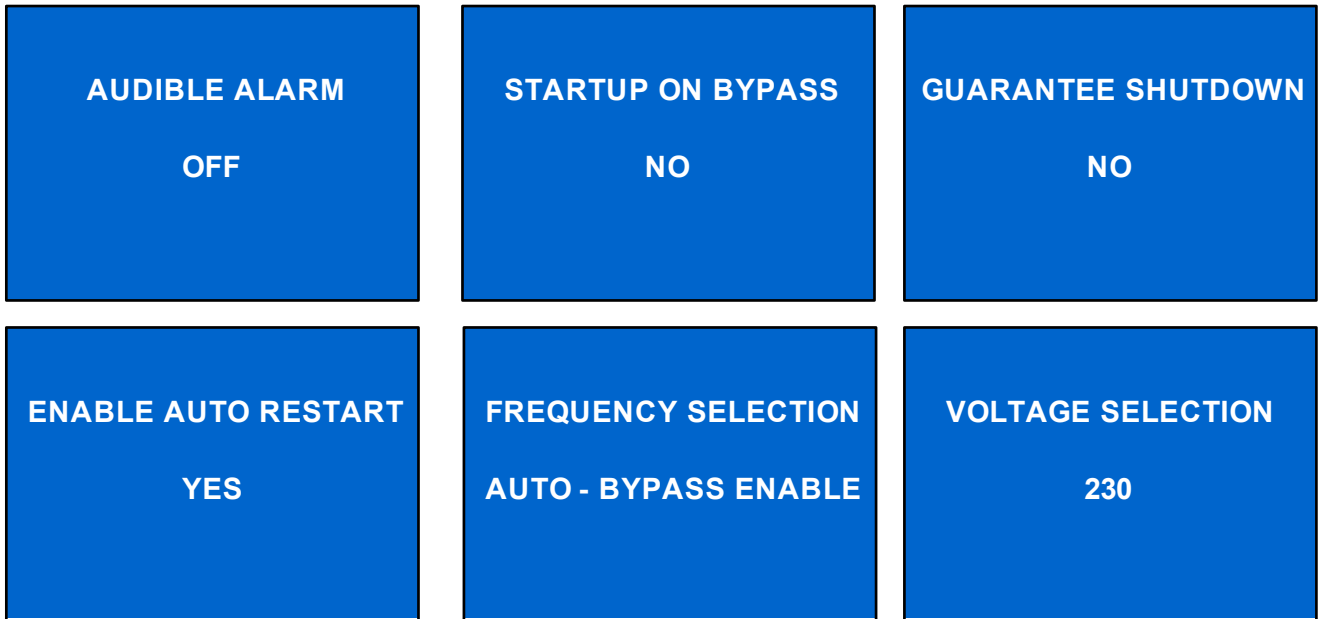


In the CONFIGURATION screen, press the Up or Down button to move the cursor to the required item, then press the Enter button to enter a submenu or set its parameters.

UPS Screen

Select *MAIN MENU* > *CONFIGURATION* > *UPS* to enter the UPS screen. This menu has six screens, as shown in **Figure 23**.

Figure 23 UPS screens

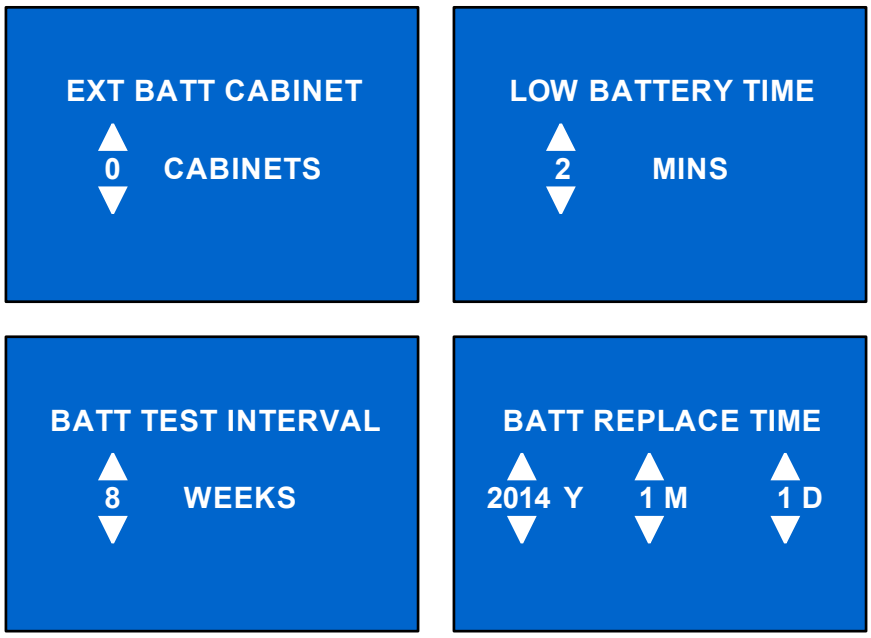


Press the Up or Down button to move the cursor to the required item, and press the Enter button to confirm the settings.

Battery Screen

Select *MAIN MENU* > *CONFIGURATION* > *BATTERY* to enter the BATTERY screen. This menu has four screens, as shown in **Figure 24**.

Figure 24 Battery screen

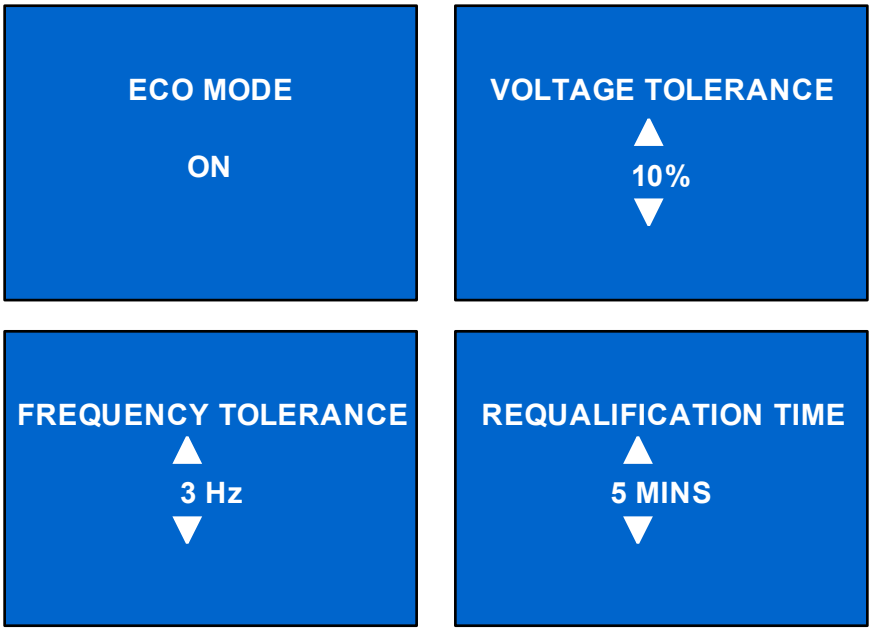


Press the Up or Down button to increase or decrease the value of the settings, and press the Enter button to confirm it.

ECO Mode Screens

Select *MAIN MENU* > *CONFIGURATION* > *ECO MODE* to enter the ECO MODE screens, as shown in **Figure 25**.

Figure 25 ECO Mode screen

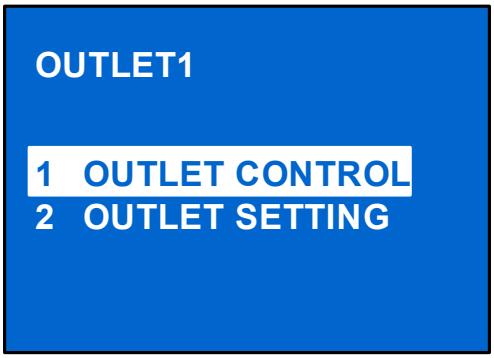


Press the Up or Down button to move the cursor to the required item, and press the Enter button to confirm the settings.

Outlet1 Screen

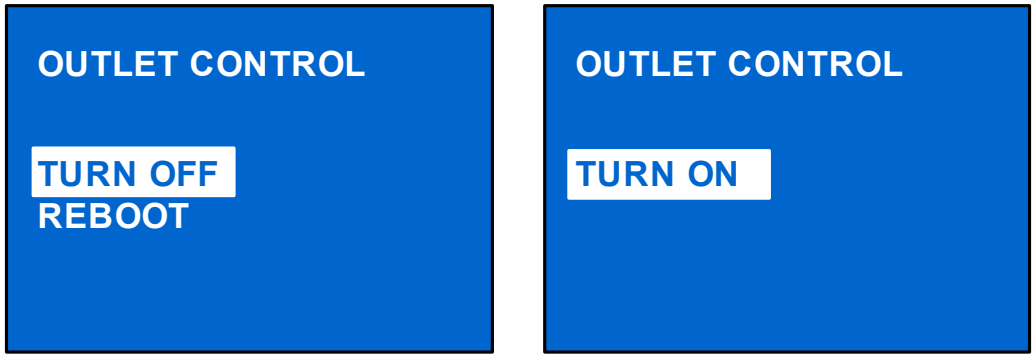
Select *MAIN MENU* > *2 CONFIGURATION* > *4 OUTLET1* to enter the OUTLET1 screen. This menu has two submenus, as shown in **Figure 26**.

Figure 26 Outlet1 screen



Select *1 OUTLET CONTROL* and press the Enter button to enter the OUTLET CONTROL screen, as shown in **Figure 27**.

Figure 27 Outlet Control screen

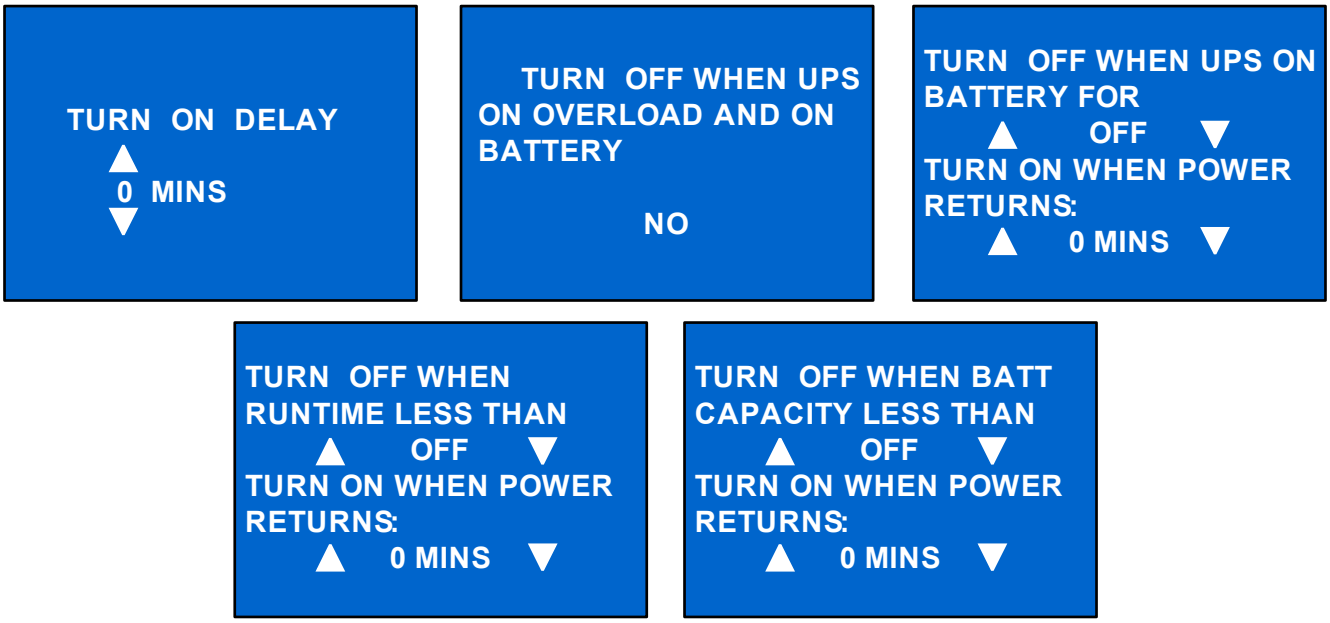


Outlet Control is On | Outlet Control is Off

Press the Up or Down button to move the cursor to the required item, and press the Enter button to confirm the settings.

Select *2 Outlet Setting* and press the Enter button to enter the OUTLET SETTING screen, as shown in **Figure 28**.

Figure 28 Outlet Setting screen

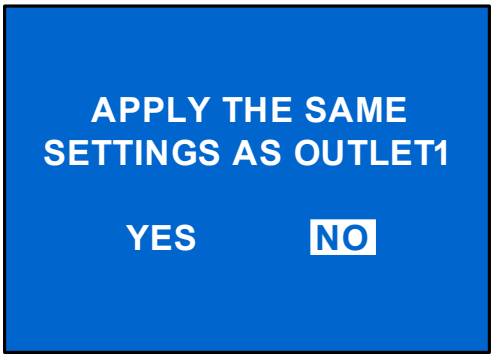


Press the Up or Down button to move the cursor to the required item, and press the Enter button to confirm the settings.

Outlet2 Screen

The Outlet2 screens are the same as the Outlet1 screens. The same settings are available as on the Outlet1 screen. If the Outlet2 group will have the same settings as the Outlet1 group, the Liebert GXT4 offers a programming shortcut, as shown in **Figure 29**. When configuring the Outlet2 group, the select *YES* and press the Enter button to apply the Outlet1 settings to the Outlet2 screen.

Figure 29 Outlet2 setting screen



LCD screen

Select Main Menu -> **2 CONFIGURATION** -> **6 LCD** to enter the LCD screen. This menu has two submenus, LANGUAGE and COLOR, as shown in **Figure 30**.

Figure 30 LCD screen

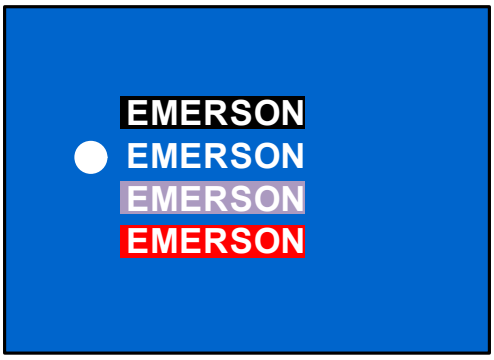
Select *1 LANGUAGE* and press the Enter button to enter the LANGUAGE screen, as shown in **Figure 31**.

The Liebert GXT4 is capable of supporting multiple languages. For the list of supported languages and instructions on how to upload them, refer to the Configuration Program user manual on the included CD.

Figure 31 Language screen

Select '**2 COLOR**' and press the Enter button to enter the COLOR screen, as shown in **Figure 32**.

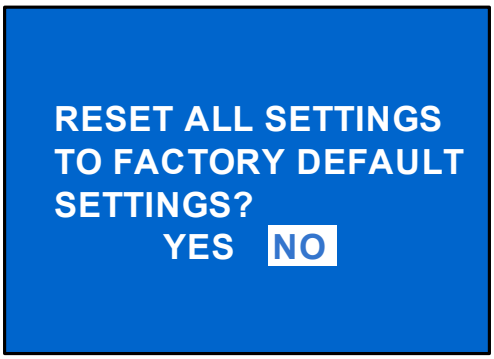
Figure 32 Color screen



FACTORY DEFAULT screen

Select *MAIN MENU -> 2 CONFIGURATION -> 7 FACTORY DEFAULT* to enter the FACTORY DEFAULT screen, as shown in **Figure 33**.

Figure 33 Factory Default screen



Control Screen

Select *MAIN MENU -> **3 CONTROL*** to enter the CONTROL screen. This screen has three submenus, TURN ON & OFF, ALARM CONTROL and BATT TEST, as shown in **Figure 34**.

Figure 34 Control screen

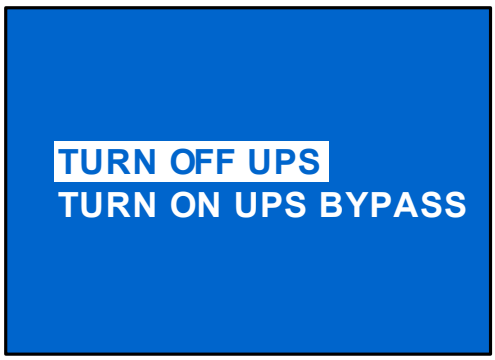
In the CONTROL screen, press the Up or Down button to move the cursor to the required item, and press the Enter button to enter its submenu.

TURN ON & OFF screen

Select *MAIN MENU -> **3 CONTROL** -> **1 TURN ON & OFF*** to enter the TURN ON & OFF screen. This screen shows one of two displays, TURN ON UPS and TURN OFF UPS, depending on the state of the UPS, as shown in **Figure 35**.

Figure 35 Turn UPS On or Off screen

UPS is Off



UPS is On

ALARM CONTROL screen

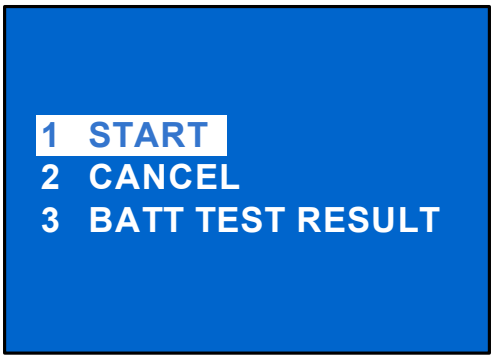
Select *MAIN MENU -> 3 CONTROL -> 2 ALARM CONTROL* to enter the ALARM CONTROL screen, as shown in **Figure 36**. This section allows active audible alarms to be silenced. To completely turn off the audible alarm, refer to CONFIGURATION > UPS as shown in **Figure 23**.

Figure 36 Alarm Control screen

BATT TEST screen

Select *MAIN MENU -> 3 CONTROL -> 3 BATT TEST* to enter the BATT TEST screen, as shown in **Figure 37**.

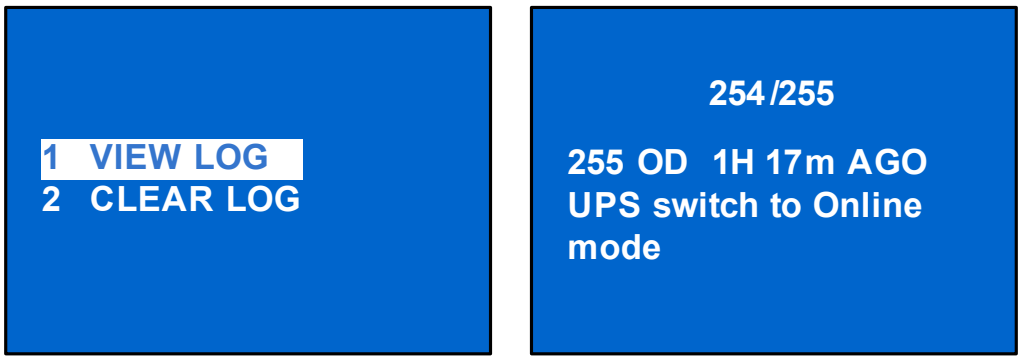
Figure 37 Batt Test screen



Log Screen

Select *MAIN MENU -> 4 LOG* to enter the LOG screen. This screen has two submenus, VIEW LOG and CLEAR LOG, as shown in **Figure 38**.

Figure 38 Log screens



CLEAR LOG Screen

Select *MAIN MENU > LOG > CLEAR LOG* to enter the CLEAR LOG screen, as shown in **Figure 39**.

Figure 39 Clear Log screen

Press the Up or Down button to move the cursor to the required item. Press the Enter button to confirm the settings.

ABOUT Screen

Select *MAIN MENU> ABOUT* to enter the ABOUT screen, as shown in **Figure 40**. The ABOUT screen displays UPS model, serial number, software version and hardware version.

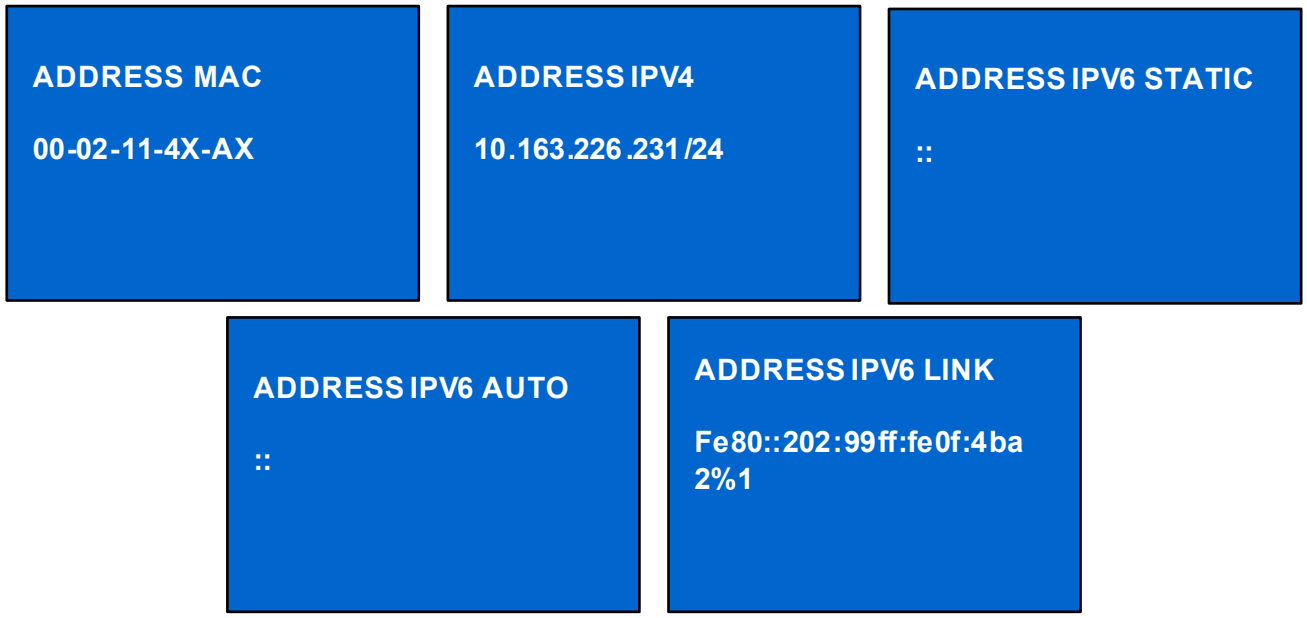
Figure 40 About screen

Network

Select *MAIN MENU>NETWORK* to enter the NETWORK screen.

The NETWORK screen displays the MAC address and the IPv4 IP address. If the Liebert GXT4 is fitted with an optional Liebert IntelliSlot® Web card (Liebert IS-WEBCARD), the screen will display IPv6 IP address settings (IPv6 requires configuration), as shown in **Figure 41**.

Figure 41 Network screens



3.4.4 Prompt List

A prompt screen is displayed during the operation of the system to alert you to certain conditions and/or to require your confirmation of a command or other operation. See **Table 5** for the prompts and meanings.

Table 5 System prompts and meanings

Prompt	Meanings
Mains Power Restored	The mains power returns and the UPS transfers back to mains (AC) mode.
UPS Return From A Low Battery Condition	The UPS transfers back to mains (AC) mode from battery low mode.
UPS Return From Battery Mode	The UPS transfers back to mains (AC) mode from battery mode.
UPS Self Test Successful	The UPS self-test is successfully performed.
UPS Shutdown Command Received	The UPS shut down was initiated through communication.
UPS Turn Off	The UPS shuts down and has no output power.
UPS Turn On	The UPS starts up successfully and supplies protected power to the load.
UPS Shutdown Process Had Been Cancelled	The shutdown command sent through Liebert MultiLink or SNMP card to the UPS is canceled,
ECO Mode Enabled	The UPS is configured to ECO mode operation,
ECO Mode Disabled	The UPS is configured to Online mode, supplying protected power to the load through the inverter.
UPS Internal Temperature Return To Normal	The internal temperature of the UPS recovers to normal range.
UPS Load Return From Overload	The loads are reduced, and the UPS recovers to normal state from overload.
Load On Inverter	The inverter is on and supplies protected power to the load.
Load On ECO Bypass	The UPS is on ECO mode; the mains is supplying power to the load directly to reduce energy usage.
OUTLET1 Closed Auto / Manual	The programmable output receptacle 1 received a turn-off command and is turned Off.
OUTLET1 Open Auto / Manual	The programmable output receptacle 1 received a Turn-On command and is turned On
OUTLET2 Closed Auto / Manual	The programmable output receptacle 2 received a Turn-Off command and is turned Off.
OUTLET2 Open Auto / Manual	The programmable output receptacle 2 received a turn-on command and is turned On.
Bypass Power Restored	The bypass power recovered and the UPS can now transfer to bypass.

3.4.5 Warning List

All UPS warning messages are described in **Table 6**.

Table 6 Warning list

Warning	Description
Mains Power Not Available	The mains power is not available, or it cannot satisfy the input requirements for the UPS to operate from mains power
UPS Batteries Low And Exhausted Soon	The battery capacity is low and will be exhausted soon
UPS Has Switched To Battery Mode	The mains power is abnormal or the PFC side is faulty, the UPS transfers back to Battery mode
Load On Bypass	The UPS transfers to Bypass mode, at this point, the input mains power supplies power to the load directly, and the load is not protected
Input Power Wiring Error	L-N line reverse or PE not connected.
Bypass Power Not Available	The bypass power is not available, or it cannot satisfy the requirements for the UPS transfers to bypass
UPS Maintenance Bypass Output	The UPS transfers to maintenance bypass.

3.4.6 Fault List

All UPS fault messages are described in **Table 7**.

Table 7 Fault list

Fault	Description
UPS Self-Test Failed	The battery is bad or weak or not connected.
UPS Overload	The UPS is overloaded.
Inverter Out Of Order	The inverter has failed.
Battery Weak/Bad	The battery is bad or weak.
Output Short Circuit	The output connection is short-circuited.
DC Bus Overvoltage	The DC bus is faulty.
UPS Overtemperature	Overtemperature occurs to the UPS and the UPS will transfer to Bypass mode.
Charger Out Of Order	The charger has failed.
Fan Out Of Order	At least one fan is failed.
DC Bus Discharge Fail	DC-DC failure occurs.
Rectifier Out Of Order	Rectifier failure occurs.

If a fault occurs, the UPS automatically switches to Bypass Mode. The original operating mode will be maintained only in the case of a battery disconnection fault. The fault message alternates with UPS Mode once a second, the red fault indicator on the operation and display panel lights up and the alarm sounds continuously.

If a fault occurs:

1. Enter the ALARM CONTROL screen (see **Figure 36**), and select *AUDIBLE ALARM ON* or *AUDIBLE ALARM OFF* to switch the alarm On or Off.
2. Enter the EVENT LOG screen (see **Figure 38**), and select *VIEW LOG* to view the entire Event log.

NOTE
There will be a short delay before the EVENT LOG screen displays the historical fault log to allow the log to load.

4.0 OPERATION

This section describes checks to be made before starting the UPS, how to start the UPS, manual battery test, manual bypass, shutting down the UPS and disconnecting mains power from the UPS.

NOTE
The Liebert GXT4's battery has been fully charged before delivery, but some charge will be lost during storage and shipping. To ensure that the battery has adequate reserve power to protect the connected load, charge the battery for three hours before putting the UPS into service.

4.1 Startup Checklist for the Liebert GXT4

Before starting the UPS, perform these checks:

___ 1. Check that the input plugs and loads are connected properly and reliably.

___ 2. Check that the battery cable is connected properly.

___ 3. Check that the communication cables are connected properly.

4.2 Starting the UPS

1. Plug the UPS into the appropriate AC outlet.
2. **3000VA models only**: Close the input breaker on the rear of the unit.
3. The UPS will begin the startup sequence once AC power is present. *The UPS will sound an audible alarm, this is normal.*
4. On the LCD, press either the Up or Down button once, then press the Enter button to turn On the UPS. *The UPS will sound the audible alarm again as the output receptacles are now being powered by the internal bypass, then will sound one more time as the inverter powers the connected equipment.*
5. Check the LCD and LED indicators to ensure that the UPS is operating normally.
6. Check the load percentage on the default screen to ensure that the connected equipment is not exceeding the UPS's rated capacity.

The UPS is now providing conditioned and protected power to the connected equipment.

4.3 Manual Battery Test

To initiate a manual battery test, select *MAIN MENU > CONTROL>BATT TEST>START*.

- If the battery test results show *FAILED*, allow the UPS to recharge the batteries for 24 hours.
- Retest the batteries after 24 hours of charging.
- After the batteries have been retested, if the battery test still shows *FAILED*, contact your local Emerson® representative or Emerson Network Power Channel Support.

4.4 Manual Bypass

To manually transfer the connected equipment to the internal bypass:

1. From the main menu select Control then press enter.
2. Select *TURN ON & OFF* and press Enter.
3. Select *TURN UPS BYPASS* and press Enter. The UPS will transfer the connected loads to the internal bypass.

If the internal bypass is not available because of input power problems, pressing this button once will be ignored. Bypass operation is indicated by an audible alarm and illuminated amber Bypass indicator. (If other indicators are illuminated, refer to **7.0 - Troubleshooting**.)

4.5 Shut Down the Liebert GXT4

To shut down the UPS from the LCD:

1. From the Main Menu select *CONTROL*, press Enter, then select *TURN ON & OFF*.
2. Press the Enter key.
3. Select *TURN UPS OFF*, then press Enter. Press either the Up or Down button to move the cursor to confirm the turn off command and press Enter. *The UPS will sound an audible alarm; this is normal.*
4. Power to the connected equipment is now Off.

The UPS display will still be illuminated because the batteries are still being charged. The UPS may now be disconnected from AC power, and the UPS will completely shut down in approximately 15 seconds.

4.6 Disconnecting Input Power from the Liebert GXT4

1. After the UPS has been shut down as detailed in **4.5 - Shut Down the Liebert GXT4**, disconnect the input cable from the wall socket.
2. Wait 30 seconds and verify that all indicators have turned Off and the fan has stopped; this indicates that the power-off is complete.
3. Turn the external battery cabinet breaker switch to the Off position if the UPS has an external battery cabinet.

After powering Off the UPS, the UPS ceases output and the load is powered Off.

5.0 COMMUNICATION

This section describes the four types of communication ports on the rear of the UPS:

- Liebert IntelliSlot® port
- USB port (standard B-type)
- Terminal Block Communication
- RS232 port (DB9F)

CAUTION

To maintain safety (SELV) barriers and for electromagnetic compatibility, signal cables should be segregated and run separate from all other power cables.

5.1 Liebert IntelliSlot Communication Cards

The Liebert IntelliSlot port accepts four optional cards:

- Liebert IntelliSlot Web Card (IS-WEBCARD)
- Liebert IntelliSlot Relay Card (IS-RELAY)
- Liebert IntelliSlot MultiPort Card (IS-MULTIPORT)
- Liebert IntelliSlot Unity Card (IS-UNITY-DP)

The Liebert IntelliSlot Web Card provides SNMP monitoring and control of the UPS across the network.

The Liebert IntelliSlot Relay Card provides dry contact relay outputs for custom-wired applications and delivers support for Liebert MultiLink® shutdown software.

The Liebert IntelliSlot MultiPort Card provides four sets of contacts for support of up to four computers that have Liebert MultiLink installed.

The Liebert IntelliSlot Unity Card provides SNMP and/or RS-485 monitoring of the UPS across the network and/or building management system. The Liebert IntelliSlot UNITY card also enables monitoring external temperature, humidity and contact closure inputs using external sensors. (The Liebert IS-UNITY-DP compatibility will be a future release, contact your Emerson sales representative for availability.)

Follow instructions provided with the Liebert IntelliSlot card to configure Liebert MultiLink®, the UPS or any additional ancillary product for the Liebert GXT4. These instructions are available at:

multilink.liebert.com

5.1.1 Liebert MultiLink

Liebert MultiLink monitors the UPS continuously and can shut down the computer or server in the event of an extended power failure. Liebert MultiLink can also be configured to shut down the UPS.

Liebert MultiLink can communicate with the UPS via the USB port, RS232 port, contact closures via terminal block or over the network via SNMP using the Liebert IS-WEBCARD. An optional Liebert MultiLink license kit permits shutting down multiple computers that are protected by the UPS.

For more information about the Liebert IntelliSlot SNMP Card, Liebert IntelliSlot Web Card and Liebert MultiLink License Kits, visit the Liebert Web site (**www.liebert.com**) or contact your local Emerson® representative.

5.2 USB Port Communication

The standard B-type USB port is used to connect the UPS and network server or other computer system using Liebert MultiLink®.

A standard B-type USB port is provided to allow connection to a computer or network server. The USB port can be used to communicate with the Liebert GXT4 configuration program (see section**5.2.1 - Configuration Program** for details) or Liebert MultiLink (refer to **5.1.1 - Liebert MultiLink** for description) that is provided on the CD that is included with the UPS.

5.2.1 Configuration Program

The configuration program is on the Liebert GXT4 CD and can be used instead of making configuration setting changes from the LCD panel. The configuration program communicates to a computer running a Microsoft® Windows® operating system via the included USB cable.

For most users, the factory default settings are adequate. This section give a brief overview of the features and parameters that are available for modification, as well as the factory default settings. Should any changes be necessary, refer to the Configuration Program User Manual that is located on the included CD for further details.

The configuration program allows these features of the Liebert GXT4 to be changed:

- Change and set the display language
- Enable/Disable Auto-Restart (default is Enable)
- Select frequency converter operation with a fixed output frequency of 50Hz or 60Hz, bypass disabled (default is Auto-Select with bypass enabled)
- Set the Low Battery Warning alarm time from 2 to 30 minutes (default is 2 minutes)
- Enable/Disable the Auto-Battery test (default is Enable)
- Enable/Disable Auto-Restart after removing Remote shutdown (default is Disable)
- Set the wiring mode of Remote shutdown (default is normally open)
- Set the Auto-Enable output after remote shutdown (default is Disable)
- Set the Auto-Battery test to 8, 12, 16, 20, or 26 weeks (default is 8 weeks)
- Select the number of external battery cabinets connected to the UPS to adjust the remaining run time calculated by Emerson® software products (default is zero)
- Select one of multiple output voltages to match various voltages (see **Table 8**).

Table 8 Output voltage option

UPS Model	Factory Default, VAC	Output Voltage Option, VAC
GXT4-500RT120 - GXT4-3000RT120	120	110, 115, 120 and 127
GXT4-3000RT208	208	208 / 220 / 230 / 240

NOTICE

The output voltage settings cannot be changed while the UPS is On and powering connected loads.

NOTE

- *Setting the output voltage of the Liebert GXT4-500RT120, GXT4-700RT120, and GXT4-1000RT120 models to 110VAC automatically derates both the VA and Watt ratings to 95% of the unit's rating.*
- *Setting the output voltage of the Liebert GXT4-1500RT120 and GXT4-2000RT120 models to 110VAC automatically derates both the VA and Watt ratings to 85% of the unit's ratings, and programming the output voltage to 115VAC automatically derates both the VA and Watt ratings to 95% of the unit's rating.*
- *Setting the output voltage of the Liebert GXT4-3000RT120 model to 110VAC automatically derates both the VA and Watt ratings to 90% of the unit's ratings (refer to **9.0 - Specifications** for the VA and Watt ratings).*

NOTE

- *This program is compatible with UPS models beginning with 'GXT4,' as in 'GXT4-3000RT230.' It is not compatible with earlier versions of the Liebert GXT UPS.*
- *A computer running Microsoft® Windows 2000®, Windows XP®, Windows Vista®, Windows 7 or Windows 8 is required to set up and run the configuration program.*

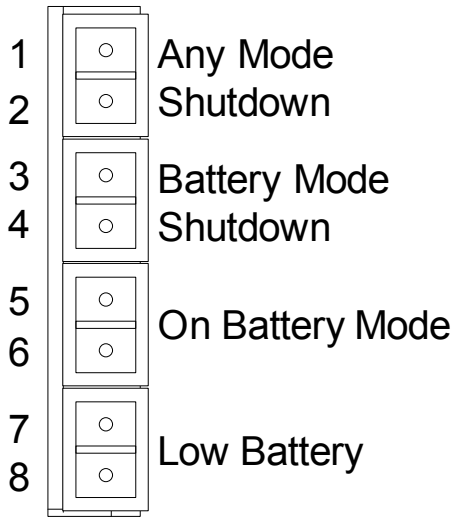
5.3 RS-232 Port

The RS-232 port uses an Emerson® proprietary protocol that is for use with Liebert MultiLink®. This port enables a more secure connection instead of the USB cable, to the computer or server that has Liebert MultiLink installed.

5.4 Terminal Block Communication

The Terminal Block includes eight pins, as shown in **Figure 42**.

Figure 42 Terminal Block Communication pin layout



5.4.1 Any Mode Shutdown

The purpose of Any Mode Shutdown is to shut down the UPS output by turning Off the rectifier, inverter and static switch so that there is no power to the loads.

Any Mode Shutdown can be operated locally or remotely:

- Local Any Mode Shutdown can be performed by shorting Pin 1 and Pin 2.
- Remote Any Mode Shutdown can be performed using a switch connected to Pin 1 and Pin 2 and mounted at a remote location.

NOTE

Remote Power Off will be performed either by NO or NC contact of Any Mode Shutdown, depending on the settings in the configuration program.

A current-limited source for this optocoupler (+12VDC, 50mA) will be available from the UPS.

The connection to the UPS for remote connection will be via terminal block connector.

Any Mode Shutdown wiring must conform to all national, regional and local wiring regulations.

WARNING

When the Auto-Enable output option is selected and the UPS output is disabled using Pin 1 and Pin 2, the Liebert GXT4's output can turn On automatically and without warning if the Pin 1 and Pin 2 connection is changed.

5.4.2 Battery Mode Shutdown

Battery Mode Shutdown permits shutting down the UPS by turning Off the rectifier, inverter and static switch so that there is no power to the load when the UPS is On Battery. The auxiliary power for the UPS will still be active.

Battery Mode Shutdown can be performed locally or remotely:

- Local Battery Mode shutdown can be performed by shorting Pin3 and Pin4.
- Remote Battery Mode Shutdown can be performed using a switch connected to Pin3 and Pin4 and mounted at remote location.

NOTE

Remote Power Off will be performed by NO contact.

A current-limited source (+12VDC, 50mA) will be available from UPS.

The connection to the Liebert GXT4 for remote connection will be via terminal block connector.

Battery Mode Shutdown wiring must conform to all national, regional and local wiring codes and laws.

This signal must last for 1.5 seconds or longer.

A battery shutdown signal will not cause an immediate shutdown. It will start a 2-minute shutdown timer. This timer cannot be stopped once triggered. If the mains power returns during this countdown, the Liebert GXT4 will still shut down and must remain shut down for 10 seconds. Whether the UPS turns back On when the power is restored depends on the auto-restart setting.

5.4.3 On Battery

On Battery signal is a Normally Open (NO) dry contact. When the UPS is supplying output power from the battery this dry contact will be closed.

5.4.4 Low Battery

Low Battery signal is a Normally Open (NO) dry contact. When the UPS is supplying output power from the battery and has reached the Low Battery Warning time selected in the configuration program, this dry contact will be closed.

NOTE

The rated values for the dry contacts for the On Battery and Low Battery signals are:

- *Rated Voltage: 30V (AC or DC)*
- *Rated Current: 300mA*

6.0 MAINTENANCE

This section describes replacing the internal battery pack, precautions, checking the Liebert GXT4's status and checking UPS functions.

WARNING

The battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed before replacing the battery pack:

- Remove rings, watches and other metal objects.
- Use tools with insulated handles.
- Do not lay tools or other metal objects on the batteries.
- If the battery kit is damaged in any way or shows signs of leakage, contact your local Emerson representative immediately.
- Do not dispose of batteries in a fire. The batteries may explode.
- Handle, transport and recycle batteries in accordance with local regulations.

6.1 Replacing the Internal Battery Pack

The Liebert GXT4 is designed to allow the user to replace the internal battery pack safely. Refer to **Table 9** for internal battery pack part numbers for Liebert GXT4 UPS:

Table 9 Replacement internal battery pack model number

UPS Model Number	Replacement Internal Battery Pack Model Number	Quantity Required
Liebert GXT4-500RT120	GXT4-5A48BATKIT	1
Liebert GXT4-700RT120	GXT4-5A48BATKIT	1
Liebert GXT4-1000RT120	GXT4-5A48BATKIT	1
Liebert GXT4-1500RT120	GXT4-9A48BATKIT	1
Liebert GXT4-2000RT120	GXT4-9A48BATKIT	1
Liebert GXT4-3000RT120	GXT4-9A72BATKIT	1
Liebert GXT4-3000RT208	GXT4-9A72BATKIT	1

Read all safety cautions before proceeding. A trained user can replace the internal battery pack when the UPS is always in a restricted access location (such as a rack or server closet). Contact your local dealer or Emerson representative to obtain the pricing of the appropriate replacement battery pack.

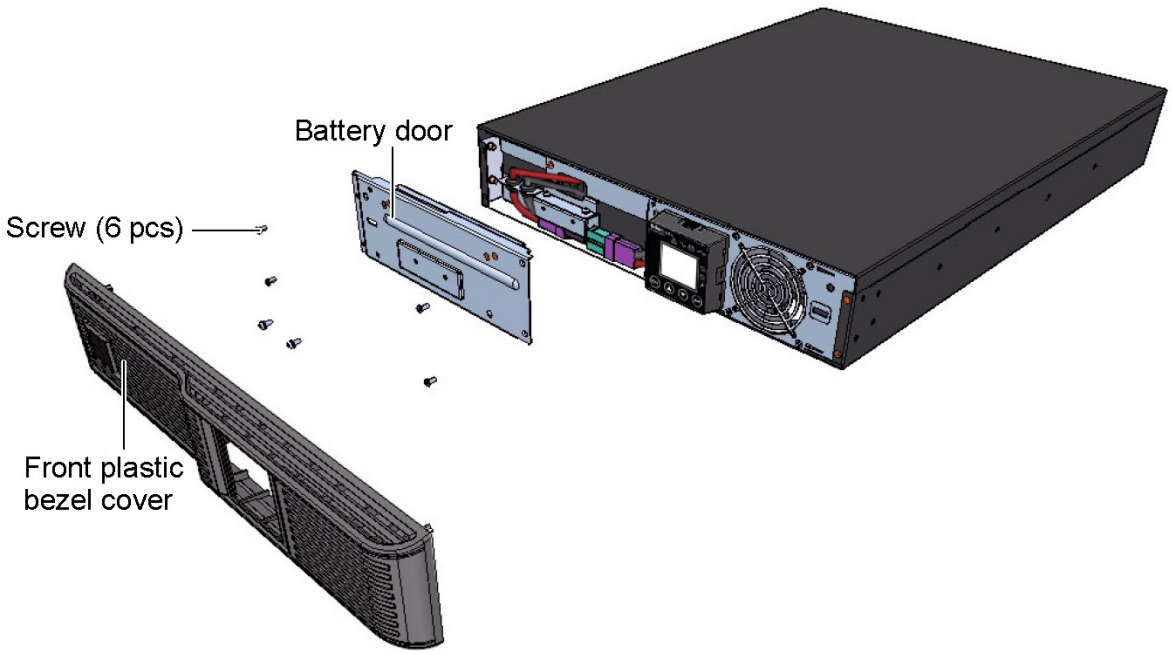
CAUTION

Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

6.1.1 Battery Replacement Procedures

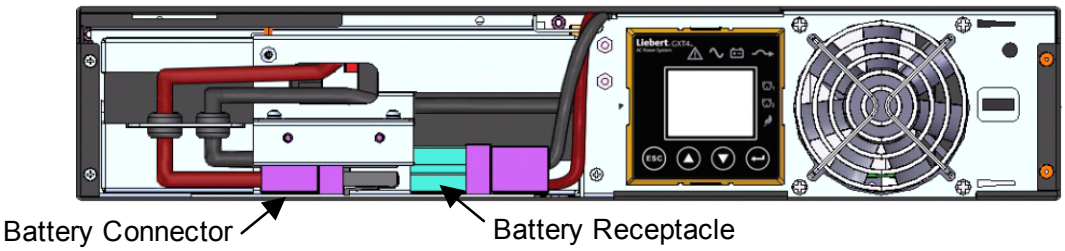
1. Remove the front plastic bezel cover from the UPS.
2. Loosen and remove the six screws on the battery door, as shown in **Figure 43**.
3. Lay the battery door and screws aside for reassembly.

Figure 43 Removing the front bezel cover and battery door



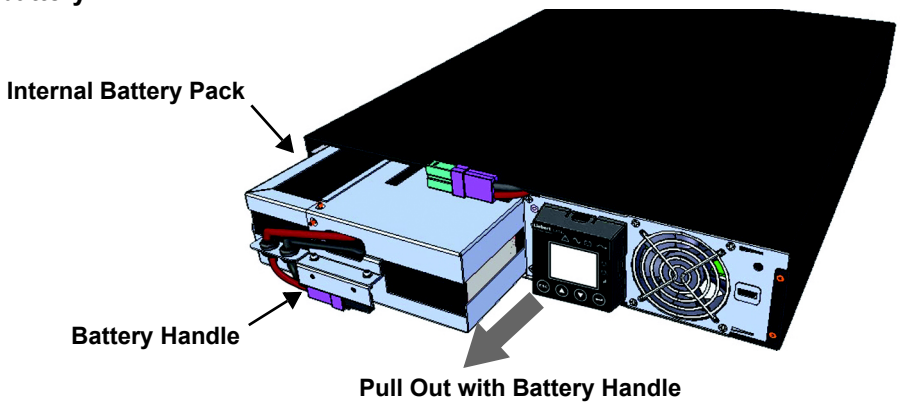
4. Gently pull the battery wire out and disconnect the battery plug and battery receptacle, as shown in **Figure 44**.

Figure 44 Disconnecting the battery plug and battery receptacle (front view)



5. Grasp the battery handle, and pull the internal battery pack out of the UPS, as shown in **Figure 45**.

Figure 45 Pull out the battery



6. Unpack the new internal battery pack. Take care not to destroy the packing.
   Compare the new and old internal battery pack to make sure they are the same type and model. If so, proceed with **Step 7**; if they are different, stop and contact your local Emerson representative, or Emerson Channel Support.
7. Line up and slide in the new internal battery pack.
8. Reconnect the battery plug and battery receptacle
9. Push the battery wire and internal battery pack back into the UPS.
10. Reattach the front battery door with the six screws.
11. Reattach the front plastic bezel cover to the UPS.

NOTE
The internal battery pack is hot-swappable. However, caution should be exercised because during this procedure the load is unprotected from disturbances and power outages. Do not replace the battery while the UPS is operating in Battery Mode. This will result in a loss of output power and will drop the connected load.

6.2 Battery Charging

The batteries are valve-regulated, nonspillable, lead acid and should be kept charged to attain their design life. The Liebert GXT4 charges the batteries continuously when it is connected to the utility input power.

If the Liebert GXT4 will be stored for a long time, Emerson recommends connecting the UPS to input power for at least 24 hours every four to six months to ensure full recharge of the batteries.

6.3 Precautions

Although the Liebert GXT4 has been designed and manufactured to ensure personal safety, improper use can result in electrical shock or fire. To ensure safety, observe the following precautions:

- Turn Off and unplug the Liebert GXT4 before cleaning it.
- Clean the UPS with a dry cloth. Do not use liquid or aerosol cleaners.
- Never block or insert any objects into the ventilation holes or other openings of the Liebert GXT4.
- Do not place the Liebert GXT4 power cord where it might be damaged.

6.4 Checking UPS Status

Emerson recommends checking the UPS operation status every six months.

- Check if the UPS is faulty: Is the Fault Indicator On? Is the UPS sounding an alarm?
- Check if the UPS is operating in Bypass mode: Normally, the UPS operates in Normal Mode; if it is operating in Bypass Mode, stop and contact your local Emerson representative or Emerson Channel Support.
- Check if the battery is discharging: When the utility input is normal, the battery should not discharge. If the UPS is operating in Battery Mode, stop and contact your local Emerson representative or Emerson Channel Support.

6.5 Checking UPS Functions

NOTE
UPS function check procedures may interrupt power supply to the connected load.

Emerson recommends checking the UPS functions once every six months.

Back up the load data before conducting the UPS functions check. Procedures are as follows:

1. Press the Standby/Manual Bypass button to check whether the alarm and indicators are normal.
2. Press the On/Alarm Silence/Manual Battery Test button to check again whether the indicators are On and the UPS is operating normally.
3. Press the On/Alarm Silence/Manual Battery Test button for three seconds after Inverter Mode; the UPS should initiate battery self-test. Check to determine whether the battery is operating normally. If not, stop and contact your local Emerson representative or Emerson Channel Support.

7.0 TROUBLESHOOTING

This section indicates various UPS symptoms a user may encounter and provides a troubleshooting guide in the event the UPS develops a problem. Use the following information to determine whether external factors caused the problem and how to remedy the situation.

7.1 UPS Symptoms

The following symptoms indicate the Liebert GXT4 is malfunctioning:

- The relative indicators illuminate, indicating the UPS has detected a problem.
- An alarm buzzer sounds, alerting the user that the UPS requires attention.

7.1.1 Indicator and LCD

In addition to the fault indicator being illuminated, the LCD will display the fault. The displayed fault on the LCD is described in **Table 10**

Table 10 Description of the displayed fault

Displayed Fault	Cause	Corrective Steps
UPS self test failed	The battery is bad or weak.	Contact customer service.
UPS shutdown command received	The UPS shuts down through communication.	Contact customer service.
UPS overload	The UPS is overloaded.	Reduce the load and contact customer service.
Inverter Out of Order	The inverter is faulty.	Contact customer service.
Battery Weak/Bad	The battery is bad or weak.	Replace the battery.
Output Short Circuit	The output connection is short-circuited.	Shut down the equipment and contact customer service.
DC Bus Overvoltage	The DC bus is faulty.	Contact customer service.
UPS Overtemperature	Over-temperature occurs to the UPS and the UPS will transfer to Bypass mode.	Reduce the load and contact customer service.
Charger Out of Order	The charger is faulty.	Contact customer service.
Fan Out of Order	At least one fan is faulty.	Contact customer service.
DC Bus Discharge Fail	A DC-DC failure occurs.	Contact customer service.

NOTE

If the UPS encounters a fault and no correction attempt is performed within 2 minutes, the LCD backlight will flash (on 1 second and off 1 second) as an alert.

Press any button to exit the alert mode. If no correction attempt is performed on the UPS, the LCD backlight will flash again until the UPS fault is corrected.

7.1.2 Audible Alarm

An audible alarm will sound in conjunction with the visual indicators to indicate a change in UPS operating status. The audible alarm will sound as described in **Table 11**.

Table 11 Audible alarm description

Condition	Alarm
Battery discharge	Half-second beep every 10 seconds
Low battery	Two half-second beeps every 5 seconds
UPS fault, load on bypass	1-second beep every 4 seconds
UPS fault, no power to load	Continuous
Overload	Half-second beep every half second
Battery replacement	2-second beep every 2 minutes
Battery loss	Continuous
Wiring problem (loss of proper grounding for UPS)	Continuous
Bypass reminder	1-second beep every 60 seconds

7.2 Troubleshooting

In the event of an issue with the UPS, refer to **Table 12** to determine the cause and solution. If the fault persists, contact Emerson® Channel Support.

Table 12 Troubleshooting table

Problem	Cause	Solution
UPS fails to start	UPS is short-circuited or overloaded	Ensure UPS is Off. Disconnect all loads and ensure nothing is lodged in output receptacles. Ensure loads are not defective or shorted internally.
	Batteries are not charged enough or not connected	Check to ensure the internal battery is connected. If it is not, make the connection and try to start the unit. If the battery is connected, leave the UPS connected to input power for 24 hours to recharge batteries, then try to start the unit.
Battery indicator is illuminated	UPS is not plugged in	UPS is operating from battery mode. Ensure UPS is securely plugged into the wall receptacle.
	UPS input protection fuse has blown/opened	UPS is operating from battery mode. Save data and close applications. Replace UPS input fuse, then restart UPS.
	Mains power is out of tolerance	UPS is operating from battery mode. Save data and close applications. Ensure mains supply voltage is within acceptable limits for UPS.
UPS has reduced battery backup time	Batteries are not fully charged	Keep UPS plugged in continuously at least 24 hours to recharge batteries.
	UPS is overloaded	Check load level indicator and reduce the load on the UPS.
	Batteries may not be able to hold a full charge due to age	Replace batteries. Contact your local dealer, Emerson representative or Emerson Channel Support for replacement battery kit.
Battery indicator is flashing.	Battery source is not available; continuous horn.	Check battery connections, completely power down and restart UPS. NOTE: If the battery circuit opens while the UPS is running, it will be detected when the next battery test is performed.
Bypass indicator is flashing.	Because the voltage or frequency is outside acceptable limits, the bypass is disabled.	The AC input powers the PFC input and serves as the bypass source. If the AC is present but the voltage or frequency exceeds the acceptable range for safe operation with a load, the bypass will be disabled and this indicator will flash, indicating that the bypass is unavailable.

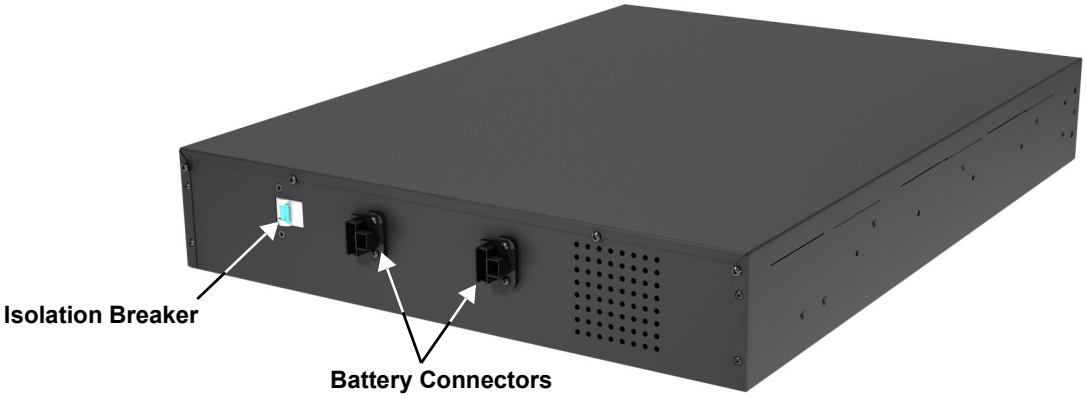
When reporting a UPS issue to Emerson, include the UPS model and serial number. These are located in several places for your ease of location: on the top panel (rack mount orientation); the left side (tower orientation); the rear panel; on the front of the unit behind the front plastic bezel; and on the LCD select *Main Menu > About*.

8.0 BATTERY CABINET

Optional battery cabinets are available for the Liebert GXT4. The battery connectors and input breaker are on the battery cabinet's rear panel, as shown in **Figure 46**. For battery cabinet specifications, refer to **Table 15**. The Liebert GXT4 may be equipped with a maximum of six extension battery packs.

For battery run times, refer to **Table 17**.

Figure 46 Battery cabinet



WARNING

Do not contact the battery connectors and ground without wearing protective gloves and clothing and taking other precautions against electrical shock. The battery loop and AC input are not insulated, which may cause a dangerous voltage between the battery connectors and ground.

NOTE

External Battery Connectors are wired in parallel. Either connector can be connected to the UPS or to another battery cabinet.

NOTE

The standard battery cable delivered with the battery cabinet is 0.65m (2.13ft) long

9.0 SPECIFICATIONS

Table 13 Specifications of GXT4-500RT120 - GXT4-700RT120 and GXT4-1000RT120 models

Parameters	Product Model		
	GXT4-500RT120 (500VA/450W)	**GXT4-700RT120 (700VA/630W)**	**GXT4-1000RT120 (1000VA/900W)**
Dimensions, D × W × H, in. (mm)			
Unit	16.2 x 16.9 x 3.4 (408 x 430 x 85)		
Shipping	25.5 x 23.9 x 10.6 (647 x 607 x 270)		
Weight, lb (kg)			
Unit	40 (18.2)		
Shipping	47 (21.4)		
Input AC			
Voltage Range (typical)	120VAC nominal; variable based on output load		
90% ~ 100% loading	90VAC/140VAC		
70% ~ 90% loading	86VAC/140VAC		
30% ~ 70% loading	77VAC/140VAC		
0 ~ 30% loading	60VAC/140VAC		
Frequency	40Hz ~ 70Hz; Auto Sensing		
Input Power Cord	10 ft. attached w/ NEMA 5-15P plug		
Output AC			
Output Receptacles	5-15R × 6		
Voltage	110/115/120VAC (user-configurable); ±3%		
Waveform	Sine wave		
Utility (AC) Mode Overload	200% for 2 seconds; 150% for 50 seconds with transfer to bypass		
Battery			
Type	Valve-regulated, nonspillable, lead acid		
Qty × V× Rating	4 × 12V × 5.0Ah		
Battery Mfr./Part #	YUASA/NPH5-12; CSB/ HR 1221W; CSB/GP1245		
Backup Time	See **Table 17**		
Recharge Time	3 Hours to 90% capacity after full discharge with 100% load till UPS auto-shutdown (Internal Batteries Only)		
Environmental Requirements			
Operating Temperature, °F (°C)	32 to 104 (0 to 40); see **Table 16 - Operating temperature parameters**		
Storage Temperature, °F (°C)	5ºF to 122ºF (-15ºC to 50ºC)		
Relative Humidity	0% to 95%, non-condensing		
Operating Elevation	Up to 10,000 ft. (3000m) at 77ºF (25ºC) without derating		
Storage Elevation	50,000 ft. (15000m) maximum		
Audible Noise	<43dBA max @ 3ft. (1m) front and sides <46dBA max @ 3ft. (1m) rear	< 50 dBA, at 3ft. (1m) rear < 45 dBA, at 3ft. (1m) front and sides	
Agency			
Safety	UL 1778, cUL Listed		
RFI/EMI	FCC Class A		
Surge Immunity	IEC 62040-2 2nd Ed		
Transportation	ISTA Procedure 1A		

Table 14 Specifications of GXT4-1500RT120 - GXT4-3000RT120 and GXT4-3000RT208 models

Parameters	Product Model			
	GXT4-1500RT120 (1500VA/1350W)	**GXT4-2000RT120 (2000VA/1800W)**	**GXT4-3000RT120 (3000VA/2700W)**	**GXT4-3000RT208 (3000VA/2700W)**
Dimensions, D × W × H, in. (mm)				
Unit	19.7 x 16.9 x 3.4 (497 × 430 × 85)		23.7 x 16.9 x 3.4 (602 × 430 × 85)	
Shipping	25.5 x 23.9 x 10.6 (647 x 607 x 270)		29.4 x 23.4 x 10.6 (747 x 607 x 270)	
Weight, lb. (kg)				
Unit	54.6 (24.8)	56.1 (25.5)	71.4 (32.4)	
Shipping	69.6 (31.6)	70.5 (32)	86 (39)	
Input AC				
Voltage Range (typical)	120VAC nominal; variable based on output load			208VAC nominal; variable based on output load
90 - 100% loading	102VAC/140VAC			177VAC/280VAC
70 - 90% loading	96VAC/140VAC			168VAC/280VAC
30 - 70% loading	84VAC/140VAC			150VAC/280VAC
0 - 30% loading	60VAC/140VAC			115VAC/280VAC
Frequency	40 - 70Hz; Auto Sensing			
Input Power Cord	10 ft. attached w/ NEMA 5-15P plug	10 ft. attached w/ NEMA 5-20P plug	10 ft. attached w/ NEMA L5-30P plug	10 ft. attached w/ NEMA L6-20P plug
Output AC				
Output Receptacles	5-15R × 6	5-20R × 6	L5-30R×1+5-20R×6	L6-20R×1+L6-15R×2
Voltage	110/115/120VAC (user-configurable); ±3%			208/220/230/240 VAC (user-configurable); ±3%
Waveform	Sine wave			
Utility (AC) Mode Overload	200% for 2 seconds 150% for 50 seconds		200% for 2 seconds 150% for 10 seconds	
Battery				
Type	Valve-regulated, nonspillable, lead acid			
Qty×V×Rating	4 × 12V × 9.0Ah		6 × 12V × 9.0Ah	6 × 12V × 9.0Ah
Battery Mfr./Part #	Panasonic/UP- RW1245; CSB/HR 1234W F2; CSB UPS12460F2			
Backup Time	See **Table 17**			
Recharge Time to 90% capacity after full discharge with 100% load till UPS auto-shutdown (Internal Batteries Only)	4 Hours	3 Hours		
Environmental				
Operating Temperature, °F (°C)	+32 to +104 (0 to 40); see **Table 16 - Operating temperature parameters**			
Storage Temperature, °F (°C)	5 to +122 (-15 to 50)			
Relative Humidity	0% to 95%, non-condensing			
Operating Elevation	Up to 10,000 ft. (3000m) at 77ºF (25ºC) without derating			
Storage Elevation	50,000 ft. (15000m) maximum			
Audible Noise	< 45dBA at 3ft (1m) rear < 46 dBA at 3ft. (1m) front and side	<48dBA max @ 3ft (1m) front and side <48dBA max @ 3ft. (1m) rear		
Agency				
Safety	UL 1778, c-UL Listed			
RFI/EMI	FCC Class A			
Surge Immunity	IEC 62040-2 2nd Ed			
Transportation	ISTA Procedure 1A			

Table 15 Battery cabinet specifications

Parameter	Model Number	
	GXT4-48VBATT	**GXT4-72VBATT**
Used w/UPS Model	**GXT4-500RT120,GXT4-700RT120 GXT4-1000RT120,GXT4-1500RT120, GXT4-2000RT120**	**GXT4-3000RT120 GXT4-3000RT208**
Dimensions, D × W × H, in (mm)		
Unit	19.7 x 16.9 x 3.3 (497 × 430 × 85)	23.7 x 16.9 x 3.3 (602 × 430 × 85)
Shipping	24.3 x 22.4 x 10.3 (617 x 570 x 262)	28.2 x 22.4 x 10.3 (717 x 570 x 262)
Weight, lb (kg)		
Unit	57.3 (26)	83.8 (38)
Shipping	86 (39)	110 (50)
Battery parameters		
Type	Valve-regulated, nonspillable, lead acid	
Qty × V× Rating	2 × 4 × 12V × 9.0Ah	2 × 6 × 12V × 9.0Ah
Battery Mfr./Part #	Panasonic/UP-RW1245; CSB/HR 1234W F2; CSB UPS12460F2	
Backup Time	See **Table 17**	
Environmental		
Operating Temperature, °F (°C)	32 to 104 (0 to 40)	
Storage Temperature, °F (°C)	19 to 122 (-15 to 50) High ambient temperatures will reduce battery life.	
Relative Humidity	0% to 95%, non-condensing	
Operating Elevation	Up to 10,000 ft. (3000m) at 104ºF (40ºC) without derating	
Storage Elevation	50,000 ft. (15000m) maximum	
Agency		
Safety	UL 1778, c-UL Listed	
RFI/EMI	FCC Class A	
Surge Immunity	IEC 62040-2 2nd Ed	
Transportation	ISTA Procedure 1A	

Table 16 Operating temperature parameters

Ambient Temperature, °C (°F)	25-30 (77-86)	30-35 (86-95)	35 - 40 (95-104)
Maximum Output Power Factor Derating @ Maximum Load	100%-93%	93%-86%	86%-79%

Table 17 Battery run times

Number of External Battery Cabinets	Load Percent of Capacity	120VAC RT Models						208VAC RT Model
		500VA	700VA	1000VA	1500VA	2000VA	3000VA	3000VA
Internal Battery	10%	128	105	90	123	92	82	92
	20%	82	61	37	52	38	38	39
	30%	41	37	30	34	23	23	23
	40%	38	32	23	23	16	16	16
	50%	34	27	17	18	12	12	11
	60%	31	22	14	14	9	9	9
	70%	27	18	11	11	7	7	7
	80%	23	15	9	9	5	5	5
	90%	20	13	8	7	4	4	4
	100%	17	11	7	6	3	3	3
Internal Battery + 1 External Battery Cabinet	10%	448	426	332	335	303	224	303
	20%	329	302	165	162	140	137	139
	30%	223	163	137	129	96	95	95
	40%	166	144	108	96	66	66	65
	50%	153	125	92	72	49	49	48
	60%	139	106	74	54	38	41	41
	70%	125	94	61	46	33	34	34
	80%	108	78	49	38	28	27	27
	90%	100	69	40	34	23	23	25
	100%	92	60	38	31	20	21	21
Internal Battery + 2 External Battery Cabinets	10%	480	480	456	451	431	427	431
	20%	454	433	331	318	207	202	205
	30%	429	327	222	187	150	149	149
	40%	333	265	166	151	124	124	123
	50%	309	201	152	131	97	98	97
	60%	225	164	137	107	75	76	75
	70%	201	153	122	91	61	62	62
	80%	166	142	105	74	50	50	50
	90%	159	131	95	64	41	45	46
	100%	151	120	79	53	38	41	41
Internal Battery + 3 External Battery Cabinets	10%	480	480	480	480	455	452	455
	20%	480	461	441	426	326	323	325
	30%	458	438	336	312	197	196	195
	40%	442	344	305	198	155	155	154
	50%	426	322	209	160	136	136	135
	60%	338	300	167	145	111	112	112
	70%	322	213	157	130	96	98	98
	80%	305	189	146	111	78	79	79
	90%	225	163	135	99	68	70	70
	100%	209	155	124	83	56	60	60

Table 17 Battery run times *(continued)*

Number of External Battery Cabinets	Load Percent of Capacity	120VAC RT Models						208VAC RT Model
		500VA	700VA	1000VA	1500VA	2000VA	3000VA	3000VA
Internal Battery + 4 External Battery Cabinets	10%	480	480	480	480	480	466	480
	20%	480	480	459	446	424	421	423
	30%	480	457	435	341	308	307	307
	40%	460	441	339	309	192	192	191
	50%	448	424	316	204	157	158	157
	60%	436	336	221	164	142	143	142
	70%	424	318	199	153	126	128	128
	80%	340	301	166	141	107	109	109
	90%	327	213	158	130	95	97	98
	100%	315	197	149	112	79	81	81
Internal Battery + 5 External Battery Cabinets	10%	480	480	480	480	480	480	480
	20%	480	480	466	458	441	439	440
	30%	480	464	446	432	333	332	331
	40%	467	451	427	333	225	225	224
	50%	457	438	341	306	188	190	188
	60%	447	424	322	207	158	159	159
	70%	438	343	303	167	145	147	147
	80%	428	329	212	158	133	135	135
	90%	390	315	193	148	120	122	122
	100%	341	300	166	139	104	107	106
Internal Battery + 6 External Battery Cabinets	10%	480	480	480	480	480	480	480
	20%	480	480	480	467	452	450	451
	30%	480	480	458	445	422	421	421
	40%	480	462	442	422	319	319	318
	50%	467	451	426	327	216	218	216
	60%	459	440	342	304	185	188	186
	70%	451	428	326	208	159	160	160
	80%	442	370	309	184	148	149	150
	90%	434	336	221	161	137	139	139
	100%	426	324	204	153	126	129	129

Run times in this table are approximate. Times can vary by ±5% due to manufacturing variances of the batteries. Times are based on new, fully charged batteries with 100% resistive loads and an ambient temperature of 77°F (25°C). To increase this time, turn Off non-essential loads (such as idle computers and monitors) or add optional external battery cabinets.

9.1 Product Warranty Registration

Registration is not required to activate the product warranty on a Liebert UPS. Registration is required to qualify for the Product Protection Promise. To register, visit the Emerson Network Power® Web site to fill out the online form at:

www.emersonnetworkpower.com/en-US/Forms/Pages/LiebertProductWarrantyRegistration.aspx

- To contact warranty support by e-mail: **dpg.warranty@emerson.com**

9.2 Technical Support

Technical support contacts are listed on the back cover of this document. To contact Emerson Channel Product Support:

Phone

- NORTH AMERICA: 1-800-222-5877
- OUTSIDE NORTH AMERICA: 00-800-1155-4499

E-mail

- TECHNICAL SUPPORT: **liebert.upstech@emerson.com**

Technical Support / Service

Web Site
www.liebert.com

Monitoring
liebert.monitoring@emerson.com
800-222-5877
Outside North America: +00800 1155 4499

Single-Phase UPS & Server Cabinets
liebert.upstech@emerson.com
800-222-5877
Outside North America: +00800 1155 4499

Three-Phase UPS & Power Systems
800-543-2378
Outside North America: 614-841-6598

Environmental Systems
800-543-2778
Outside the United States: 614-888-0246

Locations

United States
1050 Dearborn Drive
P.O. Box 29186
Columbus, OH 43229

Europe
Via Leonardo Da Vinci 8
Zona Industriale Tognana
35028 Piove Di Sacco (PD) Italy
+39 049 9719 111
Fax: +39 049 5841 257

Asia
29/F, The Orient Square Building
F. Ortigas Jr. Road, Ortigas Center
Pasig City 1605
Philippines
+63 2 687 6615
Fax: +63 2 730 9572

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