



Power Availability

GXT2 10000R230

User Manual

10kVA

230V

50Hz



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Important Safety Instructions



WARNING

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. 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 qualified service personnel. Do not attempt to service this product yourself. Never work alone.

SAVE THESE INSTRUCTIONS

This manual contains important safety instructions that must be followed when installing, operating and maintaining the GXT2-10000R230 uninterruptible power system (UPS).

Read all safety, installation and operating instructions before installing or operating the UPS. Adhere to all warnings on the unit and in this manual. Follow all operating and user instructions. Individuals without previous training are not allowed to install and operate this equipment.

The GXT2-10000R230 is not intended for use with life support or other designated critical devices. The UPS is designed for data processing equipment. If uncertain about the intended use for the UPS device, consult your dealer or Liebert representative.

This device serves as an uninterruptible power supply for connected loads. Maximum load must not exceed that shown on the UPS rating label. The device is in compliance with all relevant safety regulations concerning information technology equipment, including electronic machines for use in an office environment.

Depending on the type and rating of the UPS device, certain configurations of battery extensions may be connected. These battery extensions may be connected only to the compatible basic UPS unit.



WARNING

Liebert considers the safety of personnel to be of paramount importance. For this reason, it is essential that safety procedures be studied before commencing work and properly adhered to thereafter.

- The user or operator may intervene in the operation of the UPS provided that the instructions laid out in **Battery Precautions on page 3** and **4.2 Controls and Indicators** are strictly adhered to.
- The installation of the UPS, described in **3 Installation**, may only be carried out by qualified technical personnel.
- Even when all switches and interrupters are on, hazardous voltages are present within the UPS; any operation that requires protective panels to be opened or removed may be carried out by Liebert authorized technical personnel only.



CAUTION

Read the following safety notices carefully. Failure to observe the instructions may endanger your life, health, the reliability of your device, and the security of your data.

- Transport the unit only in suitable packaging (protected against jolts and shocks).
- If the equipment is moved from a cold environment to the operating room, condensation may occur. Before you switch on the equipment, make sure it is absolutely dry. An acclimatization period of at least two hours is required.
- The equipment must be installed in accordance with the environmental conditions specified in **2.5 Environmental Conditions** and in **Table 3-1**.
- This UPS should not be supplied from electrical power systems of the “IT” (Impedance a Terre) type. (IEC 364-ELECTRICAL INSTALLATION OF BUILDINGS)
- Even with all buttons in “OFF” position (see **4.2 Controls and Indicators**), the device (UPS) is **not** isolated from the mains. To isolate the unit completely from the mains, the power cables must be disconnected.
- In case of interruption of the mains voltage, the integrated battery maintains the power supply to the user equipment.
- Lay all cables so that nobody can stand on them or trip over them. When connecting the UPS to the power supply, follow the instructions in **3 Installation**.
- Make sure that no foreign objects (e.g., pins, necklaces, paper clips, etc.) get inside the device.
- In emergencies (e.g., damaged case, controls or power cables, penetration of liquids or foreign matter), switch off the device and contact the appropriate customer service representative.
- Do not connect equipment that will overload the UPS (e.g., laser printers or vacuum cleaners) or demand DC-current (e.g., half-wave rectifiers).
- When cleaning the unit, follow the instructions in **5 Maintenance**.
- The sum of the leakage currents (protective conductor current) of the UPS and the connected devices exceeds 3.5 mA for all ratings of the UPS. Earth connection is essential before connecting supply.
- Data transmission lines should not be connected or disconnected during a thunderstorm.
- Remote Emergency Power Off (REPO) input is located on the rear of the unit (see **3.7 Terminal Blocks for UPS** and **4.8 Emergency Switch Device**). When this connection is on, the logic circuit will shut down the UPS output immediately.
- An Emergency Switching Device (E.S.D.) must be fitted downstream of the UPS for the wiring installation safety to comply with the European Harmonized Document HD384-4-46 S1.



- When mounting the unit onto a rack, it has to be hooked on both sides and the front plate of the unit has to be fixed to the rack by screws. The unit has to be fixed in horizontal position.
- Do **not** connect more than four battery extensions GXT2-240RVBATT to the GXT2-10000R230. (For additional extended runtimes, please consult with your Liebert or Emerson Network Power representative.)
- The vents for air inlet and outlet at the front and rear side must not be obstructed.
- The sum of the leakage currents (protective conductor current) of the UPS and the connected devices exceeds 3.5 mA. Earth connection of the unit is essential before connecting supply.

Battery Precautions

- Battery maintenance must be carried out by authorized personnel.
- The batteries installed in the UPS and within the battery extensions may contain electrolyte. Under normal conditions, the containers are dry. A damaged battery may leak electrolyte which can be dangerous when in contact with the skin and cause irritation to the eyes. Should this happen, wash the affected part with copious amounts of water and seek medical advice immediately.
- Do not open or damage batteries. The released electrolyte is toxic.
- Voltage is always present on the battery contacts.
- Even when discharged, a battery has the capacity to supply a high short circuit current, which, in addition to damaging the battery and cables, may expose the operator to the risk of burns.
- The voltage of a single cell of a single battery block is not dangerous. However a number of cells or battery blocks connected in series can produce hazardous voltages.
- The battery cabinet is a hermetic type battery and must not be kept in storage or disuse for longer than six months at 20°C (68°F) without being recharged (assuming it was fully charged at the beginning of storage). If this period is exceeded, it is essential that the batteries be recharged, which requires that the UPS be switched on. If these conditions are not met, the performance of the battery can no longer be guaranteed. Liebert advises recharging the batteries at least once every four months.
- Since new batteries often do not provide full capacity after an initial charge, it may be necessary to carry out a number of discharge/recharge cycles before optimum performance is achieved.
- Do not dispose of batteries in a fire. The batteries may explode.
- Batteries must be disposed of in accordance with the regulations governing disposal of toxic and harmful waste.

Emergency



CAUTION

The supply to the load may be interrupted by turning on all the switches or by turning the Maintenance Switch on the rear of the UPS to the Off position.

DO NOT USE WATER to extinguish any fires that occur in the area where the UPS is installed.

Leakage currents



CAUTION

Connect the protection earth (PE) safety conductor before connecting any other cables.

Radio Interference

The GXT2-10000R230 is a Radio Interference Class A Product.

The UPS device may cause radio interference. Do not place it near devices that are particularly susceptible to electromagnetic interference (e.g., transmitters, receivers, radars, metal detectors and antitheft devices).



WARNING

This is a product for restricted sales distribution to informed partners. Installation restrictions or additional measures may be needed to prevent radio interference.

Notes Regarding the EU Declaration of Conformity

The GXT2-10000R230 conforms to the following European directives:

73/23/EEC

Directive of the council for adaptation of the legal regulations of the member states regarding electrical equipment for use within specific voltage limits, modified by directive 93/68/EEC.

89/336/EEC

Directive of the council for adaptation of the legal regulations of the member states regarding electromagnetic compatibility, modified by directive 91/263/EEC.

Conformity is established through compliance with the following standards:

EN 62040-1-1

EN 62040-2

Additional information regarding adherence to these directives is included in the appendices NSR and EMC of the EU Declaration of Conformity.

If required, the EU Declaration of Conformity may be requested from Liebert.

1 Introduction and System Description

Congratulations on your choice of the Liebert UPStation GXT2-10000R230 UPS. It provides conditioned power to microcomputers and other sensitive electronic equipment.

Upon generation, AC power is clean and stable. However, during transmission and distribution, it is subject to voltage sags, spikes and complete power failure that may interrupt computer operations, cause data loss, and damage equipment. The UPStation GXT2-10000R230 protects equipment from these disturbances.

The UPStation GXT2-10000R230 is a compact, on-line UPS. An on-line UPS continuously conditions and regulates its output voltage whether utility power is present or not. It supplies connected equipment with clean sinewave power. Sensitive electronic equipment operates best from sinewave power.

For ease of use, the UPStation GXT2-10000R230 features a light-emitting diode (LED) display to indicate both load percentage and battery capacity.

The UPStation GXT2-10000R230 has an interface port for communication between the UPS and a network server or other computer system. This port provides detailed operating information including voltages, currents and alarm status to the host system when used in conjunction with Liebert's MultiLink™ software.


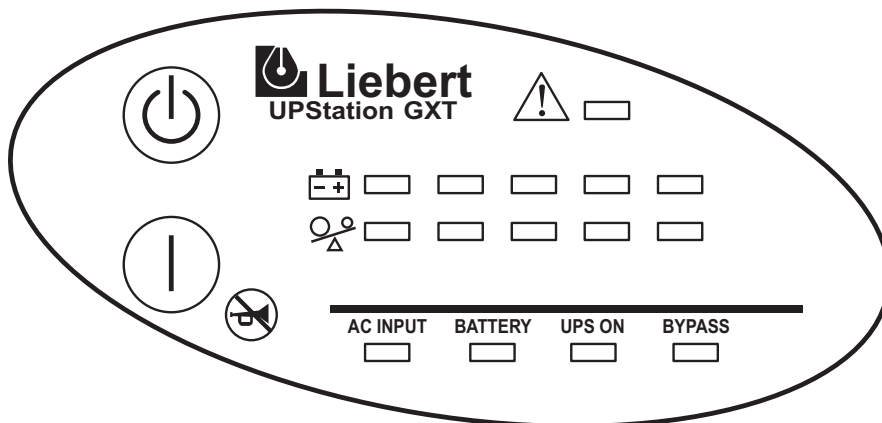
 **CAUTION**
The UPS device may be operated only by qualified personnel.

Figure 1-1 UPStation GXT2-10000R230 control panel



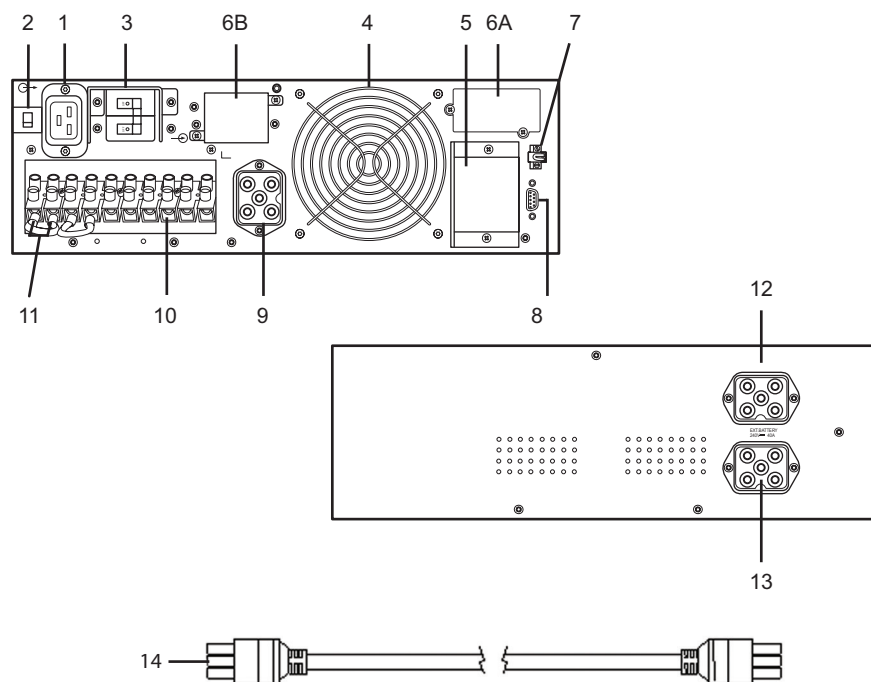
1.1 Device Overview

The GXT2-10000R230 is available at 10kVA nominal power rating. The following table provides an overview of the device:

Table 1-1 Overview of the UPS devices and batteries

Type	Model #	Nominal power
UPS	GXT2-10000R230	10000VA/7000W
Battery Cabinet	GXT2-240RVBATT	240 VDC

Figure 1-2 GXT2-10000R230 rear view with battery pack



Legend:

- | | |
|--|--|
| 1 Output socket(s) I EC 320 | 8 UPS interface COM A |
| 2 Output circuit breaker | 9 Battery socket |
| 3 Input circuit breaker | 10 Terminal block |
| 4 Fan | 11 Parallel connection |
| 5 Cover of parallel port | 12 Battery socket for battery connection cable to the UPS |
| 6A Communication slot – SNMP (Option) | 13 Battery extension cable socket. Connected to the UPS or another battery extension |
| 6B Communication port – Relay Contacts | 14 Battery extension connection cable |
| 7 REPO Contacts | |



NOTE

Each battery extension Rackmount GXT2-240RVBATT is supplied with one battery connection cable.

2 Unpacking the UPS and Site Preparation

2.1 Inspection

Upon receiving your GXT2-10000R230, examine the packaging for any signs of mishandling or damage. If any damage is noted, notify your local Liebert representative and your carrier. Any damage or missing parts must be reported to the supplier within eight days of delivery.

2.2 Required Setup Equipment

The following tools are required to set up your UPS:

- pallet jack
- utility knife or scissors
- star head screwdriver

2.3 Storage

If the UPS will not be used within seven days of delivery, store the unit indoors in a clean, and dry area. Protect all the equipment, including its batteries, from extreme temperature, high humidity, spills, and other damaging conditions. Refer to **Table 2-1** for permissible environmental conditions for storage.

Table 2-1 Storage conditions

Temperature limits Batteries ONLY	0°C to +40°C (32-104°F)
Temperature limits UPS without batteries	-25°C to +55°C (-13°F to + +131°F)
Relative humidity	0% to 90%, NON-CONDENSING

2.4 Handling

The equipment must be kept upright at all times and handled with care. It may be damaged if dropped or subjected to severe impact.

2.5 Environmental Conditions

The GXT2-10000R230 must be installed horizontally, on a level and even surface and in an area protected from extreme temperature, water and humidity, and the presence of conductive powder or dust (see **Table 3-1**). Do not stack units; do not place any objects on top of the unit.

- The functional temperature range of the UPS is 0°C to 40°C (32-104°F)
- The ideal ambient temperature range is 15°C to 25°C (59-77°F)
- The battery life is defined at 20°C. Each increment of 10°C above 25°C (increment of 18°F above 77°F) reduces the expected life by 50%.

2.6 Access to Area

The placement area must have sufficient space for installation and for routine maintenance. Access doors must be sufficiently large to permit passage of the UPS.

2.7 Rack Loading

Ensure that the place where the UPS/batteries will be installed can support the unit's weight (see **Table 3-3** for the unit's weight).

2.8 Inventory List

The GXT2-10000R230 comes with the following:

- User manual
- Multi-Link CD
- Configuration program CD
- RS232 cable
- Fixed rails for rack mounting

The battery cabinets contain one DC-power cable and fixed rails for rack mounting.

2.9 Repacking the UPS

To repack the UPS, proceed as follows:

1. Do not pack the equipment at least six hours after the last recharge.
2. Place the equipment in a bag made of porous material allows it to breathe (e.g., 100m polyethylene).
3. Do not remove air from the packaging.

3 Installation

3.1 Electrical Preparations

Before beginning installation, the input source must be isolated and secured to prevent reconnection during installation. The input circuit breaker on the rear of the UPS must be in the Off position.



WARNING

- a. Installation may be carried out only by qualified technicians and in conformity with the applicable safety standards.
- b. Electric shock hazard: Even when the unit is disconnected from the mains, hazardous voltage may still be supplied by the battery. Both poles should, therefore, be disconnected before carrying out maintenance work inside the UPS.

For electrical installation, the nominal current rating of the source must be observed. The UPS is not suitable for connection to 16A subdistribution systems.

3.2 Installation Data

Table 3-1 Environmental data

Ambient temperature	0°C to +40°C (32-104°F)
Relative humidity (w/o condensing at 20°C)	90%
Max. altitude (w/o derating)	1000 m a.s.l.
Cable inlet	bottom on the rear side
Air inlet	front
Air outlet	rear

Table 3-2 Technical specifications

Description		UPS Power Rating
Electrical Data		
Rating		10kVA
Input	Voltage	230V
	Frequency	50/60Hz \pm 5% Auto selection
	Current	45A
Battery external	Type*	External battery packs only (1 to 4 packs)
	Voltage/Watt Type	12V/45W YUASA/REW45-12(FR)
Output	Voltage	220/230/240V \pm 2%
	Frequency with mains control	50/60Hz \pm 5% Auto selection
	Frequency with internal clock	see input frequency
	Nominal current at $\cos \varphi = 0.7$ and 230V	43.5A
General		
Overvoltage category		II
Protection class		IP20
Cooling		Forced Air Fans

* Replace the batteries only with the indicated battery types. No other type is permitted.

Table 3-3 Mechanical data

Mechanical Data			
UPS Unit	Weight	kg	27
Dimensions	Width	mm	410
	Height		130(3U)
	Depth		660
Battery extensions	Weight	kg	70
Dimensions	Width	mm	410
	Height		130(3U)
	Depth		660
Maximum noise level (@ 1m)		dBA	\leq 55

3.3 Current Table and Suggested Cable Sizes

The following table indicates the currents and recommended sizes of the connecting cables in accordance with regulations IEC-287 and DIN VDE 0298

1. PVC-insulated copper cables (@ 70°C) (158°F).
2. Air temperature surrounding the conduits not greater than 30°C (86°F).



NOTE

Should there be any variation in the conditions, it is necessary to verify whether the cable dimensions satisfy the requirements of IEC-287 and DIN VDE 0298. In cases where the cables are so long that they cause a drop in tension of greater than 3%, a larger dimension must be used.

Table 3-4 Connection data

Description	Unit	UPS Power Rating
	kVA	10
Connector size	mm ²	16
Max. input current	Arms	51
Input cable size (∅ and neutral)	mm ²	10
Max. output current	Arms	50
Output cable size (∅ and neutral)	mm ²	10
Earth cable size (PE)	mm ²	10



WARNING

Particularly sensitive equipment may be susceptible to interference. To prevent this, Liebert suggests:

- Using mains input, output, and external battery cables to the UPS in earthed, metal conduits, or
- Using shielded cables

Routing of cable (e.g. power supplies, communication or data lines) to other equipment, should be kept separate from that of the UPS cables.

3.4 Neutral Connection

The installation of the UPS does not affect the existing Neutral system.

The Neutral system may be affected if the UPS is operating with the Neutral switched upstream.

3.5 External Protection and Isolating Devices

External devices for the protection of cables and for isolating the UPS external to the UPS must be installed upstream of the equipment. Select and configure the isolating device according to **Table 3-5**.

Such devices must be either curve C automatic circuit breakers or type GL/GG fuses.

Disconnecting devices must be provided in building installations and other locations.



WARNING

The following label must be displayed on all switching devices installed in the same electrical system as the UPS, even when these are located at a distance from the area.

ENSURE THAT THE UNINTERRUPTIBLE POWER SYSTEM IS ISOLATED BEFORE WORKING ON THIS CIRCUIT.

Table 3-5 indicates the protection devices (circuit breakers and fuses) that must be installed by the personnel for the protection of both the cables and the equipment.

Table 3-5 Field-supplied circuit protection

UPS Type		UPS Unit	UPS Power Rating
Input	Fuse	A	50
	Circuit breaker	A	50



NOTE

If an external battery cabinet is present, it shall be located adjacent to the UPS. When such an option is supplied by Liebert, it comes complete with protection devices and correctly-sized cables. When batteries are sourced from other suppliers, it is advised that Customer Support Technical Service be contacted for correct sizing of the protection devices and interconnection cables.

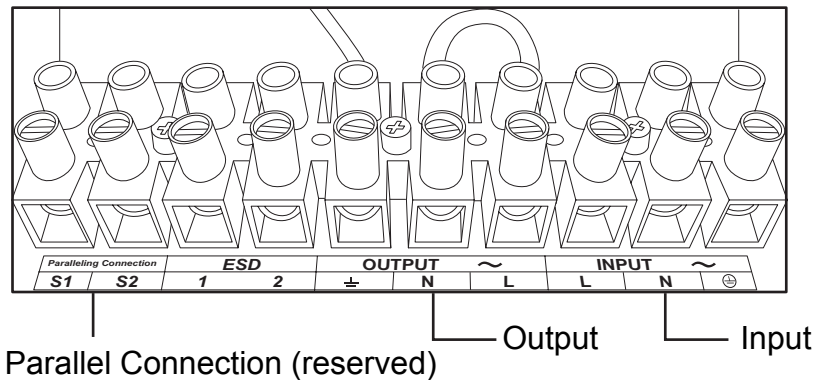
3.6 Connecting to Mains and Load

Connect the mains supply to the input terminals of the UPS.

3.7 Terminal Blocks for UPS

See below figure for terminal blocks.

Figure 3-1 Hardwire terminals



Single block: connect S1~S2

Parallel operation: open bridge S1-S2

3.8 Connecting to Power Cables

1. Open the UPS input breaker.
2. Connect loads to the output terminals.
3. Connect the mains to the corresponding input terminals (see **Figure 3-2**).

3.9 Battery Extension Installation

Optional Liebert battery extensions may be connected to the UPS to provide additional battery run time. Battery extensions are designed to be stacked beneath the UPS.



WARNING

The battery extension(s) are heavy (see **Table 3-3**).

1. Visually inspect the battery extension for freight damage. Report damage to the carrier and your local dealer or Liebert representative.
2. For slide rail installations, first remove the top/ side fin. Top/ side fin slides forward and then lift up to remove. Optional rack-mount handles are shipped with the external battery cabinet and may be installed at this time if desired.
3. Fasten the slides into position with the screws per the instructions included with the slide rails.
4. Connect the supplied external battery cabinet cable to the rear of the external battery cabinet, then to the rear of the UPS.
5. The UPS is now equipped with additional backup battery run time. For approximate battery run times, refer to **Table 7-2**.



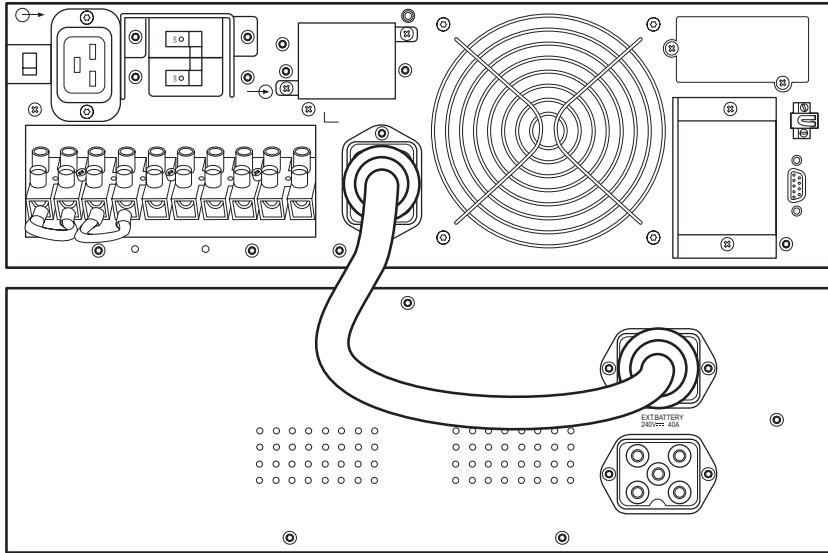
NOTE

You must use the included configuration program to program the UPS for the number of battery extensions connected. Instructions for the configuration program are in **3.10 Configuration Program**.

The following figure shows the GXT2-10000R230 with battery extension Rackmount GXT2-240RVBATT.



To connect the battery extension Rackmount GXT2-240RVBATT with the GXT2-10000R230, plug the battery cable into the socket (on Rackmount UPS) and a battery extension socket (on battery extension).

Figure 3-2 GXT2-10000R230 rear view with battery extension



NOTE

- a. The GXT2-10000R230 has no internal battery. The AC power won't be maintained when an AC Failure occurs during replacement of the first battery pack.
- b. The unit indicates an alarm condition when the battery is not connected.

1. To cancel the alarm, connect the battery.
2. Acknowledge the alarm by pushing the pushbutton .
3. Now switch the unit to online mode by pushing the button .

The unit checks the battery voltage (a beep is heard) once more and stays in bypass mode until a constant battery voltage is present.

3.10 Configuration Program

The final step of installation may require custom configuration of your UPS using the enclosed configuration program. Some configuration settings may be changed only while the UPS is off. These should be set before the UPS is put into full-time service powering the critical load.

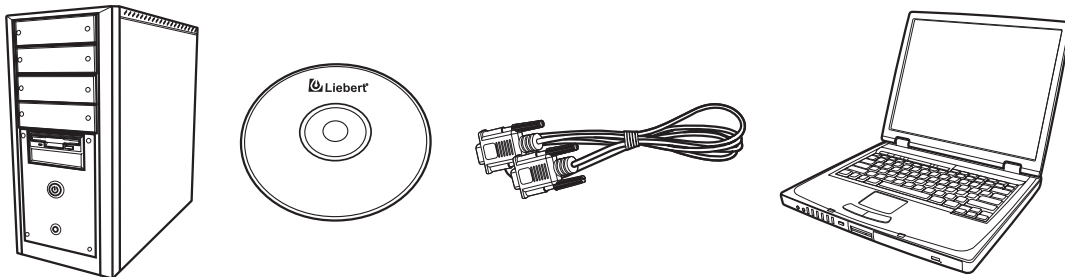
For most users operating with 230VAC, the factory default setting is adequate.

3.10.1 Configuration Program Features

- Select one of the three L-N output voltages to match local voltage.
- Enable/ disable auto-restart.
- Select frequency converter operation with a fixed output frequency of 50 or 60 Hz.
- Set the 'Low battery warning' alarm time from 2 to 30 minutes.
- Enable/ disable auto-battery test.
- Set auto-battery test to 7, 14, 21, or 28 days.
- Specify the number of external battery cabinets connected to the UPS to adjust the remaining run time calculations reported by the system software.

3.10.2 What You Will Need

In addition to the GXT2-10000R230, you will need the configuration program CD and serial cable (beige or tan, 3-wire: GND, TX, RX; straight through 2-2, 3-3, 5-5) included in the UPS accessory pack. You must be running Windows 95® or later on your computer.



4 Operation

4.1 Normal and Safe Operation

The front panel may be turned to an oblique position. To change the front panel's angle, press the lower part of the panel.

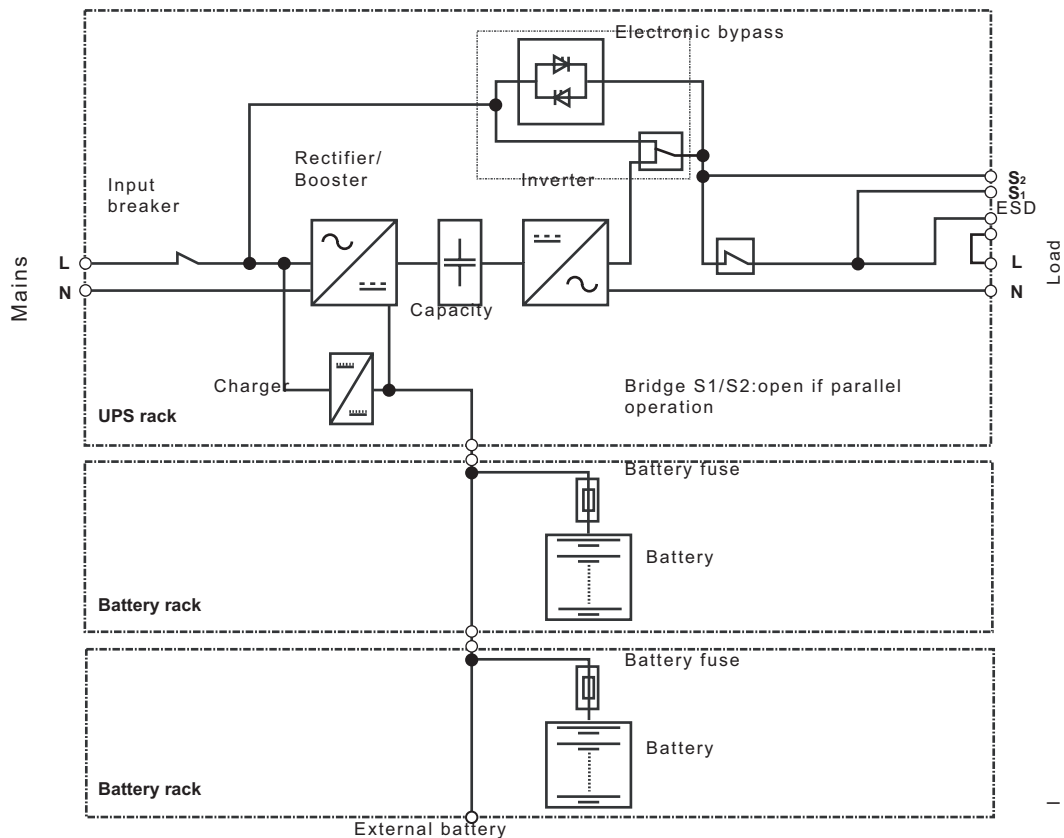
4.1.1 Block Diagram

The GXT2-10000R230 consists of several main components:

- Mains supply
- Input switch
- Rectifier/booster, inverter and charger
- Electronic bypass
- Electronic bypass
- ESD hardwired

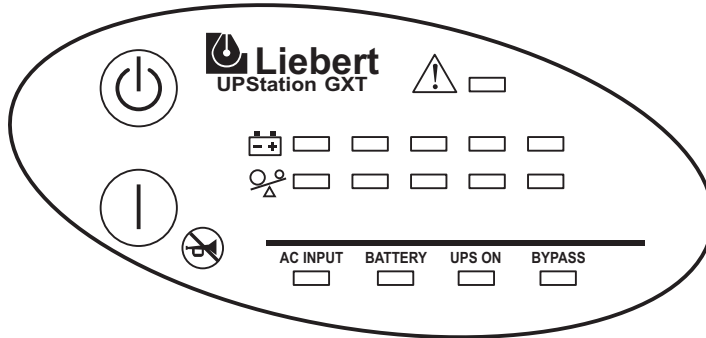
Battery racks are external.

Figure 4-1 Overview of GXT2-10000R230 components



4.2 Controls and Indicators

Figure 4-2 Control Panel



4.2.1 ON/Alarm Silence/Manual Battery Test Button



This button controls output power to connected load(s) and has three functions.

- ON
- Alarm Silence
- Manual Battery Test

ON - Pressing this button will start up the UPS in order to provide conditioned and protected power.

Alarm Silence - To silence alarms, press this button for at least one second. After the alarm is silenced, the GXT2-10000R230 will reactivate the alarm system to alert of additional problems.



NOTE

The LOW BATTERY and BYPASS reminder alarms CANNOT be silenced.

Manual Battery Test - To initiate a manual battery test, press the ON button for at least one second while operating from mains power with no alarm conditions present.

- If only three of the five Battery LEDs illuminate, allow the UPS to recharge the batteries for 24 hours.
- After 24 hours, retest the batteries.
- After the batteries have been retested, if only three of the five Battery LEDs illuminate, contact your local dealer, Liebert representative or Liebert Worldwide Support Group.

4.2.2 Standby/Manual Bypass Button



This button controls output power to connected load(s) and has dual functions: Standby and Manual Bypass.

4.2.3 Load Level Indicators (4 Green, 1 Amber)

The load level indicators display the approximate electrical load placed upon the UPS at all times.

4.2.4 Battery Level Indicators (5 Green)

The battery level indicators display approximate battery capacity at all times.

The GXT2-10000R230 is equipped with automatic and remote battery test features. The automatic test occurs every 14 days (this option is user configurable) if mains has not been interrupted. Should the battery fail this test, the red Fault indicator LED along with the A and C diagnostic LEDs will illuminate and an alarm will sound (refer to **7 Troubleshooting**). The remote test feature functions with MultiLink 3.x software can remotely initiate the battery test.

4.2.5 Fault Indicator LED (Red)

The Fault indicator LED is illuminated if the UPS has detected a problem. Also, one or more of the battery level indicators may be illuminated (refer to **7 Troubleshooting**).

4.2.6 Bypass Indicator LED (Amber)

The Bypass indicator LED is illuminated when the UPS is operating from bypass power. An alarm will sound indicating the UPS detected a problem, or the manual bypass function has been activated.

4.2.7 UPS ON Indicator LED (Green)

The UPS ON indicator LED is illuminated when the UPS inverter is operating and supplying power to the connected loads.

4.2.8 Battery Indicator LED (Amber)

The Battery indicator LED is illuminated when the UPS is operating on battery.

4.2.9 AC Input Indicator LED (Green)

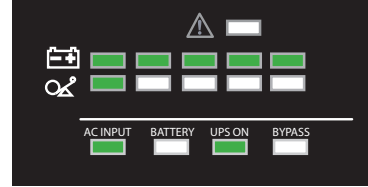
The AC Input indicator LED is illuminated when mains power is available and within the input specifications.

4.3 Operation Modes

The UPS has four different operating modes when it is switched on.

4.3.1 Normal Mode Operation

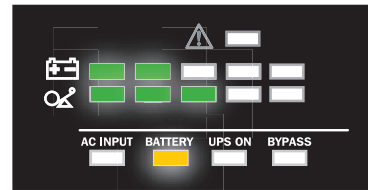
During normal operation, mains power provides energy to the UPS. The filters, power factor correction circuit and the inverter process this power to provide computer grade power to connected loads. The UPS maintains the batteries in a fully charged state. The four green load level LEDs indicate an approximate level of load in 25% increments. If the UPS becomes loaded beyond full rating, the fifth (amber) LED indicator will illuminate and the UPS will sound an audible alarm. The display template indicates the percentage of load (10% of load shown in example) on the UPS output.



Normal Mode Operation
Batteries at 100%
Charge Load at 10%

4.3.2 Battery Mode Operation

Battery mode occurs in event of an extreme input voltage condition or complete mains failure. The battery system supplies power through the DC to DC converter to the inverter to generate power for the connected load. During battery mode and alarm sounds every ten seconds. This will change to two beeps every five seconds when the battery runs low (approximately two minutes remaining, but this is user configurable). The AC Input LED will extinguish, and the Battery LED will illuminate to warn that a mains problem has occurred.



Battery Mode Operation
Batteries at 30% Charge
Load at 50%

Each battery level indicator represents a 20% capacity level. As capacity decreases, fewer indicators remain illuminated. Refer to **7 Troubleshooting**. For approximate battery run times, refer to **Table 7-2**. These times are approximate, based on resistive load and an ambient temperature of 25°C (77°F). To increase this time, turn off non-essential pieces of equipment (such as idle computers and monitors) or add the optional external battery cabinet.

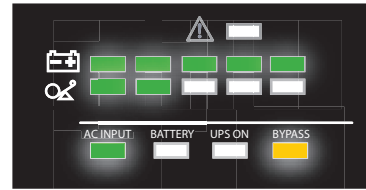


CAUTION

Turning OFF the UPS while it is in battery mode will cut off output power.

4.3.3 Bypass Mode Operation

Bypass mode occurs when the OFF button is pressed once while the UPS is in Normal Mode. During bypass operation, mains power provides energy to the UPS. The mains power bypasses the inverter and provides power for the connected load.



The four green load level LEDs indicate an approximate level of load in 25% increments. If the UPS becomes loaded beyond full rating, the fifth (amber) LED indicator will illuminate and the UPS will sound an audible alarm. The display template indicates the percentage of load (26-50% of load shown in the example above) on the UPS output.

4.3.4 Battery Recharge Mode

Once mains power is restored, the UPS resumes normal operation. At this time, the Battery Charger begins recharging.

4.4 Preliminary Controls

Before switching on the UPS and supplying the load, ensure the following:

- The ventilation grilles are unobstructed.
- The earth connection is in place.
- The 'consumer' switches are in the OFF (0) position.
- The UPS rear panel switches are in the OFF (0) position.



WARNING

As soon as the UPS is connected to input power, the output sockets are live, even if the UPS is not yet switched on via the front panel switch.

Switch on the mains supply of the UPS.

When connected to the mains, the "AC INPUT" and "BYPASS" LEDs on the control panel are illuminated and the UPS starts recharging the connected (external) batteries immediately. Before using the device, the batteries should be recharged for a period of eight hours. The UPS may be used straight away, even without charging, but it will not be able to provide the specified autonomy.

Once recharging has been completed, the UPS is ready for use. Follow the instructions in **4.5 UPS Start-up Procedures** for proceeding steps.



WARNING


Do not connect any devices that may overload the UPS or draw DC current.



NOTE

If these instructions are not observed correctly, you may experience problems with electrical supply.

4.5 UPS Start-up Procedures

1. Ensure all switches and circuit breakers upstream of the UPS are closed.
2. Switch Input Switch to position (I) ON.
3. Wait for at least 30 seconds until the output voltage has stabilized (yellow LED illuminated) then switch Output Switch to position (I) ON.
4. Close any external switches connecting the load (if present).
5. Press the button  on the UPS control panel for a minimum of one second to switch on the inverter (see **4.2 Controls and Indicators**).


In addition to the “AC INPUT” and “BYPASS” LEDs, the “LOAD” LED is now illuminated. After a few seconds the “UPS ON” LED is illuminated and the “BYPASS” LED is extinguished. The UPS is now in ON-LINE operation.

4.6 UPS Shutdown Procedures



NOTE

Carrying out this procedure will interrupt the supply to load.

1. Press the button  on the UPS control panel for a minimum of one second to switch off the inverter.
2. Open any external switches connecting the load (if present).
3. Switch Input Switch to position (0) OFF.
4. To disconnect battery DC voltage, unplug the battery cable(s) on the rearside.
5. Ensure all switches and circuit breakers upstream of the UPS are open.
6. Ensure that all LEDs on the control panel are extinguished.

The UPS is now shut down.

4.7 Functional Test



NOTE

Supply to the load is not guaranteed during this test. The test should not be carried out if a critical load is connected to the UPS.

The GXT2-10000R230's controls permit testing the UPS to ensure that the load will be supplied in the event of a mains failure.

Before you start, ensure that the batteries are fully charged.

Simulate a mains failure by interrupting the mains supply to the UPS. This may be affected by switching off the input power circuit breaker on the rear panel of the UPS. If the mains supply to the GXT2-10000R230 is protected by an external circuit breaker, the circuit breaker may be opened to interrupt the mains supply and simulate a power failure.

The GXT2-10000R230 is operating properly and the batteries are charged if:

- An acoustic signal is heard at four-second intervals.
- The UPS 'On' LED indicator turns off.

When the interval between the acoustic signals decreases to one second, the UPS has battery reserve energy to supply the load for a maximum of three more minutes. After three minutes, the GXT2-10000R230 will automatically shut down.

If the batteries do not supply the load during the simulation, consult **7 Troubleshooting**.

To end the simulated mains failure, restore the input power supply to the UPS. The UPS is ready for operation.



NOTE

The batteries must be recharged before the complete emergency supply period is again available.

4.8 Emergency Switch Device

For safety reasons, an Emergency Power Off switch must be installed to shut down the UPS immediately. To do so, do the following:

1. Remove the connections between the ESD terminals on the rear of the UPS next to the COM 1 connector.
2. Connect an emergency switch closed under normal operating conditions and held open mechanically when operated.

Once the emergency condition causing the switch to open has been resolved, open all the UPS switches (Input, Output and Battery) and restart the GXT2-10000R230 as described in **4.5 UPS Start-up Procedures**.

5 Maintenance

5.1 Testing, Replacement and Disposal of Batteries

The UPS does not require maintenance by the user. When the batteries expire, they must be replaced by the authorized customer service representative. For servicing, replace batteries with the same type and number of batteries or battery packs installed at the factory. For the battery type, see **Table 3-2**.

Disposal of the UPS and the batteries should be carried out by a certified disposal company, observing all local regulations and laws. Exhausted accumulator batteries are classified as harmful toxic waste and as such the law demands that they be disposed of by an authorized recycling centre.

The Liebert power protection customer service centre is fully equipped to deal with such batteries, in accordance with the law and with the greatest respect for the environment.

The typical battery life cycle is three to five years, at an ambient temperature of 25°C, but it is also dependent on the frequency and duration of mains failures.

5.2 Storage

For extended storage at ambient temperatures cooler than 25°C (77°F), the batteries should be charged for five hours once every four months. At higher storage temperatures, Liebert recommends charging batteries for five hours every two months.

Connect the UPS to a mains outlet socket with and an earth connection or install fixed connections (in accordance with **3 Installation**) to an appropriate source. Switch on the input miniature circuit breaker on the rear of the device in case of fixed connections.

After five hours, unplug from the mains supply or switch off the input miniature circuit breaker of the UPS in case of fixed connections. Then remove the UPS connections in the opposite sequence as described in **3 Installation**.

Record the battery charging date in the vicinity of the UPS, for example, on its packaging for future reference.

5.3 Cleaning

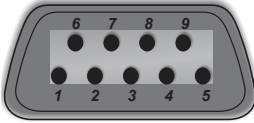
1. Switch off the UPS by pressing the OFF button following the shutdown procedures and disconnect from the mains supply.
2. Do not clean the UPS with scouring powder or solutions that may dissolve plastic.
3. Do not allow liquid to get inside the UPS.
4. Make sure that the air vents on the UPS are not obstructed. Remove dust from the air vents with a vacuum cleaner.
5. Clean the outside of the UPS by wiping the housing with a dry or slightly damp cloth.

6 Communications

6.1 Communications Interface Port

The GXT2-10000R230 UPS has a standard DB-9 serial port female connector located on the rear of the UPS unit. Several signals are provided on this port and are assigned as follows:

Table 6-1 DB-9 pin assignment

DB-9 Pin	Assignment Description	Pin Assignment
2	UPS TxD (typically RS-232 levels)	
3	UPS RxD (typically RS-232 levels)	
5	Common	

6.2 Relay Contacts

Table 6-2 Relay Contacts pin configuration

Pin	Function	Operation
1	UPS Fault	Closed if no UPS failure.
2	UPS Fault	Closed if UPS fails.
3	Summary Alarm*	Closed if SUMMARY ALARM* occurs.
4	Summary Alarm*	
5	Signal Ground (for UPS Any Mode Shutdown)	
6	Common - Low Battery	
7	Low Battery	Closed if battery is OK.
8	Low Battery	Closed if LOW BATTERY warning occurs.
9	JP01	Allows all common relay pins 6, 14 & 15 to be tied together.
10		
11	UPS Battery Mode Shutdown	Active when connected to pin 5.
12	On UPS	Closed if UPS power is on (inverter).
13	On Battery	Closed if battery power is on (utility failure).
14	Common - UPS Fault, Summary Alarm, On UPS, On Battery, On Bypass	
15	Common - UPS Fault, Summary Alarm, On UPS, On Battery, On Bypass	
16	UPS Any Mode Shutdown (short to pin 5)	Turns UPS output off when connected to pin5.

Table 6-2 Relay Contacts pin configuration

Pin	Function	Operation
17	On Battery	Closed if battery power is not on (Status: OK).
18	On Bypass	Closed if BYPASS is on.
19	JP02	Allows all common relay pins 6, 14 & 15 and the Low Battery to be tied together.**
20		

* A summary alarm occurs when any of the following four conditions exist:

1. Utility power is outside the acceptable range (voltage and/or frequency).
2. UPS is in BYPASS MODE (load not on Inverter power).
3. UPS battery is LOW (<2 minutes of battery power remaining).
4. UPS fault has occurred.

** This jumper should be removed if there is any external voltage source that may intentionally or inadvertently be connected to the relay contacts.

6.2.1 Pin 11 - Remote Shutdown on Battery

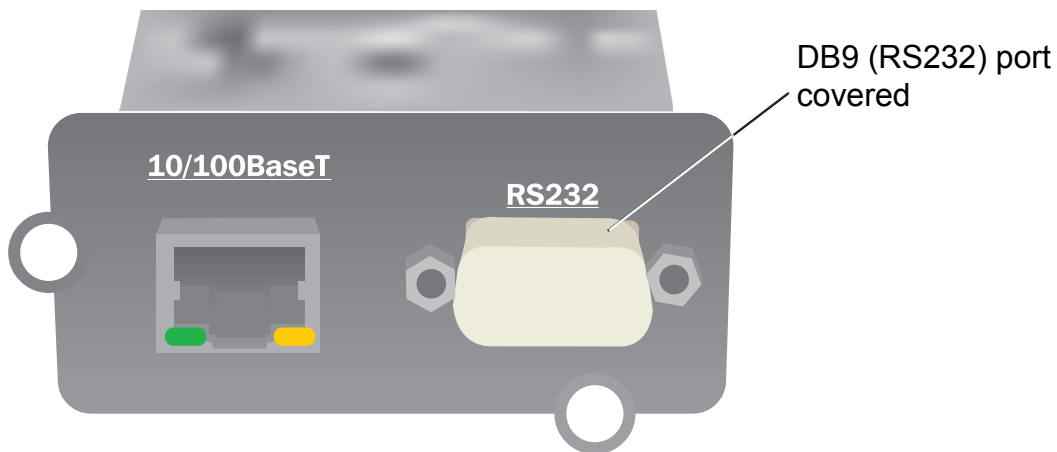
1. This pin is functional only when the UPS is in battery mode. If the UPS is being powered by the mains, Pin 11 will ignore any signal on this pin.
2. Pin 11 requires a ground signal to shutdown. A signal for 1.5 seconds or greater is required to signal a shutdown. Signals for less than 1.5 seconds will be ignored. After Pin 11 receives a shutdown signal for 1.5 seconds, the command cannot be canceled.
3. A battery shutdown signal on Pin 11 will NOT cause an immediate Shutdown. A shutdown signal will start a 2-minute shutdown timer. The timer cannot be stopped. After 2 minutes, the UPS will shut down.
4. If the mains returns during the 2-minute timer countdown, the shutdown timer will continue until the end of 2 minutes and the UPS will turn OFF. The UPS must remain OFF for at least 10 seconds even if AC input power returns before the UPS turns OFF. This serves to reset and restart the server. Whether the UPS turns back ON when power is restored depends on the autorestart setting: enabled or disabled. If the auto-restart is disabled, the UPS will not restart after performing the 2-minute shutdown delay.

6.3 UPS Intelligent Communication

The GXT2-10000R230 UPS is equipped with one Intellislot port to provide advanced communication and monitoring options.

The Intellislot port closer to the corner of the UPS chassis is the serial card slot. This Intellislot port is used for the OCWEBCARD and the USBCARD.

Figure 6-1 Liebert's OCWEBCARD



NOTE

The OCWEBCARD DB9 serial port cable should be used only for the initial card setup. Remove the cable after setup is complete. When the DB9 OCWEBCARD serial port cable is removed, the OCWEBCARD DB9 connector needs to be covered. The DB9 cover is included with the UPS.

Liebert's MultiLink software continually monitors the UPS and can shut down your computer or server in the event of an extended power failure.

MultiLink can also be configured for use without the serial cable when the Intellislot SNMP/Web card is installed in the UPS. Additionally, MultiLink can be configured to coordinate shutdown across the network with other computers running MultiLink when you purchase a MultiLink License Kits, visit our Web site (www.liebert.com) or contact your local dealer or Liebert representative.

Several optional cards are available for use in the Intellislot port of the GXT2-10000R230 UPS. The Intellislot SNMP/Web Card provides SNMP and Web-based monitoring and control of the UPS across the network.



CAUTION

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

7 Troubleshooting

If any technical problems should occur, check the following before contacting Liebert technical support:

- Is the mains voltage present at the UPS input?
- Has the input fuse blown or have the circuit breakers tripped?
- Has the UPS startup procedures been followed correctly?

When contacting Liebert technical support, have the following information at hand:

- Device model number
- Order number
- Series number (from the nameplate)
- Exact description of the problem (what loads are being operated, does the problem occur regularly or sporadically, etc.)

For descriptions of the indicators mentioned below, see **4.2 Controls and Indicators**.

Table 7-1 Rectification of errors

Problem	Possible cause	Measure
No display No alarm (The UPS is switched off)	Mains switched off	Switch on main switch.
	No mains voltage present	Have mains inspected by a qualified technician.
	Input fuse blown or input circuit breaker tripped	Replace with fuse of same type or switch on circuit breaker. If the problem persists, contact technical support.
AC INPUT indicator does not illuminate, acoustic alarm active at intervals	No mains voltage present	UPS operation (refer to 4.3 Operation Modes)
AC INPUT indicator does not illuminate when mains voltage is present, and the acoustic alarm active is at intervals	Input fuse defective or input circuit breaker tripped	Replace with fuse of same type or switch on circuit breaker. If the problem persists, contact technical support.

Table 7-1 Rectification of errors

Problem	Possible cause	Measure
Autonomy less than specified	The fuse switch of the battery extension(s) is in the 'OPEN' position.	Move the fuse switch to the 'ON' position.
	Batteries are not fully charged	Charge batteries (see Battery Precautions on page 3) and test backup time. If the problem persists, contact technical support.
	Batteries are defective	Contact technical support.
	Charging device is defective	Contact technical support.
FAULT indicator illuminates, acoustic alarm is active constantly	UPS error	Contact technical support.
	Overheating	Decrease ambient temperature.
OVERLOAD FAULT LED indicators	Overload at the UPS output	Reduce load to the permissible value.
No communication between the UPS and PC	Wrong serial connection cable	Check whether the correct cable has been used (standard modem/null modem cables are not permissible).
	Interface on the PC is being used by another process or is defective	Check whether other software/service is accessing the interface on the PC; try selecting a different serial interface.
	Interference on the data cable	Lay cable differently/Reinstall cabling.

Table 7-2 below shows the estimated run times at different loads.

Table 7-2 Batteries run times

Typical battery run times for the GXT2-10000R230	Load				
	10%	20%	30%	40%	50%
1 external battery cabinet	99	47	29	20	15
2 external battery cabinets	240	110	69	49	37
3 external battery cabinet	298	202	113	80	61
4 external battery cabinets	462	255	180	113	87

Typical battery run times for the GXT2-10000R230	Load				
	60%	70%	80%	90%	100%
1 external battery cabinet	12	9	8	6	5
2 external battery cabinets	29	24	20	18	15
3 external battery cabinet	49	41	34	29	26
4 external battery cabinets	70	58	49	42	37

Troubleshooting



Power Availability

GXT2 10000R230

User Manual

The Company Behind the GXT2

With over a million installations around the globe, Liebert is the world leader in computer protection systems. Since its foundation in 1965, Liebert has developed a complete range of support and protection systems for sensitive electronics.

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