USER'S GUIDE

LEONICS®

ULTRA SINE series

**MICROPROCESSOR CONTROL
and PURE SINE WAVE UPS**

Authorized Distributor

UL REGISTERED FIRM ®

UKAS
QUALITY
MANAGEMENT
062

LEONICS CO.,LTD A5043 ISO 9001

MASCI

ISO 14001
EMS 01007/045

CONTENT

SAFETY INSTRUCTIONS

Please read carefully and follow this Ultra Sine series UPS guide.

Important : Please keep this manual for reference in order to use the LEONICS UPS properly and safely. This user's guide contains instructions for installation, maintenance, operation and unit specifications.

If there are any symptoms of problems which are not mentioned in this guide or any queries, please contact your LEONICS local distributors, LEONICS Service Center, send e-mail to support@leonics.com or visit www.leonics.com.

For your convenience and quick reference for LEONICS UPS service, please fill the requested information in the blanks below.

UPS Model   : _____
Serial Number   : _____
Purchase date   : _____
Purchased from   : _____

1.1 Safety in handling the UPS

1.1.1 Be careful when you move the UPS, handle tighly and do not drop it.

1.1.2 This UPS is designed to be installed indoors in a dry, controlled temperature range of 0 - 45°C. Do not place near objects that generate heat, moisture or inflammable. Please keep away from hazardous and explosive material.

1.2 Safety guide about electricity

1.2.1 Do not work alone where there is danger of shock.

1.2.2 Contact with live conductors will cause burns and dangerous electric shock.

1.2.3 Please allow ONLY a certified electrician to wire your system permanently.

1.2.4 Periodically check your cable, outlets and power source to make sure that they are in good condition.

1.2.5 To reduce risk from electric shock if you can not find the electrical ground of the building, unplug the UPS from the AC source before plug in your load at the rear side of the UPS. Then, plug in the UPS to AC source.

1.2.6 Do not touch any metal parts of the loads when they are plugged into the UPS.

1.2.7 Use ONLY one hand when plugging and unpluging the load in order to avoid electric shock from touching two surfaces with different potential.

1.2.8 It is recommended to connect the UPS to a three wire AC source (two live wires and an electrical ground) which connects to a protected circuit such as employs a fuse or automatic circuit breaker.

1.3 CAUTION ! Safety guide about disconnecting from power source

1.3.1 Although the UPS is not connected to any power source, its outlets may be energized because it has a battery inside.

1.3.2 To disconnect the UPS from the power source, press the front panel switch until the UPS Mode (⌁)and Fault/Alarm (⚠)lamps are lit at the same time and the alarm sounds once. Then, release to switch off. Unplug the UPS and disconnect the battery.

1.3.3 This Ultra Sine series UPS is not intended for use with life rescue equipment! A failure of the UPS might cause the life rescue equipment to fail and endanger human lives.

1.4 Warning ! Safety guide about the battery

1.4.1 The UPS has hazardous voltages inside, do not disassemble any parts of UPS except for the battery. Users are not allowed to repair, recondition or disassemble the UPS. This must be done by LEONICS qualified technicians only.

> The battery that is inside your UPS can be recycled. It contains LEAD, which is harmful to health and the environment. If It can not be disposed of properly, please return it to a LEONICS local distributor or Leonics Service Center.

1.4.2 Do not dispose of batteries in a fire. They may be exploded.

1.4.3 Do not disassemble batteries. They contains poisonous electrolyte which is harmful to your skin and eyes.

1.4.4 When replacing a battery, use tools with insulated handles and remove any watch, rings or other metal objects that you wear in order to avoid electric shock.

1.4.5 Replace batteries with the same type and rating and follow the proper battery replacement procedure.

Vocabulary

Load : Any equipment which is plugged into the UPS and gets power from the UPS such as a computer, printer, fax machine or modem.

UPS : LEONICS Ultra Sine series UPS
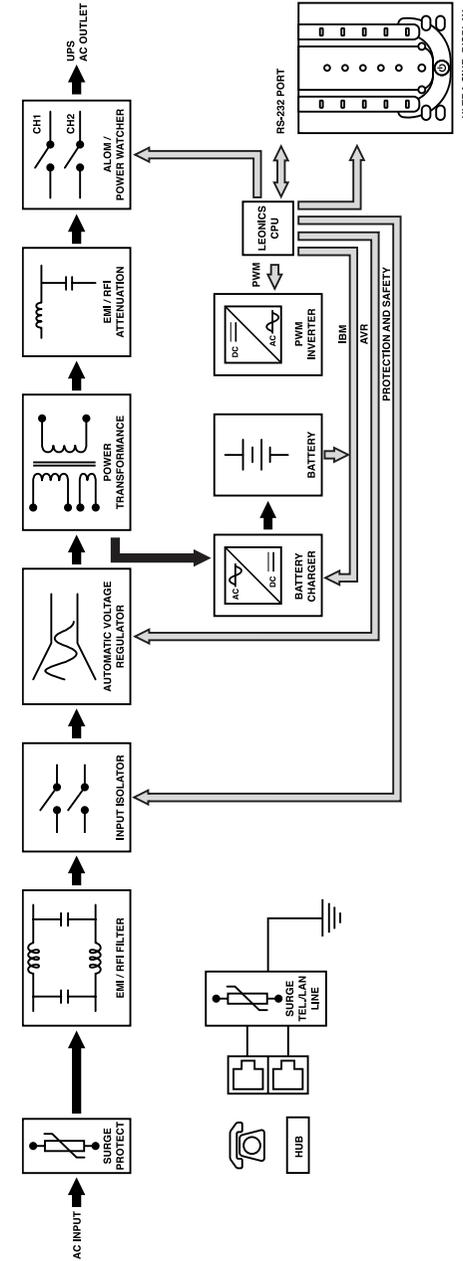
VA : The unit of UPS power rating showing its capacity.
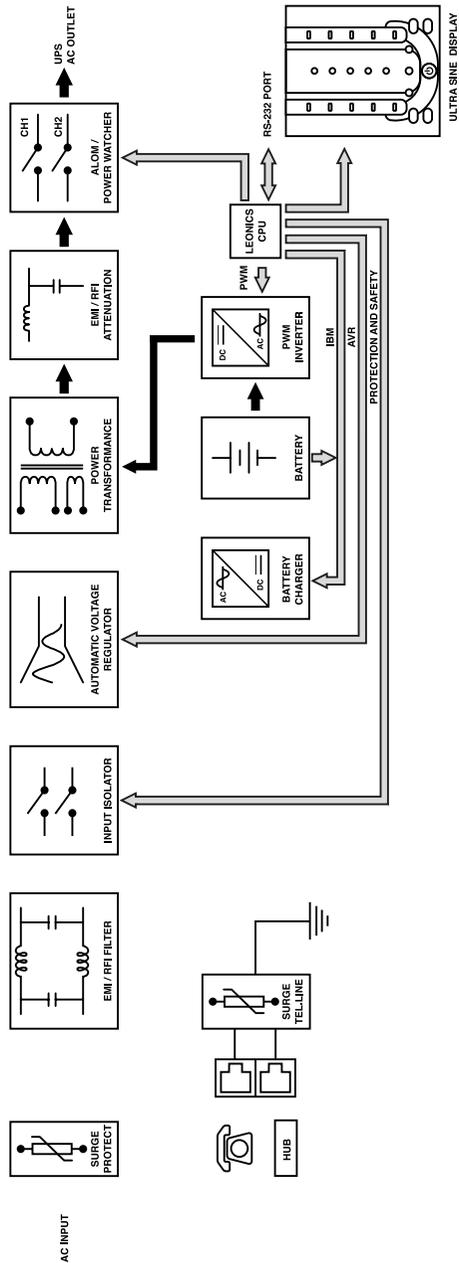
INTRODUCTION

2.1 General

The LEONICS Ultra Sine Series UPS is a bi-directional line interactive uninterruptible power supply designed for professional use with file servers, computers and peripherals such as monitors, modem, printers, fax machines, etc. It provides high quality sine wave back up power. Its major function is to eliminate any power problem such as a black out, brown out, sag, surge, spike, noise, etc. that might cause malfuction of the load causing work interruption. With its Advanced Microprocessor Control, when the UPS detects any abnormal conditions, it will respond instantaneously. It also has special features: Power Watcher, a full time load measuring system, Battery Watcher, the battery capacity checking system, Ultra Fast Charger, providing less than 3 hours charging time without shortening battery life and Perfect Ultra Display, which shows the current status of the UPS (Load level, Input voltage level, Battery level, Battery replacement condition and Overload condition) and Advanced Load Outlet Management (ALOM), which the user can program to turn off a low priority outlet when there is a low battery or pverload condition.

The Ultra Sine series UPS can be started when there is no power source. It is convenient for you to have spare power when the source fails or in an emergency. It also can communicate with a computer through the Easy-Mon X Monitoring and Management Software. It shows the status of the AC source and the UPS and you can program shut-down time, restart time, selt-test time and log UPS operating data. Moreover, you can monitor status of other UPS in the same network throught Easy-Mon Netview Manager and can inform computers in the network when a blackout occurs at the server. The Easy-Mon Netview Manager and Easy-Mon Alert are sold seperately at LEONICS local distributors.

2.2 Ultra Sine Series UPS operation

2.2.1 Operating In the normal mode

UPS AC OUTLET

CH1 CH2

ALOM / POWER WATCHER

EMI / RFI ATTENUATION

POWER TRANSFORMANCE

AUTOMATIC VOLTAGE REGULATOR

INPUT ISOLATOR

EMI / RFI FILTER

SURGE PROTECT

AC INPUT

RS-232 PORT

LEONICS CPU

PWM

DC AC PWM INVERTER

IBM

AVR

PROTECTION AND SAFETY

BATTERY

AC DC BATTERY CHARGER

ULTRA SINE DISPLAY

SURGE TEL-LINE

HUB

2.2.2 Operating under backup mode

2.2.1 Operating In the normal mode

Normally, UPS is working under line interactive mode in which the path of current is as follows : When the current first flows into the UPS, it has to pass through a surge protection circuit to filter surges and spikes which may occur from a nearby lightning discharge or load switching by the local power company. Here, the high voltage power will go to the line grounding system and let only the acceptable current pass to the EMI/RFI filter to eliminate EMI and RFI. Then it flows to the automatic voltage regulator (AVR) to regulate the voltage level to approximately your country's standard nominal mains voltage (see product specification, 100, 110, 120, 220, 230 or 240 Volts). If the voltage is too high or too low compared to the standard nominal voltage, it will be adjusted to the safety level for your loads (please refer to the specifications). After that the current will flow to two destinations. The first part goes to the Harmonic filter then to the Power Watcher and to your connected loads. The Power Watcher provides information about load conditions, whether or not you are overloading your Ultra Sine UPS. (Power Watcher is continuously monitoring in real time both for the stabilizer and inverter modes.) The remaining power flows to the battery charger circuit to charge the batteries and maintain them fully charged.

2.2.2 Operating under backup mode

The UPS will transfer to backup mode (inverter mode) when it detects abnormal situations such as blackouts, brownouts, surges, sags or abnormal frequency. These situations may harm your loads and may be too risky for the UPS to operate in the interactive mode. When an abnormal power mode is detected, the UPS will immediately transfer to the backup mode with no loss of power to the loads. At this moment, the backup power will begin to be drawn from battery. The current from the battery will flow to the inverter (changing direct current to alternating current). Then, the power flows to the Harmonic filter, Power Watcher and on to your loads.

You can also monitor the UPS from a PC by using Easy-Mon X Monitoring and Management Software through a connection between the PC and the UPS communication port. Not only can the operating Information be displayed on the PC but also additional UPS management can be done. For instance, you can set the UPS shutdown time and restart time, this status will be displayed on your PC monitor.

2.3 Features

LEONICS Advance Microprocessor Control : A specially programmed microprocessor produced only for LEONICS is used as the CPU for the UPS. This makes the Ultra Sine Series perform faster and more accurately to protect valuable equipment and its peripherals and provides advanced control features.

Power Watcher : Full time load power monitoring and battery charge warnings are provided to make sure that your UPS will be able to properly back up power to the PC protected by Ultra Sine Series UPS. "Power Watcher" helps users know in real time that they are not overloading their Ultra Sine Series UPS. With this useful feature the user can increase loads as much as is wanted until Ultra Sine Series UPS overload warning is shown. (LEONICS suggests that for highest reliability and safety that you should connect loads at no more than 75 % of rated UPS power. This allows for loads that change power level during use and provides for some reserve back up power for some loads.)

Battery Watcher (Battery Replacement Indicator) : Every time the Ultra Sine Series UPS performs a self-test and when the battery has been fully charged, it will perform a battery condition evaluation to determine whether the battery used by the Ultra Sine Series UPS is still good or should be replaced. The battery replacement indicator will show when the battery should be replaced.

Ultra Fast, < 3 hour Charger : Ultra UPS features an advanced, 3 stage charger (Bulk - Boost - Float) to shorten charging time without harming the battery. Besides fast charging, Ultra Sine Series UPS also maintains the proper charging voltage to preserve the battery from self - discharge and to make sure that it is always fully charged and ready to provide backup power to your PC.

Intelligent Battery Management (IBM) : The intelligent battery management system will manage charging and discharging to get longer back up times and prolong battery life.

Advanced Load Outlet Management (ALOM) : This feature allows the user to preset operation of the "Intelligent Channel" via Easy-Mon X Software. The user can preset the intelligent output channel to cut off power to low priority loads when the UPS is overloaded, over temperature or has a low battery.

Hot Swappable Battery : The user can replace the battery even when the UPS is running and without turning off the computer as long as mains power is available.

Surge protection for telephone line and LAN line : Surge protection protects equipment data from surges that come from telephone and LAN lines. These special sockets can accept either telephone plugs (RJ 11) or LAN plugs (RJ 45).

Scheduled shutdown, restart and self-test : When using with Easy-Mon X Monitoring and Management Software, you can program a scheduled shutdown or restart or self-test time as you wish. Furthermore, this software also assists you to log self-test results and abnormal electrical conditions and send those data via fax.

Automatic voltage regulator -35% to 25% buck and double boost : With it's especially wide range automatic input voltage regulator, Ultra Sine Series UPS can lessen back up mode transferred transaction, which helps you save the battery's energy for emergencies, it also prolong your battery life.

Multifunction switch : Single switch with 3 functions, very convenient to users
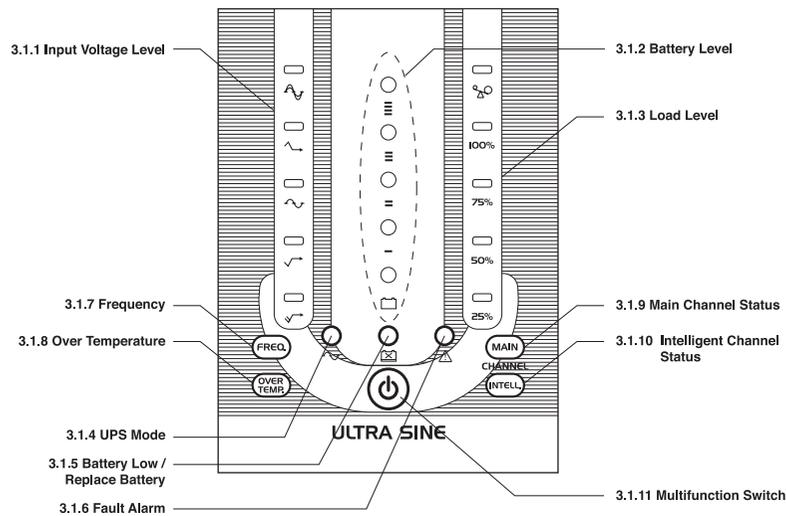   1. Turn on / off UPS   2. Mute audible alarm   3. Self-test switch

Extend backup time (optional): It extends the battery unit to increase the duration of UPS backup time. It can protect data with extra effectiveness.

SNMP/HTTP Capability (optional): Ultra Sine series UPS can connect with SNMP adadter (external or internal) for remote monitory via network management system (sold seperately by LEONICS local distributors).

FRONT AND REAR PANEL

3.1 Front panel descriptions

3.1.1 Input Voltage Level
3.1.2 Battery Level
3.1.3 Load Level
3.1.7 Frequency
3.1.8 Over Temperature
3.1.9 Main Channel Status
3.1.10 Intelligent Channel Status
3.1.4 UPS Mode
3.1.5 Battery Low / Replace Battery
3.1.6 Fault Alarm
3.1.11 Multifunction Switch
ULTRA SINE

3.1.1 <u>Input voltage level</u> : Indicates the line interactive mode (normal mode) status. There are 5 lamps, only one of these will display at a time.

   ↙→ Lit (green) : Utility line voltage is very low.
   ↗→ Lit (green) : Utility line voltage is low.
   ∿ Lit (green) : Utility line voltage is normal.
   ↖→ Lit (green) : Utility line voltage is high.
   ⚡ Lit (green) : Utility line voltage is too high or too low and UPS is operating in back up mode.

3.1.2 <u>Battery level</u> : Indicates battery voltage presents from low to high level.

3.1.3 <u>Load level</u> : Shows how much power your loads are consuming compared to the UPS capacity:

   1 lamp is lit (green) : loads are above 9 % and less than 25 %.
   2 lamps are lit (green) : loads are between 25 % and 50 %
   3 lamps are lit (green) : loads are between 50 % and 75 %.

   4 lamps are lit (green) : loads are between 75 % and 100 %.
   5 lamps are lit (red) : loads are over 100 % and you should reduce the load immediately.

3.1.4 <u>UPS Mode (green lamp)</u> : Shows UPS status.
   Lit : UPS is operating under its normal mode.
   Slow blink (on 2 sec., off 0.5 sec.) : UPS is operating in the backup mode.
   Blink (on 0.5 sec., off 0.5 sec.) : UPS is operating in the test mode.

3.1.5 <u>Low Battery / replace battery (yellow lamp)</u>
   Lit : Battery need to be replaced.
   Blink (on 0.5 sec., off 0.5 sec.) : Low battery, UPS is about to run out of power (in case of working in backup mode).

3.1.6 <u>Fault / Alarm (red lamp)</u> : The indicator is lit when it has short circuit or abnormal in UPS or overload shut down.

3.1.7 <u>Frequency (red lamp)</u> : The indicator is lit when the frequency of the utility line is abnormal.

3.1.8 <u>Over temperature (red lamp)</u>
   Lit : The temperature of inverter compartment is too high, the UPS will be automatically shutdown.
   Blink (on 0.5 sec., off 0.5 sec.) : The temperature of the inverter compartment is high and you should reduce load immediately.

3.1.9 <u>Main channel status (green lamp)</u>
   Lit : UPS is backing up power to load connected to the Main Channel.
   Blink at the same time with the Intelligent Channel lamp (slow blink : on 2 sec., off 0.5 sec.) : UPS is about to shutdown from schedule shutdown setting or shutdown command.
   Blink at the same time with Intelligent Channel lamp (4.1.10) (Fast blink : on 0.5 sec, off 2 sec) : UPS is about to restart from schedule restart setting.
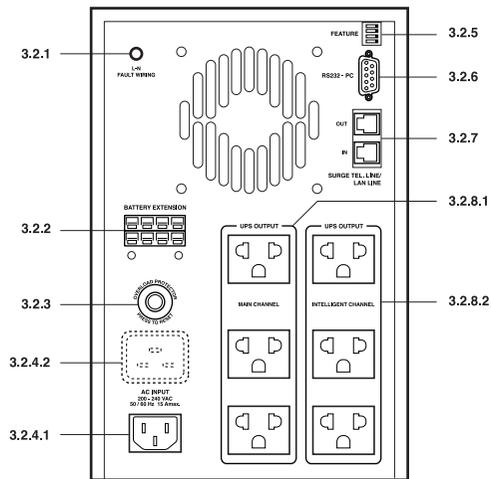
3.1.10 Intelligent Channel status (green lamp)

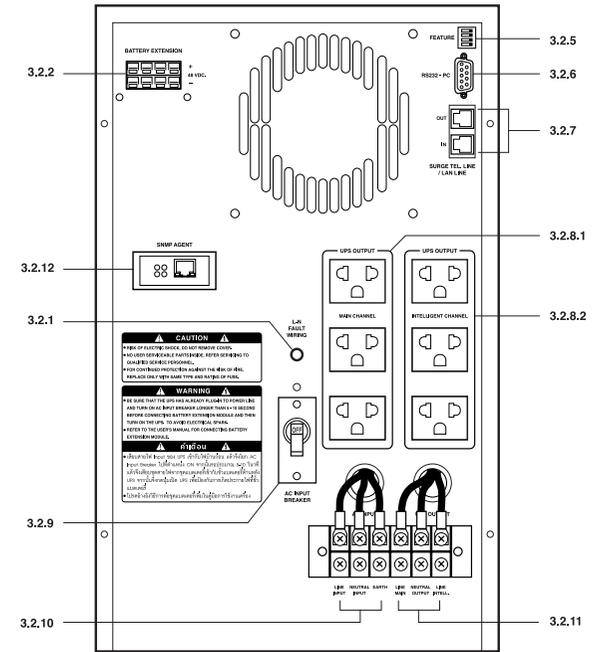Lit   :   UPS is providing backup power to the load connected to the Intelligent Channel.

Fast blink (on 0.5 sec., off 2 sec.)   :   Intelligent Channel is about to start (commanded to start on delay time).

3.1.11 Multi-function switch : The switch to turn on, turn off, test the UPS and mute the audible alarm.
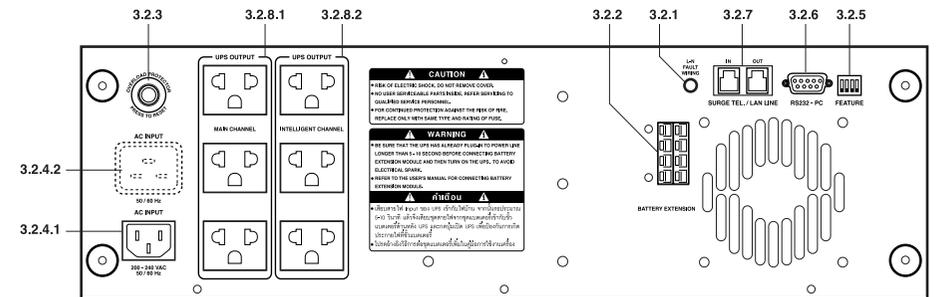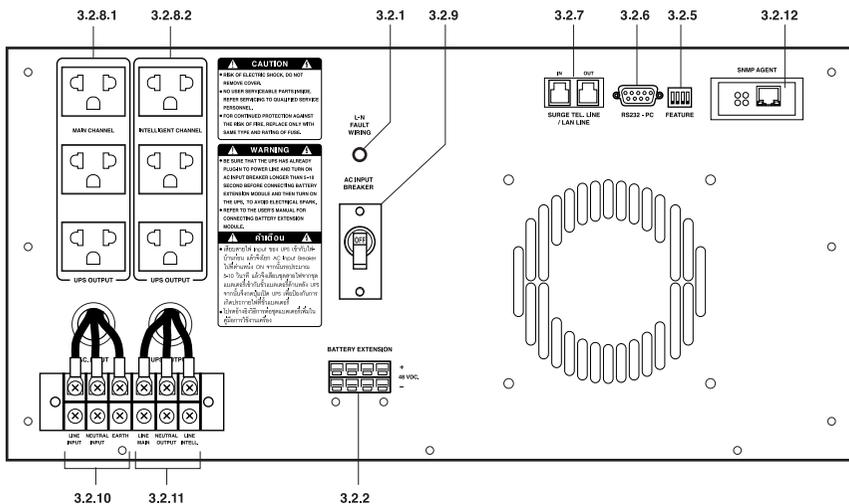
3.2 Rear panel descriptions
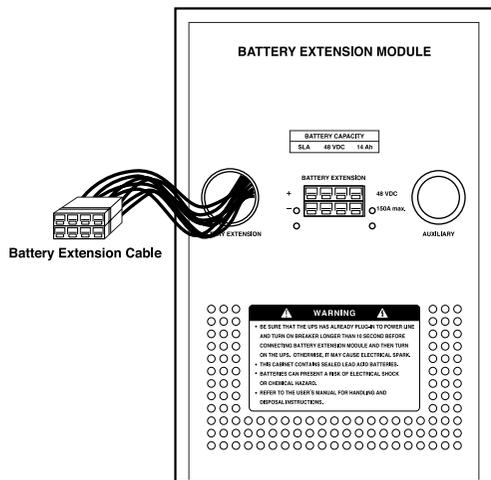

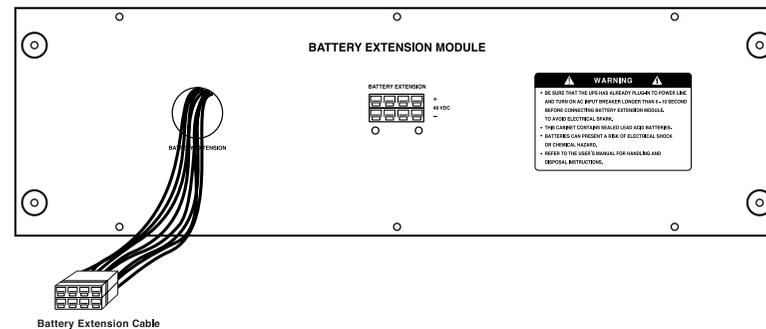Ultra Sine series UPS, Tower Type A

Ultra Sine series UPS, Tower Type B

Ultra Sine series UPS, Rack Mount 3U

Ultra Sine series UPS, Rack Mount 5U

Battery Extension Module, Tower Type

Battery Extension Module, Rack Mount Type

3.2.1 <u>Fault wiring</u> : The light signal that verifies the wiring of the utility line which connects to the UPS. A red light means either the wiring of line or neutral are crossed or there is no electric ground. No light means the   wiring is correct.

3.2.2 <u>Battery extension port (option)</u> : The port for connecting with an extension battery unit to increase the duration of UPS backup time.

3.2.3 <u>Breaker fuse or magnetic breaker</u> : To protect the system from power overload or load short circuit.

3.2.4 <u>AC input </u> : The power socket for plug in the input power cord. For standard product, the power socket will be a socket as shown in 3.2.4.1. For 110 Vac input product (optional), it will be a socket as shown in 3.2.4.2 (only for Ultra Sine series UPS Tower and Rack Mount 3U type).

3.2.5 <u>Dip switch</u> : Switch no.1 for setting the no load shutdown system ON/OFF. (Switch no. 2 to no.4 are not available at the present)

3.2.6 <u>Smart RS-232 communication port</u> : The communication port for connecting the UPS to computer. The signal from the UPS will send information to the computer through this port by a RS-232 cable and display data through the Easy-Mon X Monitoring Software.

3.2.7 <u>Surge protection for telephone line / LAN line</u> : A port for telephone /fax / modem / LAN line surge protection. Its function is to protect load against voltage spikes coming from the telephone or LAN line.

3.2.8 <u>UPS output</u> : Loads supplied from these outlets are full time monitored under Power Watcher. They are provided for the loads that the user wants to protect and provide a back up power supply when there is a power failure. Loads may be added until Power Watcher warns of an overload. (LEONICS suggest to connect load at no more than 75 % of UPS rated power for safety and enough backup power for those loads that need irregular power)

    4.2.8.1 <u>Main Channel</u> : The main outet that is always connected to the UPS backup system. It is provided for high priority loads such as a computer or server.

    4.2.8.2 <u>Intelligent Channel</u> : A supplemental outlets that the user can manage and control by Easy-Mon X Software. The Intelligent Channel can be set to permanently turn on or can be set to perform in intelligent mode to :

        1.   Turn on delay time (0 - 4,000 second) :
Supply electrical power to the Intelligent Channel with a delay of 0 - 4,000 seconds after supply electrical power to the Main Channel.

        2.   Operating on commercial power :

           2.1 Turn off when there is UPS overload.

           2.2 Automatic re-supply after an overload has been removed for about 10 minutes.

        3.   Operating on backup mode:

           3.1 Turn off when UPS gets over temperature.

           3.2 Turn off when battery is low.

           3.3 Turn off when there Is UPS overload.
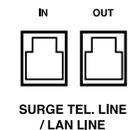
    <u>Note</u> :   1.   Intelligent Channel is set to permanently 'ON' from the factory.

           2.   If the Intelligent Channel is turned off because of condition no. 3 the UPS will re-supply automatically when the utility power returns to normal.

           3.   Loads which are connected to the Intelligent Channel should be low prioirty such as a printer or scanner.

3.2.9 <u>Input Breaker</u> : The circuit breaker for protect the UPS from overload or short circuit current (only in Ultra Sine series Tower type B and Rack Mount 5U type)

3.2.10 <u>AC Input (Input Terminal)</u> : The terminal for connect the 3C x 4 mm^2 AC input cable (only in Ultra Sine series Tower type B and Rack Mount 5U type)

3.2.11 <u>UPS Output (Output Terminal)</u> : The output terminal for connecting to additional peripherals.

3.2.12 <u>SNMP Agent (Optional)</u> : A port for connecting LAN line to computer network in order to monitoring the UPS status through SNMP/HTTP (See more details in the Net Agent II Manual).

INSTALLATION

4.1 Connect a RS-232 cable (as supplied with the Easy-Mon X Software package) from the computer serial communication port (if available) to the UPS 'RS232 - PC' port at the rear side of UPS.

4.2 Connect telephone cable's plug or LAN cable plug (if available) into the sockets as shown.

    IN   :   Connect telephone / LAN line into UPS.

    OUT :   Connect telephone / LAN line to fax, modem, or LAN card input socket.

IN   OUT

SURGE TEL. LINE / LAN LINE

    <u>Note</u>: To gain proper benefit from telephone / LAN line surge protection, your electricity system should have an electric ground. If there is no electric ground wire, there can be data transferring problems and loss of protection of the connecting devices.
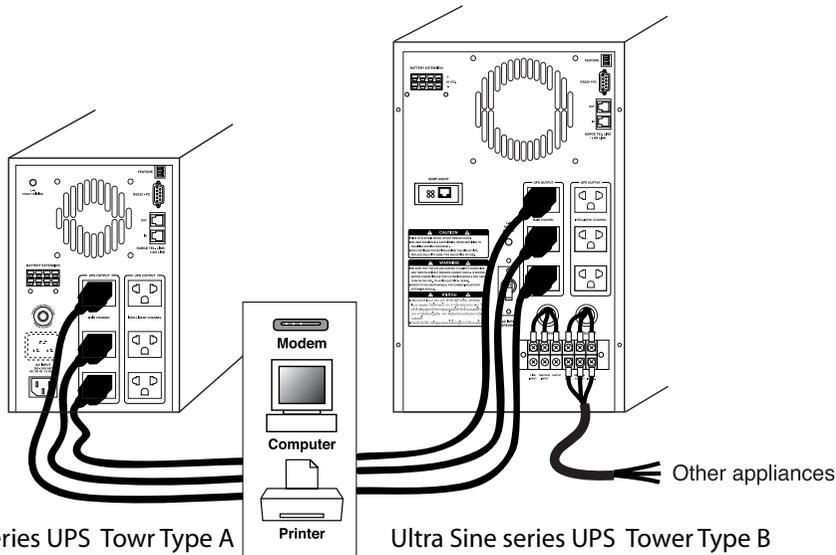
4.3 No load shutdown switch enable / disable

Set the dip switch no.1 to 'ON' as shown, if you want the UPS to shutdown automatically in backup mode when the load is less than 9 % of full rated power In order to save energy and prolong battery life.

FEATURE

Note: No load shutdown switch is set at 'OFF' from the factory. The Inverter operates any time the mains power is lost even if load is less than 9% of rated power.

4.4 Plug the load power cords such as computer, printer, modem etc. into the UPS out put sockets. For Ultra Sine series UPS Tower type B and Rack Mount 5U type, you can connect the other application into the output terminal.

4.4.1 UPS output outlets are : Plug the load power cord into the UPS output outlet as shown.

Modem

Computer

Printer

Other appliances

Ultra Sine series UPS Towr Type A   Ultra Sine series UPS Tower Type B

4.4.2 UPS output outlets are : Plug the UPS output power cord (as supplied with UPS) into the UPS output outlet and the other end to load input outlet as shown.
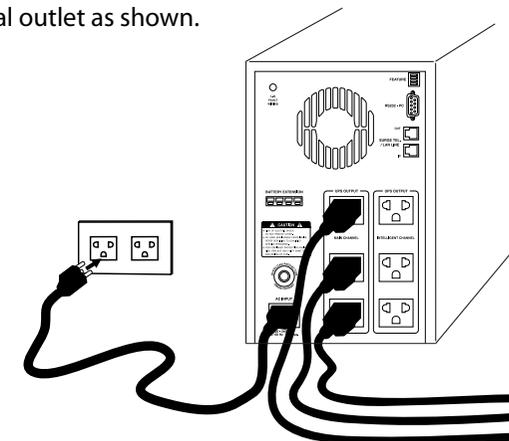
Computer CPU

◄ Power cord supply with UPS

Modem

Computer

Printer

Other appliances

▲ Power cord supply with UPS

Modem   Computer   Printer
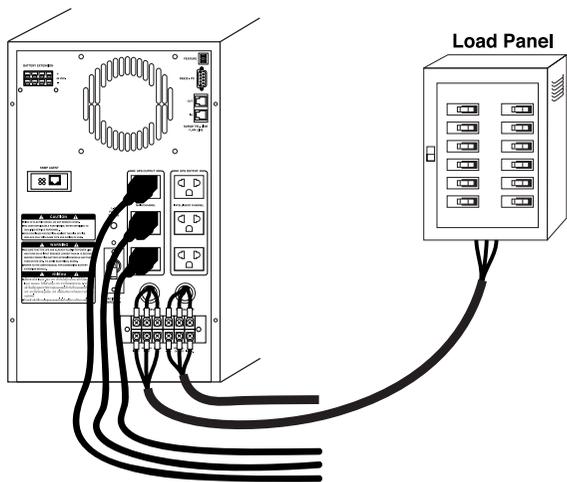
Ultra Sine series UPS Towr Type A   Ultra Sine series UPS Tower Type B

4.5 Connect the UPS to AC source

4.5.1 Ultra Sine series Tower Type A and Rack Mount 3U Type: Plug the UPS input power cord into the AC input and connect the other end of the power cord to the electrical outlet as shown.
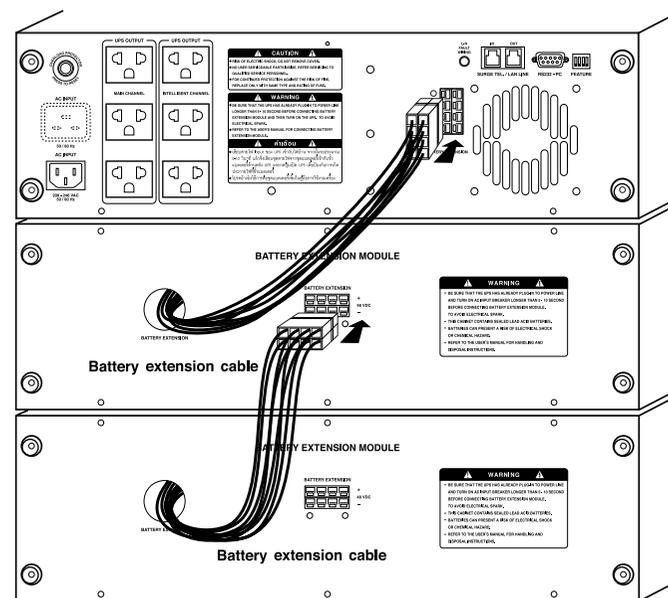
4.5.2   Ultra Sine series UPS Tower Type B and Rack Mount 5U type : Connect the UPS input cable (3C x 4 mm^2) into the UPS AC input terminal and connect the other end to the load panel as shown.

Load Panel

4.6   Battery Extension

4.6.1   For Ultra Sine series UPS Tower type B and Rack Mount 5U type, turn on the AC input circuit breaker at the rear side after connecting UPS to AC source.

4.6.2   Waiting for 5-10 seconds and then plug the cable from the battery extension module into the UPS battery extension outlet (see picture on next page).
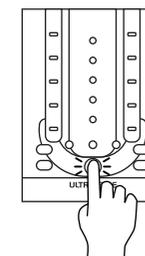
4.6.3   Turn on the UPS.

Warning ! :   Please strictly follow battery extension guideline in 4.6.1-4.6.3 before turning on the UPS. Otherwise, it may cause electrical spark.
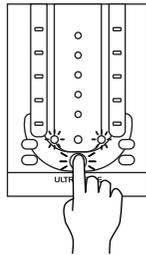

BATTERY EXTENSION MODULE

Battery extension cable

BATTERY EXTENSION MODULE

Battery extension cable

OPERATION

5.1   Switch on

5.1.1   Under normal utility power line (AC Start) : Plug in the power cord to the outlet. Press the multi-function switch for 0.5 seconds then release. All indicator lights will blink, after that UPS will start up the self-test (See details in section 5.3.1). When the test is completed the display panel will show the UPS status .(See section 6)
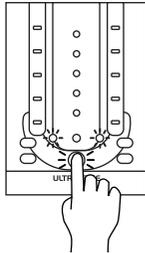
5.1.2 <u>Under power failure conditions (DC start)</u> :
Press the multi-function switch until the
UPS Mode ($\sim$) and Fault /Alarm ($\triangle$)
lamps are lit at the same time and the alarm
beep sounds once, then release before the
second alarm beep sounds. All indicator
lights will blink, after that the Ultra Sine UPS
will start the seft-test. (See details in section
5.3.1)

Note :   If you press the multi-function switch too long (until the UPS Mode
and Fault/Alarm lamps are extinguished) and the second alarm beep
sounds, the UPS will not start up.

5.2 Switch off

Under any operating conditions, there is
only one proper way to shutdown the Ultra Sine
UPS. Press the multi-function switch until the
UPS Mode ($\sim$) and Fault/Alarm ($\triangle$) lamps
are lit at the same time and alarm sound once,
then release.

Note   :   If you press the multi-function switch too long (until the UPS Mode and
Fault/Alarm lamps are extinguished) and the second alarm beep sounds,
the UPS will not switch off.

5.3 Self-test

The Ultra Sine Series UPS has a self-test capability. This complete self-testing
function will perform tests of stabilizing, charging, inverter and battery circuit
functions (See section 6). There are four cases that the UPS will do self-testing :

5.3.1 <u>Start up self-test</u> : When turned on, the UPS will do the self-test automatically.

5.3.2 <u>Manual self-test</u> : During operation, if you want to test the UPS, double click
the multi-function switch. Then the UPS will do a self-test.

5.3.3 <u>Schedule self-test by Easy-Mon X software</u> : With Easy-Mon X monitoring
software, you can command the UPS to do a self-test instantaneously or
periodically. (More details are in Easy-Mon X's guide found in the LEONICS
Easy-Mon X CDROM.)

5.3.4 <u>Auto test every 2 weeks</u> : If there is no manual or scheduled self-test during
the past 2 weeks, the UPS will do a self-test automatically. You can also set the
auto test duration through Easy-Mon X Monitoring Software.

Moreover, when Ultra Sine series UPS do a self-test and detect that the
battery has been fully charged, it will check whether the battery need to be
replaced. This is the 'Battery Watcher' function.
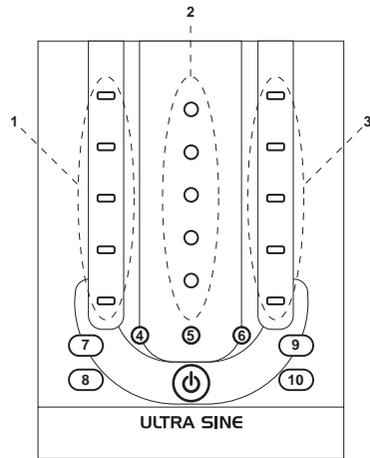
5.4 Cancel self-test

You can cancel a self-test by double click the multi-function switch. However,
if the UPS has reached the inverter testing step, the self-test can not be cancelled
(The "25%" lamp of load level is lit).

5.5 Mute alarm

When the Ultra Sine Series UPS alarm, you can mute by pressing the multi-
function switch for 0.5 seconds then release.

INDICATOR LIGHTS, AUDIBLE ALARM AND UPS STATUS

6.1 Indicator lights No. 1, 2 and 3 : See details in section 3.1.1 - 3.1.3

6.2 Indicator lights No. 4,5 and 6

Item	UPS status	Lights condition			Audible alarm
		4	5	6	
Under normal operating mode					
1	Normal	lit			no alarm
2	Blackout	blinking			— — — —
3	Battery replacement warning		lit		————
4	Low battery		blinking		— — — —
5	Fault or output short circuit			lit	— — ——
6	Overload shutdown or output short circuit			lit	————

Item	UPS status	Lights condition			Audible alarm
		4	5	6	
During self-test					
7	Stabilizer test	blinking together with the bottom of indicator light no.1			no alarm
8	Charger test	blinking together with the bottom of indicator light no.2			no alarm
8	Backup and battery test	blinking together with the bottom of indicator light no.3			no alarm

6.3 Indicator lights No. 7,8,9 and 10 : See details in section 3.1.7 - 3.1.10
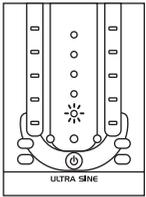
6.4 Self-test display mode : After the Ultra Sine Series UPS finishes a self-test, it will display :

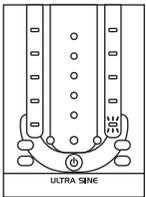   6.4.1 A short beep and the lamp No. 4 is lit means the UPS is normal.

    6.4.2 A long beep indicates that the UPS has detected something abnormal. To mute the alarm, press the multi-function switch then observe the error from the display :
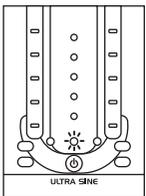
- The lowest of indicator lights No. 1 (✓→) is lit when a stabilizer fault.
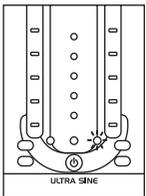
- The lowest of indicator lights No. 2 (⎕) is lit when a charger fault.

- The lowest of indicator lights No. 3 (25%) is lit when an inverter fault.

- The lamp No. 5 is lit when it need to replace the battery.

- The lamp No.6 is lit when a software failure or CPU error.

Note : If the battery power is too low or there are abnormal electrical conditions such as black out, brown out, etc. Ultra Sine Series UPS will cancel the self-test automatically.

TROUBLE SHOOTING

Symptoms	Possible Causes	Solutions
Press the switch, indicator lights No. 1,2,3 and 4 are lit then extinguished. But the UPS does not operate.	1. Pressed the switch too fast.	Repress the switch for 0.5 - 1 second then release.
	2. UPS power cord is not plugged into input socket properly. It is loose.	Plug in firmly.
	3. There is no power in the UPS mains power cord.	Press the switch until the lamp No. 4 and 6 are lit then release (DC start). If UPS still does not operate, please send it to LEONICS Service Center.
	4. If you follow steps 1 - 3 and the symptoms still exist.	Press the reset switch at the circuit breaker on the rear panel. If the UPS does not operate, please send it to LEONICS Service Center.
UPS operates normally but the highest of indicator lights No. 3 (⚡O) is lit.	Loads which are connected to Power Watcher (UPS output) are exceed the UPS rated capacity.	Reduce loads to 75 %.(please keep the remain 25 % available for instantaneous power consumption of the load when it first starts)
UPS operates normally but sounds a short beep periodically or UPS switches to backup power for a short period and returns to normal operating status.	A power sag occurred in too short a period for the user to sense. But UPS can detect that abnormal condition.	Do nothing, normal operation.

Symptoms	Possible Causes	Solutions
When a black out occurs, UPS supplies backup power but it is still supplying when the AC source recovers.	The returned AC source's voltage is too low for Ultra Sine Series UPS to run in normal operating mode.	- Turn off loads and wait until the AC source returns to normal. Then turn on loads again. or - Use backup power from UPS until battery low alarm alerts, then turn off loads and the UPS. Wait until the AC source returns to normal, then turn on loads and the UPS again. or - If AC source is normal, but the UPS still has the same symptom, see solution of the first symptom in this list.
AC source is normal but UPS supplies backup power.	1. The utility frequency is not within the frequency tolerance of the UPS, the (FREQ.) lamp is lit.	The frequency tolerance may be set too low. Resetting in "Setup Characteristic" on Easy-Mon X Software CD.
	2. The UPS AC input socket or utility outlet socket is loose or is not plugged in.	Verify both outlets are plugged in tightly.
	3. Breaker tripped.	Press reset button at breaker.
UPS starts but does not have power supply for load.	1. Load are connected to the Intelligent Channel and the Intelligent Channel is set to OFF or waiting for schedule start-up (delaying is on).	When delaying is on (the (INTELL) lamp is blinking), there is no power in the Intelligent Channel until the 'Delay on' time is up. Reset the delay time in "Setup Characteristic" on Easy-Mon X Software CD (see item 11.2)

Symptoms	Possible Causes	Solutions
	2. UPS is under overload shutdown status and the ⚠ lamp remains.	Reduce loads or shutdown the loads and UPS, then restart the UPS and loads.
UPS operates normally but sometimes the overload alarm alerts.	1. Loads are consuming more power than usual at that time. Often this is caused by a printer when it is printing.	Reduce the loads.
	2. Overload may come from a laser printer or another load that sometimes consumes high power.	Unplug laser printer from the UPS output outlet and plug into the utility outlet.
UPS does not supply backup power during a blackout.		1. Unplug all loads from UPS. Shutdown the UPS and restart again. 2. If the UPS still has the same symptom, shutdown the UPS and follow battery replacement instructions. Disconnect red wire from battery connector 5 min. later, then shutdown the UPS and restart. 3. If the UPS can operate normally after follow step 2, but this symptom always happens, please send the UPS to a LEONICS Service Center or LEONICS local distributor.

SERVICE

In case of any queries or concerns that are not referenced in this guide, please contact a LEONICS Service Center, LEONICS local distributor or e-mail your queries through www.leonics.com.
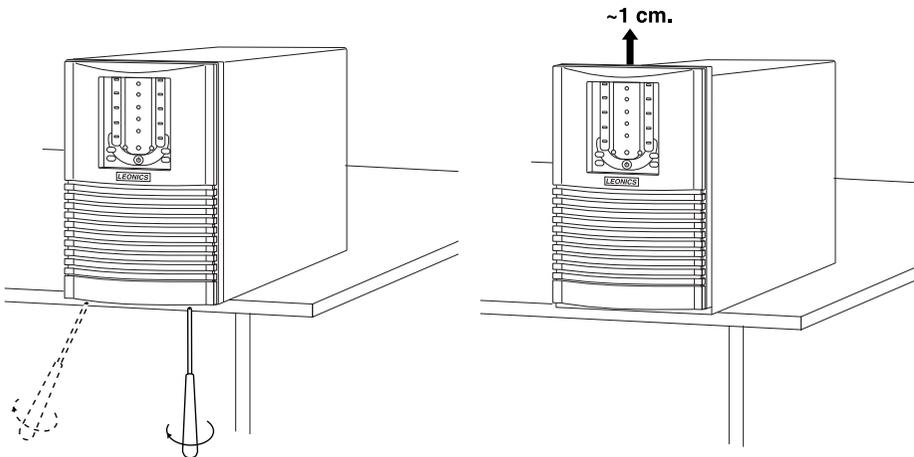
BATTERY REPLACEMENT

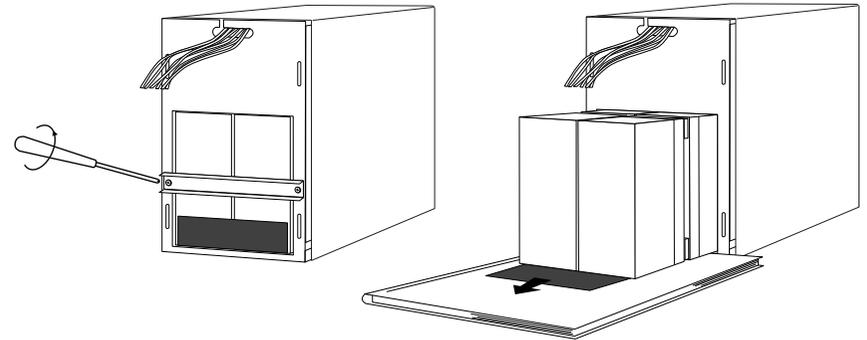When the UPS warns you to replace the battery (see details in section 6):

> Warning! : Users can replace battery by yourself only for Ultra Sine 1050ST and Ultra Sine 2000ST, Tower and Rack Mount Type.
> Other models must be done by LEONICS qualified technicians only.

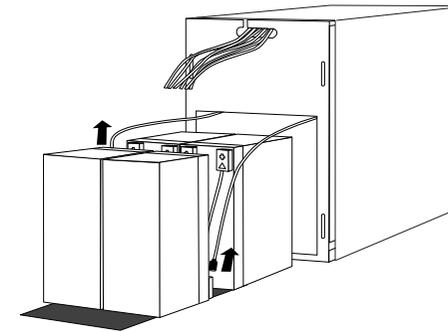**9.1 Ultra Sine 1050ST - Ultra Sine 2000ST, Tower type**

9.1.1 Stand the UPS up, place it at the edge of a table. Bulge its front panel from the edges and use a screwdriver tounscrew the fasteners. Slide the front panel up about 1 cm. and pull out as shown.

~1 cm.

9.1.2 Stand the UPS up, unscrew the screw on the battery strip. Then lift the battery's handles, place a book or magazine of about 2 cm. thick under it.
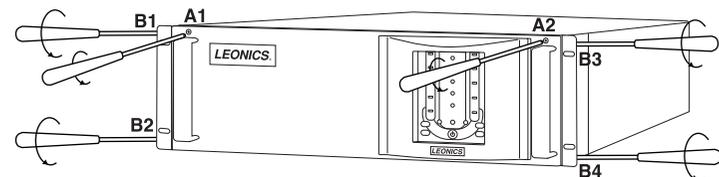

9.1.3 Remove the battery terminal cover. Disconnect the black and red wires from the battery terminals. Then pull the battery out and replace with the new one.
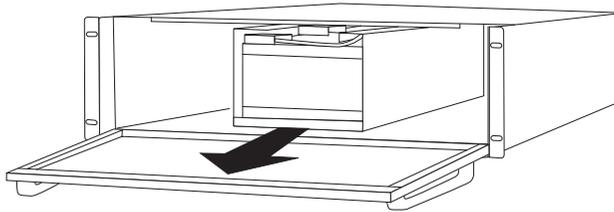

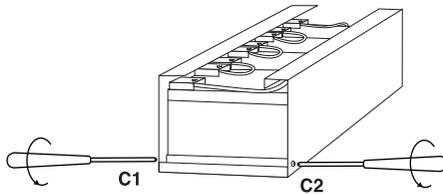**9.2 Ultra Sine 1050ST - Ultra Sine 2000ST, Rack Mount type**

9.2.1 Use a screwdriver tounscrew the fasteners on the front panel and side panel (A1, A2, B1 and B2) respectively.

B1 A1 A2 B3 B2 B4

9.2.2 Open the front panel and pull out the battery tray as shown.

9.2.3 Unscrew screw C1 and C2 for removing the battery strip. Remove the battery
terminal cover. Disconnect the black and red wires from the battery terminals.
Then pull the battery out and replace with the new one.

9.3 Reconnect the black and red wires to the black and red terminals. Beware to connect
battery with the correct polarity. Put the battery strip back in its position.

9.4 Re-screw the battery strip with the case.

9.5 Replace and screw the front panel in place and continue using the UPS normally.

STORAGE AND PRESERVATION

If you have to store UPS for a long period of time, before storing, be sure the battery
is fully charged and it need to be recharge every three months to preserve the condition
of the Internal battery;

10.1 Plug the UPS power cord into an electrical outlet. Battery level lamp blinks once.

10.2 Leave the UPS connected to the electrical outlet for at least 8 hours.

10.3 Double click the switch for self-testing and see the result of the self-test (See more
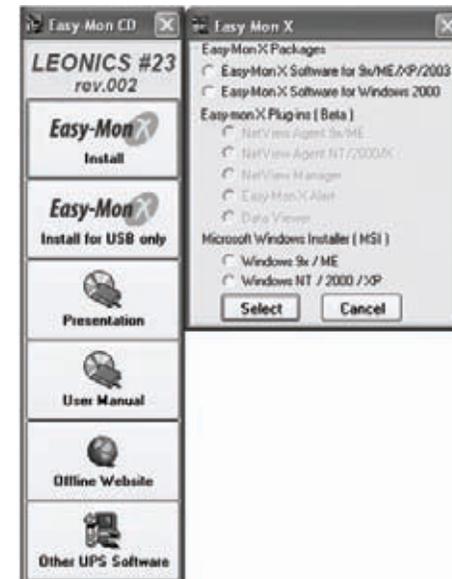details in section 6.4).

SOFTWARE INSTALLATION

11.1 Easy-Mon X installation

11.1.1 Turn off computer and UPS.

11.1.2 Connect RS-232 cable from the computer to the UPS.

11.1.3 Turn on the UPS and then turn on the computer.

11.1.4   Click the "Easy-Mon X Install" button and then install Easy-Mon X Package
which matches your OS.

11.1.5   Follow the instruction as shown on screen.

11.1.6   After finished the Easy-Mon X installation, restart the computer. Start the
"Easy-Mon X Setup" program and then click the "Auto Detect UPS" to search
for the UPS model and communication port automatically.

11.1.7   Once you get to know the communication port, start the "Easy-Mon X Spyî
program to monitor the UPS data.

 Note : - The values of input (Vin) and output (Vout) voltages read from the Easy-
Mon X Software from many UPSs in the same network may be different,
even though connected to the same power source. Possible causes of these
happenings are the voltage over each branch circuit is not equal, or ± 1%
accuracy of input and output voltage measuring circuit, or the UPSs are
connected to different power phases of the same source.

- You can find more information about Easy-Mon X in the Easy-Mon X
Software CD.

11.2 Setup Characteristic

The Setup Characteristic use for setting the UPS communication port, Limit of Input
Voltage, Alarm Sound, Auto Test and Advanced Load Outlet Management (only for higher
than 1050VA model). Enter to Setup Characteristic as follow

11.2.1   Browse files on CD and then open the "Utility" folder.

11.2.2   Enter to sub folder "Setup Characteristic".

11.2.3   Open file name "UltraSineAcuraAstra (English).exe"

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