



Tri-Athlon

3-Phase Uninterruptible Power System

User Manual for Models:

ATWS-10003-02
ATWS-15003-02
ATWS-20003-02
ATWN-10003-02
ATWN-15003-02
ATWN-20003-02

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1. Safety

IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

Please read and save this manual!

The information provided in this manual refers to our Tri-Athlon UPS series. The manual covers basic functions, operating and installation instructions, and cautionary notes. Installation must be carried out in accordance with this manual as well as local electrical regulations and should only be performed by qualified personnel to avoid the risk of electric shock or damage to the unit. Any warranties covering these units will become void if the unit is found to have been incorrectly connected or tampered with.

1.1 Safety Notes

1. Even without connection to utility power, AC voltage may still exist on the output.
2. Please ground the UPS properly before powering it on.
3. DO NOT open or tamper with the batteries as the fluid contained therein is harmful.
4. Please be careful to avoid short circuiting between the positive and negative of battery as it will create a fire hazard!
5. DO NOT disassemble the UPS to avoid risk of electric shock!
6. Check for any high voltages prior to working on the batteries.
7. The operational environment and storage of the UPS will affect its life span and reliability. Avoid the UPS from the following environments for long periods of time:
 - Areas where the humidity and temperature is out of the specified range
 - Direct sunlight or locations near heat sources
 - Areas of high vibration
 - Areas with corrosive chemicals, flammable gas, excessive dust, etc.
8. Keep the UPS in a well-ventilated area without obstructing the openings and fans on the unit that could obstruct air flow for cooling

1.2 Symbols



WARNING! Risk of electric shock



CAUTION! Read this information to avoid equipment damage

2. Main Features

2.1 Summary

The Tri-Athlon UPS series is a three-phase in; three-phase out, high frequency online UPS. The UPS can mitigate most power quality problems, such as blackouts, over-voltages, under-voltages, voltage sags, oscillations, high voltage pulses and surges, high inrush current, harmonic distortion (THD), noise interference, frequency fluctuations, etc.

2.2 Functions and Features

◆ 3 Phase In / 3 Phase Out UPS

3 Phase In / 3 Phase Out high-power UPS system, with input current and voltage balancing.

◆ Digital Control

The UPS is controlled by a Digital Signal Processor (DSP) which increases reliability, optimizes performance, improves protection and offers advanced self-diagnostics.

◆ Configurable Charging Current

Via a user adjustable setting, the user may set the capacity of the batteries as well as both the normal charging current and maximum charging current. Constant voltage mode, constant current mode or float mode can be switched automatically.

◆ Intelligent Charging Method

The Tri-Athlon UPS series adopts an advanced three-stage charging method -

1st stage: High, constant current charging to ensure recharge to 90% within a reasonable time;

2nd-stage: Constant Voltage, to energize the batteries and make sure they are fully charged.

3rd stage: Floating mode, which extends the life of the batteries and guarantees fast charging.

◆ LCD Display

With both LCD and LED displays, the UPS status and its operational parameters, such as input / output voltage, frequency & load%, battery %, ambient temperature, etc., are easily accessible

◆ Intelligent Monitoring Function

Using the optional SNMP Card, the user can remotely control and monitor the UPS.

◆ EPO (Emergency Power Off) Function

The UPS can be completely shut off when the EPO circuitry is used.

◆ REPO Function

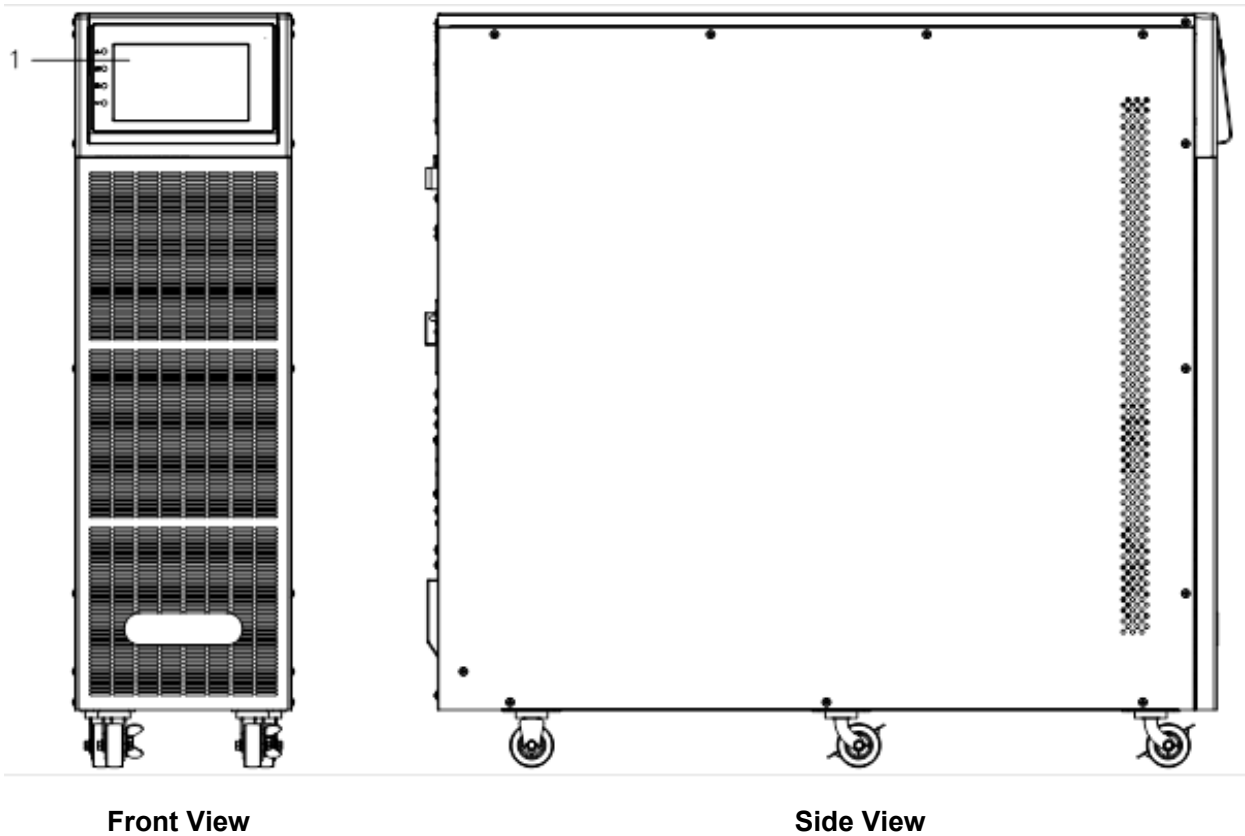
A Remote EPO function is also available on the UPS.

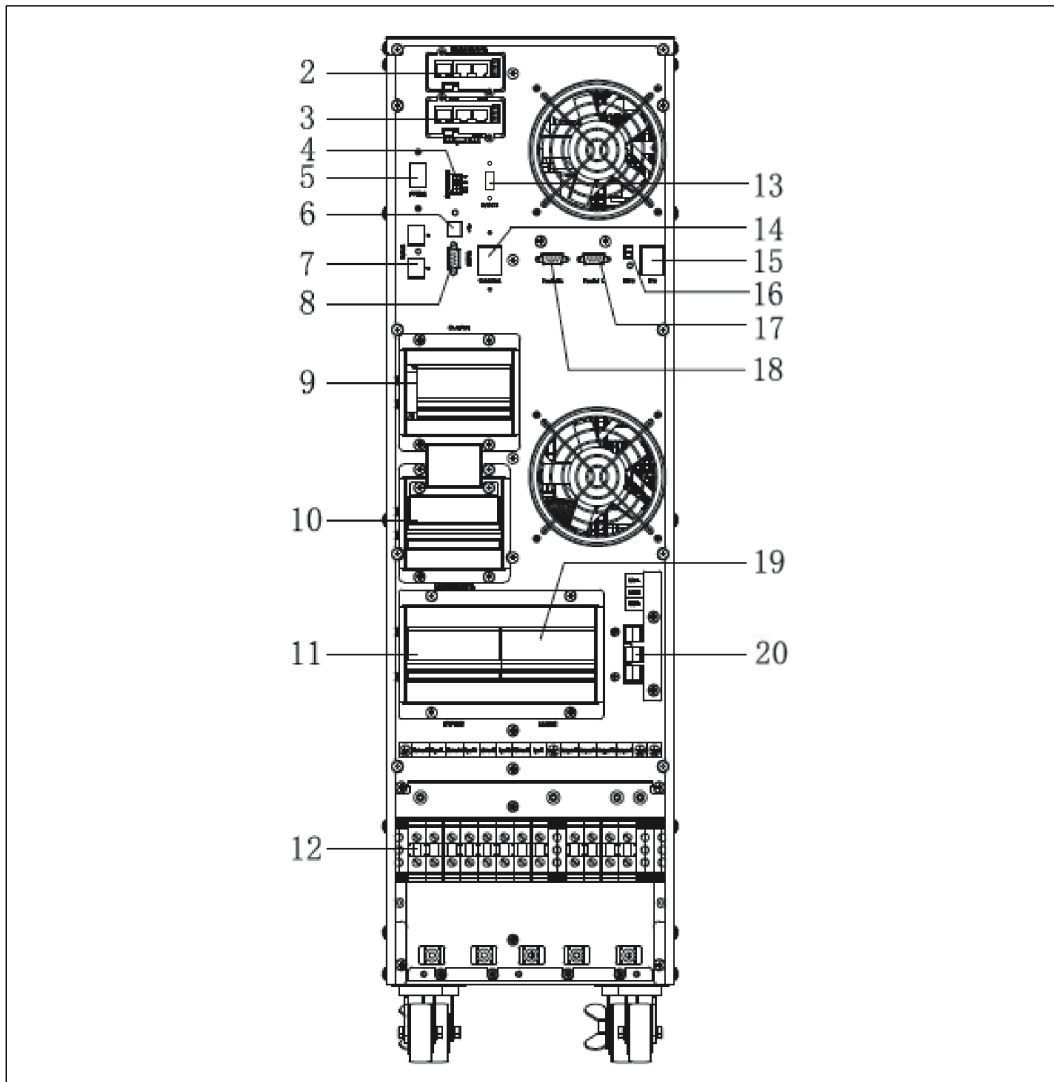
3. Installation

3.1 Unpacking

1. **DO NOT** lean or tilt the UPS when removing it from the packaging.
2. Check for damage that may have occurred during shipping.
DO NOT turn on the UPS if any damage is found. Immediately contact Marathon Power.
3. Check the accessories according to the packing list and contact Marathon Power in case of missing parts.

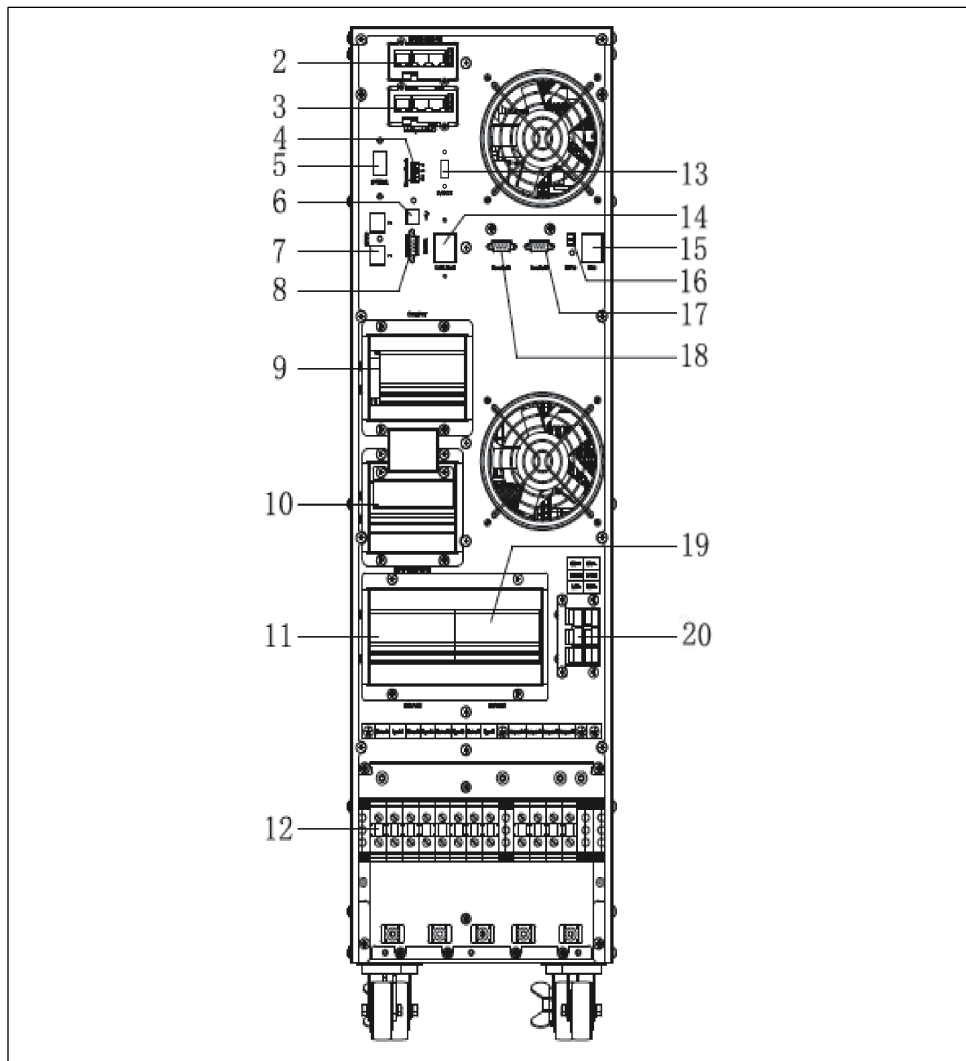
3.2 Cabinet Appearance





10kVA Rear View (showing terminal block without cover)

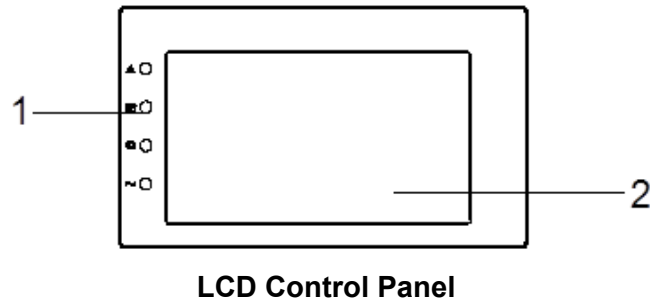
(1) LCD panel	(2) Intelligent Slot 1 (SNMP card/ Relay card)
(3) Intelligent slot 2 (SNMP card / Relay card)	(4) Dry contact port
(5) Power switch	(6) USB port
(7) RS-485 port	(8) RS-232 port
(9) O/P breaker	(10) Maintenance bypass switch with cover
(11) Bypass breaker	(12) Terminal block for AC connections
(13) EVENTS port	(14) Cold start button
(15) EPO switch	(16) REPO port
(17) Parallel port 2	(18) Parallel port 1
(19) I/P breaker	(20) Terminal block for battery connection



15-20kVA Rear View (terminal block without cover)

(1) LCD panel	(2) Intelligent Slot 1 (SNMP card / Relay card)
(3) Intelligent Slot 2 (SNMP card / Relay card)	(4) Dry contact port
(5) Power switch	(6) USB port
(7) RS-485 port	(8) RS-232 port
(9) O/P breaker	(10) Maintenance switch & its cover
(11) Bypass breaker	(12) Terminal block for AC connections
(13) EVENTS port	(14) Cold start button
(15) EPO switch	(16) REPO port
(17) Parallel port 2	(18) Parallel port 1
(19) I/P breaker	(20) Terminal block for battery connection

3.3 LCD Control Panel



- (1) LED's (from top to bottom: "Alarm", "Bypass", "Battery", "Inverter")
- (2) LCD display

3.4 Installation Notes

Note: For convenience during operation and maintenance, the space in front and back of the cabinet should be at least 40in / 100cm and 31in / 80cm respectively when installing.

- ◆ To prevent the risk of fire or electronic shock, install the UPS in a clean, temperature and humidity controlled, ventilated environment. Avoid vibration, dust, humidity, corrosives and flammable gas and liquids. To avoid high room temperatures, room extractor fans are recommended. Optional air filters are available if the UPS will operate in a dusty environment.
- ◆ The environment temperature around the UPS should be kept in a range of 0°C – 40°C / 32°F - 104°F. If the environment temperature exceeds 40°C / 104°F, the rated load capacity should be reduced by 12% per 5°C / 41°F. The maximum temperature should not exceed 50°C / 122°F.
- ◆ Batteries should be mounted in an environment where the temperature is within the required specifications. Temperature is a major factor in determining battery life and capacity. In a normal installation, the battery temperature should ideally be maintained between 15°C / 59°F and 25°C / 77°F. Keep the batteries away from heat sources or main air ventilation areas.
- ◆ If the equipment is not installed immediately, it should be stored without excessive humidity and / or heat sources.



WARNING!

Typical battery performance data is quoted for operating temperatures between 20°C / 68°F and 25°C / 77°F. Operating above this range will reduce the battery life, operation below this range will reduce the battery capacity.



CAUTION!

Unused batteries must be recharged every 6 months. Connect the UPS to a suitable AC supply for at least 24 hours to recharge the batteries.

- ◆ The highest altitude that the UPS will operate normally under full load is 1500 meters / 4500 feet. The load capacity should be reduced when the UPS is installed in locations where the altitude is higher than 1500 meters, according to the following table:

(Load coefficient equals max load in high altitude place divided by nominal power of the UPS)

Altitude (m / ft)	1500 4500	2000 6000	2500 7500	3000 9000	3500 10500	4000 12000	4500 13500	5000 15000
Load Coefficient	100%	95%	90%	85%	80%	75%	70%	65%

3.5 External Protective Devices

For safety reasons, it is necessary to install external circuit breaker/s at the AC input supply and the battery. This chapter provides guidelines for the equipment to be installed by qualified installers with knowledge of local wiring practices.

◆ External Battery

The UPS and its associated batteries are protected against over-current conditions via a DC compatible thermo-magnetic circuit-breaker (or a set of fuses) located close to the batteries.

◆ UPS Output

Any external distribution panel used for load distribution should be fitted with protective devices to avoid the risk of overload.

◆ Over-Current

A protection device/s should be installed at the distribution panel of the incoming main supply. It should identify the power cable current capacity as well as the overload capacity of the system.

3.6 Power Supply Cabling

- ◆ The cabling should comply with the voltage and current ratings provided in this section. Please follow local wiring codes and practices and take into consideration environmental conditions.



WARNING!

As a preliminary precaution, be aware of the location and operation of the external isolators which are connected to the UPS input / bypass supply at the main distribution panel. Check if these supplies are electrically isolated. Post necessary warning signs to prevent any hazardous operational conditions.

Recommended cable sizing is as follows:

UPS	Cable Sizing			
	AC Input	AC Output	DC Input	Grounding
10kVA	8 AWG	8 AWG	6 AWG	8 AWG
15kVA	6 AWG	6 AWG	2*6 AWG	6 AWG
20kVA	4 AWG	4 AWG	2*6 AWG	4 AWG



CAUTION!

Protective ground cable: Connect each cabinet to the main ground system. For Grounding connection, follow the shortest route possible.



WARNING!

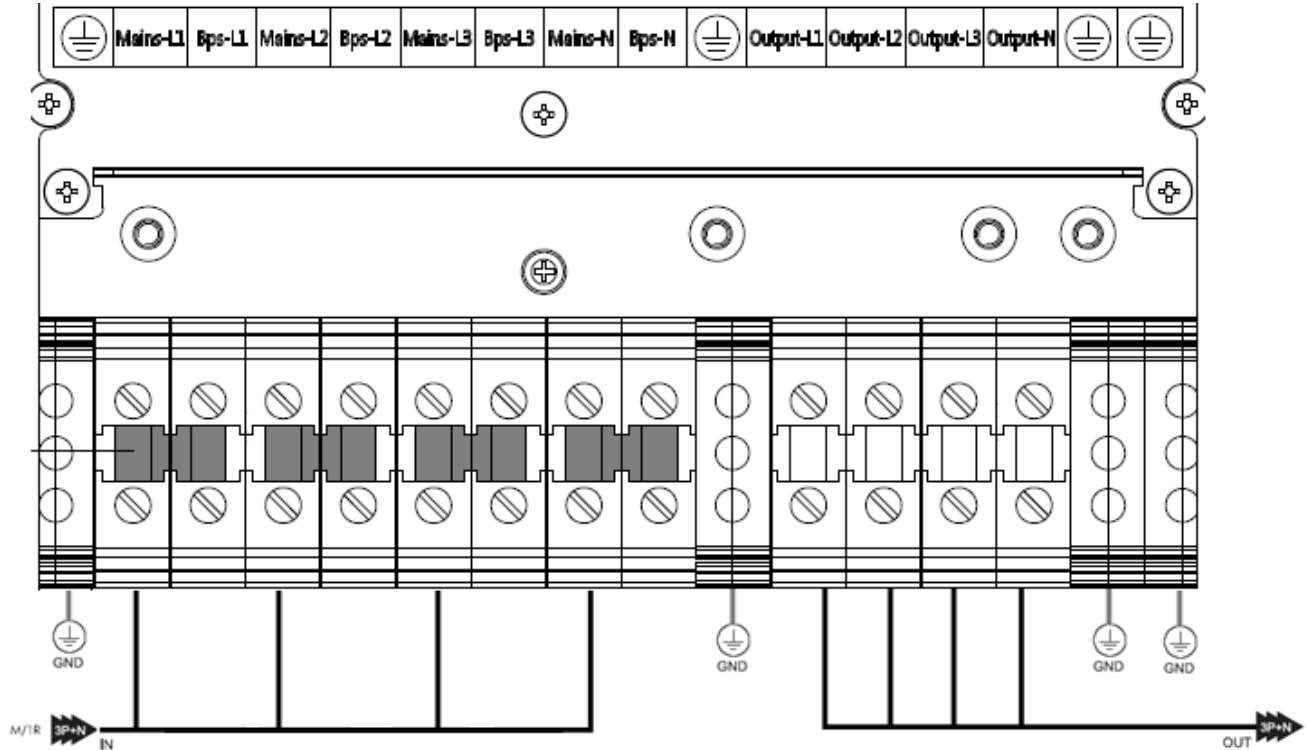
Failure to follow adequate grounding procedures may result in electromagnetic interference or electric shock and/or fire hazards.

3.7 Power Cable Connections

Once the equipment has been finally positioned and secured, connect the power cables as described in the following procedure. Verify that the UPS is totally isolated from its external power source and also all circuit breakers and switches are open. Ensure that they are electrically isolated and post any necessary warning signs to prevent inadvertent operation.

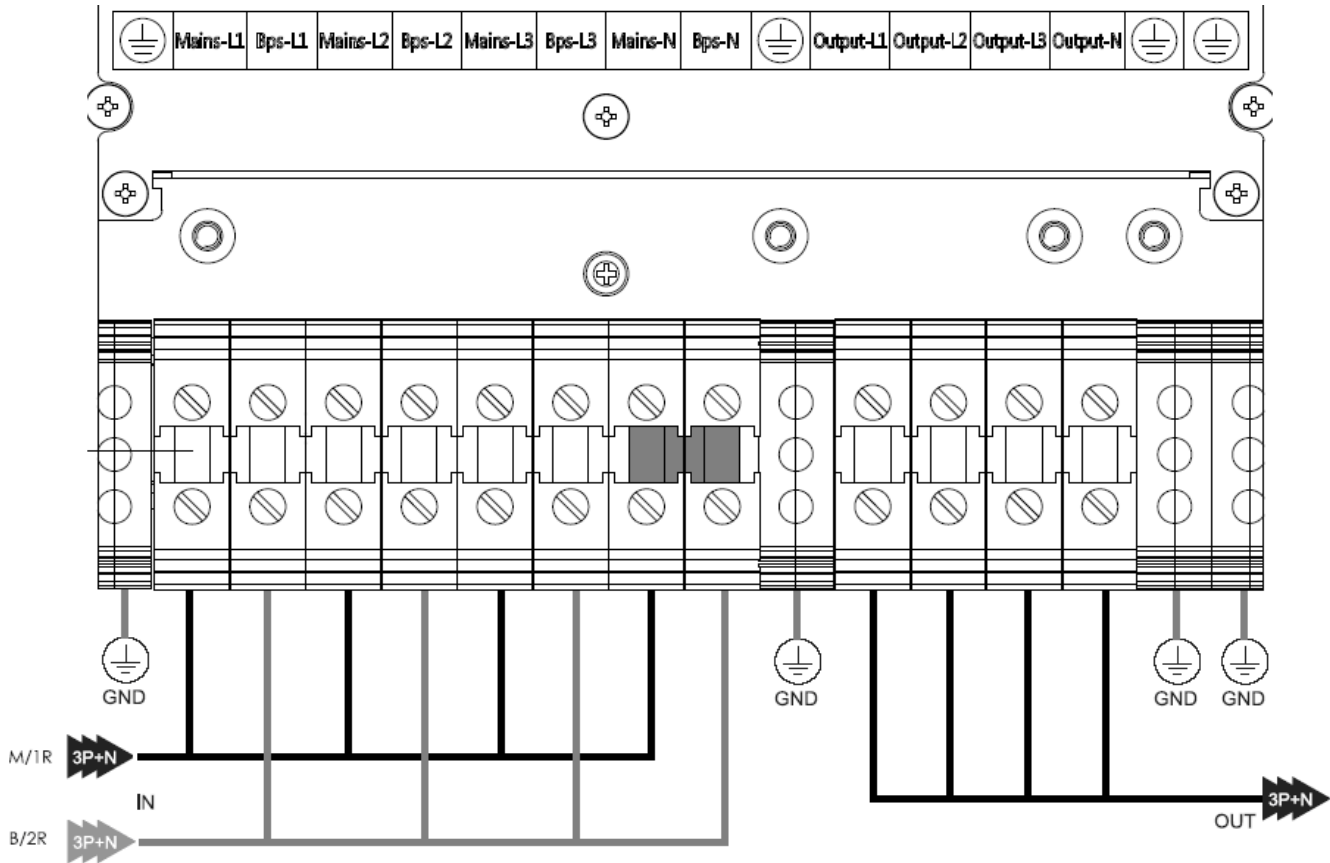
Open the UPS rear panel and remove the cover of terminals for wiring.

3.7.1 Common Input and Output Connection



M/1R Primary input Line	IN / OUT Input / Output
Input-L1: Primary input Phase L1	Output-L1: Output Phase L1
Input-L2: Primary input Phase L2	Output-L2: Output Phase L2
Input-L3: Primary input Phase L3	Output-L3: Output Phase L3
Input-N: Input Neutral for primary and secondary input	Output-N: Output Neutral
GND: Ground	GND: Ground
	BAT+: Positive terminal of the battery string
	BATN: Neutral terminal of the battery string
	BAT-: Negative terminal of the battery string

3.7.2 Split Input Connection



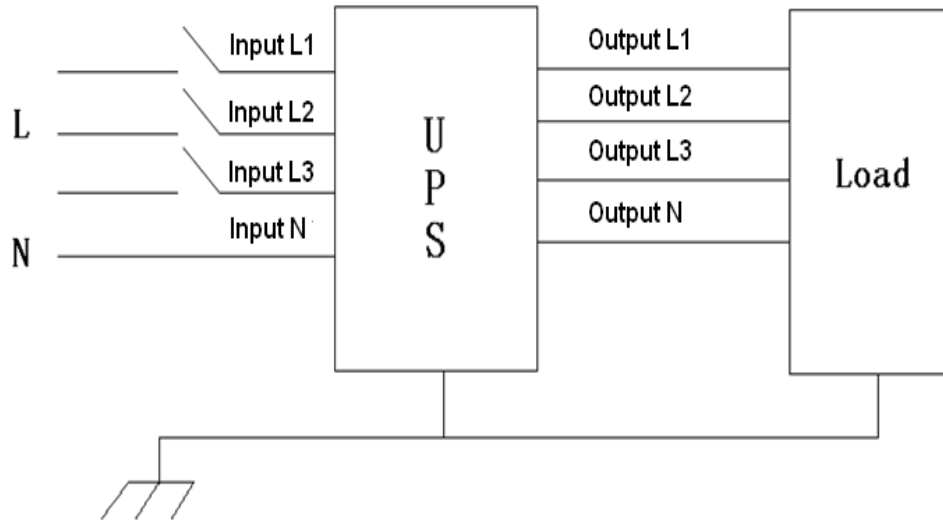
M/1R Primary input Line	IN / OUT Input / Output
B/2R Secondary/Bypass input line (optional)	Output-L1: Output Phase L1
Mains-L1: Primary input Phase L1	Output-L2: Output Phase L2
Mains-L2: Primary input Phase L2	Output-L3: Output Phase L3
Mains-L3: Primary input Phase L3	Output-N: Output Neutral
Input-N: Input Neutral for primary and secondary input	GND: Grounding
Bps-L1: Secondary input Phase L1	BAT+: Positive terminal of the batteries string
Bps-L2: Secondary input Phase L2	BATN: Neutral terminal of the batteries string
Bps-L3: Secondary input Phase L3	BAT-: Negative terminal of the batteries string



Warning!

In the case of “split bypass” operation, make sure the copper between each input lines have been removed. The AC input and the AC bypass supplies must be referenced to the same neutral point.

Choose appropriate power cabling (refer to the table above) . The diameter of the connection terminal on the cables should be greater than or equal to that of the connection terminal blocks:



WARNING!

If the load equipment is not ready to receive power, ensure that the system output cables are safely isolated at their ends. Connect the safety ground and any necessary bonding ground cables to the copper ground screw located on the base of the equipment below the power connections. All sections of the UPS must be grounded properly.



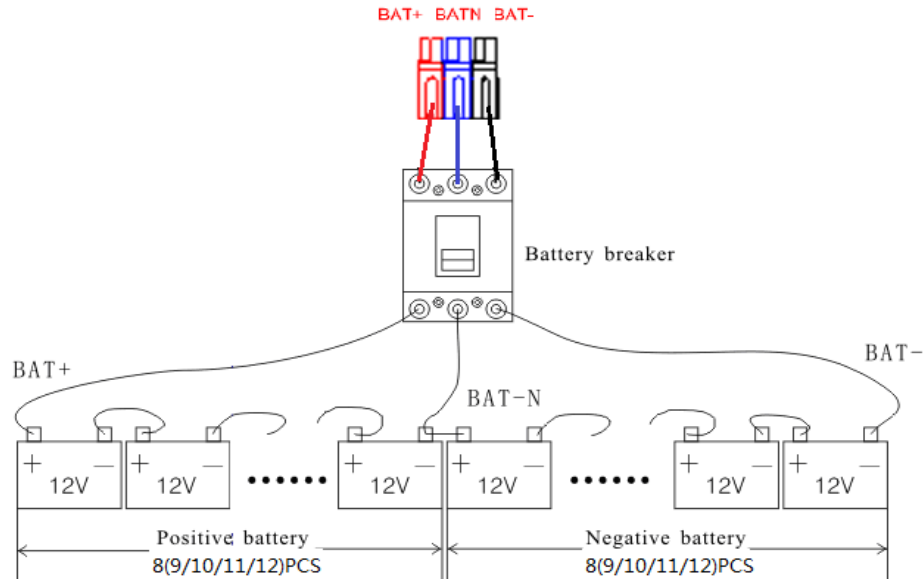
CAUTION!

The grounding and neutral bonding connections must be in accordance with local and national electrical codes.

3.8 Battery Connection

The UPS uses a positive and negative double battery structure, totaling 20 pieces in series. A neutral cable is derived from the connection between the cathode of the 10th and the anode of the 11th batteries. The neutral, positive and negative cables are connected to the UPS respectively. The batteries between the battery anode and the neutral are called positive batteries and those between neutral and the battery cathode are called negative batteries. The capacity and numbers of batteries is user selectable.

External battery connections for long-runtime units are as follows:



Note: The BAT+ is connected to the anode of the positive battery, the BAT-N is connected to the cathode of the positive battery and the anode of the negative battery, the BAT- is connected to the cathode of the negative battery.

The factory default setting for the long backup time unit is for sixteen (16) 12V batteries with a capacity of 65Ah (with a charger current of 9.75A). When connecting 18/20/22/24 batteries, re-set the battery quantity and capacity after the UPS starts up in AC mode. The charger current can be adjusted automatically according to the battery capacity selected. All related settings can be done via the LCD panel or monitoring software.



CAUTION!

Ensure the correct polarity of the batteries in series connection. Positive to negative at the terminals. Do NOT mix batteries of differing capacities, brands, or age (old with new).



WARNING!

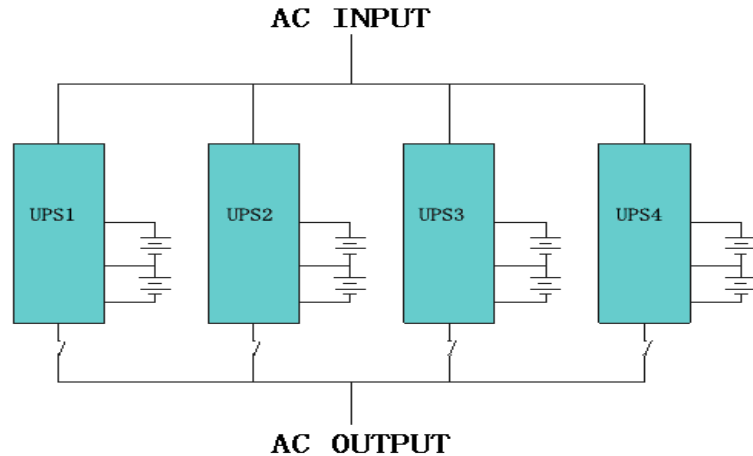
Ensure correct polarity of connections to the Battery Circuit Breaker and from the Battery Circuit Breaker to the UPS terminals i.e. (+) to (+) / (-) to (-). Disconnect one or more battery cell links in each tier and do NOT reconnect these links or close the battery circuit breaker until all the connections have been inspected and verified.

3.9 UPS Parallel Installation

The following sections describe the installation procedure for parallel installation.

3.9.1 Cabinet Installation

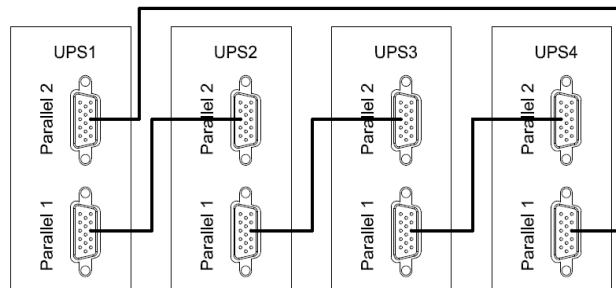
Connect UPS's as follows for parallel operation:



Ensure that each UPS input breaker is OFF and that there is no output connection from each UPS. Battery groups can be connected separately or in parallel, meaning that the system provides both separate batteries and common batteries.

3.9.2 Parallel Cable Installation

Shielded and double insulated control cables must be interconnected in a ring configuration between the UPS's as shown below. The ring configuration ensures high control reliability.



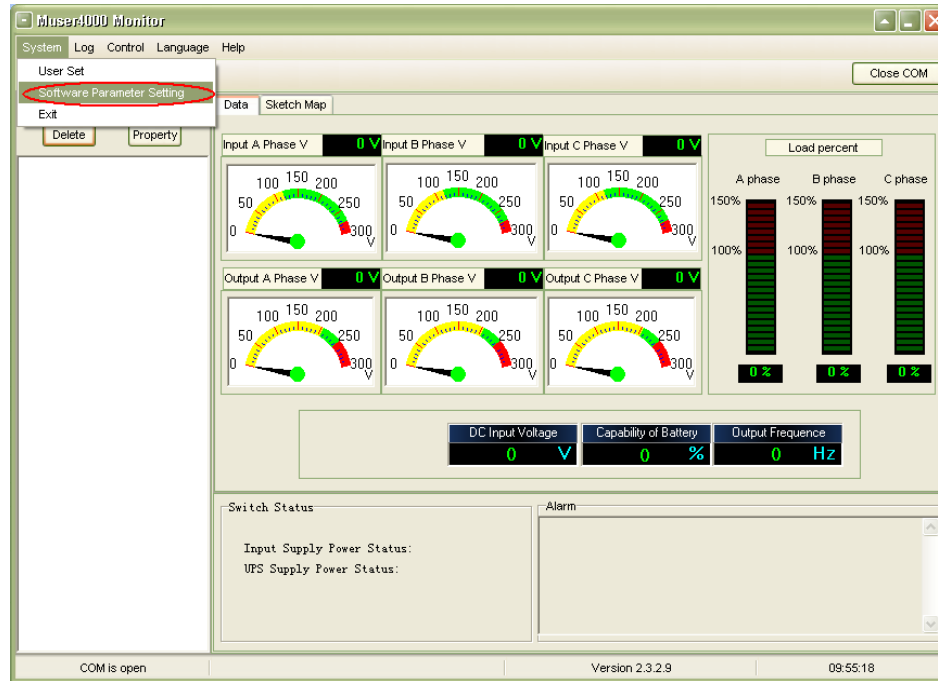
3.9.3 Requirements for the Parallel System

Paralleled UPS's perform as one large UPS system with the advantage of higher reliability. The following is required in order to assure that all UPS's are equally utilized and comply with code:

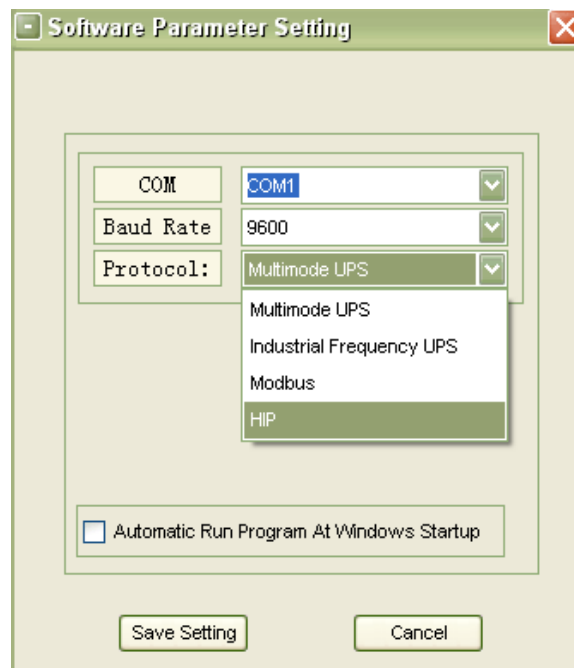
- 1) All the UPS's must be of the same rating and connected to the same bypass source.
- 2) The outputs of all the UPS's must be connected to a common output bus.
- 3) The length and specification of power cables including the bypass input cables and the UPS output cables should be the same. This facilitates load sharing when operating in bypass mode.

3.10 Computer Access

- ◆ One end of the USB cable connects to the computer, the other end connects to the USB port on the UPS.
- ◆ Open the software Muser4000, and click **System**.



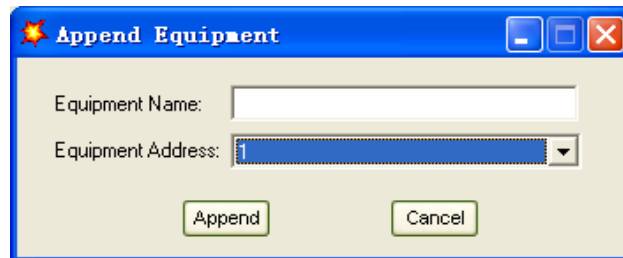
- ◆ The **Software Parameter Settings** are shown below. The COM port is chosen according to the UPS, the baud rate is 9600, and the protocol is “HIP”. Save this setting.



- ◆ On the main page of Muser4000, click **Append**, then go to **Append Equipment**.



- ◆ Enter the UPS name into **Equipment Name**, and the UPS's ID address into **Equipment Address**.



- ◆ Click **Append**, then the connection between the UPS & computer will be established.



CAUTION!

To have the UPS operate as an inverter, use a computer to set the output voltage and frequency. Shut down the inverter prior to setting the unit.

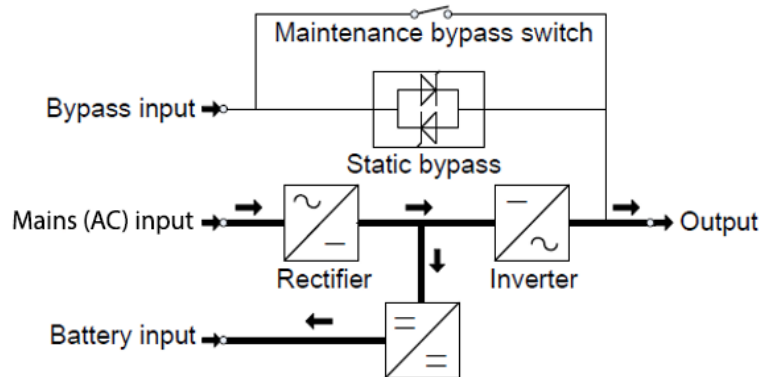
4. Operation

4.1 Operation Modes

The UPS is a double-conversion on-line UPS that can operate in the following modes:

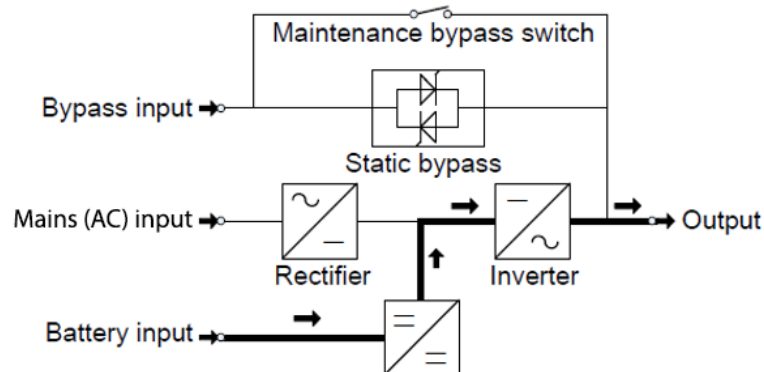
◆ Normal Mode

The rectifier/charger derives power from AC and supplies DC power to the inverter while providing a float and boost charge to the batteries as required. The inverter converts DC power to AC to supply to the load.



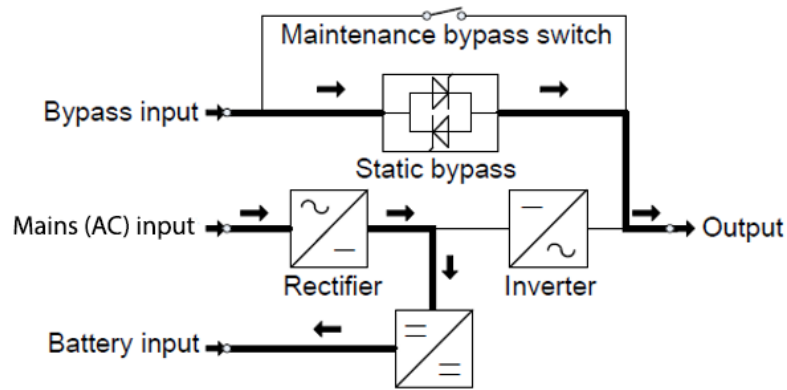
◆ Battery Mode (Stored Energy Mode)

If the AC input power fails, the inverter, which obtains power from the battery, supplies the load. The UPS will automatically return to Normal Mode when AC recovers.



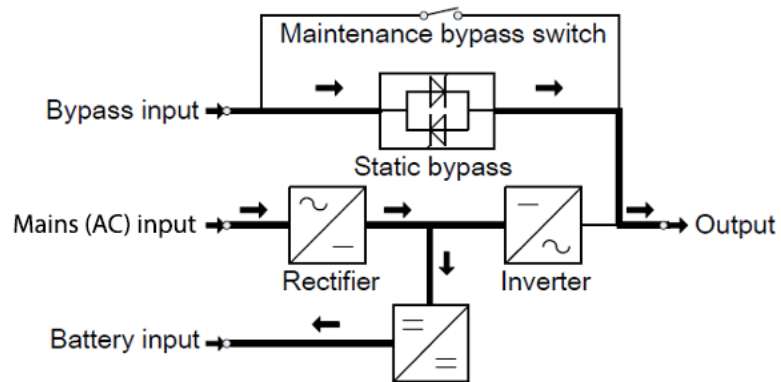
◆ Bypass Mode

If there is a fault with the inverter or if an overload occurs, the static transfer switch will be activated to transfer the load from the inverter to bypass supply without interruption to the load. In the event that the inverter output is not synchronized with the bypass AC source, the static switch will perform a transfer of the load from the inverter to the bypass with power interruption to the critical AC load. This is to avoid paralleling of unsynchronized AC sources. This interruption is programmable but typically set to be less than an electrical cycle e.g. less than 15ms (50Hz) or less than 13.33ms (60Hz).



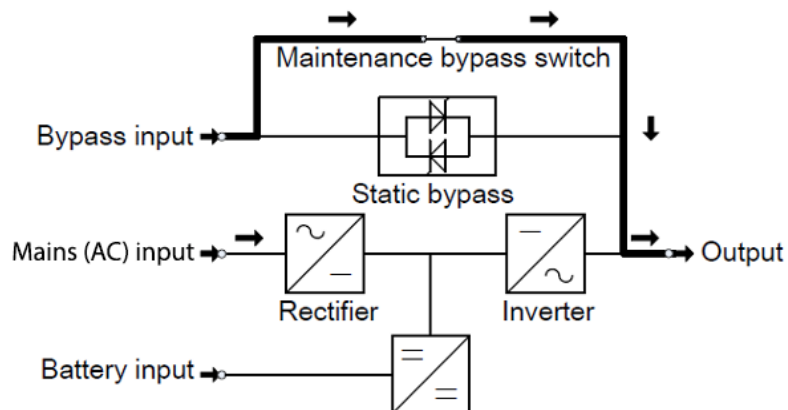
◆ **ECO Mode**

When the UPS is in AC Mode and the supply to the load is not overly critical, the UPS can be set to ECO mode to increase the efficiency of the system. In ECO mode, the UPS works in line-interactive mode, meaning the UPS will transfer to bypass. When AC is out of a set window, the UPS will transfer from bypass to inverter and supply power from the batteries. The LCD panel will display all related information.



◆ **Maintenance Mode (Manual Bypass)**

A manual bypass switch is available to ensure continuity of supply to the load when the UPS is faulty or being serviced.



4.2 Turning the UPS On / Off

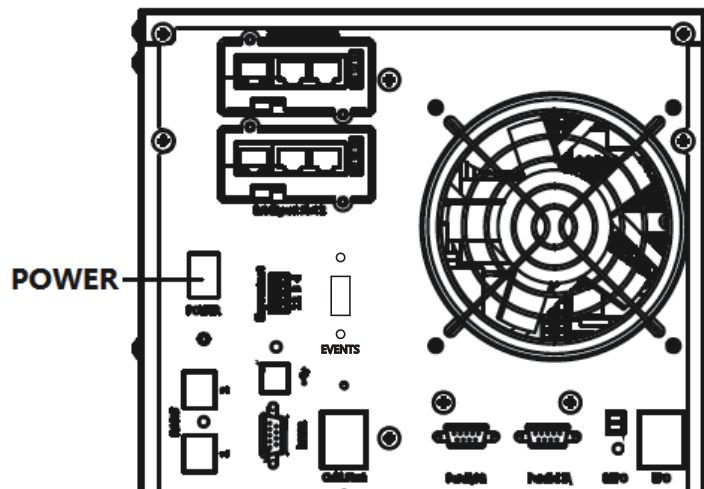
4.2.1 Start-up Procedure



CAUTION!

Ensure proper grounding connections!

- ◆ Turn ON the power switch for standard models.
- ◆ Turn the Battery Breaker “ON” for long backup time models.



CAUTION!

Ensure the load is safely connected to the output of the UPS. If the load is not ready to receive power, ensure that it is safely isolated from the UPS output terminals.

- ◆ Turn ON the UPS input breaker

If the Rectifier input is within acceptable the voltage range, the rectifier will start up in 30 seconds after which the inverter will start up.

- ◆ Turn ON the UPS output breaker

When the inverter starts up, the UPS will transfer from bypass mode to inverter mode, and then the bypass LED extinguishes, and the inverter LED illuminates. If the rectifier fails at startup, the bypass LED will illuminate. UPS status will be displayed on the LCD panel.

4.2.2 Test Procedure



CAUTION!

It can take 60 seconds for the system to boot up and complete self-tests. The UPS is operating normally.

- ◆ Disconnect the AC input to simulate a power failure; the rectifier will turn off and the battery will supply the inverter without interruption. The battery LEDs will illuminate.
- ◆ Reconnect the AC input to simulate a power recovery; the rectifier will restart automatically after 20 seconds and the inverter will supply the load. It is suggested to use a simulated or non-critical load for testing. The UPS can be used at maximum capacity during load testing.

4.2.3 Maintenance Bypass

To supply the load directly via the AC source, simply activate the internal mechanical bypass switch.



CAUTION!

The load is not protected by the UPS nor is the power conditioned when the internal mechanical bypass system is active.

Switching to Mechanical Bypass from Normal Operation



CAUTION!

If the UPS is operating normally and can be controlled through the display, proceed with steps 1 through 5; otherwise, go to Step 4.

- ◆ Open the cover for the maintenance switch, the UPS will switch to bypass mode automatically.
- ◆ Turn ON the MAINTENANCE breaker
- ◆ Turn OFF the BATTERY breaker
- ◆ Turn OFF the MAINS breaker,
- ◆ Turn OFF the OUTPUT breaker

The bypass source will then supply the load via the MAINTENANCE breaker.

Switching to Normal Operation (from Mechanical Bypass)



CAUTION!

Never attempt to switch the UPS back to normal operation until it has been verified that there are no internal faults.

- ◆ Turn ON the output breaker.
- ◆ Turn ON the input breaker.

The UPS is powered from the static bypass instead of the maintenance bypass, and the bypass LED will illuminate.

- ◆ Turn OFF the maintenance bypass breaker. The output is then supplied by the static bypass in the UPS.
- ◆ Close the maintenance switch cover. The rectifier will operate normally after 30 seconds. If the inverter is functioning normally, the system will transfer from bypass mode to normal mode.

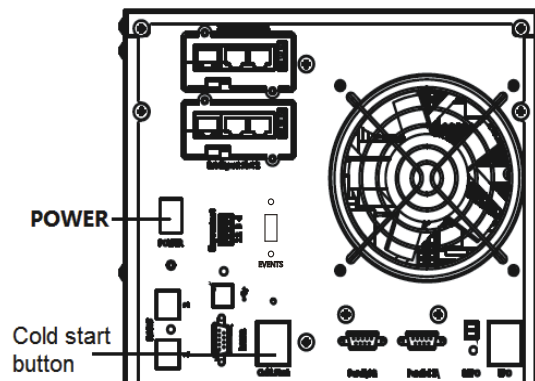
4.2.4 Cold Start Procedure



CAUTION!

Follow this procedure for when AC input power is not present, but batteries are in good working condition.

- ◆ Set the battery breaker to “ON” for long backup time models.
- ◆ Turn ON the power switch (power will feed the auxiliary power board).
- ◆ Turn ON the output breaker.



- ◆ Press the cold start button.

The rectifier starts operation and 30 seconds later, the inverter starts, and the battery LED illuminates.

4.2.5 Shut Down Procedure



CAUTION!

This procedure is used to completely shut down the UPS and the LOAD. Once all power switches and circuit breakers are opened, there will be no output.

On-line mode:

- ◆ Press OFF to shut down the UPS and wait 30 seconds.
- ◆ Turn OFF the BATTERY breaker for long backup time models. Open the battery power switch for standard models.
- ◆ Turn OFF the input breaker.
- ◆ Turn OFF the OUTPUT breaker. The UPS will shut down.
- ◆ To completely isolate the UPS from AC input power, all input switches for utility power should be completely off.
- ◆ The primary input distribution panel, which is often located a distance away from the UPS, should be labelled to advise personnel that the UPS system is under maintenance.

Battery mode:

- ◆ Press OFF to shut down the UPS and wait 30 seconds.
- ◆ Turn OFF the BATTERY breaker for long backup time models. Open the battery power switch for standard models.
- ◆ Turn OFF the OUTPUT breaker. The UPS will shut down.

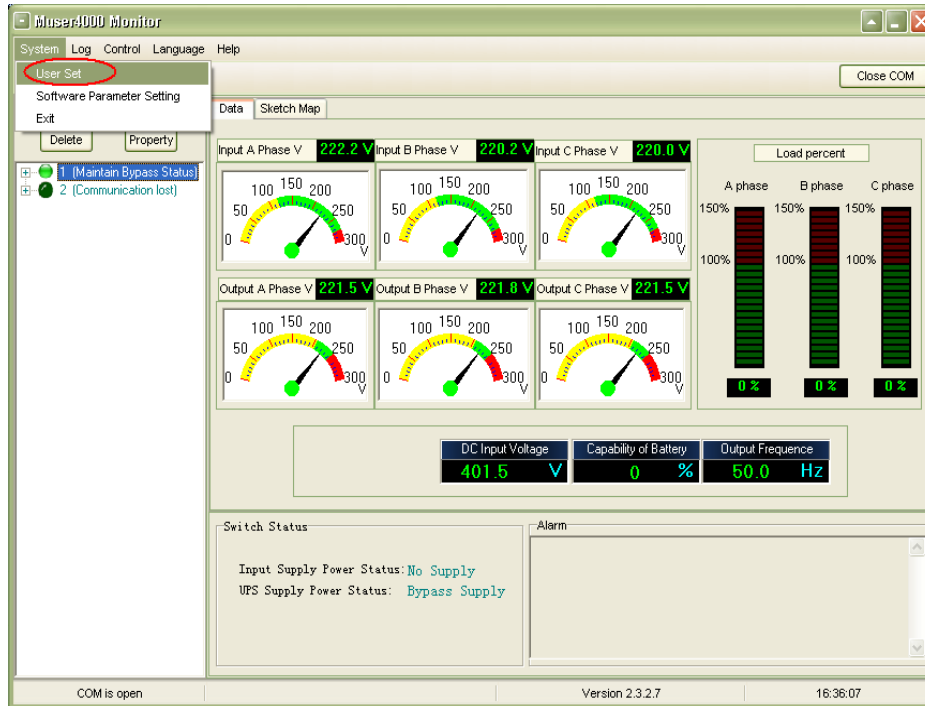


WARNING!

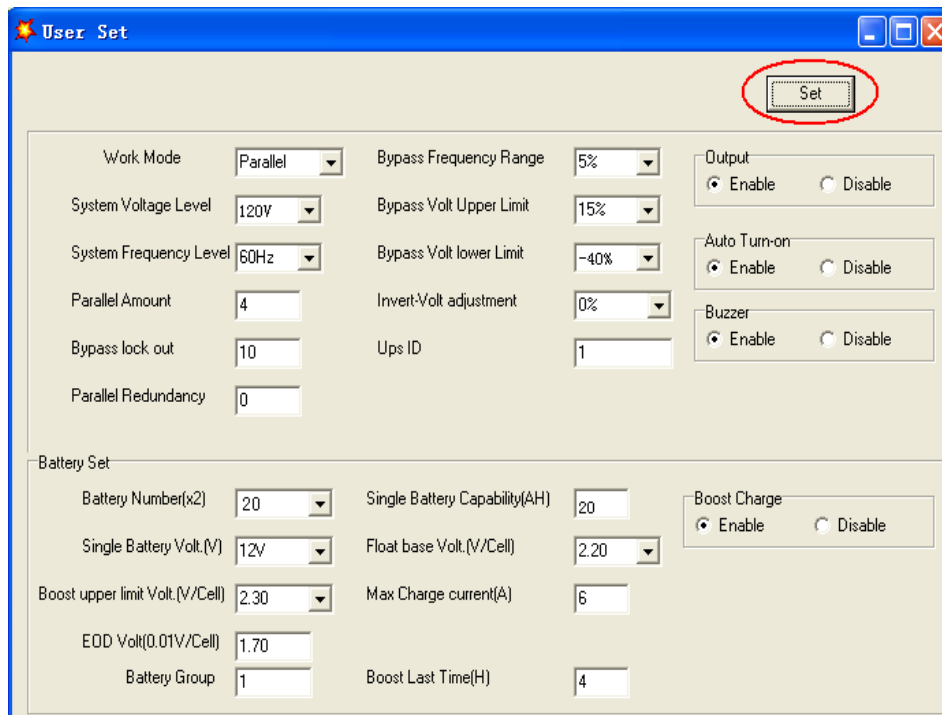
Wait 5 minutes for the internal D.C. bus bar capacitors to be completely discharged.

4.2.6 Parallel Setting

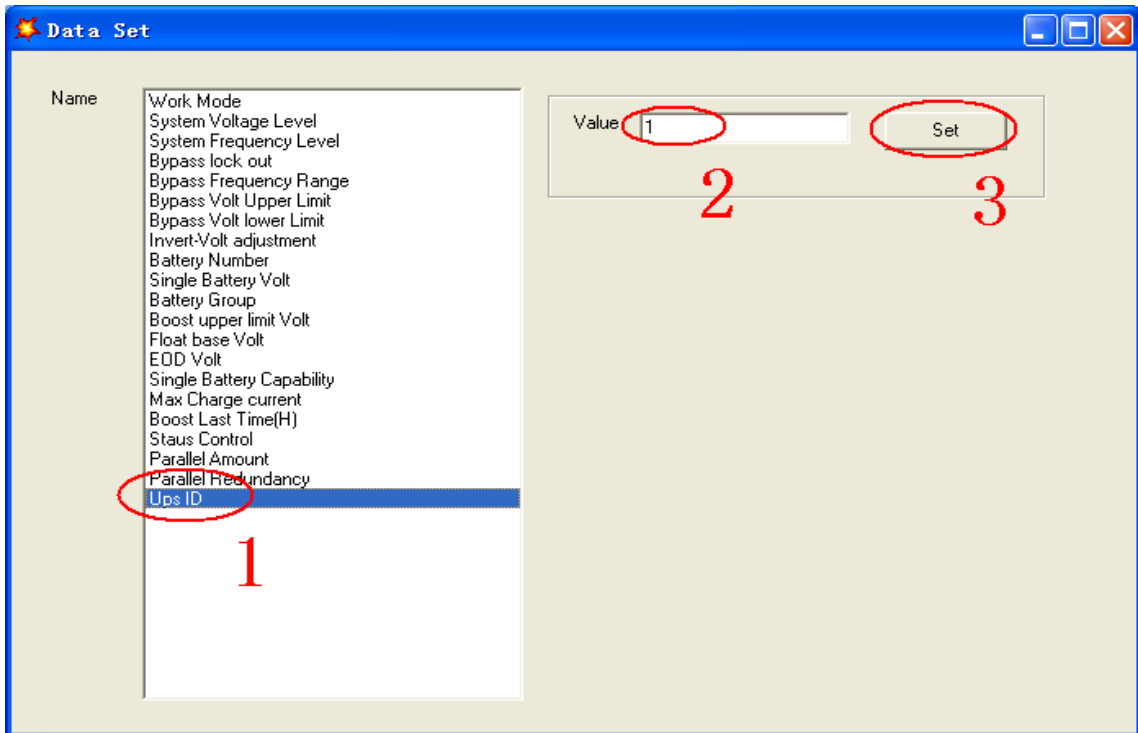
- ◆ Connect the UPS to a computer and power it on.
- ◆ Open the Muser4000 software, click **System -> User Set**



- ◆ Click **Set** at **User Set** window



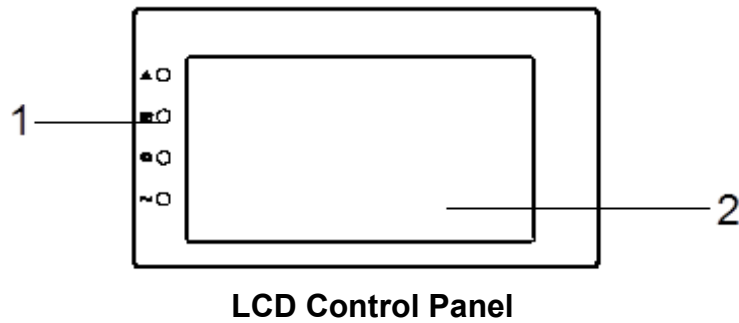
- ◆ In the **Data Set** window, click **Work Mode**, and choose **Parallel** for the value. Then enter a value and click **Set** as shown below. If the UPS “beeps”, the setting is correct.



CAUTION!

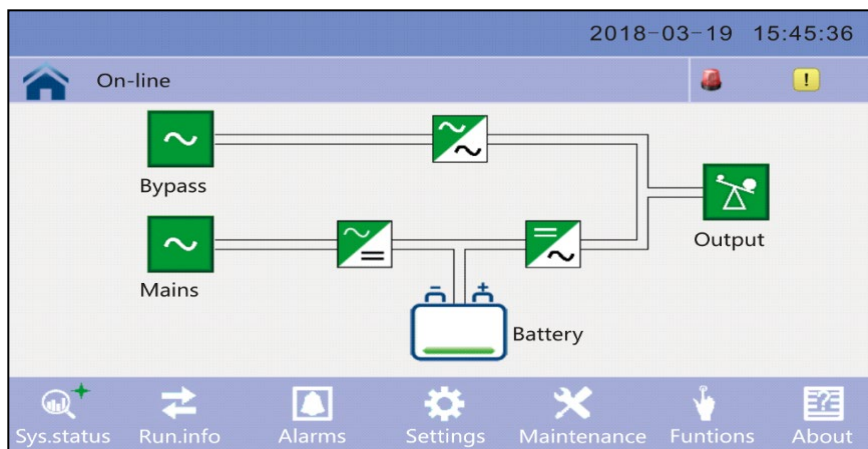
After changing the parallel system ID, the connection between Muser4000 and the equipment might be interrupted. If this occurs, re-connect as per the previous instructions.

4.3 The LCD Display

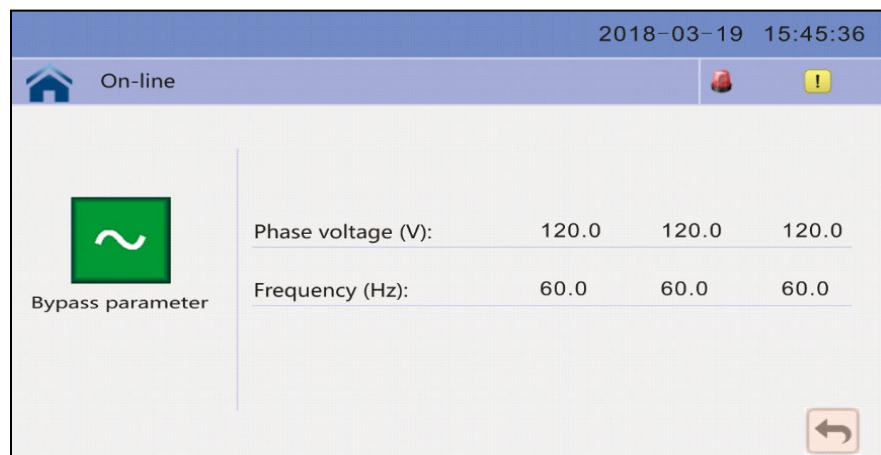


- (1) LED's from top to bottom: "Alarm", "Bypass", "Battery", "Inverter"
- (2) LCD display

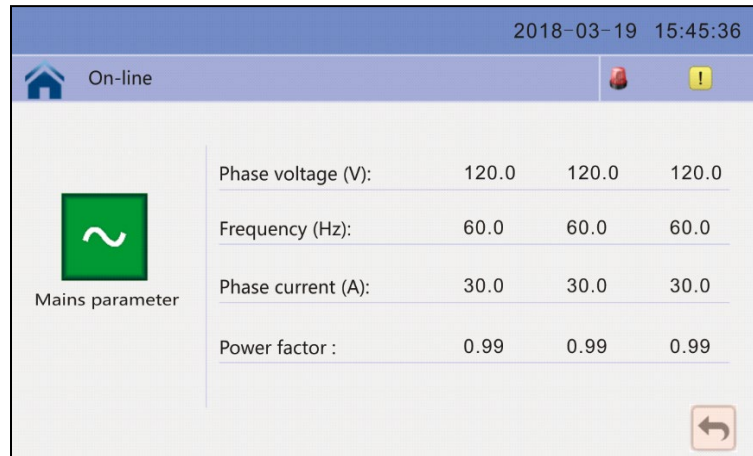
4.3.1 The home screen shows the UPS system status (Sys.status); this includes the operational flow chart and input, output and battery status



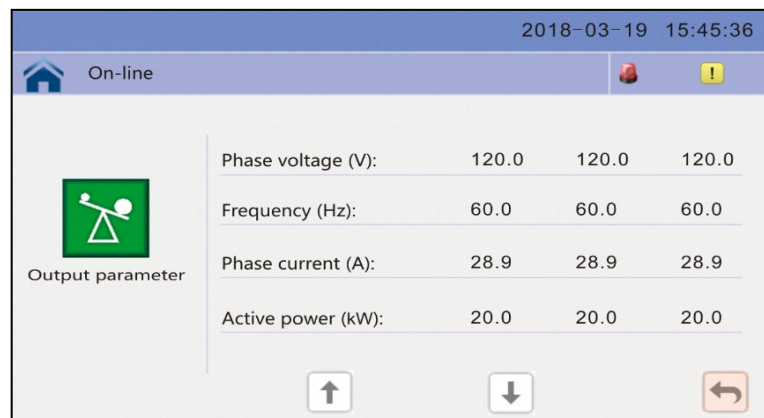
Press the bypass icon to enter the bypass data screen and press the back icon to return to the previous screen. Press the homepage icon to return to the home screen



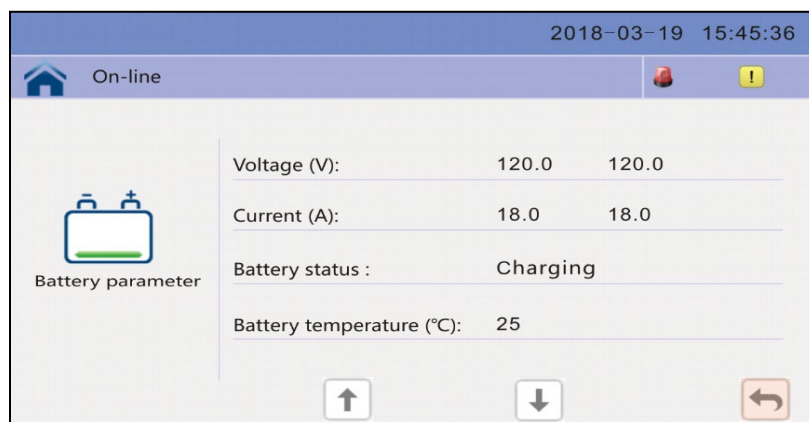
Press the mains (AC input) icon to enter the mains data screen, press the back icon to return to the previous screen. Press the homepage icon to return to the home screen.



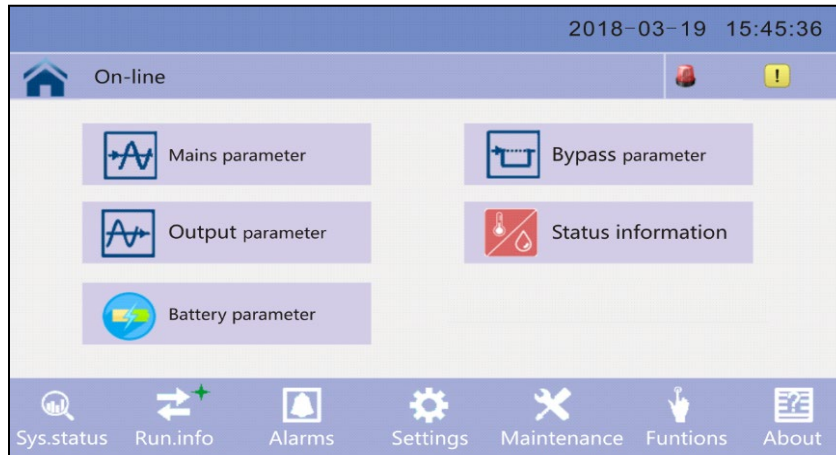
Press the Load icon to enter the output data screen, press the back icon to return to the previous screen. Press the homepage icon to return to the home screen.



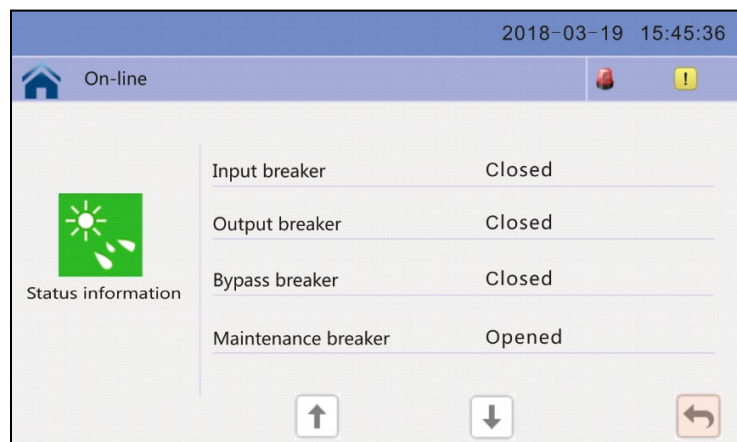
Press the battery icon to enter the battery data screen, press the back icon to return to the previous screen. Press the homepage icon to return to the home screen



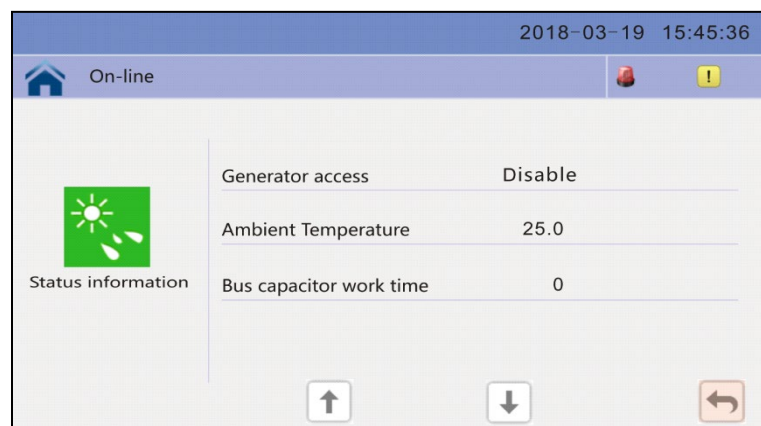
4.3.2 Click on Run.info icon to enter the information screen



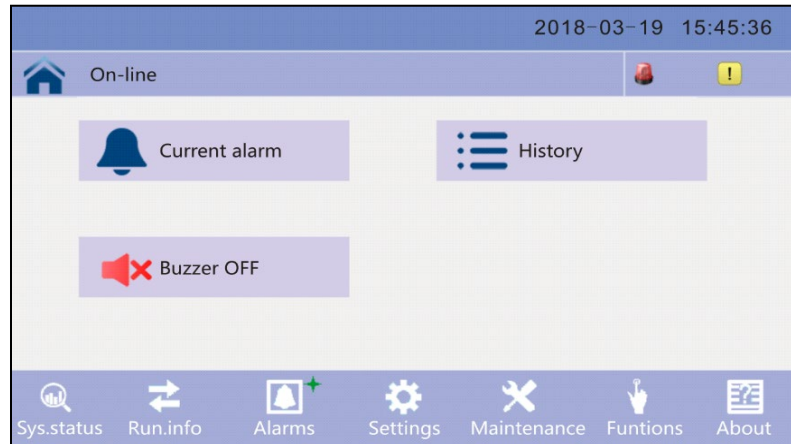
Press the Run time icon to enter the view breaker status screen. Press the back icon to return to the previous screen. Press the homepage icon to return to the home screen



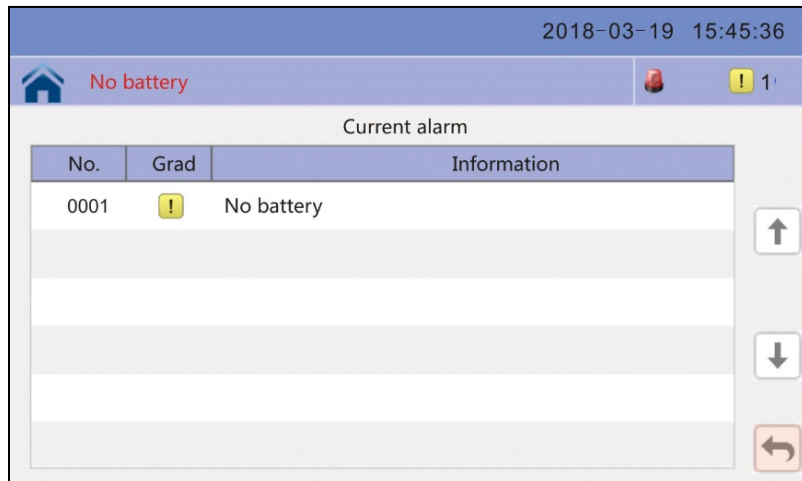
Press the ENV data icon to enter the environmental status data screen. The temperature data will appear if a temperature sensor is connected. Press the back icon to return to the previous screen. Press the homepage icon to return to the home screen.



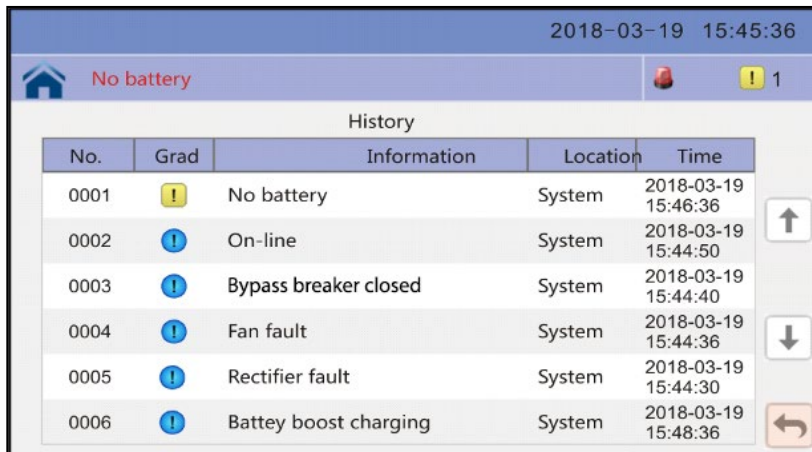
4.3.3 Press the Alarm icon to enter the alarms screen.



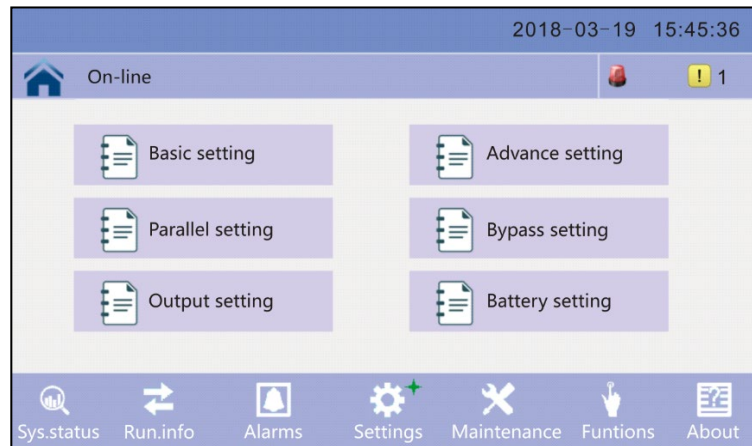
Press the active Alarm icon to view alarm info. Press the back icon to return to the previous screen. Press the homepage icon to return to the home screen



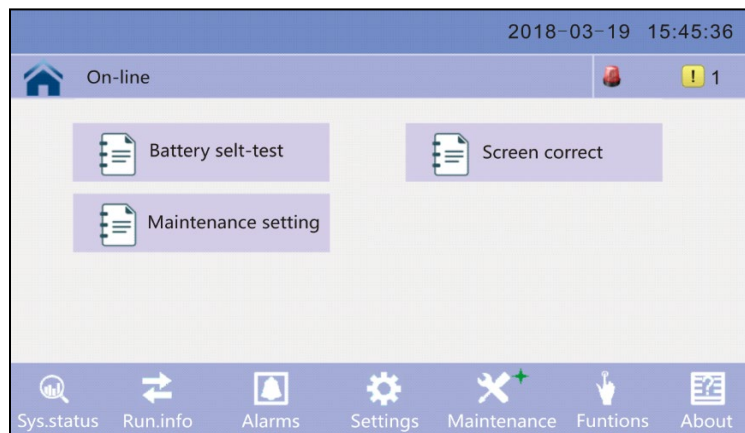
Press the history icon to enter the history screen to view data history. Press the back icon to return to the previous screen. Press the homepage icon to return to the home screen



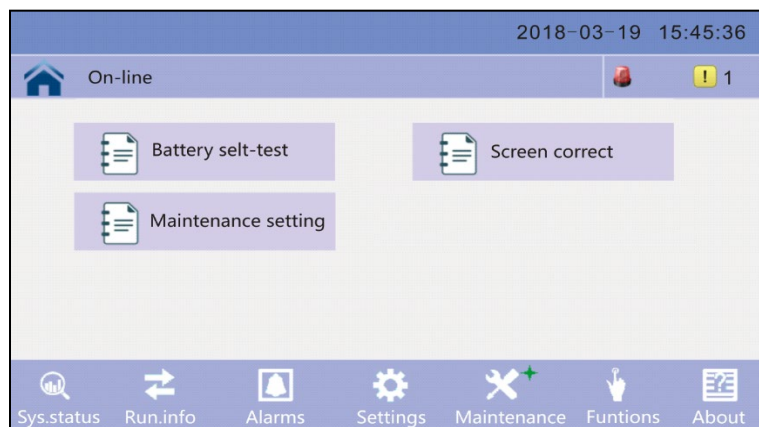
4.3.4 Press the Setting icon to enter the setting screen. Press the back icon to return to the previous screen. Press the homepage icon to return to the home screen.



4.3.5 Press the Maintenance icon to enter the maintenance page. Press the back icon to return to the previous screen. Press the homepage icon to return to the home screen



4.3.6 Press the Function icon to enter setting page. Press the back icon to return to the previous screen. Press the homepage icon to return to the home screen



Alarm Information

Fault code (Error)	LCD Warning	Buzzer	LED
1	Rectifier Fault	Beeps continuously	Fault LED illuminated
2	Inverter Fault (Including Inverter bridge is shorted)	Beeps continuously	Fault LED illuminated
3	Inverter Thyristor Short	Beeps continuously	Fault LED illuminated
4	Inverter Thyristor Damaged	Beeps continuously	Fault LED illuminated
5	Bypass Thyristor Short	Beeps continuously	Fault LED illuminated
6	Bypass Thyristor Damaged	Beeps continuously	Fault LED illuminated
7	Fuse Blown	Beeps continuously	Fault LED illuminated
8	Parallel Relay Fault	Beeps continuously	Fault LED illuminated
9	Fan Fault	Beeps continuously	Fault LED illuminated
10	Reserve	Beeps continuously	Fault LED illuminated
11	Auxiliary power 1 Fault	Beeps continuously	Fault LED illuminated
12	Initialization Fault	Beeps continuously	Fault LED illuminated
13	P-Battery Charger Fault	Beeps continuously	Fault LED illuminated
14	N-battery Charger Fault	Beeps continuously	Fault LED illuminated
15	DC Bus Over Voltage	Beeps continuously	Fault LED illuminated
16	DC Bus Below Voltage	Beeps continuously	Fault LED illuminated
17	DC Bus Unbalance	Beeps continuously	Fault LED illuminated
18	Soft Start Failed	Beeps continuously	Fault LED illuminated
19	Rectifier Over Temperature	Beeps twice per second	Fault LED illuminated
20	Inverter Over Temperature	Beeps twice per second	Fault LED illuminated
21	Input Neutral Line Missing	Beeps twice per second	Fault LED illuminated
22	Battery counter	Beeps twice per second	Fault LED illuminated
23	Parallel Cable Connection Error	Beeps twice per second	Fault LED illuminated
24	CAN Comm. Fault	Beeps twice per second	Fault LED illuminated
25	Parallel Load Sharing Fault	Beeps twice per second	Fault LED illuminated
26	Battery Over Voltage	Beeps once per second	Fault LED blinking
27	Mains Site Wiring Fault	Beeps once per second	Fault LED blinking
28	Bypass Site Wiring Fault	Beeps once per second	Fault LED blinking
29	Output Shortcut	Beeps once per second	Fault LED blinking
30	Rectifier over current Fault	Beeps once per second	Fault LED blinking
31	Bypass Over Current	Beeps once per second	BPS LED blinking
32	Overload	Beeps once per second	INV or BPS LED blinking
33	No battery	Beeps once per second	Battery LED blinking
34	Battery Under Voltage (Low Battery protection)	Beeps once per second	Battery LED blinking
35	Battery Voltage Warning (Battery Voltage Low)	Beeps once per second	Battery LED blinking
36	Internal Communication Fault	Beeps once every 2 seconds	Fault LED blinking
37	DC Component Over Limit (Unbalance INV. DC)	Beeps once every 2 seconds	INV LED blinking
38	Parallel Overload	Beeps once every 2 seconds	INV LED blinking
39	Mains (AC Input) Volt. Abnormal	Beeps once every 2 seconds	Battery LED illuminated
40	Mains (AC Input) Freq. Abnormal	Beeps once every 2 seconds	Battery LED illuminated
41	Bypass Not Available	N/A	BPS LED blinking
42	Bypass Unable to Track	N/A	BPS LED blinking
43	Inverter Invalid	N/A	N/A

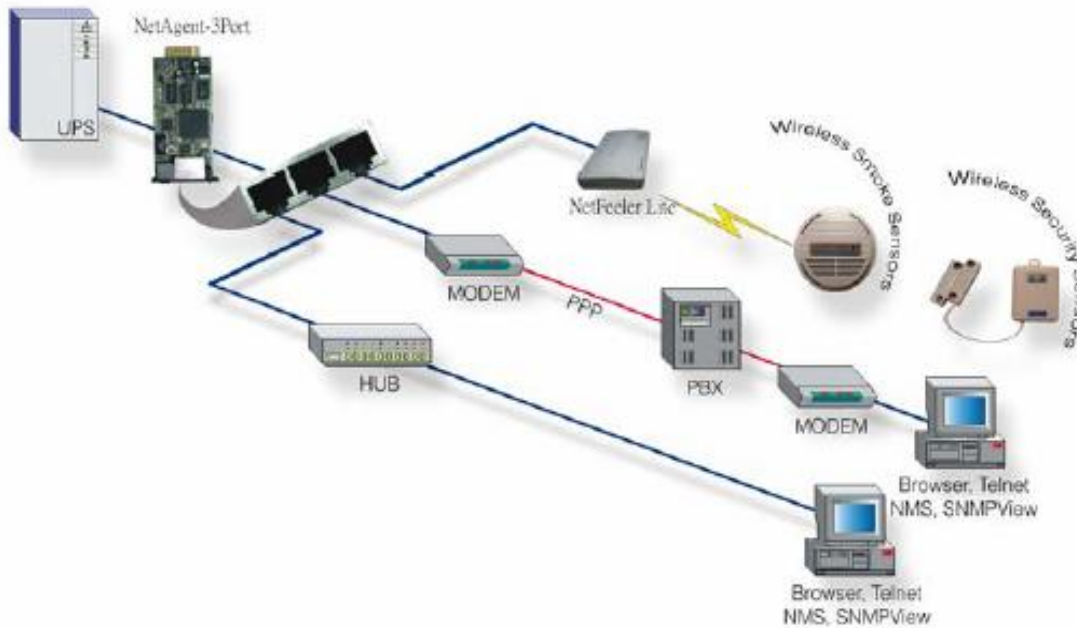
4.4 Communication Options

SNMP: Internal SNMP Card or External SNMP Module (options)

The SNMP slot supports the MegaTec protocol. The NetAgent II-3 port is also a tool to remotely monitor and manage any UPS system.

NetAgent II-3 port supports the Modem Dial-in (PPP) function to enable the remote control via the internet when the network is unavailable.

In addition to the features of a standard NetAgent Mini, NetAgent II has the option to add NetFeeler Lite to detect temperature, humidity, smoke and security sensors. Thus, making NetAgent II a versatile UPS management tool. NetAgent II also supports multiple languages and is setup for web-based auto language detection.



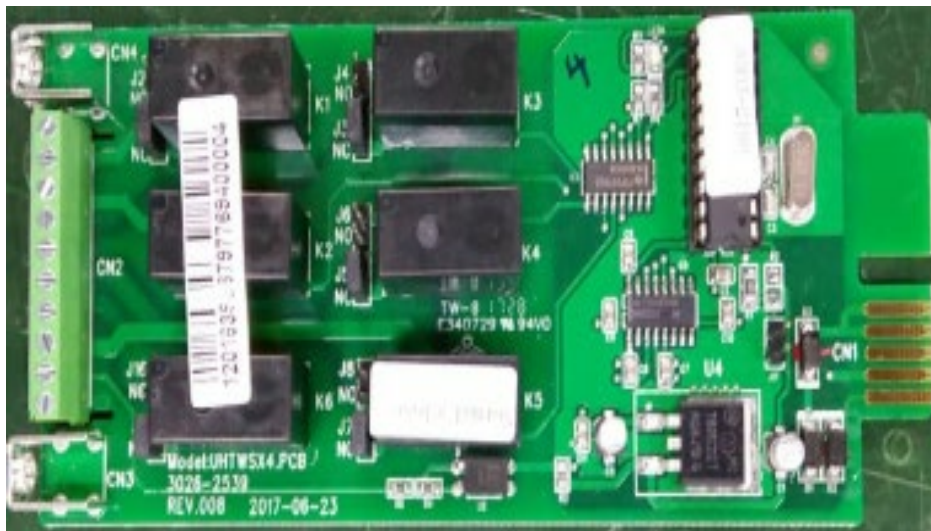
Typical UPS Network Management Topology

Dry Contact Relays

A removable card provides dry contact relay signals for functions such as Bypass, Utility (AC Power) Failure, Inverter On, Low Battery, UPS fault, UPS Alarm, and UPS Shutdown.

The relay communication card contains six dry contact outputs and one dry contact input connected via a 10-pin hardwire terminal block. The inputs and outputs are factory programmed according to functions listed in the table below.

Pin	Function Description	Input or Output
1	Utility Failure	Output
2	Battery Low	
3		
4	Bypass On	
5	UPS Fault	
6	Inverter On	
7	Summary Alarm	
8	common	
9	Remote Shutdown +	Input (5~12V)



Appendix 1 - Specifications

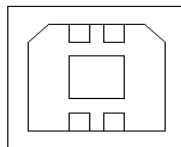
Model	Tri-Athlon10K	Tri-Athlon15K	Tri-Athlon20K			
Capacity	10kVA / 10kW	15kVA / 15kW	20kVA / 20kW			
Input						
Nominal Voltage	208/120V or 220/127V, 50/60Hz, 3-Phase, 4-Wire Plus Ground					
Operating Voltage Range	+25% -25% (96-150V or 102-159V) at Full Load; -40% +25% (72-150V or 76-159V) at <50% Load					
Operating Frequency Range	40-70Hz					
Power Factor (full load/half load)	0.99 (40% linear load)					
Harmonic Distortion	<2% (100% non-linear load)					
Bypass Voltage Range	Max. voltage: +10, +15, +20 or 25% (default: +20) Min. voltage: -10, -20, -30 or -40 (default: -30)					
Generator Input	Supported					
Output						
Output Voltage	208/120V or 220/127V, 50/60Hz, 3-Phase, 4-Wire Plus Ground					
Voltage Regulation	± 1%					
Power Factor	1.0					
Output Frequency	Line Mode: synchronize with input; when input frequency > ±10% (±1% / ±2% / ±4% / ±5% optional), output (50/60 ±0.1% Hz). Battery Mode: (50/60 ±0.1% Hz)					
Crest Factor	3:1					
Harmonic Distortion (THD)	<1% with linear load; <3% with non-linear load					
Efficiency	Up to 94%					
System Features						
Transfer Time	Utility to Battery: 0ms; Utility to Bypass: 0ms					
Overload Line Mode	Load ≤110% last 60 min, ≤125% last 10 min, ≤150% last 1 min, >150% change to bypass immediately					
Overload Battery Mode	Load ≤110% last 10 min, ≤125% last 1 min, ≤150% last 5S, >150% shut down UPS immediately					
Overload Bypass Mode	Breaker 40A	Breaker 63A	Breaker 80A			
Alarm	Overload, Utility Abnormal, UPS Fault, Battery Low, etc.					
Protection	Short Circuit, Overload, Over Temperature, Battery Low, Fan Fault Alarm					
Communication	USB, RS-485, Parallel Port, Coupler Dry Contact, Battery Temperature Sensor, Intelligent Slot for Optional SNMP Card, Relay Card					
Environmental						
Operating Temperature	0°C ~ 40°C / 32°F ~ 104°F					
Storage Temperature	-25°C ~ 55°C / -13° F ~ 131° F (no batteries)					
Humidity Range	0 ~ 95% (non-condensing)					
Altitude	<1500m / 4500ft. When > 1500m / 4500ft, lower the rated power for use					
Noise Level	<55dB from 1m	<55dB from 1m	<58dB from 1m			
Standards						
Safety	UL 1778, IEC/EN 62040-1, IEC/EN 60950-1					
EMC	FCC Part15:2015, IEC/EN62040-2, IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8					
Standard Unit w/ Internal Batteries						
Part Number	Weight	Dimension (WxHxD)	Battery DC Voltage	Built-in Charger	Internal Battery Quantity	Max. Qty
ATWS-10003-02	136kg (299.8lbs)	250 x 868 x 900mm 9.8 x 34.2 x 35.4in	±120Vdc	1.35A*	20pcs 12V/9Ah	60
ATWS-15003-02	188kg (414.5lbs)			2.70A*	40pcs 12V/9Ah	60
ATWS-20003-02	239kg (526.9lbs)			4.05A*	60pcs 12V/9Ah	60
Standard Unit w/o Internal Batteries						
Part Number	Weight	Dimension (WxHxD)	Battery DC Voltage	Built-in Charger	Internal Battery Quantity	Max. Qty
ATWN-10003-02	77kg (169.8lbs)	250 x 868 x 900mm 9.8 x 34.2 x 35.4in	±96VDC / ±108VDC / ±120VDC / ±132VDC / ±144VDC	20A*	N/A	N/A
ATWN-15003-02	78kg (172lbs)					
ATWN-20003-02	79kg (174.2lbs)					
External Battery Pack						
Model	Weight	Dimensions (WxHxD)				
ABPT-4207-120	260kg (573.2lbs)	250 x 868 x 900mm 9.8 x 34.2 x 35.4in				
ABPT-4209-120	261kg (575.4lbs)					

Appendix 2 - Troubleshooting

No.	Problem	Possible reason	Solution
1	Utility is connected but the UPS does not power ON.	Input power supply is not connected Input voltage is too low Input switch on the UPS is not turned on.	Measure if the UPS input voltage/frequency is within specified limits. Check if UPS is turned on from the rear.
2	Utility is normal but the utility LED light is not on, and the UPS operates in battery mode	Input breakers of the UPS are not turned on Poor input connections	Turn on the input breaker Check all input connections
3	The UPS does not indicate any issues but there is no output voltage	Poor output connections Output breaker is not turned on	Make sure the output cable is well connected; Switch on the output breaker.
4	Utility LED is flashing	Utility power exceeds UPS input specified range or limits	Ensure a good utility (AC input) supply is provided
5	Battery LED is flashing but there is no charge voltage and current	Battery breaker does is not turned on, or batteries are damaged, or battery polarity is incorrect. Battery quantity and capacity is not set correctly.	Turn on the battery breaker. Replace damaged batteries. Correct battery connections Use the LCD panel to set the correct quantity of batteries and capacity
6	Buzzer beeps every 0.5 second and the LCD panel displays "output overload"	UPS output is overloaded	Reduce the load on the output
7	Buzzer beeps continuously and the LCD panel displays fault code "29"	UPS output is short circuited	Remove the short circuit and then restart the UPS.
8	UPS only works on bypass mode	UPS is set to ECO mode	Set the UPS to Normal mode
9	Cannot cold start	Battery breaker is not closed Battery fuse is blown Battery low Battery quantity is incorrect Power switch on the rear is not ON	Turn on the battery breaker: Replace the fuse: Recharge the batteries Set the battery quantity Turn on the power switch
10	Buzzer beeps continuously and the LCD panel displays indicates fault codes	UPS is non-functioning	Contact Marathon Power

Appendix 3 - USB Communication Port

Port Definition:



Connection between computer USB port and UPS USB port.

PC USB port	UPS USB port	Description
Pin 1	Pin 1	PC: +5V
Pin 2	Pin 2	PC: DPLUS signal
Pin 3	Pin 3	PC: DMINUS signal
Pin 4	Pin 4	Signal ground

The USB functionality:

- ◆ Monitor UPS power status.
- ◆ Monitor UPS alarm info.
- ◆ Monitor UPS operating parameters.
- ◆ Timing settings.

The Communication data format:

Baud rate ----- 9600bps

Byte length ----- 8bit

End bit ----- 1bit

Parity check -----none

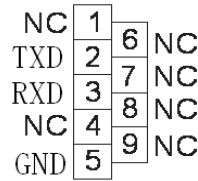


CAUTION!

Either the **USB** or the **RS-232** or the **RS-485** interface can be used.
Not more than one will function at a time.

Appendix 4 – RS-232 Communication Port

Port Definition:



Connection between PC RS232 port and UPS RS232 port

PC RS232 port	UPS RS232 port	
Pin 2	Pin 2	UPS send, PC receive
Pin 3	Pin 3	PC send, UPS receive
Pin 5	Pin 5	ground

The RS-232 functionality:

- ◆ Monitor UPS power status.
- ◆ Monitor UPS alarm info.
- ◆ Monitor UPS operating parameters.
- ◆ Timing settings.

The Communication data format:

Baud rate ----- 9600bps

Byte length ----- 8bit

End bit ----- 1bit

Parity check -----none

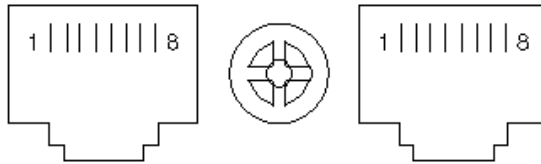


CAUTION!

Either the USB or the RS-232 *or* the RS-485 interface can be used. Not more than one will function at a time.

Appendix 5 - RS485 Communication Port

Port Definition:



Connection between the Device's RS-485 port and UPS RS-485 port.

Device (RJ45)	UPS (RJ45)	Description
Pin 1/5	Pin 1/5	485+ "A"
Pin 2/4	Pin 2/4	485 - "B"
Pin 7	Pin 7	+12Vdc
Pin 8	Pin 8	GND

The RS-485 functionality:

- ◆ Monitor UPS power status.
- ◆ Monitor UPS alarm info.
- ◆ Monitor UPS operating parameters.
- ◆ Timing settings.
- ◆ Battery and environment temperature monitoring.
- ◆ Charging voltage modulation depending on battery temperature.

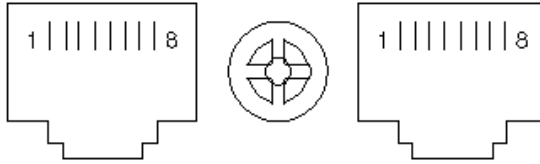


CAUTION!

Either the **USB** or the **RS-232** or the **RS-485** interface can be used. **Not more than one will function at a time**
The RS-485 port pin 7 is 12V DC.

Appendix 6 - BAT_T Communication Port

Definition of port:



Connection between the Temperature sensor RJ-45 port and UPS RJ-45 port.

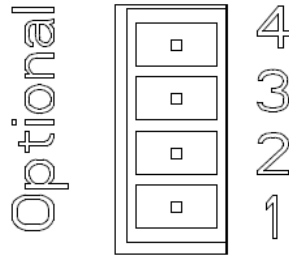
Temperature sensor (RJ-45)	UPS BAT_T (RJ-45)	Description
Pin 1/5	Pin 1/5	TX
Pin 2/4	Pin 2/4	RX
Pin 7	Pin 7	12V
Pin 8	Pin 8	GND

The BAT_T functionality:

- ◆ Battery and environment temperature monitoring.
- ◆ Charging voltage modulation depending on battery temperature.

Appendix 7 - Optional Port

Port Definition:



Instruction table:

UPS	Instruction
Pin1	Normally NC
Pin2	Normally NO
Pin3	/
Pin4	Common

Function 1 description (Optional):

- ◆ Activate the bypass breaker when alarm feedback is received.

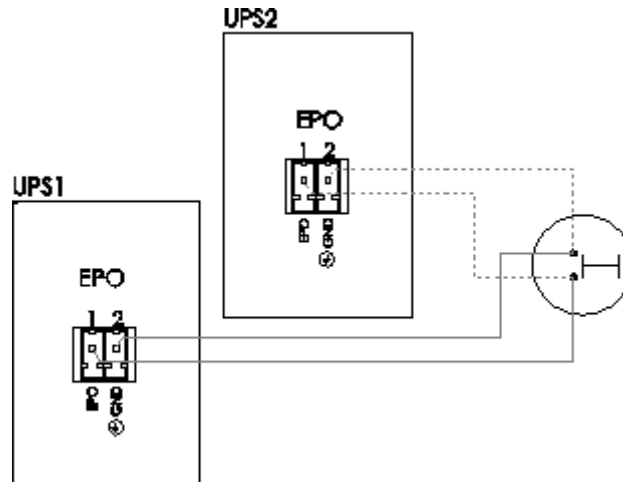
Function 2 description (Optional):

- ◆ Activate the battery breaker when the battery voltages is low.

Appendix 8 REPO Port

Port Definition:

Connection diagram:



Connection between the EPO/EMO button and UPS REPO port:

Button	UPS REPO	Description
Pin 1	Pin 1	EPO
Pin 2	Pin 2	GND

- ◆ A remote emergency stop switch can be installed in a remote location and connected via two wires to the REPO connector. It uses a dry contact signal that is “normally open” (not provided) shut off the UPS output
- ◆ The remote switch can be connected to several UPS’s in a parallel setup allowing the user to shut off all of the UPS’s outputs at the same time.

5. Warranty

Limited Three-Year Warranty and Exclusions

Marathon Power warrants to the original purchaser, and not for the benefit of anyone else that this product at the time of its sale by Marathon Power is free of defects in materials and workmanship for three (3) years (batteries for 2 years within the USA, Canada and Mexico, otherwise 1 year) from the original purchase date. Marathon Power will correct such defects by repair or replacement, at its option, if within such three-year period the product is returned prepaid and all warranty claim instructions are followed. This warranty excludes labor for removal or reinstallation of this product. This warranty is void if this product is installed improperly or in an improper environment, overloaded, misused, opened, abused, or altered in any manner, or is not used under normal operating conditions or not in accordance with all labels or instructions. There are no other or implied warranties of any kind, including merchantability and fitness for a particular purpose, but if any implied warranty is required by the applicable jurisdiction, the duration of any such implied warranty, including merchantability and fitness for a particular purpose, is limited to three years. Marathon Power is not liable for incidental, indirect, special or consequential damages, including damage to, or loss of use of, any equipment, lost sales or profits or delay or failure to perform this warranty obligation.

Limitations & Claims

This warranty does not cover any Marathon Power UPS or any properly connected electronic equipment which has been improperly installed, overloaded, abused or altered in any manner, or is not used under normal operating conditions, or in accordance with any labels or instructions, and does not cover any damage to properly connected electronic equipment resulting from a cause other than a "surge".

Damage caused by failure to provide a suitable installation environment for the product (including, but not limited to, lack of a good ground) will not be covered by this warranty. This warranty does not apply to damage caused by direct lightning strikes, or damage caused by electrical disturbances that exceed published product specifications. These products are intended to limit the maximum amplitude of transient voltage surges on power lines to specified values. They are not intended to function as surge arrestors. The UPS is intended to be installed on the load side of the service entrance and has been tested to verify that transient voltage surges are limited when subject to non-repetitive transient voltage surge events. This warranty excludes any incidental, indirect, special or consequential damages, including without limitation, labor for removal or reinstallation of the Marathon Power UPS or any connected electronic equipment, data loss or alteration loss of equipment use, lost sales or profits and any such damages for delay or failure to perform this warranty obligation. This warranty is in lieu of and excludes all implied warranties of merchantability or fitness for use. In addition, the warranty does not cover restoration of lost data and reinstallation of software. Some states may not allow the exclusion or limitation of incidental or consequential damages or other remedies, so the above exclusions or limitations may not apply to you.

Take the following steps to file a warranty claim: Contact us at Marathon Power, Inc., Attn: Returns, 2538 E. 54th Street, Huntington Park, California 90255 or call (310) 689-2328 within 30 days of the occurrence. Be prepared to provide detailed information about the event, any damage, the UPS model number, purchase date and location. You will then be provided with a Return Authorization Number (RAN), and be instructed to forward your proof of purchase (receipt), an explanation of the event and your UPS. If Marathon Power determines that the damage was due to a "surge", we may request that all connected equipment be submitted for evaluation. Marathon Power is not responsible for shipping costs. In the event that the equipment has been damaged by a "surge" Marathon Power will reimburse you for repair or replacement at fair market value (on a pro rata basis) as indicated by the respective amounts above. The warranty coverage is above and beyond, only to the extent needed, of that provided by any other source, including but not limited to any connected equipment coverage, any manufacturer's warranty or insurance policy. To receive payment for repair to damage due to a "surge," the original purchaser should (upon prior approval from Marathon Power) have such equipment repaired by an authorized service center of such equipment's manufacturer. The original purchaser will submit a repair bill along with a statement from the repair facility documenting the nature of the damage and how it was sustained to said equipment.

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