COMPAQ +

HMS 110R 1000VA
HMS 115R 1500VA
HMS 120R 2000VA
HMS 130R 3000VA
HMS 160RL 6000VA
HMS 1100RL 10000VA

User Manual

Uninterruptible Power Supply System

Thank you for purchasing the Compaq+ HMS - R from Harmer & Simmons.
Safety information and operating instructions are included in this manual.
Save this manual properly and read carefully the following instructions before installing the unit.

Revision History

Version	Date	Description	Revised by
1.0	28.05.2026	Created	A. Matute

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1. Safety and EMC instructions

Please read carefully the following user manual and the safety instructions before installing the unit or using the unit.

1-1. Transportation

- Please transport the UPS system only in the original package to protect against shock and impact.

1-2. Certification standards

*** Safety**	
IEC/EN 62040-1	
*** EMI**	
Conducted Emission. ..... :IEC/EN 62040-2	Category C3
Radiated Emission.....:IEC/EN 62040-2	Category C3
***EMS**	
ESD.....:IEC/EN 61000-4-2	Level 4
RS..... :IEC/EN 61000-4-3	Level 3
EFT.....:IEC/EN 61000-4-4	Level 4
SURGE ..... :IEC/EN 61000-4-5	Level 4
CS..... :IEC/EN 61000-4-6	Level 3
Power-frequency Magnetic field ..... :IEC/EN 61000-4-8	Level 4
Low Frequency Signals ..... :IEC/EN 61000-2-2	
Warning: This is a product for commercial and industrial application in the second environment-installation restrictions or additional measures may be needed to prevent disturbances.	

1-3. Special symbols



Risk of electric shock - Observe the warning associated with the risk of electric shock symbol.



Important instructions that must always be followed.



EU separate collection and lead content mark for lead acid batteries. Indicates that the battery must not be disposed of to the 'normal' household waste but be separately collected and recycled EU separate collection mark for waste electrical and electronic equipment (WEEE). Indicates that the item must not be disposed of to the 'normal' household waste but be separately collected and recycled.



Electrical and electronics waste must only be disposed of in compliance with local legislation and regulations



Information, advice, help

1-4. Disposal and recycling

End of life
Harmer & Simmons will process products at the end of their service life in compliance with local regulations. Harmer & Simmons works with companies in charge of collecting and eliminating our products at the end of their service life.

Disposal
The product is made of recyclable materials. Dismantling and destruction must take place in compliance with all local regulations concerning waste. At the end of its service life, the product must be transported to a processing center for electrical and electronic waste.

Recycling
The product contains lead-acid batteries that must be processed according to applicable local regulations concerning batteries. The battery may be removed to comply with regulations. For more information, contact your local recycling/reuse or hazardous waste center.



Never dispose of used batteries or battery material with refuse. Ensure compliance with local legislation and regulations governing the Notice: The sign "Pb" below the symbol for batteries indicates that this battery contains lead.



Electrical and electronics waste must only be disposed of in compliance with local legislation and regulations.

1-5. Preparation

- Condensation may occur if the UPS system is moved directly from cold to warm environment. The UPS system must be totally dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near heaters.
- Do not block ventilation holes in the UPS housing.

1-6. Installation



- **Before installation, please inspect the unit.**

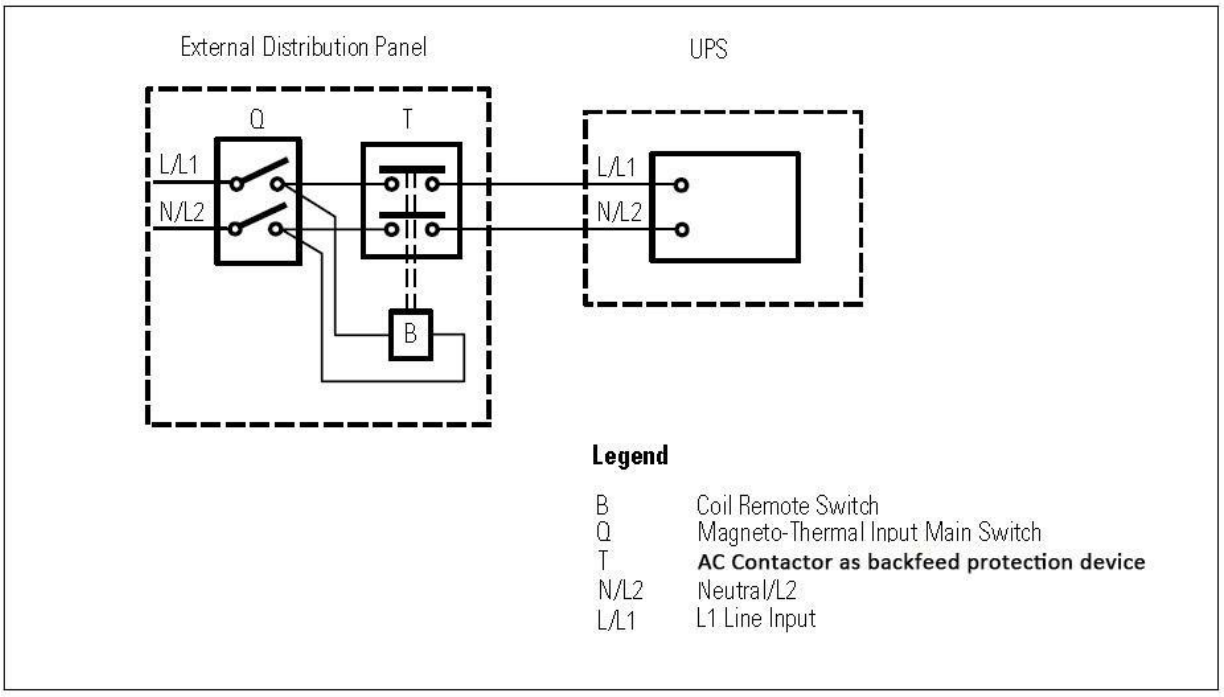
- Do not connect appliances or devices which would overload the UPS system (e.g. laser printers) to the UPS output sockets.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.
- The UPS can be operated by any individual with no previous experience.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please use only VDE-tested, CE-marked mains cable (e.g. the

mains cable of your computer) to connect the UPS system to the building wiring outlet (shockproof outlet).

- Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.
- When installing the equipment, it should ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5mA.
- Temperature Rating - Units are considered acceptable for use in an ambient temperature range within 0°C - 40°C (32°F - 104°F).
- For Pluggable Equipment - The socket-outlet shall be installed near the equipment and shall be easily accessible.

1-7. Connection Warnings

- In accordance with safety standard EN-IEC 62040-1, installation must be provided with a Backfeed Protection system, like for example a contactor, which will prevent the appearance of voltage or dangerous energy in the input mains during a mains fault. There is no standard backfeed protection inside of the UPS. Please isolate the UPS before working according to the diagram below. The isolation device must be able to carry the UPS input current.



External backfeed protection wiring

There can be no derivation in the line that goes from the «Backfeed Protection» to the UPS, as the standard safety would be infringed.

- Warning labels should be placed on all primary power switches installed in places away from the device to alert the electrical maintenance personnel of the presence of a UPS in the circuit. The label will bear the following or an equivalent text:

Before working on this circuit
Isolate UPS
Then check for Hazardous Voltage between all terminals including the protective earth.

Risk of Voltage Backfeed

- This UPS should be connected to TN earthing system.

- The power supply for this unit must be single-phase rated in accordance with the equipment nameplate. It also must be suitably grounded.

WARNING: High leakage current earth connection essential before connecting supply.

- Use of this equipment in life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly affect its safety or effectiveness is not recommended. Do not use this equipment in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
- Connect your UPS power module's grounding terminal to a grounding electrode conductor.
- The UPS is connected to a DC energy source (battery). The output terminals may be live when the UPS is not connected to an AC supply.

1-8. Operation

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- To fully disconnect the UPS system, first press the OFF/Enter button to disconnect the mains.
- Prevent fluids or any other foreign object to go inside of the UPS system.

1-9. Maintenance, service, and faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.



Caution - risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.

- The unit must be properly grounded.
- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitors such as BUS-capacitors.
- Only personnel adequately familiar with batteries and with the required safety measures may replace batteries and supervise operations. Unauthorized personnel must be kept well away from the batteries.



Caution - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present.



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

Caution - Do not open, disassemble, or damage the batteries. Leaked electrolyte is harmful to skin and eyes. It may be toxic.

Batteries may cause electric shock and have a high short-circuit current. Please take the safety measures specified below and any other measures necessary when working with batteries:

a) Remove watches, rings, or other metal objects.
b) Use tools with insulated handles.
c) Wear rubber gloves and boots.
d) Do not lay tools or metal parts on top of batteries.
e) Disconnect charging source and load prior to installing or maintaining the battery.
f) Remove battery grounds during installation and maintenance to reduce likelihood of shock. Remove the connection from ground if any part of the battery is determined to be grounded.

When changing batteries, install the same number and same type of batteries or battery packs.

Manufacturer	Type	Rated
Toplite (Guangzhou) Technology Battery Co Ltd (MH29104)	NPW45-12	12 V dc, 9.0 Ah
	UXW460-12	12 V dc, 9.0 Ah
	NPW36-12	12 V dc, 7.2 Ah
	UXW360-12	12 V dc, 7.2 Ah
	NPW45-12 FR	12 V dc, 7.0 Ah
	UXW460-12/FR	12 V dc, 7.0 Ah
	NPW36-12 FR	12 V dc, 7.0 Ah
CSB Battery Co Ltd (MH14533)	UXW360-12/FR	12 V dc, 7.0 Ah
	GP1272	12 V dc, 7.2 Ah
	UPS 12460 F2	12 V dc, 9.0 Ah
	UPS 12360 6	12 V dc, 6.5 Ah
	UPS 12360 7	12 V dc, 6.5 Ah
	HR 1234W	12 V dc, 8.5 Ah
	HR 1234W FR	12 V dc, 8.5 Ah
Yuasa Battery Co Ltd (MH29616) (Guangdong)	NPW45-12	12 V dc, 8.0 Ah
	NPW45-12FR	12 V dc, 8.0 Ah

For units with internally mounted batteries:

g) Instructions shall carry sufficient information to enable the replacement of the battery with a suitable manufacturer and catalogue number.

h) Safety instructions to allow access by Service Personnel shall be stated in the installation/service handbook.

i) If batteries are to be installed by Service Personnel, instructions for interconnections, including terminal torque, shall be provided.

- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open, disassemble, or damage the batteries. Leaked electrolyte is harmful to skin and eyes. It may be toxic.
- Please replace fuses only with the same type and capacity to avoid fire hazards.
- Do not dismantle the UPS system.



WARNING: This is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Installation and setup – HMS 110R, 115R, 120R, and 130R

2-1. Unpacking and Inspection

NOTE: Before installation, please inspect the unit. Make sure that nothing inside the package has been damaged during transportation. If there is any damage or any parts are missing, do not turn on the unit and notify the carrier and dealer immediately. Please keep the original packaging in a safe place for future use.

Open the UPS package and check the contents:

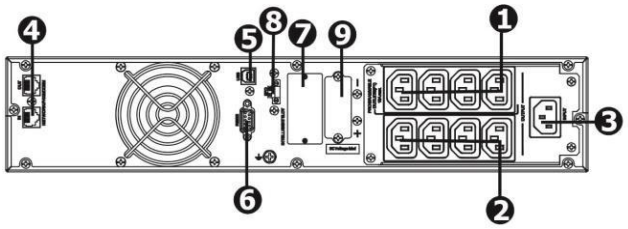
- One UPS.
- One Safety Instructions leaflet.
- One monitoring software CD.
- One USB cable.
- Two feet with extensions for tower installation.
- Two ears for rack installation.
- One input power cord (Ger/IEC).
- One output power cord (C13/C14).

If acquired, open the External battery Pack (EBP) and check the contents:

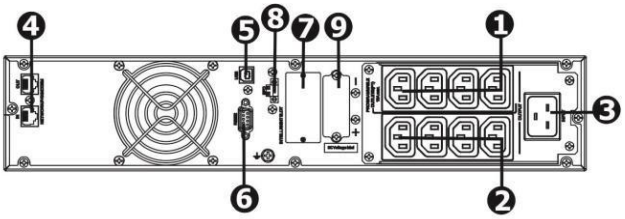
- One EBP.
- One battery cable.
- Two feet with extensions for tower installation.
- Two ears for rack installation.
- One Safety Instructions leaflet.

2-2. Rear panel view

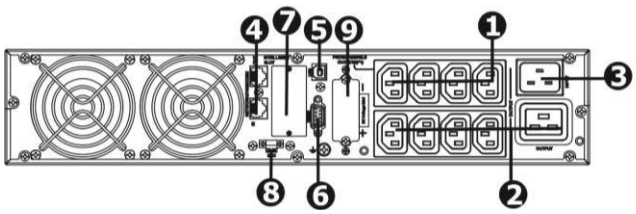
1K/1.5K

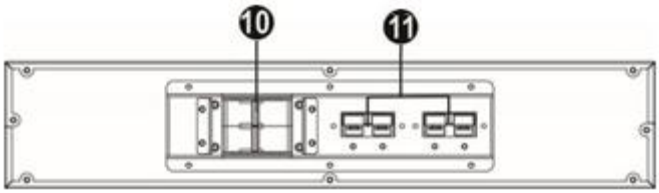


2K



3K



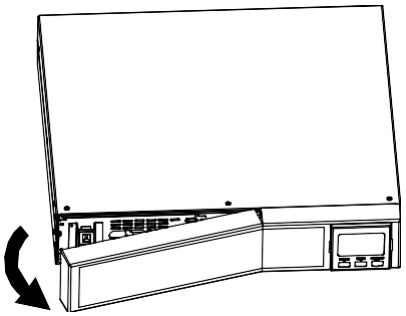


1. Programmable outlets: connect to non-critical loads.
2. Output receptacles: connect to mission-critical loads.
3. AC input
4. Network/Fax/Modem surge protection
5. USB communication port
6. RS-232 communication port
7. SNMP intelligent slot
8. Emergency power off function connector (EPO)
9. External battery connection
10. Battery pack output circuit breaker
11. External battery connector

2-3. Install the UPS

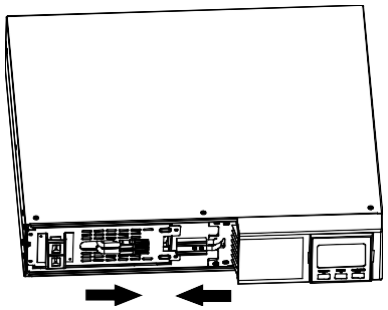
For safety consideration, the UPS is shipped out from factory without connecting battery wires. Before installing the UPS, please follow the following steps to re-connect battery wires first.

Step 1



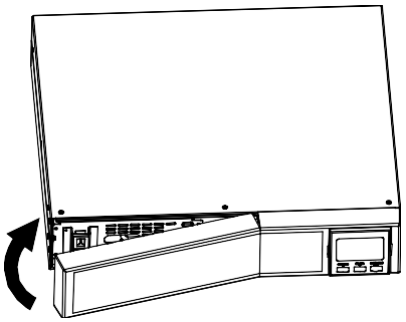
Remove front panel.

Step 2



Connect the AC input and re-connect battery wires.

Step 3

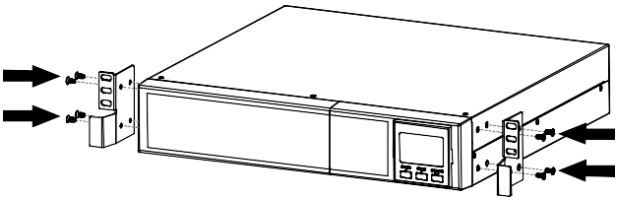


Put the front panel back to the unit.

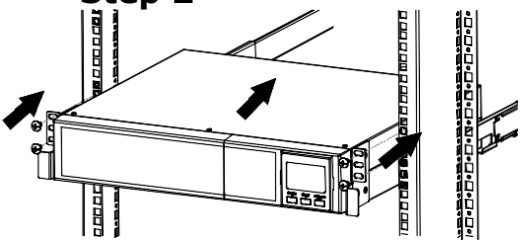
This UPS can be either displayed on the desk or mounted in the 19” rack chassis. Please choose proper installation to position this UPS.

2-4. Rack-mount installation

Step 1

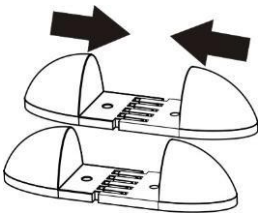


Step 2

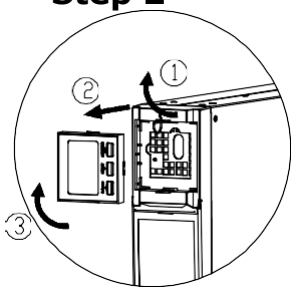


2-5. Tower Installation

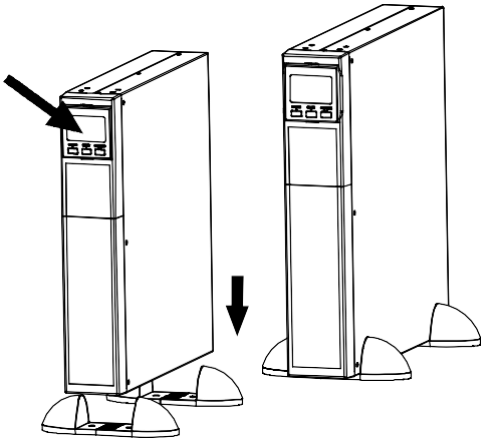
Step 1



Step 2



Step 3



2-6. Setup of the UPS

Before installing the UPS, please read below to select proper location to install it.

1. UPS should be placed on the flat and clean surface. Place it in an area away from vibration, dust, humidity, high temperature, flammable liquids, gases, corrosive and conductive contaminants. Install the UPS indoors in a clean environment, where it is away from windows and doors. Maintain minimum clearance of 100mm at the bottom of the UPS to avoid dust and high temperature.

2. Maintain an ambient temperature range of 0ºC to 40ºC for UPS optimal operation. For every 5ºC above 40ºC, the UPS will be derated 12% of its nominal capacity at full load. The highest working temperature requirement for UPS operation is 50ºC.

3. It's required to maintain maximum altitude of 1000m to keep UPS normal operation at full load UPS. If it's used in high altitude area, please reduce connected load. Altitude derating power with connected loads for UPS normal operation is listed as below:

Altitude (m)	Derating factor(1)
1000	1
1500	0.95
2000	0.91
2500	0.86
3000	0.82
3500	0.78
4000	0.74
4500	0.7
5000	0.67
Based on density of dry air = 1.225 kg/m^3 at sea level, + 15ºC	
(1) Since fans lose efficiency with altitude, forced air-cooled equipment will have a similar derating	

4. Place UPS: It's equipped with fan for cooling. Therefore, place the UPS in a well-ventilated area. It's required to maintain minimum clearance of 100mm in the front of the UPS and 300mm in the back and two sides of the UPS for heat dissipation and easy-maintenance.

5. Connect to External Battery Pack: When connecting external battery packs, please be sure to connect polarity correctly. Connect positive pole of battery pack to positive pole of external battery connector in UPS and negative pole of battery pack to negative pole of external battery connector in UPS. Polarity misconnection will cause UPS internal fault. It's recommended to add one breaker between positive pole of battery pack and positive pole of external battery connector in UPS to prevent damage to battery packs from internal fault.

   The required specification of breaker: voltage ≧ 1.25 x battery voltage/set; current ≧ 50A Please choose battery size and connected numbers according to backup time requirement and UPS specifications. To extend battery lifecycle, it's recommended to use them in the temperature range of 15ºC to 25ºC.

Step 2: UPS input connection

Plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords. The power cord is supplied in the UPS package.

Note: Check if the site wiring fault indicator lights up in LCD panel. It will be illuminated when the UPS is plugged into an improperly wired utility power outlet (Refer to Troubleshooting, chapter 6). Please also check if there is a circuit breaker against overcurrent and short circuit between the mains and AC input of the UPS for safety operation. The recommended protection values are:

- 10A for the HMS 110R and HMS 115R models.
- 16A for the HMS 120R and HMS 130R models.

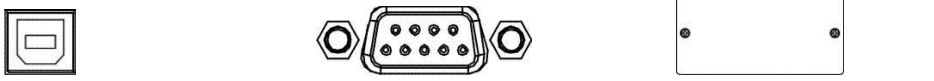
Step 3: UPS output connection

There are two kinds of output: programmable and general. Please connect non-critical devices to the programmable outlets and critical devices to the general ones. During power failure, you may extend the backup time to critical devices by setting shorter backup time for non-critical devices.

Step 4: Communication connection

Communication port:

USB port ***RS-232 port*** ***Intelligent slot***

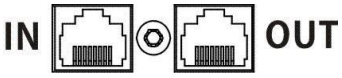


To enable unattended UPS shutdown/start-up and status monitoring, connect one end of the communication cable to the USB/RS-232 port on the UPS and the other end to the communication port on your PC. Once the monitoring software is installed, you can schedule UPS shutdown and start-up operations and monitor its status from your PC.

The UPS is equipped with intelligent slot compatible for either SNMP or AS400 card. When installing either SNMP or AS400 card in the UPS, it will provide advanced communication and monitoring options.

Step 5: Network connection

Network/Fax/Phone surge port

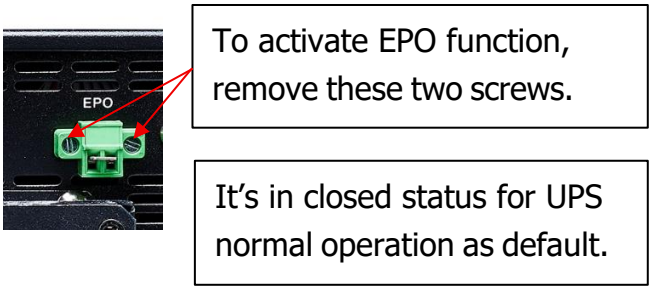


Connect a single modem/phone/fax line into surge-protected "IN" outlet on the back panel of the UPS unit. Connect from "OUT" outlet to the equipment with another modem/fax/phone line cable.

Step 6: Disable and enable EPO function

This UPS is equipped with EPO function. By default, the UPS is delivered from factory with pin 1 and pin 2 closed (a metal plate is connected to pin 1 and pin 2) for UPS normal operation. To activate EPO function, remove two screws on EPO port and metal plate will be removed.

Note: The EPO function logic can be set up via LCD setting. Please refer to program 16 in UPS setting for the details.



Step 7: Turn on the UPS

Press the ON/Mute button on the front panel for two seconds to power on the UPS.

Note: The battery charges fully during the first five hours of normal operation. Do not expect full battery run capability during this initial charge period.

Step 8: Install software

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown. Use supplied RS-232 or USB communication cable to connect RS-232/USB port of UPS and RS-232/USB port of PC. Then, follow the steps below to install monitoring software.

1. Insert the included installation CD into a CD-ROM drive and then follow the on-screen instructions to proceed software installation. If no screen shows up after 1 minute, execute setup.exe to launch software installation.

2. Follow the on-screen instructions to install the software.

3. When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

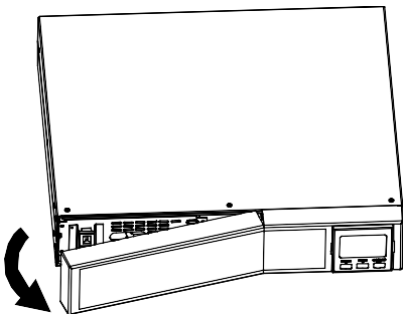
2-7. Battery Replacement

NOTICE: This UPS is equipped with internal batteries, and users can replace the batteries without shutting down the UPS or connected loads. (Hot-swappable battery design). Replacement is a safe procedure, isolated from electrical hazards.

CAUTION!! Consider all warnings, cautions, and notes before replacing batteries.

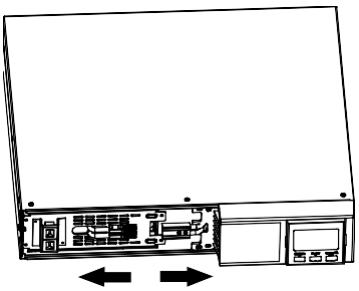
Note: While batteries are disconnected, load is not protected from power outages.

Step 1



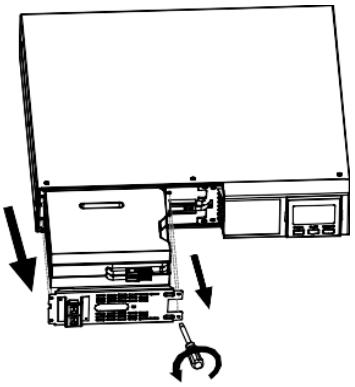
Remove front panel.

Step 2



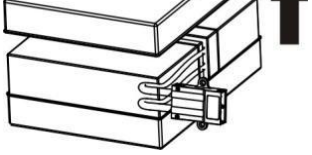
Disconnect battery wires.

Step 3



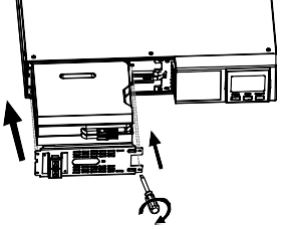
Pull
by r
on t

Step 4

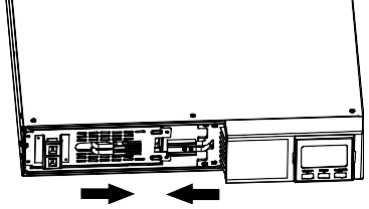


Remove the top cover of battery box and replace the inside batteries.

Step 5



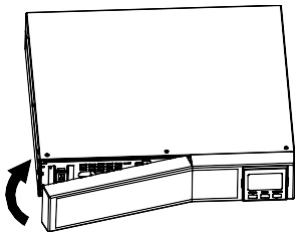
After replacing the batteries, put the battery box back to original location and screw it tightly.



Re-connect the battery wires.

Ste

Step 7



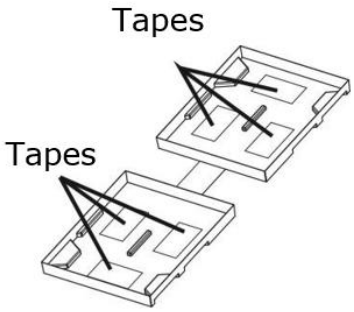
Put the front panel back to the unit.

External battery pack (EBP) assembly

NOTICE: Please assemble EBP first before installing it inside of the UPS. Please select correct EBP procedure below to assemble it.

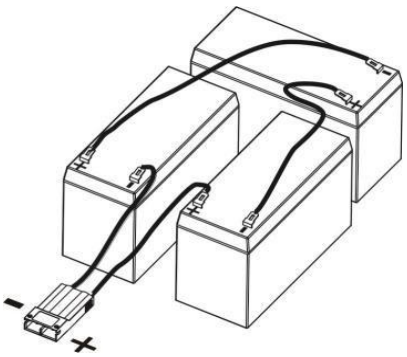
EBP – HMS 36BPR

Step 1



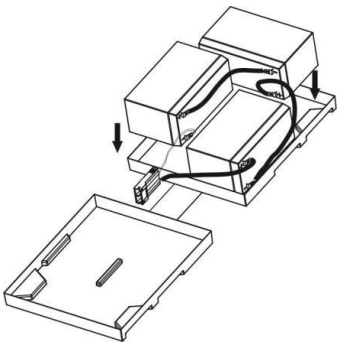
Remove adhesive tapes.

Step 2



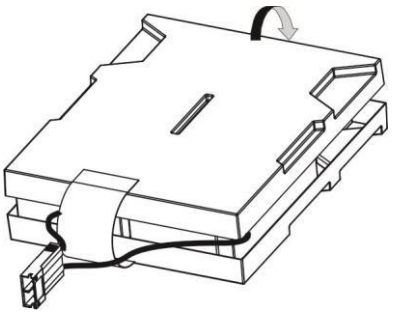
Connect all battery terminals by following image above.

Step 3



Put assembled battery packs on the plastic shell as shown in image above.

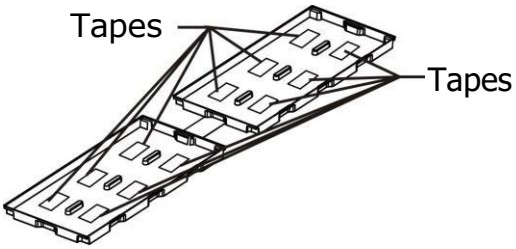
Step 4



Cover with the other side of the plastic shell as shown above. Then, EBP is well assembled

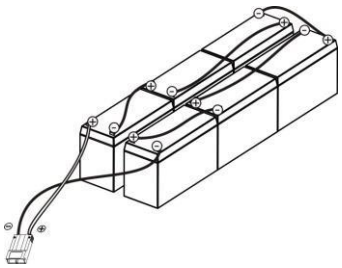
EBP – HMS 72BPR

Step 1



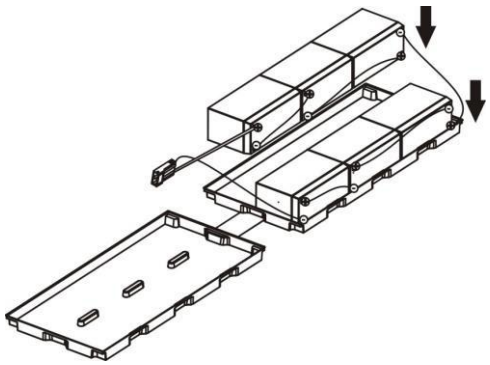
Remove adhesive tapes.

Step 2



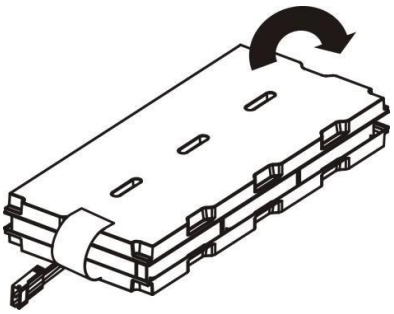
Connect all battery terminals by following image above.

Step 3



Put assembled battery packs on the plastic shell.

Step 4



Cover with the other side of plastic shell as shown above. Then, EBP is well assembled.

3. Installation and setup – HMS 160RL and 1100RL

3-1. Unpacking and Inspection

NOTE: Before installation, please inspect the unit. Make sure that nothing inside the package has been damaged during transportation. If there is any damage or any parts are missing, do not turn on the unit and notify the carrier and dealer immediately. Please keep the original packaging in a safe place for future use.

Open the package and check the contents:

- One UPS with the parallelling card inside.
- One Safety Instructions leaflet.
- One monitoring software CD.
- One USB cable.
- One parallel cable.
- One share current cable.
- One battery cable.
- Two feet with extensions for tower installation.
- Two ears for rack installation.

Open the External battery Pack (EBP) and check the contents:

- One EBP.
- One battery cable.
- Two feet with extensions for tower installation.
- Two ears for rack installation.
- One Safety Instructions leaflet.

3-2. Rear panel view

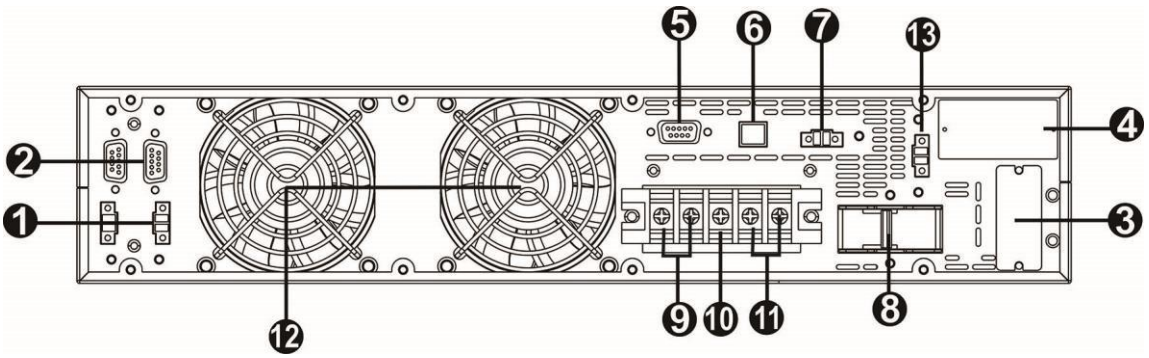


Diagram 1: UPS Rear Panel

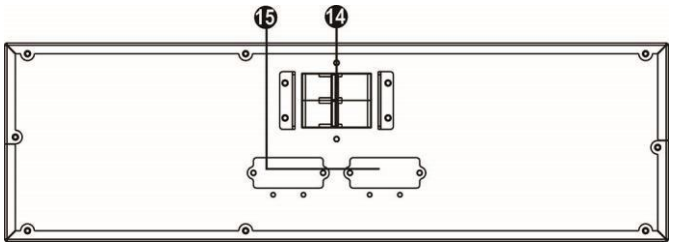


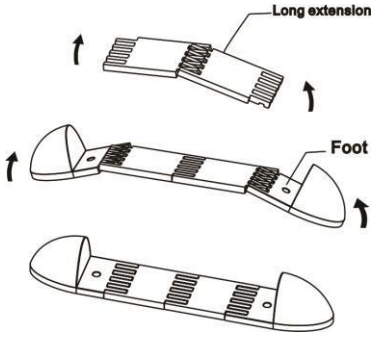
Diagram 3: 3U battery pack

1) Share current port (only available for parallel model)
2) Parallel port (only available for parallel model)
3) External battery connector
4) Intelligent slot
5) RS-232 communication port
6) USB communication port
7) Emergency power off function connector (EPO connector)
8) Input circuit breaker
9) Output terminals
10) Ground
11) Input terminals
12) Cooling Fan
13) External maintenance bypass switch port
14) Battery pack output circuit breaker
15) External battery connector

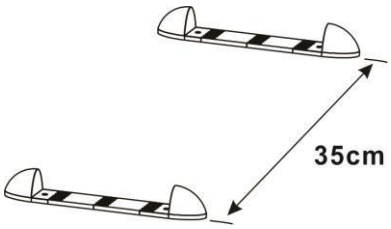
3-3. Tower Installation

The UPS system is shipped with two sets of feet and 6 extensions (2 short extensions plus 4 long extensions) that can be used to tower install the UPS module with one battery bank in 4U.

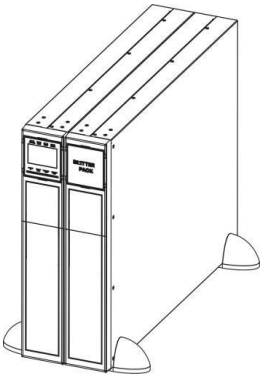
Step 1



Step 2



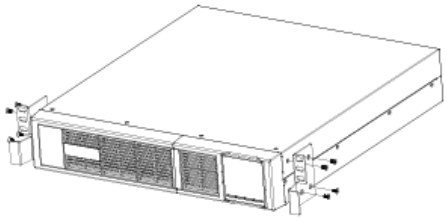
Step 3

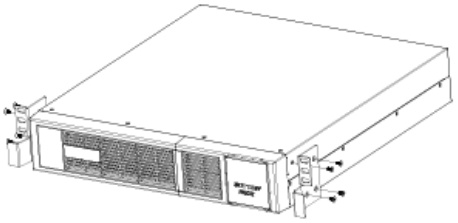


3-4. Rack Installation

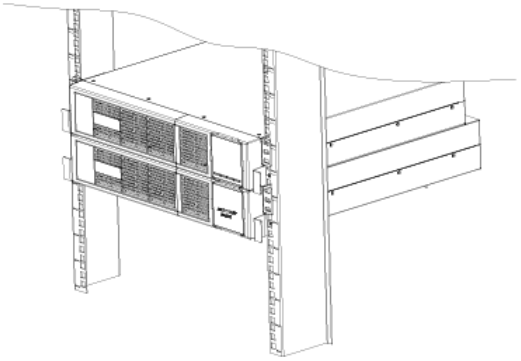
Please follow below steps to mount UPS into 19” rack or rack enclosure.

Step 1: Attach mounting ears to the side mounting holes of UPS using the screws provided and the ears should face forward. Please refer to images





Step 2: Lift the UPS module and slide it into ºrack enclosure. Attach the UPS module to the rack with screws, nuts and washers (user-provided) through its mounting ears and into the rack rails. Please refer to image.



3-5. Single UPS Installation

Installation and wiring must be performed in accordance with the local electric laws/regulations and execute the following instructions by professional personnel. Make sure the mains wire and breakers in the building are enough for the rated capacity of UPS to avoid the hazards of electric shock or fire.

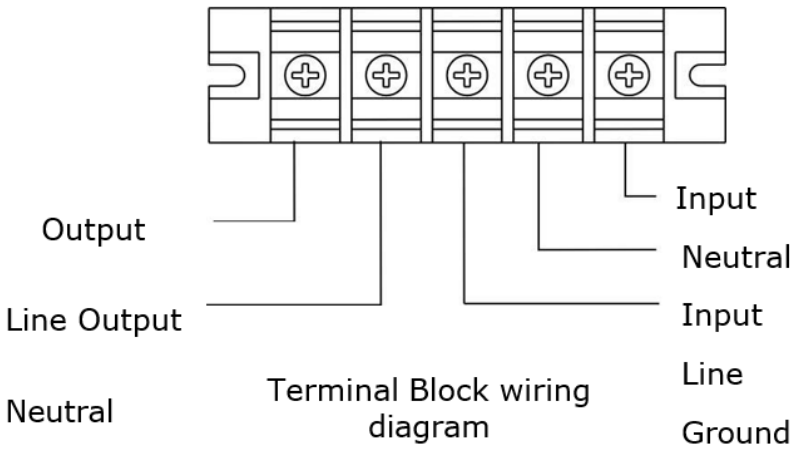
NOTE: Do not use the wall receptacle as the input power source for the UPS, as its rated current is less than the UPS’s maximum input current. Otherwise, the receptacle may be burned and destroyed.

1) Switch off the mains switch in the building before installation.
2) Turn off battery breaker before installation (only for RT model).
3) Turn off all the connected devices before connecting to the UPS.
4) Prepare wires based on the following table:

Model	Wiring spec (AWG)			
	Input	Output	Battery	Ground
HMS 160RL	10	10	10	10
HMS 1100RL	8	8	8	8

NOTE 1: The cable for HMS 160RL should be able to withstand over 50A current. It is recommended to use 10AWG or thicker wire for safety and efficiency.
NOTE 2: The cable for HMS 1100RL should be able to withstand over 63A current. It is recommended to use 8AWG or thicker wire for safety and efficiency.
NOTE 3: The selections for color of wires should be followed by the local electrical laws and regulations.
NOTE 4: For the EPO button, proceed the same way as for the HMS 110R, 115R, 120R, and 130R.

Remove the terminal block cover on the rear panel of UPS. Then connect the wires according to the following terminal block diagrams: (Connect the earth wire first when making wire connection. Disconnect the earth wire last when making wire disconnection!)



Terminal Block wiring diagram

NOTE 1: Make sure that the wires are connected tightly to the terminals.

NOTE 2: Please install the output breaker between the output terminal and the load, and the breaker should be qualified with leakage current protective function if necessary.

5) Put the terminal block cover back to the rear panel of the UPS.

Warning:

- For standard battery pack, there is one DC breaker to disconnect the battery pack and the UPS. Switch off the battery breaker before installation.

NOTE: Set the battery pack breaker in "OFF" position and then install the battery pack.

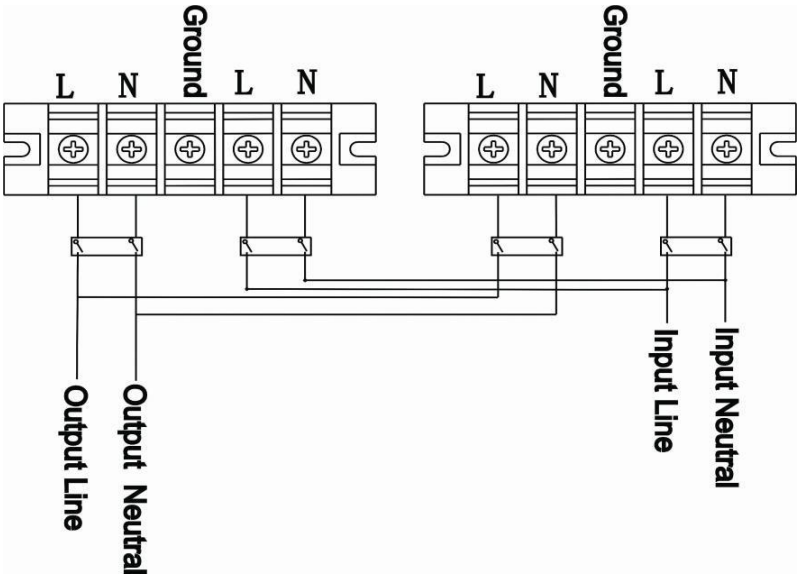
- Pay attention to the rated battery voltage marked on the rear panel. If you want to change the numbers of the battery pack, please make sure you modify the setting simultaneously. The connection with wrong battery voltage may cause permanent damage to the UPS. Make sure the voltage of the battery pack is correct.
- Pay attention to the polarity marking on external battery terminal block and make sure the correct battery polarity is connected. Wrong connection may cause permanent damage to the UPS.
- Make sure the protective earth ground wiring is correct. The wire current spec, color, position, connection and conductance reliability should be checked carefully.
- Make sure the utility input & output wiring is correct. The wire current spec, color, position, connection and conductance reliability should be checked carefully. Make sure the L/N site is correct, not reverse and short-circuited.

3-6. UPS Installation for Parallel System

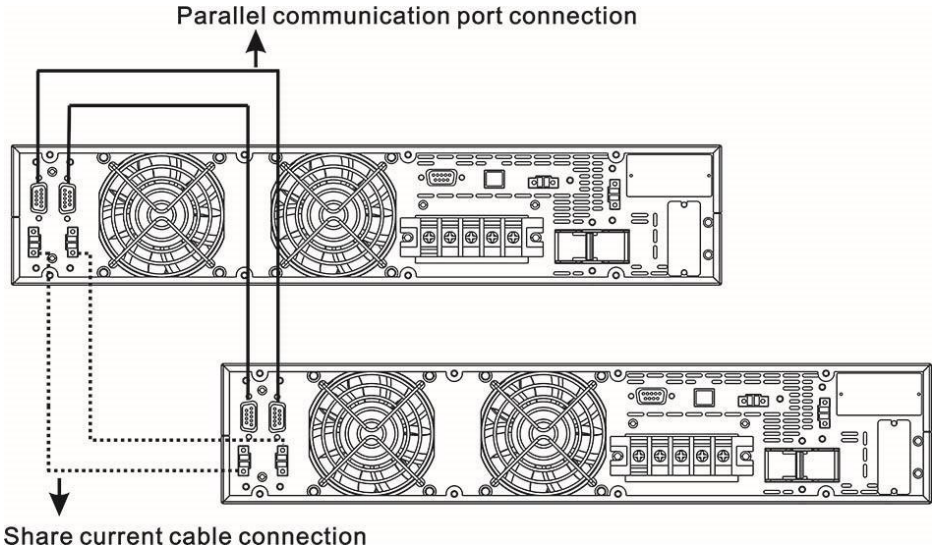
If UPS is only available for single operation, you may skip this section to the next.

1) Install and wire the UPSs according to section 3-5.
2) Connect the output wires of each UPS to an output breaker.
3) Connect all output breakers to a major output breaker. Then this major output breaker will directly connect to the loads. Refer to diagram 1 and diagram 3.
4) Each UPS is connected to an independent battery pack.
5) Remove the cover of parallel share current cable port on the UPS, connect each UPS one by one with the parallel cable and share current cable, and then screw the cover back again. Refer to diagram 2 and diagram 4.

NOTE: The parallel system cannot use only one shared battery pack. Otherwise, it will cause system permanent failure.



Power cable connection for HMS 160RL and 1100RL



Wiring diagram of parallel system for HMS 160RL and 1100RL

Software Installation

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown.

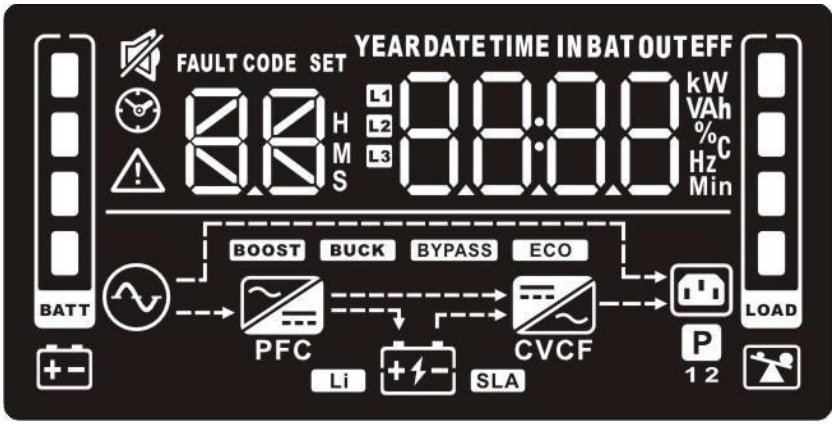
4. Operations - HMS 110R, 115R, 120R, and 130R

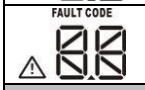
4-1. Button operation

Button	Function
ON/Mute Button	➢ Turn on the UPS: Press and hold ON/Mute button for at least 2 seconds to turn on the UPS. ➢ Mute the alarm: After the UPS is turned on in battery mode, press and hold this button for at least 3 seconds to disable or enable the alarm system. But it's not applied to the situations when warnings or errors occur. ➢ Up key: Press this button to display previous selection in UPS setting mode. ➢ Switch to UPS self-test mode: Press ON/Mute buttons for 3 seconds to enter UPS self-testing while in AC mode, ECO mode, or converter mode.
OFF/Enter Button	➢ Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS. UPS will be in standby mode under power normal or transfer to Bypass mode if the Bypass enable setting by pressing this button. ➢ Confirm selection key: Press this button to confirm selection in UPS setting mode.
Select Button	➢ Switch LCD message: Press this button to change the LCD message for input voltage, input frequency, input current, battery voltage, battery current, battery capacity, ambient temperature, output voltage, output frequency, load current and load percent. ➢ Setting mode: Press and hold this button for 3 seconds to enter UPS setting mode when Standby and Bypass mode. ➢ Down key: Press this button to display next selection in UPS setting mode.
ON/Mute + Select Button	➢ Switch to bypass mode: When the main power is normal, press ON/Mute and Select buttons simultaneously for 3 seconds. Then UPS will enter to bypass mode. This action will be ineffective when the input voltage is out of acceptable range. ➢ Exit setting mode or return to the upper menu: When working in setting mode, press ON/Mute and Select buttons simultaneously for 0.2 seconds to return to the upper menu. If it's already in top menu,

	press these two buttons at the same time to exit the setting mode.

4-2. LCD Panel



Display	Function
Backup time information	
	Indicates the estimated backup time. H: hours, M: minute, S: second.
Configuration and fault information	
	Indicates the configuration items, and the configuration items are listed in detail in section 4-5.
	Indicates the warning and fault codes listed in detail in section 4-5.
Mute operation	
	Indicates that the UPS alarm is disabled.
Input, Battery, Temperature, Output & Load information	
	Indicate the input voltage, input frequency, input current, battery voltage, battery current, battery capacity, ambient temperature, output voltage, output frequency, load current and load percent. k: kilo, W: watt, V: voltage, A: ampere, %: percent, ℃: centigrade degree, Hz: frequency
Load information	
	Indicate the load level by 0-24%, 25-49%, 50-74% and 75-100%.
	Indicates overload.

Programmable outlets information	
P	Indicates that programmable management outlets are working.
Mode operation information	
	Indicates the UPS connects to the mains.
	Indicates the battery is working.
	Indicates charging status
BYPASS	Indicates the bypass circuit is working.
ECO	Indicates the ECO mode is enabled.
	Indicates the AC to DC circuit is working.
PFC	Indicates the PFC circuit is working.
	Indicates the inverter circuit is working.
CVCF	Indicates the UPS is working in converter mode.
	Indicates the output is working.
Battery information	
	Indicate the battery level by 0-24%, 25-49%, 50-74%, and 75-100%.
	Indicates low battery

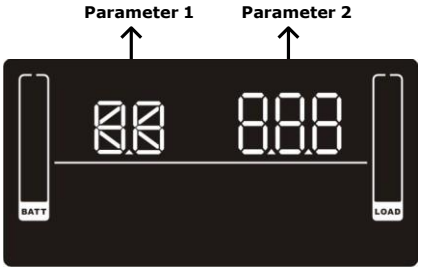
4-3. Audible Alarms

Battery Mode	Sounding every 5 seconds
Low Battery	Sounding every 2 seconds
Overload	Sounding every second
Fault	Continuously sounding
Bypass Mode	Sounding every 10 seconds

4-4. LCD display wordings index

Abbreviation	Display content	Meaning
ENA		Enable
DIS		Disable
ESC		Escape
HLS		High loss
LLS		Low loss
AO		Active open
AC		Active close
EAT		Estimated autonomy time
RAT		Running autonomy time
SD		Shutdown
OK		OK
ON		ON
BL		Battery Low
OL		Overload
OI		Over input current
NC		Battery No Connect
OC		Over Charge
SF		Site wiring fault
EP		EPO
TP		Temperature
CH		Charger
BF		Battery Fault
BV		Bypass Out Range
FU		Bypass frequency unstable
BR		Battery Replace
EE		EEPROM error

4-5. UPS Setting



There are three parameters to set up the UPS.

Parameter 1: It's for program alternatives. Refer to the table below.

Parameter 2: is the setting option or values for each program.

- **01: Output voltage setting**

Interface	Setting
	**Parameter 2: Output voltage** Choose the following output voltage: **200:** presents output voltage is 200VAC **208:** presents output voltage is 208VAC **220:** presents output voltage is 220VAC **230:** presents output voltage is 230VAC (Default) **240:** presents output voltage is 240VAC

- **02: Frequency Converter enable/disable**

Interface	Setting
	**Parameter 2:** Enable or disable converter mode. You may choose the following two options: **CF ENA:** converter mode enabled **CF DIS:** converter mode disabled (Default)

- **03: Output frequency setting**

Interface	Setting
	**Parameter 2: Output frequency setting.** You may set the initial frequency in battery mode: **BAT 50:** presents output frequency is 50Hz **BAT 60:** presents output frequency is 60Hz If converter mode is enabled, you may choose between the following output frequencies: **CF 50:** presents output frequency is 50Hz **CF 60:** presents output frequency is 60Hz

- **04: ECO enable/disable**

Interface	Setting
	**Parameter 2:** Enable or disable ECO function. You may choose the following two options: **ENA:** ECO mode enabled **DIS:** ECO mode disabled (Default)

- **05: ECO voltage range setting**

Interface	Setting
 	**Parameter 2:** Set the acceptable high voltage point and low voltage point for ECO mode by pressing Down key or Up key. **HLS:** High loss voltage in ECO mode in parameter 2. The setting range in parameter 3 is from +7V to +24V of the nominal voltage. (Default: +12V) **LLS:** Low loss voltage in ECO mode in parameter 2. The setting range in parameter 3 is from -7V to -24V of the nominal voltage. (Default: -12V)

- **06: Bypass enable/disable when UPS is off**

Interface	Setting
	**Parameter 2:** Enable or disable Bypass function. You may choose the following two options: **ENA:** Bypass enabled **DIS:** Bypass disabled (Default)

- **07: Bypass voltage range setting**

Interface	Setting
 	**Parameter 2:** Set the acceptable high voltage point and acceptable low voltage point for Bypass mode by pressing the Down key or Up key. **HLS:** Bypass high voltage point: **230-264:** setting the high voltage point in parameter 3 from 230Vac to 264Vac. (Default: 264Vac) **LLS:** Bypass low voltage point: **170-220:** setting the low voltage point in parameter 3 from 170Vac to 220Vac. (Default: 170Vac)

08: Bypass frequency range setting

Interface	Setting
 	**Parameter 2:** Set the acceptable high frequency point and acceptable low frequency point for Bypass mode by pressing the Down key or Up key. **HLS:** Bypass high frequency point for 50Hz output frequency models: **51-55Hz:** setting the frequency high loss point from 51Hz to 55Hz (Default: 53.0Hz) For 60Hz output frequency models: **61-65Hz:** setting the frequency high loss point from 61Hz to 65Hz (Default: 63.0Hz) **LLS:** Bypass low Frequency point for 50Hz output frequency models: **45-49Hz:** setting the frequency low loss point from 45Hz to 49Hz (Default: 47.0Hz) For 60Hz output frequency models: **55-59Hz:** setting the frequency low loss point from 55Hz to 59Hz (Default: 57.0Hz)

- **09: Programmable outlets enable/disable**

Interface	Setting
	**Parameter 2:** Enable or disable programmable outlets. **ENA:** Programmable outlets enable **DIS:** Programmable outlets disable (Default)

- **10: Programmable outlets setting**

Interface	Setting
	**Parameter 2:** Set up backup time limits for programmable outlets. **0-999:** setting the backup time limits in minutes from 0-999 for programmable outlets which connect to non-critical devices on battery mode. (Default: 999)

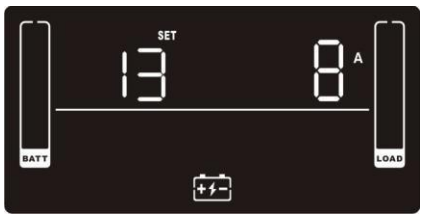
- **11: Autonomy limitation setting**

Interface	Setting
	**Parameter 2:** Set up backup time on battery mode for general outlets. **0-999:** setting backup time in minutes from 0-999 for general outlets on battery mode. **DIS:** Disable the autonomy limitation and the backup time will depend on battery capacity. (Default) **Note:** When setting as "0", the backup time will be only 10 seconds.

- **12: Battery total AH setting**

Interface	Setting
	**Parameter 2:** Set up the battery total AH of the UPS. **7-999:** setting the battery total capacity from 7-999 in AH. Please set the correct battery total capacity if external battery bank is connected.

- **3: Maximum charger current setting**

Interface	Setting
	**Parameter 2:** Set up charger's maximum current. For low voltage model with 24/36/48VDC **1/2/4/6/8:** setting charger's maximum current 1/2/4/6/8 in Ampere. (Default: 2A) For high voltage model with 24/36/48VDC **1/2/4/6/8/10/12:** setting the charger maximum current 1/2/4/6/8/10/12 in Ampere. (Default: 2A) For low voltage and high voltage model with **72/96VDC 1/2/4/6/8:** setting the charger maximum current 1/2/4/6/8 in Ampere. (Default: 2A) Note: Please set the appropriate charger current based on battery capacity used. The recommended charging current is 0.1C~0.3C of battery capacity as following table for reference.

Battery capacity (AH)	Total charging current (A)
7~20	2
20~40	4
40~60	6
60~80	8
80~100	10
100~150	12

- **4: Charger boost voltage setting**

Interface	Setting
	**Parameter 2:** Set up the charger boost voltage. **2.25-2.40:** setting the charger boost voltage from 2.25 V/cell to 2.40V/cell. (Default: 2.36V/cell)

- **15: Charger float voltage setting**

Interface	Setting
	**Parameter 2:** Set up the charger float voltage. **2.20-2.33:** setting the charger float voltage from 2.20 V/cell to 2.33V/cell. (Default: 2.28V/cell)

- **16: EPO logic setting**

Interface	Setting
	**Parameter 2:** Set up the EPO function control logic. **AO:** Active Open (Default). When AO is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in open status. **AC:** Active Close. When AC is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in close status.

- **17: External output isolation transformer connection**

Interface	Setting
	**Parameter 2:** Allow or disallow external output isolation transformer connection. **ENA:** If selected, it's allowed to connect to an external output isolation transformer. **DIS:** If selected, it's not allowed to connect to external output isolation transformer. (Default)

- **18: Display setting for autonomy time**

Interface	Setting
	**Parameter 2:** Set up the display setting for autonomy time **EAT:** If EAT is selected, it will display the remaining autonomy time. (Default) **RAT:** If RAT is selected, it will show accumulated autonomy time so far.

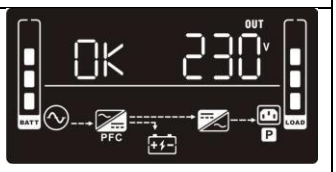
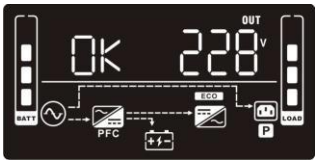
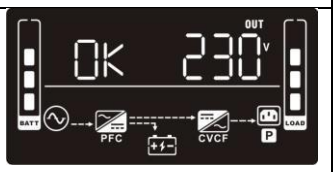
- **19: Acceptable input voltage range setting**

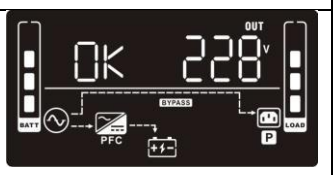
Interface	Setting
 	**Parameter 2:** Set the acceptable high voltage point and acceptable low voltage point for input voltage range by pressing the Down key or Up key. **HLS:** Input high voltage point: **280/290/300:** setting the high voltage point in parameter 2. (Default: 300Vac)

- **00: Exit setting**

Interface	Setting
	Exit the setting mode.

- **Operating Mode Description**

Operating mode	Description	LCD display
Online mode	When the input voltage is within acceptable range, UPS will provide pure and stable AC power to output. The UPS will also charge the battery at online mode.	
ECO mode	Energy saving mode: When the input voltage is within voltage regulation range, UPS will bypass voltage to output for energy saving. The UPS will also charge the battery at ECO mode.	
Frequency Converter mode	When input frequency is within 40 Hz to 70 Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge battery under this mode.	

Battery mode	When the input voltage is beyond the acceptable range or power failure, the UPS will backup power from battery and alarm is sounding every 5 seconds.	
Bypass mode	When input voltage is within acceptable range, but UPS is overloaded, it will switch to bypass mode. Also, it can be set by front panel. Alarm is sounding every 10 seconds.	
Standby mode	UPS is powered off with no voltage at its output but still can charge batteries.	
Fault mode	When a fault has occurred, the ERROR icon and the fault code will be displayed.	

- **Faults Reference Code**

Fault event	Fault code	Icon	Fault event	Fault code	Icon
Bus start fail	01	x	Battery voltage too high	27	x
Bus over	02	x	Battery voltage too low	28	x
Bus under	03	x	Charger output short	2A	x
Inverter soft start fail	11	x	Over temperature	41	x
Inverter voltage high	12	x	Overload	43	
Inverter voltage Low	13	x	Charger failure	45	x
Inverter output short	14	x	Over input current	49	x

- **Warning indicator**

Warning	Icon (flashing)	Code	Alarm
Low Battery		bL	Sounding every 2 seconds
Overload		OL	Sounding every second
Over input current		OI	Sounding 2 beep every 10 seconds
Battery is not connected		nC	Sounding every 2 seconds

Over Charge		OC	Sounding every 2 seconds
Site wiring fault		SF	Sounding every 2 seconds
EPO enable		EP	Sounding every 2 seconds
Over temperature		tP	Sounding every 2 seconds
Charger failure		CH	Sounding every 2 seconds
Battery fault		bF	Sounding every 2 seconds (At this time, UPS is off to remind users something wrong with battery)
Out of bypass voltage range		bV	Sounding every 2 seconds
Bypass frequency unstable		FU	Sounding every 2 seconds
Battery replacement		bt	Sounding every 2 seconds
EEPROM error		EE	Sounding every 2 seconds

NOTE: "Site Wiring Fault" function can be enabled/disabled via software. Please check software manual for the details.

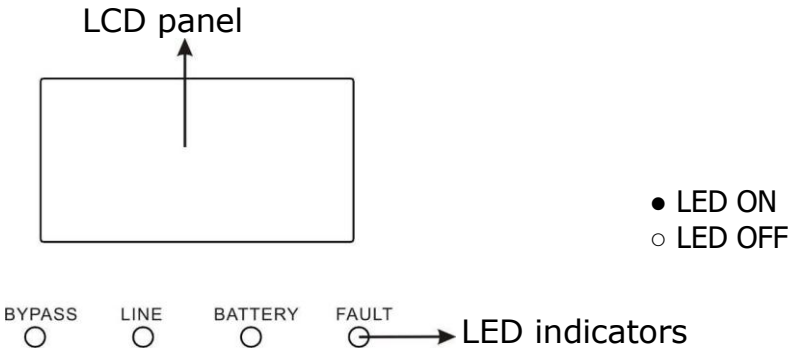
5. Operations - HMS 160RL and 1100RL

5-1. Button operation HMS 160RL and 1100RL

Button	Function
ON/Enter Button	➢ Turn on the UPS: Press and hold the button more than 0.5s to turn on the UPS. ➢ Enter Key: Press this button to confirm the selection in setting menu.
OFF/ESC Button	➢ Turn off the UPS: Press and hold the button more than 0.5s to turn off the UPS. ➢ Esc key: Press this button to return to last menu in setting menu.
Test/Up Button	➢ Battery test: Press and hold the button more than 0.5s to test the battery while in AC mode, or CVCF mode. ➢ UP key: Press this button to display next selection in setting menu.
Mute/Down Button	➢ Mute the alarm: Press and hold the button more than 0.5s to mute the buzzer. Please refer to section 5-5 for details. ➢ Down key: Press this button to display previous selection in setting menu.
Test/Up + Mute/Down Button	➢ Press and hold the two buttons simultaneously more than 1s to enter/escape the setting menu.

* CVCF mode means converter mode.

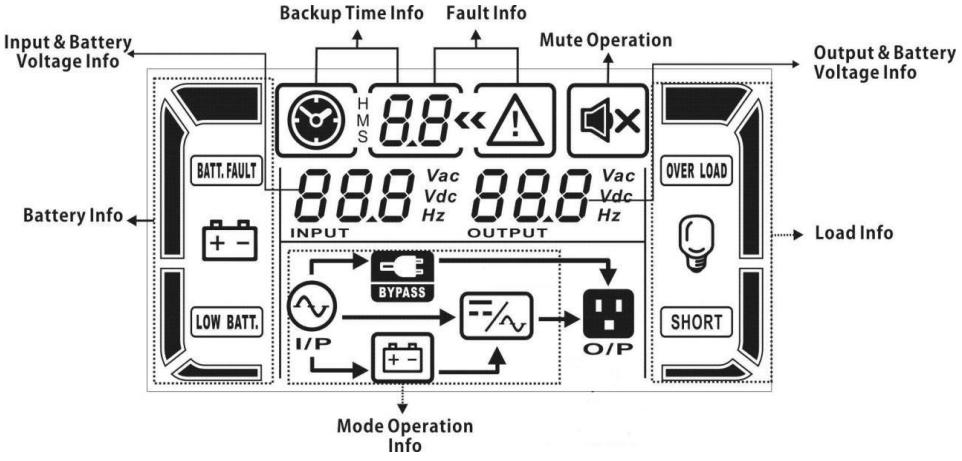
5-2. LED Indicators and LCD Panel



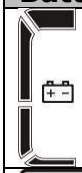
There are 4 LEDs on front panel to show the UPS working status:

Mode / LED	Bypass	Line	Battery	Fault
UPS Startup	●	●	●	●
No Output mode	○	○	○	○
Bypass mode	●	○	○	○
AC mode	○	●	○	○
Battery mode	○	○	●	○
CVCF mode	○	●	○	○
Battery Test	●	●	●	○
ECO mode	●	●	○	○
Fault	○	○	○	●

5-3. LCD Panel



Display	Function
Backup time information	
H M S 8.8	Indicates estimated backup time in numbers. H: hours, M: minutes, S: seconds
Fault information	
« ⚠	Indicates that the warning and fault occurs.
8.8	Indicates the current fault code, listed in details at section 5-9.
Mute operation	
🔇	Indicates that the UPS alarm is disabled.
Output & Battery voltage information	
888.8 Vac Vdc Hz OUTPUT	Indicates the output voltage, frequency or battery voltage. Vac: output voltage, Vdc: battery voltage, Hz: frequency
Load information	
	Indicates the load level by 0-25%, 26-50%, 51-75%, and 76-100%.
OVER LOAD	Indicates overload.
SHORT	Indicates the load or the output is short.
Mode operation information	
I/P	Indicates the UPS connects to the mains.
	Indicates the battery is working.
BYPASS	Indicates the bypass circuit is working.
ECO	Indicates the ECO mode is enabled.
	Indicates the Inverter circuit is working.
O/P	Indicates the output is working.

Battery information	
	Indicates the Battery capacity by 0-25%, 26-50%, 51-75%, and 76-100%.
	Indicates the battery is not connected.
	Indicates low battery level and low battery voltage.
Input & Battery voltage information	
	Indicates the input voltage or frequency or battery voltage. Vac: Input voltage, Vdc: battery voltage, Hz: input frequency

5-4. Audible Alarm

Description	Buzzer status	Muted
UPS status		
Bypass mode	Beeping once every 2 minutes	Yes
Battery mode	Beeping once every 4 seconds	
Fault mode	Beeping continuously	
Warning		
Overload	Beeping twice every second	Yes
Others	Beeping once every second	
Fault		
All	Beeping continuously	Yes

5-5. Single UPS Operation

Turn on the UPS with utility power supply (in AC mode)

1) After power supply is connected correctly, switch the breaker of the battery pack at "ON" position. Then set the input breaker at "ON" position. At this time the fan will start, and the UPS enters to power on mode for initialization. Several seconds later, UPS operates in bypass mode and supplies power to the loads via the static transfer switch.

NOTE: When UPS is in bypass mode, the output voltage will be the same as mains after you switch on the input breaker. In bypass mode, the load is not protected by UPS. To protect your critical loads, you should switch the UPS to AC mode. Refer to next step.

2) Press and hold the "ON" button for 0.5s to switch the UPS to AC mode. The buzzer will beep once.

3) A few seconds later, the UPS will enter to AC mode. If the utility power is abnormal, the UPS will operate in battery mode without interruption.

NOTE: When the UPS is running out of battery, it will shut down automatically at battery mode. When the utility power is restored, the UPS will auto restart in bypass.

Turn on the UPS without utility power supply (in battery mode)

1) Make sure that the breaker of the battery pack is at "ON".
2) Press the "ON" button to set up the power supply for the UPS. It will enter to power on mode. After initialization, the UPS will enter to No Output mode, then press and hold the "ON" button for 0.5s to turn on the UPS, and the buzzer will beep once.
3) A few seconds later, the UPS will be turned on and will have entered to battery mode.

Connect devices to UPS

After the UPS is turned on, you can connect devices to the UPS.

1) Turn on the UPS first and then switch on the devices one by one; the LCD panel will display the total load level.
2) If it is necessary to connect inductive loads such as a printer, the in-rush current should be calculated carefully to see if it meets the capacity of the UPS, because the power consumption of this kind of load is too big.
3) If the UPS is overloaded, the buzzer will beep twice every second.
4) When the UPS is overloaded, please remove some loads immediately. It is recommended to have the total loads connected to the UPS less than 80% of its nominal power capacity to prevent overload for system safety.
5) If the overload time is longer than acceptable time listed at specifications at AC mode, the UPS will automatically transfer to bypass mode. After the overload is removed, it will return to AC mode. If the overload time is longer than acceptable time listed at specifications in battery mode, the UPS will become fault status. At this time, if bypass is enabled and the voltage and frequency in the range of it is set value, the UPS will power the load via bypass. If bypass function is disabled or the input power is not within bypass acceptable range, it will cut off output directly.

Charge the batteries

1) After the UPS is connected to the utility power and working on the AC mode, it will charge the batteries automatically except in battery mode or during battery self-test.

2) It is suggested to charge batteries at least 10 hours before use. Otherwise, the backup time may be shorter than expected time.

Battery mode operation

1) When the UPS is in battery mode, the buzzer will beep according to different battery capacity. If the battery capacity is more than 25%, the buzzer will beep once every 4 seconds; If the battery voltage drops to the alarm level, the buzzer will beep quickly (once per second) to remind users that the battery is at low level, and the UPS will shut down automatically soon. Users could switch off some non-critical loads to disable the shutdown alarm and prolong the backup time. If there is no more load to be switched off at that time, you must shut down all loads as soon as possible to protect the devices or save data. Otherwise, there is a risk of data loss or load failure.
2) In battery mode, if sound annoys, press the mute button to mute the buzzer. Pressing it again after the buzzer is muted, it will beep again. All warning alarms can be muted.
3) The backup time depends on the external battery capacity.
4) The backup time may vary from different environment temperature and load type.
5) When setting backup time for 16.5 hours (990min in LCD setting menu 09), after discharging 16.5 hours, UPS will shut down automatically to protect the battery. This battery discharge protection can be enabled or disabled through LCD panel control.

Test the batteries

1) If you need to check the battery status press the "Test" button to let the UPS do battery self-test. This option is available when the UPS runs in any mode but battery mode.
2) To keep the system reliable, the UPS can perform the battery self-test periodically as long as it is being monitored by the corresponding software.
3) Users also can set battery self-test through the monitoring software.
4) During a battery self-test, the UPS LCD and buzzer behave the same as in battery mode, with the exception that the battery LED flashes.

Turn off the UPS with utility power supply in AC mode

1) Turn off the inverter of the UPS by pressing "OFF" button for at least 0.5s, and then the buzzer will beep once. The UPS will turn into Bypass mode.

   NOTE 1: If the UPS has been set to enable the bypass output, it will

directly feed loads from utility power to output terminal even though you have turned off the UPS (inverter).

NOTE 2: After turning off the UPS, please be aware that the UPS is working at bypass mode and there is risk of power loss for connected devices.

2) In Bypass mode, output voltage of the UPS is still present. In order to cut off the output, switch off the input breaker. A few seconds later, there is no display shown on the display panel and UPS is completely off.

Turn off the UPS without utility power supply in Battery mode

1) Turn off the UPS by pressing "OFF" button for at least 0.5s, and then the buzzer will beep once.
2) Then UPS will cut off power to output and there is nothing displayed on its panel.

Operation in warning status

When Fault LED flashes and the buzzer beeps once every second, it means that there are some problems with UPS operation. Users can get the warning code from LCD panel. Please check the 5-11 warning code table and the troubleshooting table in chapter 6 for details.

Operation in Fault mode

1) When Fault LED illuminates and the buzzer beeps continuously, it means that there is a fatal error in the UPS. Users can get the fault code from display panel. Please check the 5-9 fault code table and the troubleshooting table in chapter 6 for details.
2) Please check the loads, wiring, ventilation, utility, battery and so on after the fault occurs. Don't try to turn on the UPS again before solving the problems. If the problems can't be fixed, please contact the distributor or service people immediately.
3) For emergency case, please cut off the connection from utility, external battery, and output immediately to avoid more risk or danger.

Operation of changing charging current

1) In bypass mode, press "Test/UP" and "Mute/Down" buttons simultaneous for more than 1s to enter the setting menu.
2) Press the "Mute/Down" button until it shows 17 in parameter 1 and press "Enter" button to adjust the charging current.
3) In the parameter 2, you can set up the charging current at 1A, 2A, 3A or 4A by pressing "Test/UP" or "Mute/Down" button. Please confirm

the setting by pressing "ON/Enter" button.

4) In the parameter 3, it is to adjust the charging current according to the deviation between the actual charging current and the setting value of the current.

5) For example: you want to have a charging current of 4A, but actually the charging current is measured only 3.7A. Then, you need to select "+" and change the number to 4 in parameter 3. It means the setting charging current will be added 0.3A as output charging current. Then, confirm this modification by pressing "ON/Enter" button. Now, you may press "Test/UP" and "Mute/Down" buttons at the same time to exit the setting mode.

NOTE 1: Be careful that the maximum charging current should not exceed the maximum battery charging current.

NOTE 2: All parameter settings will be saved only when UPS shuts down normally with internal or external battery connection. (Normal UPS shutdown means turning off input breaker in bypass/no output mode).

5-6. Parallel Operation

Parallel system initial startup

First, please make sure all of the UPSs are parallel models and have the same configuration.

1) Turn on each UPS to AC mode respectively. Then, measure the output voltage of each UPS to check if the voltage difference between actual output and setting value is less than 1.5V (typical 1V) with multimeter. If the difference is more than 1.5V, please calibrate the voltage by configuring inverter voltage adjustment (Refer to Program 15, section 5-8) in LCD setting. If voltage difference remains more than 1.5V after calibration, please contact your local distributor or service center for help.

2) Calibrate the output voltage measurement by configuring output voltage calibration (Refer to Program 16, section 5-8) in LCD setting to make sure the error between real output voltage and detected value of UPS is less than 1V.

3) Turn off each UPS (Refer to section 5-5.). Then, follow the wiring procedure in section 3-5.

4) Remove the cover of parallel share current cable port on the UPS, connect each UPS one by one with the parallel cable and share current cable, and then screw the cover back.

Turn on the parallel system in AC mode

1) Turn on the input breaker of each UPS. After all UPSs enter to bypass mode, measure the voltage between output L1 of each UPS with multimeter. If the voltage difference is less than 1V, that means all connections are correct. Otherwise, please check if the wirings are connected correctly.
2) Turn on the output breaker at **only one** of the UPS
3) Check if PARXXX is displayed. If no "PARXXX" exists in any UPS, please check if the parallel cables are connected correctly. Turn off its output breaker.
4) Repeat 2) and 3) for the rest of the UPSs. Mind to perform these steps **one by one**.
5) Turn on each UPS in turns. After a while, the UPSs will enter to bypass mode synchronously and then, the parallel system is completed.

Turn on the parallel system in Battery mode

1) Turn on the battery breaker (only available in long-run model and RT model).

   NOTE: It's not allowed to share one battery pack in parallel system. Each UPS should be connected to its battery pack.
2) Check if PARXXX is displayed. If no "PARXXX" exists in any UPS, please check if the parallel cables are connected correctly.
3) Turn on the output breakers of each UPS in turns.
4) Press the "ON" button to set up the power supply for any UPS. A few seconds later, the UPS will switch to battery mode. Check if PARXXX is displayed. If not, check if the parallel cables are connected correctly.
5) Press the "ON" button to set up the power supply for another UPS, check if PARXXX is displayed. If not, check if the parallel cables are connected correctly. Then, turn on another UPS. A few seconds later, the UPS will switch to battery mode and will be added to the parallel system.
6) If you have the third UPS, follow the same procedure of 3). Then, the parallel system is complete.

Add one new unit into the parallel system

1) Adding a new unit into the parallel system when whole system is running is not possible. Cut off the load and shut down the system.
2) Make sure all of the UPS are the parallel models, and follow the wiring refer to section 3-5.
3) Install the new parallel system according to the previous section.

Remove one unit from the parallel system

There are two methods to remove one unit from the parallel system:

First method:

1) Press the "OFF" key twice and each time should last for more than 0.5s. Then, the UPS will enter into bypass mode without output.
2) Turn off the output breaker of the unit to remove and then turn off its input breaker.
3) After it shuts down, you can turn off the battery breaker the unit from the parallel system.

Second method:

1) If the bypass is abnormal, any unit cannot be removed without interruption. Cut off the load and shut down the system.
2) Make sure the bypass setting is enabled in each UPS and then turn off the running system. All UPSs will transfer to Bypass mode. Remove all the maintenance bypass covers and set the maintenance switches from "UPS" to "BPS". Turn off input and battery breakers.
3) Remove the UPS.
4) Turn on the input breaker of the remaining UPSs and the system will transfer to Bypass mode.
5) Set the maintenance switches from "BPS" to "UPS and put the maintenance bypass covers back. Turn on the remaining UPSs and finish the parallel system connection.

⚠ **Warning:** (Only for the parallel system)

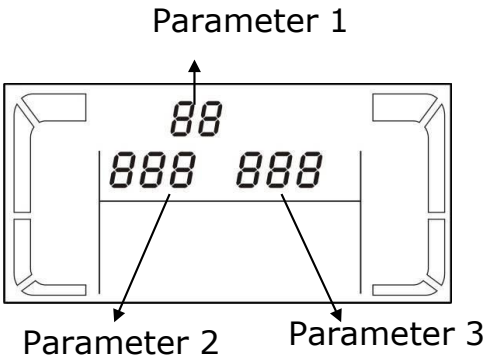
- Before turning on the parallel system to activate inverter, make sure that all unit's maintenance switch at the same position.
- When parallel system is turned on to work through inverter, please do not operate the maintenance switch of any unit.

5-7. Abbreviation Meaning in LCD Display

Abbreviation	Display content	Meaning
ENA	ENA	Enable
DIS	dIS	Disable
ATO	AtO	Auto
BAT	bAt	Battery
NCF	nCF	Normal mode (not CVCF mode)
CF	CF	CVCF mode
SUB	SUb	Subtract
ADD	Add	Add
ON	On	On
OFF	OFF	Off
FBD	Fbd	Not allowed
OPN	OPn	Allow
RES	rES	Reserved
OP.V	OPU	Output voltage
PAR	PAr	Parallel

5-8. LCD Setting

There are three parameters to set up the UPS. Refer to following diagram.



Parameter 1: It's for program alternatives. Refer to below program list for the details.
Parameter 2 and parameter 3 are the setting options or values for each program.

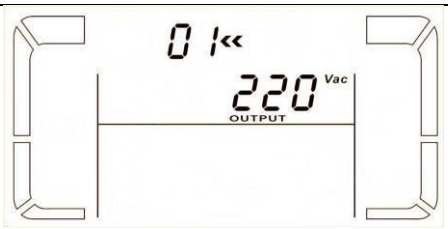
Programs available list for parameter 1:

Code	Description	Bypass/ No output	AC	ECO	CVCF	Battery	Battery Test
01	Output voltage	Y					
02	Output frequency	Y					
03	Voltage range for bypass	Y					
04	Frequency range for bypass	Y					
05	ECO mode enable/disable	Y					
06	Voltage range for ECO mode	Y					
07	ECO mode frequency range setting	Y					
08	Bypass mode setting	Y	Y				
09	Battery backup time setting	Y	Y	Y	Y	Y	Y
10	Reserved	Reserved for future					
11	Reserved	Reserved for future					
12	Hot standby function enable/disable	Y	Y	Y	Y	Y	Y
13	Battery voltage adjustment	Y	Y	Y	Y	Y	Y
14	Charger voltage adjustment	Y	Y	Y	Y	Y	Y
15	Inverter voltage adjustment		Y		Y	Y	
16	Output voltage calibration		Y		Y	Y	
17	Charging current setting	Y	Y	Y	Y	Y	Y

*Y means that this program can be set in this mode.

Note: All parameter settings will be saved only when UPS shuts down normally with internal or external battery connection. (Normal UPS shutdown means turning off input breaker in bypass mode).

- **01: Output voltage**

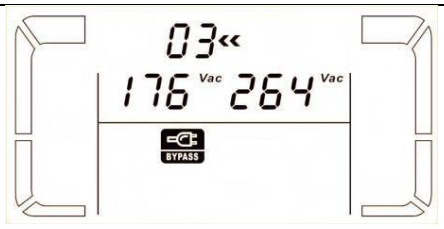
Interface	Setting
	**Parameter 3: Output voltage** You may choose the following output voltage in parameter 3: **208:** Presents output voltage is 208Vac **220:** Presents output voltage is 220Vac **230:** Presents output voltage is 230Vac **240:** Presents output voltage is 240Vac

- **02: Output frequency**

Interface	Setting
60 Hz, CVCF mode  **50 Hz, Normal mode**  **ATO** 	**Parameter 2: Output Frequency** Setting the output frequency. You may choose following three options in parameter 2: **50.0Hz:** The output frequency is setting for 50.0Hz. **60.0Hz:** The output frequency is setting for 60.0Hz. **ATO:** If selected, output frequency will be decided according to the latest normal utility frequency. If it is from 46Hz to 54Hz, the output frequency will be 50.0Hz. If it is from 56Hz to 64Hz, the output frequency will be 60.0Hz. ATO is default setting. **Parameter 3: Frequency mode** Setting output frequency at CVCF mode or not CVCF mode. You may choose following two options in parameter 3: **CF:** Setting UPS to CVCF mode. If selected, the output frequency will be fixed at 50Hz or 60Hz according to setting in parameter 2. The input frequency could be from 46Hz to 64Hz. **NCF:** Setting UPS to normal mode (not CVCF mode). If selected, the output frequency will synchronize with the input frequency within 46~54 Hz at 50Hz or within 56~64 Hz at 60Hz according to setting in parameter 2. If 50 Hz selected in parameter 2, UPS will transfer to battery mode when input frequency is not within 46~54 Hz. If 60Hz selected in parameter 2, UPS will transfer to battery mode when input frequency is not within 56~64 Hz. *If Parameter 2 is ATO, the Parameter 3 will show the current frequency.

Note: If the UPS is set to CVCF mode, the bypass function will be disabled automatically.
But when a single UPS without parallel function is powered on with mains and before the UPS finished the startup, there will be a few seconds of voltage pulse (same as the input voltage) on the bypass output.
If you need to remove the pulse in this mode to protect your load better, you could contact the dealer for help.
For the UPS with parallel function, this pulse situation won't happen.

- **03: Voltage range for bypass**

Interface	Setting
	**Parameter 2:** Set the acceptable low voltage for bypass. Setting range is from 110V to 209V and the default value is 110V. **Parameter 3:** Set the acceptable high voltage for bypass. Setting range is from 231V to 276V and the default value is 264V.

- **04: Frequency range for bypass**

Interface	Setting
	**Parameter 2:** Set the acceptable low frequency for bypass. 50 Hz system: Setting range is from 46.0Hz to 49.0Hz. 60 Hz system: Setting range is from 56.0Hz to 59.0Hz. The default value is 46.0Hz/56.0Hz. **Parameter 3:** Set the acceptable high frequency for bypass. 50 Hz: Setting range is from 51.0Hz to 54.0 Hz. 60 Hz: Setting range is from 61.0Hz to 64.0Hz. The default value is 54.0Hz/64.0Hz.

- **05: ECO mode enable/disable**

Interface	Setting
	**Parameter 3:** Enable or disable ECO function. You may choose following two options: **DIS:** disable ECO function **ENA:** enable ECO function If ECO function is disabled, voltage range and frequency range for ECO mode still can be set, but it is meaningless unless the ECO function is enabled.

- **06: Voltage range for ECO mode**

Interface	Setting
	**Parameter 2:** Low voltage threshold for ECO mode. The setting range is from 5% to 10% of the nominal voltage. **Parameter 3:** High voltage threshold for ECO mode. The setting range is from 5% to 10% of the nominal voltage.

- **07: Frequency range for ECO mode**

Interface	Setting
	**Parameter 2:** Set low frequency threshold for ECO mode. 50 Hz system: Setting range is from 46.0Hz to 48.0Hz. 60 Hz system: Setting range is from 56.0Hz to 58.0Hz. The default value is 48.0Hz/58.0Hz. **Parameter 3:** Set high frequency threshold for ECO mode. 50 Hz: Setting range is from 52.0Hz to 54.0 Hz. 60 Hz: Setting range is from 62.0Hz to 64.0Hz. The default value is 52.0Hz/62.0Hz.

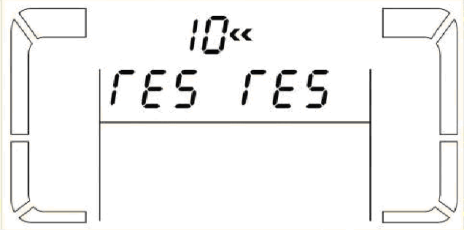
- **08: Bypass mode setting**

Interface	Setting
	**Parameter 2:** **OPN**: Bypass allowed. When selected, UPS will run at Bypass mode depending on bypass enabled/disabled setting. **FBD**: Bypass not allowed. When selected, it's not allowed to run in Bypass mode under any situation. **Parameter 3:** **ENA**: Bypass enabled. When selected, Bypass mode is activated. **DIS**: Bypass disabled. When selected, automatic bypass is acceptable, but manual bypass is not allowed. Manual bypass means users manually operate UPS for Bypass mode. For example, pressing OFF button in AC mode to turn into Bypass mode.

- **09: Battery backup time setting**

Interface	Setting
	**Parameter 3:** **000~999:** Set the maximum backup time from 0min to 999min. UPS will shut down to protect battery after backup time arrives. **DIS:** Disable battery discharge protection and backup time will depend on battery capacity. The default value is DIS.

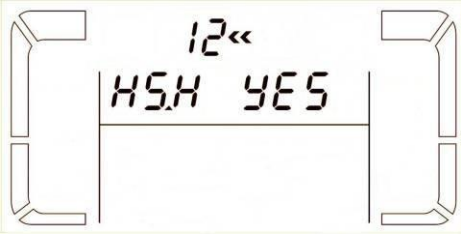
- **10: Reserved**

Interface	Setting
	Reserved

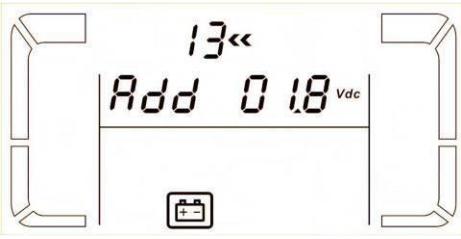
- **11: Reserved**

Interface	Setting
	Reserved

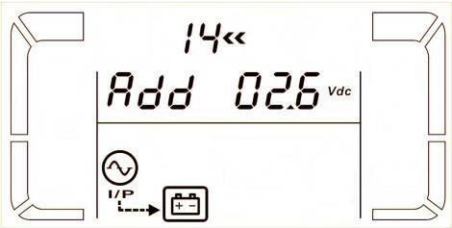
- **12: Hot standby function enable/disable**

Interface	Setting
	**Parameter 2: HS.H** Enable or disable Hot standby function. You may choose following two options in **Parameter 3**: **YES:** Hot standby function is enabled. It means that the current UPS is set to host of the hot standby function, and it will restart after AC recovery even without battery connected. **NO:** Hot standby function is disabled. The UPS is running at normal mode and can't restart without battery

- **13: Battery voltage adjustment**

Interface	Setting
	**Parameter 2:** Select "**Add**" or "**Sub**" function to adjust battery voltage to real figure. **Parameter 3:** the voltage range is from 0V to 5.7V, the default value is 0V.

- **14: Charger voltage adjustment**

Interface	Setting
	**Parameter 2:** you may choose **Add** or **Sub** to adjust charger voltage **Parameter 3:** the voltage range is from 0V to 9.9V, the default value is 0V. **NOTE:** *Before making voltage adjustment, be sure to disconnect all batteries first to get the accurate charger voltage. *We strongly suggest to use the default value (0). Any modification should be suitable to battery specifications.

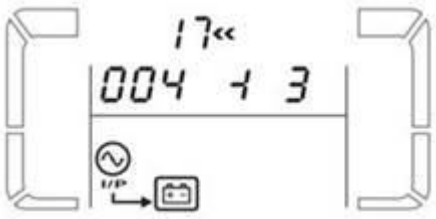
- **15: Inverter voltage adjustment**

Interface	Setting
	**Parameter 2:** you may choose **Add** or **Sub** to adjust inverter voltage **Parameter 3:** the voltage range is from 0V to 6.4V, the default value is 0V.

- **16: Output voltage calibration**

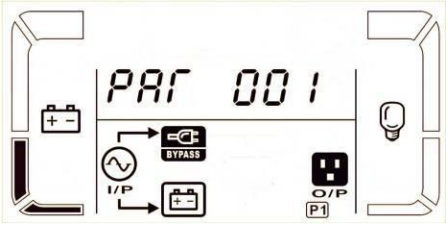
Interface	Setting
	When the output voltage can not be detected (less than 50VAC), "rES" will be displayed in parameter 2 and parameter 3.
	**Parameter 2:** it always shows **OP.U** as output voltage. **Parameter 3:** it shows the internal measurement value of the output voltage, and you can calibrate it by pressing **Up** or **Down** according to the measurement from an external voltage meter. The calibration result will be effective by pressing **Enter**. The calibration range is limited within +/-9V. This function is normally used for parallel operation.

- **17: Charging current setting**

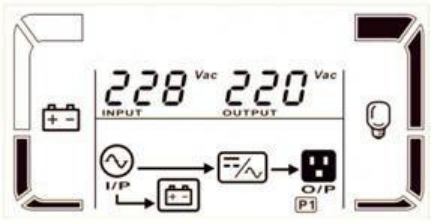
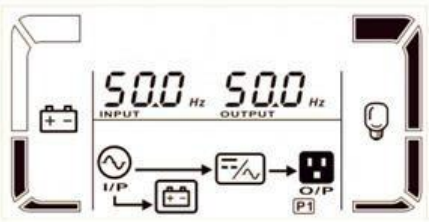
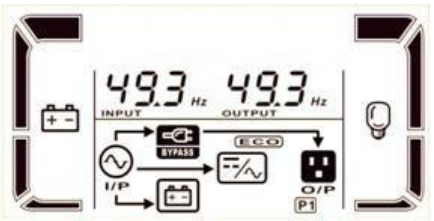
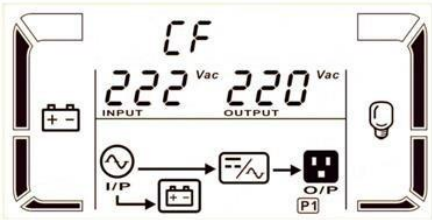
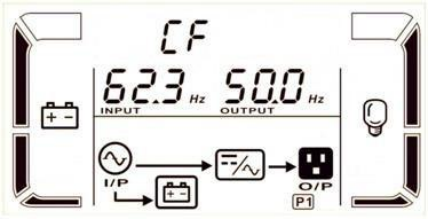
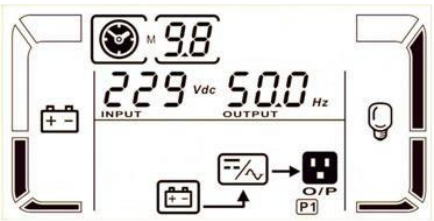
Interface	Setting
	**Parameter 2:** Set the charging current of the charger at 1A, 2A, 3A or 4A (001 ~ 004). **Parameter 3:** Calibrate the charging current. If there is deviation between setting current and real measured current, please use this parameter to calibrate the charging current. **± 0~± 5:** You may choose **'+'** as **add** or **'-'** as **Sub** to calibrate charging current. This setting number is the first number after the decimal point. The calibrated formula is listed as below: Setting charging current = "real measured current" + or – "value setting in parameter 3" For example, if setting charging current is 4A, but real current is detected as 3.7A, please set up calibrated current as + 3. Setting charging current 4A = real measured current 3.7A + 0.3A

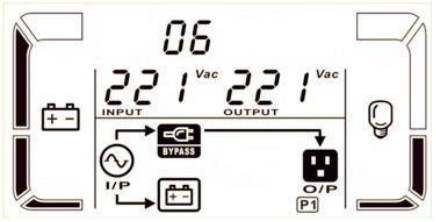
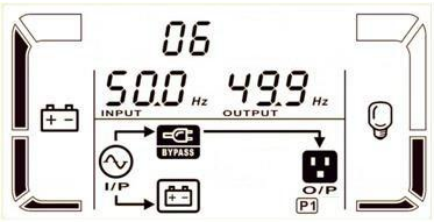
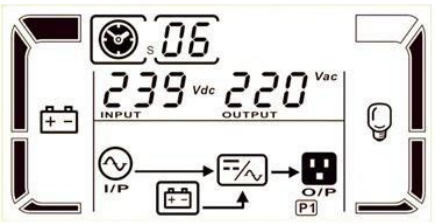
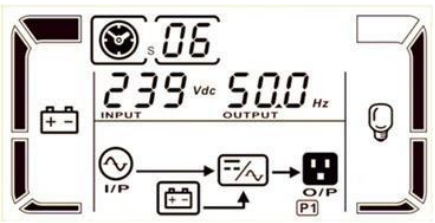
- **Operating Mode/Status Description**

If parallel UPS systems are successfully set up, it will show one more screen with "PAR" in parameter 2 and be assigned number in parameter 3 as below parallel screen diagram. The master UPS will be default assigned as "001" and slave UPSs



will be assigned as either "002" or "003". The assigned numbers may be changed dynamically in the operation.

Operating mode/status		
AC mode	Description	When the input voltage is within acceptable range, UPS will provide pure and stable AC power to output. The UPS will also charge the battery at AC mode.
	LCD display	 
ECO mode	Description	When the input voltage is within voltage regulation range and ECO mode is enabled, UPS will bypass voltage to output for energy saving.
	LCD display	 
CVCF mode	Description	When input frequency is within 46 to 64Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge battery under this mode.
	LCD display	 
Battery mode	Description	When the input voltage is beyond the acceptable range or power failure, UPS will backup power from battery and alarm will beep every 4 seconds.
	LCD display	 
Bypass mode	Description	When input voltage is within acceptable range and bypass is enabled, turn off the UPS and it will enter Bypass mode. Alarm beeps every two minutes.

	LCD display		
Battery Test	Description	When UPS is in AC mode or CVCF mode, press "Test" key for more than 0.5s. Then the UPS will beep once and start "Battery Test". The line between I/P and inverter icons will blink to remind users. This operation is used to check the battery status.	
	LCD display		
Fault status	Description	When UPS has fault happened, it will display fault messages in LCD panel.	
	LCD display		

5-9. Fault Code

Fault event	Fault code	Icon	Fault event	Fault code	Icon
Bus start failure	01	None	Battery SCR short circuited	21	None
Bus over	02	None	Inverter relay short circuited	24	None
Bus under	03	None	Charger short circuited	2a	None
Bus unbalance	04	None	Can communication fault	31	None
Inverter soft start failure	11	None	Parallel output current unbalance	36	None
High Inverter voltage	12	None	Over temperature	41	None
Low Inverter voltage	13	None	CPU communication failure	42	None
Inverter output short circuited	14	SHORT	Overload	43	OVER LOAD
Negative power fault	1A	None	Battery turn-on failure	6A	None
Inverter over current	60	None	PFC current failure in battery mode	6B	None
Inverter current detection error	6D	None	Bus voltage changes too fast	6C	None
Transformer over temperature	77	None	SPS 12V abnormal	6E	None

5-10. Warning Indicator

Warning	Icon (flashing)	Alarm
Battery low	LOW BATT.	Beeping every second
Overload	OVER LOAD	Beeping twice every second
Battery unconnected	BATT. FAULT	Beeping every second
Over charge		Beeping every second
EPO enable	EP	Beeping every second
Fan failure/Over temperature		Beeping every second
Charger failure		Beeping every second
I/P fuse broken		Beeping every second
Overload 3 times in 30min		Beeping every second

5-11. Warning Codes

Code	Event	Code	Event
01	Battery unconnected	10	L1 IP fuse broken
07	Over charge	21	Line situations are different in parallel system
08	Low battery	22	Bypass situations are different in parallel system
09	Overload	33	Locked in bypass after overload 3 times in 30min
0A	Fan failure	3A	Cover of maintenance switch is open
0B	EPO enable	3D	Bypass unstable
0D	Over temperature	3E	Boot loader is missing
0E	Charger failure	42	Over-temperature on transformer
44	Failure on parallel redundancy	45	Overload on parallel redundancy

6. Troubleshooting

If the UPS system does not operate correctly, please solve the problem by using the table below.

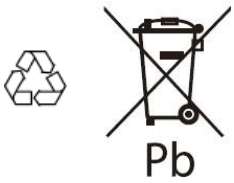
Symptom	Possible cause	Action
No indication and alarm even though the mains is normal.	The AC input power is not connected well.	Check if the input power cord / cable(s) is(are) firmly connected to the mains.
	The AC input is connected to the UPS output.	Plug AC input power cord / cable to AC input correctly.
The icon ⚠ and the warning code EP flash on LCD display and alarm is sounding.	EPO function is activated.	Set the circuit in closed position to disable EPO function.
The icons ⚠ and BATT. FAULT flash on LCD display and alarm sounds.	The external or internal batteries not connected.	Check if all batteries are correctly connected.
The icons of ⚠ , , and the warning code nC flash on LCD display. Alarm sounds.		
The icons of ⚠ , , and the warning code SF flash on LCD display. Alarm is sounding every 2 seconds.	Line and neutral conductors of UPS input are reversed.	Rotate mains power socket by 180° and then connect to UPS system.
Fault code is shown as 27 on LCD display and alarm is continuously sounding.	Battery voltage is too high or the charger is fault.	Contact your dealer.
Fault code is shown as 28 on LCD display and alarm is continuously sounding.	Battery voltage is too low or the charger is fault.	Contact your dealer.
The following icons: - ⚠ and OVER LOAD - ⚠ , , and OL flash on LCD display.	UPS is overloaded. Devices connected to the UPS are fed directly by the electrical network via the Bypass.	Remove excess loads from UPS output.
	After repetitive overloads, the UPS is locked in the Bypass mode. Connected devices are fed directly by the mains.	Remove excess loads from UPS output first. Then shut down the UPS and restart it.

Fault code is shown as 49 on LCD display and alarm sounds continuously.	The UPS shuts down automatically due too long overload situation	Remove excess loads from UPS output and restart it.
Fault code is shown as 43 and the icons or OVER LOAD are lighting on LCD display. Alarm sounds continuously.		
Fault code is shown as 14 or 2A and icon SHORT lights up on LCD display. Alarm sounds continuously.	Short circuit occurs on the charger output. The UPS automatically shuts down.	Check output wiring and whether connected devices are in short circuit status. Check whether battery wiring is in short circuit status.
Fault code is shown as 01, 02, 03, 11, 12, 13, 14, 1A, 21, 24, 36, 41, and 42 on LCD display and alarm sounds continuously.	A UPS internal fault has occurred. There are two possible results: 1. The load is still supplied, but directly from AC power via bypass. The load is no longer supplied by power.	Contact your dealer
Battery backup time is shorter than nominal value.	Batteries are not fully charged	Charge the batteries for at least 7 hours and then check capacity. If the problem persists, consult your dealer.
	Batteries defect	Contact your dealer to replace the battery.
Fault code is shown as 45 on LCD display. At the same time, alarm is continuously sounding.	The charger does not have output and battery voltage is less than 10V/PC.	Contact your dealer.
The icons ⚠ and flash on LCD display and alarm beeps every second.	- Fan is locked or not working. The UPS temperature is too high.	Check fans and notify dealer.

7. Storage and Maintenance

7-1. Operation

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case, please contact your dealer.



Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material.

7-2. Storage

Before storage, charge UPS batteries for 7 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C - 40°C	Every 3 months	1-2 hours
40°C - 45°C	Every 2 months	1-2 hours

7-3. Maintenance and recycle

The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.

Even after the unit is disconnected from the mains, components inside the UPS system are still connected to the battery packs which are potentially dangerous.

Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high rated capacitors, such as BUS-capacitors.

Only personnel adequately familiar with batteries and with the required precautionary measures may replace batteries and

supervise operations. Unauthorized personnel must be kept well away from the batteries.

Verify that no voltage between the battery terminals and the ground is present before maintenance or repair. In this product, the battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground.

Batteries may cause electric shock and have a high short-circuit current. Please remove all wristwatches, rings and other metal personal objects before maintenance or repair and only use tools with insulated grips and handles for maintaining or repairing.

When replacing the batteries, install the same number and same type.

Do not attempt to dispose of batteries by burning them. This could cause battery explosion. The batteries must be rightly deposed according to local regulation.

Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.

Please replace the fuse only with the same type and capacity to avoid fire hazards.

Do not disassemble the UPS system.

7-4. Recycle

Contact your local recycling or hazardous waste center for information on proper disposal of the used equipment.



The crossed-out wheeled bin symbol indicates that waste electrical and electronic equipment should not be discarded together with unseparated household waste but must be collected separately.

The product should be handed in for recycling in accordance with the local environmental regulations for waste disposal.

By separating waste electrical and electronic equipment, you will help reduce the volume of waste sent for incineration or land-fills and minimize any potential negative impact on human health and environment.

For proper battery replacement please proceed according to the steps in chapters 2 and 3.

8. External maintenance bypass module 1 – 3kVA

This accessory is used as an external power distribution unit in conjunction with Compaq+ HMS 110R/115R/120R/130R models. It allows to manually transfer the connected equipment to utility power via a bypass switch, permitting scheduled maintenance or UPS replacement without power interruption. Combined power distribution feature and the master-controlled design, it provides maintenance bypass function and power saving within a rack mechanism. Please, remember this unit does not come in the HMS product box and must be purchased separately.

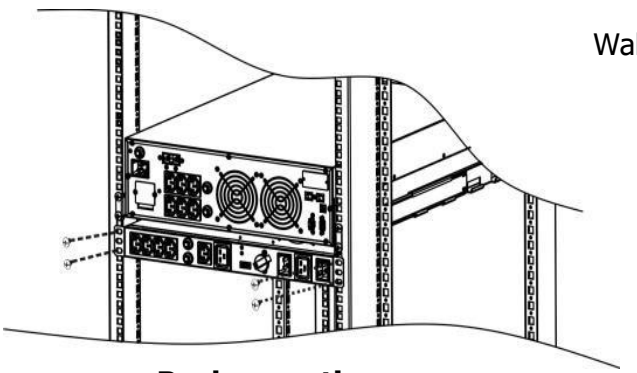
8-1. Rack Mount/Wall Mount the Unit

The module can be mounted to a 19” enclosure or wall. Please follow below chart for rack/wall mount installation.

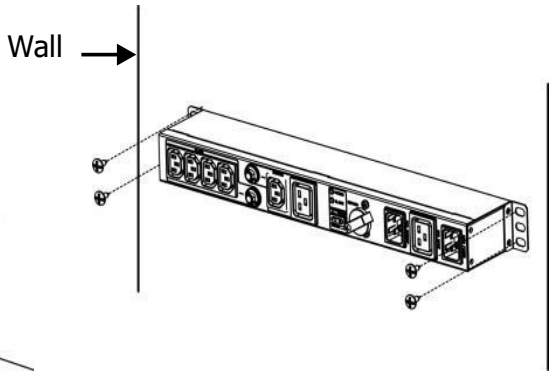
8-2. Inspection

Remove the unit from the shipping package and inspect it for damage that may occur during transportation. Notify the carrier and place of purchase if any damage is found. The shipping package contains:

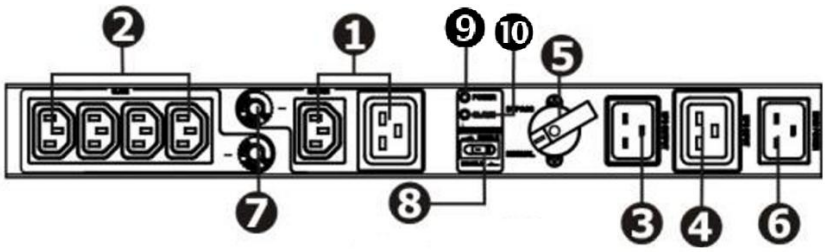
- Maintenance bypass switch module x 1
- Mains power cord x 1
- Screws and mounting ears



Rack mounting



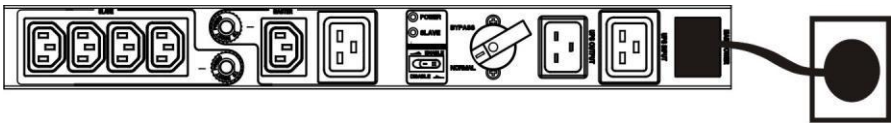
Wall mounting



❶ Master output receptacle (for connecting loads)
❷ Slave output receptacles (for connecting peripherals)
❸ Socket to UPS output
❹ Socket to UPS input
❺ Bypass switch
❻ AC input
❼ Circuit breaker
❽ Master/Slave function switch
❾ Power LED
❿ Slave On LED

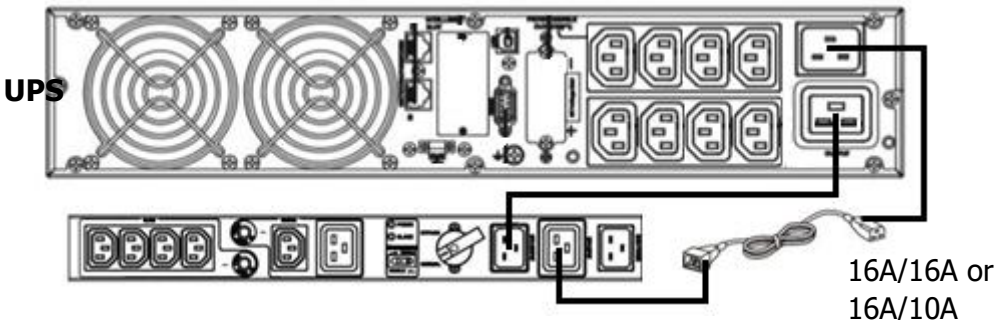
8-3. Connect to the Wall Outlet

Plug the input power cord of the unit to the wall outlet. The Power LED will light up when the mains is normal. The Power LED will be off while power failure.



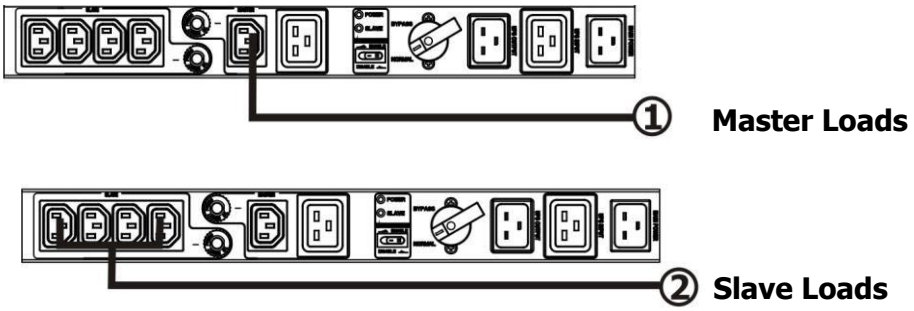
8-4. Connect UPS

Connect a power cord from UPS input to UPS input socket on the unit. Use one power cord to connect UPS output to UPS output socket on the unit.



8-5. Connect Equipment

There are two types of output receptacles: Master, and Slave.
To save power consumption, the unit is equipped with Master and Slave output receptacles. The Master output receptacle will sense if master device (computer) is on. If the master device is no longer drawing current, it will automatically shut down the power to the Slave output receptacles. Please refer to below charts for detailed equipment connection.



NOTE: When the computer is turned off, the Master output receptacle shuts off power to the slave output receptacles. However, when the computer goes into "sleep mode" or the power consumption of connected device to Master output receptacle is below 20 W, the Master output receptacle may not properly recognize the reduced power level.

8-6. Transfer to Maintenance Bypass

1) Before transferring to maintenance bypass, make sure the Power LED is lighting.
2) Transfer the UPS to bypass following the steps described at chapter 4.
3) Transfer the rotary bypass switch from "Normal" to "Bypass". At this time, all connected devices are powered by the utility power directly.
4) You may turn off the UPS and disconnect two cables connecting to UPS. Then you may now service the UPS.

8-7. Transfer to UPS Protection

1) After maintenance service is done, make sure the UPS works properly.
2) Then, reconnect UPS to the unit by following instruction at this section. Verify the Power LED is lighting.
3) Transfer the UPS to bypass mode.
4) Then transfer the rotary bypass switch from "Bypass" to "Normal".
5) Transfer the UPS to normal mode. Now, all connected devices are protected by UPS.

8-8. Master/Slave Function Operation

After connecting all devices to the unit, press "Master/Slave switch" to enable status (⏥).
The Slave On LED will light up when connecting load on master output is above 20W. Press "Master/Slave switch" to disable status (⏤), the function is disabled and the Slave On LED will be on.

Status & Indicator Table

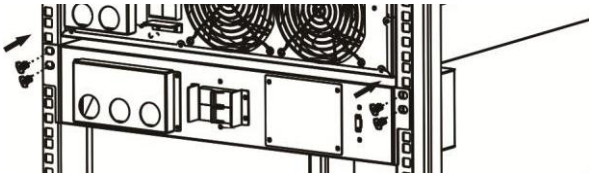
Status	Indicator
Utility is normal. Utility fails but UPS is providing power.	Power LED (Green) on
Utility fails	Power LED (Green) off
Master/Slave function is enabled and the connecting load on master output is above 20W.	Slave On LED (Yellow) on
Master/Slave function is enabled and the connecting load on master output is below 20W.	Slave On LED (Yellow) off
Master/Slave function is disabled.	Slave on LED (Yellow) on

9. External maintenance bypass module 6 – 10kVA

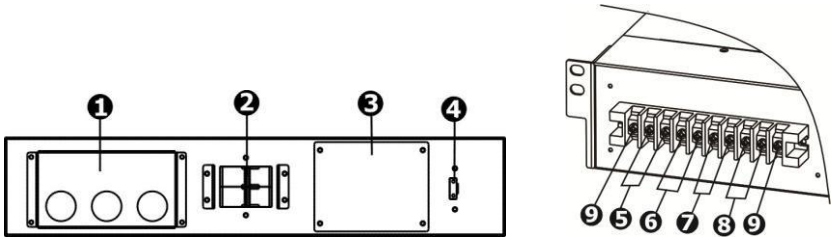
The module is used as an external maintenance bypass switch to provide continuous power without shutting down the connected loads during UPS scheduled maintenance or battery replacement. It's perfect to use in conjunction with Compaq+ HMS 160RL and HMS 1100RL UPS. Please, remember this unit does not come in the HMS product box and must be purchased separately.

9-1. Rack Mount the Unit

The module can be mounted to a 19" enclosure. Please follow below chart for rack mount installation.



9-2. Overview



Rear panel View & terminal overview

❶Input/Output terminal (details in at ❺-❾)
❷UPS input breaker
❸Maintenance bypass switch
❹Control output signal slot
❺Output terminal
❻UPS output terminal
❼UPS input terminal
❽Utility input terminal
❾Grounding terminals

9-3. Inspection

Unpack the package and check the package contents. The shipping package contains:

- Maintenance bypass switch module x 1
- Quick guide x 1
- Control signal cable x 1

NOTE: Before installation, please inspect the unit. Be sure that nothing inside the package is damaged during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or some parts are missing. Please keep the original package in a safe place for future use.

9-4. Initial Setup

The Installation and wiring must be performed in accordance with the local electric laws/regulations and execute the following instructions by professional personnel.

Make sure the mains wire and breakers in the building are enough for the rated capacity of UPS to avoid the hazards of electric shock or fire.

NOTE: Do not use the wall receptacle as the input power source for the UPS, as its rated current is less than the UPS's maximum input current. Otherwise, the receptacle may be burned and destroyed.

1) Switch off the mains switch in the building before installation.
2) Turn off and shut down the connected UPS.
3) Prepare wires based on the following table:

UPS Model	Wire Spec (AWG)
HMS 160RL	10
HMS 1100RL	8

NOTE 1: The cable for HMS 160RL should be able to withstand over 40A current. It is recommended to use 10AWG or thicker wire for safety and efficiency.
NOTE 2: The cable for HMS 1100RL should be able to withstand over 63A current. It is recommended to use 8AWG or thicker wire for safety and efficiency.
NOTE 3: The selections for color of wires should be followed by the local electrical laws and regulations.

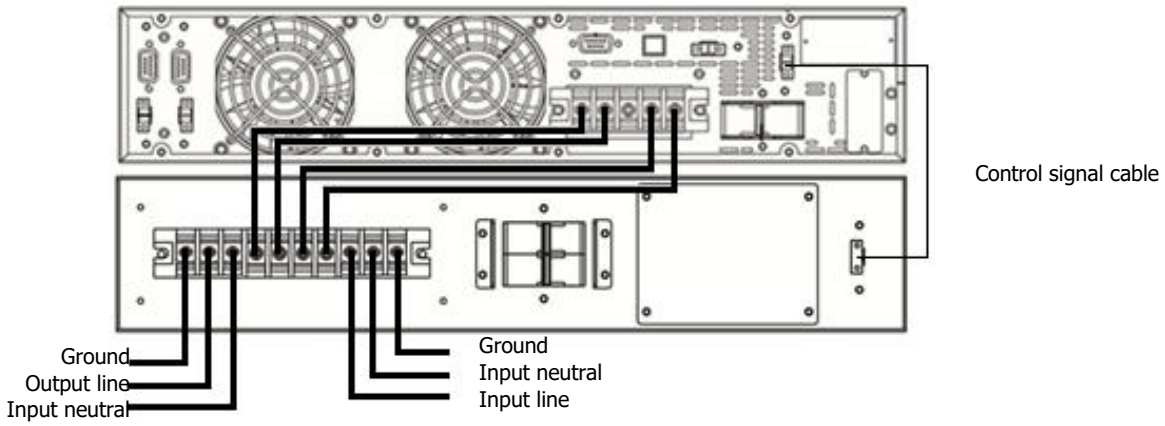
4) Remove the terminal block cover on the rear panel of the module. Then connect the wires according to the following terminal block diagrams:

9-5. Connect UPS and External Maintenance Bypass Switch Module

Remove the terminal block cover on the rear panel of the module. Then connect output terminals of UPS to output terminals of switch module. Connect utility input terminals of UPS to switch module's UPS input terminals. Connect signal slots of UPS

and switch module with control signal cable attached to the package.

Refer to the following terminal block diagrams:



NOTE: Make sure that the wires are connected tightly with the terminals. Put the terminal block cover back to the rear panel.

9-6. Transfer to Maintenance Bypass

To transfer to maintenance bypass from UPS, follow the below steps:
Step 1: Press "OFF" button of UPS unit to transfer to bypass mode.
Step 2: Open the maintenance switch cover. If step 1 is not executed first, then UPS unit will transfer to bypass mode automatically with control output signal connection when opening the maintenance switch cover.
Step 3: Transfer rotary switch to "BPS" position and switch off UPS input breaker on the module. Then, all devices are directly powered by utility and there is no current through the UPS. The output and input of UPS are isolated from the system. You may now service or maintain the UPS by shutting down the batteries of UPS.

9-7. Transfer to UPS Protection

After maintenance service is done, follow below steps to transfer back to UPS operation.

Step 1: Switch on the input breaker of the module and reconnect UPS battery input breaker.
Then UPS will enter to bypass mode.
Step 2: Transfer rotary switch to "UPS" position. Then, all devices are powered by utility through UPS bypass mode.
Step 3: Close back maintenance switch cover and press "ON" button of UPS unit.
Then, all devices are protected by the UPS.

NOTE: If maintenance will be executed in another place, before removing the UPS and the module, please follow steps of "Transfer to Maintenance Bypass" and then disconnect all wires between UPS and the module for complete isolation.

9-8. Specification of Critical Components

Parameter		Max.
Input breaker	Current	63 A
	Voltage	250 V
Bypass switch	Current	63 A
	Voltage	690 V
Input/Output terminal	Current	60 A
	Voltage	600 V

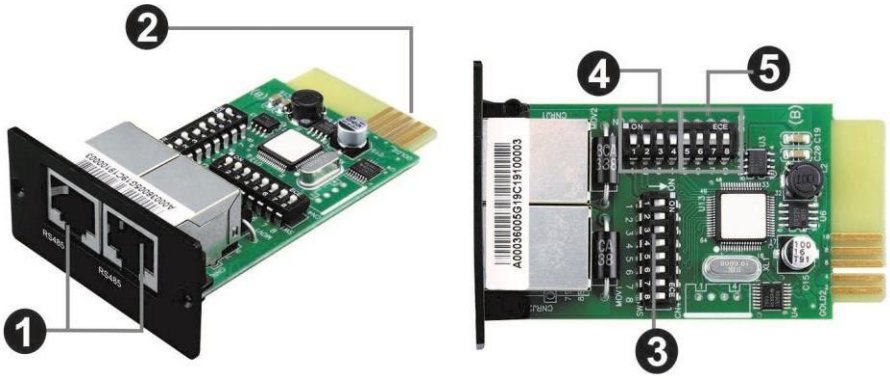
10. Modbus Card Quick Guide

This chapter contains instructions and warnings that should be followed during the installation, operating and storage of the card. Please, remember this card does not come in the HMS product box and must be purchased separately. Keep this manual for further reference.

10-1. Special Precautions

- If the card must be stored prior to installation, storage must be in a dry place
- The admissible storage temperature range is from -10ºC to +70ºC.

10-2. Product Overview



❶ RS-485 port
❷ Golden finger
❸ Address switch
❹ Communication setting
❺ Resistance switch

10-3. Product Introduction

The Modbus card provides UPS systems with the functionality of communication with PCs through MODBUS protocol:

- Implements MODBUS RTU protocol.
- Provides MODBUS functions including read Holding Registers and write Registers.
- Provides RS485 interface.
- Provides surge protection.

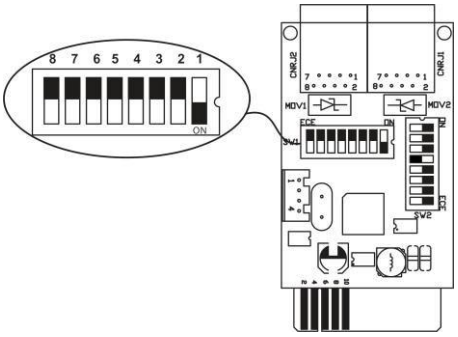
10-4. Installation and Operation

Follow the steps below to install and use this Modbus card:

- Configure Modbus ID (Refer to section 10-5 for the details)
- Configure communication format (Refer to section 10-5 for the details)
- Insert this Modbus card into intelligent slot.
- Connect Modbus card to computer with RJ45 cable, and it is not necessary to turn the UPS. (Refer to section 10-5 for the details).

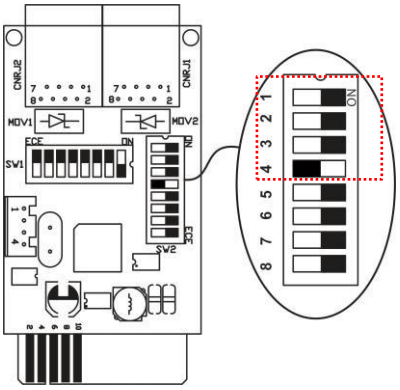
10-5. Configuration

Machine ID Configuration



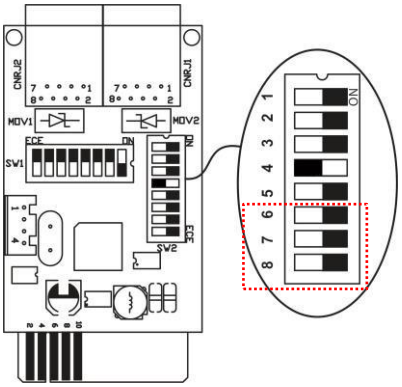
There are eight bits to present ID of eacl card. Use SW1 to set machine ID. From left to right, it's 8 to 1. As shown, when the switch is pushed down, the bit is set to "one". Otherwise, the bit is set as zero. The ID of Modbus card is set to 0x01 as image shows. Please check appendix for detailed ID no. and SW1 setting.

Communication format configuration



Function	Bit Setting		Meaning
Baud rate	# 2	# 1	
	OFF	OFF	2400bps
	OFF	ON	4800bps
	ON	OFF	9600bps
	ON	ON	19200bps (default)
Parity check	# 4	# 3	
	OFF	OFF	Even parity
	ON	OFF	Odd parity
	OFF	ON	No parity check 1 stop bits (Default)
	ON	ON	No parity check 2 stop bits

RS – 485 Resistance configuration

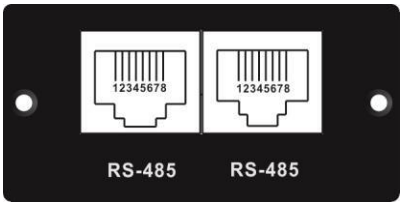


Function	Bit #	Setting	Meaning
Push up resistance	# 6	ON	Enable (Default)
		OFF	Disable
Push down resistance	# 7	ON	Enable (Default)
		OFF	Disable
Terminate resistance	# 8	ON	Enable (Default)
		OFF	Disable

Interface configuration

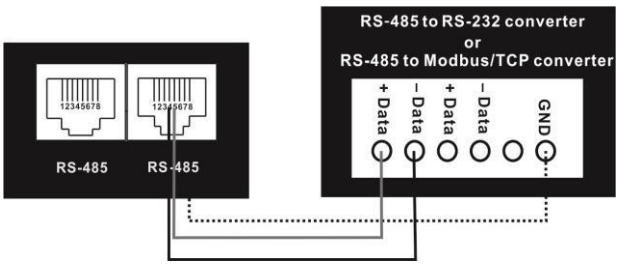
RS-485 Pin Configuration

Pin	Function
4	RS-485 - B
5	RS-485 - A
8	GND



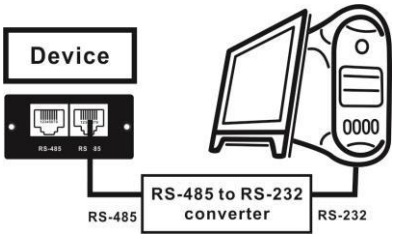
Connection

First, please use one RS485 to RS 232 converter or RS-485 to Modbus/TCP converter as media converter between Modbus card and computer. You also can use a PMU as media converter between Modbus card and PLC (Power Line Carrier) to transfer data through the grid. Please follow below image for wiring connection between RJ45 and media converter:

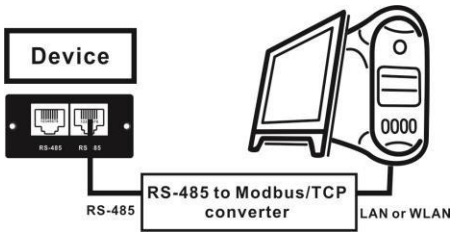


Wiring connection between RJ45 and media converter

Then, follow the diagram below to connect personal computers:



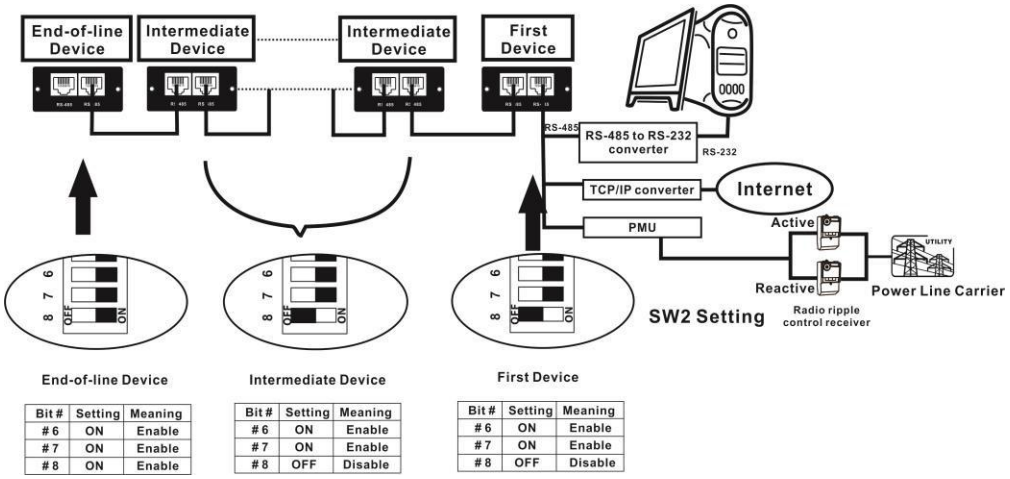
Using RS-485 to RS-232 converter



Use RS-485 to Modbus/TCP converter

10-6. Multiple Monitoring

One Modbus card only can be used in one UPS at the same time. When each UPS installed with one Modbus card, up to 31 UPSs can be monitored from a single computer.



Bit #	Setting	Meaning
#6	ON	Enable
#7	ON	Enable
#8	ON	Enable

Bit #	Setting	Meaning
#6	ON	Enable
#7	ON	Enable
#8	OFF	Disable

Bit #	Setting	Meaning
#6	ON	Enable
#7	ON	Enable
#8	OFF	Disable

10-7. Machine ID Configuration Table (SW1) √=ON ×=OFF

SW1 / ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
1	√	×	×	×	×	×	×	×
2	×	√	×	×	×	×	×	×
3	√	√	×	×	×	×	×	×
4	×	×	√	×	×	×	×	×
5	√	×	√	×	×	×	×	×
6	×	√	√	×	×	×	×	×
7	√	√	√	×	×	×	×	×
8	×	×	×	√	×	×	×	×
9	√	×	×	√	×	×	×	×
10	×	√	×	√	×	×	×	×
11	√	√	×	√	×	×	×	×
12	×	×	√	√	×	×	×	×
13	√	×	√	√	×	×	×	×
14	×	√	√	√	×	×	×	×
15	√	√	√	√	×	×	×	×
16	×	×	×	×	√	×	×	×
17	√	×	×	×	√	×	×	×
18	×	√	×	×	√	×	×	×
19	√	√	×	×	√	×	×	×
20	×	×	√	×	√	×	×	×
21	√	×	√	×	√	×	×	×
22	×	√	√	×	√	×	×	×
23	√	√	√	×	√	×	×	×
24	×	×	×	√	√	×	×	×
25	√	×	×	√	√	×	×	×
26	×	√	×	√	√	×	×	×
27	√	√	×	√	√	×	×	×
28	×	×	√	√	√	×	×	×
29	√	×	√	√	√	×	×	×
30	×	√	√	√	√	×	×	×
31	√	√	√	√	√	×	×	×
32	×	×	×	×	×	√	×	×
33	√	×	×	×	×	√	×	×
34	×	√	×	×	×	√	×	×
35	√	√	×	×	×	√	×	×
36	×	×	√	×	×	√	×	×
37	√	×	√	×	×	√	×	×
38	×	√	√	×	×	√	×	×
39	√	√	√	×	×	√	×	×

SW1 / ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
40	×	×	×	√	×	√	×	×
41	√	×	×	√	×	√	×	×
42	×	√	×	√	×	√	×	×
43	√	√	×	√	×	√	×	×
44	×	×	√	√	×	√	×	×
45	√	×	√	√	×	√	×	×
46	×	√	√	√	×	√	×	×
47	√	√	√	√	×	√	×	×
48	×	×	×	×	√	√	×	×
49	√	×	×	×	√	√	×	×
50	×	√	×	×	√	√	×	×
51	√	√	×	×	√	√	×	×
52	×	×	√	×	√	√	×	×
53	√	×	√	×	√	√	×	×
54	×	√	√	×	√	√	×	×
55	√	√	√	×	√	√	×	×
56	×	×	×	√	√	√	×	×
57	√	×	×	√	√	√	×	×
58	×	√	×	√	√	√	×	×
59	√	√	×	√	√	√	×	×
60	×	×	√	√	√	√	×	×
61	√	×	√	√	√	√	×	×
62	×	√	√	√	√	√	×	×
63	√	√	√	√	√	√	×	×
64	×	×	×	×	×	×	√	×
65	√	×	×	×	×	×	√	×
66	×	√	×	×	×	×	√	×
67	√	√	×	×	×	×	√	×
68	×	×	√	×	×	×	√	×
69	√	×	√	×	×	×	√	×
70	×	√	√	×	×	×	√	×
71	√	√	√	×	×	×	√	×
72	×	×	×	√	×	×	√	×
73	√	×	×	√	×	×	√	×
74	×	√	×	√	×	×	√	×
75	√	√	×	√	×	×	√	×
76	×	×	√	√	×	×	√	×
77	√	×	√	√	×	×	√	×
78	×	√	√	√	×	×	√	×
79	√	√	√	√	×	×	√	×
80	×	×	×	×	√	×	√	×
81	√	×	×	×	√	×	√	×

SW1 / ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
82	×	√	×	×	√	×	√	×
83	√	√	×	×	√	×	√	×
84	×	×	√	×	√	×	√	×
85	√	×	√	×	√	×	√	×
86	×	√	√	×	√	×	√	×
87	√	√	√	×	√	×	√	×
88	×	×	×	√	√	×	√	×
89	√	×	×	√	√	×	√	×
90	×	√	×	√	√	×	√	×
91	√	√	×	√	√	×	√	×
92	×	×	√	√	√	×	√	×
93	√	×	√	√	√	×	√	×
94	×	√	√	√	√	×	√	×
95	√	√	√	√	√	×	√	×
96	×	×	×	×	×	√	√	×
97	√	×	×	×	×	√	√	×
98	×	√	×	×	×	√	√	×
99	√	√	×	×	×	√	√	×
100	×	×	√	×	×	√	√	×
101	√	×	√	×	×	√	√	×
102	×	√	√	×	×	√	√	×
103	√	√	√	×	×	√	√	×
104	×	×	×	√	×	√	√	×
105	√	×	×	√	×	√	√	×
106	×	√	×	√	×	√	√	×
107	√	√	×	√	×	√	√	×
108	×	×	√	√	×	√	√	×
109	√	×	√	√	×	√	√	×
110	×	√	√	√	×	√	√	×
111	√	√	√	√	×	√	√	×
112	×	×	×	×	√	√	√	×
113	√	×	×	×	√	√	√	×
114	×	√	×	×	√	√	√	×
115	√	√	×	×	√	√	√	×
116	×	×	√	×	√	√	√	×
117	√	×	√	×	√	√	√	×
118	×	√	√	×	√	√	√	×
119	√	√	√	×	√	√	√	×
120	×	×	×	√	√	√	√	×
121	√	×	×	√	√	√	√	×
122	×	√	×	√	√	√	√	×
123	√	√	×	√	√	√	√	×

SW1 / ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
124	×	×	√	√	√	√	√	×
125	√	×	√	√	√	√	√	×
126	×	√	√	√	√	√	√	×
127	√	√	√	√	√	√	√	×
128	×	×	×	×	×	×	×	√
129	√	×	×	×	×	×	×	√
130	×	√	×	×	×	×	×	√
131	√	√	×	×	×	×	×	√
132	×	×	√	×	×	×	×	√
133	√	×	√	×	×	×	×	√
134	×	√	√	×	×	×	×	√
135	√	√	√	×	×	×	×	√
136	×	×	×	√	×	×	×	√
137	√	×	×	√	×	×	×	√
138	×	√	×	√	×	×	×	√
139	√	√	×	√	×	×	×	√
140	×	×	√	√	×	×	×	√
141	√	×	√	√	×	×	×	√
142	×	√	√	√	×	×	×	√
143	√	√	√	√	×	×	×	√
144	×	×	×	×	√	×	×	√
145	√	×	×	×	√	×	×	√
146	×	√	×	×	√	×	×	√
147	√	√	×	×	√	×	×	√
148	×	×	√	×	√	×	×	√
149	√	×	√	×	√	×	×	√
150	×	√	√	×	√	×	×	√
151	√	√	√	×	√	×	×	√
152	×	×	×	√	√	×	×	√
153	√	×	×	√	√	×	×	√
154	×	√	×	√	√	×	×	√
155	√	√	×	√	√	×	×	√
156	×	×	√	√	√	×	×	√
157	√	×	√	√	√	×	×	√
158	×	√	√	√	√	×	×	√
159	√	√	√	√	√	×	×	√
160	×	×	×	×	×	√	×	√
161	√	×	×	×	×	√	×	√
162	×	√	×	×	×	√	×	√
163	√	√	×	×	×	√	×	√
164	×	×	√	×	×	√	×	√
165	√	×	√	×	×	√	×	√

SW1 / ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
166	×	√	√	×	×	√	×	√
167	√	√	√	×	×	√	×	√
168	×	×	×	√	×	√	×	√
169	√	×	×	√	×	√	×	√
170	×	√	×	√	×	√	×	√
171	√	√	×	√	×	√	×	√
172	×	×	√	√	×	√	×	√
173	√	×	√	√	×	√	×	√
174	×	√	√	√	×	√	×	√
175	√	√	√	√	×	√	×	√
176	×	×	×	×	√	√	×	√
177	√	×	×	×	√	√	×	√
178	×	√	×	×	√	√	×	√
179	√	√	×	×	√	√	×	√
180	×	×	√	×	√	√	×	√
181	√	×	√	×	√	√	×	√
182	×	√	√	×	√	√	×	√
183	√	√	√	×	√	√	×	√
184	×	×	×	√	√	√	×	√
185	√	×	×	√	√	√	×	√
186	×	√	×	√	√	√	×	√
187	√	√	×	√	√	√	×	√
188	×	×	√	√	√	√	×	√
189	√	×	√	√	√	√	×	√
190	×	√	√	√	√	√	×	√
191	√	√	√	√	√	√	×	√
192	×	×	×	×	×	×	√	√
193	√	×	×	×	×	×	√	√
194	×	√	×	×	×	×	√	√
195	√	√	×	×	×	×	√	√
196	×	×	√	×	×	×	√	√
197	√	×	√	×	×	×	√	√
198	×	√	√	×	×	×	√	√
199	√	√	√	×	×	×	√	√
200	×	×	×	√	×	×	√	√
201	√	×	×	√	×	×	√	√
202	×	√	×	√	×	×	√	√
203	√	√	×	√	×	×	√	√
204	×	×	√	√	×	×	√	√
205	√	×	√	√	×	×	√	√
206	×	√	√	√	×	×	√	√
207	√	√	√	√	×	×	√	√

SW1 / ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
208	×	×	×	×	√	×	√	√
209	√	×	×	×	√	×	√	√
210	×	√	×	×	√	×	√	√
211	√	√	×	×	√	×	√	√
212	×	×	√	×	√	×	√	√
213	√	×	√	×	√	×	√	√
214	×	√	√	×	√	×	√	√
215	√	√	√	×	√	×	√	√
216	×	×	×	√	√	×	√	√
217	√	×	×	√	√	×	√	√
218	×	√	×	√	√	×	√	√
219	√	√	×	√	√	×	√	√
220	×	×	√	√	√	×	√	√
221	√	×	√	√	√	×	√	√
222	×	√	√	√	√	×	√	√
223	√	√	√	√	√	×	√	√
224	×	×	×	×	×	√	√	√
225	√	×	×	×	×	√	√	√
226	×	√	×	×	×	√	√	√
227	√	√	×	×	×	√	√	√
228	×	×	√	×	×	√	√	√
229	√	×	√	×	×	√	√	√
230	×	√	√	×	×	√	√	√
231	√	√	√	×	×	√	√	√
232	×	×	×	√	×	√	√	√
233	√	×	×	√	×	√	√	√
234	×	√	×	√	×	√	√	√
235	√	√	×	√	×	√	√	√
236	×	×	√	√	×	√	√	√
237	√	×	√	√	×	√	√	√
238	×	√	√	√	×	√	√	√
239	√	√	√	√	×	√	√	√
240	×	×	×	×	√	√	√	√
241	√	×	×	×	√	√	√	√
242	×	√	×	×	√	√	√	√
243	√	√	×	×	√	√	√	√
244	×	×	√	×	√	√	√	√
245	√	×	√	×	√	√	√	√
246	×	√	√	×	√	√	√	√
247	√	√	√	×	√	√	√	√

11. SNMP user Guide

This SNMP web pro can provide web server to monitor and manage multiple UPSs in a networked environment including LAN and INTERNET. It can detect temperature and humidity for the environment via connecting to EMD (Environmental Monitoring Device). The same port is also applied for data transmission. Simply connect to SMS modem for SMS sending with a RJ11 to DB9 cable.

Integrated with Shutdown Wizard, it can not only prevent data loss from power outage and safely shutdown systems but also store programming data and scheduled shut down the UPS. All UPS warning and fault event records can be kept in SNMP web pro.

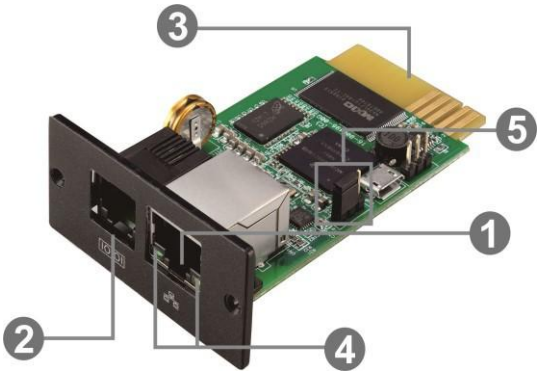
Integrated with ViewPower Pro software, it can monitor and remote access all distributed devices with SNMP web pro card within a LAN or in the INTERNET. For the detailed operations, please check user manual of ViewPower Pro. Please, remember this card does not come in the HMS product box and must be purchased separately.

Features

- Open monitor via Web Browser.
- Offer SNMP MIB to monitor UPS status.
- Automatically detect and exchange 10M/100M Fast Ethernet.
- Support wake-on-LAN function.
- Supported protocol such as TCP/IP, UDP, SNMP, SMTP, SNTP, HTTP, HTTPS, SSL, SSH, IPV4/IPV6, DHCP and so on.
- Integrated with Shutdown Wizard, it can prevent data loss from power outage and safely shut down systems.
- Able to store event log more than 200,000 threads, including UPS warnings, faults and EMD warnings, operation data logs from web users or ViewPower pro users. It will be stored safely without loss even when power failure occurs.
- Support daily reports for event log and data log.
- Scheduled UPS on/off and battery test.
- Support EMD monitoring and SMS sending.
- Equipped with real-time clock to record log with date and keep running up to 7 days without power connected.

11-1. Overlook

❶ Ethernet port (10/100Base-T)
❷ Sensor port/data transmission port
❸ Golden finger: connects to UPS slot
❹ Ethernet port status LEDs
❺ Jumper setting to restore default setting



Ethernet Port Status LED:

100M LED (Green)	On	Port is operating at 100Mbit/s
	Off	Current web bandwidth is 10Mbit/s
Link status LED (Yellow)	Flash	Link Active
	Off	Card is not connected to the network

Pin assignment for jumper:

Pin #	Status	Description
Pin 1 & Pin 2	Closed	Normal operation
Pin 2 & Pin 3	Closed	After re-connecting utility, the IP address of SNMP web card and password will restore to default setting. Default static IP address: (192.168.102.230) Default password: 12345678

NOTICE: After setting is restored to default, be sure to change the jumper setting to connect Pin 1 and Pin 2 for normal operation.

11-2. Installation and Connection

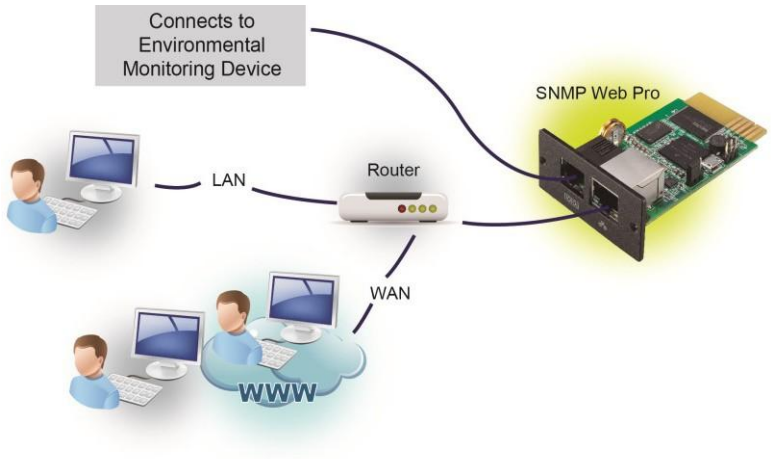
If using SNMP web card, please follow the steps below to install card first:

Step 1: Remove the cover of intelligent slot on the back panel of UPS and retain the screws.

Step 2: Slide the card into the open slot and secure with the screws from step 1.

Step 3: Plug Ethernet cable to the Ethernet port (RJ-45) on the SNMP web manager. **Step 4:** Use one more Ethernet cable. Connect one end to the sensor port on the SNMP web manager and the other end to the optional environmental monitoring device.

For connecting the SNMP web pro refer to next figure:

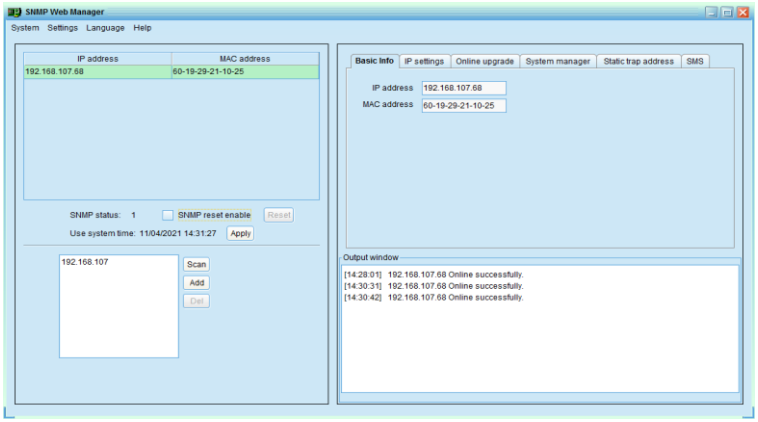


11-3. Configuration

a) Please install SNMP web manager wizard on your PC. After software is installed successfully, the Installer will leave a shortcut icon on your desktop.

b) Enter specific IP address to search all SNMP devices in LAN. The SNMP web manager is default applied static IP address as 192.168.102.230, default subnet mask as 255.255.255.0, and default gateway as

192.168.102.254. Users can modify IP address or apply DHCP mode through web server of SNMP web pro card, SSH Client or SNMP Web Manager.



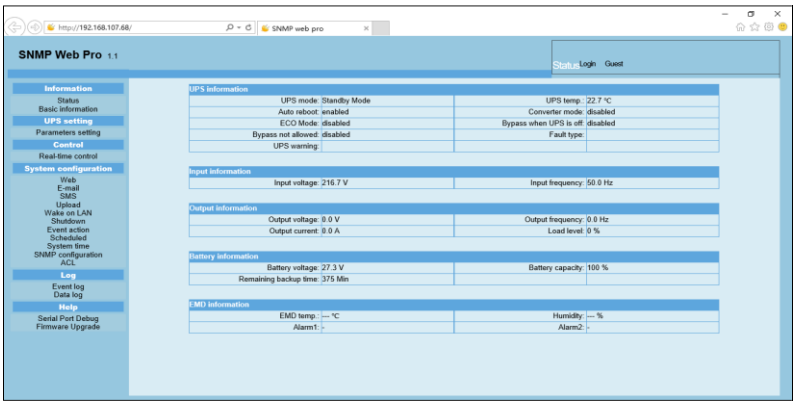
c) User can modify IP setting, online upgrade, password management, and static trap address setting in SNMP Web Manager screen. It is necessary to enter password for any medications. The default password is 12345678.

Please check SNMP Web Manager User Manual for detailed configuration.

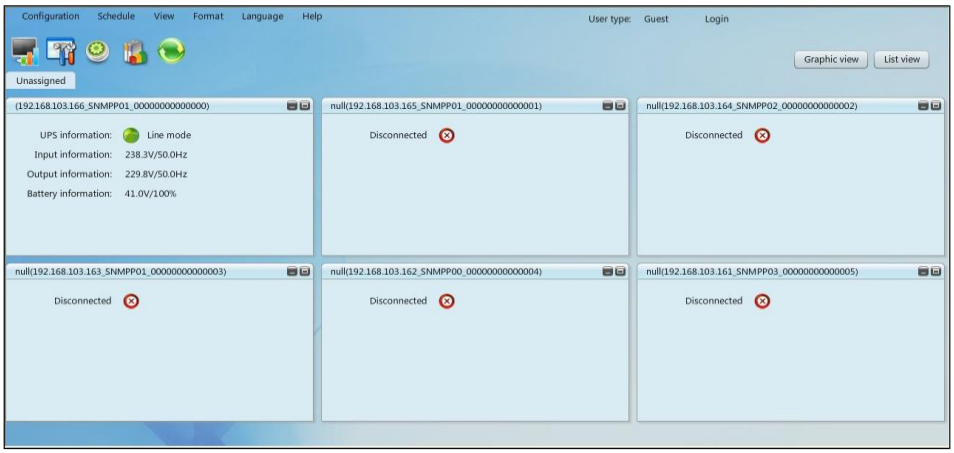
11-4. Monitoring

There are two ways to monitor:

- Double click the selected device from the device list (refer to previous figure) to open web page as shown in next figure; Or simply enter https address (http://192.168.107.68) in web browser to access web server directly.

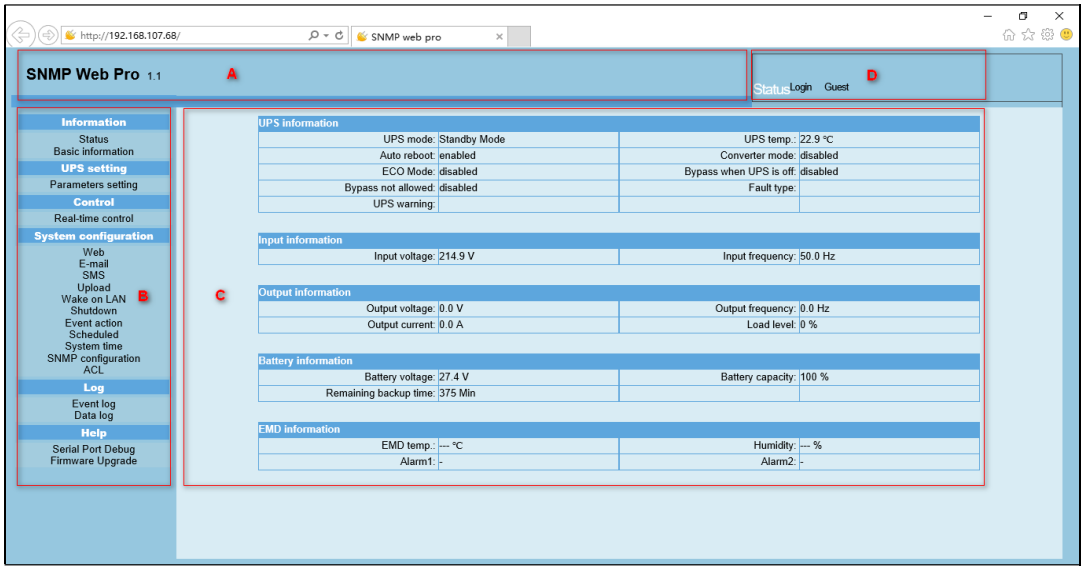


Installed ViewPower Pro software to monitor SNMP web pro. (See next figure). Please check ViewPower Pro User Manual for detailed monitoring.



11-5. SNMP web pro GUI

SNMP web pro GUI includes function menu, login section and main screen.



A. SNMP web pro GUI version

B. Function Menu

It offers complete tool-set for navigation and setting the GUI.

C. Main Screen

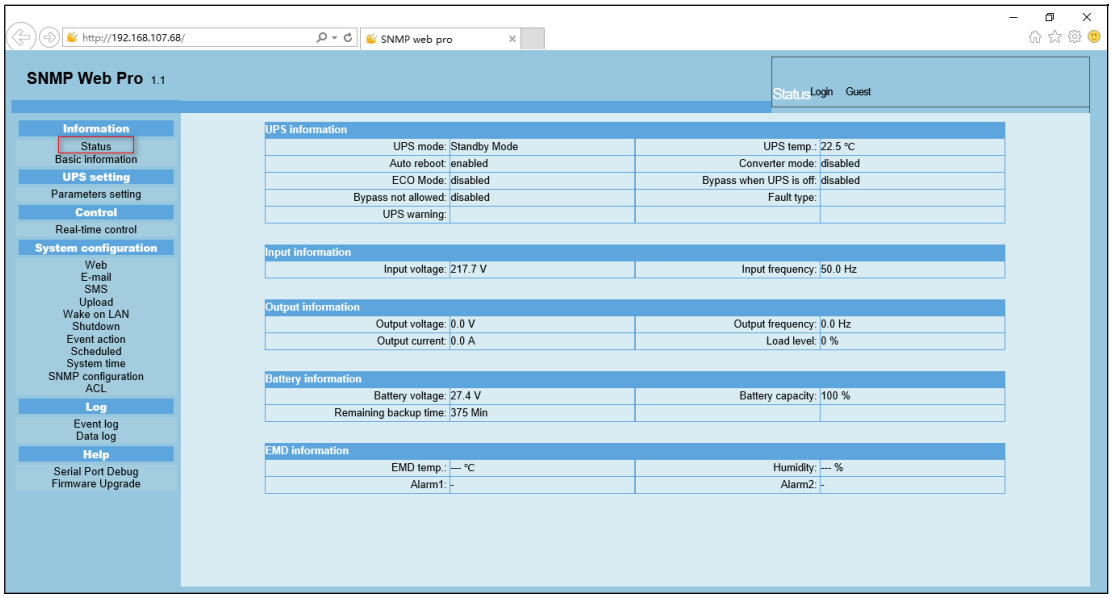
It will display information and/or control alternatives according to function menu selected.

D. Login section

It shows user type for current login user. The default password for administrator is “12345678”.

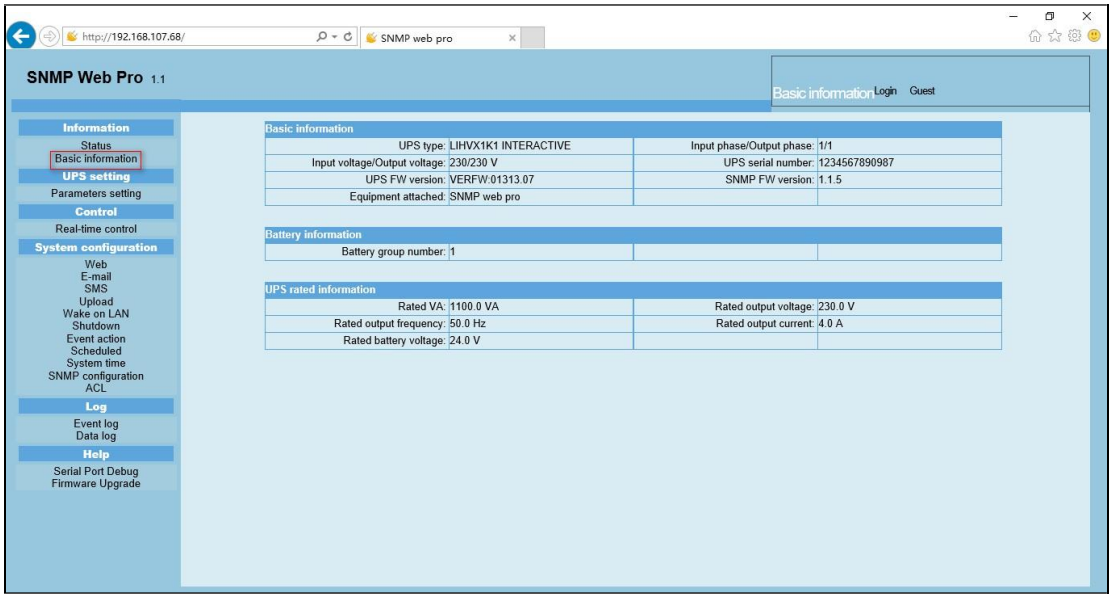
11-6. Information

It's shown real-time monitored UPS data including input, output, UPS, battery information and environmental information in table format.



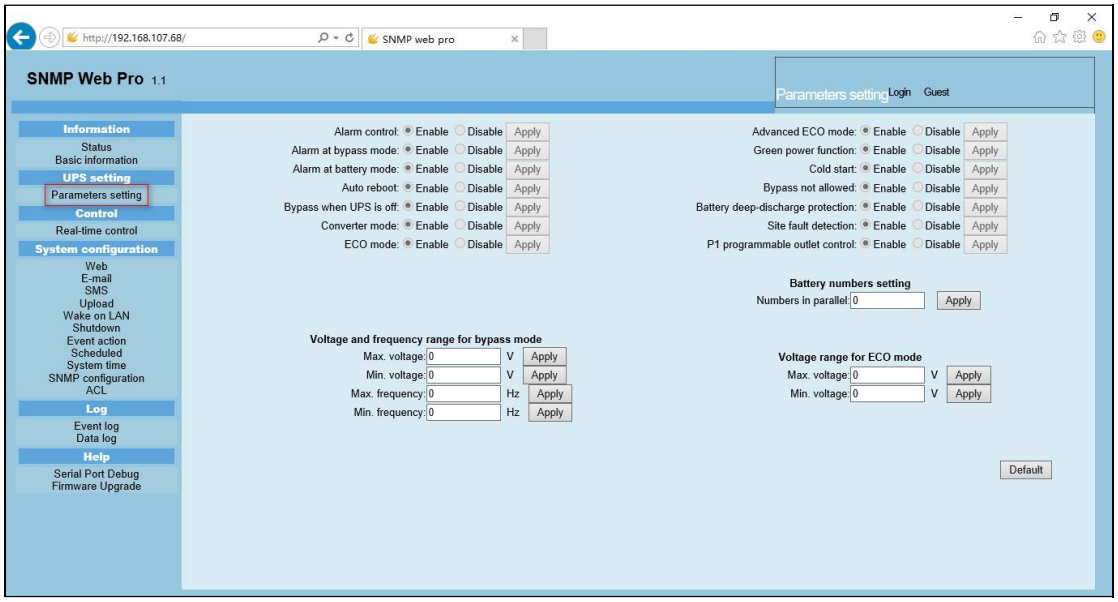
Basic information

Select Information>>Basic information. It includes UPS basic information, battery information and UPS rated information.



Parameters setting

Some UPS functions can be set and changed via software. Parameter setting includes backup time setting for programmable outlet (P1), battery number setting, voltage and frequency range setting for bypass mode and voltage range setting for ECO mode.



Note: Different UPS may access different parameter setting.

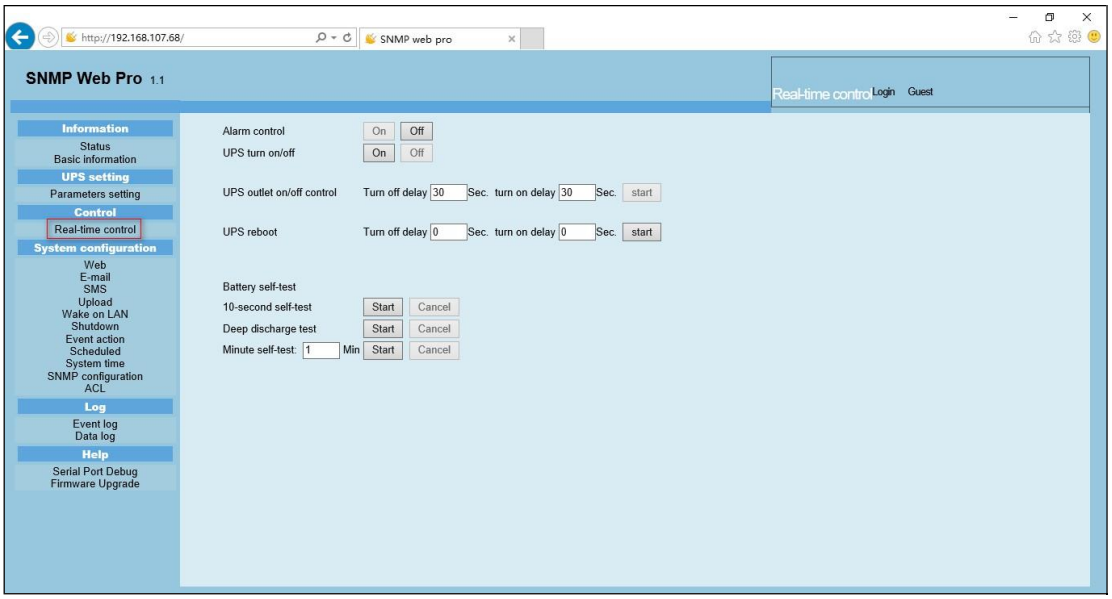
1. Select the functions by clicking "Enable" or "Disable" button. Change the numbers by clicking up-down arrows or modify the numbers directly in the number column.
2. Click "Apply" button to save the settings. Each function setting is saved by clicking "Apply" button in each section.
3. Click "Default" button to recover the default setting.

Note: Any functions which are not supported by UPS will not be able to access.

- Alarm Control: If enabled, UPS alarm will be activated. Vice versa.
- Alarm at bypass mode: If enabled, UPS alarms when it's working at bypass mode. Vice versa.
- Alarm at battery mode: If disabled, UPS will not alarm when it's working at battery mode. Vice versa.
- Auto reboot: If enabled, UPS will auto recover when AC is recovering. Vice versa.

- Bypass when UPS is off: If enabled, AC will directly provide power to connected devices when UPS is off. Vice versa.
- Converter mode: If enabled, the UPS will operate in converter mode. Vice versa.
- ECO mode: If enabled, the UPS will operate in ECO mode when input voltage is within acceptable range. Vice versa.
- Battery open status check: If enabled, the monitored UPS will check if the battery connection is ok or not when UPS is turned on.
- Cold start: If disabled, the UPS can be turned on only when AC is normally connected to UPS. Vice versa.
- Bypass not allowed: If enabled, the UPS will not transfer to bypass mode under any conditions. If disabled, the UPS will be allowed to transfer to bypass mode according to UPS internal setting.
- Battery deep-discharge protection: If enabled, the monitored UPS shuts down in accordance with the condition of battery and load on battery mode to protect battery. Vice versa.
- Site fault detection: If enabled, the monitored UPS will beep when the input neutral and hot wires are reversed. Vice versa.
- P1 Programmable outlet control (battery mode): If enabled, when UPS is running at battery mode, it will cut off P1 outlets after backup setting time arrives. If disabled, UPS will provide continuous power to P1 outlets until the battery is running out.
- Outlet setting: Users can set limited backup time for P1 outlets when UPS is on battery mode.
- Battery numbers setting: Set battery numbers in parallel.
- Voltage and frequency range for bypass mode: Set acceptable voltage and frequency range in bypass mode
    - ✓ Maximum and minimum voltage: When UPS is on bypass mode and input voltage is out of setting range, UPS will enter battery mode.
    - ✓ Maximum and minimum frequency: When UPS is on bypass mode and input frequency is out of setting range, UPS will enter battery mode.
- Voltage range for ECO mode: Set acceptable voltage range for ECO mode.

Real-time control



You can real-time control the UPS by executing following operation:

- UPS turn On/Off: Click "On" to turn on the UPS and "Off" to turn off the UPS immediately.
- Battery Self-Test: It offers three types of battery self-test: 10-second self-test, deep discharge test, and self-defined self-test. Simply clicking "Start" button from each type. It will execute the self-test immediately.

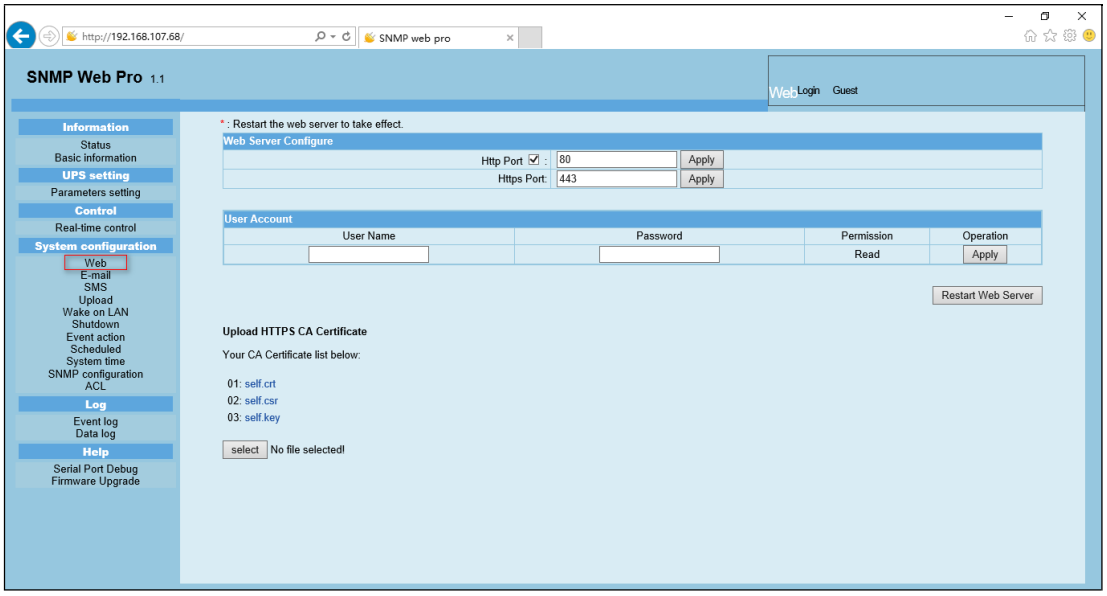
11-7.System configuration

Web

It configures the authority to access SNMP web pro. Please enter access ID and password in each column. There is no limitation to access control in default setting. It is also allowed for http and https modification. The default setting is 80 for http and 443 for https. If any modification to add web users, delete web users or port re-configuration, it's necessary to click "Restart Web Server" button to restart web server to activate all modifications.

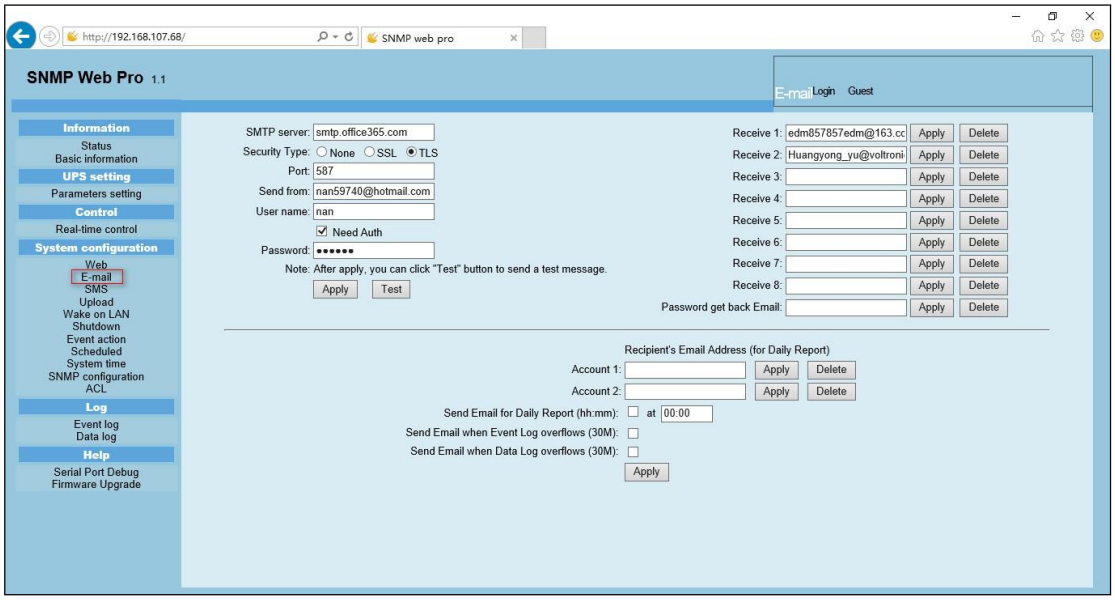
Upload HTTPS CA Certificate

Click "Select" button to select HTTPS CA certificate file under designated directory.



E-mail

It's allowed to send alarm mail by SMTP server. To use this function, the e-mail service must be correctly configured. All values in this function page are default empty. This action can't be executed without the SMTP information, e-mail account and password. Besides, the sender account should be allowed for SMTP/POP3 forwarding.



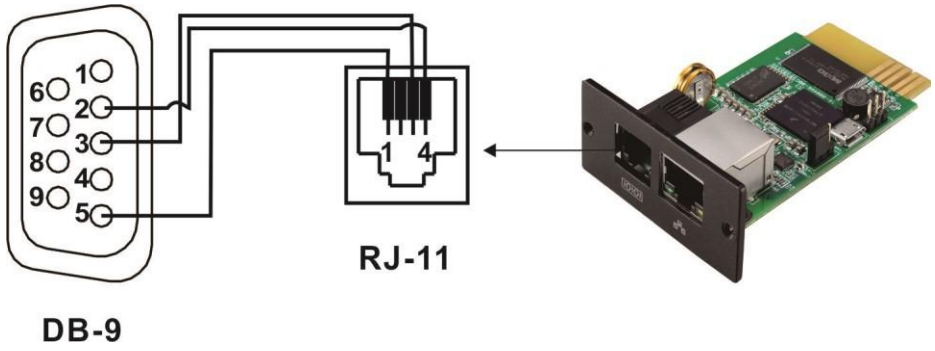
1. Enter SMTP server, security type (supported encryption from SMTP server), SMTP port, sender's E-mail address, user name and password. Click checkbox of "Need Auth" for password verify.
2. Enter correct e-mail accounts in Receive list. Then, click "Apply" to add into receivers list. Click "Delete" button to delete e-mail account.

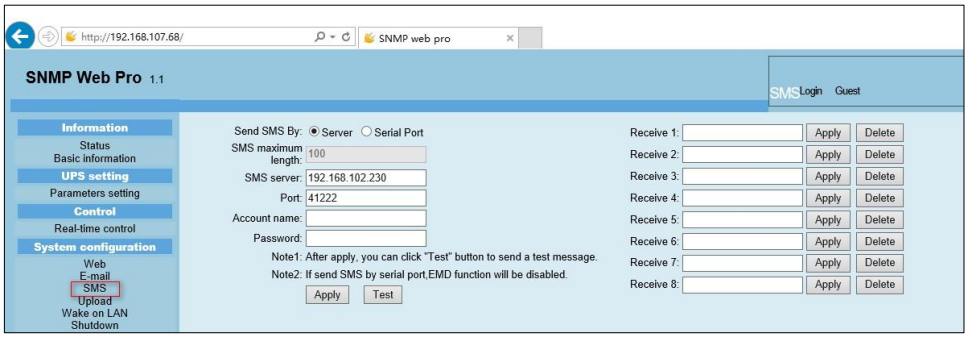
3. Click “Apply” to save the changes. The “Test” button can be used to send a test e-mail to all receivers to confirm correct operation. When the test e-mails are successfully sent to specific recipients, it will pop up a successful message on operated PC. Otherwise, it will pop up a failure dialog to indicate there is an error for parameter setting.
4. You may decide who will receive daily report e-mail at specific duration. Please enter recipient's Email Address and timer into columns. Then, click “Apply” button to set up this action. You also can configure who will receive alarm e-mail when event log exceeds 100 or data log exceeds 50 records. Please click checkbox of selections.

SMS

- Sending SMS By Server
  It is required to have service software available such as ViewPower Pro. In the event of an alarm condition occurring, a message about UPS status will be sent to the specified users via mobile phone.

- Sending SMS By Serial Port
  EMD port is used to send SMS without any service software. Please configure baud rate of GSM Modem as 9600 and then connect data transmission port of SNMP web port card to GSM Modem with a RJ11 to DB9 cable. See next figure for detailed wiring.

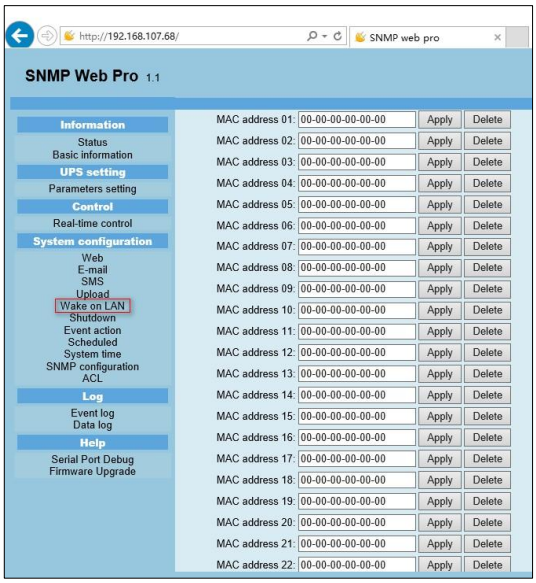


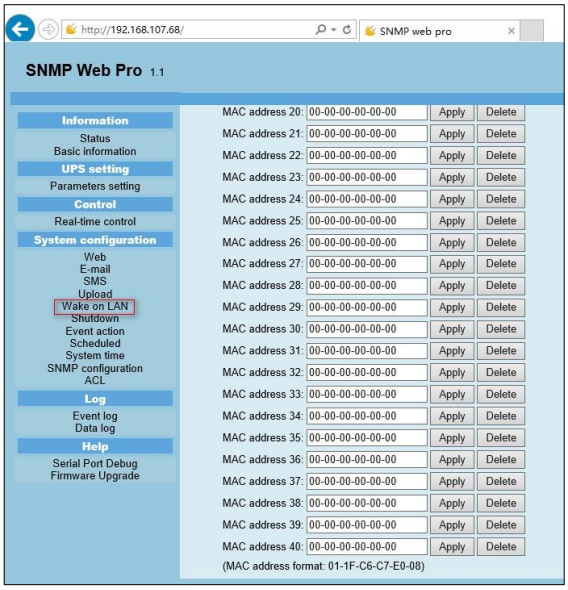


Wake on LAN

It's to remotely wake on specific PCs in LAN when these PCs are supported to Wake-on-LAN (WOL) via a magic packet.

Select System Configuration >> Wake on LAN.



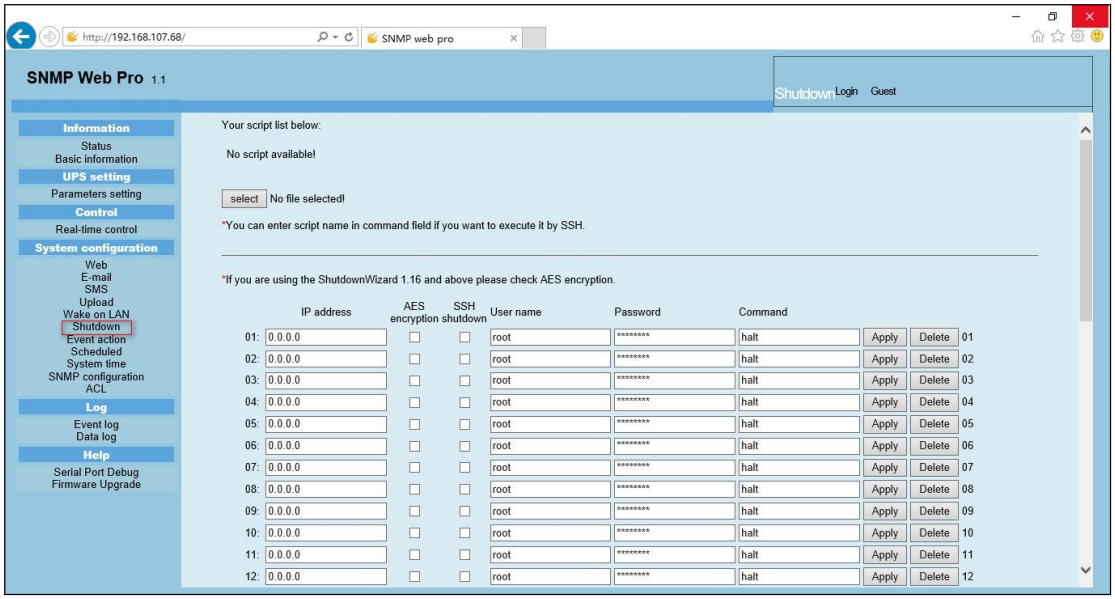


After MAC addresses of remote PCs are entered into address column, it will allow to remote control the PCs. However, it's also required to have hardware support for remote PCs to implement this function.

Shutdown

It is to remotely shut down specific PCs with Shutdown Wizard. This function is only available to integrate with Shutdown Wizard. Please also check user manual of Shutdown Wizard for the details.

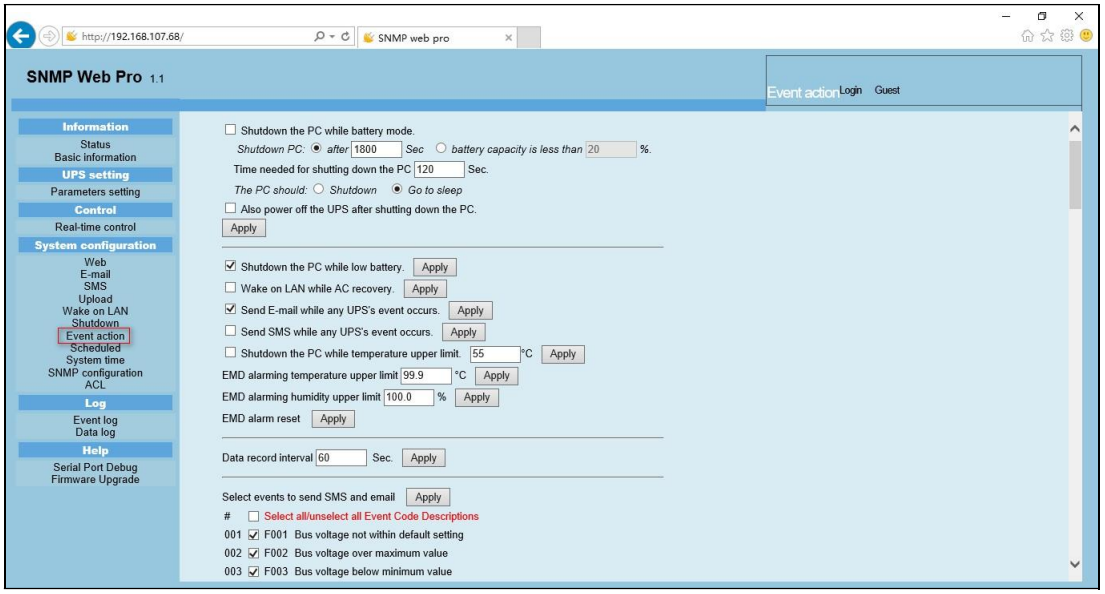
Select System Configuration >> Shutdown.



Event action

This function is only available to integrate with Shutdown Wizard. Please also check user manual of Shutdown Wizard for the details.

Select System Configuration >> Event action.



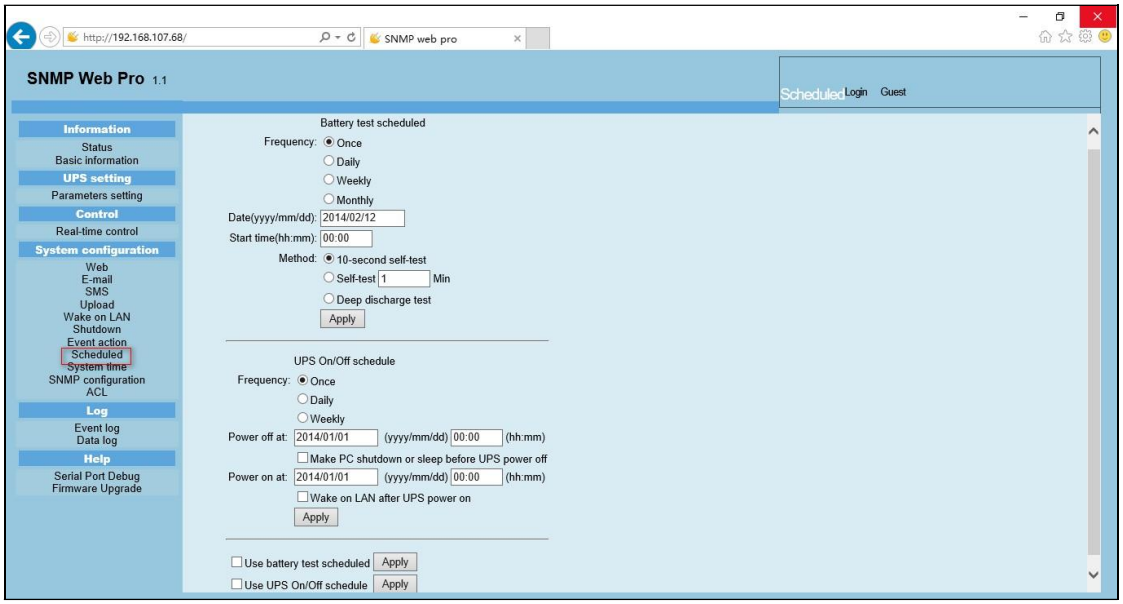
- Shutdown the PC while battery mode: When selected, integrated with Shutdown Wizard, local PC will shut down while UPS works on battery mode.
- Time needed for shutting down the PC: Enter the delay time to shut down the operating system.
- The PC should:
  1. Shutdown: When clicking the checkbox, the selected system will shut down. The default setting is clicked.

2. Sleep mode: When clicking the checkbox, selected system will suspend the system instead of a normal shutdown. But this function is only supported by Windows 2000 or higher on supported hardware.

- Also power off the UPS after shutting down the PC: When click the checkbox, monitored UPS will turn off after local system shuts down. The UPS shutdown time will be later than system complete shutdown time. Users can choose to shut down the system without shutting down the UPS.
- Shutdown UPS output after xx sec: It will cut off UPS output after monitored UPS works on battery mode for xx sec.
- Shutdown the PC while low battery: When clicking this checkbox, local PC will shut down when monitored UPS battery is running low.
- Wake on LAN while AC recovery: When clicking this checkbox, the local PC will be wake on LAN while AC recovery.
- Send E-mail while any UPS event occurs: When clicking this checkbox, it will send alarm E-mail when any event occurs on the local UPS.
- Send SMS while any UPS event occurs: When clicking this checkbox, in the event of an alarm condition occurring, a message about UPS status will be sent to the specified users via mobile phone.
- EMD alarming temperature upper limit: Set up alarm for high temperature point. If detected temperature is beyond setting value, it will send alarm message.
- EMD alarming humidity upper limit: Set up alarm for high humidity point. If detected humidity is beyond setting value, it will send alarm message.
- EMD alarm reset : Clear all EMD alarms.
- Data record interval xx sec: Data log record the data per xx sec.
- Select events to send SMS and email: Select events to notify users via SMS and Email.
- Select all/unselect all Event Code Descriptions: When selected, all Event Code Descriptions will be selected. When it changes from selected to unselected, the selected state of all Event Code Descriptions is cleared.

Scheduled

Select System Configuration >> Scheduled.



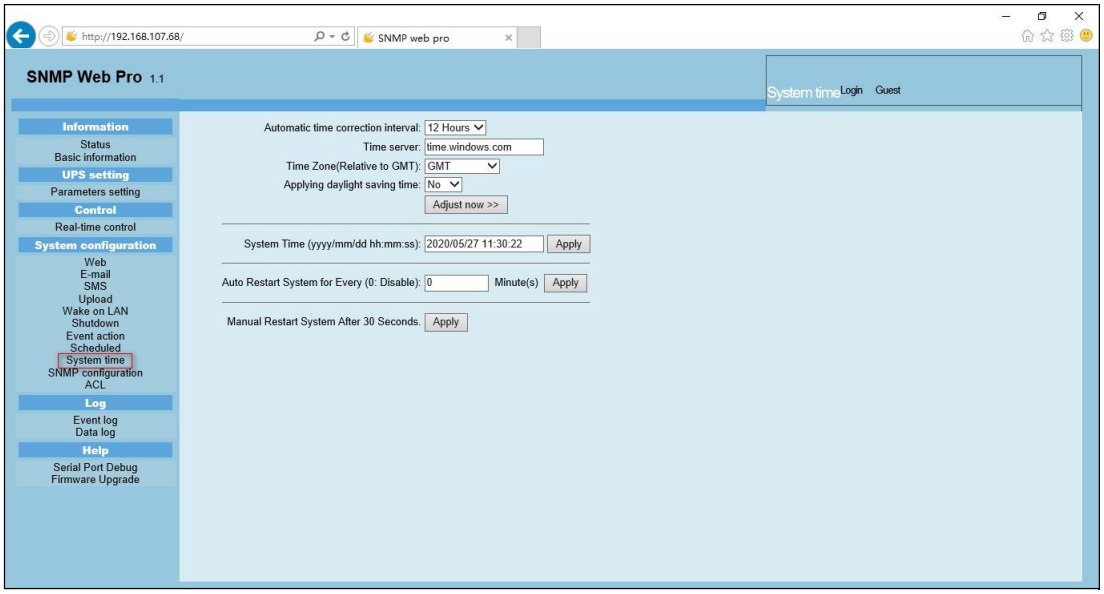
- Scheduled battery self-test: Scheduled battery self-test can be executed once, daily, weekly, or monthly. Users can select UPS and time parameters. It is recommended to set only one action in the same time. If multiple actions have been applied at the same time, some of these actions may be ignored. Any action will be ignored when the action is not supported by the UPS.
- Scheduled UPS on/off: Scheduled UPS on/off can be executed once, daily, weekly. Users can select UPS and time parameters. It is

recommended to set only one action in the same time. If multiple actions have been applied at the same time, some of these actions may be ignored. Any action will be ignored when the action is not supported by the UPS.

- Use battery test scheduled: When selected, enable battery test scheduled function.
- Use UPS On/Off schedule: When selected, enabled UPS On/Off schedule function.

System time

Select System Configuration >> System time.



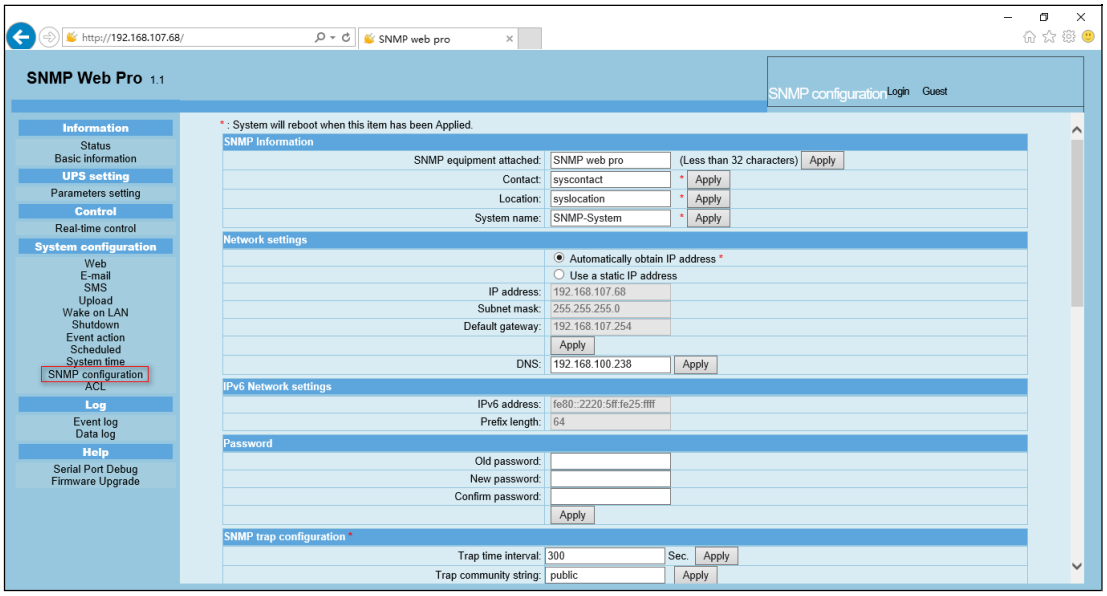
- Automatic time correction interval
- Time server: The SNTP server IP address or domain name.
- Time Zone (Relative to GMT): It's measured to relative to GMT.
- System Time (mm/dd/yyyy hh:mm:ss): It is to set up SNMP web local host time
- Auto Restart System for Every (0: Disable): XX Minute(s)
- Manual Restart system after 30 Seconds: When click "Apply" button, SNMP will restart after 30 seconds.

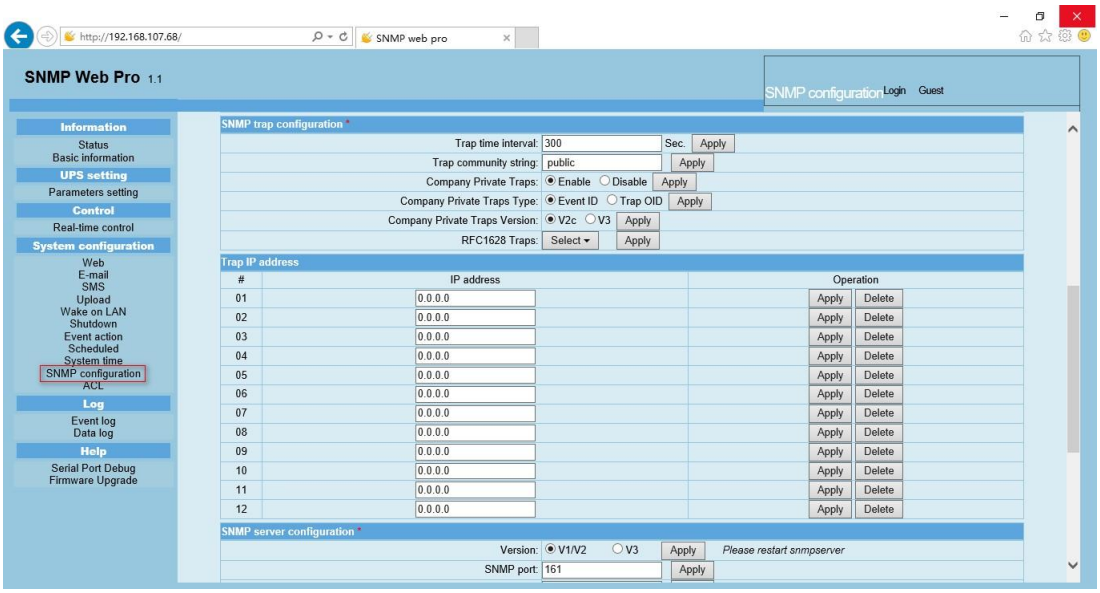
11-8.SNMP configuration

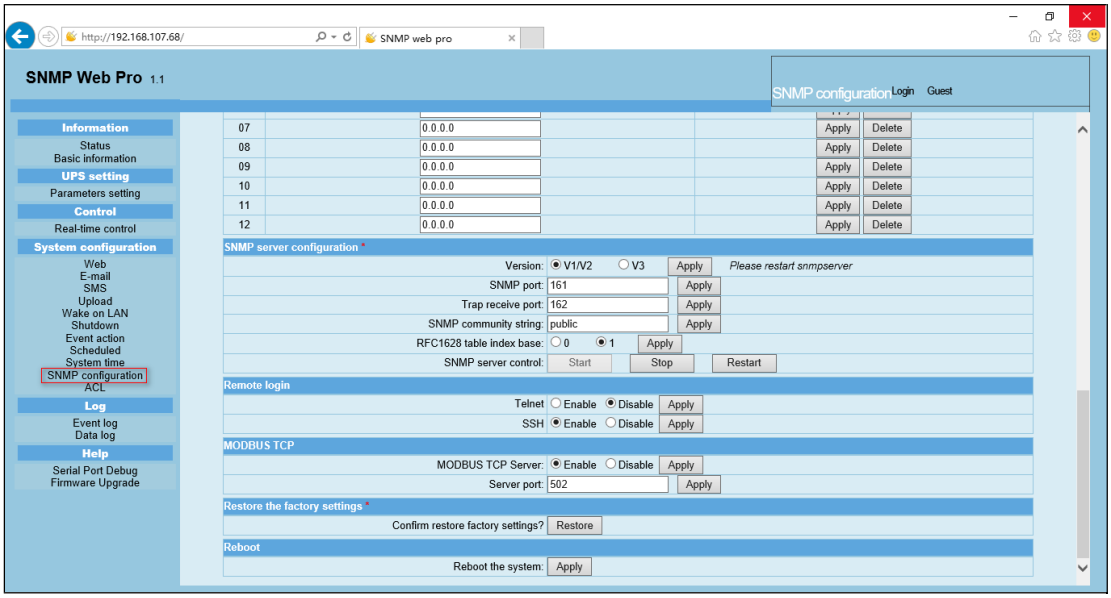
Setting SNMP web pro basic information such as IP address, password, trap IP address, SNMP UDP port, add/delete snmpv3 user account and restore the factory settings.

Note: Some modifications are required to restart snmp server to become Effective

elect System Configuration >> SNMP configuration.

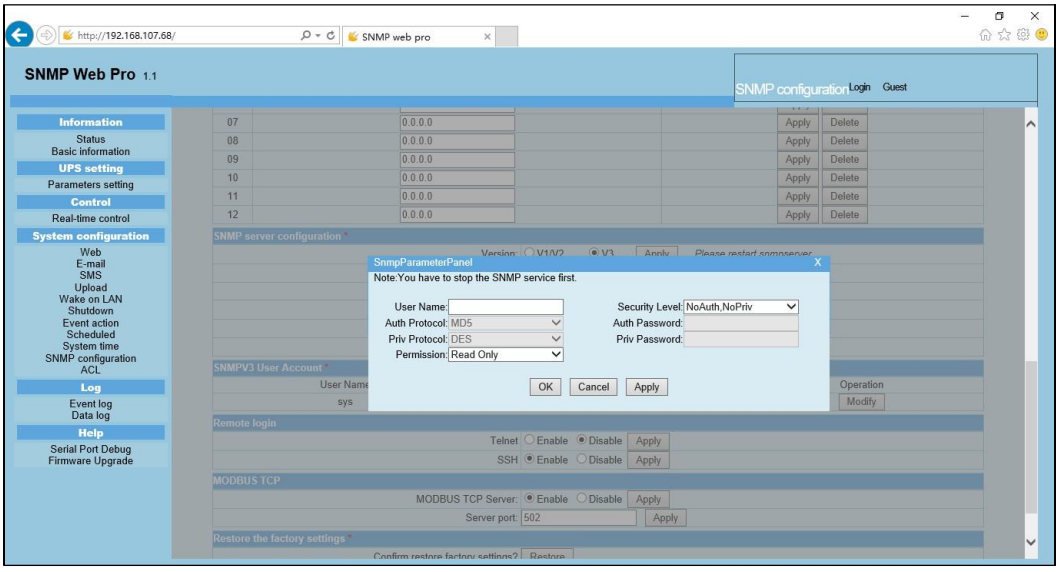




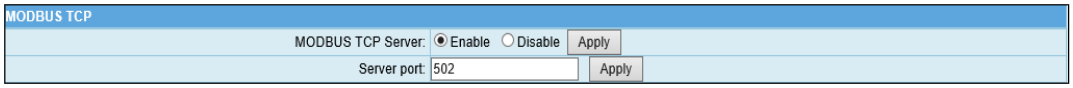


- IP address: There are two methods to obtain IP address
  1. Automatically obtain IP address (DHCP, default)
  2. Manually configure IP address

  The system will default automatically obtain IP addresses. If there is no this kind of service provided in LAN, the default IP will display as "192.168.102.230", Net mask as "255.255.255.0" and default gateway as "0.0.0.0".
- Password: Modify the password. The length of password is 8~15 digits.
- Trap IP address: The SNMP device could provide 12 static trap addresses.
- SNMP server configuration: You may change SNMP port and trap port. You also can add SNMPV3 users by clicking "Add" button. It will pop up a screen to set up user setting such as security level and permission level.



- Remote login: Enable /Disable remote access to Telnet and SSH services.
- Modbus TCP: Before using this function, you need to enable Modbus TCP Services and set the Modbus TCP port. The default setting is 502. If you disable it, the service will be not available and the data packets of Modbus TCP will not be obtained.



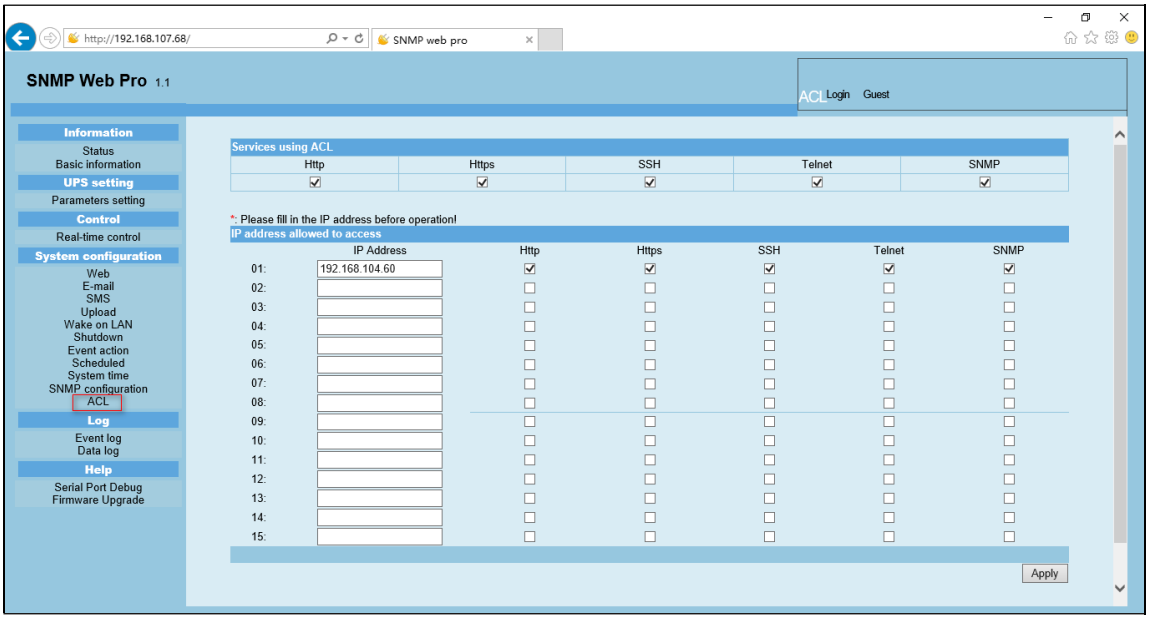
Once you've configured it, you can test it using Modbus Poll or ModScan software. The data acquisition for machine parameters is required to refer to modbus register address mapping protocol. Different machine models need to refer to the corresponding protocol.

- Restore the factory settings
  Note: The system will default automatically obtain IP addresses. Default Password is 12345678.
- Reboot: When clicked, SNMP Web Pro will reboot.

ACL

ACL is abbreviation for Access Control Lists. It's to protect internet security by identifying designated IP address to effectively control the user access for SNMP Web Pro.

Users can decide which services to apply for ACL service by clicking boxes. Before clicking "Apply" button, it's necessary to enter IP address and select service type in "IP address allowed to access" column. Otherwise, any computer whose IP address is not entered and service not selected here will be blocked from firewall and not allowed to access SNMP Web Pro.

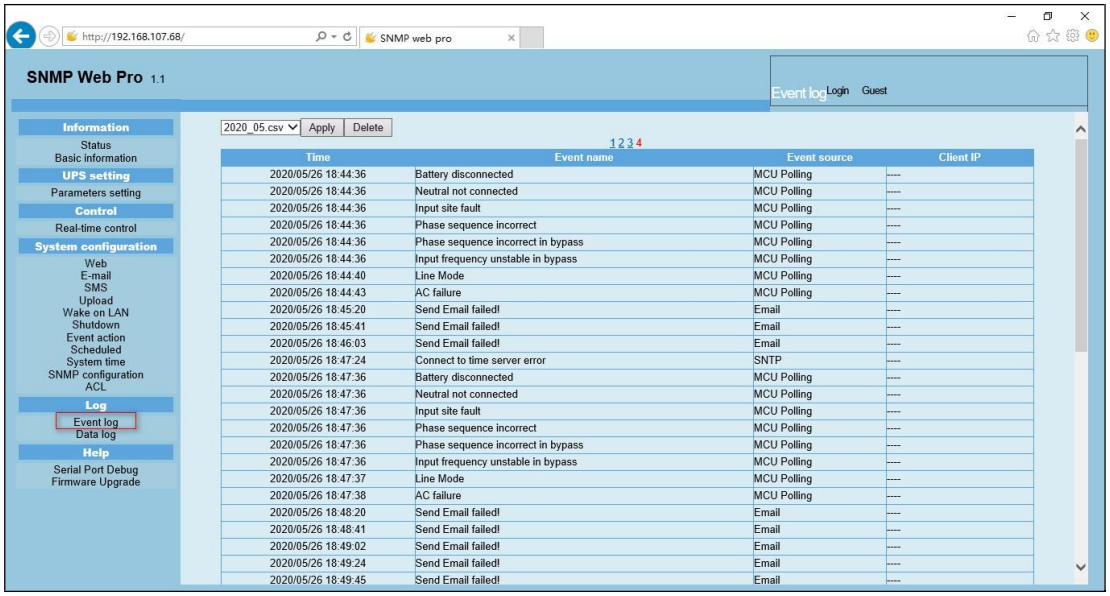


11-9. Log

Event log

In the Event Log page, it lists all history events and can be saved as .csv file. The event log includes UPS warnings, fault info, EMD warnings, UPS operation logs from web users or ViewPower pro users. All logs are recorded in flash memory of web card by month. It's safely recorded without loss even after power failure occurs. It can save up to over 200,000 threads.

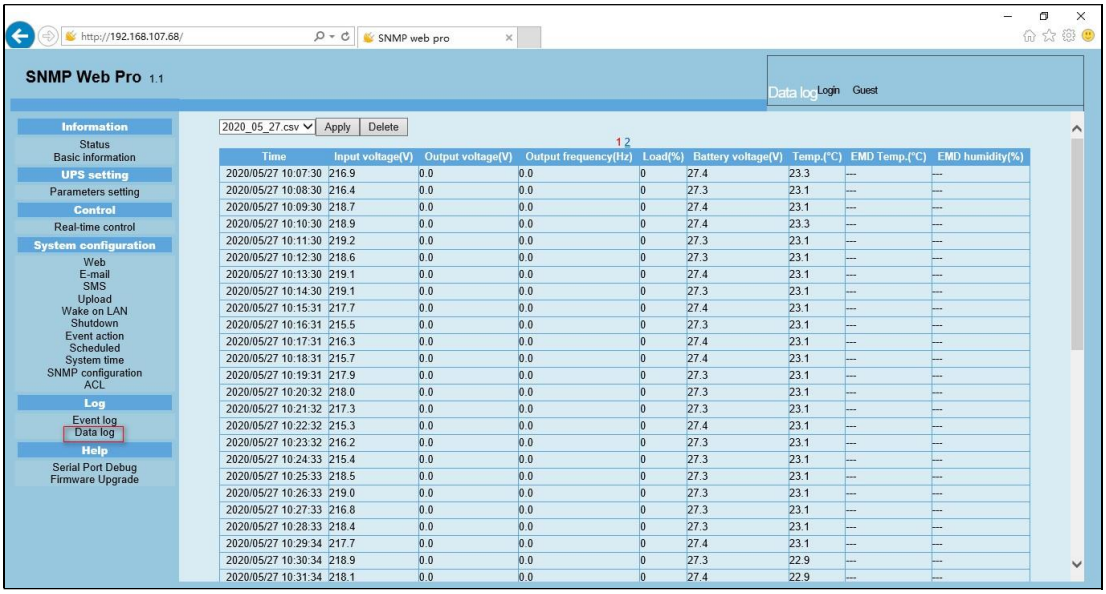
Select Log >> Event log.



Data Log

In the Data Log page, it will list all history logs and can be save as .csv file. All logs are recorded in flash memory of web card by day. It's safely recorded without loss even after power failure occurs. It can save up to over 200,000 threads.

Select Log >> Data log.

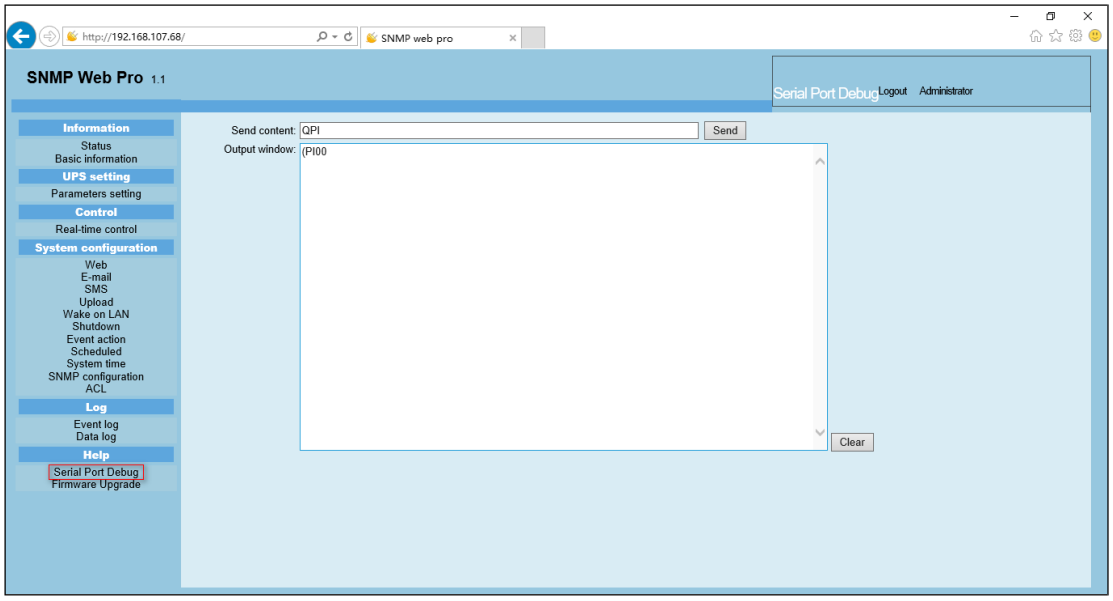


11-10. Help

Serial Port Debug

It's to test communication condition between SNMP card and device.

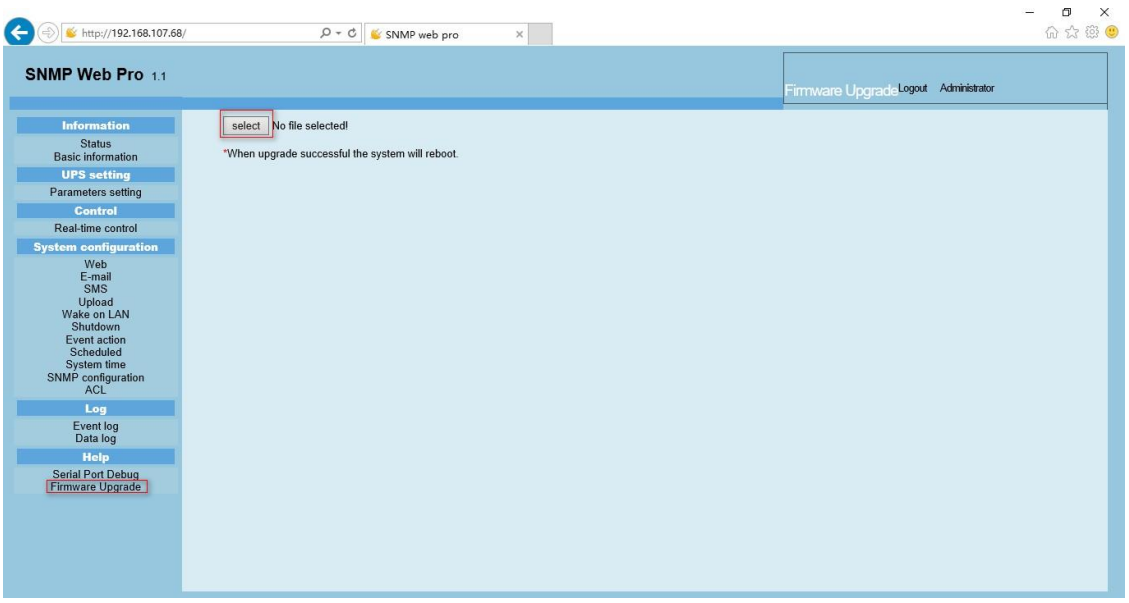
Select Help >> Serial Port Debug.



Firmware Upgrade

It is used to update firmware.

Select Help >> Firmware Upgrade.



12. Specifications

MODEL	HMS 110R	HMS 115R	HMS 120R	HMS 130R
PHASES	1ph + N + PE			
CAPACITY	1000 VA / 1000 W	1500 VA / 1500 W	2000 VA / 2000 W	3000 VA / 3000 W
Article number	6000035479	6000035480	6000035481	6000035482
INPUT				
Nominal Voltage	200/208/220/230/240 VAC			
Voltage Range	160-300 VAC ± 5% @ 100% load 110-160 VAC ± 5% derated down to 50% load linearly			
Frequency Range	40 Hz ~ 70 Hz			
Power Factor	≧ 0.99 @ nominal voltage (100% load)			
Harmonic Distortion (THDi)	≦ 5% @ nominal input voltage			
OUTPUT				
Output Voltage	200*/208*/220/230/240 VAC			
AC Voltage Regulation (Batt. Mode)	± 1%			
Frequency Range (Synchronized Range)	57 ~ 63 Hz or 47 ~ 53 Hz			
Frequency Range (Batt. Mode)	60Hz ± 0.1Hz or 50 Hz ± 0.1Hz			
Current Crest Ratio	3:1 (max.)			
Voltage Harmonic Distortion	≦ 2 % THDv (Linear Load); ≦ 4 % THDv (Non-linear Load)			
Transfer Time	Line mode to Battery mode: 0 ms; Line mode to Bypass mode: 4 ms			
EFFICIENCY				
AC Mode	≧ 89% @ full charged battery		≧ 91% @ full charged battery	
ECO Mode	≧ 96% @ full charged battery			
Battery Mode	≧ 88%		≧ 90%	
BATTERY				
Battery Type	12 V / 9 Ah	12 V / 9 Ah	12 V / 9 Ah	12 V / 9 Ah
Number of internal battery blocks	3	3	6	6
Typical Recharge Time	3 hours recover to 95% capacity for internal battery @ 2A charging current			
Charging Current	default 2A, max. 12A adjustable		Default: 2A, max: 8A adjustable	
Charging Voltage	41.1 VDC ± 1%	41.1 VDC ± 1%	82.1 VDC ±1%	82.1 VDC ±1%
COMPATIBLE External Battery Packs (EBPs)				
Model name	HMS 36BPR		HMS 72BPR	
Article number	6000035487		6000035488	
Battery content	2 x 3 x 12V/9Ah		2 x 6 x 12V/9Ah	
GENERAL DATA				
UPS Dimensions, DxWxH (mm)	410 x 438 x 88		630 x 438 x 88	
UPS Weight with integrated battery (kg)	14.1	15.5	23.3	27.5
EBP Dimension, DxWxH (mm)	410 x 438 x 88		630 x 438 x 88	
EBP Weight (kg)	21.5		41.2	
Humidity	20-90 % RH @ 0- 40°C (non-condensing)			
Audible noise	< 50dB @ 1 Meter		< 55dB @ 1 Meter	
Number of power outputs	1 programmable outlet group (with 4 x IEC C13) for non-critical loads and 1 outlet group (with 4 x IEC C13) for mission critical loads			1 programmable outlet group (4 x IEC C13) for non-critical loads and 1 outlet group (1 x IEC C19 + 4 x IEC C13) for mission critical loads
COMMUNICATION				
Interface	Smart RS232/USB: Supports Windows® Family, Linux and MAC			
Optional connectivity cards	HMS network card / HMS AS400 card			
Optional sensors	Temp & Humidity sensor			
Audible indications & alarms	Battery mode (beep every 5 seconds); Low Battery (beep every 2 sec); Overload (beep every second); Fault (beep continuously)			
OPTIONAL ACCESSORIES				
External Maintenance bypass (rack mounted)	MBS 1-3K rack			
Rack rail kit	Rack rail kit for 2U			
STANDARD CONFORMITY				
EMC/Safety	CE			

*Derate capacity to 80% when the output voltage is adjusted to 200VAC/208VAC.

MODEL		HMS 160RL	HMS 1100RL
PHASES		1ph + N + PE	
CAPACITY		6000 VA / 6000 W**	10000 VA / 10000 W**
Article number		6000035485	6000035486
INPUT			
Nominal Voltage		208/220/230/240 VAC	
Voltage Range		176-300 VAC ± 5% @ 100% load 110-176 VAC ± 5% derated down to 50% load linearly	
Frequency Range		46~54 Hz @ 50Hz / 56~64 Hz @ 60Hz	
Power Factor		≧ 0.99 @ full load	
THDi		< 4% @100% Load, < 6% @50% Load	
OUTPUT			
Output Voltage		208*/220/230/240 VAC	
AC Voltage Regulation		± 1%	
Frequency Range (Synchronized Range)		46~54 Hz @ 50Hz / 56~64 Hz @ 60Hz	
Frequency Range (Batt. Mode)		50 Hz ± 0.1 Hz or 60 Hz ± 0.1 Hz	
Current Crest Ratio		3:1 (max.)	
Voltage Harmonic Distortion		≦ 1% THDv (Linear Load), ≦ 4% THDv (Non-linear Load)	
Transfer Time		Line mode to Battery mode: 0 ms; Line mode to Bypass mode: 0 ms	
Overload	Line Mode	100%~110%: 10 min; 110%~130%: 1 min; >130% : 1sec	
	Battery Mode	100%~110%: 30 sec; 110%~130%: 10 sec; >130% : 1sec	
EFFICIENCY			
Line Mode		94%	
ECO Mode		98.5%	
Battery Mode		92%	
External Battery Packs (EBPs) compatible with HMS 160RL & HMS 1100RL models			
Model name / Battery content		HMS 192BPR / 1 x 16x12/9Ah	
Article number		6000035489	
Model name / Battery content		HMS 240BPR / 1 x 20x12/9Ah	
Article number		6000035537	
BATTERY			
Connected EBPs		Max 4 x EBP (16x12/9Ah)** or max 4 x EBP (20x12/9Ah)	
Charging Current (max.)		Default 1.0 A (adjustable 1A/2A/3A/4A)	
Charging Voltage		(13.65VDC x number of battery blocks) ± 1%	
GENERAL DATA			
Dimension, DxWxH (mm)		610x438x88	
Weight (kg)		15	17
Input/Output connections		Wired	
EBP: HMS 192BPR	Dimensions & Weight	715x438x88 mm; 50 kg	
EBP: HMS 240BPR	Dimensions & Weight	600x438x133 mm; 63 kg	
Operating Humidity		20-90 % RH @ 0 - 40°C (non-condensing)	
Audible Noise		< 58dB @ 1 Meter	
COMMINUCATION			
Interface		Smart RS-232/USB, Supports Windows® Family, Linux and MAC	
Optional connectivity cards		HMS network card / HMS AS400 relay card	
Optional sensors		Temp & Humidity sensor	
Information on LCD Panel		UPS status, Load level, Battery level, Input/Output voltage, Discharge timer, and Fault conditions	
Audible Indications & Alarms		Battery mode (beep every 4 seconds); Low Battery (beep every second); Overload (beep twice every second); Fault (beep continuously)	
OPTIONAL ACCESSORIES			
External Maintenance Bypass (rack mounted)		MBS 6-10K rack	
Rack rail kits		Rack rail kits for 2U and 3U	
STANDARD CONFORMITY			
EMC / Safety		CE	

* Derate capacity to 60% of capacity in CVCF mode and to 90% when the output voltage is adjusted to 208VAC or parallel system is operated.
** Output PF with EBP 16x12V/9Ah is 0.8.

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