CyberPower

USER'S MANUAL

Battery Management System

BM100 / BP100-12V

The Battery Remote Management System allows a battery system to be managed, monitored, and configured.

SAVE THESE INSTRUCTIONS

Please read this manual and follow the instructions for installation and use.

TABLE OF CONTENTS

Introduction 1

Installation Guide 5

Web Interface 8

Ethernet Module Firmware Upgrade 21

Save and Restore Configuration Settings 22

Troubleshooting 23

Conformance Approvals 24

Appendix 1: IP Address Settings for CyberPower Battery Manager 25

Appendix 2: How to Configure a Battery Manager User Account in Authentication Servers 27

Appendix 3: Software Support 28

Appendix 4: Mounting Bracket Installation Guide 29

Introduction

Overview

The CyberPower Battery Management System (BMS) provides a proactive approach to manage and monitor a battery system attached to a network, eliminating the risk of downtime by ensuring the batteries are optimally charged and ready for use (e.g. UPS system). The system helps extend the battery lifespan, maximize the battery performance and proactively identify the battery deterioration and failure, thus delivering a reduced cost of maintenance.

After installing the hardware and configuring an IP address, users can simply use a web browser to access, monitor, and control the Battery Manager from anywhere in the world!

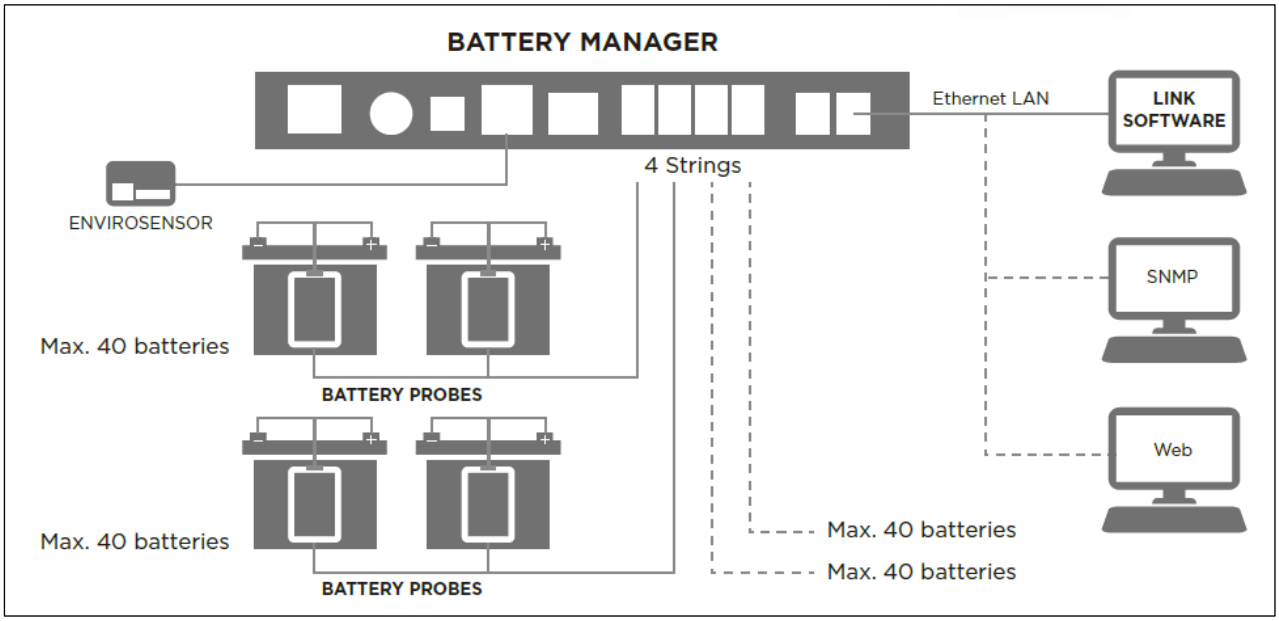
Features

- Monitor the battery voltage, temperature and internal resistance
- Charge equalization function to extend the battery lifespan and maximize the battery performance
- Reduce maintenance cost with easy battery maintenance
- Replace battery based on battery condition to prevent expensive premature replacement
- Detect the weak battery early to reduce the possibility of damage to the entire battery string
- Achieve low power consumption to reduce the impact on the battery
- Real-time battery system monitoring
- Remote management and configuration of the battery system via Web Browser or NMS
- User-friendly web interface
- Event logging to trace the battery and battery string event history
- Graphic data logging to analyze battery and battery string conditions
- Record up to 14 years with 4 probes in one string on a default recording interval (20 minutes).
- Save and restore configuration settings
- Event notifications via Email, SNMP traps, Syslog, and SMS
- Support IPv4/v6, SNMPv1/v3, HTTP/HTTPs, DHCP, NTP, DNS, SMTP, FTP, and Syslog protocol
- Support Email Secure Authentication Protocols: SSL, TLS
- Support External Authentication Protocols: RADIUS, LDAP, LDAPS, Windows AD
- SNMP MIB available for free download
- User upgradeable firmware
- Upgrade Ethernet module firmware and upload configuration files to multiple units at once
- Server level software “BMS Software” supports multiple managers monitoring/control, powerful data recording, graphing and analyzing features.
- Support Environmental Sensor (ENVIROSENSOR)
- Operate under extremely wide temperature range from -40°C to 60°C*
  *LCD Readout: -20°C to 60°C

System Requirements

- A 10/100Mbps Ethernet connection to an existing network
- Web Browser
- *(Optional)* NMS (Network Management System) compliant with SNMP

Application



Battery Manager

The battery manager continuously and securely collects the detailed information on every battery, checks each measurement with alarm thresholds, and notifies the users if abnormality occurs. The battery manager is fully Ethernet TCP/IP compatible with built-in web server and supports SNMP/MIB communication, data logging and event notification, monitoring up to 4 strings of 40 batteries each (totally 160 batteries).

Note: An optional Environmental Sensor (ENVIROSENSOR) can be added to monitor the ambient temperature and humidity.

Battery Probe

A probe is installed to the terminal posts of each monitored battery. The probes measure the battery's internal resistance, voltage, and battery temperature.

Unpacking

Inspect the package upon receipt. The package should contain the following:

Battery Manager

- CyberPower Battery Manager
- Quick Start Guide
- Dry Contact Interface Power Cable (244cm; L4)
- 4 Battery Probe Communication Cables (90cm; L1)
- DB9/RJ45 Communication Cable (for future firmware update)
- 2 Rack Fixed Brackets
- 4 (M4x8) Bracket Mounting Screws

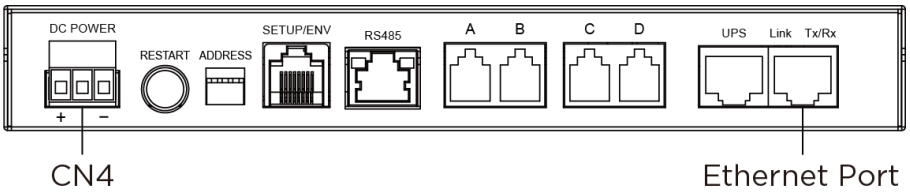
Battery Probe

- CyberPower Battery Probe
- Quick Start Guide
- Battery Connecting Cable (30cm; L3)
- Battery Probe Communication Cable (30cm; L2)

Product Callouts

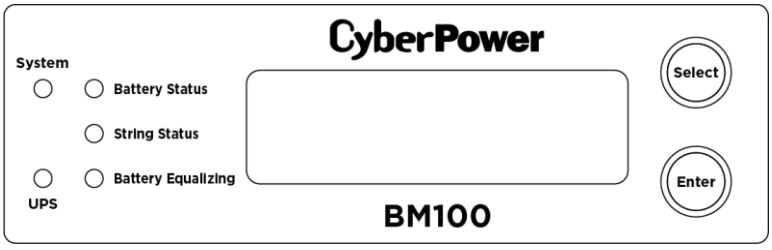
Battery Manager

- Front Panel



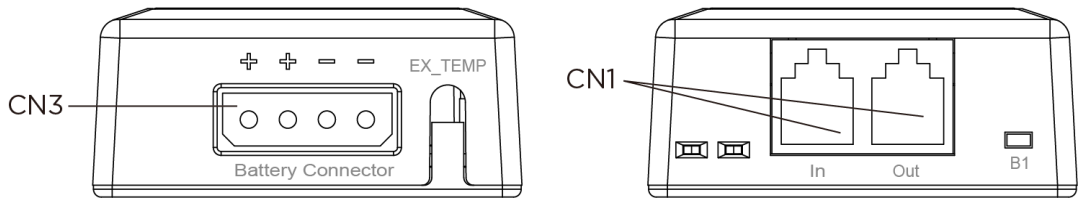
Name	Description
DC POWER (CN4)	Power input of the Battery Manager **Warning:** Required supply voltage: 15V min, 60V max.
ADDRESS	Button to restart the system and detect the battery setting
RESTART	Battery Manager RS485 communication address, LSB is on the left
SETUP/ENV	Port for firmware upgrade and an environmental sensor
RS485	Reserved for future use
STRING A/B/C/D	Port connected to Battery Probes
UPS	Port connected to UPS (Future use)
Ethernet Port	Port connected the Ethernet cable
Link LED	Off: The Battery Manager is not connected to the Network/ or the Battery Manager power is off On (Yellow): The Battery Manager is connected to the Network
Tx/Rx LED	Off: The Battery Manager power is off On (Green): The Battery Manager power is on Flashing (Green): - Receiving/transmitting data packet - Reset finished

- LCD Panel



Name	Description/Condition
System	Battery Manager is supplied power and works normally
UPS	The communication of the UPS is normal (Future use)
Battery Status	The condition of the connected batteries
String Status	The condition of the string current (Future use)
Battery Equalizing	The equalization function is active
Select Button	Control the LCD screen and toggle through the available information options.
Enter Button	Choose the selected item, enter submenu or return to the previous menu.

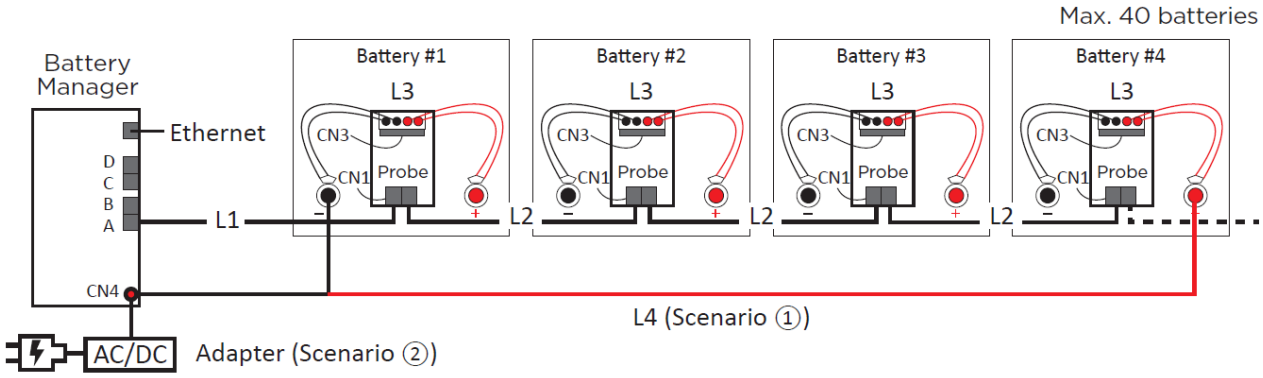
Battery Probe



Name	Description/Condition
Battery Connector (CN3)	Connected to battery **Warning:** Please connect the battery connecting cable to the confirmed positive and negative electrode. It can result in short circuit if the connection is converse.
EX_TEMP	Port for external temperature sensor (Future use)
In/Out (CN1)	Port connected to Battery Manager through the 'In' port, and to another Battery Probe (Left side is 'In' and right side is 'Out')
B1	Button (Future use)
LED1 (Red)	The battery is abnormal
LED2 (Green)	Flash: Powered but there is a communication problem (Flash in a second period) Blink: Powered and the communication is normal, and datagram is receiving or transmitting

Installation Guide

Step 1. Hardware Installation



1. Connect the battery connecting cable (L3) to each battery
2. Connect the cable to each Battery Probe through battery connector (CN3).
3. Fix each Battery Probe to each battery with Loop tape.
4. Connect the Battery Manager's 'A' (RJ25) port to the 'Left' ('In') RJ25 port (CN1) of the first Battery Probe with the communication cable (L1)..
5. Connect Battery Probes with one another through RJ25 ports (CN1) of Battery Probes with probe communication cables (L2), and up to 40 Battery Probes in a string.
6. Connect an Ethernet cable to the Ethernet port of the Manager.
7. Provide power to the Battery Manager through the DC power (CN4). The required Battery Manager input voltage is **15V min, 60V max**.

   Scenario ①

   For **4 or less** batteries per string: Use the included power cable (L4) to connect the Battery Manager. (**Warning:** A battery can present a high risk of short circuit current and electrical shock. Please pay attention to the input voltage.)

   Scenario ②

   For **5 or more** batteries per string: Connect the Battery Manager to the utility power with an AC/DC adapter cord.
8. Press the **RESTART** button for one second to restart the system.
9. IP address will show on the LCD interface once the Manager is powered and the system is initialized, or you can find it through [**About** → **Network info.** → **IPv4 address**]. Use the IP address to login to the Web Interface. The factory default Username/Password is **admin/admin**.

Note: Once the number of battery string and connected battery has been changed from last configuration, please configure it via web interface on the **[Battery** → **Configuration]**, select the number of string(s) and batteries per string, and then click **Apply**. Or you can reset the system to the factory default setting via LCD interface on the **[Reset/Reboot** → **Reset** → **Confirm]**.

Note: For mounting bracket installation, please refer to Appendix 4.

Step 2. Configure the IP address for the CyberPower Battery Manager

Note: You can find the IP address of the Battery Manager via LCD interface on the **[About** → **Network info.** → **IPv4 address]**.

Note: These instructions are for Windows OS. For other OS please refer to Appendix 4.

Method 1: Using the Power Device Network Utility

1. Install the Power Device Network Utility available for download at www.CyberPower.com.
2. After installation completes, run the “Power Device Network Utility”.
3. The main window of the Power Device Network Utility program is shown in Figure 1. The configuration tool will display all CyberPower Remote Management devices present on the local network subnet. The "Refresh" button is used to search the local network subnet again.

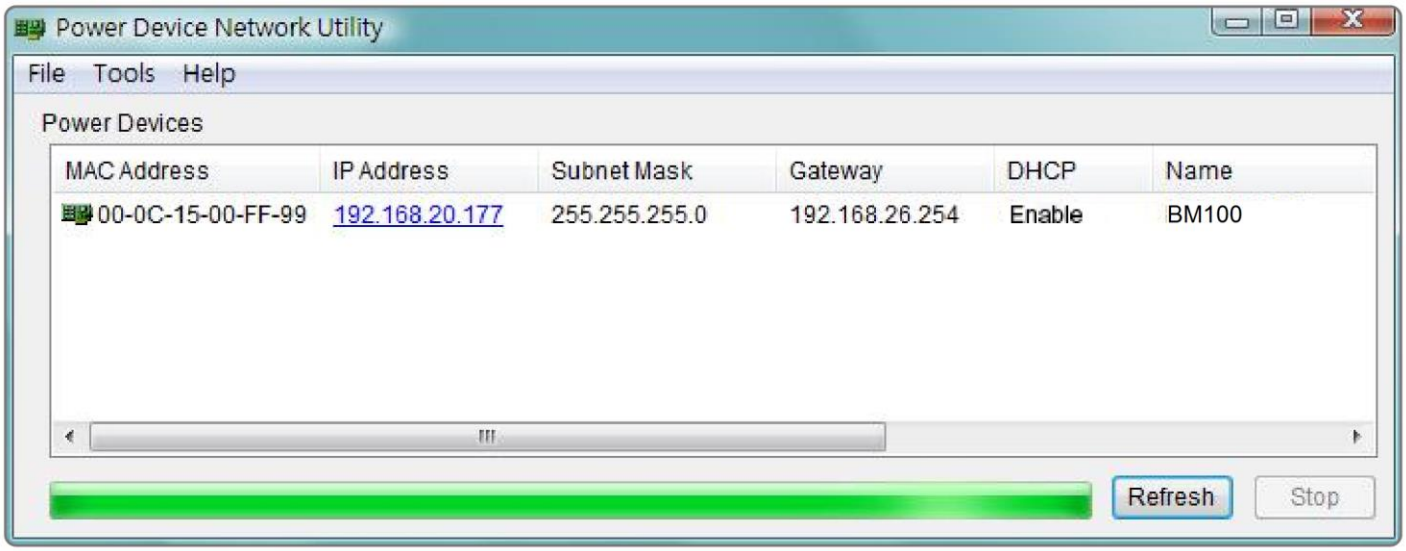


Figure 1. The main window of the “Power Device Network Utility” program.

4. Select the Battery Manager you are setting up. Click on the Tools menu and select “Device Setup” or double click the Battery Manager you want to configure.
5. You can modify the IP Address, Subnet Mask, and Gateway address for the Device MAC Address listed in the Device Network Settings window, as shown in Figure 2. The factory default IP Address is 192.168.20.177 and the default Subnet Mask is 255.255.255.0.

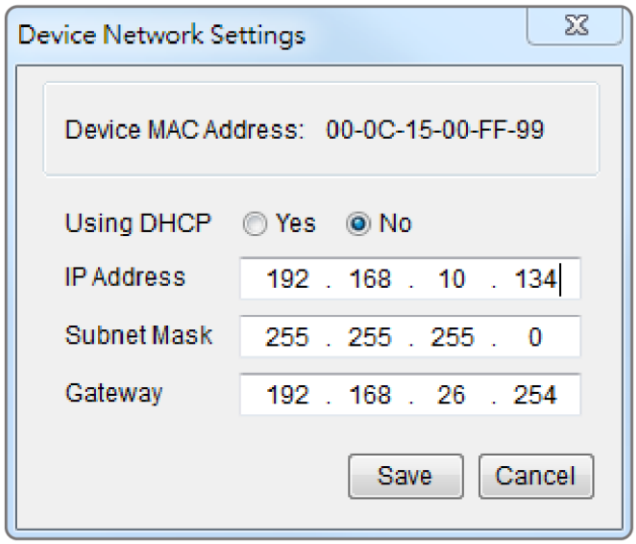


Figure 2. The Device Network setting window.

6. Modify the IP, subnet mask or gateway address. Enter the new addresses into the corresponding fields and then click “Save”.
7. You will need to enter a User Name and Password for the Battery Manager in the

authentication window, as shown in Figure 3.

- Default user name: **admin**
- Default password: **admin**

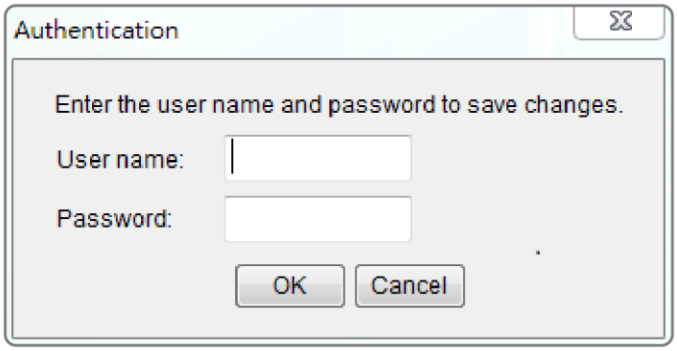


Figure 3. Authentication window.

8. If the IP address change is successful, you will see a message confirming the IP set up is OK, as shown in Figure 4.

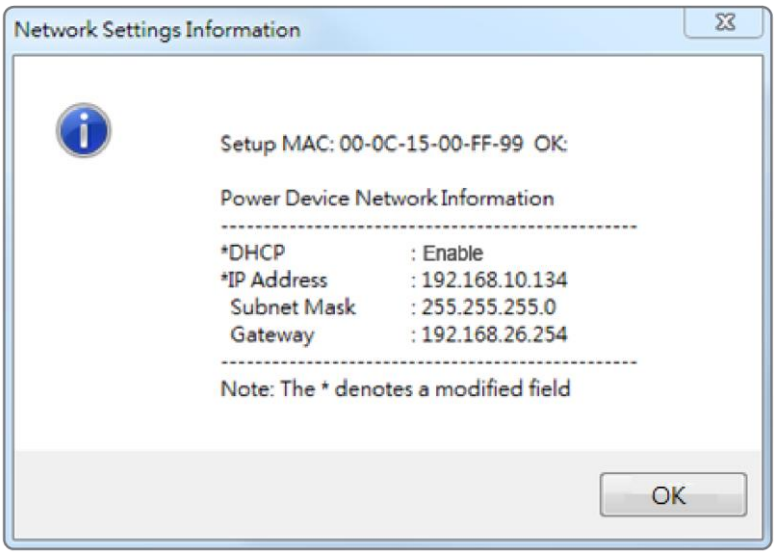


Figure 4. Setup IP Address successfully message.

9. In case the change is not successful, for example, if the IP address change is unsuccessful you will see a warning message. Attempt to make the desired changes again. If the problem persists please see the Troubleshooting section for help.

Method 2: Using a command prompt

1. Obtain the MAC address from the label on the Battery Manager. Each Manager has a unique MAC address.

   Note: The MAC address is labelled on the Manager.

2. Use the ARP command to set the IP address.

   Example:

   To assign the IP Address 192.168.10.134 for the Battery Manager, which has a MAC address of 00-0C-15-00-FF-99 you will type in the following in the command prompt from a PC connected to the same network as the Battery Manager.

   (1) Type in "`arp -s 192.168.10.134 00-0C-15-00-FF-99`" for Windows OS; type in "`arp -s 192.168.10.134 00:0c:15:00:ff:99`" for Mac OS, then press Enter.

3. Use the Ping command to assign a size of 123 bytes to the IP.

(1) Type in "`ping 192.168.10.134 -l 123`" then press Enter.

(2) If the replies are received, your computer can communicate with the IP address.

To select an IP address for the Battery Manager, please refer to Appendix 1.

Web Interface

Login User Account

You will need to enter a User Name and Password to login to the interface. There are two user account types.

1. Administrator
   - Default username: **admin**
   - Default password: **admin**
2. View only
   - Default username: **device**
   - Default password: **device**

You will be asked to reset a username and password upon the first login. The administrator can access all functions, including enable/disable the view only account. The viewer can access read only features but cannot change any settings.

Note: The Administrator account is also used for the FTP login, Power Device Network Utility, and Upgrade and Configuration Utility.

Note: Only one user can log in and access the device at a time.

Web Content

[Summary] Provide an overview of the system operation and the items that are auto refreshed; However, different Battery Management System models may have different items displayed.

Item	Definition
Current Condition	Display the current operating condition of the system.
Battery Status	Shows individual battery status. Battery is normal in green color if its voltage, temperature and resistance are good, otherwise shows abnormal in red color.
System Data	
Name	The name given to the Battery Manager.
Location	Location description given to the Battery Manager.
Contact	The person to contact about this Battery Manager.
Uptime.	Length of time the system has been working continuously
Envir Status	
Temperature	Graph of the current temperature reading of the environmental sensor.
Humidity	Graph of the current humidity reading of the environmental sensor.
Envir Data	
Name	The name of the environmental sensor.
Location	The location of the environmental sensor.
Recent Device	A list of the five most recent device events. All events are related to

Events	configuration changes.

[Battery] The following items can be displayed/configured through the Battery page.

[Battery->Status] Display the basic information about the current battery status. Items displayed are auto refreshed.

Item	Definition
Data	
# (index)	Index of the battery within its string.
Volt.	Current battery voltage reading.
Temp.	Current battery temperature reading.
Ri	Current battery resistance reading.
Equalization	Current battery equalization power in percentage.
Status	Current battery voltage, temperature and resistance status. Shows red color if voltage, temperature or resistance is out of configured range.
Graphic	
Voltage	Shows batteries voltage in graph.
Temperature	Shows batteries temperature in graph.
Resistance	Shows batteries resistance in graph.

[Battery->Configuration] Configure the parameters of the system.

Item	Definition
Manager Configuration	
Battery Probes Connection	Setup the Manager current battery probe series and parallel configuration.
Equalization	Setup battery voltage equalization function to enable or disable. Enable – Let the system to equalize managed batteries voltage under a proper voltage, temperature condition. Disable – Not equalize batteries voltage.
Resistance Measure Interval	Setup the Manager automatically resistance measurement time period.
Probe Configuration	
Voltage Range	Setup battery voltage range. Battery probe alarm when battery voltage is out of range.
Temperature Range	Setup battery temperature range. Battery probe alarm when battery temperature is out of range.
Resistance Range	Setup battery resistance range. Battery probe alarm when battery resistance is out of range.

[Envir] Following items can be displayed/configured through the Envir page. Note that Envir Tab only appears when an ENVIROSENSOR is connected to the Battery Manager.

[Envir->Status] Display the basic information of the environmental sensor and contact closure inputs.

Item	Definition
Information	
Name	The name of the environmental sensor.
Location	The location of the environmental sensor.
Temperature	
Current Value	The current environmental temperature.
Maximum	The highest temperature and time detected by the environmental sensor.
Minimum	The lowest temperature and time detected by the environmental sensor.
Humidity	
Current Value	The current environmental humidity.
Maximum	The highest humidity and time detected by the environmental sensor.
Minimum	The lowest humidity and time detected by the environmental sensor.
Contact	Display the name and status (Normal/Abnormal) of each input dry relay contact.

[Envir->Configuration] Configure the parameters of the environmental sensor.

Item	Definition
Information	
Name	The name used to identify the environmental sensor.
Location	The place where the environmental sensor is located.
Temperature	
High Threshold	Upper limit for normal temperature.
Low Threshold	Lower limit for normal temperature.
Hysteresis	The point at which the difference between the High and Low temperature threshold changes from abnormal to normal.
Rate of Change	The rate used to define an abnormal change in temperature.
Unit	The unit of temperature measurement.
Humidity	
High Threshold	Upper limit for normal humidity.
Low Threshold	Lower limit for normal humidity.
Hysteresis	The point at which the difference between the High and Low humidity threshold changes from abnormal to normal.
Rate of Change	The rate used to define an abnormal change in humidity.
Contact	Enter the name of each input dry contact relay and use the dropdown menu to define the normal status of each one.

[Logs->Event Logs] Display the list of events and a brief description of each event along with the date and time stamp.

Note: 1. The recordable events are listed under "System->Notifications->Event Action."

2. The recorded time is using the 24-hour clock format.

[Logs->Status Records] This page is used to view the logs of the system status and environment status.

- Temperature (°C or °F): The current temperature of the environmental sensor.
- Humidity (%RH): The current humidity of the environmental sensor.
- A#1 Volt.(V): The string A, 1st battery voltage data.
- A#2 Volt.(V): The string A, 2nd battery voltage data.
  ...(continue until the last valid data)
- A#1 Temp.(°C): The string A, 1st battery temperature data.
- A#2 Temp.(°C): The string A, 2nd battery temperature data.
  ...(continue until the last valid data)
- A#1 Res.(mΩ): The string A, 1st battery resistance data.
- A#2 Res.(mΩ): The string A, 2nd battery resistance data.
  ...(continue until the last valid data)

[Logs->Graphing] This page is used to display the data of the Status Record. The graphing function makes the status records easier to view.

Item	Definition
Graph Period	The period used to draw the graph. Longer periods will require more time to be displayed.
Graph Data	The data used to draw the graph. The more data selected, the more graphing time is needed.
Graph Node	Selecting "Display All Nodes in Detail" will display all the points along the line; moving the cursor on the data point will show the information of that point.
Launch Graph in New Window	Checking this box will open the graph in detail in a new page.

[Logs->Maintenance] This page is used to select "Event Logs" and "Status Records" settings. The application provides information on how many events are recorded before it is full.

Item	Definition
Event Logs	
Clear All Logs	Clear the existing event logs.
The Number of Events	The number of the existing event logs and the maximum number of the event logs that can be recorded. Once the maximum number is reached, new events overwrite oldest events in memory.
Save Event Logs	Save the existing event logs as a text file.

Status Records	
Recording Interval	Set the frequency status data is recorded. A smaller interval will provide more frequent recordings but exhaust available memory quicker. A larger interval will provide less frequent recordings, but save data for a longer period of time.
Clear All Records	Clear the existing status records.
Remaining Time	The time that records have been kept. A smaller recording interval leads to less remaining time while a larger recording interval leads to more remaining time. Once the maximum number is reached, new status records overwrite oldest status records in memory.
Save Status Records	Save the status records as a text file.

Note: Event Logs and Status Records use a First In First Out memory. Oldest data will be rewritten once memory is full.

[Logs->Syslog] Allow users to set syslog server and send test message.

Item	Definition
Syslog	Enable or disable Syslog function.
Facility Code	Select Syslog facility.
Server IP	The IP address of Syslog server.
Server Port	The UDP port used by the Syslog server.
Send Test	Send test message to Syslog server.

[System->General->Time] Display the system date and time and allow users to set it manually or by using the NTP (Network Time Protocol) server.

Item	Definition
Current Settings	Displays the current date and time on the manager status and time until the next Network Time Protocol (NTP) update.
System Time Configuration	
Time Zone	Choose the Battery Manager time zone in GMT (Greenwich Mean Time).
Using NTP server	Enter the IP address/domain name of NTP servers, and set the frequency to update the date and time from NTP server. Click "Update right now" to update immediately.
Manual Setup	Enter the date and time in the designated format.

[System->General->Identification] Assign the system's name, contact, and location.

Item	Definition
Name	The name of the equipment.
Location	Where the power equipment is located.
Contact	The person to contact about this equipment.

[System->General->Daylight Saving Time] Adjust the clock daylight saving time.

Item	Definition
DST Configuration	
Disable	Disable DST.
Tradition US DST	Set traditional US DST settings Start: 2:00, second Sunday in March. End: 2:00, first Sunday in November.
Manual DST	Manual DST date time rules.

[System->Security->Authentication] Set for login authentication and software authentication.

Item	Definition
Login Authentication	
Local Account	Use local account Administrator or Viewer settings to log in.
RADIUS, Local Account	Use RADIUS configuration settings to log in. If RADIUS authentication fails then Local Account settings will be used to log in.
RADIUS Only	Use RADIUS configuration settings to log in.
LDAP, Local Account	Use LDAP configuration settings to log in. If LDAP authentication fails then Local Account settings will be used to log in.
LDAP Only	Use LDAP configuration settings to log in.
Software Authentication	
Secret Phrase	The Authentication Phrase used to communicate with PowerPanel Business Edition Client. **Note:** For more information, please refer to Appendix 4.

[System->Security->Local Account] This page is used to configure the login account.

Information	Description
Administrator	Administrator has full access to read/write configuration settings.
Viewer	Viewer has restricted access to read only.
Admin/Viewer Manager IP	This setting determines what IP address is allowed to access the device using either Admin or Viewer accounts. If you want to access Battery Manager from any IP address, you can set one of them as 0.0.0.0 or 255.255.255.255. **Note:** A range of IP addresses can be allowed by entering the subnet mask. For example 192.168.20.0/16 means the IP which has subnet of 192.168.0.0 can be allowed to access.

Change Administrator account:

1. Enter User Name
2. Enter Current Password
3. Set the Manager IP *(optional)*
4. Enter New Password
5. Enter Confirm Password
6. Click “Apply”

Change Viewer account:

1. Select “Allow Access” to enable the Viewer account
2. Enter the User Name
3. Set the Manager IP *(optional)*
4. Enter New Password
5. Enter Confirm Password
6. Click “Apply”

Note: The maximum length of both User Name and Password is 15 characters.

[System->Security->RADIUS Configuration] After setting the proper RADIUS server, the Battery Manager can use user name and password set on the RADIUS server to login.

Item	Definition
Server IP	The IP address of RADIUS server.
Shared Secret	The shared secret of RADIUS server.
Server Port	The UDP port used by the RADIUS server.
Test Setting	Test RADIUS server using user name and password settings. If authentication is successful the settings will be saved.
Skip Test	Save RADIUS server settings without testing.

Note: Please refer to Appendix 2 for the account configuration in RADIUS servers.

[System->Security->LDAP Configuration] After setting the proper LDAP server, the Battery Manager can use user name and password that set on the LDAP server to login.

Item	Definition
LDAP Server	The IP address of LDAP server.
LDAP SSL	Enable to communicate with LDAP server by LDAPS.
Port	The TCP port used by the LDAP(S) server.
Base DN	The Base DN of LDAP server.
Login Attribute	The Login Attribute of LDAP user entry (for example: cn or uid).
Generic LDAP Server	Select LDAP server type as OPENLDAP.
Active Directory	Select LDAP server type as Windows AD.
AD Domain	The AD Domain of the Active Directory server.
Test Setting	Test LDAP(S) server using user name and password settings. If authentication is successful the settings will be saved.
Skip Test	Save LDAP(S) server settings without testing.

Note: Please refer to Appendix 2 for the account configuration in LDAP & Windows AD servers.

[System->Security->Session Control] Set for timeout setting for open sessions to automatically log off.

Item	Definition
Timeout	The period (in minutes) that the system waits before automatically logging off.

[System->Network Service->TCP/IPv4] Display the current TCP/IPv4 settings. Set DHCP and DNS server settings.

Item	Definition
Current Configuration	Displays the current TCP/IP settings: IP address, subnet mask, gateway, and DNS server.
DHCP	Select the “Enable DHCP” option and click “Apply” to get IP address, Subnet Mask, and Gateway from DHCP server. Select the “Obtain DNS Address from DHCP” and click “Apply” to get the IP of DNS from the DHCP server.
Manual	Enter the TCP/IP settings directly and click “Apply”.

[System->Network Service->TCP/IPv6] Display and configure the current IPv6 settings.

Item	Definition
IPv6 Interface	Displays the current IPv6 address.
IPv6 Gateway	Displays the current IPv6 gateway.
IPv6 Configuration	
Access	Set the IPv6 service to either Enable or Disable.
Address Mode	
Router Control	The IPv6 address is assigned through one of the following methods as configured in the router settings: Stateless Address Auto-configuration, Stateless DHCPv6 or Stateful DHCPv6.
Manual	The IPv6 address is assigned manually.
Manual IPv6 Address	Enter the IPv6 address directly when the Manual setting is selected.

[System->Network Service->SNMPv1 Service] Allow users to use a NMS and configure the appropriate SNMPv1 settings.

Item	Definition
SNMPv1 Service	
Allow Access	Set the SNMP service to either Enable or Disable.
SNMPv1 Access Control	
Community	The name used to access this community from a Network Management System (NMS). The field must be 1 to 15 characters in length.

IP Address	NMS access can be restricted by entering a specific IP address or an IP network subnet mask. The following subnet mask rules apply: • 192.168.20.255: Access only by an NMS on the 192.168.20 segment. • 192.255.255.255: Access only by an NMS on the 192 segment. • 0.0.0.0 (the default setting) or 255.255.255.255: Access by any NMS on any segment.
Access Type	The allowable action for the NMS through the community and IP address. • Read Only: GET command allowed any time; SET command restricted. • Write/Read: GET command allowed any time; SET command allowed anytime unless a user session is active. • Forbidden: GET and SET commands are restricted.

[System->Network Service->SNMPv3 Service] Allow users to use a NMS and configure the appropriate SNMPv3 settings.

Item	Definition
SNMPv3 Service	
Allow Access	Set the SNMPv3 service to either Enable or Disable.
SNMPv3 Access Control	
User Name	The name to identify SNMPv3 user. The field must be 1 to 31 characters in length.
Authentication Password	The password used to generate the key used for authentication. The field must be 16 to 31 characters in length.
Privacy Password	The password used to generate the key used for encryption. The field must be 16 to 31 characters in length.
IP Address	NMS access can be restricted by entering a specific IP address or an IP network subnet mask. The following subnet mask rules apply: • 192.168.20.255: Access only by an NMS on the 192.168.20 segment. • 192.255.255.255: Access only by an NMS on the 192 segment. • 0.0.0.0 (the default setting) or 255.255.255.255: Access by any NMS on any segment.
Authentication Type	The hash type for authentication.
Privacy Type	The type of data encryption/decryption.

Note: The privacy protocol cannot be selected if no authentication protocol is selected

[System->Network Service->Web Service] Select Enable to allow access to the HTTP or HTTPS Service and configures the TCP/IP port for them.

Item	Definition
Access	
Allow Access	Enable the access to HTTP or HTTPS service. The HTTPS supports encryption algorithm list as follow: • AES (256/128 bits) • Camellia (256/128 bits) • 3DES (168 bits) • DES (168 bits) • RC4 SHA (128 bits) • RC4 MD5 (128 bits)
Http Settings	
Http Port	The TCP/IP port of the Hypertext Transfer Protocol (HTTP) (80 by default)
Https Settings	
Https Port	The TCP/IP port of the Hypertext Transfer Protocol Secure (HTTPS) (443 by default)
Certificate Status	Click the following links: • Valid Certificate (or Invalid Certificate): Certificate detail information. • Upload Certificate: Upload a certificate and replace the current one. **Note:** The format of uploading certificate must in a standard PEM (Privacy Enhanced Mail).

[System->Network Service->FTP Service] Allow users to Enable/Disable the FTP server service and configure the TCP/IP port of the FTP server (21 by default).

Item	Definition
Allow Access	Enable the access to FTP server.
Service Port	The TCP/IP port of the FTP server (21 by default). Users can change port setting to any unused port from 5000 to 65535 to enhance security.

Note: The FTP server is used for upgrading Firmware. For more details about the upgrade process, please refer to “Firmware Upgrade” section.

[System->Notifications->Event Action] Configure notification settings for every Device Event. Events are categorized for ease of management.

- Log: Record the event in the “Event Logs”.
- E-mail: Send an email to a specific user (An available SMTP server is necessary).
- Trap: A SNMP trap sent to a specific IP address.
- SMS: Send a short message to a specific mobile phone number (An available SMS service provider is needed).

[System->Notifications->SMTP Server] After setting the proper SMTP server, event notification email can be sent to recipients when specific events occur.

Item	Definition
Service Provider	The service provider of e-mail account. There are two options: General and Gmail.
General	Select General as service provider. Complete all field settings and click Apply to save.
Gmail	Select Gmail as the service provider. Click Authorize for an authorization to send a mail notification. Then complete the sender name and click Apply to save the settings.
SMTP server address	The IP address or Host Name of the SMTP server used to send email notifications.
Sender's E-mail Address	Email address used to send the email notification.
Authentication	Select this option if the SMTP server requires to authenticate the user.
Username	Username used for Authentication.
Password	Password used for Authentication.
Secure connection	Enable TLS or SSL security.
Service port	The port number used to communicate with the SMTP server.

[System->Notifications->E-mail Recipients] Set up to five email recipients to receive notifications when configured Events occur.

To add a new recipient, click “New Recipient”. To modify or delete an existing Recipient, click the e-mail address of that recipient. To check if SMTP setting and the email recipients are set correctly, click “TEST” button to send a test message.

[System->Notifications->Trap Receivers] Setup up to 10 SNMP TRAP receivers by IP address (IPv6 supported). SNMPv1 and v3 is supported. The listed TRAP receivers will be notified when device Events occur.

To add a new receiver, click “New Receiver”. To modify or delete an existing receiver, click the IP address or name of that receiver. To check if the traps can be received correctly, click “TEST” button.

[System->Notifications->SMS Service] Short Message Service (SMS) is a communication service used by mobile communication systems. Using standardized communication protocols will allow the interchange of short text messages between mobile devices. The system provides 4 methods for users to choose how they want to send the messages.

Information	Description
Service provider is Clickatell	Select the **Clickatell** option in the SMS Method field. Complete all the account details including Username, Password and HTTP API ID fields. For example: User Name Name Password Passwd HTTP API ID 3234599
Service provider accepts	This specification from the SMS provider is required before

HTTP GET	using the **HTTP GET** method. Select the Using **HTTP GET** option in the SMS Method field. Insert the E_PHONE_NUMBER as recipient's mobile phone number and the E_PHONE_MESSAGE as event message, described by the SMS provider specification, and fill in the URL field. The expressions will be replaced by relevant content before the message is sent by the SMS provider. For example: URL http://ServiceProviderURL?user=Name&password=Passwd& api_id=3234599&to=E_PHONE_NUMBER&text=E_MESSAGE
Service provider accepts HTTP POST	This specification from the SMS provider is required before using the **HTTP POST** method to deliver messages via SMS providers. Select the Using **HTTP POST** option in the SMS Method field. Insert E_PHONE_NUMBER as recipient's mobile phone number and E_PHONE_MESSAGE as the event message, described by the SMS provider specification, and fill in the POST URL and POST BODY fields. The expressions will be replaced by the relevant content before the message is sent by the SMS provider. For example: URL http://ServiceProviderURL Content user=Name&password=Passwd&api_id=3234599& to=E_PHONE_NUMBER&text=E_MESSAGE
Service provider accepts E-mail (SMTP)	This specification from a SMS provider is required before using the E-mail to deliver the messages via SMS providers. Select the Using E-mail option in the Service Provider field. Insert E_PHONE_NUMBER as recipient's mobile phone number and the E_PHONE_MESSAGE as event message, described by the SMS provider specification. Fill in the Recipient's Address, Subject and Content. The expressions will be replaced by the relevant content before the message is sent by the SMS provider. For example: Address sample@cyberpower.com Subject TestSubject Content E_PHONE_NUMBER&text=E_MESSAGE

[System->Notifications->SMS Recipients] Users can set up to 10 mobile phone numbers as SMS recipients. The Recipients will receive a short message notification when configured events occur.

To add a new recipient, click "New Recipient". To modify or delete an existing Recipient, click the mobile number or Name of that recipient. To test SMS settings, click "TEST" button and see if the test message is correctly received.

[System->Reset/Reboot] Reset or reboot the Battery Management System.

Item	Definition
Reboot System	Restart the system without turning off and restarting the system.
Reset System	Reset the system to factory default setting. The system will restart. This action will not turn off or restart the system.
Reset System (TCP/IP Settings Reserved)	Reset the system to factory default setting but reserving TCP/IP. The system will restart This action will not turn off or restart the system.

[System->About] Display system information for the Battery Manager.

Item	Definition
Model Name	Model name of the Battery Manager.
Serial Number	The serial number of the Battery Manager.
Manufacture Date	The manufacture date of the Battery Manager
Hardware Version	The hardware version of the Battery Manager.
Firmware Version	The current firmware version installed on the Battery Manager.
LCD Hardware Version	The hardware version of the Battery Manager LCD module.
LCD Firmware Version	The firmware version of the Battery Manager LCD module.
Ethernet Hardware Version	The hardware version of the Battery Manager Ethernet module.
Ethernet Firmware Version	The firmware version of the Battery Manager Ethernet module.
Ethernet MAC Address	MAC address of the Battery Manager.
Save Configuration	Click “Save” to save the Battery Manager configuration file. The text file name will have a default format of YYYY_MM_DD_HHMM.txt.
Restore Configuration	Use this function to restore a configuration that had been previously saved. Click “Choose File” to select the location of the saved configuration file and click “Submit”.

Ethernet Module Firmware Upgrade

By upgrading the Ethernet firmware, you can obtain both the new features and updates/improvements to existing functionality. FTP service needs to be Enabled before attempting to execute a Firmware Upgrade. You can check the "Firmware version" on the **[System->About]** page on the web user interface of the Battery Manager. There are two files to update in order to upgrade the firmware version.

- A. cpsbmethafw_XXX.bin
- B. cpsbmethadata_XXX.bin

Note: To ensure keeping the Ethernet firmware up to date, please visit CyberPower website every 3 months to see if there is any updated firmware version available.

Note: Please do not turn the Battery Manager off when processing the Firmware upgrade.

Using FTP command

Use the following steps to upgrade the firmware:

1. Download the latest firmware
2. Extract the downloaded files to "C:\"
3. Open a command prompt window
4. Login to the CyberPower Battery Manager with FTP command, in the command prompt type:
   (1) `ftp`
   (2) `ftp> open`
   (3) To [current IP address of Battery Manager] [port]; EX: `To 192.168.22.126 21`
   (4) Input USER NAME and PASSWORD (same as the administrator account in web user interface, see page 7 for default factory settings)
5. Upload file A, type:
   `ftp > bin`
   `ftp > put cpsbmethafw_XXX.bin`
6. Upload is now complete, type:
   `ftp > quit`
7. The system will reboot after you type "`quit`"
8. Login to the FTP again as step 4
9. Upload file B, type:
   `ftp > bin`
   `ftp > put cpsbmethacdata_XXX.bin`
10. Upload is now complete, type:
    `ftp > quit`
11. The system will reboot after you type "`quit`"

Save and Restore Configuration Settings

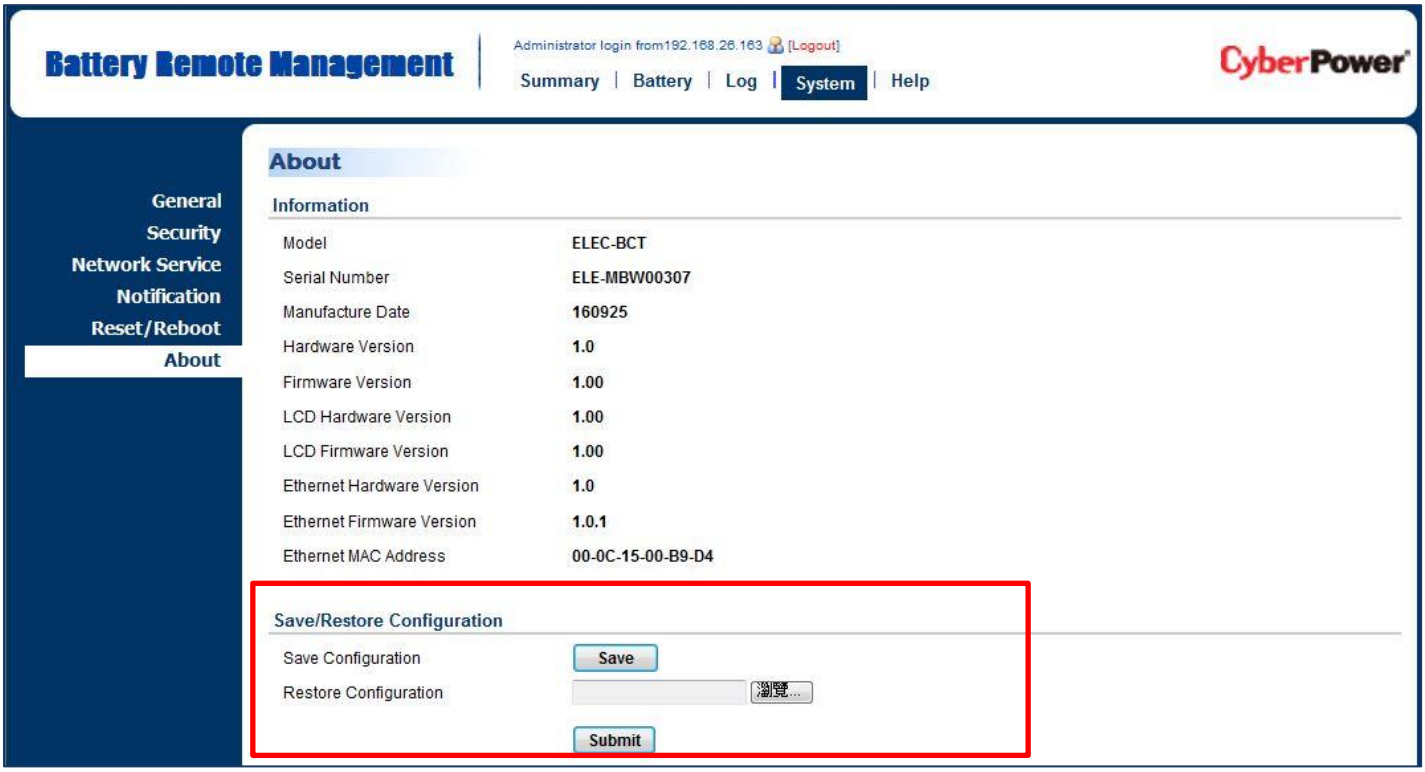


Figure 9. Save/Restore Configuration in the main window.

You can easily save and restore the device configuration to your local PC on the **[System->About]**, as shown in Figure 9.

To save the configuration file, click “Save” to save the configuration to your local PC. The text file will have a default format of YYYY_MM_DD_HHMM.txt. To restore a configuration, click “Browse” to the location of the saved configuration file and click “Submit” to restore a configuration that has been saved earlier.

Troubleshooting

Problem	Solution
Unable to configure the Battery Manager using method 1 or method 2	1. Check the LED status, it is normal when the yellow and green LEDs are both on. If yellow LED is off : ► Ensure the network connection is good. 2. Ensure the PC being used is on the same local network subnet as the CyberPower device you are trying to communicate with. 3. Ensure the Jumper on the Reset Pin is correctly installed.
Unable to ping the Battery Manager	1. Use method 1 and/or method 2 to get/set a correct IP address for the Battery Manager. 2. If the PC being used is on a different network subnet from the Battery Manager, verify the setting of subnet mask and the IP address of gateway.
Lost the user name and password	Reset the system to the factory default setting via LCD interface on the **[Reset/Reboot → Reset → Confirm]** or via web user interface on the **[System → Reset/Reboot]** **Note:** You may save configuration settings first before resetting the system. Please refer to 'Save and Restore Configuration Settings' section.
Default Network Setting	IP: 192.168.20.177 Subnet mask: 255.255.255.0 DHCP: On
Unable to access the Web Interface	1. Ensure you can ping the Battery Manager. 2. Ensure you are specifying the correct URL.
Unable to operate a SNMP get/set	SNMPv1: Verify the community name. SNMPv3: Verify the user profile configuration.
Unable to receive traps	1. Ensure the trap types (SNMPv1/SNMPv3) and trap receiver are configured correctly. 2. Ensure the IP address of gateway is configured correctly if the Battery Manager and NMS are on a different network.

Conformance Approvals

FCC Warning

This equipment has been tested and found to comply with the limits for a Class A Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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.

Any special accessories needed for compliance must be specified in the instruction.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulation.

Cet appareil numerique de la class A respecte toutes les exigencies du Reglement sur le materiel brouilleur du Canada

European Union

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Appendix 1: IP Address Settings for CyberPower Battery Manager

Overview

All devices on a computer network need to have an IP address. Each device's IP address is unique. The same address cannot be used twice. In order to assign an IP address to the CyberPower Battery Manager, you must determine the range of the available IP addresses, and then choose an unused IP address to assign to the Battery Manager.

Note: You may need to contact your network administrator to obtain an available IP address.

Procedures to find an IP address:

1. **Locate the subnet of the CyberPower Battery Manager.**

   One way to determine the range of possible IP addresses is to view the network configuration on a workstation. Click on [Start] and select [Run]. Type "**command**" into the open box and click [OK]. At the command prompt type "**ipconfig /all**" and press [Enter]. The computer will display network information as listed below:

```
Ethernet adapter
Connection-specific DNS Suffix.....: xxxx.com
 Description.....: D-Link DE220 ISA PnP LAN adapter
 Physical Address.....: 00-80-C8-DA-7A-C0
 DHCP Enabled.....: Yes
 Autoconfiguration Enabled...: Yes
 IP Address.....: 192.168.20.102
 Subnet Mask.....: 255.255.255.0
 Default Gateway.....: 192.168.20.1
 DHCP Server.....: 192.168.20.1
 DNS Servers.....: 211.20.71.202
                                 168.95.1.1
```

2. Select an IP Address for the CyberPower Battery Manager

Verify the IP Addresses for the computer and the Battery Manager belong to the same subnet. Refer to the above network information, the possible IP Address for the Battery Manager could be 192.168.20.* (* hereafter represents any number between 1 and 255). Similarly, if the Subnet Mask is 255.255.0.0, the IP Address for Battery Manager could be set up as 192.168.*.* to reach the same subnet with the computer.

To verify there is no other equipment connected to the network using the same IP Address, run "`Ping 192.168.20.240`" at the DOS Mode prompt when the IP Address you would like to set is 192.168.20.240. If the response is presented as below, the IP address is most likely not used and may be available for the CyberPower Battery Manager.

```
Pinging 192.168.20.240 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.
```

If the response is shown as below, the IP address is in use. Try another IP address until an available address is found.

```
Pinging 192.168.20.240 with 32 bytes of data:

Reply from 192.168.20.240: bytes=32 time<10ms TTL=64
Reply from 192.168.20.240: bytes=32 time<10ms TTL=64
Reply from 192.168.20.240: bytes=32 time<10ms TTL=64
Reply from 192.168.20.240: bytes=32 time<10ms TTL=64
```

Appendix 2: How to Configure a Battery Manager User Account in Authentication Servers

RADIUS

1. Add a new attribute to RADIUS Dictionary as the Cyber vendor:
   3808 – Vendor
2. Add two new specific attributes to RADIUS server interface under the vendor:
   Cyber-Service-Type (integer variable)
   Cyber-Service-Type can accept three integer parameter values:
   1 – Administrator
   2 – Viewer

The example of the Dictionary File:

```
VENDOR              Cyber          3808
BEGIN-VENDOR        Cyber
ATTRIBUTE           Cyber-Service-Type     1           integer
VALUE               Cyber-Service-Type     Admin          1
VALUE               Cyber-Service-Type     Viewer         2
END-VENDOR          Cyber
```

LDAP & Windows AD

Add one of the attributes below to **description** on the OpenLDAP or Windows AD interface for indicating the user account type and authentication:

1. **cyber_admin** (Administrator)
2. **cyber_viewer** (Viewer)

Appendix 3: Software Support

Battery Management System (BMS) Software is used to collect and configure multiple Battery Managers' data. Battery Management System (BMS) Software is available on CyberPower Systems official website. Please visit www.CyberPower.com and go to the software section for free download.

Communicate with BMS software

The Battery Manager requires authentication with BMS software via a shared secret phrase, as shown in Figure 10.

Note: The default secret phrase is 'key.secure.phase.bms'.

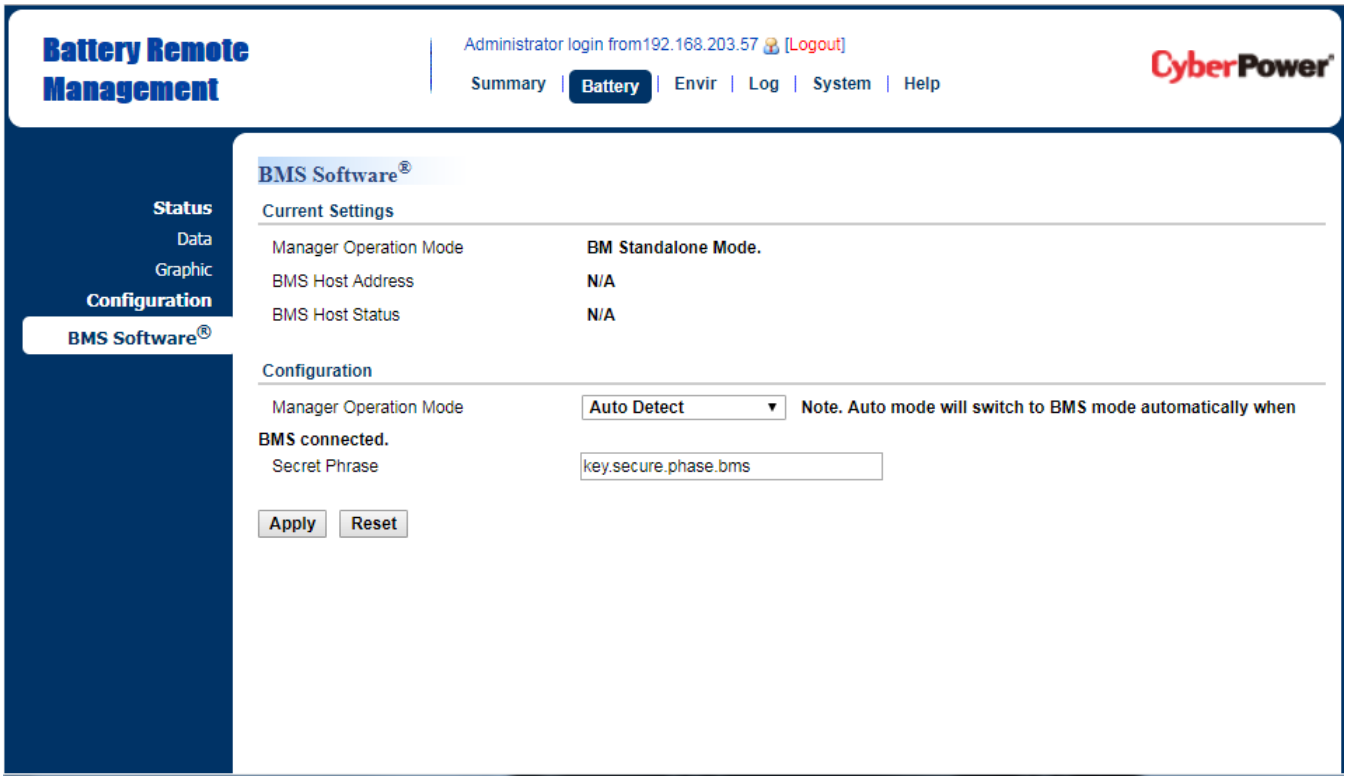
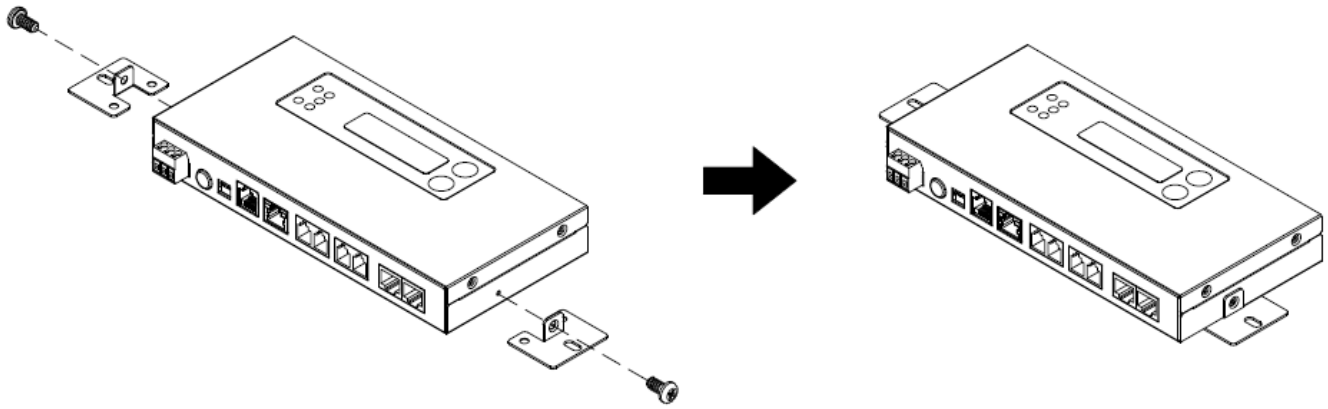


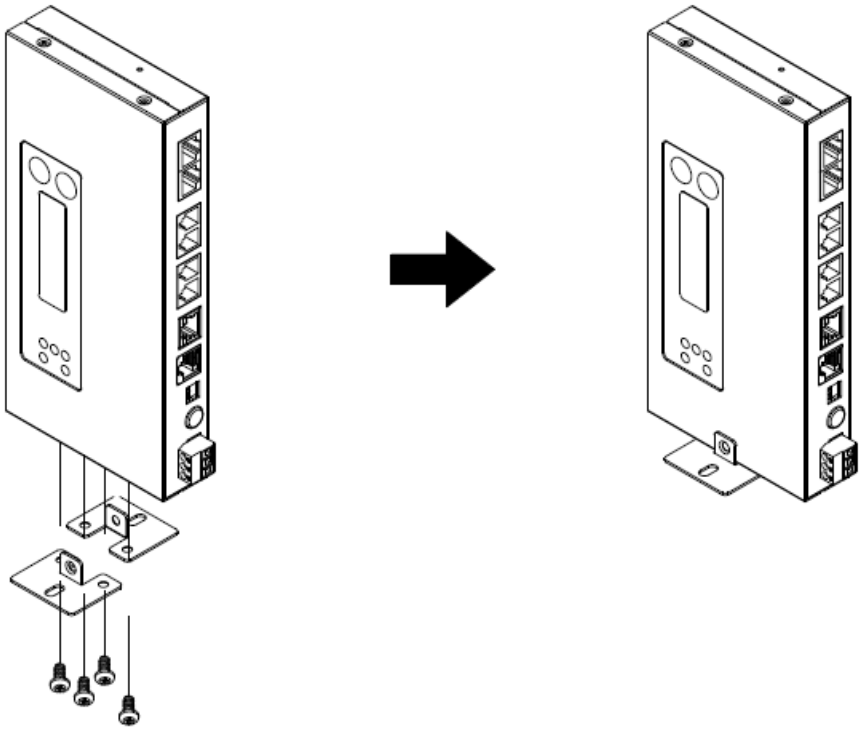
Figure 10. Battery Management System > Authentication web UI.

Appendix 4: Mounting Bracket Installation Guide

Method 1: Horizontal Installation



Method 2: Upright Installation



Note: Please set up the Battery Manager on a level surface.

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