

# **Symmetra PX**

## **250/500 kW 400/480 V**

### **Single and Parallel Operation**





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# Overview

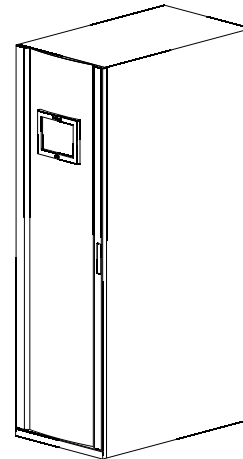
## Display Overview



**Note:** The screens shown in this manuals are examples only.

The UPS graphical user interface is located in the Input/Output/Bypass Enclosure. The UPS utilizes the touch-screen display to configure and monitor the system, and provides the user with visible and audible alarms.

The screens are organized hierarchically. In parallel systems the Parallel System Summary screen is at the top of the hierarchy. In single systems the UPS Summary screen is at the top of the hierarchy.

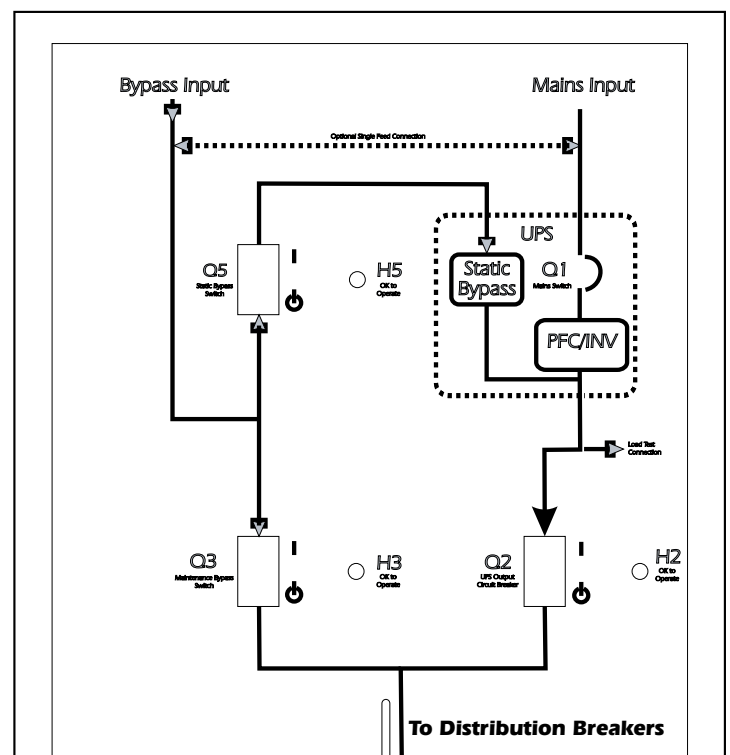


## Overview of Breakers in the MBwD (Option)



**Note:** The MBwD is only applicable for single systems.

The APC MBwD contains the breakers Q1, Q2, Q3, and Q5. When the associated breaker lamp is lit, it is ok to open and close the breaker.



# Navigation

Parallel System Summary	
	Parallel Input Summary
	Parallel Bypass Summary
	Parallel Output Summary
	UPS System
	UPS Summary
	UPS Input Summary
	UPS Bypass Summary
	UPS Battery Summary
	System Status
	Subfeed Summary
	UPS Output Summary
	UPS System
	System Information
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	Firmware Overview
	Predictive Maintenance
	Configuration
	User Configuration
	Service Configuration
	Factory Configuration
	Operation
	Start-Up
	Shutdown
	Transfer to normal operation
	Transfer to static bypass
	Isolate this UPS
	Language Settings
	Regional Settings

## Symbols used



**WARNING:** Indicates an electrical hazard, which, if not avoided, could result in injury or death.



**Caution:** Indicates a hazard, which, if not avoided, could result in injury or death.



**Note:** Indicates important information.



**See:** Indicates that more information is available on this subject.

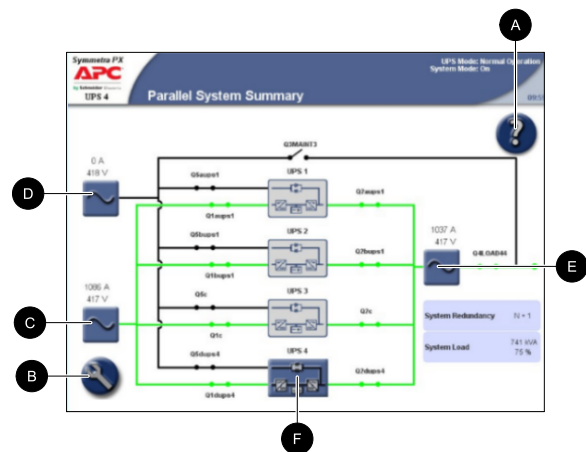
## Parallel System Summary

The Parallel System Summary screen is the home screen in parallel systems. It provides you with an overview of the parallel system and circuit breakers. It shows the system status and the power flow through the system and gives access to the system's summary screens.



**Note:** The operated UPS is highlighted on the screen and the other UPS units are faded.

- A. Access further details on the current screen.
- B. Go to the UPS System screen.
- C. Go to the Parallel Input Summary screens.
- D. Go to the Parallel Bypass Summary screens.
- E. Go to the Parallel Output Summary screens.
- F. Go to the UPS Summary screens.

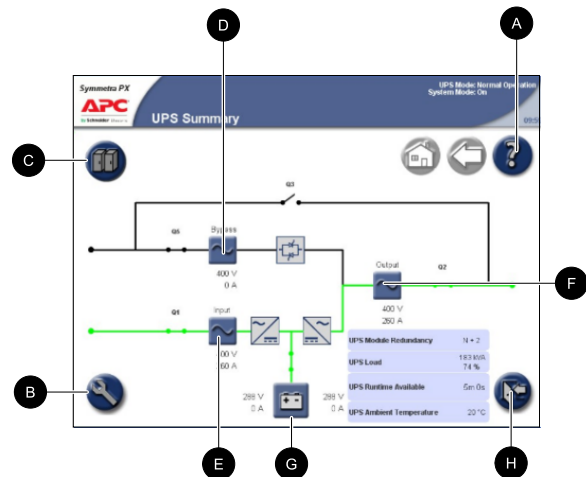


# UPS Summary Screen

## Single System

In single systems, the UPS Summary screen is the home screen. It provides you with an overview of the UPS system and circuit breakers. It shows the system status and the power flow through the system and gives access to the system's summary screens and the UPS System screen.

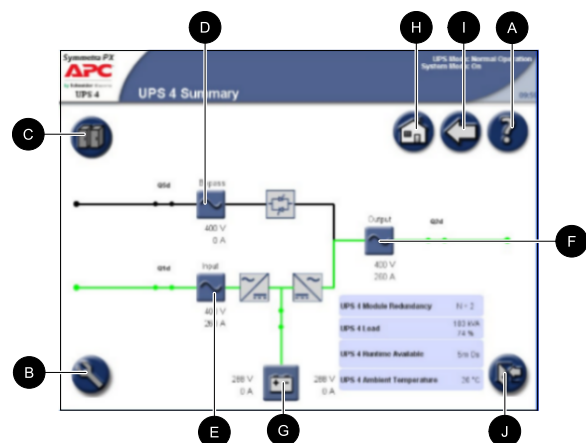
- A. Access further details on the current screen.
- B. Go to the UPS System screen.
- C. Go to the System Status screen for the current UPS.
- D. Go to the Bypass Summary screens.
- E. Go to the Input Summary screens.
- F. Go to the Output Summary screens.
- G. Go to the Battery Summary screens.
- H. Log out of password protected screens.



## Parallel System

In parallel systems, the UPS Summary screen provides you with an overview of the actual UPS and circuit breakers. It shows the system status and the power flow through the UPS and gives access to the system's summary screens and the UPS System screen.

- A. Access further details on the current screen.
- B. Go to the UPS System screen.
- C. Go to the System Status screen for the current UPS.
- D. Go to the Bypass Summary screens.
- E. Go to the Input Summary screens.
- F. Go to the Output Summary screens.
- G. Go to the Battery Summary screens.
- H. Go to the Parallel System Summary screen.
- I. Go to the previous screen.
- J. Log out of password protected screens.



# Operation Modes

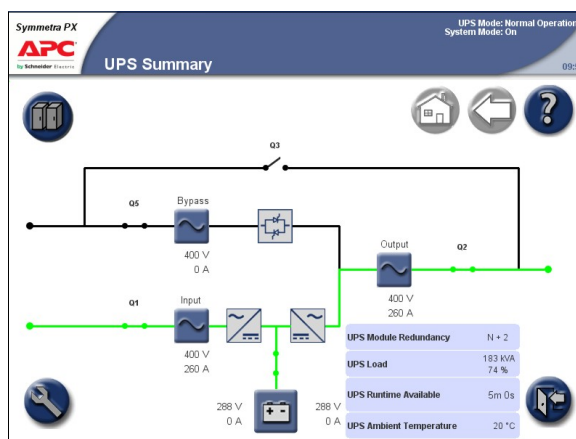
## UPS Modes

The UPS operation mode is indicated in the top right corner of the screen under the heading UPS Mode. The UPS mode indicates the current status of the operated UPS.

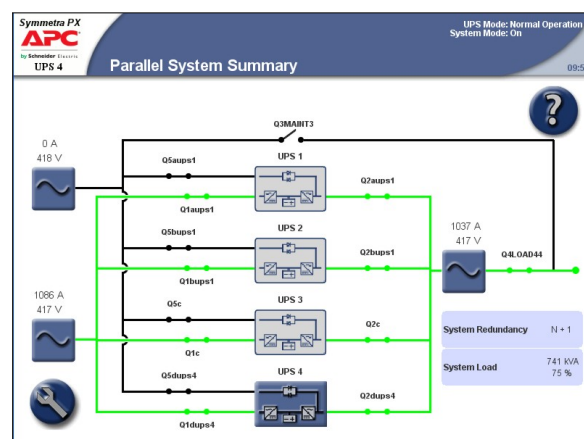
## Normal Operation

During normal operation, the UPS supports the critical load with conditioned power. While the UPS is operating in normal operation, a single-line diagram will appear on the screen. A green line indicates the power flow from the utility/mains, through the UPS system, and to the load. The green line to the batteries indicates that the batteries are connected.

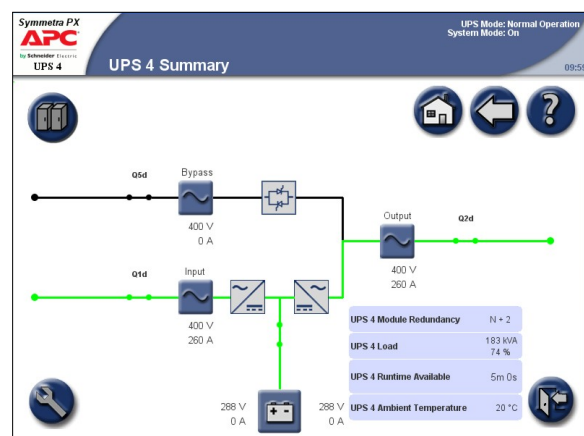
Single System



Parallel System



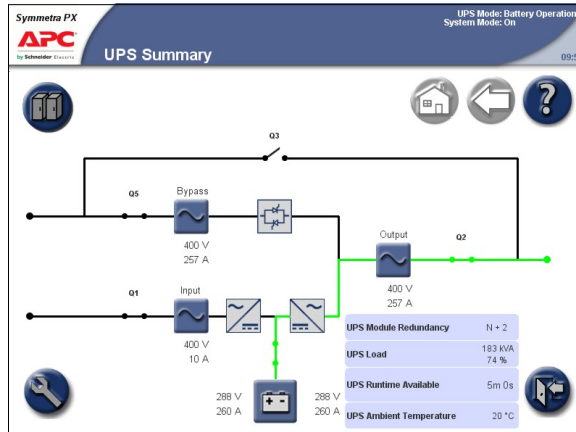
OR



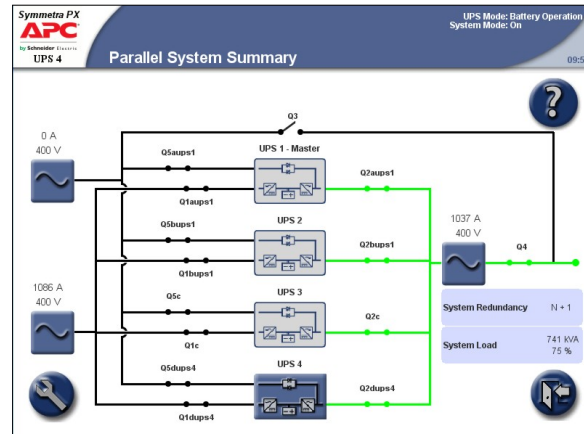
## Battery operation

If the utility/mains supply fails, the UPS transfers to battery operation. During battery operation, battery power ensures uninterrupted support to the critical load. While the UPS system is in battery operation, a single-line diagram will appear on the screen. The green line indicates the power flow from the batteries, through the inverters, and then to the load.

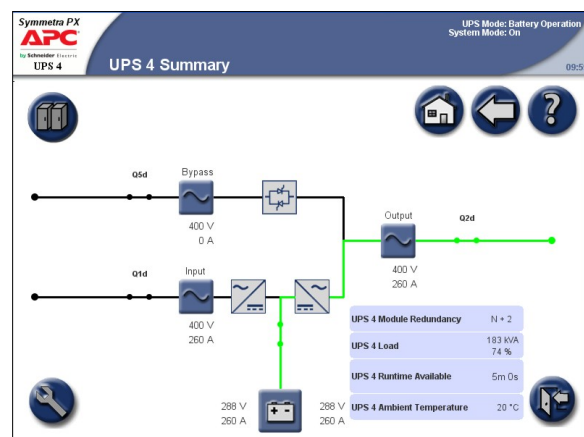
Single System



Parallel System



OR



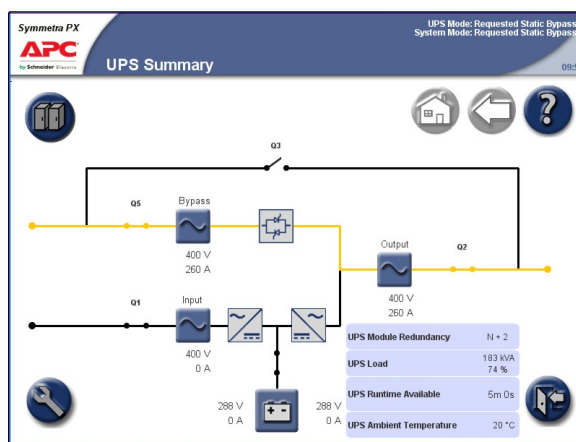
## Requested static bypass operation/forced static bypass operation

The UPS is in requested static bypass following a command from the graphical user interface. And the UPS is in forced bypass when a fault on the system has caused static bypass operation. During static bypass operation, the critical load is supplied directly by utility/mains power. While the UPS is operating in this mode, a single-line diagram will appear on the screen. The orange line indicates the power flow from the utility/mains through the bypass static switch, and then to the critical load.

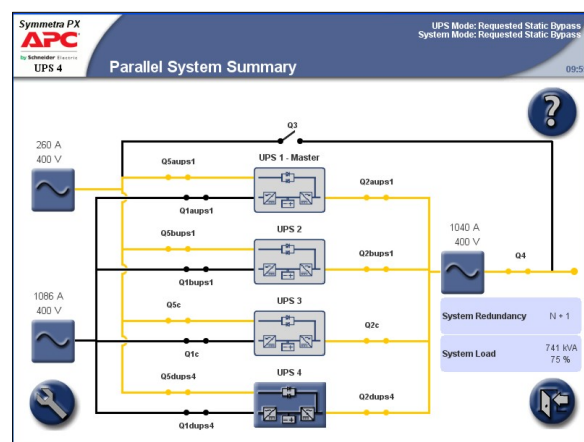


**Note:** The batteries are not available as an alternate power source while the system is in forced static bypass operation. The batteries are available in requested bypass, and it is possible to manually transfer to normal operation. If there is an interruption to the utility/mains power supply during requested static bypass operation, the system will transfer to battery operation. This will cause an interruption to the power supplying the load and may result in a load drop.

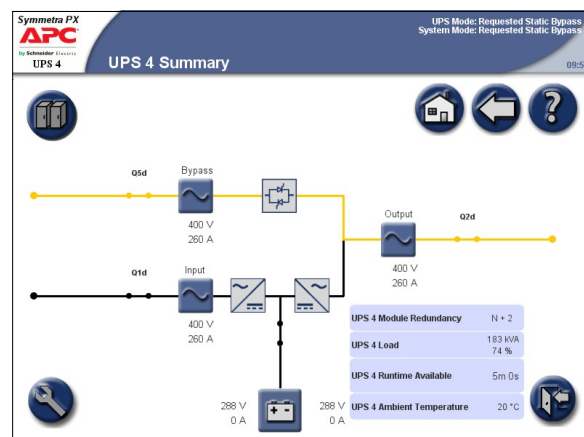
Single System



Parallel System



OR



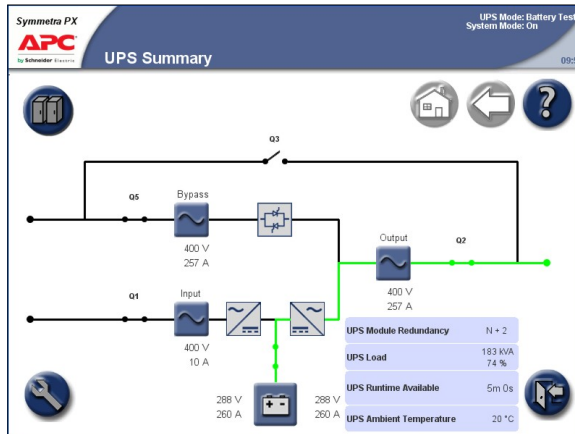
## Battery test

The UPS is in battery test mode when the UPS is performing a battery self-test. During battery test, the battery runtime capacity is reduced by 10%.

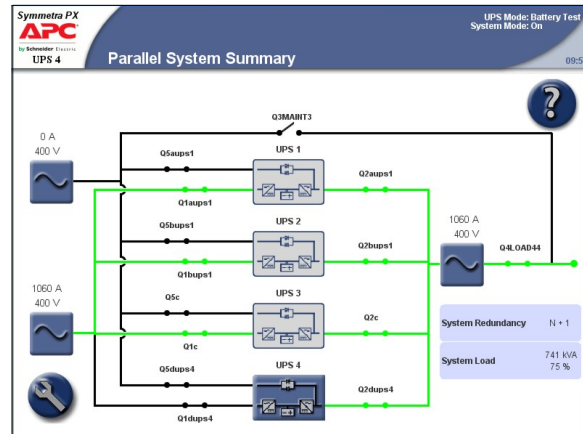


**Note:** The battery test will stop if the mains supply fails during the test.

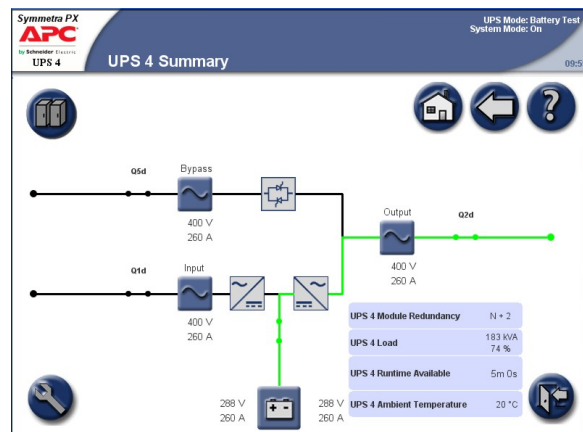
### Single System



### Parallel System



OR





# System Modes

The system mode is indicated in the top right corner of the screen under the heading System Mode. The system mode indicates the current output status of the complete system, and not the individual UPS unit.

## On

When the system mode is On, the UPS system supports the critical load with conditioned power. The load is supported by the UPS in both normal and battery operation.

## Off

When the system mode is Off, the UPS system does not support the connected load with power.

## Requested static bypass operation/forced static bypass operation

The UPS is in requested static bypass following a command from the graphical user interface. And the UPS is in forced bypass when a fault on the system has caused static bypass operation. During static bypass operation, the critical load is supplied directly by utility/mains power. While the UPS is operating in this mode, a single-line diagram will appear on the screen. The orange line indicates the power flow from the utility/mains through the bypass static switch, and then to the critical load.

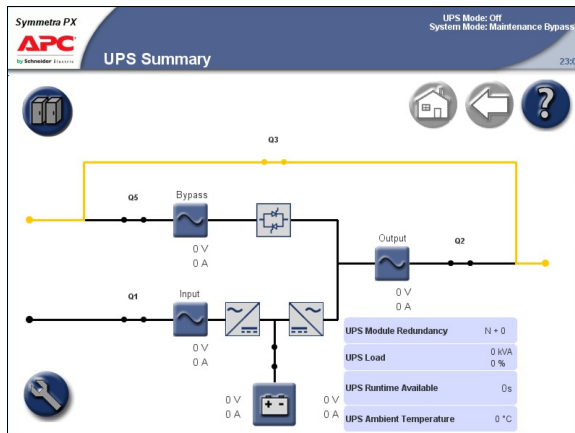
## Maintenance bypass operation

During maintenance bypass operation, the critical load is supplied directly by utility/mains power. While the UPS system is in maintenance bypass operation, a single-line diagram will appear on the screen. The orange line indicates the power flow from the utility/mains, and then to the critical load via the Q3 switch.

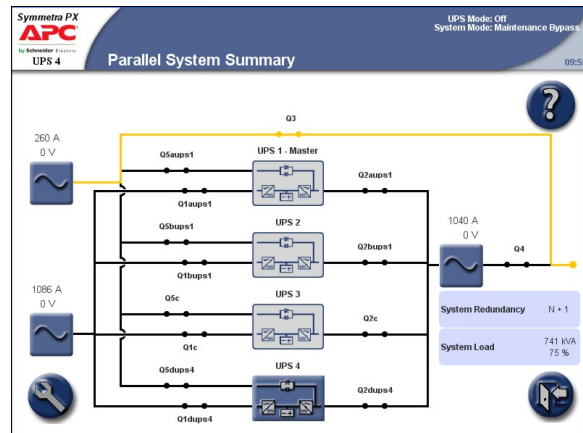


**Note:** The batteries are not available as an alternate power source while the UPS system is in maintenance bypass operation.

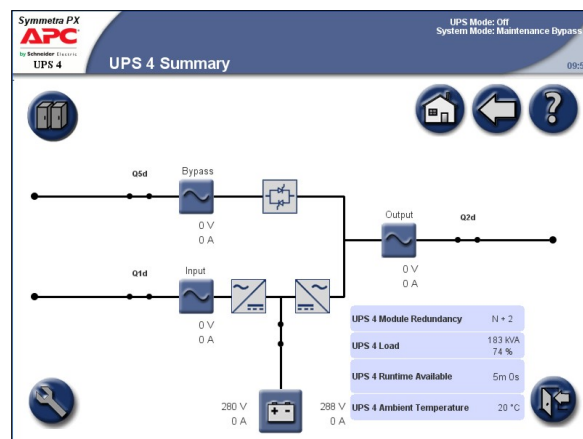
Single System



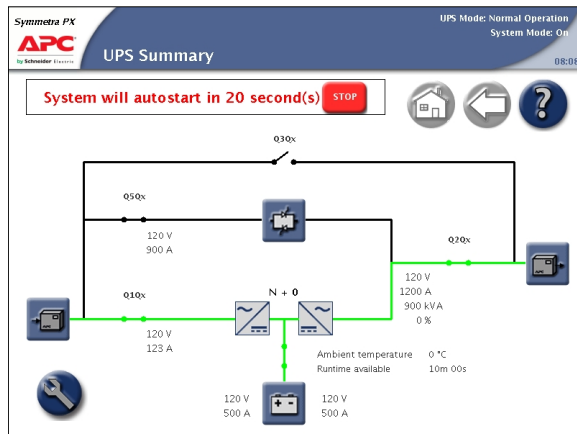
Parallel System



OR



## Autostart Countdown



The system can be set up for an automatic start when AC utility power is restored following a low battery voltage shutdown. The autostart countdown window is shown over all screens until the countdown period expires or the autostart is manually stopped by pressing the stop button.

This feature is disabled by default and is not supported in parallel systems. Contact APC if this feature should be enabled.

# Operation Procedures

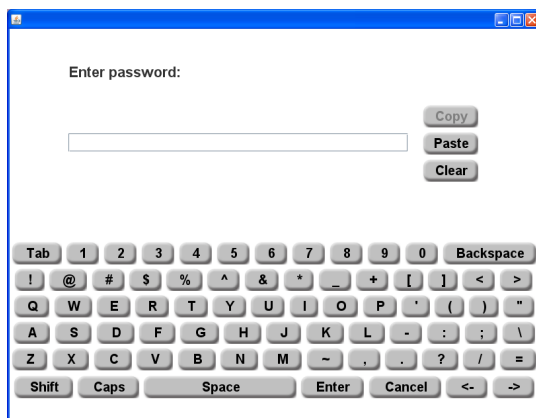
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## Access Screens Protected by User Password

1. When prompted for the user-password, press the password field to access the keyboard.



2. Type in the user password and press **Enter**.



**Note:** On installation, the user password is set to “apc”.

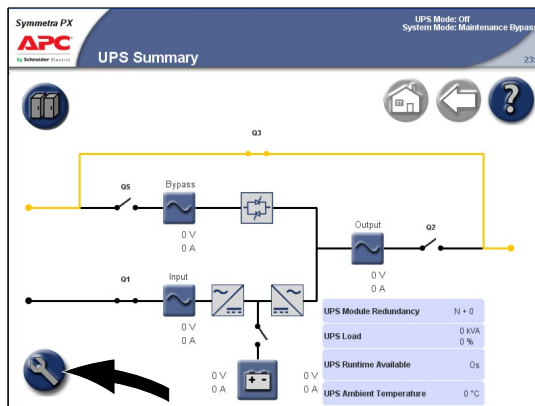
# Start Up System from Maintenance Bypass Operation



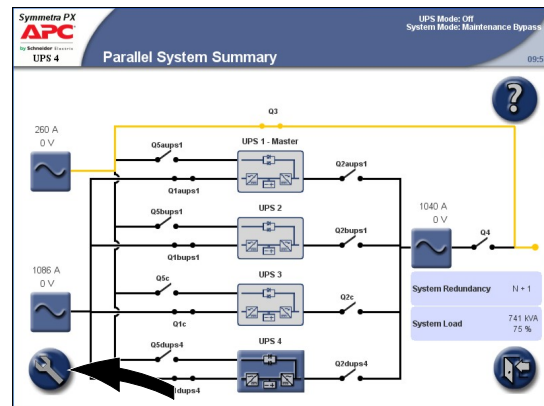
**Note:** Start-up condition: The load is supplied via the Q3 switch from the utility/mains, and the other breakers are open.

1. Close the UPS input breaker (Q1). This will power up the UPS display.
2. Press the **UPS System** button in the bottom left corner to access the UPS System screen.

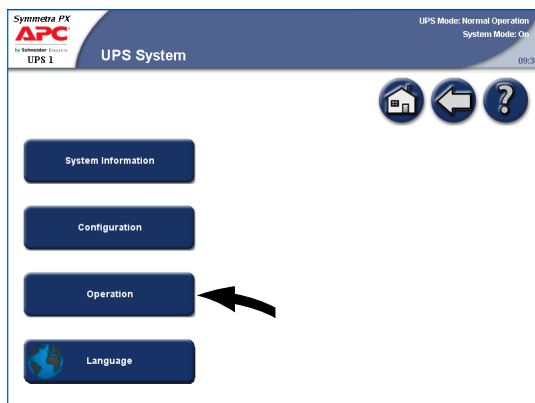
Single System



Parallel System

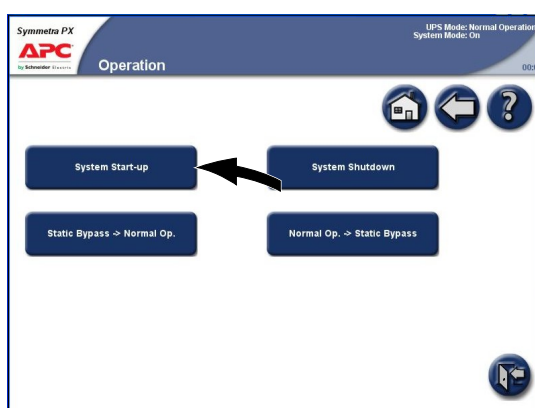


3. Press the **Operation** button. Type in the user password and complete with **Enter**.

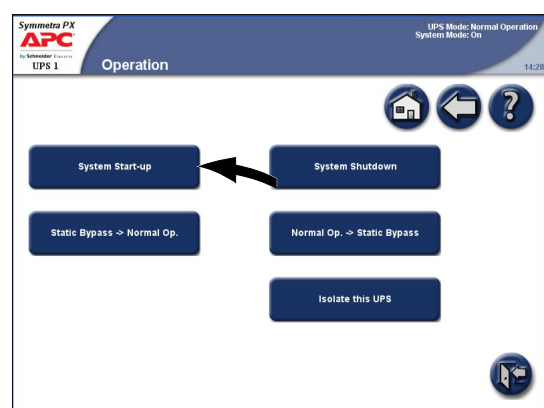


4. Press **System Start-up** button.

Single System



Parallel System



- Follow the steps which appear on the screen. Steps will appear in the order in which they need to be completed. A step will initially appear in red and then when it is completed, the step will change to green. The next step to be completed will be highlighted in red text and yellow background.



**Note:** Grey buttons are touch-screen functions.

#### Single System

Number	Step	Action / Description
1	Close breaker Q1Qx	Apply AC utility power
2	Close breaker Q5Qx	SSW input
3	Close battery breakers	Close Battery Breakers
4	Switch on UPS	UPS On
5	Initiate transfer to static bypass	Initiate Transfer
6	Close breaker Q2Qx	UPS output
7	Close breaker Q4Qx	System output
8	Open breaker Q3Qx	Static bypass
9	Transfer load to normal operation	Output On

#### Parallel System

Number	Step	Action / Description
1	Close breaker Q1 aQx	Apply AC utility power
2	Close breaker Q5aQx	SSW input
3	Close battery breakers	Close Battery Breakers
4	Switch on UPS	UPS On
5	Initiate transfer to static bypass	Initiate Transfer
6	Close breaker Q2aQx	UPS output
7	Close breaker Q4Qx	System output
8	Open breaker Q3Qx	Static bypass
9	Transfer load to normal operation	Output On

- Check that the UPS Mode is Normal Operation in the upper right corner.

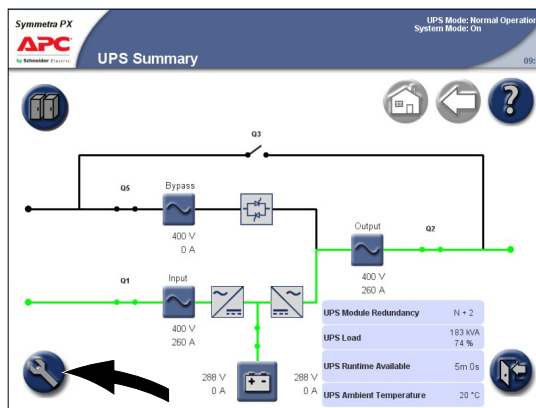
# Shut Down System from Normal to Maintenance Bypass Operation



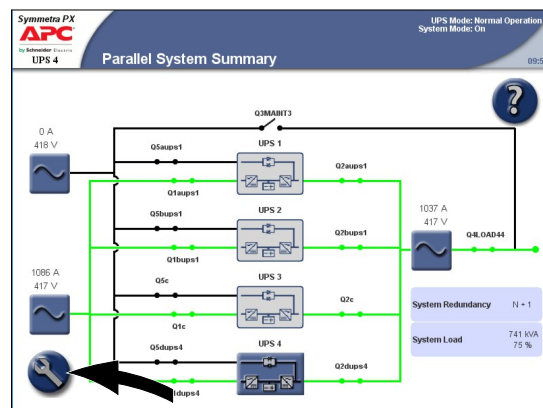
**Note:** Press the home button to go to the UPS Summary or Parallel System Summary screen.

1. Press the **UPS System** button in the bottom left corner to access the UPS System screen.

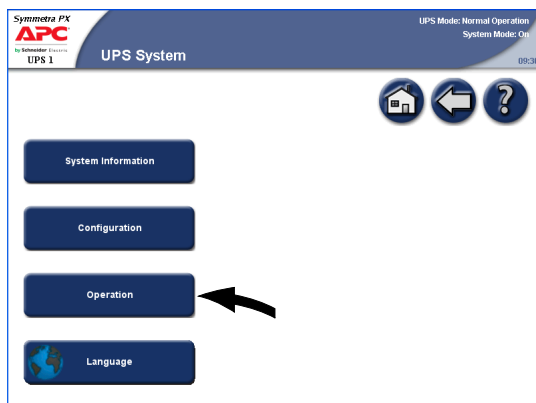
Single System



Parallel System

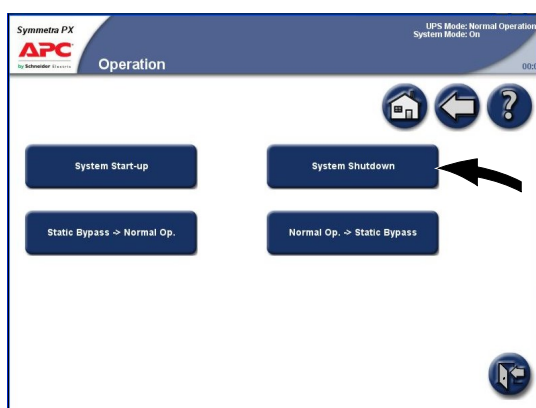


2. Press the **Operation** button. Type in the user password and complete with **Enter**.

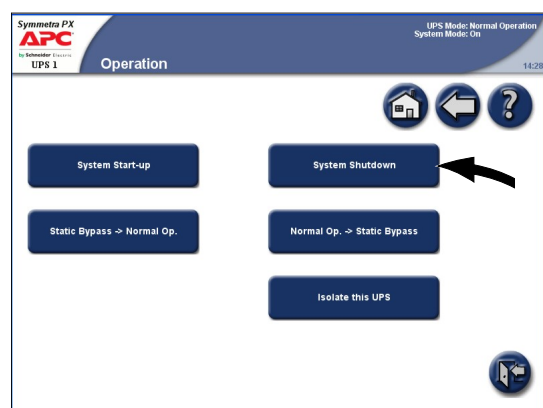


3. Press the **System Shutdown** button on the Operation screen.

Single System



Parallel System



- Follow the steps which appear on the screen. Steps will appear in the order in which they need to be completed. A step will initially appear in red and then when it is completed, the step will change to green. The next step to be completed will be highlighted in red text and yellow background.



**Note:** Grey buttons are touch-screen functions.

#### Single System

Number	Step	Action / Description
1	Initiate transfer to static bypass	Initiate Transfer
2	Close breaker Q3Qx	Load will be on manual bypass
3	Switch off UPS	UPS off
4	Open breaker Q2Qx	UPS output
5	Open breaker Q5Qx	SSW input
6	Open battery breakers	Open Battery Breakers
7	Open breaker Q1Qx	UPS input

Note: The display will switch off after all steps have been completed.

#### Parallel System

Number	Step	Action / Description
1	Initiate transfer to static bypass	Initiate Transfer
2	Close breaker Q3Qx	Load will be on manual bypass
3	Open breaker Q4Qx	System output
4	Switch off UPS	UPS off
5	Open breaker Q2aQx	UPS output
6	Open breaker Q5aQx	SSW input
7	Open battery breakers	Open Battery Breakers
8	Open breaker Q1aQx	UPS input

Please repeat sequence 4 to 8 for the other parallel UPSs you want to shutdown.

Note: The display will switch off after all steps have been completed.



**Note:** The display will turn off when the UPS input breaker (Q1) is opened.



**Caution:** Do not open the Q3 breaker when the system is in maintenance bypass operation, as it may result in a load drop.



# Transfer from Normal to Requested Static Bypass Operation



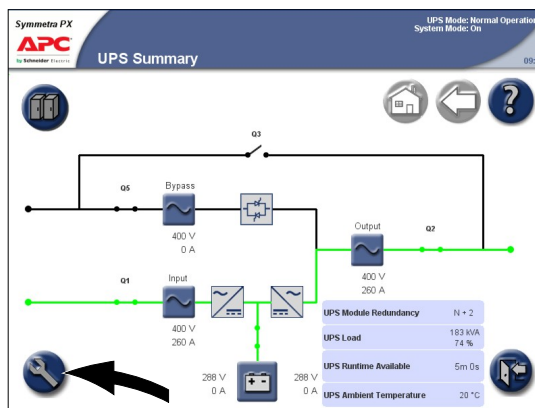
**Note:** Following this procedure will transfer the entire parallel system to requested static bypass.



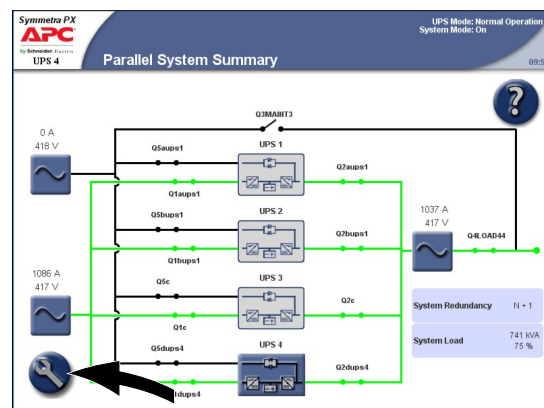
**Note:** Press the home button to go to the UPS Summary or Parallel System Summary screen.

1. Press the **UPS system** button in the bottom left corner to access the UPS System screen.

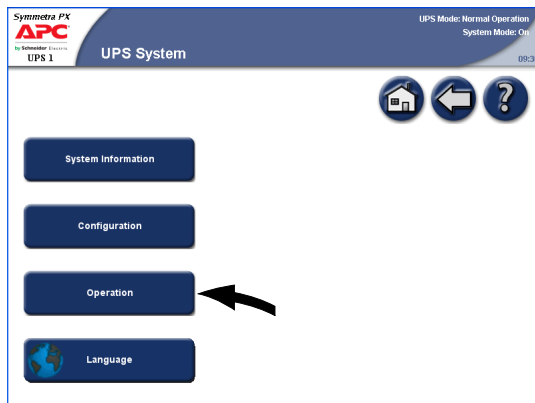
Single System



Parallel System

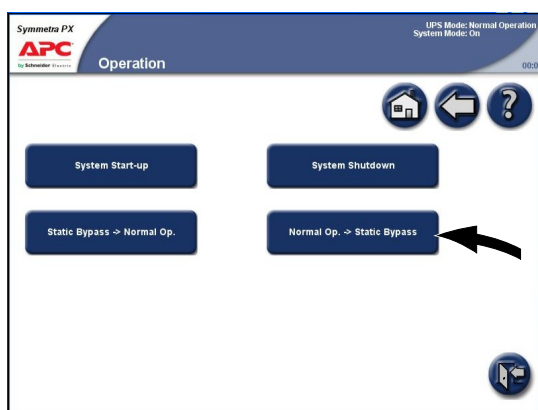


2. Press the **Operation** button. Type in the user password and complete with **Enter**.

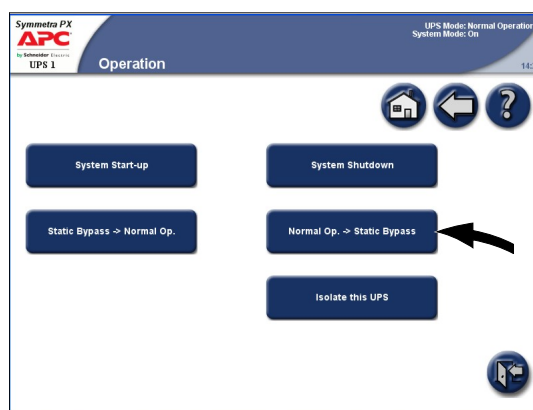


3. Press the **Normal Op. → Static Bypass** button.

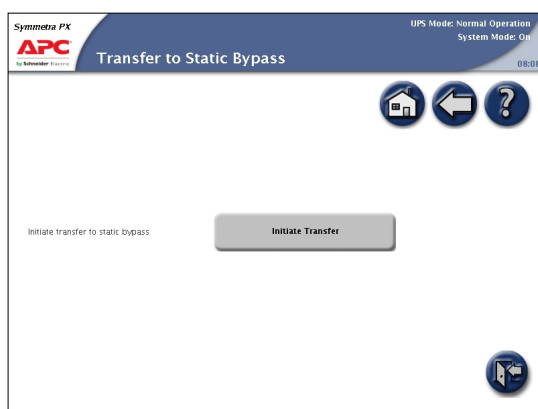
Single System



Parallel System



4. Press the **Initiate Transfer** button to go to static bypass operation. The **Initiate Transfer** button is greyed out when the transfer is not available.



5. Check that the status has changed to Requested Static Bypass in the upper right corner.

## Transfer from Requested Static Bypass to Normal Operation



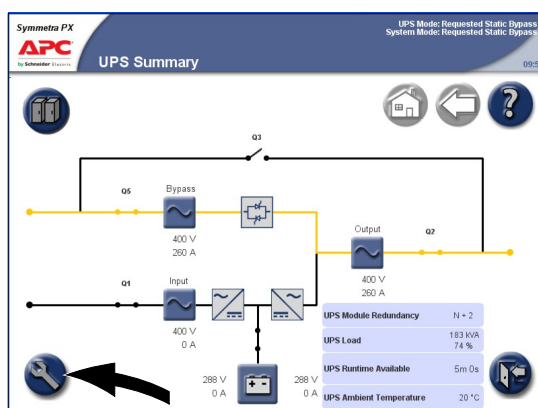
**Note:** Following this procedure will transfer the entire parallel system from requested static bypass to normal operation.



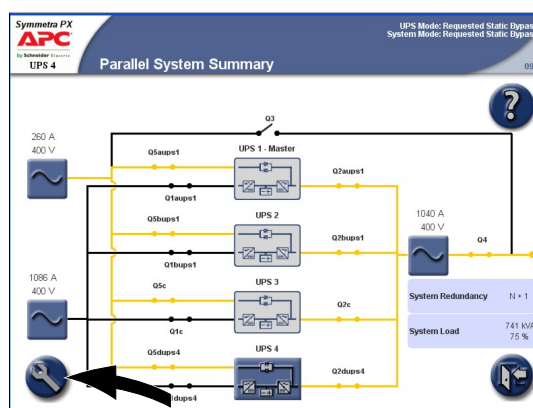
**Note:** Press the home button to go to the UPS Summary or Parallel System Summary screen.

1. Press the **UPS System** button in the bottom left corner to access the UPS System screen.

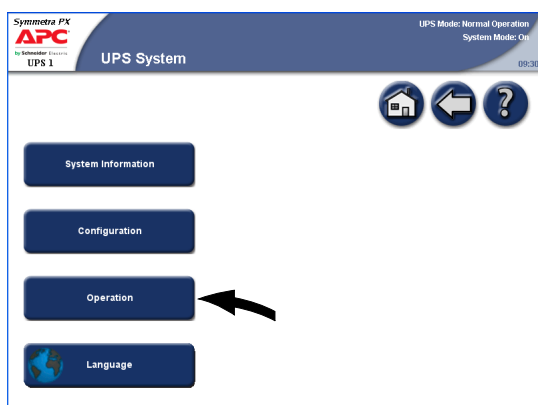
Single System



Parallel System

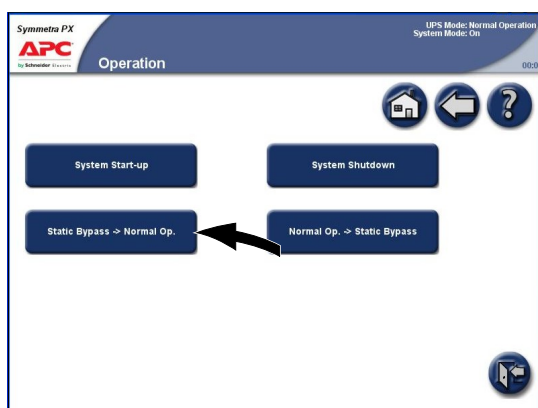


2. Press the **Operation** button. Type in the user password and complete with **Enter**.

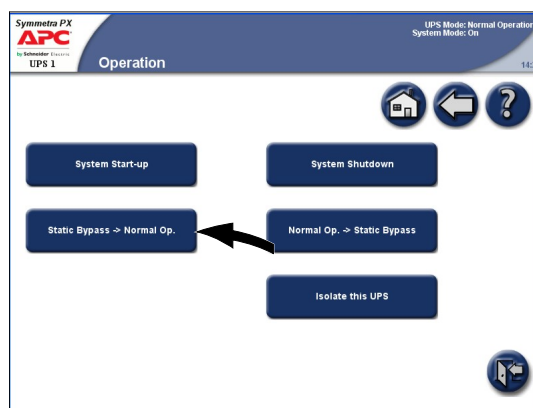


3. Press the **Static Bypass -> Normal Op.** button on the Operation screen.

Single System



Parallel System



4. Press the **Initiate Transfer** button to go to normal operation. The **Initiate Transfer** button is greyed out when transfer is not available.
5. Check that the status has changed to Normal Operation in the upper right corner.

# Isolate this Single UPS from the Parallel System



**Note:** Before you start this procedure, ensure that the remaining UPS units can supply the load.

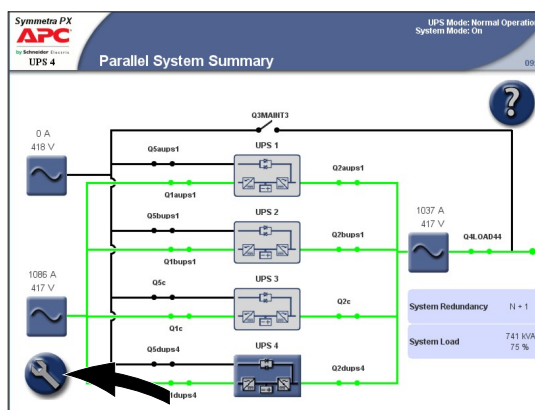


**Note:** This procedure is only applicable to parallel systems.

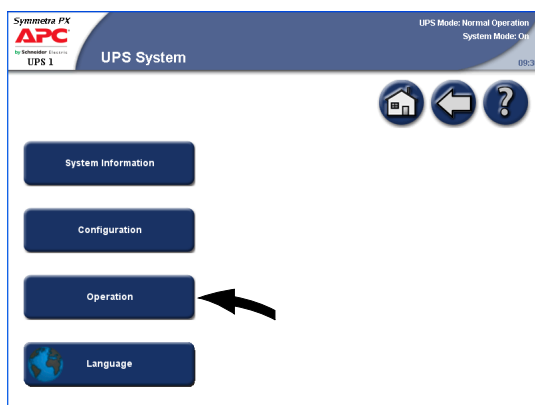


**Note:** Press the home button to go to the Parallel System Summary screen.

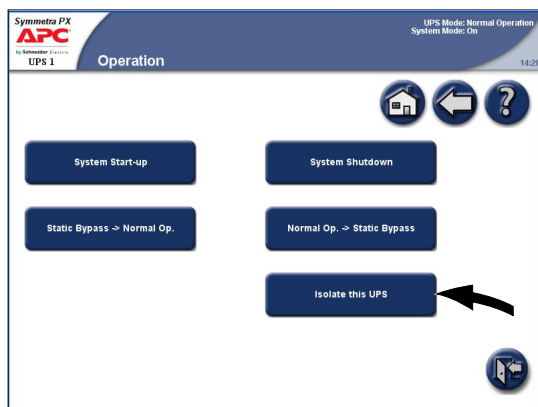
1. Press the **UPS System** button in the bottom left corner to access the UPS System screen.



2. Press the **Operation** button. Type in the user password and complete with **Enter**.



3. Press the **Isolate this UPS** button on the Operation screen.



4. Follow the steps which appear on the screen. Steps will appear in the order in which they need to be completed. A step will initially appear in red and then when it is completed, the step will change to green. The next step to be completed will be highlighted in red text and yellow background.



**Note:** Grey buttons are touch-screen functions.

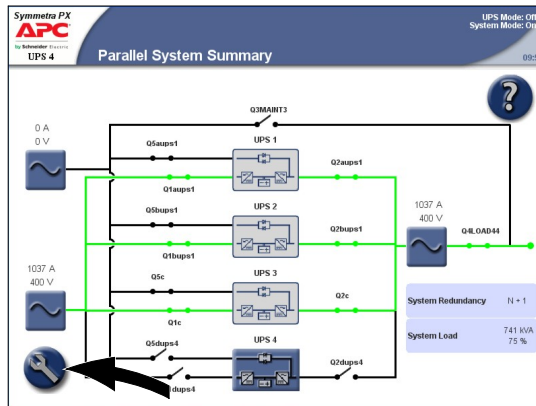


**Note:** The display will turn off when the UPS input breaker (Q1) is opened.

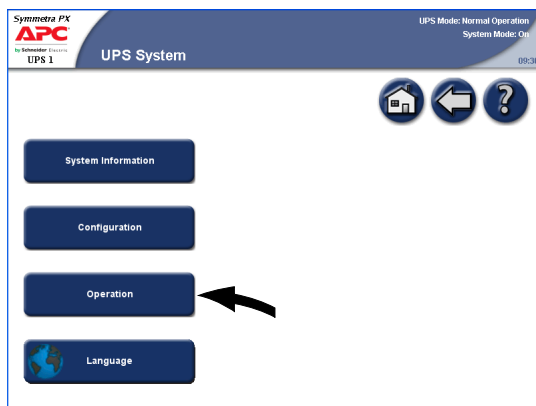
## Add UPS to a Running Parallel System

1. Close the UPS input breaker (Q1). This will power up the UPS display.
2. When the screen becomes active, verify that all UPS is set up as a parallel system and that all units are shown on the screen.

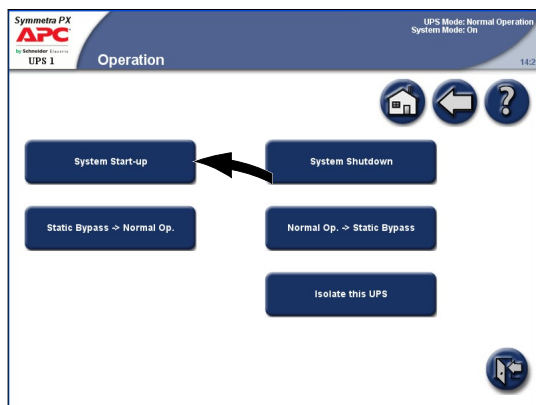
3. Press the **UPS System** button in the bottom left corner to access the UPS System screen.



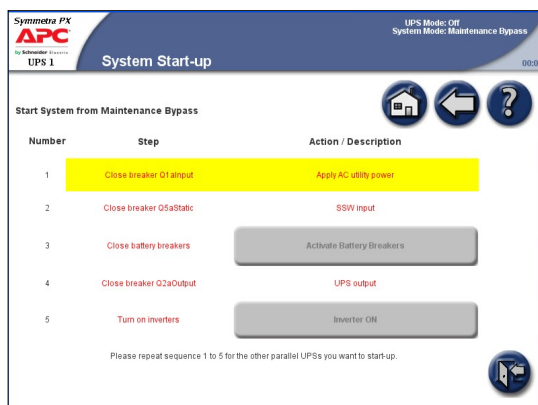
4. Press the **Operation** button. Type in the user password and complete with **Enter**.



5. Press **System Start-up** button.



- Follow the steps which appear on the screen. Steps will appear in the order in which they need to be completed. A step will initially appear in red and then when it is completed, the step will change to green. The next step to be completed will be highlighted in red text and yellow background.



- Check that the UPS Mode has changed to Normal Operation in the upper right corner.

## Access a Configured Network Management Card



**Note:** The below procedure shows how to access the Network Management Card from a web interface. It is also possible to use the following interfaces: Telnet and SSH, SNMP, FTP, and SCP. See the Network Management Card Installation Manual for more information.



**Note:** Ensure that only one NMC in the entire system is set to synchronize time.

Use Microsoft Internet Explorer® (IE) 7.x or higher (on Windows operating systems only) or Mozilla® Firefox® 3.0.6 or higher (on all operating systems) to access the Web interface of the Network Management Card. Other commonly available browsers may work but have not been fully tested by APC.

You can use either of the following protocols when you use the Web interface:

- The HTTP protocol (enabled by default), which provides authentication by user name and password but no encryption.
- The HTTPS protocol, which provides extra security through Secure Socket Layer (SSL); encrypts user names, passwords, and data being transmitted; and authenticates Network Management Cards by means of digital certificates.

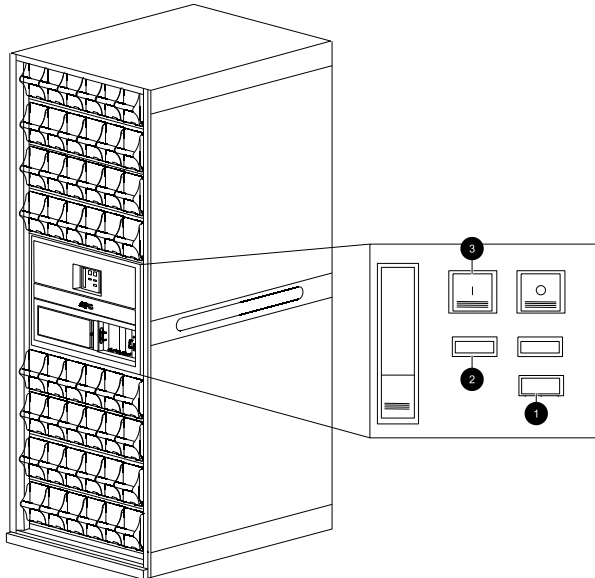
To access the Web interface and configure the security of your device on the network:

- Address the Network Management Card by its IP address (or its DNS name, if a DNS name is configured).
- Enter the user name and password (by default, “apc” and “apc” for an Administrator).
- To enable or disable the HTTP or HTTPS protocol, use the **Network** menu on the **Administration** tab, and select the **Access** option under the **Web** heading on the left navigation menu.



**See:** See the Security Handbook, available on the APC Network Management Card Utility CD or from the APC Web site, [www.apc.com](http://www.apc.com), for more information on selecting and configuring network security.

## Operate the APC Battery Breaker Manually



1. Turn the selector to Manual position.
2. Check the spring status:
  - a If CHARGED SPRING, go to step 3.
  - b If DISCHARGED, charge the spring by pressing the bottom part of the handle to release it and pumping the handle a few times until the spring status says CHARGED SPRING.
3. Push the green ON button to turn the breaker on. A red ON indication will show the breaker status.



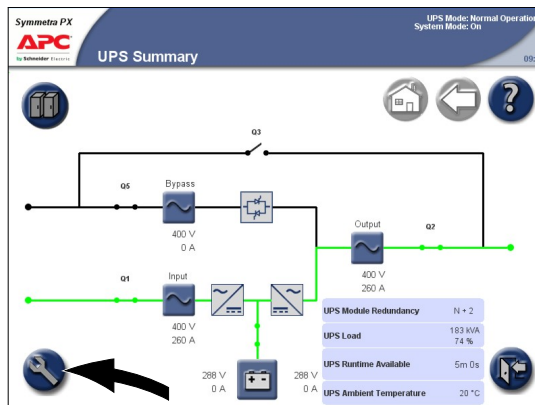
# Configuration

## Access the User Configuration Screen

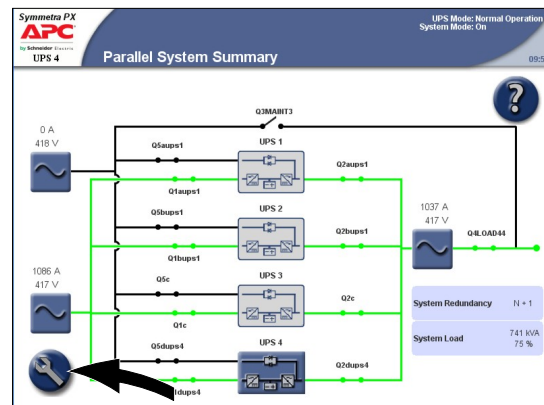
The UPS system is configured from the password-protected user configuration area of the display.

1. Press the **UPS system** button in the bottom left corner to access the UPS System screen

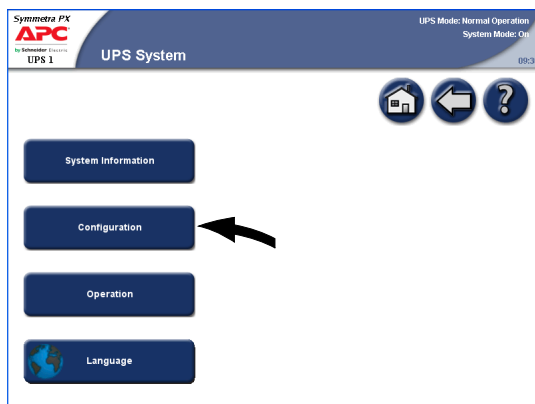
Single System



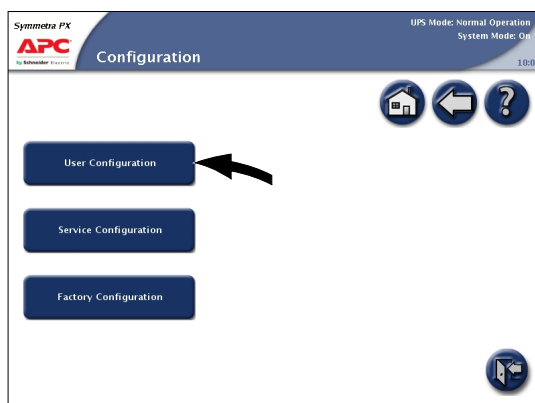
Parallel System



2. Press the **Configuration** button to access the Configuration screen.



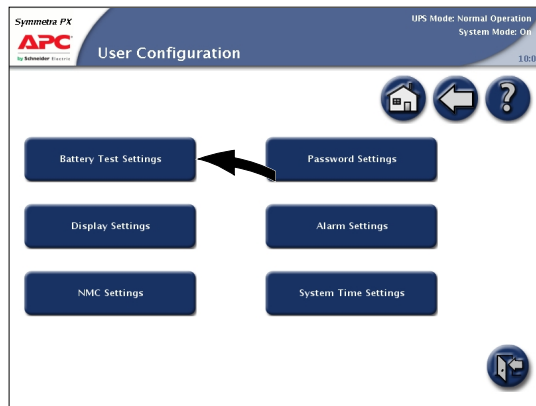
3. Press the **User Configuration** button on the Configuration screen.



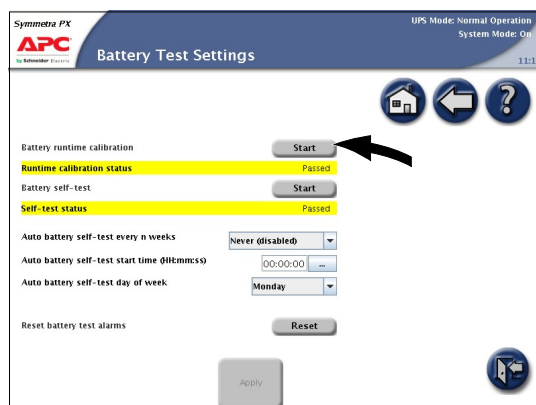
# Perform a Battery Runtime Calibration

Recalibrating the batteries keeps measurements like runtime and battery charge accurate.

1. Go to the User Configuration screen by following the steps in “*Access the User Configuration Screen*”.
2. Press the **Battery Test Settings** button on the User Configuration screen to access the Battery Test Settings screen.



3. Press **Start** to begin the battery runtime calibration. The batteries must be 100% charged to start a calibration. You can press Cancel to stop the calibration. The status of the runtime calibration is shown under Runtime calibration status.



## Set the Battery Test Settings

The battery self-test simulates the battery mode of operation. If AC utility/mains power fails during the test, the test stops and the UPS supplies battery power.

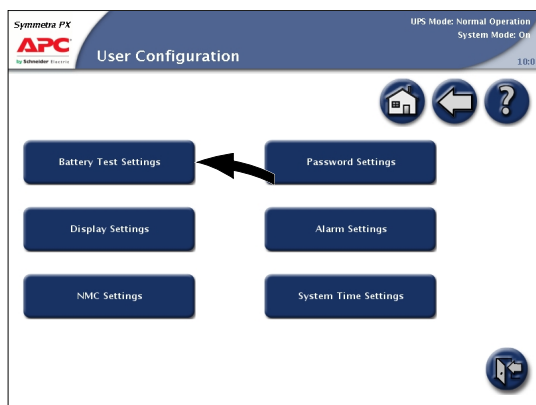
The test detects any weak or defective battery cells. To do this, the load must be high enough to draw sufficient current which in turn causes the voltage to drop to a low level.

The following criteria should be met to ensure your search detects any weak battery cells:

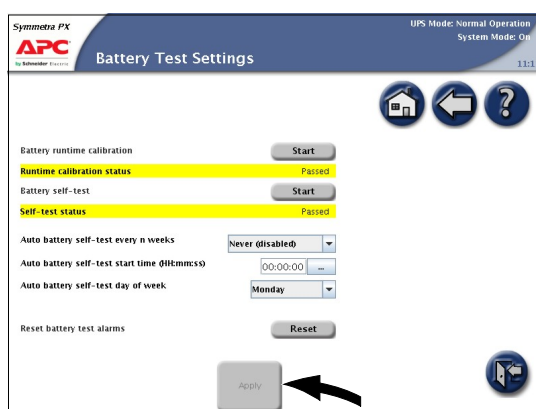
- The total discharge current to the load from both the positive and negative sides of the batteries needs to be at least half of the rated battery Ah, which is determined by the number of installed battery strings. For example, if you have 18 Ah of batteries, more than 9 A must be drawn by the load from each battery side.
- Both the positive and negative battery voltage must be lower than 280 V for longer than 16 seconds.

The test lasts for approximately 10% of the available runtime.

1. Go to the User Configuration screen by following the steps in **“Access the User Configuration Screen”**.
2. Press the **Battery Test Settings** button on the User Configuration screen to access the Battery Test Settings screen.



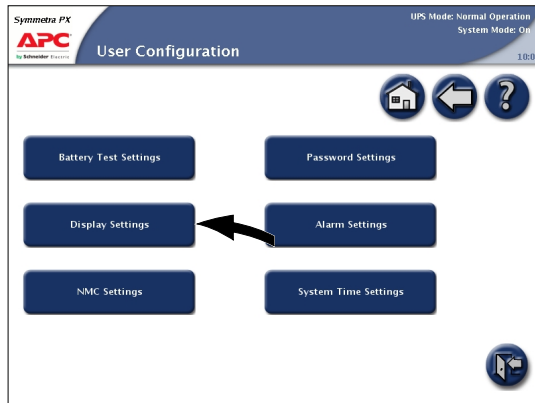
3. Set the battery test settings



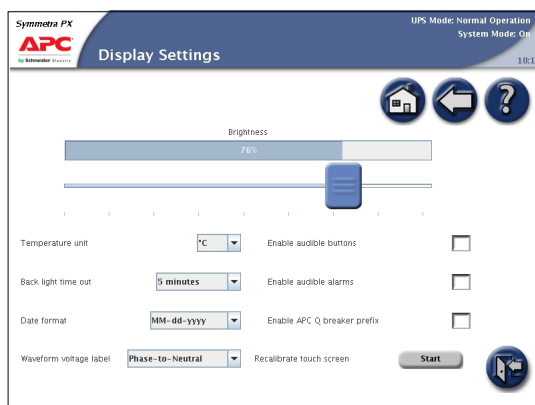
- a Battery self-test: Press **Start** to begin the battery self-test immediately. You can press **Cancel** to stop the self-test and continue in normal operation. The status of the self-test is shown under Self-test information.
  - b Auto battery self-test every n weeks: Select the time in weeks between automatic battery self-tests. APC recommends a battery self test every 12 weeks.
  - c Auto battery self-test start time (HH:mm:ss): Select the time of the day the battery self-test must start.
  - d Auto battery self-test day of week: Select the day of the week the battery self-test must start.
  - e Reset battery test alarms: Press the **Reset** button to reset the battery alarms.
4. Press **Apply** to confirm the settings.

# Set the Display Settings

1. Go to the User Configuration screen by following the steps in *“Access the User Configuration Screen”*.
2. Press the **Display Settings** button on the User Configuration screen to access the Display Settings screen.



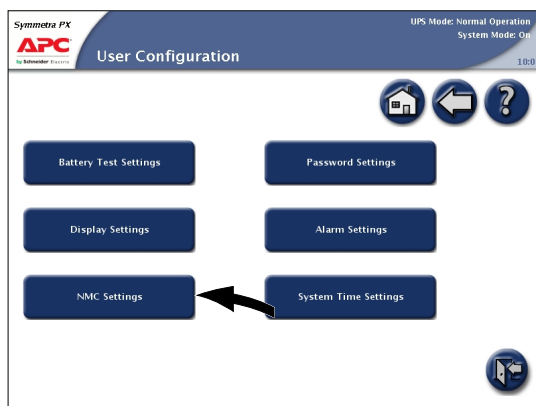
3. Set the display settings:



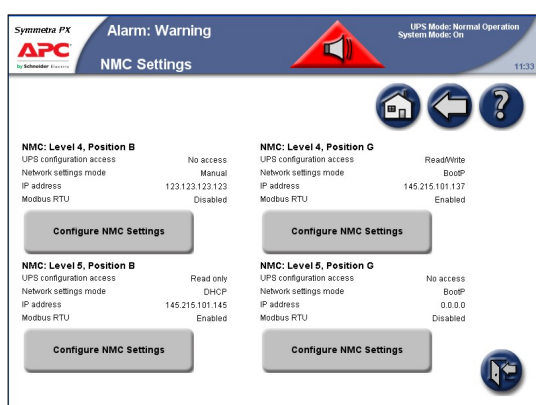
- a Brightness: Place the finger on the indicator and slide it left or right to the desired setting.
- b Temperature unit: Select C for Centigrade or F for Fahrenheit.
- c Back light time out: Select the time limit for turning off the screen back light.
- d Date format: Select the preferred setting.
- e Waveform voltage label: Select phase-to-phase or phase-to-neutral.
- f Recalibrate touch screen: Press the **Start** button to initiate the calibration of the screen. Press the points that are shown on the screen to calibrate the touch area of the display.
- g Enable audible buttons: Enable or disable audible buttons.
- h Enable audible alarms: Enable or disable audible alarms.
- i Enable APC Q breaker prefix: Enable or disable the display of the APC Q breaker prefix before the breaker name e.g. Q1 for the main input breaker.

# Set the Network Management Card (NMC) Settings

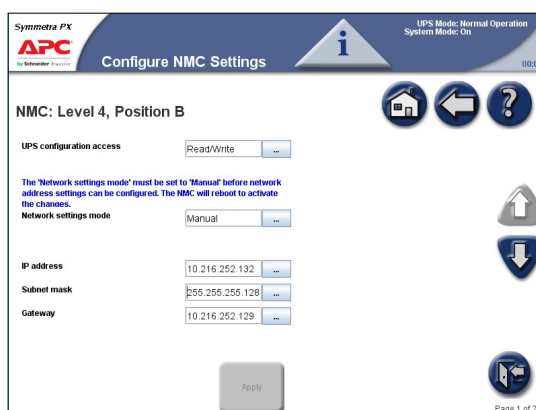
1. Go to the User Configuration screen by following the steps in *“Access the User Configuration Screen”*.
2. Press the **NMC Settings** button on the User Configuration screen to access the NMC Settings screen.



3. The NMC Settings screen displays the configuration for each NMC in the system. Press the Configure NMC Settings button to access the Configure NMC Settings screen and to change the settings.

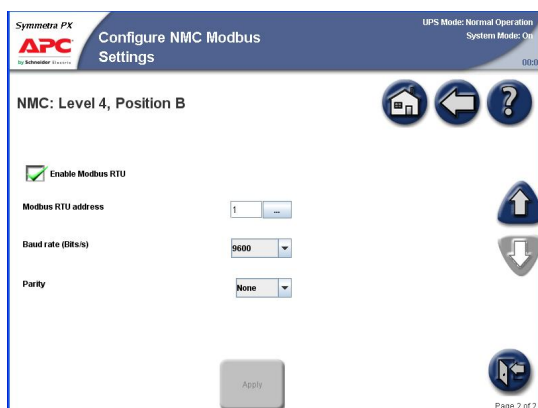


4. Change the NMC settings. The IP address, Subnet mask, and Gateway can only be edited if the NMC is set to manual. See NMC documentation for more information.



- a UPS configuration access: Set the UPS access level for the specific NMC. It can be set to No access, Read, or Read/Write.

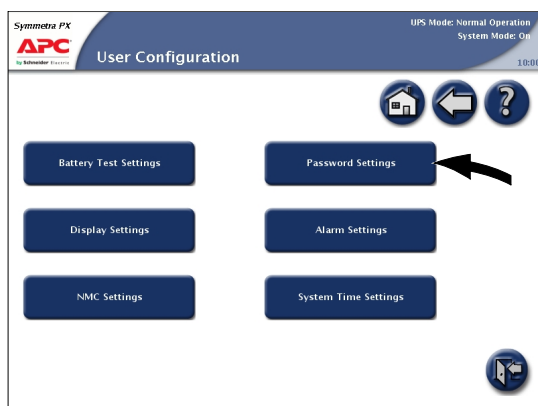
- b Network settings mode: Select to use DHCP, BOOTP, or manual IP address.
  - c IP address: Enter a valid IP address for the card. Only visible if manual mode has been selected.
  - d Subnet mask: Enter a valid subnet mask. Only visible if manual mode has been selected.
  - e Gateway: Enter a valid gateway. Only visible if manual mode has been selected.
5. Press the arrow down button and change the settings.



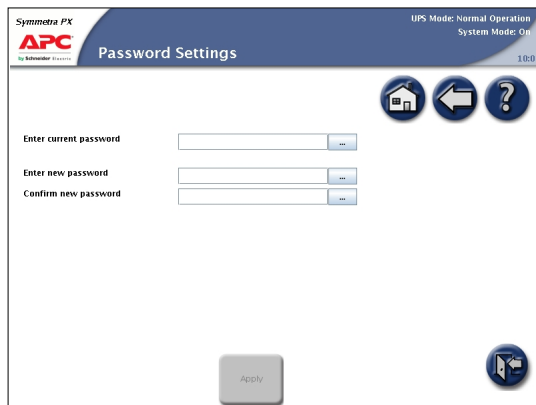
- a Select the Enable Modbus RTU box to enable the use of Modbus RTU.
  - b Specify the BMS address of the NMC device. Only a BMS Manager should modify this address.
  - c Specify the Baud rate of the modbus communication port.
  - d Specify the Parity of the modbus communication port.
6. Press **Apply** to confirm the settings.

## Set the User Password Settings

1. Go to the User Configuration screen by following the steps in *“Access the User Configuration Screen”*.
2. Press the **Password Settings** button on the User Configuration screen to access the Password Settings screen.



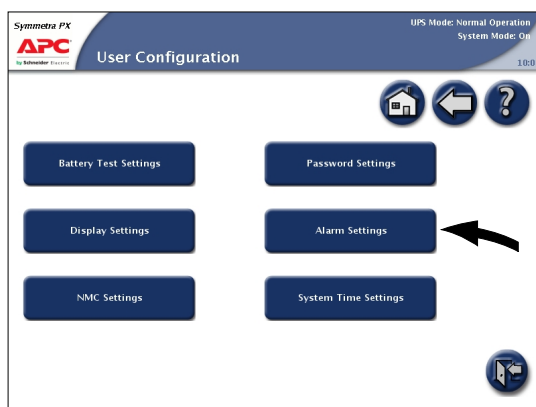
3. Change the user password:



- a Press the **Enter current password** field and type the current password by using the keyboard on the screen. Complete with **Enter**.
  - b Press the **Enter new password** field and type the new password by using the keyboard on the screen. Complete with **Enter**.
  - c Press the **Confirm new password** field and re-type the new password. Confirm with **Enter**.
4. Press **Apply** to complete the password change procedure.

## Set the Alarm Settings

1. Go to the User Configuration screen by following the steps in *“Access the User Configuration Screen”*.
2. Press the **Alarm Settings** button on the User Configuration screen to access the Alarm Settings screen(s).



3. Set the threshold values that must trigger the alarms:



**Note:** For parallel systems, shared settings are marked with \*.

Single System

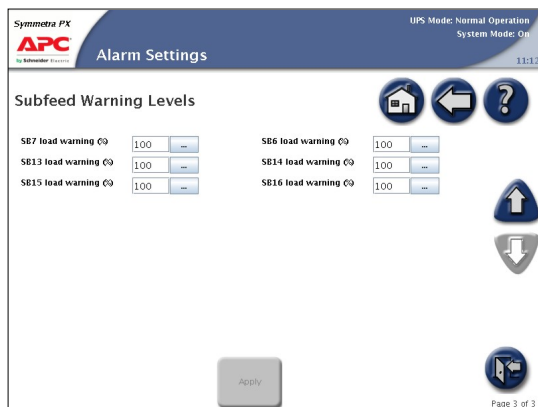
Parallel System

- a UPS module redundancy: Set the system threshold for generating alarms in the redundant power modules. N+0 indicates that the redundancy alarm is disabled. N+1 indicates that there must be one redundant power module.
  - b Parallel system redundancy: Set the number of redundant UPS units in a parallel system. If you have a parallel system with UPS redundancy, you can use this field to configure an alarm to generate when the load in your parallel system starts using some of the UPS redundant power. N+0 indicates that there is no redundant power and N+1 indicates that there is one UPS of redundant power.
  - c Load alarm threshold (%): Set the threshold for load percentage of the total UPS capacity for generating an alarm.
  - d Low battery alarm threshold (seconds): Set the remaining battery runtime threshold for generating an alarm.
4. Press **Apply** to confirm the settings and press arrow down to go to the next Alarm Settings screen.
  5. This screen is only visible if subfeed breakers are present. Set the load percentage for each subfeed breaker that should generate a critical alarm.

6. Press **Apply** to confirm the settings and press arrow down to go to the next Alarm Settings screen.



7. This screen is only visible if subfeed breakers are present. Set the load percentage for each subfeed breaker that should generate a warning alarm.



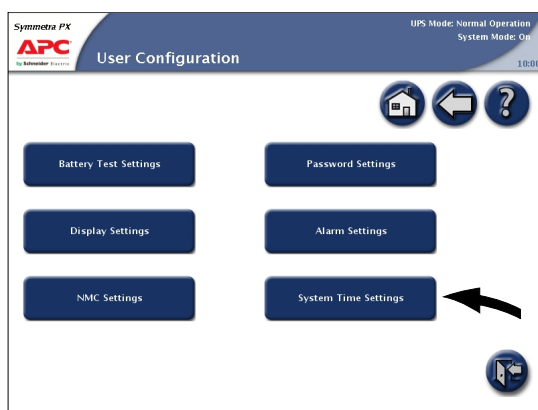
8. Press **Apply** to confirm the settings.

## Set the System Time



**Note:** The date and time will be synchronized between the UPS units in a parallel system.

1. Go to the User Configuration screen by following the steps in “*Access the User Configuration Screen*”.
2. Press the **System Time Settings** button on the User Configuration screen to access the System Time Settings screen. The System Time Settings screen can also be accessed by pressing on the time displayed in the top right corner of the screen.



- Set the system date and the system time.



- Press **Apply** to confirm the settings.

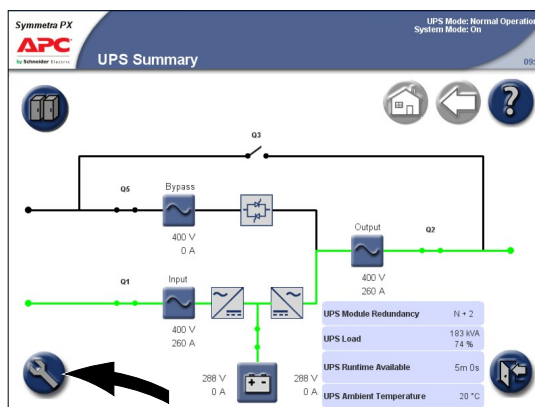
## Set the Language and Regional Settings



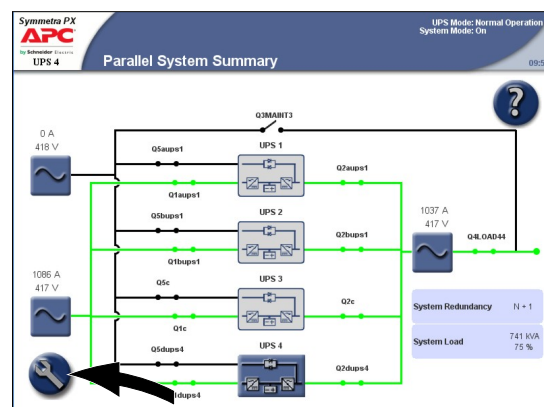
**Note:** Press the home button to go to the UPS Summary or Parallel System Summary screen.

- Press the **UPS system** button in the bottom left corner to access the UPS System screen

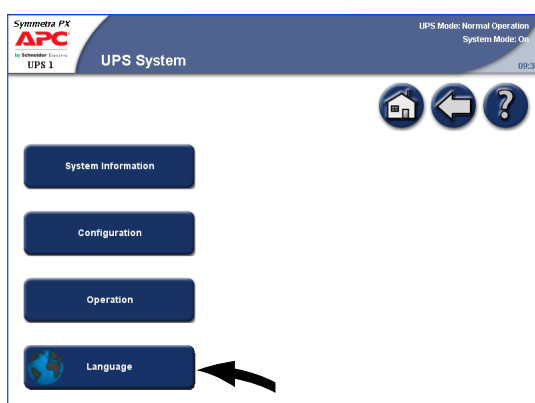
Single System



Parallel System



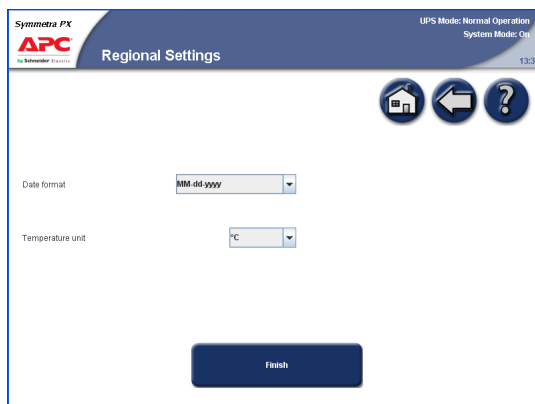
- Press the **Language** button to access the Language Settings screen.



3. Select the preferred language.



4. Select your preferred date format and temperature unit and complete with **Finish**.



# Maintenance

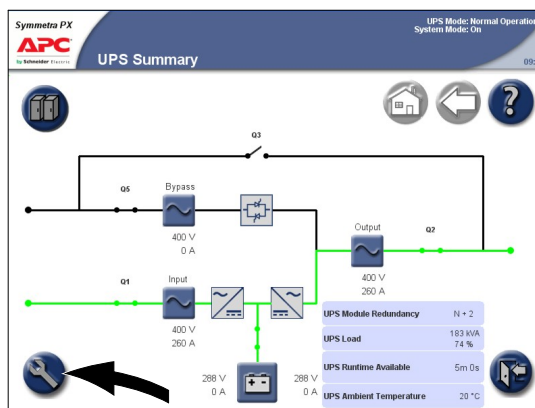
## Access Predictive Maintenance Screen



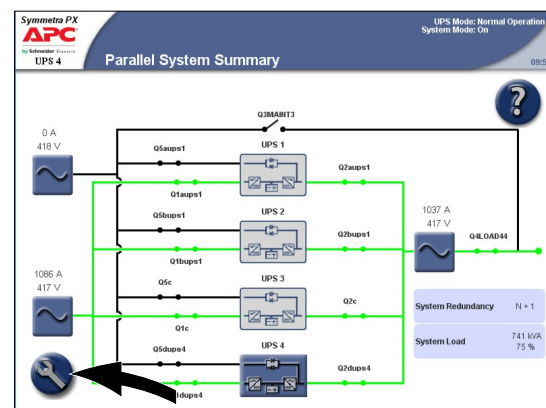
**Note:** Press the home button to go to the UPS Summary or Parallel System Summary screen.

1. Press the **UPS System** button in the bottom left corner to access the UPS System screen.

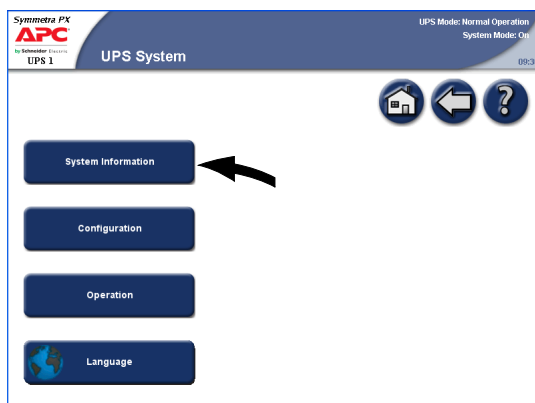
Single System



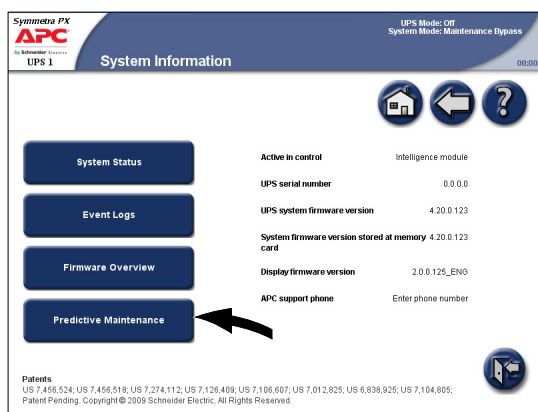
Parallel System



2. Press the **System Information** button on the UPS System screen.



3. Press the **Predictive Maintenance** button to access the Predictive Maintenance screen.



4. The Predictive Maintenance screen shows the status and the estimated remaining lifetime of the power modules and their fans. The status can be OK, Near end, or Exceeded. Remember to order new spare parts or schedule a maintenance visit when the status is Near end.

The screenshot shows the 'Predictive Maintenance' screen with a table listing the status and estimated remaining lifetime of power modules and fans.

Module	Location	Module Status	Estimated Remaining Lifetime (Months)	Fan Lifetime Status	Fan Estimated Remaining Lifetime (Months)
Power Module	Power Enclosure 1, Level 1	OK	24 (0.00%)	OK	12 (0.00%)
Power Module	Power Enclosure 1, Level 2	OK	23 (0.5%)	OK	11 (0.1%)
Power Module	Power Enclosure 1, Level 3	Near end	5 (2.0%)	OK	6 (0.0%)
Power Module	Power Enclosure 1, Level 4	Exceeded	1 (4%)	OK	9 (7.5%)
Power Module	Power Enclosure 1, Level 5	OK	20 (8.3%)	Exceeded	1 (0%)
Power Module	Power Enclosure 1, Level 6	OK	19 (7.9%)	Near end	2 (0.6%)
Power Module	Power Enclosure 1, Level 7	OK	18 (7.5%)	OK	6 (0.0%)
Power Module	Power Enclosure 1, Level 8	OK	17 (7.0%)	OK	5 (0.1%)
Power Module	Power Enclosure 1, Level 9	OK	16 (6.4%)	OK	5 (0.1%)

## Determine if you need a Replacement Part

To determine if you need a replacement part, contact APC Customer Support and follow the procedure below so that the APC Customer Support representative can assist you promptly:

1. In the event of a module failure, the display interface will indicate an alarm condition. Scroll through the alarm lists, record the information, and provide it to the representative.
2. Write down the serial number of the unit so that you will have it easily accessible when you contact APC Customer Support.
3. If possible, call APC Customer Support from a telephone that is within reach of the UPS display interface so that you can gather and report additional information to the representative.
4. Be prepared to provide a detailed description of the problem. A representative will help you solve the problem over the telephone, if possible, or will assign a return material authorization (RMA) number to you. If a module is returned to APC, this RMA number must be clearly printed on the outside of the package.
5. If the unit is within the warranty period, repairs or replacements will be performed free of charge. If it is not within the warranty period, there will be a charge.
6. If the unit is covered by an APC service contract, have the contract available to provide information to the representative.

# Return Parts to APC

Call APC Customer Support to obtain an RMA number.

To return a failed module to APC, pack the module in the original shipping materials, and return it by insured, prepaid carrier. The APC Customer Support representative will provide the destination address. If you no longer have the original shipping materials, ask the representative about obtaining a new set. Pack the module properly to avoid damage in transit. Never use styrofoam beads or other loose packaging materials when shipping a module. The module may settle in transit and become damaged. Enclose a letter in the package with your name, RMA number, address, a copy of the sales receipt, description of the problem, a phone number, and a cheque as payment (if necessary).

## User-Replaceable Parts



**WARNING:** ALL safety instructions in the Safety Sheet (990-2984) shall be read, understood and followed. Failure to do so could result in equipment damage, serious injury, or death.

Part	Part number
Battery module	WSYBTU2
Power module	WSYPM25KD
Intelligence module	WSYMIM6
System power supply	WSYPSU2
External connection board	WSYEXCB
ID and relay controller board	WSYIDRC
External switch gear board	WSYEXSG2
Battery breaker motor PSU	WSYBBMOPSU2
Battery monitoring board	WSYBMB2
A-Bus communication board	WSYBATTCOM

## Battery Module Replacement

### Directions for Replacement



**WARNING:** Only trained persons familiar with the construction and operation of the equipment, as well as the electrical and mechanical hazards involved, may install and remove system components.



**Caution:** Wait until the system is ready to be powered up before installing battery modules in the UPS (the time duration from the battery installation until the UPS is powered up should not exceed 72 hours or 3 days). Failure to do so can result in a deep discharge of the batteries and cause permanent damage.



**Caution:** The batteries must only be replaced with APC high performance battery units.

APC recommends that a whole battery module (one row of batteries) is replaced at the same time to ensure optimal run-time (see Example 1). However it may only be necessary to replace three battery units at the same time according to Examples 2 and 3 in the table below.

	Position A	Position B	Position C	Position D	Position E	Position F
Example 1	New	New	New	New	New	New
Example 2	New	New	New	Old	Old	Old
Example 3	Old	Old	Old	New	New	New

## Directions for Storage



**Note:** The battery modules must be stored indoors and with their protective packaging still in place.



**Note:** Stored batteries should be recharged at regular intervals, depending on the storage temperature.

Storage Temperature	Recharge Interval
-15° to 20°C/5°F to 68°F	9 months
20° to 30°C/68°F to 86°F	6 months
30° to 40°C/86°F to 104°F	3 months



**Caution:** Do not store the batteries for more than 12 months.

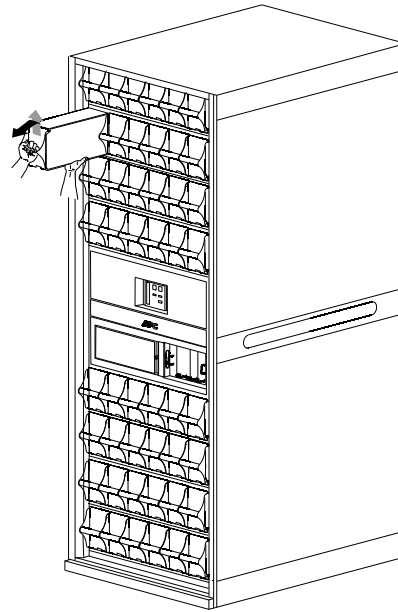
## Replace Batteries



Use two people to lift components weighing between 18–32 kg (40–70 lbs).

1. Holding the handle, gently lift the battery unit and pull it halfway out. A lock mechanism prevents it from being pulled all the way out.
2. Release the lock by pushing the battery unit upwards and pull the battery unit all the way out while you continue to support its weight.
3. Carefully guide the new battery unit into the system.

### Battery Enclosure



## Replace Power Modules



**WARNING:** Only trained persons familiar with the construction and operation of the equipment, as well as the electrical and mechanical hazards involved, may install and remove system components.

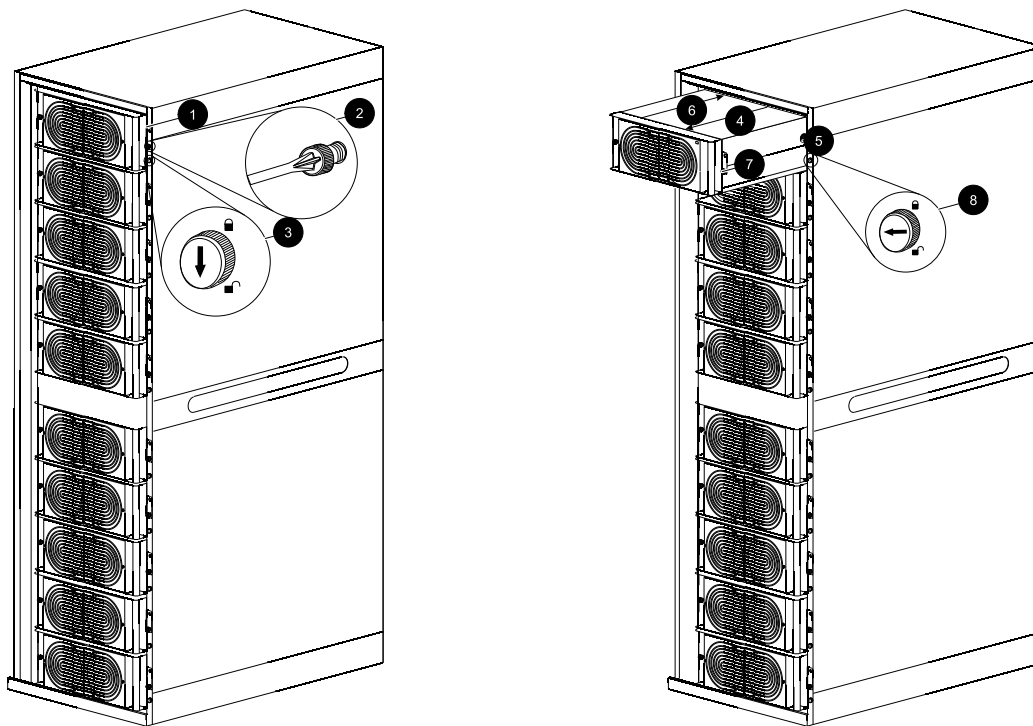


**WARNING:** Before replacing the power modules, ensure that the “UPS system firmware version” and the “System firmware version stored at memory card” are identical on the System Information screen.



Use three people to lift components weighing between 32 - 54 kg (/70 - 120 lbs).





1. Identify the faulty power module via the display or the red LED indication in the top right corner of the power module.
2. Deactivate the power module by turning the locking latch counter-clockwise to the unlocked position.
3. Unscrew the spring-activated knobs on both sides of the power module.
4. Pull the power module up and out of the enclosure as far as the lock mechanism allows.
5. Release the lock by pressing the black plastic tab on each side of the power module and pull the power module all the way out.
6. Carefully guide the new power module completely into the system.
7. Secure the spring-activated knobs on both sides of the power module.
8. Wait until the firmware update is complete and ensure that the new power module has the same firmware version as the other power modules in the UPS system:
  - a On the UPS Summary or the Parallel System Summary screen, press the **UPS System** button in the bottom left corner.
  - b Press the **System Information** button on the UPS System screen.
  - c Press the **Firmware Overview** button to open the Firmware Overview screen.
  - d Verify that the firmware versions is the same.

Symmetra PX APC  
UPS 4  
Firmware Overview

UPS Mode: Normal Operation  
System Mode: On

Save FW Versions List

Module	Location	Firmware Version	FW* Install Status
Power Module	Power Enclosure 1, Level 5	4.20.0.49	No update active
Power Module	Power Enclosure 1, Level 6	4.20.0.49	No update active
Power Module	Power Enclosure 1, Level 7	4.20.0.49	No update active
Power Module	Power Enclosure 1, Level 8	4.20.0.49	No update active
Power Module	Power Enclosure 1, Level 9	4.20.0.49	No update active
Power Module	Power Enclosure 1, Level 10	4.20.0.49	No update active

FW - Firmware.

9. Activate the power module by turning the locking latch clockwise to the locked position. The LED in the top right corner of the power module will start to flash (green) which indicates that the power module is initializing and doing a self test. When the self test is complete, the LED will be constant green.

## Replace Intelligence Modules



**WARNING:** Only trained persons familiar with the construction and operation of the equipment, as well as the electrical and mechanical hazards involved, may install and remove system components.



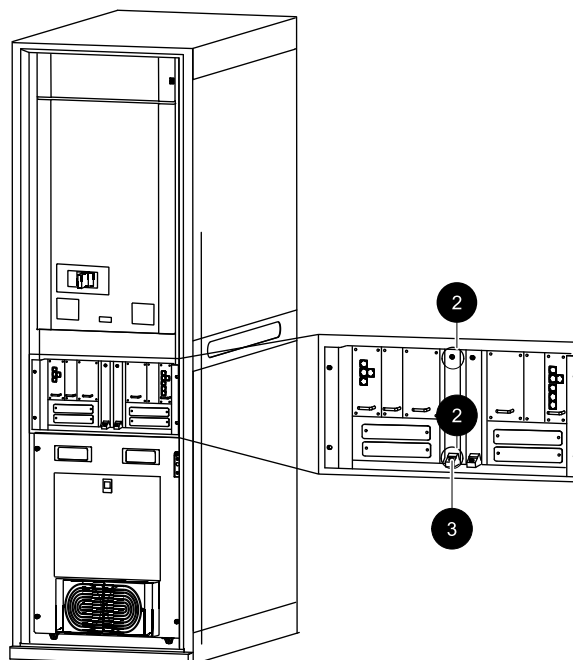
**WARNING:** Before replacing the intelligence modules, ensure that the “UPS system firmware version” and the “System firmware version stored at memory card” are identical on the System Information screen.



**WARNING:** Replace only one intelligence module at a time.

1. Identify the faulty intelligence module via the display or red LED indication.
2. Loosen the two screws in one of the intelligence modules (one in the top and one through the disable button at the bottom of the intelligence module).
3. Press down the disable button to loosen and deactivate the intelligence module.
4. Carefully insert the new module into the slot.
5. Enable the button to close and activate the intelligence module and the LED will flash green. When the initialization is complete the LED will be solid green.
6. Fasten the two screws to secure the intelligence module.

### Input/Output/Bypass Enclosure



# Replace Boards in Input/Output/Bypass Enclosure



**WARNING:** Only trained persons familiar with the construction and operation of the equipment, as well as the electrical and mechanical hazards involved, may install and remove system components.



**WARNING:** Before replacing the boards, ensure that the “UPS system firmware version” and the “System firmware version stored at memory card” are identical on the System Information screen.



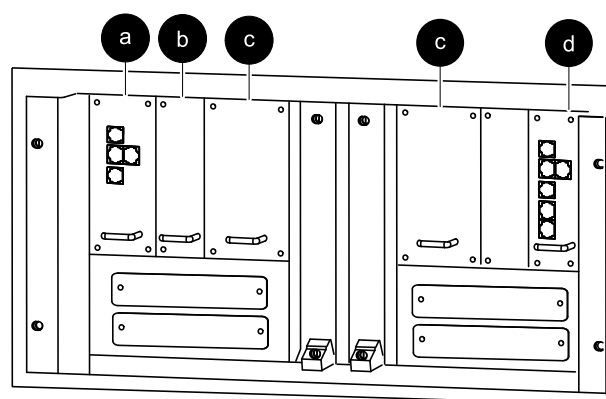
**WARNING:** Replace only one board at a time.



**Note:** A faulty system power supply can be identified via the display or a flashing red LED indication.

1. Loosen the two/four screws in the corners of the board.
  - a External connection board.
  - b External switch gear board.
  - c System power supply.
  - d ID and relay controller.
2. Only applicable to the external connection board and the ID and relay controller: remove the cables connected to the board.
3. Carefully pull out the board.
4. Only applicable to ID and relay controller: take the SD memory card from the old ID and relay controller and install it in the replacement ID and relay controller.
5. Carefully insert the new board into the slot.
6. Reconnect the cables removed in step 2.
7. Secure the new board with the two/four screws.

## Input/Output/Bypass Enclosure



# Replace Boards in the Battery Enclosure



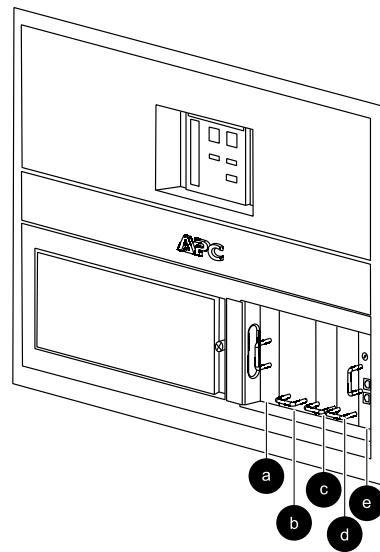
**WARNING:** Only trained persons familiar with the construction and operation of the equipment, as well as the electrical and mechanical hazards involved, may install and remove system components.



**WARNING:** Replace only one board at a time.

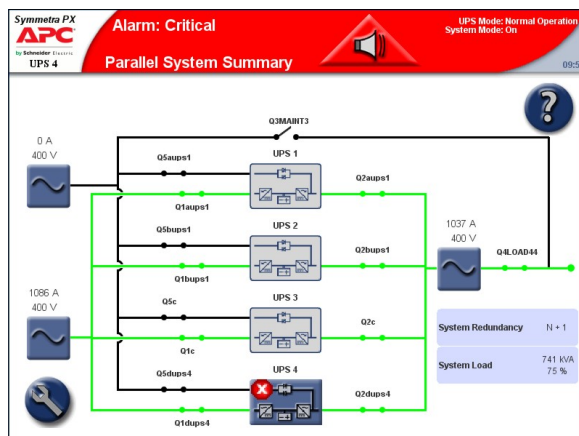
1. Loosen the two/four screws in the corners of the board.
  - a Battery motor breaker PSU.
  - b System power supply.
  - c Top-half battery monitoring board.
  - d Bottom-half battery monitoring board.
  - e A-Bus communication board.
2. Only applicable to the A-Bus communication board: remove the cables connected to the board.
3. Carefully pull out the board.
4. Carefully insert the new board into the slot.
5. Reconnect the cables removed in step 2.
6. Secure the new board with the two/four screws.

## Battery Enclosure





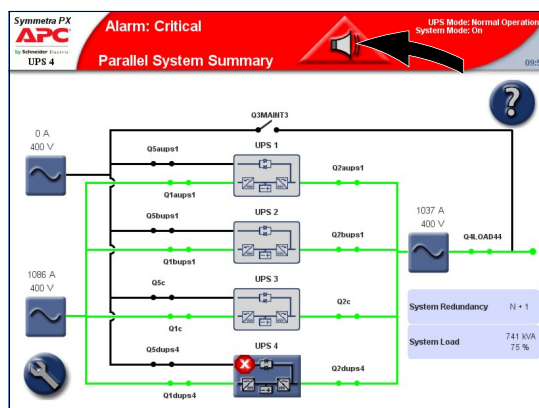
## Critical



Take immediate action. Call APC for instructions.

## View the Active Alarms

1. Press the **Alarm** button on the top bar when an alarm situation occurs.



2. A list of the active alarms is shown on the screen. Press the **Location** button to see the location of the particular module. Press the **Graph** button to see voltages and currents at the time the alarm was generated. The three alarm severity icons display at the top of the screen with numbers indicating how many times each severity type has occurred. Press on that icon or number to display the next alarm of that severity type on the screen. When you reach the final alarm, pressing the icon displays the first one of the same severity.

Symmetra PX APC Alarm: Critical Active Alarms						
UPS Mode: Normal Operation System Mode: On						
Active Controller: IM						
Severity	Alarm	Corrective Action	Location	Date/Time MM-dd-yyyy HH:mm:ss SSS	Capture	
⚠	Overload on bypass static switch	Reduce load on system	IO enclosure level 6	01-01-2000 00:00:00 001	Graph	▲
⚠	PSU module failed	Replace module	IO enclosure level 3, pos 5	01-01-2000 00:00:00 002	Graph	
⚠	Power module communication to MIM error	Please contact APC Support	Power enclosure 1 level 4	01-01-2000 00:00:00 003		
ⓘ	Power module unlocked		Power enclosure 1 level 5	01-01-2000 00:00:00 004		
ⓘ	Switchgear board communication OK		IO enclosure level 3, pos 9	01-01-2000 00:00:00 005		
⚠	ID 8 Relay board communication error	Please contact APC Support	IO enclosure level 3, pos H	01-01-2000 00:00:00 006	Graph	
ⓘ	RIM heartbeat signal OK		IO enclosure level 3, pos D	01-01-2000 00:00:00 007	Graph	▼

# View the Event Log

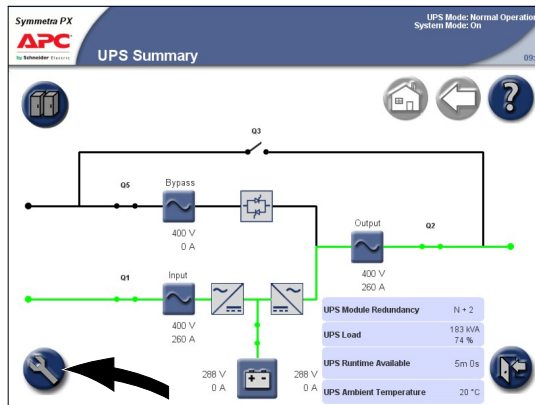


**Note:** Press the home button to go to the UPS Summary or Parallel System Summary screen.

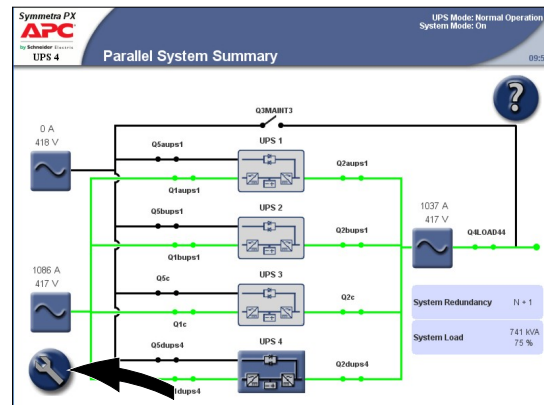
The Event Log screen can be accessed either by pressing the **Event Log** button on the Active Alarms screen see “View the active alarms” or by following this procedure:

1. Press the **UPS system** button in the bottom left corner to access the UPS System screen.

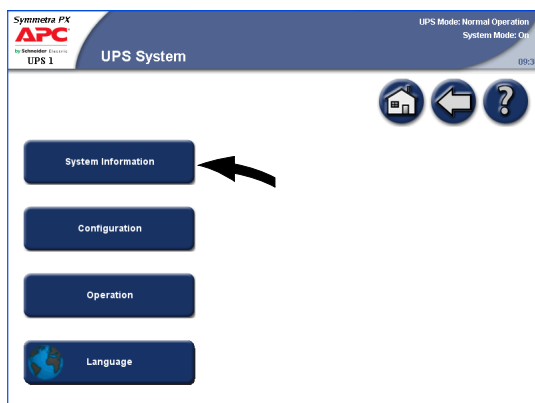
Single System



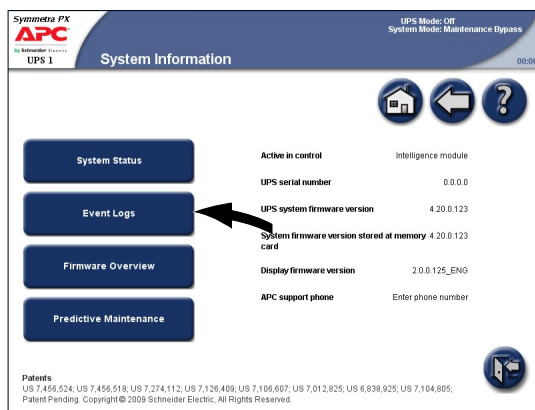
Parallel System



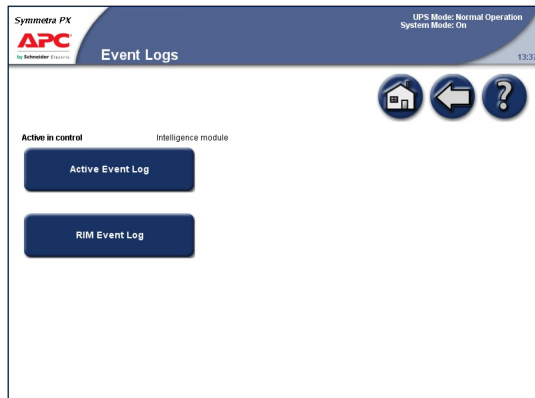
2. Press the **System Information** button on the UPS System screen.



3. Press the **Event Logs** button on the System Information screen.



4. Active in control indicates which intelligence module is in control of the system. Press the **Active Event Log** button to view the records from the intelligence module in control or press the **RIM Event Log** to view the records from the intelligence module that is passive.



5. The Recent Events log contains a detailed record of the 32 latest events. Press the **Full Log** button to see the 10000 latest events and access the **Save Log** button.

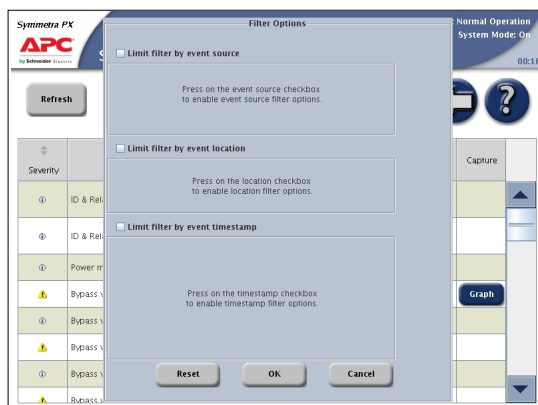
Severity	Event	Location	Date/Time MM-dd-yyyy HH:mm:ss.SSS	Capture
ⓘ	Power module input voltage error, high voltage	Power enclosure 1 level 3	01-01-2000 00:00:00.000	
ⓘ	Power module input phase sequence OK	Power enclosure 1 level 10	01-01-2000 00:00:00.000	
⚠	Power module input phase sequence error	Power enclosure 1 level 4	01-01-2000 00:00:00.000	
ⓘ	Power module input contactor and PFC-FET are ok	Power enclosure 1 level 6	01-01-2000 00:00:00.000	
⊗	Power module input contactor or PFC-FET error	Power enclosure 2 level 6	01-01-2000 00:00:00.000	
ⓘ	Power module synchronization OK	Power enclosure 1 level	01-01-2000 00:00:00.000	

6. Press the **Filter** button to filter the event log or go directly to step 9 to save the event log.

Severity	Event	Location	Date/Time MM-dd-yyyy HH:mm:ss.SSS	Capture
ⓘ	RTC Time old value		11-30-2009 12:30:07.974	
⚠	Power module lifetime error: lifetime exceeded	Power enclosure 1 level 10	11-30-2009 12:30:05.997	
ⓘ	Power module fan lifetime error corrected	Power enclosure 1 level 10	11-30-2009 12:30:05.997	
ⓘ	Synchronization OK to bypass		11-30-2009 12:29:54.650	
⊗	Bonding wire between neutral and ground error - sense cable is unplugged	IO enclosure level 2	11-30-2009 12:29:52.499	
⚠	Battery temperature sensor 2 fault	BBE enclosure level 1	11-30-2009 12:29:52.437	



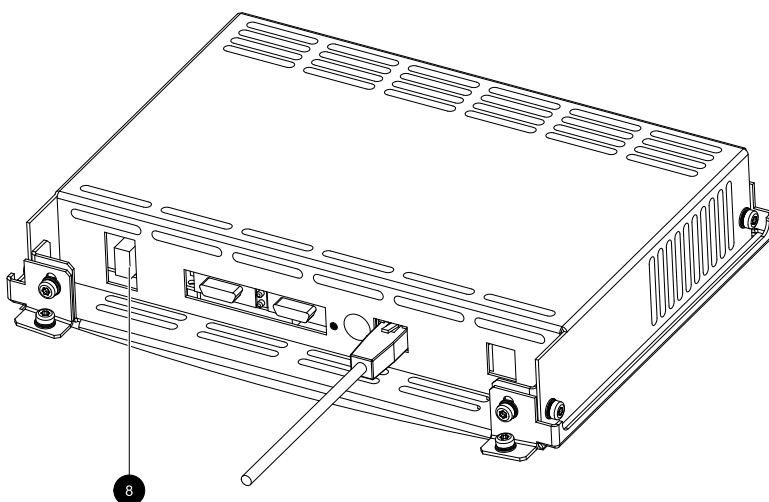
7. Select to filter the events by source, location and/or timestamp and press **OK**.



8. Set your filter parameters and press **OK** to initiate the filtering.



9. To save the log, insert a USB flash drive into the USB port on the display.



**Note:** Do not remove the USB flash drive before a dialog box on the display indicates that it is safe to remove the USB flash drive.



**Note:** USB flash drives from the following manufacturers have passed our tests: Cn Memory, SanDisk, Integral, A-Data, Pqi, PNY, OCZ, Verbatim, Lexar, TwinMOS, Freecom, Toshiba, Sony, LG, and Yifang Digital. If you experience problems using your USB flash drive, please try a different USB flash drive, preferably one from the above list.

- Press the **Save Log** button. The full event log is saved as a text and an HTML file. Associated event capture files are also saved.



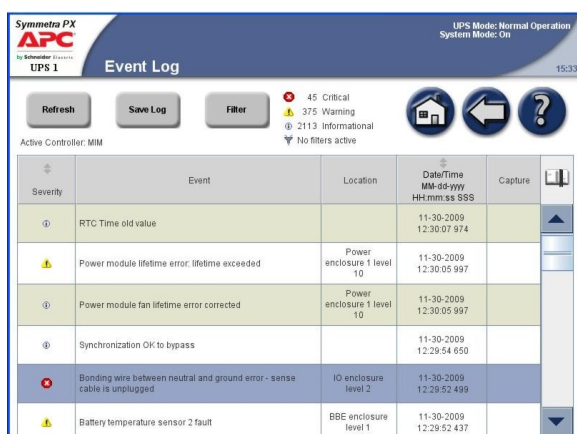
The screenshot shows the Symmetra PX APC Event Log interface. At the top, it says 'Symmetra PX APC by Schneider Electric' and 'UPS 1'. The title is 'Event Log'. There are buttons for 'Refresh', 'Save Log', and 'Filter'. A status bar shows '45 Critical', '375 Warning', and '2113 Informational' events, with 'No filters active'. The 'Active Controller' is 'MM'. Below this is a table of events.

Severity	Event	Location	Date/Time MM-dd-yyyy HH:mm:ss SSS	Capture
Informational	RTC Time old value		11-30-2009 12:30:07 974	
Warning	Power module lifetime error: lifetime exceeded	Power enclosure 1 level 10	11-30-2009 12:30:05 997	
Informational	Power module fan lifetime error corrected	Power enclosure 1 level 10	11-30-2009 12:30:05 997	
Informational	Synchronization OK to bypass		11-30-2009 12:29:54 650	
Critical	Bonding wire between neutral and ground error - sense cable is unplugged	IO enclosure level 2	11-30-2009 12:29:52 499	
Warning	Battery temperature sensor 2 fault	BBE enclosure level 1	11-30-2009 12:29:52 437	

All files are saved in a single compressed Zip-file to the USB flash drive.

## Bookmark an Entry in the Event Log

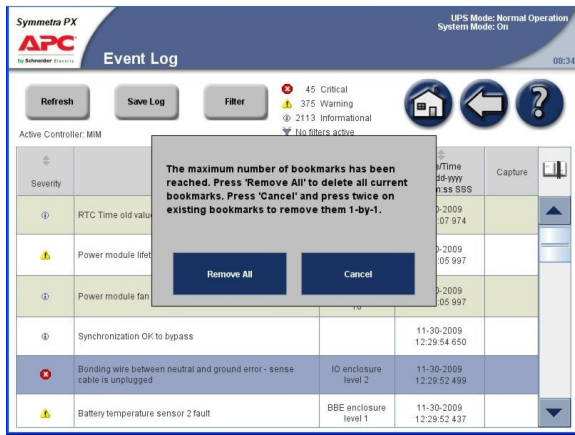
A maximum of five entries can be bookmarked in the system.



This screenshot is identical to the previous one, but the fifth entry, 'Bonding wire between neutral and ground error - sense cable is unplugged', is highlighted with a darker background, indicating it has been bookmarked. A bookmark icon (a small book) is visible in the 'Capture' column for this entry.

- Double press on an event in the event log to bookmark a log entry.
- Bookmarked entries are highlighted in a darker background colour.
- Press the Bookmark symbol to cycle through the bookmarks.

If you try to bookmark a sixth entry in the event log, the following screen will be shown:



You can choose to remove all existing bookmarks by pressing the **Remove All** button or click **Cancel** to remove them one by one. Press twice on the log entry to clear a bookmark.

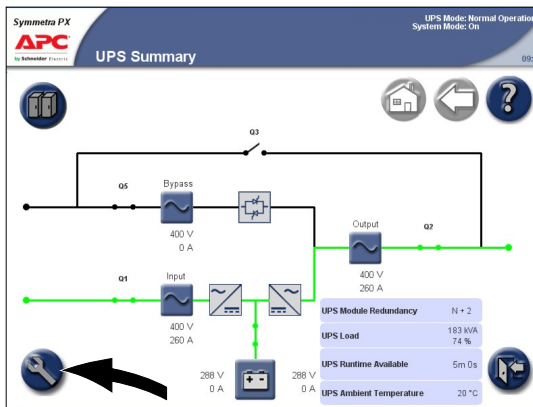
## View and Save Information about Firmware Version



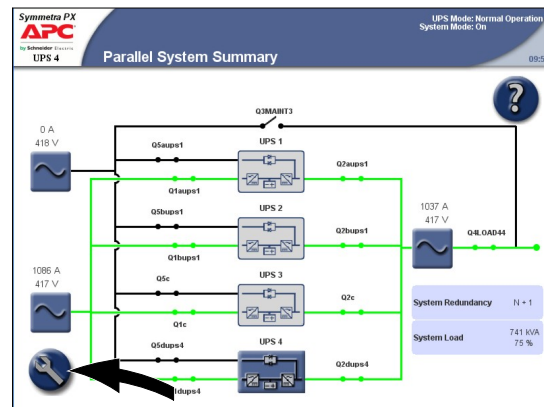
**Note:** Press the home button to go to the UPS Summary or Parallel System Summary screen.

1. Press the **UPS system** button in the bottom left corner to access the UPS System screen.

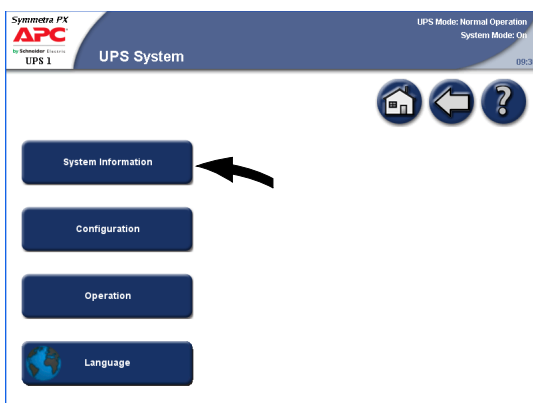
Single System



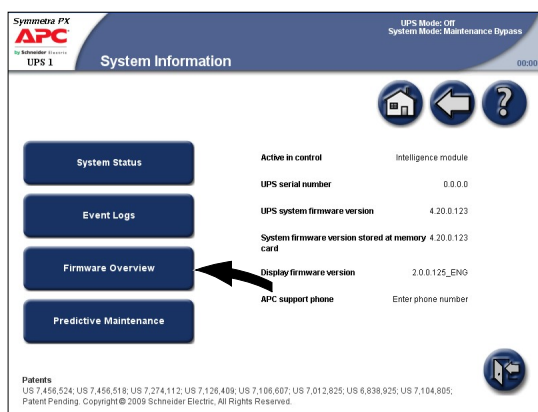
Parallel System



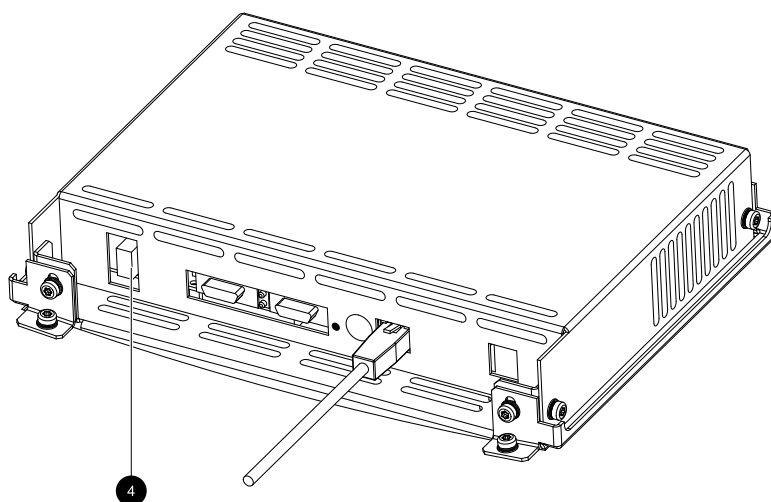
2. Press the **System Information** button on the UPS System screen.



3. Verify that the “UPS system firmware version” and “System firmware version stored at memory card” are identical. Press the **Firmware Overview** button.



4. To save the firmware version list, insert a USB flash drive into the USB port on the display.



**Note:** Do not remove the USB flash drive before a dialog box on the display indicates that it is safe to remove the USB flash drive.



**Note:** USB flash drives from the following manufacturers have passed our tests: Cn Memory, SanDisk, Integral, A-Data, Pqi, PNY, OCZ, Verbatim, Lexar, TwinMOS, Freecom, Toshiba, Sony, LG, and Yifang Digital. If you experience problems using your USB flash drive, please try a different USB flash drive, preferably one from the above list.

- Press the **Save FW\*Versions list** button to save the firmware version list as an HTML file. Press the button in the location column to open the Module Status Details screen for the particular module.

Symmetra PX APC UPS Mode: Normal Operation System Mode: On 08:00

**Firmware Overview**

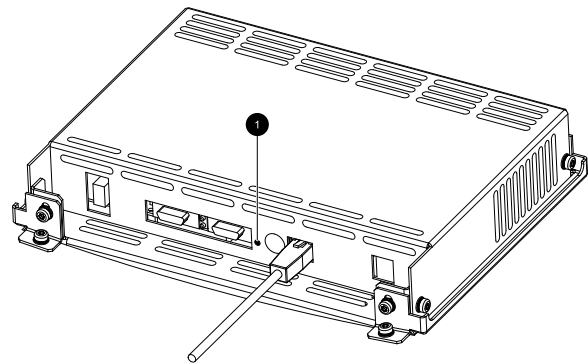
Save FW\* Versions List

Module	Location	Firmware Version	FW* Install Status
Intelligence Module 000	Input/Output/Bypass Enclosure, Level 3, Position E	4.0.1.123	No update active
Redundant IM	Input/Output/Bypass Enclosure, Level 3, Position D	4.0.1.123	No update active
Touch Screen Display	Input/Output/Bypass Enclosure, Level 2	1.1.0.125	No update active
ID and Relay Card	Input/Output/Bypass Enclosure, Level 3, Position H	4.0.1.123	Update succeeded
Ext. Switchgear Card	Input/Output/Bypass Enclosure, Level 3, Position B	4.0.1.122	Update in progress
Bypass Static Switch	Input/Output/Bypass Enclosure, Level 6	4.0.0.122	Restoring succeeded
NMC	Input/Output/Bypass Enclosure, Level 4, Position C	5.0.1.101	Update failed

\*FW – Firmware.

## Reboot the Display

- Press the reboot button at the bottom of the display to reboot the display.



## **Worldwide Customer Support**

Customer support for this or any other product is available at no charge:

- Contact the Customer Support Center by telephone or e-mail. For local, country-specific centers: go to [www.apc.com/support/contact](http://www.apc.com/support/contact) for contact information.

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