

一、UPS 之裝設

1. 地線

1)基本上，要使 UPS 有防雷擊能力而不損毀，一定要有地線。故 APC 強烈建議使用者安裝地線。

2)Smart-UPS 背板有一 “ Site Wiring Fault ” 紅色 LED。此燈亮起時表示地線不良，可能為以下三種情形之一：

- 無地線
- 極性顛倒
- 中線過載

2. 插頭

1)2200VA 以上之 UPS 其電線電流負荷量達 15A 以上，因此其插頭為 20A 以上。這種情況下，以 SU3000 為例，自配電盤的保險絲開始，配線、插座、UPS 插頭、UPS 電源線，UPS 斷電器等全部須能負荷 30A 以上，才是安全的用電環境。2200VA 以上隨機附有適用插座，請參閱下表。

機型	插頭型式	插座型式	最大電流	額定電壓
SU700 SU1000 SU1400 SU1400RM	NEMA 5-15 P	NEMA 5-15 R	15A	125V
SU2200 SU2200RM3U	NEMA 5-20 P	NEMA 5-20 R	20A	125V
SU3000	NEMA L5-30 P	NEMA L5-30 R	30A	125V
SU2200XL	NEMA 5-30 P	NEMA 5-30 P	30A	125V
MX3000	NEMA L6-30P	NEMA L6-30R	30A	250V
MX5000	NEMA L6-30P	NEMA L6-30R	30A	250V



5-15P
L6-30P



5-20P



L6-20P



L5-30P

2)若客戶選購此種大 VA 數之 UPS 只為 Runtime 長，事實上負載並不大時，可以只更換插頭。

3. 擴充卡安裝

1. 安裝擴充卡前，請先將 UPS 放電。(Smart-UPS)
- 2.2. 如遇 UPS 有任何不正常情況，請先移除所有連接的擴充卡再行測試。

4. 裝設完成

1. 安裝完成後開機，UPS 即開始自我測試。任何時候懷疑 Smart-UPS 有不正常情況，請嘗試冷啟動。(建議安裝完先充電幾小時)
2. 2. 建議以 UPS 開關為總開關。

二、軟體安裝

1.1. 安裝 PowerChute Plus

1)1)自光碟安裝

- 選擇安裝 PowerChute 或 PowerNet
- 選擇 PowerChute for Windows or Windows 95 或 for NT
- 如選擇 NT 則會先 Stop UPS Service
- 選擇 Install Directory
- 選擇 UPS Model Type : SmartUPS, BackUPS, Matrix
- 選擇 Com Port

2)2)自 APC 網站上下載的程式安裝

2.2. No Communication 問題

- 確定 Cable 已確實接好，並已打開 UPS 開關。
- 確定只有 UPS 在使用指定的 COM Port。
- 確定使用的 Cable 是正確的。

軟體	Signaling Type	Cable
PowerChute Plus (except UNIX)	simple signaling	940-0020B 灰
PowerChute Plus for UNIX	simple signaling	940-0023A
PowerChute Plus (except SGI Irix)	advanced signaling	940-0024C 黑
PowerChute Plus for SGI Irix	advanced signaling (only)	940-0049A

1)1)Windows NT

- I. I. 確定 UPS Service 已啟動。
- II. II. 確定 Com Port 的設定無誤。
 - NoSerialMice statement is included in Boot.ini.

- COM1 : Address=3f8 , IRQ=4 ; COM2 : Address=2F8 , IRQ=3 。

- **Disable FIFO**

- 確定 Modem 及 RAS 的 COM Port 無誤。

III. 確定 pwrchute.ini 檔中的幾個參數：(假設 Com1)

[UPS]

SignallingType=Smart

PortName=COM1

AutoUpsRebootEnabled=Yes

BatteryReplacementDate=12/09/96

UpsPollInterval=4

2)Novell Netware

I. I. 確定 Pwrchute.nlm 是否在執行？如沒有，請 load 。

II. II. 請檢查 Com Port 設定

先 unload pwrchute.nlm，再 unload AIOCOMX.NLM 。

(如用 COM 1) LOAD AIOCOMX INT=4 PORT=3F8 NOFIFO

III. III. 請確定 pwrchute.ini 檔中的幾個參數：(假設 Com1)

[UPS]

SignallingType=Smart

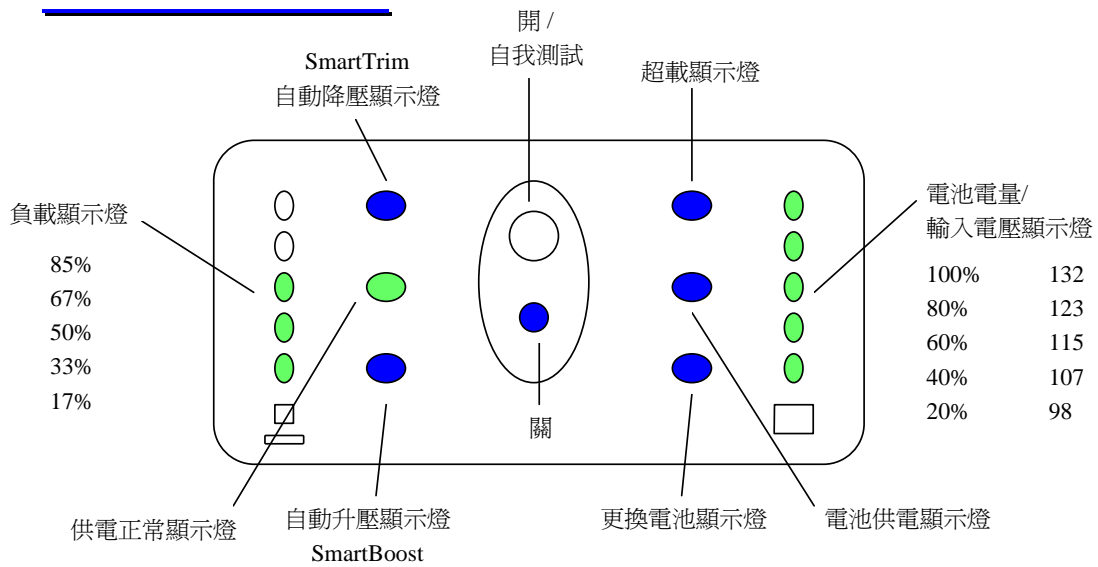
HardwareType=1

BoardNumber=0

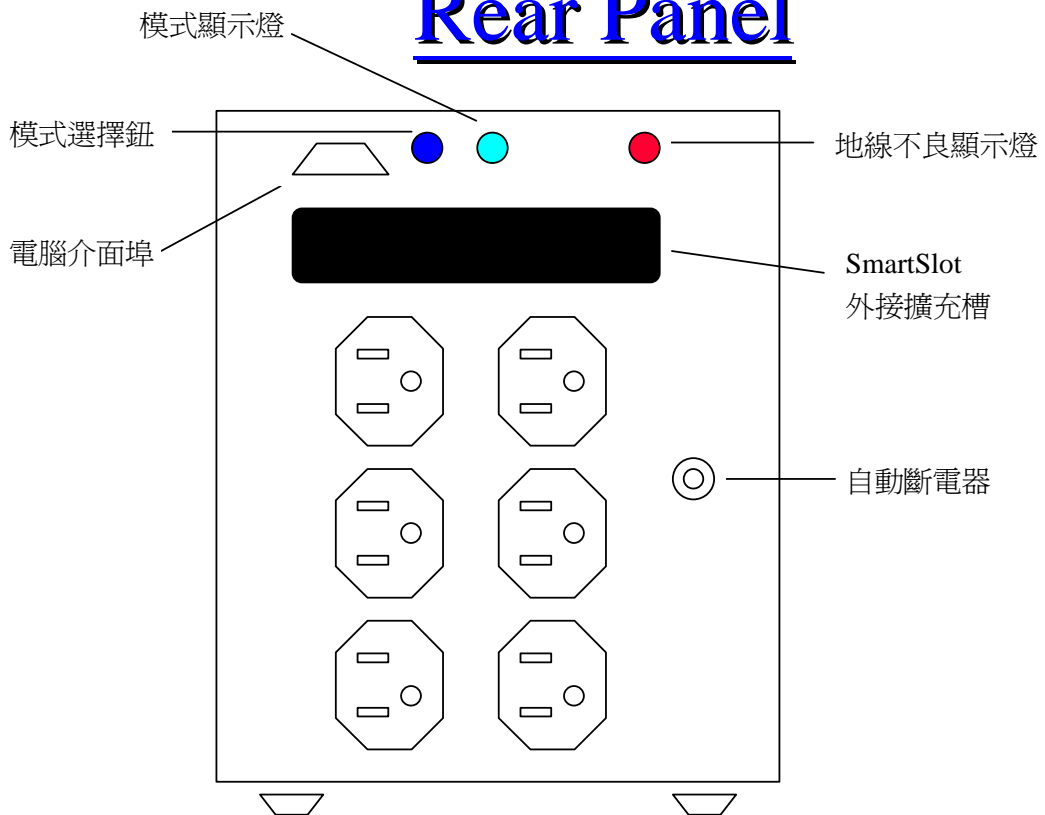
PortNumber=0

三、Smart-UPS 面板&操作

Front Panel



Rear Panel



1. 1. 自我測試
2. 2. 停電
3. 3. 冷啟動
4. 4. 不同輸入電壓（自動升降壓 SmartBoost & SmartTrim）
5. 5. 線上更換電池

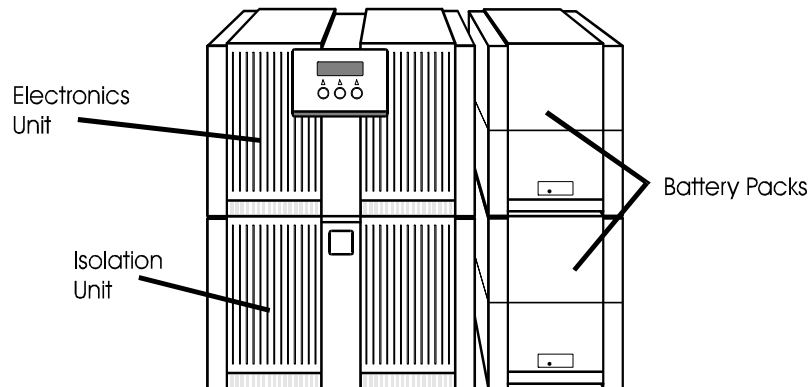
四、Smart-UPS 維修

1. 1. 可先嘗試冷啟動，若無法冷啟動，則 UPS 為故障。
2. 2. 可先去除所有配件，以簡化問題。
3. 3. 請檢查背板的自動斷電器（Circuit Breaker）有無跳起。（可能因為超載）
4. 4. 如 UPS 有冒煙、燒焦或焦味，則 UPS 為故障。
5. 5. 如 UPS 面板燈全閃，則 UPS 為故障。
6. 6. 如更換電池燈號亮起，可先將 UPS 充電整夜，再進行自我測試。
7. 7. 如超載燈號亮起，請減低負載。
8. 8. Smart-UPS 英文說明書上問題處理表

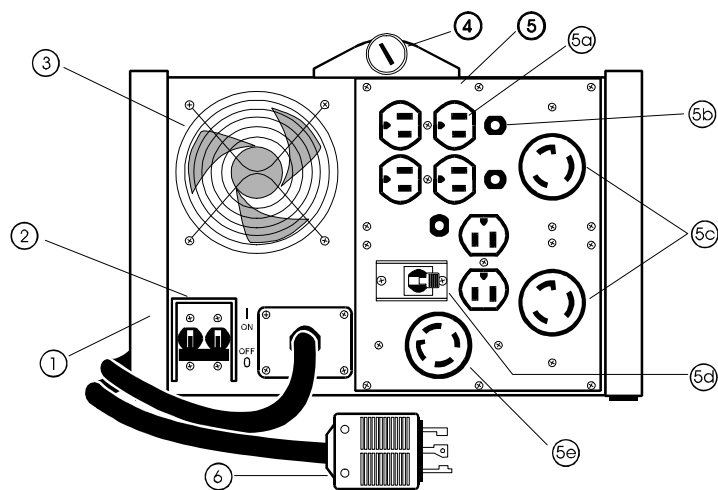
Problem	Possible Cause	Solution
UPS will not turn on.	On/test button not pushed.	Press the on/test button to power the UPS and the load
	UPS input circuit breaker tripped.	Reduce the load on the UPS by unplugging equipment and reset the circuit breaker by pressing the plunger back in.
	Very low or no utility voltage.	Check the AC power supply to the UPS with a table lamp. If very dim, have the utility voltage checked.
UPS will not turn on or off.	Computer interface or accessory problem.	Disconnect the computer interface or accessory. If the UPS now works normally, check the interface cable, the attached computer, and the accessory.
UPS operates on-battery even though normal line voltage is thought to exist.	UPS's input circuit breaker tripped.	Reduce the load on the UPS by unplugging equipment and reset the circuit breaker.
	Very high, low, or distorted line voltage.	Test the input voltage with the utility voltage display. See section 5.6. Inexpensive fuel powered generators can distort the voltage. If acceptable to the load, reduce the UPS's sensitivity. See section 5.9.
UPS beeps occasionally.	Normal UPS operation.	None. The UPS is protecting the load.
UPS does not provide expected back up time.	The UPS's battery is weak due to recent outage or is near the end of its service life.	Charge the battery. The UPS's batteries require recharging after an extended outage. Batteries wear faster when put into service often and when operated at elevated temperatures. If the battery is near the end of its service life, consider replacing the battery even if the replace battery indicator is not yet lit.
	The UPS is overloaded.	Check the UPS's load display. See section 5.4. Unplug less needed equipment, such as printers.
Front panel indicators flash sequentially.	The UPS has been shut down by remote control.	None. The UPS will restart automatically when utility power returns.
All indicators are lit and the UPS emits a constant tone.	Internal UPS fault.	Do not attempt to use the UPS. Turn the UPS off and have it serviced immediately.
The UPS operates normally, but the site wiring fault indicator is lit.	Building wire error such as missing ground or hot to neutral wire reversal.	Have a qualified electrician correct the building wiring.
Low battery light is on and the on-line light is off.	The UPS is shut down and the battery is discharged from an extended power outage.	None. The UPS will return to normal operation when the power is restored and the battery has a sufficient charge.
The replace battery light is lit	Weak batteries.	Allow the batteries to recharge for at least four hours. If the problem persists after recharging, replace the batteries. See section 10.
	Replacement batteries not connected properly.	Confirm the battery connections. See section 10.

五、Matrix 結構&操作

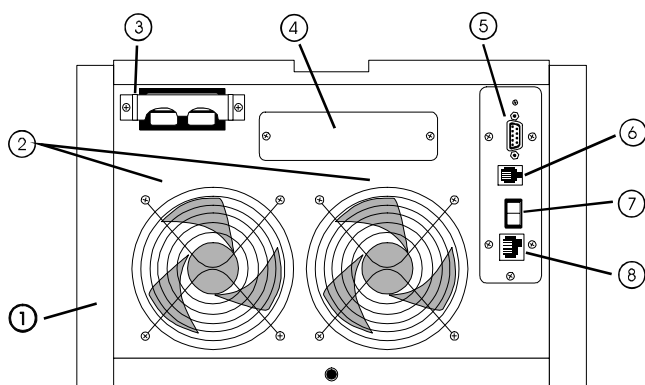
1. Matrix 結構



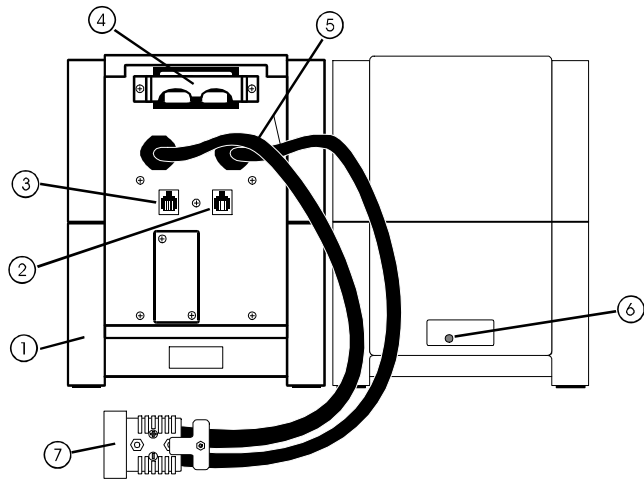
Isolation Unit (IU)：包括隔離變壓器、EMI/RFI 和突波抑制器



Electronics Unit (EU)：電路控制、充電器。



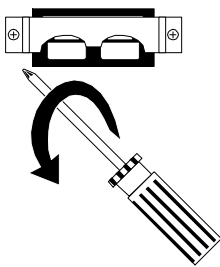
Battery (SmartCell)：



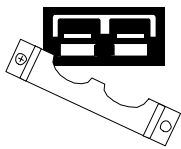
2. 電池組裝：

電源線：

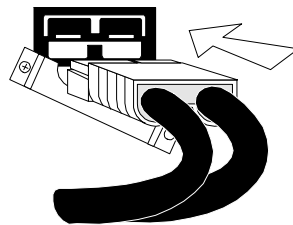
Remove clamp



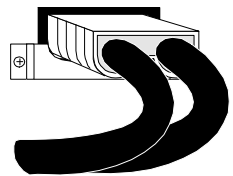
Turn clamp



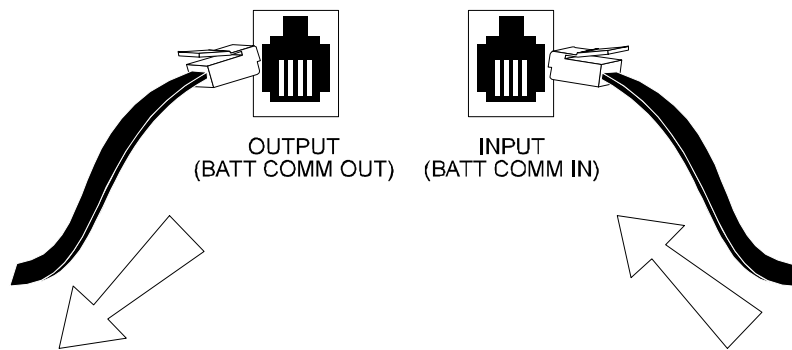
Mate couplers



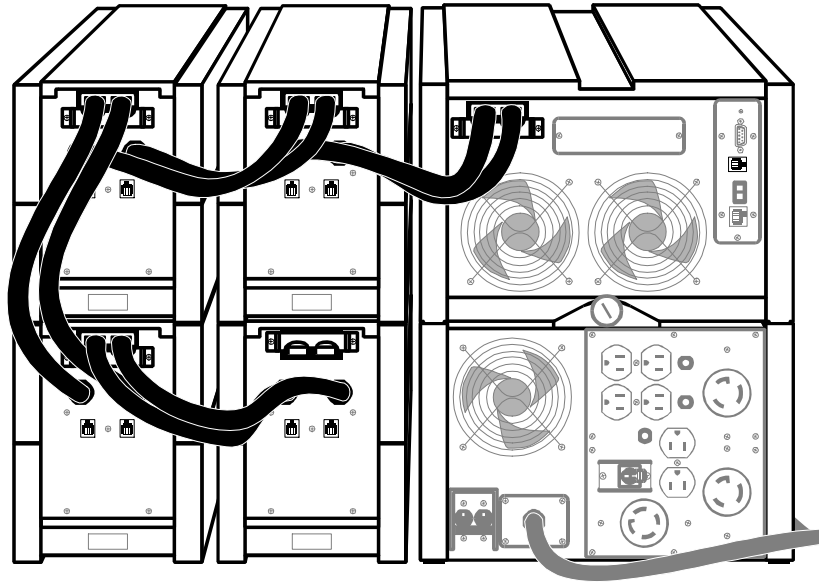
Secure clamp



訊號線：



完成圖：



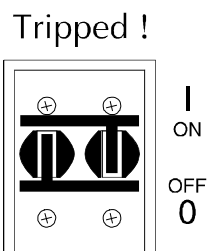
3. 3. 操作

4. 4. Matrix 維修

由於 Matrix 為一模組化的 UPS，最簡單的方法就是更換電池或 EU 嘗試，就很容易找出故障部分。絕大部分的問題都出在電池。

無法開啟：

自動斷電器 (Circuit Breaker) 跳起。(可能因為超載)



EU 螺絲鬆了。

LCD 顯示 “In Bypass Mode Press Any Key”：

電池電源連線鬆了

自動斷電器跳起

LCD 顯示 “UPS in BYPASS chk rear switch”：

背板旁路開關開啟

與 EU 有關的錯誤訊息：

DC imbalance
Call for service

WARNING!
UPS too Hot!

Top t
UPS c

Main relay fault
call for service

與 IU 有關的錯誤訊息：

Bottom fan fail
call for service

Aux Pwr Sup Fail
call for service

B
c

與電池有關的錯誤訊息：

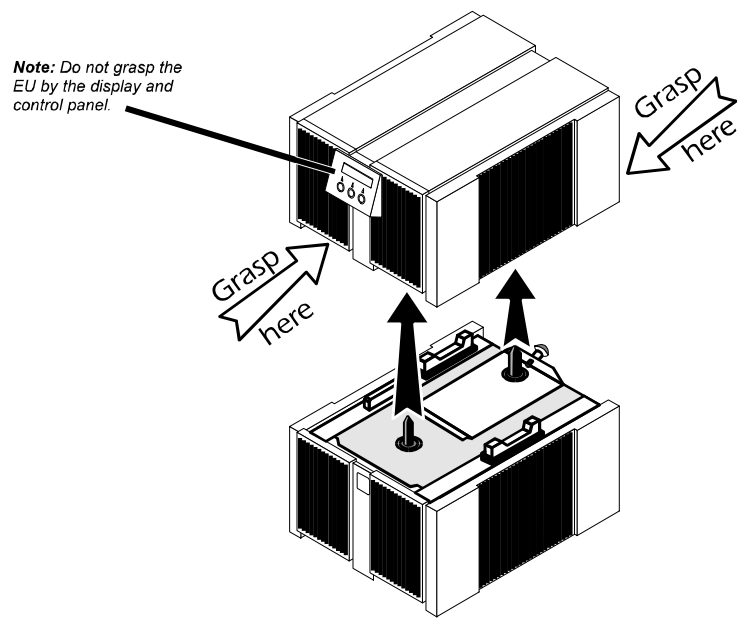
Check batt pack
connections

Batt too low
cannot start

Battery pack
need replacem

Low battery
Load is off

更換 EU



Matrix 英文說明書上問題處理表

Problem	Possible Cause	Action to Take
UPS will not turn on.	The UPS's input circuit breaker is tripped (1/2 of handle is down).	Reduce the load on the UPS by unplugging equipment and reset the circuit breaker.
	EU separating screw is loose.	Tighten the EU separating screw (do not overtighten).
	Circuit closure present at the Emergency Power Off interface.	Check the EPO connections. See section 4.7.
UPS operates on-battery even though normal utility voltage is thought to exist.	Very high line voltage.	Test the line voltage with the UPS voltage meter (see section 5.2.4). If necessary, adjust the UPS upper transfer voltage (see section 5.2.5).
	Highly distorted line voltage.	Inexpensive fuel powered generators can cause distorted line voltages. Desensitize the UPS to the distortion (see section 5.2.5).
UPS beeps occasionally.	This is normal.	None. The UPS is protecting the loads.
UPS does not provide expected back up time.	The UPS's batteries are discharged from recent utility outage.	None. The UPS's batteries require recharging after extended or successive outages.
	The UPS's batteries are weak due to age or wear.	The batteries wear faster when put into service often and when operated at elevated temperatures.
UPS display shows "No Battery Communication".	One or more battery pack cables is not properly connected.	Check connections to and from each battery pack and the EU. See section 4.6.
UPS display shows "In Bypass Mode Press Any Key".	Battery pack coupler not properly mated with the EU coupler.	Check battery pack connections. See section 4.5.
	Input circuit breaker cycled on-off-on too quickly.	Follow display prompts to return to normal on-line operation.
UPS display shows "UPS in BYPASS chk rear switch"	The manual bypass switch at the rear of the EU is in the bypass position.	Change the switch setting to resume normal on-line operation.
Output voltage reading incorrect after installation of a new power distribution plate.	Output voltage reporting incorrectly set.	Change the output voltage reporting setup. See section 5.2.6.
Output voltage outside rated regulation band.	Upper transfer voltage set higher than the factory setting.	If necessary, change the upper transfer voltage setting. See section 5.2.5.
	The UPS has relaxed load voltage regulation to compensate for distorted or fluctuating utility voltage.	Set the UPS's utility failure sensitivity to "High" to maintain narrow band regulation. See section 5.2.5.
The UPS does not power the load immediately following the return of normal utility voltage.	The turn on delay set to a non-zero value.	Set the turn on delay to the desired value. See section 5.2.6.

五、軟體操作設定

如何設定 PowerChute Plus 自動關機時間

(以 NT 版為例)

在 PowerChute Plus 中，可自行設定要關機的電力事件，包括停電、溫度過高、定時開關機…等等。這些電力事件都列在 Configuration 選項下的 Event Actions 中。針對這些不同的電力事件，每一種都可以自行設定不同的關機程序。

在 Event Actions 中，左半部 Events 列出的即為電力事件，右半部 Actions for Selected Event 列出的是所要的反應。這裡提供的反應有 Log Event（將此事件記錄於 Event Log 中）、Notify Administrators（以 message 通知系統管理員）、Notify Users（以 message 通知指定的 User）、Run Command File（關機前先執行指定的程式，用以關閉 Lotus Notes Server、Oracle 等）、Send E-Mail（發 NT mail）、Page Users（透過數據機發訊號給呼叫器）、Shut Down Server（關機）等七種。

以下我們以停電為例，來設定 UPS 關機的程序。

1.

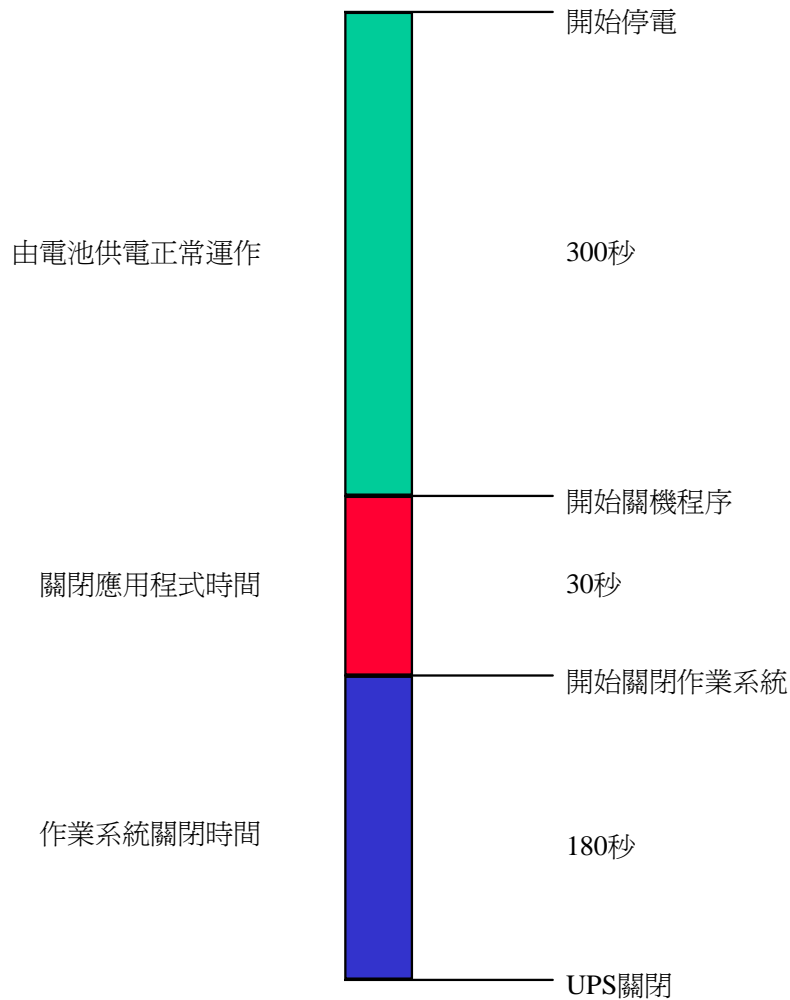
假設我們想要在停電時，讓 UPS 自動關閉作業系統、電腦及 UPS 本身，則首先在 Configuration 中選 Event Actions。在左半部 Events 中，選 UPS On Battery。右半部 Actions for Selected Event 中，已預選了 Log Event、Notify User 和 Shut Down Server。請選 Shut Down Server 並按 Options，此處要設定 UPS 以電池供電後多久開始關機程序。根據負載及需求，輸入適當的時間。假設是 300 秒。此時間過後，將開始關機程序。

2.

接下來請選 Events 中的 System Shutdown Starting 的 Options。此處設定的關機開始延遲時間是給上述所提 Run Command File 程式執行時間用。假設是 30 秒。此時間過後，將開始關閉作業系統。

3.

接下來請選 Configuration 中的 UPS Shutdown Parameters。在 UPS Turn Off Delay 中，有 20、160、300、600 秒四個選項。此為作業系統關閉最少所需時間。在此時間後，UPS 將自動關閉。如有選底下的 Automatic Reboot，則 UPS 不是關閉而是進入休眠狀態，此時 UPS 面板燈號輪流閃爍。UPS 將在偵測到市電恢復後自行開啟並開啟電腦。



其他有關之時間設定：

Configuration \ UPS Shutdown Parameters \ UPS Wakeup Delay (Time)
 UPS 在休眠狀態中，偵測市電恢復後自行啟動的延遲時間。以避免市電恢復後短時間內的再度停電。

Configuration \ UPS Shutdown Parameters \ UPS Wakeup Delay (Capacity)
 UPS 在休眠狀態中，偵測市電恢復後，要電池電量充電到多少百分比以上才自動開機。同樣避免市電恢復後短時間內再度停電時 UPS 無法提供正常供電時間。

Configuration \ Application Shutdown (PowerChute for NT 5.0 以上版本)
 針對 Microsoft Office、Corel PerfetOffice、Lotus SmartSuite 等應用程式，可在關閉作業系統前先行存檔關閉。預設時間為 60 秒，即每個應用程式 6 秒，共 10 個。PowerChute 會在開始關機程序後，取此項延遲時間或上述 2. 中 System Shutdown Starting 的延遲時間兩者之較長者。

設定的時間請以實機試驗決定。