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COMPASS DCS UPS's

APC BACK-UPS 650

We are using two APC BACK-UPS 650 units with 940-020B cables (see Appendix A for cable and port description). As only Simple Signaling is possible (see Appendix B for explanation of difference between Simple and Smart Signaling) this method is used at both PCs.

Results of the power duration test

	Power duration time, min
pccompass03 with 17" display	~28
pccompass03 without display	~70

Linux

Hardware.

The UPS is powering the pccompass04 without display (the display is powered by common COMPASS UPS). Because the PC has only one serial port and the port is used for transfer of SM2 magnetic measurement, a COM 2 connector was installed into the PC and connected with COM B port of motherboard. During the tests we discovered that as soon as a program opens the port, the PC sends a signal which shutdown the UPS. To avoid it we cut the wire which links pin 4 of external COM2 and internal COM B connectors.

Software.

Igor wrote a DCS daemon "upsd" (/home/dcs_soft/compass/ups). The program is checking each 60 seconds corresponding serial port. As soon as a power absence signal is detected, the program starts a timer. If during 25 minutes the power will not come back, the daemon will stop PVSS and shutdown computer, otherwise it come back to primary check cycle. The daemon is automatically launched at each start-up of computer by /etc/rc.d/rc.local. It is writing a /var/log/upsd.log file.

W2000

Hardware.

The UPS is powering the na58pc014 without display. Because COM 1 and 2 are used for acquisition of PLC's data the UPS cable connected to COM 3 port of additional RS232 card.

<u>Software.</u>

We are using standard APC software [PowerChute Buisness Edition](#) V6.2.2.

	pccompass03	na58pc014
The PowerChute is downloaded in	C:/Downloads	C:/Downloads
Agent is installed	yes	yes
Server and Console is installed	yes	no
UPS user	Administrator	Administrator
UPS password	standard W2000 password	standard W2000 password

For both Agents (pccompass03 and na58pc014) the Power Protection Strategy is configured to Maximize Runtime (begin shutdown when only the runtime needed for a safe shutdown remains, or when critical UPS failure occur. Reboot as soon as normal power returns).

<u>Appendix A.</u> The 940-020B cable description

```
(UPS)      DB9M                            DB9F (Computer)
Shutdown   1  <-------------------< 4    DTR
AC Fail    2  <-------------------< 8    CTS
Common     4  <---|----------------< 5    GND
Common     9  <---|
```

According to APC Computer Interface Port description ([APC Application Note #AN-12](#))
the output at pin 2 generates a LO-to-HI RS232 voltage level when the device is
signaling on-battery. The pin is normally at a LO RS-232 voltage level.

Appendix B. (from APC WEB site)

What is the difference between Smart and Simple Signalling?

Answer

This note explains the functionality and features available to users when running PowerChute plus in simple signalling mode. It includes screen shots of the PowerChute plus user interface in simple signalling mode, an overview of the features and functions of PowerChute plus in simple signalling mode, and finally an overview of which APC products are capable of functioning in simple signalling mode.

Background
There are two basic communication modes in which PowerChute plus can operate, simple signalling (also known as basic signalling) and smart signalling. Although, many of the core features of PowerChute plus, including unattended shutdown and application data saving are available when using the software in simple signalling mode, some features are only available when using the software in the smart signalling mode.

Smart signalling
In smart signalling mode, the UPS and PowerChute plus transfer ASCII data across the serial cable to communicate. This allows the UPS to provide a large array of information to the software.

Simple signalling
Simple signalling is the recognition of whether certain pins of the serial port are high or low, and allows for 3 states only; on battery, low battery and UPS turnoff.

User Interface
Since many of the advanced features of PowerChute plus are available only in smart signalling mode, the PowerChute plus user interface looks quite different when it is operating in these two modes. The most obvious is that in smart signalling you will have bar graphs and in simple they will not appear.

Since much of the information displayed by PowerChute plus is provided via smart signalling only, this information is not available for display when monitoring simple signalling UPSs, such as an APC Back-UPS.

Features/Functions in Simple Signalling Mode
Unattended Shutdown: In the event of an extended power failure PowerChute plus will gracefully shutdown the operating system when it receives a low battery signal from the UPS.

Application Data Saving: User's can enable Application Data Saving, which automatically saves open files before operating system shutdown occurs.

Event Logging: Records selected power events with a description and time/date stamp to enable diagnosis of UPS/power problems. The last two events are displayed by PowerChute plus. The user can enable or disable event logging, view the event log, as well as, limit the size of the event log file.

FlexEvents: PowerChute plus can be configured to perform as many as seven different response actions (i.e. page, email, log event, broadcast, run command file, and shutdown) to the following eight events:
PowerChute plus started
PowerChute plus stopped
UPS on Battery
Utility Power Restored
Low Battery Condition
Communication Established
System Shutdown Starting
System Shutdown Complete (logs event only)

APC Products Using Simple Signalling
All APC UPS products (Back-UPS, Back-UPS Pro, Smart-UPS, Matrix-UPS and Symmetra) can function in simple signalling mode, however, APC Back-UPSs are capable of functioning in simple signalling mode only. In addition, when PowerChute plus is used in conjunction with an APC Interface Expander or APC Share-UPS, to provide multiple server shutdown, it functions in simple signalling mode on those servers attached to the basic ports.