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

<table>
<thead>
<tr>
<th></th>
<th>Power duration time, min</th>
</tr>
</thead>
<tbody>
<tr>
<td>pccompass03 with 17” display</td>
<td>~28</td>
</tr>
<tr>
<td>pccompass03 without display</td>
<td>~70</td>
</tr>
</tbody>
</table>

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 na58pe014 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.
We are using standard APC software **PowerChute Business Edition** V6.2.2.

<table>
<thead>
<tr>
<th></th>
<th>pccompass03</th>
<th>na58pc014</th>
</tr>
</thead>
<tbody>
<tr>
<td>The PowerChute is downloaded in</td>
<td>C:/Downloads</td>
<td>C:/Downloads</td>
</tr>
<tr>
<td>Agent is installed</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Server and Console is installed</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>UPS user</td>
<td>Administrator</td>
<td>Administrator</td>
</tr>
<tr>
<td>UPS password</td>
<td>standard W2000 password</td>
<td>standard W2000 password</td>
</tr>
</tbody>
</table>

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).
Appendix A. 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](#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.
**Question**

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.