



PowerMAN Power Manager 5.5

Client Software Installation and Administration Guide

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About Data Synergy



Data Synergy is a British company based in Sheffield. We have over fifteen years' experience developing and supporting software solutions for enterprise PC deployment and management. We do not resell other vendors' products and do all our development, sales and support from our UK base.

Our products have evolved through listening to customer ideas and applying our unrivalled knowledge of PC internals. If you have a suggestion for a new product or feature we would love to talk to you.

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Contents

PowerMAN Overview	9
PowerMAN v PowerMON	9
New in PowerMAN v5.5	10
PowerMAN Basics	15
PowerMAN v Windows built-in power management – Why PowerMAN?	15
Low-power modes - Shutdown, Hibernate and Sleep.....	15
Idle-based (timeout) v scheduled power management	16
Default, No User, and specific-user idle policies.....	17
Multiple policy precedence order	17
Policy enforcement feature (Anti-Insomnia).....	18
Monitoring progress with PowerMAN reporting	19
Power Management Event Log.....	20
Separate AC (mains power) and DC (battery power) policies	20
Product Installation	20
Installation Prerequisites	21
Getting to know your hardware	21
Deployment Preparation	23
Preparation for PowerMAN reporting (Optional)	25
Configuring reporting without Active Directory	25
PowerMAN Group Policy configuration and optional deployment	26
Making effective use of policy inheritance (Larger networks)	27
Creating PowerMAN Group Policy Object	28
Group Policy PowerMAN Client Deployment (Optional)	29
Group Policy Client Configuration	32
Walkthrough: Configuring PowerMAN Reporting.....	34
Deploying PowerMAN in a pre-built software image cloned or ‘Ghost’ deployment.....	37
Deploying PowerMAN client updates	37
Permanently uninstall PowerMAN.....	38
PowerMAN Configuration	39

PowerMAN Power Manager v5.5

Product Licensing	40
Power Management Reporting	40
Advanced Reporting Settings.....	42
Default and No User Power Settings	44
Scheduled Actions.....	46
Scheduled Wake-up (Resume).....	47
Scheduled Suspend / Reboot / Shutdown	48
PowerMAN scheduled wake-up does not require Wake-on-LAN	48
Global Power Settings (Power/Sleep buttons, lid switches, password on wake)	51
Protected Objects (including maintenance windows)	51
Advanced Protected Object Features	54
Resume Configuration Feature	55
User Messages Feature	56
Power Policy Enforcement / Anti-Insomnia Feature	57
Hardware Device Power Management Settings	58
User Interface Settings.....	59
PowerMAN User Interface Icon.....	60
Miscellaneous Power Settings	61
Custom Actions	63
Policy Preferences Feature (Advanced)	63
Advanced Settings	67
Distinct User Policies	68
Getting the most from PowerMAN	69
Monitor the existing environment	69
Typical deployment phases.....	69
Idle or schedule-based power management?	70
Complementary PowerMAN features.....	71
Maximizing Savings.....	71
Walkthrough: Configure initial power management policies	72

PowerMAN Power Manager v5.5

Walkthrough: “Default” policy to disable idle-based power management.....	73
Walkthrough: “Default” policy to sleep after 30 minutes	74
Walkthrough: “No User” policy to sleep after 10 minutes when no user is logged on	75
Walkthrough: Enable policy enforcement / anti-insomnia after 5 minute grace period.....	77
Tips for a successful power management rollout.....	78
Common Scenarios.....	79
Excluding Specific Computers via a protected ‘marker’ file (Alternative method)	80
Calculating actual energy consumption	81
How PowerMAN works.....	81
Additional PowerMAN Features	83
WakeMyPC – Ad-hoc wake and remote power-on	83
Troubleshooting.....	84
Problem: PowerMAN does not deploy correctly using the GPO method	84
Problem: The PowerMAN application appears to deploy okay but the configured policy doesn’t seem to deploy consistently	85
Problem: PowerMAN appears to be deployed okay and the required settings are displayed in the Control Panel Power Management applet but the computer does not shutdown/hibernate/sleep as expected	86
OR PowerMAN reports event #2003: The computer is being prevented from entering the idle state by an unknown program.....	86
Problem: A Hard Disk (HDD) spin-down policy has been applied but doesn’t seem to do anything. The hard disk always remains powered on.	87
Problem: After enabling a Hard Disk (HDD) spin-down policy the system may sometimes freeze momentarily.....	88
Problem: PowerMAN reports that there are fewer computers than expected in the site	88
OR PowerMAN reports many more computers than expected in the site	88
OR PowerMAN reports unexpected duplicate computer names within the same site	88
OR PowerMAN reports computers that seem to be on more than 24 hours a day!.....	88
OR PowerMAN is deployed using an image based Windows installation and only one client is reported. The service appears to be operating okay on each computer	88
Problem: PowerMAN is installed but the computers are not showing up on the reporting system	89
OR Power Management Event Log reports Event #6015: Downloaded XML was corrupt.....	89
OR Power Management Event Log reports Event #6032: Server failed to respond.....	89
OR PowerMAN Enterprise Server logs show frequent truncated XML uploads (typically around 1,400-1,500 bytes in size)	89
OR PowerMAN reporting fails to work consistently with M86 Security / Trustwave web content filter when split packet detection is enabled.....	89
OR PowerMAN reporting previously worked but the PID key expired or the workstation was turned off for a prolonged period and reporting subsequently fails to work or work consistently	89
Problem: The PowerMAN service (or power configuration) is applied using a logon script but does not consistently work	92
Problem: The ‘Managed’ power scheme does not appear in the Windows Control Panel	92
OR The settings in the Windows Control Panel do not match those configured	92

PowerMAN Power Manager v5.5

Problem: Sleep has been configured (suspend to RAM). The power saving is not as great as expected	92
Problem: A scheduled wake policy has been configured but nothing happens.....	93
Problem: The computer is configured to hibernate or sleep. Sometimes the previous user leaves the workstation without logging off and this can lock the workstation for the next user.....	93
Problem: PowerMAN works correctly on some computers but gives inconsistent results on others. The settings used are the same in both cases.....	93
OR PowerMAN works correctly on some computers but others have a recurring error in the Power Management event log.....	93
Problem: The power policy doesn't work as expected. The Hard Disk / Monitor timeout is less than the idle timeout.....	94
Problem: Some computers wake-up (resume) unexpectedly	94
Problem: Some computers fail to suspend / resume reliability and consistently	94
Problem: Unable to resume computer using selected input / button method	98
OR Unable to resume PC using a USB keyboard / mouse.....	98
OR Unable to resume PC using Wake-On-Lan (WOL).....	98
OR Unable to configure Device Manager power management remotely	98
Problem: Network drive is disconnected after system has resumed.....	102
Problem: Power Management event log reports error #1019 - Product key has expired. Please contact your sales representative to obtain an updated product key. The software will continue to function in reduced functionality mode	102
Problem: Shutdown scripts are ignored on Windows 2000/XP/2003	102
Problem: PowerMAN is installed but not in the path (64-bit systems).....	102
Problem: Power management event log reports event #4042: The managed power policy has been repeatedly applied x successive times. This may indicate that another program (or user) is changing the policy settings. It may also indicate a problem with the policy settings. This warning may also be generated if multiple policy changes are for very quick succession.	103
Problem: Power management event log repeatedly records events #4030/4059	104
Problem: Power management event log repeatedly records events #4064/5004	104
Problem: Power reporting is inconsistent or intermittent when installed alongside Windows Unified Write Filter (UWF), Farionics™ Deep Freeze™, Microsoft Steadystate or similar system restoration / system security software	104
OR Workstations are frequently re-imaged and this interferes with the PowerMAN reporting feature.....	104
Using the debug log to investigate problems (DebugFile setting)	105
Other Deployment Resources.....	108
Using the upload log to investigate reporting problems (DebugUploadFile setting).....	109
Appendix A – PowerMAN Command line arguments	110
Install.....	110
Remove.....	110
Start	110
Stop.....	110
Restart	110
Status.....	110
Makeguid.....	110
License.....	110
Forceupload	110
Hibercheck	110
Sleepcheck.....	110

PowerMAN Power Manager v5.5

Info.....	110
Networkinfo.....	110
Supportdump.....	110
Inhibit.....	110
IsProtected.....	110
IsScheduled.....	110
DisplayOn.....	110
DisplayOff.....	110
Help.....	110
Appendix B – PowerMAN Configuration with Novell ZENworks.....	111
Appendix C – PowerMAN Configuration with RM Community Connect 3/4....	115
Appendix D – PowerMAN Policy Settings Reference.....	117
General Information.....	117
Product Licensing.....	118
Power Management Reporting.....	118
Advanced Power Management Reporting.....	119
Miscellaneous Configuration.....	120
Scheduled Events.....	121
Global (All User) Power Settings.....	123
User, Default and No User Power Settings.....	124
Policy Enforcement / Anti-Insomnia Settings.....	126
Protected Object Settings.....	127
Resume Configuration Settings.....	127
Debugging / Advanced Settings.....	128
Appendix E - Alternative Configuration Method - Local Group Policy / Registry Settings.....	130
Example Registry File.....	131
Appendix F – Custom Actions.....	133
CLOSEWINDOW Action.....	133
RUNPROG and RUNHIDDEN Actions.....	135
Appendix G – Inconsistent Configuration Behaviour.....	136
Appendix H – PowerSTART Tool.....	137
Appendix I – PowerMAN Reporting Protocol.....	138
Appendix J – PowerMAN Configuration with Microsoft Intune.....	139

Appendix K – PowerMAN Deployment with Microsoft Configuration Manager (SCCM).....	141
Appendix L – Hardware low-power modes (S0ix, S1-S5).....	143
PowerMAN behaviour with “Modern” standby mode (S0ix, AoAc)	144
Appendix M – Alternative SMS / XCOPY / Scripted Deployment Methods	146
Appendix N – Common PowerMAN client event log messages	147

PowerMAN Overview



PowerMAN Power Manager is an advanced systems management tool giving organisations of all sizes a simple and effective solution to manage PC running costs and monitor PC asset utilization. PowerMAN complements the built-in power management features of Microsoft Windows® to provide:

- **Comprehensive, centralised, configuration of PC power management**
- **Multiple advanced power management features, beyond those available in Windows alone**
- **Web-based, enterprise-wide reporting of PC assets, utilization and running costs**

PowerMAN builds upon the features available in Windows to deliver targeted power management that maximizes savings whilst avoiding any loss of productivity. PowerMAN's innovative approach allows PC power features to be simply and centrally managed using familiar Windows tools. This dramatically reduces implementation time and delivers rapid results. PowerMAN's unique web-based [reporting system](#) allows both IT and non-IT staff to easily monitor equipment utilization, measure progress and identify areas for further improvement. The reports are easy to understand and, if desired, can also be used to promote power and cost-saving cultural change to users.

The PowerMAN software is lightweight and scales very well. The client software is configured using standard registry-based settings, Windows Group Policy or similar. It does not require any additional server resources and will scale to the largest Windows networks with ease. The optional PowerMAN reporting suite is available as both a cloud (hosted) solution and traditional on-premise software. An optional private reporting system can handle > 100,000 computers on a single physical or virtual server. PowerMAN reporting imposes minimal network bandwidth requirements and is designed to work alongside existing proxy and firewall systems. Typically, the standard power reporting feature generates less than 500 bytes/day of network traffic and the optional live reporting feature just 2-4 KB/day depending upon activity.

This guide explains how to install and configure the PowerMAN client software. This document is intended for a system/network administrator. Separate **Quick Start** and **Reporting** software guides are also available.

PowerMAN v PowerMON

The software is available in two editions - **PowerMAN** and **PowerMON**.

The full product is known as PowerMAN. This allows both power management policies to be applied and power usage information to be monitored. PowerMON is a limited-feature version of the same software that is used for power and workstation utilization monitoring only. PowerMON does support device power management. The same executable is used for both products but the supplied license key and ADM/ADMX Group Policy templates are different. This means a PowerMON installation can be easily upgraded to PowerMAN just by deploying a new license key and optionally changing the ADM/ADMX policy template.

The term PowerMAN is generally used in this documentation. Some sections in this document refer to features only available in the full PowerMAN product.

PowerMAN Power Manager v5.5

New in PowerMAN v5.5

The latest PowerMAN v5.5 release includes many new features. Some of these are available immediately upon installation whilst reporting related features also require PowerMAN Enterprise Server (PMES) v5.5. This release of PowerMAN is backwards compatible with previous releases of PMES.

The following features have been added since v5.4:

1. PowerMAN has been updated to improve compatibility with the latest Windows 10/11 releases
2. PowerMAN now provides a monthly reporting option to complement the existing daily and weekly reports. Some of the charts have been redesigned to improve readability and are now displayed in a new bar chart format:

Weekly Activity / Hours



3. The PowerMAN Devices tab now provides a convenient search feature to locate workstations by name. This supports * and ? wildcard characters:

Summary | Live | **Devices**

Operations Devices

Client Version: All | Computer Name: Workstation??1 (Use * and ? for wildcards)

OS Version: All | CPU: All

Battery: All | Logical Cores: All

Vendor: All | RAM: All to All GB

Product/Code: All | Hard Disks: All

BIOS: All | Optical Drives: All

BIOS Version: All | Free System Drive: All GB

Export Show 1000 Computers last status from 11/05/2022 until 11/08/2022 Include sub-sites Refresh Showing 5 of 76 available records

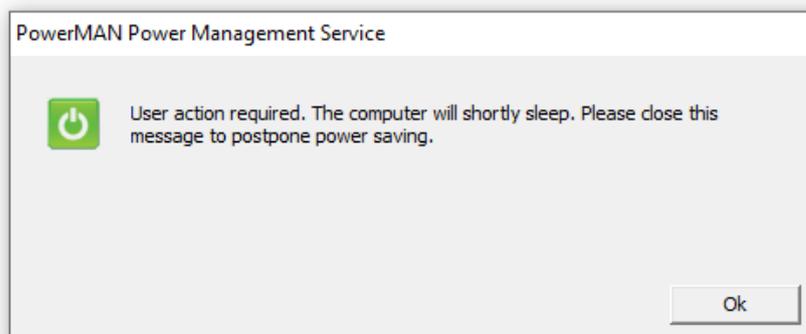
Computer	Version	OS	Battery	Vendor	Product/Code	BIOS Firmware	Version	CPU	Logical Cores	RAM MB	Disks/Optical	Free System Drive MB	Last Status
Workstation071	5.4.0.5932	6.1.7601 Service Pack 1	False	Hewlett-Packard	1496	Hewlett-Packard	J01 v02.15	Intel(R) Pentium(R) CPU G630 @ 2.70GHz	2	3242	1 / 1	245189	11/05/2022
Workstation161	5.4.0.5932	6.1.7601 Service Pack 1	False	Hewlett-Packard	1496	Hewlett-Packard	J01 v02.15	Intel(R) Pentium(R) CPU G630 @ 2.70GHz	2	3242	1 / 1	250846	11/05/2022
Workstation201	5.4.0.5932	6.1.7601 Service Pack 1	False	Hewlett-Packard	1496	Hewlett-Packard	J01 v02.15	Intel(R) Pentium(R) CPU G630 @ 2.70GHz	2	3242	1 / 1	280924	11/05/2022
Workstation211	5.4.0.5932	10.0.9200	False	HP	8299	HP	P01 Ver 02.04	Intel(R) Core(TM) i5-7500 CPU @ 3.40GHz	4	3975	1 / 1	307451	11/05/2022
Workstation251	5.4.0.5932	6.1.7601 Service Pack 1	False	Hewlett-Packard	3398	Hewlett-Packard	K01 v02.00	Intel(R) Core(TM) i5-3470S CPU @ 2.90GHz	4	3478	1 / 1	51188	11/05/2022

PowerMAN Power Manager v5.5

4. PowerMAN now provides significantly improved support for systems with "Modern" standby (e.g. S0ix, S0 low-power idle or AoAc). This is a new standby mode that was first introduced with Windows 8 / Microsoft "Surface" devices and is now becoming increasingly popular on other high-end portable Windows 10/11 devices. If available, PowerMAN will use this mode when configured to "Sleep".
5. PowerMAN now provides a distinct "fallback" policy for each of the Default, No User and Specific User power policy features. The "fallback" policy, if present, will apply when no other policy is applicable in that category. The fallback policy does not have time/day restrictions and can simplify some configurations.
6. PowerMAN Enterprise Server now supports optional email summary reports. These can be sent daily, weekly or monthly to notify stakeholders of recent power management project performance. This feature requires the hosted (cloud) reporting platform or PMES v5.5 or later.

	Week commencing 18/10/2020
Unique computers	512
User active hours	2,877 (7 %)
Other active hours (Defined by system administrator)	0 (0 %)
User inactive hours	35,672 (93 %) 29,362 due no user logon (76 %) 6,310 due to inactivity whilst user logged on (16 %)
Total hours	38,549 (100 %)
Inactive cost (estimated)	£ 455.99
Suggestion	PowerMAN "No User Policy" may reduce inactivity when no user is logged on. This will have no effect when a user is logged on.

7. PowerMAN now supports optional **power saving pending** and **logout pending** user prompts. These may be used to remind an inactive user, who is in a long presentation, online meeting, VoIP call or similar that power saving will commence shortly. Closing the dialog will postpone the action for another cycle. This feature is intended to increase power management savings in scenarios where a cautious system administrator may otherwise disable power management or configure an unusually long timeout to avoid disrupting inactive users.



PowerMAN Power Manager v5.5

- PowerMAN reports now show the number of computers reporting data in each sub-site in the last 90-days:

Site	Computers (90-days)	Last Status	Inactive Hours	Active Hours	No Logon
Operations	76	11/05/2022	310.25	635.75	
Sales	72	11/05/2022	67.50	322.50	
Marketing	13	12/05/2022	63.50	111.25	
Administration	15	11/05/2022	61.50	150.00	

Export Show **worst** 10 sub-sites from 06/05/2022 until 12/05/2022 Refresh

- To improve privacy, PowerMAN Enterprise Server now permits workstation names to be optionally hidden in the reporting interface. Previously this required client-side configuration.
- PowerMAN protected programs and computer names now support optional environment variables and wildcards (* and ?). These may be used to reduce configuration complexity by allowing a wildcard to be used instead of multiple separate protected objects. This feature was already available for protected files.
- Individual protected programs, files and computers can now conditionally apply only when CPU load% is above a threshold or during certain working hours. This allows these policies to be more finely targeted at specific circumstances and prevent these exceptions preventing power saving at other times.
- PowerMAN now permits classes of protected objects (protected programs, files or computers) to be disabled outside of specific hours, days, dates of the month or when nobody is logged on. This allows these policies to be disabled outside of working hours or at the weekends and consequently reduce the occasions when power management is unnecessarily inhibited.

The supported combinations of protected object features and class restrictions are shown in the table below:

Protected object class:	Per protected object features				Optional class restrictions			
	Environment variables	Wildcards	Min CPU%	Specific times only	Dates of month	Days of week	Specific times only	Logged on only
Computer (all)	No	No	No	No	Yes*	Yes*	Yes*	Yes*
Computer (by name)	No	Yes	Yes	Yes				
File exists	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Program running	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* The Protected Computer (All) and Protected Computer (by name) features share common restriction settings

- Similarly, the protected user feature can now optionally apply only on certain days, such as weekdays, or during certain hours. These changes ensure that power management need only be inhibited for specific users when strictly necessary.
- The protected server service feature can now optionally apply only on certain days, such as weekdays, or during certain hours. In addition, the policy may now be more finely tuned to apply only when specific classes of file or printer share, including hidden shares, are present. These changes ensure that power management need only be inhibited when strictly necessary.
- PowerMAN scheduled wake-up and scheduled sleep, hibernate, restart and shutdown policies may now optionally repeat multiple times per day until either a specific time or

PowerMAN Power Manager v5.5

midnight. This allows potentially complex configurations, which would have previously required multiple scheduled actions, to be simplified.

16. PowerMAN now supports network configuration reporting. It can report network interface adapter name, MAC address, IP addresses and, if appropriate, subnet mask. This feature supports both IPv4 and IPv6 networks. The information collected may be viewed using the new NETWORKINFO command. This feature is also available in the PowerMON SKU (requires reporting platform / PMES v5.5 or later). It is enabled by default from client v5.5.4.

Network Information

Description	Physical/MAC	Active	Hardware	Addresses
Realtek PCIe GBE Family Controller	5CE0C52AB190	✔	✔	192.168.200.190/24, FE80:0000:0000:0000:ABCD:1234:0190:64
Intel(R) Dual Band Wireless-AC 7265 WIFI	C860008C1190	✔	✔	192.168.202.190/24

17. PowerMAN can now optionally cease device monitoring when the system is offline or specific network conditions are present. This can be used to control data collection when the computer has a specific IP address or is connected or not connected to a specific network. When data collection is inhibited, the historical activity reports show the computer state as unknown/powering-off. These new features may be used to limit data collection to specific locations.
18. The PowerMAN command-line interface has been updated and each command now includes a brief description. These changes are intended to assist system administrators in troubleshooting, scripting and other similar scenarios. The revised commands include:
 - a. INHIBIT - Inhibit power management for a period of time or until a certain date (maximum of 7 days) whilst system maintenance tasks are undertaken. This command requires administrator privileges.
 - b. ISPROTECTED - Determine if a protected object is currently applicable. The result is also available as a result code which can be used in scripts / batch files.
 - c. ISSCHEDULED - Determine if a scheduled action is currently pending. The result is also available as a result code which can be used in scripts / batch files.
 - d. NETWORKINFO – Report network configuration and connection status
 - e. INFO – Reports detailed hardware / OS power management information. This command has been updated to report on "Modern/Connected" standby (S0 low-power idle / AoAc), Fast Start-up (HiberBoot) and Hybrid Sleep support.
 - f. HIBERCHECK and SLEEPCHECK – Enter the hibernate / sleep state and then attempt to resume some time later. This can be used to test both hardware power saving and resume support. These commands have been updated to support resume on a specific wake-up date/time. This can be used to verify hardware or integrated into a maintenance script or similar.
 - g. DISPLAYON and DISPLAYOFF – Turn the display on/off from scripts and during updates (to save additional energy)
19. PowerMAN now supports an optional grace period after a protected object is no longer applicable. This can be used to extend the period that power management is inhibited when protected activities, like rendering or system updates, are executed sequentially.
20. PowerMAN now supports 10 of each protected time (maintenance window), scheduled sleep/hibernate/shutdown and wake-up policies.

PowerMAN Power Manager v5.5

21. SSL (encrypted) reporting is now mandatory on the cloud (hosted) reporting platform. This is located at “secure.pmstats.org”. SSL compatibility mode is no longer supported. Non-SSL mode can still be used with a private reporting server.
22. PowerMAN is now distributed with a simplified ADM/ADMX policy template for the PowerMON edition. This product provides only power monitoring / utilization reporting and does not permit power policies to be applied. It can be used as part of an initial power management audit or alongside another power management tool. PowerMON now includes the PowerMAN GUI to provide quick access to personal workstation statistics. In addition, some rarely used advanced reporting settings have been moved to a distinct category.
23. PowerMAN now supports alternative weekend definitions used in some cultures out-of-the-box. It provides built-in support for the following combinations: Sat/Sun, Fri/Sat and Thurs/Fri. Other combinations can be created by amending the PowerMAN ADM/ADMX policy template.
24. PowerMAN now directly supports the Windows Fast Start-up or “HiberBoot” mode. When enabled, the system enters the hibernate state instead of the shutdown state. This may be advantageous because most systems can resume from hibernate much faster than a full start-up.
25. PowerMAN now has a revised Italian and Spanish PowerMAN UI and new support for a French UI:



PowerMAN Basics

PowerMAN offers a comprehensive suite of power management and reporting features. This section explains the key features and terminology used throughout the rest of this document:

PowerMAN v Windows built-in power management – Why PowerMAN?

Microsoft Windows provides basic, built-in, power management features. These can be used to configure the computer to enter a low-power mode after a period of time. This feature has evolved with each version of Windows but remains relatively limited. PowerMAN extends this to provide:

- Central configuration of all power management features
- Multiple policies per user, computer, time and day
- Specific policy when nobody is logged on
- Multiple scheduled sleep, hibernate, shutdown or wake-up policies
- Powerful exceptions engine to inhibit power management when not required
- Option to logout or shutdown on idle (with optional warning messages)
- Powerful, enterprise-wide, power management and asset utilization reporting

PowerMAN's unique benefit is that it places all of these features in one place and allows them to be easily used together. This allows effective power management strategies to be created for every organisation that meet user requirements and maximize energy saving. The built-in reporting suite means that progress can be monitored and policies fine-tuned as necessary.

Low-power modes - Shutdown, Hibernate and Sleep

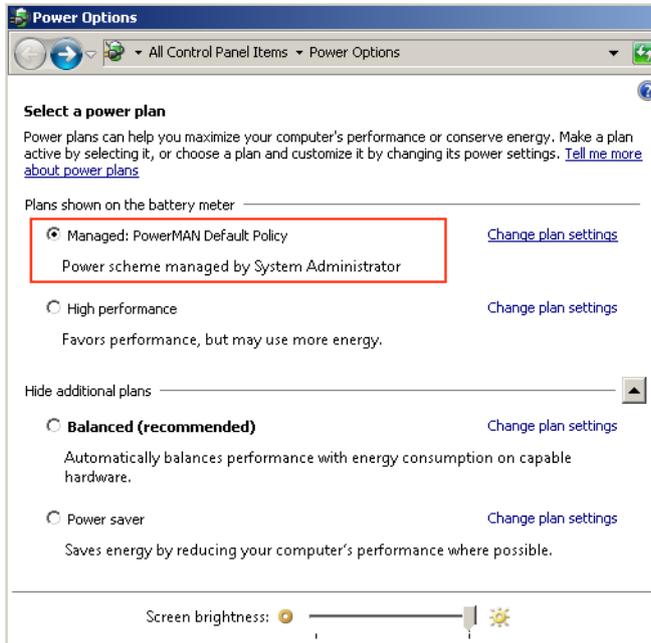
Modern PCs may offer several different power-saving modes. These can be summarised as follows:

- **Shutdown** –The equipment is powered-off. No users remained logged on
- **Hibernate** –The equipment is powered-off. User sessions may be restored in 10-30 seconds
- **Sleep** – The equipment is in a low-power state. User sessions may be restored in a few seconds

Generally, the sleep mode is preferable because it can save significant energy whilst maximizing the user experience by permitting rapid system resume. This allows power management to be used more frequently and greater energy saved. A limitation of sleep mode is that it may not be suitable for extended periods or where the mains power is not reliable. In this case, hibernate mode is an excellent second choice with the limitation that the system will take longer to resume. In some circumstances, hibernate may save marginally more energy. However, the difference between sleep and hibernate is typically very small (or even unmeasurable without specialist equipment).

Different devices may implement sleep and hibernate differently. These differences can be ignored for most purposes and PowerMAN will use the best mode available. If necessary, you can use the command: `POWERMAN INFO` to troubleshoot which low-power modes are available on a specific device. This is described further in Appendix L.

Idle-based (timeout) v scheduled power management



PowerMAN allows power management actions to be triggered in two different ways:

- When the system is **idle**
- At a **scheduled time**

Basic idle based power management is built into Windows. This can be used to configure the computer to enter a low-power state (sleep or hibernate) after a pre-set period of idleness.

PowerMAN extends Windows **idle management** to provide different policies for different users, times of the time and additional idle actions such as logout, shutdown and reboot.

A computer is idle when no user activity occurs (keyboard or mouse activity) for a pre-set time and no important programs are running. This is typically the most effective form of power management because it allows each device to respond individually.



Scheduled power management allows the system to enter a low-power state or resume to a working state at a pre-set time. This can be useful in environments, like schools or colleges, with a well-defined operating timetable.

The idle and scheduled approaches can both be useful and in some cases be effectively used together. PowerMAN fully supports this. Some organisations prefer an idle driven approach whilst others are more comfortable with a scheduled system. The choice is yours.

Tip: Idle power management generally offer greater energy savings because it allows each computer to respond dynamically to the environment. Scheduled techniques may be appropriate for environments with a predictable operating pattern such as a school classroom.

Default, No User, and specific-user idle policies

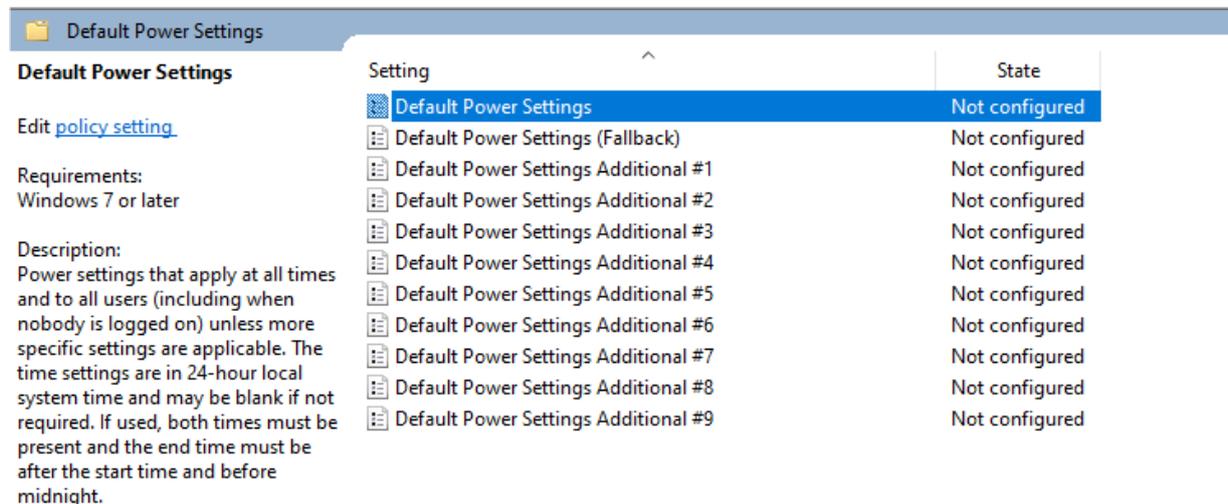
PowerMAN provides several different types of idle policy. Each has a specific use:

- **Default policy** – Applies whenever another policy is not applicable. This is ideal if only one policy is required or to define a fall-back policy for use when no other policy is applicable.
- **No user policy** – Applies specifically when no user is logged on. This may be used to define a more aggressive power management strategy for this scenario. If a ‘no user’ policy is not present then the default policy applies.
- **Specific user policy** – Applies when a specific user or user group member is logged on. This allows a policy tailored for the user to apply. If no user is present then the default or ‘no user’ policy applies.

Multiple policy precedence order

PowerMAN allows multiple policies to be defined for each of the default, no user and specific user categories. Each policy may have an optional start/end time and apply only on certain days or dates of the month. Optionally, the time and day fields may be left blank. In this case, the policy applies at all times. PowerMAN processes the policies in **numeric order** and will apply the first applicable policy at any given time. To ensure consistent behaviour, we suggest that you configure time bound policies first, avoid overlapping times and provide a non-time bound or fallback policy last.

Each idle policy category also provides a distinct **“fallback” policy**. This policy, if present, will apply when no other policy is applicable in that category. The fallback policy does not have time/day restrictions.



Setting	State
Default Power Settings	Not configured
Default Power Settings (Fallback)	Not configured
Default Power Settings Additional #1	Not configured
Default Power Settings Additional #2	Not configured
Default Power Settings Additional #3	Not configured
Default Power Settings Additional #4	Not configured
Default Power Settings Additional #5	Not configured
Default Power Settings Additional #6	Not configured
Default Power Settings Additional #7	Not configured
Default Power Settings Additional #8	Not configured
Default Power Settings Additional #9	Not configured

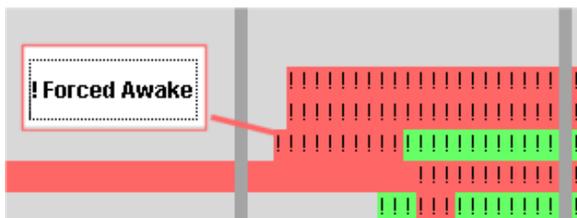
Policy enforcement feature (Anti-Insomnia)

Windows uses an idle timer to track the last significant system activity. When this timer reaches zero the computer enters a low-power state (suspend). Activity such as keyboard/mouse input, higher CPU usage, significant network or application activity can reset this timer and postpone the low-power state.

Normally, the Windows idle timer can also be inhibited or reset by applications. Applications legitimately do this when performing a critical task (such as an update) or when it would be inconvenient to the user for the system to enter a different power state. For instance, the idle timer is disabled when Microsoft PowerPoint is performing a slideshow.

In some circumstances, applications can make excessive use of this feature. This is sometimes known as 'PC insomnia' and results in the desired power management policy not performing as expected. This will reduce system energy efficiency and increase operating costs. Depending upon the installed applications this phenomenon may almost never happen or may be a constant problem. For example, this problem is typically more apparent with longer idle timeouts because a longer period of uninterrupted inactivity is necessary before the computer is considered idle.

PowerMAN includes a powerful policy enforcement feature that can be used to overcome this undesirable behaviour.



The PowerMAN reporting system marks periods spent in this 'forced awake' state with an exclamation mark (!) symbol. This will result in increased energy consumption if it occurs during otherwise inactive (red or pink) periods.

There are several signs that policy enforcement may be beneficial:

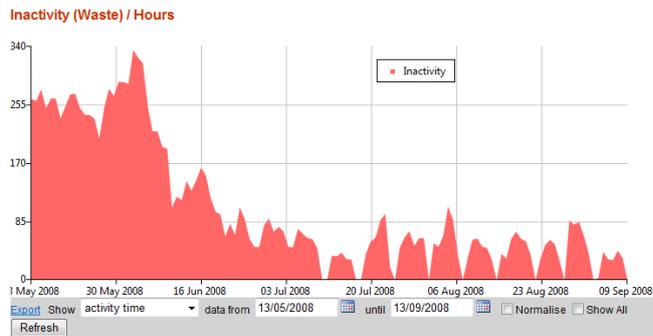
- Power management fails to consistently behave as expected (particularly with longer timeouts)
- PowerMAN event log frequently reports event #2003: **'The computer is being prevented from entering the idle state by an unknown program'**
- The PowerMAN detailed report for a computer include significant periods marked 'forced awake' – indicated with the exclamation mark (!) symbol character

The PowerMAN Policy Enforcement feature allows you to configure a 'grace period' in **addition** to the standard timeout period. When this grace time has expired, PowerMAN will force the configured power action to occur. This works alongside the Protected Objects feature and will not enforce a power action whilst protection for a specific application, file, time or similar is applicable..

The Policy Enforcement feature is enabled by default with a grace period of 10 minutes. This means that the assigned idle policy is enforced a maximum of 10 minutes after the last user activity. To ensure maximum compliance, we recommend that this feature is not disabled.

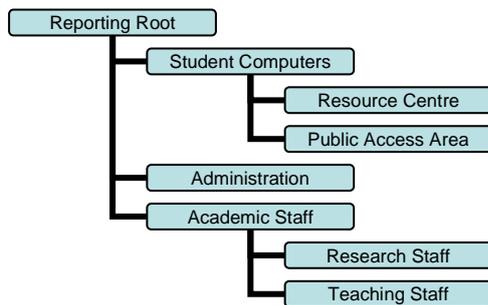
Monitoring progress with PowerMAN reporting

PowerMAN allows PC activity information to be recorded. This information is aggregated for each group (or “site”) of computers and may be used to understand the usage profile of managed equipment, create a tailored management policy and monitor the on-going effectiveness of the policy. The reporting features are fully described in a separate **PowerMAN Server Platform Guide**. This section is designed to give you a brief overview of the features available.



Sub-Sites

	Inactive Hours	Active Hours	Inactive	User Active	Other Active
Sales Area	18810.75	8286.00	[Bar chart showing high inactivity]		
Admin Area	7989.00	3763.25	[Bar chart showing moderate inactivity]		
Logistics Area	4910.75	3860.75	[Bar chart showing moderate inactivity]		
Development Area	729.50	370.00	[Bar chart showing low inactivity]		



The PowerMAN reporting platform is available as either private, PowerMAN Enterprise Server, software or as a cloud (hosted) service. Both product editions offer exactly the same reporting features.

The system activity information in a variety of graphical and tabular formats. The reporting system has the following key features:

- Rank computers by inactivity level and highlight the most and least wasteful computers
- Group similar computers, display summary information and drill-down to individual PCs
- Minimal network overhead at <0.5KB per PC/day. Only anonymous data is logged
- Additional 2-4KB per PC/day if live reporting feature is also enabled
- Download data in Excel compatible format for further analysis

Tip: Reporting sites are independent of deployment and can be re-arranged at any time with no loss of data. We recommend that each physical or functional computer area is reported separately. We also suggest that each area with a distinct power management strategy is reported separately. This will allow the effect of that power strategy to be clearly understood and avoid mixing devices which are managed using different strategies. PowerMAN will, typically, group computers by their Windows Active Directory OU. If this not appropriate, computer groups can be established manually and workstations moved between reporting groups as necessary. This is described further below.

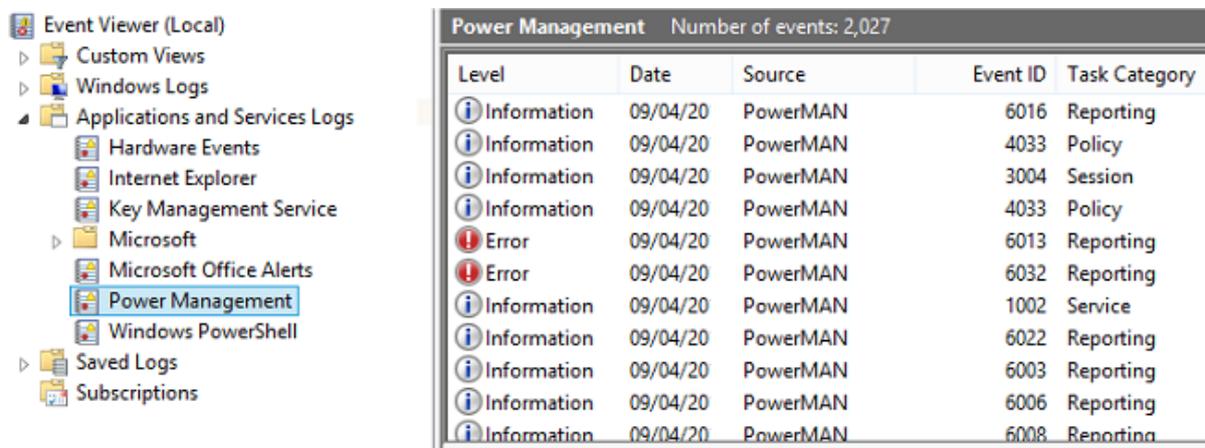
Information is collected in an **anonymous format** that cannot be used to directly identify a specific user or the activity the user was performing. The information is uploaded in XML format using the industry standard HTTP protocol that is designed to work with proxy servers and network filtering. Data sent to the cloud reporting system is encrypted in transit. The protocol of the transmitted data is available, upon request, from PowerMAN Technical Support.

The PowerMAN statistics can be viewed on the cloud (hosted) PowerMAN reporting platform secure.pmstats.org or, if appropriate, a private PowerMAN reporting server. Detailed logs are normally retained for at least three months and summary information is retained for a further year or more.

Power Management Event Log

PowerMAN incorporates a powerful power management event logging feature. This can be accessed with the standard Windows event viewer tool **Eventvwr**. Optionally, PowerMAN can be configured to log additional troubleshooting information by enabling the setting under Advanced/Event Logging category. The PowerMAN service must be restarted or the computer rebooted for this change to become effective.

The event log combines relevant power related events together with PowerMAN activity in chronological order. This information can be extremely useful when investigating power management problems or fine tuning settings. There is a summary of the most commonly logged events in an appendix at the end of this document. The Power Management event log is located under **Application and Services Logs** category:



Level	Date	Source	Event ID	Task Category
Information	09/04/20	PowerMAN	6016	Reporting
Information	09/04/20	PowerMAN	4033	Policy
Information	09/04/20	PowerMAN	3004	Session
Information	09/04/20	PowerMAN	4033	Policy
Error	09/04/20	PowerMAN	6013	Reporting
Error	09/04/20	PowerMAN	6032	Reporting
Information	09/04/20	PowerMAN	1002	Service
Information	09/04/20	PowerMAN	6022	Reporting
Information	09/04/20	PowerMAN	6003	Reporting
Information	09/04/20	PowerMAN	6006	Reporting
Information	09/04/20	PowerMAN	6008	Reporting

Separate AC (mains power) and DC (battery power) policies

PowerMAN uses the term AC to refer to mains power and DC to refer to battery power. The software supports separate power management policies for systems running on AC (mains) and DC (battery) power. This feature is commonly used to provide for greater power saving on battery powered systems.

Tip: DC policies are ignored by default. This feature may be enabled by using the policy located under in the Miscellaneous configuration category. For simplicity, we suggest that you configure the DC settings to be the same as AC settings unless distinct battery powered behaviour is required. This can be ignored for desktop computers which do not have a battery.

Product Installation

Installation Prerequisites

PowerMAN currently supports the following platforms:

- **PowerMAN client** – Windows 7 SP1, Windows 8.x and Windows 10/11
- **PowerMAN reporting server (optional)** – Windows Server 2008 R2 and later

The PowerMAN client is available as both 32-bit and 64-bit software. The 32-bit version may be used on both 32/64-bit workstations and offers identical features on 64-bit systems.

In most cases the client software offers the same power management features on every supported Windows platform. There are some minor differences between operating systems due to OS design. Where necessary these are highlighted in this guide. In all other respects, the features and configuration are identical.

PowerMAN is designed to integrate seamlessly with a **Windows Active Directory / Group Policy** infrastructure and can, typically, be configured and deployed in less than one hour.

Alternatively, the industry standard PowerMAN MSI package can be deployed with a variety of alternative tools such as:

- Microsoft Intune
- SCCM
- LANDesk
- ZENworks
- Altiris
- HP OpenView
- SMS
- RM Community Connect
- XCOPY installation (self-installing EXE method)

The following sections explain the how to deploy and configure PowerMAN using native Windows Group Policy. The appendices at the end of this guide explain how to deploy and configure PowerMAN with other tools such as XCOPY, SCCM, Intune, ZENworks and RM Community Connect. Variations of the techniques described can be used with other tools.

PowerMAN Client Windows 2000/XP/2003/Vista Support

PowerMAN previously supported Windows 2000. This feature was removed in v5.4.0. The product also previously supported Windows XP/2003/Vista. This feature was removed in v5.5.0.

Please contact Data Synergy if you require support for older versions of Windows.

PowerMAN Power Manager v5.5

Getting to know your hardware

Before starting a PowerMAN deployment, we recommend you spend some time investigating your devices to understand what power management features are available. This information can be invaluable later when planning a power management strategy or troubleshooting a problem.

The following quick checks can be performed using the PowerMAN program located in the Standalone folder of the product distribution:

1. First, check the power management capabilities of a sample PC with the command:

```
POWERMAN INFO
```

PowerMAN will display useful technical information about the PC. The system power capability information is located at the bottom. A typical result would be:

```
SystemPowerCapabilities:
PowerButtonPresent          1
SleepButtonPresent         1
Supports Suspend           1 (Legacy S1-S3)
...
Supports S0 (Low-power idle) 0 (AoAC)
Supports S1 (CPU Sleep)      0
Supports S2 (Sleep)         0
Supports S3 (Standby)       1
Supports S4 (Hibernate)     1
Supports FastS4 (Hybrid Sleep) 1
Supports FastStart (HiberBoot) 1 (Enabled=1)
Supports S5 (SoftOff)       1
...
Min RtcWake State          S3 (Standby/STR)
```

In the example, this indicates the system supports S3 (sleep) and S4 (hibernate). The 'Supports Sx' fields indicate which low-power state are supported. The S0ix, S1, S2 and S3 states are all variants of "Sleep". The 'Min RtcWake state' field indicates the maximum low-power state that the system may self-resume (automatically wake) from. This information can be useful if you want to use the PowerMAN wake-up feature. If necessary, please see Appendix L for further detailed information on hardware low-power modes.

2. Try manually suspending (sleeping) the PC using the Windows Start Menu, wait 30 seconds and then wake it again. If necessary, repeat this test for hibernate to verify that this mode also works reliably.
3. Finally, you can check that the computer can suspend and then self-resume about one minute later by using the following two commands. This confirms the PowerMAN wake-up feature will work as expected:

```
POWERMAN SLEEPCHECK
```

or

```
POWERMAN HIBERCHECK
```

Tip: Most modern PCs can reliably sleep and resume. Occasionally, it may be necessary to amend BIOS settings to enable this feature. Similarly, most systems can successfully hibernate although it may be necessary to enable this feature in the operating system (PowerMAN can do this automatically). The facility to self-resume is not universal and may not work on some older systems, laptops or when running from battery power. Again, it may be possible to enable this feature in the BIOS. Self-resume can be useful but may not be essential. Confirmation that sleep, hibernate, resume and self-resume function correctly will be useful when planning an effective power management strategy.

Deployment Preparation

Before starting a new PowerMAN deployment, please check you have the following:

1. **A valid client software product key** – Two different types of product key are available:
 - **PowerMON (Reporting only)** – PC activity information is reported. This is ideal for environments with an existing power management system or for long-term audit purposes.
 - **PowerMAN (Full product)** – In addition to the reporting features above, PowerMAN can apply and manage power policies.

For the purposes of this document the following *fictitious* information is used:

Organisation: Example Corporation Limited
Product Key: XGHK-GABQ-GDTH-UJKQ-HYJK-DBKY

NB: This product key is a demonstration key and will not function on a live system. Please remember that the client product key and the server product key **are different**.

Tip: PowerMAN **evaluation product keys** are designed to expire. When this happens PowerMAN stops applying new power settings and stops reporting usage information to the reporting server (if applicable). The PowerMAN service continues to run and internally cache PC usage information. In a normal configuration the data log is retained for a rolling 28 days. If a new product key is applied PowerMAN resumes normal operation following the next system reboot.

There is **no user pop-up** when the product key expires and the process is transparent to the user. PowerMAN continues to report in the event log.

2. **Select a reporting strategy** – PowerMAN may be used with three different reporting strategies:
 - **No reporting** – Power management only (not recommended)
 - **Cloud (hosted) reporting** – Running on Data Synergy platform or partner servers
 - **Private reporting** – PowerMAN Enterprise Server running on a private server

The cloud reporting system minimises installation time and avoids the need to provision a private server. The data is held securely and is only accessible to users you authorise. The reporting features available are identical to the private server solution.

3. **Determine if “live” reporting is required** – This additional reporting feature provides contemporaneous information throughout the day at the cost of 2-4KB/day of additional network traffic per device. Live data is typically updated instantly but during busy times may only be updated every five minutes or so.
4. **Select a deployment method** – PowerMAN may be deployed using a variety of methods. The common methods, using Windows Group Policy is described below. Appendices at the end of this document contain worked examples for other installation methods.
5. **Design a rollout strategy** – PowerMAN works best if it is used progressively to introduce power saving. We recommended that a new installation proceed as follows:

PowerMAN Power Manager v5.5

- Deploy initially with monitoring enabled but no active power management
- Wait several weeks for a usage pattern to emerge (two complete weeks is usually sufficient)
- Activate some modest power settings. Typically these may include turning off PC's that are not logged on and turning off monitors after a few minutes. Wait another period to observe the effect of these changes before proceeding. This initial policy need not be visible to users.
- Apply some more aggressive power settings. There are a number of approaches to this depending on the operation scenario. For example, some organisations hibernate computers that are not being actively used after 30 minutes. In a public access area, where a user should not be left logged on for prolonged period of inactivity it may be appropriate to shut down the computer (with suitable warning) after 10 minutes.
- If appropriate, consider communicating the strategy and on-going progress to the users. Some customers have reported that user participation may itself contribute significantly to real energy savings. It may even be possible to create league table of the most wasteful computers or departments!
- Consider applying other settings that may be beneficial to users such as automatically starting PCs at a certain time in the morning. Please remember, of course, that in some scenarios with irregular usage patterns (such as libraries) this may result in a significant increase in energy consumption
- Consider enabling the PowerMAN user interface icon. This may be used to permit some users to opt-out of the managed policy or to view their personal workstation PowerMAN statistics.
- Use the reporting features to periodically monitor the deployment and ensure that it is working effectively.

Preparation for PowerMAN reporting (Optional)

The PowerMAN reporting feature complements the power management features by providing powerful, enterprise-wide, and monitoring of PC activity, estimated energy usage, costs and waste. **The reporting feature is optional** – the PowerMAN client software can fully function without it. However, the reporting features are recommended to monitor the on-going effectiveness of your deployment and determine where further improvements can be made. Cloud (hosted) reporting is included free in the first year with all direct PowerMAN purchases.

The reporting feature is simple to configure but will work best if a reporting strategy is planned in advance. PowerMAN refers to groups of associated computers as a 'site' and uses a unique identity, called a SiteGUID, to associate the workstations for reporting purposes. The SiteGUID must be setup on the reporting server before deployment and each site may also be given a friendly description.

Tip: PowerMAN Enterprise Server v5.2 and later supports automatic creation of reporting sites based upon the Active Directory membership of each workstation. To use this feature deploy a single '**root**' SiteGUID to all workstations and enable automatic site creation on the server. In this case, you can skip the next section. Please see the PowerMAN Enterprise Server documentation for further information. When using the cloud (hosted) platform, the root SiteGUID will be provided in your platform setup documentation.

Configuring reporting without Active Directory

To prepare PowerMAN reporting without Active Directory, please proceed as follows:

1. **Identify a group or multiple groups of PCs for deployment** – Each group of related PCs is known as a PowerMAN 'site'.

Tip: An **ideal site** is a group of similar PC's within a defined environment such as an office, department or computer room. It is also good practice to use a separate site for areas with **distinct power management strategies**. This will allow you to compare areas.

A typical site can have from 20 to several hundred computers and will be **suitable for managing as a single entity**. After deployment you should try not to change the scope of the site (it is easy to create another one) as this may reduce the quality of the report data gathered.

You can easily create additional sites to logically divide your estate of managed computers and nest sites within one another to reflect your organisation structure. There is no limit on the number of sites supported.

2. If using **manual site creation**, allocate a unique **SiteGUID** for each site and register it – A SiteGUID may be generated on the PowerMAN reporting website using the **Add/Move Site** link

Example Corporation Limited

Organisation	Example Corporation Limited	OU=Desktop,DC=corp,DC=local
Created	01/01/2009	First Data 25/02/2008
Expires	Never	Last Data 25/04/2009
Min. Data Retention 	Unlimited	Total Computers 104 Export
		Total Sub-Sites 2 Export Add/Move Site

Please see the **PowerMAN Server Guide** for further information.

PowerMAN Group Policy configuration and optional deployment

PowerMAN can be deployed and/or configured using Windows Group Policy. If you choose to deploy PowerMAN with another technique such as SCCM, you can skip the deployment steps below and follow only the configuration procedure. Appendices at the end of this document describe alternative deployment methods for XCOPY, SCCM, Intune, ZENworks etc.

The Group Policy Management Console is built into modern releases of Microsoft Windows Server. It can be added to older (pre-Windows 2008) servers by downloading the software from the link below. Alternatively, the older GPEDIT tool can also be used:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=0A6D4C24-8CBD-4B35-9272-DD3CBFC81887>

PowerMAN client deployment requires two core files. These are the only files you need to perform an installation:



PowerMAN Setup.msi contains the PowerMAN client software in an easily deployable form.

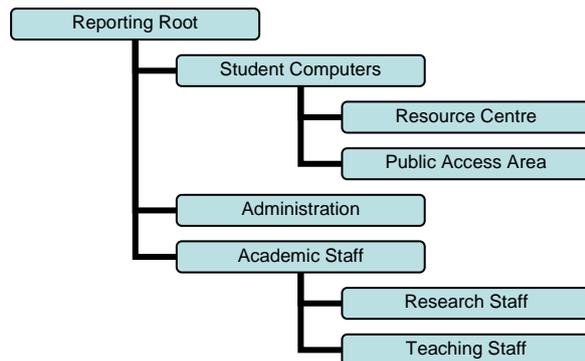


PowerMAN5.adm / PowerMON5.adm is an Administrative Template that is loaded onto the Windows Server and used to configure the PowerMAN or PowerMON software using Group Policy. An **ADMX** file is also provided for use on Windows 2008 and later servers and with Microsoft Intune. The features in both are identical.

Making effective use of policy inheritance (Larger networks)

The supplied ADM/ADMX file can be used to configure the PowerMAN client software.

The basic example below assumes that there is only a single Organisation Unit (OU) and a single PowerMAN GPO policy. However, PowerMAN fully supports operation in a diverse, multi-OU, network with multiple GPO objects.



The ADM/ADMX file may be used to create several Group Policies to deploy unrelated settings at different OU levels. By default Group Policy will automatically propagate policies using inheritance so that child organisational units receive the combination of higher level policies.

A common approach is to deploy the software and common settings (for instance, the PID key and reporting settings) at the top level and apply more specific policies to child OUs.

Policy elements may be freely mixed in this way.

The only requirement is that a given policy setting must only be present once.

Tip: A common configuration mistake is to create a separate PowerMAN policy for each distinct OU and duplicate every setting. In a small Active Directory this may be acceptable but, generally, this should be avoided. **If you find yourself duplicating the same setting many times this may indicate that the selected strategy is not making best use of policy inheritance.**

In a large network with multiple policies and/or reporting units, and where group policy inheritance is not blocked, we suggest that policies are applied in up to three distinct layers:

1. **Common policies** – License PID key etc. that apply globally
2. **Reporting unit policy** – Reporting settings applied on a per location/site basis.

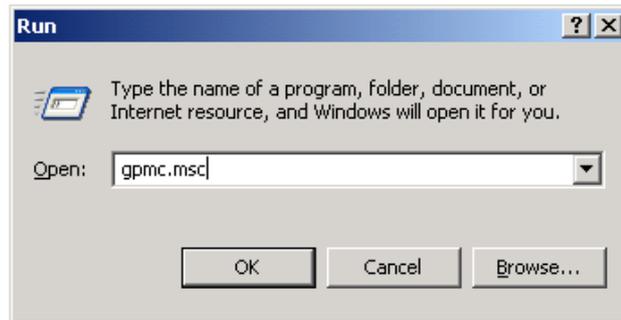
NB: This can be merged with the common policy if using Active Directory based reporting or when only a single SiteGUID is required

3. **Power management policy(s)** – Actual power management policies created for each scenario and linked to appropriate management units as necessary

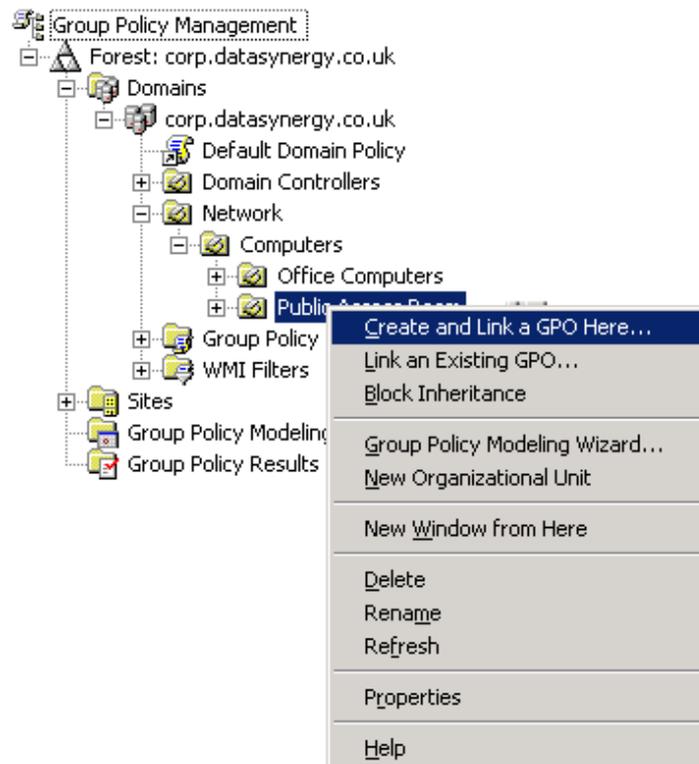
Creating PowerMAN Group Policy Object

To **configure** or **deploy** the PowerMAN client using Group Policy please follow the procedure below to create a GPO. If you are using Microsoft Intune, you can skip this section and refer to the appendix at the end of this guide.

1. Open the **Group Policy Management Console (GPMC.MSC)**:



2. Locate the **Organizational Unit (OU)** that you wish to deploy the software to. The example deploys the software to a OU called **Public Access Room**:



3. Right click the OU and select **Create and Link a GPO here**
4. Enter a name of the new policy and click **OK**:

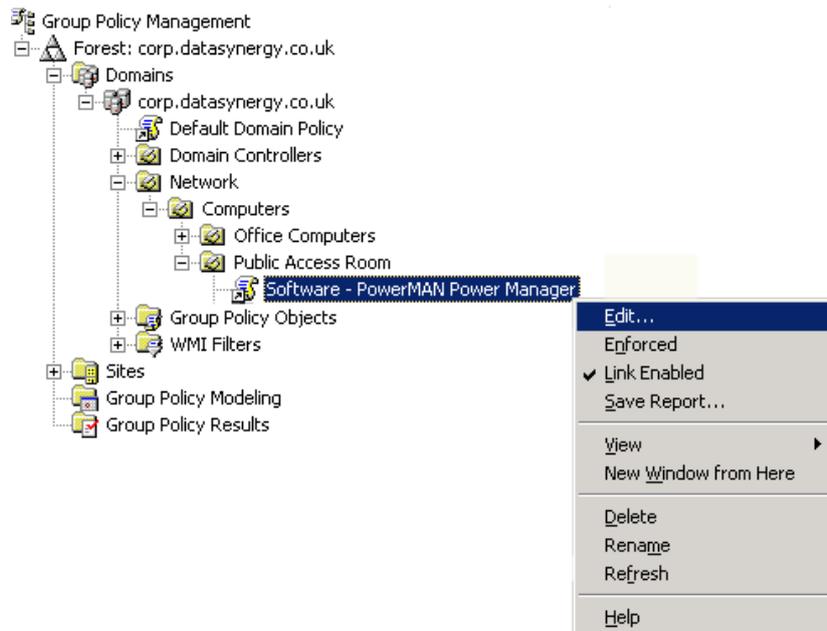


PowerMAN Power Manager v5.5

Group Policy PowerMAN Client Deployment (Optional)

To deploy the PowerMAN client software using Group Policy, please follow the steps below. You can skip this section if you use another deployment tool such as XCOPY, SCCM or Intune (see appendices):

1. Locate the **PowerMAN GPO** (see previous section)
2. Right-click and select **Edit**

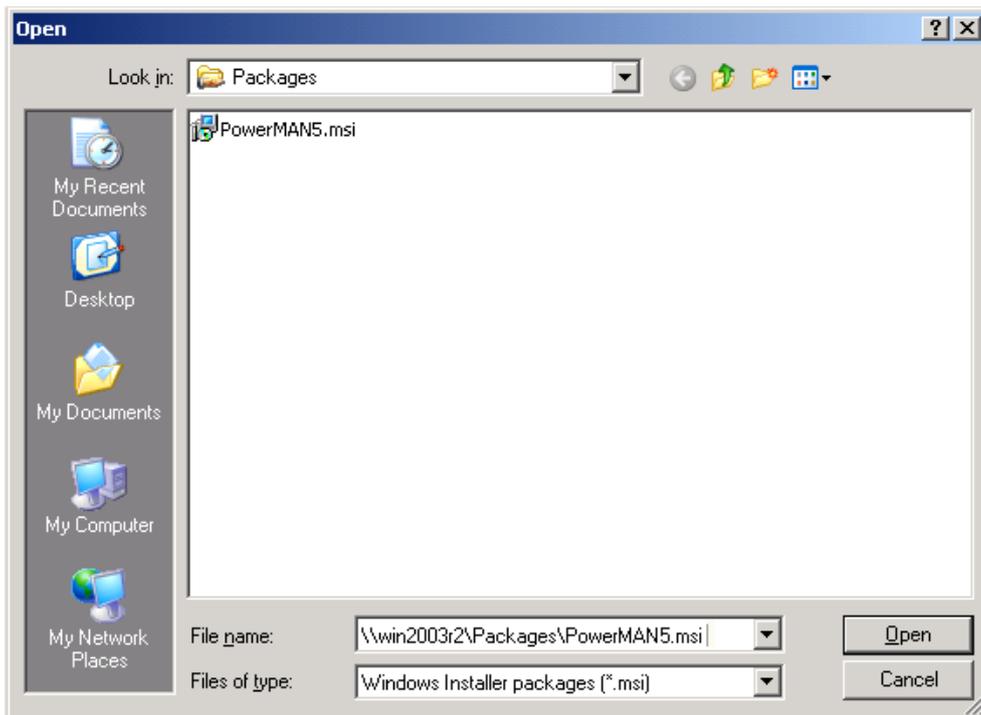


3. The **Group Policy Object Editor** should open. This is used to configure the deployment. Navigate to the **Computer Configuration** section and expand **Software Installation**. Right-click and select **New/Package**:



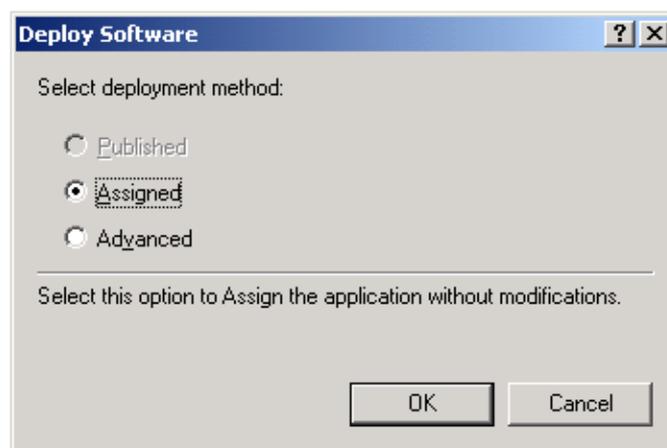
PowerMAN Power Manager v5.5

- Browse to the network share that contains the **PowerMAN Setup.msi** file and press **Open**.



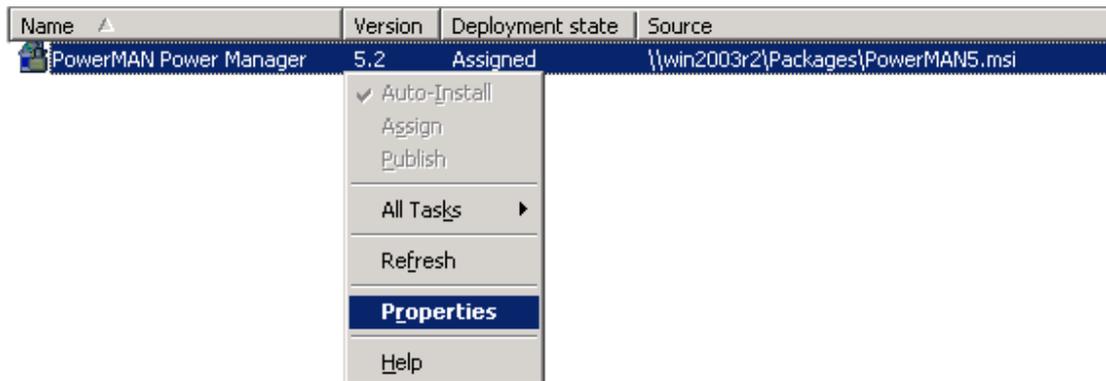
Remember: The MSI file should be placed in a **share** on the server that is accessible to the destination computers and accessed using a UNC path. A common technique is to grant **Domain Computers** read access of the share and underlying file system. This is explained further in the troubleshooting section below

- Select **Assigned** as the deployment method. PowerMAN is a system application and therefore it is not appropriate to 'publish' it to users:

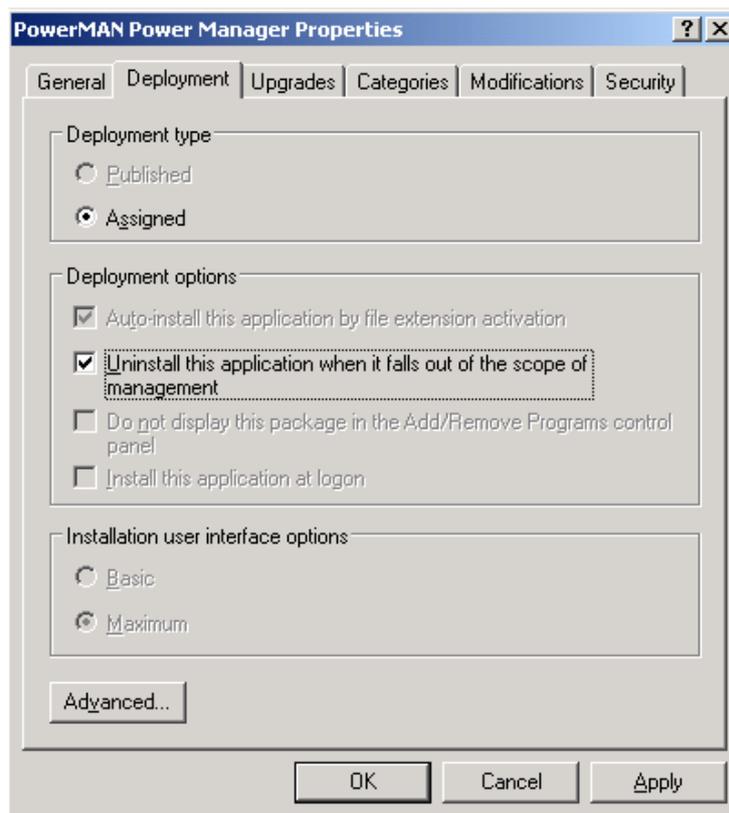


- Right click on the newly created package and select **Properties**:

PowerMAN Power Manager v5.5



7. Select the **Deployment** tab (called “Advanced” in some earlier Windows releases) and tick **Uninstall this application when it falls out of the scope of management**.

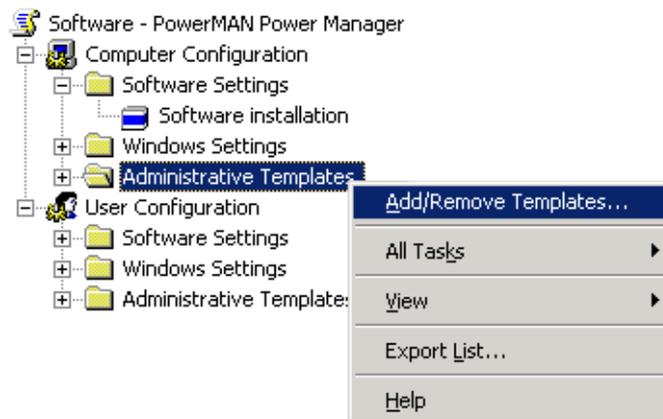


8. Finally, click **OK**

Group Policy Client Configuration

To configure the PowerMAN client using Group Policy, please follow the steps below. If you are using another tool such as ZENworks or Microsoft Intune to configure the PowerMAN client, please see the appropriate appendix at the end of this guide.

1. Open the **PowerMAN GPO** (see previous section)
2. Navigate to the **Computer Configuration / Administered Templates**, right click and select **Add/Remote Templates**:



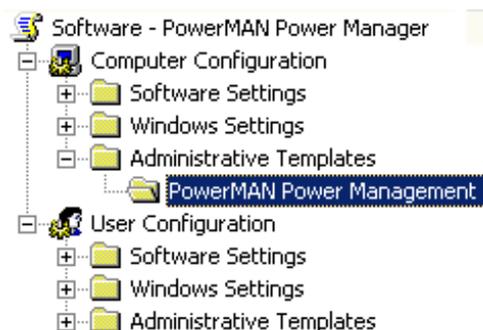
3. Click **Add** and locate the **PowerMAN5.adm** file supplied. When this is completed, click **Close**. It may be helpful to remove the other administrative templates present using the **Remove** button. These are not required for PowerMAN.

Tip: An ADMX file is also provided for use on servers running Windows Server 2008 and later. It supports exactly the same features as the ADM file. To install the policy files copy the **ADMX file** and **en-US** folder to the **WindowsPolicyDefinitions** folder (standalone server) or **Windows\sysvol<your_domain>\PoliciesPolicyDefinitions** folder (domain) and re-open the Group Policy editor. Please see the following Microsoft documentation for further information:

<http://msdn.microsoft.com/en-us/library/bb530196.aspx>

4. The Group Policy editor should now contain a section for **PowerMAN Power Management** (other sections may be present depending on server configuration). When using the ADM file method this is located under **Administrative Templates / Classic Administrative Templates**.

Select the **PowerMAN Power Management** section:



PowerMAN Power Manager v5.5

5. The right hand pane will display a list of the available PowerMAN policy settings:

Setting	State
 Advanced Reporting	
 Policy Preferences	
 Custom Actions	
 Protected Objects	
 Miscellaneous Power Settings	
 Device Power Settings	
 Scheduled Actions	
 No User Power Settings	
 Default Power Settings	
 Product Licensing	Not configured
 Power Management Reporting	Not configured
 Advanced Settings	Not configured
 Resume Configuration	Not configured
 Enforcement / PC Insomnia	Not configured
 User Messages	Not configured
 Global Power Settings	Not configured
 User Interface	Not configured

Tip: PowerMAN is system software. Consequently, most PowerMAN settings are made in the **Computer Configuration** section of the Group Policy Editor. This is because the software must be deployed to a computer (and not a specific) user. It is possible to assign some PowerMAN policies to specific users or groups of users but this is rarely necessary.

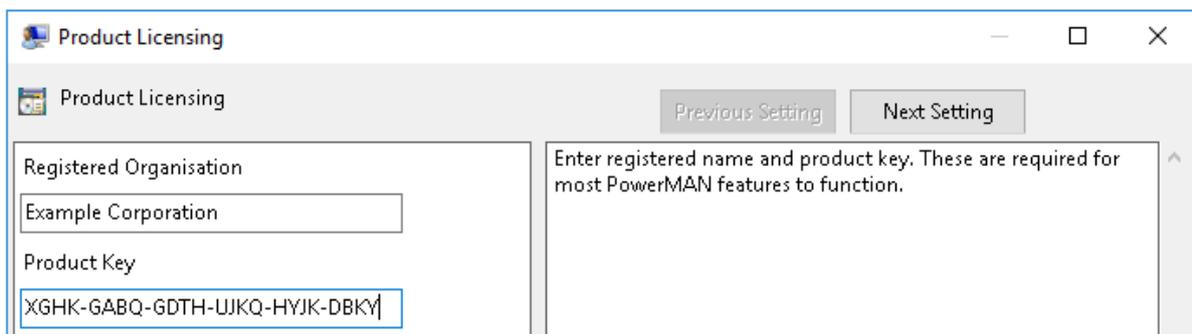
Walkthrough: Configuring PowerMAN Reporting

A basic PowerMAN/MON deployment, operating in reporting-only mode, requires just a few settings:

- Registered organisation name and product identification (PID) key
- SiteGUID – Provided for the cloud (hosted) system or from private PMES server
- Server address – The default cloud platform is **secure.pmstats.org**
- Server port – The default hosted platform port is **443** (typically, 8080 for private PMES)
- SSL encryption – Enabled for the hosted platform (typically, disabled for private PMES)

To configure the product licensing settings using Group Policy, proceed as follows:

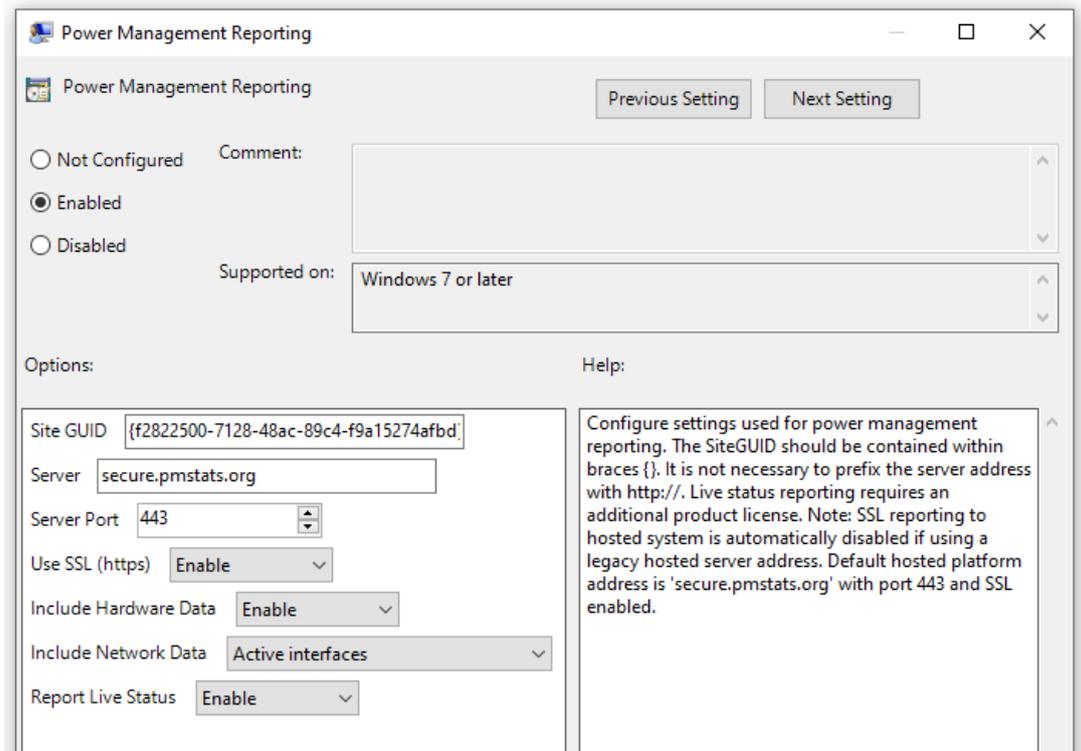
1. Open the **PowerMAN GPO** (see above)
2. Select **Product Licensing**, right-click and select **Properties**
3. Select **Enabled**, carefully enter the license details supplied with the software, and click **OK**:



To configure the optional PowerMAN reporting settings proceed as follows:

1. Select **Power Management Reporting**, right click and select **Properties**
2. Select **Enabled** and configure the reporting settings. For example:

```
SiteGUID: {customer specific - see server or setup documentation}  
Server: secure.pmstats.org  
Server port: 443  
Use SSL: Enabled
```



3. If applicable, configure the proxy server details in the **Advanced Reporting** category:
 - Proxy server name
 - Proxy server port

Tip: Please remember to ensure that your site firewall / proxy server will allow **HTTP/HTTPS protocol** traffic to the desired reporting server.
e.g. <https://secure.pmstats.org> or your private PMES server address.

4. Close the Group Policy Editor, restart a computer in the target Organisation Unit and confirm that the policy functions as expected.
5. If you use Group Policy to deploy the PowerMAN client, you should see the PowerMAN Power Management application install on the next restart. If this does not happen please consult the troubleshooting section below.

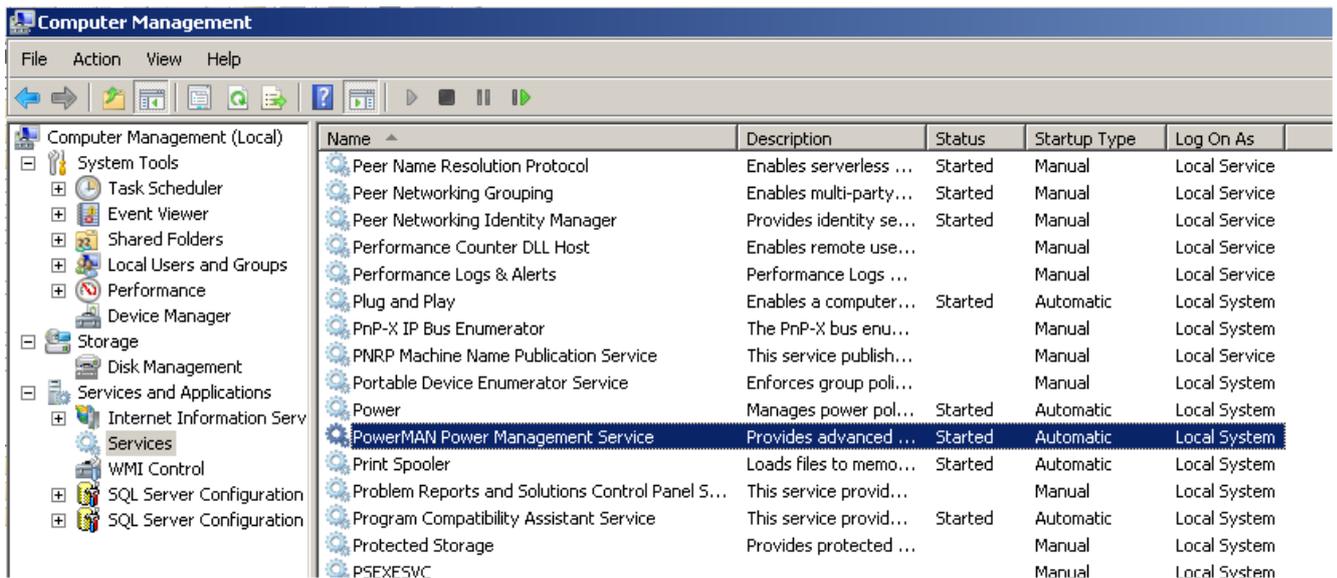
Tip: The PowerMAN client requires a license (PID) key to start. Consequently, we recommend the configuration settings are deployed before or at the same time as the client software. In some cases, a second reboot may sometimes be necessary for the client software to complete installation.

6. If this is the first time PowerMAN has been deployed, you can confirm that the service has successfully installed and is running with the command:

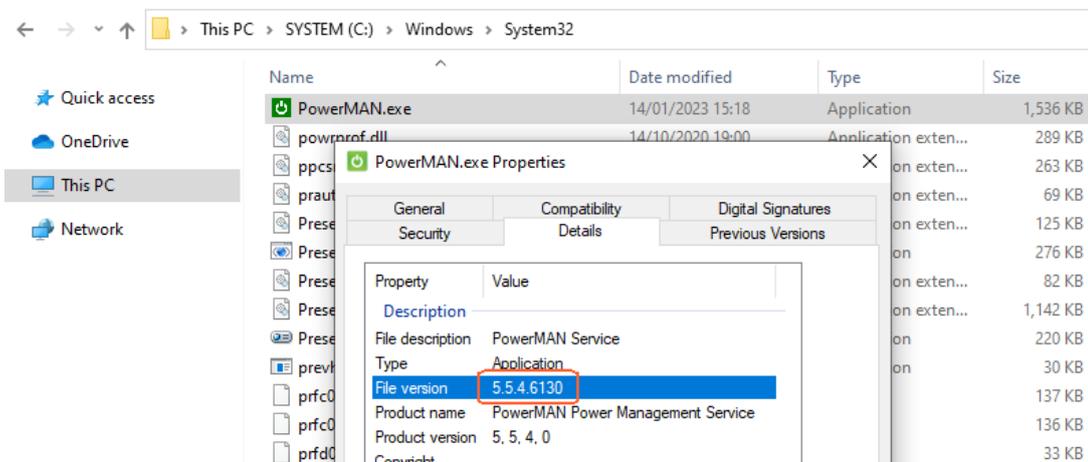
```
POWERMAN STATUS
```

7. Alternatively, you can open the **Computer Management Console** (compmgmt.msc) and checking the status of the **PowerMAN Power Management** service. The service should be in the **started** state:

PowerMAN Power Manager v5.5



8. If necessary, you can also verify the version of the PowerMAN client by locating the program in the **Windows\System32** folder (or **Windows\SysWow64** for 32-bit PowerMAN installed on a 64-bit platform), right-clicking and then selecting **Properties/Details**:



Alternatively, the installed client can be verified from the command-line using the `POWERMAN` command:

```

C:\Windows\System32>powerman
PowerMAN v5.5.4.6130 x64 [Built Jan 14 2023 15:18:16]
PowerMAN (c) Data Synergy UK Ltd 2007-2023 www.datasynergy.co.uk

PowerMAN may be used to control the PowerMAN Power Management Service
  
```

Deploying PowerMAN in a pre-built software image cloned or 'Ghost' deployment

PowerMAN supports deployment in a pre-built or cloned software image. This is sometimes known as a 'Ghost' deployment. Typically, in this scenario, PowerMAN is manually installed on a master computer. In some cases, initial settings may also be configured using Local Group Policy or similar. This computer is then cloned on to multiple destination computers.

Remember: The PowerMAN `ClientGUID` is used to uniquely identify each computer. This is automatically generated and should not be cloned from one computer to another. If this field is removed PowerMAN will generate a unique new `ClientGUID`. If the same `ClientGUID` is present on multiple computers this will prevent the reporting feature from operating correctly. Please remember to remove the `ClientGUID` prior to creating the master software image. The easiest way to do this is to stop the PowerMAN service and then use the `RegEdit` tool to delete the setting from the `HKLM/Software/PowerMAN` registry key. This step should be performed just prior to creating the software image.

Deploying PowerMAN client updates

PowerMAN is periodically updated. This may be necessary to resolve minor product problems or introduce new features. **For technical reasons the MSI file supplied with PowerMAN does not support in-place upgrade installations.** Therefore, the existing PowerMAN installation must be removed prior to installing a new one. This is typically achieved by reversing the installation process. An upgrade is a transparent process and no reporting continuity will be lost if PowerMAN is immediately replaced.

Depending on the original deployment method, there are several ways to update the client:

- **Using Group Policy for deployment (recommended method):** Create a new PowerMAN policy and unlink the old one. The old installation will be removed and the new one installed the next time the workstation is rebooted. This should normally only require a single reboot.
- **Using Group Policy for deployment (alternative method):** Use the package "Upgrades" tab to amend the existing policy to update the MSI package. In this scenario, Group Policy automatically removes the old software before deploying the new version.
- **Non-Group Policy deployments (e.g. SCCM, Intune etc.):** Remove the old package and deploy the new package.
- **Scripted deployments (e.g. SMS/XCOPY etc.):** Execute the following sequence:
 - POWERMAN REMOVE
 - Copy the new PowerMAN.exe to \Windows\System32 (32-bit OS or 64-bit PM/OS)
 - OR copy new PowerMAN.exe to \Windows\Syswow64 (32-bit PM on 64-bit OS)
 - POWERMAN START

PowerMAN Power Manager v5.5

Permanently uninstall PowerMAN

PowerMAN may be removed using the reverse of the mechanism used to install it:

- **Group Policy based deployment:** Unlink the policy. PowerMAN will be removed following the next system reboot
- **Non-Group Policy deployments (e.g. SCCM, Intune etc.):** Remove the deployment package
- **Scripted deployment (e.g. SMS/XCOPY etc.):** Execute the following sequence:
 - POWERMAN REMOVE
 - Optionally, remove the PowerMAN executable(s) from the device

When PowerMAN is uninstalled, the cached reporting information is retained in the Registry. This allows a subsequent installation to continue the reporting process with no loss in data continuity.

To completely remove all PowerMAN data and the Power Management event log, please use the following commands:

```
REG DELETE "HKLM\SYSTEM\CurrentControlSet\services\eventlog\Power  
Management" /f
```

```
REG DELETE "HKLM\SOFTWARE\PowerMAN" /f
```

PowerMAN Configuration

PowerMAN support a wide variety of power management features. The following sections provide a summary of the supported features in the supplied ADM/ADMX policy templates. These can be managed using the PowerMAN GPO (see above) or alternative tools such as ZENworks or Microsoft Intune (see appendices).

Tip: Unless stated otherwise, all times are local times (to the PC) and in 24-hour format.

The following PowerMAN configuration sections are present in the supplied policy template. These are described in more detail in the following pages:

Section	Meaning
Advanced Reporting	Additional reporting settings for advanced reporting configurations
Policy Preferences	Settings to manage lists of power policies that may optionally be selected by the user or external logic.
Custom Actions	Configure actions that occur during suspend and resume.
Protected Objects	Settings to configure a list of protected programs, files and times that, when present, ensure the system does not enter a low power state.
Miscellaneous Power Settings	Miscellaneous settings for power management
Device Power Settings	Settings to configure device support and behaviour in a power managed environment.
Scheduled Actions	Configure the system to shutdown, suspend, hibernate, reboot and resume at specific scheduled times.
No User Power Settings	Power settings that apply when no user is logged on
Default Power Settings	Power settings that apply unless a more specific policy applies
Product Licensing	Product key settings. These are required for PowerMAN to fully function.
Power Management Reporting	Reporting site configuration and server settings
Advanced Settings	Advanced configuration and debug settings used to investigate problems
Resume Configuration	Configure system behaviour after automatic resume (auto wake-up or Wake-on-LAN)
Enforcement / PC Insomnia	Settings to ensure other programs or Windows cannot override the selected power policy and optionally to prompt idle users that power management is pending.
User Messages	Messages display when the system is idle and power management or logout is pending
Global Power Settings	Power settings that apply to all users
User Interface	User interface settings

Product Licensing

The **Product Licensing** settings are used to configure the unique organisation product license. These **MUST** be configured for PowerMAN to function:

Setting	Meaning
RegisteredOrganisation	The organisation that PowerMAN is licensed to. This must be spelled exactly as supplied. e.g. Example Corporation Limited
RegisteredProductKey	The unique product key (PID) required to activate the software. This is exactly six groups of four characters separated by five dashes. e.g. XGHK-GABQ-GDTH-UJKQ-HYJK-DBKY

Power Management Reporting

The **Power Management Reporting** settings are used to configure site membership and reporting server. These can be skipped if reporting is not required:

Setting	Meaning
Site GUID	Unique site identity used to track a group of computers that are managed as a single entity. This value can be generated on the server or with the <code>MAKEGUID</code> command. e.g. {5c952c78-832f-4b68-bbf3-9986262e55ed} The SiteGUID should be enclosed in {brace} characters. PMES v5.2 and later supports automatic site creation based on Active Directory. If this feature is being used then all workstations should be assigned the “root” SiteGUID. Please see the PowerMAN Enterprise Server documentation for further details.
Server	The address of the logging server. This can be blank if management reporting information is not required. The default cloud (hosted) address is: secure.pmstats.org
Server Port	The port number of the logging server. The “secure.pmstats.org” platform is available on port 443 . A private PowerMAN Enterprise Server may be configured to run on any port. e.g. 8080.
Use SSL (HTTPS)	Encrypt reporting data with SSL/TLS. This must be enabled for the cloud reporting platform and typically disabled for a private PMES system. NB: The data transferred is relatively anonymous and does not include information about specific users and their activities. It does however, typically, include the workstation name. SSL/TLS encryption provides extra security by preventing eavesdropping of this network traffic.
Include Hardware Data	Report hardware details about the current workstation including: <ul style="list-style-type: none"> • Number of CPU sockets / cores / logical

	<p>processors</p> <ul style="list-style-type: none"> • Estimated CPU speed (MHz) • CPU make / model • Installed RAM • Motherboard make / model • BIOS make / version / release date • Number of hard / optical disks <p>NB: This feature requires PMES v5.3.0 or later</p>
<p>Include Network Data</p>	<p>Report IP v4 and v6 network information about the current workstation including:</p> <ul style="list-style-type: none"> • Adapter name • MAC address • IP address(s) • Subnet mask (IP v4) <p>This feature requires PowerMAN client v5.5.0 or later.</p>
<p>Report Live Status</p>	<p>Report contemporaneous power status information whenever a significant power management event occurs. This includes:</p> <ul style="list-style-type: none"> • Start-up / shutdown • Sleep or hibernate • Resume • User logon / off • Battery / Mains power source <p>NB: This feature is enabled by default and will generate a very small amount (approximately 2-4KB/day/PC) of additional network data per day/workstation. This feature requires PMES v5.3.0 or later.</p>

Advanced Reporting Settings

The **Advanced Reporting** features allow additional reporting features to be configured. These will not be required in typical deployments:

Setting	Meaning
Proxy Server	<p>The address and port of the local proxy server that PowerMAN must use to send management information to the server.</p> <p>NB: Please note that the PowerMAN client runs in the context of the machine account and does support proxy user authentication. If using the cloud reporting platform, you may need to create an “allowed” or “whitelist” entry to permit unauthenticated traffic to the reporting platform.</p>
Enhanced Privacy (Hide PC identity)	<p>Do not report the computer name or MAC address. In some environments, this may be desirable to further anonymise the PowerMAN data collected. Enabling this feature will make it impossible to determine which workstation generated the data and may prevent effective troubleshooting.</p>
Data Collection Offline	<p>Continue to collect and store data when the system is offline. This is enabled by default and has no effect when at least one active network is connected or when no enable/disable data collection network criteria (see below) have been configured.</p> <p>NB: It is recommended that this feature is not disabled because this will prevent data collection when the computer is offline / no active network is available and specific network criteria are present. This could unexpectedly reduce the quantity of the data collected.</p>
Enable data collection on specific networks	<p>Optionally, enable activity data collection only on specific networks or all networks if none specified. Invalid entries are treated as enabled. Disconnected and virtual networks are ignored.</p> <p>When data collection is disabled, the computer state is treated as unknown/powered-off. The network address may be specified as either a specific address or network address in CIDR format. e.g.</p> <p>192.168.1/24 specifies a range of IPv4 addresses from 192.168.1.0 to 192.168.1.255</p> <p>2001:db8:abcd:0012::0/64 specifies a range of IPv6 addresses from: 2001:db8:abcd:0012:0000:0000:0000:0000 to 2001:db8:abcd:0012:ffff:ffff:ffff:ffff.</p>
Disable data collection on specific networks	<p>As above but disables activity data collection only on specific networks. When present, disable network criteria take precedence over enable network criteria. When data collection is inhibited, the historical activity reports show the computer state as unknown/powered-off.</p> <p>Data is collected on all networks unless explicitly disabled</p>

	<p>or specific enable data collection criteria are also specified.</p>
<p>Local data Retention (and Log Backup File)</p>	<p>Configure how long data will be retained locally in the system registry before it is discarded (minimum 28 days).</p> <p>Some sites frequently re-install (sometimes called re-image) workstations to ensure a smooth user experience. A similar scenario occurs when system protection software such as Windows Unified Write Filter (UWF), Faronics® Deep Freeze or Microsoft Steadystate are used. In such configurations, the most recent power usage information can be lost during a re-installation. This can result in the PowerMAN reporting feature providing only intermittent data. This can be avoided by configuring PowerMAN to store a backup of the usage information. It is the responsibility of the system administrator to ensure that this file is protected during the reinstallation process by either excluding it from being over-written or by moving it to a safe location. This setting must refer to a local path. e.g.</p> <p><code>%windir%\system32\logfiles\PowerUsage.xml</code></p> <p>or</p> <p><code>T:\PowerUsage.xml</code></p> <p>Tip: If the workstation is not frequently re-installed the log backup file setting may be left blank. When used with the Windows Unified Write Filter (UWF), Faronics® Deep Freeze or similar products, this file may be located in the 'Thaw Space'. This may optionally be hidden.</p>

Default and No User Power Settings

The **Default Settings** and **No User Power** features allow idle policies to be configured for all users and when nobody is logged on respectively. If a 'No User' policy is not specified then the default policy also applies when nobody is logged on.

For instance, in some situations it may be desirable to employ a separate, often stricter, policy when no user is logged into the computer. For example, it may be desirable to shut down a computer when no user is present but unacceptable when a user is logged in. The **No User** feature allows you to configure a separate policy for this situation. The majority of the settings are comparable to those available in the Windows control panel applet (Powercfg.cpl).

Tip: In addition to supporting distinct policies for different user scenarios, PowerMAN also allows different policies to be active at different times. These features may be combined to create a layered power management strategy where different policies apply at different times and to different users. PowerMAN prioritises the policies in numerical order and implements the first applicable policy. If no time bound policy is applicable, the last or fallback policy applies.

Setting	State
Default Power Settings	Enabled
Default Power Settings (Fallback)	Not configured
Default Power Settings Additional #1	Not configured
Default Power Settings Additional #2	Not configured
Default Power Settings Additional #3	Not configured
Default Power Settings Additional #4	Not configured
Default Power Settings Additional #5	Not configured
Default Power Settings Additional #6	Not configured
Default Power Settings Additional #7	Not configured
Default Power Settings Additional #8	Not configured
Default Power Settings Additional #9	Not configured

Tip: Take care to avoid overlapping policy times. PowerMAN will process the policies in numeric order and use the first valid and applicable policy. It will ignore an overlapping policy until it is applicable.

The following settings are available for both the Default and No User configurations:

Default and No User Power Settings	Meaning
Policy Name	A name to identify the policy. This is displayed in the Control Panel power applet and also used in the power management event log. The policy name is mandatory.
Idle Action AC	The action to take (shutdown, suspend, hibernate, nothing) upon entering the idle state
Policy Applies	The days that the policy will apply
Start Time (hh:mm) (Optional)	The time of day the policy starts to apply. This may be blank. A blank time is treated as 00:00.
End Time (hh:mm) (Optional)	The time of day the policy ceases to apply. This may be blank. A blank time is treated as 23:59. NB: The end time MUST be after the start time and on the same day. e.g. The maximum value is 23:59.

Idle Timeout AC	The inactive time in minutes, when running on AC (mains power), that will trigger the idle action.
Idle Action DC	As per Idle AC but applies when running on battery power.
Idle Timeout DC	As above
Monitor Off AC	The inactive time in minutes, when running on AC power, before switching the console monitor off.
Monitor Off DC	As above but applies when running on battery power.
HDD Off AC	<p>The inactive time in minutes, when running on AC power, before switching the hard disk off.</p> <p>NB: This policy may not be very effective on many systems that perform frequent background tasks. See troubleshooting section for further information.</p>
HDD Off DC	As per HDD Off AC but applies when running on battery power.
CPU Performance AC	<p>The processor throttling policy to apply when running on AC power:</p> <p>Adaptive – Match performance to demand</p> <p>Degrade – Maximize energy saving by reducing CPU performance</p> <p>None – Maximize performance (increased energy consumption)</p> <p>Processor throttling is not available on all hardware and is ignored if it is not supported. Energy consumption can be dramatically reduced when CPU Performance is set to degrade. This is especially useful when no user is present as it unlikely to have any adverse impact. See the following for additional information:</p> <p>http://www.microsoft.com/whdc/archive/winpowmgmt.mspx</p>
CPU Performance DC	As per CPU Performance AC but applies when running on battery power.
Preference Tag (optional)	See policy preferences section for further information. This setting may be blank.

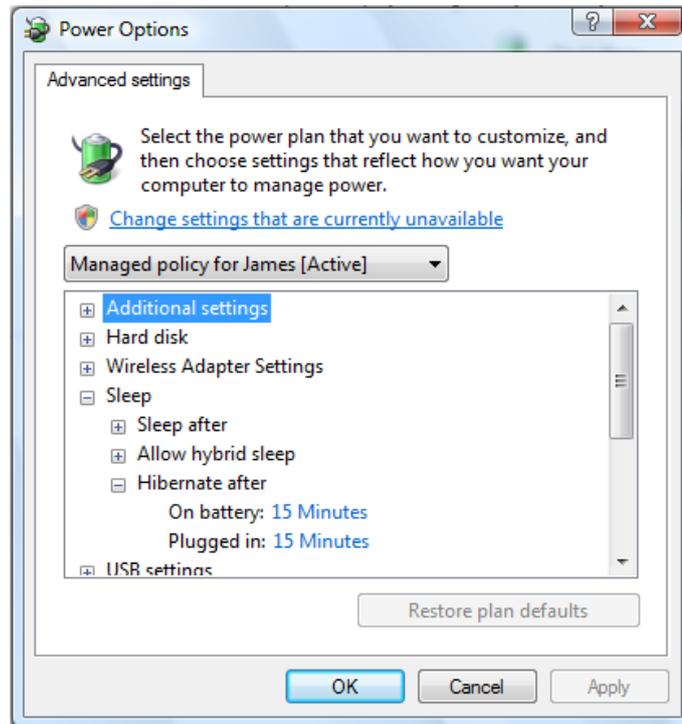
The following additional settings are not available in the No User configuration:

Default Power Settings	Meaning
Logout Timeout AC	The inactive time in minutes, when running on AC (mains) power, that will trigger the user to be logged out.
Logout Timeout DC	As above but applies when running on DC (battery) power.

PowerMAN Power Manager v5.5

The PowerMAN idle policy is fully integrated with the Windows control panel applet. For example:

PowerMAN running on Windows 7/8/10/11:



Scheduled Actions

The **Scheduled Actions** feature allows specific power management actions to occur at specific times. This can be used standalone or to complement the idle power policy. Scheduled actions can shutdown, reboot or suspend the PC and optionally resume it again. Multiple scheduled actions may be configured to run concurrently, run on specific days or optionally to repeat.

Setting	Meaning
Randomly Distribute Wake Times	Allow wake-up times to be distributed a few seconds either side of the specified time. This is option is designed to avoid power surges that could result from many computers simultaneously resuming at the same time.

Scheduled Wake-up (Resume)

The **Scheduled Wake** option allows you to configure a time that the computer will automatically wake from the sleep or hibernated states. This time may be up to 3 months (92 days) in the future:

Scheduled Wake	Meaning
Days	The weekdays that the scheduled wake policy will apply (typically All or Mon-Fri). This option may be extended by editing the ADM file. See appendix for further details.
Only Dates (optional)	<p>The days of the month that the scheduled action will apply. This works in combination to the weekdays specified and may be left blank if not required.</p> <p>e.g. To wake on the 1st, 8th, 15th and 29th of each month at 23:00 - specify: 1, 8, 15, 29 and set days to "Everyday"</p> <p>Day(s) <input type="text" value="Everyday"/></p> <p>Only Date(s)(Optional) <input type="text" value="1, 8, 15, 29"/></p> <p>Time (hh:mm) <input type="text" value="23:00"/></p>
Time (hh:mm)	<p>The local time that the computer is scheduled to wake. Typically this value is set to be a few minutes before the user requires the computer. Remember that, depending on other power settings, the computer may shutdown or sleep if no activity occurs within the timeout period.</p> <p>Note: The wake-up time may be imprecise on systems with "Modern Standby".</p>
Repeat Every	Repeat the action at the specified interval until either midnight or the time specified by the Repeat Until Time setting.
Repeat Until Time (hh:mm) (optional)	The local time that a repeating action should cease. This may be blank if not required. A blank time is treated as midnight when the action is configured to repeat.

PowerMAN scheduled wake-up does not require Wake-on-LAN

The PowerMAN scheduled wake-up feature uses a hardware timer. This is built-in to most modern PCs. It more reliable than Wake-on-LAN (WoL) techniques and does not require any network configuration. You can test this feature on a PC by using the `SLEEPCHECK` or `HIBERCHECK` commands. The scheduled wake feature is not suitable for ad-hoc wake because the timer must be configured before the PC enters the low-power state.

Scheduled wake can be especially useful when combined with sleep or hibernate power saving. For example, a system can be made available at a specific time such as the start of a school day. Scheduled wake is not possible from the full power-off (shutdown) state.

The complementary [WakeMyPC](#) software can be used for scheduled wake from the power-off (shutdown) state and for ad-hoc wake at any time. This feature is available from the WakeMyPC UI or optionally via the PowerMAN reporting web interface:

Data Synergy / ENGAGE

Site	Data Synergy
Computer	ENGAGE WakeMyPC
Created	30/06/2011
Last Status	23/09/2014

In some cases, this feature may require WoL to be enabled in the system BIOS or Windows Device Manager. PowerMAN can automatically enable WoL in Device Manager.

Remember: Some older systems do not support scheduled wake. This is because it requires specific hardware to be present. In practice most modern computers do have this function. Some hardware manufacturers disable scheduled wake on laptop devices or when running on battery power. In this case, it may be possible to enable this feature by changing the BIOS settings. PowerMAN can report if the computer *claims* it is capable of scheduled wake. This reporting information is, however, not always accurate. If in doubt, please test the feature or contact your PC vendor for further advice. PowerMAN Technical Support can provide further information on debugging automatic wake issues.

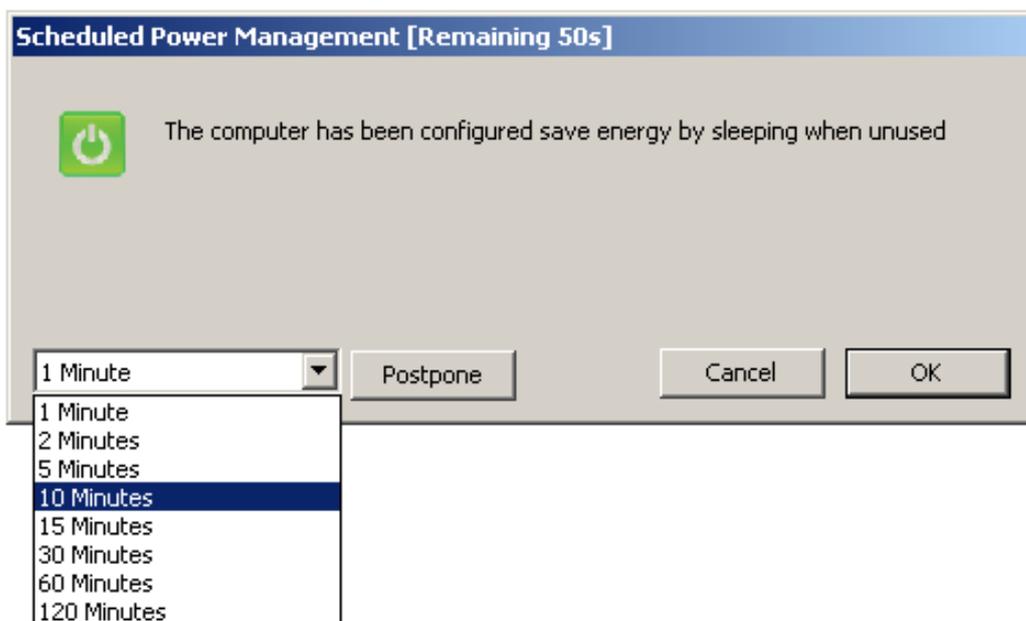
Scheduled Suspend / Reboot / Shutdown

The **Scheduled Suspend/Reboot/Shutdown** feature allows you to specify a scheduled time when the system will automatically enter a power saving state, reboot or shutdown. This time may be up to 3 months (92 days) in the future. This approach is generally not as efficient as idle based methods but may be appropriate in classrooms or similar where a predictable common behaviour is desirable:

Scheduled Shutdown/Sleep	Meaning
Days	The weekdays that the scheduled action will apply (typically All or Mon-Fri). This option may be extended by editing the ADM file. See appendix for further details.
Only Dates (optional)	The days of the month that the scheduled action will apply. This works in combination to the weekdays specified and may be left blank if not required. e.g. To sleep on the 1 st and 10 th of each month specify: 1, 10 and set days to "Everyday".
Time	The local time that the computer is scheduled to enter the specified state. Typically this value is set to be a few minutes after the closing of a public access area.
Repeat Every	Repeat the action at the specified interval until either midnight or the time specified by the Repeat Until Time setting.
Repeat Until Time (hh:mm) (optional)	The local time that a repeating action should cease. This may be blank if not required. A blank time is treated as midnight when the action is configured to repeat.
Mode	How to apply the specified action - This may be one of the following: <ol style="list-style-type: none"> 1. Allow user to cancel the action (the user is prompted) 2. Do not allow user cancel (the user is warned but cannot prevent the action) 3. Only if no user logged on (the action is ignored if a user is present)
Action	The action to take. This may be sleep, hibernate, reboot or power off.
Resume If Necessary	Allow system to wake from a low power state in order to perform another task or transition to another power state. This setting is typically used in environments where Sleep (S1-S3) is used during the daytime but at night additional energy saving is desired by changing to Hibernate (S4) or power off (S5). If this setting is enabled the system will wake from one state and immediately transition to the specified state. As with the scheduled wake feature this

	function depends upon the hardware support for scheduled wake-up.
Override	Allow scheduled event to be inhibited by other programs or settings. This option can be used to prevent the event from occurring when a protected program or file is present.
User Prompt	The message displayed to the user (if present) when the scheduled action runs
Prompt Timeout	The time that the message is displayed to the user.
Maximum Postpone	The maximum time that the user may postpone the scheduled action (if permitted). The available postponement time decreases with each postponement subject to the prompt timeout period.

Tip: Some customers have found that power saving can be maximized without sacrificing usability by combining sleep and hibernate. In such a configuration sleep is configured as the 'daytime' idle action with a relatively low timeout value (for example 10 minutes). This means that the system will frequently sleep but is available almost instantly should the user require it. The user experience with such a light sleep is very similar to that when only the monitor is turned off. When this is combined with scheduled hibernation during non-operating hours (night) and wake at the start of operating hours the user may not even notice that the system is using power saving.



Global Power Settings (Power/Sleep buttons, lid switches, password on wake)

PowerMAN supports the following **Global Power Settings**. These apply to the workstation at all times regardless of which user is logged on:

Global Power Settings	Meaning
Lid Open AC	The action to take, when running on AC power, when the computers lid (if present) is opened. Support for this feature may not be present on all hardware.
Lid Open DC	As above but applies when running on DC power
Power Button AC	The action to take, when running on AC power, when the power button is pressed.
Power Button DC	As above but applies when running on DC power
Sleep Button AC	The action to take, when running on AC power, when the sleep button (if present) is pressed.
Sleep Button DC	As above but applies when running on DC power
Lid Close AC	The action to take, when running on AC power, when the computers lid (if present) is shut. Support for this feature may not be present on all hardware.
Lid Close DC	As above but applies when running on DC power
Password on wake	Require a password when the computer wakes from sleep or hibernate. This should normally be enabled.

Protected Objects (including maintenance windows)

PowerMAN allows various objects to be 'protected'. When a protected object is present power management may be inhibited. The following protected objects are supported:

Protected Setting	Meaning
Protected Times (maintenance windows)	<p>Specifies a time window that power management will be disabled. Optionally the system may be configured to resume from a low-power state to enter the protected time period.</p> <p>A protected time may optionally be specified to only apply on certain days of the month. This works in combination to the weekdays specified and may be left blank if not required.</p> <p>e.g. To apply on the 1st and 10th of each month specify: 1, 10 and set days to "Everyday"</p>
Protected Computers	Specifies a list of computers where power management is disabled. This may be used to provide exceptions for certain computers

	<p>within a policy group that generally implements power management.</p> <p>Protected computer names may optionally use * and ? wildcards. For instance, the following would identify all workstations starting with "Workstation"</p> <p>e.g. WORKSTATION*</p> <p>To specify a time window when the protected computer applies, add the time in 24-hours format:</p> <p>e.g. WORKSTATION*;10:00-14:00</p>
Protect Computer	<p>Protect any computer that this policy is deployed to.</p>
Protected Programs	<p>Specifies a list of programs that, when running, require the system to remain awake.</p> <p>Program names should be specified without a file extension.</p> <p>e.g. CMD and <i>not cmd.exe</i></p> <p>To specify a minimum CPU load% threshold for the protected program use ;10%</p> <p>e.g. CMD;10</p> <p>The minimum CPU load must be 10-100%.</p> <p>Similarly, to specify a time window when the protected program applies, add the time in 24-hours format. This can optionally be combined with the CPU load% feature.</p> <p>e.g. NOTEPAD;10:00-14:00 e.g. NOTEPAD;15;10:00-14:00</p> <p>Protected program names may optionally also use * and ? wildcards. For instance, the following would identify all processes starting with "Note" such as Notepad:</p> <p>e.g. NOTE*</p> <p>Similarly, protected programs may optionally use Windows OS environment variables. For instance:</p> <p>e.g. %CUSTOM%Prog</p>
Protected Files	<p>As above but applies to files. When a file in the protected list exists PowerMAN will ensure that the system remains awake.</p> <p>Files should be fully qualified and include a file extension.</p>

	<p>e.g. C:\CONDOR\ACTIVE.LOG</p> <p>To specify a minimum CPU load% threshold for the protected program use ;10%</p> <p>e.g. C:\CONDOR\ACTIVE.LOG;10</p> <p>The minimum CPU load must be 10-100%.</p> <p>Similarly, to specify a time window when the protected file applies, add the time in 24-hours format. This can optionally be combined with the CPU load% feature.</p> <p>e.g. C:\CONDOR\ACTIVE.LOG;10:00-14:00 e.g. C:\CONDOR\ACTIVE.LOG;15;10:00-14:00</p> <p>Protected file names may optionally also use * and ? wildcards. For instance, the following would identify all workstations starting with "ACTIVE"</p> <p>e.g. ACTIVE*</p> <p>Similarly, protected filenames may optionally use Windows OS environment variables. For instance:</p> <p>e.g. %WINDIR%\Active.txt</p>
Protect Users	See: Distinct User Policies below

The **Protected Server Service/Shares** feature allows you to configure the client computer to remain awake (not idle) when the computer is sharing resources:

Protected Setting	Meaning
Protected Server Service/Shares	<p>The following protection scenarios are available:</p> <p>Server service running – This service provides resource sharing features to other computers. It is enabled by default. This option should be used cautiously as it will inhibit power management on typical systems.</p> <p>File shares – Power management is inhibited if any file share is present</p> <p>Print shares – Power management is inhibited if any file share is present</p> <p>Combinations – Logical combinations of file/print shares.</p>

	In v5.5.0 and later, the protection can also be configured to only apply on specific week days or between two times. This may be used to prevent the protection applying outside of normal working hours.
--	---

Tip: When a PowerMAN policy permits start and end time to be specified, the start time must be before the end time and the end time **MUST** be after the start time and on the same day. e.g. The maximum time value is 23:59. **A policy must not start before midnight and end after midnight.**

Advanced Protected Object Features

PowerMAN v5.5.0 and later permit protected objects to be qualified by rules. This can be used to ensure the protection only applies during specific hours or days, or when users are logged on. This can avoid unnecessary excess energy costs outside these periods. The following advanced settings are supported:

Protected Restriction Setting	Meaning
Protected Computer Restrictions Protected Program Restrictions Protected File Restrictions	These settings may be optionally used to restrict the associated protected object feature to only apply on specific week days, days of the month, between specific times or when user is logged on.
Protected Object Grace Period	Defines an additional protected grace period after a protected object is no longer present. This may be used to create a protected period between transitory protected objects.
Protected Inhibit (command-line)	Allow Administrator/Power User to inhibit power management for up to 7 days from the command-line. This feature is enabled by default unless explicitly disabled by this policy setting.

Resume Configuration Feature

By design Windows will return to the previous low power state (sleep or hibernate) after few minutes if there is no user activity following an automatic resume. This feature is automatically disabled as soon as user activity resumes. On some systems application behaviour may interfere with this feature or it may be undesirable. For instance, this Windows feature can sometimes interfere with a scheduled Anti-virus scan.

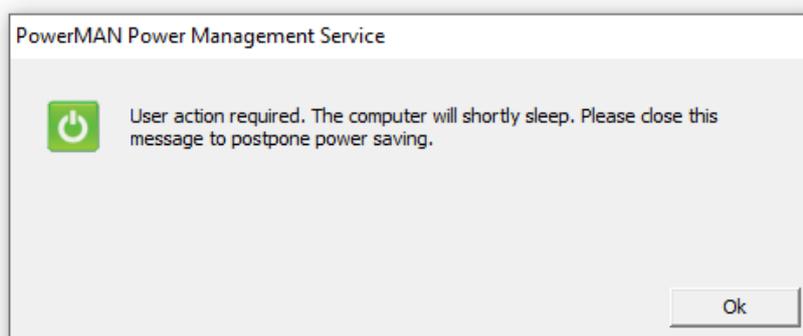
PowerMAN's **Resume Configuration** feature allows this Windows feature to be inhibited where necessary:

Resume Configuration Setting	Meaning
Activate display *This feature is not supported on some hardware platforms or graphics cards.	Activate display on resume. This feature is not supported on some hardware platforms or when the workstation is locked or no user is logged in. In such cases, it will have no effect. For example, on systems with "Modern Standby" it may not be possible to turn the display on.
Inhibit re-suspend timeout	Specifies a period of time during which PowerMAN will prevent the system from returning to the previous low power state. If no user activity occurs during this period PowerMAN will subsequently allow the PC to return to the previous low power state. This process is terminated immediately upon any user activity. NB: This feature is present to maintain compatibility with older versions of PowerMAN. It will inhibit the system from re-suspending for the specific period but cannot disable this behaviour completely. The Prevent automatic re-suspend AC/DC feature (below) will probably be more convenient in most scenarios.
Prevent automatic re-suspend AC	Prevent system from automatically re-suspending when running on mains power. This feature requires Windows 7 or later.
Prevent automatic re-suspend DC	As above, when running on battery power.
Desktop refresh delay	Refresh the user desktop shortly after system resume. This feature is intended to work around specific problems where the Windows OS does not recognise a change in network connection state or similar following resume.

User Messages Feature

PowerMAN can optionally display a **user message** prior to a power action such as Sleep, Hibernate, Shutdown or Logout. This can be used to remind an inactive user that the action will occur shortly and allow them to postpone the action by simply closing the message prompt. This feature may be useful in scenarios such as long VoIP calls, online meetings or presentations where the user is not an active participant:

Policy Enforcement Settings	Meaning
Display Sleep/Hibernate/Shutdown/Restart pending message (before idle timeout)	<p>The amount of time before the idle timeout that the idle pending prompt should be displayed.</p> <p>This can be used to remind an inactive (but otherwise present) user that power saving will commence shortly. It is intended for scenarios such as remote working, VoIP calls, presentations etc.</p>
Sleep/Hibernate/Shutdown/Restart pending message	<p>The message that should be displayed to the user prior to reaching the idle state. e.g.</p> <p>“This computer will sleep soon. Please close this message to postpone power saving”.</p>
Display Logout pending message (before idle timeout)	<p>The amount of time before the logout timeout that the optional logout pending prompt should be displayed.</p>
Logout pending message	<p>The message that should be displayed to the user prior to logout:</p> <p>“This computer will logout soon. Please close this message to postpone this”.</p>



Tip: The Windows idle timer is only approximate and can sometimes briefly pause. PowerMAN will display the user message prior to the **expected** timeout expiry. This does not mean that the idle action will occur precisely after the elapsed time has expired. Typically, it will happen a short time later.

Power Policy Enforcement / Anti-Insomnia Feature

PowerMAN supports a **Policy Enforcement / Anti-Insomnia** feature. This can be used to ensure that the specified idle action such as Sleep, Hibernate, Shutdown or Restart will occur and cannot be suppressed by Windows or another program. If this happens regularly, it is sometimes described as 'PC Insomnia'. This occurs when third-party software periodically resets the Windows idle timer or otherwise prevents the system from idling.

Policy Enforcement Settings	Meaning
Maximum grace timeout AC	The amount of time, in addition to the specified idle timeout after which the idle action will be forced.
Maximum grace timeout DC	As above but applies when running from battery power.
Managed policies Only	Apply policy enforcement to managed (PowerMAN) policies only. If this setting is set to disabled policy enforcement will be applied to the active power scheme even if it was not created by PowerMAN. This is disabled by default.
No user policy only	Apply policy enforcement only to the 'No User' policy that applies when nobody is logged in. This is disabled by default.

Tip: The policy enforcement feature is enabled by default with a grace period of 10 minutes. To maximize policy consistency, we recommend that this feature is not disabled.

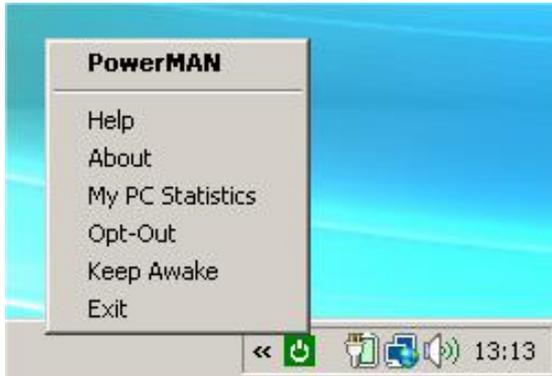
Hardware Device Power Management Settings

PowerMAN allows the power management properties of some hardware devices to be configured centrally. This feature is intended to ease the transition to a power managed environment by ensuring hardware settings are consistent. Separate settings are provided for portable (laptop) and desktop computers. Portable computers are those with an internal battery. All of the following features become effective at the next reboot:

Device Power Management Setting	Meaning
Network interface power management	<p>Specify power saving / wake mode for supported network interface devices. This may be used in preparation for a Wake-on-LAN (WoL) deployment or to disable WoL.</p> <p>The available options have the following meanings:</p> <p>Disable power management – No power saving enabled.</p> <p>Allow power saving modes – Allow device to enter low-power state</p> <p>Allow computer wake (any) – Allow any network packet to wake workstation (not recommended)</p> <p>Allow (WoL) computer wake (strict) – Allow only Wake-on-LAN packets to wake PC. This is the recommended setting.</p> <p>The 'Allow Wake (Any)' setting may cause occasional wake-up due to normal network traffic and should not be used on portable computers. This setting becomes effective on the next reboot.</p> <p>This feature supports most network interface devices. Please contact Data Synergy Support if this feature fails to work with your device for further advice.</p>
USB Hub power management (Selective Suspend)	<p>Configure power saving mode for USB hubs. In some Microsoft documentation this feature is known as 'selective suspend'. Allowing USB hubs to enter a low-power state can decrease overall energy consumption. However, this may also prevent a device such as a keyboard, connected to the hub from being used to wake the workstation.</p> <p>NB: The principle purpose of this feature is to disable power management for USB hubs that manage a USB keyboard where the keyboard is used to wake the PC.</p>
HID Keyboard / Mouse wake	<p>Configure keyboard / mouse devices to wake the PC. In some cases this may also require</p>

	a related BIOS settings change to operate. This feature is not available for legacy PS/2 devices.
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User Interface Settings



PowerMAN includes an optional user interface feature. This makes some convenient options available to users via an icon in the System Notification (Tray) area.

The user interface allows users to interact with the power management strategy and, within limits, customise it for their own requirements. Experience has shown that this can greatly increase user acceptance of a new power managed environment.

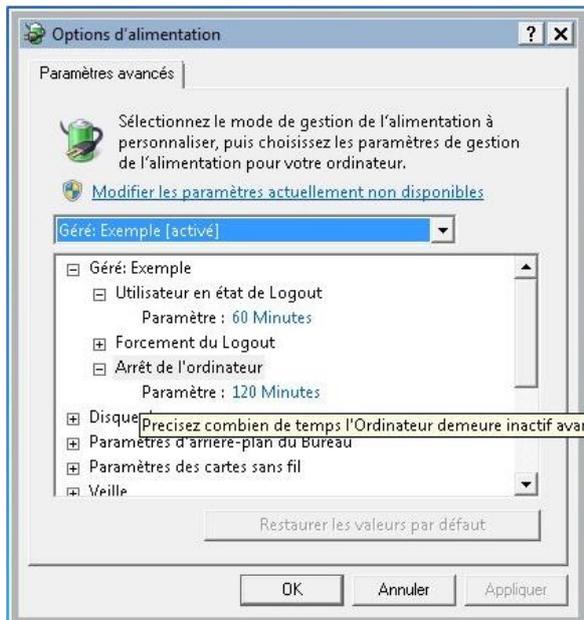
The user interface may be enabled only for certain users and each feature within the interface may be configured via the policy settings below:

User Interface Setting	Meaning
Display GUI	Enables display of the user interface icon. If necessary the icon can be enabled without enabling any of the other UI features.
Help Page	The URL of the power management help page. This can be the default page provided by Data Synergy or a custom page specific to your organisation. To disable this feature blank the page link. The default page is: https://www.datasynergy.co.uk/help/powermanhelp55.aspx
Allow exit	Permit user to exit the UI
Allow opt-out	Configures the opt-out menu option. When enabled this allows a user to opt-out of the centrally managed power management strategy and self-configure using the standard Windows Control Panel applet (powercfg.cpl). When this feature is enabled the Control Panel power management applet can be opened by double clicking on the PowerMAN Icon We recommend that this feature is only enabled for users that strictly require it.
Allow keep awake	Configures the keep awake feature. When enabled by the user this feature will prevent the computer from entering a low power state. We recommend that this feature is only enabled for users that strictly require it.
Personal Statistics Link	Enables display of the personal statistics menu option. When selected this link will open the PowerMAN statistics webpage for the current workstation. This option is intended for computers that are predominately used by a single user and should not be enabled for shared workstations.

PowerMAN Power Manager v5.5

The majority of user interface settings are available as both per-computer and per-user settings. If a user policy is specified it takes precedence over the computer policy. The behaviour of the user interface feature may be further modified using the miscellaneous settings.

The PowerMAN user interface supports English, French, Italian and Spanish. It will automatically be displayed in the correct language if a compatible language version of Windows is installed. For instance:



PowerMAN User Interface Icon

The PowerMAN icon displays the current power management state. This may be green, grey or orange. Orange indicates that a recent power management event has occurred. In some cases the icon may be overlaid with an additional symbol as indicated below:

Meaning / Icon		Keep awake enabled	Out-out enabled	Forced awake (third-party app)
Managed Plan Active				
No managed plan / Managed plan not active				

The user interface is designed to place minimal requirements upon the workstation. For this reason it only updates every few seconds. There may be a small delay between changing power management state and the icon changing. This is normal.

Miscellaneous Power Settings

PowerMAN provides several miscellaneous configuration features. These are rarely used features or features that influence the way other policies are interpreted.

Separate DC power policy settings are provided for systems, such as laptop computers, that run on both AC (mains) and DC (battery) power. Typically, the DC policy is stricter to enhance battery life. For desktop computers these values should be set to the same as the AC policy. The DC settings are ignored unless the **Separate DC Settings** feature is enabled:

Setting	Meaning
Separate DC Settings	Allow separate DC settings to be configured. When disabled any DC settings are ignored. This option should be set to not-configured or disabled except when configuring PowerMAN for use with portable computers. If separate DC settings are used care should be taken to ensure they are compatible with the AC settings.

The **Hibernate (Suspend to disk)** option allows the Hibernate (S4) power saving state to be remotely enabled. This has the same effect as enabling this locally via the Power Management Control Panel applet. As noted elsewhere S4 is the most effective power saving state available that still retains the users' (logon) session state. However, resume from S4 will take considerably longer than resume from S1-S3.

Setting	Meaning
Hibernate (Suspend to disk)	Enable support for the hibernate (S4) power saving mode. If hibernate is not enabled attempts to hibernate will normally result in Suspend To RAM (S1-S3) instead. PowerMAN will automatically enable hibernate if it is required.

Remember: Only Power Users and Local Administrators can usually change the computer power settings. PowerMAN allows you to specify settings for all users regardless of their access level. If users really require the ability to override you Administrator defined configuration you should consider either applying a separate user policy OR allowing the user access to the opt-out feature via the user interface.

The **Hybrid Sleep (Fast S4)** option allows the Fast S4 power saving state to be remotely enabled. This has the same effect as enabling this locally via the Power Management Control Panel applet. Hybrid Sleep combines the advantages of both the sleep and hibernate states. The user session state is saved to a hibernation file and to RAM. On resume, if the power supply has not been interrupted the system resumes from RAM (like sleep). If the power has been interrupted, the system resumes from disk (like hibernate). Enabling this feature automatically enables hibernate.

Setting	Meaning
Hybrid Sleep (Fast S4)	Enable support for the Hybrid Sleep (Fast S4) power saving option. If hybrid sleep is enabled then hibernate will perform both suspend to RAM and suspend to disk. This requires Windows 8 or later. NB: Hybrid sleep cannot be selected as a specific power saving mode. It changes the behaviour of the hibernate mode.

PowerMAN Power Manager v5.5

The **Fast Start-up (HiberBoot)** option allows the Windows fast system start-up mode to be enabled. In this configuration, the system will hibernate instead of performing a fully system shutdown. This is desirable because resume from hibernate can be much quicker than a full system start-up. This feature relies on underlying hibernate support and may therefore be unavailable or unreliable if hibernate is not supported or doesn't work reliably. Enabling this feature automatically enables hibernate.

Setting	Meaning
Fast Start-up (HiberBoot)	Enable support for the Fast Start-up (HiberBoot) mode. In this configuration, the system will hibernate instead of performing a full shutdown. This feature requires Windows 8 or later.

Tip: Hybrid Sleep (Fast S4) and Fast Start-up (HiberBoot) were disabled in versions of PowerMAN prior to v5.5.0 because they could cause compatibility problems on older hardware where hibernate or sleep were unreliable. Such hardware is now much rarer and these features are generally safe to use. If you find that systems fail to consistently either suspend or resume, please try disabling Hybrid Sleep (Fast S4) and Fast Start-up (HiberBoot). To maintain compatibility with previous PowerMAN releases, Hybrid Sleep (Fast S4) is disabled unless explicitly enabled.

The **Ignore User Power Policies** option allows you to disable the separate user specific power settings on a per-machine basis. This option may be useful where you are using a combination of default and specific user settings but on certain workstations you want the default settings to apply regardless.

Setting	Meaning
Ignore User Power Policies	Ignore any user specific power settings (configured in a user-based policy). When a user is logged in the default settings will apply and the user's PowerMAN settings ignored. When no user is logged in the No User settings, if present, will apply. This setting may be used to override the specific user settings on a per-computer basis. This is ideal for shared systems or computers in a public area.

The **Ignore User Opt-out** feature instructs PowerMAN to ignore the user opt-out option available, at the administrator's discretion, to users via the user interface icon.

Setting	Meaning
Ignore User opt-out	Ignore user opt-out configuration. This option also removes the user opt-out option from the user interface menu.

PowerMAN Power Manager v5.5

The **Discard User Opt-out** and **Discard User Keep Awake** features instruct PowerMAN to discard any user opt-out or keep awake setting upon logon or reboot. This may be used to discourage persistent abuse of these features by users to work around the intended power management scenario:

Setting	Meaning
Discard User Opt-out	Discard user opt-out selection upon logout / reboot.
Discard User Keep Awake	Discard user keep awake selection upon logout / reboot.

Windows Vista and later allow the hardware wake-up timer to be disabled. This decreases power consumption in a low-power state by disabling automatic system resume. If system resume is not required then these timers may be safely disabled. Conversely, if wake-up is desired then this feature should be enabled. This feature has no effect on legacy operating systems prior to Windows Vista:

Setting	Meaning
Allow wake-up timers AC	Globally enable/disable hardware wake-up timers on AC power
Allow wake-up timers DC	As above when running on battery power.

Custom Actions

PowerMAN allows specific custom actions to be performed during system suspend and resume. These actions can be run for the entire system or per-user. Custom actions may be used to implement workarounds for undesirable application behaviour in a power managed environment or to notify a third-party component that suspend/resume is occurring.

Two action types are currently supported:

1. **CLOSEWINDOW** – Close specific application window(s) or dialog(s). This action supports wildcards.
2. **RUNPROG** and **RUNHIDDEN** – Launch application / script

The command syntax and operation of custom actions is further explained in the Appendix at the end of this document.

Policy Preferences Feature (Advanced)

The PowerMAN Policy Preferences feature allows a menu of power policies to be assembled and periodically displayed to the user for self-selection. This may be used to greatly increase user participation in an enterprise-wide power management strategy whilst strictly controlling the options available. We recommend that this feature is only used by administrators already familiar with basic PowerMAN configuration.

Tip: This feature may also be leveraged in non-directory environments to deploy a 'pool' of power policies and to selectively activate the desired policies using client-side logic. This may be achieved by using the **Policy preset** or **Registry defined for system** modes.

The preferences feature may be combined with the start/end policy times and default, no user/specific user settings to create powerful, multi-layered policies. The preferences system also provides

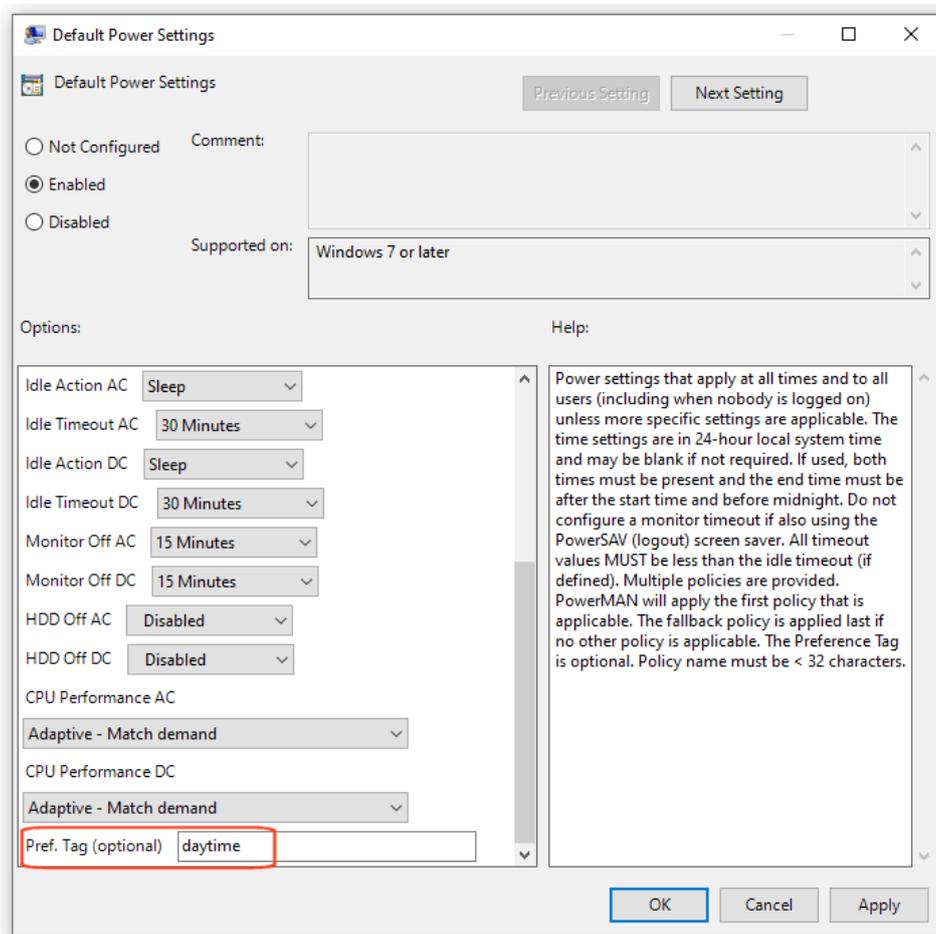
PowerMAN Power Manager v5.5

for a fallback to an alternative policy if no preference policy is applicable. It is good practice to provide a fallback policy. This will ensure that a centrally defined policy always applies.

Tip: Multiple Default, No User and User-specific policies may be tagged with the same tag. The normal PowerMAN rules apply and the first applicable policy will apply. This may be used to implement a linked collection of policies that apply at different times and in different situations

The preferences feature is implemented using a **Preference Tag** that may be assigned to PowerMAN idle policies. The tag is a short alpha-numeric string and is not displayed to users. This tag associates groups of related policy settings together.

When not required, the preference tag field should be blank.



The screenshot shows the 'Default Power Settings' dialog box. The 'Enabled' radio button is selected. The 'Supported on:' dropdown is set to 'Windows 7 or later'. Under the 'Options' section, various settings are shown as dropdown menus: Idle Action AC (Sleep), Idle Timeout AC (30 Minutes), Idle Action DC (Sleep), Idle Timeout DC (30 Minutes), Monitor Off AC (15 Minutes), Monitor Off DC (15 Minutes), HDD Off AC (Disabled), HDD Off DC (Disabled), CPU Performance AC (Adaptive - Match demand), and CPU Performance DC (Adaptive - Match demand). The 'Pref. Tag (optional)' field is highlighted with a red box and contains the text 'daytime'. A 'Help' section on the right provides detailed instructions on policy configuration. At the bottom, there are 'OK', 'Cancel', and 'Apply' buttons.

PowerMAN Power Manager v5.5

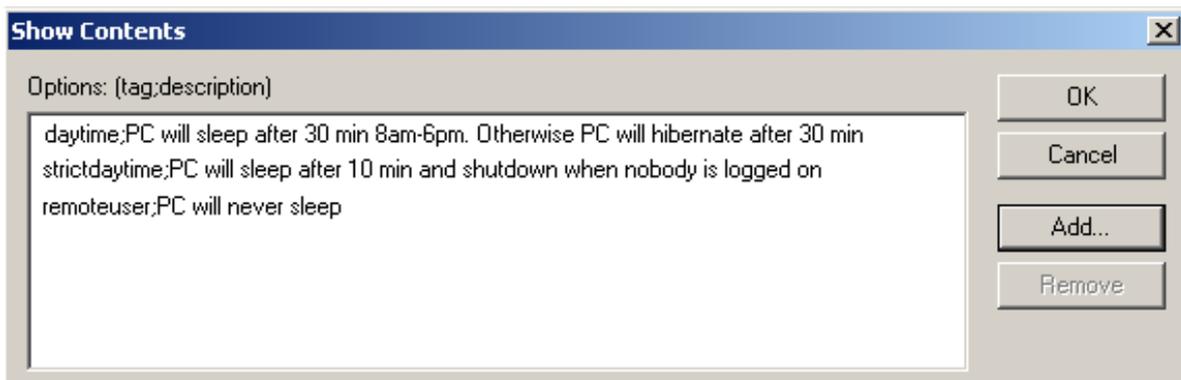
The following basic settings are supported:

Policy Preferences Configuration	Meaning
Mode	<p>Defines the operating mode of the policy preferences feature.</p> <p>The available options have the following meanings:</p> <p>User self selection – The user is prompted to self-select from the available options. The selection only applies whilst the user is logged on.</p> <p>User selection for system – The user is prompted to self-select from the available options. The selection applies to the workstation regardless of who is logged on until a subsequent selection.</p> <p>Policy preset – No user interface is displayed. The selection is defined by a policy setting.</p> <p>Registry defined for system – No user interface is displayed. The selection is defined by a registry setting. This feature allows the selection to be made by third-party logic or a script.</p>
Fall-back to	<p>Defines the PowerMAN behavior if the current policy preference selection is not available. The available options have the following meanings:</p> <p>Any applicable policy – Use first applicable policy regardless of policy tag</p> <p>None. Preference policy only – Only use tagged policies. If no applicable tagged policy available do nothing.</p> <p>Non-preference policies only – Ignore tagged policies and use first applicable non-tagged policy.</p>

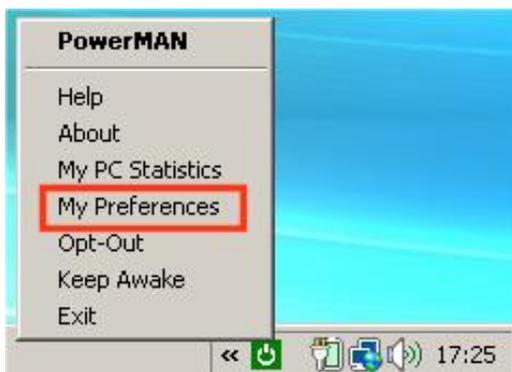
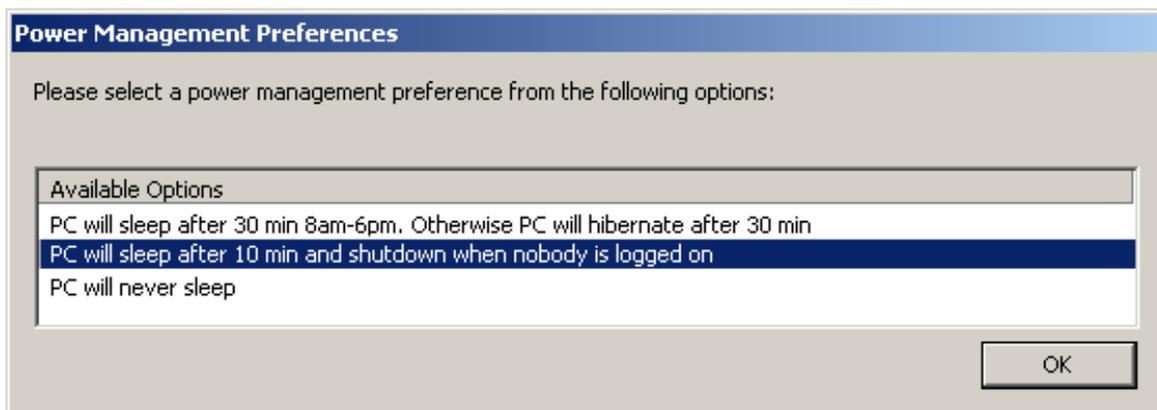
The Policy Preferences selection menu is displayed whenever a user selection is required. This can be because the interface has not been displayed for a period of time or because the previous selection is no longer available. The following settings are available to configure this feature:

Policy Preferences User Interface Setting	Meaning
Display Interface	Defines how often the selection menu is displayed.
User Prompt	Defines the message displayed to the user
Options (tag;description)	Define a list of options to display. These are in tag;description format where the tag is available within the pool of available policies.

For example, the Options (tag;description) configuration could be:



PowerMAN will only display menu options that are available. Therefore, if no options are actually available the policies the menu will not be displayed. The menu is displayed when the user next logs on:



The menu may also be displayed at any time by selecting the option from the PowerMAN icon.

Advanced Settings

Finally, PowerMAN supports the following **Advanced Options**. These are intended for resolving configuration options and should normally be used only under the supervision of PowerMAN Technical Support.

Advanced Settings	Meaning
Ignore active flag	When enabled this option will ignore other related tools (such as the legacy PowerCONFIG tool and PowerSTART) and protected objects. This means that non-user activity will not be reported and will be counted as idle time. Use this option to enforce a policy regardless of these tools.
Ignore phantom activity	Ignore phantom (e.g. typically optical) mouse input when no user logged on. This policy is enabled by default and provides a workaround for problem mice when no user is present.
UI Ignore recent events	Disable UI notification of recent power management events. This prevents display of the orange status icon.
Default Idle Sensitivity% AC	The level of sensitivity applied by Windows to detect system idle when running on AC (mains) power. On systems that fail to correctly idle it may be necessary to lower this (see notes below). The recommended value is 5%. This value may be 5-95%.
Default Idle Sensitivity% DC	As above for DC (battery) power source
GUI refresh (ms)	The frequency that the PowerMAN UI Icon updates. The default is 10 seconds.
Upload timeout (ms)	The period that PowerMAN will wait for a response from the PowerMAN server before aborting a data upload. The default is 10 seconds.
Maximum upload retry delay (secs)	The maximum period that PowerMAN will wait before re-trying to repeat a failed upload. The default is 300 seconds (5 minutes)
Fix inconsistent settings	By default PowerMAN will try to resolve configuration problems by using the closest policy possible to that configured. This may be necessary because of inconsistent settings or missing hardware support for the chosen configuration. This feature is enabled by default. Care should be exercised when disabling this feature as it may expose problems with existing settings.
Default Enforcement	<p>The policy enforcement (anti-insomnia) feature is enabled by default with a timeout of 15 minutes. This setting may be used to disable this feature. This should not normally be necessary.</p> <p>Policy enforcement may also be disabled by explicitly setting the enforcement timeout to zero.</p>
Offline network detection	By default PowerMAN will attempt to upload outstanding data every few hours. In some infrequently connected environments this may

	result in a delay before PowerMAN reporting data is available on a server. PowerMAN includes a built-in offline network detector that will detect infrequently connected computers and attempt an immediate upload if a network connection is detected. This feature is enabled by default.
Delay PowerMAN Activity	In some systems it can be desirable to delay PowerMAN start-up until after the system is fully running. This setting defines a time period that PowerMAN will pause before starting. NB: This feature was created to work around rare problems with slow GPO refresh on some networks.
Event Logging	The amount of information reported in the Event Log. This setting may be changed to increase or reduce the amount of information reported.
Event log size (MB)	The size of the power management event log.

Distinct User Policies



All of the PowerMAN settings described above are computer policies that apply to the entire workstation. When using Group Policy they are configured within the **Computer Configuration** branch of the Group Policy Object Editor.

These policies apply to all users and are the simplest way to quickly implement an effective power management policy.

In some cases it may be necessary to apply **additional** policy settings for specific users or groups of users.

Tip: PowerMAN can usually be most effectively implemented **without** creating any separate user based policies. These are only necessary when specific users need to deviate from the standard policy and should be the exception rather than the rule. If this approach is taken please remember to continue to configure No User (logon prompt) and Default (everyone else) policies to ensure you achieve the most effective coverage. **The user policy should always be created using a separate Group Policy Object to that used to install and configure the PowerMAN**

To create a separate user policy you must create a distinct Group Policy Object for the user settings. This is necessary because the normal policy is applied on a per-computer basis. To perform this configuration:

1. Open the **Group Policy Management Console** (GMPC.MSC)
2. Locate the Organisational Unit (OU) to which you wish the initial policy to apply
3. Right click the OU and select **Create and Link a GPO here**

PowerMAN Power Manager v5.5

4. Enter a name of the new policy and click **Ok**. The example creates a policy called **Software – PowerMAN Power Manager**
5. Select the newly created policy, right click and select **Edit**
6. The Group Policy Object Editor should open
7. Navigate to the User Configuration section and expand the **Administrative Templates / Classic Administrative Templates** section
8. Right click and select **Add/Remote Templates**
9. Click **Add** and locate the PowerMAN5.adm file supplied. When this is completed, click **Close**. It may be helpful to remove the other administrative templates present using the Remove button. These are not required for PowerMAN.
10. Configure the **User Power Settings** using the same method as outlined above for the Default Settings

Getting the most from PowerMAN

Monitor the existing environment

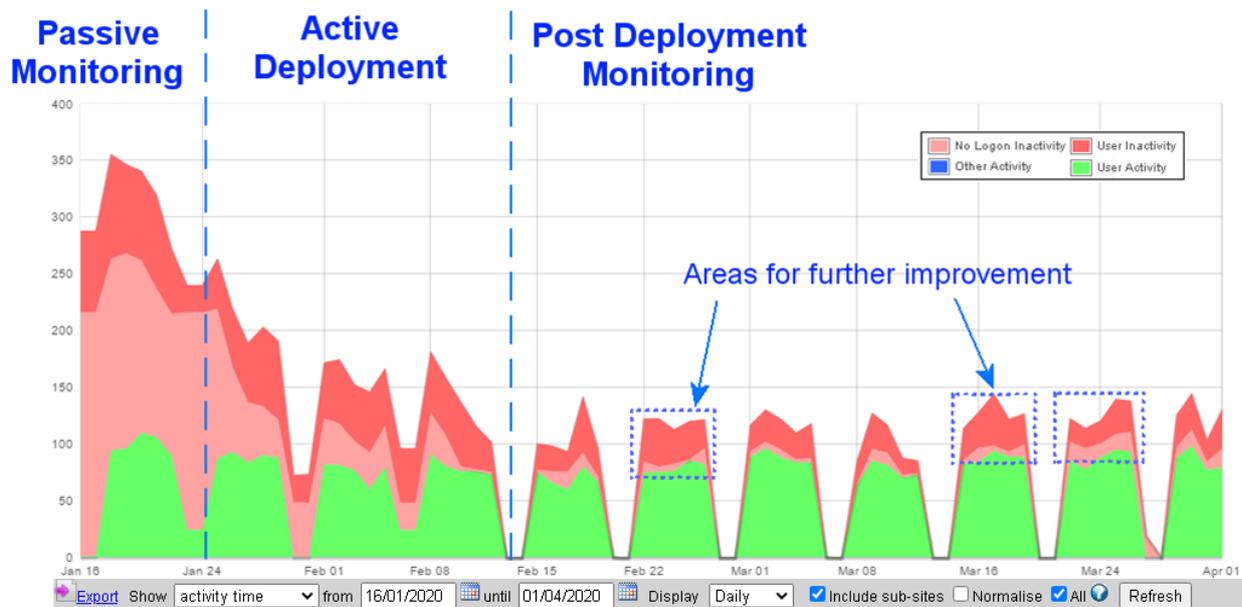
PowerMAN will work best if the existing environment is measured before any power management is used. We recommend monitoring only during the first few weeks of operation. After a consistent pattern has emerged, this information may then be used to inform decisions about the best power management strategy and subsequently to quantify the effect of that strategy.

PowerMAN offers many different ways to manage power effectively. The following section suggests some best practices and configuration examples.

Typical deployment phases

A typical deployment is divided into three distinct phases:

- An initial period of **passive monitoring**. This allows a baseline usage profile to be established
- Deployment of an **active power policy**. This is designed to reduce energy from the established baseline. Often the specific settings used are chosen based upon both the results of the monitoring phase and existing knowledge about the usage pattern and user requirements
- A **post deployment monitoring** phase. In this phase, the statistics are monitored, areas for further improvement identified and changes made as necessary



Idle or schedule-based power management?

PowerMAN supports both idle (timeout) and scheduled power management. Each has advantages and in some cases they may be used most productively together:

- **Idle Strategy** – The Default, No User and specific user policies allow an idle timeout to be defined. This is very similar to the basic configuration available in the Windows Control Panel Power applet. A timeout strategy allows each computer to respond dynamically to its environment. This will normally maximize any power savings but does mean that each computer will behave independently. This may be unsuitable for some environments such as timetabled rooms in schools.
- **Scheduled Strategy** – The scheduled shutdown / sleep / hibernate policy allows a specific action to occur at a specific time. This is ideal for environments with a predictable usage pattern or where independent computer behaviour may be disruptive. Unless computer utilisation is very high it is unlikely that a scheduled strategy alone will achieve the savings possible from an idle-based approach.
- **Combined Strategy** – In some environments a combination of the two strategies may be ideal. A common approach is to use a light sleep timeout driven strategy for 'daytime' periods. This has the advantage of a fast resume time and minimal disruption. This can be complemented by a nightly full shutdown or hibernation strategy.

Complementary PowerMAN features

Consider using the following additional options to improve results:

- **Default Policy** – The power policy that applies at all times to all users unless a more specific policy is applicable. This policy allows a common standard to be quickly implemented
- **No User Policy** – It is often possible to use a more aggressive power management strategy when nobody is logged on. PowerMAN allows a distinct policy to be defined for this situation.
- **Logout Policy** – Sometime operating environments (such as school or university computer rooms) have a very high turn-over of users. It would be inappropriate to enable an idle policy, whilst a user was logged on, in such environments as this may result in a computer being locked for subsequent users.

A logout policy can be used in combination with the No User policy to ensure that the user is not logged on before the appropriate idle action occurs. This approach can also benefit usability because it allows Sleep or Hibernate to be configured as the idle action when no user is logged on which means the system can become available again to the next user in a reduced time.

- **Policy Enforcement / Anti-insomnia** – Sometimes the installed software may prevent the computer from becoming idle. As noted elsewhere in the documentation there are numerous legitimate reasons for this (such as a Microsoft Office PowerPoint slide show) where this is desirable. Unfortunately this can also happen when not intended and can result a significant additional amount of energy waste. If this appears to happen the policy enforcement feature may be used to configure an **additional** time, after the last user input, after which the idle action will be forced. Policy enforcement is enabled by default in PowerMAN v5.2 and later.
- **Scheduled Power Management** – Alternatively, the scheduled shutdown/sleep/hibernate policy may be used as a 'catch-all' policy to ensure that systems are shutdown or configured to use less energy at certain times of the day. This approach can prove very effective where the usage pattern is predictable.
- **Policy Preferences Feature (advanced)** – This feature allows users to participate in the power management strategy by selecting a policy from a menu provided by the system administrator. Whilst the options available are controlled by the system administrator this approach can increase user acceptance by offering users some degree of autonomy.

Maximizing Savings

Each organisation has specific operating requirements that will require tailored power management settings. Often the perceived drawbacks of using active power management can be overcome by a well designed deployment and by keeping the users informed. The following tips may help maximize savings:

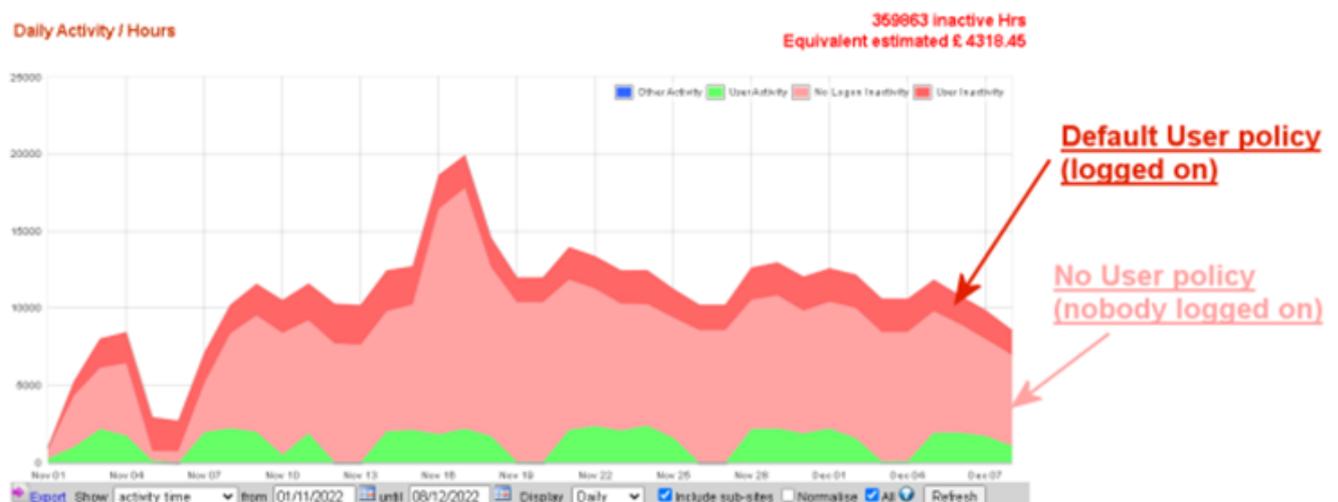
1. An effective idle-based strategy will usually have the greatest effect on energy consumption. The savings available greatly exceed those possible from display, hard disk power management or scheduled strategies alone.
2. The display and hard disk settings may be used to further reduce energy consumption without risking the user's session.
3. Similarly the CPU performance settings can be used to reduce energy consumption with minimal impact on users. Typically these should be set to 'Adaptive' when a user is present and 'Degraded' when no user is present.

PowerMAN Power Manager v5.5

4. Screen savers consume energy. Consider turning the monitor off rather than enabling a screen saver.
5. Most modern programs fully support sleep and hibernate. These may be used to save energy whilst preserving the user session and any open documents. Sleep and hibernate are most appropriate when the PC is used by the same long-term user.
6. When the computer is regularly used by many users (for instance in a hot desk or public access area) sleep or hibernate are rarely appropriate policies for when the user is logged on. This because both lock the workstation for subsequent users. Instead consider using a logout policy to prevent the system being hogged by an absent user. Typically it can be quite simple to determine a suitable timeout after which the user is assumed to have 'abandoned' the computer.
7. The power settings appropriate when a user is logged on may be very different from those appropriate when no user is logged on. PowerMAN allows separate user and 'No User' policies to be easily defined. Ideally a power policy should be configured in both situations (even if the user policy doesn't implement an idle action it can still save significant energy by turning the monitor off or logging the user out after the specified period).
8. Power off does not need to be the default action – hibernate or sleep can be used as idle actions when no user is logged on to allow the next user to rapidly logon and become active.
9. Similarly PowerMAN can resume the PC from one sleep state to transition to another. This can be effectively used to use a light sleep (S1-S3) during the daytime when the system is idle but transition to power-off or hibernate (S4) at night time.

Walkthrough: Configure initial power management policies

A common scenario is that the majority of PC inactivity occurs when no user is logged on. This is displayed as pink in the PowerMAN reports. For example:



Inactivity that occurs when no user is logged on can be almost entirely eliminated by using a PowerMAN "No User" policy. This is often a quick win because such a policy only applies when nobody is logged on and consequently cannot inconvenience users.

PowerMAN Power Manager v5.5

This scenario could be implemented using the following PowerMAN policies:

- “Default” policy – Disable low-power mode when a user is logged on
- “No user” policy – Enter low-power mode when nobody is logged on e.g. 10 minutes

This has the advantage that it is simple and, if the majority of PC inactivity occurs when nobody is logged on, may be sufficient.

Alternatively, if user inactivity (red in the reports) is significant, it may be desirable to actively manage power when users are logged on too. In this scenario, a “Default” policy can be configured to also enter a low-power mode after a period of inactivity. In this case, the required period inactivity will typically depend on balancing the needs of the users, their environment and the desire to save energy. For example:

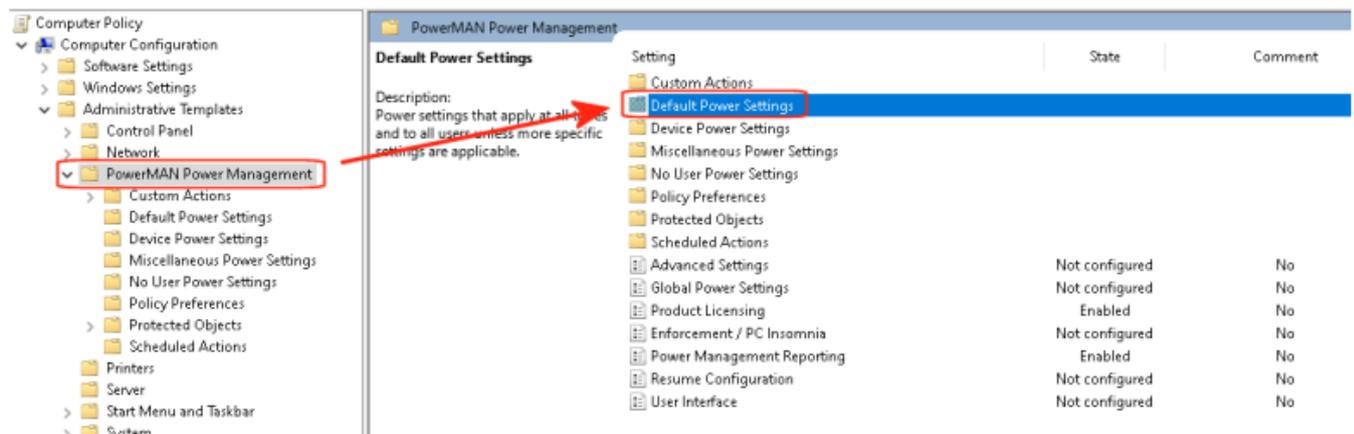
- “Default” policy – Disable low-power mode when a user is logged on e.g. 30 minutes
- “No user” policy – Enter low-power mode when nobody is logged on e.g. 10 minutes

NB: If the timeout of the “Default” and “No User” policy are the same, the “No User” policy can be ignored. The sections below explain how to configure these policies.

Walkthrough: “Default” policy to disable idle-based power management

To disable idle-based power management by default, proceed as follows:

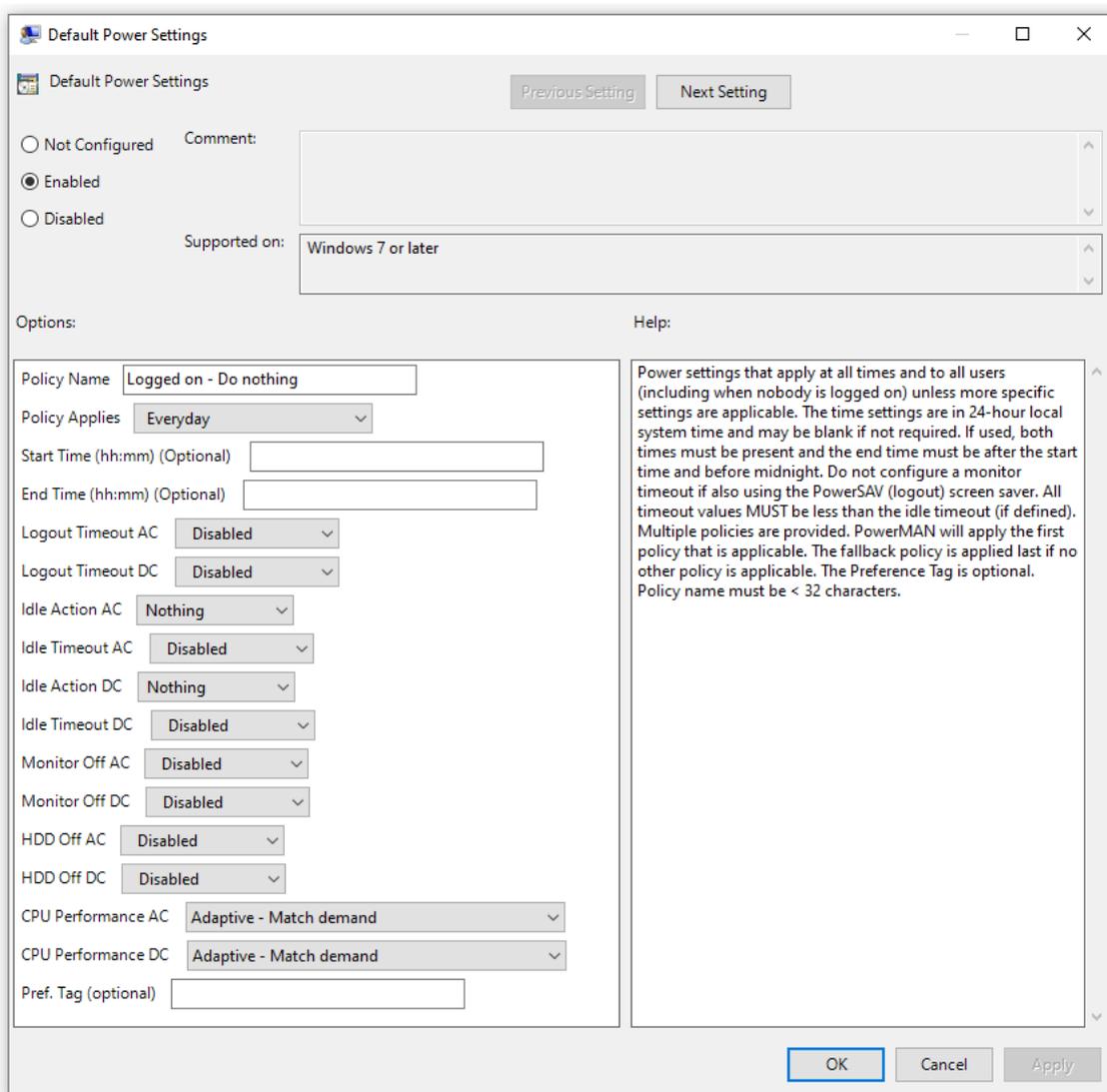
1. Open the **PowerMAN GPO** (see above)
2. Locate the **Default Power Settings** category:



3. Open the first **Default Power Settings** policy:

Setting	State	Comment
Default Power Settings	Not configured	No

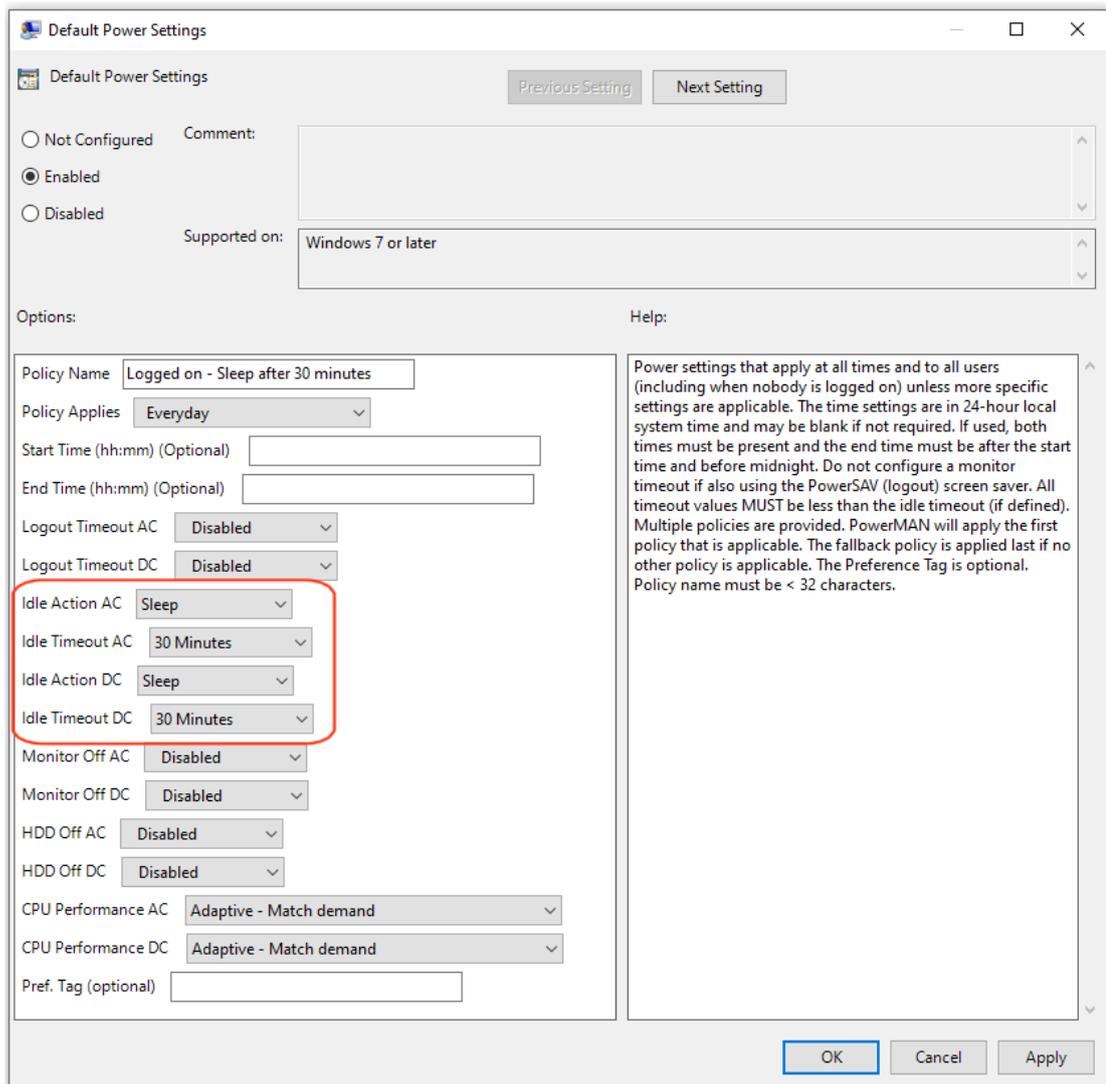
4. Set the policy name to “**Logged on - do nothing**” and set the actions / time out values to disabled / nothing as shown below:



Walkthrough: “Default” policy to sleep after 30 minutes

Alternatively, to enter sleep mode after 30 minutes of inactivity, proceed as follows:

1. Open the **PowerMAN GPO** (see above)
2. Locate the **Default Power Settings** category (see previous section)
3. Open the first **Default Power Settings** policy
4. Set the policy name to “**Logged on – Sleep after 30 minutes**” and set the actions / time out values as shown below:



Walkthrough: “No User” policy to sleep after 10 minutes when no user is logged on

To enter sleep mode after 10 minutes when nobody is logged on, follow the steps below. This is not necessary if the “Default” policy is already sufficient:

1. Open the **PowerMAN GPO** (see above)
2. Locate the **Default Power Settings** category (see previous section)
3. Open the first **No User Power Settings** policy
4. Set the policy name to **“No User – Sleep after 10 minutes”** and set the actions / time out values as shown below:

PowerMAN Power Manager v5.5

No User Power Settings
Previous Setting
Next Setting

Not Configured Comment:

 Enabled

 Disabled

Supported on:

Options:

Policy Name:

Policy Applies:

Start Time (hh:mm) (Optional):

End Time (hh:mm) (Optional):

Idle Action AC:

Idle Timeout AC:

Idle Action DC:

Idle Timeout DC:

Monitor Off AC:

Monitor Off DC:

HDD Off AC:

HDD Off DC:

CPU Performance AC:

CPU Performance DC:

Pref. Tag (optional):

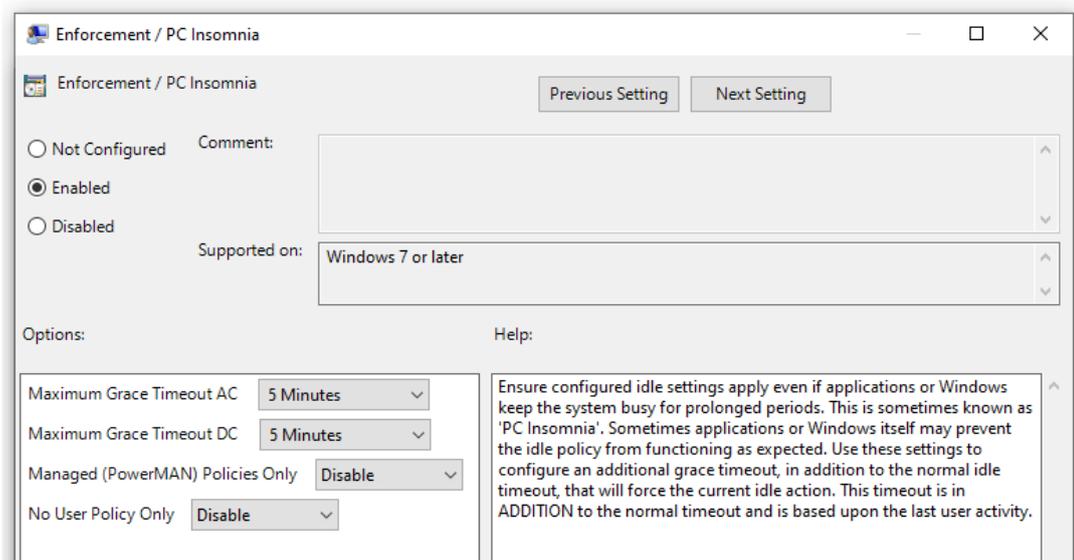
Help:

Power settings that apply when no user is logged on. These are only required if the default settings are intentionally different. The time settings are in 24-hour local system time and may be blank if not required. If used, both times must be present and the end time must be after the start time and before midnight. All timeout values MUST be less than the idle timeout (if defined). Multiple policies are provided. PowerMAN will apply the first policy that is applicable. The fallback policy is applied last if no other policy is applicable. The Preference Tag is optional. Policy name must be < 32 characters.

Walkthrough: Enable policy enforcement / anti-insomnia after 5 minute grace period

To maximise compliance, we would suggest you also enable the PowerMAN enforcement / anti-insomnia feature. This will ensure that rouge applications cannot prevent the desired power policy from activating after a short additional grace period. To configure policy enforcement, proceed as follows:

1. Open the **PowerMAN GPO** (see above)
2. Open the **Enforcement / PC Insomnia** category
3. Configure the additional grace period to 5 minutes:



Tips for a successful power management rollout

As you move towards active power management, the following tips may help:

1. Think about your users and their usage pattern. Are your user-computer relationships persistent? Will the same user use the PC next time? If the same user will be the next person to use the PC then using hibernate / sleep may be ideal.
2. If the users change frequently then hibernate or sleep may result in the computer being locked for the next user. In this case a forced logout may be a good approach. When the user has been logged out you can then implement your chosen power management strategy using a 'No User' policy.
3. PowerMAN offers several different policy management policies. Most organisations implement a standard 'Default' policy. If appropriate you may also wish to implement a 'No User' policy for when nobody is logged on. This is a good opportunity to use full power-off (shutdown) when nobody is logged on.
4. Idle (timeout) strategies generally save more energy because they allow each computer to respond independently to its environment. This works well in some environments but may be unacceptable in others with a more rigid operating schedule (for instance school classrooms).
5. Alternatively you may like to use a scheduled strategy (scheduled hibernate etc.) as your primary management mechanism. Depending upon your environment this may be a cruder approach but have the advantage of being consistent on every PC and therefore more suitable for your users.
6. Some organisations use a mixture of Idle and Scheduled approaches. This can work very well with the 'daytime' idle timeout being used for a 'light' sleep and the night-time scheduled shutdown being used to clean-up and maximize savings over night.
7. Whatever approach you use please remember that PowerMAN will work most consistently if you:
 - **Baseline the environment before implementing actual power management** – This will allow the effect of the remedial action to be quantifiably measured.
 - **Always define a Default idle policy** - even if it is configured to do nothing
 - **Always define a Global policy for hardware buttons etc.** - even if the configuration is trivial this will ensure consistency.
 - **Enable 'Policy Enforcement'** to ensure consistent application on PCs suffering from PC Insomnia.

Common Scenarios

The following table explains two common scenarios and suggested PowerMAN management strategies:

Scenario	Description	Suggested Strategy
Office / Workplace Exclusive PC access User dedicated PC	<p>Same user uses PC every day. Locked workstations are acceptable.</p> <p>Some users may leave systems on to avoid start-up delay and preserve work or allow remote access</p>	<p>Sleep system when not in use. This preserves system state ready for later access whilst permitting fast resume.</p> <p>Hibernate or power-off systems when no user is logged on. This will increase energy saving for workstations that may remain unused for some time.</p> <p>Consider enabling scheduled wake-up for start of working day. Configure system for remote wake if remote access required.</p> <p>Ensure password required on wake-up.</p>
Public access area or Hot desk office Non-exclusive access Non-dedicated PC	<p>Different user uses PC every session. Locked workstations are not acceptable.</p> <p>Users frequently change and users understand the need to save open documents before leaving a workstation unattended.</p> <p>No requirement for remote access</p>	<p>Log out inactive workstations and then use a 'No User' policy to sleep/hibernate the PC ready for the next user. This will minimize start-up delays.</p> <p>If appropriate use scheduled wake-up to match user patterns.</p>

Excluding Specific Computers via a protected 'marker' file (Alternative method)

Normally it is possible to apply the same power management configuration to each computer within an organisational unit (OU) and use a separate OU for each logical power policy. However, sometimes this may not be desirable or it may not be practical to re-arrange the OUs to match the required power scheme. **The protected computers feature may provide a more convenient method to exclude specific computers. From v5.5.0, this feature supports ? and * wildcards and system environment variables.**

In some cases, such as update scripts, it may be desirable to exclude a computer based upon the presence of special 'marker' file. In this scenario the Protected Files feature may be used to exclude specific computers.

To use this procedure proceed as follows:

1. Create an empty text file which matches the computer name (or a global name if appropriate). One way to do this is to use a computer start-up script to execute the following batch file:

```
echo %computername% > c:\%computername%.txt
```

2. Use the Protected Files feature to exclude the `c:\%computername%.txt` file. For instance the following settings would exclude three computers:

```
c:\CriticalPC.txt  
c:\OfficePC.txt  
c:\FaxServer.txt
```

The following Microsoft document provides further information on computer start-up scripts:

[http://technet.microsoft.com/en-us/library/cc779329\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc779329(WS.10).aspx)

Alternatively, Group Policy itself may be used to exclude certain computers using Security Filtering. This is explained in the following Microsoft article and related discussion:

[http://technet.microsoft.com/en-us/library/cc781988\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc781988(WS.10).aspx)
<http://adisfun.blogspot.com/2009/04/security-filtering-and-group-policy.html>

Calculating actual energy consumption

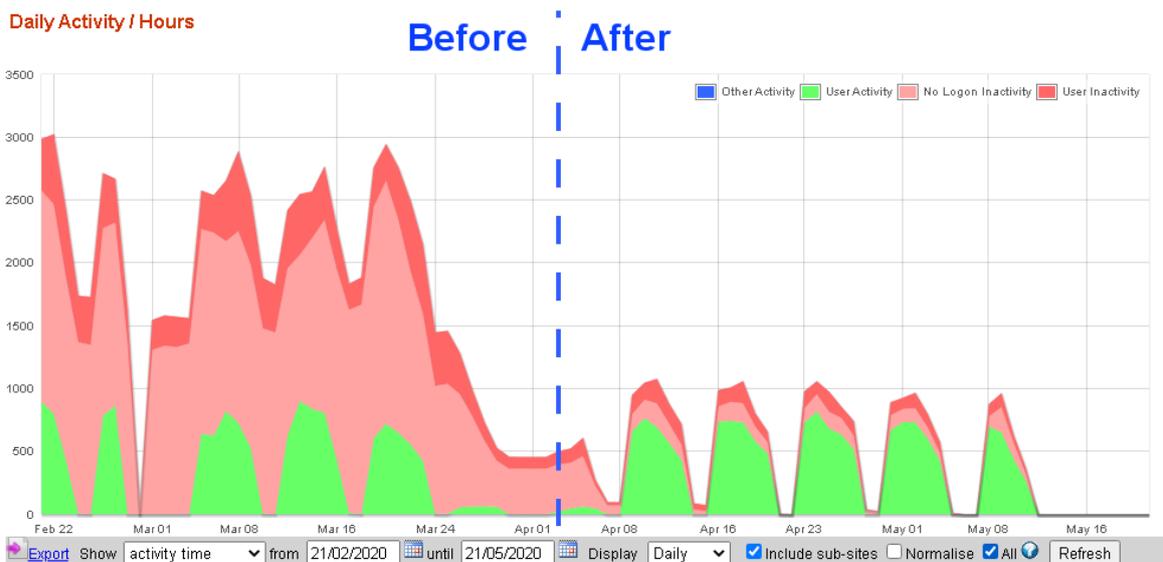
Due to the nature of PC hardware it is not possible to calculate an exact amount of energy (in watts) used by each PC. This is because the standard PC architecture does not provide a method for measuring energy. Therefore, PowerMAN measures:

- Cumulative time the computer is turned on
- Cumulative time the computer is in active use

From this information it is simple to calculate the time the computer was **not being used**. This is expressed as a number of hours 'idle'. This figure is directly proportional to amount of energy being wasted.

PowerMAN also measure other power related factors such as: The amount of time the hard disk is spun down, the monitor off, the computer was artificially prevented from sleeping by user configuration etc. In future revisions of the reporting software this information may be included to give a more detailed picture of the power consumption profile.

The Site Summary graph gives a fast, visual, indication of the amount of waste. Over a number of weeks progressive increases in the amount of power management can significantly reduce the amount (and cost) of waste.



Example: A typical desktop PC and display uses 65W. This is equivalent to 0.065 kW. Therefore, for a site of 1,000 computers, where a typical computer is idle for 6-hours/day or 42,000 hrs/week and the cost of the electricity \$0.20/kWh, the cost of energy calculation is:

$$0.065 \text{ kW} \times 42,000 \text{ hours/week} \times \$0.20 / \text{kWh} = \$546 \text{ per week}$$

This is equivalent to a yearly cost of \$28,392

A useful **rule of thumb** is that office based computers are typically used 25% of the time (40 hours per week). If the computers are not energy saving at other times, then 75% of running costs may be wasted. With suitable configuration, PowerMAN can virtually eliminate this waste.

How PowerMAN works

PowerMAN installs a service application POWERMAN.EXE on each computer. The service spends the **majority of the time in an inert state** and therefore does not have any measurable impact on system performance. Periodically (every minute or so) the service checks the current status of the computer. This process only takes a fraction of a second.

During each check, PowerMAN will:

- Determine if the system has recently been accessed by a user
- Check for the managed power scheme ('Managed policy for [username]')
- If necessary, create and configure an applicable managed power scheme

PowerMAN uses the built-in power management features of Microsoft Windows wherever possible. This is why the current PowerMAN settings can be viewed through the Windows Control Panel. This approach means that PowerMAN works alongside Windows wherever possible and allows the software to achieve maximum software compatibility. PowerMAN does implement some features (such as shutdown, policy enforcement, user logout and scheduling) internally. This is necessary because these features are not available in Windows.

PowerMAN is fully capable of configuring the power management settings for users who are not permitted, themselves, perform this action. Unlike some other solutions, this is achieved without relaxing the default security safeguards built into the operating system. In addition, PowerMAN provides finer control not normally available including:

- Default power policy
- Distinct policy for when no user is logged on
- Separate policy per user (if required)
- Multiple, time-bound, policies
- Multiple scheduled wake, shutdown, reboot sleep and hibernate policies
- Policy 'enforcement' to overcome PC 'insomnia' issues
- User override (for permitted users)
- Protection for specific programs or files from power management
- Customisable maintenance windows
- Full management reporting

PowerMAN is invisible to users and uses minimal system resources.

Additional PowerMAN Features

WakeMyPC – Ad-hoc wake and remote power-on

PowerMAN can optionally be integrated with Data Synergy's complementary [WakeMyPC](#) product. This allows any computer within a managed site to be woken on demand. This may be used by a remote worker or Technical Support to turn on a workstation that is shutdown. This feature is achieved by using the Wake-On-LAN (WoL) feature and may require some network configuration changes. This is not necessary if scheduled wake-up is sufficient alone.

PowerMAN can integrate with WakeMyPC. When this is enabled, a computer can be woken directly using the 'Wake' link on the PowerMAN reporting UI:



Data Synergy / ENGAGE	
Site	Data Synergy
Computer	ENGAGE WakeMyPC
Created	30/06/2011
Last Status	23/09/2014

WoL can sometimes be a problematic technology to introduce to an enterprise network. The most common issues are:

- WoL typically uses broadcast network packets. These are not routable and consequently can only reach devices on the local subnet. In some cases, it may be possible to re-configure your router to forward WoL packets. However, this is rarely desirable in a large network and may reduce network security. The WakeMyPC 'subnet directed broadcast' method can overcome these limitations and support secure WoL in a larger network.
- WoL must be enabled in the system BIOS and usually in Windows Device Manager. There is sometimes a degree of trial and error required to get WoL working. PowerMAN can enable WoL in Device Manager if required.

WakeMyPC is designed to comprehensively overcome these issues and provide practical and secure ad-hoc device wake-up. The WakeMyPC documentation explains suggested implementation strategies in further detail.

Troubleshooting

PowerMAN has been successfully used for over 15 years. However, problems do sometimes happen. Most issues arise during installation and can normally be solved quickly. The following section details some of the most common issues and explains possible solutions for them:

Problem: PowerMAN does not deploy correctly using the GPO method

This can occur for a number of reasons. The following should be considered:

1. Do other programs deploy correct via Group Policy?
2. Is the client computer within the correct Organizational Unit (OU)?
3. Are there any errors in Event Log?

If PowerMAN is the first program to be deployed via GPO there may be an underlying problem with the domain or active directory configuration. The following should be checked:

- Do other applications deploy successfully using the group policy mechanism from the same file-share? Sometimes applications are inadvertently configured to deploy from a local drive letter (on the server) and not a publically available share.
- The client computer is within the correct Organisational Unit (OU). This can be checked with the **Active Directory Users and Computers** snap-in (dsa.msc)
- The PowerMAN MSI is in share accessible (read access) to the **computer account** of the client PC. Sometimes there may be NTFS access restrictions that are stricter than the share permissions. Both types of permission should be checked. The easiest way to achieve this is to grant a Read Access to the group **Domain Computers**.

Remember: The Windows group policy engine runs in the security context of the computer account. Therefore the share and underlying NTFS permissions must grant access to this account. The effective permissions are the lowest common denominator of the share and NTFS permissions.

- Another policy or application may be preventing installation. This can be checked with the Resultant Set of Policy (RSOP.MSC) tool provided with Windows. The error tab contains information about policy deployment problems.
- Is the problem resolved by disabling Asynchronous policy deployment (see **Computer Configuration\Administrative Templates\System\Logon** in the Group Policy Object Editor)?
- Is the problem resolved by restarting the computer twice? Depending upon other group policies scheduled for installation and removal it can take up to two additional reboots for PowerMAN to install. This situation can also happen if the MSI and license settings are deployed separately because PowerMAN will not start until the product license key is present.

Microsoft also provides some advice on debugging GPO based deployment issues:

[http://technet.microsoft.com/en-us/library/cc787386\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc787386(WS.10).aspx)

[http://technet.microsoft.com/en-us/library/cc775679\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc775679(WS.10).aspx)

PowerMAN Power Manager v5.5

Microsoft also documents a scenario where a network timeout problem can prevent effective Group Policy application. The following document explains this and provides links to the necessary Windows hotfix:

<http://support.microsoft.com/kb/840669>

In some cases it may be necessary to investigate further by enabling 'verbose' MSI logging. This can be enabled on the client computer by creating the following Registry value:

Key: HKEY_LOCAL_MACHINE\Software\Policies\Microsoft\Windows\Installer
REG_SZ: Logging
Value: voicewarmup

This will create log files in the %temp% folder (\Windows\Temp for standard Group Policy MSI deployment. The users' own temporary folder for manual MSI deployment). This following document explains this in detail:

<http://support.microsoft.com/kb/223300>

After this setting has been enabled, reboot the PC, and allow Windows to attempt the MSI installation again. When this process has completed (or nothing has happened) log into the machine and check the log files created in the \Windows\Temp folder.

If this technique does not reveal the cause of the problem it may also be useful to enable 'verbose' logging for the Windows Group Policy engine. Please remember that this is an advanced technique and it may take some time to decipher the log files. You can enable this logging by creating the following registry value. It may also be necessary to create the Diagnostics key if one is not already present.

Key: HKEY_LOCAL_MACHINE\Software\Microsoft\Windows NT\CurrentVersion\Diagnostics
REG_DWORD: AppMgmtDebugLevel
Value: 0x4b

After this setting has been enabled, reboot the PC, and repeat the installation process described above. The Group Policy engine will create a file called Appmgmt.log in the C:\Windows\Debug\Usermode folder. This is further explained here:

<http://support.microsoft.com/kb/246509/>

NB: You may also need to create the Usermode folder if it does not already exist.

Problem: The PowerMAN application appears to deploy okay but the configured policy doesn't seem to deploy consistently

This is commonly caused by attempting to apply invalid power settings. Please check the Power Management Event Log to determine the cause of the problem.

This can also be caused by attempting to configure the majority of settings against a User object rather than a computer. The following guide lines should be applied:

- The PowerMAN service should be deployed to computers (not users)
- The majority of the settings should also be deployed to computers
- If a specific user policy is required this should be deployed using a **separate group policy** to the users

PowerMAN Power Manager v5.5

Problem: PowerMAN appears to be deployed okay and the required settings are displayed in the Control Panel Power Management applet but the computer does not shutdown/hibernate/sleep as expected

OR PowerMAN reports event #2003: The computer is being prevented from entering the idle state by an unknown program

Some programs can inhibit the Windows idle timer and effectively force the computer to remain awake. There are many legitimate reasons for this. For instance:

1. Microsoft PowerPoint forces the computer to remain active when displaying a slide show
2. Microsoft Word has been seen to prevent the computer from sleeping when editing a document.
3. Microsoft Windows will force the computer to remain awake if remote users are accessing local resources (such as printers or files) through a Windows share.
4. Cyberlink PowerDVD (or similar) forces the computer to remain active when playing a DVD
5. The PowerMAN user interface or PowerSTART tools can be used to force the computer to remain active when other programs are running or the user has specified the system cannot sleep

When this happens too often or is undesirable it can prevent timeout driven power management from working effectively. This can be because of deliberate application behaviour, intermittent activity bursts, or because of non-power management aware application development practices. This is sometimes known as 'PC Insomnia'. For instance:

1. Background activity such as anti-virus scanning, system updates (for instance Symantec Endpoint Live Update or Windows Update) or automatic system optimization (such as hard disk defragmentation) may cause the system to be relatively busy.
2. Foreground activity such as a screen saver may keep the system artificially busy. Some screensavers may intermittently perform more intensive activities that result in the idle timer being periodically reset.
3. Some (mainly optical) mice can infrequently (or worse continuously) send small movements resulting the illusion that the user is active. This can sometimes happen in the presence of fluorescent light.

PowerMAN reports this problem in the Power Management Event Log. Typically this is reported as Event #2003: "The computer is being prevented from entering the idle state by an unknown program"

The following steps should be performed to locate the cause of the problem:

1. Check the Event Log. PowerMAN logs to ensure that the desired policies have actually been applied (with no errors) and that no other program is keeping the system awake.
2. Enable the Policy Enforcement settings and re-test. In most cases the system will perform the configured idle action as expected. If this option resolves the problem then one or more of the installed programs were preventing the idle action from occurring.
3. Enable additional event logging (located in the Advanced configuration section) and restart the computer or PowerMAN service. After a few minutes check the Power Management Event Log for additional information.

PowerMAN Power Manager v5.5

4. Enable the debug log file (Advanced\All Information + Debug Log) and restart the computer or PowerMAN service. After a few minutes stop the PowerMAN service and examine the log file (see the section below on using the debug log file for more information) to determine if the system is being prevented from entering the idle state because of hardware input (mouse / keyboard) or system activity. It can sometimes help to plot the idle time remaining field using a charting tool such as Microsoft Excel. This may help you visualise the timer behaviour and understand what is happening. Often this can result in a 'saw-tooth' pattern as the timer periodically resets. There is an example of this later in this guide.
5. Reduce the idle sensitivity to a much lower value. This change increases the threshold of system activity that Windows uses to reset the idle timer. Try reducing the sensitivity to 5%.
6. Unplug the mouse and the keyboard and determine if the problem is resolved. Sometimes a faulty input device (especially an optical mouse) may be the cause of the problem.
7. Unplug the network cable and determine if the problem is resolved. If the Wake-On-LAN (WOL) feature is not required disable it. If the network card supports wake on 'directed packet' (using IP address) and this feature is not actually required try disabling it.
8. Confirm that the system will reliably sleep and/or hibernate (and resume again) on demand by using Windows Task Manager and selecting the appropriate option from the Shutdown menu.
9. Stop all running programs (one at a time if necessary) and wait for the computer to enter the idle state. This can most quickly be done by disabling PowerMAN (stop the PowerMAN service) and manually setting the idle timeout to 1 minute.

If the above steps do not reveal the cause of the problem PowerMAN Technical Support will be able to offer further debugging steps to find the cause of the problem.

Problem: A Hard Disk (HDD) spin-down policy has been applied but doesn't seem to do anything. The hard disk always remains powered on.

Unfortunately for power conservation modern installations of Windows remain stubbornly busy even when no user is present.

Unlike earlier revisions such as Windows 95/98, Windows 2000 and later includes a number of optimization features that are designed to run in the background. Coupled with the typically large number of other background services this means that many systems are never idle long enough for the system hard disk (the one containing Windows) to switch off.

On fresh OS installation it is sometimes possible for the hard disk to spin-down, in practice however, many real-world installations do not because the required level of inactivity never occurs. It is, however, quite common for systems with multiple drives to reach a point where one drive is not being used and therefore that drive will spin-down as expected. (See the next problem below for the side effects that result from this)

PowerMAN Technical support can advise on possible actions that may improve the situation.

PowerMAN Power Manager v5.5

Problem: After enabling a Hard Disk (HDD) spin-down policy the system may sometimes freeze momentarily

If the hard disk becomes idle (see above problem) for a sufficient period it will spin down to save energy. When the system is activated again (for instance by a user moving the mouse or pressing a key) the hard disk is accessed again and usually takes several seconds to spin up. During this time the system may appear to freeze momentarily.

As noted in the previous problem it is quite unusual for the system hard disk to become idle enough to spin down. However, in systems with more than one hard disk it is quite likely that the secondary drives will power off after a period of inactivity. Therefore this symptom is usually more apparent on such multi-drive systems.

Typically this problem can be resolved by increasing the HDD policy timeout to the same value as the monitor timeout. This means that the HDD will spin-up at the same time the monitor powers on and therefore the delay will not be apparent to the user.

Problem: PowerMAN reports that there are fewer computers than expected in the site

OR PowerMAN reports many more computers than expected in the site

OR PowerMAN reports unexpected duplicate computer names within the same site

OR PowerMAN reports computers that seem to be on more than 24 hours a day!

OR PowerMAN is deployed using an image based Windows installation and only one client is reported. The service appears to be operating okay on each computer

These symptoms are commonly seen in the following circumstances:

1. A problem is preventing PowerMAN being deployed correctly. This will reduce the number of computers registered in the site
2. Computers containing a working PowerMAN installation are cloned using imaging software such as Symantec Ghost.

PowerMAN uses a randomly generated identity (called the ClientGUID) to distinguish each computer within a site. If an image is deployed with such an identity PowerMAN is unable to determine this has happened and therefore all computers have the same identity. This can cause most computers to be ignored by the logging server.

This problem can be worked around by using the following technique:

- Temporarily stop the PowerMAN service with **ONE** of the following commands:

```
NET STOP POWERMAN
```

or

```
POWERMAN STOP
```

- Delete the following value from the registry:

PowerMAN Power Manager v5.5

HKEY_LOCAL_MACHINE\SOFTWARE\PowerMAN\ClientGUID

- If necessary shutdown the computer
- Create the image
- Do not restart the computer until the image is created because the PowerMAN service will create another Client GUID

Problem: PowerMAN is installed but the computers are not showing up on the reporting system

OR Power Management Event Log reports Event #6015: Downloaded XML was corrupt

OR Power Management Event Log reports Event #6032: Server failed to respond

OR PowerMAN Enterprise Server logs show frequent truncated XML uploads (typically around 1,400-1,500 bytes in size)

OR PowerMAN reporting fails to work consistently with M86 Security / Trustwave web content filter when split packet detection is enabled

OR PowerMAN reporting previously worked but the PID key expired or the workstation was turned off for a prolonged period and reporting subsequently fails to work or work consistently

PowerMAN records and transfers log data on a daily basis. The data is not sent until the close of the day. If the reporting feature is enabled the data is transferred to the reporting server. When the hosted PowerMAN reporting system is being used this is located at *.pmstats.org. If a private PowerMAN Enterprise Server is being used then this address will normally be located somewhere on the enterprise network.

The upload normally happens between 00:00 and 03:00 if the computer is on or within a few minutes of the computer next starting. Therefore, if you installed PowerMAN today it will not report anything until tomorrow.

If computers do not register within 24 hours of being installed with PowerMAN then there may be a configuration problem. The following should be checked:

1. The SiteGUID setting is correctly configured and registered on the PowerMAN reporting server. The SiteGUID should always contain the {brace} characters.
2. The server address. This is normally secure.pmstats.org. There is no need to prefix this with http:// or www.
3. The server port. This is normally 443. In some circumstances it may be necessary to use the alternate port 8080. This is commonly necessary in networks which bar all HTTP traffic but permit standard SSL traffic.
4. The server SSL configuration. This is typically enabled for the secure.pmstats.org platform and disabled for a private PMES reporting server.

PowerMAN Power Manager v5.5

5. The proxy address and port setting. If you are using a proxy server please check that server address and port are correctly configured. The proxy should permit unauthenticated HTTP traffic to the reporting server. The proxy server logs may also indicate the cause of the problem.
6. The Power Management Event Log. This will probably explain the cause of the problem. Some upload problems are reported using a standard Winsock error code. These are explained in the following Microsoft document:

[http://msdn.microsoft.com/en-us/library/ms740668\(VS.85\).aspx](http://msdn.microsoft.com/en-us/library/ms740668(VS.85).aspx)

In some cases it may be helpful to enable additional event logging (located in the Advanced configuration section) and restart the computer or PowerMAN service. This may be combined with the `FORCEUPLOAD` command (see below).

Power Management Event #6015: 'Downloaded XML was corrupt' indicates that there was a problem with the response data from the PowerMAN server. This can happen when an intermediate proxy server blocks the traffic and returns a human-readable error page.

NB: The *.pmstats.org hosted reporting service has redundant IP addresses. Ideally, firewalls should be configured to use the DNS name `secure.pmstats.org`. If this is not possible then the IP addresses should be configured to ensure reliable operation. The addresses are available here: <https://www.datasynergy.co.uk/products/powerman/PowerManagerFAQ.aspx#Firewall>

In some circumstances it can be useful to force an upload. Please remember this will only work if **more than one** day of log data is present. It is never possible to force the upload of the current, incomplete, log data. To force an upload use the following command:

```
POWERMEN FORCEUPLOAD
```

If the above steps do not resolve the problem it may be necessary to investigate and debug the network communication between the computer running PowerMAN and the server. This advanced technique may be especially useful when using an intermediate proxy server. The simplest method to investigate network requests/responses is to use the `DebugUploadFile` setting described earlier in this document. This feature is available from PowerMAN v5.5.0 and later.

Alternatively, the method below can be used with older editions of PowerMAN:

PowerMAN uses a standard Windows supplied component called WinHTTP to perform network communication. This is the same library used by most of Windows including Internet Explorer. Microsoft has incorporated a logging system into WinHTTP that can be used to examine the network traffic.

On Windows Vista and later proceed as follows:

1. Confirm that there is some PowerMAN data to upload. The easiest way to check this is to confirm that more than one log value exists in `HKLM/Software/PowerMAN/Logs`
2. Create a folder for the log files e.g. `C:\Logs`
3. Ensure that Everyone has "Full Control" access to the `C:\Logs` folder. This step is necessary because WinHttp runs in several different security contexts.
4. Open a CMD prompt and launch `NETSH.EXE`
5. At the prompt type: `winhttp` and press **Enter**
6. To view the current configuration use the following command and press **Enter**:

PowerMAN Power Manager v5.5

```
show tracing
```

7. To view the syntax available use the command:

```
set tracing /?
```

8. To configure logging use the command:

```
set tracing output=file trace-file-prefix=c:\logs\powerman  
level=verbose format=ansi state=enabled
```

This will create a series of files in the C:\logs folder.

9. Force an upload using the above technique:

```
POWERMAN FORCEUPLOAD
```

Check the C:\logs folder for a log file (there may be several). These show the network transaction with the (proxy) server

10. Remember to disable logging with the NETSH command:

```
set tracing state=disabled
```

Microsoft provides a reference to the NETSH commands used for WinHTTP logging here:

[http://technet.microsoft.com/en-us/library/cc731131\(v=ws.10\).aspx](http://technet.microsoft.com/en-us/library/cc731131(v=ws.10).aspx)

The most common proxy server communication issues are:

- Incorrect proxy server address / port setting
- Proxy server requires authentication – PowerMAN does not support proxy authentication. You can work around this behaviour by creating an proxy server exception for the PowerMAN server
- The PowerMAN server address is missing from the proxy 'white-list'

Specific problems when Trustwave Web Filtering and Reporting Suite (formerly known as M86 Web Filtering and Reporting Suite) is present:

PowerMAN reporting may fail to work consistently when Trustwave Web Filtering and Reporting Suite (formerly known as M86 Web Filtering and Reporting Suite) is present. This software is commonly used in educational establishments to provide web content filtering and logging.

This problem occurs because the web filtering software truncates multipacket HTTP POST requests. This can prevent the PowerMAN reporting protocol from operating correctly when attempting to upload a backlog of multiple days reporting data. This scenario is most common when a workstation has been turned off for a prolonged period or a PowerMAN product key has expired and been updated sometime later. This scenario is less likely if no PowerMAN reporting data backlog has built-up. For this reason the problem not initially be apparent and may emerge later.

If this problem occurs the WinHTTPTraceCfg (or proxy) logs will typically show something similar to:

PowerMAN Power Manager v5.5

"Redirected by M86 Web Filter Internet access to the requested website has been denied based upon your user profile and organisation's internet usage policy" (Result code 302)

This problem can be worked around by modifying the content filter settings to **disable split packet detection**. The M86 documentation states that this feature is disabled by default. However, if split packet filtering is enabled the scenario described above may occur.

Customers have also reported that this problem can be worked around by adding the reporting server domain (typically secure.pmstats.org) into a content filter category that is permitted for workstations with a currently logged on user and when there is no logged on user.

Problem: The PowerMAN service (or power configuration) is applied using a logon script but does not consistently work

PowerMAN is a service application and therefore must be installed by an Administrator (or via GPO). Similarly, the majority of PowerMAN settings are in the HKEY_LOCAL_MACHINE area of the registry and this is not modifiable by most users. PowerMAN cannot be installed or configured from a user logon script.

Problem: The 'Managed' power scheme does not appear in the Windows Control Panel

OR The settings in the Windows Control Panel do not match those configured

PowerMAN typically only refreshes power settings every 10 minutes. Therefore it may take a few minutes for recently changed settings to become active. Group Policy settings can sometimes take up to 120 minutes to propagate across the network. Please be patient.

You can force a faster update using the following commands:

```
GPUPDATE /FORCE  
POWERMAN RESTART
```

Sometimes it isn't possible for PowerMAN to activate the configured settings. This can happen if there is an inconsistency in the settings or (sometimes) if the hardware is not capable of configuration selected. If the desired settings do not appear in the Control Panel applet or configuration doesn't function as expected please check the Power Management event log.

Problem: Sleep has been configured (suspend to RAM). The power saving is not as great as expected

There are several levels of sleep called (S1-S3). Each offers increased amounts of energy saving by progressively stopping additional levels of the PC hardware. All resume within a second or two and therefore the highest (S3) setting should be used wherever possible. Sometimes PC motherboards are not capable of S3 (or have been configured to use S1 instead). Sometimes these are referred to as **Suspend to RAM** and **Power On Suspend**. Please check your BIOS settings to ensure that S3 support is enabled.

Problem: A scheduled wake policy has been configured but nothing happens

Unfortunately not all computers are capable of resuming from all sleep states. This functionality depends on underlying support from the PC motherboard hardware which is not always present. The following steps should be checked:

1. Check the Power Management Event Log. A problem may be preventing the wake policy from being applied
2. Use the `POWERMAN INFO` command to determine the supported wake states. Check the value of `Min RtcWake State`. This is the highest (S1-S5) state from which the computer is capable of waking. Sometimes this can be changed by modifying the BIOS settings.
3. Check the BIOS Power Management settings. Different BIOS manufacturers use different terminology for the wake-up / resume feature. If the computer supports this function it is normally located in the power management settings and may be described as S1/4 Resume, Alarm Resume or similar. This setting should not be confused with the BIOS based alarm feature (with a resume time) that is present in some older BIOS.
4. Attempt wake from different levels of sleep – some computers can wake from hibernate whilst others can only wake from the suspended state. You can test this using the `POWERMAN HIBERCHECK` and `SLEEPCHECK` commands. Remember most hardware does not support wake from the powered off state (although it is quite common for wake from hibernate to work fine). In addition, some laptop computers are designed to prevent system resume when running on battery (DC) power. To confirm this re-test the computer when the mains supply is connected.
5. Contact the motherboard vendor to determine if the required functionality is available

Problem: The computer is configured to hibernate or sleep. Sometimes the previous user leaves the workstation without logging off and this can lock the workstation for the next user

This problem can be avoided by using the logout feature. Configure the Default (or specific user) power settings to log the user out after the desired time period. Configure the Default policy idle action to 'Nothing' when using the logout feature and use a suitable No User policy to save energy. Systems configured using this approach will never be locked.

Problem: PowerMAN works correctly on some computers but gives inconsistent results on others. The settings used are the same in both cases**OR PowerMAN works correctly on some computers but others have a recurring error in the Power Management event log**

There are several reasons why this may happen:

1. **Incomplete power settings / Interaction with pre-existing settings** – This happens when pre-existing settings are not fully replaced by the new PowerMAN configuration. For instance, if specific user policies are used or a NoUser policy is applied this can still leave periods when no PowerMAN policy is applicable. In this case the pre-existing settings present on the computer are used. This

PowerMAN Power Manager v5.5

scenario is especially likely if other power centralised-management techniques (such as EZ-GPO) have been trialled on the same systems in the past.

This problem can be avoided by ensuring that a Default policy is always applied. This step may not be strictly necessary but it will ensure that a known power configuration is always operational.

2. Hardware limitations / Windows Configuration – Sometimes the configured power policy may not be supported by the computer hardware or existing Windows configuration. This commonly occurs when sleep mode is not supported (or is disabled in the BIOS) or the hibernation feature is not enabled. Depending upon the cause of this PowerMAN may use alternative settings or do nothing. PowerMAN reports this in the event log.

Rarely similar problems can happen if no global settings are employed. To avoid this and ensure that the power configuration always works as intended we suggest the following guidelines:

- Remember to check the hardware capabilities. This can be done with the `POWERMAN INFO` command. Only use sleep if it is supported by the hardware
- Similarly, remember to enable the hibernate feature if you intended to use hibernate as an idle or scheduled action
- Always configure a default policy idle (even if it does nothing)
- Always configure a Global power policy (even if its settings are trivial)
- Remember to check the event log. It may provide further explanation of the problem

Problem: The power policy doesn't work as expected. The Hard Disk / Monitor timeout is less than the idle timeout

PowerMAN will reject inconsistent settings. For instance, it is not possible to configure the hard disk to spin-down or the monitor to standby after the system has already entered a low-power state. Please change the settings to ensure that the hard disk or monitor timeout is less than the idle timeout. Please check the Power Management event log for further information.

Problem: Some computers wake-up (resume) unexpectedly

There are several reasons a PC may automatically resume from a low-power state. The following steps will help isolate the cause of the problem:

1. Unplug the mouse and the keyboard and determine if the problem is resolved. Sometimes a faulty input device (especially an optical mouse) may be the cause of the problem
2. Unplug the network cable and determine if the problem is resolved. If the Wake-On-LAN (WOL) feature is not required disable it. If the network card supports wake on 'directed packet' (using IP address) and this feature is not actually required try disabling it
3. Study the power management event log. Is there a pattern? Does the automatic resume happen at set times or regular intervals?
4. Try a minimal software image removing all non-essential applications. The automatic resume maybe caused by another application

Problem: Some computers fail to suspend / resume reliability and consistently

Successful power management implementations often make extensive use the suspend (sometimes called sleep) and resume functionality present in modern computers. In most situations these

PowerMAN Power Manager v5.5

functions work very well and require no specific configuration to be effective. Occasionally, however, some computers may have problems either successfully suspending or resuming to an operational state.

There are many potential reasons why this may happen and it may require some experimentation to fully diagnose. The following sections explain the basic steps that you can take to isolate the cause of such a problem. A separate troubleshooting section explains the steps that may be required on some systems to allow the computer to wake from a specific input (such as a USB keyboard or via Wake-On-Lan).

For the purposes of this troubleshooting procedure 'suspend' means either S1, S2 or S3 sleep (sometimes called 'suspend-to-RAM') rather than hibernation (S4) which is sometimes known as 'suspend-to-disk'. In Windows 2000 and later S4 is implemented almost exclusively by the operating system itself and therefore is less prone to failure caused by hardware or BIOS issues.

It is important to remember that **PowerMAN itself does not implement suspend and resume**. These functions are provided by the underlying Windows operating system.

Depending upon the configuration PowerMAN operates in the following ways:

- **Suspend with idle timeout** – PowerMAN creates a standard Windows power policy (visible in the Control Panel power applet – powercfg.cpl) and operating system implements the policy. There is therefore no practical difference between a centrally deployed PowerMAN policy and one manually created on the PC.
- **Scheduled suspend, enforced suspend and shutdown (Windows Vista and later)** – PowerMAN instructs Windows to suspend or shutdown the PC and the operating system implements the suspend operation. This is identical to using a third party program (for instance SysInternal's [PSShutdown](#)) to perform this procedure and very similar to pressing the suspend button.

The following procedure should be followed:

Isolate PowerMAN from the problem. Try the following steps:

1. Temporarily remove the PowerMAN service (POWERMAN REMOVE)
2. Manually create a similar power policy using the Control Panel. It may be helpful to use a minimal timeout value
3. Determine if the PC will suspend/resume reliably

Manually initiate a suspend operation:

1. Download the PSShutdown utility. This is available from:
<http://technet.microsoft.com/en-us/sysinternals/bb897541.aspx>
2. Initiate a manual suspend operation with the following command

```
pssshutdown.exe -d -t 5
```

It can sometimes be unclear if the problem is occurring during suspend OR resume. Try the following:

1. Manually suspend the PC and observe the process. A successful suspend will have the following characteristics:
 - Operation may take 5-30 seconds (depending upon configuration)

PowerMAN Power Manager v5.5

- Windows will usually report the operation is in progress. This does not happen in Windows Vista and later when hybrid sleep mode is enabled
- The screen becomes blank. External monitors should switch to standby mode within a few seconds
- The hard disk should spin down. This may make a distinctive sound
- The fan should stop running (and the PC become generally quieter)
- A hardware indicator may illuminate or start flashing to indicate the PC is suspended

2. Similarly, a successful resume will have the following characteristics:

- Resume operation can be initiated by keyboard/mouse button press or by pressing the hardware sleep/power buttons or, sometimes, opening a laptop lid.

NB: Sometimes it may not be clear how to initiate the resume process or it may not be possible to initiate resume using the desired method. This is distinct from being unable to initiate the resume process using ANY method and is discussed further below.

- The hard disk will spin up
- The fan will resume operating (and the PC become generally noisier)
- On a laptop PC the screen backlight will turn-on. On a desktop PC the monitor will return to the normal power mode (often with a distinctive click) and a flashing cursor may be displayed
- After a few moments (sometimes up to 30 seconds) the normal Windows user interface will be displayed
- The PC will respond to mouse / keyboard input and normal application operations can be resumed

If the PC will suspend but it is not obvious how to resume the PC please try the following

1. Confirm if the PC will resume automatically. This may provide reassurance the problem is caused by being unable to initiate the resume operation rather than the PC being unable to resume. The simplest way to do this is with the following PowerMAN command which will suspend the computer and then resume it 60 seconds later:

```
POWERMEN SLEEPCHECK
```

2. Double check the PC will hibernate and then resume. The simplest way to do this is with the PSShutdown utility:

```
psshutdown.exe -h -t 5
```

3. Check the PC BIOS settings and confirm the following:

- Suspend / Sleep (Sometimes called S1/S2/S3) is enabled
- The keyboard / mouse can wake the PC (especially for non-USB devices)
- USB devices may wake the PC (for USB keyboards and mice)

Determine if the problem occurs every time or just sometimes:

PowerMAN Power Manager v5.5

1. Repeat the manual suspend operation 10 times
2. Record the number of times the operation fails. Does the operation fail on suspend or resume?

Determine if the problem is caused by S1 or S3:

1. Check the PC BIOS settings and look for a setting related to suspend / sleep mode. This is sometimes called Suspend-to-RAM or S1/S3
2. Repeat the above steps for both S1 and S3. S3 is a deeper sleep state that requires less energy. Some systems work correctly with S1 but are inconsistent or unreliable with S3.

Determine if the problem occurs on a specific model of PC or with a specific software image:

1. Repeat the basic tests on a number of different computers. Does the problem only occur on specific models or with specific hardware / software revisions?
2. Try to initiate suspend directly at the logon prompt. Does the problem still occur on first boot-up prior to logging on? Does the problem become more evident after the PC has been in use for a period of time? This may indicate the problem is related to a specific application.

NB: It may be helpful to use the Control Panel power applet, powercfg.cpl, to configure the power button as a 'sleep' button.

3. Unplug any non-essential devices, reboot, and repeat the tests. If the PC has a USB keyboard/mouse and supports a legacy PS/2 keyboard/mouse retry the operation with the PS/2 devices. This may indicate the problem is related to USB (this is quite common)
4. Repeat the tests using a 'clean' software image that contains the basic Windows installation and minimal drivers
5. Check that the latest Windows service pack and hot fixes are installed. This is often easily achieved by using the Windows update tool.
6. Double check for driver updates. The most common drivers to cause problems are Video, Sound and Network related drivers.
7. Contact the PC vendor and determine if there is a known problem with suspend. Confirm if there is a BIOS update available for the PC.

The following Microsoft Knowledge Base documents may also be useful:

Article	Title
http://support.microsoft.com/kb/907477	How to troubleshoot hibernation and standby issues in Windows 7
http://support.microsoft.com/kb/815304	The computer does not resume from hibernation or does not Wake-on-LAN from standby
http://support.microsoft.com/kb/331506	Computer Stops Responding When You Stand-by or Hibernate More Than One Time
http://support.microsoft.com/kb/822827	Computer stops responding after you put it into hibernation, and then resume it from hibernation many times

http://support.microsoft.com/kb/302713	Error Message: Power Policy Manager Unable to Set Policy. Indicates Two Revision Levels Are Incompatible
---	--

Problem: Unable to resume computer using selected input / button method**OR Unable to resume PC using a USB keyboard / mouse****OR Unable to resume PC using Wake-On-Lan (WOL)****OR Unable to configure Device Manager power management remotely**

Most computers can be configured to suspend / resume with little difficulty.

However, sometimes, it can be difficult to initiate a 'resume' from suspend (S1, S2 or S3) or hibernate (S4) using the desired method. This is a distinct problem and should not be confused with systems that are unable to suspend or resume reliably. The most common scenario is that the PC can resume but not using the desired keyboard, mouse or Wake-On-Lan (WOL) method. This may cause user experience problems and potentially cause a power saving initiative to fail.

This troubleshooting section explains the most common scenarios and how they may be resolved.

There are four stages to this process:

1. Confirm the system can suspend and resume reliably (using ANY method)
2. Check the appropriate BIOS settings
3. Check the related Windows Device Manager settings
4. Check and configure the Power Management settings (this can be done with PowerMAN)

First, confirm that system can actually suspend and resume reliably using **any method**. The simplest approach is as follows:

1. Use the following command to initiate a suspend operation:

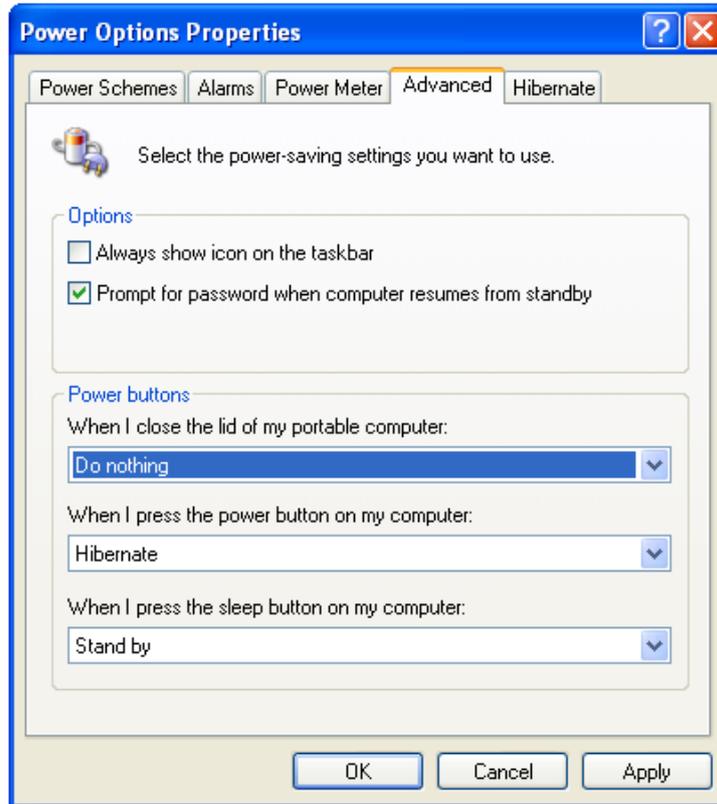
```
POWERMAN SLEEPCHECK
```
2. Wait two minutes. The system should resume automatically within this time
3. If this does not happen this may indicate the PC does not (currently) support automatic resume. Follow the following sections to resolve this.

The most simple resume method is a dedicated hardware button. Some systems include such buttons (although they are not always connected). Such buttons may normally be configured via a BIOS setting. It is not possible to configure this behaviour from Windows. Please check the BIOS configuration to determine if this is supported on your specific PC.

A second, related, approach is to initiate system resume using a legacy PS/2 keyboard (not a USB keyboard). As above, these are configured using only BIOS settings and do not require any configuration of the related Windows Device Manager entry. In some cases pressing any key will resume the system whilst in others a specific key must be pressed. Some systems also support resume via PS/2 mouse buttons. Please check the PC BIOS configuration to determine if this is supported on your specific PC.

PowerMAN Power Manager v5.5

Dedicated hardware sleep/resume buttons (including those on some legacy keyboards) may be configured using the PowerMAN 'Global Power Settings' feature. This is similar to the Power Options dialog in Windows 2000/XP/2003 Control Panel Power applet:



When investigating suspend / resume issues it can often be helpful to configure the hardware 'Power' button as the 'Sleep' button. This is especially useful on systems that do not have a dedicated sleep button or where this is not connected or appears to not function correctly. Please consider re-configuring the 'Power' button temporarily to check this.

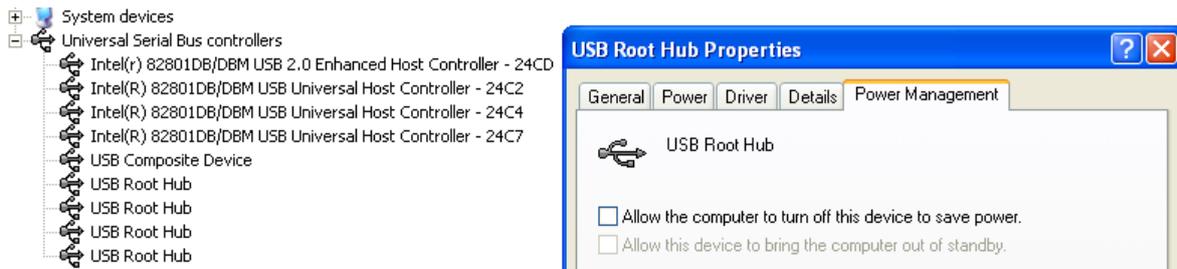
Configuring the system to resume from a USB keyboard or mouse is considerably more complex than in the legacy cases above. This is because the functionality must be configured in the BIOS, Windows Device Manager and sometimes the related USB Hub devices. To configure resume from for USB keyboard please check the following:

1. The BIOS supports USB resume and this is enabled (often there is a dedicated setting called 'Resume on USB' or similar)
2. The Device Manager entry for the keyboard has the 'Allow this device to bring the computer out of standby' option ticked:



PowerMAN Power Manager v5.5

3. If this option is unavailable (greyed out) then this may indicate that the related BIOS feature is not enabled.
4. If the USB keyboard is connected via a USB Hub then this device must be configured to remain powered and not standby. This is because the hub must remain powered for the keyboard to operate. Please remember that in some cases the USB hub may be internal to the PC. To prevent a USB hub from entering the standby state un-tick the 'Allow the computer to turn off this device to save power' option in Device Manager.



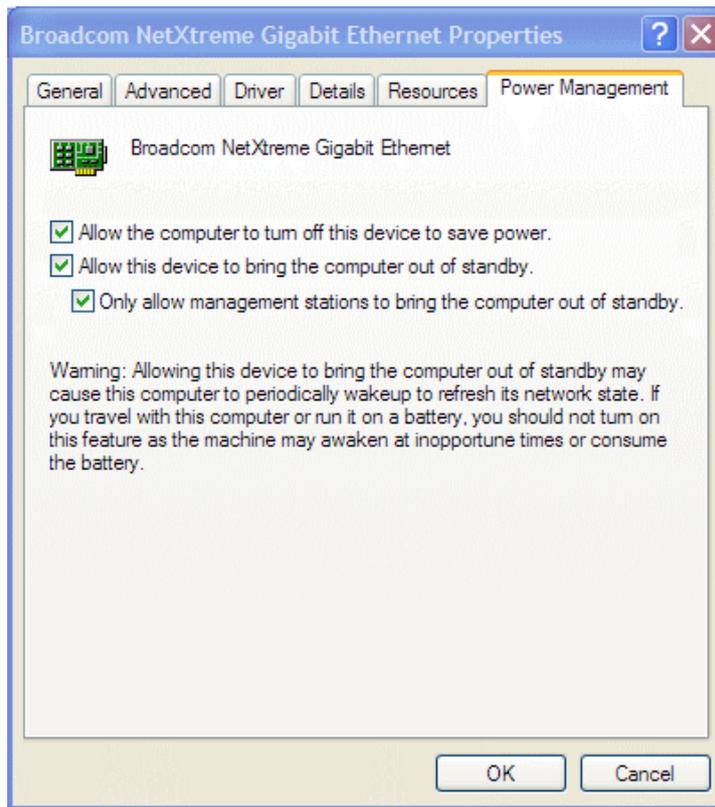
Some system administrators use the Wake-On-LAN (WOL) feature to initiate system power-on or resume from a remote location. This is commonly used for patch management and remote support. WOL is a complex topic requiring specific hardware and network support. To allow WOL to operate the following must be correctly configured on the client PC:

1. WOL must be enabled in the system BIOS (if present)
2. The following options must be selected (ticked) in Device Manager:

Allow the computer to turn off this device to save power
 Allow this device to bring the computer out of standby / wake the computer
 Only allow management stations to bring the computer out of standby

NB: Some systems are unable to resume from S5 (full power-off) using WOL. Please check your system BIOS – in many cases there is a specific setting related to S5 WOL. A 'management station' means a true WOL 'magic' packet and not more general network traffic.

Please contact Data Synergy Technical Support if you require further advice on WOL.



Sometimes it may be necessary to automate the deployment of these settings. This can be done using a script or batch file at deployment time. The following Microsoft documentation may also be useful:

Article / Title	Notes
http://support.microsoft.com/kb/837058 How to disable power management for a network adapter when you deploy Windows.	This document explains the PnPCapabilities Registry setting. This is a DWORD value where the network device wake-up configuration is stored: HKLM\SYSTEM\CurrentControlSet\Control\Class\ [DriverKey] The following (hexadecimal) values are commonly used: No options ticked = dword:00000038 Allow device power saving = dword:00000030 Allow device to wake PC = dword:00000020 Management stations only = dword:00000120 The system must be rebooted for a change in this setting to become active and be reflected in Device Manager.
Undocumented by Microsoft	The WaitWakeEnabled Registry setting is a DWORD value that is linked to the 'Allow this device to bring the computer out of standby' option in Device Manager. It may be necessary to change this setting to allow a USB keyboard / mouse to wake the system: HKLM\CurrentControlSet\Enum\[DeviceInstancePath]\Device Parameters

	<p>The following (hexadecimal) values are commonly used</p> <pre>Disabled = dword:00000000 Enabled = dword:00000001</pre> <p>The system must be rebooted for a change in this setting to become active and be reflected in Device Manager.</p>
--	--

Problem: Network drive is disconnected after system has resumed

This problem can occur on some systems if the server connection has timed out. This following Microsoft article explains how to resolve this problem:

<http://support.microsoft.com/kb/297684>

Problem: Power Management event log reports error #1019 - Product key has expired. Please contact your sales representative to obtain an updated product key. The software will continue to function in reduced functionality mode

This indicates that the PowerMANMAN PID key has expired. This can happen during product evaluations when a time limited PID key is used. Non-evaluation PID keys are perpetual and do not expire. Please contact you Sales Representative to obtain an updated PID key.

Problem: Shutdown scripts are ignored on Windows 2000/XP/2003

This problem may occur on Windows 2000/XP/2003 where an idle policy has been configured to shutdown the system rather than suspend (sleep or hibernate). The built-in Windows idle timer does not correctly support system shutdown and fails to execute operating system shutdown scripts. This is a known limitation of Windows. The PowerMAN internal shutdown timer feature is available to work around this problem. When this feature is enabled PowerMAN implements the idle timer internally and shutdown scripts will execute as expected. This feature is disabled by default. This feature is available in PowerMAN v5.2 and later.

Problem: PowerMAN is installed but not in the path (64-bit systems)

This problem may occur when the 32-bit version of PowerMAN is installed on 64-bit systems. The PowerMAN client is a common executable (EXE) on all supported versions of Windows. The client software is available in both 32-bit and 64-bit formats. The 32-bit version may be used in mixed 32/64-bit workstations estates and offers identical features on 64-bit systems. The 64-bit version is provided to support 100% 64-bit environments. If the 32-bit version is installed on a 64-bit system it is located in the **\Windows\Syswow64** folder. This is not in the standard command-prompt search path.

Problem: Power management event log reports event #4042: The managed power policy has been repeatedly applied x successive times. This may indicate that another program (or user) is changing the policy settings. It may also indicate a problem with the policy settings. This warning may also be generated if multiple policy changes are for very quick succession.

Occasionally other programs may interfere with PowerMAN. This event warns that PowerMAN has repeatedly configured the chosen power settings because some other process is also changing them. In some rare circumstances it may also indicate that Windows has changed the applied power settings because they are incompatible with the system hardware. If this continues please check policy settings, hardware support (PowerMAN INFO) and enable additional event logging to determine the cause.

Problem: Power management event log repeatedly records events #4030/4059

Events #4030 and #4059 record the pre-existing and post-configuration Windows power settings respectively. If these settings contain inconsistencies it may result in them failing to operate as expected. PowerMAN contains logic to check for such inconsistencies and warn about them both before and follow a configuration cycle. The most common inconsistency is where the video or hard disk timeout is greater than the idle timeout. PowerMAN issues these warnings for both the PowerMAN 'managed' power scheme and the built-in Windows power schemes. Therefore you may ignore these warnings if you are not using PowerMAN for active power management (e.g. monitoring only).

Problem: Power management event log repeatedly records events #4064/5004

Events #4064 and #5004 indicate that PowerMAN found conflicting Group Policy override power settings. This may prevent PowerMAN from configuring the desired power policy. To resolve this problem, remove the problem settings. These are typically configured via local / domain group policy in: "Administrative Templates/System/Power Management"

Problem: Power reporting is inconsistent or intermittent when installed alongside Windows Unified Write Filter (UWF), Faronics™ Deep Freeze™, Microsoft Steadystate or similar system restoration / system security software**OR Workstations are frequently re-imaged and this interferes with the PowerMAN reporting feature**

Several system products exist which prevent effective write-access to the local file system. These products generally operate by re-directing all file write requests to a temporary file which is deleted upon restart. This creates a system which is effectively reset upon start-up and therefore immune to unauthorised re-configuration by users or installed software. This software is commonly used in high-turnover environments such as school computer labs or university open-access areas. Such software can interfere with the PowerMAN reporting mechanism.

This happens because PowerMAN caches reporting data in the local registry and only uploads it periodically. If the system is restarted prior to a PowerMAN upload the cached data can be lost resulting in intermittent reporting coverage. The result can be large gaps in the reported data.

This problem can be avoided by using the 'Log Backup' feature located with the reporting settings. This allows a parallel reporting log backup file to be stored in an arbitrary local drive/folder. This file is used by PowerMAN if the primary registry based data is missing. This PowerMAN feature may also be used as part of a frequent re-imaging strategy. There are two common scenarios:

- **System frequently re-imaged (e.g. daily)** – Configure the log back up file and incorporate it into the re-imaging process. Typically this will require the file to be stored elsewhere prior to re-imaging and restored to the original location prior to system restart.
- **System security software** – Configure the log backup file to be stored in a protect filesystem location e.g. The 'Thaw space' for Faronics™ Deep Freeze™

Using the debug log to investigate problems (DebugFile setting)

Sometimes power policies may not behave as expected. As described above this can happen for a number of reasons and sometimes it can be difficult to pinpoint the exact cause of the problem. This was more common in older versions of Windows which had a more complex power management implementation which may rarely reject or transparently change apparently valid policies. It is much less common on Windows Vista and later.

PowerMAN includes a feature that, when enabled, will dump useful system state information to a log file every second. This feature can result in very large log files and therefore should only be enabled when investigating a problem.

There are **two different** ways that this feature can be enabled:

- Enable **Advanced/All Information + Debug Log**. This will create a file called `powerman.log` in the same folder as the PowerMAN executable file
- Manually configure a log file

To manually configure the debug log file, proceed as follows:

1. Start Regedit
2. Navigate to `HKEY_LOCAL_MACHINE\SOFTWARE\PowerMAN`
3. Create a REG_SZ (string) value called `DebugFile`
4. Set the value to the name of the desired file. For instance:

```
[HKEY_LOCAL_MACHINE\SOFTWARE\PowerMAN]
"DebugFile"="c:\powerman.log"
```

5. Restart the PowerMAN service (or restart the computer) with the following command:

```
POWERMAN RESTART
```

PowerMAN will log useful information every second to the specified log file. After a sufficient period has elapsed (ideally at least as long as the desired idle timeout plus a margin of a few minutes) proceed as follows to examine the log:

1. Stop the PowerMAN service with the following command:

```
POWERMAN STOP
```

2. Open the file. For instance:

```
NOTEPAD C:\WINDOWS\SYSTEM32\POWERMAN.LOG
```

The log file contains the following information:

Field	Meaning
CurrentUTC	The time of the log entry in UTC. A log entry is produced every second
Local	The local time. This field was added in PowerMAN v5.5.0.
Busy%	The average level of CPU activity during the last second
Idle%	The current level of idleness.

	NB: This is the internal value calculated by Windows and is NOT the same as 100 minus Busy%
MaxIdle%	<p>The maximum amount of idleness. Windows allows the idle timer to decrement whilst the current Idle% level is above this value.</p> <p>Typically this is 100% when no idle action is configured and 82% when an idle action is configured and the idle sensitivity is 50%. This value can be lowed (making the system more likely to reach idle) by reducing the idle sensitivity setting</p>
LastInput	The time of last user (mouse / keyboard input). If this value is frequently changing this indicates that the system is receiving phantom input (usually from a faulty or over sensitive mouse)
Remain Time (seconds)	<p>The amount of time remaining before the system is considered idle. This decreases (usually in 15s intervals) whilst the Idle% is above MaxIdle%. Where there is intermittent background activity (or user input) this value can decrease but will reset to the initial value before reaching 0.</p> <p>NB: Windows uses a negative value to indicate that the system is not using the idle timer. This happens when no idle action/timeout is configured</p>
Users	The number of users currently logged onto the computer
State	The internal Windows System Execution State flags. Any value other than 0x0 indicates that the system is being artificially prevented from entering idle state by a program

PowerMAN Power Manager v5.5

An example log file, where an idle timeout or action is not specified, would appear as follows:

Log started 20080604 110319

CurrentTime	Busy	Idle	MaxIdle	LastInput	Remain	Users	State
20080604 110319	100	58	100	20080604 110318	-15s	1	0x0
20080604 110320	19	58	100	20080604 110318	-15s	1	0x0
20080604 110321	0	58	100	20080604 110318	-15s	1	0x0

Note that the MaxIdle% is 100% and the remaining timeout value is -15 (The timer isn't running).

A common scenario is that a faulty (or poorly designed) mouse may introduce phantom inputs. This can be exacerbated by the presence of florescent lighting. Note that the LastInput field changes in every entry. This results in the idle timer being reset and therefore the system will never idle. In such a situation the log may appear as follows:

CurrentTime	Busy	Idle	MaxIdle	LastInput	Remain	Users	State
20080604 110319	0	58	82	20080604 110319	1200s	1	0x0
20080604 110320	1	58	82	20080604 110320	1200s	1	0x0
20080604 110321	0	58	82	20080604 110321	1200s	1	0x0

Another typical scenario occurs when a program artificially prevents the system from reaching the idle state. You can determine if this is happening by examining the **State** field. Any value other than 0x0 indicates that the system is currently being prevented from idling. For instance

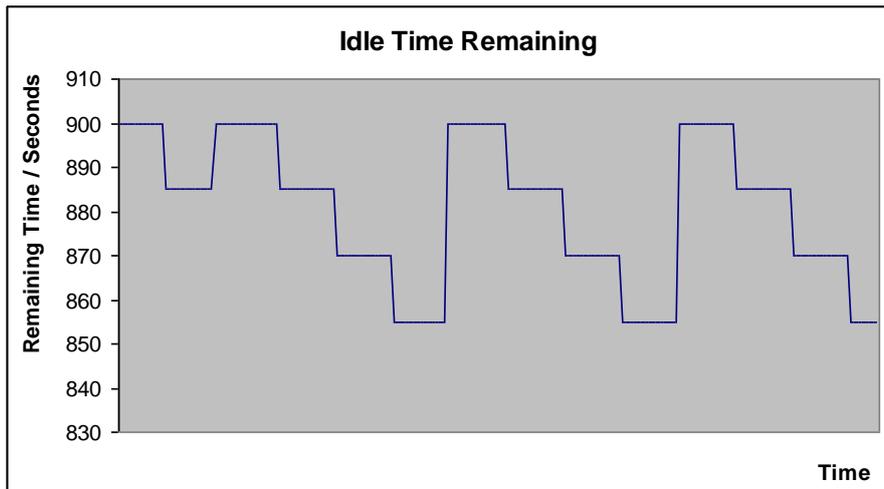
20080604 110321	0	58	82	20080604 110321	1200s	1	0x7
20080604 110322	0	58	82	20080604 110321	1200s	1	0x1

Finally, another scenario may be that an intermittent background process (such as the screen saver) may be preventing the system from reaching the idle state. In this situation the remaining idle time may appear to initially decrease but will frequently reset to the initial value. This may appear as follows (intermediate records have been omitted for brevity):

20080604 100003	10	97	82	20080604 095736	1200s	0	0x0
...							
20080604 100034	0	98	82	20080604 095736	1185s	0	0x0
...							
20080604 100049	8	92	82	20080604 095736	1170s	0	0x0
...							
20080604 100104	0	90	82	20080604 095736	1155s	0	0x0
...							
20080604 100134	0	79	82	20080604 095736	1200s	0	0x0
...							
20080604 100159	0	98	82	20080604 095736	1185s	0	0x0
...							
20080604 100239	8	92	82	20080604 095736	1170s	0	0x0
...							
20080604 100304	0	90	82	20080604 095736	1155s	0	0x0
...							
20080604 100334	0	79	82	20080604 095736	1200s	0	0x0

NB: Some versions of PowerMAN include additional fields in the debug log file. If you need more information on these please contact Technical Support.

It can sometimes help to plot the idle time remaining field using a charting tool such as Microsoft Excel. This may help you visualise the timer behaviour and understand what is happening. Often this can result in a 'saw-tooth' pattern as the timer periodically resets before reaching zero. This is a classic sign of 'PC Insomnia':



Other Deployment Resources

The following Microsoft resources may also be useful:

[302430](#) How to assign software to a specific group by using Group Policy

[224330](#) Assigning a Windows Installer Package with minimal interaction

[257718](#) How to create a third-party Microsoft Installer package (MSI)

[278472](#) Packages assigned to computers with Group Policy are not installed

Using the upload log to investigate reporting problems (DebugUploadFile setting)

In some cases, the PowerMAN reporting (upload) feature may not work as expected. The most common reasons for this are that the reporting server address/port is incorrectly configured or the server is inaccessible due to a proxy or other network filter. The **DebugUploadFile** setting, introduced in PowerMAN v5.5.0, can be used to troubleshoot such scenarios by recording all network transactions in a log file. This replaces a variety of less convenient methods that were necessary in prior versions of PowerMAN.

To enable the network logging feature, proceed as follows:

6. Start `Regedit`
7. Navigate to `HKEY_LOCAL_MACHINE\SOFTWARE\PowerMAN`
8. Create a `REG_SZ` (string) value called `DebugUploadFile`
9. Set the value to the name of the desired file. For instance:

```
[HKEY_LOCAL_MACHINE\SOFTWARE\PowerMAN]
"DebugUploadFile"="c:\network.log"
```

10. Restart the PowerMAN service (or restart the computer) with the following command:

```
POWERMANTEST RESTART
```

11. Force a report upload with the command:

```
POWERMANTEST FORCEUPLOAD
```

PowerMAN will record server requests and responses in the specified file. To disable this feature, remove the `DebugUploadFile` registry value and restart the PowerMAN service again.

Appendix A – PowerMAN Command line arguments

PowerMAN supports the following command line arguments. These may be used by an administrator to manually configure the service and report on the current installation status:

Command	Meaning
Install	Install the PowerMAN service. For example: <code>POWERMAN INSTALL</code>
Remove	Remove (uninstall) the PowerMAN service (also stops if running)
Start	Start the PowerMAN service (also installs if not already installed)
Stop	Stop the PowerMAN service
Restart	Restart the PowerMAN service
Status	Display the current service status
Makeguid	Generate a unique GUID value. This may be used for the SiteGUID
License	Check the current PowerMAN license key and expiry (if applicable)
Forceupload	Force any logged data to be uploaded immediately.
Hibercheck	Test system ability to hibernate and automatically self-resume. Examples: <code>HIBERCHECK</code> – Hibernate and resume in approximately 60 seconds. <code>HIBERCHECK 20200101</code> – Hibernate and resume on 1 st January 2020 <code>HIBERCHECK 20200201 1200</code> – Hibernate and resume on 1 st January 2020 at 12pm
Sleepcheck	Test system ability to sleep and automatically self-resume. See <code>HIBERCHECK</code> for command-line examples.
Info	Display various power related information. This is intended for use by Technical Support
Networkinfo	Report network configuration and connection status information
Supportdump	Generate a CAB file containing PowerMAN settings and debug information. This is intended for Technical Support use. This command requires Admin privileges.
Inhibit	Inhibit power management for specified period (up to 7 days). This is intended to temporarily disable PowerMAN whilst system maintenance tasks are performed. This command requires Admin privileges.
IsProtected	Report if a protected object is currently applicable. This command may be used in system maintenance scripts or to help troubleshoot the protected objects feature. The result is displayed on screen and optionally returned via the <code>%ERRORLEVEL%</code> environment variable.
IsScheduled	Report if a scheduled object is currently applicable. This command may be used in system maintenance scripts or to help troubleshoot the scheduled objects feature. The result is displayed on screen and optionally returned via the <code>%ERRORLEVEL%</code> environment variable.
DisplayOn DisplayOff	Turn the display on/off from scripts and during updates (to save additional energy)
Help	Display the command line help

Appendix B – PowerMAN Configuration with Novell ZENworks

Recent releases of Novell’s ZENworks product directly support deployment and configuration of applications using a Group Policy based method. This approach is similar to the native Windows Group Policy method and is the simplest approach for deploying PowerMAN in a Novell based environment.

The following section describes the basic approach for ZENworks 6.5. A similar method may be used for later versions of ZENworks. This method assumes the **Novell ZENworks agent** to be already deployed and the **Workstation Manager** component is enabled.

To configure PowerMAN using ZENworks 6.5 proceed as follows:

1. Locate the PowerMAN **PowerMAN5.adm** file supplied with PowerMAN



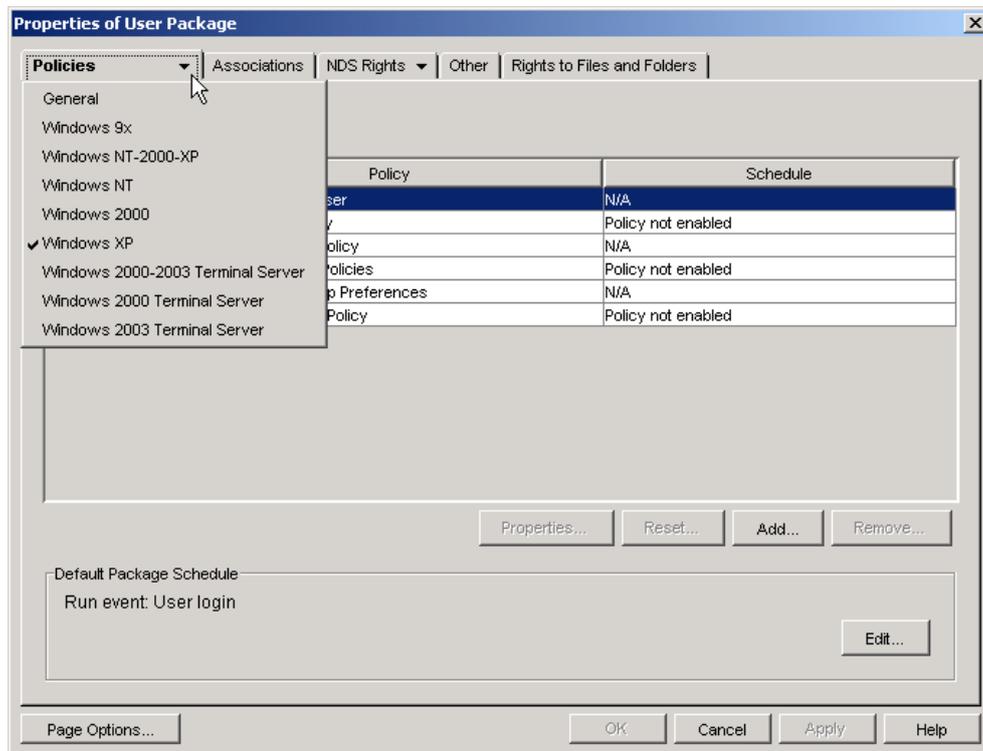
2. Open the **ZENworks ConsoleOne** tool and locate the container where you wish to create the PowerMAN policy. This should be an appropriate container for policies based upon your tree design.

NB: If this is your first policy then the container where the workstations you wish to manage are located may be an appropriate place to start.

3. Right Click and select **New Policy Package**
4. Select **Workstation Package** and click **Next**



- Click the **Policies** tab and select the operating system(s) you wish to deploy PowerMAN to:



Remember: It is strongly recommended that you create a separate policy for each supported operating system. Whilst ZENworks does allow a unified (multiple operating system) policy to be created Novell recommend that the policy for each operating system be configured from a client running that operating system. In other words the Windows 7 policy should be configured on a Windows 7 client and the Windows 8 policy should be configured on a Windows 8 client.

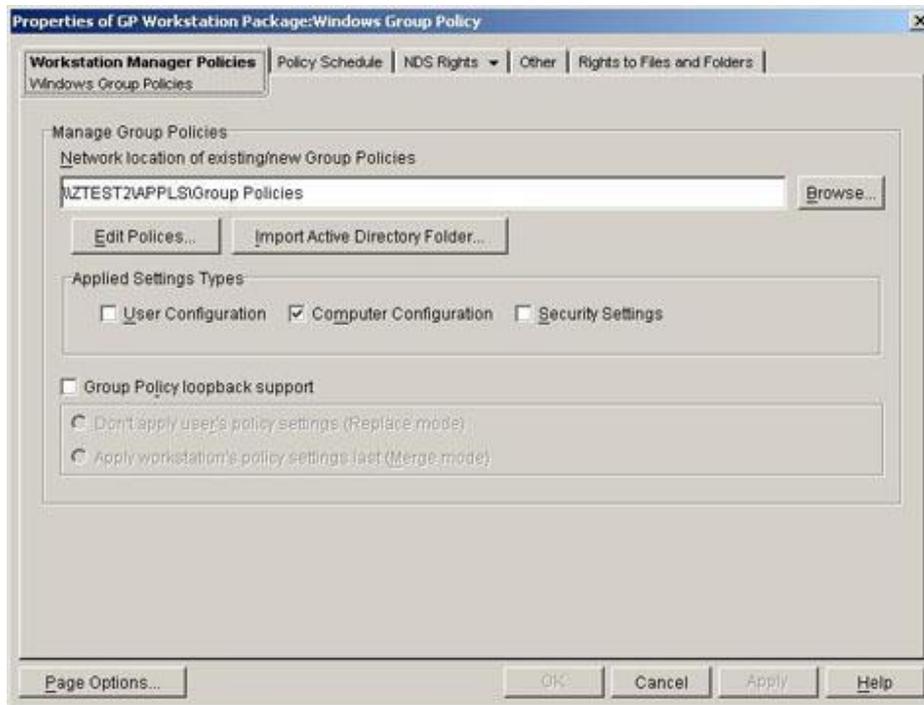
- Tick the **Windows Group Policy** option and click **Properties**



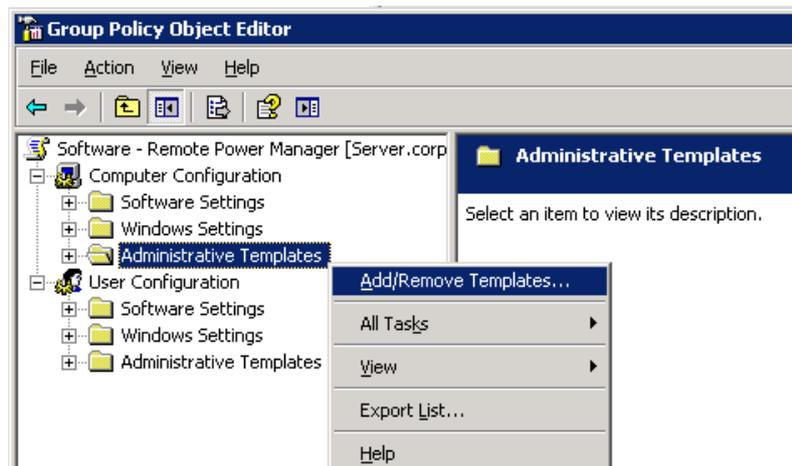
- Tick **Computer Configuration**
- Click **Browse** and locate the UNC path where you wish to store the resulting .POL file.

PowerMAN Power Manager v5.5

NB: A UNC path should be used to avoid problems with drive letter mapping. This path should be accessible to workstation objects that you wish to configure.



9. Select **Edit Policies**. The **Windows Group Policy Object Editor** will open
10. Navigate to the **Computer Configuration / Administered Templates**, right click and select **Add/Remote Templates**:



11. Click **Add** and locate the **PowerMAN5.adm** file supplied.

NB: It may be helpful to remove the other administrative templates present using the **Remove** button. These are not required for PowerMAN.

12. The **Administrative Templates** section should now contain a section for **PowerMAN Power Management** (other sections may be present depending on server configuration). Select the **PowerMAN Power Management** section and configure the appropriate PowerMAN settings.

PowerMAN Power Manager v5.5

13. For instance, to configure the license settings select **Product Licensing**, right click and select **Properties**
14. Select **Enabled**, carefully enter the product details supplied with the software, and click **Ok**



15. When the appropriate settings have been configured close the Group Policy Object Editor and return to the ZENworks package settings
16. Open the **Policy Schedule** tab, drop down **Schedule Type**, and select **Event**
17. Configure the policy to apply on the **Service Startup** event.
18. Open the **Associations** tab and select the container(s) you wish to associate this settings package with.
19. Click **OK** to complete the package configuration

There is further information about Group Policy based workstation packages on the Novell website:

<http://www.novell.com/documentation/zenworks65/?page=/documentation/zenworks65/dmadmin/data/a777rvi.html>

Appendix C – PowerMAN Configuration with RM Community Connect 3/4

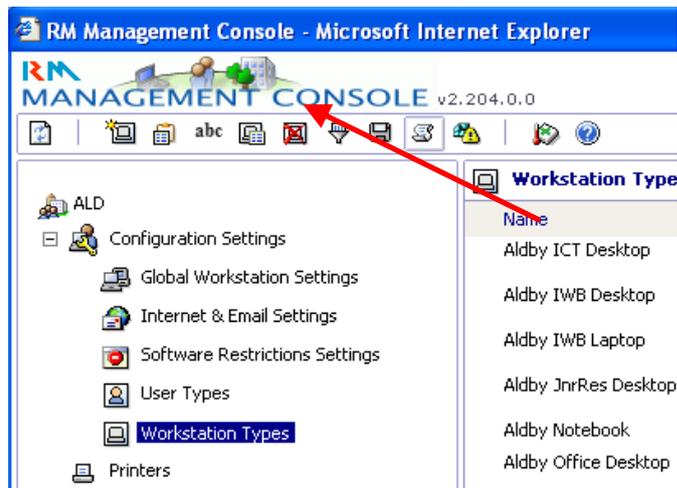
The following section describes the basic configuration approach for RM Community Connect 3. A similar method may be used for other versions of Community Connect (CC).

To configure PowerMAN using RM Community Connect proceed as follows:

1. Locate the PowerMAN ADM file and copy it to the location where group policies are stored on the server.

NB: On a workstation, this folder is normally L:\Type Manager\ADM (e.g. the RMMManage share) or if at the server, it is D:\RMDelivery\RMMManage\Type Manager\ADM.

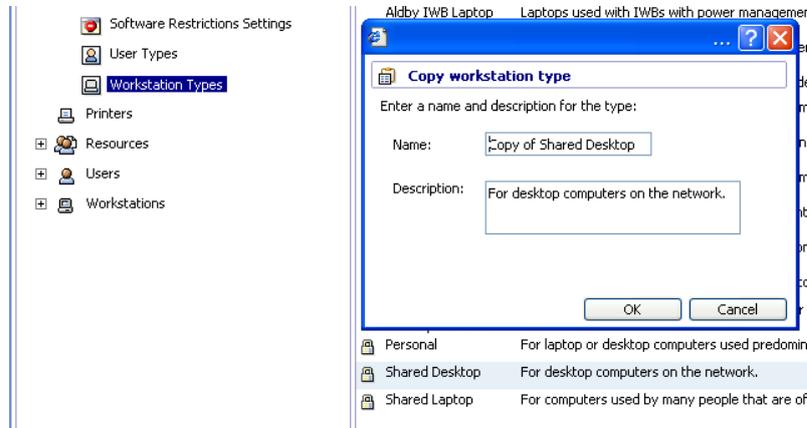
2. Login to the RM Management Console (RMMC) as System Admin.
3. Expand Configuration settings and click on 'Workstation Types' and then on 'Type Options' at the top (4th button from the right).



4. A drop down list will appear. Tick the new policy and click OK.
5. The new policy will be applied to a group of computers. To create a workstation type (it is not possible to change the properties of standard RM workstation types), select an appropriate workstation type to copy, e.g. Shared Desktop. Right-click on it, select copy and then give the workstation type a meaningful name.

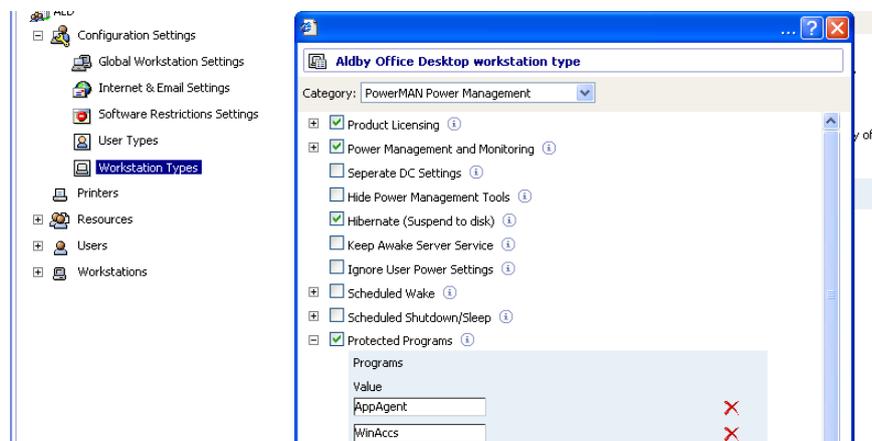
PowerMAN Power Manager v5.5

Hint: Avoid using a name with something which is exactly the same as your 3-letter establishment code as this can sometimes cause confusion in Active Directory. In the example above and below, the code is ALD but workstation type names start with Aldby.



6. Edit the properties of the new workstation type. Double click the new type and select the PowerMAN Power Management option from the drop-down list.
7. Configure the product licence details and other PowerMAN settings as required.

Hint: It can be helpful to configure 'AppAgent' and 'WinAccs' as protected programs. This will avoid the computers suspending whilst lengthy updates are being installed.



8. Finally select a workstation computer to test the policy. Apply the policy to this workstation by assigning that workstation to the new workstation type. To do this locate the PC in the RMMC, select it's properties, and on the General page, change the workstation type to be the new one. Restart the computer (a second reboot may sometimes be required) and the policy should be applied.

Hint: A useful tip is to make a change to the screen-saver, or the colour of the pre-login desktop at the same time as you are making other policy. Then when you see that, you know that the other policy will be in effect, too.

Appendix D – PowerMAN Policy Settings Reference

PowerMAN is designed, primarily, for configuration with the Microsoft Windows group policy tools supplied with all recent versions of Windows Server. An Administrative Template file is supplied to simplify this process.

PowerMAN may also be configured by manually creating a suitable settings and importing them into the system registry of the deployed workstation computers. This section documents the supported policy settings and their default values. In a few cases options available via the registry are deliberately omitted from the associated ADM file. These options are intended for advanced configuration and troubleshooting.

General Information

Unless otherwise noted all settings are of type REG_DWORD. True is indicated by 1. False is indicated by 0. Where no value is specified for a setting (it is missing) a sensible default value is assumed.

The following are valid values for settings marked **_ACTION**:

_ACTION Meaning	REG_DWORD Value
PowerActionNone	0
PowerActionSleep e.g. S0ix-S3	2
PowerActionHibernate e.g. S4	3
PowerActionReboot	5
PowerActionShutdownOff	6

NB: Some policies only support a subset of the above actions

The following are valid values for settings marked **_STATE**:

_STATE Meaning	REG_DWORD Value
PowerSystemWorking	1
PowerSystemSleeping1	2
PowerSystemSleeping2	3
PowerSystemSleeping3	4
PowerSystemHibernate	5
PowerSystemShutdown	6

The following table may be useful for calculating values expressed in seconds:

Time in seconds	REG_DWORD Value (Decimal)
Disabled	0
1 Minute	60
5 Minutes	300
60 Minutes	3600 etc

Product Licensing

The product license settings are stored in **HKLM\SOFTWARE\Policies\PowerMAN:**

Registry Setting Name / Type	Meaning
RegisteredOrganisation REG_SZ e.g. Example Supplies Ltd	Organisation name supplied with the PowerMAN product key. This forms part of the product key and must be entered exactly.
RegisteredProductKey REG_SZ e.g. KHAT-RDJV-XGQX-JURT-KKXR-KYTH	The product key supplied with PowerMAN. This is exactly six groups of four characters separated by five dashes.

Power Management Reporting

The reporting settings are stored in **HKLM\SOFTWARE\Policies\PowerMAN:**

Registry Setting Name / Type	Meaning
SiteGUID REG_SZ e.g. {c0388a36-0826-4566-ba64-c22a96cb7863}	Unique site identity used to track a group of computers that are managed as a single entity. This value can be generated with the <code>Makeguid</code> command line option.
LogServer REG_SZ e.g. secue.pmstats.org	The address of the logging server. This can be blank if management reporting information is not required. The standard hosted "cloud" platform is secure.pmstats.org
LogServerPort REG_DWORD e.g. 443	The port number of the logging server. The default "secure.pmstats.org" port is 443 . The default port with a private PMES server is 8080.
LogServerSSL REG_DWORD 0=Disable 1=Enable	Use SSL/TLS encryption for data uploads. This should typically be enabled for the hosted "secure.pmstats.org" platform and disabled for private reporting servers (unless a security certificate is installed).
UploadLiveStatus REG_DWORD 0=Disable 1=Enable	Report live power management status data.
UploadNetworkInfo REG_DWORD 0=Disable 7=Enable	Upload network information including adapter names, MAC addresses and IP addresses for both IP v4 and IP v6. NB: A value of 7 enables this feature. Other values are reserved for future expansion.
UploadHardwareInfo	Report hardware details of workstation.

REG_DWORD 0=Disable 1=Enable	
---	--

Advanced Power Management Reporting

The advanced reporting settings are also stored in **HKLM\SOFTWARE\Policies\PowerMAN:**

Registry Setting Name / Type	Meaning
LogProxy REG_SZ e.g. 192.168.1.1	<p>The address of the local proxy server that PowerMAN must use to send management information to the logging server. This can be blank if a proxy server is not required.</p>
LogProxyPort REG_DWORD e.g. 8080	<p>The port number of the proxy server. This is typically 8080. This value has no effect if a proxy server address is not defined.</p>
CacheDays REG_DWORD e.g. 28	<p>The number of days that reporting information will be retained locally.</p> <p>Data is normally cached for up to 28 days. This allows logging to continue when the client computer is off the network or the logging server is unavailable. This setting can be used to adjust this default value (minimum 28 days)</p> <p>The power logs are stored in HKLM\SOFTWARE\Powerman\Logs</p>
CacheBackup REG_SZ e.g. %windir%\system32\logfiles\PowerUsage.xml	<p>Some sites frequently reinstall (sometimes called re-image) workstations to ensure a smooth user experience. In such sites the most recent power usage information can be lost during a re-installation. This can be avoided by configuring PowerMAN to store a backup of the usage information. It is the responsibility of the system administrator to ensure that this file is protected during the reinstallation process by either excluding it from being over-written or by moving it to a save location.</p> <p>This setting must refer to a local path.</p>
HidIdentity REG_DWORD 0=Disable 1=Enable	<p>Do not report the workstation name (and MAC address and OU membership if applicable) to the reporting server. This option may be required to meet privacy requirements in some jurisdictions.</p>

Miscellaneous Configuration

PowerMAN supports the following miscellaneous features on a per-machine basis. These are stored in **HKLM\SOFTWARE\Policies\PowerMAN**:

Registry Setting Name / Type	Meaning
SeparateDCPolicy REG_DWORD 0=Disable 1=Enable	Allow separate DC settings to be configured. When disabled any DC settings are ignored. This option should be set to not-configured or disabled except when configuring PowerMAN for use with portable computers. If separate DC settings are used care should be taken to ensure they are compatible with the AC settings.
EnableHibernate REG_DWORD 0=Disable 1=Enable	Enable support for the hibernate (S4) power saving option. This is the same as ticking the hibernate option in the local control panel applet. If hibernate is not enabled attempts to hibernate will normally result in a suspend to RAM (S1-S3) instead.
IgnoreUserSettings REG_DWORD 0=Disable 1=Enable	Ignore any user specific power settings. When a user is logged in the default policy settings will apply. When no user is logged in the No User settings will apply.
IgnoreUserOverride REG_DWORD 0=Disable 1=Enable	Ignore user opt-out configuration. This option also removes the user opt-out option from the user interface menu.
DiscardUserOverride REG_DWORD 0=Disable 1=Enable	Discard user opt-out selection upon logout / reboot.
DiscardUserKeepAwake REG_DWORD 0=Disable 1=Enable	Discard user keep awake selection upon logout / reboot.
AllowWakeTimersAC REG_DWORD 0=Disable 1=Enable	Globally enable/disable hardware wake-up timers on AC power
AllowWakeTimersDC REG_DWORD 0=Disable 1=Enable	Globally enable/disable hardware wake-up timers on battery power

ServerServiceKeepAwake REG_DWORD 0=Disable 1=Enable	When enabled and the Server service is running, the system will not sleep, hibernate or shutdown. This option should normally be either not configured or disabled unless specifically required as incorrect configuration will result in increased energy consumption. This option has no effect if the Server service is not running.
--	---

Scheduled Events

PowerMAN supports both scheduled wake and shutdown features. These are stored in the following Registry locations respectively:

HKLM\SOFTWARE\Policies\PowerMAN\AutoShutdownX
HKLM\SOFTWARE\Policies\PowerMAN\AutoWakeX

where X is a number from 1-n.

Days for auto-shutdown/wake are configured using the following bit mask values:

DAY	REG_DWORD Value
Sunday	1
Monday	2
Tuesday	4
Wednesday	8
Thursday	16
Friday	32
Saturday	64

To determine the value for a specific combination of days add the required values together:

For example:

Weekdays (Monday-Fri) = 62
 Weekends (Sat/Sun) = 65
 Everyday (Sun-Sat) = 127

The supported scheduled wake settings are as follows:

Registry Setting Name / Type	Meaning
AutoWakeDays REG_DWORD Sun=1, Mon=2, Tues=4...Sat=64 etc e.g. 62 (Monday-Fri)	The weekdays that the scheduled wake policy will apply (typically All or Mon-Fri). This option may be extended by editing the ADM file. See appendix for further details.
AutoWakeDates REG_SZ CSV separated list of days of the month e.g. 1, 10	The days of the month that the scheduled action will apply. This works in combination to the weekdays specified and may be left empty if not required.
AutoWakeLocalTime	The local time that the computer is

<p>REG_SZ</p> <p>Time in hh:mm:ss format (seconds are optional)</p> <p>e.g. 08:55</p>	<p>scheduled to wake. Typically this value is set to be a few minutes before the user requires the computer. Remember that, depending on other power settings, the computer may shutdown or sleep if no activity occurs within the timeout period.</p> <p>Policy is enabled by presence of both valid AutoWakeDays and AutoWakeLocalTime settings</p>
--	---

Similarly the supported scheduled shutdown/sleep settings are as follows:

Registry Setting Name / Type	Meaning						
<p>AutoShutdownDays</p> <p>REG_DWORD</p> <p>Sun=1, Mon=2, Tues=4...Sat=64 etc</p> <p>e.g. 62 (Monday-Fri)</p>	<p>The weekdays that the scheduled action will apply (typically All or Mon-Fri). This option may be extended by editing the ADM file. See appendix for further details.</p>						
<p>AutoShutdownDates</p> <p>REG_SZ</p> <p>CSV separated list of days of the month</p> <p>e.g. 1, 10</p>	<p>The days of the month that the scheduled action will apply. This works in combination to the weekdays specified and may be left empty if not required.</p>						
<p>AutoShutdownLocalTime</p> <p>REG_SZ</p> <p>Time in hh:mm:ss format (seconds are optional)</p> <p>e.g. 18:00</p>	<p>The local time that the computer is scheduled to enter the specified state. Typically this value is set to be a few minutes after the closing of a public access area.</p>						
<p>AutoShutdownMode</p> <p>REG_DWORD</p> <table border="1" data-bbox="188 1563 730 1659"> <tr> <td>0</td> <td>Ignore action if user logged on</td> </tr> <tr> <td>1</td> <td>Warn user. Allow user cancel</td> </tr> <tr> <td>2</td> <td>Warn user. No allow user cancel</td> </tr> </table> <p>e.g. 1</p>	0	Ignore action if user logged on	1	Warn user. Allow user cancel	2	Warn user. No allow user cancel	<p>How to apply the specified action.</p>
0	Ignore action if user logged on						
1	Warn user. Allow user cancel						
2	Warn user. No allow user cancel						
<p>AutoShutdownAction</p> <p>REG_DWORD</p> <p>This must be one of the value _ACTION values noted above.</p> <p>e.g. 3 (PowerActionHibernate)</p>	<p>The action to take. This may be sleep, hibernate, reboot or power off.</p> <p>The policy is enabled by the presence of a valid combination of all four AutoShutdown policy settings.</p>						

AutoShutdownAllowResume REG_DWORD 0=Disable 1=Enable	Allow system to wake from one power saving state to transition to another. If this feature is not enabled the system will remain in the other state and ignore the scheduled shutdown/sleep policy. This feature is typically used in sites that have a lower sleep policy during the daytime and wish to transition to a deeper state at night time. As noted elsewhere this feature requires that the hardware correctly supports a scheduled wake operation. No all hardware is capable of doing this and some hardware incorrectly reports that it supports this.
AutoShutdownOverrideMode REG_DWORD 0=Operation is not inhibited 1=Protected files/programs inhibit 2=Any application may inhibit	Allow other applications (including protected files and programs) to inhibit the shutdown/sleep operation.

Global (All User) Power Settings

PowerMAN supports the following global power management features on a per-machine basis. These are stored in **HKLM\SOFTWARE\Policies\PowerMAN\AllUsers**:

Registry Setting Name / Type	Meaning
Enable REG_DWORD 0=Disable 1=Enable (default)	Enable or disable All User Power settings. This is enabled by default. Setting this value to 0 can temporarily disable these settings. This is the same as deleting the HKLM\SOFTWARE\Policies\PowerMAN\AllUsers registry key.
LidOpenAcState REG_DWORD This must be one of the value _STATE values noted above. e.g. 0 (PowerSystemWorking)	The action to take, when running on AC power, when the computers lid (if present) is opened. Support for this feature may not be present on all hardware.
LidOpenDCState REG_DWORD	As above but applies when running on DC power
PowerButtonAcAction REG_DWORD This must be one of the value _STATE values noted above. e.g. 4 (PowerSystemHibernate)	The action to take, when running on AC power, when the power button is pressed.

PowerButtonDcAction	As above but applies when running on DC power
REG_DWORD	
SleepButtonAcAction	The action to take, when running on AC power, when the sleep button (if present) is pressed.
REG_DWORD	
SleepButtonDcAction	As above but applies when running on DC power
REG_DWORD	
LidCloseAcAction	The action to take, when running on AC power, when the computers lid (if present) is shut. Support for this feature may not be present on all hardware.
REG_DWORD	
LidCloseDcAction	As above but applies when running on DC power
REG_DWORD	
EnablePasswordOnWake	Require a password when the computer wakes from sleep or hibernate. This should normally be enabled.
REG_DWORD	
0=Disable	
1=Enable	

User, Default and No User Power Settings

PowerMAN supports three different types of power settings. All support the same options but are stored in different registry locations:

1. User specific settings are stored in **HKCU\SOFTWARE\Policies\Powerman\User**
2. No User settings (for the logon prompt when nobody is logged on) are stored in **HKLM\SOFTWARE\Policies\Powerman\NoUser**.
3. Default settings (for users without their own specific configuration) are stored in **HKLM\SOFTWARE\Policies\Powerman\DefaultUser**. These are used for every use and the logon prompt 'user' unless another specific policy is applied

Registry Setting Name / Type	Meaning
LogoutAcTimeoutSeconds	The inactive time, in seconds, when running on AC (mains Power), that will trigger the user to be logged about. This time is measured since the last user activity (mouse or keyboard input). This setting is not available for the NoUser policy.
REG_DWORD	
e.g. 300 (5 minutes)	
LogoutDCTimeoutSeconds	As above but applies when running on battery power. This setting is not available for the NoUser policy.
REG_DWORD	
LogoutForce	When enabled this option will force the logout to occur. If this setting is not enabled an application may veto the logout. Typically applications do this to prompt the user to save unsaved work therefore, if this setting is enabled, user data loss may occur. This setting is enabled for environments where data integrity is not a concern. This setting is enabled by default and is
REG_DWORD	
0=Disable	
1=Enable	

	<p>hidden in the standard ADM/ADMX file distribution.</p> <p>This setting is not available for the NoUser policy.</p>						
<p>IdleAcAction</p> <p>REG_DWORD</p> <p>e.g. 3 (PowerActionHibernate)</p>	<p>The action to take (shutdown, suspend, hibernate, nothing) upon entering the idle state</p> <p>NB: This must be one of the value _ACTION values noted above.</p>						
<p>IdleDcAction</p> <p>REG_DWORD</p>	<p>The inactive time in seconds, when running on AC (mains power), that will trigger the idle action.</p>						
<p>IdleAcSensitivity</p> <p>REG_DWORD</p> <p>e.g. 50 (Windows default)</p>	<p>The level of sensitivity applied by Windows to detect system idle. The Windows default is 50%. Some systems fail to reach idle due to background system activity. In this situation it can be useful to lower this value. A value of 5% is recommended. This must be between 5% and 90%</p>						
<p>IdleDcTimeoutSeconds</p> <p>REG_DWORD</p>	<p>Same as IdleAcAction but applies when running on battery power.</p>						
<p>IdleDcTimeoutSeconds</p> <p>REG_DWORD</p>	<p>As above</p>						
<p>IdleDcSensitivity</p> <p>REG_DWORD</p>	<p>As above</p>						
<p>VideoTimeoutAcSeconds</p> <p>REG_DWORD</p>	<p>The inactive time in seconds, when running on AC power, before switching the console monitor off.</p>						
<p>VideoTimeoutDcSeconds</p> <p>REG_DWORD</p>	<p>Same as VideoTimeoutAcSeconds but applies when running on battery power.</p>						
<p>HDDTimeoutAcSeconds</p> <p>REG_DWORD</p>	<p>The inactive time in seconds, when running on AC power, before switching the hard disk off.</p> <p>NB: This policy may not be very effective on many systems that perform frequent background tasks. See troubleshooting section for further information.</p>						
<p>HDDTimeoutDcSeconds</p> <p>REG_DWORD</p>	<p>Same as HDDTimeoutAcSeconds but applies when running on battery power</p>						
<p>CPUThrottleAc</p> <p>REG_DWORD</p> <table border="1" data-bbox="188 1809 679 1910"> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>2</td> <td>Degrade</td> </tr> <tr> <td>3</td> <td>Adaptive</td> </tr> </table> <p>e.g. 3 (Adaptive)</p>	0	None	2	Degrade	3	Adaptive	<p>The processor throttling policy to apply when running on AC power.</p> <p>Adaptive – Match performance to demand</p> <p>Degrade – Maximize energy saving by reducing CPU performance</p> <p>None – Maximize performance (increased energy consumption)</p> <p>Processor throttling is not available on all hardware and is ignored if it is not supported.</p>
0	None						
2	Degrade						
3	Adaptive						

	Typically this setting should be set to Adaptive when a user is present but may be set to Degrade when no user is logged on.
CPUThrottleDc REG_DWORD	As per CPUThrottleDC but applies when running on battery power

Policy Enforcement / Anti-Insomnia Settings

PowerMAN allows the administrator to enforce the specified idle settings. These can be used to ensure that the specified idle action will occur and cannot be suppressed by Windows or another program. These are necessary on some systems where the installed software may periodically reset the Windows idle timer or otherwise prevent the system from idling.

Policy Enforcement Setting	Meaning
ForcIdleAcExtraTimeoutSeconds REG_DWORD e.g. 300 (5 minutes)	The amount of time, in addition to the specified idle timeout after which the idle action will be forced.
ForcIdleDcExtraTimeoutSeconds REG_DWORD	As above but applies when running on battery power.
ForcIdleManagedPolicyOnly REG_DWORD 0=Disable 1=Enable	Only apply policy enforcement for PowerMAN managed policies. Enabling this setting prevents PowerMAN from enforcing third-party power policies.
ForcIdleNoUserOnly REG_DWORD 0=Disable 1=Enable	Only apply policy enforcement when no user is logged on.
IdlePendingMessageSeconds REG_DWORD e.g. 300 (5 minutes)	The time, prior to the current idle timeout, that the idle pending message should be displayed.
IdlePendingMessage REG_SZ	The message that should be displayed prior to system idle. <i>e.g. User action required. The computer will shortly sleep/hibernate/shutdown. Please close this message to postpone power saving.</i>

Protected Object Settings

PowerMAN allows the administrator to specify programs and files that, when running or present respectively, will prevent the system from enter the idle state. These are specified by listing creating a value in the following registry keys. The name of the value is not important (Windows numbers them when configured with the administrative template)

- HKLM\SOFTWARE\Policies\PowerMAN\ProtectedFiles
- HKLM\SOFTWARE\Policies\PowerMAN\ProtectedPrograms

Protected Setting	Meaning
ProtectedPrograms REG_SZ e.g. CMD	<p>Specifies a list of programs that, when running, require the system to remain awake.</p> <p>Program names should be specified without a file extension.</p> <p>e.g. CMD and <i>not cmd.exe</i></p> <p>Protected compuer names may optionally use * and ? wildcards and system environment variables. For instance, the following would identify all workstations starting with "Workstation"</p> <p>e.g. WORKSTATION*</p>
ProtectedFiles REG_SZ e.g. C:\CONDOR\ACTIVE.LOG	<p>As above but applies to files. When a file in the protected list exists PowerMAN will ensure that the system remains awake.</p> <p>Files should be fully qualified and include a file extension.</p> <p>e.g. C:\CONDOR\ACTIVE.LOG</p> <p>Protected file names may optionally use * and ? wildcards and system environment variables. For instance, the following would identify all files starting with "Active"</p> <p>e.g. ACTIVE*</p>

Resume Configuration Settings

By design Windows will return to the previous low power state two minutes after an automatic resume if there is no user activity. On some systems application behaviour may interfere with this behavior or it may be undesirable.

PowerMAN's **Resume Configuration** feature allows this Windows feature to be inhibited where necessary:

Resume Configuration Setting	Meaning
ResumeDisableResuspendSeconds REG_DWORD	<p>The inactive time, in seconds, during which PowerMAN will prevent the system from returning to the previous low power state.</p> <p>If no user activity occurs during this period</p>

	PowerMAN will subsequently allow the PC to return to the previous low power state. This process is terminated immediately upon any user activity
ResumeActivateMonitor REG_DWORD 0=Disable 1=Enable *This feature is not supported on some hardware platforms or graphics cards.	Allow the display to be turned on following an automatic system resume.

Debugging / Advanced Settings

The following debugging settings are supported. These settings are located in **HKLM\SOFTWARE\Policies\Powerman**. These are intended primarily for resolving problems under the instruction of Technical Support.

Setting	Meaning / Supported Values
IgnoreSystemActive REG_DWORD 0=Disable 1=Enable e.g. 1	When enabled this option will ignore other related tools (such as the legacy PowerCONFIG and PowerSTART) and protected objects. This means that non-user activity will not be reported and will be counted as idle time. Use this option to enforce a policy regardless of these tools.
MaskNonInteractiveSessions REG_DWORD 0=Disable 1=Enable e.g. 1	Ignore user input (mouse / keyboard) for policy enforcement when nobody is logged on. This feature is intended to workaround problem hardware such as “chatty” optical mice.
MaskUserInterfaceRecentEvents REG_DWORD 0=Disable 1=Enable e.g. 1	Disable UI notification of recent power management events. This prevents display of the orange status icon.
HostPollMS REG_DWORD e.g. 60000 Note: This value is in milliseconds	How often PowerMAN checks the current power status. This should happen at least once per minute. The default setting is 60 seconds.
PolicyUpdateMS REG_DWORD	How often PowerMAN updates the active power settings. Typically PowerMAN checks the system every 10 minutes. This option

<p>e.g. 600000</p> <p>Note: This value is in milliseconds</p>	<p>may be used to speed up (or slow down) this process. Warning: Values below 30s can have a very detrimental impact on system performance.</p>
<p>UploadTimeoutMS</p> <p>REG_DWORD</p> <p>e.g. 5000</p> <p>Note: This value is in milliseconds</p>	<p>How long PowerMAN will wait for the server before terminating an upload attempt. The default is 5 seconds</p>
<p>EventLoggingLevel</p> <p>REG_DWORD</p> <p>0 = Standard information only (default) 1 = Additional information 2 = All information (maximum verbosity)</p>	<p>The level of event logging detail required. This may be one of the supported values shown.</p> <p>Logging additional information may fill the event log and cause other events to be lost. This option should therefore only be enabled when required.</p>

Appendix E - Alternative Configuration Method - Local Group Policy / Registry Settings

It can be time consuming and potentially error prone to manually create the PowerMAN registry settings. It is recommended that the Group Policy template method is used wherever possible. However, if this approach is not practical, an alternative is to use the supplied ADM/ADMX file on a **local computer** to generate a master configuration and then deploy this using the built-in Windows Registry tools. This **Local Group Policy** approach has the advantage that it will create a consistent and reliable configuration with less likelihood of errors.

To use the ADM file on a local PC proceed as follows:

1. Install Windows on a computer that is **not** a member of a domain. It is not necessary for the PowerMAN service to be installed on the computer.
2. Create a folder, for example C:\PowerMAN and place a copy of the PowerMAN5.adm file within the folder.
3. Launch the Microsoft Management Console (MMC.EXE)
4. Navigate to the File menu and select Add/Remove Snap-in
5. Click Add
6. Select Group Policy Object Editor and click Add
7. The snap-in will default to Local Computer mode. This is correct. Click Finish
8. Click Close and then Ok to return to the main MMC window
9. Expand Local Computer Policy
10. Select Administrative Templates
11. Right click and select Add/Remote Templates
12. Click Add and locate the Powerman5.adm file. When finished click Close
13. Configure the desired power settings as per the GPO method instructions
14. Save the snap-in for later reuse (this avoids repeating steps 4-12 again) by selecting File/Save As and selecting the filename Powerman5.msc
15. Exit the management console
16. Export the generated registry settings for deployment on other computers by using the following command to create a file called PM.REG:

```
REG EXPORT HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Powerman PM.REG
```

17. Optionally, edit the PM.REG file to remove all previous PowerMAN configurations. This avoids successive configurations being inadvertently merged together. To do this, add the following lines to the top of the file using Notepad or similar:

PowerMAN Power Manager v5.5

Windows Registry Editor Version 5.00

```
[-HKEY_LOCAL_MACHINE\SOFTWARE\Policies\PowerMAN]
```

18. Deploy the settings to the required computers using your chosen deployment method. This could be one of the following:

i. REG IMPORT PM.REG

ii. REGEDIT /S PM.REG

iii. Third party deployment tool

19. If you need to create additional settings the following small batch file may be helpful. This overwrites the locally cached copy of the PowerMAN5.adm file and launches the previously saved snap-in. This process is particularly necessary if a new version of the ADM file has been released (it is normally only copied to the %windir%\system32\grouppolicy\adm\ folder when the snap-in is first configured):

```
COPY powerman5.adm %windir%\system32\grouppolicy\adm\powerman5.adm
```

```
MMC powerman5.msc
```

Example Registry File

The following registry example contains the settings for a basic site with the following properties:

1. Site GUID is **{bf9d6144-02f1-4292-9f59-225fae4f1234}**
2. Server is **secure.pmstats.org:443** (0x1bb in hexadecimal) using **SSL (encrypted) mode**
3. A Default policy applies that hibernates the system after 30 minutes (0x708 seconds) and turns off the monitor after 10 minutes (0x258 seconds)
4. A No User policy applies that powers off the computer after 10 minutes (0x258 seconds) when no user is logged on
5. Policy enforcement (anti-insomnia) that provides a 5 minute (0x12c seconds) grace period

Windows Registry Editor Version 5.00

```
[-HKEY_LOCAL_MACHINE\SOFTWARE\Policies\PowerMAN]
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Powerman]
```

```
"SiteGUID"="{bf9d6144-02f1-4292-9f59-225fae4f1234}"
```

```
"LogServer"="secure.pmstats.org"
```

```
"LogServerPort"=dword:000001bb
```

```
"LogServerSSL"=dword:00000001
```

```
"ForceIdleAcExtraTimeoutSeconds"=dword:0000012c
```

```
"ForceIdleDcExtraTimeoutSeconds"=dword:0000012c
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Powerman\DefaultUser]
```

```
"IdleAcTimeoutSeconds"=dword:00000708
```

```
"IdleAcAction"=dword:00000003
```

PowerMAN Power Manager v5.5

```
"IdleDcTimeoutSeconds"=dword:00000708
"IdleDcAction"=dword:00000003
"VideoTimeoutAcSeconds"=dword:00000258
"VideoTimeoutDcSeconds"=dword:00000258
"HDDTimeoutAcSeconds"=dword:00000258
"HDDTimeoutDcSeconds"=dword:00000258

[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Powerman\NoUser]
"IdleAcTimeoutSeconds"=dword:00000258
"IdleAcAction"=dword:00000006
"IdleDcTimeoutSeconds"=dword:00000258
"IdleDcAction"=dword:00000006
"VideoTimeoutAcSeconds"=dword:00000258
"VideoTimeoutDcSeconds"=dword:00000258
"HDDTimeoutAcSeconds"=dword:00000258
"HDDTimeoutDcSeconds"=dword:00000258
```

Appendix F – Custom Actions

PowerMAN allows specific custom actions to be performed during system suspend and resume. These actions can be run for the system or per-user. Custom actions may be used to implement workarounds for undesirable application behaviour in a power management environment or to notify a third-party component that suspend/resume is occurring.

Two action types are currently supported:

1. **CLOSEWINDOW** – Close specific application window(s)
2. **RUNPROG** and **RUNHIDDEN** – Launch application / script

Custom actions are divided in to Computer and User actions. Computer actions run in the local system account. These actions cannot interact with the user's desktop. User actions configured in a run in the context of the user and may interact with the user's desktop.

CLOSEWINDOW Action

The CLOSEWINDOW action may be used to close an application or dialog prior to suspend or immediately upon resume. This is most commonly used to work around legacy applications that fail to handle suspend gracefully or fail upon resume. In most cases the CLOSEWINDOW command has the same effect as closing the window manually or pressing the Cancel button. The exact behaviour is application specific and must be determined prior to use.

Tip: Windows allows each window to be assigned some text and a window 'class'. The window text is usually the message displayed in the title bar. The 'class' is application specific and is commonly used to group similar windows together or link them to the parent application. Each application may have many windows associated with it including some that are hidden.

The CLOSEWINDOW syntax is as follows:

CLOSEWINDOW [windowtext] [windowclass]

Where either [windowtext] or [windowclass] or both may be specified or include a wildcard (*) character.

To use the CLOSEWINDOW action proceed as follows:

1. Open the target application and ensure that it is in the correct state. For the purposes of this example the target application is 'Notepad'
2. Determine the window text (and optionally class) for the window you wish to close:

```
POWERMEN LISTWINDOWS
```

3. PowerMAN will display a list of available windows. For example:

```
;HANDLE TEXT CLASS
#10424206 "Start" "Button"
#9377002 "CiceroUIWndFrame" "CiceroUIWndFrame"
#429722238 "Example - Notepad" "Notepad"
#16978356 "Start menu" "DV2ControlHost"
#25890692 "Close" "VBBubble"
#15929788 "Jump List" "DV2ControlHost"
```



PowerMAN Power Manager v5.5

```
#7932092 "View Available Networks (Tooltip)" "VANUITooltip"
#20972380 "Task Switching" "TaskSwitcherWnd"
#19989242 "Show Results Pane" "OfficeTooltip"
#12453072 "Battery Meter" "SystemTray_Main"
```

4. Use the following command to close the specific window called 'Example – Notepad':

```
POWERMAN CLOSEWINDOW "Example - Notepad"
```

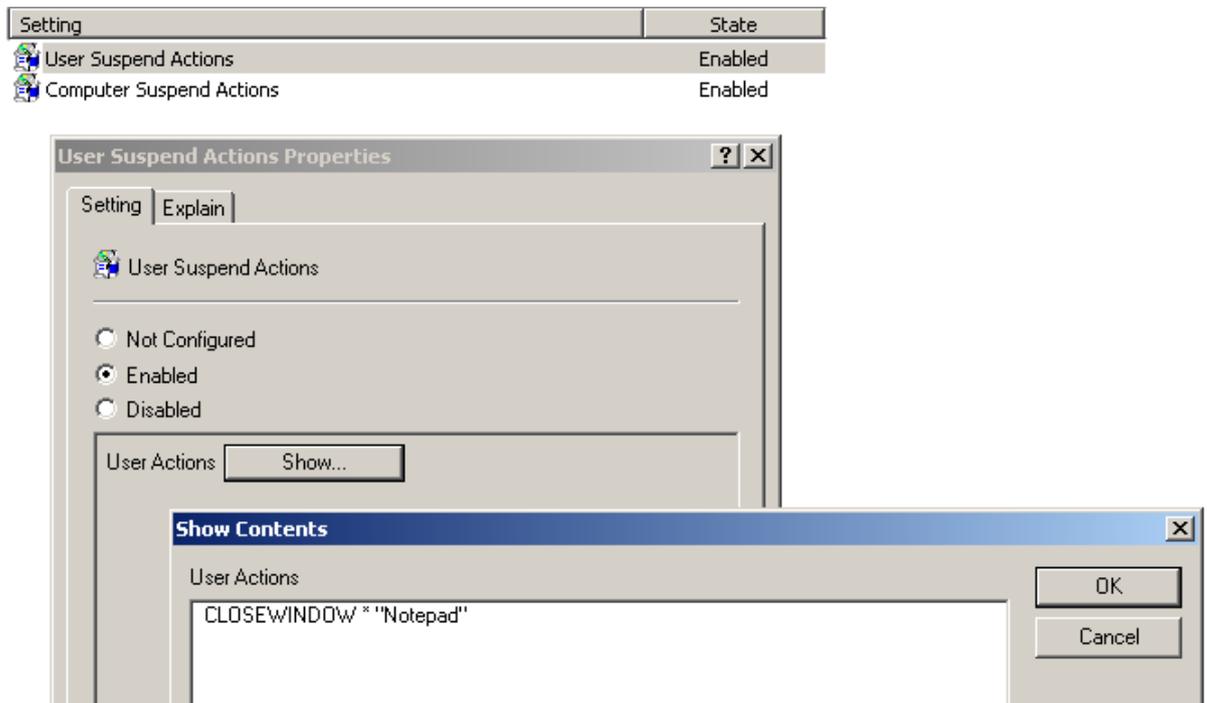
5. Use the following command to close all windows with the word 'notepad' in the title:

```
POWERMAN CLOSEWINDOW "*Notepad*"
```

6. Similarly, use the following command to close all windows with the class 'Notepad':

```
POWERMAN CLOSEWINDOW * "Notepad"
```

7. After confirming the correct command to achieve the desired behaviour add the appropriate CLOSEWINDOW command to the desired custom action policy:



Warning: Windows Vista and later allow some applications to be marked as 'High Integrity Processes'. The security feature prevents standard applications from interacting with these applications and is designed to prevent message injection attacks. CLOSEWINDOW may not be used to interact with a high integrity process. Please see the following Microsoft documentation for further details:

<http://msdn.microsoft.com/en-us/library/bb625962.aspx>

RUNPROG and RUNHIDDEN Actions

The RUNPROG and RUNHIDDEN actions may be used to launch another program during suspend or resume. The RUNHIDDEN uses the same syntax but launches the program in an invisible state.

The action syntax is as follows:

RUNPROG program [arguments]

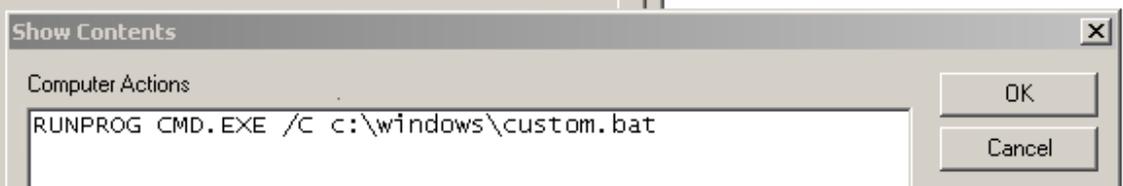
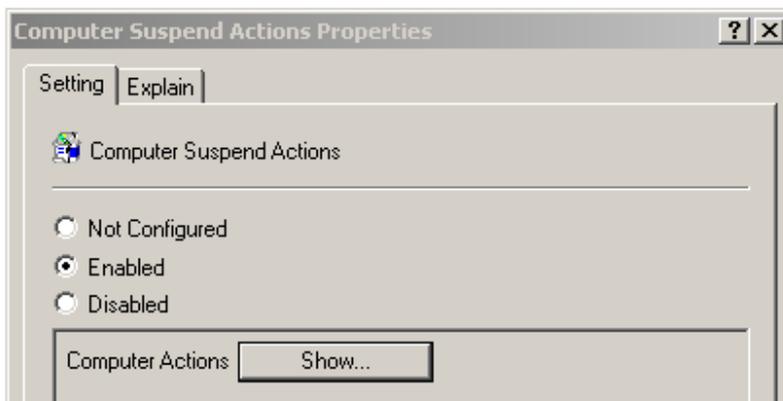
RUNHIDDEN program [arguments]

Where [arguments] may be blank.

Tip: To launch a batch file / script the program is the command interpreter CMD.EXE. For example:

```
RUNPROG CMD.EXE /C C:\WINDOWS\CUSTOM.BAT
```

Setting	State
User Suspend Actions	Enabled
Computer Suspend Actions	Enabled



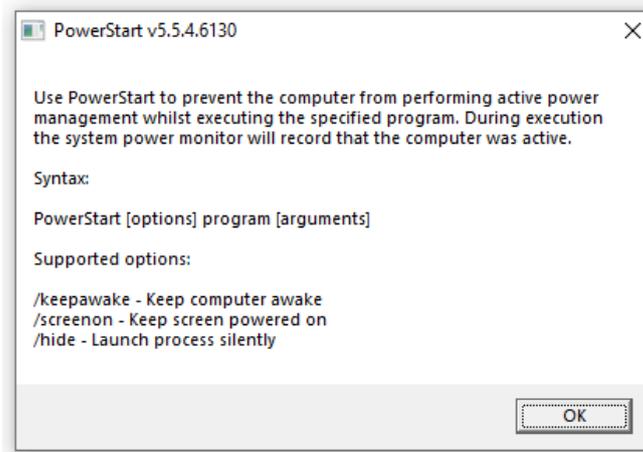
Appendix G – Inconsistent Configuration Behaviour

By default PowerMAN will try to resolve configuration problems by using the closest policy possible to that configured. This may be necessary because of inconsistent settings or missing hardware support for the chosen configuration. This feature is enabled by default. Care should be exercised when disabling this feature as it may expose problems with existing settings.

The following is a non-exhaustive list of configuration problems that may be amended by this feature:

- Mismatched global power policy or idle power policy (default, no user or specific user policy)
– The missing policy is automatically created with sensible default settings
- Policy action requires hibernate but hibernate not enabled – Hibernate is automatically enabled unless explicitly disabled
- Policy action requires hibernate but hibernate not possible – Sleep mode is automatically used instead
- Scheduled resume (wake-up) policy present but wake-up timers not enabled – Wake-up timers (Windows Vista and later) automatically enabled
- Excessive video or hard disk timeout – Inconsistent timeout reduced to match idle timeout

Appendix H – PowerSTART Tool



It is sometimes desirable to ensure the computer does not sleep or hibernate whilst performing an important task. This can be difficult to ensure whilst using standard idle based power conservation and may result in active power management being sacrificed to ensure correct operation.

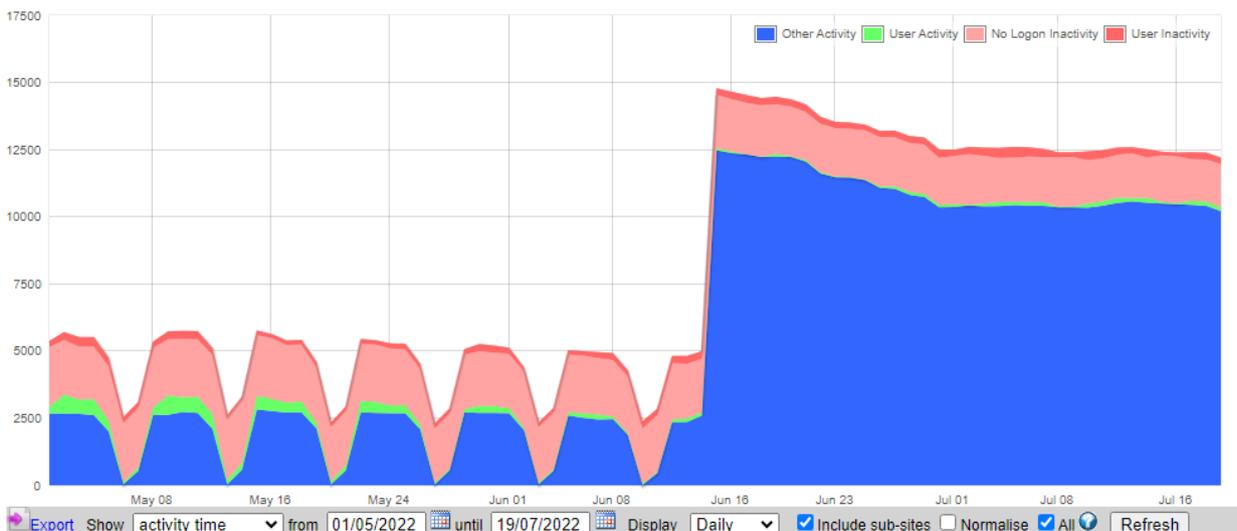
PowerMAN is supplied with a utility called PowerSTART that be used to launch a critical application. PowerSTART is included in the main PowerMAN installation when installed from the MSI file.

PowerStart can launch almost any application and whilst that program is executing will:

- Log that system was not idle (even when no user is present)
- Prevent the computer from entering the idle state

Programs launched with PowerSTART are labeled 'Other Activity' in the PowerMAN reports. This activity is shown in blue and can therefore be easily distinguished from user activity shown in green:

Daily Activity / Hours



Appendix I – PowerMAN Reporting Protocol

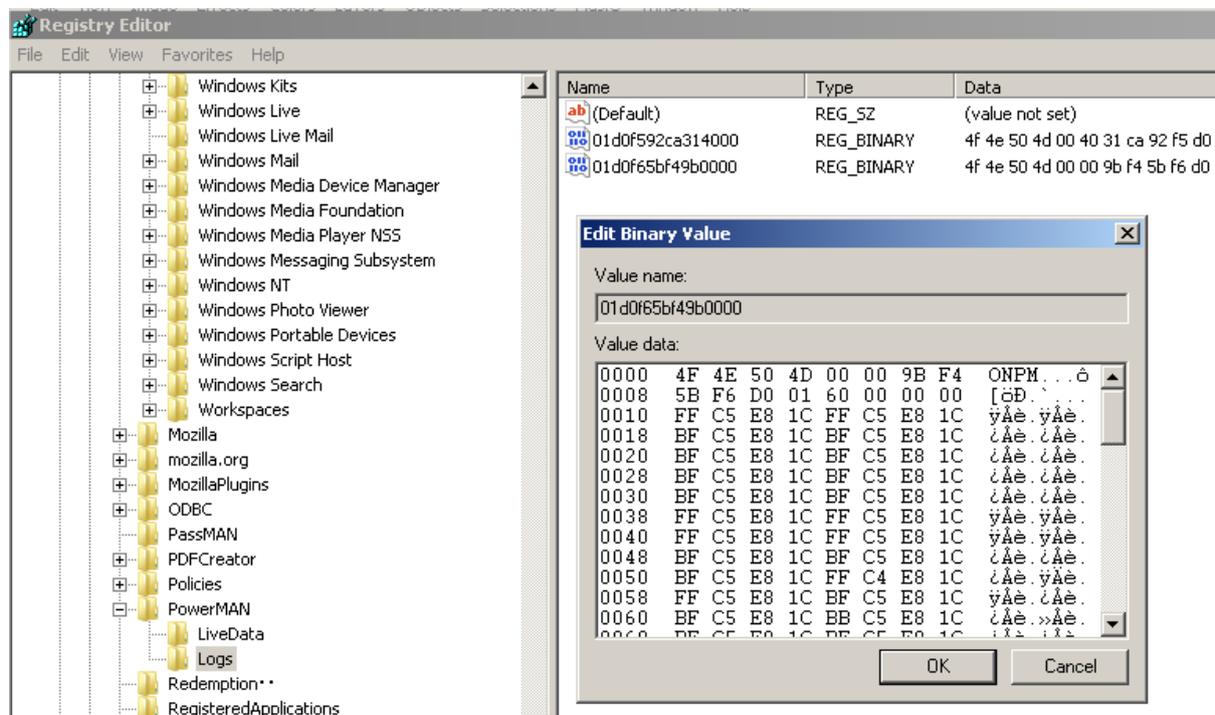
PowerMAN collects power related information on a per computer basis. This information may be used to understand the usage profile of managed PC equipment, create a tailored management policy and monitor the ongoing effectiveness of the policy.

Information is collected in an anonymous format that cannot be used to identify a specific user or the activity the user is performing. The information is uploaded in XML format using the industry standard HTTP/HTTPS POST protocol.

The log data is stored in the *HKEY_LOCAL_MACHINE\SOFTWARE\PowerMAN\Logs* key of the Windows registry. Logs are stored in binary format with a single binary record representing an entire day. Slightly less than 500 bytes of information are logged in each record. The protocol is designed to impose the minimum demand on network bandwidth and be compatible with all known proxy servers.

In normal circumstances only a single log record will be present. This represents the current active day. At midnight (or as soon as possible thereafter) PowerMAN creates a new log record and prepares to upload the previous record to the logging server. The upload is timed to happen at a random time usually between 00:00 and 03:00. If the upload is successful the log record is deleted from the registry. If the log transfer fails for any reason it is reattempted approximately every two hours until successful.

The power reporting is 'historic' and performed using Universal Coordinated Time (UTC). If PowerMAN were to be installed today it would not report anything until tomorrow. PowerMAN will normally retain log records for up to 28 days. This allows logging to continue whilst the logging server or network connectivity is unavailable. The number of days that logs are retained may be configured using the *PowerDataCacheDays* setting.



If you require further details of the PowerMAN logging and data transfer format please contact Data Synergy Technical Support.

Appendix J – PowerMAN Configuration with Microsoft Intune

Microsoft Intune (SR 2208 / August 2022 and later) supports configuration via custom ADMX policy template files. This feature can be used to configure PowerMAN with Intune. The technique is similar to the Windows Group Policy method described in the main guide.

Microsoft documents the procedure to import and use an ADMX template here:

<https://learn.microsoft.com/en-us/mem/intune/configuration/administrative-templates-import-custom>

The following section describes the basic approach with Intune.

To import the PowerMAN policy template into Intune proceed as follows:

1. Locate the **PowerMAN5.admx** file supplied with PowerMAN. This is in the Policies\PowerMAN\ADMX folder.
2. Sign-in to Microsoft Endpoint Manager admin centre
3. Navigate to Devices, Configuration Profiles, Import ADMX
4. Click Import and upload the PowerMAN5.admx file and the associated “en-us\PowerMAN5.adml” language file
5. Click Next
6. Review the changes and click Create to complete the import

To configure PowerMAN using Intune proceed as follows:

1. Sign-in to Microsoft Endpoint Manager admin centre
2. Navigate to Devices, Configuration Profiles, Create Profile
3. Enter the following:
Platform: Windows 10 and later
Profile: Select Templates / Imported Administrative Templates
4. Click Create
5. In the Basics panel, enter the following:
Name: PowerMAN Power Management (or similar)
Description: As required
6. Click Next
7. Select the desired PowerMAN configuration settings. Typically, this will include:
 - Licensed organisation / PID key
 - Reporting settings
 - One or more Default Power policies
 - One or more No User Power policies
 - A anti-insomnia / enforcement policy

PowerMAN Power Manager v5.5

- Optionally, one or more scheduled power management policies
8. If necessary, in Scope Tags (optional), assign a tag to filter the profile to the desired groups and click Next
 9. In Assignments, select the user or device groups that will receive the profile and click Next

NB: Typically, we recommend PowerMAN is used to manage Devices rather than specific users. PowerMAN does support user specific policies but these are best used as an addition to common device / hardware policies.

10. Review the settings and click Create

Appendix K – PowerMAN Deployment with Microsoft Configuration Manager (SCCM)

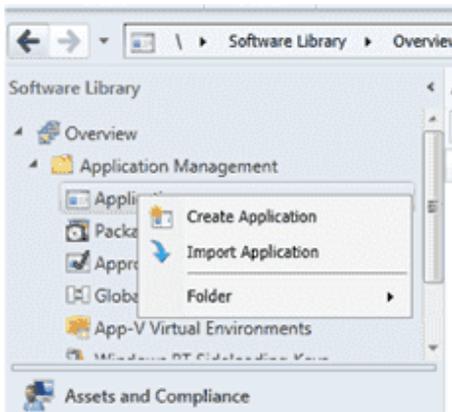
Microsoft Configuration Manager (SCCM) can be used to deploy the PowerMAN client software. The following steps describe the general technique. This can be modified to suit your own environment.

To deploy the PowerMAN client to a SCCM device collection, proceed as follows:

1. Follow the steps in the main guide to configure the PowerMAN client using the supplied ADM/ADMX policy template.

NB: We recommend the PowerMAN client configuration is staged before the client software itself because this will avoid the need to restart the PowerMAN service or restart the target workstation before PowerMAN starts to operate.

2. If necessary, create and share a folder to contain the PowerMAN MSI deployment package. The share must be accessible to the target workstations.
3. Copy the PowerMAN MSI package to the deployment share
4. Open the **Configuration Manager Console**
5. Expand **Software Library**
6. Right-click on **Applications** and then select **Create Application**



7. Click **Browse** and locate the PowerMAN MSI package using the deployment share UNC path:

e.g. \\Server\DeploymentShare\PowerMAN.MSI

8. Click **Next** and then **Next** again to confirm
9. Complete the application information form:

Name: PowerMAN Client v5.5.x

Comments: Install the PowerMAN client

Manufacturer: Data Synergy UK Ltd

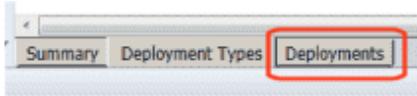
Software Version: v5.5.x

Installation Program: MSIEXEC /I "PowerMAN Setup.msi" /qn [Modify for specific version]

10. Select **Install Behaviour: Install for System** and then click **Next**

PowerMAN Power Manager v5.5

11. Confirm the application settings and then click **Next**
12. Click the **Deployments** tab to see the configuration:



13. If applicable, configure one or more distribution points:
 - a. Right-click on the PowerMAN application package
 - b. Select **Distribute Contents**
 - c. On the Content Options page, confirm the package and click **Next**
 - d. On the Content Destination page, click **Add** and select the target Collection Distribution Point/Group
 - e. Click **Ok** and then **Next**
 - f. Tick the desired distribution point(s) and then **Ok**
 - g. Click **Next** to begin copying
 - h. Click **Close**
14. Deploy the application to the target device collection as follows:
 - a. Expand **Software Library / Applications**
 - b. Locate the PowerMAN application
 - c. Right-click and select **Deploy**
 - d. Select **Device Collections** (top-left)
 - e. Select the desired target device collection
 - f. Click **OK** and then **Next**
 - g. Click **Next** again
 - h. Confirm the distribution point selections and then click **Next**
 - i. Select **Action: Install** and **Purpose: Required** and then click **Next**
 - j. Select the desired deployment schedule (or as soon as possible) and click **Next**
 - k. Select **User Notifications: Hide in Software Center and notifications** and click **Next**
 - l. Select the desired alert options (if application) and click **Next**
 - m. Confirm the deployment and then click **Next** and finally **Close**

NB: PowerMAN is a system application. It must be deployed as a required application to devices (and not users)

15. Finally, to monitor the deployment:
 - a. Select **Monitoring**
 - b. Select **Deployments**
 - c. Monitor the deployment and resolve any problems as required

Appendix L – Hardware low-power modes (S0ix, S1-S5)

The `POWERMAN INFO` command can be used to determine detailed technical information about which low-power modes are available on a specific device. A typical output is below:

```
SystemPowerCapabilities:
PowerButtonPresent          1
SleepButtonPresent         1
Supports Suspend           1 (Legacy S1-S3)
...
Supports S0 (Low-power idle) 0 (AoAC)
Supports S1 (CPU Sleep)     0
Supports S2 (Sleep)        0
Supports S3 (Standby)      1
Supports S4 (Hibernate)    1
Supports FastS4 (Hybrid Sleep) 1
Supports FastStart (HiberBoot) 1 (Enabled=1)
Supports S5 (SoftOff)      1
...
Min RtcWake State          S3 (Standby/STR)
```

The `'Supports Sx'` fields indicate which low-power modes are available. Generally speaking, the modes S0ix and S1-S3 may all be described as “Sleep” or “Save to RAM” and are functionally similar. Most modern systems support the S3 state. Some high-end portable devices offer the S0ix sleep state instead.

In order of energy saving, the available power states are as follows:

<p>S1 Sleep (Smaller saving)</p>	<p>System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode. To maintain the user's session the power supply must remain connected. The system can resume in a few seconds.</p> <p>This mode is rarely available on modern systems. In some cases, it may be enabled via a BIOS setting.</p>
<p>S2 Sleep</p>	<p>System appears off. The CPU has no power; RAM is refreshed; the system is in a lower power mode than S1. To maintain the user's session the power supply must remain connected. The system can resume in a few seconds.</p> <p>This mode is rarely available on modern systems.</p>
<p>S3 Suspend (Bigger saving)</p>	<p>System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode. To maintain the user's session the power supply must remain connected. The system can resume in a few seconds.</p> <p>This is the most common power saving mode on modern systems. In some cases, it must be enabled via a BIOS setting.</p>
<p>S0ix "Modern" Standby</p>	<p>The system appears off but selected software may periodically run. To maintain the user's session the power supply must remain connected. The system can resume instantly.</p> <p>If this mode is supported, it will consume a similar amount of energy to S3 but provide more software functionality. If S0ix is</p>

	present, the S1-S3 modes will not be available. This feature is only available from Windows 8 and later on some high-end portable devices.
S4 (Hibernate) (Biggest saving)	<p>System is turned off. The CPU and RAM have no power. This mode is also referred to as 'Save to Disk'. The power supply may be disconnected without any loss to the user's session. The system can typically resume in 10-30 seconds.</p> <p>The difference between the S4 and S5 states is that the computer can resume to the previous user session from S4. This is not possible from the S5 state.</p> <p>NB: Whilst the S4 state should consume less energy than S3, the difference is often very small (and sometimes practically unmeasurable). The main reason to select S4 mode is because it protects the device against power failure (at the expense of a longer resume time) and not because it uses less energy.</p>
S5 (Shutdown)	<p>System is turned off. There is no user session. A full start-up sequence is required to use the device. This may take 20-60 seconds or more.</p> <p>NB: A system in the shutdown state may still consume some energy if connected to the mains supply. In most systems there is little measurable difference in power consumption between sleep, hibernate and shutdown.</p> <p>In some cases, enabling Wake-on-LAN has been observed to increase S4/S5 power consumption over that of S3.</p>

PowerMAN behaviour with “Modern” standby mode (S0ix, AoAc)

Windows 8 introduced a new “Modern” standby mode on the Microsoft “Surface” range. Subsequently, this mode has started to appear on other high-end Windows 10/11 portable devices and mini-PCs based on mobile chipsets. This feature is sometimes also referred to as S0ix, S0 low-power idle or always-on/always-connected “AoAc”.

The “Modern” standby mode requires special hardware support and allows the OS to retain much finer control whilst the device consumes less power. This means that applications such as email and messaging clients can continue to periodically process data whilst the system is inactive. From a user perspective, a device in the “Modern” standby state has no display and appears to be “asleep”. In this respect, it is functionally the same as traditional sleep mode but capable of resuming instantly.

Portable devices that support “Modern” standby typically have SSD (fast) disks and do not support the traditional S1-S3 “sleep” modes. Such devices retain S4 “hibernate” support as a fall back to protect user data when the battery is low.

PowerMAN client v5.5.4.6130 and later offer improved support for “Modern” standby and will use this state, if possible, when the administrator has selected “Sleep” as the low-power mode. This allows the PowerMAN “sleep” action to be used seamlessly on both traditional and “Modern” standby devices.

PowerMAN behaves as follows:

PowerMAN Power Manager v5.5

- “Modern” standby is treated as a valid power-saving mode, functionally equivalent to traditional “sleep” mode
- “Modern” standby and AoAcConnectivity support are now detected and reported by the POWERMAN INFO command, the power management event log, and in the computer detail report (requires PMES v5.5.4)
- When “Modern” standby is present, PowerMAN will automatically enable hibernate to ensure a fall back power-saving mode is available. This is reported in event #4129.
- When “Modern” standby is present, a PowerMAN sleep on idle policy and the sleep button both enter modern standby
- When “Modern” standby is present, PowerMAN resume actions will not execute
- When “Modern” standby is present, scheduled sleep and enforced sleep on idle upgrade to hibernate (due to OS design). This may marginally increase resume time following a scheduled sleep operation. However, the user impact is limited because the “Modern” standby state is typically enabled on devices with a (fast) SSD disk.
- When “Modern” standby is present, scheduled wake-up may not occur at the precise time specified (or may occur some minutes later), the display may not turn on and, in some circumstances, the system may return to the previous low-power state after a few minutes if no user is present (due to OS design).

Microsoft provides further information about “Modern” standby here:

<https://learn.microsoft.com/en-us/windows-hardware/design/device-experiences/modern-standby>

Appendix M – Alternative SMS / XCOPY / Scripted Deployment Methods

PowerMAN supports a variety of alternative deployment methods.

The so-called **XCOPY** method describes the most basic (legacy) technique for installing the client software. This may be adapted for environments such as SMS or similar. This section explains the key features of such a deployment.

PowerMAN can be installed using one of the following methods:

- Double click the MSI file and follow the on-screen prompts:



- Install the client silently with the following command line:

```
MSIEXEC /I "PowerMAN Setup.msi" /qn
```

- Locate the PowerMAN.exe file in the Standalone folder (supplied with the PowerMAN distribution) and copy it to the \Windows\System32 folder on the destination computer:



Once the executable is installed, logon with an administrative account and execute the following command to start the service:

```
POWERMAN START
```

The PowerMAN.exe file is the **ONLY** file required on the client computer.

You may optionally wish to use the separate PowerStart.exe program. This can be installed using the same method.

Remember: The PowerMAN service must be installed by a user with local administrative rights. It is not possible to install PowerMAN using a logon script (which runs as a user). It is possible to install PowerMAN with a computer start-up script. See the following web page for an example:

[http://technet.microsoft.com/en-us/library/cc779329\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc779329(WS.10).aspx)

Appendix N – Common PowerMAN client event log messages

PowerMAN includes a comprehensive event logging feature. These are recorded in the Windows “Power Management” event log. This section describes the most common logged events. The exact wording of some events may change from one PowerMAN release to another. However, the general meaning of a specific event number will always be the same. Some events include parameters such as times, program or user names. The first parameter is shown as %1. The second parameter, if present, is marked %2 and so on.

Event	Meaning
1000	PowerMAN Power Management service installed.
1001	PowerMAN Power Management service uninstalled.
1002	PowerMAN Power Management service running.
1003	PowerMAN Power Management service stopped.
1013	<p>Additional debug power information will be reported. This is an intensive process and should only be used when absolutely necessary</p> <p>PowerMAN's debugging features are enabled. This will result in a much greater amount of information being logged in the event log. Sometimes a debug text file is also created. This option should not be enabled in a production environment for longer than necessary.</p>
1016	<p>No valid product key was found. Check product key and registered organisation name.</p> <p>The product key was missing or invalid. Please check it. The POWERMAN LICENSE command will report additional information.</p>
1019	<p>Product key has expired. Please contact your sales representative to obtain an updated product key. The software will continue to function in reduced functionality mode.</p> <p>Some types of product key are designed to expire after a certain time. Please obtain an updated product key.</p>
2000	System entering sleep/hibernate state
2001	System resumed
2002	System entering shutdown
2003	<p>The computer is being prevented from entering the idle state by an unknown program. This is NOT a program configured by the Administrator. This may result in increased energy consumption</p> <p>Another program, not part of the PowerMAN suite, is preventing the computer from entering a lower power state. Please consider using the policy enforcement feature or other debugging steps to determine the specific program that is causing the problem.</p>
2004	A program has indicated that it is performing activity and the computer is being prevented from entering the idle state. This may result in increased energy consumption.
2005	The computer is being prevented from entering the idle state because the Server Service is running. This may result in increased energy consumption
2006	The computer is being prevented from entering the idle state due to a protected program or file specified by the Administrator. This may result in increased energy consumption
2010	PowerMAN is preventing the computer from entering the idle state because it has recently automatically resumed.
4000	Removed invalid power policy for user

Event	Meaning
	Sometimes power polices can become inconsistent. This often happens when roaming profiles are used and the power policy in the roaming profile has no counterpart on the computer. PowerMAN removes such policies before creating a new one.
4003	Power policy for user checked and does not need to be updated The existing power settings match those configured by the administrator. No action is necessary.
4009	Automatic wake enabled for %1. The auto-wake operation may fail if not supported by hardware or if the system is shutdown. Most systems do not support wake from power off (S5) state.
4013	Scheduled shutdown/sleep policy enabled for %1
4016	The next power policy update is scheduled for around %1
4019	Scheduled sleep event. This system will suspend
4020	Scheduled hibernate event. The system will hibernate
4021	Scheduled shutdown event. The system will shutdown
4023	Scheduled wake event. The system is now active
4024	An invalid global power policy was found. The policy settings were %1 PowerMAN detected invalid global power settings e.g. button/lid actions
4025	An invalid power policy was found. The policy settings were %1 PowerMAN detected an invalid power policy.
4026	A global power policy was found. The policy settings are %1
4027	A power policy was found. The policy settings are %1
4031	Due to recent activity rescheduled next power policy update for around %1 PowerMAN detected a change that requires the power policy to be checked / updated. The update is postponed for a few seconds to allow the system to stabilise.
4042	The power policy has been repeatedly applied %1 times. This may indicate that another program (or user) is changing the policy settings. It may also indicate a problem with the policy settings. If this continues please contact Technical Support Occasionally other programs may interfere with PowerMAN. This event warns that PowerMAN has repeatedly configured the chosen power settings because some other process is also changing them. If this event happens frequently you will need to investigate the cause of the problem.
4047	Enforced sleep event. This system will suspend. Last activity %1. Active timeout was %2 seconds The policy enforcement feature forced the computer to sleep. This happened because some other process was inhibiting the normal Windows idle timer.
4048	Enforced hibernate event. The system will hibernate. Last activity %1. Active timeout was %2 seconds The policy enforcement feature forced the computer to hibernate. This happened because some other process was inhibiting the normal Windows idle timer.
4049	Enforced shutdown event. The system will shutdown. Last activity %1. Active timeout was %2 seconds The policy enforcement feature forced the computer to power-off. This happened because some other process was inhibiting the normal Windows idle timer.
4051	User has been inactive for over %1s and will be logged out

Event	Meaning
4052	Scheduled shutdown/sleep event inhibited by protected service, program or file
	A protected object prevented the scheduled power action from running.
4053	Scheduled shutdown/sleep event inhibited by an application or service that has requested the system remain active
	An application request prevented the scheduled power action from running.
4061	The system has automatically resumed and will be prevented from returning to previous power state for %1
	The system resumed (without user input) and PowerMAN will prevent it from reverting to the suspended state for a period of time.
4062	The system has automatically resumed but may return to the previous state shortly unless user activity prevents this. To avoid the system entering automatically re-entering a low-power state please consult product documentation
4064	Unable to create or configure power setting.
	PowerMAN found Group Policy override power settings that may conflict with the PowerMAN configuration. To resolve the problem, remove the associated Group Policy override power settings. See also event #5004.
4123	User %1 has been idle for %2s. Logout timeout is %3s and logout pending message timeout is %4s. User logout prompt required.
	The system has been idle for an extended period and PowerMAN will now display the logout pending message to logged on user(s)
4124	User logout prompt displayed: [Message]
	PowerMAN displayed the logout pending message to user(s)
4125	User logout prompt result
	The result of PowerMAN displaying a logout pending prompt.
4126	System supports "Modern/Connected" standby (S0 low-power idle / AoAC) and does not permit application directed sleep. The system will attempt to hibernate instead.
	PowerMAN was configured to schedule sleep but the OS / hardware does not support this. PowerMAN will hibernate instead.
4127	System has been idle for %1s. Idle timeout is %2s and idle pending message timeout is %3s. User idle prompt last displayed %4s ago. Prompt required now.
	The system has been idle for an extended period and PowerMAN will now display the idle pending message to logged on user(s)
5004	Detected Windows Group Policy override power settings. These may prevent the specified configuration from being correctly applied. This may result in error #4064 being reported later. The problem settings are typically configured via local / domain group policy in: "Administrative Templates/System/Power Management"
	PowerMAN found Group Policy override power settings that may conflict with the PowerMAN configuration. To resolve the problem, remove the associated Group Policy override power settings. See also event #4064.
6009	Discarded some stale events. These are too old to be reported
	PowerMAN abandoned some historic power logs because they were older than the configured timeout. This usually happens if the PC has been turned off for an extended period. Although this does result in some loss of log continuity it is rarely a problem.

Event	Meaning
6013	<p>Failed to upload XML (Error %1): %2</p> <p>There was a problem transferring the power log data to the PowerMAN reporting platform / private PMES server. The error number is normally a Windows Winsock error code indicating the cause of the problem. See http://msdn.microsoft.com/en-us/library/ms740668(VS.85).aspx for an explanation of these codes.</p>
6015	<p>Downloaded XML was corrupt: %1</p> <p>The response from the PowerMAN server was incomplete. This may indicate a network or proxy server problem.</p>
6016	<p>Report operation fully completed. All data sent to server.</p>
6017	<p>Report uploads are disabled. Both a logging server and site identity are required. This can also be caused by a failure to correctly determine the computer identity</p>
6020	<p>No SiteGUID value configured. The computer is not a member of a reporting site. This will prevent power usage information being uploaded. To enable reporting features check the SiteGUID setting</p> <p>PowerMAN will be unable to report activity data. To resolve this, locate the SiteGUID on the server (or cloud) reporting platform and configure it in the reporting settings.</p>
6037	<p>Detected invalid reporting configuration. Default settings used</p> <p>The cloud (hosted) reporting platform "secure.pmstats.org" was configured but the other network settings were not consistent with this. PowerMAN will default to using port 443 and SSL (encrypted data) mode.</p>