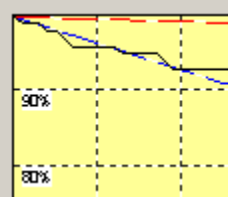
BatteryMon by PassMark Software - Overview

BatteryMon is an easy to use Windows based application that allows users to monitor the performance of battery systems being used to power portable computers and compatible uninterruptible power supplies connected to servers. The battery charge level is graphed in real time, along with an extrapolated trend line and comparison trend line. A log file is maintained of the battery charge level and other statistics for later analysis.

For more information click on one of the following topics.

BatteryMon Display



Graph: The battery charge level is graphed in real time. The percentage charge level (0-100%) is shown on the vertical (Y) axis. The sampling times are shown on the horizontal (X) axis. Three lines are shown on the graph. The black line shows the current charge level. The blue line shows the trend line based on the extrapolated samples. The red line shows a comparison to a battery system with a particular life span.

There is also some extra information displayed in the top left of the graph relating to the rate the systems batteries are currently discharging.

Capacity: Displays the current total of all batteries capacities vs. the total of those batteries fully charged capacity.

Capacity drop: Displays the total drop in charge for all batteries since the Start button was pressed.

Discharge rate/**Charge rate** displays the total rate of change of charge for all batteries.

To the left of the graph the follow information is displayed.

Status: Indicates if BatteryMon is running (collecting samples) or stopped.

A/C Power: Indicates the current power source. Battery (Bat) or mains A/C power (AC)

Battery Status: This is the battery status as reported by the battery. Possible values are high, low, critical, charging. “NoBat” will be displayed if there battery to be monitored.

% Life left: The charge % in the battery, as reported by the battery. Can be between 0% and 100%. Under Windows the battery can only report integer values.

Seconds left: How many seconds of use are left before the computer runs out of power. This information is normally collected from the battery itself, but if the battery pack can’t supply this information it is estimated in the BatteryMon software.

Seconds total: How many seconds are of use are available when the battery is fully charged. This information is normally collected from the battery itself, but if the battery pack can’t supply this information it is estimated in the BatteryMon software.

Num Samples: The number of times BatteryMon has sampled the battery information.

Run time: How long has the sampling session been running for. The format is HH:MM:SS

Discharge rate: The current discharge rate. Total battery life in hours. This is calculated by looking at the rate of discharge over a period of time and extrapolating the discharge rate to a value of 0% charge. It is this value that is represented on the graph by the blue line. When only a few samples have been made the extrapolation is not very accurate and the value can vary widely. Are more samples are made the value becomes more accurate.

Comparison Rate: The user can select a baseline discharge rate to compare to the actual discharge rate. The rate selected here is displayed with a red line on the graph.

Log file

The last 1000 samples are logged in memory by BatteryMon. Clicking on the view log button will create a log file on the disk and start up the default text file viewer to view the file (normally Notepad).

If the auto logging check box is checked, then this file will be updated in the background after each battery sampling. Auto logging can be used to ensure some record is kept during unattended testing or if the PC shuts down unexpectedly.

The name of the log file is always “batterymonlog.txt”. The file is always created in the BatteryMon executable directory. Each time the View log button is used this file will be overwritten with the current log information.

Five pieces on information are stored for each sample recorded in the log file.

```
2001-06-24, 10:19:42, 92%, 0.76, 2530

2001-06-24, 10:19:52, 91%, 0.71, 2325

2001-06-24, 10:20:02, 91%, 0.74, 2426
```

These are,

Date: The date in YYY-MM-DD format

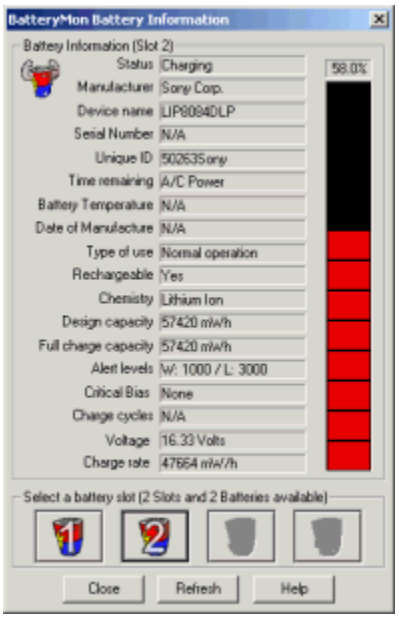
Time: The time the sample was taken. HH:MM:SS format

Percentage charge: The battery charge as a % (0-100%)

Charge rate: Total battery life in hours. This is calculated by looking at the rate of discharge over a period of time and extrapolating the discharge rate to a value of 0% charge. It is this value that is represented on the graph by the blue line. When only a few samples have been made the extrapolation is not very accurate and the value can vary widely. Are more samples are made the value becomes more accurate.

Seconds of charge remaining. How many seconds of use are left before the computer runs out of power. This information is normally collected from the battery itself, but if the battery pack can’t supply this information it is estimated in the BatteryMon software. When only a few samples have been made the extrapolation is not very accurate and the value can vary widely. Are more samples are made the value becomes more accurate.

Battery Information



All available information about each available battery is displayed in this window. How accurate this information is depends on the device driver software supplied with the battery pack and the intelligence of the battery pack. Smart battery packs can provide detailed information about the battery, while dumb battery packs may supply nothing at all. If no information is available the letters N/A are displayed. Battery systems have slots and batteries. A slot is a socket that can hold a battery pack. It's not unusual to have more slots that batteries.

Status: Indicates the current status of this particular battery. Values include, "Charging", "Discharging", "Critical" and "Not in use". The Critical status indicates imminent failure.

Manufacturer: The name of the company that manufacturers the battery pack.

Device Name: The name of the device. This is often the model number of the battery pack, as defined by the manufacturer.

Serial number: The serial number of the device as defined by the manufacturer.

Unique ID: An identification string, which is unique across all battery packs. This is often a concatenation of the serial number, the device name and the manufacturers name.

Time remaining: A rough estimate of how much time remains before the battery is fully discharged.

Battery Temperature: The temperature inside the battery pack.

Date of manufacture: The date when the battery was manufactured.

Type of use: Indicates if the batteries normal use is to provide power for normal operations or if the battery is a fail safe device.

Rechargeable: Indicates if the battery is rechargeable or not.

Chemistry: The type of battery. Typical values are, Lead Acid, Lithium Ion, Nickel Cadmium, Nickel Metal Hydride, Nickel Zinc, Rechargeable Alkaline-Manganese

Design capacity: The theoretical capacity of the battery when new. For most batteries this is measured in milliwatts hours.(mWh). For some batteries this figure may not have any units, and will be a relative value.

Full charge capacity: The battery's current fully charged capacity in mWh (or relative). In some batteries it is possible to compare this value to the designed capacity to estimate the battery's wear.

Current capacity: The battery’s current charged capacity in mWh (or relative). For some batteries this figure may not have any units, and will be a relative value.

Alert levels: The manufacturer's suggestion of when a "low" and “Warning” battery alert should occur. Definitions of "low" and “Warning” will vary from manufacturer to manufacturer.

Bias: Some batteries reserve a small charge that is biased out of the battery's Full Charge Capacity and Current Capacity values to show "0" as the critical battery level. Critical bias is analogous to setting a fuel gauge to show "empty" when there are several liters of fuel left.

Charge cycles: The count of the number of charge/discharge cycles the battery has experienced. This provides a means to determine the battery's wear. Not all batteries will support this feature.

Voltage: The current battery voltage in Volts across the battery terminals.

Charge Rate: The current rate of battery charge or discharge. This value will be in mW unless the battery is relative, in which case it will be in arbitrary units per hour. A nonzero positive rate indicates charging; a negative rate indicates discharging.

External Interfaces

BurnInTest Interface

BatteryMon can work with another product from PassMark Software called, BurnInTest. If you have BurnInTest version 2.2.1006 and above, then it can be configured to log the battery statistics collected by BatteryMon. This can be configured from within BurnInTest. Both programs need to be active and running for this feature to work. See BurnInTest for more details.

Shared memory interface

This section is intended for programmers and software integrators looking to use BatteryMon as part of their complete software solution.

Most of the information collected by BatteryMon relating to the batteries is exposed via a shared memory interface. This interface allows the collected information to be used by other software products which have been designed to be compatible with BatteryMon.

The name of the shared memory interface is, "BatteryMonInterface". Here is an example of how to access the interface in C++.

```
hMappedObject = OpenFileMapping (FILE_MAP_READ,FALSE,"BatteryMonInterface");

pDataAddress = MapViewOfFile(hMappedObject,FILE_MAP_READ,0,0,0);
```

After the interface has been opened the data relating to each battery can accessed.

Contact us for more details on the structure of the data in this interface, support@passmark.com

Custom development

If you need BatteryMon customized to fit your application or product please let us know.

sales@passmark.com

Contacting PassMark Software

On the Web

You can contact PassMark on the web at

http://www.passmark.com

E-Mail

For technical support questions, suggestions

support@passmark.com

For sales & commercial issues

sales@passmark.com

For any other issues

info@passmark.com

FAQ

You may also want to check out the list of Frequently Asked Questions .

Purchasing information

Price

US Dollars: $18 (Single user)

{button Purchase Online,EF(`http://www.passmark.com/sales',`',1)} from the PassMark Software web site

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- The removal of the 30day evaluation period associated with the shareware version.

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http://www.passmark.com/support/keyhelp.htm

Questions & more information

If you have any questions we would be happy to hear about them. Contact

sales@passmark.com

System Requirements

80486 50Mhz or faster.

Windows 98, WinMe, Windows 2000, Windows XP
(Windows 95 and NT are not supported)

16Meg RAM

1 Meg of free hard disk space to install the software

A compatible battery system.

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info@passmark.com

Problems and Frequently Asked Questions (FAQ)

Note: See the PassMark website (www.passmark.com) for the latest version of the FAQ

Q. How accurate is BatteryMon?

BatteryMon is only as accurate as the battery pack which supplies the information. Due to their chemical nature it is often hard to get a precise indication as to the charge level in the battery.

Q. Are all types of portable computers and UPS's supported?

Some older nonstandard battery systems and UPSs are not supported. Machines running Windows95 and WindowsNT are also **not** supported. Machines running Windows98, Me, 2000 are supported.

Q. How many batteries can be reported on?

A unlimited number of batteries are supported for the graph display. For the detailed, per battery, information up to 4 battery slots are supported.

Q. The log file appears to be limited in size. Is it possible for user to change the log file size, and/or sampling frequency?

The log only stores the last 1000 samples. However it is possible to change the sample rate by entering a new value for "Sample time" in the BatteryMon window.
If you chance this value to 30sec, then the log should cover 8.3hours
If you chance this value to 60sec, then the log should cover 16.7hours

Q. My battery has a full charge capacity much lower than the design capacity, what is wrong?

The battery has stored the wrong full charge capacity. A battery learns a new full charge capacity from a full charge to a full discharge. If it leans a very low full charge then it cannot re-learn a normal value. A low full charge capacity can be learned in several ways;

The battery reads a 'false' full charge signal. This can be caused by excessive heat in the system such as from inserting a cold battery into a hot system and charging immediately, or some other heat source located near the battery cavity. It can also occur if the battery has been unused for a long period of time or has been over-discharged.

The battery has not seen a large portion of capacity drained from it, therefore the battery does not record capacity leaving, only learning the capacity that is actually monitored during the discharge. Another similar cause is when the battery undergoes a small discharge over an extended period of time, such as being in a hibernate or suspended state for a few days, drains the battery but is again not measured.

What new - Version history

Version 1.3 26/11/2003

- Added /r /m command line options
- Added mini window display
- Added configuration dialog
- Added option to play a sound when battery drops below a specified level
- Added System Information button and dialog
- Added header to log file containing battery information
- Fixed bug causing “Run time” to have an incorrect value when woken from Standby mode in Windows 2000

Version 1.2 23/12/2002

- Fixed incorrect units for charge 'rate' in info window. Was mW/h but should have been mW.
- Added current capacity to the battery info window.
- Added current capacity, total capacity, capacity drop and charge rate display to the main window.

V1.1.1000 27/Oct/2001

- Windows XP support

V1.0.1001 13/Oct/2001

- Bug fix that corrects graph position for displays running at greater than the standard 96dots per inch.

V1.0.1000 19/Sept/2001

- The first full version of BateryMon is released

Auto-run applications

This page gives a brief description of how an application can be setup to run automatically when Windows starts.

Method1 – Windows Startup folder

There is a “Startup” folder in the Start menu of Windows. Shortcuts to files can be placed in this directory. All the shortcuts in this folder will be executed automatically when Windows starts. One easy way to edit the contents of the startup folder is to use the Advanced view in the “Start / Settings / Task bar & Start menu”, window. Short cuts can be created by dragging executable files into this Startup folder with the ALT key held down.

Right clicking on the short cut and selecting properties then allows the shortcut settings to be modified. This is the best and easiest method to auto-run applications.

See the Windows documentation for more information about short cuts.

Method2 - win.ini

In the windows section of this file, new lines can be added to start applications automatically. For example,

```
[windows]
run="C:\PROGRA~1\BATTER~1\Batter~1.exe"
```

This file is found is in the Windows installation directory. Note the use of older style 8.3 files names as spaces are not allowed in the file name. This method is not recommended, as it was designed for Windows3.1 and Windows95 and is no longer used in newer versions of Windows. (It still works in Windows98 however).

Method3 – Edit the registry

By placing entries into following registry key, applications can be executed automatically at startup

```
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
```

Don’t edit the registry unless you know what you are doing.

Command line options

There are two command line options. If no command line option is specified, BatteryMon starts normally.

/r

BatteryMon will automatically start taking samples when it is run, removing the need to click ‘start’.

/m

BatteryMon will shrink to the mini monitoring mode on startup. This must be used in conjunction with /r as the mini mode cannot be used unless BatteryMon is currently taking samples.

Example – Execute BatteryMon with automatic start and mini mode

```
Using “Run” selected from the windows start menu,

"C:\BatteryMon\batterymon.exe" /r /m
```

Configuration

Sample time: This setting determines how often BatteryMon should sample the battery information. If auto logging is turned on, this value will also determine how often the log file is updated.

Low battery % flash threshold: When the % Life left of the battery drops below this level the mini BatteryMon window will begin to flash.

Start sampling when run: BatteryMon will automatically start taking samples when it is run, removing the need to click ‘start’, same as the command line parameter /r.

Start mini BatteryMon when run: BatteryMon will shrink to the mini monitoring mode on startup, same as the command line parameter /m.

Auto logging: If the auto logging check box is checked, then this file will be updated in the background after each battery sampling

Mini BatteryMon Always on Top: Having this option on ensures the mini BatteryMon window is always displayed on top of other windows.

Play sound when battery below certain level: Selecting this option will play a sound (once) when the selected battery drops below a certain level.

Level %: If the % Life left of the battery drops below this level a sound will be played.

Sound File: This is the sound to play.

Transparency: The amount of transparency determines how transparent the mini BatteryMon window is, 0% is solid and 100% is totally transparent.

The Mini Window

To use the mini window function, make sure BatteryMon is currently sampling by clicking the ’Start’ button. Next double click the left mouse button anywhere on the graph section and BatteryMon will switch to mini window mode. To return to the main window double click the left mouse button on the mini window.

When the battery is charging the bar will be drawn with green and when the battery is discharging the bar will be drawn in red. Leaving the mouse pointer on the bar for roughly a second will result in a tooltip being displayed with the slot number of the battery, it’s percentage of charge left, estimated time of charge remaining, discharge/charge rate and voltage level.

System Information

Processor Max Mhz - Maximum specified clock frequency, in MHz, of the system processor

Processor Current Mhz - Processor clock frequency, in MHz. This number is the maximum specified processor clock frequency multiplied by the current processor throttle.

UPS present - Indicates the presence of an uninterruptible power supply (UPS).

Processor throttling - Indicates the system supports processor throttling.

Processor min throttle - Minimum level of system processor throttling supported, expressed as a percentage.

Processor max throttle - Maximum level of system processor throttling supported, expressed as a percentage.

Thermal zones - Indicates the system supports thermal zones.

Video display dimming - Indicates the system supports video display dimming capabilities.

APM BIOS power management - Indicates the system supports APM BIOS power management features.

Removal of power to fixed disk devices - Indicates the system supports allowing the removal of power to fixed disk devices.

Fan throttle tolerance % - Lower limit, expressed as a percentage, that the processor may be throttled down to prior to turning on system fans in response to a thermal event.