



Software for Windows to monitor
computer hardware temperatures
and control fan speeds

Where ?

- <http://www.almico.com/speedfan.php>

What & Why ?

- SpeedFan is a program that monitors **voltages**, **fan speeds** and **temperatures** in computers with **hardware** monitor chips. SpeedFan can even access **S.M.A.R.T.** info for those hard disks that support this feature and show **hard disk temperatures** too, if supported. SpeedFan supports SCSI disks too. SpeedFan can even change the FSB on some hardware (but this should be considered a bonus feature). At the lowest level, SpeedFan is a hardware monitor software that can access **digital temperature sensors**, but its main feature is that it can **change fan speeds** (depending on the capabilities of your sensor chip and your hardware) according to the temperatures inside your pc, thus reducing noise.

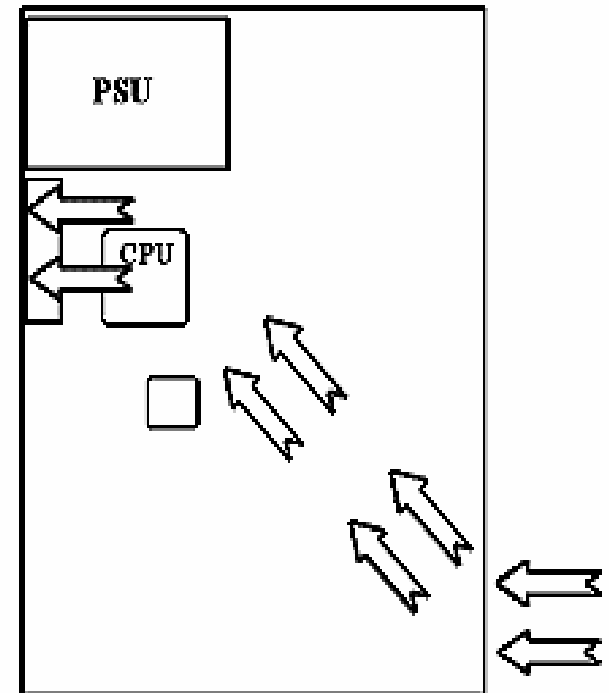
SpeedFan Requirements

The screenshot shows the 'PC Health Status' section of the Phoenix - AwardBIOS CMOS Setup Utility. It displays various system parameters and their current values. The 'CPU FAN Control by' and 'SYS FAN Control by' settings are highlighted in red, both set to '[Always ON]'. The 'Current CPU FAN Speed' is 3515 RPM, and the 'Current SYS FAN Speed' is 2481 RPM. Other parameters include Shutdown Temperature (60°C/140°F), CPU Vcore (1.47V), AGP Voltage (1.45V), +3.3V (3.36V), +5.0V (5.13V), +12.0V (12.03V), 5V(SB) (5.10V), Voltage Battery (3.24V), Current CPU Temp (30°C), and Show H/W Monitor in POST (Disabled).

Phoenix - AwardBIOS CMOS Setup Utility		Item Help
PC Health Status		
Shutdown Temperature	[60°C/140°F]	
CPU FAN Control by	[Always ON]	
SYS FAN Control by	[Always ON]	Menu Level ▶
CPU Vcore	1.47V	
AGP Voltage	1.45V	
+ 3.3 V	3.36V	
+ 5.0 V	5.13V	
+12.0 V	12.03V	
5V(SB)	5.10V	
Voltage Battery	3.24V	
Current CPU Temp	30°C	
Current SYS FAN Speed	2481 RPM	
Current CPU FAN Speed	3515 RPM	
Show H/W Monitor in POST	[Disabled]	

Desktop Cooling Basics - Typical

- The case – placement of vents
- CPU cooling fan
- Induced Draft Fans
 - Power supply exhaust fan
 - Rear case exhaust fan
- Forced Draft Fans
 - Front case injection fan
- Others, including video



Cooling Restriction Issues

- Case location and proximity to surrounding objects
- Dirt in heat sink fins and vent holes
- Undesired case openings
- Induced draft vs forced draft
- References:
 - <http://www.endpcnoise.com/cgi-bin/e/computercooling.html>
 - http://www.amd.com/us-en/assets/content_type/white_papers_and_tech_docs/cooling_guide.pdf

Fan Considerations

- CFM – affected by RPM & size + other design factors
- Noise – primarily affected by fan tip velocity which is determined by RPM and diameter
- For a given CFM and given fan design, bigger fans will produce less noise
- Motherboard amperage limitations
- Case fan placement – general cooling vs spot cooling
- Balanced draft issues

Safety – Yours & Equipment

- When making hardware modifications...
 - Electrical
 - Turnoff
 - UNPLUG !
 - Static charge
 - Make sure you & equipment are at same potential
 - Work in an environment that minimizes creation of static charges

SpeedFan Installation

- Download
 - <http://www.almico.com/sfdownload.php>
- During installation...
 - SpeedFan automatically searches your computer for interesting chips: the hardware monitor chips. SpeedFan can expose **voltages**, **fan speeds** and **temperatures**. On rare occasions, the BIOS doesn't activate such features. SpeedFan tries to enable them as long as this is a safe thing to do. Not only the motherboard is searched, but also some **video cards** and almost every recent hard disk. SpeedFan can access status info from EIDE, SATA and even **SCSI** drives, showing, in a consistent way, internal data that can be used to diagnose current and future hard disk failures.

Software **Features** (Tabs)

- Readings – default opening interface & configuration access
- Clock – over clocking; expert mode; not part of this presentation
- Info – sharing hardware & configuration with others
- S.M.A.R.T – monitoring hard drive status
- Charts – temperature, speed, voltage graphing functions

Temperature ID & Config

- Hard drives
- CPU – can be tricky
 - By comparison to BIOS or motherboard utility
 - By varying CPU fan speed
- Other temperatures
- Hiding unknown / unwanted temperature displays

Fan ID & Config

- Fan ID
- Fan labeling
- Displaying correct speed reliably
 - **Advanced** settings
- Hiding unwanted speed displays

Fan Speed ID & Config

- Fan speed control ID
- Fan speed control labeling
- Setting speed control limits
- Hiding unwanted speed displays

Speed Control Config

- **Advanced** settings
 - <http://www.almico.com/sfarticle.php?id=1>
 - Use F1 for help
- **Options** settings
- Associating temperatures w/fan speeds
- Disabling undesired associations
- Automatic control
 - Establishing
 - Tuning

Troubleshooting & Help

- FAQ's
 - <http://www.almico.com/sffaq.php>
- Support
 - <http://www.almico.com/forumindex.php>
- Articles
 - <http://www.almico.com/sfarticles.php>

Other Config & Control Features

- CLI
 - <http://www.almico.com/sfarticle.php?id=3>
- Events & notification
 - <http://www.almico.com/sfarticle.php?id=4>
- xAP
 - Remote monitoring for multiple computers
 - http://www.edjo.pwp.blueyonder.co.uk/edward/xAP/what_is_xap.htm

The END

- SpeedFan at work
 - <http://www.silentpcreview.com/article144-page1.html>
 - <http://www.silentpcreview.com/article144-page3.html>
- Q&A ?
- Other references
 - <http://www.heatsink-guide.com/content.php?content=control.shtml>
- Reference pictures are after this slide
- RivaTuner, a video card fan / temperature utility
 - <http://www.vaguesoft.com/users/dwood/blog/tutorials/rivatuner/#control>

SpeedFan Main Interface

The screenshot displays the SpeedFan 4.32 application window. The title bar reads "SpeedFan 4.32". Below the title bar are tabs for "Readings", "Clock", "Info", "S.M.A.R.T.", and "Charts". The "Readings" tab is active, showing system information: "Win9x:NO 64Bit:NO GiveIO:YES SpeedFan:YES", "I/O properly initialized", "Linked ISA BUS at \$0290", and "Linked Intel 82801EB ICH5 SMBUS at \$0500". To the right of this text are "Minimize" and "Configure" buttons. Below the system info is a "CPU Usage" bar at 23.8% and a checked "Automatic fan speed" option. The main display area is split into two columns: the left column shows "Case Fan Speed: 1548 RPM" and "CPU Fan Speed: 2860 RPM"; the right column shows "CPU Temp: 32C" and "HDD Temp: 36C". Below this are controls for "Case Fan Control" and "CPU Fan Control", both set to 20%. At the bottom, a table lists various voltage levels: Vcore1 (1.49V), Vcore2 (1.46V), +3.3V (3.36V), +5V (5.11V), +12V (12.10V), -12V (-12.03V), -5V (-5.11V), +5V (5.11V), and Vbat (3.22V). The footer text reads "Coded by Alfredo Milani Comparetti - 2000-2007 - alfredo@almico.com".

Win9x:NO	64Bit:NO	GiveIO:YES	SpeedFan:YES
I/O properly initialized			
Linked ISA BUS at \$0290			
Linked Intel 82801EB ICH5 SMBUS at \$0500			
CPU Usage: 23.8%		<input checked="" type="checkbox"/> Automatic fan speed	
Case Fan Speed: 1548 RPM		CPU Temp: 32C	
CPU Fan Speed: 2860 RPM		HDD Temp: 36C	
Case Fan Control: 20%			
CPU Fan Control: 20%			
Vcore1: 1.49V	-12V: -12.03V		
Vcore2: 1.46V	-5V: -5.11V		
+3.3V: 3.36V	+5V: 5.11V		
+5V: 5.11V	Vbat: 3.22V		
+12V: 12.10V			

SpeedFan Temperature Config

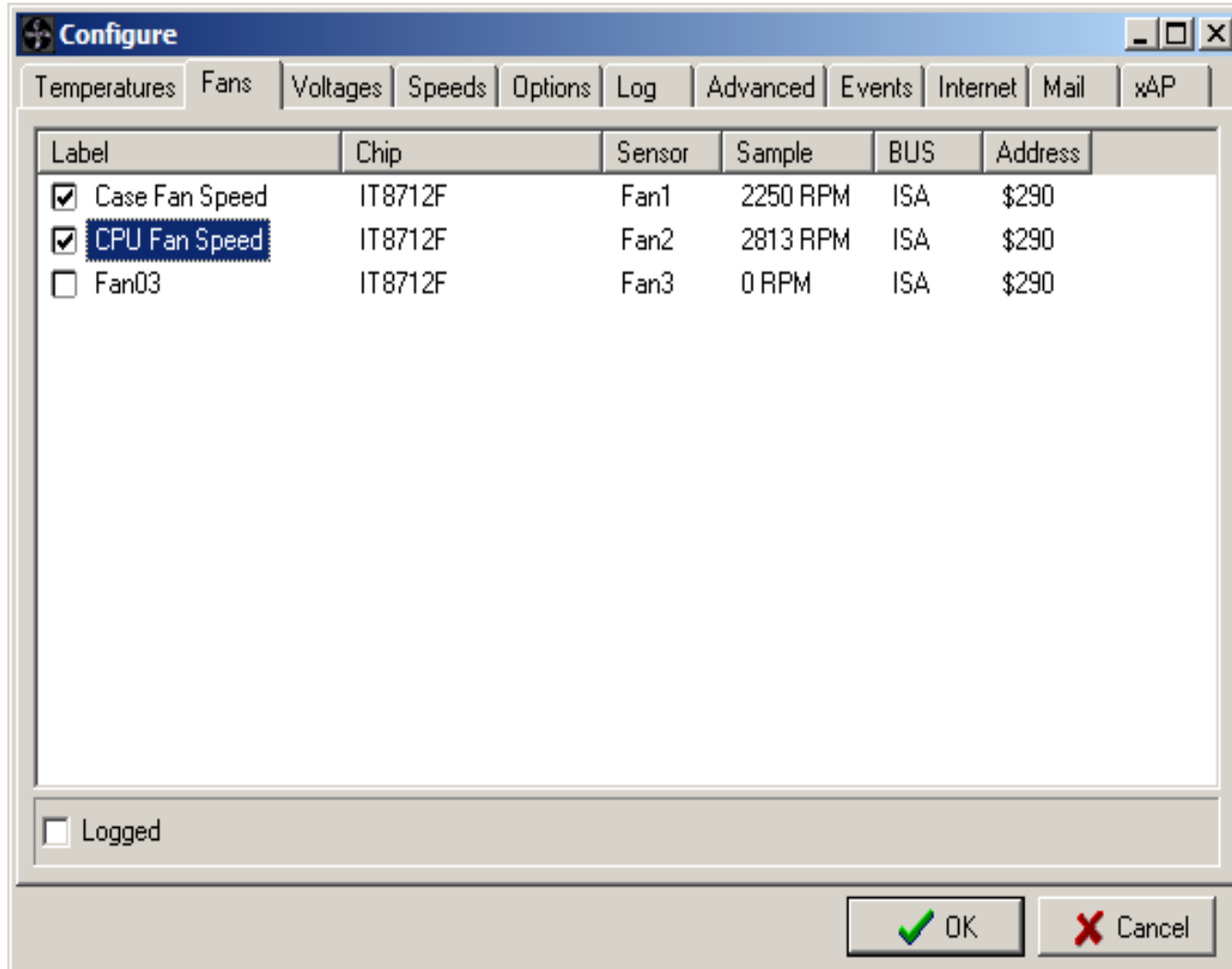
The screenshot shows the 'Configure' dialog box for SpeedFan. It has a tabbed interface with 'Temperatures' selected. The main area contains a table of temperature sensors and fan controls. The 'CPU Temp' sensor is selected and highlighted. Below the table, there are settings for 'Desired' and 'Warning' temperatures, and checkboxes for 'Show in tray' and 'Logged'.

Label	Chip	Sensor	Sample	BUS	Address
<input type="checkbox"/> Temp1	IT8712F	Temp1	127C	ISA	\$290
<input type="checkbox"/> Temp2	IT8712F	Temp2	127C	ISA	\$290
<input checked="" type="checkbox"/> CPU Temp	IT8712F	Temp3	32C	ISA	\$290
<input checked="" type="checkbox"/> Case Fan Control	IT8712F	Pwm1		ISA	\$290
<input checked="" type="checkbox"/> CPU Fan Control	IT8712F	Pwm2		ISA	\$290
<input type="checkbox"/> Speed03	IT8712F	Pwm3		ISA	\$290
<input checked="" type="checkbox"/> HD0 Temp	HD0 (120.1GB)	HD0	36C	SMART	\$0
<input checked="" type="checkbox"/> Case Fan Control	IT8712F	Pwm1		ISA	\$290
<input type="checkbox"/> CPU Fan Control	IT8712F	Pwm2		ISA	\$290
<input type="checkbox"/> Speed03	IT8712F	Pwm3		ISA	\$290
<input type="checkbox"/> Temp5	ACPI	Temp1	23C	ISA	\$0

Desired C (95F) Warning C (113F) Show in tray

Logged

SpeedFan Fans Config



SpeedFan Speed Config

Label	Chip	Sensor	BUS	Address
<input checked="" type="checkbox"/> Case Fan Control	IT8712F	Pwm1	ISA	\$290
<input checked="" type="checkbox"/> CPU Fan Control	IT8712F	Pwm2	ISA	\$290
<input type="checkbox"/> Speed03	IT8712F	Pwm3	ISA	\$290

Minimum value % Maximum value % Automatically varied

SpeedFan Advanced Config

Configure

Temperatures | Fans | Voltages | Speeds | Options | Log | **Advanced** | Events | Internet | Mail | xAP

Chip: IT8712F at \$290 on ISA

Property	Value
Temperature sensor diode 1	Thermistor
Temperature sensor diode 2	Thermistor
Temperature sensor diode 3	Diode
FAN1 divisor	8
FAN2 divisor	8
FAN3 divisor	8
PWM 1 mode	Software controlled
PWM 2 mode	Software controlled
PWM 3 mode	ON/OFF
PWMOUT clock	6M
Temperature 1 offset	0
Temperature 2 offset	0
Temperature 3 offset	2
FAN1 mult	1
FAN1 div	1
FAN2 mult	1
FAN2 div	1
FAN3 mult	1
FAN3 div	1
Reverse PWM01 logic	OFF
Reverse PWM02 logic	OFF
Reverse PWM03 logic	OFF

Set to: 6M remember it

OK Cancel

SpeedFan Options Config

