

SuSE Linux 9.0 Hardware Monitoring: VT8231, VT1211

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1. Summary

This document describes in SuSE Linux 9.0 on how to install the LM_Sensors package to enable the hardware monitoring functions of VIA south bridge chip VT8231 and Low-Pin-Count Super I/O chip VT1211 with an integrated hardware monitor controller. We offer a graphical-user-interface system health utility that facilitates acquiring system voltage, temperature, and fan speed information; and that can be configured to automatically send out warning messages or shut down the system upon abnormality. For systems using third party's hardware monitor chips, we provide a sample program for reading data via the SMBus. The information and the utility in the document are provided "AS IS", without guarantee of any kind.

2. File description

The package contains 5 files as described below.

2003/06/20 05:35pm	95,975	VIAlinuxSysHealthUtilityver0.2A.zip	VIA_SysHealth utility
2003/01/13 07:57pm	127	VT6015_chassign_conf	sample configuration
2003/01/20 10:54am	122	EPIAV_chassign_conf	sample configuration
2003/01/13 07:25pm	26,916	smbus_read_byte_data	sample program
		Readme.doc	this file

3. Overview

This guide will focus on the use of the integrated hardware monitor controller in chip VT8231 or VT1211. The following table summarizes what and how VIA chips are supported by the LM_Sensors and I2C packages.

Driver type	Supported chip
I2C/SMBus	VT82C596A, VT82C596B, VT82C686A, VT82C686B, VT8231, VT8233, VT8233A, VT8235
Hardware monitor controller	VT82C686A, VT82C686B, VT8231, VT1211

To make use of the integrated hardware monitor controller, a graphical-user-interface utility is offered to facilitate acquiring system-wide health information including voltage, temperature, and fan speed; and that can be configured to automatically send out warning messages or shut down the system upon abnormality. In particular, the utility allows users to individually

enable/disable the system warning or system shutdown option upon the monitored voltage value fluctuating out of a pre-determined tolerance range, upon the monitored CPU or system temperature rising over a pre-determined value, or upon the fan speed dropping under a pre-determined value.

4. Install the LM_Sensors modules

If during the OS installation process you didn't install LM_sensors package, the system includes no LM_sensors. Fortunately, you may run the YaST (selecting through [system]/[YaST]/[Software] /[Install and Remove Software]) to install the LM_sensors package anytime from the installation CD; alternatively, you may run "rpm -U" to import it. After installing the LM_sensors package from the OS installation CD, user can follow section 5 to run the "VIA_SysHealth" utility.

5. Using VIA_SysHealth utility

We show below three cases of how to use the "VIA_SysHealth" utility with the EPIA-M10000, EPIA-V10000, and VT6015B boards.

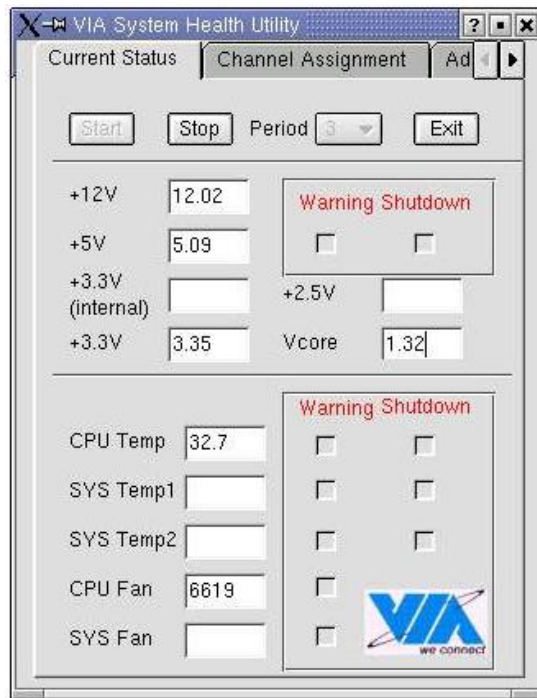
Note: The measurement results from the "VIA_SysHealth" utility are heavily hardware dependent. Users are advised to refer to the on-line help file for more information about the features and how to modify related configuration files to improve measurement accuracy.

(1) EPIA-M10000

Run the commands below to replace the "**chassign_conf**" file and the "**voltage_conf**" file in the "~/VIA_SysHealth/bin" folder with those two sample channel assignment and voltage configuration files in the "~/VIA_SysHealth/sample" folder.

```
# cd VIA_SysHealth/bin
# cp ../sample/EPIAM_chassign_conf chassign_conf
# cp ../sample/EPIAM_voltage_conf voltage_conf
```

Start the utility, click on the "start" button, and it will display the system voltage and temperature values, and the CPU fan speed as illustrated below.

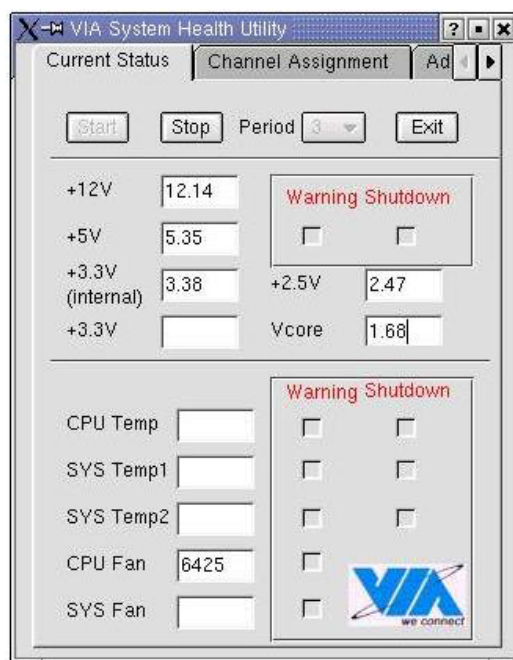


(2) EPIA-V10000

Run the command below to replace the “chassign_conf” file in the “~/VIA_SysHealth/bin” folder with the sample channel assignment configuration file “EPIAV_chassign_conf” in this package.

```
# cp EPIAV_chassign_conf ~/VIA_SysHealth/bin/chassign_conf
```

Start the utility, click on the “start” button, and it will display the system voltage values and the CPU fan speed as illustrated below.



(3) VT6015B

Run the command below to replace the “**chassign_conf**” file in the “~/VIA_SysHealth/bin” folder with the sample channel assignment configuration file “VT6015_chassign_conf” in this package.

```
# cp VT6015_chassign_conf ~/VIA_SysHealth/bin/chassign_conf
```

Start the utility, click on the “start” button, and it will display the system voltage and temperature values, and the CPU fan speed.

7. Get access to SMBus devices

For systems using third party’s hardware monitor chips, we provide a sample program for reading data via the SMBus to facilitate users’ test and development. Before running the “smbus_read_byte_data” program, it is necessary to load the module “i2c-viapro” and “i2c-dev” by running commands “**# modprobe i2c-viapro**” and “**# modprobe i2c-dev**”. And the “smbus_read_byte_data” program accepts 4 arguments whose syntax is described below.

```
smbus_read_byte_data <Adapter_num> <SMB_slave_addr> <SMB_slave_cmd> <Count>
```

Two samples are given below for your reference. Users, however, need to give those hardware-dependent arguments according to their actual system design.

```
# ./smbus_read_byte_data 0 0x50 0 60
dev:/dev/i2c-0 slave_addr:0x50 slave_cmd:0x00 count:0x60
80 08 04 0C 0A 01 40 00 01 75 54 00 80 08 00 01
0F 04 04 01 01 00 0E 00 00 00 00 14 0F 14 2D 20
15 08 15 08 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 12 2D
7F 7A 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

# ./smbus_read_byte_data 0 0x69 0 40
dev:/dev/i2c-0 slave_addr:0x69 slave_cmd:0x00 count:0x40
12 12 12 12 12 12 12 12 12 12 12 12 12 12 12
12 12 12 12 12 12 12 12 12 12 12 12 12 12 12
12 12 12 12 12 12 12 12 12 12 12 12 12 12 12
12 12 12 12 12 12 12 12 12 12 12 12 12 12 12
```

8. Test configuration

The following hardware configurations were used for test.

Mother Board	VT6015B (PN133T +VT8231)
CPU	VIA C3 533 MHz
Memory	128 MB SDRAM

Mother Board	EPIA-V10000 (VT8601A +VT8231)
CPU	VIA C3-2 1 GHz
Memory	128 MB SDRAM

Mother Board	EPIA-5000 (VT8601A +VT8231)
CPU	VIA C3 533 GHz
Memory	128 MB SDRAM

Mother Board	EPIA-M10000 (CLE266 +VT8233+VT1211)
CPU	VIA C3-2 1 GHz
Memory	128 MB DDR RAM

Mother Board	EPIA-CL 10000 (CLE266 +VT8233+VT1211)
CPU	VIA C3-2 1 GHz
Memory	128 MB DDR RAM