

Mandrake Linux 9.1 Hardware Monitoring: VT8231, VT1211

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1. Summary

This document describes 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 in Mandrake Linux 9.1. 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 8 files as described below.

2002/12/08 10:39p 595,379	lm_sensors-2.7.0.tar.gz	LM_Sensors package
2002/12/24 06:44p 96,117	VIA Linux SysHealth Utility ver 0.1A.zip	
2003/01/13 07:57p 127	VT6015_chassign_conf	sample configuration
2003/01/20 10:54a 122	EPIAV_chassign_conf	sample configuration
2003/01/13 07:25p 26,916	smbus_read_byte_data	sample program
2003/01/13 07:17p 122	via.mk	sample make file
2002/07/08 01:50p 5,804	i2c.c	sample source
	Readme.doc	this file

Users are advised to download and use the LM_Sensors packages (ver 2.7.0) from the website at <http://www2.lm-sensors.nu/~lm78/>.

3. Overview

In this guide, we 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, we offer a

graphical-user-interface utility that facilitates 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, if you didn't install the LM_sensors package, the system includes no LM_sensors. Fortunately, you may run `rpmrake` (selecting through [Configuration]/[Packing]/[Install Software]) to install the LM_sensors package anytime from the installation CD; alternatively, you may run “`rpm -U`” to import it.

A. VT1211

After installing the LM_sensors package from the OS installation CD, user can follow section 5 to run the “VIA_SysHealth” utility.

B. VT8231

After installing the LM_sensors package from the OS installation CD, user has to build the “vt8231.o” from the LM_sensors 2.7.0 source package. That is because Mandrake Linux 9.1 does not include the “vt8231.o” binary code in the OS inbox LM_sensors rpm package. User can download the LM_sensors 2.7.0 source package from the website at <http://www2.lm-sensors.nu/~lm78/>, and run the following commands to compile the “vt8231.o”.

The kernel-source is required for compiling the LM_sensors driver source. If during the OS installation process you didn't install kernel-source package, the system includes no kernel-source. Fortunately, you may run `rpmrake` (selecting through [Configuration]/[Packing]/[Install Software]) to install the kernel-source package anytime from the installation CD; alternatively, you may run “`rpm -U`” to import it.

```
# tar zxvf lm_sensors-2.7.0.tar.gz
# cd lm_sensors-2.7.0
# make
# cp kernel/chips/vt8231.o
  /lib/modules/2.4.21-0.13mdk/kernel/drivers/sensors
# depmod -a
```

5. Using VIA_SysHealth utility

Three examples are given below on how to use the “VIA_SysHealth” utility, with the use of EPIA-M9000, EPIA-V8000, and VT6015B boards.

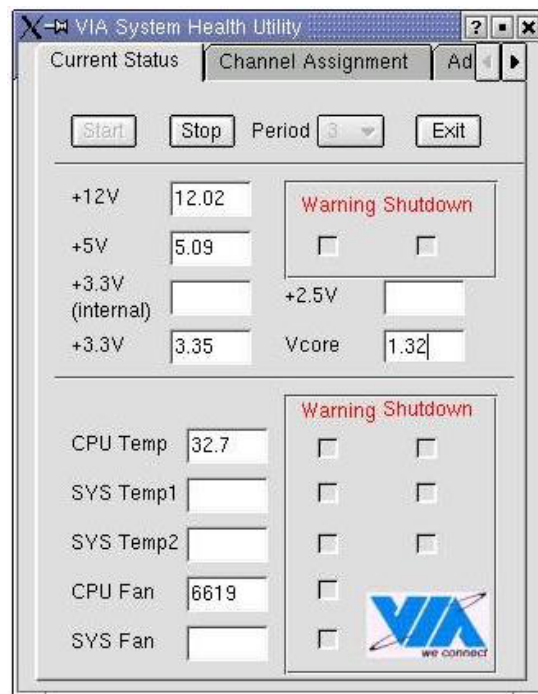
Note: The measurement results from the “VIA_SysHealth” utility are heavily hardware dependent. Users are advised to refer to the on-line help file for more information about the features and how to modify related configuration files to improve measurement accuracy.

(1) EPIA-M9000

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.



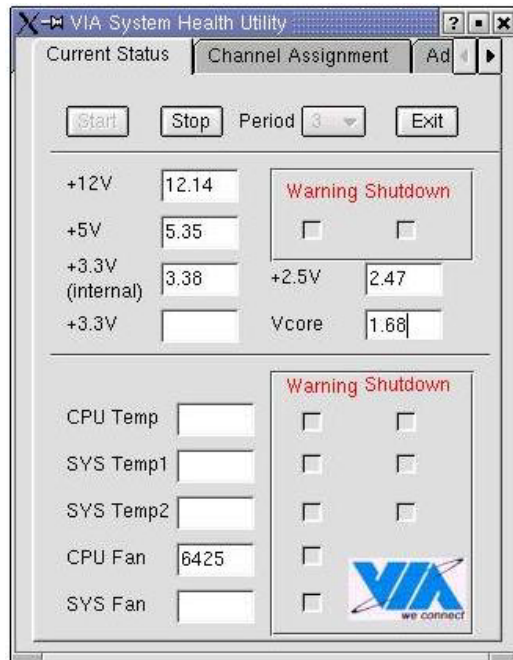
(2) EPIA-V8000

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. Execute the following make file to compile the “i2c.c” source code to build the “smbus_read_byte_data” program.

```
# ./via.mk
```

Before running the “smbus_read_byte_data” program, it is necessary to load the module “i2c-viapro” by running command “# modprobe i2c-viapro”. 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>
```

Refer to the “i2c.c” file for information about these four arguments. 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 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-V8000 (VT8601A +VT8231)
CPU	VIA C3 800 MHz
Memory	128 MB SDRAM

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