

Hardware monitoring on Fujitsu mainboards

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<i>ACTION</i>	<i>NAME</i>	<i>DATE</i>	<i>SIGNATURE</i>
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REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME
0.9	2013-12-04	First draft	Rainer König
1.0	2013-08-01	Updates for D3003-Sx and D3313-Sx boards.	Rainer König

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Abstract

This document explains how to use the hardware monitoring features of current Fujitsu mainboards with various Linux distributions.

Chapter 1

Introduction

1.1 General information

Fujitsu mainboards provide hardware monitoring functions by using an ASIC that can be read out by a Linux kernel device driver. The userspace application to read out the sensor data is called `lm-sensors`. This application is usually shipped with all current Linux distributions.

There are some desktop applets for displaying sensors around. The best supported GUI frontend as of today is `GKrellM` which is also available in most Linux distributions. Other graphical frontends like the sensors plugin for `gDesklets` for `Gnome` seem to be no longer maintained.

1.2 Required prerequisites and skills

To do the configuration steps described in this document you need *root access* for your Linux operating system.

**Important**

All shell commands must be executed with root privileges.

If your distribution kernel does not provide the required device driver module then you need to compile it by yourself. Therefore you need to know how to compile kernel modules for your distribution kernel. This also requires that your system has the complete toolchain for building kernel modules installed.

You need to know how to locate and install packages for your Linux distribution.

Chapter 2

Fujitsu OEM mainboard overview

This table shows you which mainboards you can use and what monitoring ASIC devices are used on those mainboards.

Board	ASIC	Comment
D3003-Sx	SCH5627	eOntario chipset
D3076-Sx	Theseus	CougarPoint chipset
D3236-Sx	Theseus	LynxPoint chipset
D3313-Sx	SCH5627	eKabani chipset

Table 2.1: Fujitsu mainboards

From this table you can see what ASIC is used for system monitoring.

Chapter 3

Instructions for using the Theseus chip

The following instructions apply to mainboards that use the Theseus ASIC.

3.1 Kernel driver information

The Theseus chip uses the following kernel modules:

- sch5636.ko
- sch56xx-common.ko

The driver was first introduced into the 3.1 kernel.

If you don't know the kernel version of your distribution then you can execute the following command:

```
# uname -r
```

If the version that you get from the above command is lower than 3.1 then you should see if the driver is maybe backported to your older distribution kernel. Execute the following command:

```
# find /lib/modules/`uname -r` -name "sch5636.ko"
```

If the search is successful you will probably get the location of the driver module under `/kernel/drivers/hwmon/5636.ko`. If you don't get a result with the search above, then you need to compile the driver from the sources.

The sources for the driver are provided at <http://people.fedoraproject.org/~jwrdegoede/sch56xx/>.

3.2 Installation and configuration of lm-sensors package

First install the m-sensors package with the package management tool of your distribution (apt-get, zypper, yum or whatever your distribution uses).

Once lm-sensors is installed you need to configure it by executing the following command:

```
# sensors-detect
```

sensors-detect will ask you what parts of your hardware should be scanned for manamgenent devices. Use the defaults for scanning, there is no need to try out other options.

When sensors-detect is finished it might ask you to activate a boot service or to write configurations. Do that and then reboot the system to get everything in place.

After rebooting verify that the kernel drivers are loaded with the following command:

```
# lsmod | grep sch56
```

You should see the 2 kernel modules mentioned above.

The next step is to verify if you can read out sensors. Execute the following command:

```
# sensors
```

Now you should get a list of very all your sensor values. This list is using generic labels as long as you don't configure the Theseus data for lm-sensors.

To get a translation table between the generic labels and what the sensors are really used for you need to either append the following lines to the file `/etc/sensors3.conf` or put them into a file named `/etc/sensors.d/theseus.conf`:

```
chip "theseus-*"  
  label fan1 "CPU Fan"  
  label fan2 "Rear Fan"  
  label fan3 "Fan3"  
  label fan4 "Front Fan"  
  label temp1 "CPU"  
  label temp2 "Super I/O"  
  label temp3 "Memory"  
  label temp4 "Power Regulator"  
  label temp5 "PCH"  
  label temp6 "PCIe"
```

If you run `sensors` again your list should show the correct labels for your sensors.

Chapter 4

Instructions for using the SCH5627 chip

The following instructions apply to mainboards that use the SCH5627 ASIC.

4.1 Kernel driver information

The SCH5627 chip uses the following kernel modules:

- sch5627.ko
- sch56xx-common.ko

The driver was first introduced into the 3.1 kernel.

If you don't know the kernel version of your distribution then you can execute the following command:

```
# uname -r
```

If the version that you get from the above command is lower than 3.1 then you should see if the driver is maybe backported to your older distribution kernel. Execute the following command:

```
# find /lib/modules/`uname -r` -name "sch5627.ko"
```

If the search is successful you will probably get the location of the driver module under `/kernel/drivers/hwmon/5627.ko`. If you don't get a result with the search above, then you need to compile the driver from the sources.

The sources for the driver are provided at <http://people.fedoraproject.org/~jwrdegoede/sch56xx/>.

4.2 Installation and configuration of lm-sensors package

First install the m-sensors package with the package management tool of your distribution (apt-get, zypper, yum or whatever your distribution uses).

Once lm-sensors is installed you need to configure it by executing the following command:

```
# sensors-detect
```

sensors-detect will ask you what parts of your hardware should be scanned for manamgenent devices. Use the defaults for scanning, there is no need to try out other options.

When sensors-detect is finished it might ask you to activate a boot service or to write configurations. Do that and then reboot the system to get everything in place.

After rebooting verify that the kernel drivers are loaded with the following command:

```
# lsmod | grep sch56
```

You should see the 2 kernel modules mentioned above.

The next step is to verify if you can read out sensors. Execute the following command:

```
# sensors
```

Now you should get a list of very all your sensor values. This list is using generic labels as long as you don't configure the SCH5627 data for lm-sensors.

To get a translation table between the generic labels and what the sensors are really used for you need to either append the following lines to the file `/etc/sensors3.conf` or put them into a file named `/etc/sensors.d/SCH5627.conf`:

```
chip "SCH5627-*"  
  label in0 "3.3V"  
  label in1 "VDimm"  
  label in2 "VBAT"  
  label in3 "3VSB"  
  label in4 "VCore"  
  label fan1 "CPU-Fan"  
  label fan2 "Case-Fan"  
  ignore fan3  
  ignore fan4  
  label temp1 "CPU"  
  label temp2 "SIO"  
  label temp3 "PCIe"  
  ignore temp4  
  ignore temp5  
  ignore temp6  
  ignore temp7  
  ignore temp8
```

If you run `sensors` again your list should show the correct labels for your sensors.

Chapter 5

Online resources

5.1 Homepage of lmsensors

<http://lm-sensors.org>

5.1.1 lm-sensors device support status page

<http://lm-sensors.org/wiki/Devices>

5.2 GKrellM homepage

<http://freecode.com/projects/gkrellm>