MARK 5 MEMO #092

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To: Mark 5 Development Group

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Subject: Voltage and Temperature Sensors for Mark 5 Units

This Memo applies to Dell and SuperMicro Main Boards on earlier Mark 5 units (those with serial numbers below 600) with a Debian Etch Operating System. It may also apply to later versions of Debian, such as Lenny, but it has been tested only with Etch. For Intel S5000 Main Boards, see Mark 5 Memo #078.

Several power supplies in Mark 5 units have failed after months of successful operation. The failure mode is a drop in the +5 volts to less than 4.7 volts, after the system has warmed up. This sagging power supply causes some, but not all, disk modules to appear to have bad drives. Note that some disk drives are more tolerant of the low voltage than others. It is helpful to check the power supply voltages regularly, before every session. The utility described in this Memo also checks temperatures and fan speeds.

Linux provides a `'sensors'` command that uses sensors on the main board to measure power supply voltages, temperature, and fan speeds. It is easy to install and configure the 'lm-sensors' package on a Mark 5 system. Once the `'sensors'` command is working, it is easy to check the power supply voltages, temperatures, and fan speeds.

In a Mark 5 unit with a failing power supply, you can watch the 5-volt supply voltage drop as power is applied to the disk modules.

Since Etch is no longer supported, you need to get the `lm-sensors` package from the Debian Etch Archive. To install from the Etch Archive, replace the corresponding old lines in your `/etc/apt/sources.list` file with the following lines (as `"root"`):

```
deb http://archive.debian.org/debian etch main contrib non-free
deb http://archive.debian.org/debian-security etch/updates main contrib non-free
```

Also, be sure that the `cdrom` entries are removed from the file, or placed in the file after the above `archive` lines.

(NOTE: In addition, if you want to install packages from more recent distributions that have been backported to Etch you can add:

```
deb http://archive.debian.org/backports.org etch-backports main contrib non-free
```

However, the backports are not normally needed.)

After making the appropriate changes to the `sources.list` file (as "`root`"), please use the command (also as "`root`"):

```
aptitude update
```

to update the index files. If you see this message

```
W: There is no public key available for the following key IDs:
```

then try (as "`root`")

```
apt-get install --force-yes debian-archive-keyring
aptitude update (again)
```

Next (again as "`root`")

```
aptitude install lm-sensors
```

If you have a SuperMicro mother board (Units between Mark5-21 and Mark5-599)
add the following lines to the end of the `/etc/rc.local` file:

```
# For lm_sensors:
/sbin/modprobe i2c-piix4
/sbin/modprobe i2c-dev
/sbin/modprobe lm87
```

To test the installation,
you can just type the above `modprobe` commands in to the command line as "`root`".
Once these modules are loaded, you can try sensors, as "`root`", or as "`oper`":

```
% /usr/bin/sensors
lm87-i2c-0-2e
Adapter: SMBus PIIX4 adapter at 0580
VCore:      +1.42 V  (min =  +0.98 V, max =  +2.00 V)
+3.3V:      +3.32 V  (min =  +2.99 V, max =  +3.51 V)
+5V:        +5.08 V  (min =  +4.50 V, max =  +5.52 V)
+12V:      +12.19 V  (min = +10.00 V, max = +13.00 V)
CPU Fan:  5315 RPM  (min = 2848 RPM, div = 2)
fan2:        0 RPM  (min = 2848 RPM, div = 2)           ALARM
M/B Temp:    +38Â°C  (low  =    +0Â°C, high =   +50Â°C)
CPU Temp:    +43Â°C  (low  =    +0Â°C, high =   +85Â°C)
temp3:      -128Â°C  (low  =    +0Â°C, high =   +75Â°C)    FAULT
vid:       +1.450 V  (VRM Version 8.5)
```

Some of the reported values may not be trustworthy, but the `+3.3V, +5V` `+12V` power, `CPU Fan,` and the two temperatures, seem to be OK. In particular, the `fan2` and `temp3` lines are spurious. It may be possible to customize this report by editing the `lm87` section of the `/etc/sensors.conf` file.

Note that a different driver is needed for the original Mark5 units with Dell main boards (Mark5-01 through Mark5-20):

```
# For lm_sensors:
/sbin/modprobe i2c-piix4
/sbin/modprobe i2c-dev
/sbin/modprobe adm9240
```

and the `sensors` command reports a different set of values:

```
% /usr/bin/sensors
lm81-i2c-0-2c
Adapter: SMBus PIIX4 adapter at 0580
2.5V:       +2.76 V  (min =  +2.56 V, max =  +2.84 V)
Vccp1:      +1.74 V  (min =  +1.65 V, max =  +1.84 V)
3.3V:       +3.35 V  (min =  +3.13 V, max =  +3.47 V)
5V:         +5.00 V  (min =  +4.74 V, max =  +5.26 V)
12V:       +12.00 V  (min = +11.19 V, max = +12.62 V)
Vccp2:      +1.49 V  (min =  +1.38 V, max =  +1.60 V)
fan1:         0 RPM  (min =    0 RPM, div = 8)
fan2:      2377 RPM  (min = 1103 RPM, div = 8)
temp:       +26.0Â°C  (high =   +55Â°C, hyst =    +5Â°C)
vid:        +1.75 V
alarms:
```

If you are unsure about which main board you have,
enter the following command at a linux prompt:

```
egrep "name|MHz" /proc/cpuinfo
```

SuperMicro main boards reply

```
model name      : Intel(R) Pentium(R) III CPU - S         1266MHz
cpu MHz         : 1266.125
```

Dell main boards reply

```
model name      : Pentium III (Coppermine)
cpu MHz         : 997.533
```

For the Intel S5000 main board in Mark5-700 to Mark5-799, see Mark 5 Memo #078. For other main boards, try the `sensors-detect` utility, which was installed as part of the `lm-sensors` package.