Application for System Monitor and Configuration Using BIOS API Driver on Linux

1. Supported Linux Distros:

This application has been tested on the following Linux Distros:

OS Name	Kernel Version	Platform Type	Supported
CentOS 6.6 – i386	2.6.32	32 bit	No
CentOS 7 – x86_64	3.10.0	64 bit	Yes
Debian 8.1.0 – i386	3.16.0	32 bit	Yes
Debian 8.1.0 – amd64	4.1.3	64 bit	Yes
Fedora 22 – i386	4.1.3	32 bit	Yes
Fedora 22 – x86_64	4.1.3	64 bit	Yes
Red Hat 6.7 – i386	2.6.32	32 bit	No
Red Hat 7.1 – x86_64	3.10.0	64 bit	Yes
Ubuntu 14.04.2 – i386	3.16.0	32 bit	Yes
Ubuntu 14.04.2 – x86_64	3.16.0	64 bit	Yes

As shown in the table above, this application supports any Linux Distros with kernel 3.0 or above. It cannot support kernel 2.x.x because the file structure in those kernels are too much different than kernel 3.x.x which is required by the BIOS API driver. The 32 bit version of CentOS and Red Hat are the latest versions of those OSes that can be found, and they are not upgraded to kernel 3.x.x. This application will not work with them.

2. How to install and run the adl_biosapi application:

- First, execute the following command to verify that the kernel on the target Linux machine is at least 3.0 for this application to run:
  ```
  uname –r
  ```
- cp adl_biosapi.zip <empty folder on target linux machine>

  Notice that there is a single zip file named adl_biosapi.zip that supports both 32 bit and 64 bit Linux platforms by running a script to detect the platform type at run time, then call the appropriate command automatically.
- Extract the files with command:
  ```
  unzip adl_biosapi.zip
  ```
- cd adl_biosapi
- ./start_adl_biosapi.sh

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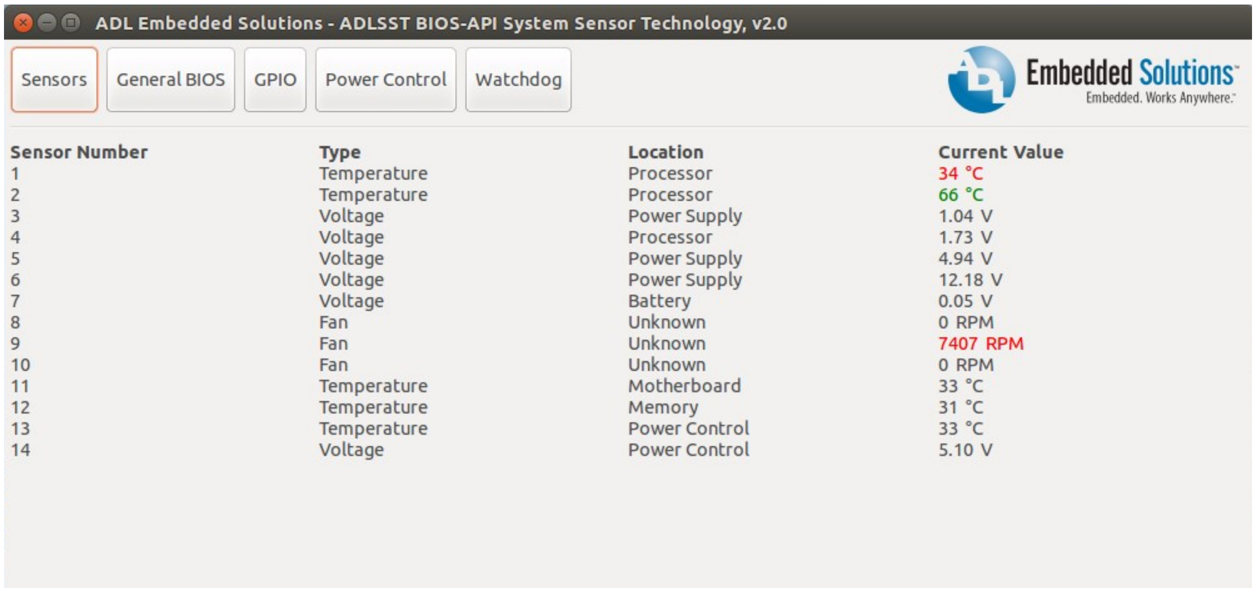
If this application is running for the first time, it will extract and build the BIOS API driver (bbapi-1.2.tgz), load the driver module into the kernel, then start the adl_biosapi_xx application automatically (where xx is 32 or 64 depending on the platform type). If this is the second time or later run, the BIOS API driver will not be built again. It will just load the bbapi.ko module into the kernel, then run the application.

3. Description of supported functions:

Currently, there are 5 pages in the application with the default of the Sensors page:

- **Sensors page:**
  Picture 1 below is an example of the Sensors page. This page shows the current status of all sensors in the system retrieved from the BIOS API driver. By default, all sensor data will be refreshed every 2 seconds. The user can change the refresh rate by adding a number next to command adl_biosapi_xx in the script start_adl_biosapi.sh. If any sensor value increases when compared to the previous value, then its color will be changed from grey to green. If the sensor value decreases when compared to the previous value then its color will be changed from grey to red. If the sensor value does not change, then its color stays at grey.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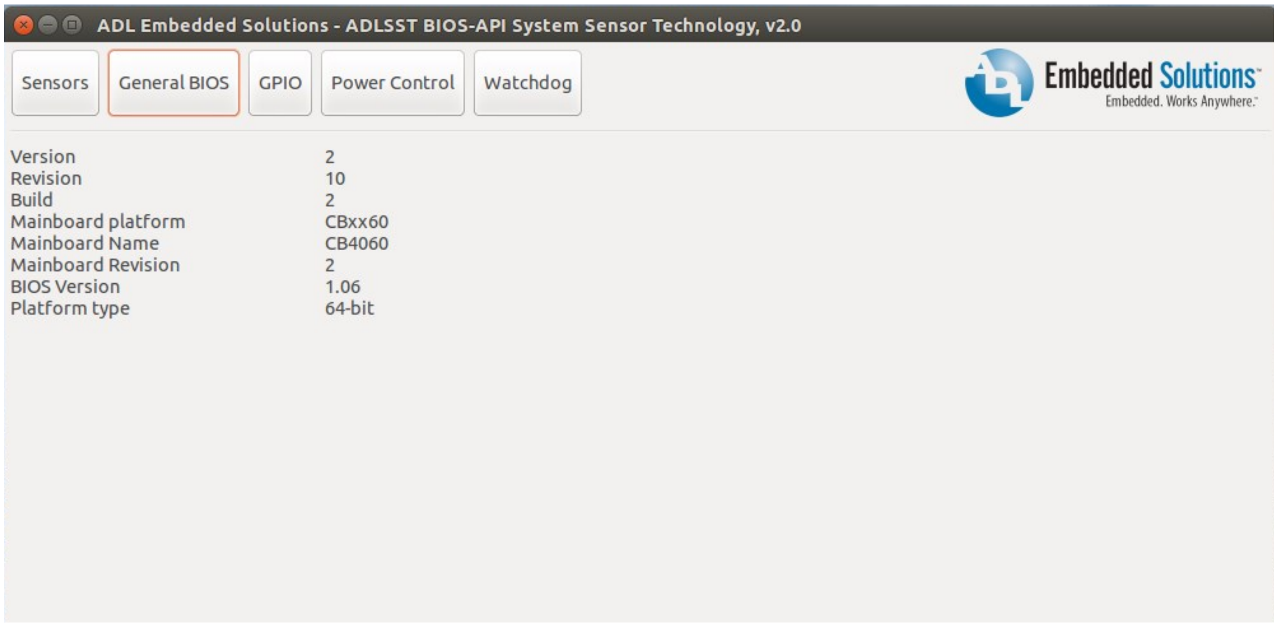
Sensor Number	Type	Location	Current Value
1	Temperature	Processor	34 °C
2	Temperature	Processor	66 °C
3	Voltage	Power Supply	1.04 V
4	Voltage	Processor	1.73 V
5	Voltage	Power Supply	4.94 V
6	Voltage	Power Supply	12.18 V
7	Voltage	Battery	0.05 V
8	Fan	Unknown	0 RPM
9	Fan	Unknown	7407 RPM
10	Fan	Unknown	0 RPM
11	Temperature	Motherboard	33 °C
12	Temperature	Memory	31 °C
13	Temperature	Power Control	33 °C
14	Voltage	Power Control	5.10 V

Picture 1 – Sensors page

- **General BIOS page:**
  Picture 2 below is an example of the General BIOS page. This page shows some static information about General BIOS data retrieved from the BIOS API driver. Data in this page does not change while the application is running so it will not be refreshed as in the sensor page.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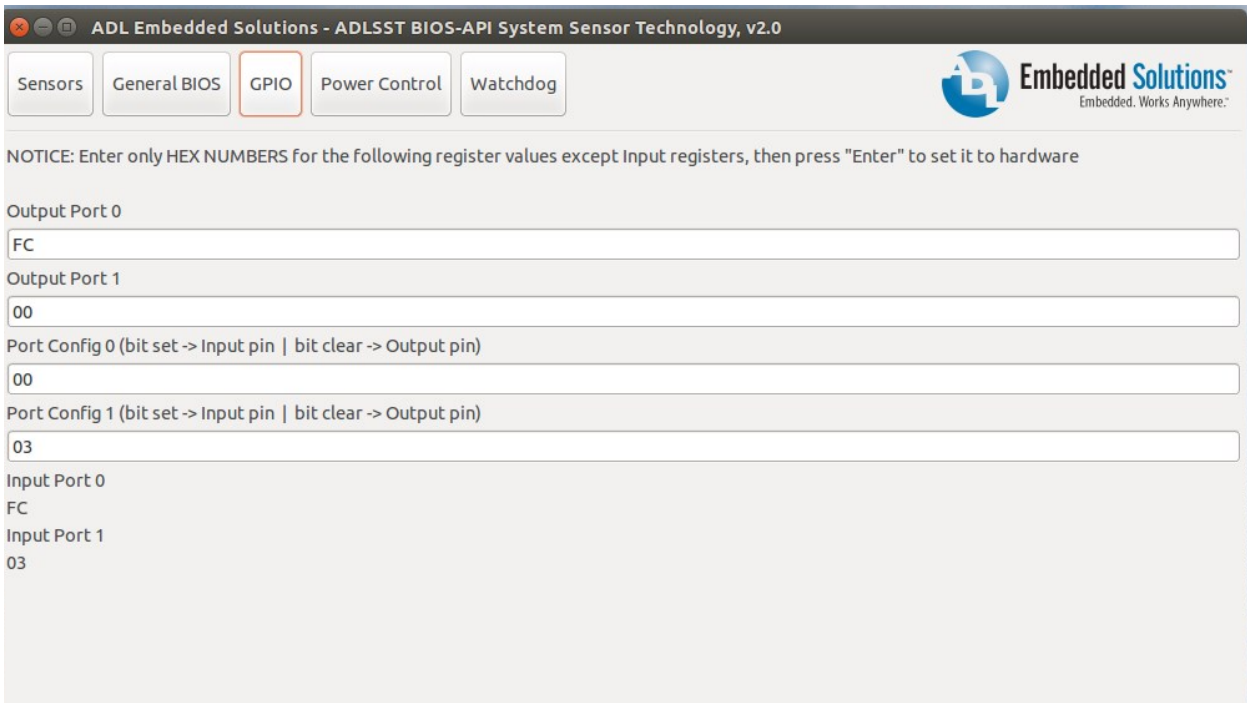
Version	2
Revision	10
Build	2
Mainboard platform	CBxx60
Mainboard Name	CB4060
Mainboard Revision	2
BIOS Version	1.06
Platform type	64-bit

Picture 2 – General BIOS page

- **GPIO page:**
  Picture 3 below is an example of the GPIO page. This page shows the current values of all GPIO registers retrieved from the BIOS API driver: Input, Output, and Configuration registers. Only data in Input registers will be refreshed every 2 seconds (default value) to reflect the changes in the hardware. If any GPIO input value increases when compared to the previous value then its color will be changed from grey to green. If the GPIO input value decreases when compared to the previous value then its color will be changed from grey to red. If the GPIO input value does not change, then its color stays at grey.

  The user can configure any value they want on all of the other GPIO registers. Notice that for port config registers a value of 1 in any bit position will make it an input bin, and a value of 0 on any bit position will make it an output bin.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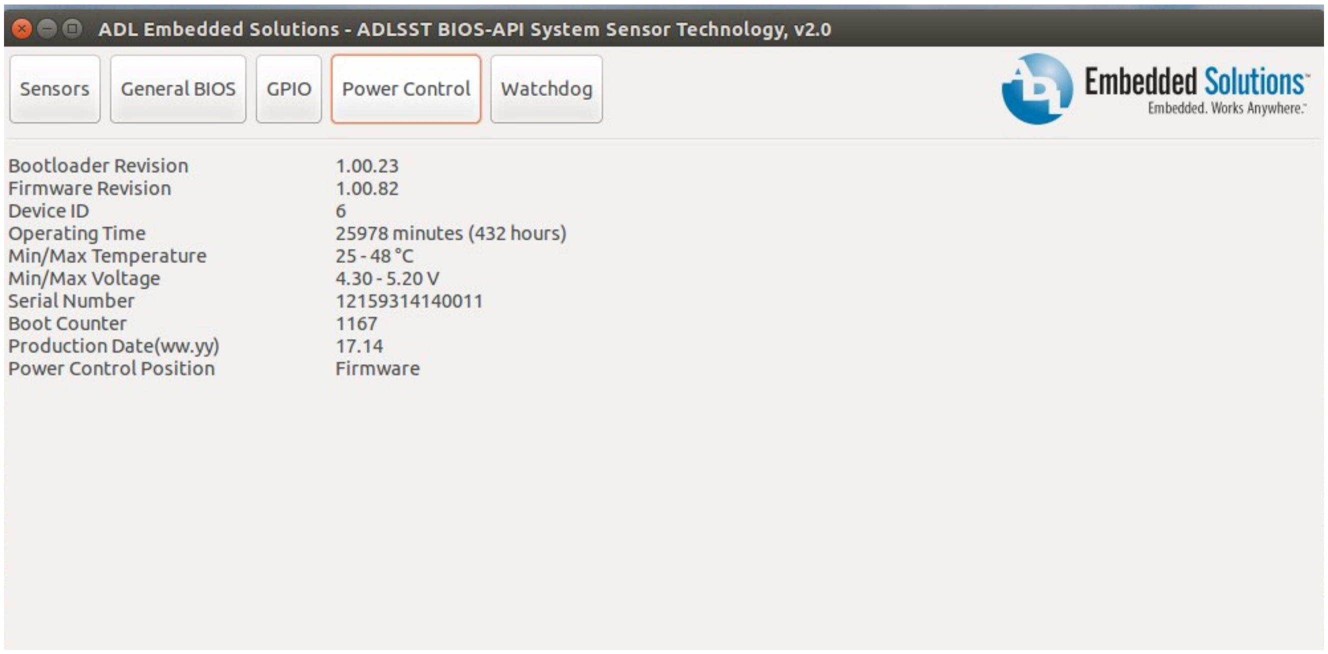
NOTICE: Enter only HEX NUMBERS for the following register values except Input registers, then press "Enter" to set it to hardware

Output Port 0
FC
Output Port 1
00
Port Config 0 (bit set -> Input pin | bit clear -> Output pin)
00
Port Config 1 (bit set -> Input pin | bit clear -> Output pin)
03
Input Port 0
FC
Input Port 1
03

Picture 3 – GPIO page

- **Power Control page:**
  Picture 4 below is an example of the Power Control page. This page shows the current Power Control data retrieved from the BIOS API driver. The only value that will be changed in this page is the "Operating time" which will keep increasing. This page will not be refreshed because most of the data are static information.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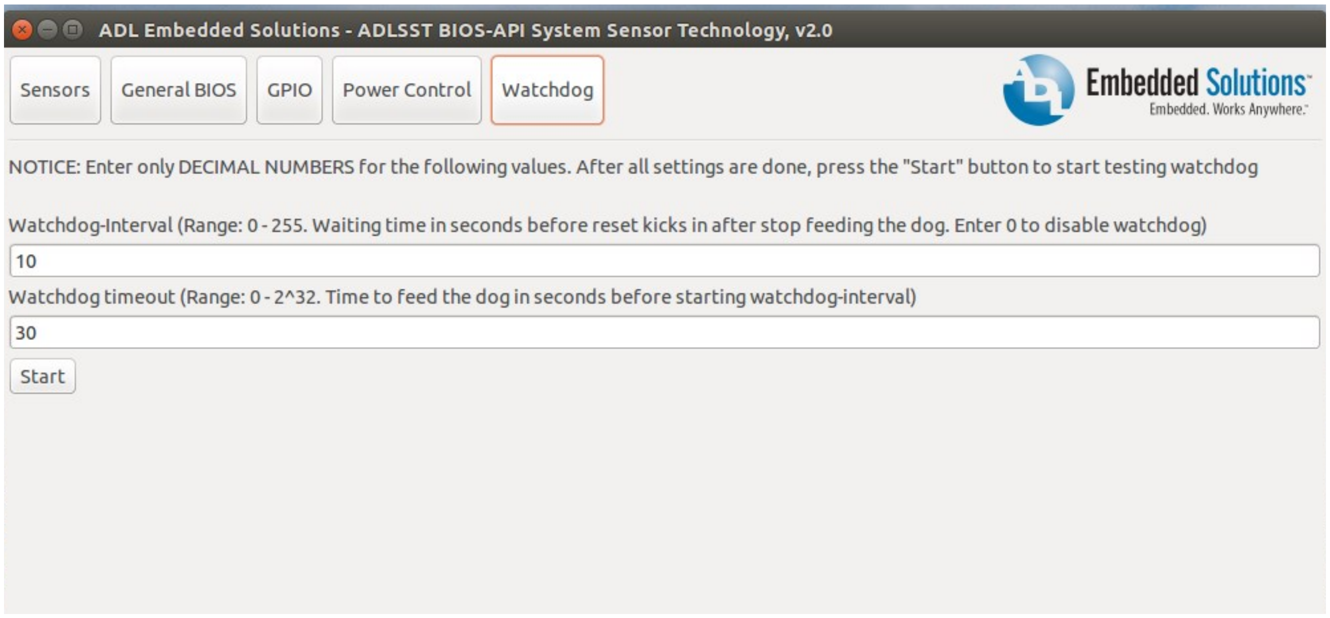
Bootloader Revision	1.00.23
Firmware Revision	1.00.82
Device ID	6
Operating Time	25978 minutes (432 hours)
Min/Max Temperature	25 - 48 °C
Min/Max Voltage	4.30 - 5.20 V
Serial Number	12159314140011
Boot Counter	1167
Production Date(ww.yy)	17.14
Power Control Position	Firmware

Picture 4 – Power Control page

- **Watchdog page:**
  Picture 5 below is an example of the Watchdog page. This page shows the current settings of the Watchdog parameters: watchdog interval, and watchdog timeout. The watchdog interval is the waiting time in seconds before reset kicks in after the dog is stopped feeding. Watchdog Timeout is the time in seconds to feed the dog.

  The user must press [Enter] after inputting a value in Watchdog interval and Watchdog timeout fields. Press the START button to begin the Watchdog test. Once the timeout elapses, a system message will appear at the bottom of the screen to let the user know that the watchdog is activated and a system reset is imminent: “System will reset in xx seconds…”

  This page will not be refreshed because all of the data are static information.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Start

NOTICE: Enter only DECIMAL NUMBERS for the following values. After all settings are done, press the "Start" button to start testing watchdog

Watchdog-Interval (Range: 0 - 255. Waiting time in seconds before reset kicks in after stop feeding the dog. Enter 0 to disable watchdog)

10

Watchdog timeout (Range: 0 - 2^32. Time to feed the dog in seconds before starting watchdog-interval)

30

Picture 5 – Watchdog page