USER MANUAL

INSTALLATION:

Downloading Project Package:

- Open your favorite web browser and go to http://senior.ceng.metu.edu.tr/2008/ hsbssmart/index.html page and download the *HSBS_Final_Package.tar.gz* file to your computer.

- Go to the directory where you have downloaded *HSBS_Final_Package.tar.gz* and extract it.

- Let *ProjectPath* be the identifier of the path where you extracted *HSBS_Final_ Package.tar.gz*.

Installing .hex files to the PIC:

- Go to the *ProjectPath* directory. This directory contains the *sht15.hex*.

- You can load *sht15.hex* into PIC via either *Winpic800* or *Odyssey* programs.*Winpic800* is for Windows and *Odyssey* is for Linux.

- In order to install *Winpic800*, go to http://www.winpic800.com/index.php?lang=en page and download the latest version.

- In order to install *Odyssey*, go to
  http://vasco.gforge.enseeiht.fr/index.php?article=Odyssey .html page and download the latest version.

Installing kernel and disk images into AP-400:

You have to install *Cutecom* and *TftpServer* programs in order to install the kernel and disk images into AP-400 device.

Installing Cutecom:

- Go to http://cutecom.sourceforge.net/ page and download the source code of the latest version to your computer.
- Go to the directory where you have downloaded *Cutecom* and extract it.
- Go to the directory where you extracted *Cutecom* and compile the source code.

Installing TftpServer:

- Go to http://sourceforge.net/project/showfiles.php?group_id=162512 page and download the latest version for Unix to your computer.
- Go to the directory where you have downloade *TftpServer* and extract it.
- Go to the directory where you have extracted *TftpServer* and open the *tftpserver.ini* file.
- In the *tftpserver.ini* file, delete the uncommented lines under *[LISTEN-ON]* part and write *'10.0.0.167:2100* there.
- In the *tftpserver.ini* file, delete the uncommented lines under *[HOME]* part and write a path there. (This path is be the place where you are going to put the kernel and disk images. Let *Kernel_and_Disk_Imag_Path* be the identifier of this path.)
- Go to *ProjectPath* directory.
- Put *vmlinux.ap400.bin.l7* and *sqfs.ap400.bin* files into *Kernel_and_Disk_Imag_Path* directory.

Now we are ready to install the kernel and disk images to AP-400 device.

- Connect the AP-400 device to your computer.

- Run *TftpServer*.

- Run *Cutecom*.

- In the GUI of *Cutecom*, select device type that you have connected to AP-400 device and select the baudrate as *115200* and press the *Open Device* button.

- Run the AP-400 device.

- In the GUI of *Cutecom*, you will see a '+' character after a short time you started AP-400. When you see the '+' character, press *Ctrl-C* on your keyboard.

- In the GUI of *Cutecom*, in the *Input* part

- Write *ip_address -h yourIP -l IP_of_AP-400* and press *ENTER*. (*yourIP* is the IP of your computer and *IP_of_AP-400* is the IP of the AP-400 device on which you are going to install kernel and disk images.)

- Write *load -r -b 0x80400000 vmlinux.ap400.bin.l7* and press *ENTER*. (Wait until the execution is completed.)

- Write *fis create -l 0x00080000 -f 0xBFD70000 -e 0x80041040 -r 0x80041000 vmlinux* and press *ENTER*. (Wait until the execution is completed.)

- Write *load -r -b %{FREEMEMLO} sqfs.ap400.bin* and press *ENTER*. (Wait until the execution is completed.)

- Write *fis create -l 0x00140000 -f 0xbfc20000 -e 0 rootfs* and press *ENTER*. (Wait until the execution is completed.)

Now you have installed the kernel and disk images into your AP-400 device, you can turn off AP-400.

Configuring and running the server:

You must have MySQL running on your computer in order to store measured values coming from sensors.

Installing and Configuring MySQL:

- Install *MySQL* via using the package manager of your operating system.
- Alternatively, you can go to
  http://dev.mysql.com/downloads/mysql/5.0.html#downloads page and download one
  of the Linux versions proper to your opearting system.
- Go to ProjectPath directory and press F4.
- In the console, write *sudo mysql*, press *ENTER* and enter your password.
- Then write \. *HSBS_WSN.sql* on the command line and press *ENTER*.

Running Server Module:

- Go to ProjectPath directory.
- On the console, write *telnet AP-400_IP* (*AP-400_IP* is the IP of the AP-400 device.)
  and then press *ENTER*.
- Press F4, and on the console write *./hservSMS -h host -u user -p passwd* and press
  ENTER. (*host* is the hostname of the *MySQL* server, *user* is the user name of the
  MySQL server and *passwd* is the password of the *MySQL* server.)

Now, you have started to receive values from sensors and store them to MySQL
database.

Running the GUI Module:

We have implemented the GUI Module in NetBeans. You can open the "HSBS_GUI" project
via NetBeans.

- Go to http://download.netbeans.org/netbeans/6.1/final/ page and download *NetBeans and* install it.

- Open *NetBeans* and create a project using *HSBS_GUI* where located in *ProjectPath*.

- Build and then Run the project.

HOW TO USE HSBS_GUI:

HSBS_GUI has four *tab*s. These are NodeMonitor, DataAnalyzer, ReportGenerator and SensorSettings *tab*s.

NodeMonitor:

On the left of the page, you can see the Sensor Nodes as a tree. The sensor nodes that are active, in other words, the sensor nodes that are sending data to the server are green and inactive ones are red. If you right click on a Node, you can see a menu. This menu helps the user ping or reboot the Node. When you click *Ping,* the result of the ping operation can be seen in the *Log Action Panel*. There you can see whether the Node is reachable or not. When you click *Reboot,* the Node reboots itself. On the right of the page, you can see the setup topology and locations of the sensor nodes.

DataAnalyzer:

On the left of the page, you can see the Sensor Nodes as a tree. On the right, there are two sub-tabs, one is Humidity and the other is Temperature. Below these sub-tabs is the space where the graphs will be drawn. On below of the Sensor Nodes, there are the date spinners. And below of these, there is the Draw button. On the buttom of the left side, there is the Live Data checkbox. After the user selects the From and To dates, if he/she presses the Draw button and if there are values in this time interval in the database, that values will be drawn as a graph on the space on the right of the page. If Live Data checkbox is checked, a graph is drawn on the space on the right of the page via using the recent values in the database.

Report Generator:

On the left of the page, you can see the Sensor Nodes as a tree. On below of this, there are the From and To date spinners. And below of these, there are Generate, Save and Clear buttons. If you press Generate, a report will be generated using the selected nodes and time interval and this report can be seen as text format on the Log Panel on the right. When you press the Save button, you can save the report as a .pdf or .txt file.

Sensor Settings:

When the Sensor Settings is opened the first time, on the below of the page, you can see two text fields for user id and password. The user enters his/her userid and password and presses the Login button. The user can continue if there is a user with that userid and password. If the user has forgotten his/her password, he/she presses the Forgot Psw? button and his/her password will be sent to his/her e-mail.

If you are succeed in to login, you can see the page where you can modify Sensors and Users tables. The upper part of the page is used to delete entries from the Sensors table, update entries in the Sensors Table and insert entries into Sensor Tables. If you click a row in the Sensor Table, the text fields related with Sensor table are filled with these values. When you press the Delete button, the selected row in the Sensor table is deleted from the database. If you press the Update button, the selected row will be updated using the values in the text fields related with Sensor table. If you press the Insert button, a new row will be added to the Sensor Table in the database, using the values in the text fields related with Sensor table. If you press the Clear Form button, the text fields above are cleared.

The below part of the page is used to update entries in the Users Table. The user fills the text fields related with the Users Table and if he/she presses the Update button, the Users Table in the database will be updated via using these values.