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Wireless Home Automation Using Cloud Interface

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***Abstract*: This kind of project presents the overall type of Home Automation Program (HAS) with low cost and wireless system. This kind of system is designed to assist and provide support in order to carry out the needs of older and disabled in home. Also, the smart home concept in the system increases the typical living at home. The switch function is being used to control the property home appliances. The status is received in the android software which streams the Fuses. The main control system implements wireless technology to provide remote access from smart phone. The design remains the present electrical fuses and provides more protection control on the fuses with low voltage causing method. The switches position is synchronized out of all control system wherein every user interface signifies the real time existing switches status. The system designed to control electrical devices and devices in house with relatively low cost design, user-friendly interface and ease of installation. Web of things is a growing phenomenon and home automation solutions are most likely to be user's first introduction to this kind of technology. Car radio frequency technologies are significant part of sensor network and at this time there are many systems looking to be standard of home automation. Home robotisation as a business will grow rapidly in the coming years and with wireless sensors networks the possibilities just in home is enormous. Energy intake of an appliances in home can be monitored and may take preceding action to protect the appliances by using a current sensing equipment consumer can statistically preview the energy consumption of every product.**

***Key Words:* Internet, WIFI, and ATtiny85.**

I. INTRODUCTION

1.1 Introduction on our Project:

The Electrical metering instrument in presently a days, the vitality utilization and vitality circulation has turned into a major subject for exchange due to tremendous distinction in vitality creation and utilization. In such manner, vitality buyers are confronting such a large number of issues because of the regular influence disappointments; another imperative purpose behind influence slices is because of the UN-constrained vitality utilization of rich individuals. In this angle, to minimize the force slices and to appropriate the vitality similarly to all regions, some confinement ought to have over the force utilization of every last vitality customer, and as indicated by that the Government ought to actualize an arrangement, by presenting Autonomous Energy Meters all around in local part. Henceforth, the need has come to think on this line and an answer must be developed out.

1.2 Electrical Metering Instrument Technology:

Today the metering instrument innovation grown up fundamentally, such that the Consumed vitality can be ascertained numerically, shown, information can be put away, information can be transmitted, and so forth. Without further ado the micro controllers are assuming real part in metering instrument innovation. The present task work is intended to gather the expended vitality information of a specific vitality shopper through remote correspondence framework (without going to customer house), the framework can be called as programmed meter perusing (AMR) framework. The Automatic Meter perusing framework is planned to remotely gather the meter readings of an area utilizing a correspondence framework, without persons physically going and perusing the meters outwardly.

2.3 Prepaid Energy Metering

Energy meters, the only direct revenue interface between utilities and the consumers, have undergone several advancements in the last decade. The conventional electro-mechanical meters are being replaced with electronic meters to improve accuracy in meter reading. Asian countries are currently looking to introduce prepaid electricity meters across their distribution network, buoyed up by the success of this novel methodology in South Africa. The existing inherent problems with the post-paid system and privatization of state held power distribution companies are the major driving factors for this market in Asia. Over 40 countries have implemented prepaid meters in their markets.

In United Kingdom the system, has been in use for well over 70 years with about3.5 million consumers. The prepaid program in South Africa was started in 1992since then they have installed over 6 million meters. Other African counties such as Sudan, Madagascar are following the South African success. The concept has found ground in Argentina and New Zealand with few thousands of installations. The prepaid meters in the market today are coming up with smart cards to hold information on units consumed or equivalent money value. When the card is inserted, the energy meter reads it, connects the supply to the consumer loads, and debits the value. The meters are equipped with light emitting diodes (LED) to inform consumers when 75 percent of the credit energy has been consumed. The consumer then

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recharges the prepaid card from a sales terminal or distribution point, and during this process any changes in the tariff can also be loaded in the smart card.

II. PROPOSED WORK

This project is focused developing Smart home energy meter with the Cloud interface. Aim of this project is to study and develop a complete system that will transfer the data samples of the energy consumption of the home appliance to the android APP. This system enables user control appliances and monitoring status of appliance. The designed embedded system based Smart home energy meter with cloud interface receives the sample value from the current sensing element sends to the controller for calibration, the calibrated value is sent to the WI-FI for cloud update to the channel.

2.1 MOTIVATION

Smart Networked home offer advantages when devices are connected directly or through server they are able to use and access the information that would otherwise be unavailable. They could share time information, location data, processing power etc. with each other through the network. When the sensor data from all around the home is collected and combined the system can gain a clear picture about the situation in home.

2.2 PROBLEM DEFINITION

At present there are used controlling module and some low specification controller used. This project I have to develop monitoring module for energy consumption and some other features added here.

2.3 GOALS AND OBJECTIVES

The goals and objectives of this project are

- Become familiar with the practical aspects of network communications.
- Study the principle of Current Sensor with network utilizing master slave polled protocol.
- Understand the coding issues in dealing with Controller, Current sensor and Wi-Fi module.
- Extend current knowledge in Microcontroller based system
- To extend our application with more flexible based real time interaction system by which one can understand the system.
- Debugging the Hardware boards for problems.

2.4 SCOPE

This thesis concentrates mainly on the technical aspects of the smart home as this is as it is also the standpoint from which research has been conducted. Since smart home research in general spans with multiple disciplines with naturally limit the scope of the study to hardware, software and communication. Practical findings, results in user tests and other issues related to everyday use are also presented. Networks included Body Area Network (BANs) and Wireless Personal Area Network (WPAs) they are used for not controlling but used to interface wireless with the home network and devices.

2.5 Block Daigram

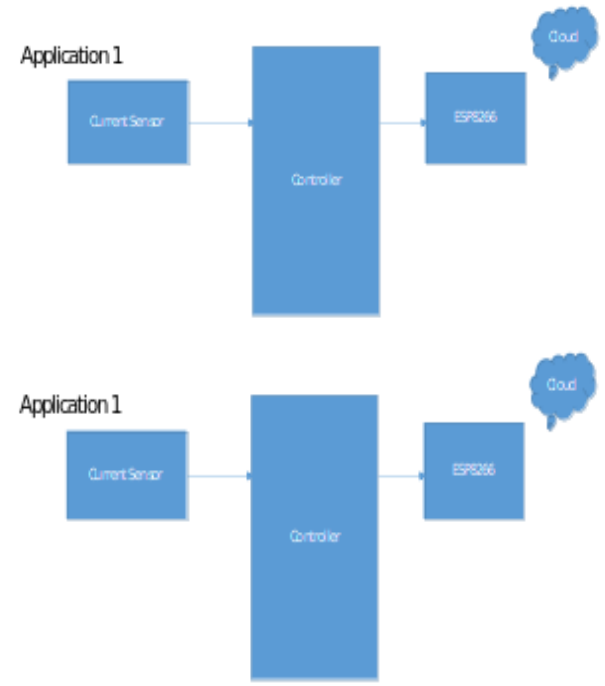

Figure 2.1: Current monitoring

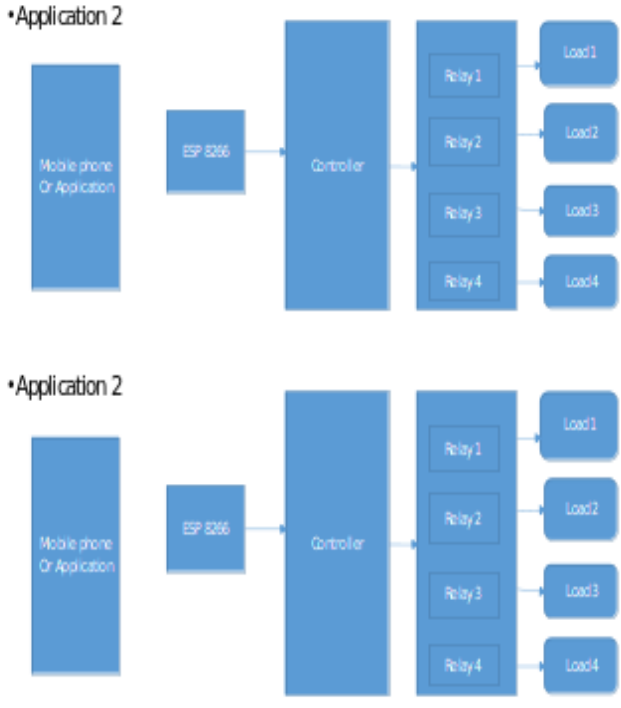

Figure 2.2: Controlling module

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2.6 Embedded Processor:

In the proposed work, The Atmel ATtiny85 Microcontroller is an eight bit device. Being an Atmel tiny AVR device the ATtiny85 is packs performance and power efficiency into a small package, perfect for applications where space is at a premium. Attiny 85 executes an powerful instruction cycle for an single the ATtiny85 achieves throughputs tends to 1 MIPS per MHz, power saving mode and speed.

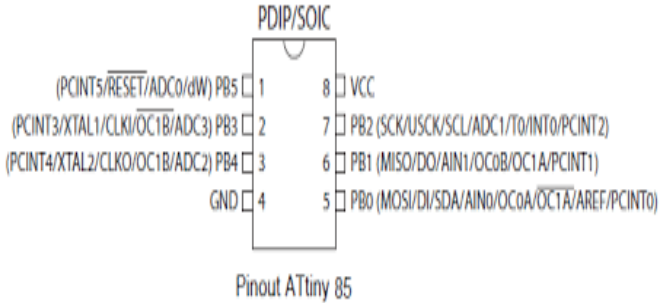

Figure 2.3: At tiny 85

Micro controller Features:

- 20 MHz Max. Operating Frequency
- 8 KB Flash
- 512 Bytes EEPROM
- 0.5 KB SRAM
- 6 GPIO

III. EXPERIMENTAL RESULTS

3.1 Results

In this chapter the details of the results that are obtained in the process of the thesis execution are described in detail. The results of the power consumption graph with the time and amperes consumed, switching results for switching ON and OFF the loads, getting the switch status, changing the board name, scheduling the switches, getting the schedule status, getting the MAC ID of the current device connected and getting the current running time of controller.

3.1.1 Current Consumption:

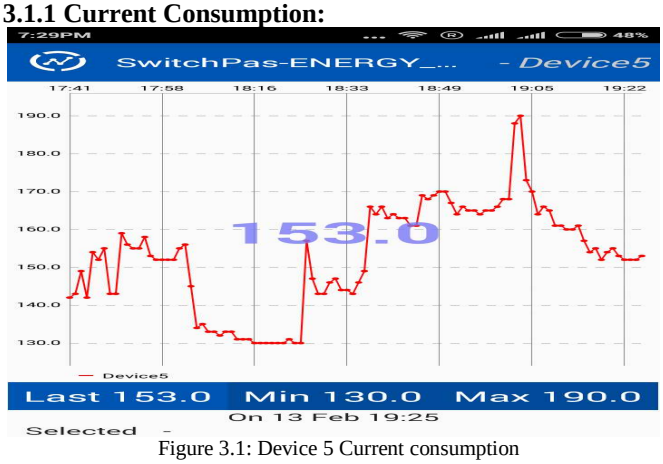

Figure 3.1: Device 5 Current consumption

Above result revels the Current consumption graph of the home appliance connected to device 5 for which the corresponding current values are updated in the application. Figure 3.2 shows the updated current values for the device 2 home appliance load is connected.

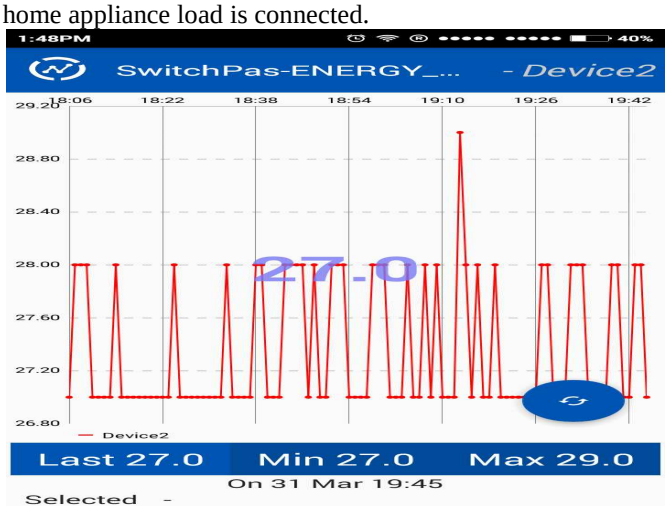

Figure 3.2: Device 2 current consumption

3.1.2 Switch ON/OFF Single/ALL Switches Switching ON/OFF with board IP address

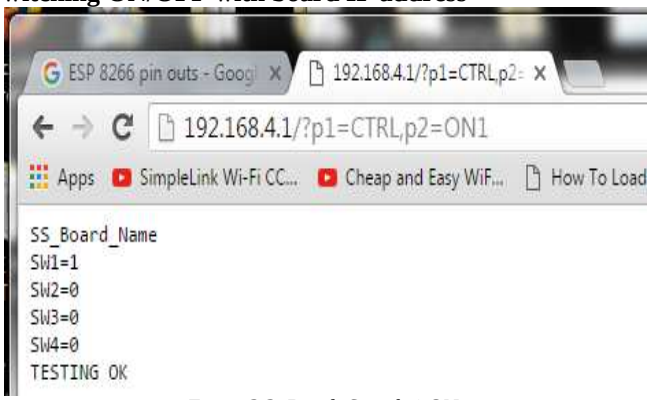

Figure 3.3: Result Switch 1 ON

This output result show the switch 1 active in the browser link when the command is sent to the corresponding IP address of the device the Switch activated.

Figure3.4: Result Switch 2 ON

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This output result show the switch 2 active in the browser link when the command is sent to the corresponding IP address of the device the Switch activated.

Figure 3.5: Result Switch 3 ON

This output result show the switch 2 active in the browser link when the command is sent to the corresponding IP address of the device the Switch activated.

Figure 3.6: Result Switch 4 ON

This output result show the switch 4 active in the browser link when the command is sent to the corresponding IP address of the device the Switch activated.

Figure 3.7: Result Switch 4 OFF

This output result show the switch 4 deactivated in the browser link when the command is sent to the corresponding IP address of the device the Switch activated.

Figure 3.8: Result Switch 3 OFF

This output result show the switch 3 deactivated in the browser link when the command is sent to the corresponding IP address of the device the Switch activated.

Figure 3.9: Result Switch 2 OFF

This output result show the switch 2 deactivated in the browser link when the command is sent to the corresponding IP address of the device the Switch activated.

Figure 3.10: Result Switch 1 OFF

This output result show the switch 1 deactivated in the browser link when the command is sent to the corresponding IP address of the device the Switch activated.

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5.1.3 Set Switch Names and Board Name

Figure 3.11: Switch Board and switch name Change

The switch board configuration board default name for the first command is "SS_Board_Name" after executing the configuration command with the board new board name "board1" reflected.

3.1.5 Set System Time

Figure 3.12: Setting the Controller time

The above result resembles controller time running can be set were p1 is the command to be set. P2 is the time with hours, minutes and time, p3 is the flag bit for the switch number and p4 is the date with day month and year.

3.1.6 Get System Time

Figure3.13: Getting the controller time

This result shows the controller running time with the 24 hours' time format for a day and corresponding date.

3.1.7 Schedule

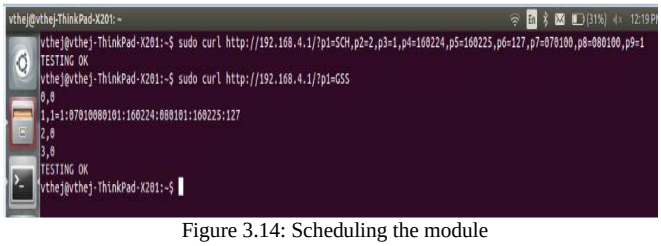

Figure 3.14: Scheduling the module

The above result shows the scheduling of the module for some time to activate and deactivate switches. P1=SCH indicates the schedule command.

3.1.8 Get Schedule Status

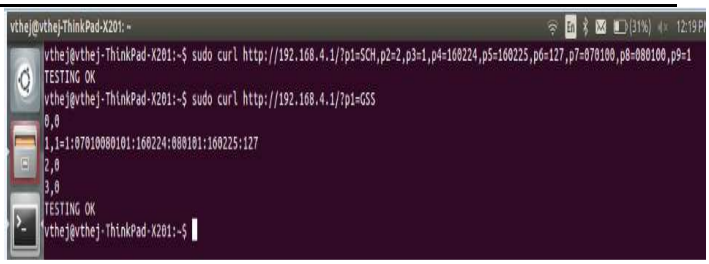

Figure 3.15: Getting schedule status

The above result shows the scheduling status of the switch that is set to be active after some time. P1=GSS indicates the scheduling status command.

3.1.9 Get Switch Board Status

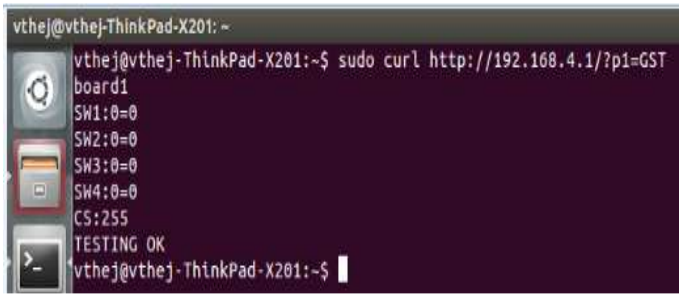

Figure3.16: Getting Switch board status

The above result shows board status of each switch weather active high or low. P1=GST shows the current status of the board.

3.1.10 Get Unique Ids of the switch board

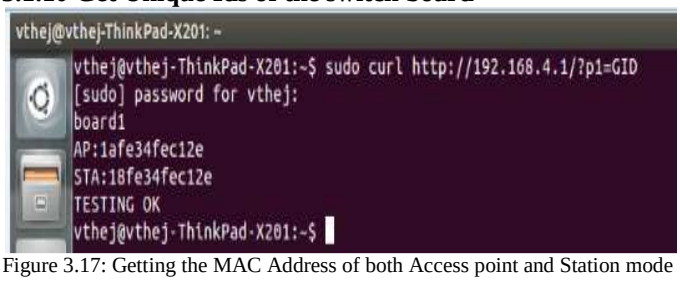

Figure 3.17: Getting the MAC Address of both Access point and Station mode

The above result shows board corresponding MAC IDs in access point. If the board is connected to the Station mode the corresponding station MAC ID is displayed. P1=GID indicates getting the MAC IDS of the device.

3.1.11 Get Wi-Fi Firmware Version

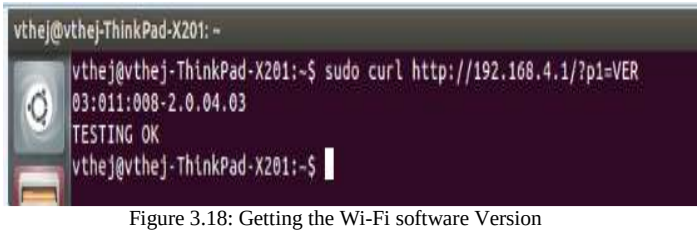

Figure 3.18: Getting the Wi-Fi software Version

The above result shows the corresponding firmware version of the board by which the correct Wi-Fi firmware can be monitored. P1=VER indicates the command to display the Wi-Fi firmware version.

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IV. CONCLUSIONS

In this Paper we can make the Easy and Low Cost product sto everyone. In the Business Plan we verified that our Idea is innovative and competitive compared with the other products already present in the market. Obviously, not all that glitters is gold: we acknowledge the presence of strong competitors, and especially we have discovered the existence of a similar product overseas. Then, taking into account the considerations made in the Business Plan, we pass to the design of the product. By the mere reading of this document, designing the structure of the system may appear an easy challenge, but it is not so; also if we already knew all the requirements, writing down the found solution, and concretizing an Idea, is never an easy work. However, the most interesting part is always the implementation, and it is largely described in this thesis. Through what we wrote the reader should achieve an appropriate knowledge of the system, enough to be able to develop the product by himself. We know that the thesis lacks the testing phase part, but sadly we have not developed other packages yet; we left the testing phase to be a future work. This document summarizes a part of the work done so far, not only with the goal of writing a thesis but, with the aim of using what we learned during our studies to create our future. Lot of efforts has been done until now to reach this step, and for sure we will face with many other obstacles during the route addressed 80 for Home Automation to build an enterprise, but this does not discourage us, we will go forward as we always have done.

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