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Car Ignition System via Mobile Phone

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Abstract - **SMS text messaging is the most popular and widely used data application in this era for sending text messages from one mobile to another. Short Message Service (SMS) is a communications protocol allowing the interchange of short text messages between mobile telephone devices [7]. Short messages can be encoded using a variety of alphabets. The implementation of Car ignition system through mobile phone consists of 2 parts: software design and hardware development. The software part is designed by using Dynamic and loads the program into Rabbit Core Module (RCM3200). The data loaded into RCM3200 will be saving at the memory. The hardware parts are Rabbit Core Module (RCM3200) with Prototyping Board (RCM3100), GSM/GPRS modem: Wavecom 900/1900 MHz Machine-to-Machine (M2M) and bipolar junction transistor (BJT) circuit. The system purpose is to ignite the car engine by using the mobile phone. By sending a text message (SMS) from mobile phone, the system could ignite the engine. The advantage of this system is user could ignite their car engine wherever they parked their car whether near or far distance from the user. The engine will run for 5 minute without unlocks the door.**

Keywords: Rabbit Core Module (RCM3200), Prototyping Board (RCM3100), GSM/GPRS modem: Wavecom 900/1900 MHz Machine-to-Machine (M2M), Mobile Phone and BJT circuit

1. INTRODUCTION

Nowadays most mobile phone equipped with Bluetooth device, Short Message Service (SMS) and Camera. It had been integrated and installed in the mobile phone chipsets so that the subscriber could use the mobile phone as a computer. Subscribers are highly dependent on a mobile phone due to it small in size, a lot of applications and easy to use.

Most popular and widely used data application in mobile phone is SMS text messaging. It is used for sending text messages from one mobile user to another. Short Message Service (SMS) is a communications protocol allowing the interchange of short text messages between mobile telephone devices [7]. Short messages can be encoded using a variety of alphabets. The maximum text message size per page is categories by the bit of the character: 160 for 7-bit characters, 140 for 8-bit characters, or 70 for 16-bit characters. SMS allow user to communicate with each other wherever they are.

Recently, wireless car ignitions are becomes popular among the car user. Time becomes precious and importance for those who are particular with their time, for example a new executive who is always rushing to their workplace. This system could keeps maintain their car engine in good performance and well condition. With SMS (text) message, the car can be starts and a few minutes later the car is ready to go, with all the windows cleared of fog in the morning and the car could be drive without any delay.

2. METHODOLOGY

2.1 Operation System

The purpose of this project is to make useful of mobile application. It gave a futuristic concept for the subscriber to ignite car engine by using their mobile phone. Figure 1 shows the overall system Car Ignition System via Mobile Phone. There are 2 elements involved in this project, software design and hardware development.

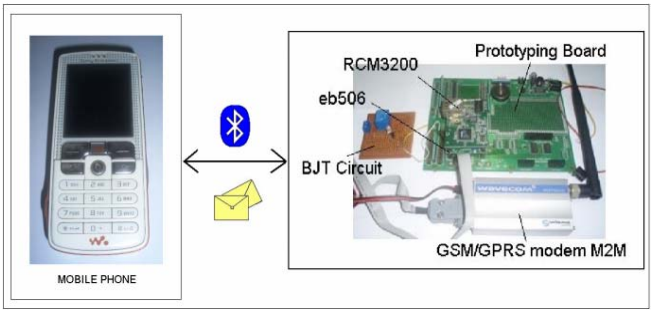

Figure 1: System Model

When Rabbit RCM3200 is loaded with a program from PC, it has the ability to control the external circuits depend on the program design that has been loaded. The external circuits are connected to prototype board RCM3100 input/output port (I/O). In this project, BJT circuits been used as the external circuit to ignite the car engine.

2.2 Software Design

The software used to develop this project is Dynamic C. Dynamic C is an integrated development system for writing embedded software. Dynamic C has an easy-to-use, built-in, full-featured, text editor. Dynamic C programs can be executed and debugged interactively at the source-code or machine-code level [3].

Dynamic C software supports C language and assembly but in this project, only C language been used. For this project, some of the libraries provided with Dynamic C software are edited to suit with the project requirements. Dynamic C also provides 5 types of debug windows for the designer; Watch, Stdio, Assembly, Register and Stack

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window. This window is usually used to track progress of a program output on the standard I/O window.

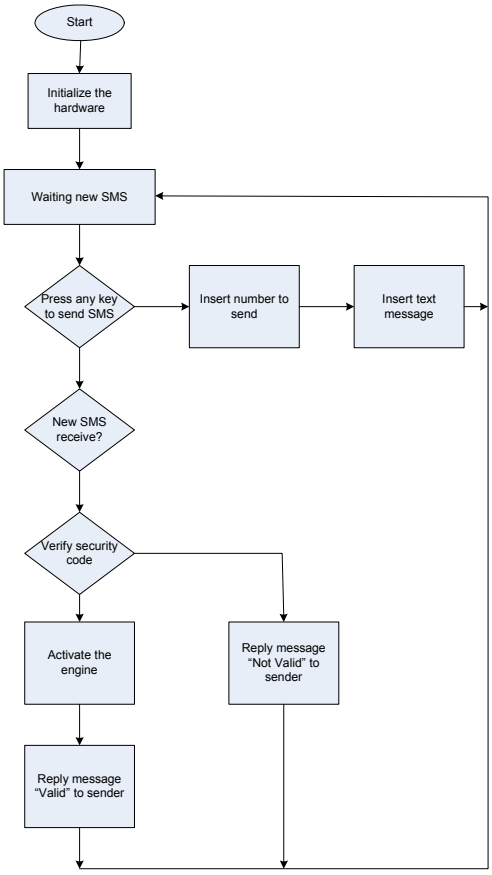

Figure 3: Flowchart for Software Programming

Figure 3 shows the flowchart for the programming of Car Ignition System. If the system is connected to PC, the user could send the SMS to whomever by pressing any key as a command to send SMS.

2.3 Hardware Development

The whole hardware involved in developing these project are mobile phone equipped with serial port profile(SPP) Bluetooth technology, RCM3200 with its prototyping board RCM3100, GSM/GPRS modem M2M and BJT circuit.

2.3.1 Mobile Phone

Mobile phone is the key element in sending the command signal to the system. Once the system accepts the text message contain the security code, the system is activated.

2.3.2 Rabbit Core Module (RCM3200)

The RCM3200 is an advanced module that incorporates the powerful Rabbit 3000® microprocessor, flash memory, static RAM, digital I/O ports, and a 10/100Base-T Ethernet port. It connects to a Prototyping Board RCM3100 that allows evaluating the RCM3200. The RCM3200 directly connected to PC with programmed cable and store the loaded program from PC into the access memory (RAM) or flash memory [4]. When the power supply is on, it can control the system by itself without connect to PC after the program loaded.

2.3.3 GSM/GPRS modem: Wavecom 900/1900 MHz Machine-to-Machine (M2M)

The modem is function as a connector to the provider such as Celcom, Maxis, U-mobile and Digi likelihood the mobile phone. The modem requires a SIM card, and supports both 3 V and 5 V SIM cards. The modem used the DB15 to 10-pin adapter cable to connect the modem to the RS-232 header on the Prototyping Board RCM3100 [2].

2.3.4 Bipolar Junction Transistor (BJT) Circuit

BJT act as switch is used for a wide variety of applications. It is commonly used to turn on circuits, LED, cooling fans and even relays. It often used to take the low-level output from logic circuit to turn on or off a particular device [6].

3. RESULTS AND DISCUSSIONS

The systems receive SMS command through GSM/GPRS Modem equipped with SIM card. Therefore, to ignite the car engine, needed two SIM card with difference number involved. There is no requirement which SIM card provider is used. In this project, SIM card provider from Digi has been used on the system and SIM card provider from Maxis on the mobile phone.

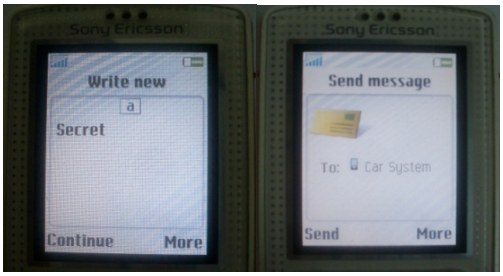

Figure 4: SMS command activated

Figure 4 shows the code to activate the system via SMS. The system is always in standby mode for SMS. After the system received the SMS, it confirms the *pass code* trusted and then ignites the car engine. Anyhow it only ignite the engine if the code valid and reply SMS to the sender to inform that the engine already been ignite. If the codes receive is not valid, the systems will not ignite the engine and reply SMS to the sender to inform that the codes receive is not valid or the sender is not allow to send SMS to the system phone number.

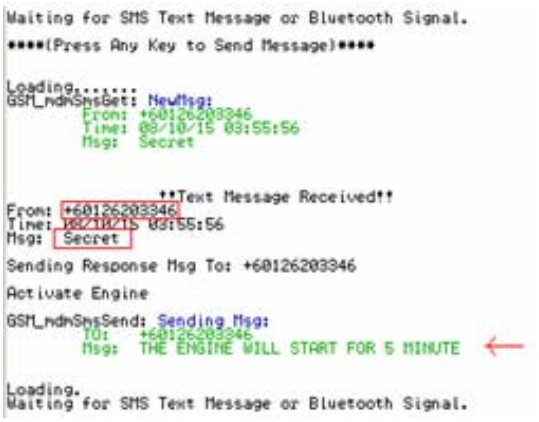

Figure 5: The printf for GSM at Stdio Windows

Figure 5 show the SMS received by the system and the reply action taken by the system to counter weather the code received are valid or not valid. strcmp (inbox.txt_msg,"Secret")==0 is part of C language that worked as a engine in the system to define whether the code received equal with the setting code.

4. CONCLUSION

From the result obtain, this project has achieved its entire objective to develop a car ignition system via mobile phone. By sending SMS from mobile phone, the system could ignite the engine. The GSM technology allowed user to send command to ignite car engine from wherever they are without boundaries.

In the future, the system can be modified and use to switch ON or OFF the garage door, house lights, water pumps, electric sunshade, block the engine of your car or your motorcycle, for the security purpose and much more. It also could be use as security system to give notification direct to our mobile phone which will make the human life better and easier.

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