Android Application for Single Phase Motor Control Using IVRS and GSM

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Abstract: Android is a software stack for mobile devices that includes an operating system, middleware and key applications. Android Applications are made in a Java-like language running on a virtual machine called Dalvik created by Google. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. The purpose of the final application is to help farmer to use easily with the regional language. The project will be designed to develop an application in android motor control system. The four operation of the AC motor is best suited for industries where motors are used and as per requirement as they operate on android phones. In case of a specific operation in industrial environment, the motor needs to be stopped immediately. In such scenario, this proposed system is very apt as we can easily perform Operations To Set Power On Time, To Set Auto Switch Time, To Set Under Voltage, To Set Over Voltage, To Set Motor OFF Time and many more like are its integral features. The running motor for a brief period and the parameter control of the motor can be achieved with the micro controller.

Keywords: IVRS, DTMF, GSM Modem, Single / Three Phase, Sensor etc.

1. Introduction

The control system is a system where we can stop the machine whenever we want. This is the difference between controlled and uncontrolled machine. Our project is about make this control system efficient and dynamic. In those days in Bangladesh for industrial sector motors are too much important. But high rating motors required safe and efficient operation. Equipment required for automatic motor control and safety system requires more foreign currency to import. The maximum systems are consist of wires which increase complexity of the system. That’s why we are making a device which is dynamic, cheap and wireless in the field of motor controlling. Again safety of a motor is also a major issue because malfunctioning of a huge motor can cause a big loss in production also increase maintenance cost of motor itself. That’s why we include safety function in our project. Mentioning that safety system is also wireless makes it dynamic and one can see motor’s operation from a remote place and control it. We use GSM system here to increase reliability of the network and save the cost of networking components.

In this paper very good example of embedded system as all its operations are controlled through intelligent Software using microcontroller. The aim of this paper implementation is to control i.e. to ON/OFF, control different motors, the electrical and electronic appliances connected to this system from anywhere in the world. For this purpose user can use android system Mobile. Using mobile it overcomes the limited range of infrared and radio remote controls. Using the convenience of SMS, this project lets you remotely control equipment by send a text messages, and also the motor can be control using Android Application. In a similar vein to email, messages are stored and forwarded at an SMS center, allowing messages to be retrieved later if you are not immediately available to receive them. Motor can be control by SMS only by entering the password. It will provide the information in the regional language so that any ordinary person can handle that system. It displays the fault occurred in the system through LED’s and accordingly send the SMS to the registered numbers.

2. Methodology

In this paper we implements two methods to track location and catch the theft and give return the stolen smart phone to the user. One is the basic method and other one is advanced. The basic method include the mobile tracker in which whenever someone changes SIM the user will be notified about thief’s mobile number via SMS messages sent on mobile numbers stored in mobile tracker allowed.

A. GSM Based Motor Control

The goal of this paper is to develop a cost effective solution that will provide remote control of induction
motors through mobile phones using messages. The mobile user in the world has a tremendous expand during the past few years. Remote monitoring of processes, machines, etc., is popular due to advances in technology and reduction in hardware cost. Cellular networks provide Short Messaging Service (SMS) approach offers user friendly interface with only destination cell phone address and message requirement without any header protocol overhead.

B. System Description

In this project we can switch On & Off 3-phase motor pump through mobile by using GSM. For this purpose we will use 3 Phase supply, Micro-controller IC, LCD Display, Max 232, GSM Module, Current Amplifier, Relay & 3 Phase pump. If 3 phase supply is OK GSM will Give message to mobile & mobile will display massage “3Phase OK”

C. Android Based Control

In this project On and Off motor Will system is handed using 50 commands they will check all information of motor. They are set current and water level is check they send feedback SMS.

3. Modules

A. Motor Control Module

Whenever user enters a registered mobile number and enter password then motor should be control through commands like motor ON/OFF and controlling timetable should be scheduled in this way our Motor should be controlled. User knows continuous status of motor through feedback messages.

B. Security Module

In this module for security Purpose there are three registered mobile numbers and a specific password we are using cryptography for security purpose here. After entering password a user can enters into the system or else he has to reenter mobile number again and correct password again.

C. Log Module

Sometimes there is a need to see in past week wherever the motor is ON/OFF because of moisture purpose for this purpose logs are saved in logs all the history of motor control is saved through this farmer can check whenever his motor is ON/OFF and incase fault has been occurred that message should be stored in logs overall history of whole system is stored in logs.

D. Parameter Setting Module

In our system there are many kind of parameters we have to set such as voltage parameter security purpose water level etc. for voltage parameters under voltage and over voltage measurement is done. Whenever user enters in the system through password he has to select a proper language for safety reasons here water level indicator is also set. For error detection system LED’s are in build through this there are less chances of motor damage.

4. Implementation

The proposed model for smart phone security has been implemented in the Android 4.2.2 platform Operating System. This application helps the user by informing him about the theft SIM number from the stolen smart phone.

In this application the smart phone user first login to use this application, then he inserts an additional phone number in the application. The user can also update and delete the previous phone number he inserted before. One user may have multiple phone number, so when he change his SIM card number then a message will be delivered at that inserted number and charged money from his current balance. After that you have got the thefts phone number and instantly you should report that phone number to local police. Our application provides good features to solve this problem by stopping message sends and saves his account balance when the user change his SIM card several times. But when the theft change the SIM card the message must be send to the number, that was inserted by the user. In this way the user can get thefts SIM number.

A. System Architecture

The SIM card of smart phone will be detected by the boot up listener and will be informed to remote user if it so. Database handler will do all the read and write operation to the database. Boot handler will automatically receive the mobile boot up so that the application will be started automatically when the mobile start up.
4.1. Renesas Micro Controller

Renesas, the world’s number one micro controller supplier and manufacturer. We have used Renesas Microcontroller for monitoring the different parameters and making decision. The RENESAS MCU is True Low Power Platform (as low as 66 A/MHz, and 0.57 A for RTC + LVD), Supply voltage is 1.6 V to 5.5 V operation, 16 to 512 Kbyte Flash, 41 DMIPS at 32 MHz, for General Purpose Applications.

4.2. Max232 IC

Here in this project we have used the Max232 IC But the IC is in SMD Package so it is very small in size due to that it require less space. The Max232 is used to transmit the Pc data to the Micro controller 89S52 and also from controller to PC. It is also used to shift the voltage level low to high a vise a versa.

4.3. Aplus A89341

This IC is mainly used for the Sound Recording and it is OTP IC that is onetime programmable IC. The capacity of this IC to store the Sound Clip is 170sec. The IC we are using is DIP package so it requires more Space as compare to theMaxx232.

4.4. Current Transformer CT

This Device is mainly used to monitor the Current . In Our Project we have used the CT with Rating 5Amp 5mA. The CT is also used to set the starting current of the Motor.

4.5. GSM Modem

Here we have used the GSM modem of Queactel M95 since it has very good range compared with sim 300 and sim 900. We have used the Extended Antenna which will help to get the Range in the rural area.

4.6. Power Supply (440v-0.5a)

According to the market surveys of the Project We have seen that the same product present in the market have separate power supply but in our project we have taken the same three Phase Power Supply which we are giving to the motor.

5. Mathematical Module

System $S=$/Android Application
Input $S=$\{S', B\}
Output $S=$\{R, V\}

$S =$ SMS
$V =$ Voice
$B =$ Button
$R =$ Return SMS
$1 1 =$ Security = Password
$1 2 =$ Lang = Languages
$1 3 =$ Buttons = MOTOR ON
$1 4 =$ MB =mobile no
$1 5 =$ Command = *1234ON#

[1] $1 1 =$ \{Mobile No. Password\}
Check mobile no. is register or not
Password will be correct or not

[2] $1 2 =$ \{Marathi, Hindi, English\}
Select any one language

[3] $1 3 =$ \{ON, OFF, Setting\}
Click on any button to perform any operation

[4] $1 4 =$ \{Personal Mobile No\}
Add and delete mobile number

[5] $1 5 =$ \{*1234ON#, *1234OFF# ...\}

$O 1 =$ \{Motor ON, Voice Message\}
Button operation perform the feedback is return
$O 2 =$ \{dry state, Fault\}
Any dry state fault then send to user
$B =$ Call
Use IVRS system
Call =Voice clips
$B =$\{no,1,2,3,4,5,6,7,8,9\}
IVRS Command \{1= language, 2 = ON, 3=OFF\}
6. Conclusion

In this paper, we have presented an android application for single phase motor control using IVRS and GSM. We basically focus on the ability of the user to control the motor and electronic appliances using mobile phone. For doing this we used control motor and mobile application. It makes the use of appliances remotely for this purpose. Next we apply security module and the use of log is done so that user can access the electronic appliances using android phone. Hence, in such ways we can provide better privacy and security to the users.

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8. References


