

Design of GSM Based Agriculture Security using Arduino Uno Microcontroller

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Abstract: In this paper we are designing project simulation of GSM based Agriculture security using Tinkercad software. In this simulation we used Arduino Uno R3 microcontroller for easy control. We use virtual sensors for sensing all the security purpose aspects. For motor run we used pulse width modulation for smooth run. For displaying GSM operation, we used LCD display for show the output. This project is very helpful to farmers.

Index Terms - GBAS) GSM Based Agriculture Security, Simulation, Microcontroller, Pulse Width Modulation (PWM).

I. INTRODUCTION

This system is designed by basically to avoid the death of farmer in electrical default. There are two type of transmission line faults, unsymmetrical fault and symmetrical fault. Our project is dependent on unsymmetrical fault the unsymmetrical fault is of 3 types fault, i. Line to line fault (L-L), ii. Line to ground fault (L-G), iii. Double line to ground fault (LL-G).

So, our project idea occurs in line-to-line fault mentioned in transmission line. The fault analysis becomes important requirement of the electrical power system to become more accurate. The need of automatic fault clearance becomes necessity of the system. A line fault to unsymmetrical fault occurs when two conductors are short circuited. The short circuit divided by the two stages in Transient state fault and Steady state fault stages. The fault on the transmission lines above 115 KV mostly occurs due to lighting due to which the insulation flash over occurs. The circuit breaker isolates the faulty system It has been observed through experimentation that 70 % to 80 % of the faults.

The main line in the field is cut and excess current is flowing there, when the farmer goes to work there, he does not know that there is excess current flowing there preparing for the protection of farmers. In this we will use GSM module to alert the farmer owner and the nearby DISCOM office by texting the farmer will not go there as he has received message in the phone and the DISCOM office will receive the message if a person is passing by, he will be alerted based on the LED bulbs on the poles in the field.

In this way we can save the life of farmer by using this system so we have made this project especially for farmers.

II. BLOCK DIAGRAM

In this Tinkercad simulation we used Arduino Uno R3 microcontroller [3]. In input section there is PT for detection of supply. At output we connected GSM module and LCD.

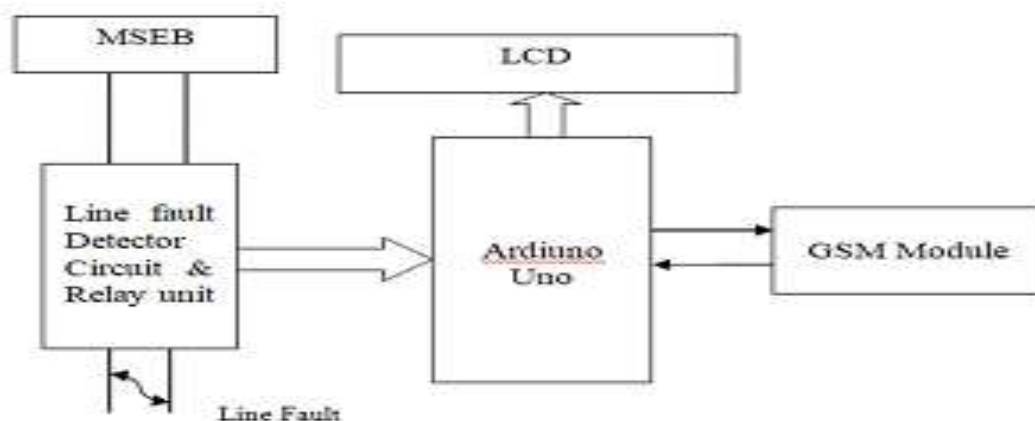


Fig. 1: Main Block Diagram

III. CIRCUIT DIAGRAM

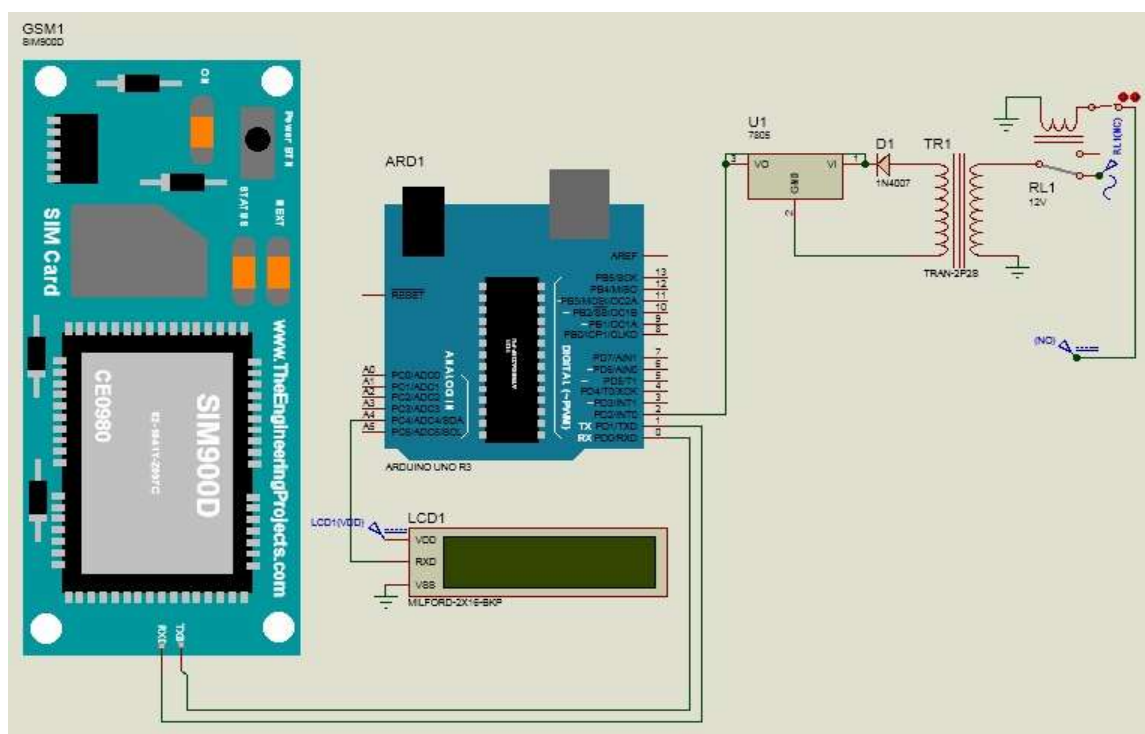


Fig. 2: Circuit Diagram of transmission line detection and GSM Control unit

For control unit we are using Atmega series Arduino Uno R3 microcontroller[4]. These microcontrollers are familiar of Atmel 8-bit AVR microcontroller. In this microcontroller 14 digital I/O pins, 6 analog pins which is also use I/O pins, 2 UART pins are present. 13 Digital PINs and 6 analog pins this sort of pins allows you to connect hardware to your Arduino Uno board external.

The relay connected in the diagram will shows whether it is a person. In this microcontroller 9 digital is input PIN and 2, 3, 4, 5, 11, 12 output PIN. GSM model pin A1 and A2 is input pin and 5 and 6 pin is output deciding. If the UNO at 5 and 6 pin are connected in resistor. GSM section for send SMS for while line fault. The LED bulb is connected on GSM section.

IV. OPERATION

For control unit we are using Atmega series Arduino Uno microcontroller [4]. These microcontrollers are familiar of Atmel 8-bit AVR microcontroller. In this microcontroller 14 digital I/O pins, 6 analog pins which is also use I/O pins, 2 UART pins are present.

GSM will be operated on UART mode operation. When any command from input section distribution line under fault signal will applied to microcontroller. Microcontroller gives command to output section which is GSM module and GSM will send SMS to respected operator as indication.

V. SIMULATION WORK

In this section, at input section pin 9 work as input pin. Which is connected to trip sensor we convert AC supply in to DC for sensing purpose. This sensed output from sensor apply to microcontroller pin 9. Basically, trip sensors output is always high. At output we use GSM module in real time work, but because of some simulation limitations we will not able to put GSM module in this simulation. We alternatively use LCD display as GSM module output to show how it is work. When distribution line will trip or breaks than pin 9 will goes low. Therefore, microcontroller will run particular program which is send data to GSM module. GSM module read this data and send the SMS to respected person. Also, microcontroller will switch off the mains distribution line from sub-station for saving life.

VI. RESULTS



Fig. 3: GSM module output on LCD display and 0v denotes main line switch off

Sr. No	Devices	Operation in Modes		
		Action	Speed (rpm)	Voltage
01	GSM Module	Send SMS & trip the Line from SS	Depends on network 2/3 sec.	5 V

Table 1: Results of SIMULATION

When we are taking the 3-phase input supply from the distribution line, then using the step-down transformer, the microcontroller will step down the voltage as per the voltage required by the microcontroller and give its input pin to the microcontroller. Whether the key line is running.

If the trips, the supply will not reach the microcontroller, the microcontroller does not get required supply, so low pulse create in there, then send a message to GSM model connected to the microcontroller, then immediately send the message to the farmer and DISCOM office. Will be line is tripped.

VII. CONCLUSION

In this report, we are presenting our idea regarding electric fault protection in farming to make automated farming security. In this case by using in GSM module to alert by farm owner and DISCOM office in send by SMS through. We alternatively use by the LCD display as GSM module to output to LCD show it how it is work.

Our task is design in safe to the person and farmer life it quick operation by using microcontroller for simulation we used Tinkercad software. Microcontroller will switch off the main servicing line form substation and save the farmer or other person life.

VIII. ACKNOWLEDGEMENTS

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