

Real Time Motor Billing and Controlling by Using GSM Module

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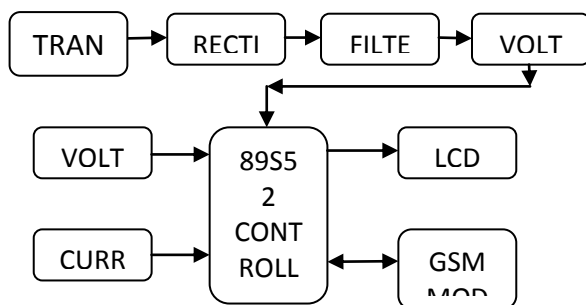
Organization Name: Guru Gobind Singh Polytechnic, Nashik (India)

ABSTRACT

Motor is the most important part of electrical field. It is used in all the industrial, commercial and agriculture sectors. As it also consumes a lot of part of the energy generated and also has a huge part in our electric bill, so we have developed a system that will reduce the amount of electric bills. By using this system, we can get real time bill of our motor & also we can switch ON & OFF the motor using this system. So automatically it will result in reduction in electric bill.

I.INTRODUCTION

In this system the user just has to send the SMS to the GSM module using his mobile phone, like ON, OFF, Bill, etc. He will get the real time bill on his mobile phone via SMS and also he will get the real time voltage, current. There is also a LED displayed in the system that is mounted on the PCB which also displays the continuous power consumption of the motor, voltage and current. The system sends SMS to user on the occurrence of faults in the motor such as over voltage, under voltage, over current and single phasing.



II.BLOCKDIAGRAM:

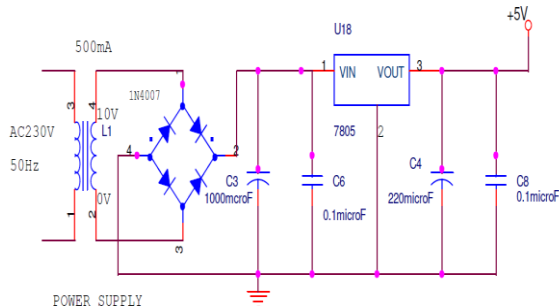
1. POWER SUPPLY:

1.1. TRANSFORMER:

Transformer steps down the voltage level from 230 to 5 volt AC. The microcontroller operates on 5V DC. For the operation of microcontroller the transformers step down the voltage level up to 5V.

1.2. RECTIFIER:

The rectifier converts the AC supply into DC. The rectifier used in this system is Bridge Rectifier which consists of four diodes.



1.3 FILTER:

Filter is an electronic circuit used along with rectifier in order to get pure ripple free DC voltage. In order to obtain DC waveform the rectifier is connected. Filter circuit uses passive component like capacitor. The capacitor input filter is used to reduce the ripple contents in output of rectifier obtain a pure DC voltage. Capacitor is filter capacitor which is connected across the load electrolytic capacitors that are normally used as filter capacitor.

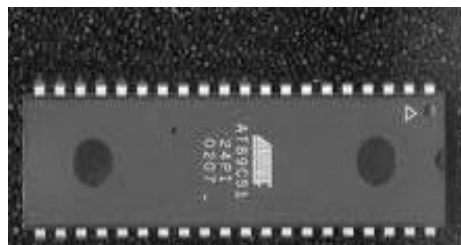
1.4. VOLTAGE REGULATOR:

Voltage regulator regulates the voltage at which microcontroller can operate. Voltage regulator gives 5V output voltage. In this system BONENS 3296 voltage regulator is used.



III.MICROCONTROLLER

- Fully static operation: 0 to 24 MHz's.
- 32 Programmable I/O lines.
- 256 x 8-Bit internal RAM.
- Three 16-Bit Timers/counters.
- 8 interrupt sources.
- Programmable Serial channel.Low power Idle & Power Down mode.
- Three level program memory lock.



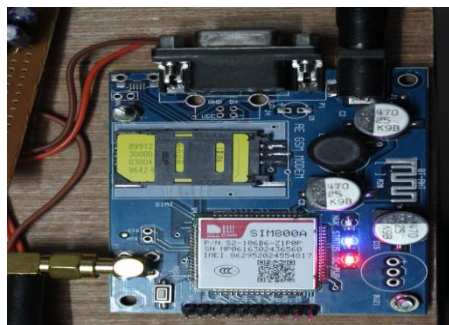
3.LCDDISPLAY:

LCD (Liquid Crystal Display) screen is such a display module and a 16x2 LCD module is very commonly used. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers.



IV.GSM MOUDLE

SIM800A, works on frequencies 900/ 1800 MHz the Modem is coming with RS232 interface, which allows you connect PC as well as microcontroller with RS232 Chip(MAX232). The baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS, Voice as well as DATA transfer application in M2M interface.



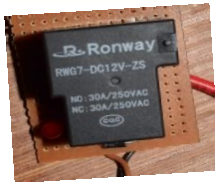
V.CURRENT SENSOR

The WINSON WCS2705 current sensor senses the current up to 5A. The WCS2705 consists of a precise, low-temperature drift linear hall sensor IC with temperature compensation circuit and a current path with 8.3mΩ typical internal conductor resistance.



VI.RELAY

Relays are devices which allow low power circuits to switch a relatively high Current/Voltage ON/OFF. For a relay to operate a suitable **pull-in & holding current** should be passed through its coil. Generally relay coils are designed to operate from a particular voltage often its 5V or 12V. Over here we have used a 12v relay with which we can switch 30A load current. This relay is also commonly known as CUBE Relay. The relay basically consists of five terminals, two of them are used for the coil & the remaining three consists of a common pole & one Normally Closed (NC) & Normally Open Pole.



VII.MOTOR

The motor used is 3-ph AC induction motor. Ratings of motor:

- 440V AC,3-ph
- 3 Amp
- 2 HP
- 1.71 kW

VIII.CONCLUSION

FEATURES OF SYSTEM:

- Real time billing of motor is possible.
- Switching of motor is possible by using GSM.
- Idle running can be minimized.
- Circuit is portable.
- It can be calibrated as per the motor rating.

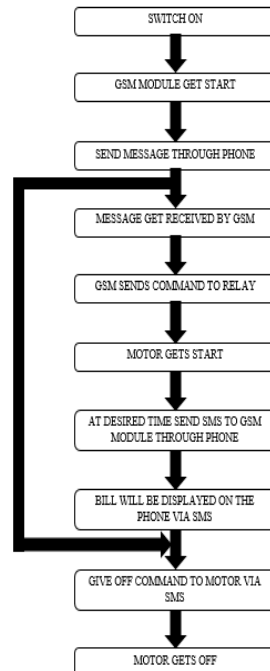
FUTURE ADVANCEMENT:

- Dry sensor can be added.
- Temperature sensor can be added.
- It can be used for DC motor.

APPLICATION:

- Real time billing using GSM module.
- Switching of motor can be possible.

FLOWCHART:



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