

Intelligence wathour meter using GSM

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Abstract : In view of limitation function, cost and applications in distribution as well as domestic meter, This model designed on the basis over voltage and over voltage protection which give SMS alert on your mobile phone through GSM module with using microcontroller and also providing protection with fault. It supports easy to detect over current and over voltage in transmission system, this system provide, better performance in future. The main motive of this IWM is to low power consumption, low-cost smart meter and PC system based on microprocessor.

IndexTerms – Watthourmeter, GSM Module.

I. INTRODUCTION

This project aims to create a system that monitors voltage and current that's provides break point based low and high voltage tripping mechanism that avoids any damage to the load various industrial and domestic system consist of fluctuation in the AC main supply. There is a chance of damaging of electronic device that are quite sensitive to these fluctuations. So there needs to be a tripping system that's avoids any damage to these loads. This system also includes 8051 microcontroller which finds out the voltage level which is displayed on LCD screen microcontroller measure the voltage level, if the voltage level is high which alerts the user whenever voltage level is crosses the bounds . Our system consists of a tripping mechanism that's monitors the input voltage and trips according to limits provides. Here we use a quad comparators IC with two more comparators to it. Well the system delivers an error as soon as the input voltage fall out of our range. This trigger then operates a relay that cuts of the load to avoid any damage there to be here use a lamp to demonstrate as a load. Well the system is also alert with an alarm that goes on as soon as tripping takes place.

With the help of this IWM(Intelligence watt-hour Meter) we can collect the data quickly and efficiently. And can be stored data as a record, as there is no any type of human intervention so that we can reduce the human error. And reduces the labour charges. The main advantages of the IWM (Intelligence watt-hour Meter) is that the GSM Module is stable means there will be no any effect of unwanted weather condition like storm, rain, Heavy rainfall etc. it can be used on that places where bulk amount of energy consumption. We design an intelligence wathour meter with a function that they can measure energy consumption as well as give protection of entire circuit with fault. A Intelligence watt-hour meter for Industrial application using GSM Module through which we can easily measure and control the over voltages, over current, reactive power and power factor. It is simply a modified version of Intelligence watt-hour meter.

II. LITERATURE REVIEW

1. It can be used for protection of system or load from over voltage and over current.
2. Microcontroller is used for the automation action.
3. 2*16 LCD will be used.
4. Due to having microcontroller error correction takes place very smoothly.
5. GSM module, Arduino-uno, Breadboard, LCD screen and connecting wires is used to construction.

III. SYSTEM ARCHITECTURE

Here GSM network provide an easily communication between the central server and industrial or apartment. It would eliminate the postpaid and prepaid billing system. Through which we are able to disconnect the supply automatically if they are not able to pay the bill till 3 months or ignore the order of central server.

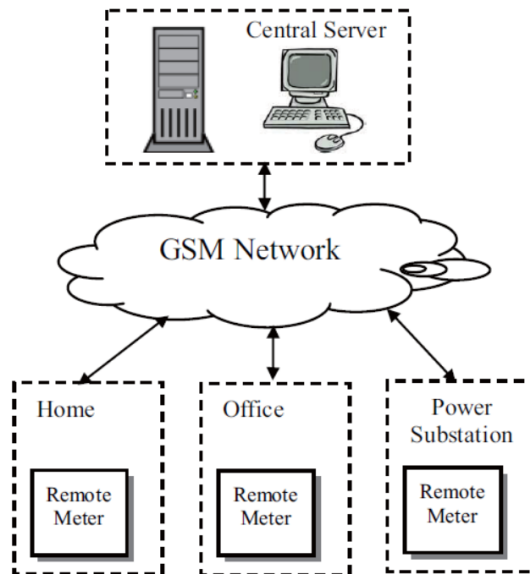


Fig 1:- Block Diagram of the metering system..

IV. REMOTE METER/ METERING SYSTEM.

It mainly consist of a Micro-controller unit, Over voltage and Over current relay, and GSM Module , Energy measuring Module (EMM) , and Liquid Crystal Display(LCD), an AC source and Energy Metering Devices. As shown in figure.

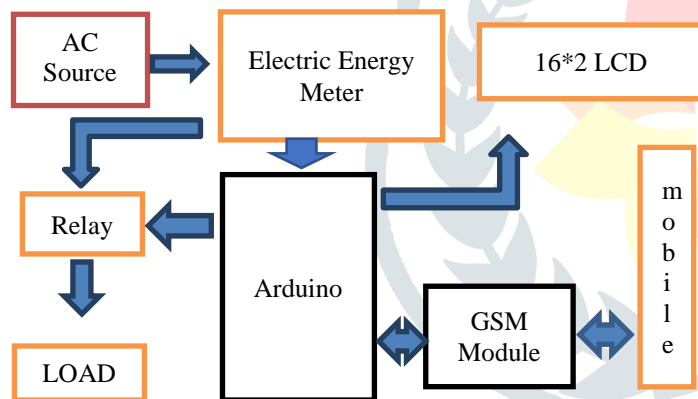


Fig 2. Block Diagram of the IWM

4.1 Energy Measuring unit.

An CT (Current transformer) and PT (Potential transformer) are attached with the energy measuring unit in the transmission line. So that is sense the current and voltage of Transmission line. And for distribution center, there is a no need of CT and PT. The energy measuring unit is used to measured the power factor, voltage, current and power in KWH. Using this module we can easily calculate the total electric energy consumption and reactive power

4.2 Micro-controller unit.

An Intel 8051 architecture micro-controller with 40 Pins is used as a micro-controller unit. It is used in the robotics, space and various field of electronics like embedded system and automobile. It is most commonly and economically used micro controller. It had 250 bite of RAM and 4kb of ROM. It has 8 Bit port and 32 input/ Output lines. it is the brain of IWM and help for decision-making. It consists Micro-processor, RAM, ROM, Communication interface and Input Output ports in a single chip.

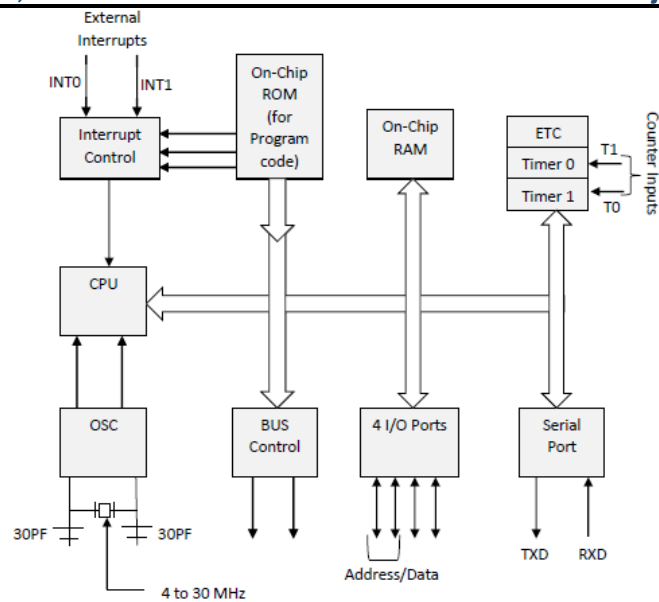


Fig 3. Block Diagram of the micro-controller

4.3 Display unit.

16 x 2 character LCD (HD44780) having two pinout surface on bottom and upper surface of the LCD Module. LCD interface with the Micro-controller port using 4 data wire mode. It displayed the output and provide information for calculation.

4.4 Relay unit.

In Relay Unit we simply used Latching relay which is simply a electromechanical switch. With the help of latching relay we control large amount of flow of current with a single pulse. However it is used to control large amount of flow of current with the smaller ones. Latching Relay can be used for connecting and disconnecting the transmission line.

4.5 Arduino UNO

It is an open source micro-controller or prototyping platform. It has a physical programmable circuit board and a Integrated development environment (IDE). ATmega328p, It consist of total 14 digital I/O pins out of which 6 pins are analog(input pins), and 6 pins configures as a PWM Output, a USB portal, Power jack, 16MHz quartz crystal, reset button and a ICSP header. Here we use Arduino UNO version and 1.0 software version.

4.5 GSM Module.

It is actually a GSM Modem (like SIM900) connected to a PCB. To interface the GSM Modem with a PC TTL output and RS232 output are taken from the board. The board has the pin attach the microphone and the speaker and to take out +5V or other values of power and for ground connection. These types of pins has different modules. There are many types of GSM Module and GSM Modem are available in the market. Here we use a GSM Module should be connected to the Arduino for sending and receiving messages, It's better to choose a GSM Module that has TTL Output. In our project, we use SIM1900 GSM

Module is used. This module supports communication in 1900MHz band. For People from other country mobile network band have to be checked in their area and the wiki entry band around the world has to be read. The power requirements of GSM module have to be checked. GSM Modules are manufactured by many companies. They possess various input power supply specifications. So it is necessary to double check the GSM modules power requirements. For this, the GSM module requires a input in the range of 12 volts. Hence we feed it using a 12V, 1A DC power supply. Second is to Check for the TTL Output Pins in the module. The data from GSM module can be directly fed to the Arduino only if it is enabled with TTL output pins. If the TTL output is not enabled, the RS232 data must be converted to TTL using MAX232 IC and should be fed to the Arduino. The Modules are mostly equipped with TTL output pins. The right one should be bought while buying.

V. OUTCOMES

1. It will provide better protection.
2. It is fully Automatic.
3. It is electricity saver.
4. It is easy to operate.
5. GSM notification can be gathered.
6. Labour charge will be reduce.
7. Improve the continuity of flow of current

VI. ACKNOWLEDGMENT

In this paper we proposed and intelligence watt hour meter which can controlled the units of consumption in the consumer side. With the help of GSM module we can easily communicate between the consumer energy meter and the server unit. Through which we can easily protect the circuit and reduces the power losses and increases the efficiency and durability in the Distribution center With the help of GSM Module we can improve the efficiency of flow of current without any interruption faster and in Quick manner.

VII. REFERENCES

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