

# Automatic MSEB Meter Reading

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**Abstract:** The MSEB E-METER reading is advanced technology which increase the demand for automatic meter reading this proposed system replaces the traditional meter reading methods into the digital meter readings. Also, they can monitor the meter readings regularly without the person visiting from home to home. Live meter reading from the GSM enable the energy meter is sent back to the billing point periodically and these details are updated in the MSEB office and we get the exact readings of meter with the updates of number of units consume at every end of the month. This technique helps to reduce human errors.[1]

**Key Words:** Effective readings, reduces human efforts, accurate reading.

## 1. INTRODUCTION

The main concept of this project is to design automatic meter reading system for receiving the information of monthly energy consumption from remote location to an electricity department as well as to the consumer. At present electricity departments sends employees every month to take meter reading which is very time-consuming job. In electric meter the 3200 blinks are equal to the 1 unit consumed. As per this the GSM helps the consumer to see how much units are consumed at every end of the month. Many times, the image taken is not clear which effects to the bill of the consumer to reduce this kind of human errors this technique is used to be very helpful. The number of units consumed is view on the LED screen present in the electric meter. [1]

### 1.1 Description

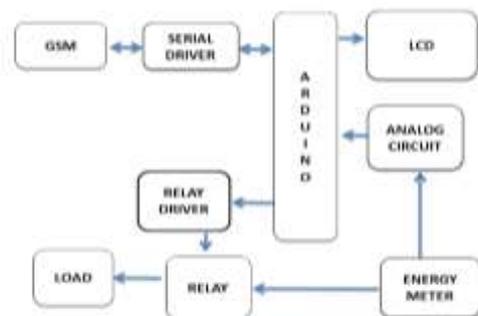
Arduino is the brain of the system. It is used to read, analyses process and give output data as per the written program. Microcontroller counts the pulses from Analog circuit and measure the unit consumer and display unit with amount of charges on LCD. Here an alphanumeric 2\*16 LCD is also used to which it works as a display unit and amount of electricity which is used by the consumers. Analog circuit is used to read the electricity consumed optically a convert it to binary form so that the controller can read it. The work of relay driver is to amplify the signal from microcontroller to a required level that relay can work on it. Relay is used to on and off the power to the load and controller through the relay driver.[3]

## 1.2. Problem Definition

Every time the MSEB employees goes to every consumers house take the image, but sometimes the image is not clear due to which many errors occurs.

Unexpected bills due to false unit entered.

Electric line is cut when the bill is not paid. It Is not possible to go in dangerous areas to cut the line.



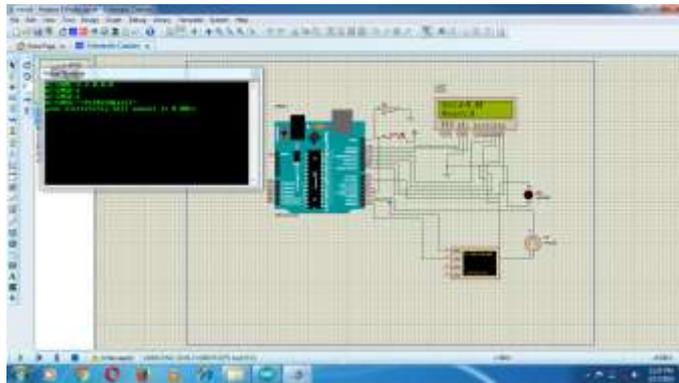
## 2. PROPOSED METHODOLOGY

In block diagram Arduino is the brain of the system. It is used to read, analyse process and give output as per the written program. Microcontroller count the pulses from Analog circuit and measure the unit consumer and display unit with amount of charges in LCD. Here 2x 16 alphanumeric LCD is used to display the unit and Amount. Analog circuit is used to read the electricity consumed optically and convert to binary form that controller can read. Relay driver is used to amplify the signal from controller to a required level that can drive delay. Serial driver is used to support serial communication between GSM and 8051. It converts the voltage logic level that can be understand by both of them. Relay is used to power on and off to the load and controller through Relay driver[2]

## 3. IMPLEMENTATION:

Microcontroller count the pulses from analog circuit and measure the unit consumed and display unit with amount of charges on LCD. Here 2x16 Alphanumeric LCD is used to display unit and amount. Analog circuit is used to read the electricity consume optically and convert to binary form than can controller read. Serial driver is used to support serial communication between GSM and 8051. It converts voltage logic level that can both understand. Relay

is used to ON and OFF the power to the load and controller through relay driver.



#### 4.WORK DONE:

Block diagram of AMR (Automatic meter reading) is shown in the fig. As shown in the block diagram we have divided our project in two section one is Transmission office Mobile and another one is users meter system. We have employed GSM Module at consumer meter ends to enables the bidirectional communication. Whenever meter received the send instruction, system responds to the request and send meter reading to the operator end. Operator then stores the recorded reading to computer for billing purposes. The main Component of this communication is GSM MODEM, which is work on GSM frequency Band. In our System we have make meter such that on every month 1<sup>st</sup> day it will send current meter reading to the billing center.

At the Customer side we have also provided extra memory to store the reading. There is also a Local display to display the status of request.

At customer end with the help of microcontroller continuously recorded the power utilization of the customer and at the same time it is ready to respond to a request. Power requirement is very low for this system only +5-volt 500mA required for operation.

The project is based on GSM technology. The AMR system automatically records the power reading internally and stores that data in the external EEPROM memory. The microcontrollers also continuously check the RTC reading. Whenever the RTC data matches with new months and date it automatically sends the SMS regarding the current reading at the MSEB stored mob number. That SMS is further used for the billing purpose.

The system consists of LCD which continuously displays the current reading, date and time. Keypad also provided to adjust the RTC.[3]

#### 5. CONCLUSIONS:

After scanning, we get the actual and proper reading, in the form message which Sent by Arduino through GSM. Due this we get the proper cost of bill at the end of the month without any error

When no electricity bill is paid, the line is directly cut from the office, that's why it is time consuming job.

We can disconnect the connection of those consumer who don't pay bill at a due date, also of area which are not safe and of consumer which steals the electricity. Now the time is reduced and the process is fast.

#### COMPONENTS DECSRIPTION:



**LCD** (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

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, namely, Command and Data.

The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

**GSM MODEM** is a class of wireless MODEM devices that are designed for communication of a computer with the GSM and GPRS network. It requires a **SIM (Subscriber Identity Module)** card just like mobile phones to activate communication with the network. Also they have **IMEI (International Mobile Equipment Identity)** number similar to mobile phones for their identification. A GSM/GPRS MODEM can perform the following operations:

1. Receive, send or delete SMS messages in a SIM.
2. Read, add, search phonebook entries of the SIM.
3. Make, Receive, or reject a voice call.

The MODEM needs **AT commands**, for interacting with processor or controller, which are communicated through serial communication. These commands are sent by the controller/processor. The MODEM sends back a result after it receives a command. Different AT commands supported by the MODEM can be sent by the processor/controller/computer to interact with the **GSM and GPRS cellular network**.

## 6. REFERENCES:

[1] Md. Masudur Rahman, Mohd. OhidulIslam, Md.SerazusSalakin,Noor-E-Jannat“**Arduino and GSM based smart energy meter for advanced metering and billing system**”

Department of Electrical and Electronic Engineering, Pabna University of Science & Technology, 6600, Bangladesh (ICEEICT-2015)

[2] K. Ashna,Sudhish N George “**GSM based automatic energy meter reading system with instant billing**”**Electronics & Communication Dept., National Institute of Technology, Calicut, India, ((ICEEICT-2013)**

[3].Ali Abdollahi, MarjanDehghani, Negar Zamanzadeh“**SMS-based Reconfigurable Automatic Meter Reading System**”**Niroom Research Institute, Tehran, Iran ((ICEEICT-2007)**

[4].Kumar Shashank, Syed Imran, Vishwamurti Purushottam, Dr. A. R. Aswatha **Design and Implementation of Automatic Electricity Meter Reading Using GSM**(March 2013) **Published in: International Journal of Engineering Research & Technology**