
AN EFFICIENT AND ERROR LESS WIRELESS PREPAID ENERGY METER FOR HOUSE APPLICATION

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ABSTRACT:

In the era of emergency of power, it's significant to analyze and record the amount of power dispersed to the customers. Since, the customers try to increase the load to the maximum to the power connection so it is necessary to restrict the excessive use of energy of the supply provided by the company. If the load connection is in surplus amount then it could create disturbance in the power distribution and would lead to unstable amount of loading and other difficulties like sequence of current with negative phase, etc. Here, the customers are restricted of maximum or surplus load because if the consumer uses the load greater than the assigned value for more than a pre-planned time then the supply will be disconnected automatically from the customer's residence. Basically, this project helps the customers to use the allocated amount of power and would prevent the stealing of energy.

Keywords: Electrochemical meter, Current transformer, Energy Meter Reading, LCD, Proteus Software, Microcontroller.

INTRODUCTION:

In recent years several attempt are created to style the energy meter with instant asking technique however until currently the designed energy meters don't seem to be economical and don't give replacement. Nowadays the numbers of Electricity customers are increasing in nice extent. It's exhausting to handle and maintain the ability because of growing needs. Maintenance of the ability is a very important task because the human operator goes to the consumer's house and produces the bill as per the meter reading. The asking method takes abundant time if the customers aren't within the house whereas taking readings on energy consumption. It needs loads of your time and a lot of labor to analyze energy consumption and generating the bill. If the patron didn't pay the bill, the Foreman must visit their homes to disconnect the facility offer. These consume time and troublesome to handle. The manual operator cannot notice the malpractices or Un-authorized connections applied by the patron to cut back or stop the meter reading/power offer.

“An Efficient and Errorless Wireless Prepaid Energy Meter for House Application” is the system that provides economical meter reading and fault detection in case of high voltage or theft of electricity provided to the house.

DESCRIPTION OF BLOCK DIAGRAM :

When the system is ON then the microcontroller and display will start. So when the first switch (start button) is clicked, the LCD will show Pulse, Unit and Balance, under load, the LED(D3) will be ON. Here, the input voltage is given 5V and at the output 5V is received. When the second switch is pressed in the form of pulse, the unit is counted. So, the microcontroller increases spent energy by 1 unit which contains 5 pulses each, the moment there is an increase in the unit the balance will decreased by Rs 2.

In this way 1 unit will be added and balance will keep on decreasing, the moment our balance is Low, the LED (D2) at the output will glow that means Buzzer is ON and balance is completely finished, and the main supply to the load is switched-off when microcontroller sends a signal to the relay driver which in turn switches-off the relay, LCD will show Zero balance. Third switch is for over voltage condition, if in the circuit there is voltage more than the estimated voltage then load will automatically turned off. If the button is clicked again, the normal condition will be restored. If in case the fire

occurs, fourth switch on the circuit will be clicked and display will show overheating, load will automatically be off. The amount of energy consumed is displayed by LCD which is interfaced to the microcontroller.

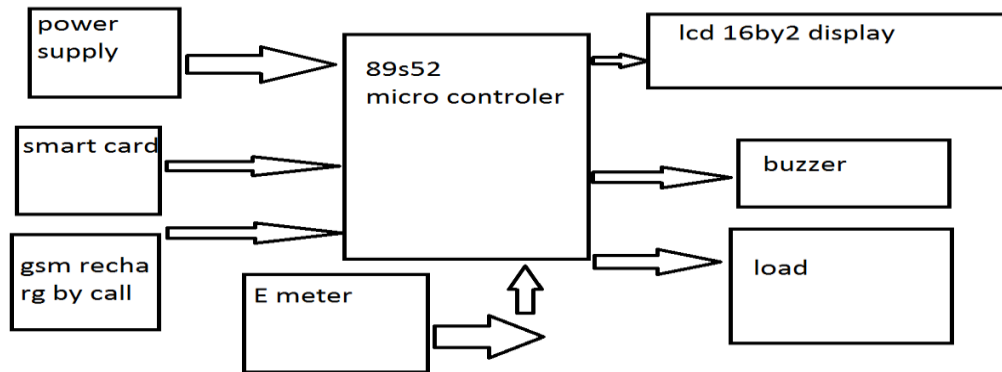


Fig 1: Block Diagram

MICROCONTROLLER PROGRAMMING:

The microcontroller programming is being done on the C-Compiler. 8051 Microcontroller is used and programming is done using proteus software. The microcontroller is interfaced with the energy meter using a device called ‘Opto-Isolator’. The microcontroller is arranged in a way that it gives commands to relay driver either to switch-off or switch-on the relays. The units, pulse and balance is displayed on the LCD which is interfaced with the microcontroller and the voltage required by the microcontroller to work is 5V and if the voltage exceeds, it will damage the system. Here, microcontroller counts the units which are being recharged. The working of microcontroller includes the checking of units whether they are more than zero or not. It will display “Recharge your Account” if the units are less than 0. The units will keep on decreasing with the proportionate of power usage and when the units are completely finished the microcontroller will give the message “Recharge your Account” and the load will be completely decoupled from the microcontroller and the supply. It will follow the same procedure. The microcontroller will show the decreased value of units count. For the future scope, if the GSM technology is used, it is also interfaced with microcontroller and is added in coding. An android cell phone is also attached through GSM. The phone will have an application where the relay will red-dial the last number of the cell phone when the balance will be finished.

RESULTS OF SIMULATION:

Fig 2 shows the Prepaid Energy Meter circuit diagram.

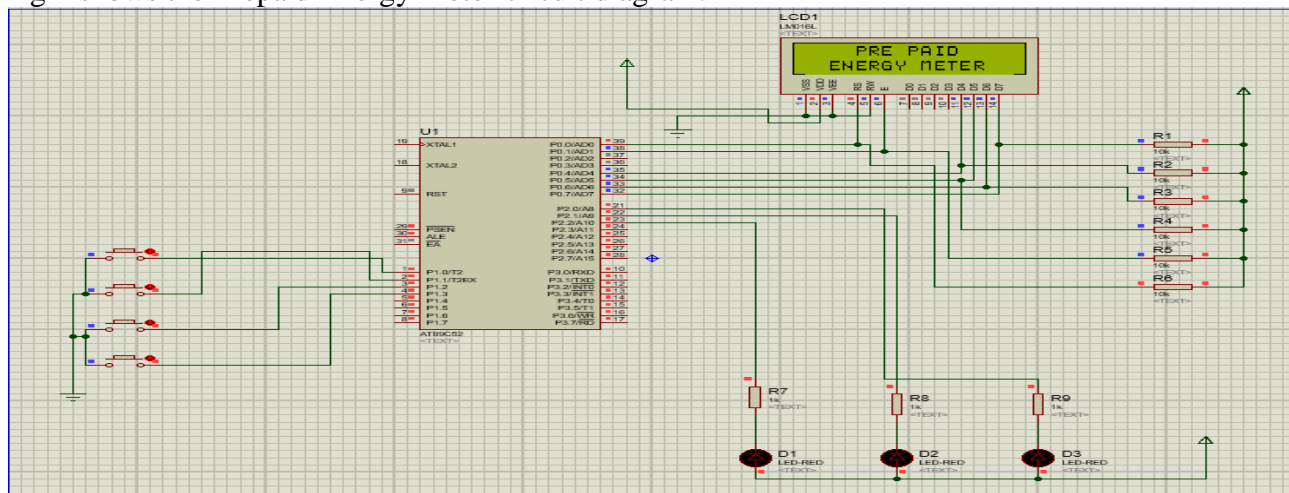


Fig 2: Circuit Diagram

Fig 3 shows the Prepaid Energy Meter circuit diagram in initial condition

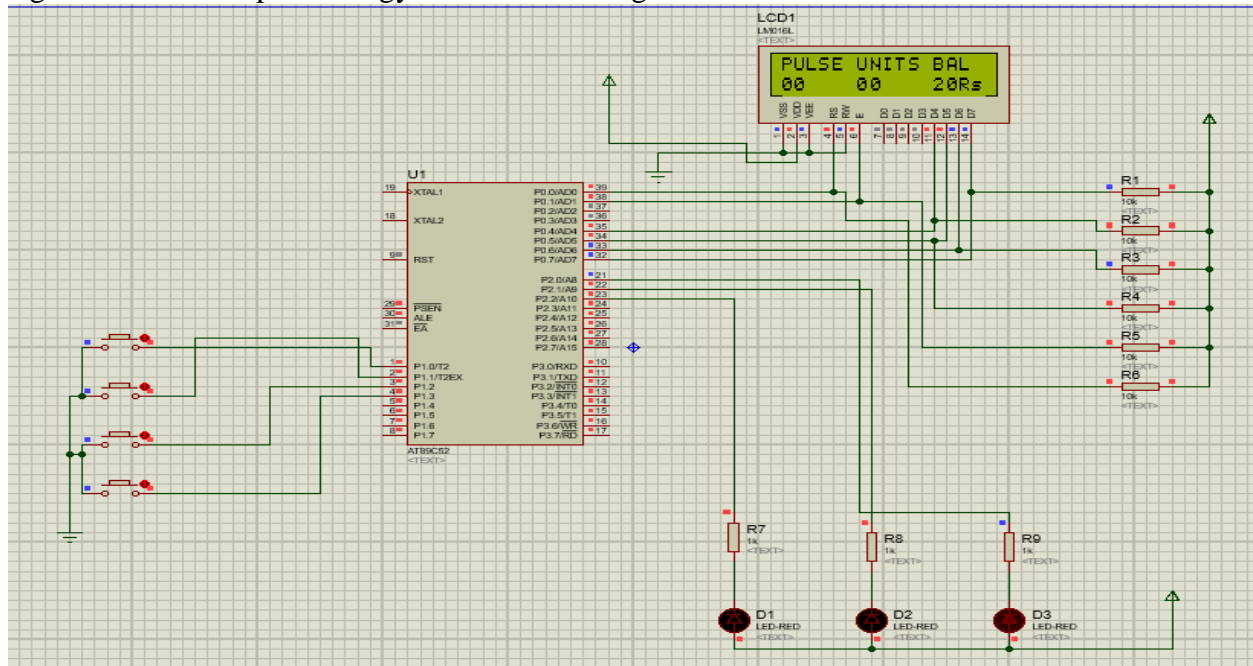


Fig 3: Initial Condition

Fig 4 shows the Prepaid Energy Meter circuit diagram in running condition

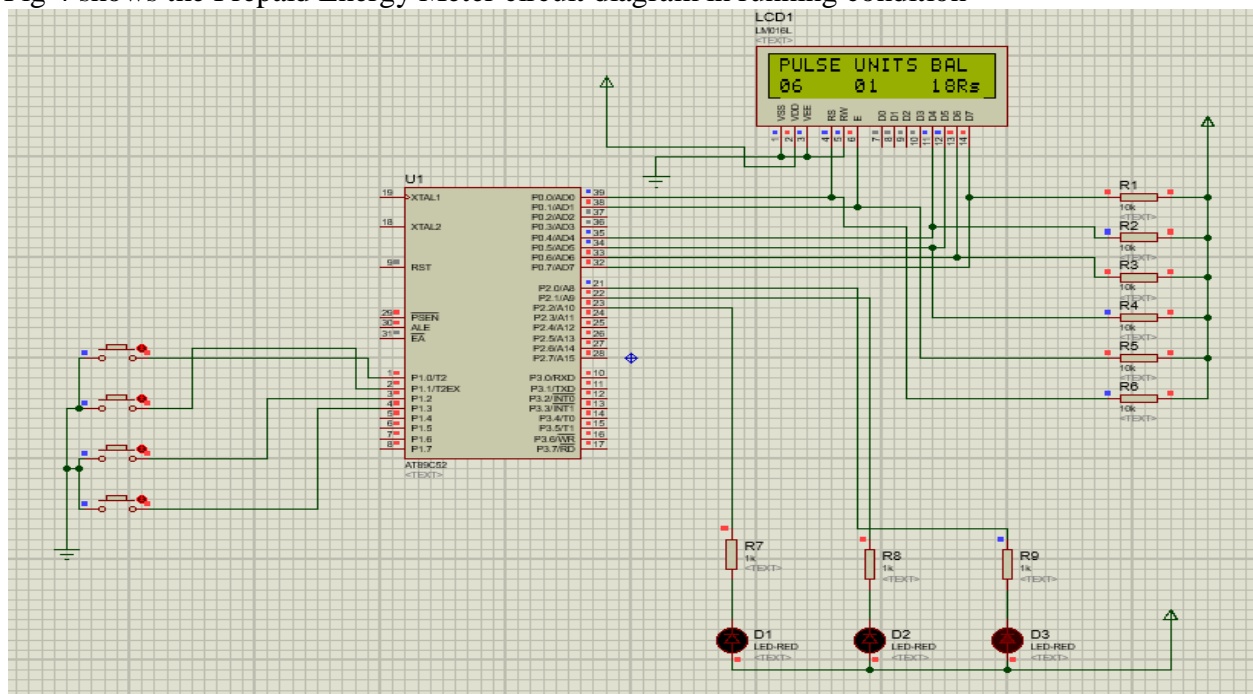


Fig 4: Running Condition

Fig 5 shows the Prepaid Energy Meter circuit diagram at Low Balance.

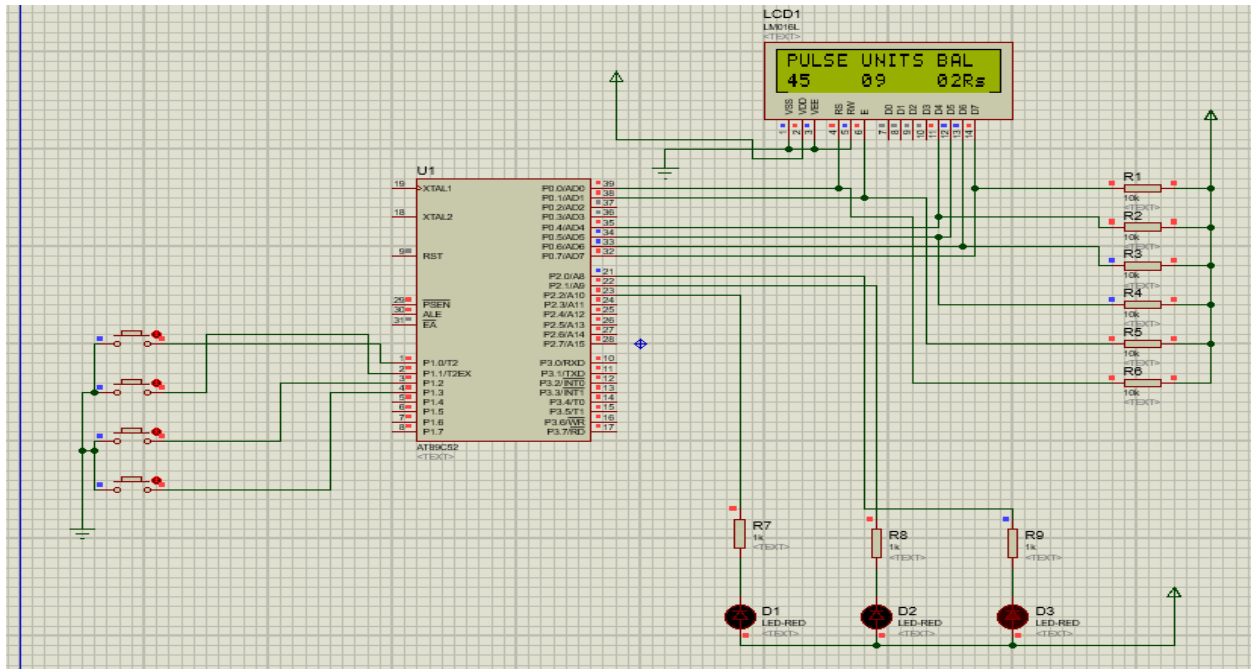


Fig 5: Low Balance

Fig 6 shows the Prepaid Energy Meter circuit diagram at Zero Balance.

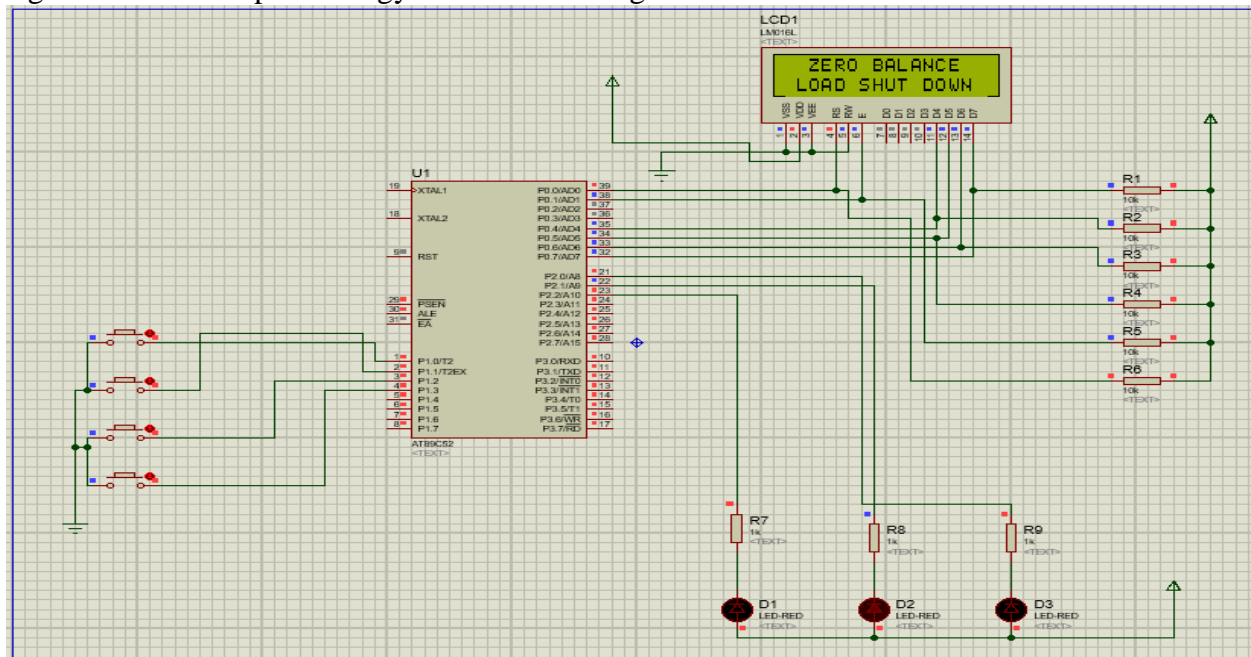


Fig 6: Zero Balance

Fig 7 shows the Prepaid Energy Meter circuit diagram in High Voltage Condition.

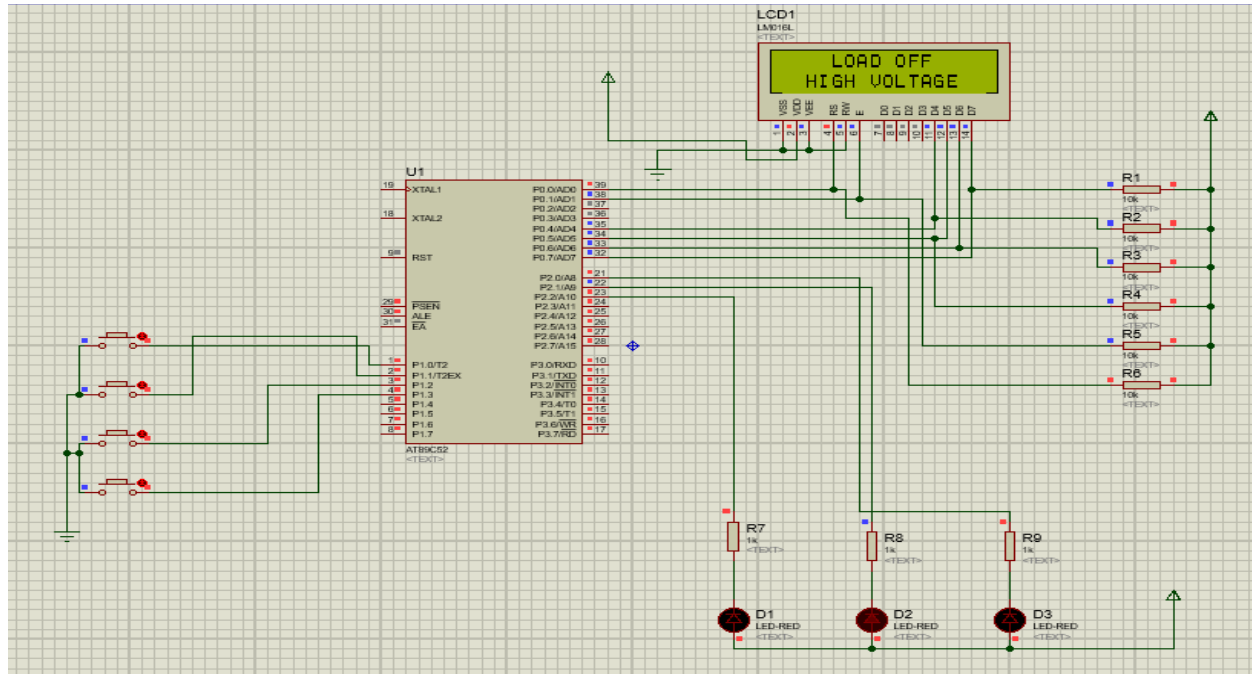


Fig 7: High Voltage

Fig 8 shows the Prepaid Energy Meter circuit diagram in Over Heating Condition.

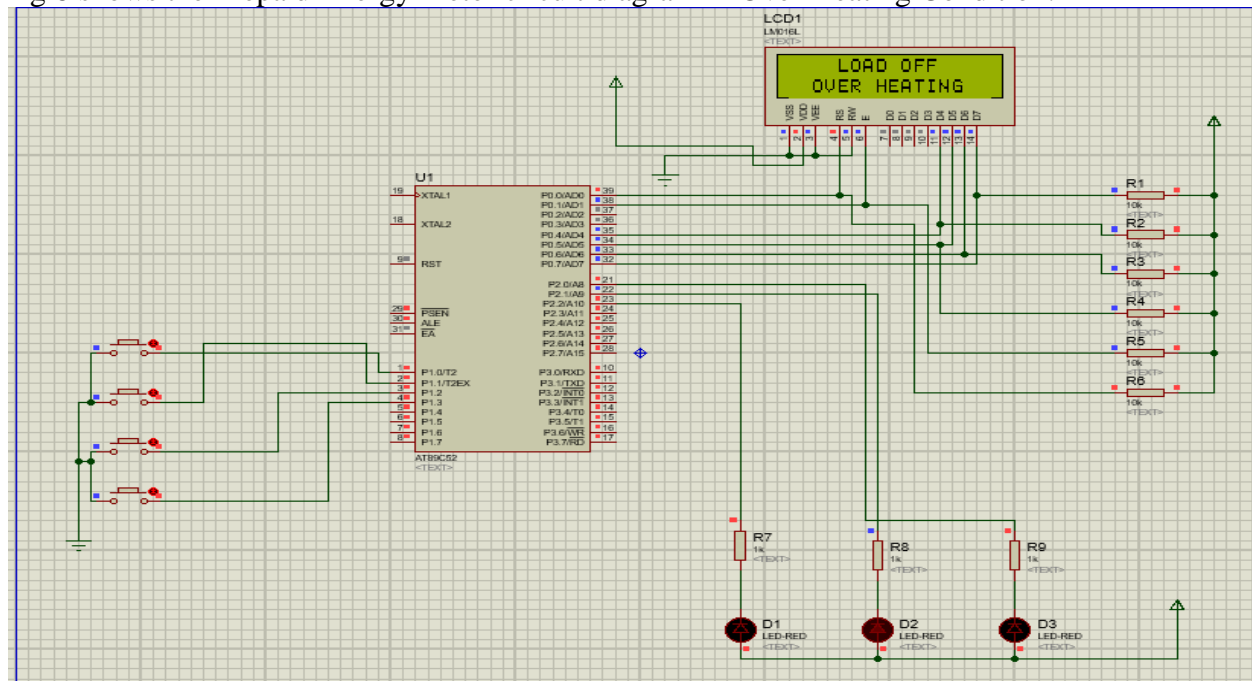


Fig 8: Over Heating

CONCLUSION

In this project, the 8051 management section controls and co-ordinates all the activities of the energy meter, which is meant to unceasingly monitor the energy meter reading and to disconnect the ability affiliation remotely whenever it fails to pay the bill once warning amount is no church going and power reconnects after bill payments. It avoids the human intervention, provides effective and

economical meter reading, avoids the charge error, and scale back the upkeep value. It shows the corresponding data on alphanumeric display for user notification. The generated bill also can be sent to the patron by GSM. Hence, the entire method of observance of energy meter, bill calculation, and notification of the date, meter disconnection, or reconnection may be machine-controlled with efficiency with higher performance and fewer forces.

This code is playacting satisfactory operating in laboratory conditions. The device designed is employed in conjunction with Associate in Nursing Induction Energy Meter and with minor modification within the code and hardware, this method is additionally employed in the sector applications.

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