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ELECTRICITY METER BOX AUTOMATION

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Abstract— In modern society, automation become increasingly important as it provides better way of information exchange and time management as well. This paper represents automation in electricity meter box. Now a day's requirement of automation is at peak and every system is getting automated. In our system automation and security both objectives are achieved. This system is used for dedicated application with the help of microcontroller JGDT-05. Automation of electricity meter box has been achieved by using wireless transmission between MSEB (Maharashtra State Board of Electricity) office and customer premises. Bidirectional transmission between both ends is achieved with the help of wireless module. If any person tries to disturb the function of meter box security is provided by locking the meter box and it will be unlocked only by MSEB authorized person.

Key Words: *Electricity meter, Automation, Wireless Transmission*

I. INTRODUCTION

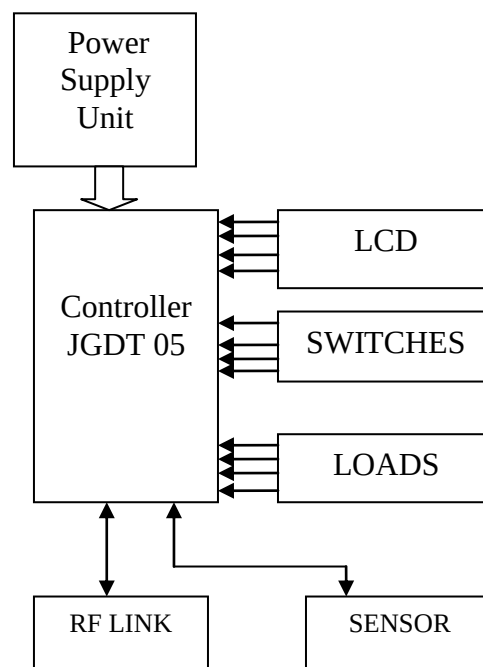
With the development in automation, it provides several advantages in our daily life. This project is based on electricity meter data collection system wirelessly. This smart meter records consumption of electrical units in each interval of hours. This advanced metering system differs from traditional system as it enables bidirectional communication between meter and central system. The consumed units will be displayed on meter box and transmitted to MSEB office wirelessly. Thus the need of MSEB resource person will be eliminated. Smart meter also includes IR proximity sensor for security aspect. IR proximity sensor will continuously monitor the case of meter box. If any unauthorized person tries to open the case the meter will be automatically locked as well as same will be informed to MSEB office. Only MSEB personnel will be allowed to unlock the meter.

II. EXISTING SYSTEM

The current system for collection of reading of meter box is manual. Maharashtra state electricity board (MSEB) has to depute a person individually to every meter, take its photo

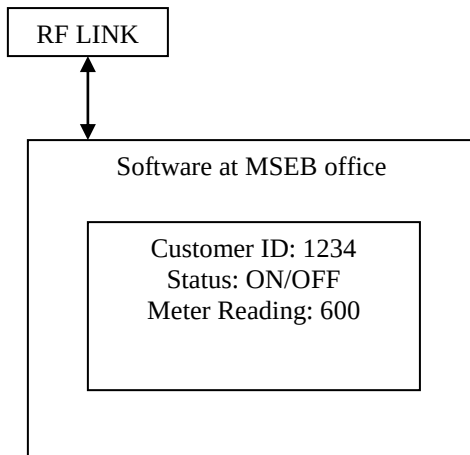
graph and print it on the bill and calculate the usage. Also some people disturb the function of meter box using various techniques. Some uses the magnets which slow down the meter box this manual system is time consuming which is not compatible with today's life or some uses diode in series with meter. So effect of this technique automatically reduces the units consumed which will cause the disadvantage to MSEB. So it is necessary to develop intelligent system for meter box and MSEB.

III. BLOCK DIAGRAM





Receiver at MSEB office



IV. WORKING

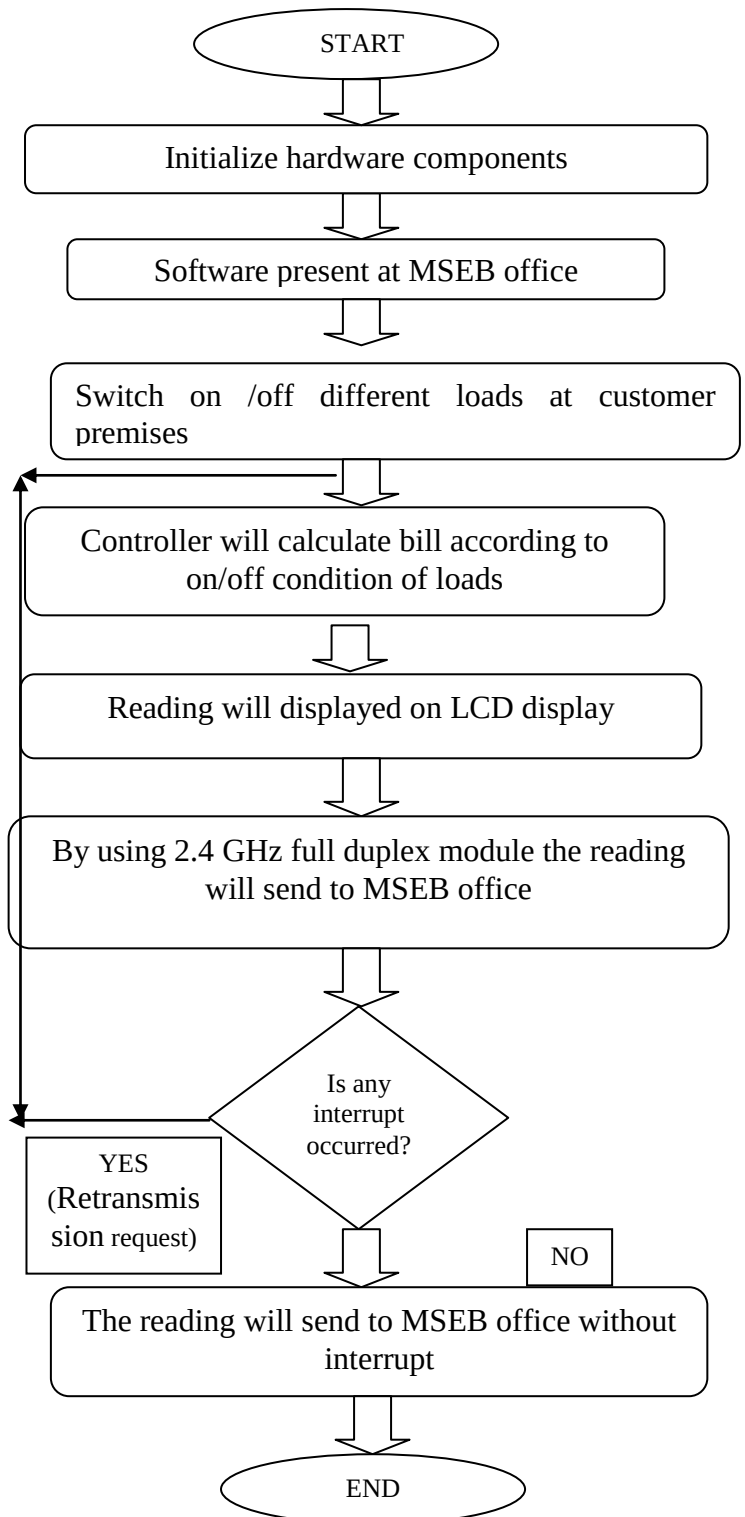
The circuit diagram consist of two parts: one is controller circuitry located at customer premises and other part is software on PC at MSEB office.

Controller is interfaced to LCD, 2.4GHZ of wireless module, different loads (LED) and switches for driving the loads. Different kinds of loads operating at different voltages along with the on/off type switches are provided. Three main functions are performed by the controller mentioned as follows:-

- Controller will automatically send the reading i.e. the bill from customer premises to MSEB office via wireless module.
- Controller will automatically calculate the bill according to the number of loads switched ON or OFF.
- Controller will continuously monitor the IR proximity sensor. If any unknown person tries to open the protective cover of meter box the box will lock automatically and it will be unlocked only by the authority personnel.

The other part consists of software which is present at MSEB office. This will provide different options like printing the bill of customer, locking the meter, displaying the bill to customer. The communication between the meter box and MSEB office is done via RF link. We are going to use 2.4 GHz free band of radio frequency. The advantage of using 2.4 GHz RF band is that it is freely available. Full duplex communication is possible. Also automatic retransmission request is send if data is lost.

V. FLOW CHART



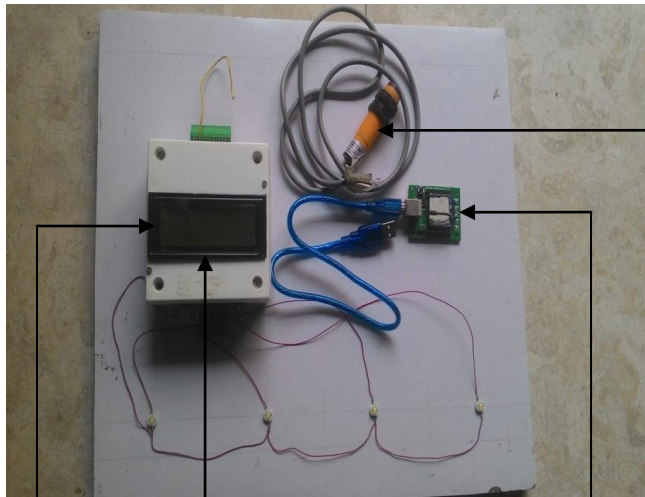
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LCD

Meter Box (Controller Inside)

RF
Mod
ule

IR Proximity
Sensor

VI. CONCLUSION

In proposed work, we have interfaced the microcontroller JGDT-05 with 20*4 LCD, switches, loads (LEDS), 2.4 GHz wireless sensor. The industry grade IR proximity sensor will provide security to meter box. The reading of per second will send to MSEB office wirelessly. If interruption occurred while transmitting retransmission request can be sent to controller. Security option will be provide by locking the meter automatically if someone tries to open the cover of meter box. We can embed this concept in future by using existing mobile towers for wireless transmission of units.

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