KWh Detector

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Abstract. KWh meter use to calculate how much electricity is used in a building, whether at home, office or factory. Values are calculated in KWH units (Kilo Watt Hours) every month will be multiplied by the unit price of electricity (TDL) and increase the tax subscription value by 10 percent generate a bill received by every month. Be aware difficulty to do calculations above the high place. Then, this project make it easy for us to do the calculations for electricity payments. This tool give value per minute. We can know how much electricity costs and we can always see it. This tool suitable for use in dormitories where usually house owner fix flat rate for additional electrical equipment such as televisions, computers, refrigerators, and many more. Flat rate payments can be changed according to usage so that no one is harmed.

Introduction

Since electricity was discovered, various equipment was created by humans. Equipment created in analog and mechanical form, either one of the equipment is a meter Kilo Watts Hour (KWh) which until now is still used to record electricity. In recording the electricity used, it is still done from house to house. So far, to record the value of current in energy meters, it still uses a computer-counting system. By using this system has caused many problems.

In addition, the excessive of workers, human factor in the error of recording energy meter impact on the consumer services section to fix the mistake. Weather factors and traffic jams also cause meter readings to be delayed. Each year, the number of electric customers increases, registered in peninsular Malaysia, 6,420.51. This represents a 21% increase over the previous year [1] (TNB, 2018). Therefore, KWh meters are widely used and many workers are also needed. In addition, meter reading report late received by section electricity bill data processing.

Problem statements is waste electricity in every household. There are some users, using more electrical appliances. Especially rented house, they use the electoral energy as if there were no tomorrow. With this KWh Detector, waste problems can be minimized and can save the environment.

Previouse Work

Digital Household Energy Meter, which is a digital electricity pricing system consisting of a communication system for uploading usage data from meters to central computers for data processing. The display panel uses a computer interface developed using Visual Basic Software connected via RS-232 communication cable to the MK-6 Genius, a kind of digital power meter. However, this proposed idea is not a tool because it simply simulates the total cost calculated internally by using the software interface. [2]

Cost Monitoring Digital Power Meter where it measures electricity and converts it to cost. The PIC 16F877A microphone is used as a key component of the input and output interface. Inputs to this system are voltage supply, current of load, and time taken from the workpiece, while LCD display as output and LED as indicator. The 240volt shutter is reduced using a step down transformer. Measurements for this device use the Energy Meter Chip by stabilizing voltage and current before the output of the circuit is integrated into the PIC microprocessor and outputs a pulse output. This system has a problem, which is not as accurate as the actual power meter. According to the report, the transformer used resulted in a high percentage of voltage drop. [3]

Methodology

Block Diagram of the Project.

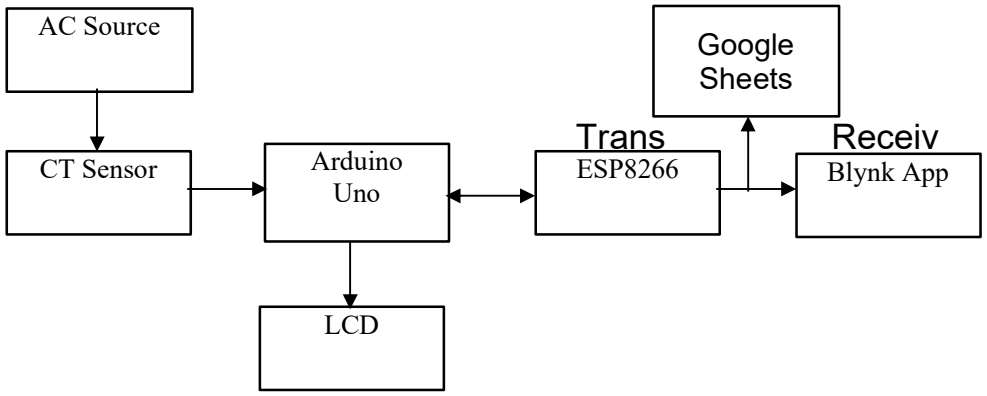

Figure 1: Project Block Diagram

The row data take from CT sensor, and it through Arduino to process data and it will display at LCD. It will transmit trough ESP8266 and it will receive at Google Sheets and Blynk App.

Flow of methodology

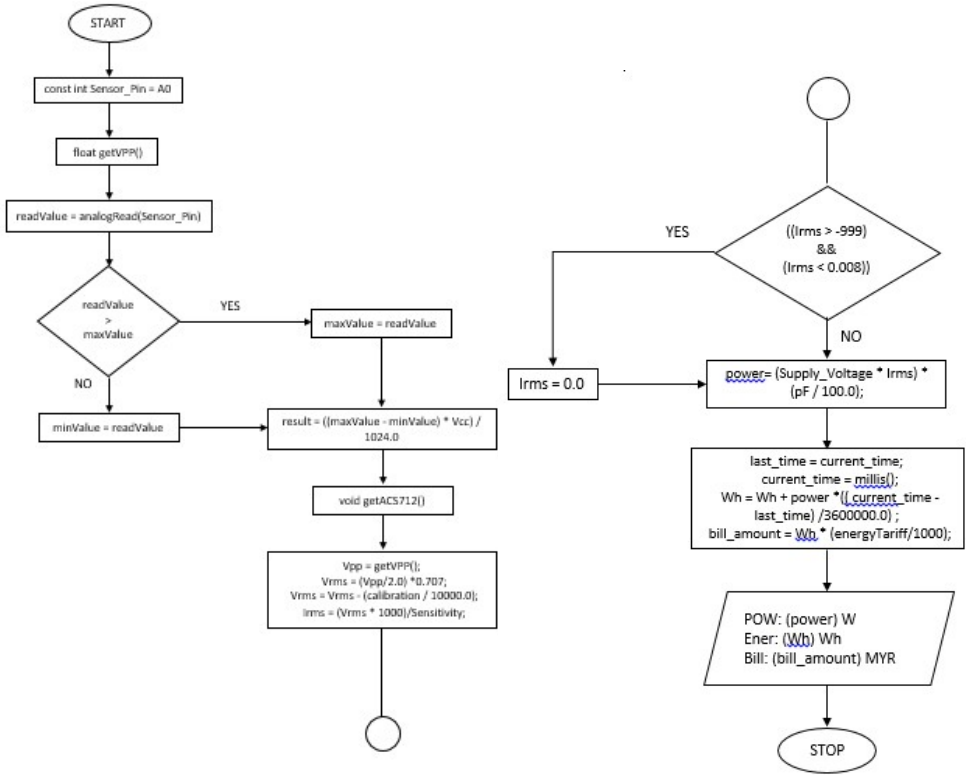

Figure 2: Flow of methodology

Current Transform (CT) sensors act as input data taken from the current flow generated from the circuit. Next, it is processed in an Ardiuno microcontroller to obtain peak voltage to peak (vpp). readValue will take readings from analog pin A0, where readValue = analogRead (Sensor_Pin). Next, if readValue> maxValue then maxValue = readValue, and if so then minValue = readValue. This will happen intermittently because, the input current is a shutter and the resulting wave is a sine wave. As such, they will be able to read both the positive and the negative side. The result of readValue readings will then be used to get result = ((maxValue - minValue) * Vcc) / 1024. This process will take place in the getVPP () float.

Upon completion of the getVPP () float section, it will be forwarded to the getACS712 () section for Vrms and Irms counts. In addition, by obtaining Vrms and Irms, the amount of power as well as energy can be calculated and thus, the amount of electricity consumption can be displayed on the LCD.

Product Design

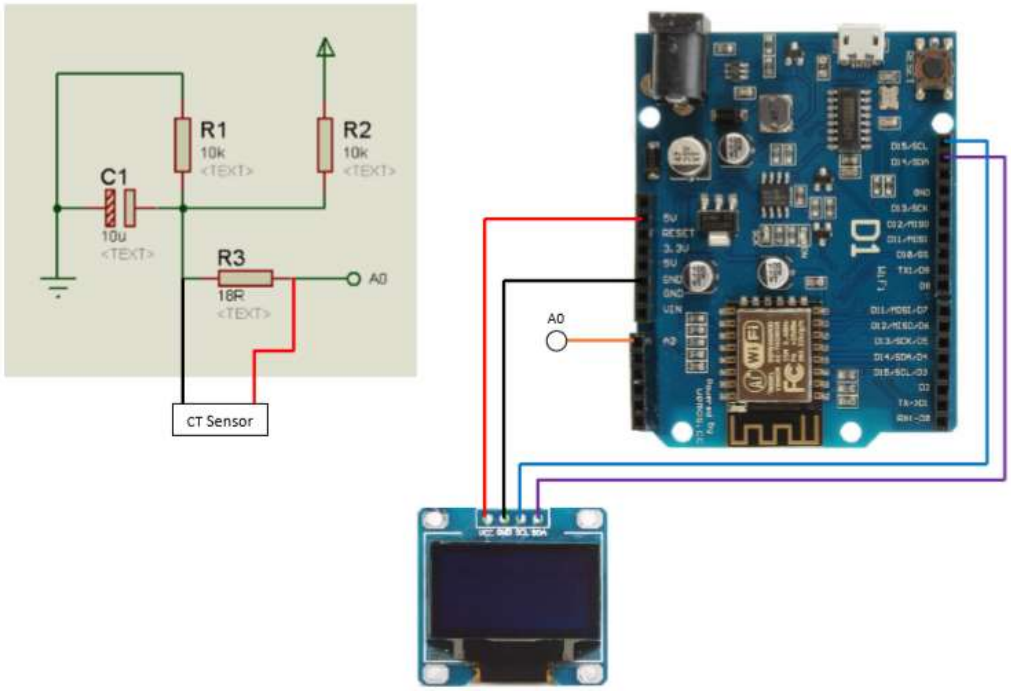

Figure 4: Schematic circuit

Phototype

Figure 5: kWh Detector

Conclusion

KWh Detector design. All the software used to design it is discussed in detail. Software installation and setup are outlined systematically to ensure the effectiveness of the tools needed to develop the KWh Detector project. After analyzing the data, it is important to draw conclusions or conclusions about the results and hypotheses of whether the project is working or not.

References

1. Dave. (2019, March 30). Explain about 3 Basic Types of Energy Meters?

   Retrieved from https://www.watelectrical.com

2. Nor'aisah, S., Mohd Zeid, A. B., & Mohd Helmy, A. W. (2008).
   Digital Household Energy Meter. *Proceedings of EnCon2008*, 1008–1013.
   Retrieved from http://eprints.uthm.edu.my/
3. Loo, S. E. (2011). Cost Monitoring Digital Power Meter. Retrieved from
   http://eprints.utem.edu.my/
4. PRICING & TARIFFS. (n.d.). Retrieved from https://www.tnb.com.my/commercial-industrial/pricing-tariffs1.