

# **UNIQUE GATEWAY FOR TETHERING SMART METERS VIA SMART TECHNOLOGY FOR ENERGY CONSERVATION**

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**Abstract:** Smart Technology have developed a smart meter which is the next technological development of the energy system. In UK this system is so-called 'smart grid'. Smart meter is more efficient and reliable energy supply to the consumers with smart sensors -communicating the information of energy usage which help us to manage our energy on our day-to-day usage. The electricity usage data's can be of hourly, weekly, monthly and also yearly can be updated to the consumers and also to suppliers, which leads to save time and hassle. Thus the energy consumption, cost and man power reduction can be achieved by this smart meter implementation.

**Keywords:** Smart meter, Energy, Electricity and Sensors.

## **1. INTRODUCTION**

Smart meter can make a smart home by using smart devices such as smart bulb, thermostats to secure smart locks and window, automatic lighting, heating, etc., which can be adjusted or controlled through wireless communication system of smart technology. This system supports us to connect sensors and to receive data for which electricity bill amount can be reduced. This device helps us to save time, money, energy and environment impacts can be reduced. Smart Technology have made us to control smart home through internet by using mobile remotely. In industries by this smart technology –automation and control process has been made easy for power management and also maintenance.

## **2. SMART METER**

Smart meters are a device which can be used to give the information of energy usage through internet of things. By the data which has been updated to the users – home or industries will be useful in saving electricity utilization and maintenances cost. By the digital readings of electricity utilization by a smart meter will be communicated hourly, weekly and monthly to the consumers and also for the suppliers automatically. By the data's received automatically will be accurate and timely, which can be used to generate estimated bills of energy usage.

## **3. OPERATIONS**

Smart meters update the digital data to the users and also to the suppliers automatically through Wi-Fi. The available data can be monitored for maintaining the devices in home and also in industrial machineries by which we can know our energy consumption and it leads to control the electricity bill.

## **4. NETWORKS**

Smart meters by using smart technology which facilitates the user to receive the electricity utilization data through a network such as mobile phones, radio frequency radiations and also in website- information can be stored and shared. Smart sensors which emits a signal for very short duration at low power of every one minute per day of the electricity consumers will be used in networks. Thus the networks are used to communicate the sensed data for long distance with secure data transmission for the consumers and suppliers.

## **5. ADVANTAGES**

Smart meter updates the real time data usage of electricity. Monitoring the real time digital readings can save the maintenance cost and cut off the power loss. Automatic updating of energy usage data can view day by day and the bill generated will be accurate. Efficient energy utilization by the smart home and industries are possible by this smart meter of Smart technology.

## 6. BENEFITS

- Real time energy utilization data can be received.
- Automatic billing for energy usage readings will be accurate.
- History of an energy usage over the day, week, month or year can be monitored and displayed.
- Tariff can be maintained by regular energy monitoring.

## 7. ENERGY EFFICIENCY

It's using less energy at home. It can be done quite easily, and cheaply, through changing habits and behaviours around the home. We could also buy products that help us to use our energy more efficiently or simply, use less of it.

There are two main reasons to be more energy efficient at home:

**a. Save on bills:** using less energy means we'll lower our energy bills.

**b. Be kind to the planet:** using less energy is more environmentally friendly. So if we're trying to be greener - cut back on your energy use.

## 8. CONCLUSION

**Smart Technology** is changing the world in which we live. A network of sensors and controllers using state-of-the-art wireless communication, positioning, and timing **technology**. Thus the smart meter is a device, which is used to monitor and analysis the energy usage can lead to reduce the energy consumption, save money and time. Use of energy efficiently by proper control of machineries and devices used for energy consumption. This automatic electricity digital reading updates can reduce the man power with accuracy in readings.

## 9. REFERENCES

1. K. Gill, S. Yang, F. Yao, and X. Lu. A ZigBee-based Home Automation System. IEEE Trans. On Consumer Electronics, Vol. 55, No. 2, pp. 422-430, May (2009)
2. S. M. Diesburg and A. I. A. Wang, "A survey of confidential data storage and deletion methods," ACM Computing Surveys (CSUR), vol. 43, no.1, p.2, 2010.
3. Z. Wang, R. Murmura, and A. Stavrou, "Implementing and optimizing an encryption filesystem on android," in IEEE 13th International Conference on Mobile Data Management (MDM), 2012, pp. 52-62.
4. K. Dittawit and F. A. Aagesen, "Home energy management system for electricity cost savings and comfort preservation," 2014 IEEE Fourth International Conference on Consumer Electronics Berlin (ICCE Berlin), Berlin, 2014, pp. 309-313.
5. A. Industries, "DHT11 basic temperature-humidity sensor + extras ID: 386 - \$5.00 : Adafruit Industries, Unique & fun DIY electronics and kits", Adafruit.com, 2016. [Online]. Available: <https://www.adafruit.com/product/386>.
6. Darshan Iyer N, Dr. KA Radhakrishnan Rao, "IoT Based Energy Meter Reading, Theft Detection & disconnection using PLC modem and Power optimization ",IRJET, (2015)
7. CEN-CENELEC-ETSI Smart Grid Coordination Group, European Commission. (2012). Smart Grid Reference Architecture (European Commission White Paper) [Online]. Available: [http://ec.europa.eu/energy/gas\\_electricity/smartgrids/doc/xpert\\_group1\\_reference\\_architecture.pdf](http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group1_reference_architecture.pdf), accessed on Dec. 28, 2014.
8. R. Gerwen, S. Jaarsma, and R. Wilhite. (2006, Jun.). Smart Metering. Leonardo Energy (White Paper) [Online]. Available: <http://www.leonardo-energy.org/sites/leonardo-energy/files/root/pdf/2006/SmartMetering.pdf>, accessed on Apr. 28, 2014.
9. D. Ilic, S. Karnouskos, and P. G. Da Silva "Sensing in power distribution networks via large numbers of smart meters," in Proc. 3rd IEEE PES Int. Conf. Exhib. Innov. Smart Grid Technol. (ISGT'112), 2012, pp. 1-6.
10. Edison Electric Institute. (2011). Smart Meters and Smart Meter Systems: A Metering Industry Perspective (White Paper) [Online]. Available: <http://www.eei.org/issuesandpolicy/grid-enhancements/Documents/smartmeters.pdf>, accessed on Apr. 25, 2014.
11. US Department of Energy. (2009). Perspectives for Utilities and Others Implementing Smart Grids. (GovernmentReport)[Online]. Available: [http://www.epa.gov/cleanenergy/documents/suca/stakeholder\\_roundtable\\_sept09.pdf](http://www.epa.gov/cleanenergy/documents/suca/stakeholder_roundtable_sept09.pdf), accessed on Apr. 26, 2014.
12. P. Palensky and D. Dietrich, "Demand side management: Demand response, intelligent energy systems, and smart loads," IEEE Trans. Ind. Informat., vol. 7, no. 3, pp. 381-388, Aug. 2011.

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