

ENERGY METER WITH GSM

Project report submitted

In partial fulfilment of the requirements of the degree of

Bachelor of Technology
in
Electrical and Electronics Engineering

By
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Under the Supervision of
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SCHOOL OF ENGINEERING AND TECHNOLOGY
K R MANGALAM UNIVERSITY, GURUGRAM, HARYANA, INDIA

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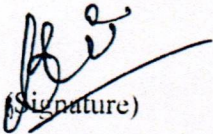
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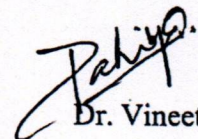
CERTIFICATE

It is certified that the work contained in the project report titled "Energy Meter With GSM," by the following students:

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has been carried out under my/our supervision and that this work has not been submitted elsewhere for a degree.



Dr. Vineet Dahiya

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At the end I would like to express my sincere thanks to all my friends and others who helped me directly or indirectly during this project work.

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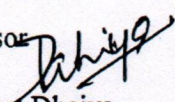
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APPROVAL SHEET

This project report entitled (Energy Meter With GSM) by (Mubin Ali) is approved for the degree of B.Tech (Electrical And Electronics Engineering), School of Engineering and Technology.

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Abstract

The TM4C123GH6PM board is the most recent system-on-chip (SOC), which falls under ARM family of boards and devices. This family of boards and devices comes under the powerful 32-bit ARM family after adding a lot of new features, properties and flexibility to support robust single, 2 and three phase metrology solutions. This project is only for domestic uses as we have considered only the single phase case. We can also extend this project for two phase and three phase environment. In that case this will be very helpful for industrial application. Here we take input as current and voltage from the main supply and we use sensing circuits to make its level compatible with that of ARM Processor. Here the GSM module is added to reduce the manual work and complexity of analog meters. Here we can send sms to every individual about their energy usage. The calculation and data sending capacity of this model is made easier by the source code. Handling these complex systems easily with the help of software has made it more popular. Higher level of current capacity can easily be obtained by simple replacement of the shunt resistor or its value. We can achieve any desired value by either by changing the ratio in transformer or the resistor value of voltage divider circuit. The TM4C123GH6PM has a powerful 60 MHz CPU with ARM architecture. The analog front end consists of up to two channel of 12-bit analog-to-digital converters (ADC), with conversion time 2.44 microsecond per channel. The software supports calculation of various parameters for single phase energy calculation. The key parameters measured during energy measurements are: RMS current and voltage, energics. Finally the calculated value of power and other parameters are displayed on 16x2 LCD and the same data is sent to user and station via SMS using GSM module.

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Introduction:

These days have evolved more into digital world. This design helps us to measure active power/energy, potential, and current flowing in a single-phase environment. The heart of the meter is an ARM cortex M4 processor. All the readings and measurements are taken in the digital domain, so we use ADC, and measurement results are displayed in LCD. Then the data calculated is sent as SMS via GSM module. This project is only for domestic uses as we have considered only the single phase case. We can also extend this project for two phase and three phase environment. In that case this will be very helpful for industrial application. Here we take input as current and voltage from the main supply and we use sensing circuits to make its level compatible with that of ARM Processor. Here the GSM module is added to reduce the manual work and complexity of analog meters. Here we can send sms to every individual about their energy usage. The calculation and data sending capacity of this model is made easier by the source code. Handling these complex systems easily with the help of software has made it more popular. These are also known as power meter and vice versa. According to terminology, active power is a measure of what is required or consumed in order to do a task or perform any particular useful work. These energy meters described in this application also can be referred to as an energy meter or a power meter or a watt-hour meter. The Digital calibration is very fast and efficient, minimizing the overall calculation time and cost. The brain of this meter is the software firmware/source code, which does all the calculation and interfacing.

1.1 Objective

The main objective and aim of this intended project is to implement and construct a digital power or energy meter for domestic appliances. This energy meter will measure the electrical energy digitally and send messages to individual user so that user can easily identify how much energy they used at one time. We can use only 160 characters to send messages