# 2011

## GSM ENABLED DIGITAL ENERGY METER



Submitted as the "Final Year Project" in Bahria University

Of Management and Computer Sciences,

Shangrilla Road, E-8, Islamabad

**Group Members:** 

Qamar Javed (01-133072-191)

Zeeshan Mazhar (01-133072-195)

Amir Mehmood (01-133072-197)

Supervisor:

Mr. Shaftab Ahmed

## **Certificate**

We accept the work contained in this report as a confirming to the required standard for the partial fulfillment of the degree of BCE.

Mr. Bilal Awan	Mr. Shaftab Ahmed
Head of Department	Supervisor
Internal Examiner	External Examiner

#### **DEDICATION**

We would like to dedicate this project to our loving parents and teachers for their unwavering support, effort and guidance. Surely we would not have been the same without them.



#### **ACKNOWLEDGEMENT**

We would like to take this opportunity to pay our humble gratitude to Almighty Allah (S.W.A.T), the most merciful.

We are extremely thankful to our Project Supervisor Mr. Shaftab Ahmed who supervised the project in a very encouraging and helpful manner. Whenever we find any query during our project, our supervisor helps us completely

Following people have been very helpful at different stages of this project.

Mr. Muhammad Kashif Lab teacher in Bahria University Islamabad.

Mr. Zeeshan



#### **ABSTRACT**

In this project we will retrieve the reading from digital energy meter. What actually we do is that we retrieve the reading using the process of messaging between the server end and the client end. This process starts when the server side sends the message when it requires the reading from the client side and on the client side we have the GSM module with the programmed Microcontroller device installed with the energy meter. When the Microcontroller receive message through the GSM module it will get the reading from energy meter and reply the server. At the server end we will have the database of meter readings with the help of which we can generate the bill. In this project we have to work on the digital energy meter and its parts, Microcontroller programming, study of GSM and their different interfaces.

#### **PROJECT IN BRIEF**

Project Title:	GSM Enabled Digital Energy Meter
Undertaken:	Qamar Javed
	Zeeshan Mazhar
	Amir Mehmood
Supervised By:	Mr. Shaftab Ahmed
Starting Date:	25 <sup>th</sup> November, 2010
Ending Date:	22 <sup>nd</sup> April, 2011
Tools Used:	Keil Micro Version 2
	Proteous 7.1 SP2
System Used:	Acer Extensa 6702ZN, with 512 MB
	DDR2 RAM
Operating System:	Microsoft Windows XP

## **Table of Contents**

	Cont	ents	Page #
1.	Introdu	uction	2
	1.1.	Issues with existing energy meters	2
	1.2.	Solution using our project.	3
	1.3.	Internal Processing.	3
2.	Project	t Description	5
	2.1.	Project Description.	6
	2.2.	Digital Vs Analog Energy Meter	7
3.	Design	and Implementation	8
	3.1.	Hardware Design.	9
	3.2.	Set of AT Commands	14
A.	Appen	dix A System Components	17
	a.	89c52 Microcontroller	20
	b.	CT (choke or coil)	21
	c.	7805 Voltage Regulator	22
	d.	Vero board	22
	e.	LCD Display 2x16.	22
	f.	MAX 232	23
	g.	MAX 232 IC	23
	h.	Bridge rectifier	24
	i.	GSM Modem	24
B.	Appen	dix B Programming Of Microcontroller	27
	Bibliog	graphy & References	51
	Index.		52

### **List of Figures**

Figure	Page #
Fig.1 Abstract view of Project	4
Fig.2 Energy Meter Diagram	4
Fig.3 Snapshot of 1 <sup>st</sup> Module	10
Fig.4 Block Diagram I	10
Fig.5 Basic Overview	11
Fig.6 Snapshot of 2 <sup>nd</sup> Module	12
Fig.7 Block Diagram II	12
Fig.8 Schematic Diagram	15
<u>List of Tables</u>	
Table 1 AT-Command set overview	14