

Data Acquisition Unit using GSM (SMS) interface

By

Usman sadiq



Supervised by

Mr. Abid Ali Minhas

A report is submitted to the department of Computer Sciences
BIM&CS, Islamabad.

In partial fulfillment of requirement
for the degree of BCS

Department of Computer Sciences, Islamabad
University of Peshawar, Peshawar.

Dedication

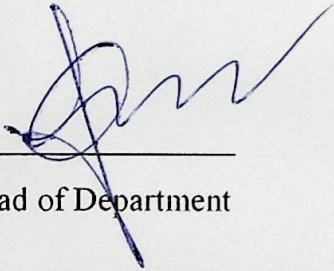
Dedicated to my parents whose prayers make me stand where I am today

Acknowledgements

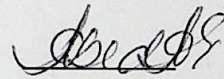
Thanks to all the people who made this project a success. Firstly I would like to thank my advisor ABID ALI MINHAS who has always been there in case of any problems. I have been greatly benefited from the help of my advisor ABID ALI MINHAS has extended to me. His contribution towards making of this project was overwhelming. He was tolerant towards all the questions I asked and given every sort of technical skills .In the end I would like thank the staff members who have provided their valuable time and efforts.

Certificate

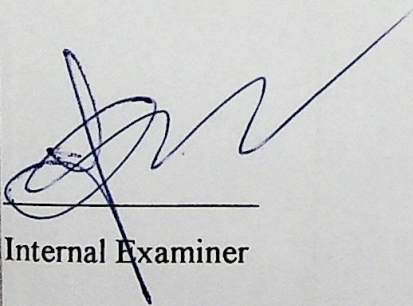
This is certify that we have read the project report submitted by Usman Sadiq, it is our judgement that this report is of sufficient standard to warrant its acceptance by Bahria Institute of Management and Computer Science department of University of Peshawar , Islamabad for the degree of Bachelor of Computer Science .



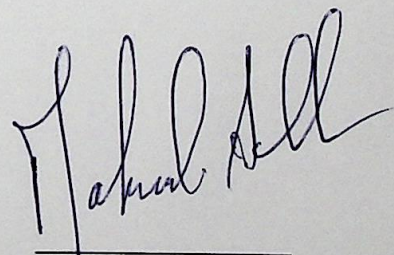
Head of Department



Supervisor



Internal Examiner



External Examiner

PREFACE

Remote monitoring is the need of today's industry. Control of fire alarms and warning system are as important as the remote visual monitoring of the building systems. Remote control of the lights, heating and cooling systems can save a lot of effort.

In the same way the storage god owns for textile and food material do need a control of humidity and temperature for a long life of the fabric and freshness of the food .All these requirements are very genuine and exist in the industry and project scenario of our country.

Use of microcontrollers in microwave ovens, printers, televisions ,radio transceivers ,speedometers ,electronic fuel injection system and fly by wire systems of the aircraft has become very common .This has resulted in the cost of embedded hardware .

The objective of this project is to make available the node parameters which can be Send data from node parameters to any where you want using short messaging service of GSM.

TABLE OF CONTENTS

Acknowledgments

Table of Contents

Abstract

Chapter 1	INTRODUCTION	6
	1.1 problem statement	7
	1.2 aim of project	7
	1.3 project report	7
Chapter 2	SYSTEM DESIGN	8
	2.1 overall architecture	
	2.1.1 The remote station	9
	2.1.2 The sensor interface	9
	2.1.3 Mobile interface	9
	2.2 Functional design of sensor interface	9
	2.3 Functional design of mobile interface	10
Chapter 3	HARDWARE DESIGN	11
	3.1 Hardware requirements	12
	3.2 Hardware design	12
	3.2.1 Processing Unit	12
	3.2.2 A to D converter requirements	13
	3.3 Hardware working description	13
	3.4 Firmware Description	13
Chapter 4	SOFTWARE DESIGN	14
	4.1 CVI	15
	4.2 Protocol architecture	15
	4.3 SMS format	15
	4.4 Program	15
Chapter 5	TEST BENCH	22
	5.1 Test Bench Requirements	23
	5.2 Test Bench Design	24
	5.3 Test Bench Marking	24
	5.3.1 for Software	24
	5.3.2 for Hardware	24
	5.4 Result	24
Chapter 6	GSM	25
	6.1 System Block Diagram	26
	6.2 GSM network	27
	6.3 The switching system	28
	6.4 Mobile Station	28
	6.5 Base station subsystem	29

Chapter7	Short Message Services	30
	7.1 Definition	31
	7.2 Introduction	31
	7.3 Benefits of SMS	32
	7.4 Network elements and Architecture	33
	7.5 SMSC	33
	7.6 Signal transfer Point	34
	7.7 Hlr	34
	7.8 Visitor Location Register	34
	7.9 MSC	34
	7.10 Air Interface	
	7.11 The Base station system	34
	7.12 The Mobile device	35
	7.13 Mobile Terminated short message example	35
	7.14 SMS applications	37
Chapter8	8.1 Interfacing Microcontroller	39
	8.1.1 Transmission of Data	40
	8.1.2 Interfacing Microcontrollers with the Computers	
	8.2 Programming Microcontrollers	41
	8.2.1 All-07a Microcontroller Programmer	41

APPENDICES

Appendix	Description
A	Notes C51
B	Datasheets of Microcontroller, AD7820 converter
C	Code and Firmware
D	Serial Communication

LIST OF FIGURES:

Figure 2.1	System Block Diagram	10
Figure 6.1	System Block Diagram of GSM	26
Figure 6.2	GSM Network Elements	27
Figure 7.1	Basic Network Architecture for SMS Deployment	32
Figure 7.2	Network Elements and Architecture	33
Figure 7.3	MT – SM Scenario (GSM)	35
Figure 7.4	MT Short Message Scenarios	36
Figure 8.1	Programming a Microcontroller	42