

ABSTRACT

The aim of home automation is to control home devices from a central control point. In this paper, we present the design and implementation of a low cost but yet flexible and secure internet based home automation system. The communication between the devices is wireless. The protocol between the units in the design is enhanced to be suitable for most of the appliances. The system is designed to be low cost and flexible with the increasing variety of devices to be controlled. Networking is a major component of the processes and control instrumentation systems as the network's architecture solves many of the Industrial automation problems. There is a great deal of benefits in the process of industrial parameters to adopt the Ethernet control system. Hence an attempt has been made to develop an Ethernet based remote monitoring and control of home appliances. In the present work the experimental result shows that remote monitoring and control system (RMACS) over the Ethernet.

LIST OF FIGURES

Fig 1.1	Frame Structure of Ethernet	3
Fig 2.1	Block diagram	5
Fig 2.2.1.1	ARDUINO board	6
Fig 2.2.1.2	Algorithm for writing into ARDUINO	7
Fig 2.2.1.3	Algorithm for reading from ARDUINO	9
Fig 2.3.1	Pin Configuration of TQFP	11
Fig 2.3.2	PDIP pin configuration	12
Fig:2.3.3	Pin configurations of MLF	12
Fig 2.4.1	ATMEGA 328P's Block Diagram	15
Fig 2.5.1	Register File	22
Fig 2.5.2	Special Addressing Registers	22
Fig 2.5.3	AVR Memory	23
Fig 2.6.1	Direct Register Addressing	24
Fig 2.6.2	Direct I/O Addressing	24
Fig 2.6.3	Direct data memory addressing	25
Fig: 2.6.4	Direct data memory with displacement addressing	25
Fig 2.6.5	Indirect data memory addressing	26
Fig 2.6.6	Indirect data memory addressing with pre-decrement	26
Fig: 2.6.7	Indirect data memory addressing with post-increment	27
Fig 2.6.8	Program memory addressing	27
Fig 2.7	SRAM R/W Timings	28
Fig 2.7.2	Status Bits of PSR	29
Fig 2.8.1	Ethernet Shield	31
Fig 2.8.2	Interface of Ethernet Shield	32
Fig 2.8.3	Ethernet fixed on ARDUINO	34
Fig 2.8.4	Webserver with SD Card	35
Fig 2.8.5	Analog results	36
Fig 2.8.6	Test.txt	36
Fig 2.9.1	I/O Terminals of a Transformer	39

Fig 2.9.2	Voltage Regulator Schematic	40
Fig 2.9.4	Schematic and Illustration of a Diode	41
Fig 2.9.5	Circuit Diagram	42
Fig 2.10.1	Relay Construction	44
Fig 2.10.2	Relay Design	44
Fig 2.10.2.1	Terminals of relay	46
Fig 2.10.2.2	Relay Terminals	46
Fig 2.10.2.3	Connection of Relay	47
Fig 2.10.3.1	Terminals of DPDT Relay	48
Fig 2.10.3.2	DPDT Relay pins	49
Fig 2.10.3.3	Circuit Diagram of DPDT Relay Connections	50
Fig 2.10.3.4	SPDT Relay	51
Fig 3.1.1	ARDUINO board	53
Fig 3.1.2	ARDUINO IDE	54
Fig 3.1.3	ARDUINO board	55
Fig 4.1.1	Freeduino Board	57
Fig 4.1.2	USB Cable	57
Fig 4.1.3	USB drivers	58
Fig 4.1.4	Roboduino Board	59
Fig 4.1.5	Found New Hardware	59
Fig 4.1.6	Install Drivers	60
Fig 4.1.7	Browse	60
Fig 4.1.8	Finish	61
Fig 4.2.1	Uploading Program	61
Fig 4.2.2	Board Selection	62
Fig 4.2.3	New Program	63
Fig 4.2.4	Blink the Digital output	63
Fig 4.2.5	Port Selection	64
Fig 4.2.6	USB plug in	64
Fig 4.2.7	Arduino LED off	65

Fig: 4.2.8	IDE Options	66
Fig: 4.2.9	Set Baud Rate	68
Fig 4.2.10	Toolbar	69
Fig 4.2.11	Edit menu	70
Fig 4.2.12	File Menu	70
Fig 4.2.13	Tools menu	71

LIST OF TABLES

1. Table 2.4.1:	Comparison of different versions of ATMEGAs	13
2. Table 2.7	Instruction Set of SPR	29
3. Table 3.2	Commands	66

ACRONYMS & ABBREVIATIONS

LAN	Local Area Network
MAN	Metropolitan Area Networks
WI-FI	Wireless Fidelity
TQFP	Thin Quad Flat Package
MLF	Micro Lead Frame
CSMA	Code Segment Multiple Access
CDMA	Code Division Multiple Access
MAC	Media Access Control
OSI	Open System Interconnection
LLC	Logical Link Control
LED	Light Emitting Diode
QFN	Quad Flat No-leads package
XTAL	Crystal Inputs
SRAM	Static Random Access Memory