## **CONTENTS**

Chapter-1 Introduction  1- 1.1 Ethernet  1.2 IEEE standards  2.3 Ethernet protocol  1.4 Topology  Chapter-2Hardware Requirements  5 2.1 Block Diagram of IoT Based Home Automation using Ethernet  2.2 Hardware Requirements  5 2.2.1 ARDUINO  2.2.2 ATMEGA328 features	
Acronyms and Definitions  Chapter-1 Introduction  1.1 Ethernet  1.2 IEEE standards  2.3 Ethernet protocol  1.4 Topology  Chapter-2Hardware Requirements  2.1Block Diagram of IoT Based Home Automation using Ethernet  2.2 Hardware Requirements  5  2.2.1 ARDUINO  2.2.2ATMEGA328 features	i
Chapter-1 Introduction  1.1 Ethernet  1.2 IEEE standards  2.3 Ethernet protocol  1.4 Topology  Chapter-2Hardware Requirements  2.1Block Diagram of IoT Based Home Automation using Ethernet  2.2 Hardware Requirements  5  2.2.1 ARDUINO  2.2.2ATMEGA328 features	,
1.1 Ethernet 1 1.2 IEEE standards 2 1.3 Ethernet protocol 2 1.4 Topology 3  Chapter-2Hardware Requirements 5 2.1Block Diagram of IoT Based Home Automation using Ethernet 5 2.2 Hardware Requirements 5 2.2.1 ARDUINO 5 2.2.2ATMEGA328 features 9	V
1.2 IEEE standards 2 1.3 Ethernet protocol 2 1.4 Topology 3 Chapter-2Hardware Requirements 5 2.1 Block Diagram of IoT Based Home Automation using Ethernet 5 2.2 Hardware Requirements 5 2.2.1 ARDUINO 5 2.2.2ATMEGA328 features 9	4
1.3 Ethernet protocol 2.1 Topology 3 Chapter-2Hardware Requirements 5 2.1 Block Diagram of IoT Based Home Automation using Ethernet 5 2.2 Hardware Requirements 5 2.2.1 ARDUINO 5 2.2.2ATMEGA328 features 9	
1.4 Topology  Chapter-2Hardware Requirements  5.1Block Diagram of IoT Based Home Automation using Ethernet  2.2 Hardware Requirements  5.2.2.1 ARDUINO  5.3.2.2.2ATMEGA328 features	2
Chapter-2Hardware Requirements  2.1Block Diagram of IoT Based Home Automation using Ethernet  2.2 Hardware Requirements  5  2.2.1 ARDUINO  5  2.2.2ATMEGA328 features	2
2.1Block Diagram of IoT Based Home Automation using Ethernet  2.2 Hardware Requirements  5  2.2.1 ARDUINO  5  2.2.2ATMEGA328 features	3
2.2 Hardware Requirements 5  2.2.1 ARDUINO 5  2.2.2ATMEGA328 features 9	-51
2.2.1 ARDUINO 5 2.2.2ATMEGA328 features 9	5
2.2.2ATMEGA328 features 9	i
	í
2.3 Pin Configurations	)
2.5 Till Configurations	1
2.4 Block Diagram of ATMEGA328p	5
2.4.1 Comparison between ATmega48PA, ATmega88PA, ATmega168PA	6
2.4.2 POWER 1	7
2.4.3Memory-	8
2.4.4 Input and Output	9
2.4.5 Communication	9
2.4.6 Programming	20
2.4.7 Automatic (Software) Reset	20
2.5 Register file	22
2.6 Addressing modes	24

2.6.1	Direct register addressing	24
2.6.2	Direct I/O addressing	24
	Ç	
2.6.3	Direct data memory addressing	25
2.6.4	Direct data memory with displacement addressing	25
2.6.5	Indirect data memory addressing	26
2.6.6	Indirect data memory addressing with pre-decrement	26
2.6.7	Indirect data memory addressing with post-increment	27
2.6.8	2.6.8 Program memory addressing (constant data)	27
2.7 SRAM Re	ead/Write timings	28
2.8 Ethernet s	shield	30
2.8.1 Feat	tures	31
2.8.2 Inte	rface	32
2.9 Power sup	ply	37
2.9.1	Transformer	38
2.9.2	Voltage Regulators	39
2.9.3	Diode Bridge	40
2.9.4	Filter Circuit	41
2.10Relays		42
2.10.1	How Relay Works	44
2.10.2	How to connect a single pole single throw (SPST) relay	45
2.10.3	How to connect a DPDT relay in a circuit	48
Chapter-3 So	ftware Requirements	53-56
3.1 AI	RDUINO IDE	53
Chapter-4 W	orking	57-71
4.1 Ge	etting Started	57
4.2 U <sub>I</sub>	pload your first sketch	61
Chapter-5 A <sub>1</sub>	pplications	72

Chapter-6 Advantages & Limitations	73
Chapter-7 Conclusion	74
Chapter-8 Future Scope	75
Chapter-9 References	76