**SMART IRRIGATION MONITORING SYSTEM**

**A MINI PROJECT** **REPORT**

***Submitted by***

**MOHMAD MUHYMIN KADIR R (8115U21EE029)**

**PONNUCHAMY P (8115U21EE038)**

**PRAVEEN S (8115U21EE040)**

**RAJESH K** **(8115U21EE305)**

***in partial fulfilment for the award of the degree***

***of***

**BACHELOR OF ENGINEERING**

**IN**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

|  |  |  |
| --- | --- | --- |
|  | **K. RAMAKRISHNAN COLLEGE OF ENGINEERING**  **(AUTONOMOUS)**  **SAMAYAPURAM, TRICHY** |  |
|  | **ANNA UNIVERSITY**  **CHENNAI 600 025** |  |

**MAY 2024**

**SMART IRRIGATION MONITORING SYSTEM**

**UEE1612 UG MINI PROJECT**

***Submitted by***

**MOHMAD MUHYMIN KADIR R (8115U21EE029)**

**PONNUCHAMY P (8115U21EE038)**

**PRAVEEN S (8115U21EE040)**

**RAJESH K** **(8115U21EE305)**

***in partial fulfilment for the award of the degree***

***of***

**BACHELOR OF ENGINEERING**

**IN**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**Under the Guidance of**

**Mr. A. PRABHU**

Department of Electrical and Electronics Engineering

K. RAMAKRISHNAN COLLEGE OF ENGINEERING

**ELECTRICAL AND ELECTRONICS ENGINEERING**

|  |  |  |
| --- | --- | --- |
|  | **K. RAMAKRISHNAN COLLEGE OF ENGINEERING**  **(AUTONOMOUS)**  **Under**  **ANNA UNIVERSITY, CHENNAI** |  |

|  |  |  |
| --- | --- | --- |
|  | **K. RAMAKRISHNAN COLLEGE OF ENGINEERING**  **(AUTONOMOUS)**  **Under**  **ANNA UNIVERSITY, CHENNAI** |  |

**BONAFIDE CERTIFICATE**

Certified that this project report titled “**SMART IRRIGATION MONITORING SYSTEM”** is the bonafide work of **MOHMAD MUHYMIN KADIR R (8115U21EE029), PONNUCHAMY P (8115U21EE038), PRAVEEN S (8115U21EE040)** and **RAJESH K (8115U21EE305)** who carried out the work under my supervision.

**Mr. A. PRABHU**

**SUPERVISOR**

**ASSISTANT PROFESSOR,**

Department of Electrical and Electronics Engineering,

K. Ramakrishnan College of

Engineering, (Autonomous)

Samayapuram, Trichy.

**Mr. G. GABRIEL SANTHOSH KUMAR**

**HEAD OF THE DEPARTMENT**

**ASSISTANT PROFESSOR,**

Department of Electrical and

Electronics Engineering,

K. Ramakrishnan College of

Engineering, (Autonomous)

Samayapuram, Trichy.

**SIGNATURE OF INTERNAL EXAMINER SIGNATURE OF EXTERNAL EXAMINER**

**NAME: NAME:**

**DATE: DATE:**

|  |  |  |
| --- | --- | --- |
|  | **K. RAMAKRISHNAN COLLEGE OF ENGINEERING**  **(AUTONOMOUS)**  **Under**  **ANNA UNIVERSITY, CHENNAI** |  |

**DECLARATION BY THE CANDIDATE**

I declare that to the best of my knowledge the work reported here in has been composed solely by myself and that it has not been in whole or in part in any previous application for a degree.

Submitted for the Mini Project Viva Voce held at K. Ramakrishnan College of Engineering on \_\_\_\_\_\_\_\_\_

**SIGNATURE OF THE CANDIDATE**

**INSTITUTE VISION AND MISSION**

### VISION

To achieve a prominent position among the top technical institutions

### MISSION

* To bestow standard technical education par excellence through state of the art infrastructure, competent faculty and high ethical standards.
* To nurture research and entrepreneurial skills among students in cutting edge technologies.
* To provide education for developing high-quality professionals to transform the society.

### DEPARTMENT VISION AND MISSION

**VISION**

To emerge as a renowned department for high quality teaching, learning and research in the domain of Electrical and Electronics Engineering, producing professional engineers, to meet the challenges of society

### MISSION

**M1.** To establish the infrastructure resources for imparting quality technical education in Electrical and Electronics Engineering.

**M2.** To achieve excellence in teaching, learning, research and development.

**M3.** To impart the latest skills and developments through practical approach along with moral and ethical values.

i

### PROGRAM SPECIFIC OUTCOME (PSO)

**PSO1:** Use logical and technical skills to model, simulate and analyze electrical components and systems

**PSO2:** Integrate the knowledge of fundamental electrical and electronics, power electronics and control systems for the reliability, sustainability and controllability of the electrical systems.

### PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

**PEO1:** Have strong foundation in Electrical and Electronics Engineering to excel in professional career, in higher studies or research.

**PEO2:** Analyze, design and develop various interdisciplinary projects and products, to solve social issues.

**PEO3:** Have professional ethics and effective communication skills with life-long learning attitudes.

### PROGRAM OUTCOME (PO)

**PO1 Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2 Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO3 Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

ii

**PO4 Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5 Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

**PO6 The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7 Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8 Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9 Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

**PO10 Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11 Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. **PO12 Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

### iii

### COURSE OUTCOMES:

|  |  |  |  |
| --- | --- | --- | --- |
| **SNO** | **BLOOM S LEVEL** | **DESCRIPTION** | **PO(1..12) &**  **PSO(1..2) MAPPING** |
| C318.1 | K3 | To expose the students to apply knowledge to solve problems. | PO1, PSO1, PSO2 |
| C318.2 | K3 | To expose the students to find solutions to complex problems, issues for public and  environmental concerns. | PO3, PO7, PSO1, PSO2 |
| C318.3 | K3 | To expose the students to give conclusions, analyze methods for various  scenarios. | PO4, PSO1, PSO2 |
| C318.4 | K2 | To expose the students to communicate  efficiently their technical knowledge and concepts. | PO9, PO10, PSO2 |
| C318.5 | K2 | To expose the students to self learning  and long term learning processes. | PO12, PSO1 |

**COURSE OUTCOMES VS POS MAPPING (**DETAILED; HIGH:3; MEDIUM:2; LOW:1**):**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SNO | PO  1 | PO  2 | PO  3 | PO  4 | PO  5 | PO  6 | PO  7 | PO  8 | PO  9 | PO  10 | PO  11 | PO  12 | PS O1 | PS O2 |
| C318.1 | 3 | - | - |  | - | - | - | - | - | - | - | - | 2 | 3 |
| C318.2 | - | - | 3 | - | - | - | 3 | - | - | - | - | - | 2 | 3 |
| C318.3 | - | - |  | 3 | - | - | - | - | - | - | - | - | 2 | 3 |
| C318.4 | - | - | - | - | - | - | - | - | 3 | 3 | - | - | - | 2 |
| C318.5 | - | - | - | - | - | - | - | - | - | - | - | 3 | 2 | - |

*\** For Entire Course, PO /PSO Mapping; 1 (Low); 2(Medium); 3(High) Contribution to PO/PSO

iv

**ABSTRACT**

### Agriculture is the most important and worshipped occupation in India. Agriculture is livelihood for the most of the Indian who has rural background. Smart Irrigation helps to the development of agricultural country. In India, agriculture contributes about 16% of total GDP and 10% of total exports. Water plays an important role in Agriculture. Water is main resource for Agriculture. Irrigation is one method to supply water. In this irrigation process people are wasting water more by missing the timings. So too save water and time we have a excellent method called Smart irrigation system using IoT. By the smart irrigation system we are using various equipments like temperature sensor, humidity sensor, and soil moisture sensor. IoT defines the system of physical thing rooted with software, sensors as well as additional technologies. These sensors will find the various situations of the soil and based on soil moisture percent, land gets automatically irrigated. It means when field needs water then automatically motor will get ON and it will get OFF.

v

### ACKNOWLEDGEMENT

We thank the Almighty God, for showing abundance of grace, without his blessings it would not have been possible for us to complete our project.

At this pleasing moment of having successfully completed our project, we wish to convey our sincere thanks and gratitude to our beloved kind Chairman, **Dr.K.Ramakrishnan,** who provided all the facilities to us.

Our sincere gratitude to **Dr.S.Kuppusamy,** Executive Directorfor his constant encouragement. We are also grateful to our Principal **Dr. D.Srinivasan** for constructive suggestions and encouragement during our project.

We wish to express the profound thanks to **Mr. G. Gabriel Santhosh Kumar,** Assistant Professor and Head, Department of Electrical & Electronics Engineering, for providing all necessary facilities for doing this project.

We whole heartedly acknowledge our deep sense of gratitude and indebtedness to beloved guide **Mr. A. Prabhu**, Assistant Professor, Department of Electrical & Electronics Engineering, for his expert guidance and encouragement throughout the duration of the project.

We extend our gratitude to all the teaching & non-teaching staff members of Electrical & Electronics Engineering Department, **K.Ramakrishnan College of Engineering**, for their kind help and valuable support to complete the project successfully. We would like to thank our parents and friends for their constant support and encouragement throughout this project.

vi

### LIST OF CONTENTS

|  |  |  |
| --- | --- | --- |
| **CHAPTER**  **NO** | **TITLE** | **PAGE NO** |
|  | **ABSTRACT** | **v** |
|  | **ACKNOWLEDGEMENT** | **vi** |
|  | LIST OF CONTENTS | **vii** |
|  | **LIST OF FIGURES** | **ix** |
|  | **LIST OF ABBREVIATIONS** | **x** |
| **1** | **INTRODUCTION** | **1** |
|  | 1.1 POWER SUPPLY | 1 |
|  | 1.1.1 FUNCTIONAL OF POWER SUPPLY | 1 |
|  | 1.2 POWER CONVERSION METHOD | 2 |
|  | 1.3. DC - DC CONVERTER | 2 |
|  | 1.4 DC BATTERIES | 4 |
|  | 1.4.1 TYPES OF DC BATTERIES | 5 |
|  | * + 1. VOLTAGE AND CAPACITY | 5 |
|  | * + 1. CHARGING AND DISCHARGING | 5 |
|  | 1.4.4. MAINTENANCE | 6 |
|  | 1.4.5 APPLICATIONS | 6 |
|  | 1.4.6 ENVIRONMENTAL CONSIDERATIONS | 6 |
|  | 1.5 LEAD ACID BATTERY | 6 |
| **2** | **LITERATURE REVIEW** | **8** |
| **3** | **EXISTING SYSTEM** | **12** |
|  | 3.1 EXISTING SYSTEM ANALYSIS | 12 |
|  | 3.1.1 BLOCK DIAGRAM OF EXISTING SYSTEM | 13 |
| **4** | **PROPOSED SYSTEM** | **14** |
|  | 4.1 INTRODUCTION | 14 |

vii

|  |  |  |
| --- | --- | --- |
|  | 4.1.1 LIQUID CRYSTAL DISPLAY | 14 |
|  | 4.1.2 BLOCK DIAGRAM OF PROPOSED  SYSTEM | 16 |
|  | 4.1.3 CIRCUIT DIAGRAM OF PROPOSED  SYSTEM | 17 |
| **5** | **HARDWARE COMPONENT DESCRIPTION** | **20** |
|  | 5.1 NODE MCU | 20 |
|  | 5.2 NODE MCU ESP8266 SPECIFICATIONS AND  FEATURES | 22 |
|  | 5.3 SOIL MOISTORE SENSOR | 23 |
|  | 5.4 RELAY MODULE | 24 |
|  | 5.5 WATER PUMP | 25 |
| **6** | **METHODOLOGY** | **27** |
|  | 6.1 INTRODUCTION | 27 |
|  | 6.2 PROCESS FLOW CHART | 28 |
|  | 6.3 ADVANTAGES | 29 |
| **7** | **CONCLUSION** | **32** |
| **8** | **REFERENCES** | **33** |

viii

**LIST OF FIGURES**

|  |  |  |
| --- | --- | --- |
| **FIGURE NO** | **DESCRIPTION** | **PAGE NO** |
| 3.1.1 | BLOCK DIAGRAM OF SMART IRRIGATION SYSTEM | 13 |
| 4.1.1 | LIQUID CRYSTAL DISPLAY | 15 |
| 4.1.2 | PROPOSED BLOCK DIAGRAM | 16 |
| 4.1.3 | PROPOSED CIRCUIT DIAGRAM | 17 |
| 5.1 | NODE MCU TOP VIEW | 20 |
| 5.1.1 | NODE MCU FRONT VIEW | 20 |
| 5.3 | SOIL MOISTORE SENSOR | 24 |
| 5.4 | RELAY MODULE | 24 |
| 5.5 | WATER PUMP | 25 |
| 6.2 | PROCESS FLOW CHART | 28 |

ix

**LIST OF ABBREVIATIONS**

|  |  |
| --- | --- |
| **ACRONYMS** | **EXPANSION** |
| AC | ALTERNATING CURRENT |
| DC | DIRECT CURRENT |
| PWM | PULSE WIDTH MODULATION |
| FM | FREQUENCY MODULATION |
| UPS | UNINTERRUPTIBLE POWER SUPPLY |
| NiCd | NICKEL-CADMIUM |
| NiMH) | NICKEL-METAL HYDRIDE |
| SLA | SEALED LEAD-ACID |
| LCD | LIQUID CRYSTAL DISPLAY |
| AGM | ABSORBED GLASS MAT |
| GSM | GLOBAL SYSTEM FOR MOBILE COMMUNICATION |
| IOT | INTERNET OF THINGS |
| NODE MCU | NODE MICRO CONTROLLER UNIT |

x