INTELLIGENT AUTOMATIC VALVE ON OFF CONTROL SYSTEM USING INTERNET OF THINGS

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ABSTRACT

The objective of the work is to invent an intelligent and automatic Valve ON OFF Control system that operates based on the real time Valve Status. The IoT enabled controller allows the control to motor and valves remotely anywhere in the world. This system is built at a low cost model as compared to the earlier method of Motor control systems using different wireless modules. The Internet of Things feature in the present system can be an extra advantage to the user, from anywhere in the world, based on any forecast of weather can seize the watering process from a remote area, in the process saving a lot of water and preventing the motor overloading. This project proves the possibility of replacing conventional valves with the smart control with IoT capability at low cost.

KEY WORDS : Microcontroller unit, Smart Irrigation, Motor control systems

I. INTRODUCTION

In the competitive world, everyone are busy in the official works and other personal works so that they do not have enough time to complete the other works at home such as plant watering and other works. So, everybody is also interested to making their work automated. People may be interested in control of lighting, air conditioner and heating appliances, security locks of gates and other systems[1]. Home automation helps us to provide a convenience, energy efficiency, comfort and security. Automation plays a vital role in the life of the elder and disabled people. Elder and disabled people can be more independent and lead good quality of life who might otherwise require institutional care. With the popularity of smart mobile and tablets among common people the concept of home automation has been increased in recent years and also giving a great relief to the caregivers[2]. The integration of IoT with Home Automation has added to the functionality of Home Automation. The main motivation for the project is to give the elder people, handicapped, a safe and independent living by providing the automation in their home. This project shows how the automation present in the home, office, shops etc. can be controlled through internet by the smart mobile devices using arduino board and other devices[3-6]. A low cost smart home environment for remotely monitoring and helping the elder people and patient in their everyday life activities.
II. PROPOSED METHOD

Main objective to implement this project is to design and develop a low cost reliable and efficient technique to form proper water distribution by continuous monitoring and also controlling it from a central server so we are able to solve water related problems. Proposed system contains a Arduino Motherboard, different are used. Arduino collects the information from sensors and send it Server. Continuous monitoring and controlling from a central server is possible using this technique. Figure 1 block diagram of proposed system.

![BLOCK DIAGRAM OF PROPOSED SYSTEM](image)

2.1 ARDUINO MICRO CONTROLLER

Arduino is an open source prototype that used to create microcontroller based kits for building of digital device and interactive object which can control and sense physical devices. The project is based on microcontroller board design, produced by several company, using various microcontroller. These system provide sets of analog and digital (I/O) pins which can interface to varied expansion boards and other circuits. The Arduino consists of serial communication interfaces, including Universal Serial Bus (USB) in some models, for uploading programs from personal computer to Arduino board. For programming the Microcontrollers, the Arduino provides an Integrated Development Environment (IDE) supported a programming language named Processing, which also supports the languages C and C++. Arduino Uno can also be a Microcontroller board that supported with the ATmega328P. It's has 14 digital pins (of which 6 are often used as PWM outputs), 6 analog inputs, a 16 MHz quartz, a USB connection, an influence jack, an ICSP header and a push. Arduino contains of 3.3v output pin and 5v output pin because most of Arduino supported component are operates with 3.3v or 5v which can powerd by the 3.3v and 5v pins.

2.2 WIFI MODULE

The Node MCU (Node Micro Controller Unit) is an open source firmware and development kit that helps to develope prototype to IoT product with the help of high level language script lines. The Node MCU is an open source software and hardware development environment that’s built around a really inexpensive system on a Chip (SoC) called the ESP8266. The ESP8266, designed and made by Espress if Systems, contains all crucial elements of the fashionable computer CPU, RAM, networking (wifi), and even a contemporary OS and SDK. The term
NodeMCU usually refers to the firmware, while the board is named Devkit. Node MCU Devkit 1.0 consists of an ESP-12E on a board, which facilitates its use. It also features a transformer, a USB interface.

2.3 RELAY DRIVER

Relays are simple switches which control the opening and closing of circuits electromechanically. Relays contain an electromagnet and also a group of contacts. The switching mechanism is administered with the assistance of the electromagnet. The most operation of a relay comes in places where only a low power signal are often used to control a circuit. It is also utilized in places where just one signal are often used to control tons of circuits. They were used to switch the signal coming from one source to a different destination.

2.4 WATER PUMP MOTOR

As the name implies, water pumps pump water. Whether that be during a vehicle, at a business, within the home, or during a well, shoppers can probably find a pump to suit their vehicle or to assist them draw water from the bottom during a self-dug well to be utilized in pressure tanks within the situation[7][8]. Vehicle water pumps help regulate the flow of water through a vehicle's cooling system when the seal on these go bad, the entire pump must get replaced. Located within the house or business, pressure water pumps regulate the water pressure year round, controlling water flow to different areas of the situation[9][10]. A pump motor may be a DC motor device that moves fluids. A DC motor, that converts DC electric energy into mechanical energy. DC or DC motor works on the principal, when a current carrying conductor is placed during a magnetic flux, it experiences a torque and features a tendency to maneuver, this is often referred to as motoring action. The water pumps that operated by some and consume energy to perform mechanical work by moving the fluid. Pumps operate via many energy sources, including manual operation, electricity, engines, or wind generation, are available many sizes, from microscopic to be used in medical applications to large industrial pumps.

2.5 LCD DISPLAY

Liquid crystal cell displays (LCDs) are utilized in similar applications where LEDs are used. These applications are display of display of numeric and alphanumeric characters in matrix and segmental displays are shown in figure.2
We can the valve and water pump using smart mobiles, when all the valve are closed, then the motor automatically turned off.

III. CONCLUSION

This paper proposed a Intelligent Automatic Valve On Off system which is independent of any human intervention while watering the plants when needed. It abandons the necessity of user monitoring and maintain the Valve status. The system is made as a low-cost model as compared to the sooner reported systems using different wireless modules. The IoT feature in the present system are often a further advantage because the user, from anywhere in the world, supported any forecast of thunderstorm can seize the watering process from a remote area within the process saving tons of water and preventing the death of plants through overwatering.

REFERENCE