e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:05/May-2022 Impact Factor- 6.752 www.irjmets.com

FLOATING SOLAR WITH DAM DOOR CONTROL

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ABSTRACT

The history, culture, current and future socioeconomic status and environmental sustainability of India and its people are intricately linked to the water resources which are available from dams. These water resources available through dams are one of the main sources available for the usage to industries, livestock, irrigation etc. and there is a critical need to ensure the safety of the water level at these dams against any natural or anthropogenic threats and to develop an effective Water Level Management system using IoT. This paper gives an outline for the development of an information system based on the existing systems with the utilization of some sensors and IoT. This paper also proposes a novel idea of collecting and sharing real-time information about water levels to an authorized central command center through far field communication. The authorized central command center then takes a call whether to release the water by opening dam gates or keep them closed. By doing so, the operation of dams all over the country is centralized and automatized

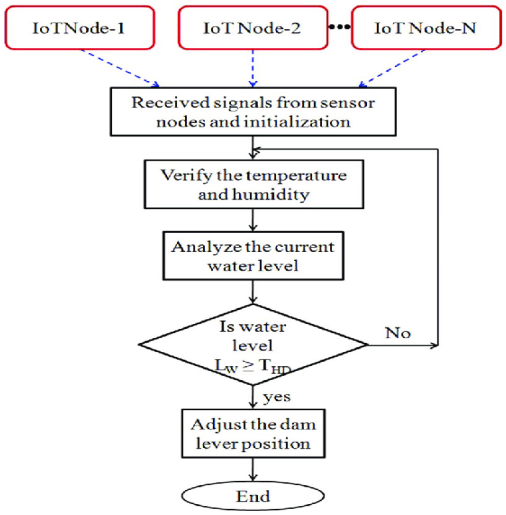
Keywords: PV, Solar.

I. INTRODUCTION

This project IOT based Water quality Monitoring system is a very innovative system which will help to keep the water clean. This system monitors the temperature & humidity level and informs about the level of water collected in the tank via a things speak server. For this the system uses level sensors placed in the tank to detect the water level and compare it with the water tank depth. The system makes use of arduino uno board/ armega 328 microcontrollers, Wi-Fi modem for sending data, wifi module to send data over thing speak server. The system is powered by a 12V Solar panel stored in battery. The LCD screen is used to display the status of the level of water collected in tank with its quality.

The data on things speak in graphical format consists with reading, related to all water tank. The LCD screen shows the status of the water level. The system puts on LCD screen continuously monitoring of water quality with arduino board. Thus this system helps to keep the city clean by informing about the water levels of the tank by thing speak server.

II. METHODOLOGY



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III. MODELING AND ANALYSIS

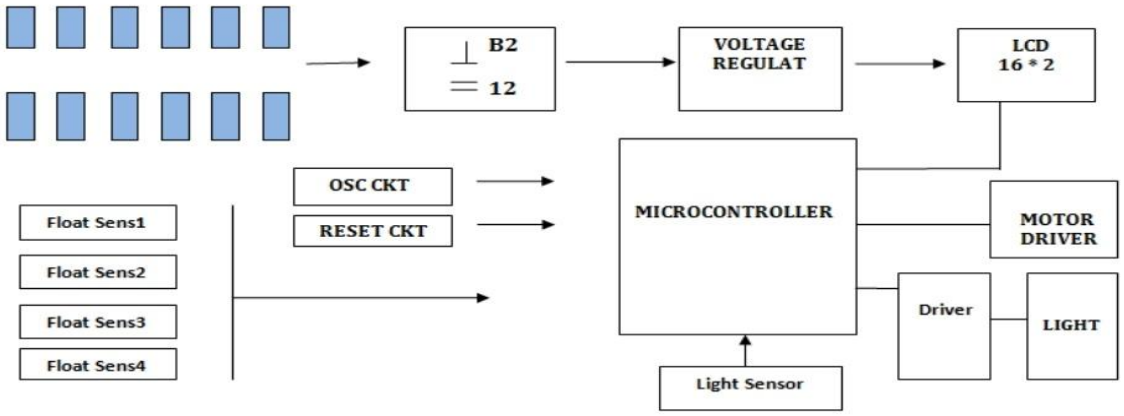

FIG 1: Block Diagram

POWER SUPPLY- Circuit requires 5V DC for microcontroller, sensor and 12V for motor and motor driver. Solar panel of 12V is used to store electricity in battery of 12V, and 12Voutput is connected with circuit using 5V regulator IC for fixed DC output.

WATER LEVEL SENSOR- Here we used float sensor to detect water level as 25%, 50%, 75% and 100%. Float sensor works as water comes at particular level float the ring and microcontroller detect that particular level.

MOTOR REIVER WITH MOTOR -Motor driver used to drive motor from microcontroller, because microcontroller has lower current motor required higher current and voltage. Gate is used as dam door for demo purpose.

LCD DISPLAY -LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits.

These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

MICROCONTROLLER ATMEGA 328 (13)- In this arduino board (atmega328 28 pin microcontroller) works with 16MHz frequency used for (timer configuration), the unwanted frequency produced is bypassed 11 by the capacitor of 27pf capacitor. Reset pin is connected to resistor of 10K whenever reset requires the reset switch (2 lead push to ON switch/ micro push to switch) required pressing. 6 channel 10 bit inbuilt ADC available, 6 PWM pins available, multiple serial communication available, up to 20 programmable pins available.

ABOUT THING SPEAK SERVER- ThingSpeak allows you to aggregate, visualize and analyze live data streams in the cloud. Some of the key capabilities of ThingSpeak include the ability to: Easily configure devices to send data to ThingSpeak using popular IoT• protocols. Visualize your sensor data in real-time.• Aggregate data on-demand from third-party sources.• Use the power of MATLAB to make sense of your IoT data.• Run your IoT analytics automatically based on schedules or events.• Prototype and build IoT systems without setting up servers or developing web• software. Automatically act on your data and communicate using third-party services like• Twilio® or Twitter®. To learn how you can collect, analyze and act on your IoT data with• ThingSpeak, explore the topics below: CHAPTER

Arduino- is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board. The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate

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piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

IV. RESULTS AND DISCUSSION

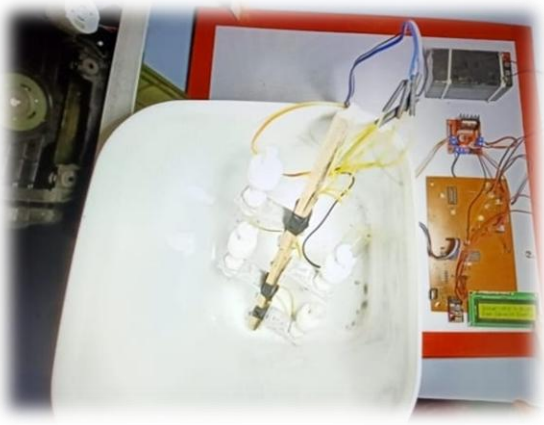

FIG 2: Project hardware

Here circuit requires 5V regulated DC supply. We used here solar panel of 12V 5Watt. The output AC ripples is reduced by diode D1 and stored it in to battery. Now the out of battery is DC 12V-14V according to solar ratings. The battery output is given to the arduino board, which is required to convert in 5V regulated for microcontroller and other devices, here we have used LM7805 13 regulator for getting 5V regulated DC. For motor driver it is separately used to cancel loading effect. In this arduino board (atmega328 28 pin microcontroller) works wit16MHz frequency used for (timer configuration), the unwanted frequency produced is bypassed by the capacitor of 27pf capacitor. Reset pin is connected to resistor of 10K whenever reset requires the reset switch (2 lead push to ON switch/ micro push to switch) required pressing. 6 channel 10 bit inbuilt ADC available, 6 PWM pins available, multiple serial communication available, up to 20 programmable pins available. Motor driver (dam door motor) and pump is connected to the motor driver IC L293D and controlled via microcontroller pins 1, 2, 3, 4 respectively.

Atmega328 microcontroller pins 14, 15, 16, 17, 18, 19 are connected to LCD as RS, E, D4, D5, D6, D7 respectively. LCD shows text as our programming conditions. Like dam level is 25% etc. Microcontroller input sensors are connected with A0 (temperature sensor) A1 (humidity sensor). Water level sensors are provided at pin 23, 24, 25, 26. Here we have used float sensor to detect levels with help of microcontroller. Wifi modem is connected to 12 and 13 pin of microcontroller to TX and Rx pin for Wifi modem ESP8266. It requires 3.3V supply provided with LM317 variable voltage regulator, with 330 ohm and 560 ohm resistors. All capacitors of 0.1uf near analog/ digital/ microcontroller Ics are connected to reduce spikes in the circuit, spikes produced by inductive load/ sparking contacts of loads and capacitor of 1000uf/25V at regulator output is connected for the cancel loading effect in the circuit while driving the high current source.

FIG A. Dam Level 25%

FIG B . Dam Level 50%

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V. CONCLUSION

The aforementioned design of the system helps to properly monitor the opening of dam gates. IoT has increased the quality and productivity of dam management system and also conferred to the public issues. To automatically and proactively manage the outflow of dam during crisis by using statistical data. Since the system is using IoT technology, human intervention and time delay is minimized.

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