

WIRELESS WATER LEVEL CONTROLLER USING ARDUINO

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Abstract: In the existing wiring system it is difficult to install and at the same time its time consuming too. And It's also quite expensive in case we try to install in apartment areas. We can't tolerate wire vulnerability, so it's not future proof. Most of the float switches used in this existing system are outdated too. In our proposed system we going to replace the above seen process in wireless and fully automated way. That's why we come up with this Wireless Water Level Controller System to solve most of these issues. In our proposed system we going to cut these whole wiring process instead we going to use 2 Arduino board with 2 transceivers, one will be installed at motor room and other one will be installed at the overhead tank. In the overhead tank we install a limit switch to Arduino board it will sense the water level and send those data through transceiver as RF frequency to the transceiver in the motor room. The transceiver receives those data and send to Arduino board. The Arduino board is connected to a relay contactor switch to control the motor. If the tank is going to be nearly empty the motor will be turned on or else if the tank is going to be nearly overflow then motor will be immediately turned off. This process will be automatic until the water in the bottom tank is going to run out. A limit switch will be installed in the bottom tank, if sensor detects the water is nearly empty then it cuts the process immediately and make the led blink in the Arduino to state that water in bottom tank is not enough to pump to the overhead tank. This process is mainly to prevent air lock in the water pipes. After water level increased to a certain level in the bottom tank then this process will be resumed.

Index Terms: Wireless Communication, Wireless Sensor Network, HC -12 Transceiver Module, Water Level Detection Sensor, Relay Switch, Arduino.

1. INTRODUCTION

The Project entitled “ **WIRELESS WATER LEVEL CONTROLLER USING ARDUINO** “ is to automatically control the water level in the Overhead Tank. In the existing wiring system it is difficult to install and at the same time its time consuming too. And it's also quite expensive in case we try to install in apartment areas. We can't tolerate wire vulnerability, so its not future proof. Most of the float switches used in this existing system are outdated too. In our proposed system we going to replace the above seen process in wireless and fully automated way. Costly for four core wiring upto 50 metres & above. And man power also cost too much per day and it will be risky for them in case they work in hazardous areas. The motivation for this project came from drawbacks of existing system and proposed an efficient system. Water is very precious and needed for many and every activities. Conservation of water is similarly important and has adverse effects otherwise. The storage of water for the domestic, industrial, agricultural or other such needs is very important. To conserve and make effective use of water a controller is needed to manage the required volume or level in underground and overhead tanks of premises. It will automatically switch ON and OFF the domestic water pump to fill the over head tank to the set level or volume of water. The main advantage of this water level controller circuit is that it automatically controls the water pumps built with simple electronic components. The heart of this pump controller circuit is Arduino UNO. Water level controller does help to control The level of water automatically by using sense circuit which consturcted by another set of Arduino board and sensors. This system not only monitors the water level of the tank, it switches ON the motor automatically whenever overhead tank is empty. The motor is switched OFF when the required level in the overhead tank is reached. Pump motor is not started whenever underground water level is below the pre set threshold. Using this system we can avoid the overflow and wastage of the water.

2. Proposed System

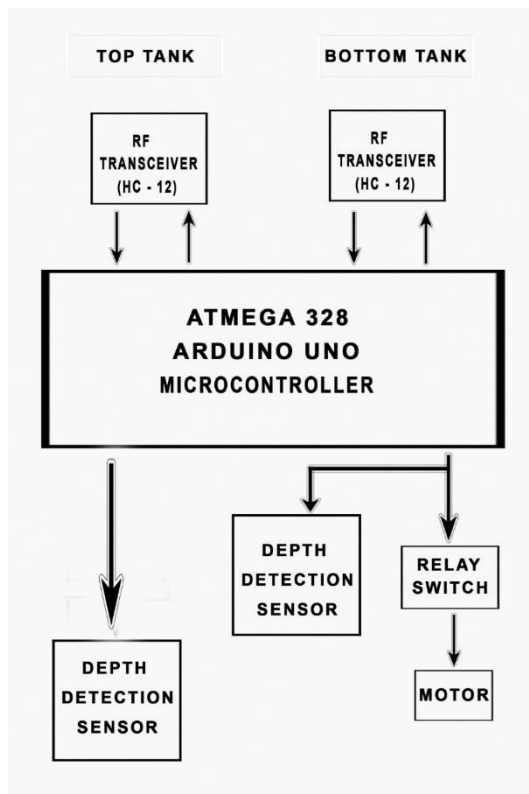


Figure 1. Block diagram of the Proposed System

ARDUINO UNO

The Figure 1 shows the Block Diagram of wireless water level controller using Arduino. Here the main device is an Arduino Uno microcontroller, its acts as a processing unit of the system.

WATER LEVEL DEPTH DETECTION SENSOR

Water Level Depth detection Sensor measures the water level in the send the data to the Arduino board. The micro controller gets the inputs from the water level depth detection sensor. The actions of these respective sensors outputs are processed by Arduino microcontroller and send output as Radio Frequency to the transceiver.

HC – 12 TRANSCEIVER MODULE

Transceiver receives the signal and send to Arduino microcontroller which is connected with motor through a Relay Switch. If water level sensor detects that water level low it produce a signal in Arduinio board and transmits the data in Radio Frequency using HC – 12 Transceiver to the receiver. Another HC – 12 Transceiver module receives the and send signal to Arduino board to energize the Relay switch.

RELAY SWITCH

The output of the controller are given to a Relay switch module. Then it turn on the motor to pump water to the upper tank in case the water level is low. When the water level reaches the Maximum limit the above seen process will be repeated and the Relay switch turn off the motor. This process will be fully Automatic until the system is turned off.

3. CONCLUSION

Automation of the various components around us has been widely increased to reduce human intervention and save time. The water tank overflows as the height of water in the tank cannot be randomly guessed. This leads to extra energy consumption, which is a high concern in the present. People also need to wait and stop doing their other activities until the tank is full. Hence, here is an idea which senses and indicates the water level so that the pump can be switched off on appropriate time and save water, electricity and time as well. “ **WIRELESS WATER LEVEL CONTROLLER USING ARDUINO** ” project can definitely be useful on a large scale basis due to minimum requirement of man power and also the installation process being easier making more compatible. It is observed that the offices and households are the main areas of water wastage. So, constant monitoring and control of water level in the overhead tank is required. The Proposed System was implemented and without much human involvement the water level in the tank is controlled automatically. The ultimate objective is to save water, time and money. In future, the real time monitoring and controlling can be achieved by using this project can also be implemented through IoT along with mobile Application to monitoring mechanism.

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