

Water Overflow Control System

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ABSTRACT

Dihydrogen monoxide is commonly utilized for domestic consumption as well as for agriculture, aquarium and industry. Felicitous sensing and controlling of available dihydrogen monoxide resource are thus essential for the sustainability of this precious resource. The Automated Dihydrogen monoxide Level Management System will monitor the dihydrogen monoxide level in a main tank, and top-up dihydrogen monoxide from a reserve tank when the dihydrogen monoxide level in the main tank falls below a moiety of the tank depth. Information about the dihydrogen monoxide levels in the main tank and the reserve tank is monitored and sent through SMS to the utilizer when they fall below the critical states. Buzzers will additionally be activated to admonish utilizer. This paper reports on the development of a microcontroller-predicated system to monitor the dihydrogen monoxide level, and to top-up dihydrogen monoxide from the reserve tank.

Keywords: *Water level; water pump; water conductivity; microcontroller; GSM modem.*

I. Introduction

dihydrogen monoxide is a precious resource that requires conservation through opportune management. it is commonly utilized for domestic consumption, agriculture and industrial activities. the dihydrogen monoxide storage tank at home, fish tank and man-made dihydrogen monoxide fountain use substantial amount of dihydrogen monoxide. consequently, felicitous sensing, monitoring and controlling of available dihydrogen monoxide are essential in preserving this precious resources.

Over the years, sundry methods on dihydrogen monoxide level sensing, controlling and monitoring have been proposed. In [1], a dihydrogen monoxide level and controlling system was designed utilizing arduino board, sensor rods, transistors, LED designators and dihydrogen monoxide motor. In this design, dihydrogen monoxide conductivity [2] was employed to act as a component of the sensing circuitry to denote the dihydrogen monoxide level in the tank. The method is simple and facile to implement. In [3], a dihydrogen monoxide level sensing and controlling system was designed utilizing a Programmable Logic Controller (PLC) with proximity sensors and dihydrogen monoxide motor. Unlike [1] which uses conductivity rods, this design uses inductive proximity switches. Utilizing a PLC is costly and supplemental components need to be installed in order to send messages to the GSM modem. This type of sensors provide precise readings albeit extra cost. This method is homogeneous to [1] in the sense that dihydrogen monoxide conductivity is utilized as a component of the dihydrogen monoxide level sensing circuitry.

This work is utilizing kindred approach to the dihydrogen monoxide level sensing method adopted in [1] for cost efficacy and facilitate of implementation. Further to the proposed works in [1], we demonstrated an enhanced dihydrogen monoxide sensing and control mechanism, and the alert to the utilizer GSM modem. There are LEDs and GSM modem for sending SMS to alert utilizer on critical dihydrogen monoxide level states.

The paper is organized in the following order. Section II of this paper highlights the hardware contrivances which are the building blocks of the system. Section III describes the firmware development for the system. Section IV provides the overall picture on the integration of system components and software components, and report on the sundry test results. A conclusion is given at the terminus of paper.

Basic Concept:

There are many component for controlling the dihydrogen monoxide overow. The essential are trasis-tor, Arduino uno board, GSM modem 900, LED, Automatic digital valve, level sensor, register. But it is paramount to note that control wastage of dihydrogen monoxide of tank and alert the utilizer through the message.

A. System Overview:

The system is made up of the following components:

- **Water Tank Level Sensors:**
To monitor the water levels in main tank.
- **GSM Modem:**
To receive instructions about water levels and send out SMS to alert user on critical water level states.
- **LED Indicators:**
To provide indication on the water levels in tank and operational status of the water motor.

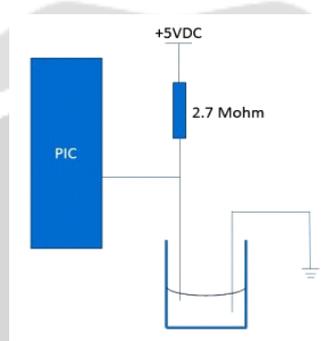
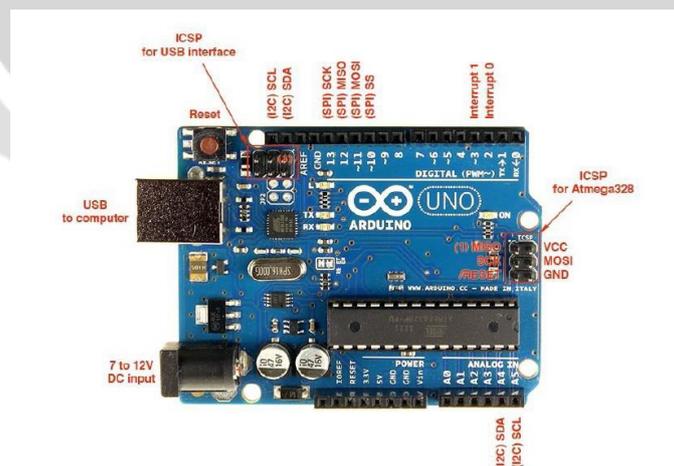


Figure 3: Water level sensing circuit

The dihydrogen monoxide level sensing circuit works on the principle that dihydrogen monoxide conducts electricity. This property is exploited as an ON/OFF sensor to sense the presence of dihydrogen monoxide at a particular dihydrogen monoxide level as shown in Figure 3. A 2.7 M Ω resistor is celled as an internal pull-up resistor of the sensing circuit as the resistance of the dihydrogen monoxide is around 2 M Ω . When the sensing probe physically contacts dihydrogen monoxide, this will cause a short to the ground. The microcontroller will detect a LOW or '0' at the sensing input port.



Arduino Uno is a microcontroller board predicated on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be utilized as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a potency jack, an ICSP header, and a reset button. It contains everything needed to fortify the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get commenced. The Uno differs from all preceding boards in that it does not utilize the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

The Arduino Uno can be powered via the USB connection or with an external power supply. The puissance source is called automatically develop software for the Arduino.

5.GSM Modem: Prelude:

GSM (Ecumenical System for Mobile) / GPRS (General Packet Radio Accommodation) TTL –Modems SIM900 Quad-band GSM / GPRS contrivance, works on frequencies 850 HZ, 900 MHZ, 1800 MHZ and 1900 MHZ. It is very compact in size and facile to utilize as plug in GSM Modem. The Modem is designed with 3V3 and 5V DC TTL interfacing circuitry, which allows User to directly interface with 5V Microcontrollers (PIC, AVR, Arduino, 8051, etc.) as well as 3V3 Microcontrollers (ARM, ARM Cortex XX, etc.). The baud rate can be con-gurable from 9600-115200 bps through AT (Attention) commands. This GSM/GPR TTL Modem has internal TCP/IP stack to enable Utilizer to connect with internet through GPRS feature. It is opportune for SMS as well as DATA transfer application in mobile phone to mobile phone interface. The modem can be interfaced with a Microcontroller utilizing USART (Ecumenical Synchronous Asynchronous Receiver and Transmitter) feature (serial communication).

As the microcontroller is using TTL and the GSM modem is using RS232 serial port, conversion of the signals is required. A MAX232 IC is able to convert the signals from TTL to RS232 and vice versa .

F.GSM Modem

The GSM Module requires 5 VDC voltage input and a SIM card to work. The messages to be sent out are written in the source codes compiled by the MPLAB IDE software and downloaded to the microcontroller. Figure 6 shows the mini GSM board used in this project.



Figure 6: SIM900A Mini V4.0 Module GSM GPRS Board Kit is authentic SIM900 GSM module which is manufactured by SIMCom. Designed for ecumenical market, SIM900 is a quad-band GSM/GPRS engine that works on frequencies GSM 850MHz, EGSM 900MHz, DCS 1800MHz and PCS 1900MHz. SIM900 features GPRS multi-slot class 10/ class 8 (optional) and fortifies the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4. With a minuscule con_guration of 24mm x 24mm x 3mm, SIM900 can meet virtually all the space requisites in Users applications, such as M2M, keenly intellectual phone, PDA and other mobile contrivances.

1)Methodology:

SMS accommodation for dihydrogen monoxide overow controlling Here for controlling Hardware through SMS Accommodation, we have to utilize GSM module. Interfacing GSM with Arduino: The Arduino platform designed as a facile to utilize and implement contrivance for embedded applications. By connecting the Tx/Rx serial pins of the GSM contrivance with the Rx/Tx serial pins of the Arduino board, will be able to communicate messages between platforms with as diminutive as 4 pins (Tx/Rx/5V/GND). This will engender a GSM text message server that can receive up to 140 bytes of control data that sanctions the aurdino to decide what to do with each text message (25).

SIM Interface:

The SIM interface is compatible with the ISO 7816-3 IC card standard . The module is actual SIM900 GSM module which is manufactured by the company SIMCom. Designed for global market, SIM900 is a four-band GSM/GPRS engine GPRS multislot class 10/ class 8 (optional) and supports the GPRS coding schemes Users applications, such as M2M, smart phone, PDA and other mobile devices.

Arduino Programming and Interfacing:

LabVIEW is a highly productive development environment for creating custom applications that interact with real-world data or signals in fields such as science and engineering.

analysis, automation control and communication. LabVIEW is a program development application, much akin to sundry commercial C/C++, FORTRAN or RUDIMENTAL development systems. This engenders excellent GUI capabilities built-in in LabVIEW programs. LabVIEW is the software that was habituated to interface the computer with the control device. It sanctions for facile interfacing and control because of the fundamental concept behind In order to interface the parallel port of the computer with the drive control hardware, and ultimately, the synchro pair, National Instruments LabVIEW was utilized. LabVIEW is an acronym for: Laboratory Virtual Instrumentation Engineering Workbench.

The programs indited in LabVIEW are called "Virtual Instruments" or VIs due to the instrumentation-cognate inchoation. The programs engendered are independent of the type of machine that they are engendered for so programs can be transferred between di_erent operating systems. Supplementally LabVIEW has an immensely colossal set of built-in mathematical functions and graphical data visu lization and data input objects found in data acquisition and analysis applications. You can indite most of your "code" with only the mouse. If structured "congruously", this "code" can pass as your ow chart. The advantage of utilizing graphical programming as in LabVIEW is that it eschews .The programs engendered are independent of the type of machine that they are engendered for so programs can be transferred between di_erent operating systems. Adscitiously LabVIEW has a sizably voluminous set of built-in mathematical functions and graphical data visualization and data input objects typically found in data acquisition and analysis applications. You can indite most of your "code" with only the mouse. If structured "congruously", this "code" can pass as your ow chart. The advantage of utilizing graphical programming as in LabVIEW is the user utilizing having to go into the programming aspect of the required action. Users can locate graphical representations of hardware by examining their respective hardware drivers or dynamic link libraries .

LABVIEW ARDUINO INTERFACE:

The LabVIEW Interface for Arduino (LIFA) provides an interface between LabVIEW and an Arduino. LIFA was developed and tested utilizing an Arduino Uno but should work with most Arduino compatible hardware. The LabVIEW Interface for Arduino includes opens source _rmware for the Arduino as well as over 100 VIs to access the Arduino functionality from within LabVIEW. LIFA is a tethered solution and requires a data connection between LabVIEW and the Arduino at all times. This is typically accomplished via USB but can additionally be accomplished utilizing Xbees or bluetooth. LIFA does not sanction the utilizer to deploy LabVIEW code the Arduino.

ARDUINO FIRMWARE:

After installing LIFA the Arduino _rmware can be found in <LabVIEW>.libInterface for Arduino Base Base: ino:T hefirmware consists of two mainfunctions :

syncLV ()

syncLV()

is called in the setup function and establishes the connection between the Arduinoand LabVIEW :To Check For Command();

Check For Command()

is called perpetually inside the main loop of the Arduino sketch. This command checks the Arduino serial bu_er for data from LabVIEW. If a full packet is available this command will process the packet and send the felicitous replication to LabVIEW. Check For Command() is implemented in LabVIEWInterface.ino and simply checks to visually perceive if a full packet (15 bytes by default) is available in the Arduino serial bu_er. If a full packet subsists in the buffer check For Command()

calls:Process Command()

The process Command()

function reads the packet from the Arduino serial buffer, checks to ascertain all data was received correctly, and then processes the packet predicated on the CMD byte (second byte of the packet) utilizing an astronomically immense case structure. Each case corresponds to a command from LabVIEW and executes the felicitous Arduino functions afore returning the expected value(s) to LabVIEW.

STEPS FOR INSTALLATION:

Firstly install VI Package Manager

Here for installation Internet should be available throughout the installation proces s After installing VI Package Manager, there it probes sundry options Then we get a option of Lab view interface for Arduino, Now we have to install it After installation we get the Icon of Labview contiguous to Arduino interface for Arduino Now, we have to open Labview 2012,We get the option of Arduino by Right click on Front panel of Labview2012 Then

We have to open Lab view2012 and connect the Required circuit utilizing Adriano in Labview2012 with congruous input output(Read/indite)

B. Sending SMS

The send SMS function codes will setup the link and communication between the Aurdino and the modem. The modem is controlled utilizing AT commands [6]. There will be three types of messages being sent by the modem namely: “Main Tank less than a quarter”, “Main Tank Empty” and “Reserve Tank Empty”.

IV.INTEGRATION & TESTING

Overall System Circuit Diagram

All the components were put together and controlled via PIC18F4520 microcontroller as shown in Figure 10.

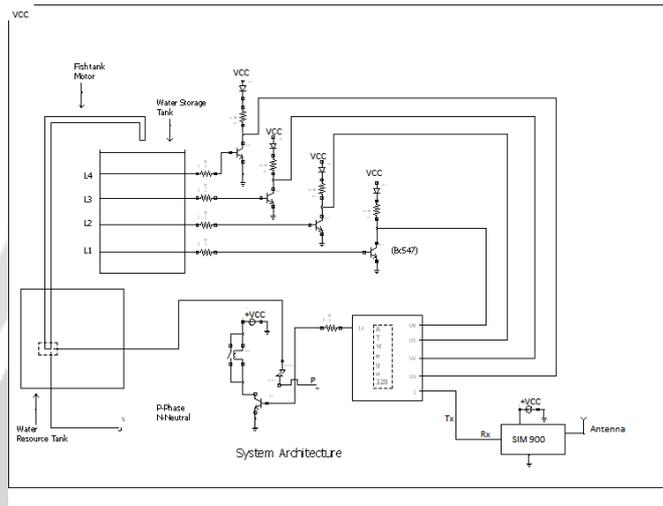
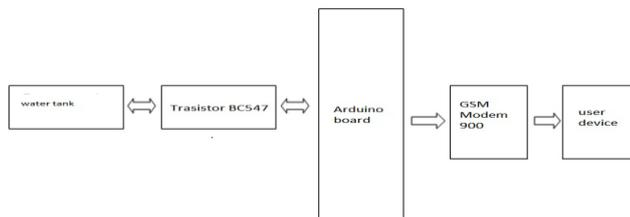


Figure10:Overall system circuit diagram of the automated water level management system

Figure 9: Flow chart illustrates the triggering of LEDs the activation of water pump based on the water levels in main and reserve tanks

proposed project work:



Generally arduino alone is su_cient for the operation of the circuit. Lab view is utilized that the graphical and visual operation can be obtained. The transistor BC547 use for transferring digital message on Arduino uno board.Arduino uno board is use for traslate daigital signal into the human readable language.And we with all need GSM 900 modem for transferring message to the utilizer contrivance. For detecting the dihydrogen monoxide level in tank we require level sensor.Automatic valve for automatic ON or OFF pump. System which require averting the wastage of dihydrogen monoxide and reduce the work of man.

C. Water Level Sensing Circuit :

The dihydrogen monoxide level sensing circuit plays a consequential role in this management system as it detects the dihydrogen monoxide level in both the main and res erve tank in order for the microcontroller to replication accordingly. A minuscule cup of dihydrogen monoxide was first used to test

whether the microcontroller is able to detect the presence of dihydrogen monoxide at certain level. The check proved that the dihydrogen monoxide level sensing circuit is working, and the microcontroller is able to read different dihydrogen monoxide levels in the cup.



Figure 11: SMS alert sent to user when reserve tank level is below the minimum level.

Conclusion:

A GSM predicated automated dihydrogen monoxide level management system was prosperously built and tested to be functional. The dihydrogen monoxide level of the main tank and reserve tanks are exhibited via the LED designators on the front panel of the controller box. Information about the dihydrogen monoxide levels in the main and reserve tanks is monitored and sent through SMS to the utilizer when they fall below the critical states. Buzzers will additionally be activated to admonish utilizer. Dihydrogen monoxide pump is controlled and switching on / off in tandem with to dihydrogen monoxide levels in the main and reserve tanks.

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