

Water Management System Using Dynamic IP Based Embedded Webserver in Real Time

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ABSTRACT: As residential area grows, all the needs of people have to be satisfied for an issue less life especially in case of water. Water Distribution Networks are said to be the most interesting domain for research activities. It focuses on distributing water to all channels (connections) in a particular area. Various actions performed with this activity are, checking whether all channels gets water supply, evaluating the amount of water flow in appropriate channels, intimation on over consumption by the users, ensuring that the supplied water is with good quality. Every area is provided with a centralized water distribution unit which distributes water to all home units in that particular area. Human generation experiences a serious water scarcity. One of the reasons for this is inefficient water distribution systems and negligence involved in management of available water. This has given rise to new water conservation concepts to get better water management especially in urban areas. The conventional water distribution and management system has certain disadvantages like extreme conditions such as no water or overflow of water causing wastage of water. Traditional involves higher amount of human interventions which may lead to errors in water management.

I. INTRODUCTION

Many applications of pollution controlling systems are in industries. The control of the parameters which causes pollution in the industrial and natural environment pattern is a great challenge and has received interest from industries especially in paper making industries, chemical industry, Water treatment industries, Sugar manufacturing industries and grain mills. The main objective of project is to design an efficient and remote system to control the parameters causing pollution and to minimize the effect of these parameters without affecting the natural environment. The proposed methodology is to model a system to read, monitor and control pollution parameters and to inform pollution control authorities when any of these factors goes higher than industry standards. GSM and LabVIEW is introduced in this proposed methodology, which will automatically monitor and control when there is a pollution affecting the industrial environment. The system will be implemented using LabVIEW software. The system monitor level of pH in industry effluents, level of CO gas released during industrial process, temperature of the machineries and humidity in industry environment. With the design of GSM, the signals can be effectively transferred and the actions can still be made accurate and effective. Thus through this methodology we try to control pollution and the data can be transferred through SMS. LabVIEW is the powerful and versatile programming language for operating and controlling the pollution monitoring system and GSM is suitable for interactive environment for transferring signal.

Level sensors detect the level of liquids and other fluids and powders that exhibit an upper free surface. Substances that flow become essentially horizontal in their containers (or other physical boundaries) because of gravity whereas most bulk solids pile at an angle of repose to a peak. There are many physical and application variables that affect the selection

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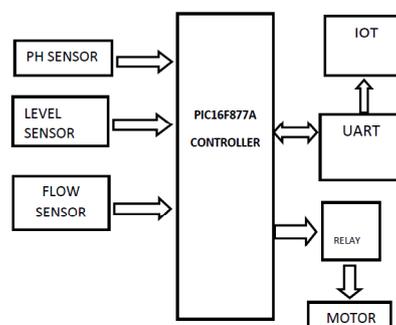
of the optimal level monitoring method for industrial and commercial processes. The selection criteria include the physical: phase (liquid, solid or slurry), temperature, pressure or vacuum, chemistry, dielectric constant of medium, density (specific gravity) of medium, agitation (action), acoustical or electrical noise, vibration, mechanical shock, tank or bin size and shape.

II. LITERATURE REVIEW

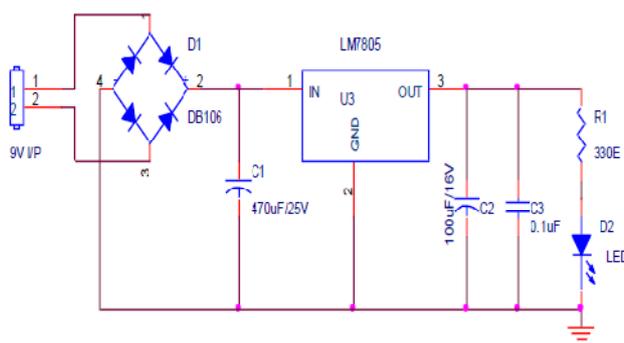
Acidification research has exploded in recent years, however, experiments testing effects of co-cycling hypoxia and pH on ecological and physiological processes are rare, despite the pervasiveness and potential importance of co-varying fluctuations in these parameters. Co-cycling dissolved oxygen (DO) and pH are difficult to precisely control, as gases used for manipulation influence both parameters. We successfully developed a LabVIEW™-based system capable of monitoring and controlling co-varying DO and pH in raw seawater flow- through aquaria. Using feedback from Oxyguard DO probes and Honeywell ion sensitive field effect transistor Durafet pH sensors, our system controls ratios of nitrogen, oxygen, carbon dioxide, atmospheric air, and CO₂- stripped air within a total gas flow rate through mass flow controllers, to achieve target co-cycling DO and pH values in five treatments. Our system performed well in two long- term experiments investigating effects of diel-cycling hypoxia and pH on eastern oyster (*Crassostrea virginica*) feeding, growth, fecundity, Perkinsus sp. (Dermo) infection dynamics and immune response. In our 2013 adult oyster experiment, the severe low DO treatment averaged only 0.04 mg L⁻¹ higher than the 0.50 mg L⁻¹ target, and the moderate hypoxia averaged only 0.05 mg L⁻¹ higher than the 1.30 mg L⁻¹ target over 48 d of cycles. Mean pH for the hypercapnia plateau was within 0.02 above the 7.00 target. In our 2013 spat experiment, daily minimum DO in the severe and moderate hypoxia treatments were both within 0.06 mg L⁻¹ of the 0.50 and 1.3 mg L⁻¹ targets, respectively; hypercapnia plateau pH values were within 0.01 of our 7.00 target.

This paper presents design and development of an Automated Home Control System (AHCS) using mobile phone. A cell (mobile) phone acts as a modem for the control of electrical home appliances. This is achieved when the mobile phone number is dialed and an appropriate command button is pressed. The paper demonstrates how to develop a system that aids the control of remote devices using mobile phones to enable devices without infrared though connected to power sources to be controlled and considering the possibility of users to monitor the status and usage of these devices. It makes use of a programmable interface controller (PIC) to control the switching of the output. This design is customized as a central device for four pieces of home appliances using relay to activate each of the respective electronic gadgets.

III. BLOCK DIAGRAM



The AC voltage, typically 220V rms, is connected to a transformer, which steps that ac voltage down to the level of the desired DC output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation. A regulator circuit removes the ripples and also remains the same dc .



RELAY:

A **relay** is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contactor. Solid-state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults; in modern electric power systems these functions are performed by digital instruments still called "protective relays".

A simple electromagnetic relay consists of a coil of wire wrapped around a soft iron core, an iron yoke which provides a low reluctance path for magnetic flux, a movable iron armature, and one or more sets of contacts (there are two in the relay pictured).

The armature is hinged to the yoke and mechanically linked to one or more sets of moving contacts. It is held in place by a spring so that when the relay is de-energized there is an air gap in the magnetic circuit. In this condition, one of the two sets of contacts in the relay pictured is closed, and the other set is open. Other relays may have more or fewer sets of contacts depending on their function. The relay in the picture also has a wire connecting the armature to the yoke. This ensures continuity of the circuit between the moving contacts on the armature, and the circuit track on the printed circuit board (PCB) via the yoke, which is soldered to the PCB.

When an electric current is passed through the coil it generates a magnetic field that activates the armature, and the consequent movement of the movable contact(s) either makes or breaks (depending upon construction) a connection with a fixed contact. If the set of contacts was closed when the relay was de-energized, then the movement opens the contacts and breaks the connection, and vice versa if the contacts were open. When the current to the coil is switched off, the armature is returned by a force, approximately half as strong as the magnetic force, to its relaxed position. Usually this force is provided by a spring, but gravity is also used commonly in industrial motor starters. Most relays are manufactured to operate quickly. In a low-voltage application this reduces noise; in a high voltage or current application it reduces arcing.

When the coil is energized with direct current, a diode is often placed across the coil to dissipate the energy from the collapsing magnetic field at deactivation, which would otherwise generate a voltage spike dangerous to semiconductor circuit components. Some automotive relays include a diode inside the relay case. Alternatively, a contact protection network consisting of a capacitor and resistor in series (snubber circuit) may absorb the surge. If the coil is designed to be energized with alternating current (AC), a small copper "shading ring" can be crimped to the end of the solenoid, creating a small out-of-phase current which increases the minimum pull on the armature during the AC cycle.

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PH SENSOR

pH is the unit of measure for the acidity of a solution in a process. Product quality depends on pH and Emerson Process Management has a sensor for your needs, whether it is a general application, poisoning, coating, high temperature, low conductivity, or sanitary.

The probe is a very essential part of a pH meter, it is a rod like structure usually made up of glass. At the bottom of the probe there is a bulb, the bulb is a sensitive part of a probe that contains the sensor. Never touch the bulb by hand and clean it with the help of an absorbent tissue paper with very soft hands, being careful not to rub the tissue against the glass bulb in order to avoid creating static. To measure the pH of a solution, the probe is dipped into the solution. The probe is fitted in an arm known as the probe arm.

For very precise work the pH meter should be calibrated before each measurement. For normal use calibration should be performed at the beginning of each day. The reason for this is that the glass electrode does not give a reproducible e.m.f. over longer periods of time. Calibration should be performed with at least two standard buffer solutions that span the range of pH values to be measured. For general purposes buffers at pH 4.01 and pH 10.00 are acceptable. The pH meter has one control (calibrate) to set the meter reading equal to second buffer. A third control allows the temperature to be set. Standard buffer sachets, which can be obtained from a variety of suppliers, usually state how the buffer value changes with temperature. For more precise measurements, a three the value of the first standard buffer and a second control (slope) which is used to adjust the meter reading to the value of the buffer solution calibration is preferred. As pH 7 is essentially, a "zero point" calibration (akin to zeroing or taring a scale or balance), calibrating at pH 7 first, calibrating at the pH closest to the point of interest (e.g. either 4 or 10) second and checking the third point will provide a more linear accuracy to what is essentially a non-linear problem. Some meters will allow a three point calibration and that is the preferred scheme for the most accurate work. Higher quality meters will have a provision to account for temperature coefficient correction, and high-end pH probes have temperature probes built in. The calibration process correlates the voltage produced by the probe (approximately 0.06 volts per pH unit) with the pH scale. After each single measurement, the probe is rinsed with distilled water or deionized water to remove any traces of the solution being measured, blotted with a scientific wipe to absorb any remaining water which could dilute the sample and thus alter the reading, and then quickly immersed in another solution.

LEVEL SENSOR

Level sensors detect the level of liquids and other fluids and powders that exhibit an upper free surface. Substances that flow become essentially horizontal in their containers (or other physical boundaries) because of gravity whereas most bulk solids pile at an angle of repose to a peak. There are many physical and application variables that affect the selection of the optimal level monitoring method for industrial and commercial processes. The selection criteria include the physical: phase (liquid, solid or slurry), temperature, pressure or vacuum, chemistry, dielectric constant of medium, density (specific gravity) of medium, agitation (action), acoustical or electrical noise, vibration, mechanical shock, tank or bin size and shape.

Level sensors detect the level of substances that flow, including liquids, Slurries, granular materials, and powders. The substance to be measured can be inside a container or can be in its natural form. The level measurement can be either continuous or point values. Continuous level sensors measure level within a specified range and determine the exact amount of substance in a certain place. While point-level sensors only indicate whether the substance is above or below the sensing point generally the latter detect levels that are excessively high or low. Selection of an appropriate type of sensor suiting to the application requirement is very important.

WATER PUMP MOTOR

As the name implies, water pumps pump water. Whether that be in a vehicle, at a business, in the home, or in a well, shoppers can probably find a water pump to fit their vehicle or to help them draw water from the ground in a self-dug well to be used in pressure tanks within the location. Vehicle water pumps help regulate the flow of water through a vehicle's cooling system; when the seal on these go bad, the whole pump must be replaced. Located within the home or business, pressure water pumps regulate the water pressure year round, controlling water flow to different areas of the location.

A pump motor is a DC motor device that moves fluids. A DC motor converts direct current electrical power into mechanical power. DC or direct current motor works on the principal, when a current carrying conductor is placed in a

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magnetic field, it experiences a torque and has a tendency to move. This is known as motoring action. Pumps operate by some mechanism (typically reciprocating or rotary), and consume energy to perform mechanical work by moving the fluid. Pumps operate via many energy sources, including manual operation, electricity, engines, or wind power, come in many sizes, from microscopic for use in medical applications to large industrial pumps

IV. PROPOSED SYSTEM

In this proposed system, we are developing the IP based Embedded Web server. Here we are monitoring the quality of water by using the PH sensor and level of water in the tank is measured using the level sensor and this values are updated to the server by using the IP address of the particular user we can monitor the level of the water and quality of the water.. We can control both in the automatic and the manual mode by the user. The automatic ON/OFF control of the motor is done using the internet of thing.

Internet of Things (IoT) is an environment in which objects, animals or people are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to- computer interaction. IoT board featured with SIM900 GPRS modem to activate internet connection also equipped with a controller to process all input UART data to GPRS based online data. Data may be updated to a specific site or a social network by which the user can able to access the data.

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V. CONCLUSION

This paper mainly focuses on the controlling of home appliances remotely and providing security when the user is away from the place. The system is SMS based and uses wireless technology to revolutionize the standards of living. This system provides ideal solution to the problems faced by home owners in daily life. The system is wireless therefore more adaptable and cost-effective. The HACS system provides security against intrusion as well as automates various home appliances using SMS. The system uses GSM technology thus providing ubiquitous access to the system for security and automated appliance control.

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