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AUTOMATED TOWN WATER MANAGEMENT AND BILLING SYSTEM

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ABSTRACT

In this paper we introduce the motion of water level monitoring and management within the context of electrical conductivity of the water. More specifically, we investigate the microcontroller based water level sensing and controlling in a wired and wireless environment. Water Level management approach would help in reducing the home power consumption and as well as water overflow. Because of disadvantages of traditional meter reading such as errors in reading, inaccuracy, external conditions affecting readings, delayed work we have implemented meter reading system based on latest GSM technology. In this model we have designed and implemented wireless sensor network for measuring utilities such as electricity, water. Finally, we proposed a web and cellular based monitoring service protocol which would determine and senses water level and billing globally.

KEYWORDS: - AC Motor, DC Motor, GSM, Water flow sensor.

INTRODUCTION

Water is one of the most important basic needs for all living beings. But unfortunately a huge amount of water is being wasted by uncontrolled use. Traditional billing system has many disadvantages as manual reading has shortcomings such as errors in taking readings, inaccuracy, external condition affecting reading, delayed work. These techniques also require huge manpower. We tried to overcome these problems and implemented an efficient automated water management and billing system. Automated water management and billing system is one way to avoid these shortcomings. Our intension of this research work is to establish a flexible, economical and easy configurable system which can solve our water losing problem. We have been used a low cost AVR microcontroller in this system which is the key point to reduce cost.

Here we detect water level and control of water flow. The distribution of water can be done according to bill payment. The calculation of bill is on basis of water used. Status update on mobile through GSM module.

MATERIAL AND METHOD

Microcontroller ATMEGA 16:

The ATmega16 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. AVR is a modified Harvard architecture 8 bit RISC single chip microcontroller which was developed by Atmel in 1996. AT mega 16 is high performance low power Atmel AVR 8bit microcontroller. The operating frequency of ATMEGA 16 is 16 MHz Having four Ports Port A, Port B, Port C,
Port D.

DC Motor:

A DC motor relies on the fact that like magnet poles repels and unlike magnetic poles attracts each other. DC Motor is used for rotate the valve of pipe according level of water in the tank.

LCD:

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other.

RELAYS:

A relay switch can be divided into two parts: input and output. The input section has a coil which generates magnetic field when a small voltage from an electronic circuit is applied to it. This voltage is called the operating voltage. Commonly used relays are available in different configuration of operating voltages like 6V, 9V, 12V, 24V etc. The output section consists of contactors which connect or disconnect mechanically

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Motor driver IC:
L293D is a dual H-bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors.

Voltage regulator(7805):
7805 is a voltage regulator integrated circuit. It is a member of 78xx series of fixed linear voltage regulator ICs. The voltage source in a circuit may have fluctuations and would not give the fixed voltage output. The voltage regulator IC maintains the output voltage at a constant value. The xx in 78xx indicates the fixed output voltage it is designed to provide. 7805 provides +5V regulated power supply. Capacitors of suitable values can be connected at input and output pins depending upon the respective voltage levels.

IR SENSOR
An IR SENSOR, also known as IR transmitter, is a special purpose LED that transmits infrared rays in the range of 760 nm wavelength.

DC power supply:
We are using 12V, 1A DC power supply. In this system we need a regulated dc power supply of 5V. The need of the 5V supply is because of the microcontroller's operating voltage. Hence to convert a Dc 12 V supply in the regulated 5V dc, a 7805 IC is used.

GENERALIZED BLOCK DIAGRAM

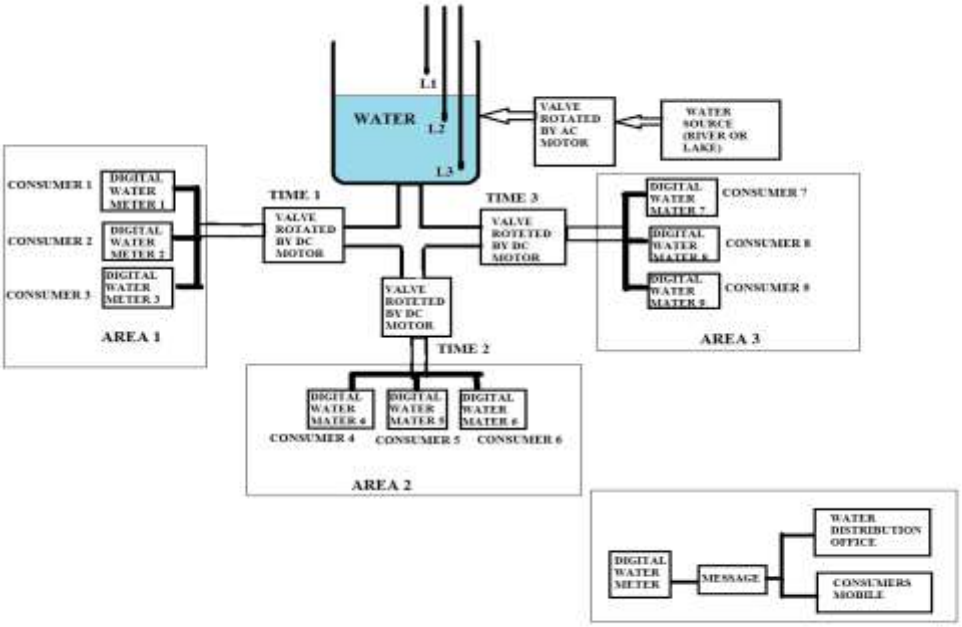

FIG 1 : GENERALISED BLOCK DIAGRAM

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WATER LEVEL DETECTION AND DISTRIBUTION

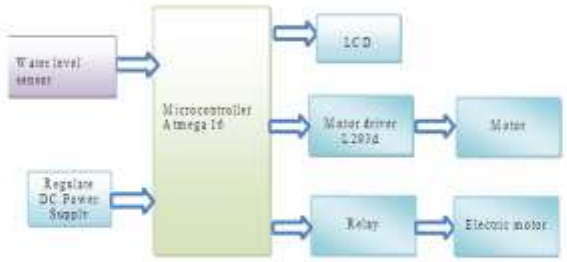

FIG 2 : WATER LEVEL DETECTION AND DISTRIBUTION SYSTEM

In above proposed system there is two systems one is water level detection and distribution and second is billing system using global system for mobile communication (GSM).In water level detection and distribution section there is three water level sensors for detecting water level in the distributed tank. 0ne sensor at 25 % second one 50% and third in 100%. This sensor connected to the microcontroller. For controlling ac water motor there is relay through which motor connected. For outlet of water flow controlling using dc motor which connected to valve of the pipe.

BILLING SYSTEM

FIG 3: BILLING SYSTEM

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WATER INLET MECHANISM

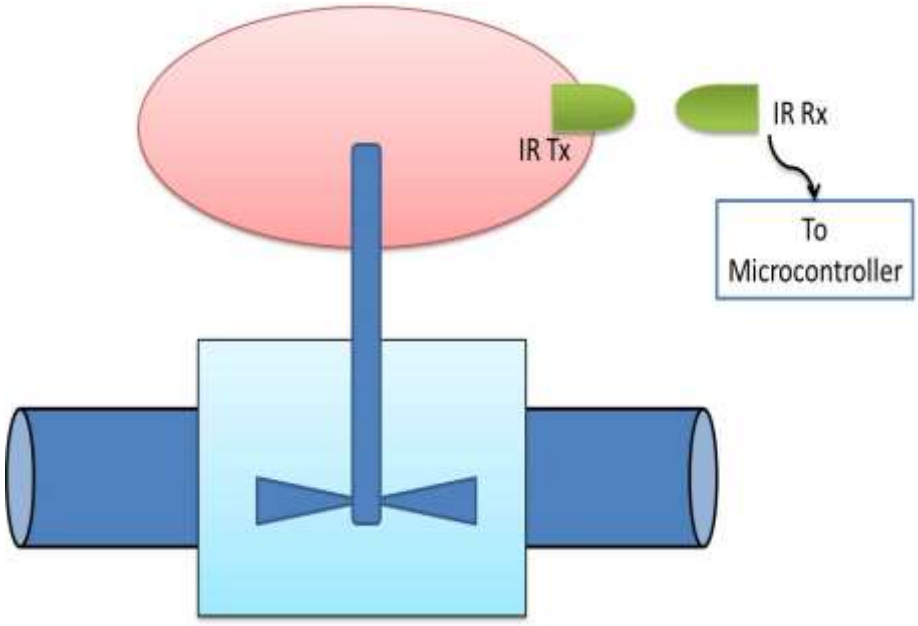

FIG 4 : WATER INLET MECHANISM

In above proposed system there is two systems one is water level detection and distribution and second is billing system using GSM. In water level detection and distribution section. There are three water level sensors for detecting water level in the distributed tank. 0ne sensor at 25 % second one 50% and third in 100%. This sensor connected to the microcontroller.
For controlling ac water motor there is relay through which motor connected. For outlet of water flow controlling using dc motor which connected to valve of the pipe.

The second system is billing system using GSM. In that system there is water inlet mechanism which measure how much amount of water we consume. The output of water inlet mechanism connected to microcontroller. Here we use AVR family at mega 16 microcontroller. For operating microcontroller there is need of +5 v. The reading display on LCD display. For sending reading of that meter to the owner person and control room we use GSM module.

For manually sending value we use switch. By pressing switch the reading will be send to the authentication person.

CONCLUSION

Water is one of the most important basic needs for all living beings. But unfortunately a huge amount of water is being wasted by uncontrolled use. We tried to overcome these problems and implemented an efficient automated water management and billing system. Our intension of this research work is to establish a flexible, economical and easy configurable system which can solve our water losing problem. We have been used a low cost AVR microcontroller in this system which is the key point to reduce cost.

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TABLE:

Figure No.	**Description**
1	GENERLIZED BLOCK DIAGRAM
2	WATER LEVEL DETECTION AND DISTRIBUTION DIAGRAM
3	BILLING SYSTEM USING GSM DIAGRAM
4	WATER INLET MECHANISM