8051 Microprocessor based Water Preservation Project

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Abstract: **water preservation is very essential in our agricultural nation which is done only by selling embankment where pollution and preservation are not prevented according to demand cure. The title concern, 8051 Microprocessor is being used. This should mandatory to use the microprocessor else be whole circuit or process will be undone. As per Electronics based Embedded System is used very often. This 8051 Microprocessor is being learnt in college syllabus and normal electronic circuits. The main principal of the project is to preserve the rainwater by systematic way with the help of embedded system. Now a days water is very croquet for every climatic sufferance. This project has been designed for those URBAN/RURAL area where water level or Water Table is much lower compared to normal benchmark. For making this project simple and make this project budget friendly, this project has been designed by 8051 Microprocessor.**

I. INTRODUCTION

By highlighting and emitting the project, at first I would like to introduce water sensor which is the basic sensor of this project. After processing of the project equalised by both end, a Piezo Transducer has been used on end and on the other end of 8051 Microprocessor is being used. From the basic of this project, water is maintaining wise preservation is only motto of this project. In our natural water emitted work is done before several applications but the water preservation project is less often introduced by a way of Electronics Microprocessor usability.

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On the other hand, this project contains some nominations of work, which is important as an Embedded System run away. 8051 Microprocessor has been designed for communicate or colligated between Two Motors, which are connected with 8051.

II. HARDWARE IMPLEMENTATION

A. WATER SENSOR

Water sensor is a sensor which to sense the water flow or the water substance is filled off. Generally, water sensor is made or the generate of Integrated Circuit. This water sensor's work is to get some output with respect to water emitted. Generally the sensor is set on the cover-shed at the top of the tank.

B. PIEZO TRANSDUCER

Piezo Transducer is a part of the whole Circuit. This Piezo Transducer works like a device that makes a loud prolonged signal or warning sound whenever the rain comes or the rain sensor send a packet signal to it.

C. MOTOR

Motor is a machine, especially one powered by electricity or internal combination that supplies motive power for a device with moving parts clockwise or counter-clockwise.

In this field I used two dc motors which is in short of definition It says "dc motor is any of a class of electrical machines that converts direct current electrical power into mechanical power. The most common types rely on the forces produced by magnetic fields". This kind of dc motors are being operated with the help of power supply stumpage that means If the Positive (+ve) side and Negative

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Side (-ve) is taking part of the motor's evolution's category where the motors rotate clock or anti-clockwise. There is a certain voltage bound working on it where I have used these dc motors with 9V connection. If this dc motor operated over 9V connection then this dc motor's shaft will be non-workable or this Motor will be not workable.

D. 8051 MICROCONTROLLER

The controller used in experimental result is Atmel type: AT89C51/AT89S 52 features are:

1. 4 Kbytes of In-System Reprogrammable Flash Memory. Endurance 1,000 Write/Erase Cycles

2. Fully Static Operation: 0 Hz to 24 MHz

3. Three-Level Program Memory Lock

4. 128 x 8-Bit Internal RAM

5. 32 Programmable I/O Lines

6. Two 16-Bit Timer/Counters

7. Six Interrupt Sources

8. Programmable Serial Channel

9. Low Power Idle and Power Down Modes

DESCRIPTION :

The AT89C51/AT89S52 is a low-power, high-performance CMOS 8-bit microcomputer with 4 Kbytes of flash Programmable and Erasable Read Only Memory (PEROM). The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry standard MCS-51 instruction set and pin out. The on-chip flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with flash on a monolithic chip, the Atmel AT89C51/AT89S52 is a powerful microcomputer, which provides a highly flexible and cost effective solution to many embedded control applications. In addition, the

AT89C51/AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters.

Arithmetic and logic unit (ALU) [1] data is transferred to and from the CPU via data bus lines $D_7 - D_0$. Address register (MAR) is being used external components via the address bus, $(A_{15}-A_0)$ In the addition,

ALU Components: Associated with the arithmetic and logic unit (ALU) are a true/complement (T/C) gate array for bus R, a group of five flag flip-flops, and an output latch. The T/C array can be used to gate into the ALU complement of the data contained on bus R. This is done under micro-program control and is useful in performing ones and two's complement subtraction schemes. The processor status word (PSW).

E. H- BRIDGE

A circuit diagram, which resembles the letter "H." The load is the horizontal line, connected between two pairs of intersecting lines. It is very common in DC motor-drive applications where switches are used in the "vertical" branches of the "H" to control the direction of current flow, and thus the rotational direction of the motors will serve.

An H-bridge is a type of circuit that you can use to get a reversible DC motor to spin both clockwise and anti-clockwise.

In other words, this circuit allows you to quickly reverse the direction a motor is spinning by using a switch or controller chip to change its direction.

In simple way with general purpose, H-Bridge has been introduce to drive motor throughout by an integrated circuit as an driver to general over through the work done. If a motor could operate in 9V along with Microcontroller then L293B IC used for 9V DC Motor drive.

By Illusion, with circuit diagram 1.1 'L293B' H-Bridge has been introduced which has 16 pin at

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that. first of all, Pin1 works like a switch, named as E1, & pin9 works again like the second switch named E2. When E1 is active, M1 motor is being activated and M2 motor has been deactivated at that E2 is deactivated and vice versa. In addition, with motor 1 (M1)'s two ports are connected through pin3 and pin6 on the other hand, For Motor 2 (M2)'s two port are connected through pin14 and pin11.

WHEN E1 IS ACTIVE

Pin2 (ln1) is VCC and Pin7 (ln2) is ground at that point Motor (M1) rotating direction is Clockwise. Moreover, when Pin2 (ln1) is ground and Pin7 (ln2) is VCC the motor (M1) rotating direction is Counter-Clockwise.

WHEN E2 IS ACTIVE

Pin15 (ln4) is VCC and Pin9 (ln3) is ground at that point Motor (M2) rotating direction is Clockwise. In addition, when Pin15 (ln4) is ground and Pin9 (ln3) is VCC the motor (M2) rotating direction is Counter-Clockwise.
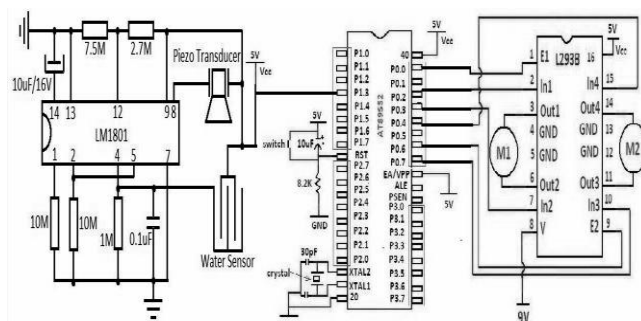
CICUIT DIAGRAM 1.1

II. WORKING PRINCIPAL

In the way of conducting this Circuit with a physical working principals, that need an explanation which is, at first the Microprocessor has to be designed properly via proper programmed with Embedded Software/Simulated Software like Keil Tools by ARM. After this process done like this circuit diagram, the plotting of Pin diagram is being initiated

```
sbit Sensor=P1^3;
sbit E1=P0^0;
sbit ln1=P0^2;
sbit ln2=P0^3;
sbit ln4=P0^4;
sbit E2=P0^6;
sbit ln3=P0^7;
```

After the insalivation of pin marking is done, Let us coming to the main thing. There is while (1) is applied for making loop infinite.

```
while (1)
```

As per plotting, this circuit has been mandated to a Microprocessor port1 at pin3. When it is ZERO or The rain's force/rail water garb egging is not happening, the Tank's upper shelter was closed, due to protect garbage water.

```
while(Sensor==0)
 {
  ln2=0;
  E2=0;
  ln3=0;
  ln4=0;
  E1=1;
  ln1=1;
 }
```

In addition as per plotting, this circuit has been mandated to a Microprocessor port1 at pin3. At the time when raining the water has to be saved via store. To do so, at first while sensor is on the shelter of garbing water is open/opened for store the rainwater.

```
while(Sensor==1)
 {
  ln4=0;
  E1=0;
  ln1=0;
  ln2=0;
  E2=1;
  ln3=1;
 }
```

III. HELPING HINTS

For extra tips, while using H-Bridge we can alternatively use 3-Phase Induction Motor [2] for the higher voltage application

IV. CONCLUTION

Today world water storing is very little & needed and sophisticated too. This project/circuit has to be designed into PCB and for making PCB all the proper material like (FeCl3, Etching Material, Cooper Board, Solder Iron etc.) For drilling PCB wholes .8-.1mm hand drills has to be used for making this project smooth.

V. SCOPE OF IMPLEMENTATION

This project has been designed to make water crisis/water demand correctly, so all in one this project has to be implemented whatever place where Water Storing is available with minimum cost of effect or to collect rain-water.

REFERENCES :

[1] CECIL O.ALFORD,   ROBERT B.SLEDGE, " Microprocessor Architecture for Discrete Manufacturing Control, Part III: System Architecture " IEEE Transaction on Manufacturing Technology
[2] VITHAL   V.ATHANI,   and   SUDHIR   M.   DESHPANDE, "Microprocessor Control of a Three Phase Inverter in Induction Motor Speed Control System", IEEE Transaction on Industrial Electronics and Control Instrumentation, VOL. IECI-27, NO. 4, NOV. 1980.

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