AUTOMATIC DAM SHUTTER SENSES THE WATER LEVEL AND CONTROL THE DAM DOOR USING SERVO MOTOR

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Abstract- Dams are typically constructed with a drain or similar mechanism to control water levels in an impoundment for normal maintenance or emergency purposes. By definition, a disaster is any event that causes great harm or damage, serious or sudden misfortune. Dam failures clearly fit this definition.

In this paper we use the microcontroller of common 8 bit Atmel microcontroller AT89s8253.It is a low-power, high-performance CMOS 8-bit microcontroller with 12K bytes of In-System Programmable (ISP) Flash program memory and 2K bytes of EEPROM data memory. It has 32 programmable input output lines.

Keywords- Dam, Water, Sensor

I. INTRODUCTION

Dams are man-made or artificial barriers usually constructed across a stream channel to impound water. Dams are typically provided with spillway systems to safely pass a broad range of flows over, around or through the dam. Various materials are used for dam construction such as timber, rock, concrete, earth, steel or a combination of these materials. However, in Connecticut, most dams are constructed of earth or combinations of earth and other materials. Spillways are commonly constructed of non-erosive materials such as concrete or rock.

Dams are typically constructed with a drain or similar mechanism to control water levels in an impoundment for normal maintenance or emergency purposes. By definition, a disaster is any event that causes great harm or damage, serious or sudden misfortune. Dam failures clearly fit this definition.

Because of the sudden and unexpected manner in which dam failures can occur, they are potentially as destructive as earthquakes, hurricanes and tornadoes.

II. HARDWARE COMPONENTS:

- Microcontroller
- Servo Motor
- LCD
- Power supply block

III. TYPES & TECHNICS

The water level at different levels is sensed according to which the gate is closed or open. That is when the water is filled to level 3 the closed dam shutter is fully opened, for level 2 gate is partially closed while for level 1 the gate is fully closed.

IV. MICROCONTROLLER DETAILS:

This unit is the brain of the system. This is responsible for the full control of the system. The microcontroller used here is a common 8 bit Atmel microcontroller AT89s8253. It is a low-power, high-performance CMOS 8-bit microcontroller with 12K bytes of In-System Programmable (ISP) Flash program memory and 2K bytes of EEPROM data memory. It has 32 programmable input output lines.

V. FEATURES:

12K Bytes of In-System Programmable (ISP) Flash Program Memory SPI Serial Interface for Program Downloading Endurance: 10,000 Write/Erase Cycles

2K Bytes EEPROM Data Memory Endurance: 100,000 Write/Erase Cycles 2.7V to 5.5V Operating Range Fully Static Operation: 0 Hz to 24 MHz (in x1 and x2 Modes) Three-level Program Memory Lock
Automatic Dam Shutter Senses The Water Level And Control The Dam Door Using Servo Motor

256 x 8-bit Internal RAM
32 Programmable I/O Lines
Three 16-bit Timer/Counters
Nine Interrupt Sources
Enhanced UART Serial Port with Framing Error Detection and Automatic Address Recognition
Enhanced SPI (Double Write/Read Buffered) Serial Interface.

VI. SERVO-MOTOR:

A servomotor is a rotary curator that allows for precise control of angular position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors. Servomotors are not a different class of motor, on the basis of fundamental operating principle, but uses servomechanism to achieve closed loop control with a generic open loop motor. Servomotors’ are used in applications such as robotics, CNC machinery or automated manufacture.

VII. LIQUID CRYSTAL DISPLAY:

This is 16×2 B/W LCD for the display of the data.

VIII. POWER SUPPLY BLOCK:

The power supply consists of a step down transformer 230/12V, which steps down the voltage to 12V AC. This is converted to DC using a Bridge rectifier. The ripples are removed using a capacitive filter and it is then regulated to +5V using a voltage regulator 7805 which is required for the operation of the microcontroller and other components.

Block Diagram –

IX. BLOCKS IN BRIEF: INPUT SECTION:

- Sensing probes: The sensor copper probes which is capable of detecting water level on the basis of its continuity

X. PROCESSING SECTION:

- Microcontroller: Programmed by the user to monitor the input and generate proper output for the output unit. In general this is the brain of the system.

XI. OUTPUT SECTION:

Servo Motor control: This motor can be commanded to move at exactly given angle (0-180).

16×2 LCD: Used as display device for required data
XII. APPLICATIONS AND ADVANTAGES-

- Can be implanted to modernize irrigation schemes
- Prevents any type of dam disaster
- Easy to install and reliable
- Requires less maintenance

CONCLUSION-

the microcontroller of common 8 bit Atmel microcontroller AT89S8253. It is a low-power, high-performance CMOS 8-bit microcontroller with 12K bytes of In-System Programmable (ISP) Flash program memory and 2K bytes of EEPROM data memory. It has 32 programmable input output lines.

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