PLC Based Dam Automation System

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***Abstract*: Presently a-days water shortage has turned into a major issue in India and there are numerous variables in charge of this like uncalled for supply of water from the dam, dishonourable water sparing frameworks, and so on however one main consideration is the shameful opening and shutting of the dam entryway as per the level of water in the dam. Additionally till date the control component of the dam doors are done physically and utilizing PLC. Be that as it may, there are bunches of blunders in manual technique. Likewise the PLC based framework is enormous and henceforth appropriate for significant dams because of its cost. For medium and little dams like water system dams does not require such tremendous PLC frameworks. So to diminish these issues a mechatronic control framework is proposed in this paper. This venture is an AT89S51 microcontroller based dam entryway control framework which helps in watching out for the successive use of water assets from dam for water system purposes and productive activity of dam door as per the level of water and furthermore helps in demonstrating about surge to individuals living in the encompassing. This proposed component of dam door control decreases the water wastage and productive utilization of accessible water is guaranteed. Likewise there are overwhelming burden shedding issues in the towns in all conditions of India. To defeat these issues the proposed dam entryway control framework can be joined with the task of the geothermal and atomic power plants for age of power**

***Keywords*:water supply, dam gate, levelmonitoring, gatemechanism,microcontroller, DC motor, SIMO (simple input multiple output), visual basic 6.0**

I. INTRODUCTION

In India around 3200 dam are available and it cover 1, 70,000 sq.km for gathering water. Dam are synthetic or manufactured boundaries as a rule built crosswise over to appropriate water. There is additionally 2067.68 km long and complex trench organize through which around 10 lakes hectare arrive gets water for water system and drinking reason. The ranchers are subject to regular pursued and that drag well water for their harvests.Implanted framework is the blend of equipment and programming co-plan. Inserted frameworks are presently a-days assuming an imperative part in Engineering configuration process for productive examination and compelling activity. From information examination to equipment work, wherever inserted items are presently a-days assuming a crucial part due to its unwavering quality and constant task execution. Because of time many-sided quality in electronic viewpoints inserted frameworks have turned into a noteworthy piece of our everyday life. Our work depicts the plan of an implanted framework for the "Installed Dam Control System". For mechanical applications, home mechanization, and supervisory control applications, Personal Computer based electrical

II. BLOCK DIAGRAM

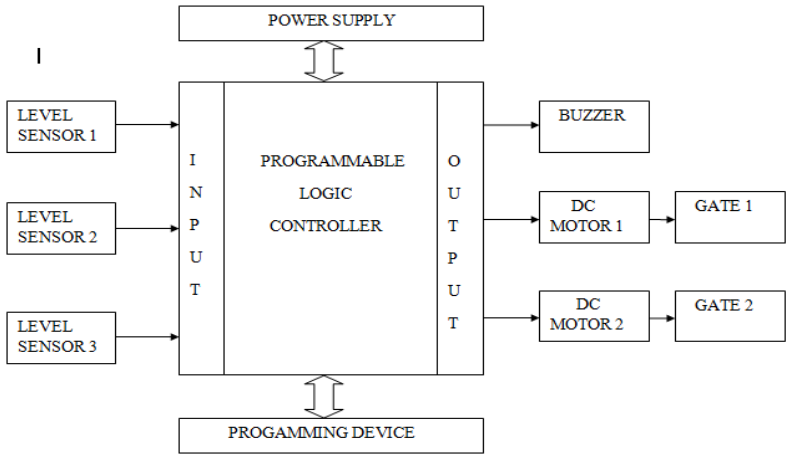

Fig.1 Block Diagram of the proposed system

Fig. 1 portrays the square graph of Microcontroller AT89S51 based Dam Gate Control System. The proposed framework utilizes five sensors to detect different levels of dam water. At whatever point the water level ascents or reductions and comes in contact of any sensor then the circuit is finished and ebb and flow streams because of which the comparing transistor directs and circuit is shut. The yield of the sensor circuit triggers the microcontroller. At whatever point the water level transcends the most abnormal amount or abatements beneath the least edge level then the sensor circuit triggers the microcontroller. As indicated by the code composed and consumed in the microcontroller, it will drive the DC engine through the engine driver hand-off circuit and the

dam door associated with the DC engine [11] will likewise move and it will get opened or shut by the water level. To work the entryways of dam at the water levels which are not bolstered by the framework an administrator can be set at the control space to control all the activity of the dam. The administrator's framework will be associated with the microcontroller through the USB interface. This is the primary interface through which the administrator is associated with the microcontroller and without this interface code can't be scorched in the controller. Likewise the administrator is given the office to show the general population living in the encompassing zones of the dam about the water utilization for water system and alert the general population to let the discharged water from dam to their fields.

III. SWITCHED MODE POWER SUPPLY (SMPS)

A switched-mode power supply (switching-mode power supply, switch-mode power supply, switched power supply, SMPS, or switcher) is an electronic power supply that incorporates a switching regulator to convert electrical power efficiently. Like other power supplies, an SMPS transfers power from a DC or AC source (often mains power) to DC load, while converting voltage and current characteristics. Unlike a linear power supply, the pass transistor of a switching-mode supply continually switches between low-dissipation, full-on and full-off states, and spends very little time in the high dissipation transitions, which minimizes wasted energy. Ideally, a switched-mode power supply dissipates no power. Voltage regulation is achieved by varying the ratio of on-to-off time. In contrast, a linear power supply regulates the output voltage by continually dissipating power in the pass transistor. This higher power conversion efficiency is an important advantage of a switched-mode power supply. Switched-mode power supplies may also be substantially smaller and lighter than a linear supply due to the smaller transformer size and weight.

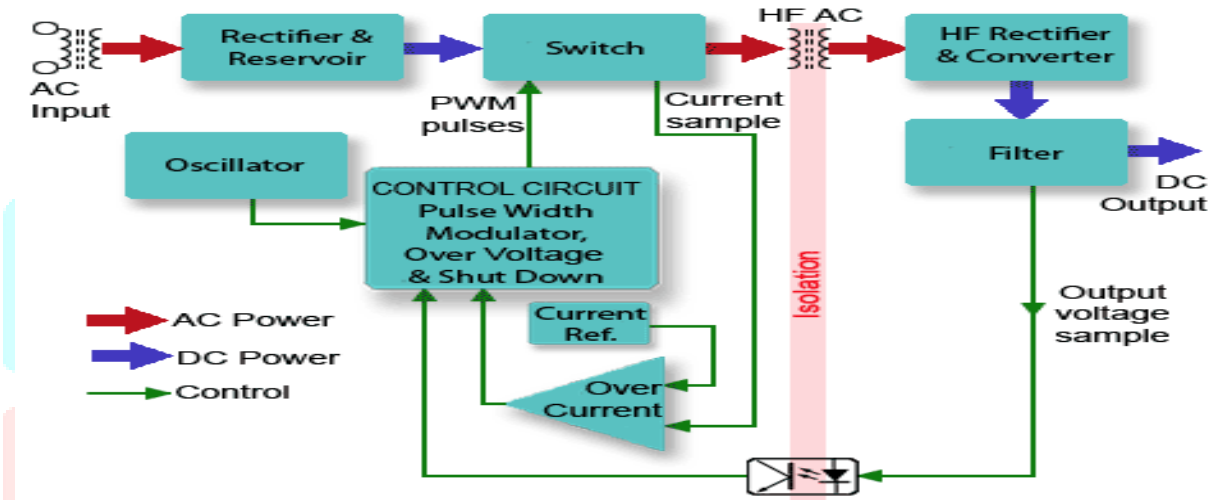

Fig 2 Block Diagram of SMPS (Switched Mode Power Supply)

IV. LEVEL SENSOR

Level sensors detect the level of liquids and other fluids and fluidized solids, including slurries, granular materials, 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. The substance to be measured can be inside a container or can be in its natural form (e.g., a river or a lake). 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. There are many physical and application variables that affect the selection of the optimal level monitoring method for industrial and commercial processes.

Level Sensor

V. BUZZER

A buzzer is a device that provides audio signalling functions. The devices may be mechanical or electronic or a combination of the two. They are used in an enormous range of products and are available in various levels of sophistication. They are also available at various price levels, from devices that cost very little too expensive, purpose-specific devices that are designed to emit sound over a wide area or to provide more specialized functions

A buzzer takes some sort of input and emits a sound in response to it. They may use various means to produce the sound; everything from metal clappers to electromechanical devices. A buzzer needs to have some way of taking in energy and converting it to acoustic energy.

BUZZER

VI. MINIATURE CIRCUIT BREAKER (MCB)

An MCB or miniature circuit breaker is an electromagnetic device that embodies complete enclosure in a molded insulating material. The main function of an MCB is to switch the circuit, i.e., to open the circuit (which has been connected to it) automatically when the current passing through it (MCB) exceeds the value for which it is set. It can be manually switched ON and OFF as similar to normal switch if necessary.

MCBs are of time delay tripping devices, to which the magnitude of over current controls the operating time.

Miniature Circuit Breaker

VII. DC MOTOR

The direct current (DC) motor is one of the first machines devised to convert electrical power into mechanical power. Permanent magnet (PM) direct current convert electrical energy into mechanical energy through the interaction of two magnetic fields. One field is produced by a permanent magnet assembly; the other field is produced by an electrical current flowing in the motor windings. These two fields result in a torque which tends to rotate the rotor. As the rotor turns, the current in the windings is commutated to produce a continuous torque output. The stationary electromagnetic field of the motor can also be wire-wound like the armature (called a wound-field motor) or can be made up of permanent magnets (called a permanent magnet motor).

VIII. FUTURE SCOPE

1. To enhance the sophistication of this process we can make use of level transmitter and standalone PID controller. This system is opening and closing with in particular stages of gates.
2. The level transmitter can be used of RFID devices for wireless communication along with the PLC. In this system we are use also GPS .Global position system are indicating for particular person will receiving message and alert through mobile .
3. Authentication process of SO (section officer) are developed to the perform of flood and sprinkler irrigation.

IX. CONCLUSION

In this system, we expect that an automatic controlling of a DC motor using PLC. This System model of a Dam automation system which is the completely automated can control the level of the dam gates using backup of the water. Thus using PLC the level of water in the dam is controlled effectively there by opening and closing the gates of the dam whenever the level increases.

Therefore the use of Programmable logic control has opened doors for a level of automation Dam system also monitoring the entire plant and stored the entire information about opening and closing of the gate.

REFERENCES

[1] S. M. Metev and V. P. Veiko, Laser Assisted Microtechnology, 2nd ed., R. M. Osgood, Jr., Ed. Berlin, Germany: Springer-Verlag, 1998.
[2] J. Breckling, Ed., TheAnalysis of Directional Time Series: Applications to Wind Speed and Direction, ser. Lecture Notes in Statistics. Berlin, Germany: Springer, 1989, vol. 61.
[3] S. Zhang, C. Zhu, J. K. O. Sin, and P. K. T. Mok, "A novel ultrathin elevated channel low-temperature poly-Si TFT," IEEE Electron Device Lett., vol. 20, pp. 569–571, Nov. 1999.
[4] M. Wegmuller, J. P. von der Weid, P. Oberson, and N. Gisin, "High resolution fiber distributed measurements with coherent OFDR," in Proc. ECOC'00, 2000, paper 11.3.4, p. 109.
[5] R. E. Sorace, V. S. Reinhardt, and S. A. Vaughn, "High-speed digital-to-RF converter," U.S. Patent 5 668 842, Sept. 16, 1997.
[6] (2002) The IEEE website. [Online]. Available: http://www.ieee.org/
[7] M. Shell. (2002) IEEEtran homepage on CTAN. [Online]. Available: http://www.ctan.org/tex-archive/macros/latex/contrib/supported/IEEEtran/
[8] FLEXChip Signal Processor (MC68175/D), Motorola, 1996.
[9] "PDCA12-70 data sheet," Opto Speed SA, Mezzovico, Switzerland.
[10] A. Karnik, "Performance of TCP congestion control with rate feedback: TCP/ABR and rate adaptive TCP/IP," M. Eng. thesis, Indian Institute of Science, Bangalore, India, Jan. 1999.
[11] J. Padhye, V. Firoiu, and D. Towsley, "A stochastic model of TCP Reno congestion avoidance and control," Univ. of Massachusetts, Amherst, MA, CMPSCI Tech. Rep. 99-02, 1999.
[12] Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specification, IEEE Std. 802.11, 1997.