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AUTOMATIC WATER DISTRIBUTION USING PLC AND LEAKAGE DETECTION

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Abstract—— *This proposed automatic water appropriation system is utilized to convey the city water similarly to all road pipe line. So everybody will get the equivalent measure of water. The set point is settled for each pipe line. The water from the capacity tank is estimated with the assistance of level sensor. Stream sensor measures the flow rate of the water. Solenoid valve is utilized to open and close the valve automatically. In the event that the stream rate achieves its set point, Solenoid will be off and it will be turned ON following 24 hours after the fact. Here we likewise distinguish the water theft precisely. This system comprises of PLC. PLC is utilized to control the appropriation of water. The general system is associated with PLC with the assistance of RS-232 link. PLC gives the flag to the solenoid valve as indicated by the set point written in the program..*

Key words—*PLC, solenoid valve, water level sensor, flow sensor.*

I. INTRODUCTION

The water wastage is because of numerous reasons, for example, wastage of water, human lethargy, administrator blame and so forth. In existing framework urban water is provided to the home with the assistance of some human power. The individual to take the charge will go to the place and for opening the valve that individual require going that specific place. Once the time is over the individual will go again to that place and shut the valve instantly. This task needs human power it likewise requires a considerable measure of investment doing this activity. Likewise the general population may take additional water for their own utilization with the help of engine. Additionally for this situation there is unlawful association show in system. Because of this issue numerous individuals not get adequate water for their utilization. Water is an essential and imperative need of human life. Additionally for this situation water theft is happening, so it is avoided just when any individual educate that with respect to office. The proposed system is completely automatic. Here human work and time is reduced. The water wastages, for example, storage, humankind laziness and working mistake can be maintained a strategic distance from

II. OBJECTIVE OF OUR SYSTEM

1. Vast measure of water is saved.
2. There is a no human mistake.
3. Robbery is effortlessly distinguished.
4. To be set up for future water emergency.
5. To use data coming from each house for further water management..

III. NEED FOR PLC

In this framework PLC assumes a vital part and is utilized for working a solenoid valve. It additionally works stream sensor and stream transmitter. This activity is done through step graph.

IV. PREVIOUS WORK

The water wastage is because of numerous reasons, for example, wastage of water, human lethargy, administrator blame and so on. There is likewise issue of carelessness of water supply i.e. he rundown of water supply isn't secure. Presently a-days, water storage and distribution system, controlling temperature, weight and for each phase for estimating and breaking down. We can't ready to distinguish the theft in urban drinking water supply. Water flow control is difficult to control. The water supply system are a piece of the urban structure which must guarantee the progression of the water distribution. In existing system, urban water is provided to the home with the assistance of some human power. The individual to take the charge will go to the place and after that open the valve to that exact region. Once the time is over the individual will go again to that place and close the valve instantly. This sort of activity needs human power. This is wastage of time and to go to that place and operate frequently. Additionally the general population may take additional water for their own utilization with the help of engine.Because of this numerous individuals won't get adequate water for

their utilization. Water is the fundamental and vital needs of the human life. The water theft avoided just when any public informs the authorities about the theft..

V. COMPONENTS:

A. *Solenoid Valve:*

Solenoid valve are associated with the Output of PLC.Output voltage of the PLC is 24v DC which can be effortlessly worked by Ladder of PLC. This is associated with the PLC by RS232 link. Two way Solenoid valve is utilized as a part of this case since two way valves is more affordable than three way and four way valve. Solenoid Valve is an electromechanically worked valve. There task are to stop, discharge, appropriate water. Solenoid Valve change over Electrical Energy to Mechanical Energy. Advantages of Solenoid Valves:-

1. More reliable.
2. Long life.
3. Safety switching.
4. Fast switching.

Fig.1 Solenoid Valve

B. *Flow Sensor:*

Stream sensors are utilized to quantify flow rate of water. In our system we have actualized stream sensor for distinguishing leakage in the system.It is effectively done by looking at pressure between two stream sensors. Stream sensor contains pin wheel and pin wheel contains six teeth.The pulse output comes from the pin wheel sensor. On the off chance that teeth rotate once it gives pulse output in like manner to particular of the stream sensor. From the pulse output we can without much of a stretch measure the amount of water passed through the pipe. The pulse is changed over to voltage with the help of Hall Effect sensor. Stream sensor output is in the range of 5vDC. Fig.2 Flow Sensor

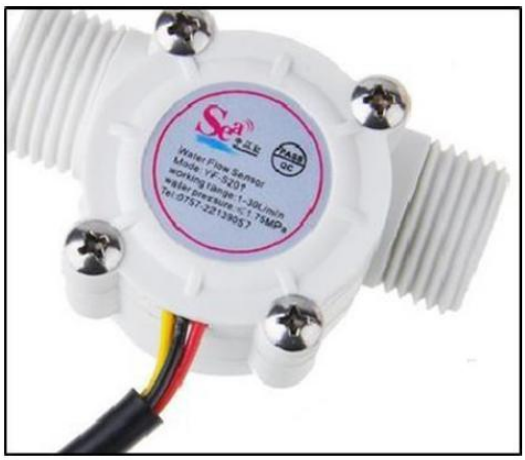

Fig.2 Flow Sensor

VI. PROPOSED SYSTEM

The equipment design of the proposed system is appeared in figure 5.The overall distribution process is observed in PC. Pumping section is associated with PLC.

If the water level below the set point then pump is automatically ON with the help of PLC. Checking the level in tank is the primary procedure. If the level attains the set point overall system is started. The water is flow through the pump when the solenoid valve opens. The flow rate is estimated with the assistance of pulse output from the flow sensor. The people can get water until the point that the set point comes to. Once the water use accomplishes the set point the specific solenoid valve is consequently close.

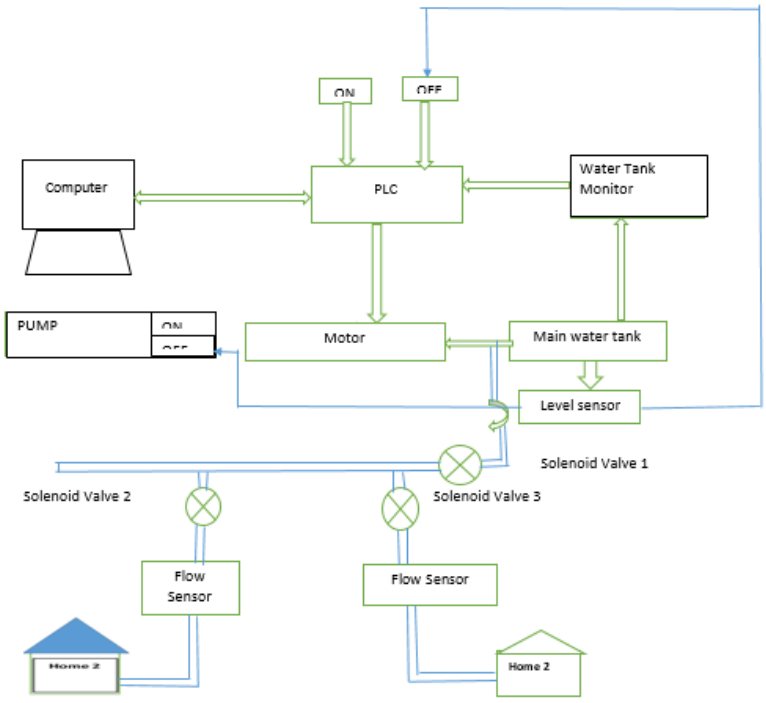

Fig.3 Proposed System

VII. METHODOLOGY

Level sensor is used to sense the amount of water level present in the storage tank. It will then connect to the PLC. It is shown in the below figure 2. If the water capacity reaches 80 percentages in the storage tank the buzzer will give the alarm signal. The pump will be turned off with the help of PLC. Once the water is not sufficient (if it below 80%) in the tank the pump will be turned on. If the water level once attains its 80% the overall system is started.

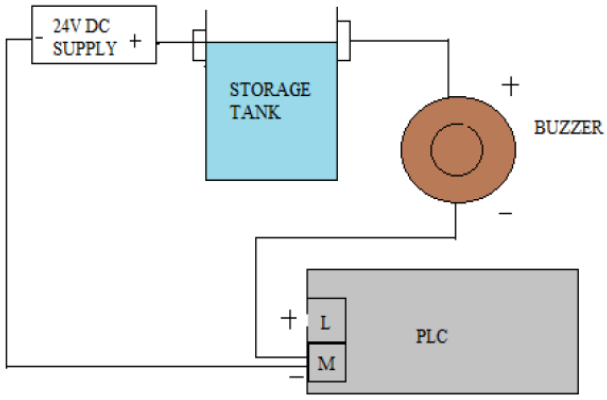

Fig.4 Level Measurement

TABLE I. COMPONENTS WITH RATINGS

In table one components used in our project is shown with their ratings.

Sr. No.	**Components with Ratings**		
	Components	***Quantity***	***Ratings***
1	Solenoid Valve	2	DC 24V,50/60Hz
2	Flow Sensor	1	1-30L/min, 1.75Mpa
3	AC motor	1	160-220V, 50Hz,19W
4	AC motor	1	165-220V, 50Hz,18W

In table II details of specifications of PLC used for our project is shown.

TABLE II. RATING OF PLC

1	PLC	Micro 830
		Series Catalog No.2080-LC30-24(0WB)
2	Family	Allan Bradly
3	Software	Connected Component Workbench

VIII. CONCLUSION

This proposed project is automatic so it reduces lots of man power. The automation will be implemented in water distribution system ensures to avoid wastage of water and reduces time. And also we can completely avoid the water theft in the pipelines. So that people could get equal share of water. This system is excellent and cost effective to prevent the drinking water from the theft. By using PLC it is possible to distribute water and it is also possible to detect leakage in the water distribution system.

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