

PLC Based Water Distribution and Management System

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Abstract: *This project presents a cost-effective and scalable water distribution and leakage detection system designed for sustainable civil infrastructure, the system addresses common issues such as manual valve operation, irregular water supply, and undetected pipeline leakages that lead to water wastage. A PLC is used for dependable water distribution control, while a microcontroller handles flow measurement, data processing, and display functions. Two flow sensors are installed at different points in the pipeline to measure and compare water flow. Leakage is detected using a threshold-based comparison method, and alerts are generated through visual or audible indicators. The use of a microcontroller instead of expensive industrial sensors and HMI's makes the prototype affordable and suitable for academic and pilot applications. The system can be easily upgraded with SCADA, industrial meters, and remote monitoring, making it applicable to rural water supply systems, smart cities, and industrial water management in the future.*

Keywords: Programmable Logic Controller (PLC), Water distribution, Leakage Detection

