

Smart Home Automation based on PLC with Energy Saving

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Abstract: We provide a thorough introduction to PLC-based home automation in this paper, with an emphasis on how sensors and actuators work together to provide intelligent control and monitoring. The suggested system makes use of actuators including fans and lights, Solid State Relay (SSR) modules, motion sensors, light sensors, temperature sensors, and relay modules to provide an effective and responsive automation solution. The PLC uses real-time data collection and analysis to carry out pre-programmed logic that allows it to operate different devices in an adaptive manner according to user preferences and environmental conditions. The rest of the paper is structured as : A review of the literature is given in Section 2, wherein PLC-based home automation advancements and research are examined. The components and features of the suggested automation system are described in depth in Section 3, which also explains the system design and functioning. The implementation processes—hardware setup, programming, testing, and deployment—are covered in Section 4. The article is finally concluded in Section 5, which also suggests future paths for PLC-based home automation research.

Keywords: Automation, PLC, Sensors, Actuators, Efficiency, Security, Integration, IoT, Smart Home, Temperature, Lighting, Motion, Customization, Architecture, Implementation

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