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ADVANCING RAILWAY SAFETY: AUTOMATED CONTROL SYSTEM WITH PIC16F877A MICROCONTROLLER

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Abstract: The project introduces an Automated Railway Gate Control System employing a PIC16F877A microcontroller alongside pressure sensors, motors, LCD, and traffic lights. Its core objective is to heighten the safety and efficacy of railway crossings by dynamically detecting train presence and regulating gate closure and signal activation accordingly. By seamlessly integrating these components, the system operates to mitigate the risk of accidents and optimize traffic flow, thereby fostering safer and more efficient railway operations. The implementation of automated control mechanisms ensures swift response times and precise coordination, thereby enhancing safety measures and facilitating smoother traffic management at railway crossings. This innovative solution holds significant potential for bolstering railway safety standards while enabling uninterrupted transportation services. Through the utilization of state-of-the-art technology and meticulous design, the system stands poised to revolutionize railway safety practices by providing real-time monitoring and control capabilities. The incorporation of the PIC16F877A microcontroller enables intelligent decision-making processes, ensuring rapid and accurate responses to changing railway conditions. Pressure sensors serve as reliable indicators of train presence, triggering the timely activation of gate closure mechanisms and traffic signals. Furthermore, the integration of an LCD interface enhances user interaction and provides vital feedback regarding system status and operation. In conclusion, the Automated Railway Gate Control System represents a pioneering advancement in railway safety and management, offering a robust framework for enhancing operational efficiency and safeguarding public welfare. By leveraging cutting-edge technology and innovative design principles, the system promises to redefine industry standards and pave the way for safer and more streamlined railway operations in the modern era.

Keywords: Gate; Railway; Safety; Technology