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PLC and LabVIEW Convergence for Smart Industrial Automation

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Abstract: *Industrial automation greatly reduces the need for human sensory, human workforce and cost. This research paper presents integrated bidirectional communication architecture for establishing real-time data exchange between the Allen-Bradley MicroLogix 1000 PLC and the National Instruments LabVIEW graphical development environment. The planned solution for industrial automation is achieved by implementing a real-time controlling and monitoring system. This enabling advanced supervisory control and monitoring in industrial automation systems. The main objective of this study is to detect the damage or fault of the product and consistently record those values over the internet with the presence of classic models of plc, and make monitoring and datalogging. In this outline, the MicroLogix 1000 PLC serves as a real-time control unit and sends process variables such as sensor values to LabVIEW for analysis and visualization. This connection allows operators to monitor the performance of the system in real time. LabVIEW generates setpoints and control commands based on processed data, which are sent back to the MicroLogix 1000 PLC for necessary adjustments. This bidirectional communication enhances system, which are written back to the PLC to enable closed-loop control. By enabling the closed loop control system, the features like live monitoring fault detection, data logging over the internet and also ensures a significant leap in operational efficiency, these chows the how classic PLCs can be revitalized and digitally augmented to fulfill the evolving demands of smart industrial needs.*

Keywords: Allen Bardley PLC, LabVIEW SCADA, Industrial Automation, Real-Time Systems

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