

# Report

on

## Basics and Future Innovation Research: PLC, SCADA, HMI, DCS, IoT

A one-day workshop on “*Basics and Future Innovation Research: PLC, SCADA, HMI, DCS, and IoT*” was conducted on 21-08-2025 to provide participants with insights into the fundamentals of industrial automation and future research opportunities in this domain. The program emphasized the integration of traditional control systems with emerging technologies like IoT and AI, which are shaping the future of Industry 4.0.

The workshop began with a welcome address and an inaugural speech by Dr. V. D. Dhiman, Principal GEC, Valsad, highlighting the importance of automation and smart industry in today’s world.



Technical Session by the speaker Mr. Mihir Raval about Basics of PLC, SCADA, HMI, and DCS Overview of automation systems and their role in industry, Explanation of PLC architecture and ladder logic programming, SCADA for real-time monitoring and control, HMI as an interface for operators, DCS in large-scale process industries.

Future Innovation Research in Industrial Automation in AI and ML in predictive maintenance and optimization, Cloud-based SCADA and IoT integration, AR/VR-based HMIs for immersive control, Cybersecurity challenges and solutions in automation systems, Industry 4.0 and Smart Manufacturing trends

Hands-on/Practical Session Participants were given demonstrations on PLC programming, SCADA dashboards, and IoT-enabled devices for industrial monitoring. Participants gained theoretical and practical knowledge of automation systems, Awareness about emerging trends and future research areas was created, Practical exposure to programming, monitoring, and IoT integration, Motivated participants towards research and innovation in Industry 4.0 technologies

The one-day workshop on “*Basics and Future Innovation Research: PLC, SCADA, HMI, DCS, and IoT*” was highly successful in achieving its objectives. It equipped participants with essential knowledge of industrial automation and inspired them to explore innovative solutions for the future.