



Kot Bhalwal, Jammu

Model Institute of Engineering
& Technology (Autonomous)
Lab Handout

LABORATORY HANDOUT

PLC and SCADA Lab (ECE-413)

ECE-4th SEMESTER

ACADEMIC YEAR (2023-24)

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Department of Electrical Engineering

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Dr. Arun K. Gupta Teaching-Learning Centre

Version 1.1



Please Do Not Print Unless Necessary



| Course Code | Course Name | Course Type | Cd | L | T | P | Marks | | |
|-------------|-------------------|-------------|----|---|---|---|-----------|------------|-------|
| | | | | | | | Sessional | Final Exam | Total |
| ECE-413 | PLC and SCADA Lab | PCC | 2 | 0 | 0 | 4 | 50 | - | 50 |

COURSE OUTCOMES

| At the end of the course the student will be able to: | |
|---|---|
| CO1 | Demonstrate skill and knowledge of PLC system |
| CO2 | Demonstrate the hardware and software functioning of PLC |
| CO3 | Apply the programming knowledge of PLC |
| CO4 | Apply a combination of hardware and software to implement applications. |
| CO5 | Design and create real time applications using PLC. |

LIST OF EXPERIMENTS

| S.No. | Title |
|-------|---|
| 1 | Introduction to Hardware modules and components of PLCs (iQR series) |
| 2 | Wiring and connections with PLC (iQR series) |
| 3 | Programming of PLCs using GXWork3 |
| 4 | Implementation of Timer operation on GXWorks3 |
| 5 | Implementation of Cascaded Timers operation on GXWorks3 |
| 6 | Implementation of Counter operation on GXWorks3 |
| 7 | Implementation of Cascaded Counter operation on GXWorks3 |
| 8 | Implementation of Cascaded timer and Counter operation on GXWorks3 |
| 9 | Sequential operation of ON/OFF of a set of lights. |
| 10 | Implementations of basic boolean logic operations using PLC |
| 11 | Demonstrate the functionality of different type of switches using PLC |
| 12 | Speed control of servo motor using PLC |
| 13 | Water level controlling using PLC |
| 14 | Implementation of PID Controller |

ADDITIONAL WEB RESOURCES

| | |
|----|--|
| 1. | Video link: Automation IITD which gives hands-on experience to the students. |
|----|--|



| | |
|----|--|
| | https://ial-coep.vlabs.ac.in/List%20of%20experiments.html |
| 2. | Video link: Logic controller by IIT roorkee which gives hands-on experience to the students https://archive.nptel.ac.in/courses/112/107/112107298/ |

LAB REPORT INSTRUCTIONS

- Provide specific title of the lab experiment.
- Theory: Provide a concise abstract (typically 100-200 words) that summarizes the purpose, methods, key findings, and significance of the experiment.
- Materials/ Equipment: List all materials, components, and equipment used in the experiment. Include specifications when applicable.
- Software/Simulation Tools:
- Experimental Procedure: Describe the step-by-step procedure for conducting the experiment. Be detailed and clear in your instructions. Include diagrams or schematics to illustrate the setup, connections, and component placement. Explain any variations or adjustments made to the standard procedure.
- Observation & Calculations/Analysis: Detail the data you collected during the experiment. Include descriptions of measurements and any calculations made. Use tables, charts, or graphs to present data clearly. Discuss any trends, patterns, or significant observations. Interpret the data in the context of the experiment's objectives. Ensure that all figures, tables, and equations are correctly labeled.
- Results: Summarize the key findings of the experiment. Present results in a clear and organized manner using tables and graphs. Include units of measurement and labels for data points.
- Conclusion: Provide a concise summary of the experiment's key points and outcomes.

GRADING AND ASSESSMENT

- **Continuous Evaluation:** 30 marks
- **Final Demo & Viva:** 10 marks
- **Attendance:** 10 marks
- **Lab Overall Marks:** 50 marks

COURSE POLICIES

- **Attendance:** Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Late Submissions:** Manuals and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**
Monday (12:05 PM - 12:55 PM)
Friday (12:05 PM - 12:55 PM)
- **Contact Information**
satyendra.ece@mietjammu.in



RUBRICS FOR LAB CONTINUOUS EVALUATION

| Parameters | Performance | | | Marks |
|------------------------------------|---|--|--|-----------|
| | Low | Medium | High | |
| Execution of the Experiment | Student was not able to setup and conduct the Experiment completely | Student was able to setup and conduct the experiment but measurement/results/observations were not correct | Students was able to set and conduct the experiment and the measurement/results/observations were not correct | 10 |
| | 0-2 Marks | 3-6 Marks | 7-10 Marks | |
| Record | Student was not able to describe the detailed procedure and could not record the measurement. | Student was able to describe the detailed procedure partially or with some inaccuracy. | Student was able to describe the detailed procedure accurately and record all measurements correctly. | 10 |
| | 0-2 Marks | 3-6 Marks | 7-10 Marks | |
| Viva Voice | Students could not demonstrate sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva. | Students demonstrated sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva. | Students demonstrate strong knowledge of foundation, functional or applied aspects related to the experiment during viva | 10 |
| | 0-2 Marks | 3-6 Marks | 7-10 Marks | |
| Total Marks | | | | 30 |