

Lab Exercise for INST231 course – introduction

Your team’s task is to wire the basic controls for a 3-phase power generating station, which includes a PLC as a “remote terminal unit” (RTU) for a SCADA system we will complete in the next course.

All documentation will be provided to you, to ensure consistency between all six of the generating stations. Any modifications you make in the wiring will be edited in the final diagram version by your instructor.

Objective completion table:

Performance objective	Grading	1	2	3	4	Team
Come up with a good name for your station	mastery	–	–	–	–	
Lay out and mount all components on subpanel	mastery	–	–	–	–	
AC/DC control power wiring test and inspection	mastery	–	–	–	–	
Breaker trip/close wiring test and inspection	mastery	–	–	–	–	
Explain PLC control philosophy document	mastery					– – – – –
PLC discrete I/O wiring test and inspection	mastery	–	–	–	–	
PLC analog I/O wiring test and inspection	mastery	–	–	–	–	
Circuit design challenge (PLC driving relay)	mastery					– – – – –
Lab question: Selection/testing	proportional					– – – – –
Lab question: Commissioning	proportional					– – – – –
Lab question: Mental math	proportional					– – – – –
Lab question: Diagnostics	proportional					– – – – –

The only “proportional” scoring in this activity are the lab questions, which are answered by each student individually. A listing of potential lab questions are shown at the end of this worksheet question. The lab questions are intended to guide your labwork as much as they are intended to measure your comprehension, and as such the instructor may ask these questions of your team day by day, rather than all at once (on a single day).

It is essential that your team plans ahead what to accomplish each day. A short (10 minute) team meeting at the beginning of each lab session is a good way to do this, reviewing what’s already been done, what’s left to do, and what assessments you should be ready for. There is a lot of work involved with building, documenting, and troubleshooting these working instrument systems!