

Lab Exercise for INST232 course – introduction

Your team’s task is to program your generating station’s PLC and create a “detail” screen on a central HMI unit to create a working SCADA system for our miniature 3-phase power grid.

All documentation will be provided to you – including tagnames to be used in the PLCs and HMI – to ensure consistency throughout the whole SCADA system. Any modifications to this plan will be edited in the final documentation version by your instructor.

Objective completion table:

Performance objective	Grading	1	2	3	4	Team
Install Ethernet cable cord grip	mastery	–	–	–	–	
PLC program functional test as per PLC philosophy document	mastery	–	–	–	–	
Network “ping” test of PLC IP address = 169.254.15.X (X = team #)	mastery	–	–	–	–	
Final PLC program inspection	mastery	–	–	–	–	
HMI detail screen functional test as per HMI philosophy document	mastery	–	–	–	–	
Troubleshooting	mastery					-----
Circuit design challenge (diagram sketch)	mastery					-----
Lab question: Selection/testing	proportional					-----
Lab question: Commissioning	proportional					-----
Lab question: Mental math	proportional					-----
Lab question: Diagnostics	proportional					-----
Lab clean-up	mastery	–	–	–	–	
Team tool locker inspection	mastery	–	–	–	–	

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!