Laboratory Exercise - Week 7

Part 1

Topic: Programmable Logic Controllers

Background: Programmable Logic Controllers (PLCs) are widely used in industry and will likely be used when translating the preliminary designs into working systems in any factory environment.

Outcomes:

Use the ladder logic of PLC to simulate (a) the ON and OFF operation of a motor to stir reagents by using switches, (b) the introduction of time delays for the motor operation, (c) the introduction of time usage limits with the motor before its need for servicing is mandated.

Part 2

Topic: Geared Motor Control

Background: Motors are arguably the most widely used actuators in automation. The type of motor to be used is dependent on the application requirements. A gearbox is a mechanical system that is typically attached to motors to alter their rotational positions, speeds, and torques. DC geared and stepper geared motors have differing characteristics that make them useable in different applications.

Outcomes:

Use Simscape to (a) model the control of a geared DC motor, and (b) model the control of a geared stepper motor.

Submit a .zip file (from ONE representative of the team) containing (i) the Simscape (fully labelled) and link for the PLC files of the exercises, and (ii) a brief description of the submission (snapshot pictures are expected) in a .pdf document (not exceeding 500 words). [1 mark]