EE663- Project 2b Report
Servo Motor

Contents

Overview:

The objective of the lab is to control two servo motors using the QNX multi- threaded language. Similar the STML board implementation of controlling servo motors, this purple box is used in real time systems for commanding the servo motor position according to user's inputs. The user l command will move the servo motor 1 position to the left. Likewise, the R command will move 1 position to the right of the servo motor. The P command will pause the servo motor actions. The C command input will resume the actions. The b command will start the recipe's execution immediately. If the N command is passed to the program, no action will be taken.

Cover Page:

Project title	:	Servo motor
Names	:	Deepak Siddharth Parthipan.
E-mail addresses	:	dp9040@rit.edu.
Date of submission	:	12-7-2016.

Areas of Focus:

Vedant Karia	: Problem Statement analysis, Functional Design, Developing Code, Test plan and Report.
Deepak Siddharth Parthipan	: Problem Statement analysis, Functional Design, Developing Code, Test plan and Report.
Zeyar Win	: Problem Statement analysis, Functional Design, Developing Code, Test plan and Report.

Analysis / Design:

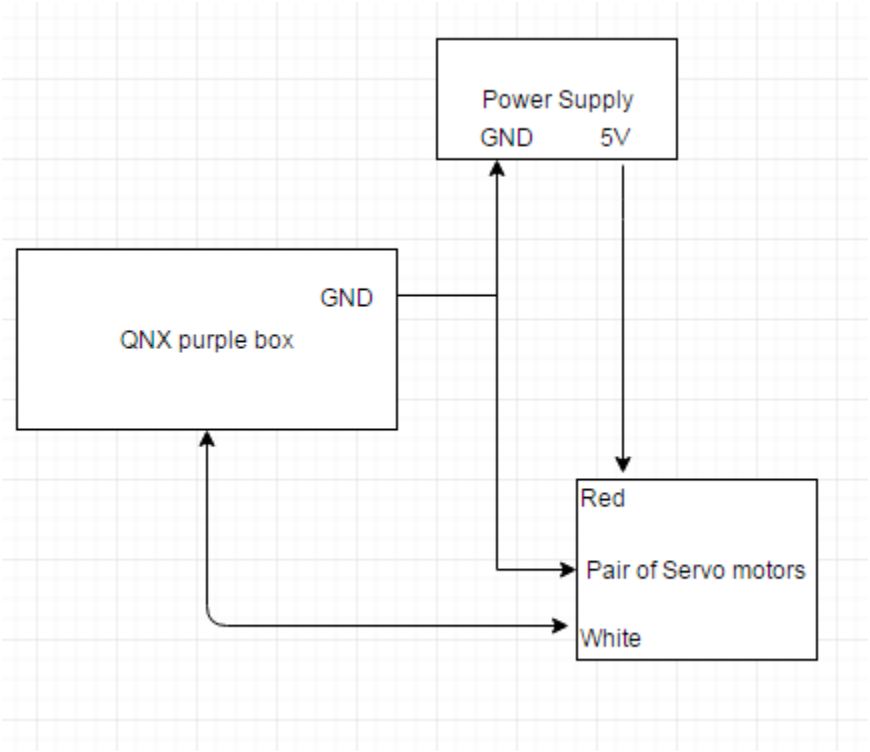

Figure 1: The connection between the hardware architecture

The driver of program is used to control the two servo motors concurrently or different times. The recipes are created with multi-threading to generate the servo motion and position as a user desire. After configuring the hardware and the multithreading functions correctly, the PWM waveforms are obtained in the oscilloscope display.

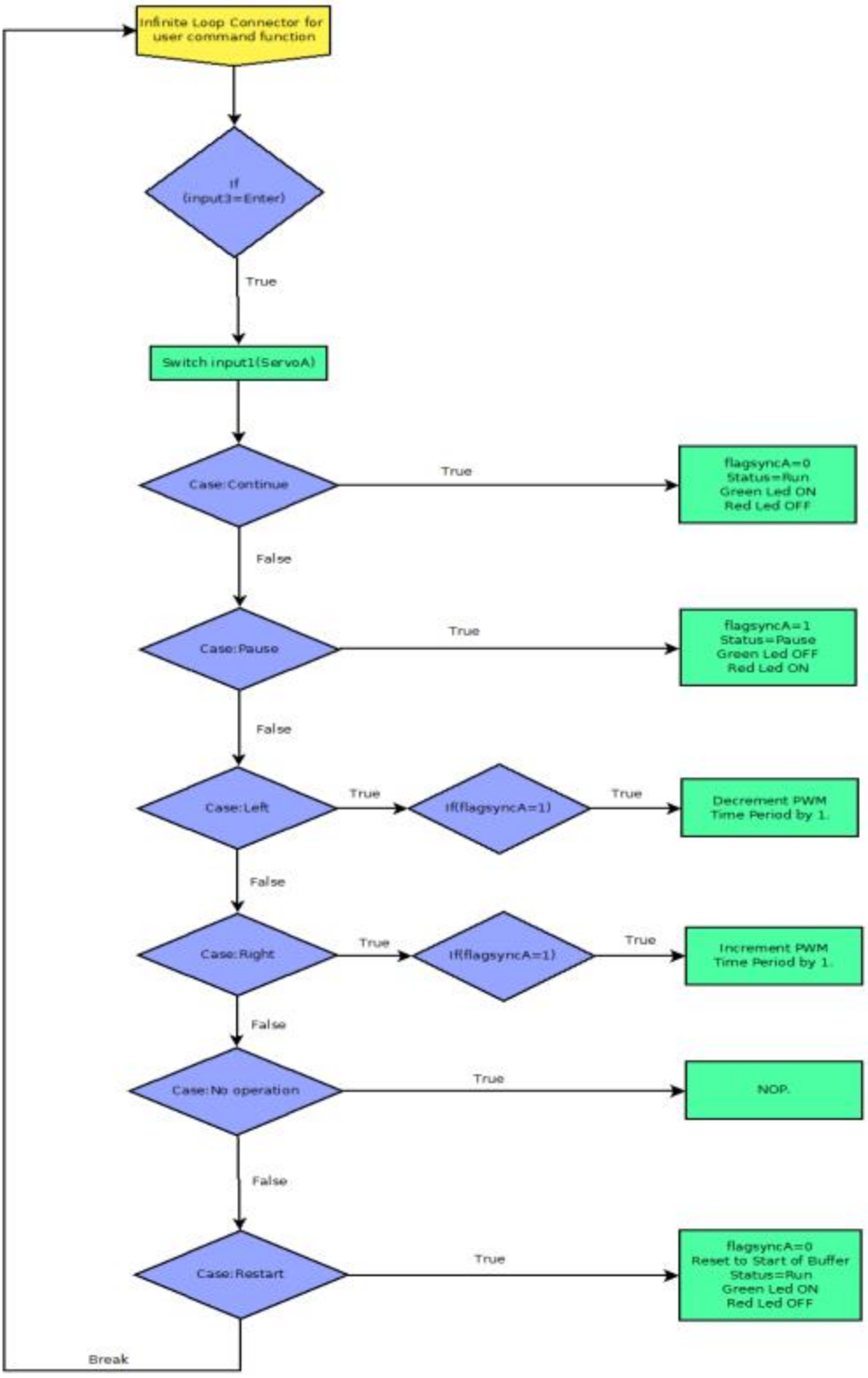

Figure 2: Software flow chart for user reference

Test Plan:

- The recipe cases were checked for each command input.
- The position of the servo motors should move to six designated locations with equal spacing between the positions.
- The output position verify the program's logic and performance.
- Check the positive and negative cases for both opcode and operands.

Project Results:

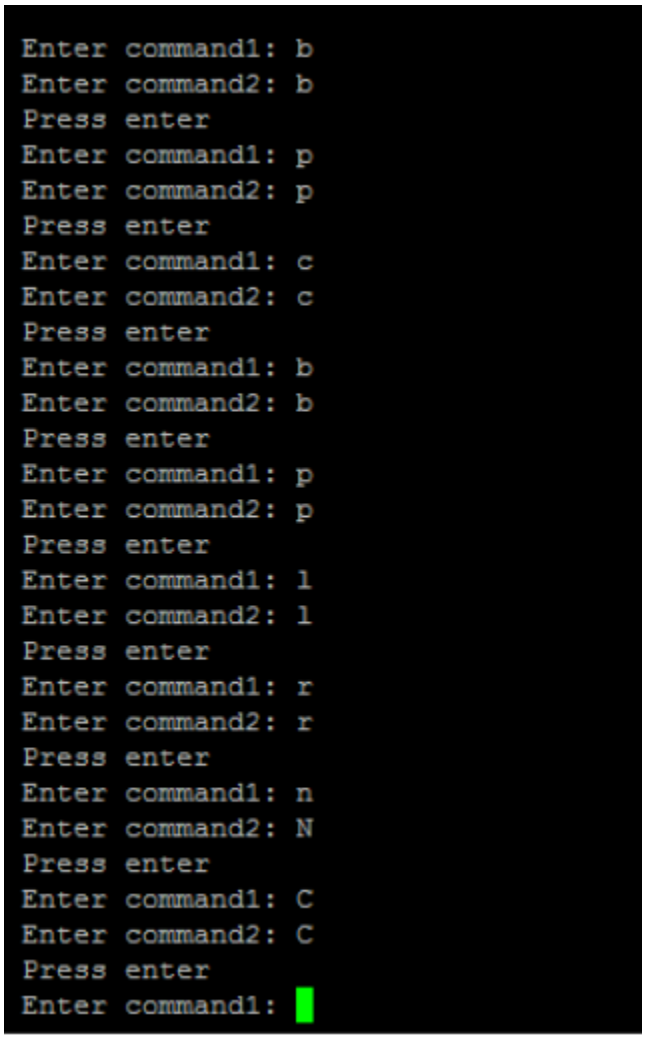

Figure 3: The user interface

Lessons Learned:

- Working with QNX to configure PWM waveforms and learning not only software but also hardware to control the servo motor
- Learning about the digital input output configurations
- Running program with multi-threading functions, nanospin and usleep
- Creating the PWM utilizing the delay
- Debugging the software using both hardware and software aspects
- General C coding methods

Submission:

The output was obtained as expected. The test cases were used to verify the project functionality. The recipe codes were working fine with the correct output servo motor position. Overall, the project was finished without major issue.