

Tetrix Prime Motor Instructions

GENE 121 – Fall 2015

Contents

Introduction	1
Lego NXT Brick Connections	1
RobotC Code – Tetrix Prime Servos	2
Library File.....	2
Setup Code.....	2
Continuous Servo Uncalibrated – Usage	3
Continuous Servo – Calibration	3
Continuous Servo Calibrated – Usage.....	3
Standard Servo – Usage	4
Gripper – Usage	4

Introduction

In this course you have access to three different motors:

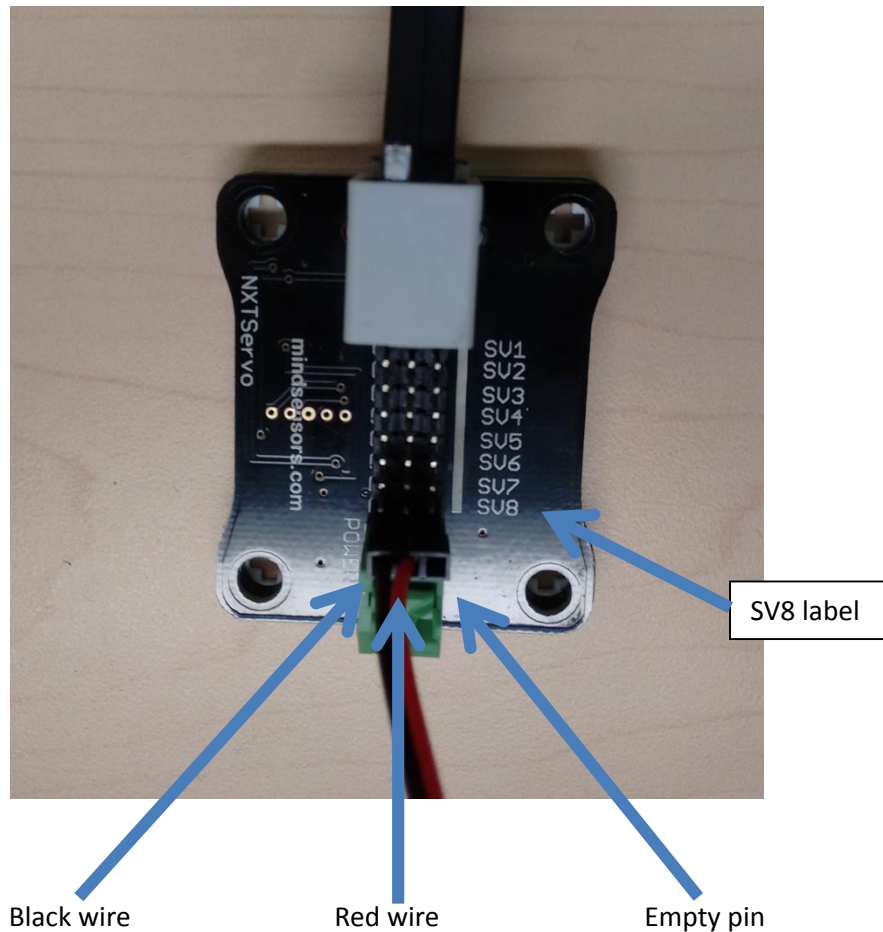
1. Tetrix Prime Standard Servo – ‘S’ inscribed on servo
2. Tetrix Prime Continuous Rotation Servo – ‘C’ inscribed on servo
3. Lego NXT Motor

In order to drive or control these motors, you can use the Lego NXT brick. The Tetrix Prime servos can also be controlled with the red handheld radio controller.

Lego NXT Brick Connections

The Tetrix Prime servos must be connected to one of the sensor ports at the **bottom of the NXT brick** (recommended port: S1). The Tetrix Prime servos require the NXT controller module when connecting to the NXT brick. **DO NOT PLUG THE SERVO CONTROLLER INTO A MOTOR PORT, AS THIS WILL DAMAGE THE CONTROLLER (~\$75).**

Plug the battery pack into SV8 on the servo controller. The black wire is connected to the pin furthest from the SV8 label.



RobotC Code – Tetrrix Prime Servos

Library File

Download the file `NXTServo-lib-UW.c` into the same folder where you store your RobotC code.

Setup Code

Your RobotC program should follow the format shown below (assuming you have plugged the interface into S1):

```
#include "NXTServo-lib-UW.c"

task main()
{
    // configure servo controller port
    SensorType[S1] = sensorI2CCustom9V;
```

```

        // rest of the code
    }

```

Continuous Servo Uncalibrated – Usage

Set the speed of the continuous rotation servos (uncalibrated), values range from -100 (counter clockwise rotation) to +100 (clockwise rotation)

```

setServoSpeed(int nxtPort,
               int servo_number,
               int speed);

```

e.g.

```

// servo is plugged in to SV2, set to rotate at 45
setServoSpeed(S1, 2, 45);

```

```

// stop servo
setServoSpeed(S1, 2, 0);

```

Continuous Servo – Calibration

Plug the servo to be calibrated into the servo controller port SV1. The yellow wire is connected to the pin closest to the SV1 label and the black wire is connected to the pin further from the SV1 label.

Compile and download the ServoDemo.c program to the Lego NXT robot. Run the program.

Using buttons 1 and 2 (right and left buttons) on the Lego NXT brick, increase the servo speed until the servo begins to move. Record the highest servo speed setting for which the servo does not move.

Decrease the service speed until the servo begins to move in the opposite direction. Record the lowest servo speed setting for which the servo does not move.

Continuous Servo Calibrated – Usage

Set the speed of the continuous rotation servos (calibrated to remove the deadband)

```

setServoSpeed(int nxtPort,
               int servo_number,
               int speed_setting,
               int negative_offset,
               int positive_offset);

```

e.g.

```

/* servo is plugged in to SV2
   deadband (when then motor does not move)
   is between -24 and +16
   motor is set to run at 10 counts beyond the deadband
*/
setServoSpeed(S1, 2, 10, -24, 16);

```

Standard Servo – Usage

Set the standard servo to a position between -90 degrees and +90 degrees

```
setServoPosition(int nxtPort,  
                 int servo_number,  
                 int position);
```

e.g.

```
// servo is plugged in to SV4, set to 30 degrees  
setServoPosition(S1, 4, 30);
```

Gripper – Usage

Set the gripper position from 0 to 70.

```
setGripperPosition(int nxtPort,  
                  int servo_number,  
                  int position);
```

e.g.

```
// gripper is plugged in to SV5, partly open, NXT port is S1  
setGripperPosition(S1, 5, 25);
```

To reset the gripper to its neutral position,

```
resetGripper(int nxtPort,  
             int servo_number);
```

e.g.

```
resetGripper(S1, 5); // gripper is plugged in to SV5
```