

# Controlling 3-Wheeled Omnidirectional Nexus Robot with a Lynxmotion PS2 Controller V3

Astrobotic

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## 1 Products Used

- A Lynxmotion PS2 controller V3 (See [here](#))
- Nexus Triangular 100mm Omni Wheel Robot Car (See [here](#))
- macOS High Sierra Version 10.13.4
- Arduino IDE 1.8.5
- ATMEGA328 Arduino Board and I/O expansion board included with the Nexus Triangular 100mm Omni Wheel Robot Car
- PS2X.lib.h, Omni3WD.h, MotorWheel.h, and PID\_Beta6.h libraries (See Section 3)

*Note:* The ATMEGA328 board may need to be installed on the Arduino software. To do this go to Tools → Board → Boards Manager → Search for and download "Atmel AVR Xplained-minis by Atmel University France". After downloading, to interface with the board go to Tools → Board → "Arduino Duemilanove or Diecimila" and then set the Processor to ATmeg328P.

## 2 Controlling the Nexus Robot with the Lynxmotion PS2 Controller

### 2.1 Interfacing the Controller and the ATMEGA328 Arduino Board

It is recommended to connect the following Lynxmotion pins to the specified analog pins on the ATMEGA328:

- PS2 DAT pin → A2
- PS2 CMD pin → A3
- PS2 ATT pin → A4
- PS2 CLK pin → A5
- PS2 5V pin → 5V
- PS2 GND pin → Ground

The send commands to the Nexus robot through the PS2 controller, the following names for each button are defined in the PS2X library (Download [here](#)) and must be used:

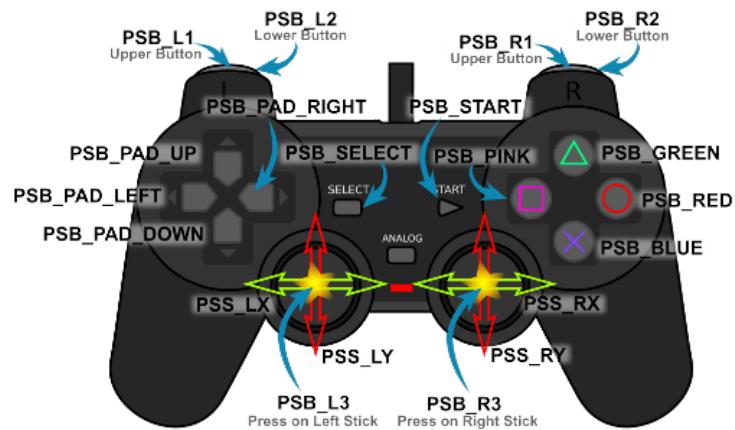


Figure 1: The names for each button used in Arduino.

## 2.2 Determining the Front, Back, Left, and Right of the Robot



Figure 2: The front of the robot according to the Omni3WD library.

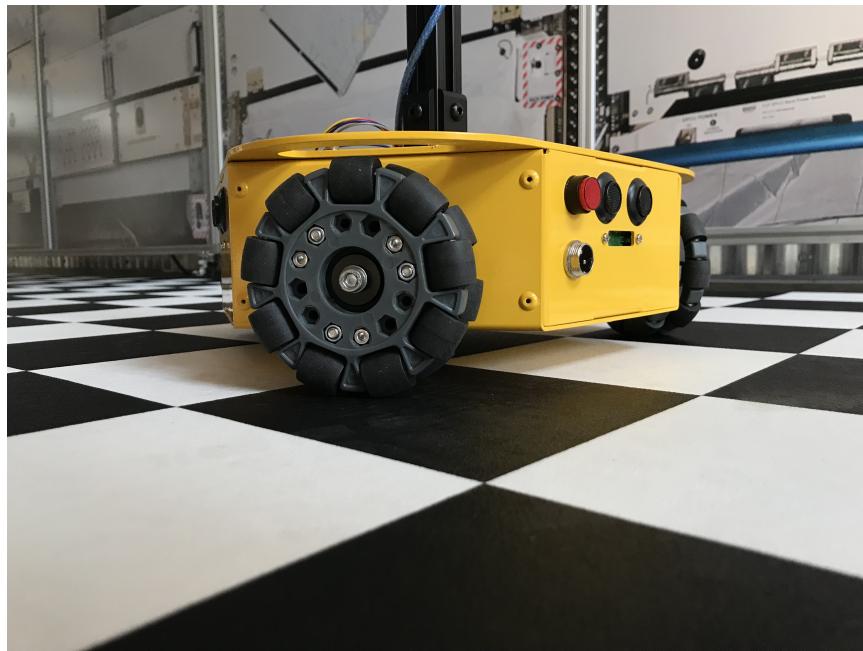


Figure 3: The right wheel of the robot according to the Omni3WD library.

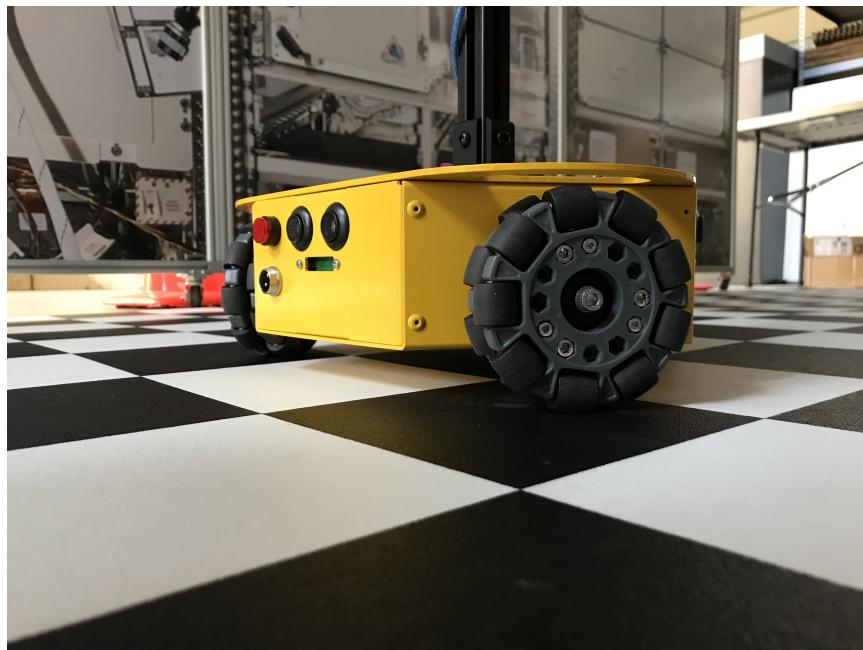


Figure 4: The left wheel of the robot according to the Omni3WD library.

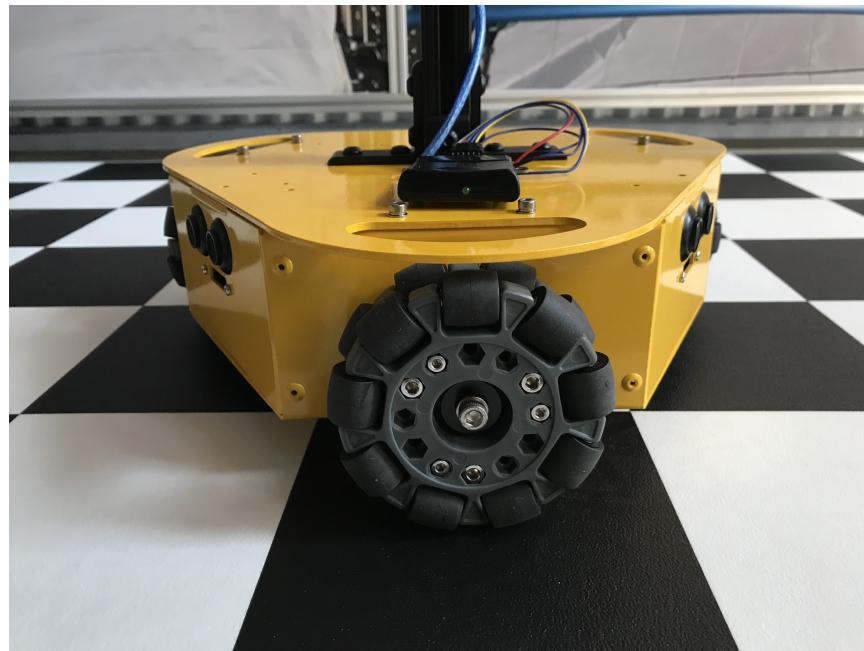


Figure 5: The back wheel of the robot according to the Omni3WD library.

It is important to note that when the robot is directed to go in a forward motion, with the left joystick pointed forward (See 2.3 below for controls), the robot will move only in the direction that the front face is facing. Likewise, if the left joystick is pointed left, right, or back, the robot will travel to the left, right, or backwards, respectively, relative to whichever way the front face of the robot, with the on button and power plug-in, is facing.

### 2.3 Directing the Robot

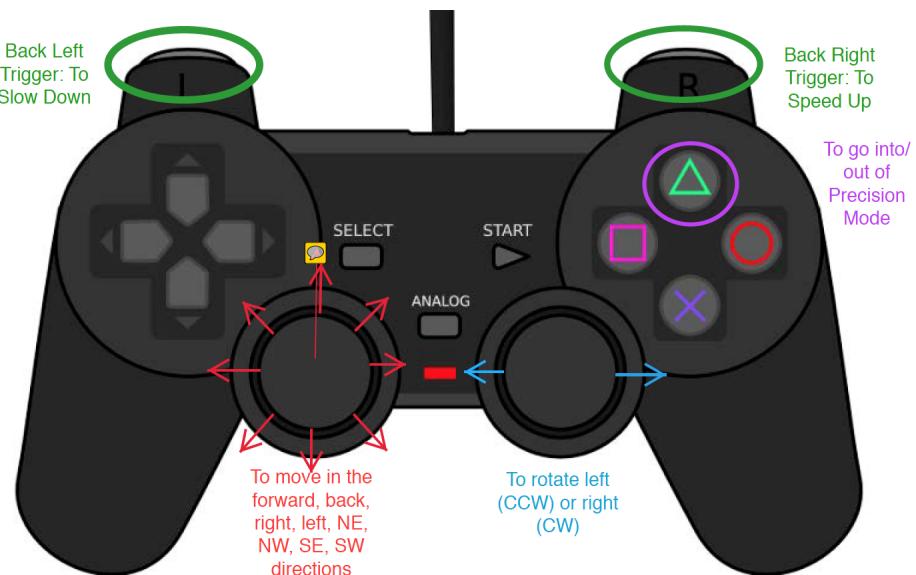


Figure 6: Controls for maneuvering the Nexus Robot.

### 3 Useful Links

- For connecting the Lynxmotion controller see [here](#)
- PS2X Library Download [here](#)
- PID\_Beta6 Library Download [here](#)
- MotorWheel Library Download [here](#)
- Omni3WD Library Download [here](#)