Mechanic PV2 User Guide

The PV2 version of the LabVIEW SuGO program assumes two drive motors, two line (light) sensors, one set of SumoEyes and a third defensive "Slap" motor . These should be mounted as follows:

- Drive motors can be located at the front, or rear, of the SuGObot. One on each side.
- Line sensors must be located at the front of the SuGObot (one on each side) looking down, and raised approximately ½" off the ground.
- SumoEyes must be at the front of the SuGObot looking forward. Ideally these should be mounted between 1 and 3 inches off the ground, aimed out in a flat horizontal plane.
- Slap Motor is optional, but can be used to defend against an opponent directly in front of the SuGObot. Ensure that the Eyes do not see any part of the defensive tool.

The SuGObot software requires that the drive motors (outputs) and sensors (inputs) are plugged into specific ports on the NXT.

Outputs	• Left Wheel:	Port C
	• Slap Motor:	Port B
	• Right Wheel:	Port A
Inputs	• Left Line Sensor:	Port 4
	• Right Line Sensor:	Port 1
	• SumoEyes:	Port 2

Left and Right are relative to the front of the SuGObot.

The "Mechanic PV2" program.

Each SuGObot is loaded with a program called "Mechanic PV2". This program can be used to establish the correct motor drive direction and speed, as well as to verify that all the sensors are connected to the right ports, and are working properly.

Install ALL the NXT cables as per the table above. Follow the test procedure (next page).

Mechanic PV2 test procedure.

Place the SuGObot on the white portion of the field, and run **Mechanic PV2**.
Note: The SuGObot must be placed on the white portion of the field to calibrate the line sensors.

Motors:

Press the **ORANGE** button on the NXT to run the drive motors through a short sequence of "**forward** & reverse", "**SuGO** slap", "**right** & left". The NXT will **speak** these commands to verify the correct direction. If the robot moves incorrectly, you must fix the forward/reverse direction first.

If the SuGObot starts moving backwards first

- Use the **LEFT ARROW** to move the selector pointer (>)on the screen , and the Right arrow to change the value between **NORMAL** and **reverse**. Press the **ORANGE** button again to retest. The same applies to the Slap Motor.

If the SuGObot turns to the Left first

- The motor wires must be reversed**. Switch** the wires at the motors, **or** at the NXT (ports A & C). Press the **ORANGE** button again to retest.

Once the drive motors have been verified, move on to sensor testing.

Sensors:

When the SuGO Mechanic program is running, you can place an object in front of the SumoEyes, or a black surface under the line sensors, and the NXT will **speak** what it sees.

Line Sensors (test with black surface)

- Speaks: "Left" or "Right"

SumoEyes (test with solid object)

- Speaks: "Left Object", "Forward Object" or "Right Object"

If any of these do not report correctly, check that each sensor cable is plugged into the correct port. If the SumoEyes continually report, check that there are no stray objects (like cables) in front of the eyes.

When testing is complete, exit the SuGO Mechanic program and run the SuGObot program as a final test. Secure all wires to ensure that the sensors and wheels will not be entangled by cables.

