

## Mechanic C2 User Guide (NXT 2.0 Kit with Color Sensor)

The SuGO (C2) program assumes two drive motors, one color sensor, one light Sensor and one set of SumoEyes. These should be mounted as follows:

- Drive motors can be located at the front, or back 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  $\frac{1}{2}$ " off the ground. **Color sensor on LEFT, Light sensor on RIGHT.**
- 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.

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 |
| • Right Wheel: | Port A |

### Inputs

- |                      |        |
|----------------------|--------|
| • Left COLOR Sensor: | Port 4 |
| • Right Line Sensor: | Port 1 |
| • SumoEyes:          | Port 2 |



*Note: Left and Right are relative to the forward motion of the SuGObot.*

## The “Mechanic C2” program.

Each SuGObot should be loaded with a program called “Mechanic C2”. 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. (Note: Requires Color Sensor on LEFT Side)

*Note: Programs and full instructions can be downloaded from - <http://www.sugobot.com/SOP>*

## “Mechanic C2” test procedure.

Place the SuGObot on the white portion of the field, and run **Mechanic C2**.

*Note: The SuGObot must be placed on the white portion of the field to calibrate the line sensors.*

### Motors:

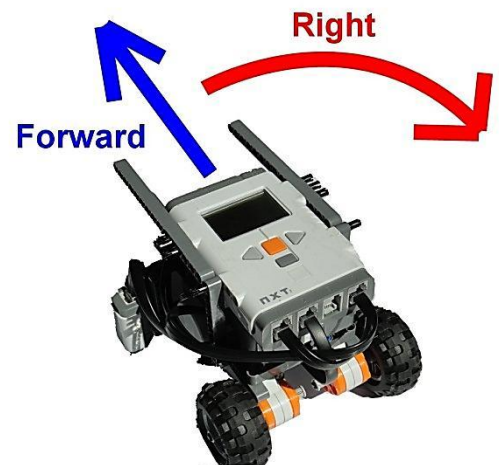
Press the **ORANGE** button on the NXT to run the drive motors through a short sequence of “**forward & reverse**”, “**right & left**”. The NXT will **speak** these commands to verify the correct direction. If the robot moves incorrectly, you must fix the forward/reverse direction first.

If the SuGObot starts moving backwards first

- Use the **LEFT ARROW** to change the NXT display between **NORMAL** and **reverse**. Press the **ORANGE** button again to retest.

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 B & 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 **SuGO C2** program as a final test. Secure all wires to ensure that the sensors and wheels will not be entangled by cables.

Now you're ready to: Ready, Set, SuGO!

*Note: Programs and full instructions can be downloaded from - <http://www.sugobot.com/SOP>*