How to SSCI SoccerBots

Integrated Hub

# Hardware Inventory

* (1) Integrated Hub
* (2) Battery packs for the Hub (micro USB)
* (1) Wall adapter for the Hub (micro USB)
* (2) EV3 SoccerBots: SSCI-19, SSCI-24
* Blue SSCI Soccer Bots bucket. Inner tray stores small inventory.
* (4) Silver Logitech gamepads (marked with yellow, blue, green, red tape)
  + The Blue and Yellow micro receivers are permanently installed in the Hub
* (8) spare AA batteries for gamepads
* (2) Patchwork leather hacky sack ball
* (1) 6’ folding table
* (1) folding wooden border for table edge
* (1) Plug strip for charger power
* (1) Extension cord. Choose size for venue.

# Hardware Setup

* Table
  + Unfold wooden border, connect clips, and drop onto table. It should fit snugly.
* Integrated Hub:
  + Ensure battery is charged (or power is available for wall adapter)
  + Mount Hub to bracket on side of field border
* Inspect robots:
  + Ensure all joints, cables, and fittings are snug and connected

# Software Setup

Do these steps for each Robot:

1. Insert batteries in Gamepads (Game Controllers)
2. Boot both robots (press center dark gray button). Robots take a couple minutes to boot.
3. Attach power to Integrated Hub. It takes a minute to boot. *See Details page for pix & info.*
4. Start SoccerBot program on each robot:
   1. Ensure Bluetooth logo appears next to battery level icon at top of screen.
      * Reboot robot until Bluetooth logo appears.
   2. Select “File Browser”, click dark gray button
   3. Select “RunSoccerbot.sh\*”, click dark gray button
   4. Robot is ready when lights turn solid orange or green and the PowerUp meter shows
5. A group of fans on a table

   Description automatically generatedOn Integrated Hub:
   1. Verify that all status lights are green:
6. Press Red button on Hub to enter Test mode.
7. Verify control of robot by pressing any button on gamepad first, THEN try thumbsticks second.
8. Press Red button to return to Attract Mode

# Gameplay

* Each player gets 1 try per wait-in-line.
* Give quick controls training to new players as required. Use Test mode (Red button toggles test)
  + Any button activates the PowerUp (go fast or flip), but it’s limited and must recharge.
  + Thumbsticks use “Tank” style control, which is harder, but faster
  + D-pad uses “Arcade” style control, which is easier, but slower
  + Robot screen is PowerUp meter and shows available power-up.
* Objective is for a robot to make the ball to touch the wall at the far end of the field.
* Match play:
  + Player bots begin by touching the end-wall directly in front of each player
  + Check players ready. “Drivers are you ready?”
  + Drop ball at center field.
  + Press Green button to start match (Plays “Charge” music)
  + Match lasts until any goal is scored or 1-minute, whichever comes first.
    - If goal is scored, Press Green button to ring bell and end match.
    - If time runs out, buzzer sounds and match ends automatically.
    - If you need to abort a match early, press the Red button.
  + Bots that fall over are restored in-place, or at home position for grossly mismatched players. Gameplay does not stop while ref corrects a fallen bot.

# Shutdown and pack up

* Hub
  + **NEVER UNPLUG POWER FROM THE HUB WITHOUT SHUTTING IT DOWN PROPERLY**
  + Shutdown the Integrated Hub by holding the Red button for 5 seconds until the lights look like this A close up of a fan

    Description automatically generated Shortly after, they will all go dark.
  + **IMPORTANT: After the Hub status lights go dark, WAIT 30 SECONDS before unplugging its power.**
* Robots
  + Shutdown the robots: Click the back button until “Power Off” appears. Select that.
* Gamepads
  + Remove the batteries from the gamepads.

# Details About the Hub

* The Hub can be powered with the wall adapter or the battery pack. (Micro USB)
* The battery pack is properly installed like this:  
  A black rectangular object with a white rectangular object with a red button

  Description automatically generated
* The lights on the battery pack show its charge level. (The lights are on the Velcro side) Each of the 4 lights seem to be good for about 4+ hours of playtime. That’s roughly 16 hours total per pack. The topmost light will always blink while connected to the Hub.  
  A close-up of a button with blue lights

  Description automatically generated
* When the Hub gets power, there will be a red glow inside the corner by the power plug.
* The Hub will boot automatically when it has power. It takes almost a minute between plugging power and being ready to go.
* When the Hub is starting, it will be dark for a while, then the status lights will briefly turn white as the code starts up.
* When the Hub is ready, the status lights will look like this:A group of fan blades

  Description automatically generated

Blue Player Game Status Yellow Player

Robot OK?

Gamepad OK?

* The Gamepad OK lights should always be Green, even if the Gamepads are asleep.
* After the robots are started and connect to the Hub, their OK lights will turn green:  
  A group of fans on a table

  Description automatically generated
* The Center Lights show the game status:

|  |  |  |  |
| --- | --- | --- | --- |
| **Mode** | **Center Lights** | **Robots** | **Display** |
| Attract | A group of fans on a table  Description automatically generated | Disabled | scrolling text “PLAY SoCCERbotS” |
| Test | A close up of a light  Description automatically generated | Enabled | text “tESt” |
| Active Game | A green light with a black pole  Description automatically generated | Enabled | 1 minute count-down timer |

# Troubleshooting

* After selecting “RunSoccerbot.sh”:
  + The lights keep flashing green forever
    - Check the screen for messages. If it says a motor is not connected, check that motor’s cable on both ends. If it looks well connected, try unplugging one end and re-plugging it. The message should clear and the robot will go to the orange lights. If it doesn’t clear, then reboot the robot.
  + The light goes orange for a while, then solid green back at the main menu
    - Ensure the Bluetooth logo appears at the top of the menu screen. Reboot the robot until the logo appears.
* Robot suddenly stops dead
  + Hub is in Attract Mode. Robots are disabled.
  + Robot battery died. Replace battery, reboot robot and RunSoccerbot.sh
  + Hub lost power. Check Hub power.
  + Gamepad stopped working. See gamepad section below. Replace batteries. (Flashing Green light on gamepad may warn of low battery)
* One Robot wheel stops driving
  + Check motor cables to be completely plugged in
* Robot left wheel stops driving or controls start behaving very strangely
  + Gamepad “Mode” button got pressed. (See gamepad section below.) Check for Solid Green light on Gamepad. Press “Mode” button next to light to make it go out.
* Gamepad issues
  + Most gamepad issues can be diagnosed using the green light on the front of the gamepad.  
      
    This chart shows the meaning of the status light while *no buttons* are being pressed on the gamepad.

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **Gamepad is working** | **Gamepad is not working** |
| **Green Light** | **Off** | Connected; Normal operation | Gamepad asleep/dead batt |
| **On** | Mode switched (d-pad/stick swap) |  |
| **Flashing** | Low battery | Lost sync |

* + The gamepad will go to sleep if no button is pushed for several minutes. When this happens, press any button (*not the thumbsticks*) to wake it back up.
    - If the gamepad connects to the Hub, the green light will blink once and go out.
    - If the gamepad cannot connect to the Hub, then the green light will flash for 10 seconds and the gamepad will go back to sleep.
  + If the gamepad is working normally, but the green light is flashing, the batteries are getting low. Don’t worry, even after the light starts flashing, the batteries will still last for several hours.
* Bluetooth issues
  + Bluetooth issues can be tricky. Try these steps. Stop when you get a good connection:
    1. Reboot the Robot until it shows the Bluetooth Logo