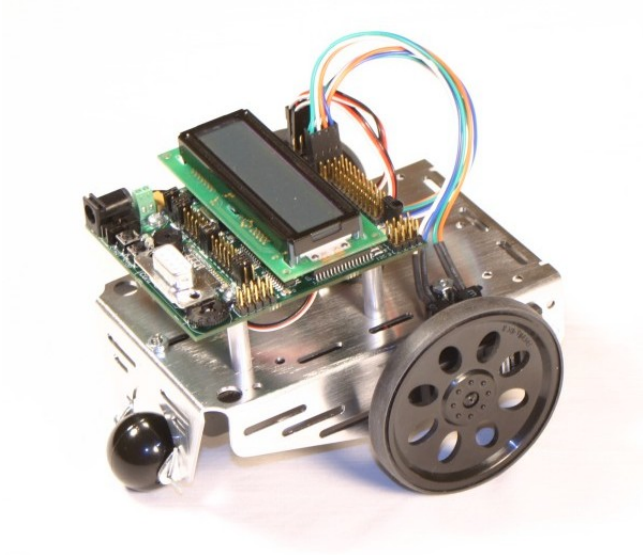
RidgeSoft™

IntelliBrain™-Bot

Educational Robot

Assembly Guide



www.ridgesoft.com

Revision 1.0

Introduction

This document provides instructions to guide you through assembly of your IntelliBrain-Bot. It takes approximately one to two hours to assemble the IntelliBrain-Bot.

IntelliBrain-Bot Parts

Your IntelliBrain-Bot kit includes the parts shown and listed below.

Parts List:

- 1 IntelliBrain™ robotics controller
- 1 LCD display module
- 2 infrared photoreflector sensors
- 1 battery holder
- 1 metal chassis
- 2 continuous rotation servos
- 2 large wheels
- 4 rubber band tires
- 1 ball tail wheel
- 1 13/32” grommet
- 4 1” standoffs
- 1 cotter pin
- 10 3/8” (long) 4-40 round head screws
- 2 3/8” (long) 4-40 flat head screws
- 4 1/4” (short) 4-40 round head screws
- 4 1/4” (short) 4-40 flat head screws
- 12 4-40 nuts
- 1 6’ serial extension cable (not shown)
- 1 Software and documentation CDROM (not shown)

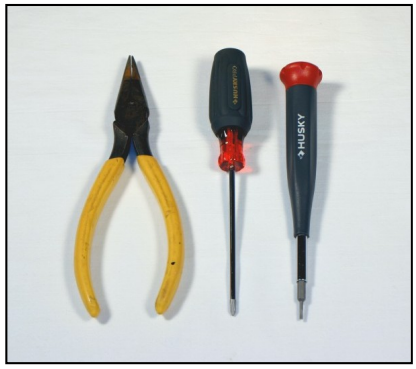
In addition to these parts, you will need four AA alkaline, NiCad or NiMH batteries, which are not included with the IntelliBrain-Bot kit.

Assembly Tools

You will need the following tools to assemble your IntelliBrain-Bot:

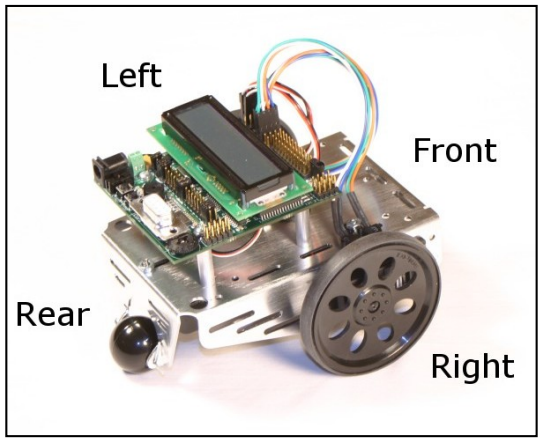
Tools:

- #1 tip Phillips screwdriver
- 1/16” flat tip screwdriver
- needle-nose pliers (optional)



Orientation

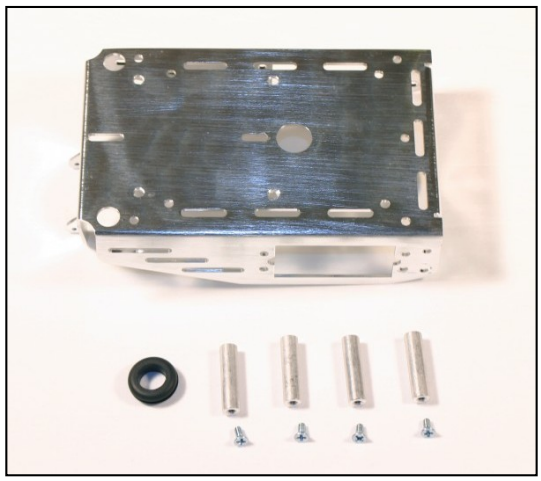
Before getting started, take a moment to review the picture of the fully assembled IntelliBrain-Bot, to the right. Familiarize yourself with the orientation of the robot, as several of the assembly steps refer to the orientation.



Installing the Standoffs and Grommet

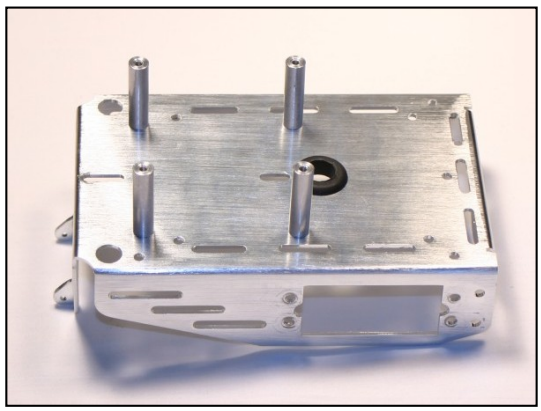
Parts:

- 1 metal chassis
- 1 grommet
- 4 standoffs
- 4 short flat head screws



Instructions:

1. Insert the grommet in the large center hole in the chassis.
2. Use four short flat head screws to attach the standoffs as shown. Leave the screws slightly loose to make it easier to align the standoffs when you attach the IntelliBrain controller.

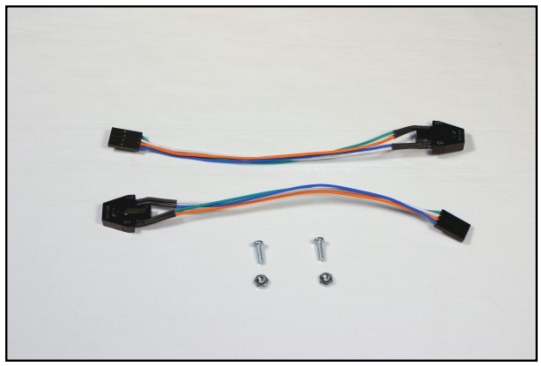


Attaching the Wheel Encoder Sensors (optional)

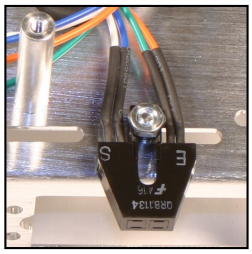
You may use the infrared photoreflector sensors included with the IntelliBrain-Bot as wheel encoder sensors. If you choose to use these sensors for wheel encoding, complete this step, otherwise proceed with the following step.

Parts:

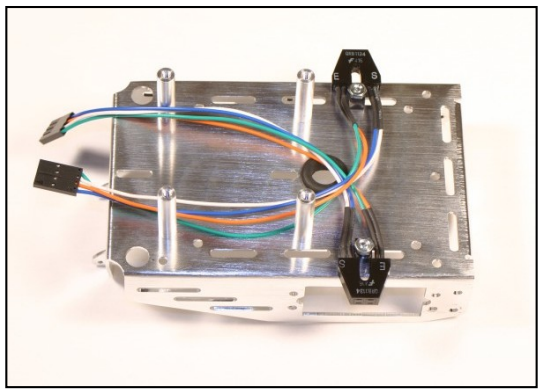
- 2 infrared photoreflector sensors
- 2 long round head screws
- 2 nuts



Instructions:



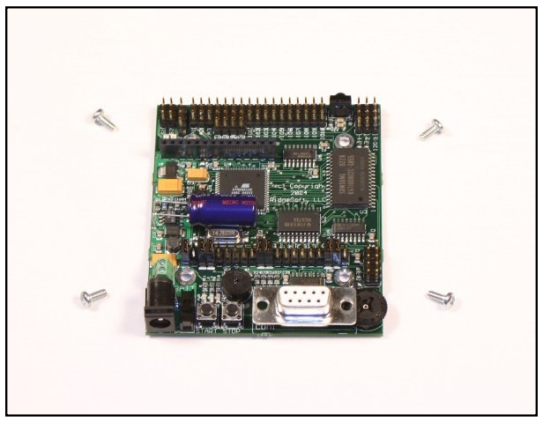
1. Insert a long round head screw through from the bottom of the forward-most slot on the chassis deck.
2. Slide an infrared sensor over the screw protruding from the top of the chassis and loosely fasten it in place with a nut.
3. Slide the sensor and screw all the way to the rear end of the slot and extend the sensor as far over the side of the chassis as possible, as shown in the detailed photo.
4. Aim the sensor to point straight to the side and fully tighten the screw.
5. Repeat the previous steps for the second sensor.



Attaching the IntelliBrain Controller

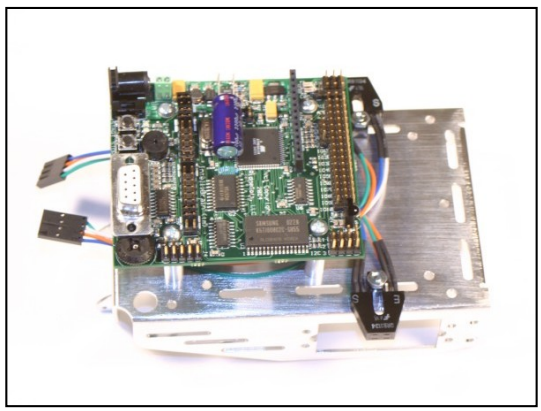
Parts:

- 1 IntelliBrain controller
- 4 short round head screws



Instructions:

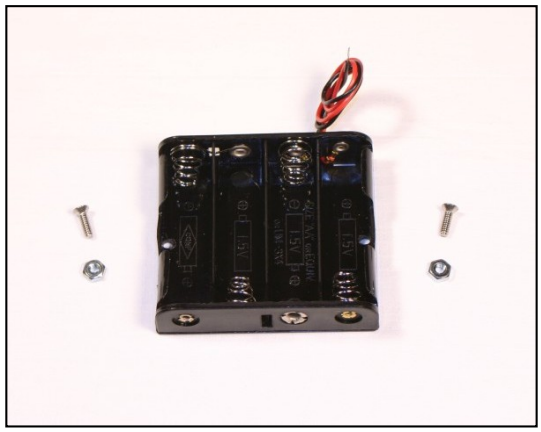
1. In the orientation shown, attach the IntelliBrain controller to the four standoffs using four short round head screws.
2. Tighten the four round head screws holding the IntelliBrain controller in place until they are snug, but do not over tighten them.
3. Tighten the four flat head screws that fasten the bottom ends of the standoffs to the chassis until they are snug.



Attaching the Battery Holder

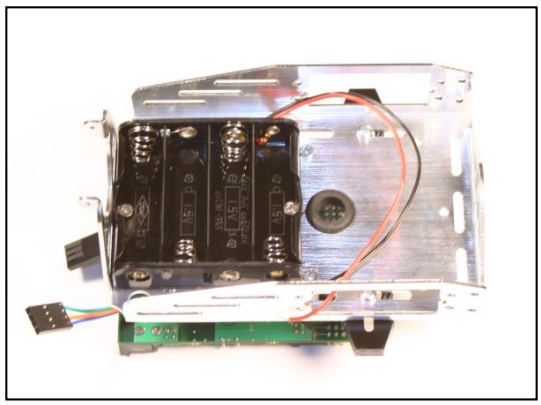
Parts:

- 1 battery holder
- 2 long flat head screws
- 2 nuts



Instructions:

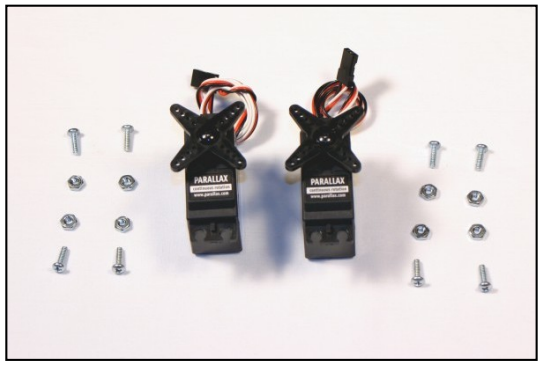
1. Position the battery holder as shown, paying special attention to the position of the two wire leads.
2. Insert two long flat head screws through the battery holder first and then through the slots in the chassis.
3. Attach a nut on each screw on the top side of the chassis to fasten the battery holder in place.



Attaching the Servos

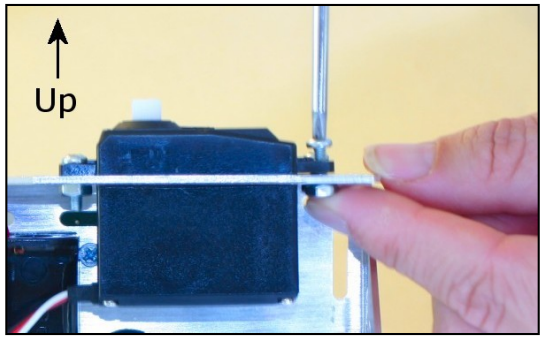
Parts:

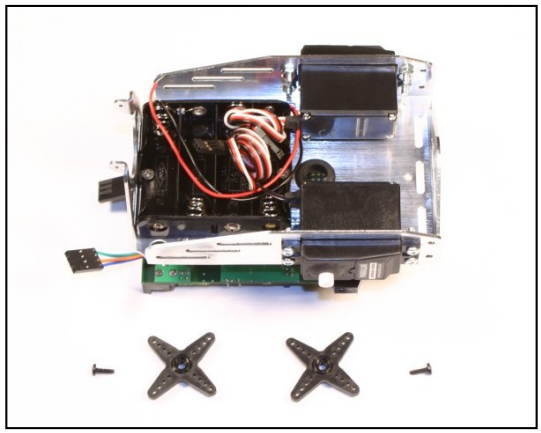
- 2 continuous rotations servos
- 8 long round head screws
- 8 nuts



Instructions:

1. Remove the servo horn (four pronged plastic piece on the end of the servo shaft) from each servo by removing the screw and pulling the horn off. The servo horns are spare parts that you will not use, but you will use the screws later to attach the wheels.
2. Set the robot chassis on its edge then slide a servo into the servo mounting hole from above, positioning the servo such that the shaft is nearest to the center of the chassis, as shown to the right.
3. With the chassis on its edge, fasten the servo in place with four long round head screws and nuts, positioning each nut from below using your finger and inserting the screws from the above, as shown. This will be easiest if you keep the chassis on its edge and position the nut, using your finger, under the hole before inserting the screw, as shown.
4. Repeat the previous steps to install the other servo.

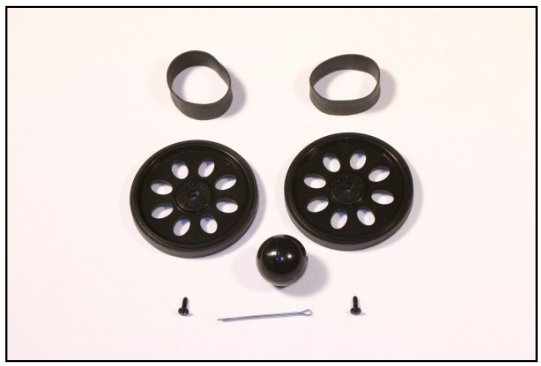




Attaching the Wheels

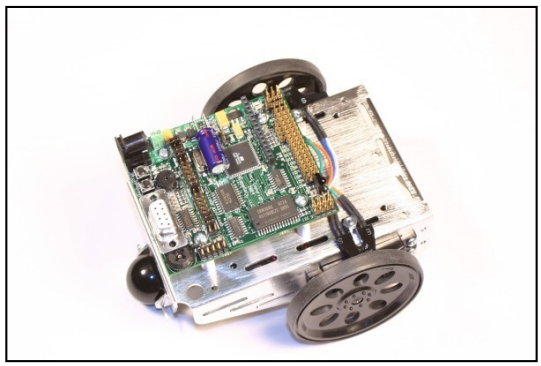
Parts:

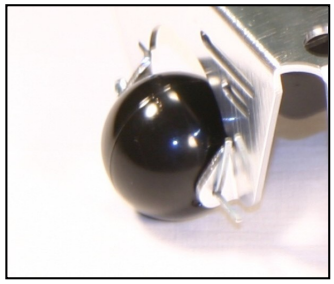
- 2 large wheels
- 2 rubber band tires
- 2 black screws previously removed from the servos
- 1 ball tail wheel
- 1 cotter pin



Instructions:

1. Stretch a rubber band tire over each large wheel. The other two rubber band tires are spares.
2. Press a large wheel on to a servo shaft.
3. Fasten the wheel in place with the black screw you previously removed from the servo.
4. Repeat the previous steps for the other large wheel.
5. Hold the tail wheel ball between the mounts on the chassis then slide the cotter pin through the mounting holes and the hole in the ball.
6. Bend the ends of the cotter pin apart so it can't slide out of place.

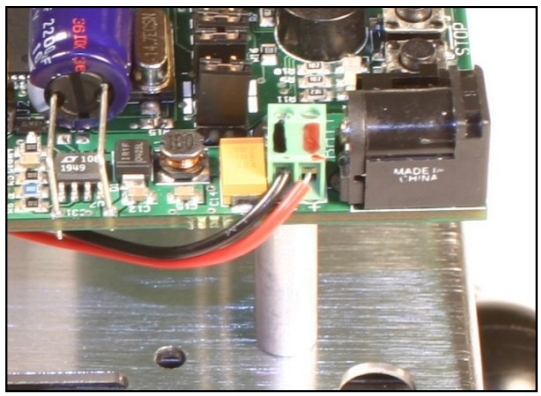




Attaching the Battery Power Leads

Instructions:

1. Slide the battery holder leads through the hole in the grommet in the center of the chassis.
2. Insert the end of the red lead into the battery terminal on the right, with the red mark, on IntelliBrian controller then fasten it in place by tightening the screw in the terminal block with a 1/16" flat tip screw driver until the screw is snug and the lead is held securely in place.
3. Similarly, fasten the black lead into the black terminal, on the left.

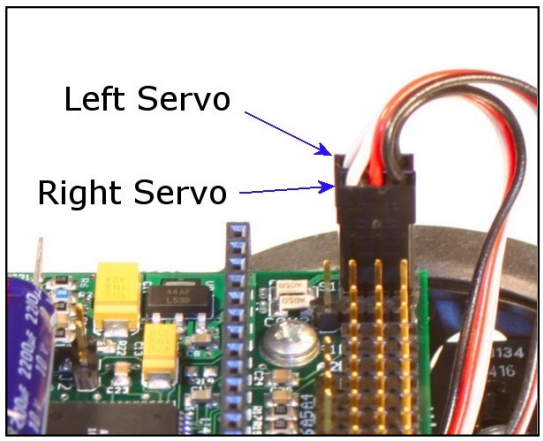


Attaching the Servo Leads

NOTE: INCORRECTLY CONNECTING THE SERVO MAY DAMAGE THE SERVO. Carefully follow the instructions below to avoid damaging your servos.

Instructions:

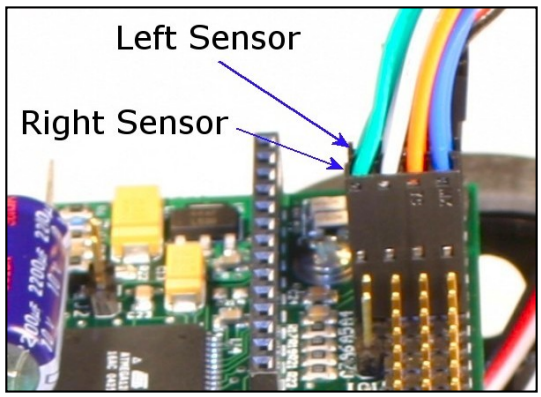
1. Slide the left servo leads through the hole in the grommet.
2. Attach the left servo lead connector to servo port 1, marked “S1”, on the front-left corner of the IntelliBrain controller with the connector oriented such that the black lead attaches to the pin nearest the front edge of the IntelliBrain controller.
3. Repeat the previous steps, for the right servo, attaching it to servo port 2, marked “S2”.



Attaching the Wheel Encoder Sensor Leads (optional)

Instructions:

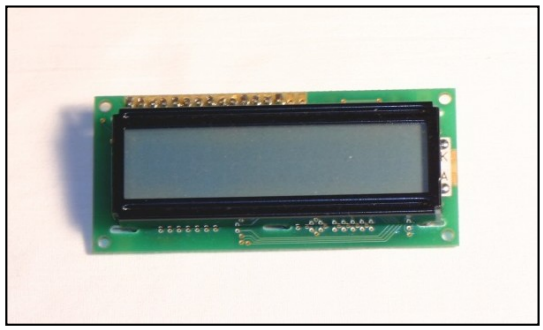
1. Aligning the blue lead with the pin nearest the front edge of the IntelliBrain controller, attach the leads from the left wheel encoder sensor to analog port 4, marked “A4”, on the IntelliBrain controller.
2. Attach the right wheel encoder sensor to analog port 5, marked “A5”, on the IntelliBrain controller, aligning the blue lead with the pin nearest the front edge of the IntelliBrain controller.



Attaching the LCD Display

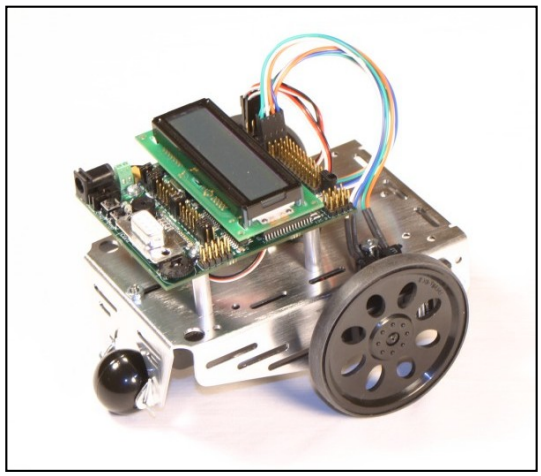
Parts:

- 1 LCD display module



Instructions:

1. Align the 14 pin connector on the LCD module with the 14 pin connector on the IntelliBrain controller.
2. Look carefully to ensure each pin is properly aligned with its hole in the connector.
3. Gently press the display module on to the IntelliBrain controller until the pins are completely inserted.



Re-checking Connections

To avoid damage to the electronics, re-check each connection.

Instructions:

1. Check that the left servo is connected to the port marked S1.
2. Check that the right servo is connected to the port marked S2.
3. Check that the black lead on each servo is connected to the pin nearest the front edge of the IntelliBrain controller.
4. Check that the left sensor is connected to the port marked A4.
5. Check that and the right sensor is connected to the port marked A5.
6. Check that the blue lead on each wheel encoder sensor is connected to the pin nearest the front edge of the IntelliBrain controller.
7. Check that the red battery lead is attached to the red battery terminal and the black battery lead is attached to the black battery terminal.

Inserting Batteries and Powering your IntelliBrain-Bot

Parts:

- 4 AA alkaline, NiCad or NiMH batteries

Instructions:

1. Check that the power switch on the left rear corner of the IntelliBrain controller is in the off position (switch knob pushed toward the rear of the board).
2. Insert the batteries into the battery holder in the orientation indicated on the battery holder.
3. Switch the power on and verify the RoboJDE™ welcome message is displayed on the LCD screen.

Congratulations, you are now ready to begin programming your IntelliBrain-Bot!