ABOT CHASSIS ASSEMBLY GUIDE

ABOT-0004
02/13

Features

- Abot assembly
- Distance sensor and servomotor data

Description

The guide for assembling the Abot robot chassis
Including the basic data

Table of Contents

1. Introduction

This document provides a step by step assembly guide for Abot

You can also find the Servo and Distance sensor basic data.

2. Basic data

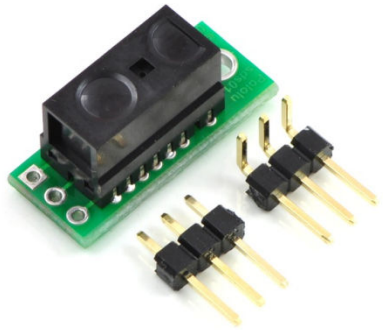
2.1 HSR-1425CR Continuous Rotation Servo

HSR-1425CR Continuous Rotation Servo	
Motor Ctrl (PWM)	Yellow
Motor pwr (4.8-6.0V)	Red
Motor GND	Black

Control System	Pulse Width Modulation 20 000uSec Frame
Neutral position	1 500uSec +/-50uSec
Direction	Clock wise pulse traveling 1500 to 1900uSec
Operating Voltage	4.8 to 6.0V
Idle current	7.7mA
Running current	150mA no load

2.2 Pololu Carrier with Sharp GP2Y0D810Z0F Digital Distance Sensor 10cm

Digital Distance Sensor	
Square pad	GND
operating voltage: 2.7 V to 6.2 V	VIN
digital out	OUT



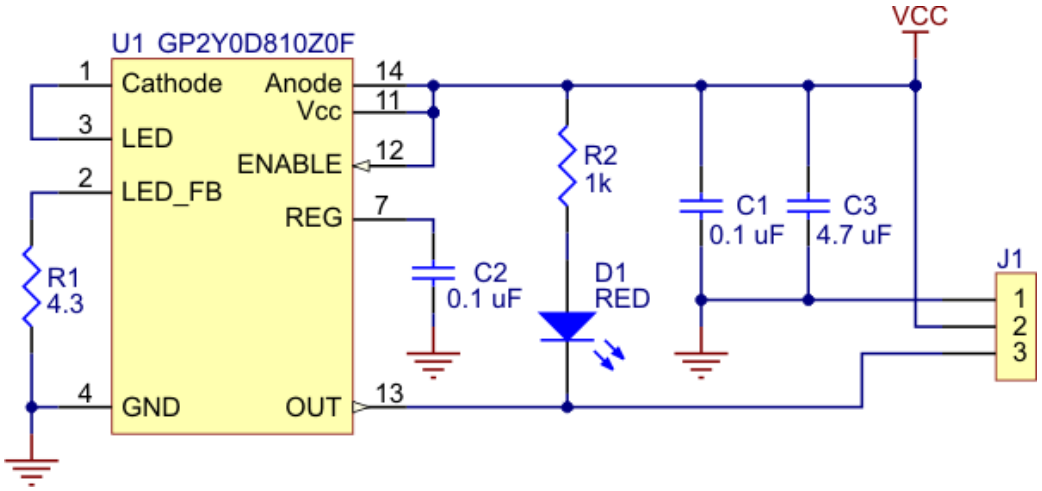
The square pad is ground, the middle pad is VIN (2.7 – 6.2 V), and the remaining pad is the sensor output, OUT.

The output, Vo, is driven low when the sensor detects an object; otherwise, the output is high.

The Pololu carrier board lets you interface with the GP2Y0D805 or GP2Y0D810 sensor using a three-pin 0.1" connector, such as the included 3×1 straight male header strip and 3×1 right-angle male header strip.

Feature summary

- operating voltage: 2.7 V to 6.2 V
- average current consumption: 5 mA (typical)
- distance measuring range for GP2Y0D810Z0F: 2 cm to 10 cm (0.8" to 4")
- output type: digital voltage
- steady state response time: 2.56 ms typical (3.77 ms max)

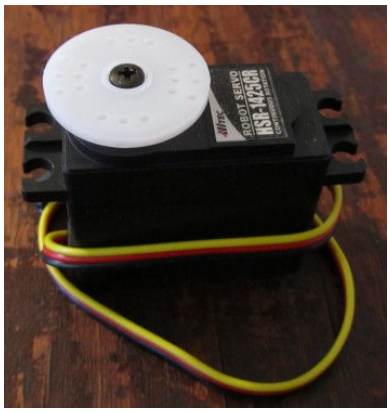


3. Assembling Abot

Tools required

- Screwdriver
- Drill with 2mm bit

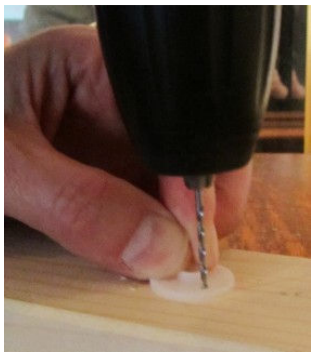
3.1 Assemble the wheels



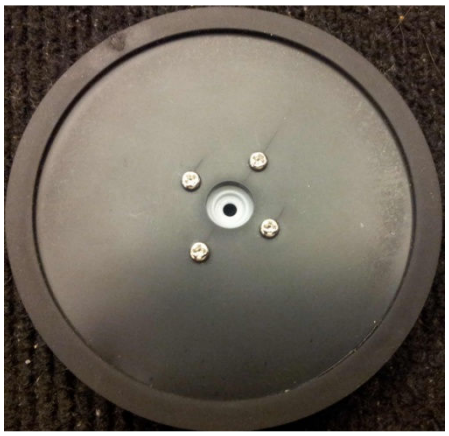
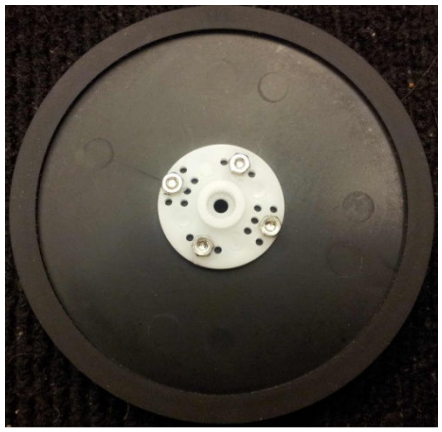
Unpack the motor



Remove the center screw

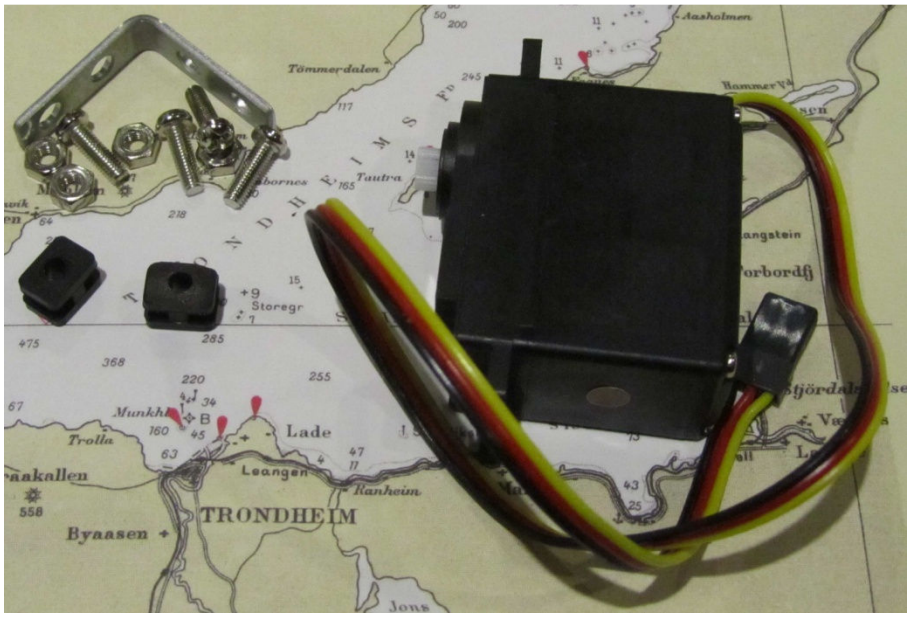

Use a 2mm drill on the 4 holes for wheel to horn assembly, selected holes shown in picture bellow.

Note:
Abot wheel and servo horn are slightly misaligned in rev.1
One method to assemble is: select the horn holes indicated on the picture bellow, assemble the 3 that fit first and use the drill on the 4th.

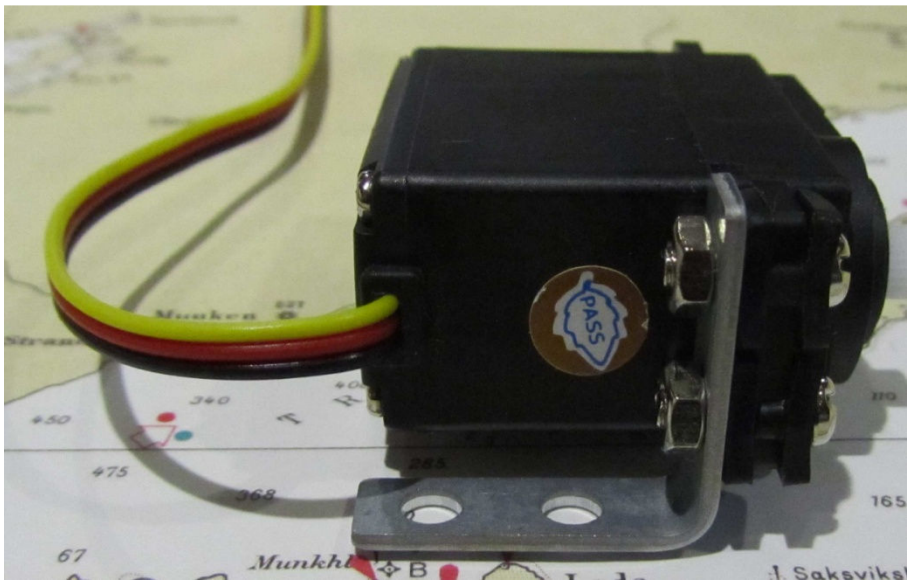



Attach the horn to the wheel using 4x 2mm screews w/nut

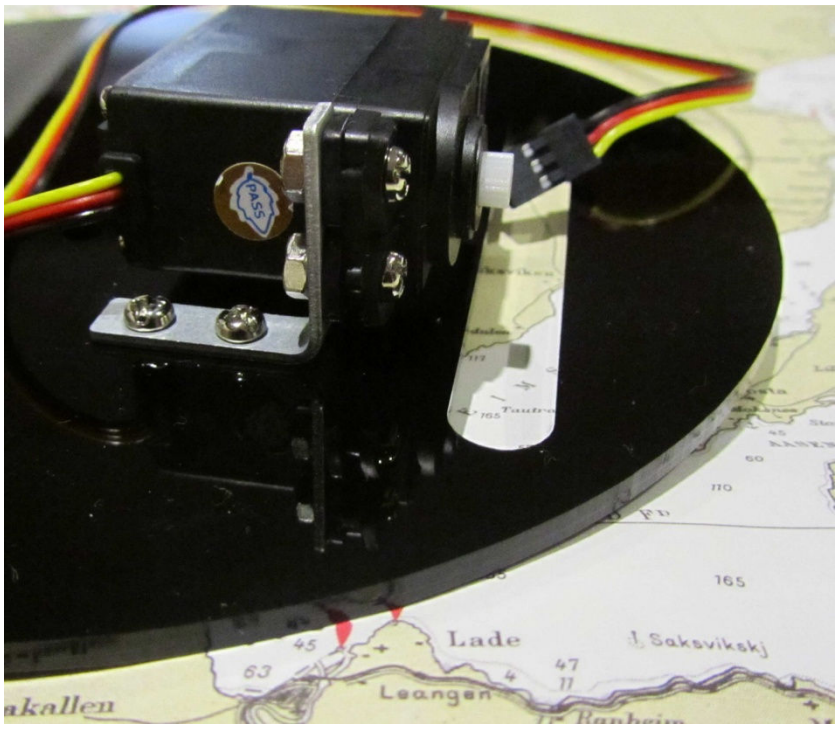
3.2 Assemble the motors



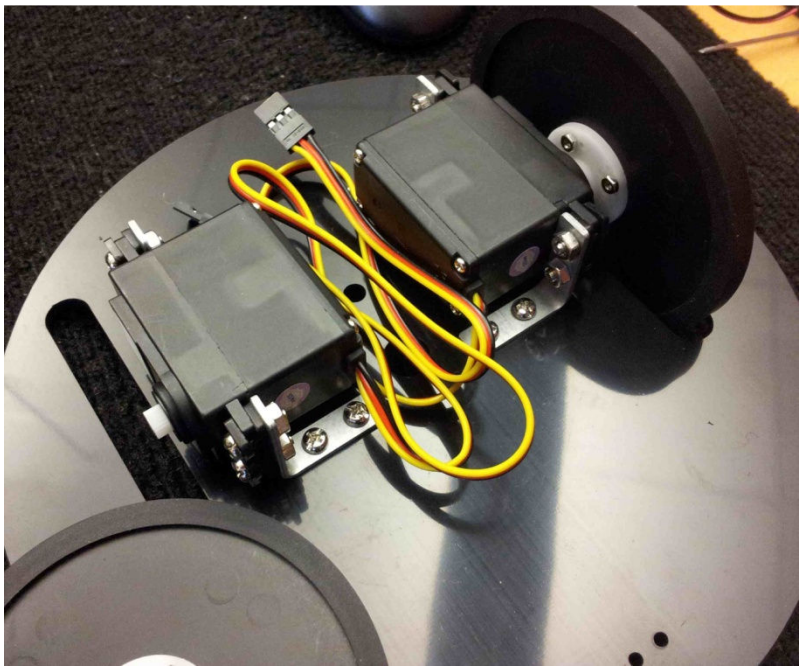
To assemble one bracket you need these parts



Assemble bracket to motor

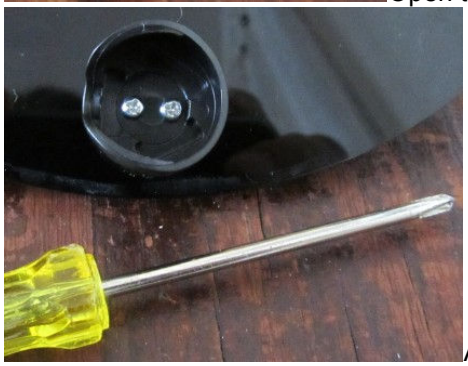


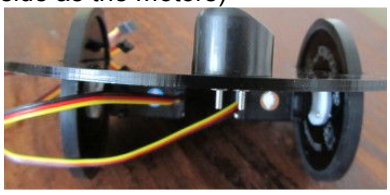
Assemble motor to chassis


Adjust to allign wheels before fasten

3.3 Assemble the ball caster

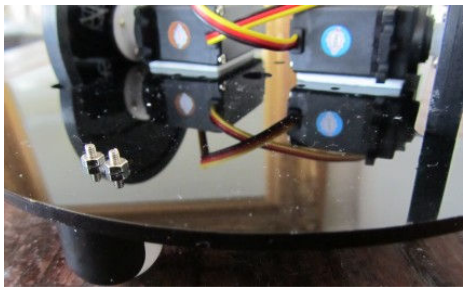

Open the pacage and remove the ball.


Attach the ball caster to the base plate with the two shortest screw’s (on the oposit side as the motors)

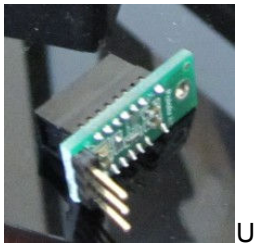


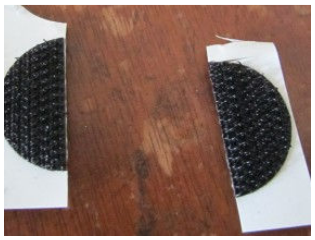
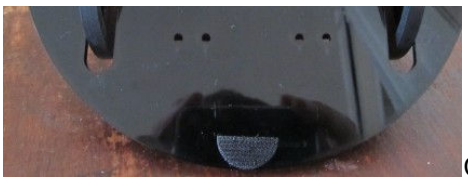


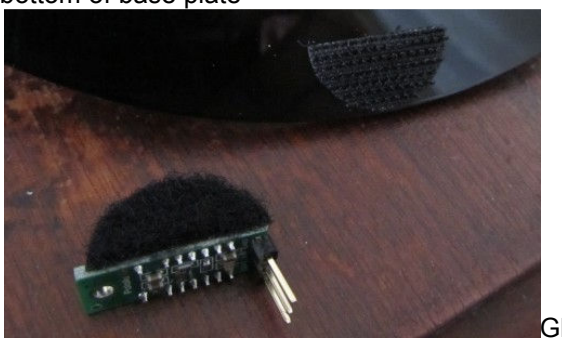
Insert the white cylinders and insert the ball



3.4 Assemble the Distance Sensor



Unpack the sensor and solder the connector



Cutt the Velcron in a sutable size and glue to front bottom of base plate


Glue the other Velcron part to the sensor


Attach wires and fasten the sensor to the base plate

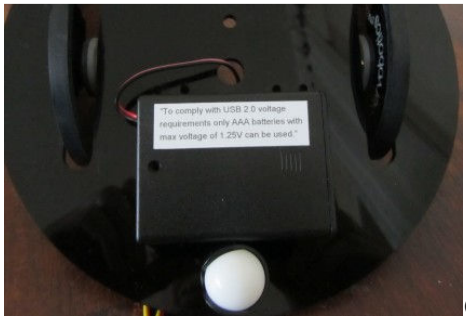
3.5 Assemble battery


Unpack battery case


Glue Velcron to battery case



Attach other part of Velcron to battery case and remove protection



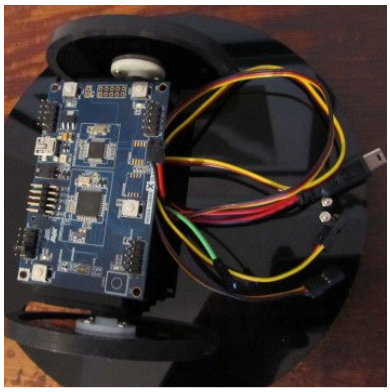
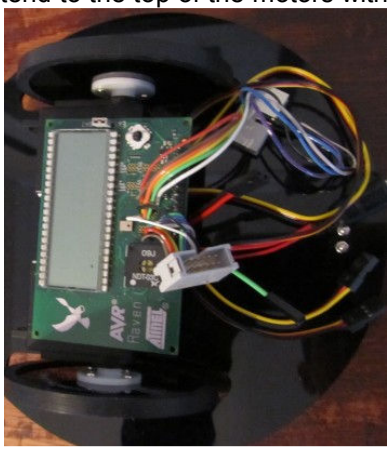
Glue the Velcron to the base plate by the ball caster.

3.6 Assemble control unit

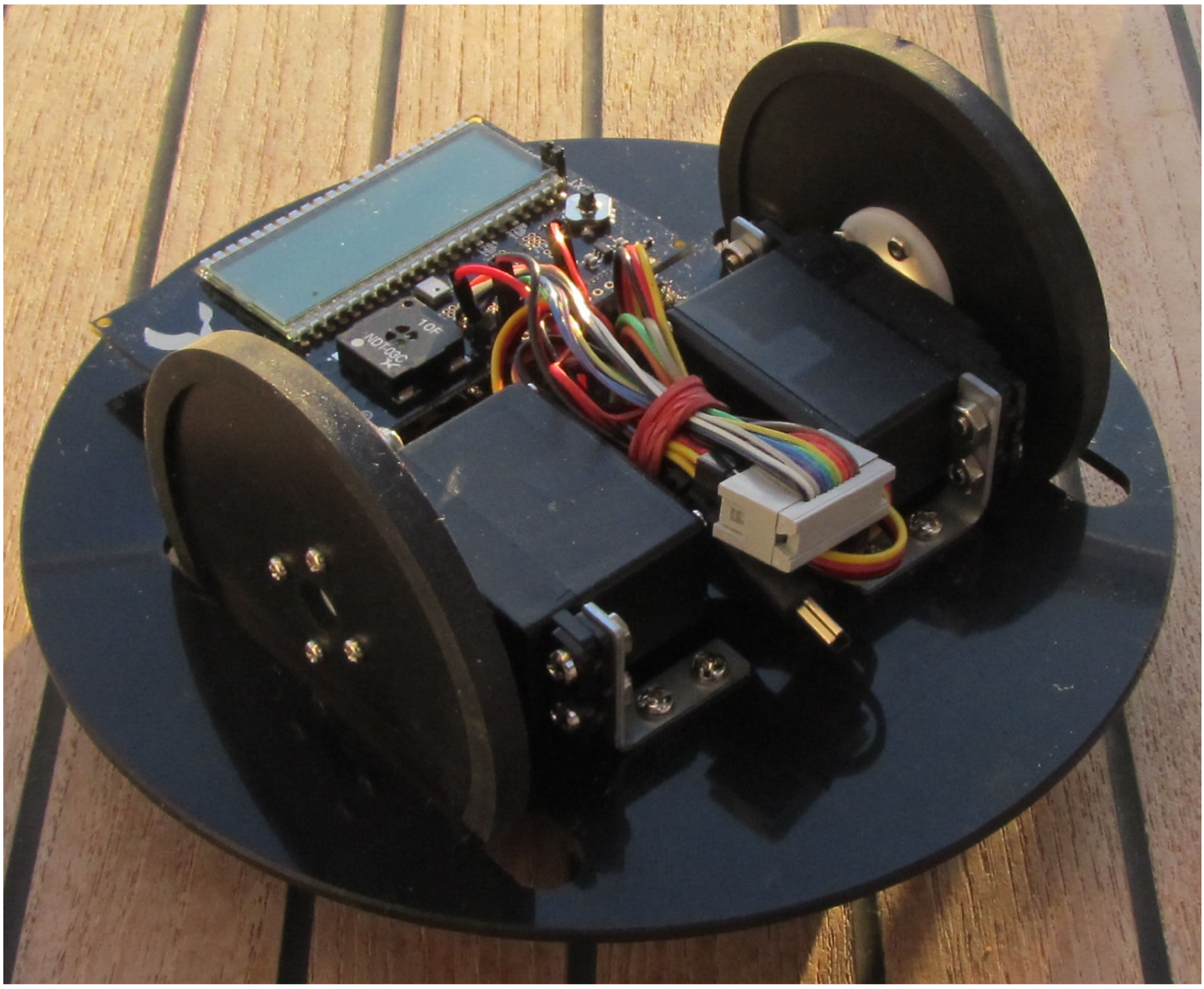
A number of development boards from Atmel can be used as control unit.
Bellow an example with the Raven kit (ATAVRRZRAVEN) and the MEGA-1284P Xplained (ATMEGA1284P-XPLD)


The wires can be “hidden” between the motors

The Raven or XPLD kit can be fastend to the top of the motors with Velcron

Or behind the motor:



3.7 Add yor own stuff

It is easy to glue or screw new sensors etc. to the chassis.

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