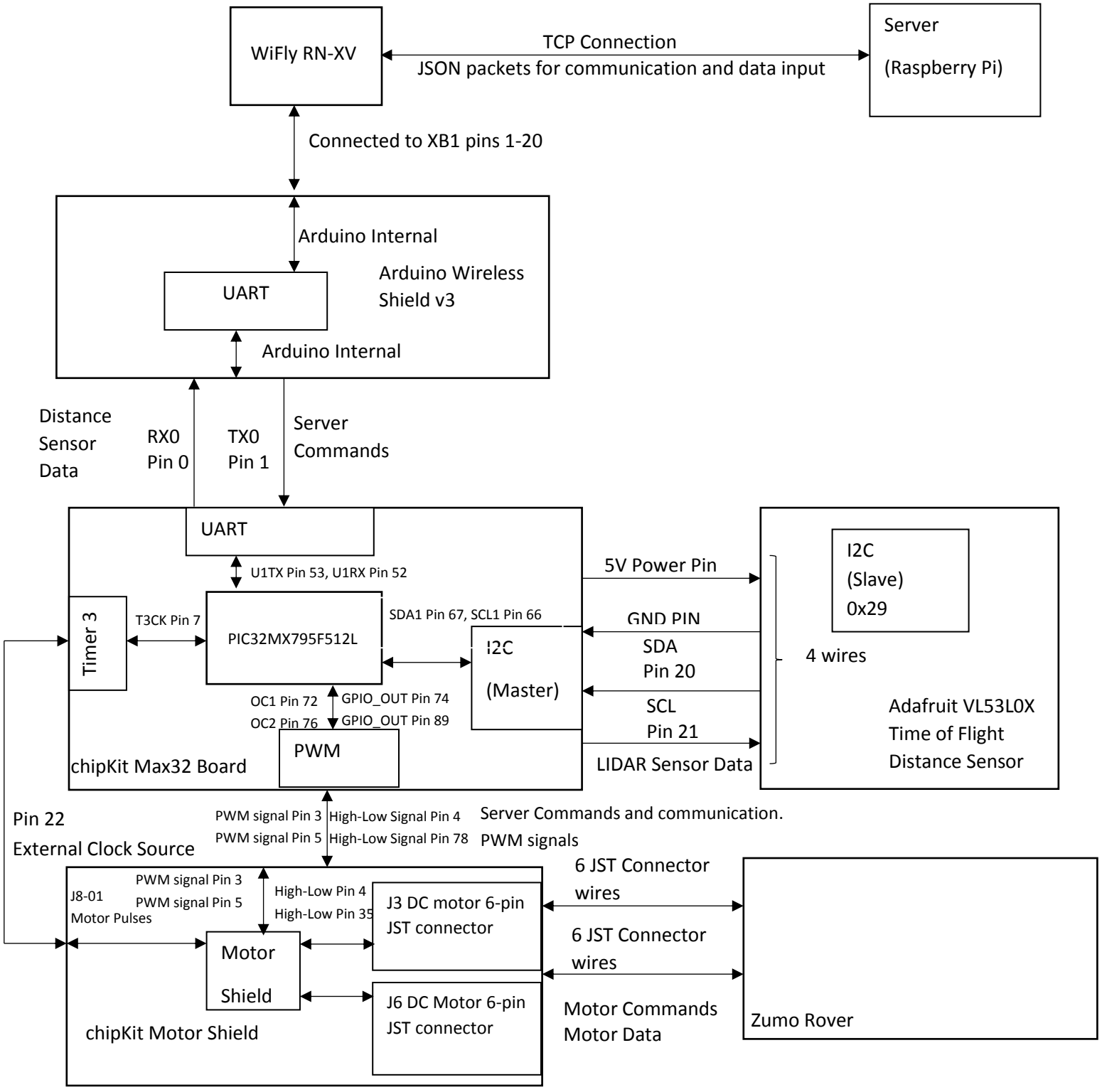
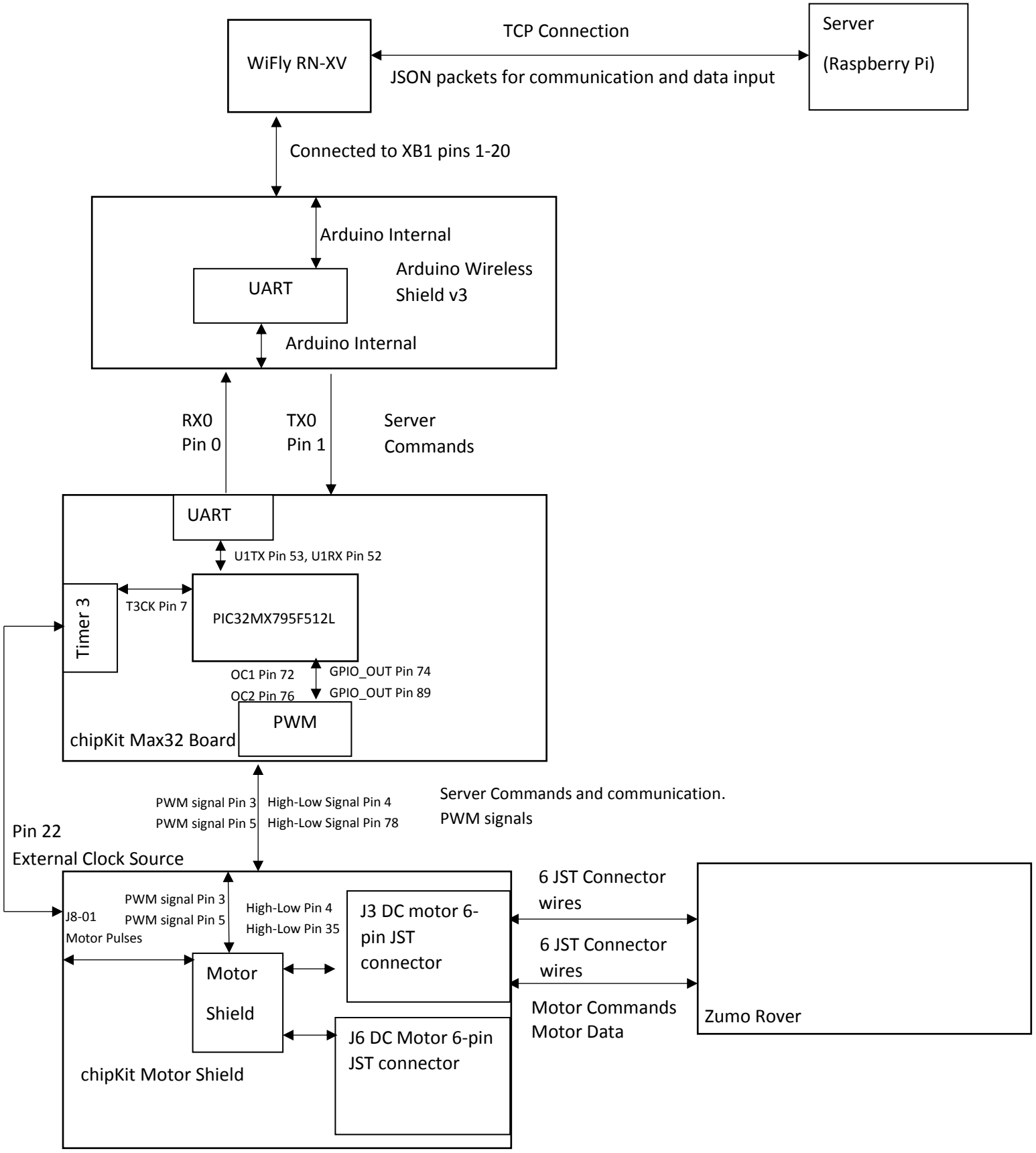
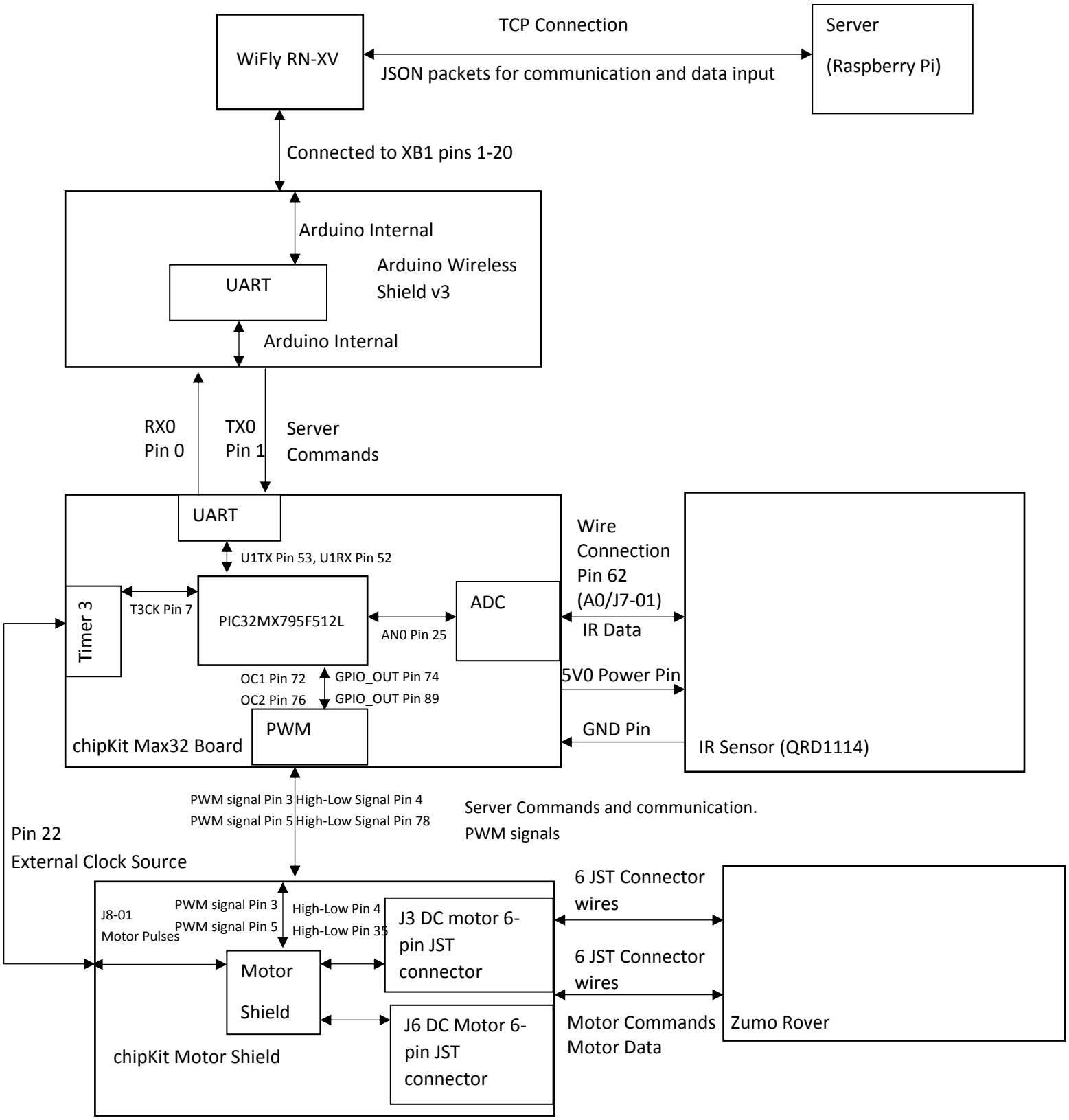
Mapping Rover



Hiding Rover



Seeking Rover



Description

Board Placement and Sensors

The placement of the boards will have the Max32 be the base board with the Motor Shield going on top of that and the Arduino Wireless SD board going on top of that. This will be the same setup for all rovers in the system. The distance sensor will only be present on the Mapping rover and will be positioned on top of the Wifly module. The Hiding rover will have no sensors attached to it and will use data from the server and its own motor data to determine its position. The Seeking rover will have a IR reflective sensor on it and will be placed around the rover.

Communication

UART will be used to communicate with the Wifly. The Wifly will communicate with the server using a TCP connection. The server will send commands and receive data from the distance sensor. JSON will be used to package messages and will be in the general form of {“cmd”:”command”,”type”:”data_type”,”data”:12345}. PWM will be used to manipulate the rover. ADC will be used to communicate data to the system from an analog pin on the board. I2C will be used to communicate with the distance sensor.

Distance Sensor

The distance sensor needs to use the 5V power pin and a ground pin on the mapping rover to be powered. It will also need to use the SDA and SCL pins for I2C communication. The slave address for the distance sensor is 0x29.

IR Reflective Sensor

This sensor will only be on the Seeking rover. Analog pin A0 will be used to receive data from the IR sensor and will also need to make use of the 5V0 power pin and a ground pin to power itself.

Motor

The motor shield will be the board interfacing with the rover because of its JST connector pins. J3 and J6 pins will each handle a rover and through these pins commands will be sent to the motor and data will be sent to the system from them. The motor shield outputs motor pulses on J8-01, that will be used as an external clock source for timer 3 in the PIC board. This timer is used to calculate the distance traveled by the motor. 2 Output Compare modules on the PIC board will be used to generate the PWM signal, called OC1 and OC2. Using the GPIO module on the PIC board will be used to generate a high or low signal for each motor. This can be used to control the direction of the motor.