The idea of this kit is to be educational and for the customer to build it anyway they see fit hence there are no detailed step by step instructions. However if you get stuck and would like more detailed instructions, please get in touch stating which area of the build you are having problems with.

**REMEMBER** – We are here to help if you have any problems whatsoever please drop us an email at [support@littlebluepigs.com](mailto:support@littlebluepigs.com) and we should get back to you within the hour. If you want us to call you back please remember to let us know your phone number.

**HINTS & TIPS**

1. Don’t over tighten the castor as it may crack the Perspex base.
2. The round discs go on the inside spindle of the motor. These can be used as speed sensors.
3. We enclose a 9V PP3 connector as well as the 8x1.5V battery holder .
4. We would suggest using the 8xAA battery Holder for the L298N motor driver and the 4xAA for the Arduino. If you have access to a 11.1V LIPO battery that would work well for the L298N
5. The Arduino software is on the enclosed CD to allow you to make changes.
6. In order to make changes to the software you will need an FTDI programmer , these can be purchased from the following links  
     
   <http://www.littlebluepigs.com/ftdi.html>

Three Separate Modules are available for this kit

1. Avoidance
2. Infrared
3. Line Following

Please contact us at [sales@littlebluepigs.com](mailto:sales@littlebluepigs.com) if you wish to purchase any of these.

The microprocessor included in this kit has been pre-programmed with the model that you have purchased. In order to change any of the settings or functionality you will need a Serial to TTL converter (FTDI) as described later in this documentation.

BREADBOARD  
The breadboard has a self-adhesive backing and can be stuck on the front of the board to hold the ultrasonic sensor.

CONTENTS

* 4WD Chassis
* 4 x Wheels
* 4 x Motor Holders (2 with drive motors)
* 2 Spare motors
* 1 x 20cm 4 Pin Female to Female Wire for Ultrasonic Sensor Connection
* 1 x 10cm 6 Pin Female to Female wire for connecting L298N to Arduino
* 1 x 20cm 3 Pin Female to Female wire for connecting the Infrared Sensor

|  |  |
| --- | --- |
| **HC-SR04 Ultrasonic Module**  This module has 4 connectors   * VCC * GND * Trig Pin * Echo Pin   The ultrasonic connects to the main board on the pins labelled ULTRASONIC  NOTE: If you get intermittent operation, it is probably down to the ultrasonic sensor either being too far away (>200cm) from an object or it is picking up reflections from the floor. Trial and error will prevail in getting the operation correct |  |

|  |  |
| --- | --- |
| **LM298N Motor Driver**  The L298N Motor driver is the interface between the motors and the Arduino. The Arduino cannot handle the current draw from high power devices such as motors, so we use the L298N.  The pins on the L298N from left to right are   * ENA * IN1 * IN2 * IN3 * IN4 * ENB   The 3 pin blue connector (next to the pins) from left to right are   * 12V * GND * 5V   Out 1 & Out 2 go to one motor Out 3 & Out 4 go to the other motor. | C:\Users\steve\Google Drive\LittleBluePigs\Images\L298.jpg  It doesn’t matter which way round you wire the motors up, however which ever wire you put to OUT1, put the same colour wire on the other motor to OUT3. If for any reason the motors don’t appear to function the way you expect swap OUT1 with OUT2 **OR** OUT3 with OUT4  If you mix them up, the worst that will happen is one motor will go in the opposite direction of the other. |

**PIN CONFIGURATION – QUICK REFERENCE**

|  |  |
| --- | --- |
| Ultrasonic Sensor | (if purchased) |
| VCC | ULTRASONIC + (on board) |
| GND | ULTRASONIC GND (on board) |
| TRIG | ULTRASONIC (T) (on board) |
| ECHO | ULTRASONIC (E) (on board) |

|  |  |
| --- | --- |
| Infrared Sensor | (if purchased) |
| - | Infrared (-) (on board) |
| Middle Pin | Infrared (+)(on board) |
| S | Infrared (D) (on board) |

|  |  |
| --- | --- |
| Line Following Sensor | (if purchased) |
| VCC | Line Following (+)(on board) |
| GND | Line Following (-)(on board) |
| OUT4 | Line Following (1) (on board) |
| OUT3 | Line Following (2) (on board) |
| OUT2 | Line Following (3) (on board) |
| OUT1 | Line Following (4) (on board) |

|  |  |
| --- | --- |
| L298N – Motor Driver |  |
| ENA | E2 (on board) |
| IN1 | I4 (on board) |
| IN2 | I3 (on board) |
| IN3 | I2 (on board) |
| IN4 | I1 (on board) |
| ENB | E1 (on board) |
| 12V | Positive of PP3 Connector (Red Wire) |
| GND | Negative of PP3 Connector (Black Wire) |
| GND | Negative (-) (on board L298N\_PWR) |
| Note you will have 2 wires in the GND connector on the L298N motor driver | |
|  |  |
| 5V | 5V on board (L298N\_PWR) |
|  |  |
| OUT1 | Motor 1 Black Wire |
| OUT2 | Motor 1 Red Wire |
| OUT3 | Motor2 Red Wire |
| OUT4 | Motor 2 Black Wire |

**OPTIONAL FTDI SERIAL TO TTL PROGRAMER**

The FTDI programmer is used to upload sketches (programs) to the Arduino.

In the Arduino IDE (Development Software) make sure you have the following set

TOOLS -> Board = Arduino Pro or Pro mini

TOOLS -> Port set to the comport of the FTDI programmer

|  |  |
| --- | --- |
| Arduino Pro Mini | E:\DCIM\100D3100\Arduino Pro Mini With Labels CUT DOWN.jpg |
| FTDI PROGRAMMER | E:\DCIM\100D3100\FTDI-1\DSC_0369-WITH-LABELS.jpg |

|  |  |
| --- | --- |
| Arduino Pin | FTDI PROGRAMMER |
| GND (any) | **GND** |
| VCC | **VCC** |
| RX | **TX** |
| TX | **RX** |
| DTR | **DTR** |

In order to compile the sketch you will need to move the IRemote folder from the CD to your Arduino libraries folder. We cannot say exactly where the location is but the chances are its in the following location

C:\Program Files (x86)\Arduino\libraries