ARDUINO AVOIDANCE CAR V4.0

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 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 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

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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.

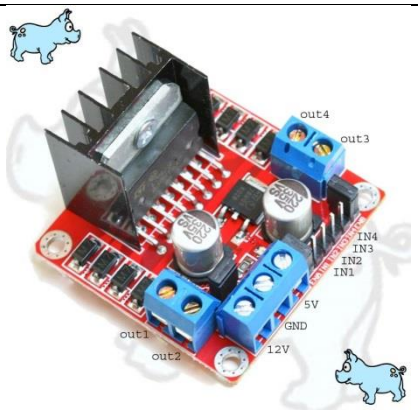
The pins on the L298N from left to right are

- 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.



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.

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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

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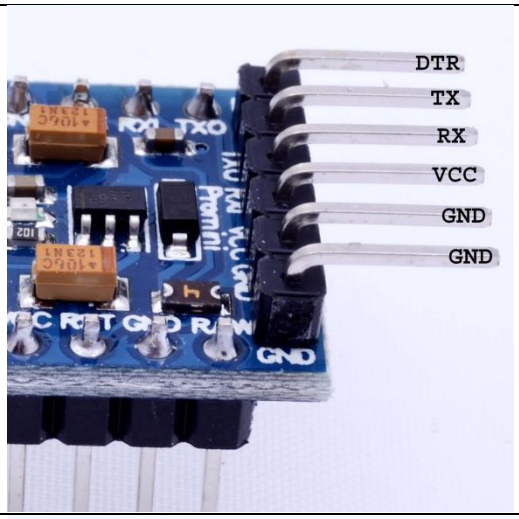
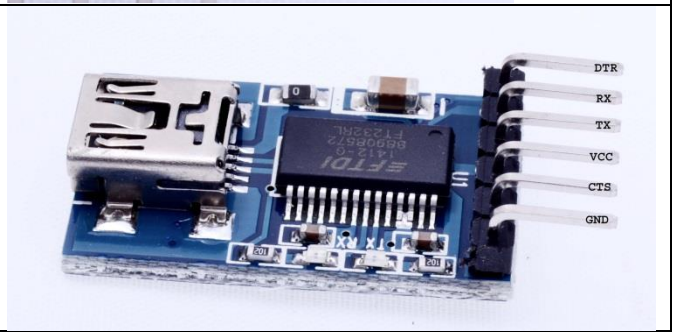
OPTIONAL FTDI SERIAL TO TTL PROGRAMER

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	
FTDI PROGRAMMER	

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