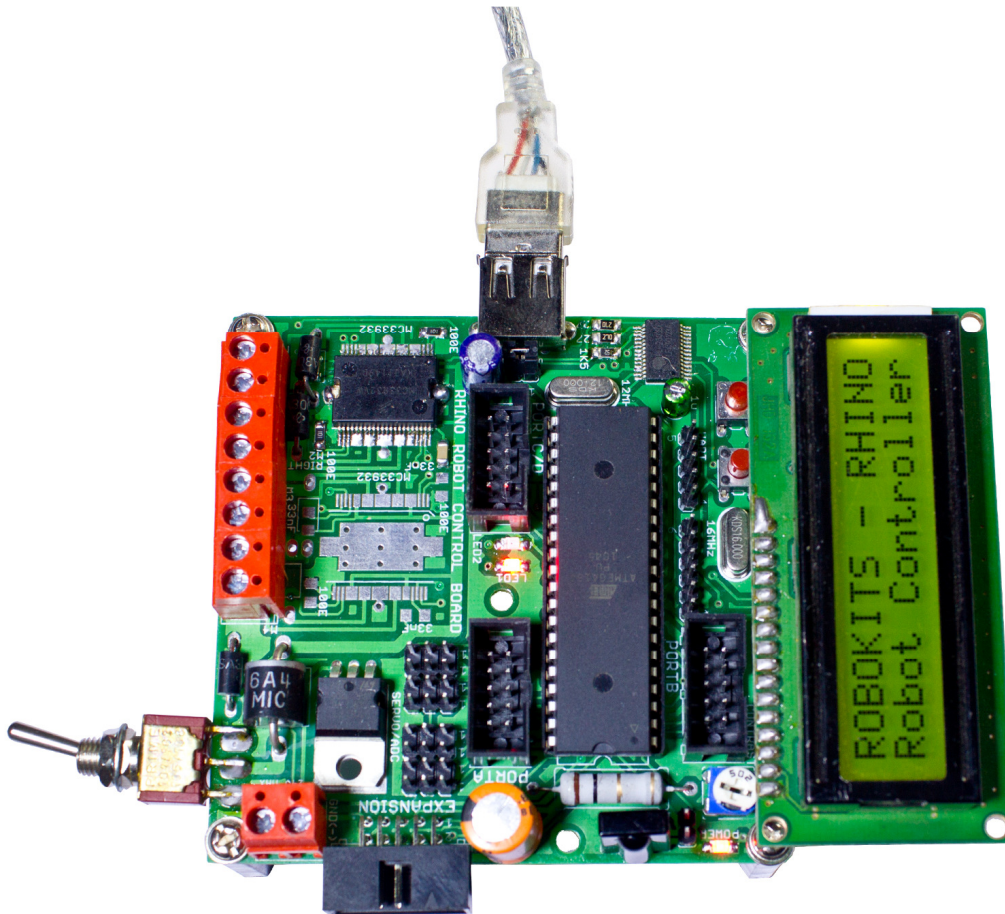


Rhino Robot Control Board

Application notes, Tutorials and Demos



03 : Manual Control Robot

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Rhino Robot Control Board is our most powerful, versatile and most easy to use robot control board. In this first part of tutorials and application notes series you will learn about basic elements of Rhino Board and Quick C – IDE software which is specially developed software for this board.

We also hereby assume that you have gone through [Rhino Board Manual](#), [Quick C IDE user manual](#) and [Quick C IDE library reference](#). It's not necessary for you to understand everything written in those documents but you should have an overview so that you can use them as reference for some part in this document.

This tutorial covers

- **Making a Wireless IR Remote Controlled Robot**

Required Items

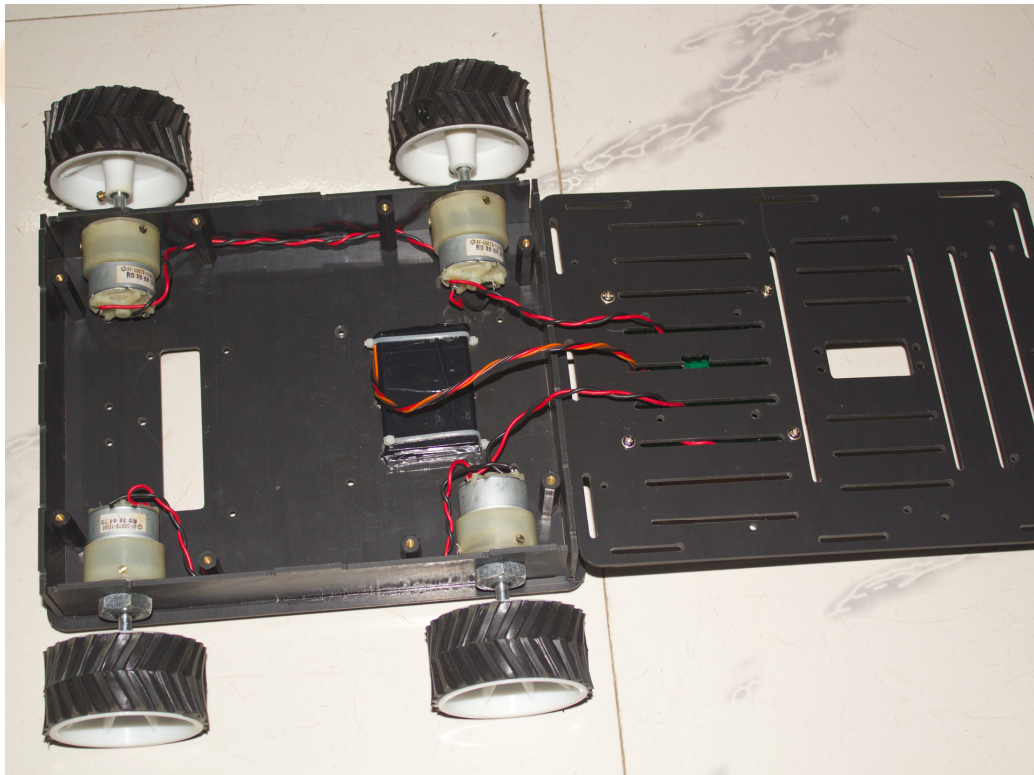
REQUIRED ITEM	SUGGESTED ITEM/USED IN THIS TUTORIAL
Rhino Board	http://robokits.co.in/shop/index.php?main_page=product_info&products_id=312
Robot Chassis	http://robokits.co.in/shop/index.php?main_page=product_info&products_id=378
Motors	http://robokits.co.in/shop/index.php?main_page=product_info&products_id=50
Battery	http://robokits.co.in/shop/index.php?main_page=product_info&products_id=69
Wheels	http://robokits.co.in/shop/index.php?main_page=product_info&products_id=297
IR Remote	http://robokits.co.in/shop/index.php?main_page=product_info&products_id=168

* It's not necessary to use the same items, you can use any similar items. However some coding may need to be changes as per hardware if it's different this listed above.

Items used for in this tutorial



General purpose robot chassis with 4 300 RPM motors and 4 cm width wheels



Insied view



IR Remote

We have chosen a general purpose chassis with 4 motors. An 11.1V 1500mAh battery is mounted inside with cable ties. Rhino Board is mounted on top and Battery and motor connections are made to the board. A TV remote control which is working on RC5 protocol is used.

Which remote to choose? I have a remote, How do I test is it compatible?

Any remote with RC5 protocol will work with this board. Most TV remotes work on this protocol. If you are not sure what codes each button is transmitting check code **013 - IR Remote Tester** in sample codes folder. GETRC5() function will return received RC5 code on call. If your remote is compatible with Rhino board it will show some value less than 255. If you get different values on different buttons that remote will work.

This code will also help to know codes for each button. Different remotes transmit different codes on same buttons, so you will need to know first which buttons you will be using to control the robot and what are the codes for that.

If you don't get any number on LCD display after flashing this code, your remote will not work.

Key codes for specific buttons

The remote which is shown above in picture, we chose CH+ button to move forward, CH- Button to move backward, VOL+ button to turn right and VOL- Button to turn left. Buttons 1, 2 and 3 to change speeds.

When this remote was tested with remote tester code it returned these values

Button	RC5 Code
CH+	32
CH-	33
VOL+	16
VOL-	17
1	1
2	2
3	3

Code

Code is similar to previous tutorials manual robot control code. Only difference is the input. Instead taking input from switches we will be taking inputs from a Remote control which is already tested and codes are known for each switches we will be using.

You can open **014 - IR Remote Controlled Robot** code in sample codes folder.

Library used in this code : Delay, IO Notations, Motor – Motor 1 & 2 Active with PWM

Here num=GETRC5(); statement takes RC5 input and stores in num variable. Then in the same loop the if-else if tree checks for proper key press and action to be done upon pressing it. Here a variable delay is used which is set to 85ms. The GETRC5() function needs around 80 ms to process so till that time motors should remain on otherwise we get jerks in driving motors.

This code has fixed speed of 100 so motors will run continuously on full speed. If we need speed control over the same, see next code.

Open **015 - IR Remote Controlled Robot with Speed Control** in sample codes folder.

Library used in this code : Delay, IO Notations, Motor – Motor 1 & 2 Active with PWM

Here the whole code is same the only difference is the speed is variable and changed through keys 1, 2 and 3. 1 is minimum and 3 is maximum speed.