

Lesson 2: Ranger Bot Movement Programming Guide (LabVIEW™ for LEGO® MINDSTORMS®)

Objective:

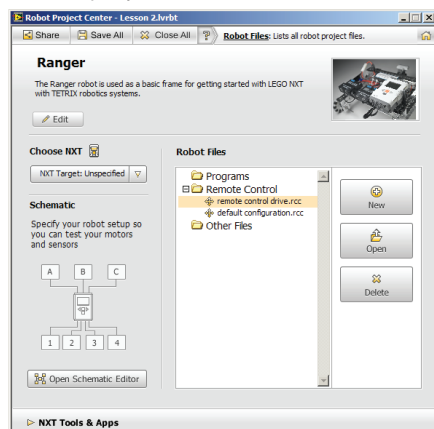
In this guide, the NXT Brick will be connected to the computer. Then, the motors and joystick will be configured and the motors will be driven using a keyboard (or optional joystick). This guide is for use with the LabVIEW™ for LEGO® MINDSTORMS® programming language.

Connecting the NXT to the Computer:

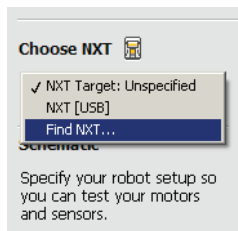
1. To launch LabVIEW for LEGO MINDSTORMS, find **LabVIEW** in the program files list in the **Start** menu and click it.
2. Open the **LabVIEW for LEGO MINDSTORMS Robot Project** file for Lesson 2.



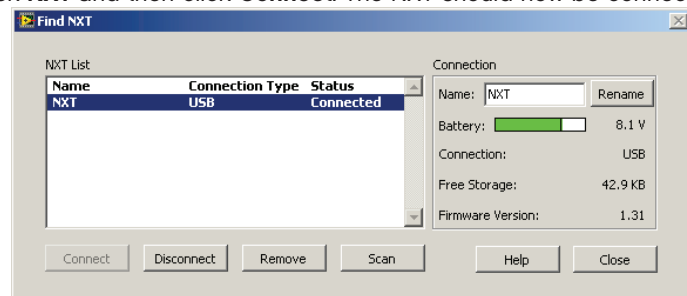
- a. On the DVD, navigate to **Lessons** and select **Lesson 2**.
- b. Then, under **Resources** on the left side, click on **Programming**.
- c. Under **Programming**, select **Sample Programs** and click on **Robot Movement (LabVIEW for LEGO MINDSTORMS)**.
- d. Save the .zip file to the computer. Then, navigate to the .zip file's location, right-click the folder and extract it.
- e. Finally, open the extracted folder and double-click on the **Lesson2.lvrpt** file to open the file.



3. Connect the NXT to the computer with a USB or a Bluetooth® link. Once connected, select the NXT from the **Choose NXT** pull-down menu. To connect a new brick, select **Find NXT...** and then follow steps 4-6



4. In the Find NXT window, click **Scan** to find all of the NXTs that are connected via USB or Bluetooth®.
5. Once the NXT has been found, it will appear in the NXT List.
6. Click **NXT** and then click **Connect**. The NXT should now be connected to the computer.



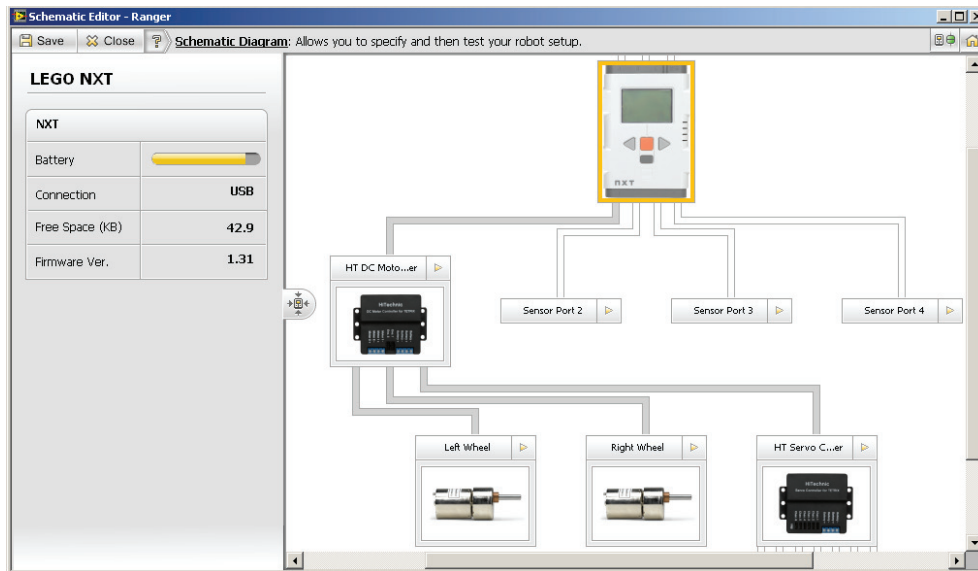
Note: For more information about connecting to the NXT, consult the NXT Brick Guide on the TETRIX Getting Started Guide DVD.

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Schematic Editor:

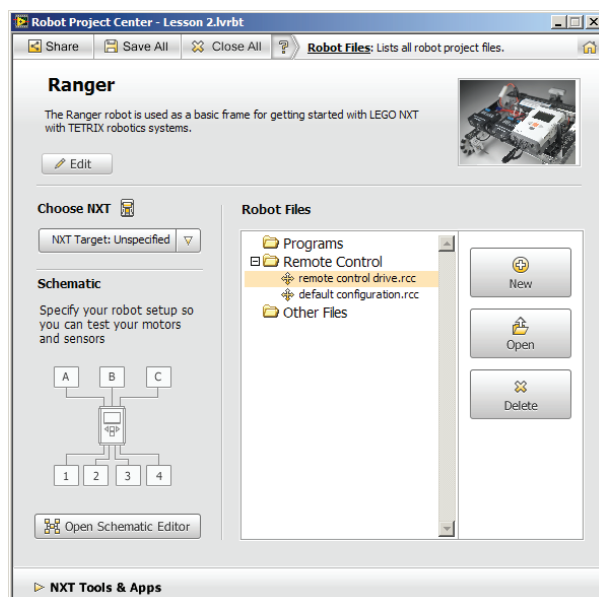
Now that the NXT has been connected, examine how the TETRIX® DC Motors are configured.

7. Click **Open Schematic Editor**. In the Schematic Editor, everything that is connected to the NXT's Ports can be configured.
8. Note that the following have been preconfigured in the robot project opened in step 2:
 - a. DC Motor Controller for TETRIX, wired to the first sensor port on the NXT
 - b. Two TETRIX DC Motors, connected to the motor controller
 - c. One TETRIX servo controller, connected to the Daisy Chain Port
9. Because the left and right motors are built into the robot as a mirror setup, the left motor is reversed to make the robot move forward when a positive motor power is fed into it.



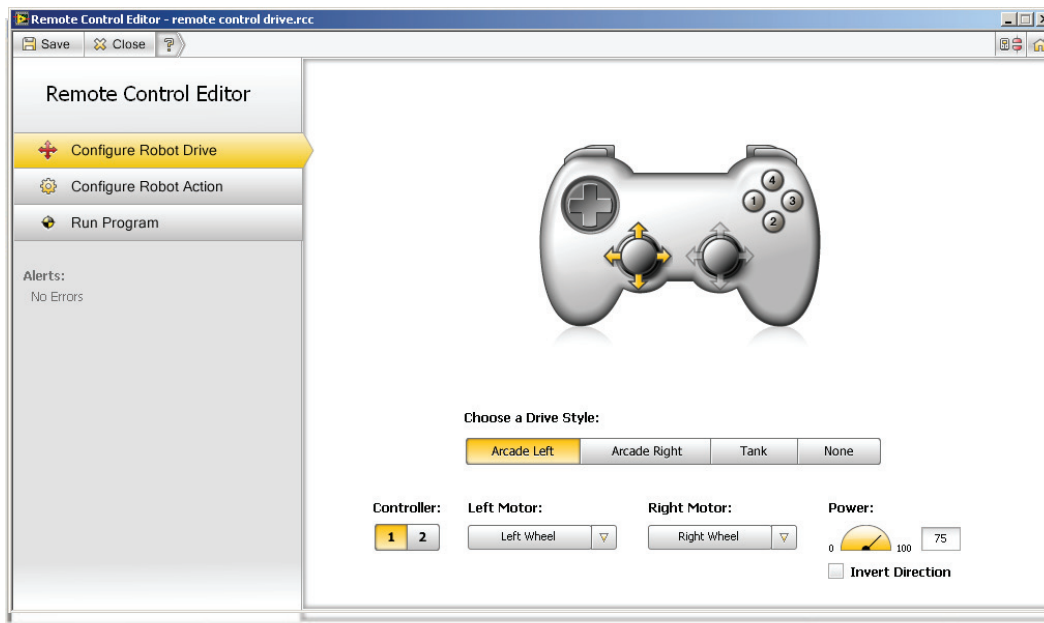
Remote Control:

10. Once the motor controller and DC Motors are configured properly, they can be controlled with a keyboard (or optional joystick). Double-click the **Remote Control** file. This will open the Remote Control Editor, which can be used to configure the way the robot will drive.



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11. In the **Configure Robot Drive** section, select a drive style. The available options are Arcade Left, Arcade Right, Tank, and None.



12. Navigate to the **Run Program** section and choose a controller from the **Controller 1** pull-down menu. Select **Keyboard** to control the robot. The **W** key will make the robot move forward, the **S** key will make the robot move back, the **A** key will make the robot turn left, and the **D** key will make the robot turn right. Optionally, if a joystick is available, select it from the **Controller 1** pull-down menu.



13. Once a controller has been set, make sure that the robot is on the floor, with nothing touching it. If the robot is connected using a USB cable, ensure that the USB cable is long enough for the robot to move around freely.
14. Navigate to the **Run Program** section and click **Start Test** to run the program and control the robot.