

## LABVIEW – Experiment 3: Line Following Robot

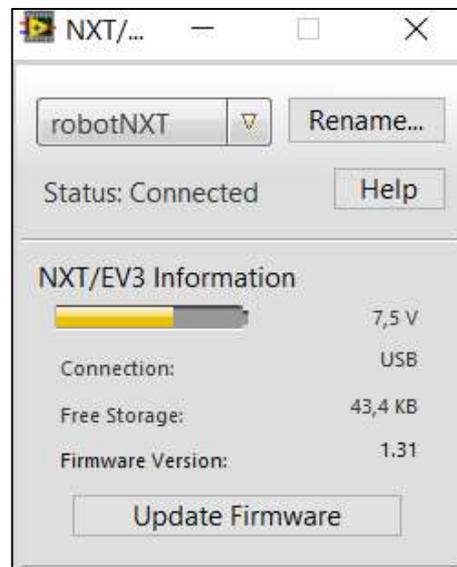
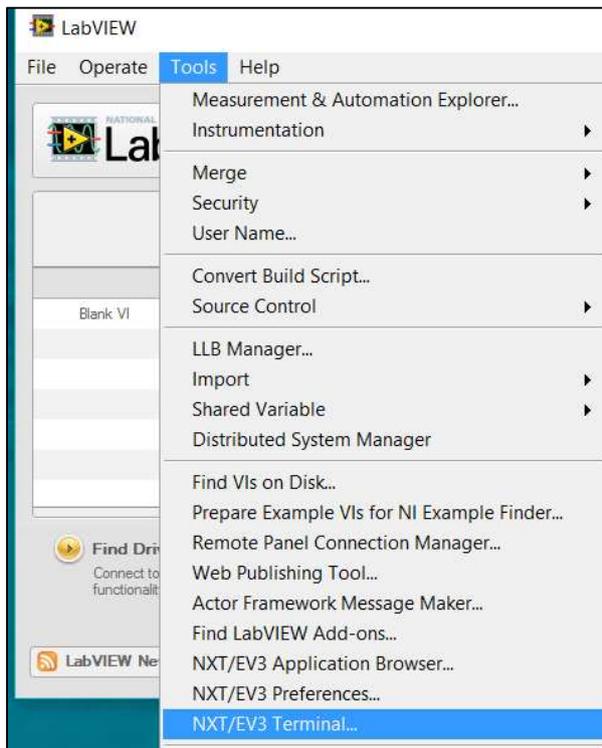
This laboratory session is an introduction to the use of light sensor for the LEGO MINDSTORMS NXT in the **remote** mode.

### 1. Connecting the NXT Robot

a) Turn on the NXT robot using orange button and connect the PC and the NXT kit using the USB cable.



b) Open LabVIEW 2013 program on your computer. Click on “Tools >> NXT/EV3 Terminal..” and verify NXT robot connection.

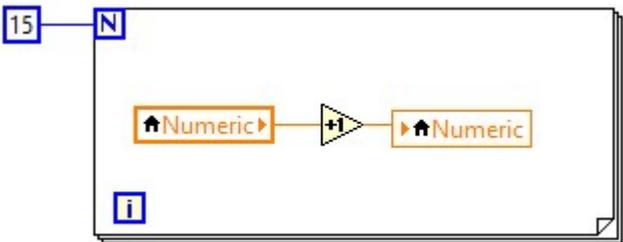


**Warning! : Do not press “Update Firmware” button.**

c) After verifying your NXT robot connection, you can write the program on LabVIEW.

## 2. Local Variables

Due to controls are read-only and indicators are write-only type, any of them cannot be used for the purpose of reading and writing. But local variables provide reading or writing to one of the controls or indicators on the front panel of a VI.

In C program:	In LabVIEW program:
<pre>int count;  for (i=0; i &lt; 16; i++)      count = count +1;  end</pre>	 <p>The LabVIEW diagram shows a loop structure. At the top left, a numeric control is set to 15 and labeled 'N'. Below it, a numeric indicator is labeled 'i'. The loop body contains two numeric indicators and an increment (+1) block. The first numeric indicator is connected to the increment block, which is then connected to the second numeric indicator.</p>

Local variables will be used in the second part of the laboratory session. For this reason, you should learn how to add/use a local variable.

## 3. Software Design

Design a block diagram which will fulfill the conditions given below:

- Read value from NXT kit using light sensor and show it in the middle of NXT screen.
- If measured lightness value is less than or equal to 50, right motor will stop and left motor will move with the power of 35.
- If measured lightness value is greater than 50, left motor will stop and right motor will move with the power of 35.

This program can be used for line following robot using motors and light sensor basically. You can improve this design due to your opinions.

**BONUS:** Read five sequential values from the light sensor and calculate average of them using local variable.

### **Useful Keyboard Shorcuts and Description:**

Keyboard Shortcut	Description
CTRL - H	Displays the Contex Help window.
CTRL - B	Deletes all broken wires in a VI