

LABVIEW – Experiment 2: Usage of Ultrasonic Sensor and Distance Control

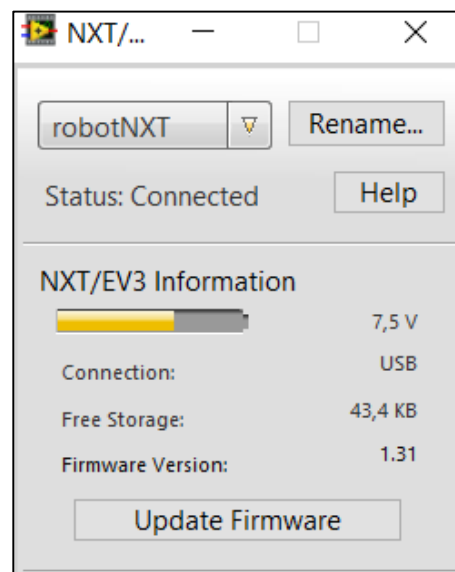
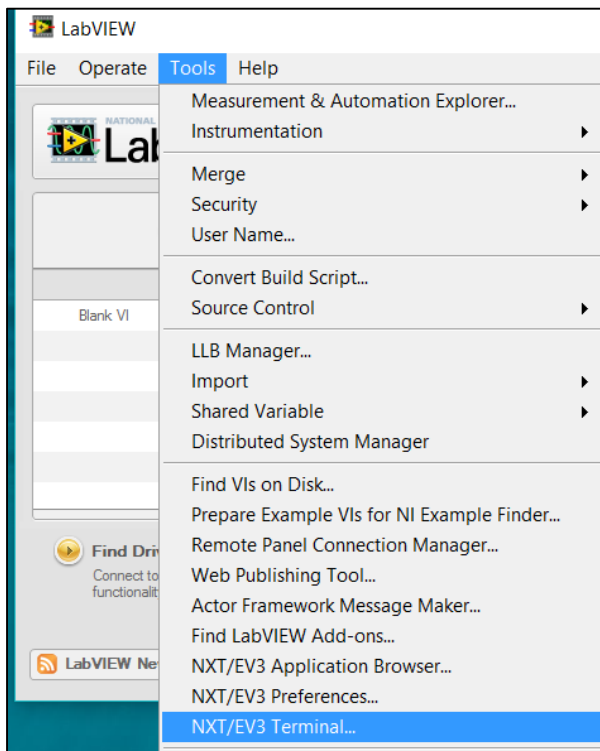
This laboratory session is an introduction to the use of ultrasonic sensor for the LEGO MINDSTORMS NXT in the remote mode.

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.



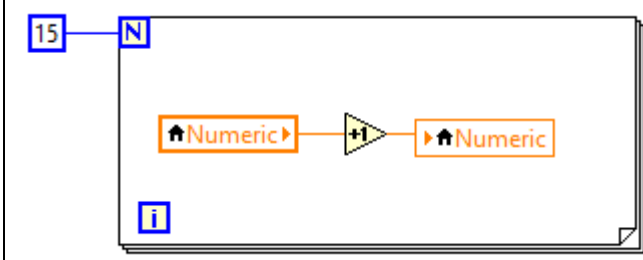
b) Open LabVIEW 2013 program on your computer. Click on “Tools >> NXT/EV3 Terminal..” and verify NXT robot connection.



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.

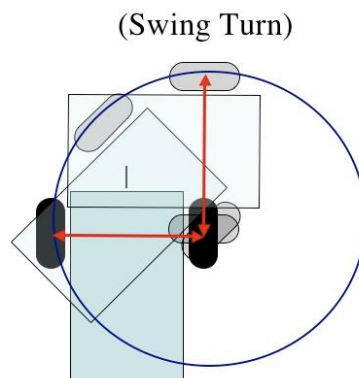
In C program:	In LabVIEW program:
<pre>int count; for (i=0; i < 16; i++) count = count +1; end</pre>	

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 distance value from NXT kit using ultrasonic sensor and show it in the middle of NXT screen.
- If distance value is less than or equal to 50 cm, right motor will stop and left motor will perform 90° swing turn. (Distance between wheels = 112 mm, Diameter of Wheel = 56 mm)



- If distance value is greater than 50 cm, left and right motor will move in the forward direction with the same power value.

Useful Keyboard Shorcuts and Description:

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