

Lego Mindstorms Nxt User Manual (6/27): Contents

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Intro and learning a little about the important pieces

Lego Mindstorms Nxt is the second version of the Lego Robotics kits released first in 2006, after Lego Mindstorms and before Lego Mindstorms EV3.



Important parts are as shown in the Figure above (1-6).

1 The Nxt Brick

This is the controller which runs programs, reads sensor data and sends commands to motors.

Note: The firmware on both Nxt Bricks in Nicolina's boxes has been replaced from the regular Lego firmware to LeJOS Java.

This means you cannot test the sensors/motors as shown in the Lego user guides in the boxes. However, this gives you more control to develop programs (you can write in Java instead of using a limited visual drag-and-drop interface), which is a good thing.

Motors can only be connected to the top (ports A-C) and sensors must be connected at the bottom (ports 1-4).

It can communicate via a USB cable or Bluetooth.

2 Touch sensor

3 Sound sensor

4 Brightness sensor

5 Ultrasound (range) sensor

6 Motor

Setting up your computer

*Install the Mindstorms software and driver for the Nxt brick (Assuming you are using Nicolina's boxes) There should be a cd in one of the boxes. You can install from this if you have a cd drive and internet connection.

If you do not have a cd drive, you can download the .iso file from the Lego homepage.

<http://www.lego.com/en-us/mindstorms/downloads/software/nxt-software/download-software/>

To install from the iso file you need to mount it.

Note: on my Windows 7 computer, the windows xp tool for doing this did not work correctly; I downloaded and used "Virtual CloneDrive".

Note: the Mindstorms Nxt software was not intended for Windows 7, but seems to work (it was originally written for Windows XP/Vista or Mac).



CD for Mindstorms Nxt

*Install the Lejos development kit

You can download the latest version for NXT from Sourceforge.

<http://sourceforge.net/projects/lejos/files/latest/download?source=files>

Note: when trying to install on my computer, an error message popped up stating that the driver is old and a new one should be installed, but checking the Mindstorm software indicated that the correct driver version was being used; I was able to bypass the installer's advice by pressing "cancel", which allowed me to continue with the installation.

Trying some basic programs

Create one main folder (e.g., called "lego") where you will keep your code.

Within the main folder create a folder for your first program called "HelloWorld", then inside this last folder a file called HelloWorld.java.

Paste in the code below (you may change the message in quotes to whatever you might like to see):

```
import lejos.nxt.Button;

public class HelloWorld {
    public static void main (String[] args) {
        System.out.println("Hello World Nxt and Lejos");
        Button.waitForAnyPress();
    }
}
```

Open a command prompt (Start-Run "cmd" in Windows)

Compile and link the code by typing in the commands below in your HelloWorld folder:

```
nxjc HelloWorld.java
nxjlink -o HelloWorld.nxj HelloWorld
```

Note: be careful to type in "nxjc" correctly on the first line, and not "nxj". The latter command also exists but will give you errors which say it cannot find a java/class file in the classpath.

Connect the NXT brick to your computer using the USB cable.

Turn on the NXT brick by pressing the orange button (it needs 6 AA batteries).

Your computer should report that it has found the driver.

Now upload and run the code:

```
nxjupload -r HelloWorld.nxj
```

("-r" means run)

Your brick should display the message.

Pressing any button should end the program.

You can turn off the brick by pressing the gray button.

Congratulations! You have (I hope) successfully written and executed your first program for the Lego Mindstorms Kit!

Note: some nuisances exist.

The NXT brick constantly turns itself off and disconnects (from windows)

Also, some of the examples on the Lejos website are written poorly.

For example, the "while(true)" loop for the code to check the light sensor will lock the brick unless you physically remove the batteries, and some programs end before you can see any sensor data, so you should tweak the code as needed.

Some other useful code to try out:

```
import lejos.nxt.Button;
import lejos.nxt.LCD;
import lejos.nxt.Motor;

/**
 * Simplest 3 motor commands
 * @author owner.GLASSEY
 *
 */
public class MotorTutor1{

    public static void main(String[] args){
        LCD.drawString("Program 1", 0, 0);
        Button.waitForAnyPress();
        LCD.clear();
        Motor.A.forward();
        LCD.drawString("FORWARD", 0, 0);
        Button.waitForAnyPress();
        LCD.drawString("BACKWARD", 0, 0);
        Motor.A.backward();
        Button.waitForAnyPress();
        Motor.A.stop();
    }
}
```

The code above will turn a motor at port A forwards and backwards when you press buttons on the NXT brick.

Much more code is available:

In the samples folder where you installed leJOS

On the leJOS homepage (<http://www.lejos.org/>)

Good luck!