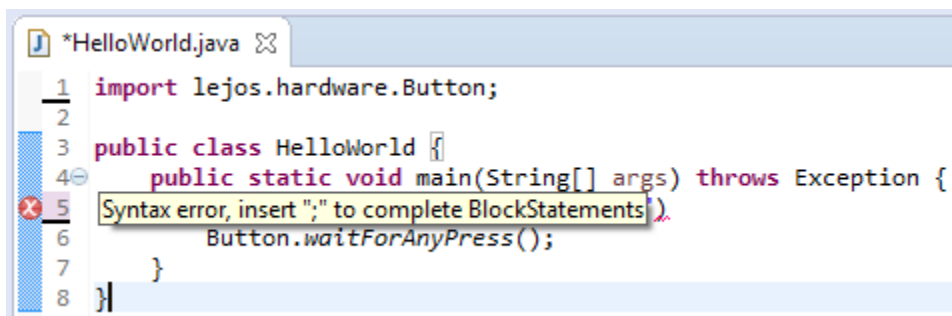# Installation Instructions for Students (September 2018)

These are the instructions for installing LeJOS and Eclipse onto your computer for use in the course. The instructions are for Windows 10 users. If you are using a Mac or a Linux laptop, you will need to look at the wiki page of the www.lejos.org website for further instructions ... which will bring you to the sourceforge website: http://sourceforge.net/p/lejos/wiki/Installing leJOS/ It is assumed for the remainder of this document that you are using a laptop running Microsoft Windows.

1. Download and install the x86 version of the "older" Java SE Development Kit 7 **JDK** (**DO NOT DOWNLOAD THE x64 VERSION**, although with Mac OS X there is only a 64-bit version. Also, make sure NOT to download the JRE ... you need the JDK). Also, do not download version 8 as it does not yet work on the EV3. When this was written, the latest was **jdk-7u80-windows-i586.exe** for windows) from this website: http://www.oracle.com/technetwork/java/javase/downloads/java-archive-downloads-javase7-521261.html. Once you click download, you will be redirected to a login page. Create an oracle account and login to continue. You will need to go to the bottom of the page to **Java Archive** and press the **Download** button. Select **Java SE 7** from the list. Select Java SE Development Kit 7u80. Accept the licence agreement and then select the **Windows x86** version which is **jdk-7u80-windows-i586.exe**. You will be redirected to a login page. Create an account and login to complete the download.

2. As eclipse (the IDE we will be using for this course) requires java 1.8+, repeat the steps above for **jdk-8u181-windows-i586.** (**DO NOT DOWNLOAD THE x64 VERSION**, although with Mac OS X there is only a 64-bit version. Also, make sure NOT to download the JRE ... you need the JDK). This can be found here: http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html.

3. Download the **0.9.1-beta** version of the leJOS windows installer from https://sourceforge.net/projects/ev3.lejos.p/files/ and run it (for Windows, the file is called **leJOS_EV3_0.9.1-beta_win32_setup.exe**. Follow the instructions to select the java jdk version that you installed in step 1. Note that the program will automatically go to the **Program Files** folder on the **C** drive. You will have to back up and go to the **Program Files (x86)** folder to find the version that you just installed. Allow the remaining default options during the setup ... which will create a **leJOS EV3** folder in the **C:\Program Files** folder. Once installed, it will have a checkbox to **Launch the EV3SDCard utility**. Uncheck this because I have already prepared the micro SD cards for you and will give them to you on the first day of class (or possibly sooner if I see you).

4. Eclipse will be used as the IDE for the course. Download **Eclipse** from this website http://www.eclipse.org/downloads/eclipse-packages/. You will want the **Eclipse IDE for Java Developers** (usually the forth option in the list). Make sure to download the Windows 32-bit version (**NOT THE 64-BIT VERSION**). At the time this was written the file was called: **eclipse-java-photon-R-win32.zip**. Unzip the file after it downloads. If any errors pop up when unzipping … just "skip" those files. A folder should have been created with the same name. It is a good idea to drag this folder to the **C:\Program Files (x86)** folder. Inside the folder is an **eclipse** folder and inside there you should see a purple circle icon ... this is the eclipse application. Right-click on it and select **Create shortcut**. Drag the shortcut to your desktop and rename it to **Eclipse**. Double-click to run it. It will ask you to create a workspace ... enter this **C:\Users\Mark Lanthier\ COMP2801** (of course, your username will be different) You can close the "welcome" screen.

5. From the **Help** menu, select **Eclipse Marketplace...**.   Under the **Search** tab, type in **lejos EV3** into the Find: textbox and press **ENTER**.   The **leJOS EV3 Plug-In** should appear at the top.   Press the **Install** button.   **Accept** the licence agreement and press **Finish**. Click **Install anyway** when the Warning dialog box pops up. Go ahead and restart Eclipse when it asks you. Once Eclipse has restarted, the plugin should be available and you will see a menu item called **leJOS EV3** as well as a couple of orange leJOS icons.

6. Now we need confirm that EV3_HOME is set properly in the preferences. Click the **Window** menu and select **preferences** and then **leJOS EV3** in the list on the left-hand side.   You should set the **EV3_HOME** to your installed folder location (likely **C:\Program Files\leJOS EV3**) if it has not been set yet.   Make sure that **Run Tools in separate JVM** is selected as well as **Run program after upload**. Check off **Connect to named brick** and enter **10.0.1.1** into the text field labelled **Name**. Press the **Apply and Close** button.

7. Turn on your EV3 at this time.   It typically takes a good minute or so for the EV3 to boot up.   In fact, the very first time that you turn on the EV3 with the micro SD card, it will take a good 8 minutes or so to initialize everything!

8. Now we will get a **Hello World** program running on the robot. All code in Eclipse is organized into *Projects*. Once eclipse has started, go to the **File** menu and select **New** and then **Project...** (**i.e. NOT Java Project**).   Select the **LeJOS EV3** folder and then **LeJOS EV3 Project** and press **Next >**. Enter **COMP2801** as the **Project name** at the top.   Under JRE, change "Use an execution environment JRE" to JavaSE-1.7. Make sure to do this every time you create a new project. Then click the **Finish** button. You should see the **COMP2801** project appear in the workspace under the Package Explorer on the left side of the window.

9. Select the **COMP2801** project (from the Package Explorer) that you just made.   Select **File/New/Class** from the menu bar. Type **HelloWorld** into the **Na̲me:** field (with no spaces) of the resulting window. Select the checkbox that says **public static v̲oid main(String[] args)**. Click **F̲inish**. The new class should appear.

10. Adjust code to look as shown here:

```
import lejos.hardware.Button;
public class HelloWorld {
    public static void main(String[] args) throws Exception {
        System.out.println("Hello World");
        Button.waitForAnyPress();
    }
}
```

11. If there are any syntax errors, then will be shown with an ⊗ along the left side of the code:
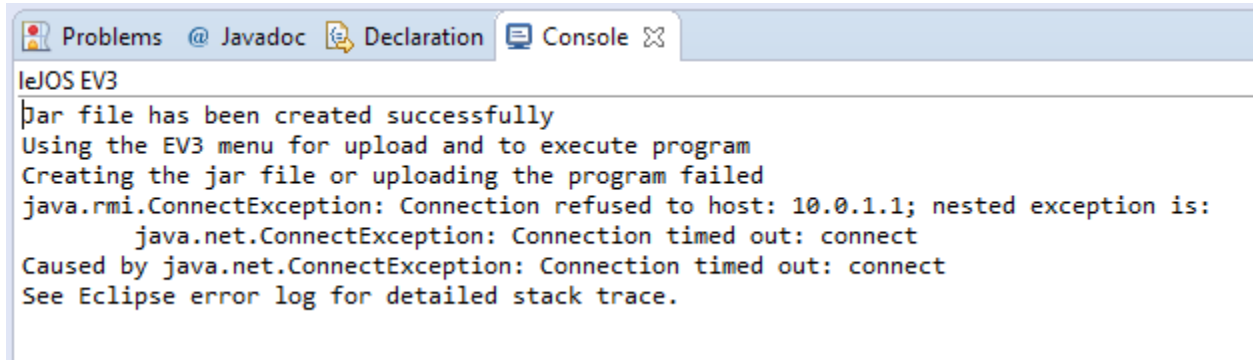
Fix any syntax errors before continuing and then save your code by pressing the save button ⊟ (or press CTRL + S).

12. Once your code compiles and saves ok, we can run it.   Make sure that the EV3 is turned on and that it is not currently running a program. Connect the EV3 to your laptop using the USB cable provided in the kit.   In Eclipse, press the run button ⊙ to upload your program onto the robot and run it.   The first time you do this for each program, it will ask how you want to run the program. Select **LeJOS EV3 Program** and press **OK**.
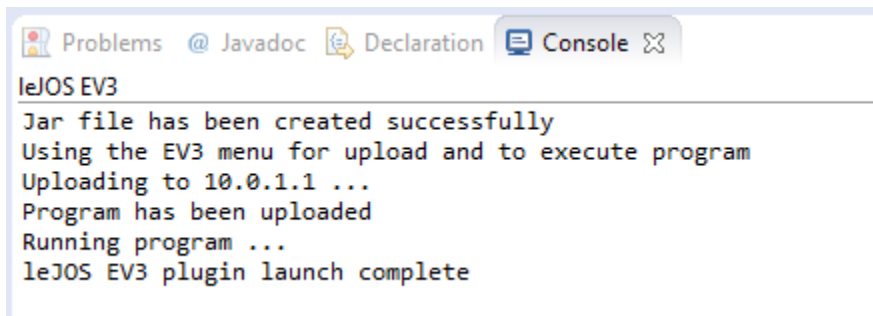
If the upload did not work, you will get a message like this in the bottom Console pane of Eclipse:

```
 Problems  @ Javadoc  Declaration  Console ⊠
leJOS EV3
Jar file has been created successfully
Using the EV3 menu for upload and to execute program
Creating the jar file or uploading the program failed
java.rmi.ConnectException: Connection refused to host: 10.0.1.1; nested exception is:
        java.net.ConnectException: Connection timed out: connect
Caused by java.net.ConnectException: Connection timed out: connect
See Eclipse error log for detailed stack trace.
```

If this happens, it is likely because the EV3 just booted up and there was not enough time for the USB port to be initialized … takes up to a minute or so.   You can try again … or perhaps just unplug the USB cable and plug it back in again, then wait for 30 seconds.

Hopefully, the program will load and run on the robot.   Note that it takes a bit of time for the program to start up.   If it worked, you should see the following in the bottom Console pane of Eclipse:

```
 Problems  @ Javadoc  Declaration  Console ⊠
leJOS EV3
Jar file has been created successfully
Using the EV3 menu for upload and to execute program
Uploading to 10.0.1.1 ...
Program has been uploaded
Running program ...
leJOS EV3 plugin launch complete
```

You should also see the words **Hello World** appear on the EV3.   Press any button on the EV3 to quit the program.

If you get an Exception when you try to run your code ... assuming that you did not have any typos ... the problem is likely that Eclipse has defaulted your project to use the latest version of JAVA instead of version **1.7**.   To fix this, right-click on your **COMP2801** project on the left side panel.   Select the **Build Path** submenu and then select **Configure Build Path ...** at the bottom of the menu.   On the left side of the dialog box, select **Java Compiler**. Unselect the checkbox under the **JDK Compliance** section that says "**Use compliance from execution environment ...**".   For the **Compiler compliance level:**, select **1.7** from the drop down list.   Press **Apply** and then **OK**. Hopefully, the code will run now.

13. Unplug the USB cable … we will try to get it working with the Bluetooth. On the EV3, use the left and right buttons on the menu to scroll until it says **Bluetooth** ... with the bluetooth icon centered. Select it by pressing the center dark gray button. Make sure that the EV3 is visible by scrolling to **Visibility** (i.e., the eye icon). It should say **Visibility on**, otherwise press the dark gray button to turn it on.
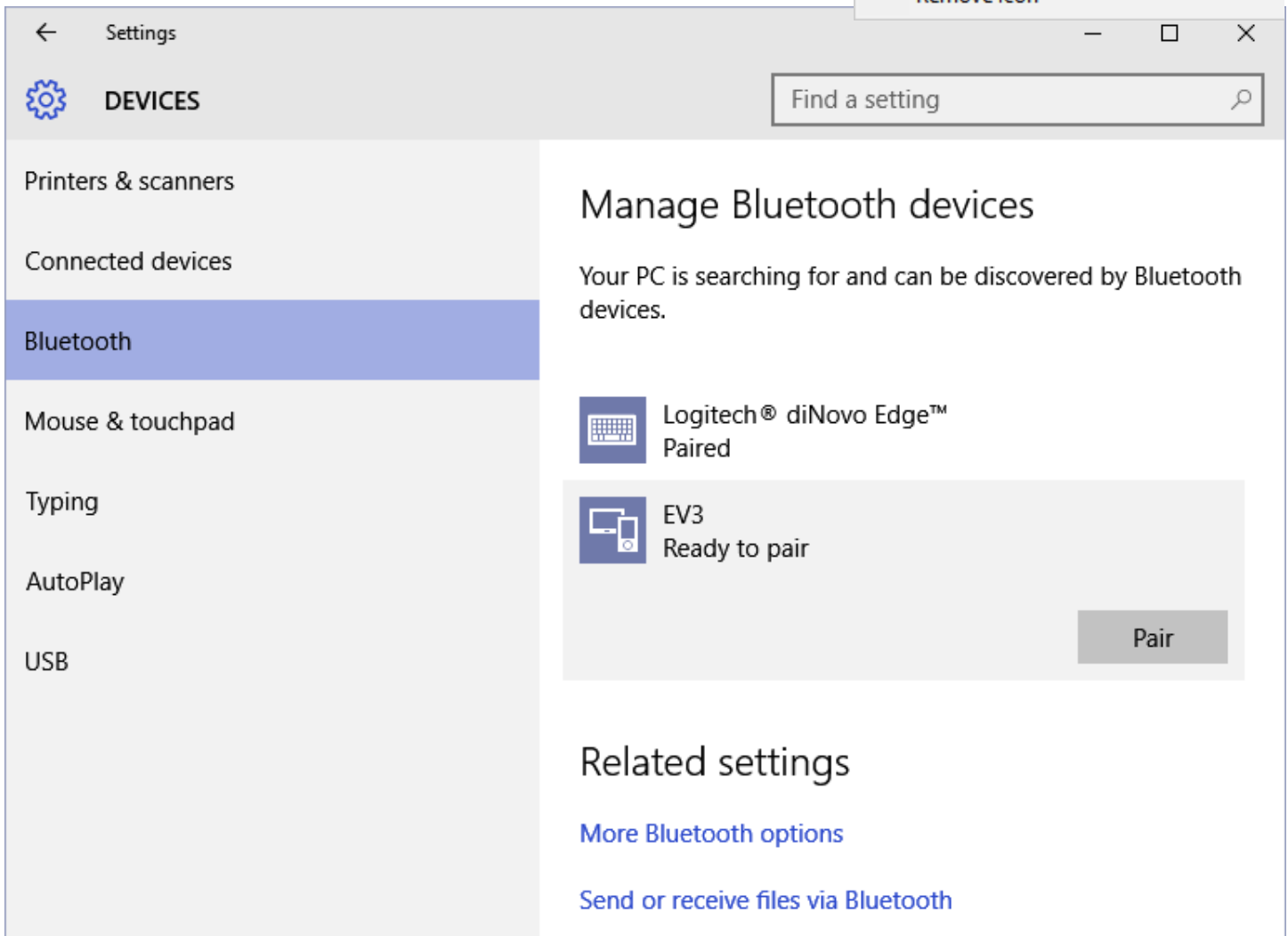
14. In the taskbar of windows, off to the right, you should see something like this under the hidden icons.   Select the **Bluetooth** icon as shown here circled:

Now select **Add a Bluetooth Device** from the popup menu that appears:
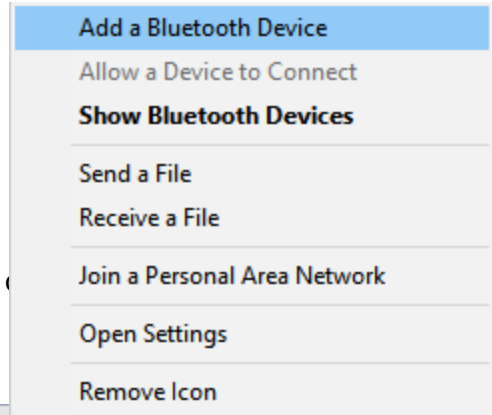
Hopefully, the EV3 will appear in the list bluetooth devices. If not, double check that the Visibility is enabled on the EV3.   Select the EV3 and press **Pair**:

| Add a Bluetooth Device |
| Allow a Device to Connect |
| **Show Bluetooth Devices** |
| Send a File |
| Receive a File |
| Join a Personal Area Network |
| Open Settings |
| Remove Icon |

← Settings   — □ ✕

⚙ DEVICES   Find a setting   ⌕

Printers & scanners

Connected devices

Bluetooth

Mouse & touchpad

Typing

AutoPlay

USB

Manage Bluetooth devices

Your PC is searching for and can be discovered by Bluetooth devices.

⌨ Logitech® diNovo Edge™
Paired

▯ EV3
Ready to pair

Pair

Related settings

More Bluetooth options

Send or receive files via Bluetooth

15. It will try to confirm the device that you are connected to. The pairing code should be 1234 (although you can confirm this on the EV3 by pressing the right arrow so that the key icon appears and then press the dark grey button to go in and change it).

Enter the passcode for your device

Enter the passcode for your device

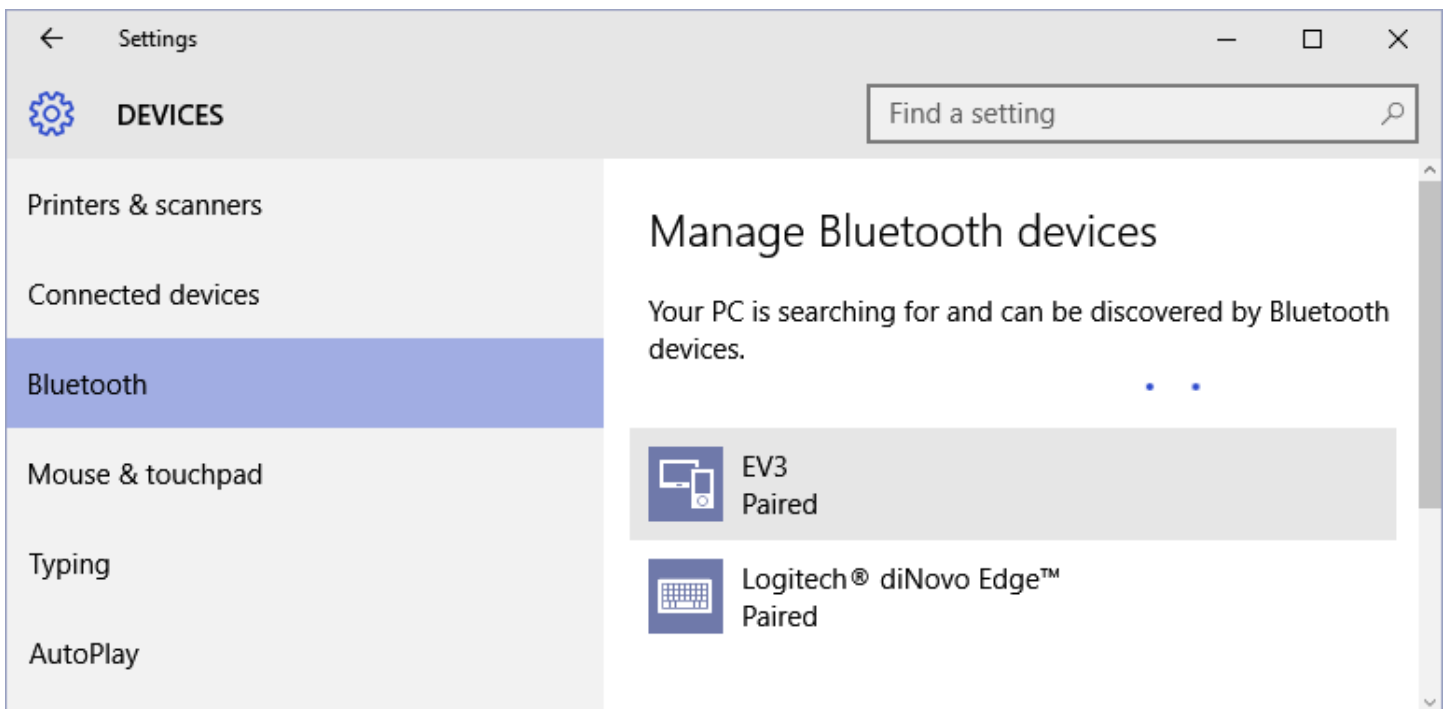You can find the passcode on your EV3 or in the info that came with it.

[   ]

Next   Cancel

Make sure to do this when no other EV3 devices are around.   That is ... don't try doing this in the lab when everyone has their EV3 on, otherwise you may be pairing up with someone else !!!   Do it at home. Press **Next**. It should say that it is installing device driver software.   Hopefully you see this:

← Settings   — □ ✕

⚙ **DEVICES**   Find a setting   🔍

Printers & scanners

Connected devices   Manage Bluetooth devices

Bluetooth   Your PC is searching for and can be discovered by Bluetooth
                                      devices.
Mouse & touchpad   • •

Typing   🖥 EV3
                                         Paired
AutoPlay   ⌨ Logitech® diNovo Edge™
                                         Paired

16. Now we must create a PAN (Personal Area Network).   In Windows 10, go to the Start menu and select **Settings**. Select **Network and Internet**.   Select **Ethernet** on the left side.   Select **Network and Sharing Center** on the right.   Select **Change adapter settings** on the left.   Select **Bluetooth Network Connection**.   On the toolbar, select **View Bluetooth network devices**. Select the **EV3** icon. Select **Connect using** on the toolbar and then choose **Access point**.
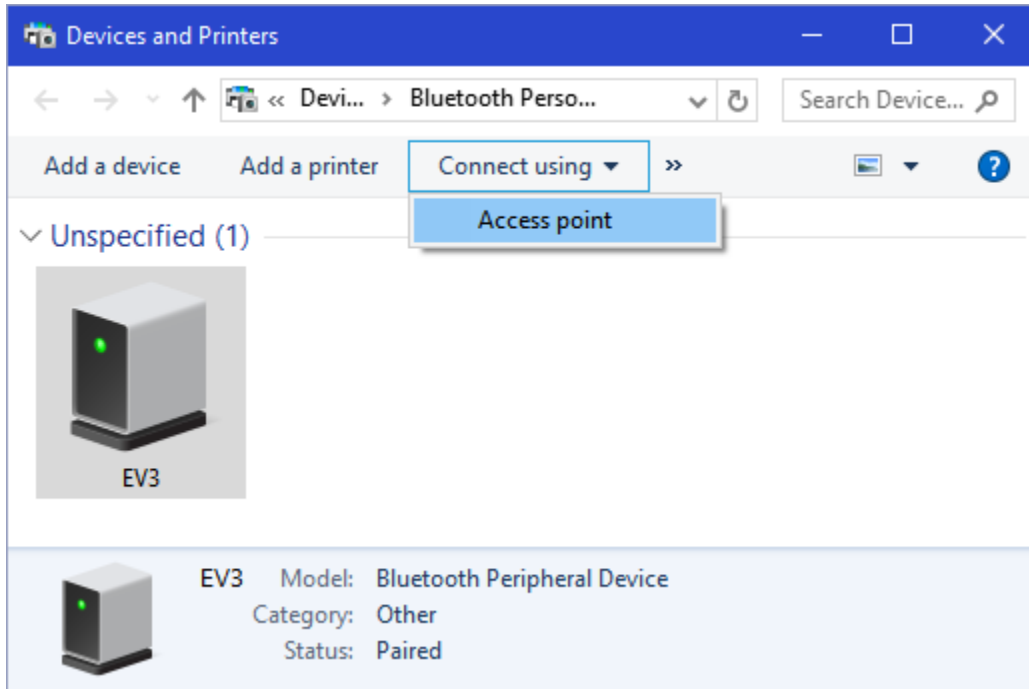
You should see this:
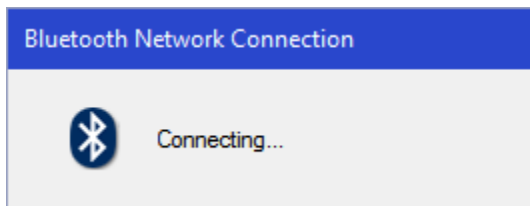
The connection should then be made.   You should now be able to upload your programs using bluetooth.   Try to run your program again (make sure that the USB cable is unplugged).

If you get an error message similar to "IP Address is null Brick 10.0.1.1 not found" in eclipse when running a program, consult this troubleshooting guide:

https://jira.iais.fraunhofer.de/wiki/display/ORInfo/EV3+%28leJOS%29+driver+installation+under+Windows+8%2C+10

Each time that you turn on your EV3, you will need to repeat this last step to connect the access point.