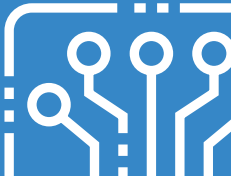




LabPlus:  
How to Program  
the Joint Block



LabPlus



## Where to Begin

1. Install the STEAM SNIPS LabPlus software found [here](#) (Windows Only).
2. Open LabPlus.
3. Connect the Micro USB end of the Micro USB-USB cable to the top of the Joint Block.
4. Connect the USB end to a PC that has LabPlus installed.
5. Once the Joint Block is connected to a PC, go to “Connect” in the LabPlus menu and click “COM3 (newly detected)”.
6. When the three red lights at the top middle of the LabPlus menu turn green, the Joint Block is successfully connected to the PC.

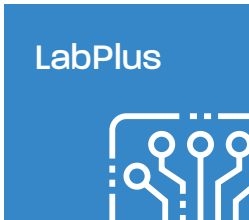
**Now it's time to start coding!**

## Troubleshoot

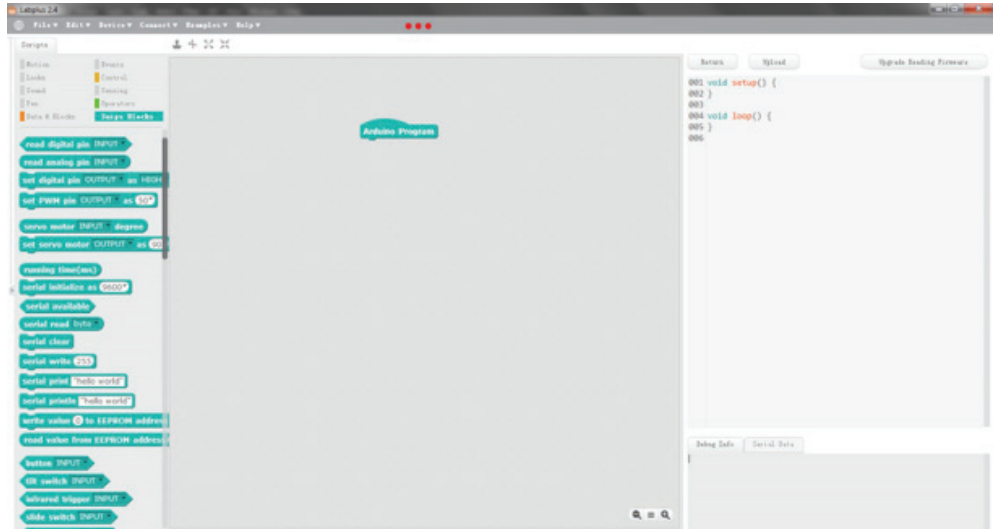
### Unable to connect Joint Block to LabPlus?

If you can't connect the Joint Block to LabPlus, find the “Help” tab on the top menu and click the down arrow. Click the option “Install 210X USB Driver”. Once 210X USB Driver is installed, close LabPlus.

With the Joint Block connected to the PC, reopen LabPlus and go to “Connect” in the LabPlus menu and you will now be able to click “COM3 (newly detected)”.



## Navigating LabPlus



When you open LabPlus you will see the user interface pictured above. The software includes 4 main sections;

- LabPlus Menu – Horizontal navigation section at the top
- Scripts Section – Left Column
- Easy Code Section – Middle Column
- Upload Section – Right Column

### LabPlus Menu

Use the menu to save and load files, connect the Joint Block, open example programs and install the 210X USB Driver.

### Scripts Section

All the STEAM SNIPS blocks, Controls, and Operators can be found in the Scripts Section. Drag and drop script commands into the Easy Code Section (middle column) to start writing code for the Joint Module.

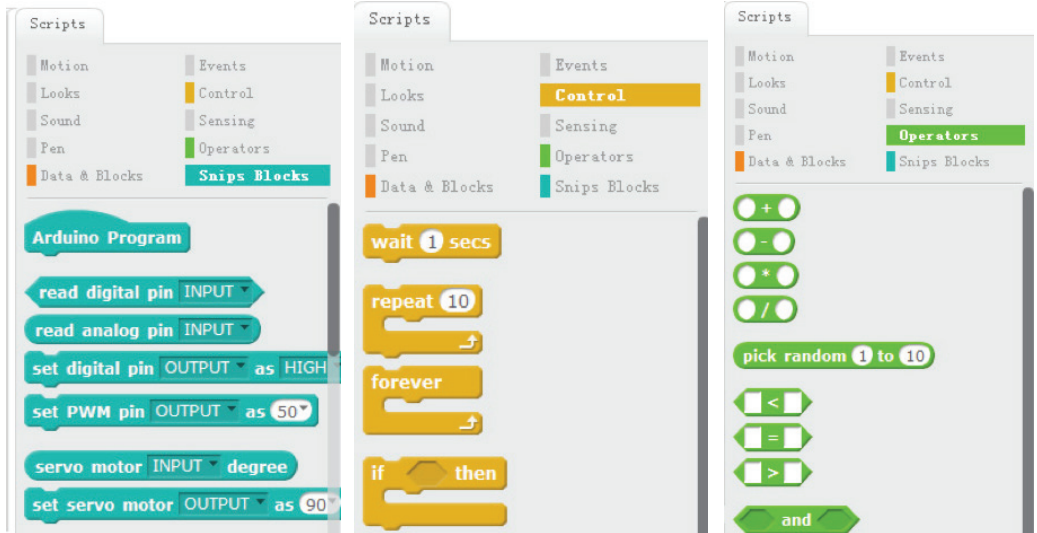
### Easy Code Section

The middle column where the Scripts are dragged and dropped in order to create programs that will be uploaded to the Joint Block. This is a visual representation of how the code will run, making it easy for anyone to start coding.

### Upload Section

In this right column, the script commands from Easy Code Section are translated into code. This gives students the ability to see what they're creating and the actual code required to execute the commands. The Upload button, found at the top this section, is used to upload code to the Joint Block.

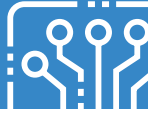
## LabPlus Scripts Explained



**Snips Blocks:** The **TEAL** Snips Blocks commands are where you choose which STEAM SNIPS Blocks you want to use in a program.

**Control:** The **ORANGE** Control commands are used to control how the Input and Output modules should function.

**Operators:** The **GREEN** Operator commands are used to dictate specific functions of the program, such as choosing a random number or creating equations within the code that will control how the program will operate.



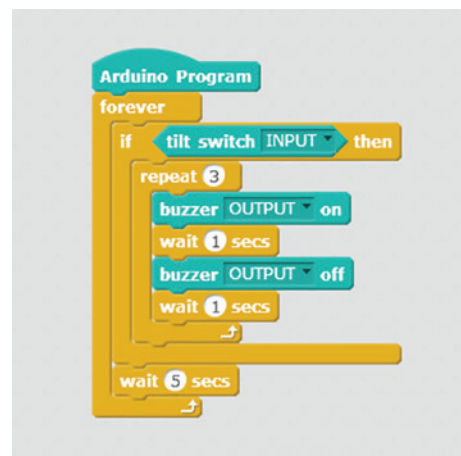
### Example 1: Fragile, Handle with Care

**Note:** Input Modules must be connected to the left of the Joint Block and Output Modules must be connected to the right of the Joint Block.

## Program Example 1: Fragile, Handle with Care!

### What you will need:

- Joint Block
- Tilt Sensor
- Buzzer Block



The program (shown left) will sound a buzzer when the Tilt Sensor is activated. This alarm will sound three times.

If 5 seconds goes by and the Tilt Sensor still isn't level, the alarm will repeat.

Use this program and STEAM SNIPS to make sure a fragile package or object is handled with care!

### How to Upload a Program to the Joint Block:

1. Connect the Micro USB-USB cable to the top of the Joint Block
2. Connect the USB end to a PC with LabPlus installed
3. Open up LabPlus
4. On the horizontal LabPlus menu, select "Connect" and click "COM3 (newly detected)"

**Note:** The three red lights at the top of the program will turn green. This means the Joint Block is successfully connected to the LabPlus software.

5. Recreate the program pictured above
6. Click "Upload" button found at the top of the Upload Section to upload the program to the Joint Block
7. Once it is successfully uploaded, indicated by the message in the space at the bottom of the Upload Section, unplug the Joint Block from the computer.

The Joint Block will now carry out the program written in LabPlus. All that's left is to connect the rest of the STEAM SNIPS modules in the proper order.

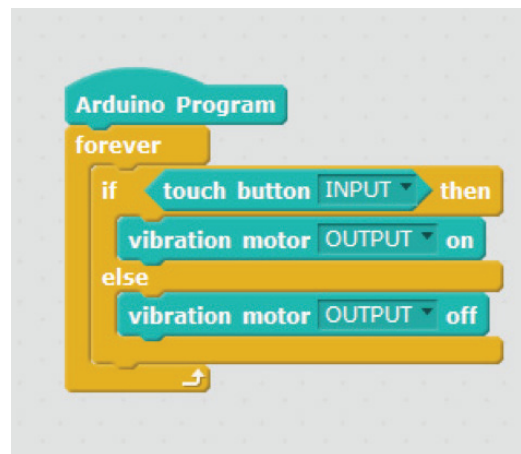
**STEAM SNIPS Module Order: Tilt Sensor > Joint Module > Buzzer Block**

Example 2: On/Off Touch Sensor Alarm

## Program Example 2: On/Off Touch Sensor Alarm

### What you will need:

- Joint Block
- Touch Sensor
- Vibrator Block



When someone comes in contact with the Touch Sensor, the Vibrator Block will activate.

There are many different ways to incorporate the operation above to create a variety of tools and inventions.

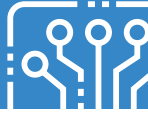
Change the Touch Sensor input with a Motion Sensor and swap the Vibrator Block with a Buzzer Block and create an alarm for your room!

### How to Upload a Program to the Joint Block

1. Connect the Micro USB-USB cable to the top of the Joint Block.
2. Connect the USB end to a PC with LabPlus installed.
3. Open up LabPlus
4. On the horizontal LabPlus menu, select “Connect” and click “COM3 (newly detected)”.  
**Note:** The three red lights at the top of the program will turn green. This means the Joint Block is successfully connected to the LabPlus software.
5. Recreate the program pictured above.
6. Click “Upload” button found at the top of the Upload Section to upload the program to the Joint Block.
7. Once it is successfully uploaded, indicated by the message in the space at the bottom of the Upload Section, unplug the Joint Block from the computer.

The Joint Block will now carry out the program written in LabPlus. All that’s left is to connect the rest of the STEAM SNIPS modules in the proper order.

**STEAM SNIPS Module Order: Touch Sensor > Joint Block > Vibrator Block**

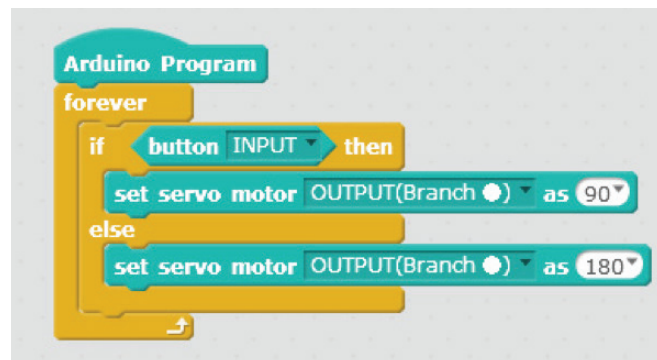


### Example 3: Waving Arm

## Program Example 1: Fragile, Handle with Care!

### What you will need:

- Joint Block
- Button Block
- Servo



**Important:** To change the Output on the Servo Motor, click the down arrow and additional options will be displayed.

When the Power Block is turned on, the Servo will align flat on a horizontal plane. If the Button Block is pressed, the Servo will point straight up. This action can be repeated for an infinite number of times – thus creating a waving motion.

### How to Upload a Program to the Joint Block:

1. Connect the Micro USB-USB cable to the top of the Joint Block.
2. Connect the USB end to a PC with LabPlus installed.
3. Open up LabPlus.
4. On the horizontal LabPlus menu, select “Connect” and click “COM3 (newly detected)”.

**Note:** The three red lights at the top of the program will turn green. This means the Joint Block is successfully connected to the LabPlus software.

5. Recreate the program pictured above.
6. Click “Upload” button found at the top of the Upload Section to upload the program to the Joint Block.
7. Once it is successfully uploaded, indicated by the message in the space at the bottom of the Upload Section, unplug the Joint Block from the computer.

The Joint Block will now carry out the program written in LabPlus. All that’s left is to connect the rest of the STEAM SNIPS modules in the proper order.

**STEAM SNIPS Module Order: Button Block > Joint Block > Servo**