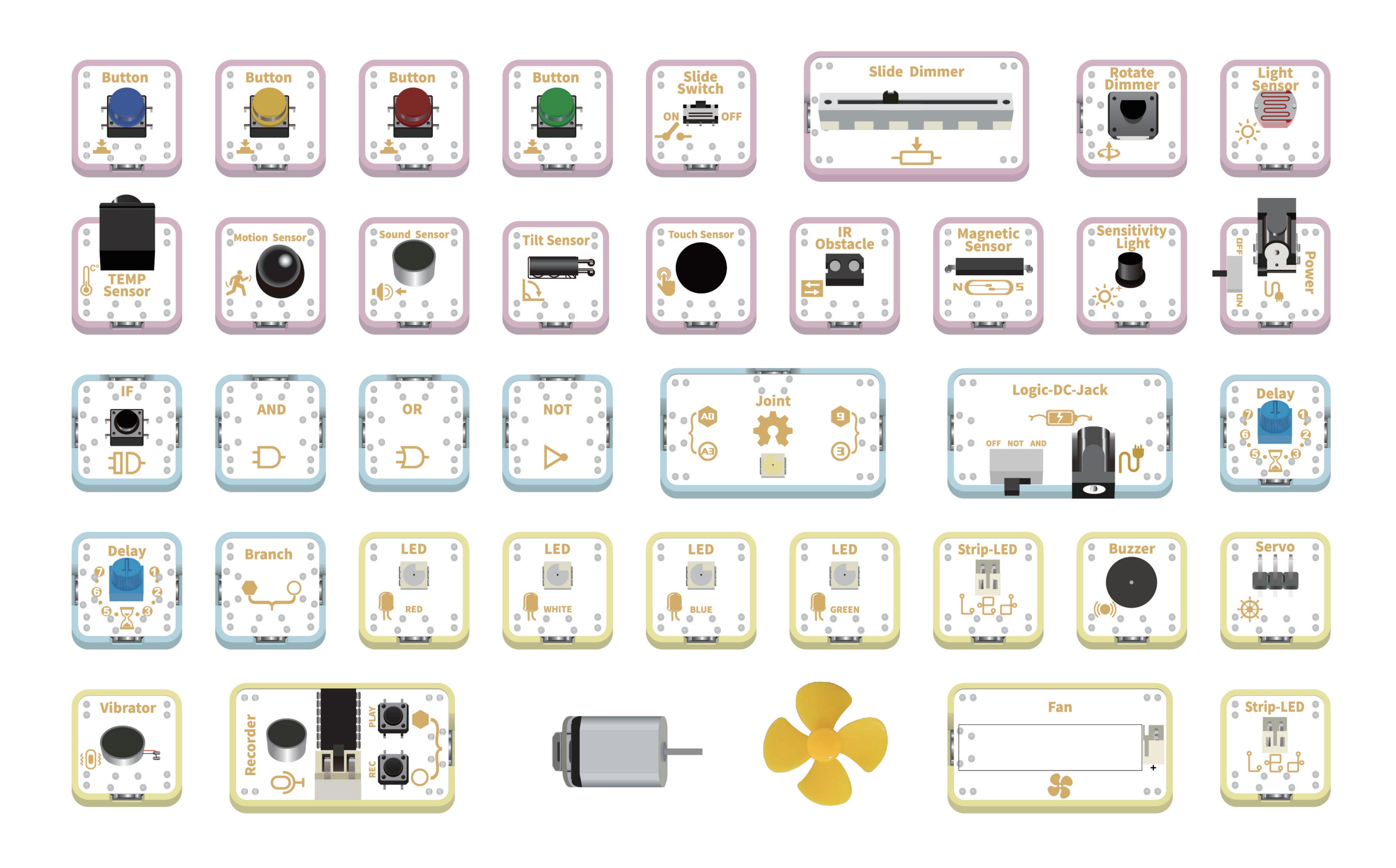


# Instruction Manual

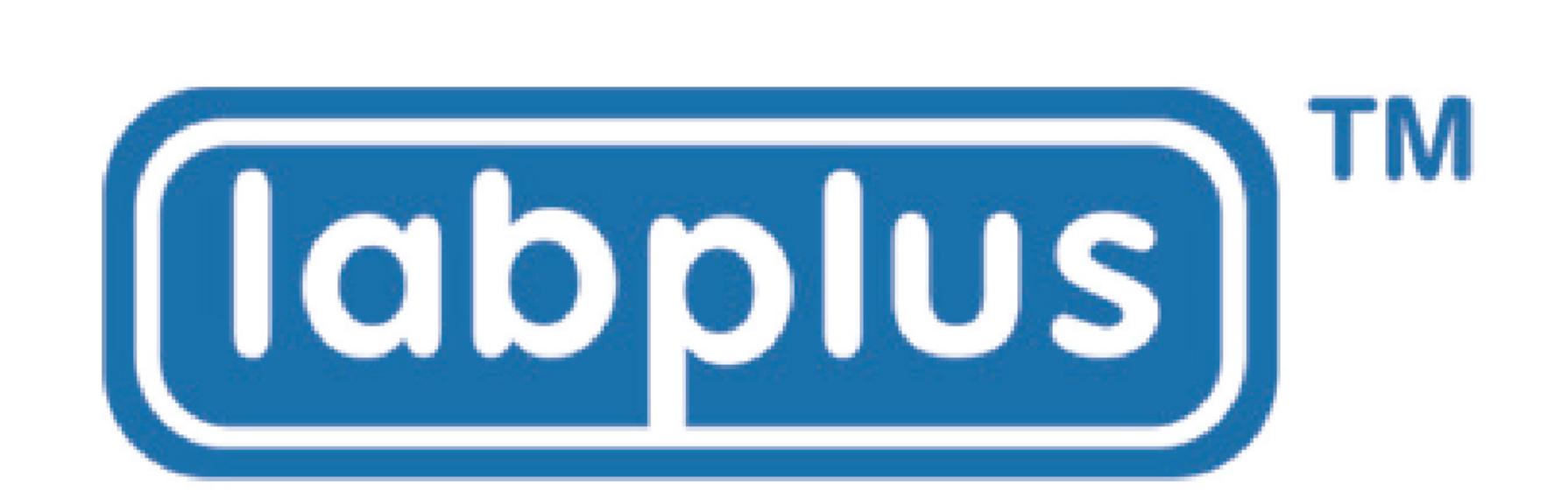
Model #: SNIP18



# The Ideal Kit for:

- Electronics Sensor Knowledge
- Electrical Hardware Knowledge
- Circuitry Structure and Configuration
- Logic Gate Operation
- Scratch and Arduino Programming for PC (only)







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Module and Sensor List					3
Non-Programmable Mode					7
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Software Installation					8
Programming and Downloading to Module	le				9

## NOTE:

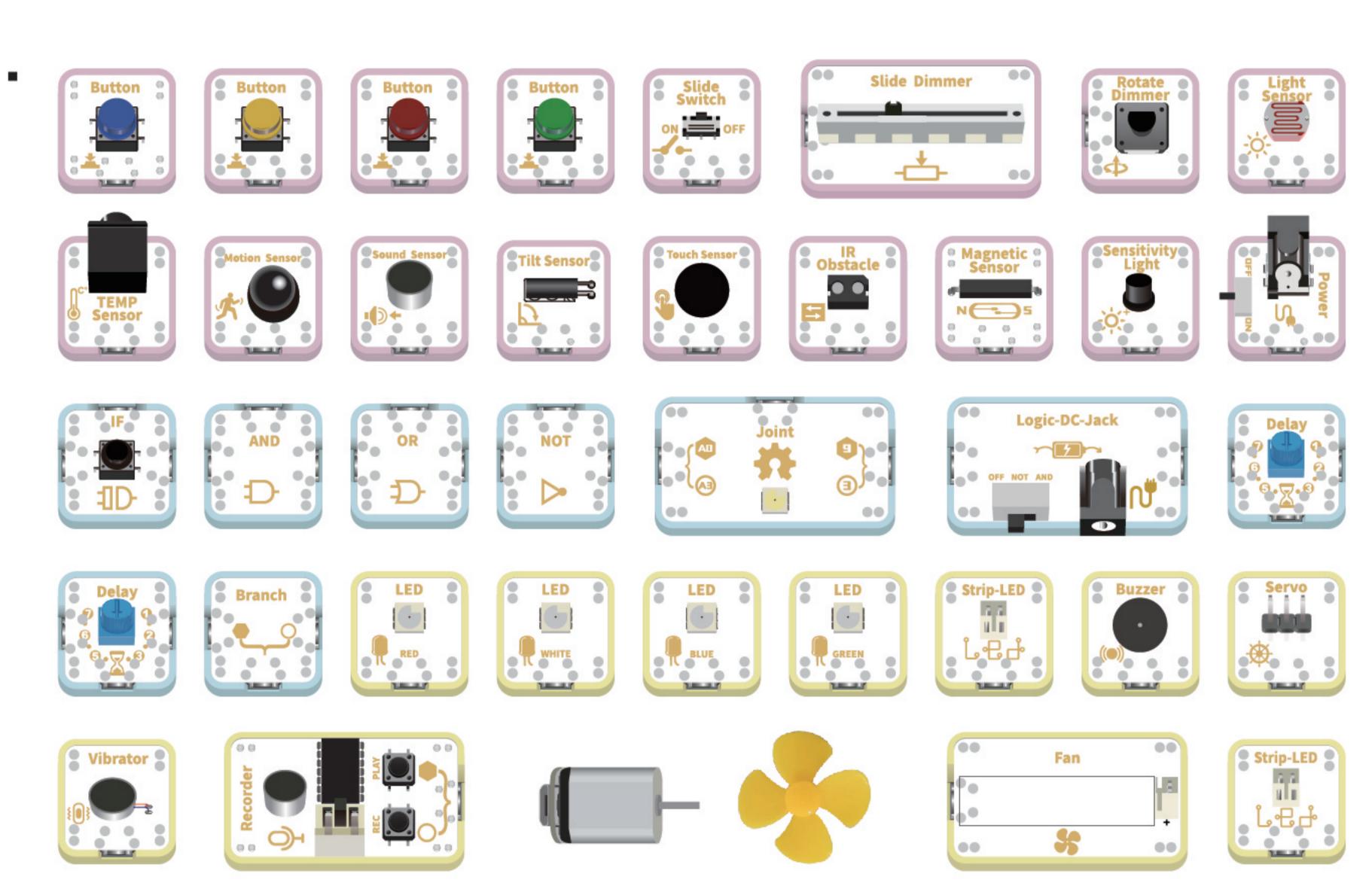
- Please read these instructions carefully and retain for future reference.
- You will need a PC (Windows-based) to install all software.
- Always power on the servos before beginning.

## 1. INTRODUCTION

**STEAM SNIPS™** are electronic building modules that can be combined in an infinite number of ways, creating all sorts of electronic inventions, and best of all, they are designed to appeal to both boys and girls.

Non-Programmable Mode is ideal for younger learners. It has a variety of Logic Control Modules to enhance and inspire their creativity. It provides an easy platform and inspires interest, encouraging hands-on learning. All modules are interchangeable, providing users with varied and versatile experiences.

Programmable Mode is the ideal way to allow students to reach another level and explore more advanced techniques through coding with customized Scratch Software.



## UNIQUE CHARACTERISTICS

**Designed for Safety:** The USB cable, rubberized edges and sharp contacts have all been designed to better protect users.

Compatibility: Easily connects to other standard 3-pin configured modules.

Age Groups: Suitable for elementary (5+ years) through higher education students.

Comprehensive Offering: Greater number of modules than most other competitors.

**Durability: STEAM SNIPS™** are designed to be durable and versatile for the rigors of the classroom and heavy-duty daily use.

#### 2. MODULE AND SENSOR LIST

## a. INPUT MODULES (Color-Coded Pink)

Input modules are sensors and detectors that sense, detect and collect environmental data – sound, light, temperature, motion, tilt, touch, IR distance, and magnetic switches, buttons and dimmers.

# b. LOGIC AND POWER CONTROL MODULES (Color-Coded Blue)

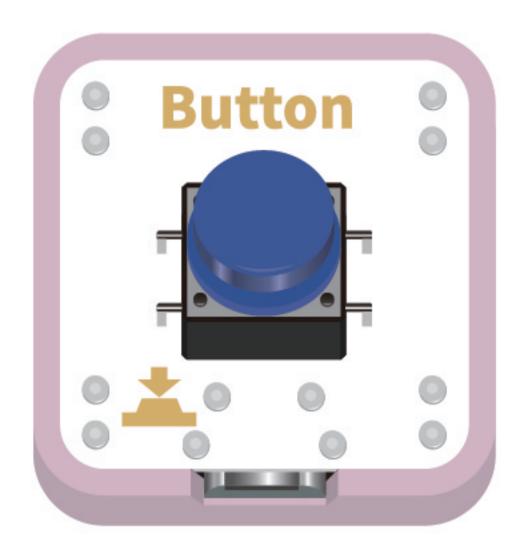
- Logic Control Modules receive and analyze data from the Input Modules and deliver a digitized signal to the Output Modules (i.e., Branch, AND, OR, NOT and IF).
- Each Control Module has a pre-programmed task that is used to enhance the overall performance of the Input/Output Module.
- The Controller (Programming Module) controls output based on logic and can be combined with other programmable modules to adjust input and output parameters and interfaces with the Master Control Board through coding.
- The Power Supply Module powers the configuration via 9V alkaline battery and/ or USB power through a computer.

# c. OUTPUT MODULES (Color-Coded Yellow)

Output Modules produce motion, audio and visual effects that include LED lights, LED light strip, buzzer, vibrator, voice recorder, servo and fans.

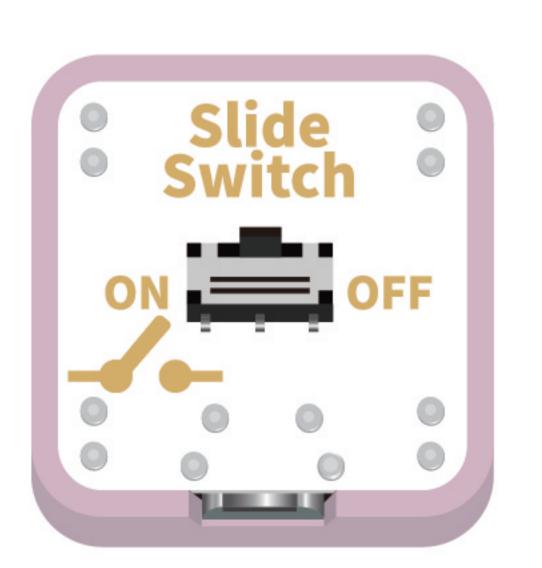
# 2.1 INPUT MODULE DESCRIPTION (Color-Coded Pink)

Use the Micro-USB cable to connect Output Modules to the Logic Control Module.



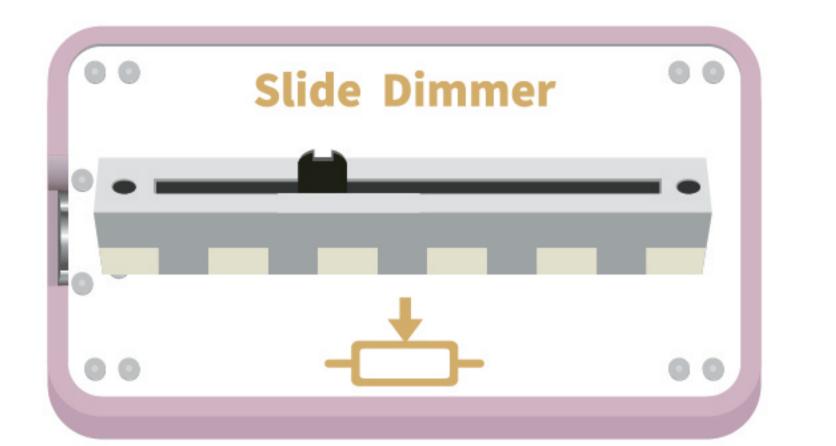
#### **Button Module:**

Push once to turn ON, and again to turn OFF.



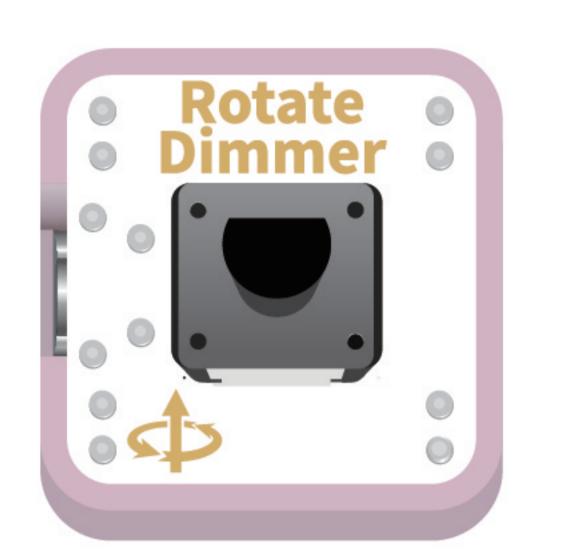
#### Slide Switch Module:

Slide to turn ON or OFF.



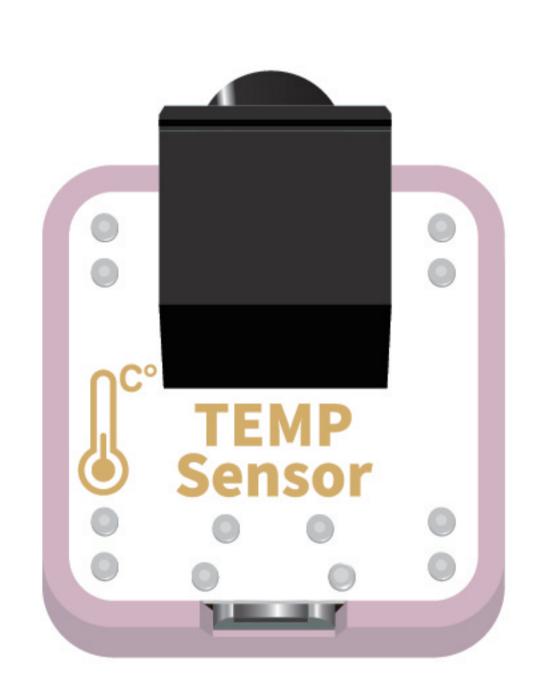
#### Slide Dimmer Module:

Slide the Potentiometer knob to vary the output.



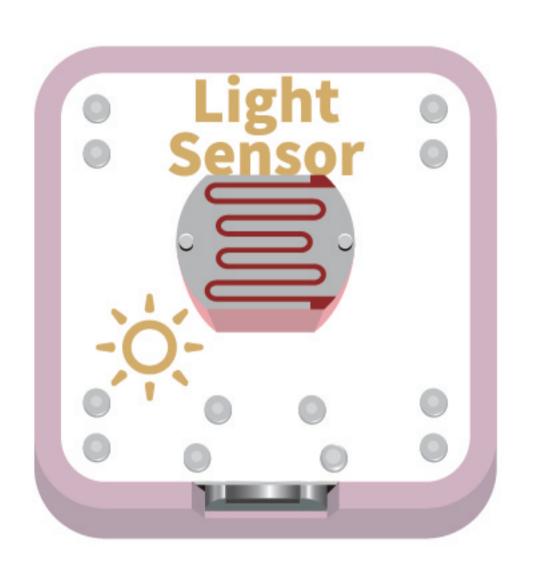
#### Rotate Dimmer Module:

Rotate the Potentiometer dial to vary the output.



### Temperature Sensor Module:

Plug the temperature probe jack into the temperature sensor module. Place the probe tip on the object's surface to measure the temperature. For water/liquid, immerse the probe tip into the liquid.



#### Light Sensor Module:

The Light Module measures dark or light density (0% or 100%).



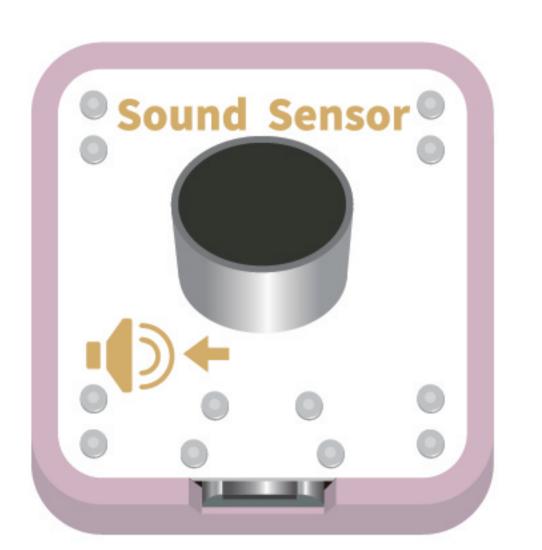
## Sensitivity Light Module:

The Sensitivity Light Module measures a range of dark to light (0%~100%).



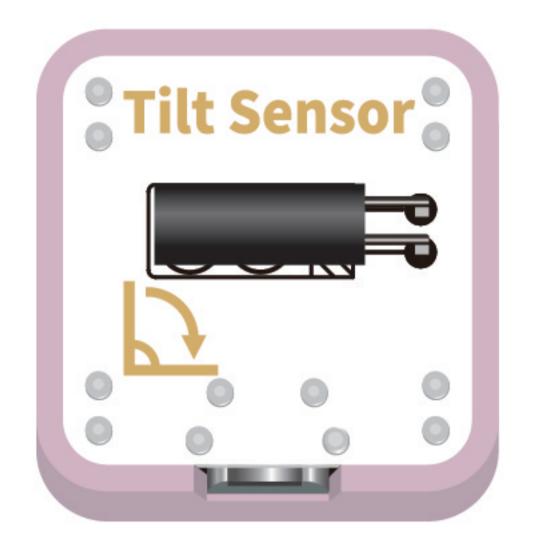
#### Motion Sensor Module:

The Motion Sensor detects any nearby motion of objects, human or animal.



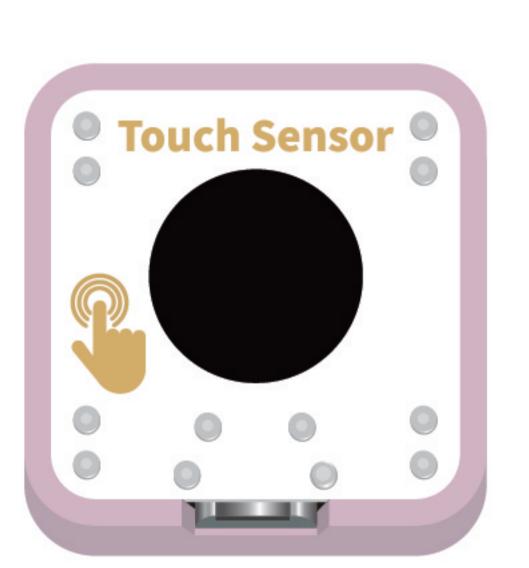
### Sound Sensor Module:

The Sound Sensor detects surrounding sound intensity levels.



### Tilt Sensor Module:

The Tilt Switch attaches to an object to detect the tilt angle.



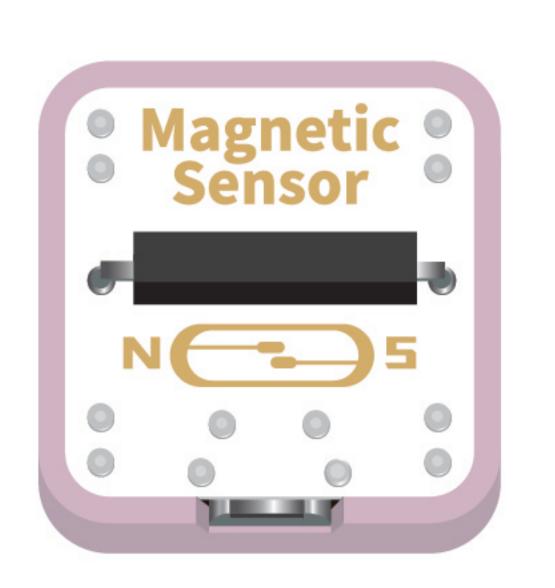
# Touch Sensor Module:

The Touch Sensor activates a signal.



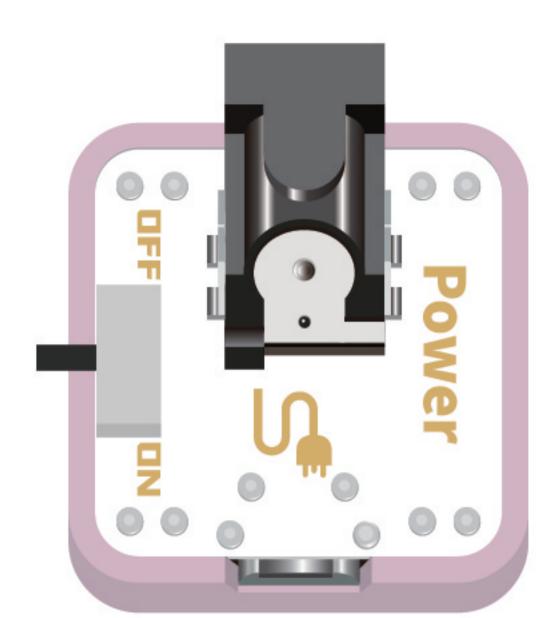
#### IR Obstacle Sensor:

The IR Obstacle Sensor detects when an object is within approximately 1 inch.



#### Magnetic Sensor Module:

The Magnetic Sensor Module detects a magnetic field.

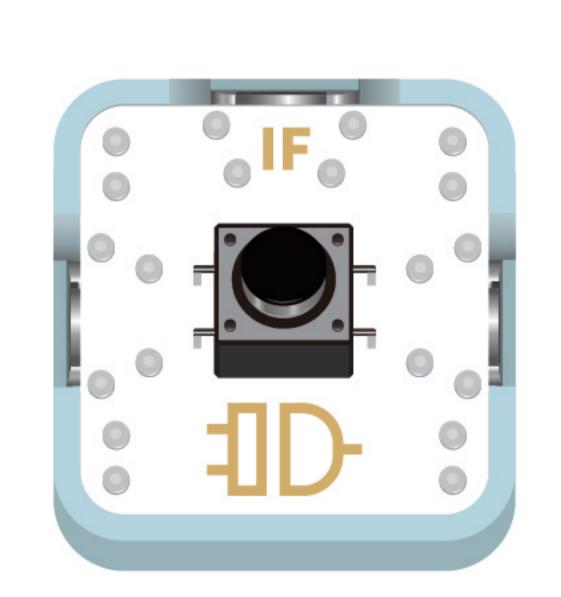


#### Power Module:

Power Module is used to connect the Logic Control Modules to a power supply.

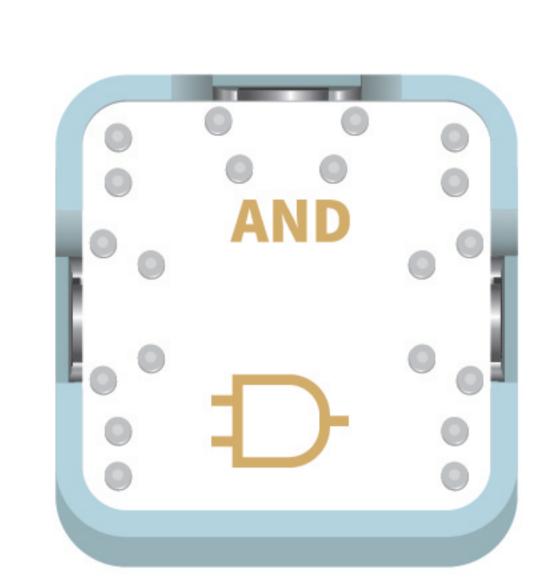
# 2.2 LOGIC AND POWER CONTROL MODULES (Color-Coded Blue)

Logic Control Modules have 3 USB Connectors: 1 for input, 1 for power and 1 for output.



#### IF Module

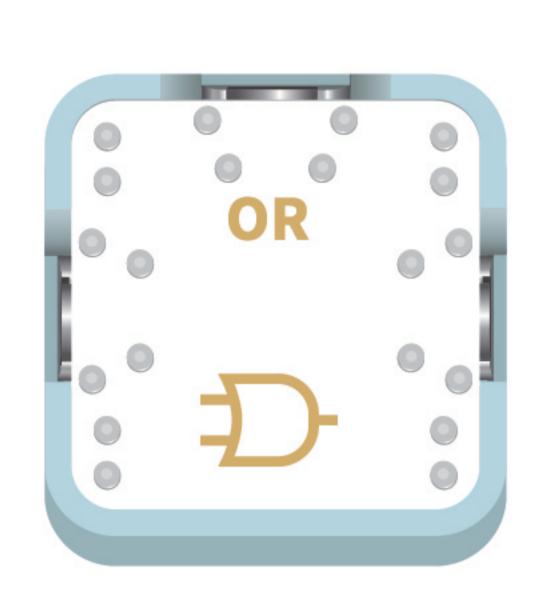
Performs the function of IF logic. Detects input signals and judges if it meets the pre-set condition, then triggers communication with the Output Module.



#### AND Module:

Performs the function of AND logic. Detects two separate input signals and judges if it meets the pre-set conditions, then triggers communication with the Output Module.

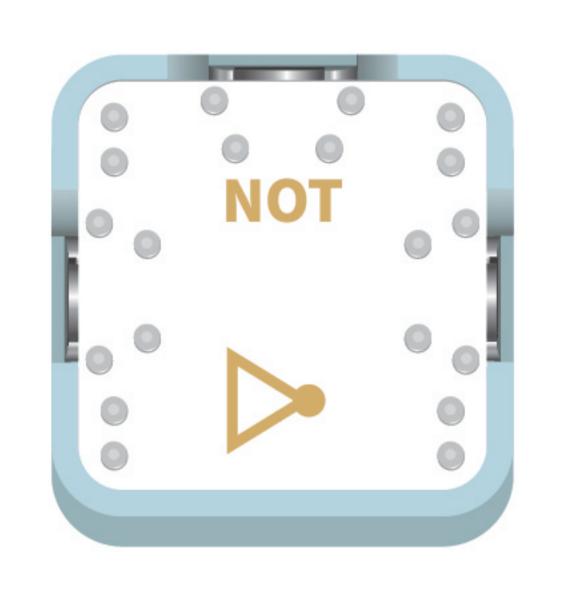
Input		Output		
Α	В	A and B		
0	0	0		
0	1	0		
1	0	0		
1	1	1		



#### OR Module:

Performs the function of OR logic. Detects one or the other input signal, then triggers communication with the Output Module.

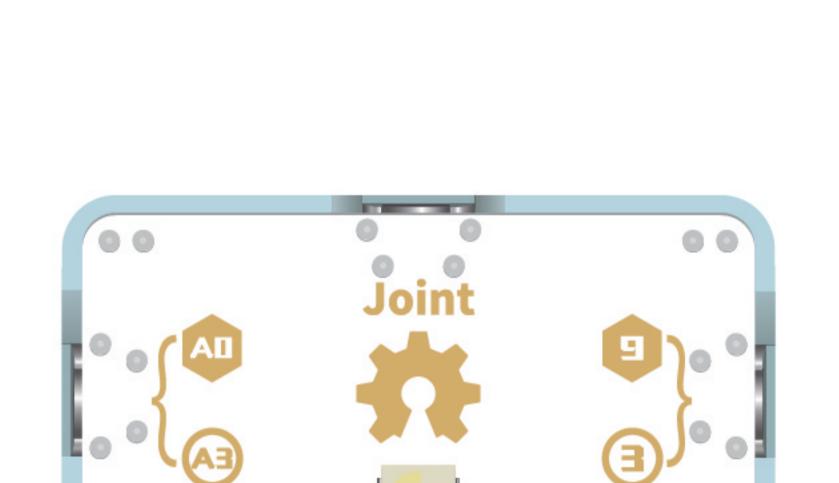
Input		Output		
Α	В	A or B		
0	0	0		
0	1	1		
1	0	1		
1	1	1		



### NOT Module:

Performs the NOT logic. Detects the input signal then triggers communication in reverse.

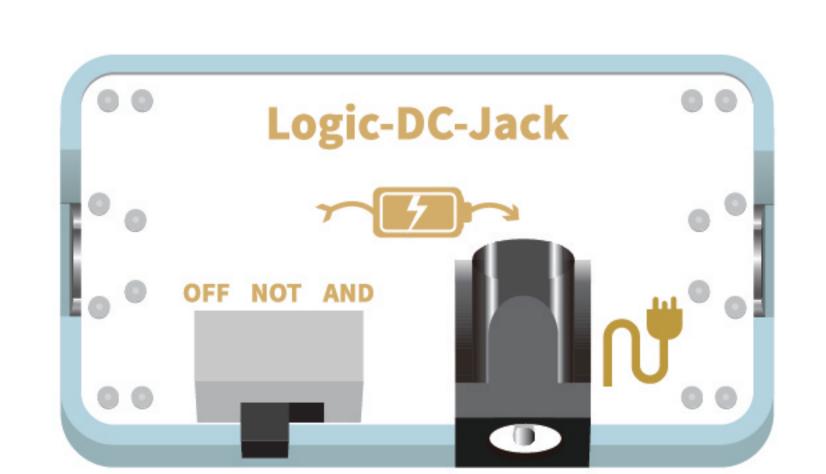
Input	Output
Α	NOTA
0	1
1	0



## JOINT (Programmable) Module:

The Programmable Joint Module is a Master Control Board that can be programmed using the customized Scratch software.

**Note:** Includes 3 Micro USB ports: one for Input, one for Output and the center port for a power supply. Also includes a connector for connecting a PC for program downloading.



#### Link Module (Logic-DC-Jack):

Controls the Output Module, based on the following options, without any additional programming:

- OFF Acts as a power module only
- NOT Acts as a power module plus a NOT logic module
- AND Acts as a power module plus an AND logic module





The Branch Module acts as a traffic signal between two Input Modules and communicates with the Output Module.

Function 1: 2 Inputs => 1 Output

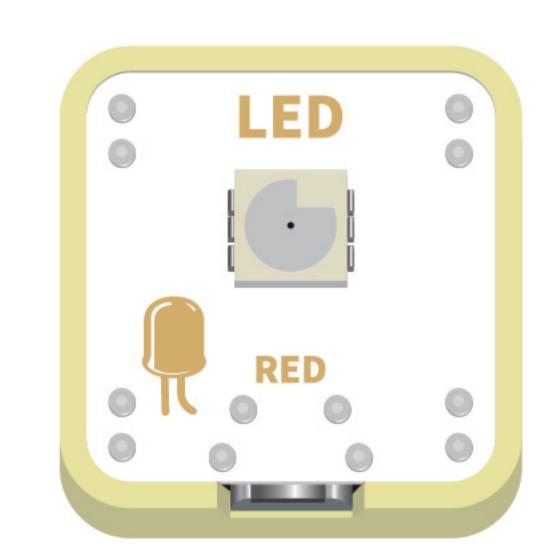
Function 2: 2 Outputs => 1 Input



#### Delay Module:

Connected to front of the Output Module, used to delay the start/stop of the Output Module, center knob rotates to adjust delay time.

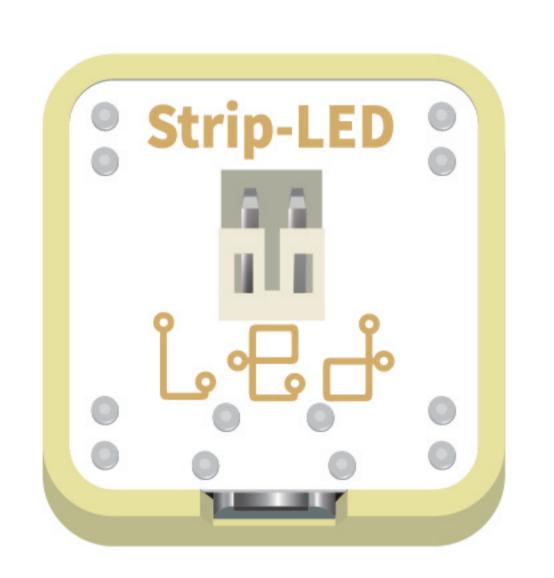
# 2.3 OUTPUT MODULES (Color-Coded Yellow)



## LED Module:

LED lights go on when the signal is received.

Note: Use the Micro-USB cable to connect to the Logic Control Module.



#### Strip-LED Module:

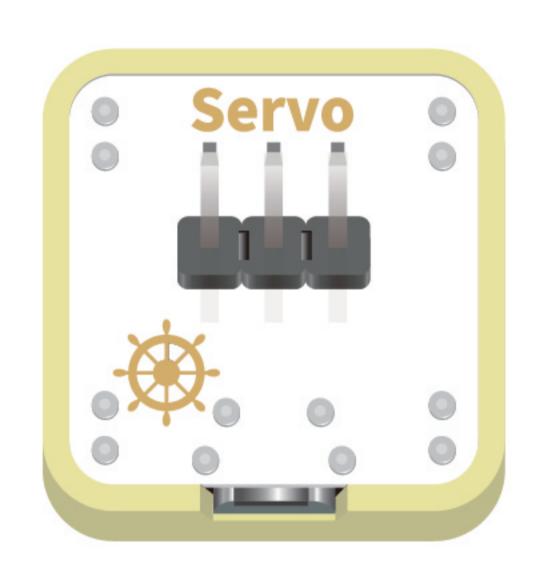
This module, with variable output, controls a length of Strip LED lights. Note: Use the Micro-USB cable as input and the 3-pin plug as output.



#### Buzzer Module:

For sound, the Buzzer Module produces a buzzer sound when signal is received.

Note: Use the Micro-USB cable as input and buzzer as sound output.



#### Servo Module:

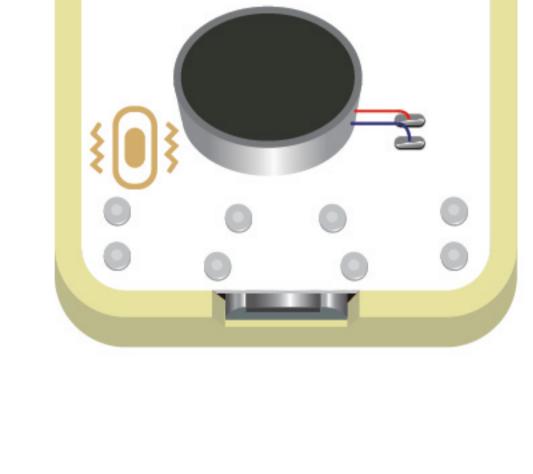
The Servo Module controls the Servo Motor for movement and direction of an object.

Note: Use the Micro-USB cable as input and the 3-pin plug as output.



## Vibrator Module:

The Vibrator Module produces a vibration when signal is received. Note: Use the Micro-USB cable to connect to the Logic Control Module.

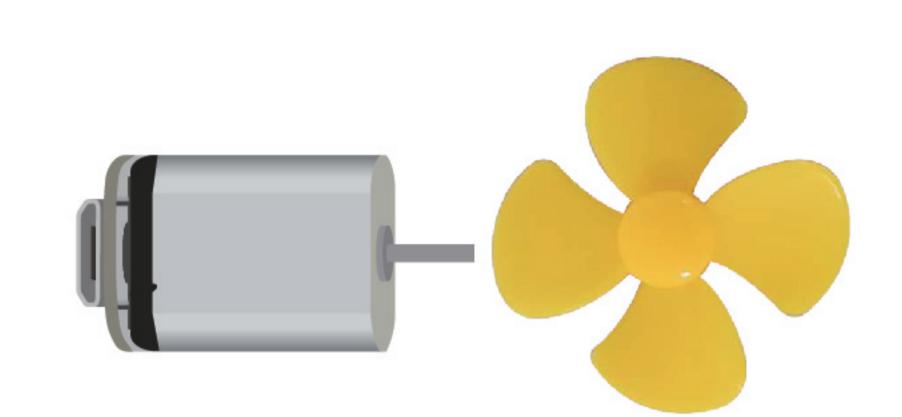


#### Fan Module:



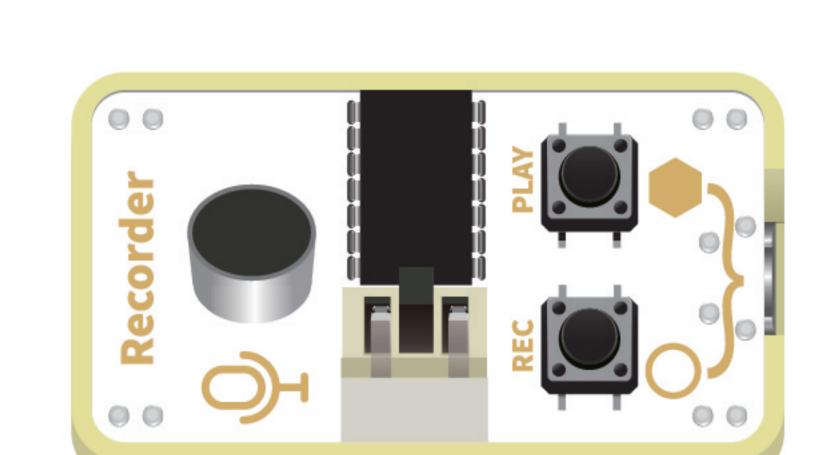
The Fan Module sends a signal to turn fan on or off. Plug the black PC fan (with the 3-pin wire) to the Fan Module.

Note: Use the Micro-USB cable to connect to the Logic Control Module.



#### Yellow Fan and Motor:

The Yellow Fan and Motor connect to the Logic Control Module with a Micro USB cable sends a signal to turn fan on or off.



#### Recording Module:

Record and playback up to 10 seconds of audio. Use the built-in microphone to record and mini-speaker to playback (connected by 3-pin plug). Use the REC and PLAY buttons to record and playback audio.

Note: Use the Micro-USB cable as input and the 3-pin plug as output.

## 3. NON-PROGRAMMABLE MODE

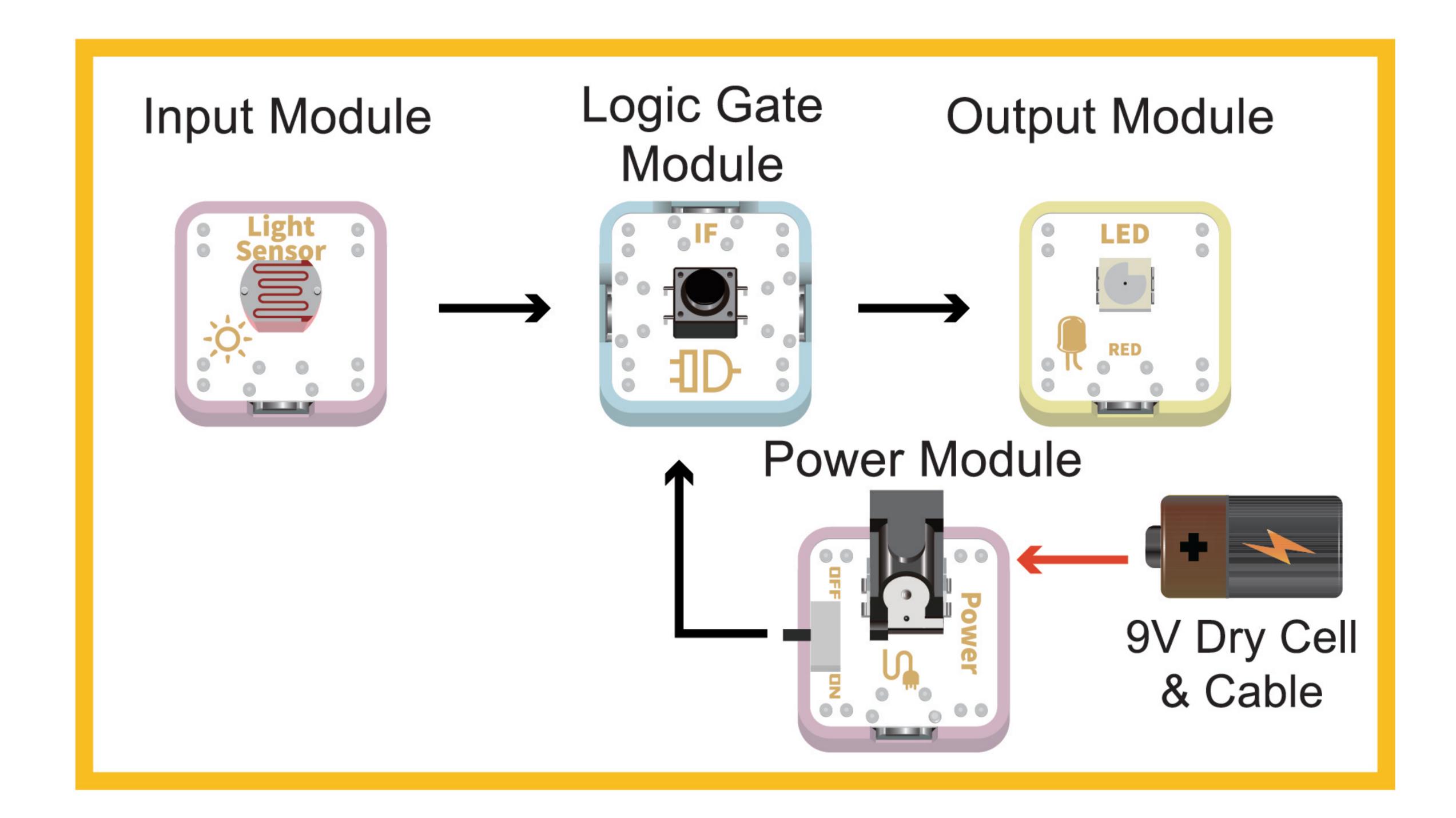
## Ideal Hands-On Experimentation with Logic Modules

Utilize a comprehensive list of Logic Modules to design a variety of creations with Input and Output Modules.

Following are some examples:

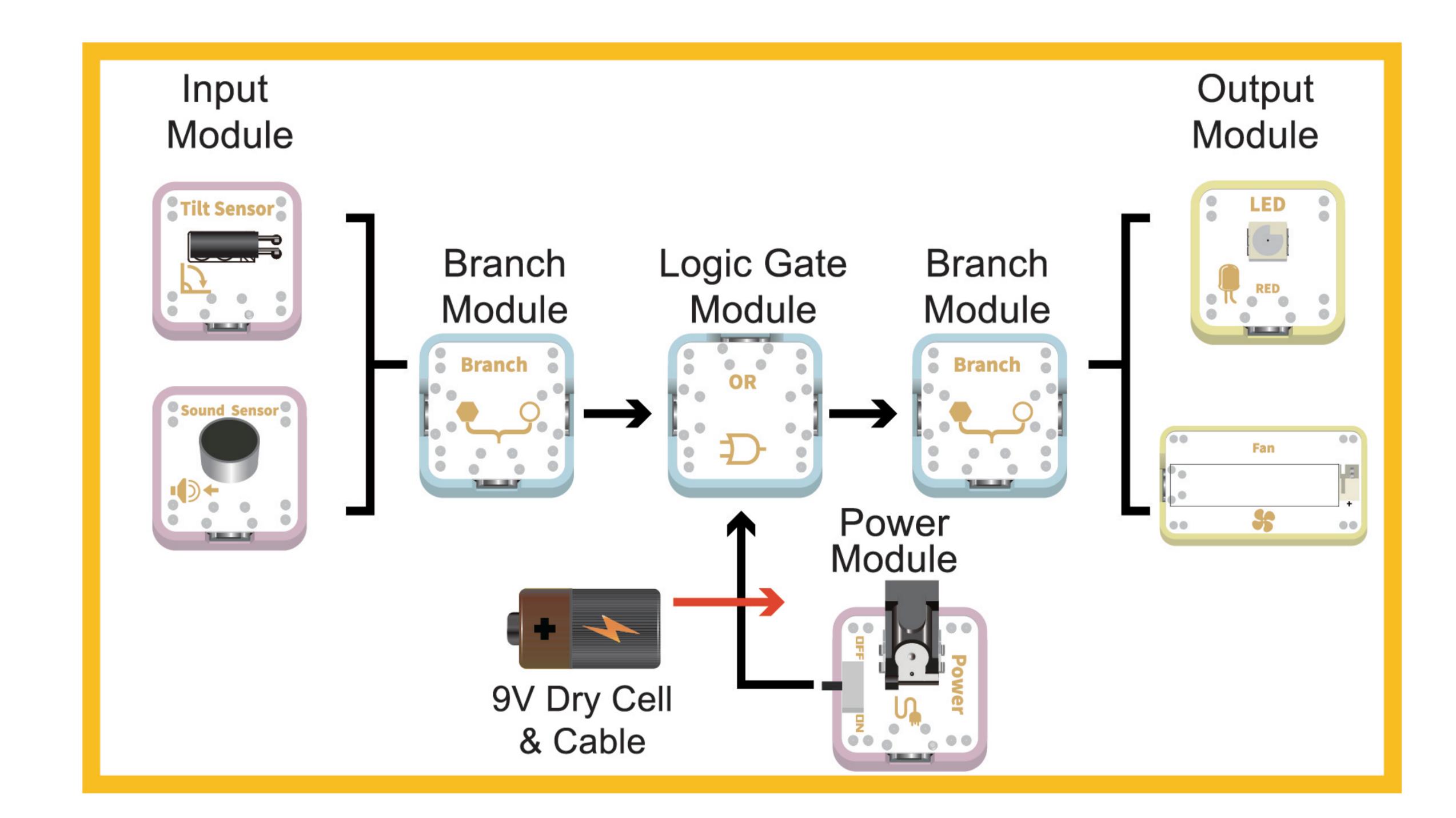
## Single I/O Logic Control:

 Connect the 9V Battery to a Power Module using the power adapter plug or the USB cable connected to a PC.



## Multiple I/O Logic Control:

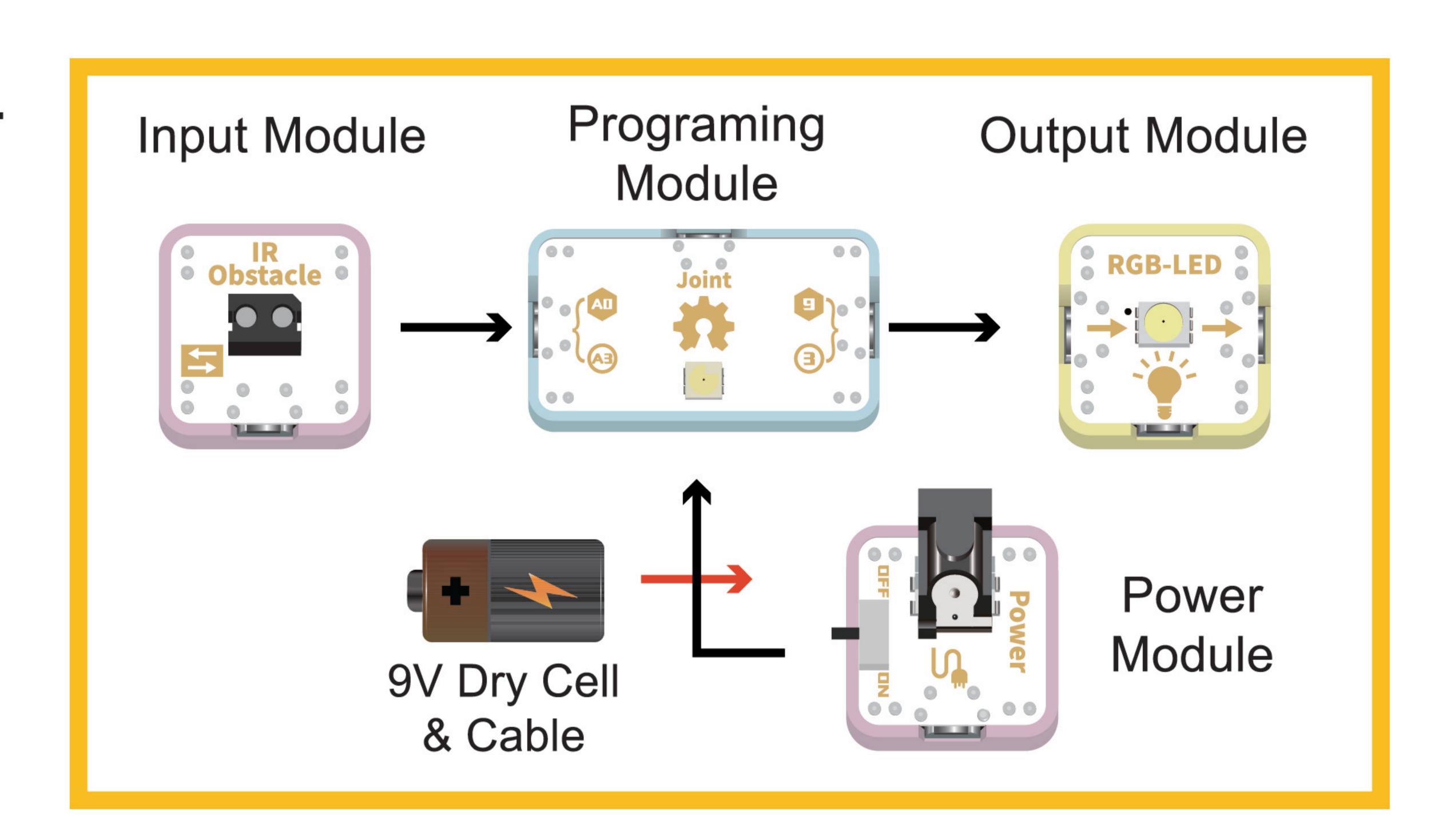
- Use the Branch Module to merge dual Inputs or split dual Outputs.
- Connect the 9V Battery to a Power Module using the power adapter plug or the USB cable connected to a PC.



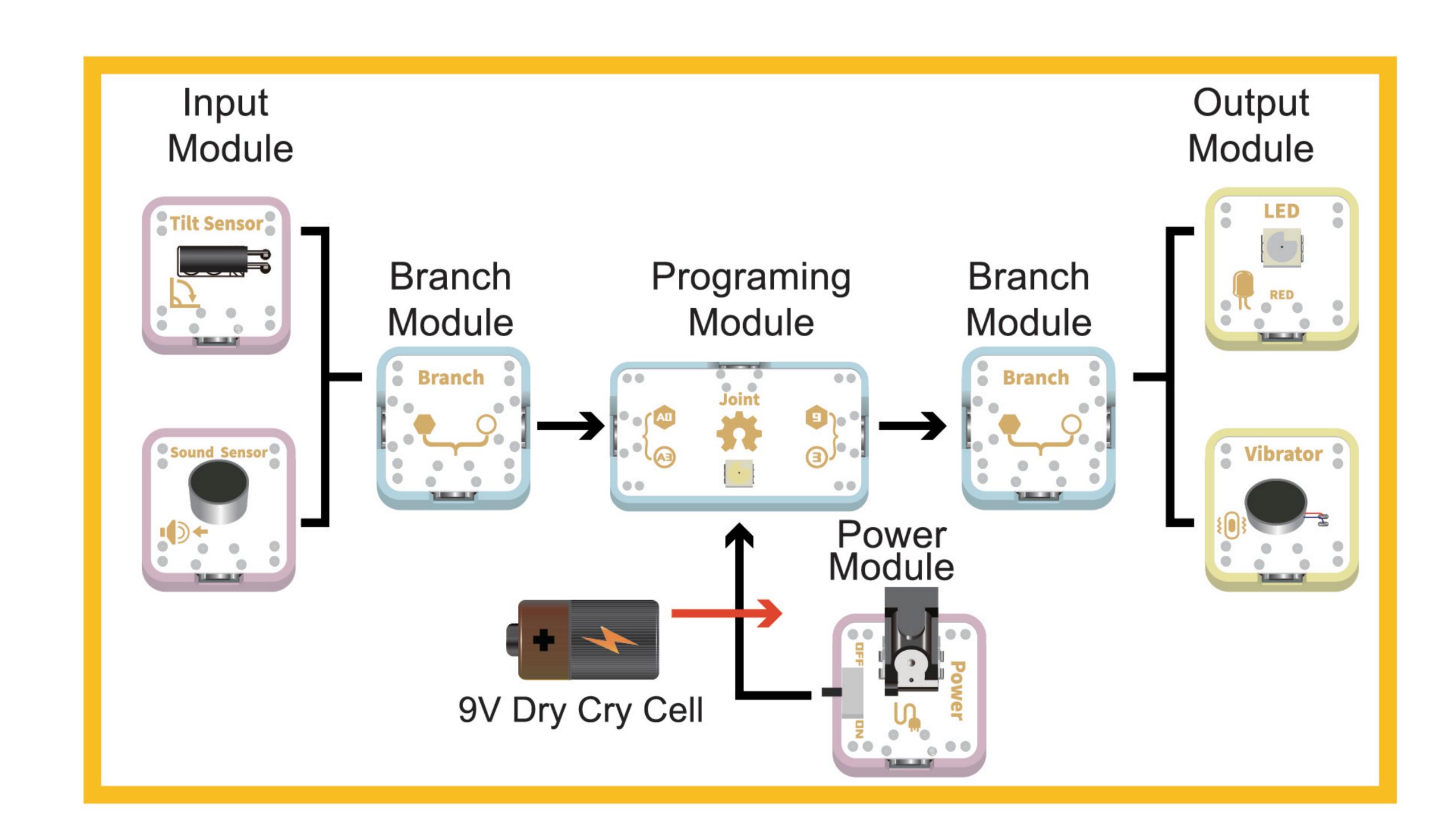
## 4. PROGRAMMABLE MODE

Students can being learning coding and create more complex systems using the Programmable Mode.

Basic Single I/O Programming Control – Ideal Starter for SCRATCH Programming



**Basic Dual I/O Programming Control** – Ideal Starter for SCRATCH Programming



# 4.1 SOFTWARE INSTALLATION

Follow these instructions to download and install the customized HamiltonBuhl's Labplus Scratch Software.

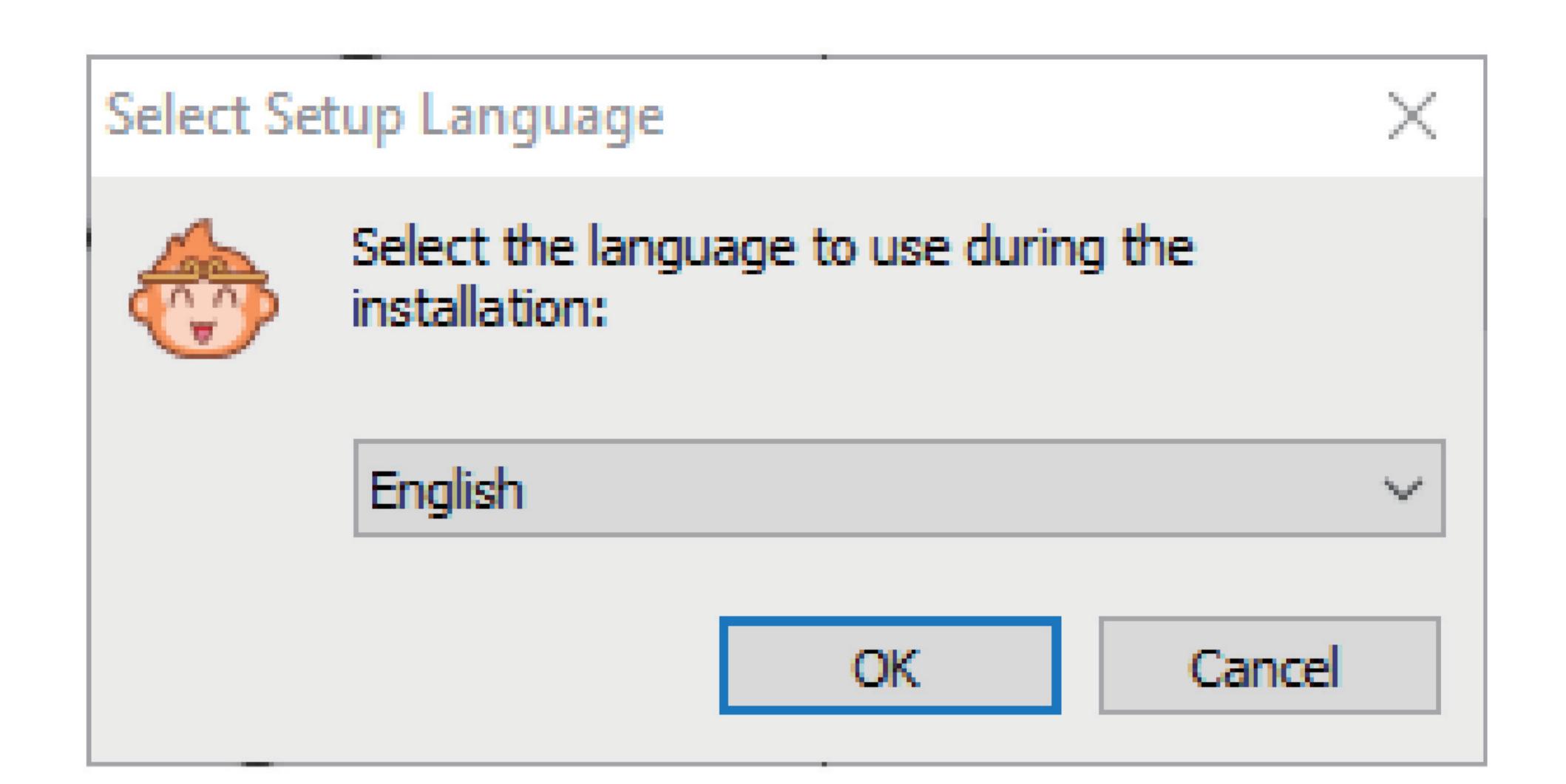
Go to: http://hamiltonbuhl.com/snips-software

(for Operating Systems: Windows7/8/10.)

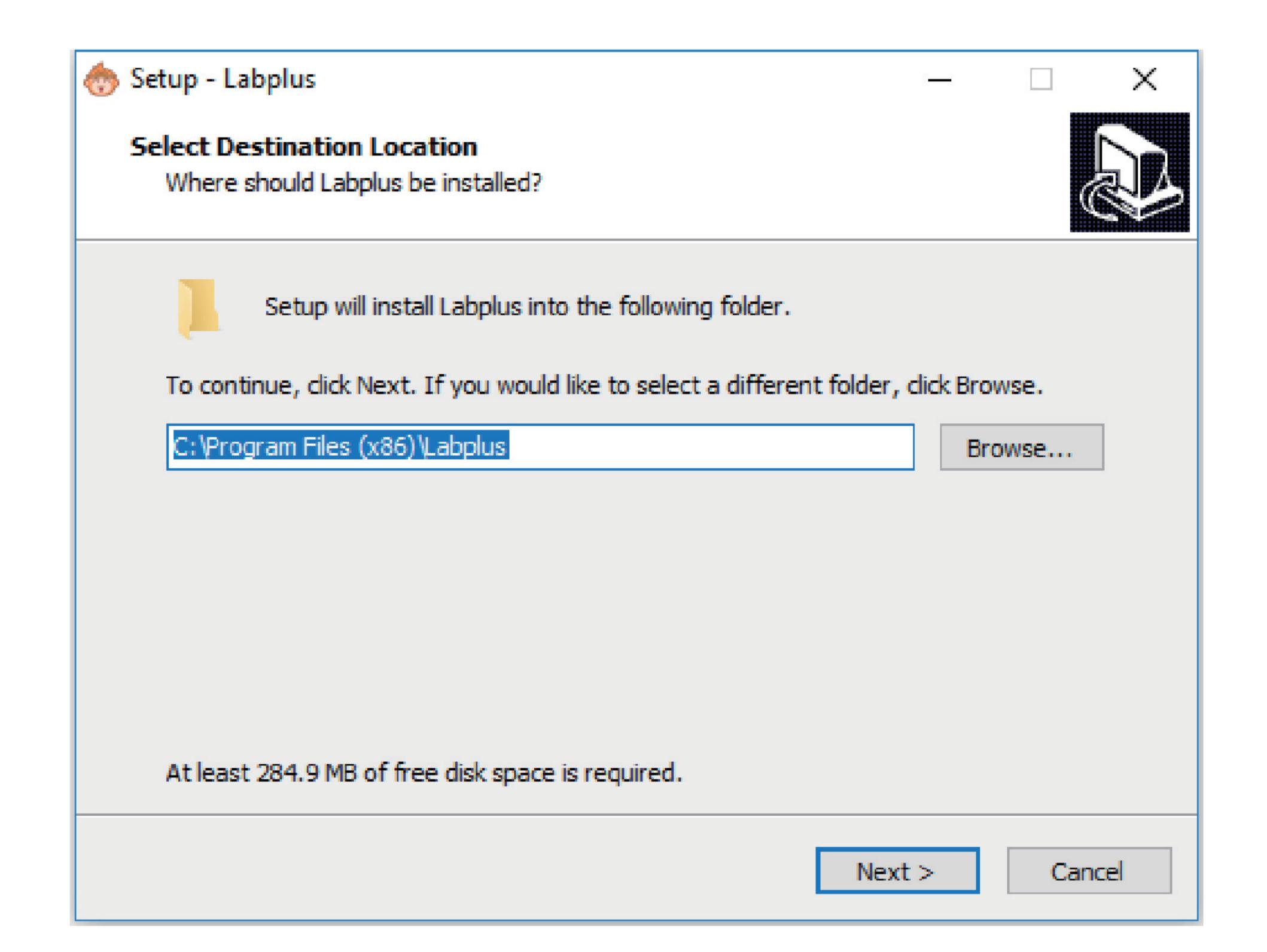
Double-click on the LabplusSetupx.x.x.exe fiile to begin installation.



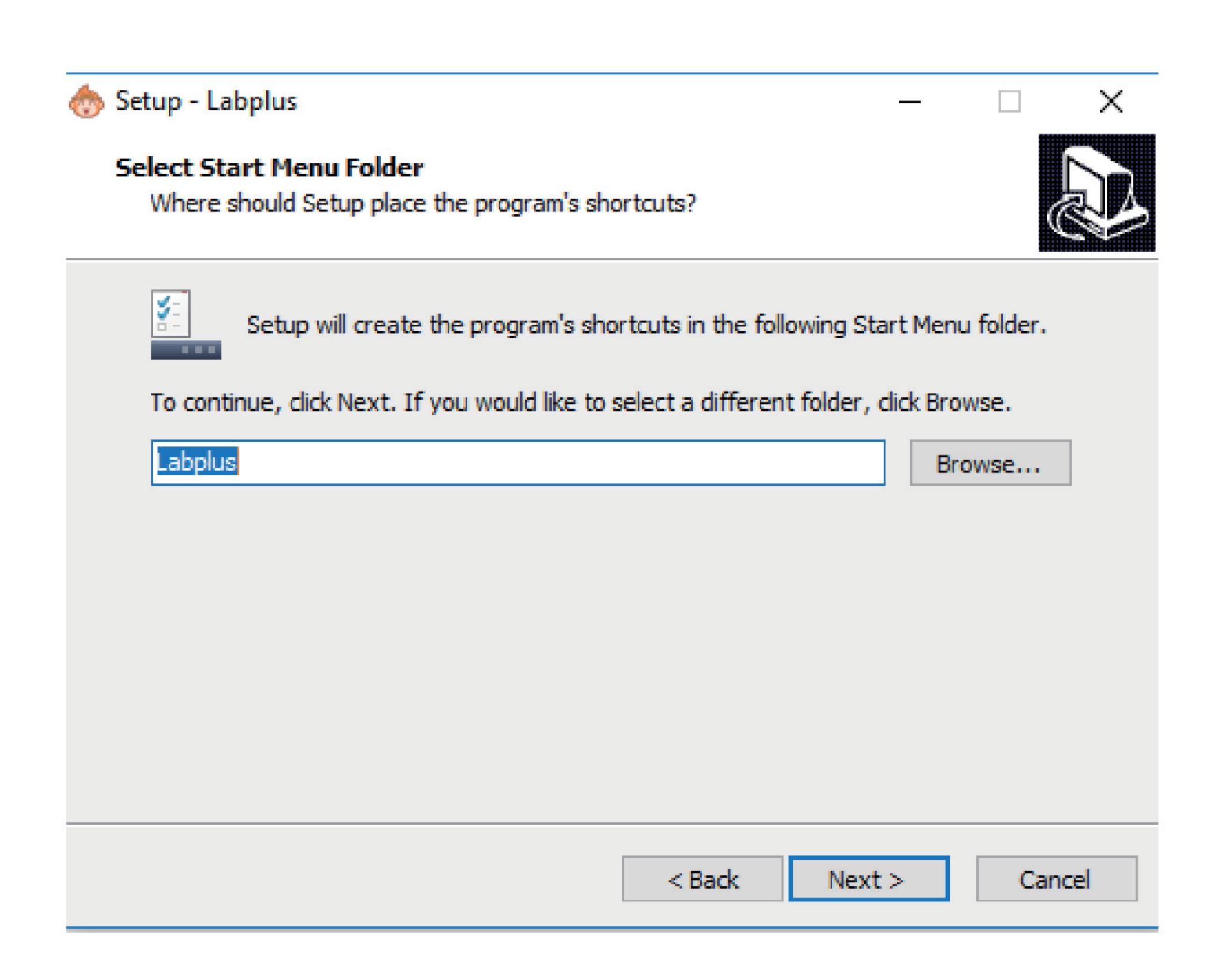
From the pull-down menu, select your language to install and click "OK".



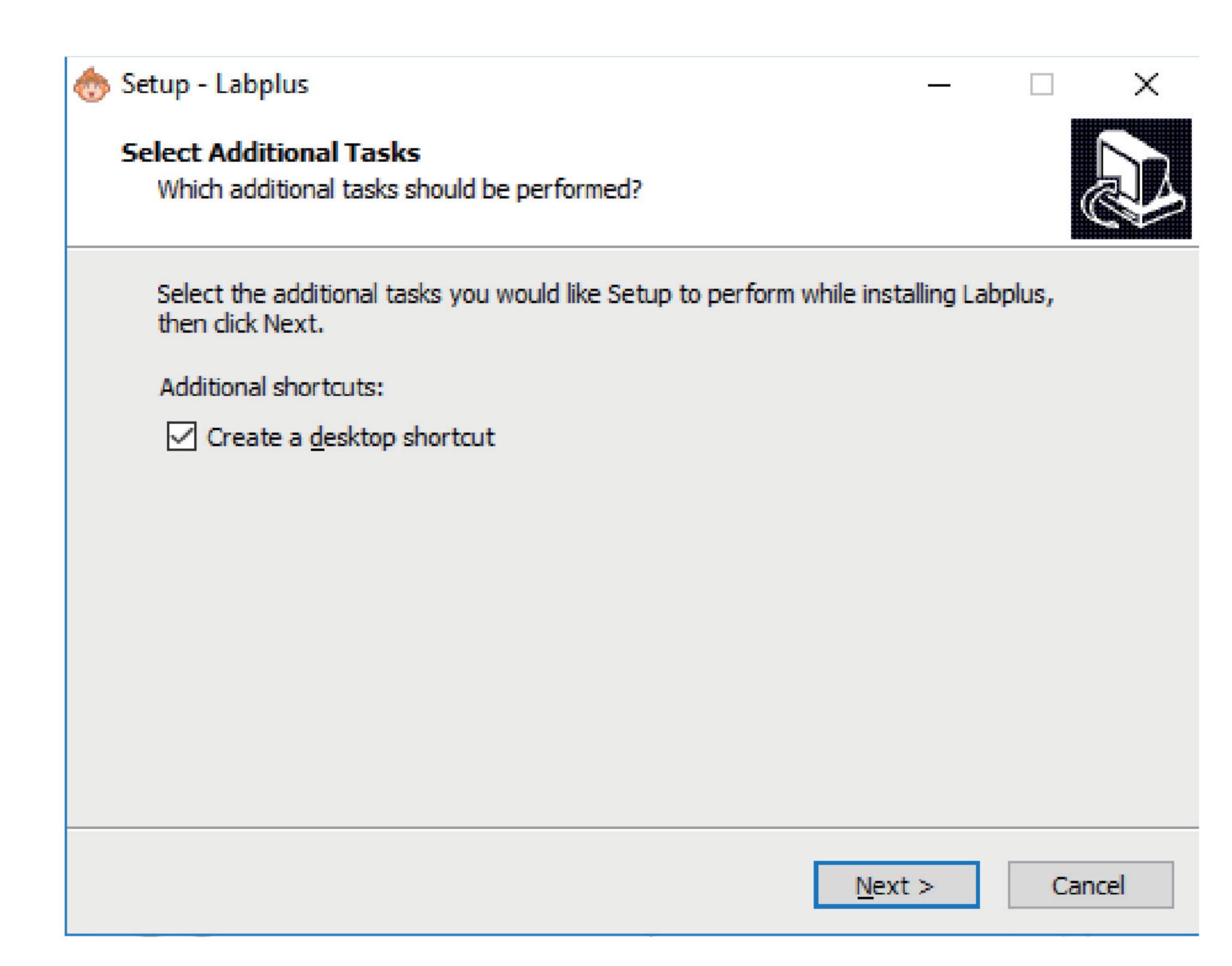
Select the destination location and click "Next".



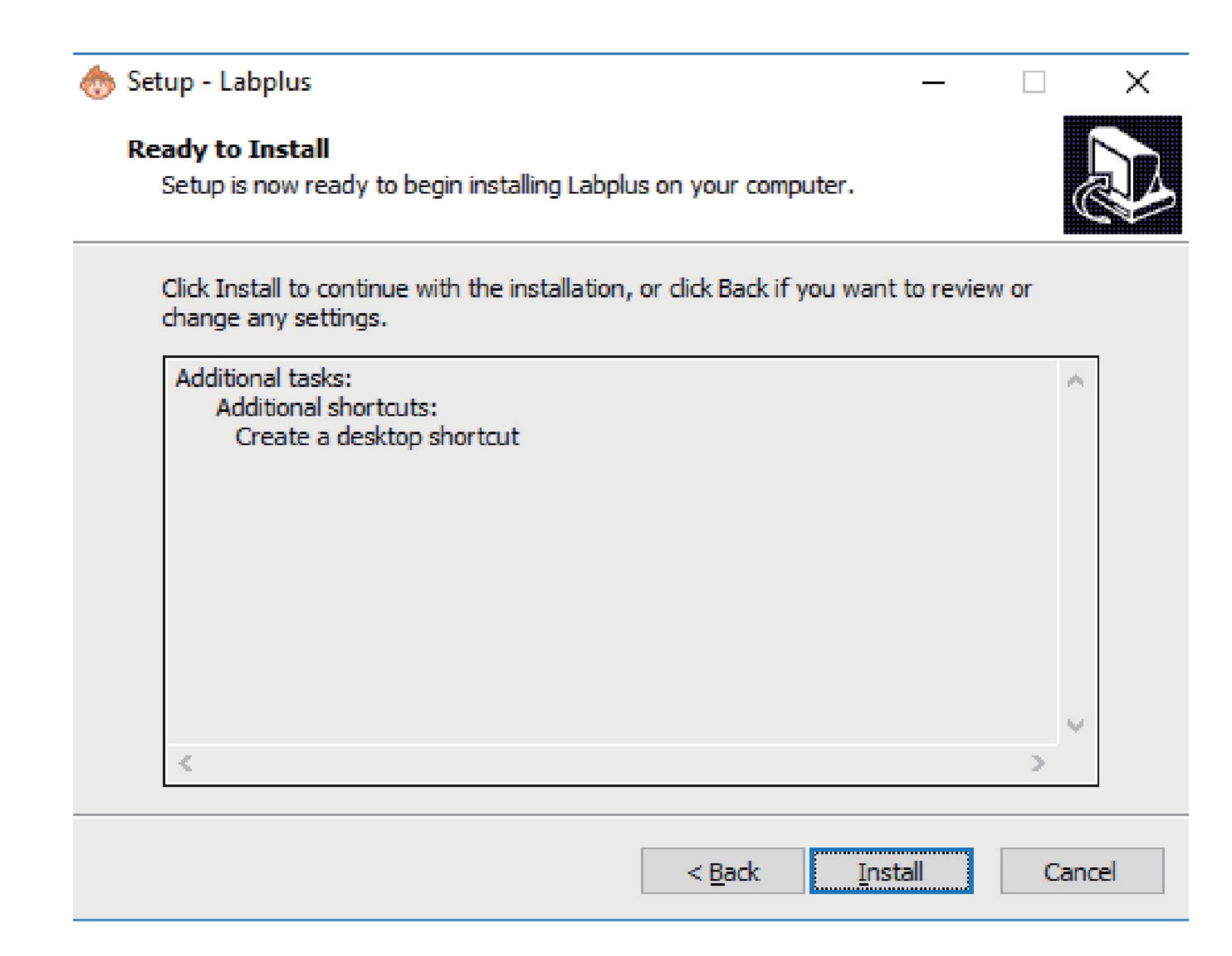
Select where your Shortcut should appear and click "Next".



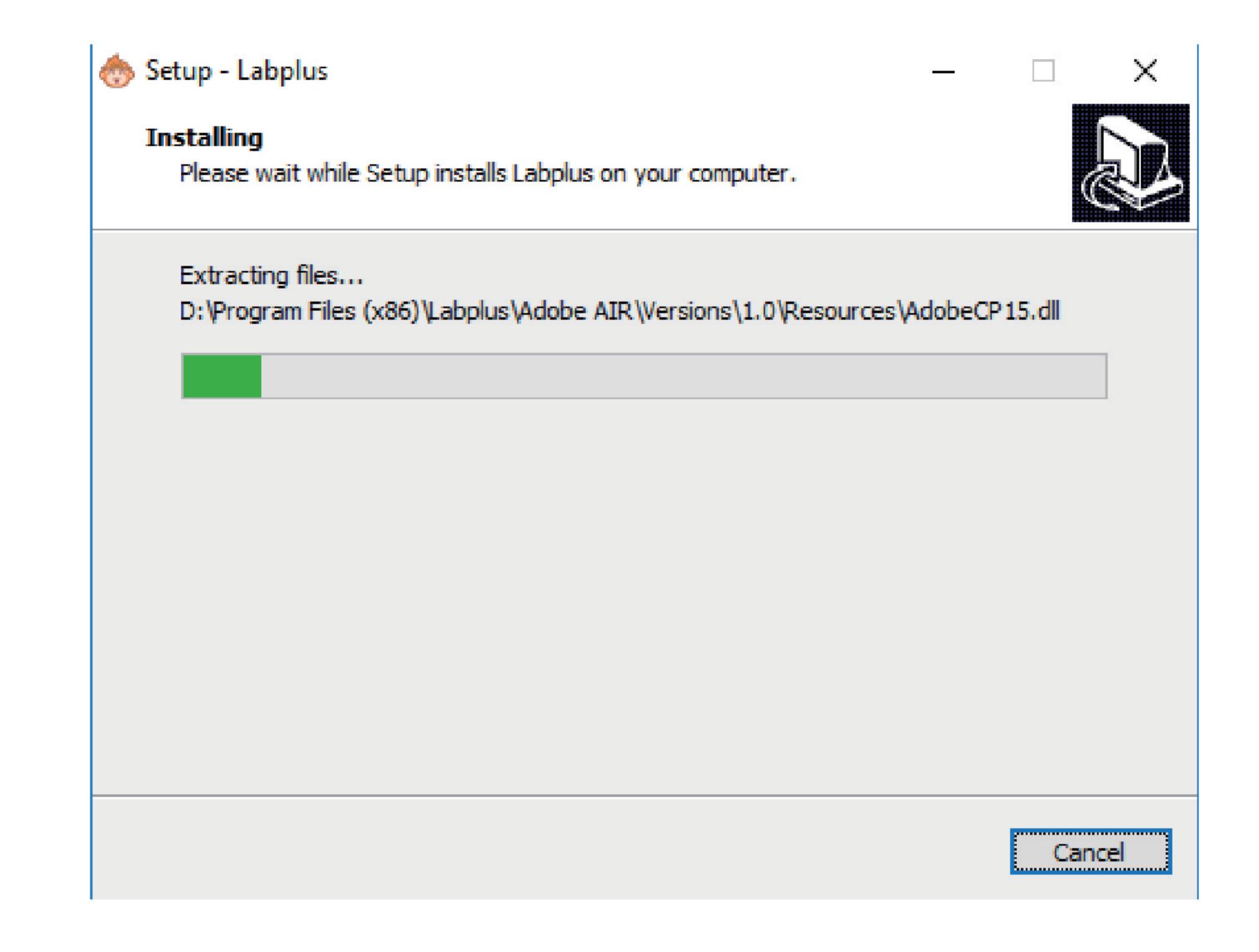
Select additional tasks, then click "Next".



Click "Install"

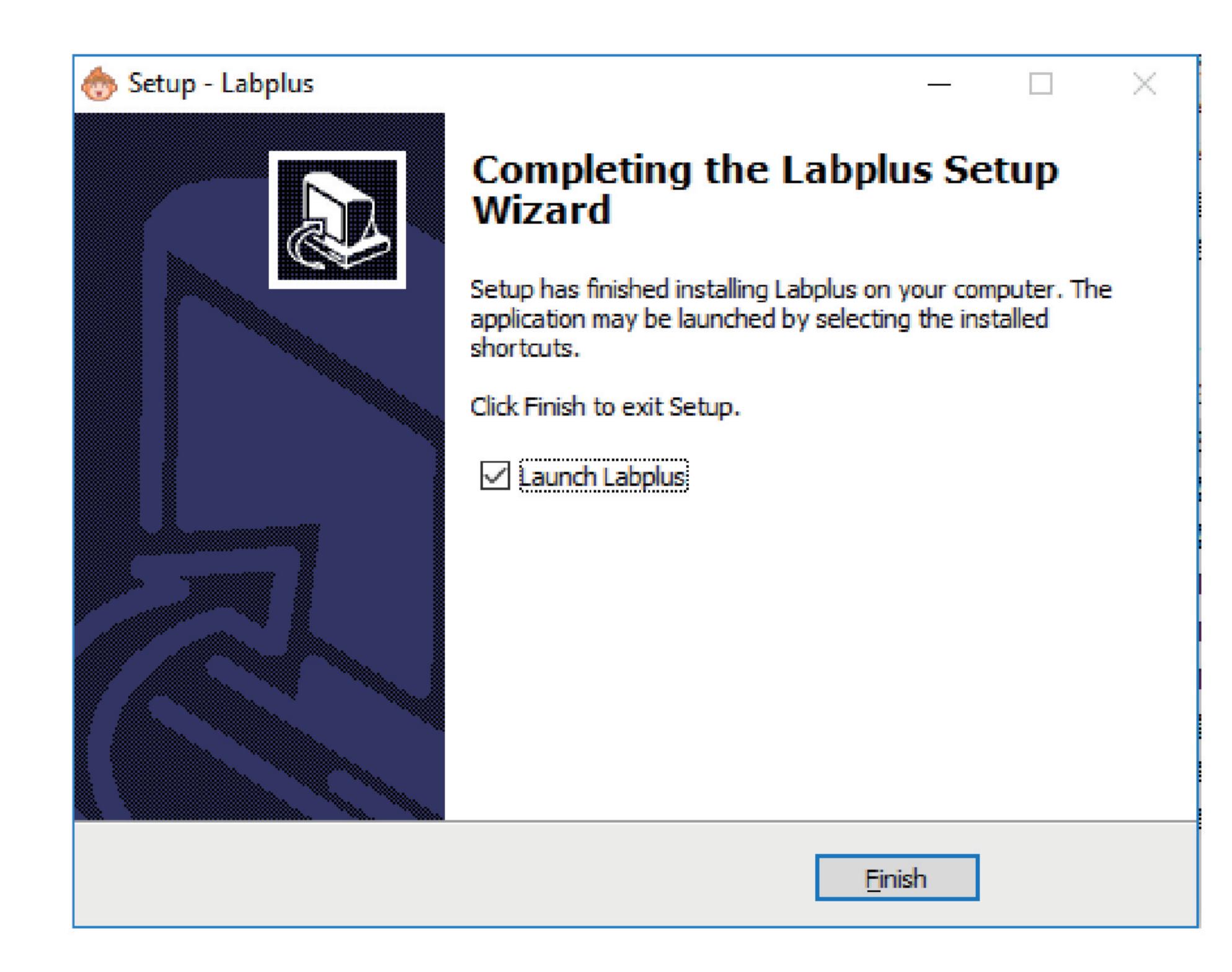


Installation in progress:



When installation is complete' click "Finish". Note: For best performance,

it is recommend you reboot your computer.



# 4.2 PROGRAMMING AND DOWNLOADING TO MODULE

# Setting Up Software

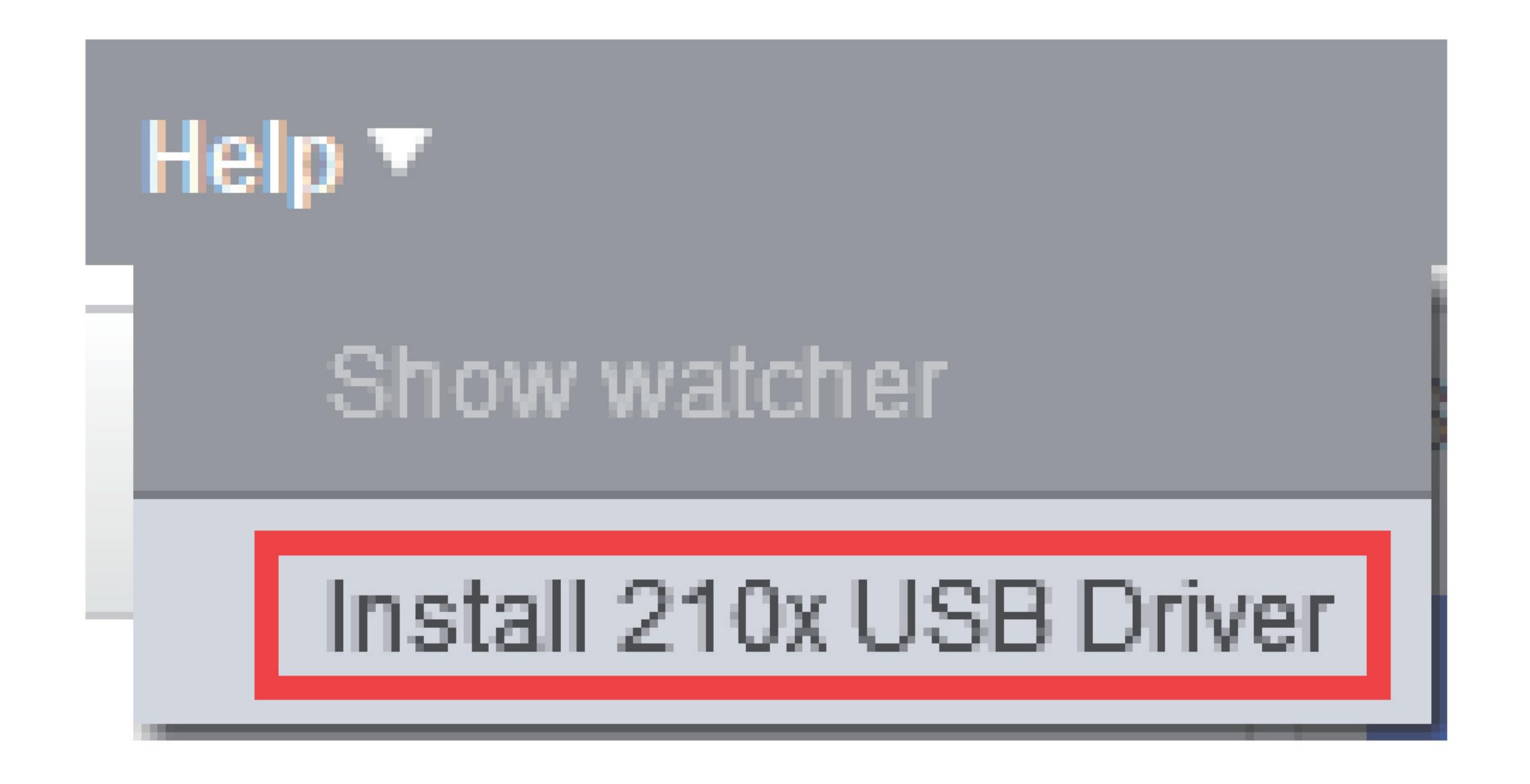
 To launch the customized Scratch interface, double-click on the Labplus icon on your desktop (or find it in your applications folder).



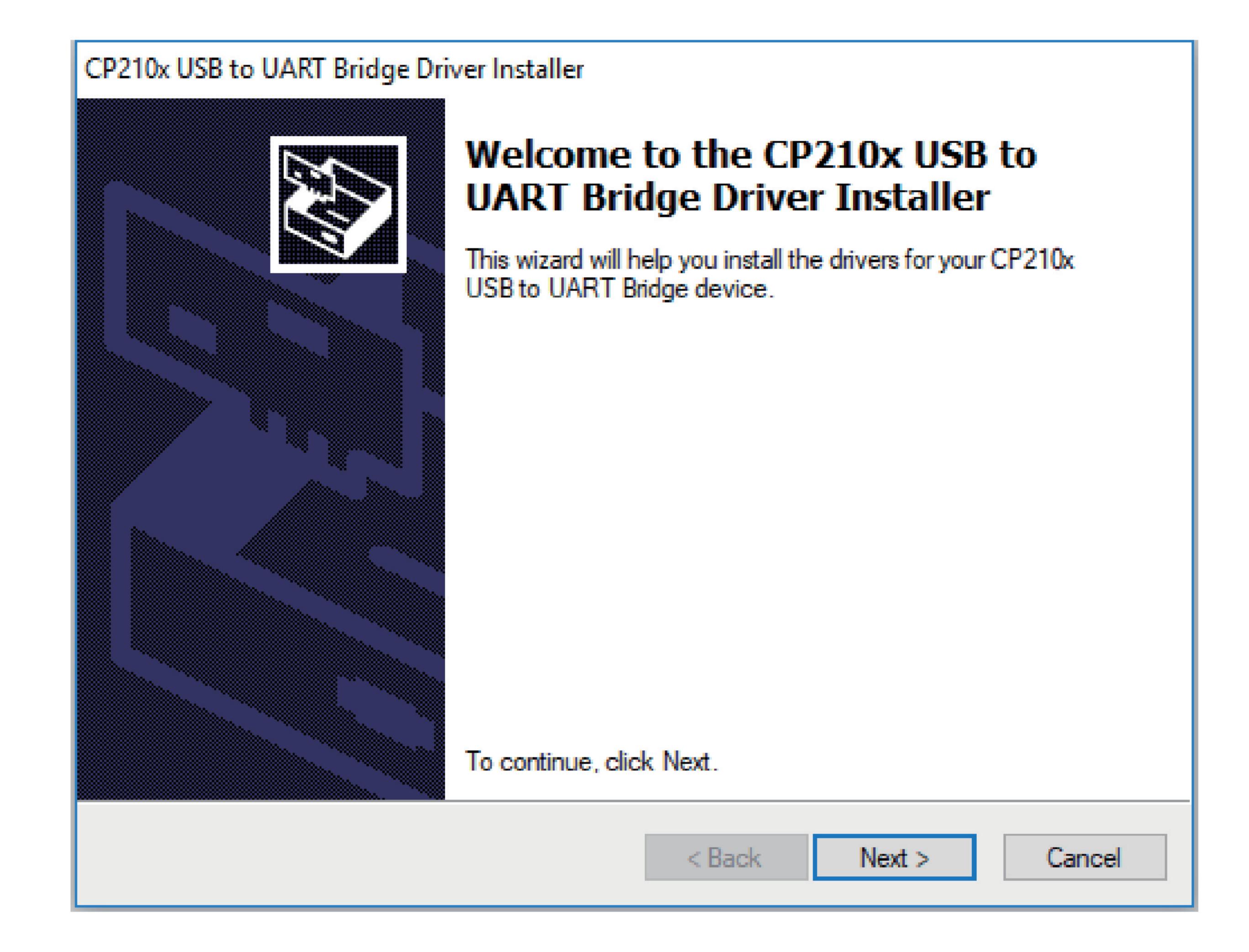
 Click on the Globe icon and select your language from the pull-down menu.



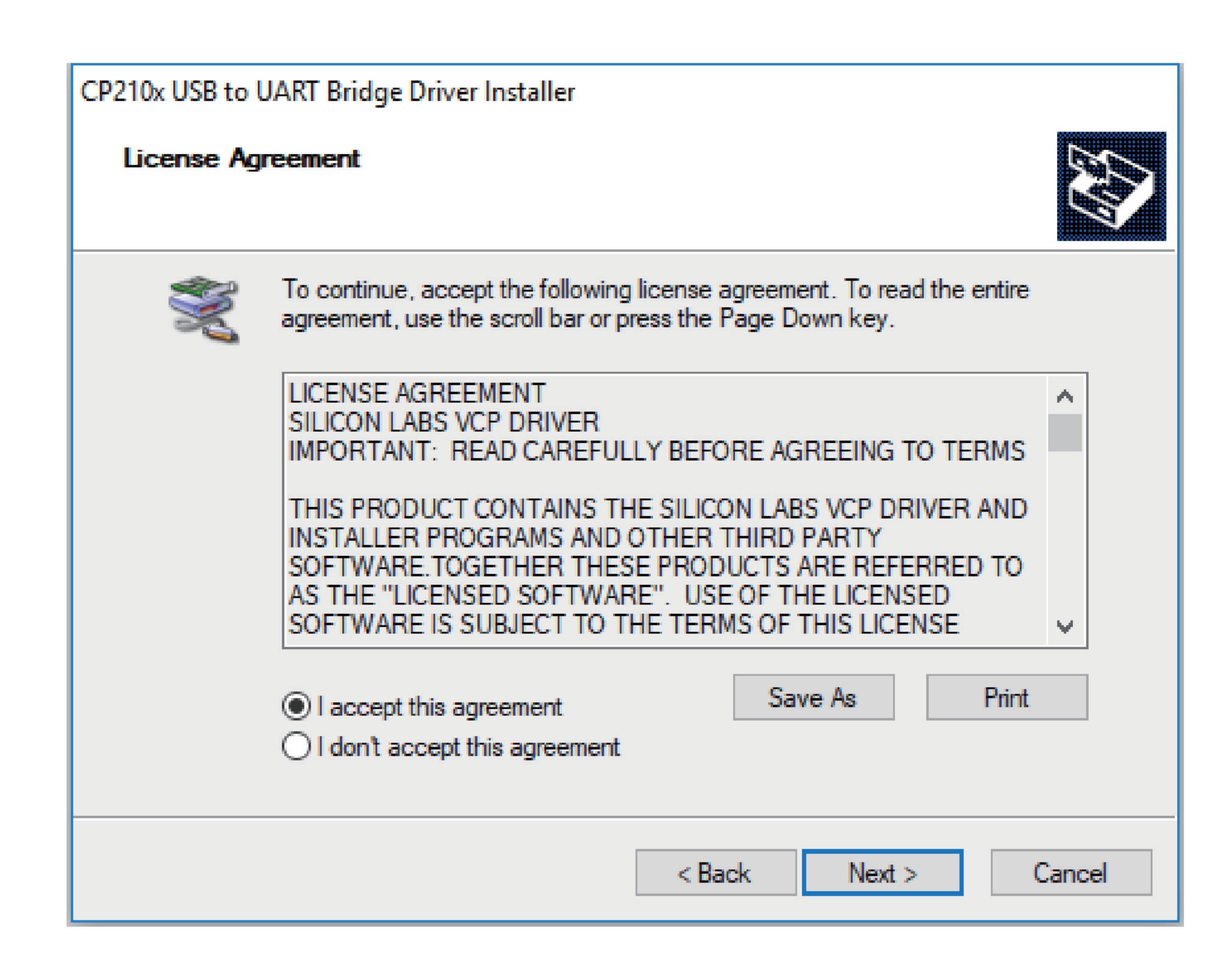
 Click on the Help button and select "Install 210x USB Driver".



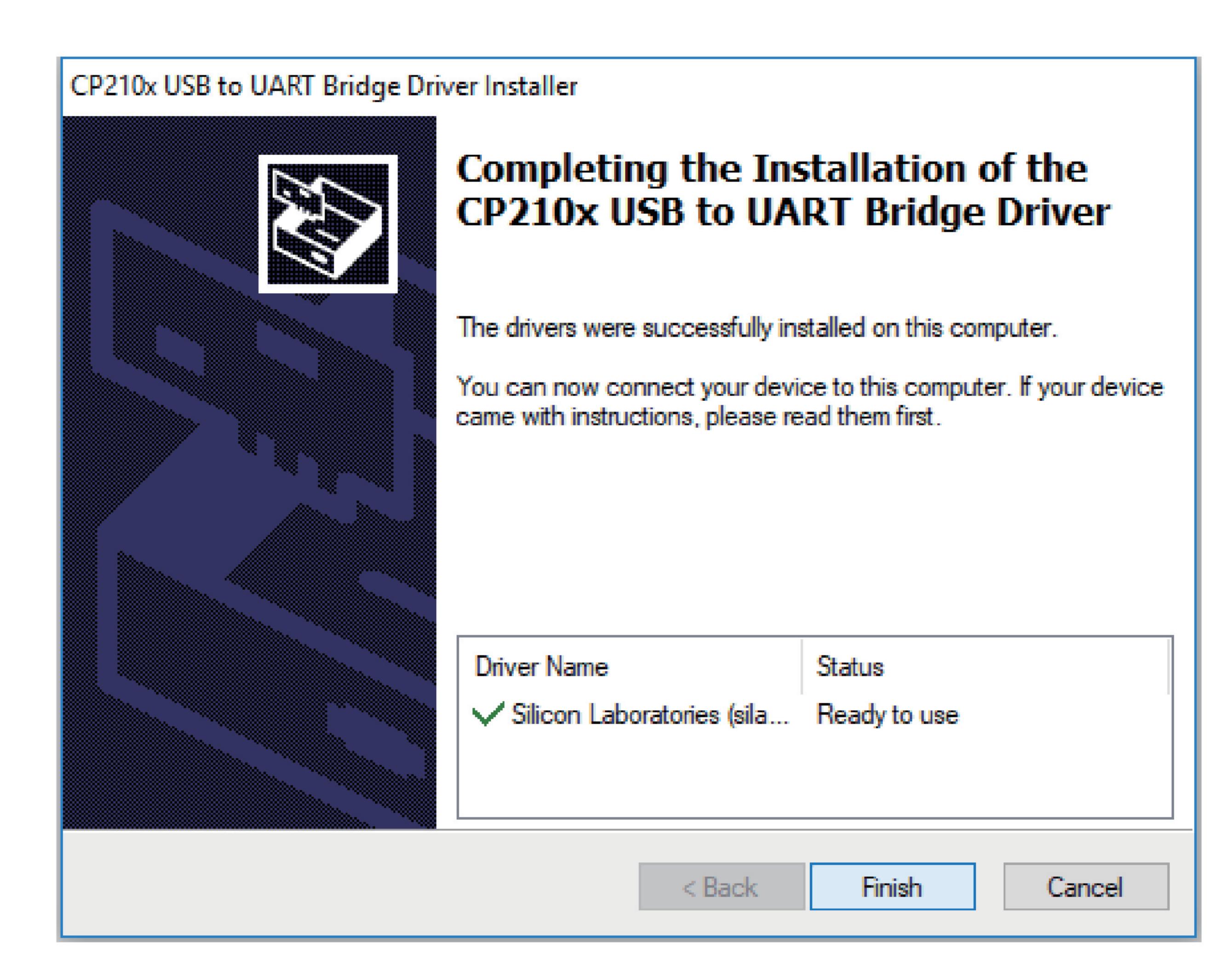
Select "Next"



• Select "I accept..." and click "Next"

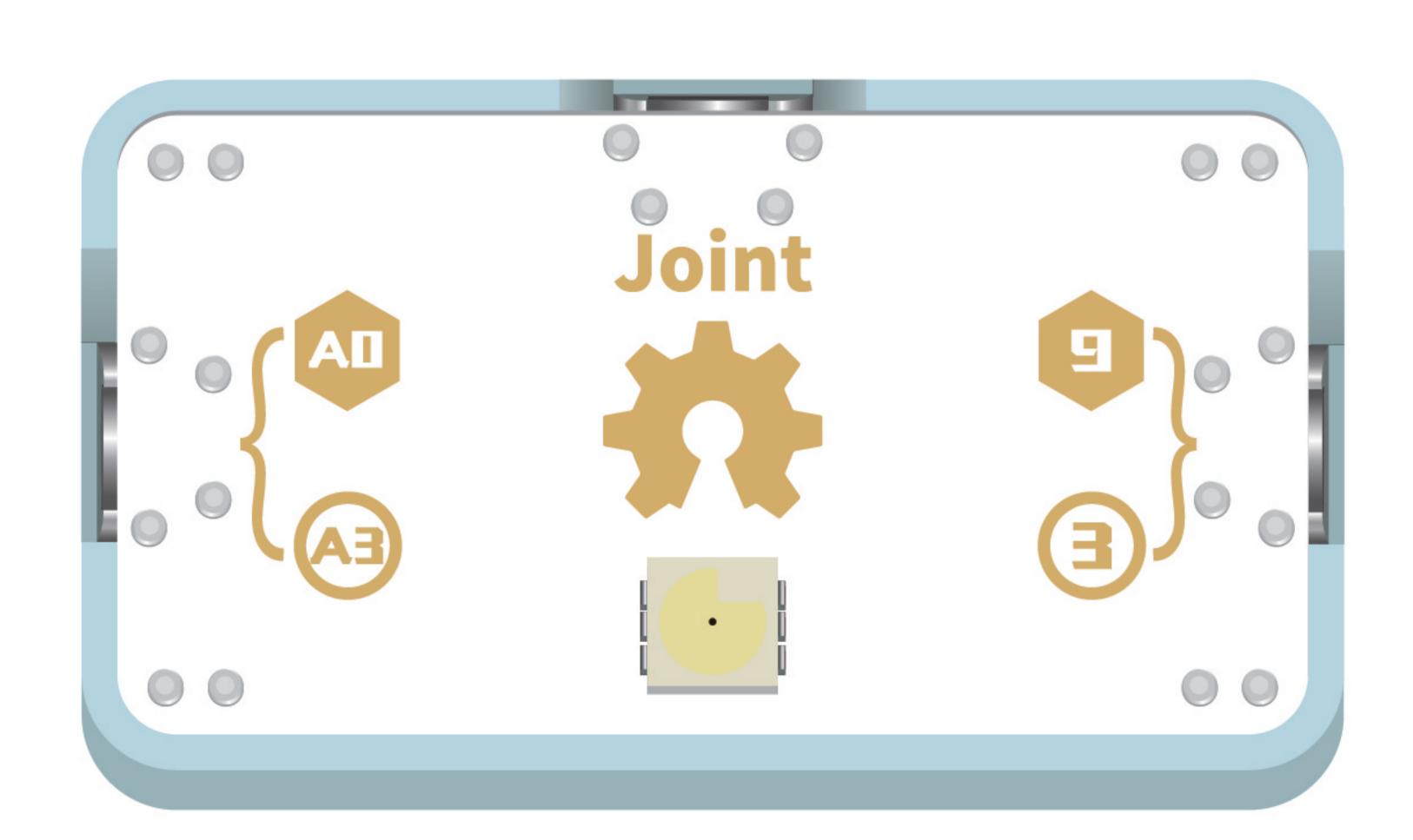


Select "Finish"

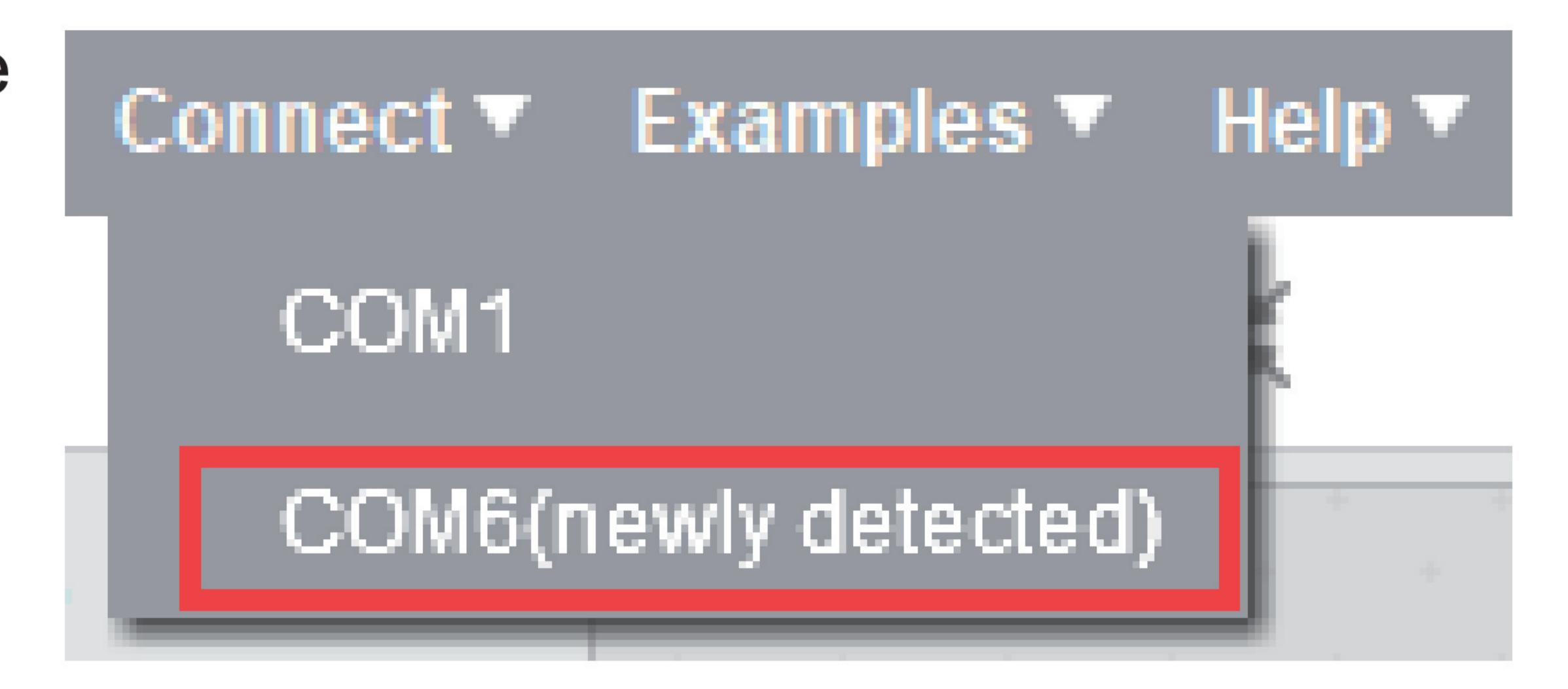


# Programming Module

• Connect the Joint Module to the PC with the USB cable.



• Click "Connect" in the bar menu and select the newly detected COM port, in this case is "COM6(newly detected)".



 Select the sample compiled program "Examples" and choose "Touch Light"



```
Arduino Program

forever

if touch button INPUT then

led OUTPUT on

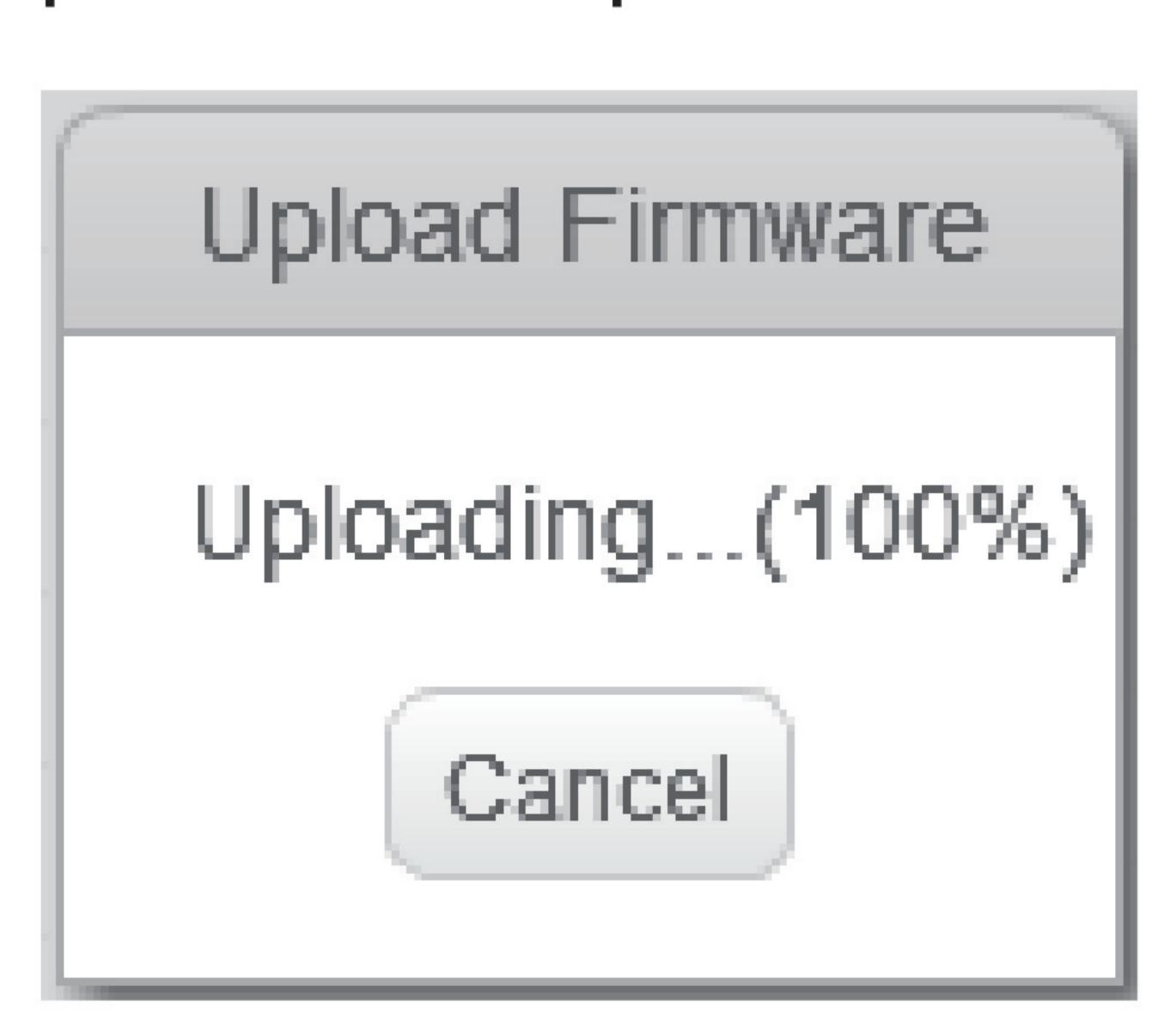
wait 5 secs

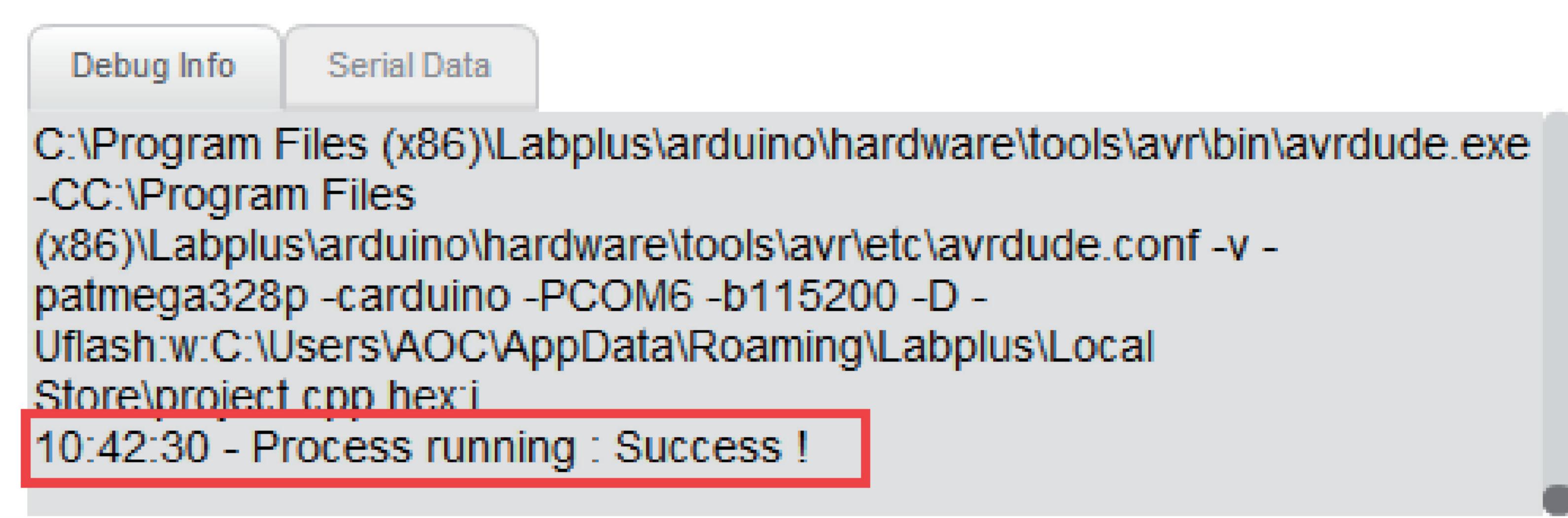
else

led OUTPUT off
```

 Click "Upload" button. After the progress bar reaches 100%, it will close automatically, and the program upload is complete!







Note: Modules can be powered offline with a 9V battery when not connected with the USB.

# Product Registration Instructions



## Visit: www.HamiltonBuhl.com

- 1. Click on Customer Care
- 2. Click on Product Registration Form
- 3. Please fill out all fields marked with \* to register your product

#### Warranty:

Warranty begins the date item ships from our warehouse. All products have a one year warranty from original date of shipment, unless otherwise noted.



80 Little Falls Road, Fairfield, NJ 07004 1-800-631-0868