Introduction

The main goal of this project was to create an intervalometer more portable and cheaper than those off-the-shelf. The solution I would create must be light-weight and the tinier it can get so it could be put in your bag during hiking. I chose to put the control over the intervalometer's settings on a smartphone since I assume it's an object that you may carry with you.

This project is only compatible with Android phones because I used Android studio and didn't take the time to adapt my app on iOS.

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I- Install

a. Project download

To download the whole project, clone this git project.

The folder contains two main parts:

- The Android application: **bluetooth-intervalometer/src/android/app**

Which is an Android Studio project itself. You'll also find a build folder containing the latest apk

- The Arduino program: **bluetooth-intervalometer/src/android/app**

This contains a **.ino** file that is the program used on the Arduino board.

b. Arduino device setup

i. Arduino device components

The Arduino device is composed of:

- An Arduino board (I'm using a nano for its small size)
- A 1000ohm resistor
- A 2000ohm resistor
- A Bluetooth interface module (I'm using the HC-05, if you want to use another one, you may change some things in the Android app in order to make it work)
- Some cable to link all components
- A 2.5 mm jack for the connection to your camera. A simple 2

ii. Arduino components assemble/layout

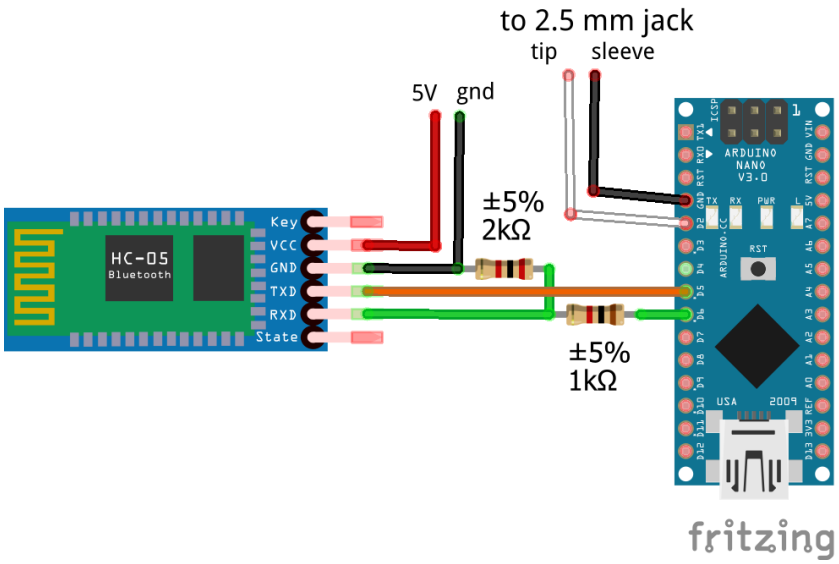

Figure 1 : Arduino device layout

iii. Device cover

A 3D case is currently being designed to simplify the assemble of the whole setup into one little case. STL of the case will be shared soon.

iv. Arduino program installation

To install the program on your Arduino board, you must open the .ino file in the Arduino software and then flash your board. You must make sure the ports used in the program are the same as those you plugged your components on when assembling the whole device.

c. Android app install on smartphone

You can find the latest built apk in the **src/android/app/app/release**. Download it on your phone and launch it.

II- The device connection procedure

Pairing and connecting:

To connect the arduino device to your android smartphone, first power the Arduino device (through the usb port or other), then make sure you allow Bluetooth on your phone.

Go to the app and click on the connect button on the top right of your screen.

If the device has not been connected yet, the smartphone should enter a discovering mode, and then a pairing procedure. A dialog should appear and ask you to fill in a code, whether "***1234***" or "***0000***". The first input works better for me.

If the pairing fails, please try again. If after multiple attempts, the app doesn't connect, restart the app and the Arduino device.

After you successfully paired the device, it should automatically connect and the status on the top of the screen should be "***connected***", you can now use it.

Removing the device:

If you want to unpair the Arduino Bluetooth module from your smartphone, you need to access the Bluetooth settings, select the **HC-05** device, the dissociate it.

Disconnecting:

If you want to disconnect the Bluetooth device, click on the disconnect button on the top right of your screen. The status indicator should turn red, and display "***disconnected***".

III- Quick tour of the android app features

Take a single picture:

To take a single picture, connect to the Bluetooth device and click the button with a camera logo.

Set the time interval between pictures:

To set the interval, click on the first text field or the edit button next to it. It will open a window where you can set the interval precisely in hours, minutes, and seconds.

You must set the interval considering the shutter speed set on your camera because the time between two pictures is set from the beginning of the first shot to the beginning of the second one and so on.

As an example, putting a 3 second interval between 2 seconds exposure pictures will result in pictures taken 1 second apart.

Setting delay before your camera starts shooting:

Setting the delay before the first picture is the same as setting the interval, click the delay field, or the edit button and you will be redirected to the page to set the delay precisely in hours, minutes, and seconds.

Setting the number of pictures to take:

You can set the number of pictures you want to take in the third field, simply fill in the number of pictures you want to take, and the estimated time to take all pictures given all the settings will be displayed just above the start button.

Using the bulb mode and setting your shutter speed:

The app allows you to use bulb mode and to set custom shutter speed for your camera. To use bulb mode, check the switch and set the shutter speed in seconds.

Custom shutter speed can only be used if you put your camera in bulb mode as well. Otherwise, the shutter speed used for shooting will be the one set by the camera.

Starting the photoshoot / timelapse:

When all settings are filled, you can start your photoshoot by clicking on the start button, it will send the settings to the Arduino device and start shooting photos.

Stopping the photoshoot / timelapse:

If you want to stop the photo shooting, don’t stop, or unplug your camera, click on the stop button. You can also unplug or reset the Arduino device; it will stop the program.

IV- Battery options

Currently, the device does not include a battery, it's powered by an external power supply through the USB-mini port on the Arduino nano.

One option could be to use a 5V step up board that has a battery charger built in. Coupled with a 3,7V battery (1s) such as the 18650 Li-ion pack. This setup hasn't been tested yet.