Biometric & capacitive sensors

- Touch (knock) sensor with Piezo
- Grove - Ear-clip Heart Rate Sensor
- Capacitive Touch Sensor Breakout - Adafruit MPR121 12-Key

Touch (knock) sensor with Piezo

If you want to make a simple touch sensor but you don't have the fancy ones around you can also use a piezo element, which come with a lot of basic arduino starter sets.

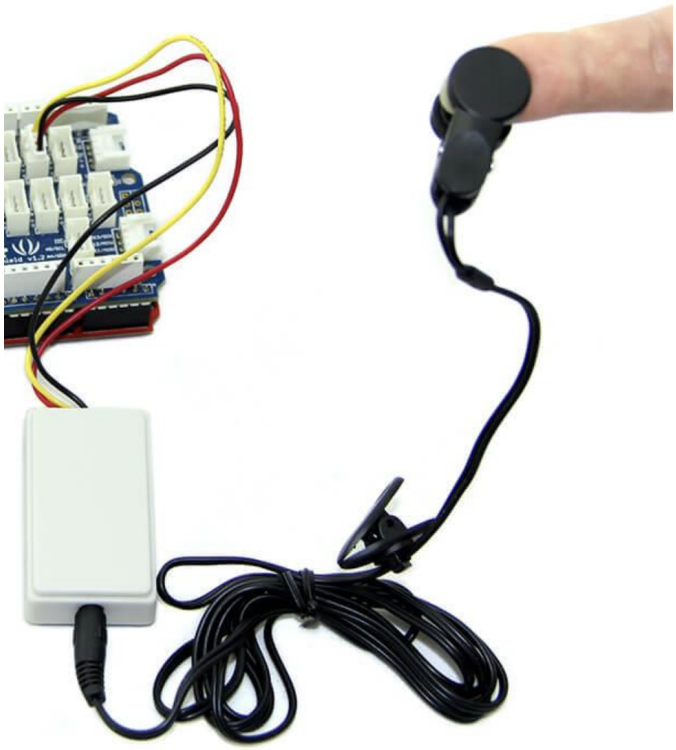
What you need:

piezo element B400%2FEKULIT-190051.jpg?type=Product&	breadboard broadboard-afmetingen-81-x-55-x-8mm.jpg	resistor 1 M ohm images?q=tbn:ANd9GcTBA4twFjVplLxCI
piece of paper tape shopping?q=tbn:ANd9GcRQQMlNLQViZ2PP1b8sfp-hSPZUXq4crtlXjPWIL6NVMVDzg	some male/male jumper wires 	 lMaPLBn3jHA5zJfmCBD8wS55BpYr2IThg7

This video explains it all. To make the input visual, open the serial Monitor from the Tools menu.

https://www.youtube.com/embed/X3XXRZMBPO0?si=h6yr3887zh71YfDZ

Grove - Ear-clip Heart Rate Sensor



Info & Arduino code

https://wiki.seeedstudio.com/Grove-Ear-clip_Heart_Rate_Sensor/

Parts

Grove - Ear-clip Heart Rate Sensor
https://www.kiwi-electronics.com/nl/grove-ear-clip-heart-rate-sensor-2058

Grove - Base Shield voor Arduino V2
https://www.kiwi-electronics.com/nl/grove-base-shield-voor-arduino-v2-2100

Arduino uno
https://www.kiwi-electronics.com/nl/arduino-uno-rev3-atmega328-729?search=arduino%20uno

usb kabel
https://www.kiwi-electronics.com/nl/usb-a-naar-usb-b-kabel-05-meter-763

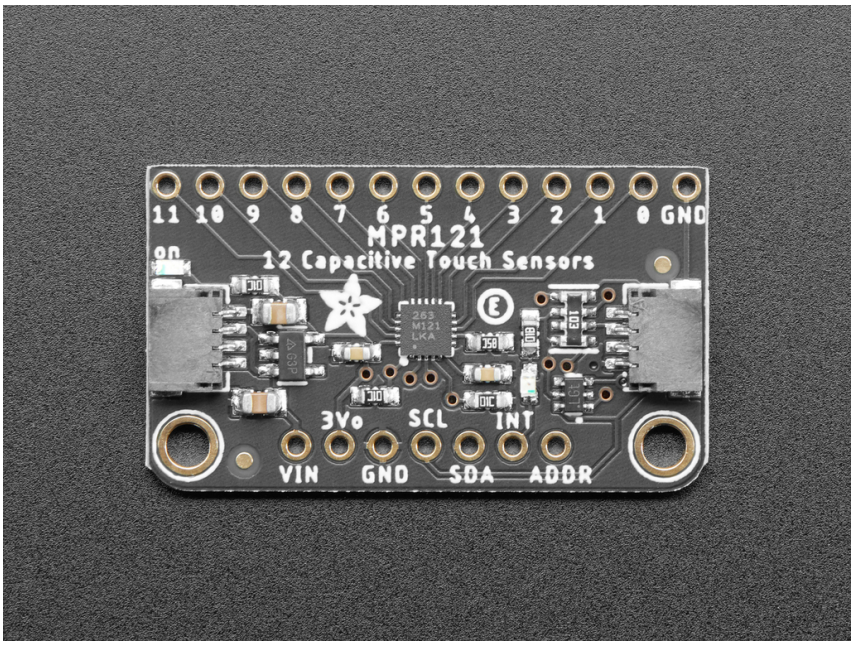
Software to receive the data

If you get this device through blackbox employe the code is already installed on the Arduino board
Download the Isadora file, Communications > Enable serial ports
Output > force stage preview & go

Isadora file: heart_beat_visualisatie_isadora_mk2.izz (credits for this file: Tjerk Stoop)

Capacitive Touch Sensor Breakout - Adafruit MPR121 12-Key

On this page you will find a tutorial for how to connect and use a Adafruit MPR121 12-Key Capacitive Touch Sensor Breakout to an Arduino board to send the data to for example Isadora. This is useful because the Adafruit board can act as an replacement for the Bare Conductive since they are no longer active since 05-03-2025.

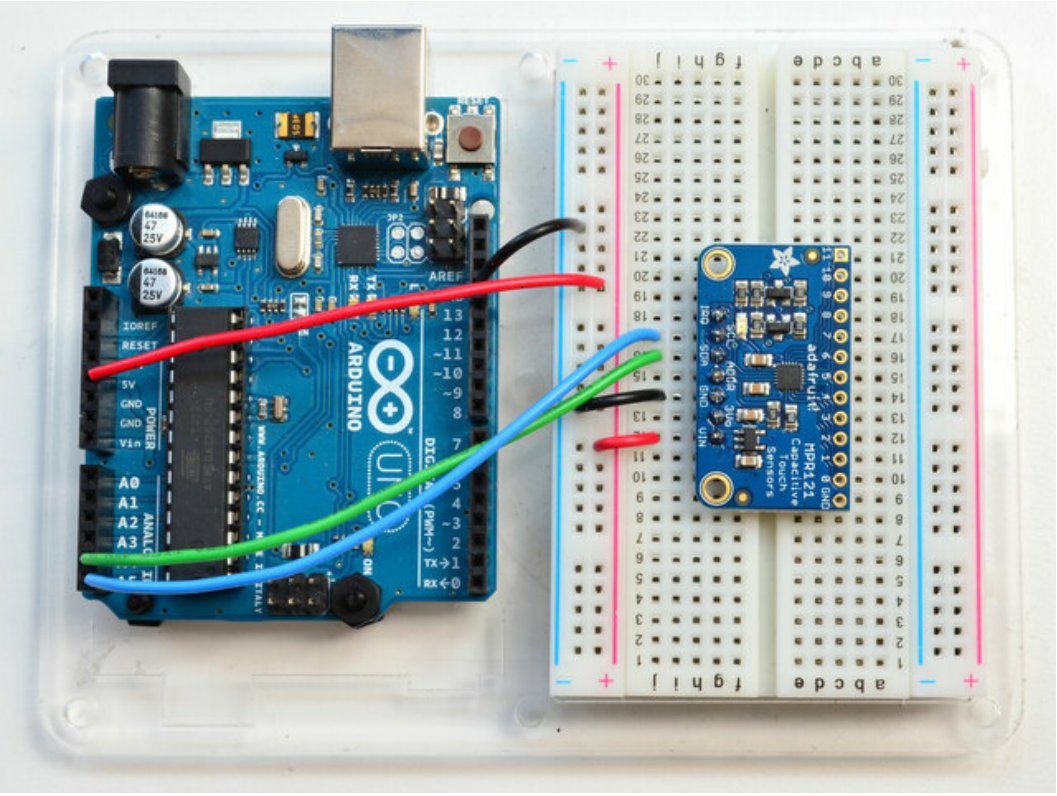


Step 1:

Buy an Adafruit MPR121 12-Key Capacitive Touch Sensor Breakout for example here

Step 2:

Wire up the board:



- Connect **Vin** to the power supply, 3-5V is fine. Use the same voltage that the microcontroller logic is based off of. For most Arduinos, that is 5V
- Connect **GND** to common power/data ground
- Connect the **SCL** pin to the I2C clock **SCL** pin on your Arduino. On an UNO & '328 based Arduino, this is also known as **A5**, on a Mega it is also known as **digital 21** and on a Leonardo/Micro, **digital 3**
- Connect the **SDA** pin to the I2C data **SDA** pin on your Arduino. On an UNO & '328 based Arduino, this is also known as **A4**, on a Mega it is also known as **digital 20** and on a Leonardo/Micro, **digital 2**

Step 3:

Install the Arduino library and test. You could use the Adafruit library but in our experience the Bareconductive library works better it adds proximity options.

Adafruit

- Open up the Arduino library manager and search for: **Adafruit MPR121** library and install it.
- Then open Examples -> Adafruit MPR121 -> MPR121test
  Thats it! Now open up the serial terminal window at 9600 speed to begin the test. Make sure you see the "MPR121 found!" text which lets you know that the sensor is wired correctly. Now touch the 12 pads with your fingertip to activate the touch-detection
  You now have the board successfully working!
  if you get the message: "MPR121 not found, check wiring?" make sure to check all the wires on the side of the sensor and the side of Arduino to make sure you did not make any

mistake.

Bareconductive

- Download the Zip file from here, Click on the green "<> Code" button and then on "Download ZIP."
- **Manually install** the library in your Arduino software, **go here** and find "**Importing a .zip Library**", follow these steps.
- Use the sketch "Datastream.ino" that is edited by **HKU-ect** to be used together with Bare Conductive and adds the proximity option, this file can be found **here.**
- Save it under a new name for instance **Datastream-proximity.ino** so its easy to find when you come back to this project.

Step 4:

Let's get the data over to Isadora!

For this we will use the Arduino "Datastream.ino" that is meant to be used together with Bare Conductive this file can be found here

Open the file in Arduino and go to line 44:

```
if(!MPR121.begin(0x5C)){
```

and change to:

```
if(!MPR121.begin(0x5A)){
```

This weird thing: 0x5C is the IC2 address of the board. On the bare conductive this is 0x5C but if we connect it to the Arduino it is 0x5A.

Upload the code and then you can us it in Isadora with the same Isadora Patch as you use for the Bare Conductive!

Find it here: bareConductiveDemo.izz

If you want to change the sensitivity of the board change the values of this code:

```
// this is the touch threshold - setting it low makes it more like a proximity trigger
// default value is 40 for touch
const int touchThreshold = 8;
```

```
// this is the release threshold - must ALWAYS be smaller than the touch threshold

// default value is 20 for touch

const int releaseThreshold = 4;
```

Sources

- Adafruit tutorial
- Electronics shop
- Bare Concuctive github