

DIY Microcontroller - Hand Dynamometer

by [Kiddyhub](#) on May 3, 2014

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Intro: DIY Microcontroller - Hand Dynamometer

Did this DIY Hand Dynamometer as a sensor for **PICAXE micro-controller**. It also can be use for **Arduino** or any micro-controller too.

List of the materials I used to make Hand Dynamometer :

- 1) **Hand Exerciser from Amazon** - 1 pc
- 2) **Flex Sensor 2.2" from Amazon** - 1pc
- 3) Some cable ties
- 4) Wires
- 5) Plastic holder for IC chip.
- 6) Super glue

- 7) Double sided tape

Tools require :

- 1) Hot glue gun
- 2) Scissor
- 3) Soldering iron
- 4) Metal files
- 5) Plier
- 6) Pen knife



Step 1: Get the right size Flex sensor.

- Bought the Flex Sensor 2.2" from Amazon, which can fit nicely around the circumference of the metal spring on the Hand Exerciser.

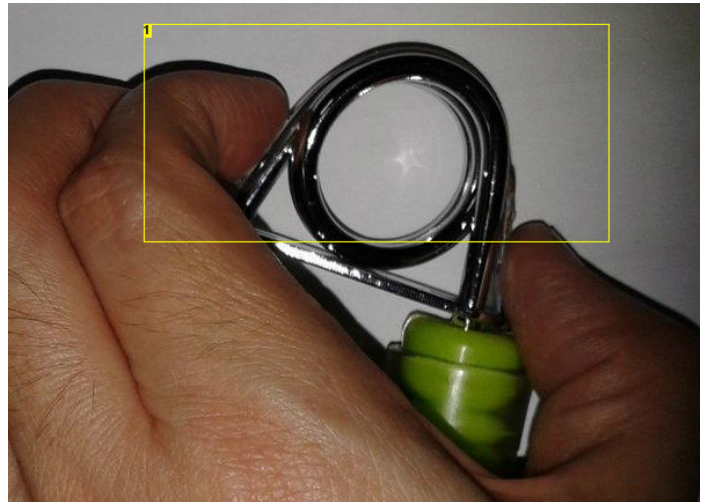
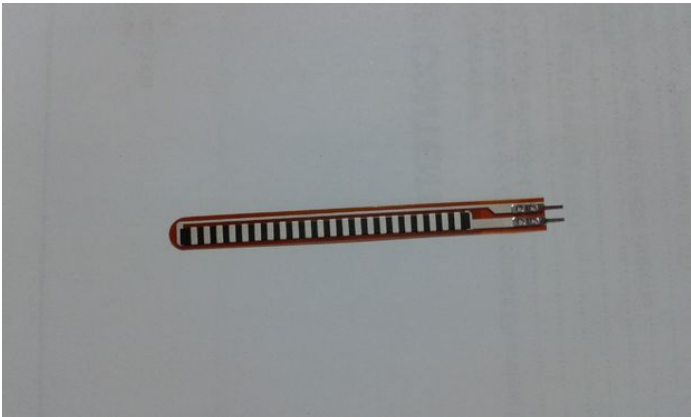


Image Notes

1. The flex sensor should fit nicely around the metal spring.

Step 2: Solder the terminals

- Solder the wire to the Flex Sensor 2.2" using the plier to hold the sensor down.
- While soldering please be careful not to soldered directly on the mica sheet.

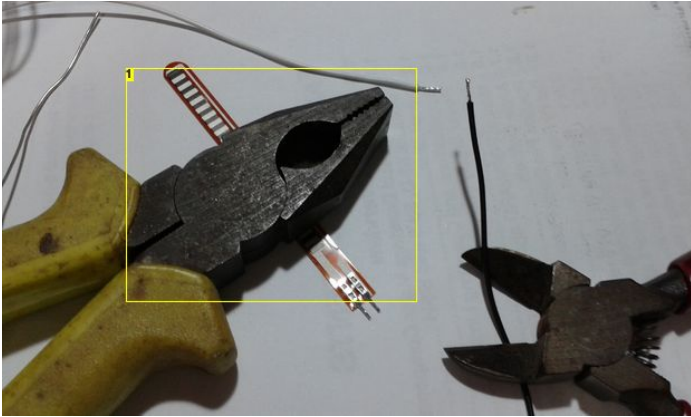


Image Notes

1. use a heavy object such as a plier to hold down the flex sensor while soldering.

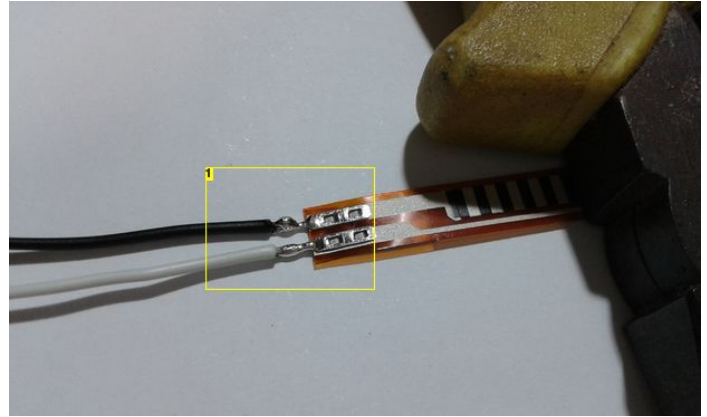


Image Notes

1. solder the terminals

Step 3: Making the backing material for the flex sensor terminals

- The Flex Sensor 2.2" is fragile at the terminal part. So to strengthen it, I cut out some plastic piece from a plastic IC shipping tube.
- You will then glue the flex sensor on to the plastic piece just little over the label on the flex sensor. The flex sensor label should face down as shown on the picture.



Image Notes

1. Glue the flex sensor to the plastic piece with the label facing down. And just little over the label.

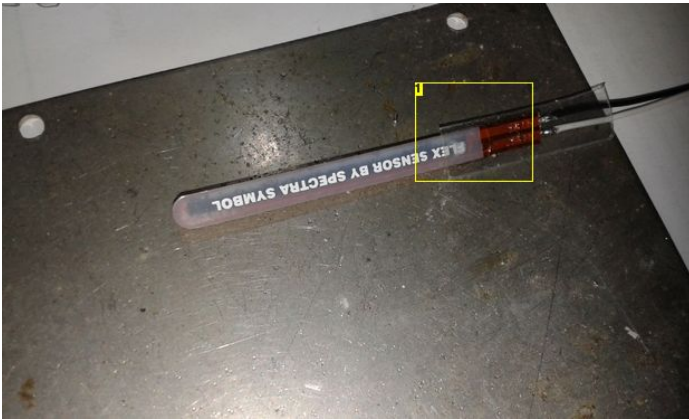


Image Notes

1. glue the plastic piece just a little over the label.

Step 4: Hot glued the terminals and trim the excess plastic.

- Hot glued the terminals to insulate it as well as to provide extra protection.
- Use a pen knife to level the hot glue before it solidified.
- Trim off the excess plastic with a scissor.

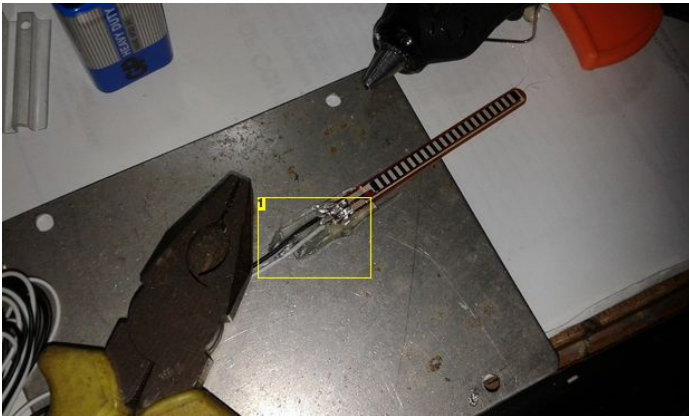


Image Notes

1. Hot glued the terminals. Just before the glued hardened, use a pen knife to level it.

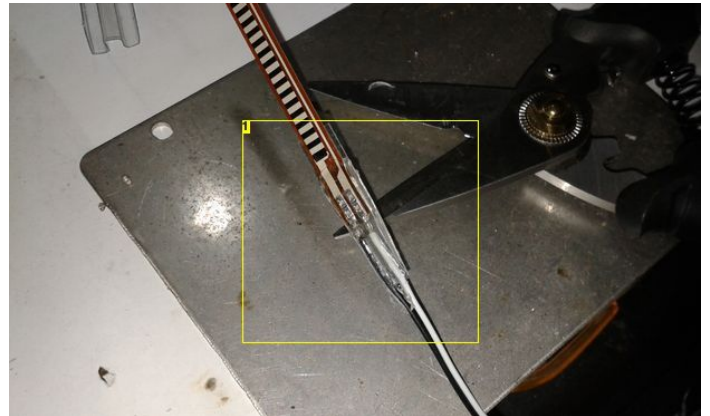


Image Notes

1. trim-off excess plastic piece with a scissor.



Step 5: File the metal ring and secure the flex sensor

- Position the Flex Sensor 2.2" flex sensor along the circumference and mark the metal spring using a maker.
- Marked 3 points left, centre and right.
- Then use a metal file to file a groove which the cable ties can just fit.
- Stick a double sided tape along the metal ring.
- Stick the flex sensor along the double sided tape.
- Then secure the flex sensor with cable ties.

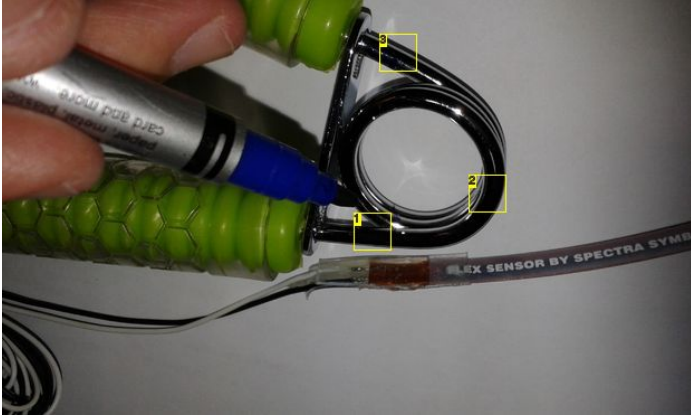


Image Notes

1. mark here
2. mark here
3. mark here



Image Notes

1. filing a groove



Image Notes

1. stick the double sided tape along the metal spring.



Step 6: Testing the hand dynamometer using a multimeter.

- Connect the sensor cable to a multimeter and switch to resistance setting. You should get a reading between 56 kOhm and 80 kOhm when you release or depress the Hand Exerciser.



Step 7: Interface the sensor to PICAXE 28x2 microprocessor

- Make the interface board for the flex sensor. And the PICAXE program can be downloaded :

<http://www.kiddyhub.com/dynamometer.html>

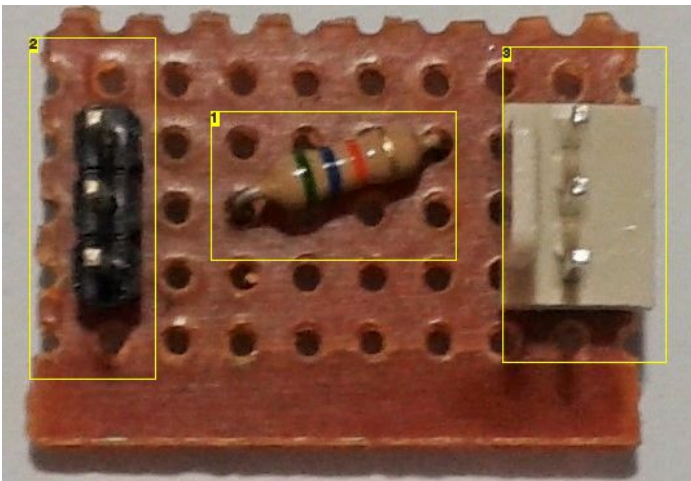


Image Notes

1. 56K resistor
2. To PICAXE microprocessor
3. To flex sensor mounted on the hand exerciser

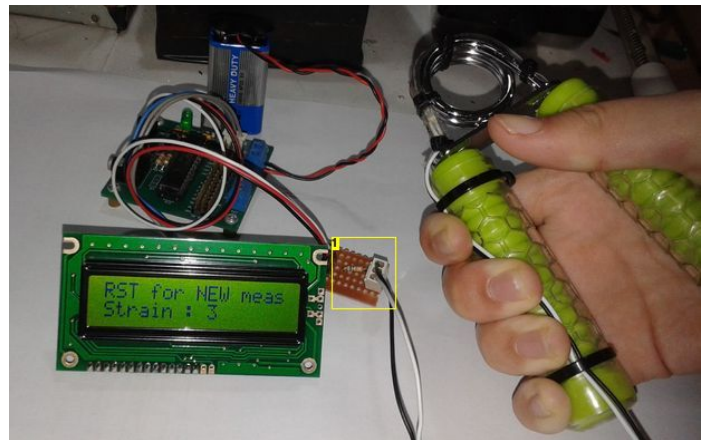
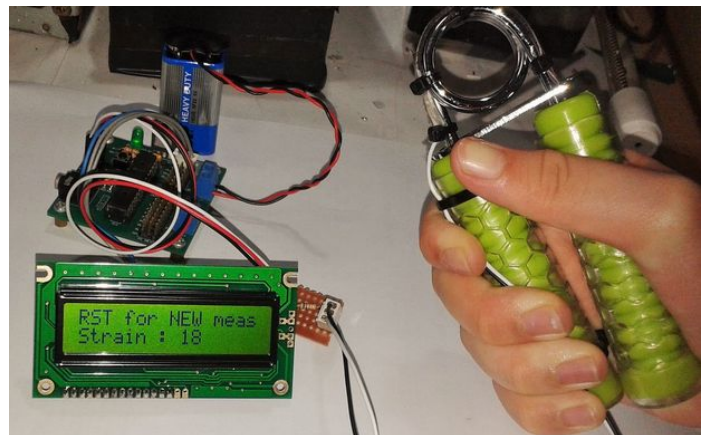
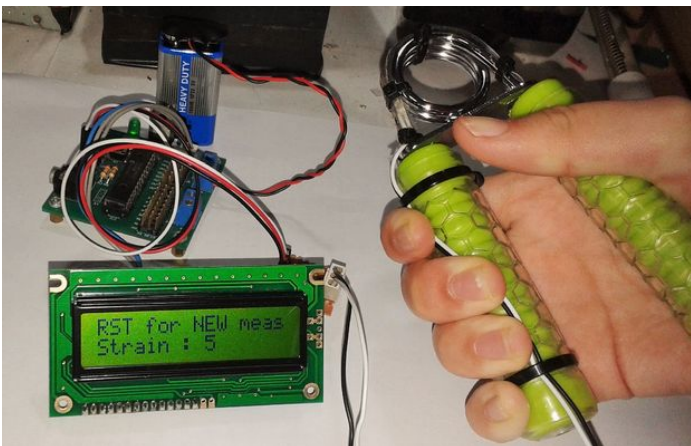
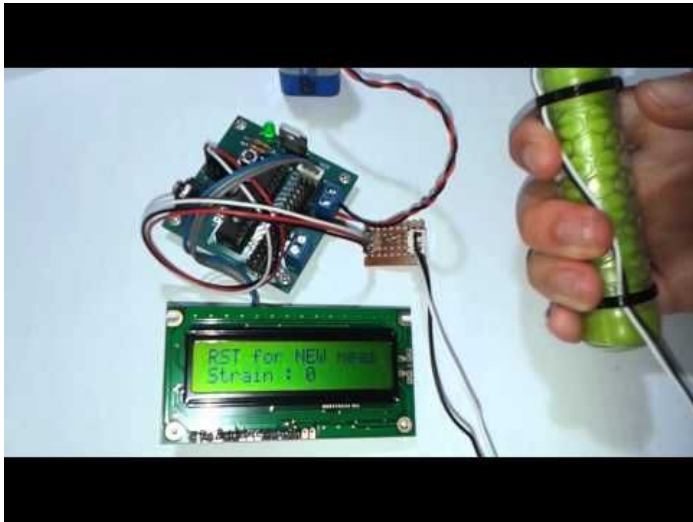


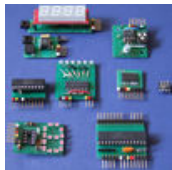
Image Notes

1. interface board





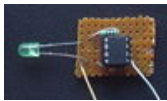
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