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Tutorial to Interface HX711 Balance Module with Load Cell

by mybotic on October 9, 2016

Table of Contents

Tutorial to	Interface HX711 Balance Module with Load Cell	1
Intro:	Futorial to Interface HX711 Balance Module with Load Cell	2
Step 1:	Material Preparation	2
Step 2:	HX711 Pin Description	3
Step 3:	Load Cell Wire Connection	3
Step 4:	Hardware Installation	3
Step 5:	HX711 Library	4
File	Downloads	5
Step 6:	Sample Source Code	5
File l	Downloads	6
Step 7:	Serial Monitor	6
Step 8:	Result	7
Step 9:	Videos	7
Related	Instructables	8
Advertisen	nents	8
Comme	ints	8

Intro: Tutorial to Interface HX711 Balance Module with Load Cell

Description

This module uses 24 high-precision A/D converter. This chip is designed for high-precision electronic scale. It has two analog input channels, programmable gain of 128 integrated amplifier. The input circuit can be configured to provide a bridge voltage electrical bridge (such as pressure, load) sensor model is an ideal high-precision, lowcost sampling front-end module.

Specification

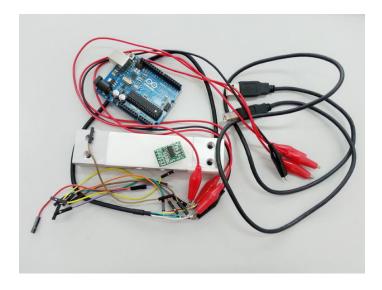
- Two selectable differential input channels
- On-chip power supply regulator for load-cell and ADC analog power supply
- On-chip oscillator requiring no external component with optional external crystal
 On-chip power-on-resetData Accuracy: 24 bit (24 bit analog-to-digital converter chip)
- Refresh Frequency: 10/80 Hz
- Operation supply voltage range: 4.8 ~ 5.5V
 Operation supply Current: 1.6mA
- Operation temperature range: -20 ~ +85 \hat{a} ,,f
- Demension: Approx. 36mm x 21mm x 4mm / 1.42" x 0.83" x 0.16"



Step 1: Material Preparation

In this tutorial, you will need:

- 1. Arduino Uno Board and USB
- 2. HX711 Balance Sensor
- 3. Load Cell (can be any weight of load cell ie 20KG, 60KG or 100KG)
- 4. Male Female Jumpers
- 5. Crocodile Clip Wires
- 5. Arduino IDE



Step 2: HX711 Pin Description

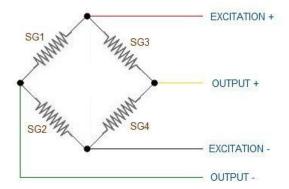
Regulator Power	VSUP	\Box	1 •	16	Þ	DVDD	Digital Power
Regulator Control Output	BASE	ᅥ	2	15	Þ	RATE	Output Data Rate Control Input
Analog Power	AVDD	ᅥ	3	14	Ь	XI	Crystal I/O and External Clock Input
Regulator Control Input	VFB	ᅥ	4	13	Þ	XO	Crystal I/O
Analog Ground	AGND	ᅥ	5	12	Þ	DOUT	Serial Data Output
Reference Bypass	VBG	ᅥ	6	11	\vdash	PD_SCK	Power Down and Serial Clock Input
Ch. A Negative Input	INNA	ᅥ	7	10	Þ	INPB	Ch. B Positive Input
Ch. A Positive Input	INPA	ᆸ	8	9	\vdash	INNB	Ch. B Negative Input

Step 3: Load Cell Wire Connection

The four wires coming out from the wheatstone bridge on the load cell are usually:

- Excitation+ (E+) or VCC is red
- Excitation- (E-) or ground is black
 Output+ (O+), Signal+ (S+)+ or Amplifier+ (A+) is white
- Output- (O-), Signal- (S-)+ or Amplifier- (A-) is green

LOAD CELL WIRING



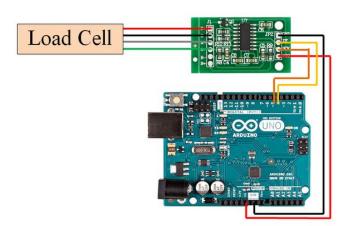
Step 4: Hardware Installation

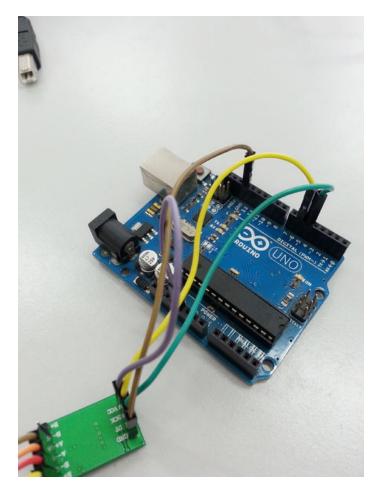
HX711 to Arduino Uno :

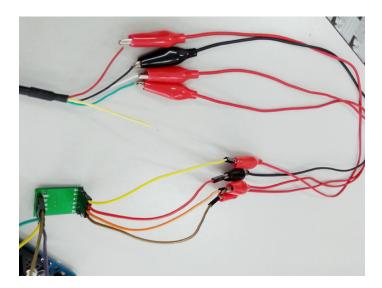
- VCC to 5V
- GND TO GND
- SCK to D5
- DT TO D6

Load Cell to HX711

- E+: RED
- E-: BLACK • A-: WHITE
- A+: GREEN

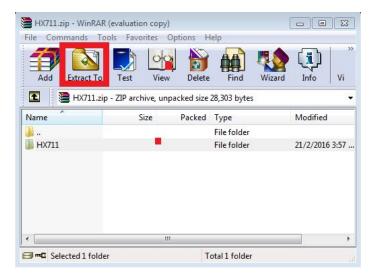


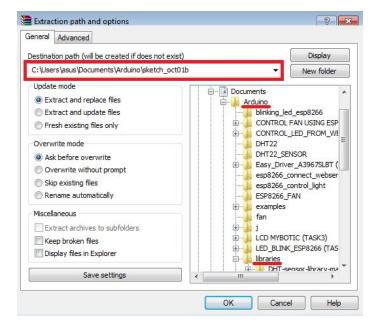




Step 5: HX711 Library

Communicating with the Balance Module requires a driver for the HX711 sensor. The simplest way to install the driver is to download the HX711 library. Download the ZIP file below > Open Zip File > Extract to your Arduino Uno Library folder. Refer the image above for your references.





File Downloads

HX711.zip (12 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'HX711.zip']

Step 6: Sample Source Code

Download the sample source code below, open and upload this sample source code into your Arduino IDE.

NOTE: You can change your calibration factor before uploading the code OR you can adjust it later in the serial monitor box since the code allow you to add and substract the value of calibration factor.



Image Notes

1. Double click to open



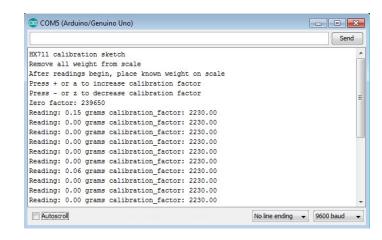
File Downloads



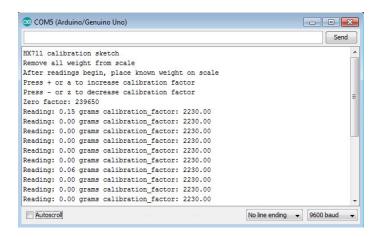
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'HX711.rar']

Step 7: Serial Monitor

When you has succesfully uploaded the sample source code into your Arduino Uno Board. Open Serial Monitor and it will show u as shown in the picture above.



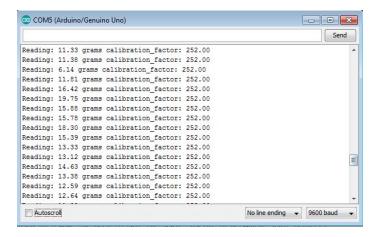
```
O HX711 | Arduino 1.6.11
File Edit Sketch Tools Help
  HX711 §
void loop() {
   scale.set_scale(calibration_factor); //Adjust to this calibration factor
   Serial.print("Reading: ");
   units = scale.get_units(), 10;
   if (units < 0)
     units = 0.00:
   ounces = units * 0.035274;
   Serial.print(units);
Serial.print(" grams");
Serial.print(" calibration_factor: ");
   Serial.print(calibration_factor);
   Serial.println();
   if (Serial.available())
      char temp = Serial.read();
     if(temp == '+' || temp == 'a')
calibration_factor += 1;
      else if(temp == '-' || temp =
        calibration_factor -= 1;
Sketch uses 5,676 bytes (17%) of program storage space. Maximum is 32,256 bytes.
Global variables use 487 bytes (23%) of dynamic memory, leaving 1,561 bytes for local
```



Step 8: Result

when the serial monitor give u a value for reading, it means that u has succesfully interface your load cell. Now, you can set your own calibration factor by adjusting the value using the '+' or 'a' to increase the value OR '-' or 'z' to decrease the value. You have to calibrate only once for each load cell.

NOTE: This tutorial only show you on how to interface HX711 with load cell. We did not use the correct calibration factor. You have to set your own calibration factor for your load cell. Check on this video and tutorial to learn on how to set the calibration factor for load cells. Remember that each load cell with different weight ie. load cell 20KG, 60Kg and 100KG have different value of calibration factor. Thus, you will have to set calibration factor for each load cell with different weight.



Step 9: Videos

This video shows how to interface HX711 Balance Module with Load Cell.



Related Instructables



How to interface Arduino Nano with 5kg Balance Module or Load Cell by mybotic



and Visuino: **Measure Weight** with HX711 Load Cell Amplifier and ADC by BoianM



Make your weighing scale hack using arduino and **hx711** by SohamG



Reprap Load Cell Z-Probe by palmerr23



How to use OV7670 Camera Module with Arduino? by ElecFreaks



SmartCityZen Recycle with **HX711** by rickhank

Comments