Adafruit ADXL343 + ADT7410 Sensor FeatherWing

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Overview

Upgrade any Feather board with motion and precision temperature sensing, with this all-in-one sensing FeatherWing. It sports two fantastic sensors from Analog Devices: an ADXL343 triple-axis accelerometer and an ADT7410 precision temperature sensor.

Both sensors are connected over the shared I2C bus, so you can use it with any and all Feathers! We also break out the interrupt pins and address-selection jumpers in case you want multiple Feathers or have I2C address conflicts. We've got both Arduino (C/C++) and CircuitPython libraries available so you can use it with any Feather board and get data readings in under 5 minutes.
The Analog Devices ADXL343 has three axes of measurements, X Y Z. You can set the sensitivity level to either ±2g, ±4g, ±8g or ±16g. The lower range gives more resolution for slow movements, the higher range is good for high speed tracking. The ADXL343 is the latest and greatest from Analog Devices, known for their exceptional quality MEMS devices.

The Analog Devices ADT7410 is an I2C temperature sensor, with 16-bit 0.0078°C temperature resolution and 0.5°C temperature tolerance. Use with any microcontroller to get reliable temperature readings with ease.
Thanks to DigiKey () and Analog Devices () for sponsoring the development of this breakout board - we've made the PCB "DigiKey red ()" in their honor!

If you purchased your FeatherWing before April 18th, 2023, you will have a version of it without a STEMMA QT connector on it, as shown below. The rest of the FeatherWing works exactly the same, and all of the examples in this guide will work with both!
Pinouts

This FeatherWing includes two second, inner rows of through-hole pads, each one of which is connected to the adjacent pad.

Power Pins

- **3.3V** - The lower-left highlighted pin-pair is the 3.3V power pin. This connects to 3.3V power on the Feather, and powers the Wing.
- **GND** - The lower-right highlighted pin-pair is the common ground for power and logic.
I2C Logic Pins

Both sensors use I2C to communicate. The highlighted pin-pairs are SCL (left) and SDA (right). These pins are shared with the STEMMA QT connector.

The default I2C address for the ADXL343 is 0x53.

The default I2C address for the ADT7410 is 0x48.

- SCL - This is the I2C clock pin. Connect to your microcontroller’s I2C clock line. It has a 10K pullup.
- SDA - This is the I2C data pin. Connect to your microcontroller’s I2C data line. It has a 10K pullup.

STEMMA QT Connector

On the right end of the board is a STEMMA QT connector. These connectors allow you to easily connect to development boards with STEMMA QT connectors, or to other things, with various associated accessories.
ADXL343 Features

These two features are specific to the ADXL343.

ADXL343 Interrupt Pins

INT1 and INT2: There are two optional interrupt output pins on this sensor, which can be configured to change their state when one or more 'events' occur.

ADXL343 Address Jumper

The ADXL343 has two address options: 0x53 (default) and 0x1D (jumper soldered closed).

- A0 - This is the address jumper for the ADXL343. By default the pin is pulled down, meaning it has a value of 0 at startup, which will results in an I2C address of 0x53. If you set this pin high (to 3.3V) by soldering the jumper closed, and reset, the I2C address will be updated to 0x1D.
ADT7410 Features

These two features are specific to the ADT7410.

ADT7410 Interrupt and CT Pins

- **INT** - This is the 'open-drain' interrupt output pin, and can be optionally connected to your MCU to trigger a HW interrupt whenever an appropriate event happens with the sensor. See the datasheet and driver for further details. It will go low or logic '0' when it is asserted.
- **CT** - This 'open-drain' pin can be configured to trigger to go low or to logic '0' when a Critical Temperature (CT) threshold is passed.

ADT7410 Address Jumper Pins

The ADT7410 has two address jumper pins. These jumpers allow you to chain up to 4 of these boards on the same pair of I2C clock and data pins. To do so, you solder the jumper "closed" by connecting the two pads.
On the front of the board are two address pins, labeled A0 and A1. Just like the jumpers, these pins allow you to change the I2C address to connect multiple boards by connecting them to 3.3V.

The default I2C address is 0x48. The other address options can be calculated by “adding” the A0 and A1 to the base of 0x48.

A0 sets the lowest bit with a value of 1 and A1 sets the next bit with a value of 2. The final address is 0x48 + A0 + A1 which would be 0x4B.

If A0 is soldered closed, the address is 0x48 + 1 = 0x49.

If A1 is soldered closed, the address is 0x48 + 2 = 0x4A.

The table below shows all possible addresses, and whether the pin(s) should be high (closed) or low (open).

<table>
<thead>
<tr>
<th>ADDR</th>
<th>A0</th>
<th>A1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x48</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>0x49</td>
<td>H</td>
<td>L</td>
</tr>
<tr>
<td>0x4A</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>0x4B</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

ADXL343 CircuitPython

ADXL343 Arduino

ADT7410 CircuitPython
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Downloads

Files

- ADXL343 Datasheet
- ADT7410 Datasheet
- EagleCAD PCB files on GitHub
- Fritzing object in the Adafruit Fritzing Library

Schematic and Fab Print