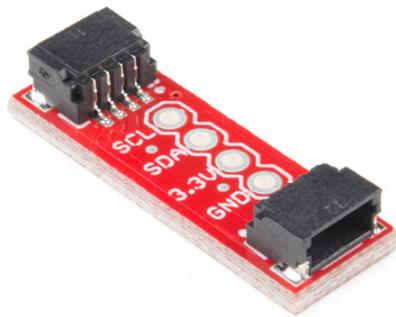




Qwiic Adapter Hookup Guide

Introduction

The SparkFun Qwiic adapter board is the perfect board to use if you need to make any old I²C board into a Qwiic enabled board. This adapter breaks out the I²C pins from the Qwiic connectors to pins that you can easily solder with your favorite I²C enabled device.



SparkFun Qwiic Adapter

© DEV-14495

Suggested Materials

To follow along with this tutorial, you will need a I²C enabled device and some headers:



**Break Away Headers -
Straight**

© PRT-00116



Female Headers

© PRT-00115



Break Away Male Headers - Right Angle

● PRT-00553

You will also need our handy Qwiic connectors to easily connect the adapter to your development board or system. Below are a few options:



Qwiic Cable - Breadboard Jumper (4-pin)

● PRT-14425



Qwiic Cable - 500mm

● PRT-14429



Qwiic Cable - 100mm

● PRT-14427



Qwiic Cable - 50mm

● PRT-14426

Note: Depending on your development board and system's voltage level, you may also need to use a logic level converter. Certain stackable breakout boards have a built in logic level converter (such as the Qwiic Shield for Arduino). If it is not included in the design, you will need to grab the bi-directional logic level converter.

Tools

You will need a soldering iron, solder, and general soldering accessories. To modify the headers, you will also need needle nose pliers and diagonal cutters.



Hakko FX888D Soldering Station
● TOL-11704



Solder Lead Free - 100-gram Spool
● TOL-09325



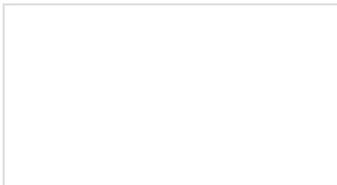
Needle Nose Pliers
● TOL-08793



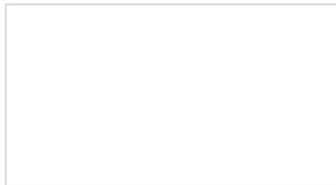
Diagonal Cutters
● TOL-08794

Suggested Reading

If you aren't familiar with our new Qwiic system, we recommend reading here for an overview. We would also recommend taking a look at the following tutorials if you aren't familiar with them.



How to Solder: Through-Hole Soldering
This tutorial covers everything you need to know about through-hole soldering.



Logic Levels
Learn the difference between 3.3V and 5V devices and logic levels.

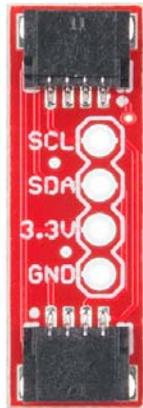


I2C
An introduction to I2C, one of the main embedded communications protocols in use today.

Hardware Overview

There are a few things you should know about the Qwiic system before you go plugging in I²C devices willy nilly. The first thing to be aware of is that all Qwiic devices run on **3.3V**. So if you have a 5V device and you are not using a stackable breakout board with a logic level converter (such as the Qwiic Shield for Arduino), you'll need to grab a logic level converter to boost your signals up to 5V. Also, be aware that all Qwiic devices have pull-up resistors on the I²C lines. So if your device does not have it, you'll need to add those in or use the ones on your microcontroller.

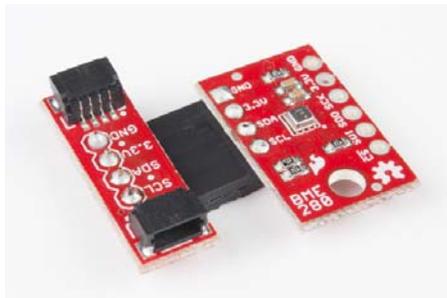
The Qwiic adapter is populated with two 4-pin 1mm JST connectors to quickly connect your I²C devices together. Four plated through holes are broken out for SCL, SDA, 3.3V, and GND. These pins can be used to convert an old I²C enabled device into a Qwiic enabled board.



Hardware Assembly

There are several different ways to connect your I²C device to the Qwiic adapter. The simplest and probably cleanest method would be to use headers. This also allows the adapter to be reattached to a different I²C device in the future. I've found that I enjoy the look of the 90 degree male headers on the Qwiic Adapter, combined with a 90-degree bend in the legs on the female headers I²C device. However, you can really use any combination you'd like depending on how you want the adapter to be oriented relative to your I²C enabled board.

Using pliers, snap off a row of 4 pins from the right angle male header. Using diagonal cutters, you will need to sacrifice one socket in order cut off a row of 4 pins from the female header. Carefully bend the female header's pins using the pliers to make a right angle with the I²C device. Solder the male headers to the Qwiic adapter and the female headers to the I²C device as shown in the image below.



Once you've got headers soldered onto each of your boards, simply plug your adapter into your I²C enabled device. Using a Qwiic cable, plug your Qwiic adapter into a stackable Qwiic board of your choice. Assuming that there is example code loaded on your development board, you can now start reading data from your I²C enabled device!

Resources and Going Further

For more information, check out the resources below:

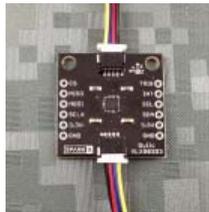
- Schematic (PDF)
- Eagle Files (ZIP)
- Qwiic System Landing Page
- Qwiic Adapter GitHub Repository

Now that you have your Qwiic adapter ready to go, it's time to check out some of SparkX's Qwiic enabled products, many of which are on their way to becoming good old fashioned SparkFun products.



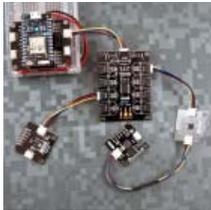
Qwiic Micro OLED

SPX-14269



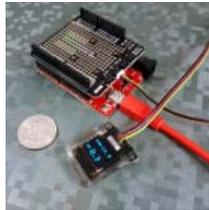
Qwiic Magnetometer - MLX90393

SPX-14294



Qwiic Mux - PCA9548A

SPX-14293



Qwiic Water-Resistant OLED

SPX-14287

More I²C Please

Here is the list of the boards that have the standard I²C pinout and will work with the Qwiic adapter board:

- 9DoF Stick IMU - LSM9DS1
- 9DoF IMU - MPU-9250
- 6DoF IMU - LSM303C
- 6DoF IMU - LSM6DS3
- Triple Axis Accelerometer - LIS3DH
- Triple Axis Magnetometer - MAG3110
- Triple Axis Magnetometer - MLX90393
- Compass Module - HMC6343
- Atmospheric Sensor - BME280
- Barometric Pressure Sensor - MS5803-14BA
- Barometric Pressure Sensor - T5403
- Humidity and Temperature Sensor - Si7021

- Digital Temperature Sensor - TMP102
- Particle Sensor - MAX30105
- Air Quality Sensor - CCS811
- ToF Range Finder - VL6180
- Haptic Motor Driver - DRV2605L
- Micro OLED Display
- RGB and Gesture Sensor - APDS-9960
- RGB Light Sensor - ISL29125
- LED Driver - LP55231
- DAC Breakout - MCP4725
- 16 Output I/O Expander - SX1509
- Battery Babysitter - BQ24075