smôl Header Hookup Guide

Introduction

smôl is a new board format and, as the name suggests, they're *really* small!

smôl Header

SPX-18620

Need to do some prototyping with smôl? Or want to connect your smôl stack to a Qwiic board or your favorite SPI sensor? The smôl Header is the perfect solution!

Required Materials

If you want to connect a Qwiic board to your smôl stack, you're going to need some Qwiic cables:

SparkFun Qwiic Cable Kit
KIT-15081

Qwiic Cable - 50mm
PRT-14426

Flexible Qwiic Cable - Female Jumper (4-pin)
CAB-17261

Qwiic Cable - Breadboard Jumper (4-pin)
PRT-14425

If you're prototyping with smôl, you may need:

Break Away Headers - Straight
PRT-00116

Breadboard - Classic
PRT-00112

Jumper Wires Premium 6" M/M Pack of 10
PRT-08431

Breadboard - Mini Modular (Red)
PRT-12044

The Header is part of the smôl ecosystem. Why not pair it with one of the smôl Processor Boards?

smôl ESP32
SPX-18619

To be able to reduce the sleep current below 10µA, you're going to want to pair the ESP32 with one of our intelligent smôl Power Boards:

smôl Power Board LiPo
SPX-18622

smôl Power Board AAA
SPX-18621

Don't forget that you will need Flexible Printed Circuits to connect your smôl boards together. You're going to need one FPC per board. Our 36mm FPC is the perfect length if you want the smôl boards to stack neatly, one on top of the other.

smôl 36mm 16-way Flexible Printed Circuit
CAB-18731

Suggested Reading

This is the hookup guide for the smôl Header. Click the button below if you want to find out more about smôl itself.

GET STARTED WITH THE SMÔL HOOKUP GUIDE

We recommend taking a look through the following tutorials if you are not familiar with the concepts covered in them:

Serial Peripheral Interface (SPI)
SPI is commonly used to connect microcontrollers to peripherals such as sensors, shift registers, and SD cards.

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

Hardware Overview

smôl boards are designed to stack one on top of the other, using 16-way 0.5mm-pitch Flexible Printed Circuits (FPCs). We really like FPCs and we're using them on more and more of our products. But they can be a bit tricky when it comes to prototyping or if you want to connect other devices to your smôl stack. The smôl Header is here to help!

FPC Connections

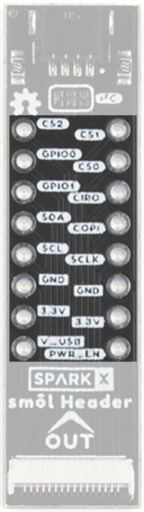
Like all of our smôl boards, the Header is equipped with a 16-way 0.5mm-pitch Flexible Printed Circuit connector. The pin-out for the smôl Header connector is as follows:

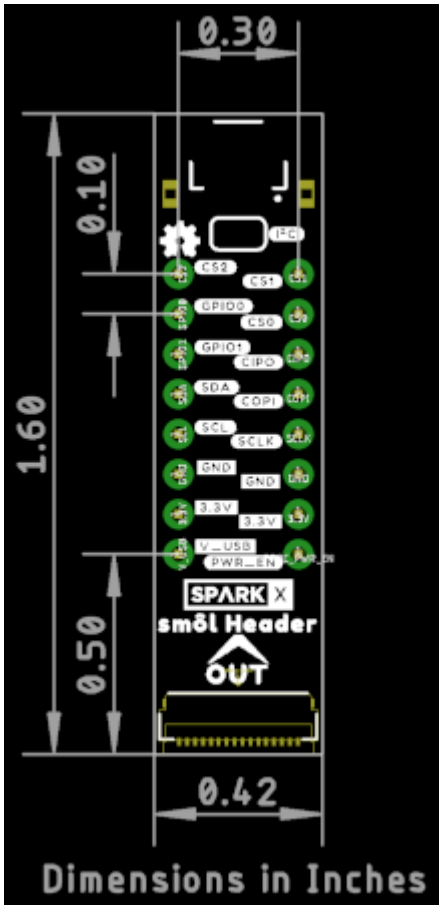
Connector Pin No.	Signal Name	Function
1	PROC_PWR_EN	Processor Power Enable
2	3V3	3.3V Power Rail
3	GND	Power Ground / 0V
4	SCLK	SPI Clock
5	COPI	SPI Controller Out Peripheral In
6	CIPO	SPI Controller In Peripheral Out
7	CS0	SPI Chip Select 0
8	CS1	SPI Chip Select 1
8	CS2	SPI Chip Select 2

10	GPIO0	General Purpose Input / Output 0
11	GPIO1	General Purpose Input / Output 1
12	SDA	I^2C Data
13	SCL	I^2C Clock
14	GND	Power Ground / 0V
15	3V3	3.3V Power Rail
16	V_USB	USB Power Rail (5V)

Breakout Pins

You've got full access to all the smôl pins, so connecting your favorite SPI board to smôl is as easy as plug-and-play! The smôl Header breaks out all 16 smôl connections in good old 0.1" format. The hole pattern is the same as an old school 16-pin 0.3" Dual-In line Package (DIP). Perfect for soldering header pins to and then pushing into standard breadboard.





Qwiic Connector

We've included a Qwiic connector too, so you can attach your favorite Qwiic boards to your smôl stack qwiicly and easily.

Qwiic (I^2C) Pull-ups

The Header also includes pull-up resistors for the I^2C SDA and SCL signals. You can disconnect the resistors if required by opening the dual split-pad jumper links.

If you haven't used jumpers before, please check out our tutorial.

How to Work with Jumper Pads and PCB Traces

Handling PCB jumper pads and traces is an essential skill. Learn how to cut a PCB trace, add a solder jumper between pads to reroute connections, and repair a trace with the green wire method if a trace is damaged.

Troubleshooting

Not working as expected and need help? SparkX products are rapidly produced to bring you the most cutting edge technology as it becomes available. These products are tested but come with no guarantees. Live technical support is not available for SparkX products. Head on over to our forum for support or to ask a question and we will get back to you as soon as we can.

Resources and Going Further

For more information about the smôl Header, check out the following links:

smôl Header Documentation:

- Schematic
- Eagle Files
- GitHub Hardware Repo
- Dimensions

smôl Documentation:

- smôl Hookup Guide