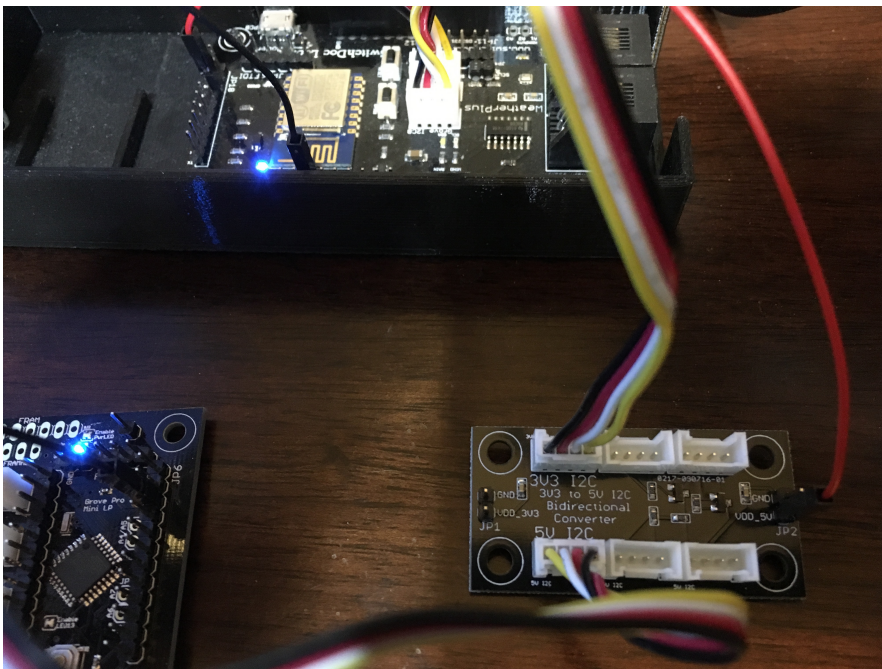


The **Grove 3.3V to 5V Bidirectional I2C Hub Board** is an easy to use, high speed voltage translator for I2C buses. You can change 3.3V to 5V easily.

Features and Benefits:

- The Perfect Grove 3.3V to 5V Translator for I2C
- Also includes 6 Port Hub
- Three - 3.3V Grove I2C Connectors
- Three - 5V Grove I2C Connectors
- Can be used as 6 Port I2C Hub
- No Software Needed
- Low Cost
- Quantity Discounts Available
- Immediate Availability



Introduction

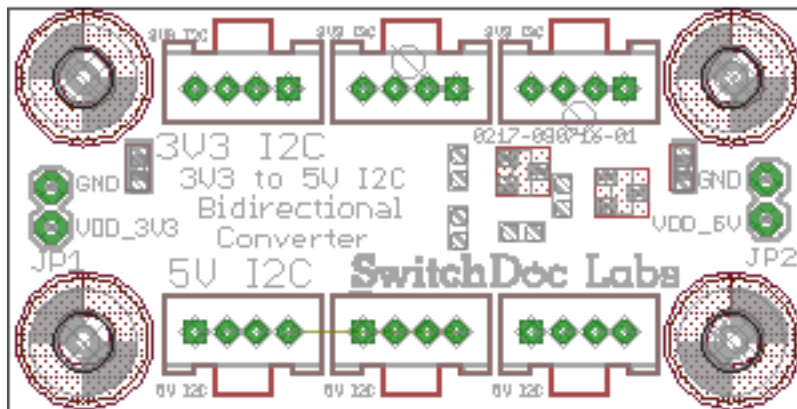
This board is an inexpensive 3.3V to 5V I2C Translator and Hub Board.

It allows you to mix 3.3V and 5V I2C Devices in the same design. It also provides additional 3.3V and 5V Grove I2C connectors. You can also use it as a 6 port I2C hub for either 3.3V or 5V.

How To Use

The 3.3V to 5V I2C Hub Board is easy to use. Typically, one I2C bus will be connected to 5V and the other to 3.3V. The main connector to the computer will typically have 3.3V in the case of a Raspberry Pi or 5V (in the case of most Arduinos or the Pi2Grover Interface Board). The other side of the bus (with all the I2C devices on it), typically is unpowered and you will either need to hook up 3.3V or 5V depending on what your computer is.

3.3V To 5V I2C Hub Board Pinout



Theory of Operation

The Grove 3.3V to 5V I2C board has a bidirectional level translation circuit between the SDA and SCL lines. Ground is common between both sides of the board. The Grove power line is NOT connected between the

3.3V and the 5V sides of the board. Which ever side is not powered but the attached computer must be connected to the power.

Note that the 3V3 Bank Labeling and the 5V I2C labels are provided for convenience. You can set either side anywhere from 1.2V to 5.5V

Operating Values

		Min	Normal	Max	Unit
VDD_3V3	3V3 I2C Bank	1.2		5.5	V
VDD_5V	5V I2C Bank	1.2		5.5	V
I	Board Current			< 2	mA

Physical dimensions of board: 51 mm x 26 mm x 12mm(max).

I/O Key:

- I - Digital Input
- O - Digital Output
- A - Analog

What are Grove Connectors?



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A Grove connector is a four pin standardized size connector used to plug into the Pi2Grover base unit and Grove devices and modules. These standardized connectors (common to all types of Grove Connectors) are the key to making this system work. They are keyed to prevent plugging them in backwards, and the four types of connectors (see below) are all designed so that if you plug the wrong type of device into the wrong type of base unit, there is no problem. They just won't work. This is a good thing. Less smoke, more prototyping!

Now, note. You will never short out power and ground by mis-plugging one type of Grove connector in the other. **However, it is possible to plug a 3.3V Grove Module into a 5.0V Grove connector and damage**

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the device. The same could happen with an output coming back from a Grove button or switch for example into another output. While you do need to be careful and think about what you are doing, it is a lot less risky than soldering or using just jumpers to wire up devices to your Pi or Arduino.

Generically, all of the Grove connectors are wired the same: Signal 1, Signal 2, Power, Ground.

Grove I2C

The Grove I2C connector has the standard layout. Pin 1 is the SCL signal and Pin 2 is the SDA signal. Power and Ground are the same as the other connectors. This is another special version of the Grove Digital Connector. In fact, often the I2C bus on a controller (like the ESP8266, Raspberry Pi and the Arduino) just uses Digital I/O pins to implement the I2C bus. The pins on the Raspberry Pi and Arduino are special with hardware support for the I2C bus. The ESP8266 is purely software.

Grove I2C		
Pin 1	SCL	I2C Clock
Pin 2	SDA	I2C Data
Pin 3	VCC	Power for Grove Module (5V or 3.3V)
Pin 4	GND	Ground

Pin Functions

JP1 - 3V3 I2C Bank Power Pins

Note if you are connecting to a 3.3V I2C computer (such as the Raspberry Pi) then you will probably have the 3.3V through the Grove connector. You will need to connect JP2 /1 to 5V.

NAME	PIN	I/O	DESCRIPTION
GND	JP1 / 1	A	GND
VDD_3V3	JP1 / 2	A	3.3V

JP2 - 5V I2C Bank Power Pins

Note if you are connecting to a 5.0V I2C computer (such as the Arduino or the Pi2Grover board) then you will probably have the 5.0V through the Grove connector. You will need to connect JP1 /1 to 3.3V in that case..

NAME	PIN	I/O	DESCRIPTION
GND	JP2 / 1	A	GND
VDD_5V	JP2 / 2	A	5V

Software for Arduino and Raspberry Pi

There is no software required for this board.