

## Teensy 4.1 “No-Solder Method”

The following procedure is for those that can’t use a soldering iron or would like to confirm the keyboard and software are working before soldering a custom board.

A few people have used variations of this method and posted pictures in the “I Made It” section at the end of this Instructable (see examples below). I sometimes get involved in helping debug these projects because it gets confusing when the jumpers are installed randomly. If you install the jumpers the same way as the traces on my circuit board, you can use all the same software including Marcel’s Python code.

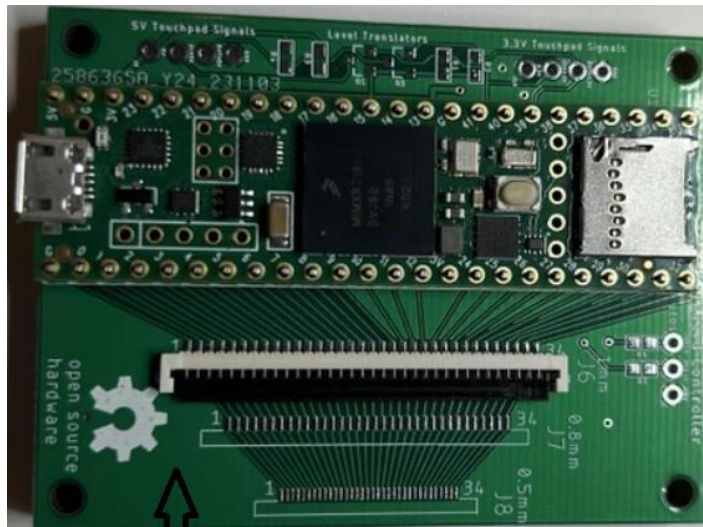


### Parts List:

1. Purchase a [Teensy 4.1 with header pins](#). Don’t try this with a Teensy 4.0 because it only has 23 usable I/O header pins (unless you want to do some soldering to the LED and backside I/O pads).
2. Purchase a [0.5mm pitch FPC adapter board](#) or [1mm pitch FPC adapter board](#) that has the correct pin count for your keyboard FPC cable. Make sure the board has header pins installed so you won’t need to solder them. These header pins can be straight or 90 degrees for connection to the jumper wires.
3. Purchase enough [Dupont jumper wires](#) with female connectors on each end for all the keyboard FPC pins. They will be connected in the same way as the traces on the Teensy 4.1 connector board as shown in the table below. Example: Install a jumper from FPC pin 11 to Teensy I/O number 18.

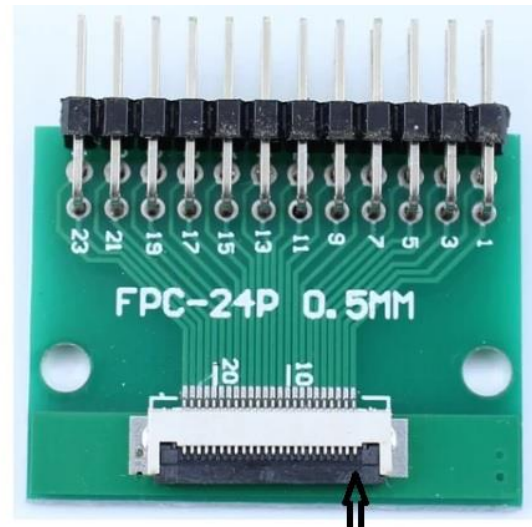
F P C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
I O #	23	0	22	1	21	2	20	3	19	4	18	5	17	6	16	7	15	8	14	9	13	12	11	10	9	8	7	6	5	4	3	2	1	

The location of pin 1 on the FPC connector is not consistent in the electronics industry. Sometimes it's on the left side and sometimes on the right side. I've even seen PC motherboards that put 1 on the left for some FPC connectors and on the right for others. For my FPC connector boards, I chose to put pin 1 on the left (see silkscreen "1" on lower left picture). My software expects pin 1 to be wired to a certain Teensy I/O pin. Unfortunately the popular FPC adapter boards available on AliExpress have silkscreen markings that put pin 1 on the right (see silkscreen on lower right picture).



Pin 1 on the Left

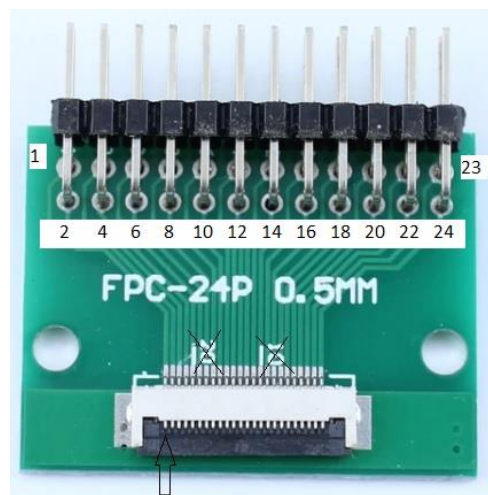
Teensy 4.1 FPC Connector Board  
(from step 4 in Instructable)



Pin 1 on the right

AliExpress FPC Adapter Board

To avoid confusion, cover the silkscreen numbers on the AliExpress adapter board with masking tape and use a pen to write the new numbers as shown below:



Pin 1 on the Left

Cover Silkscreen with tape and write new numbers as shown

Once you have all the jumpers installed per the table, proceed with the steps in the Instructable to create a key list text file, create the key matrix manually or with Marcel's Python program, and modify a USB keyboard routine with the new key matrix.