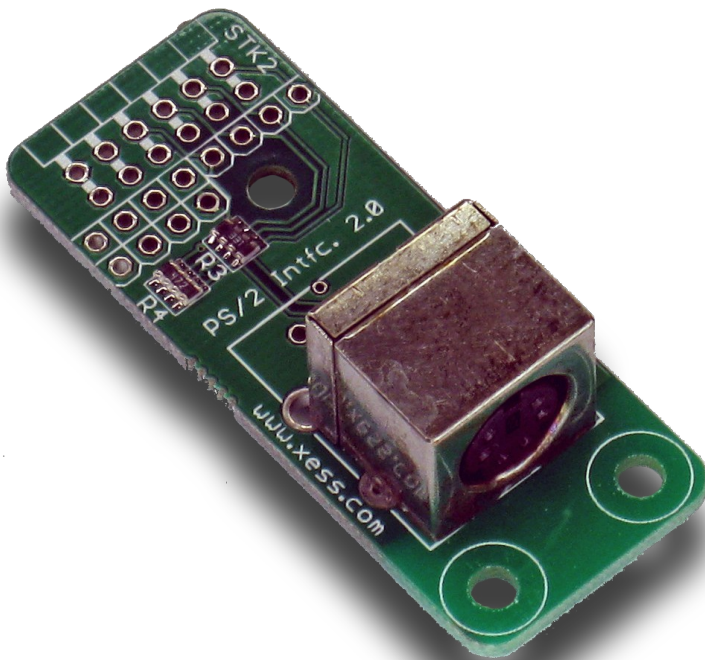


# StickIt! PS/2 Manual

*How to install and use your new  
StickIt! PS/2 Module*



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**StickIt! PS/2 Manual**  
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**VandeboutOctober 17, 2013**

The following table shows the revision history for this document.

<b>Date</b>	<b>Version</b>	<b>Revision</b>
02/03/2012	1.0	Initial release for StickIt! PS/2 module V1.0.
10/17/2013	2.0	Image changes for StickIt! PS/2 module V2.0.

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# C.1 Preliminaries

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Here's some helpful information before getting started.

## Getting Help!

Here are some places to get help if you encounter problems:

- If you can't get the StickIt! PS/2 module to work, send an e-mail message describing your problem to [help@xess.com](mailto:help@xess.com) or submit a problem report at <http://www.xess.com/help.php>.
- Our web site also has
  - answers to frequently-asked-questions,
  - example designs, application notes and tutorials,
  - a forum where you can post questions.

## Take Notice!

It's pretty hard to get in trouble with this module.

## Packing List

Here is what you should have received in your package:

- a StickIt! PS/2 module.
- PMOD™ male header.
- Wing male headers (8-pin & 4-pin).

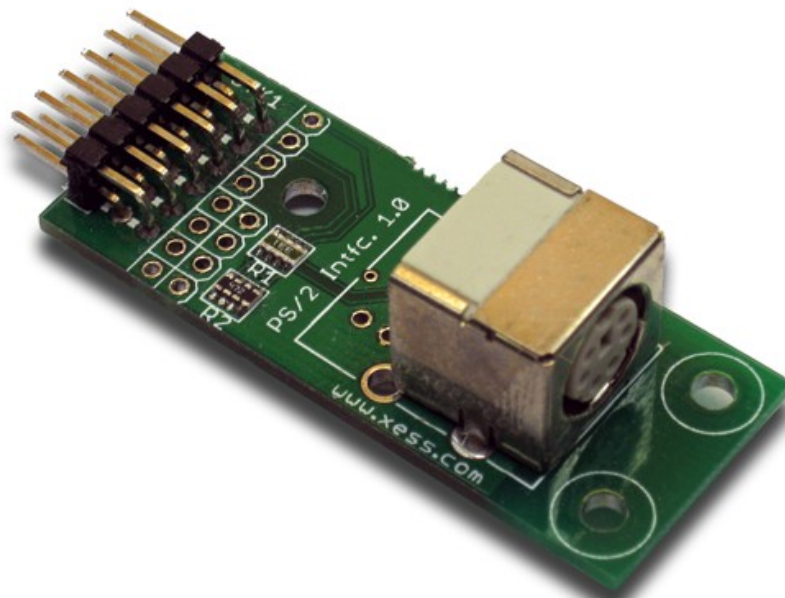
## C.2 Setup

The StickIt! PS/2 module provides one or two PS/2 sockets that connect to a four-bit or eight-bit PMOD or a Wing socket on your StickIt! board.

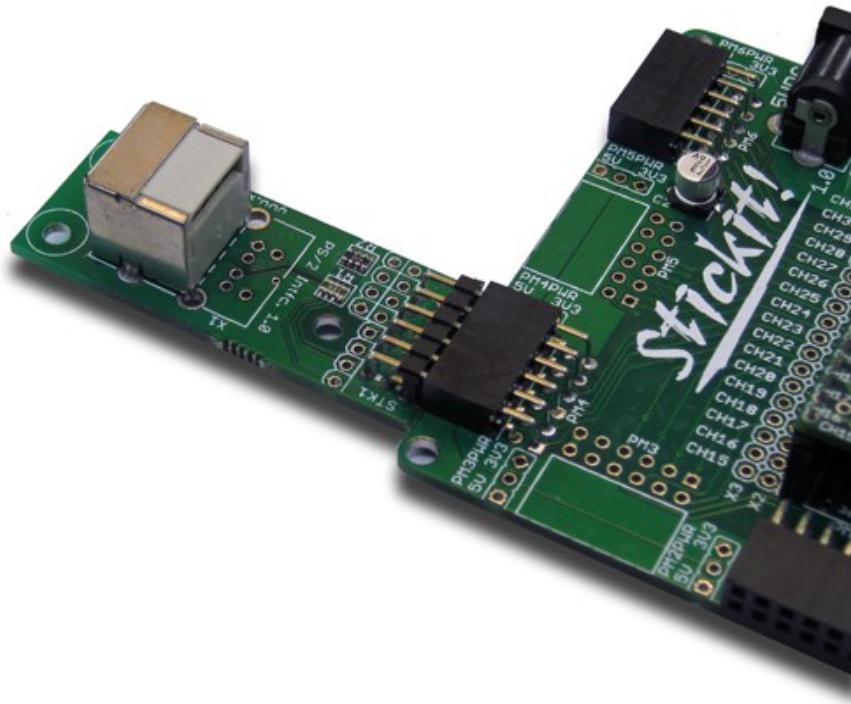
### Inserting Your StickIt! PS/2 Module Into Your StickIt! Board

#### Inserting Into a PMOD Socket

To use the StickIt! PS/2 module with a PMOD socket, first solder the included male PMOD header to the module as shown. (**To insure a stable connection, only use a header with 0.025" square pins.**)

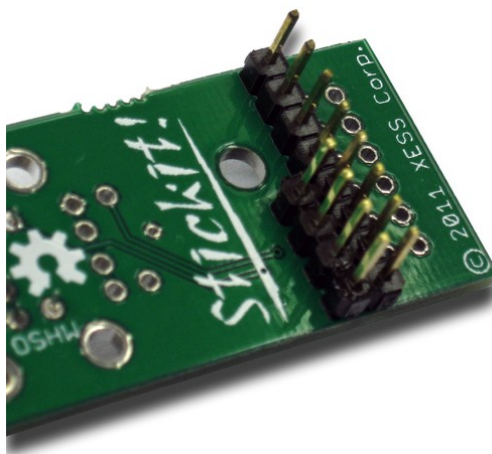


Then insert the module into one of the PMOD sockets on the StickIt! Board and plug in a PS/2 keyboard. The keyboard gets its power through the PS/2 socket from either the +3.3V or +5V supply, so set the voltage selection jumper for the PMOD socket appropriately. (Many keyboards will run off of either voltage, so try the default +3.3V setting first.)

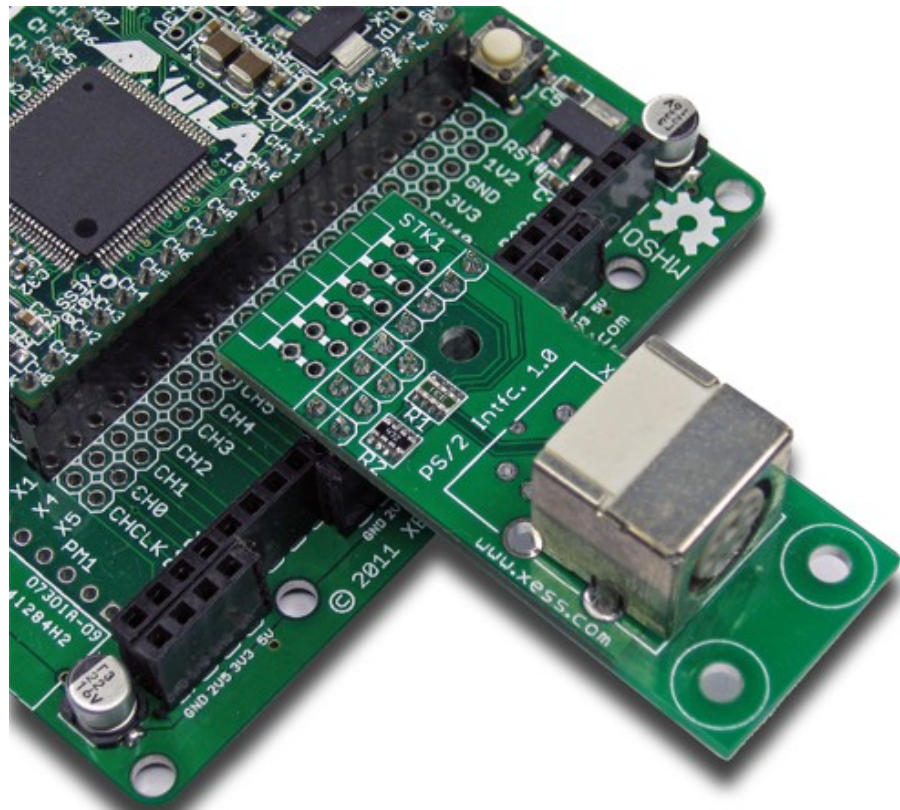


### Inserting Into a Wing Socket

To use the StickIt! PS/2 module with a Wing socket, first solder the included male Wing headers to the module as shown. (**To insure a stable connection, only use a header with 0.025" square pins.**)



Then insert the module into one of the eight-bit Wing sockets on the StickIt! board.

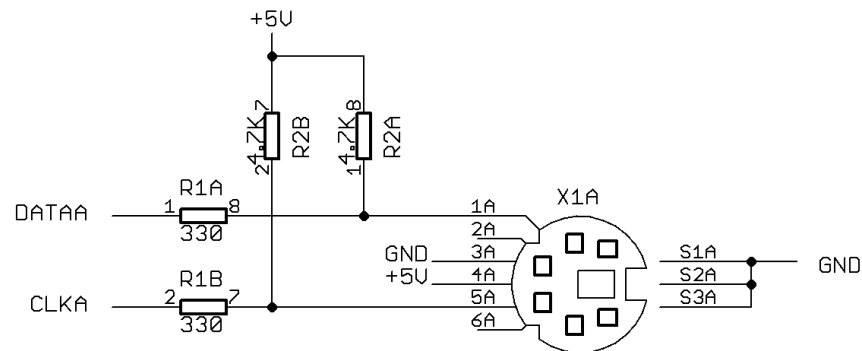




## C.3 Operation

This chapter describes the operation of the StickIt! PS/2 module using a simplified schematic. You can find a complete [schematic](#) at the end of this manual.

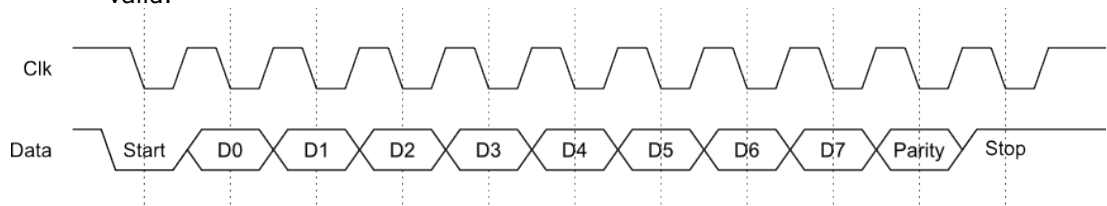
The StickIt! PS/2 module has two identical and independent interface circuits and PS/2 sockets. Each circuit consists of a PS/2 socket, two pull-up resistors and two series current-limiting resistors that allow a 5V keyboard to drive the 3.3V pins of the FPGA without causing damage.



A keyboard attached to the PS/2 socket delivers two signals:

**Data:** This signal carries the serial data stream as each key is pressed and released. [Each key is assigned an eight-bit scan code](#) that is transmitted from least-significant to most-significant bit with a preceding start bit and a terminating parity bit and stop bit.

**Clk:** The falling edge of this signal indicates when the next bit of the serial data signal is valid.



A single scan code is transmitted when a key is pressed. But two scan codes are transmitted when the key is released: an initial scan code of 11110000 to indicate the key release, and then the scan code for the key is sent again.

## C.4 *Using the Module*

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To use the StickIt! PS/2 module, you will need to do the following:

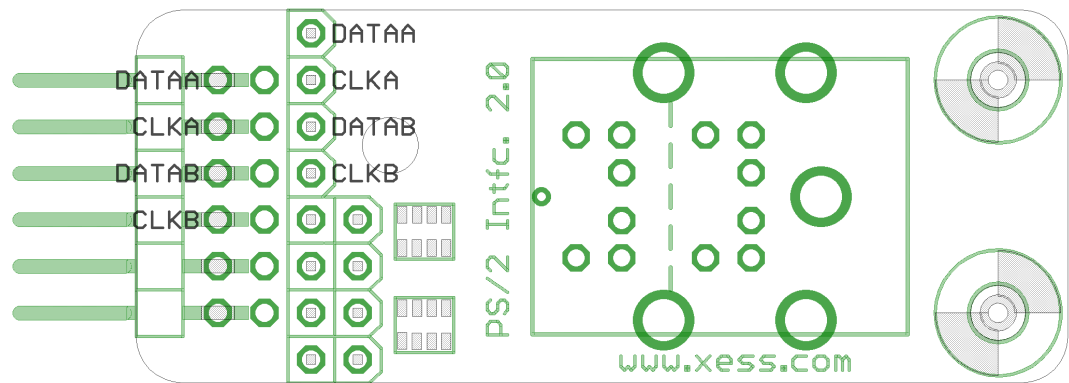
- Create a Xilinx ISE FPGA project and write some HDL code for gathering the serial scan codes from a PS/2 keyboard.
- Attach the module to either a PMOD or Wing socket on the StickIt! board.
- Determine the channel signals on the PMOD or Wing socket that connect to each I/O pin of the module.
- Find which FPGA pin of the XuLA board connects to each channel signal.
- Make a UCF file associating each FPGA pin with an I/O pin of the module.
- Include the UCF file in your ISE project.

**That's a lot of work just to get a keypress, so we've done most of it for you.** Just go to <http://github.com/xesscorp/StickIt>. There, you will find a subdirectory with a Xilinx ISE project that includes:

- a PS/2 keyboard-scanning HDL module,
- an example that uses the keyboard-scanning module and an LED Charlieplexing module to detect and display the pressed button,
- and a UCF file containing the FPGA pin assignments to use when installing the StickIt! PS/2 module into any of the PMOD or Wing sockets.

# A.1 I/O Locations

The connections of the I/O signals to the PMOD and Wing headers of the StickIt! PS/2 module are shown below.



# A.2 Schematic

