

SparkFun PicoBoard Kit User Guide

PicoBoard Kit User Guide

Make sure you have:

- A computer
- The PicoBoard Kit from the library which contains:
 - PicoBoard
 - USB cable
 - Alligator clips
 - Getting Started with PicoBoard Guide
 - Getting Started with Scratch Booklet
 - Scratch cards

NOTE: There should be a photo on the lid of the kit of all of these items. If any are missing please let your librarian know.

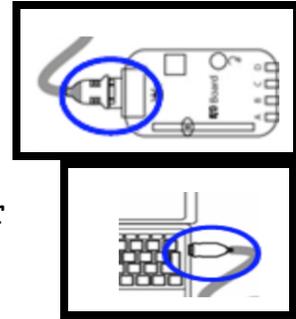
START HERE!!!!

Getting Started:

Step 1: Turn on your computer.

Step 2: Open the Internet browser you use. Go to the following address: <http://www.sparkfun.com/FTDI> and download the FTDI driver for your machine / operating system.

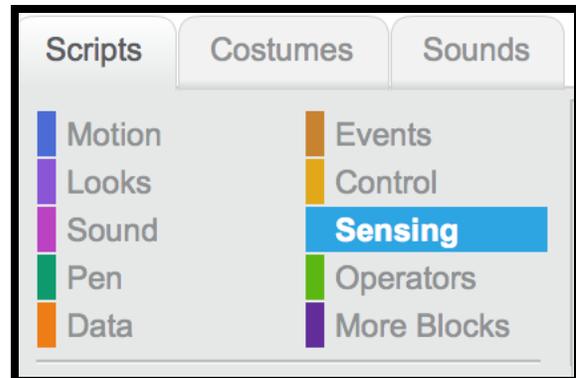
Step 3: Take the USB Cable from the kit and connect the USB Cable to the USB port on your computer. Connect the other part of the USB cable into the USB port of the PicoBoard. The small end goes into the PicoBoard and the bigger end into the USB slot on your computer.



Step 4: Open the Internet browser that you use. Go to https://scratch.mit.edu/scratch_1.4/ Scratch is currently available as an on-line (v2) option, but the PicoBoard is not yet compatible with this system.

Download and install Scratch 1.4 onto your computer.

Step 5: In the middle of the screen under “Scripts” select the “Sensing” category. The various sensing blocks will now appear.



Step 6: Click on the gray box in front of the “slider sensor value” block.

value” block.

Click and drag the block into the Scripts area. Now, find the **set size to ()** block under looks and the **forever** block under Controls to create this:



Double-click on the script to run it, and watch. You should see the red & green lights on the PicoBoard start to flash, and as you move the slider, you should notice the size of the Sprite change.

There are also additional ideas to try in the “Getting Started with PicoBoards” booklet included in your kit. Otherwise you can email: techsupport@sparkfun.com

Step 7: Now that you have the PicoBoard set up you are ready to start playing with it. The picture below illustrates each sensor.

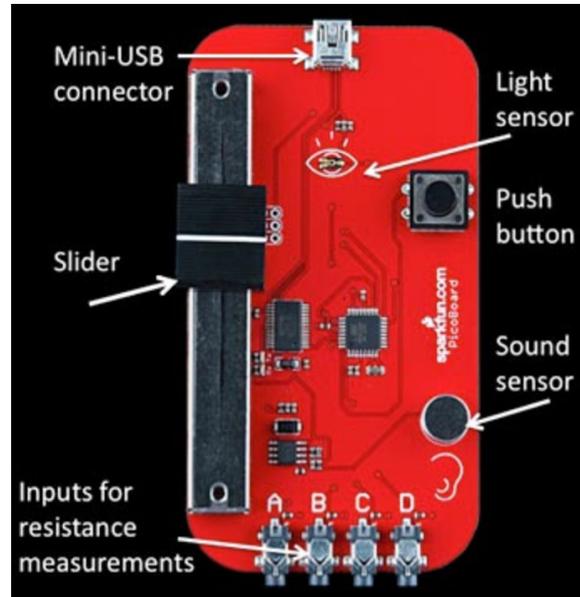


Photo from:

http://www.sciencebuddies.org/science-fair-projects/project_ideas/scratch-picoboard.shtml

Now What?

- Once your PicoBoard is set up and working properly take the “Getting Started with Scratch” Booklet from your kit. You may have already done this in Step 4: Option 1 in the “Getting Started” section above. It is always helpful to revisit to make sure you are really comfortable with Scratch. This way you will be able to create the most interesting and innovative projects possible.
- Take the “Getting Started with PicoBoards” Guide from your Kit. It will walk you through the steps to create all

kinds of projects using your PicoBoard. Let your imagination go crazy as you think about all kinds of different creations.

- Go to the following project that was created in Scratch:

<http://bit.ly/16QTL1h>

This will help you make sure your sensors are working, play a game and get a few ideas of your own. When the PicoBoard senses darkness a mouse crawls out of its hole. You can control the cat with your slider and button and if you catch the mouse you win.

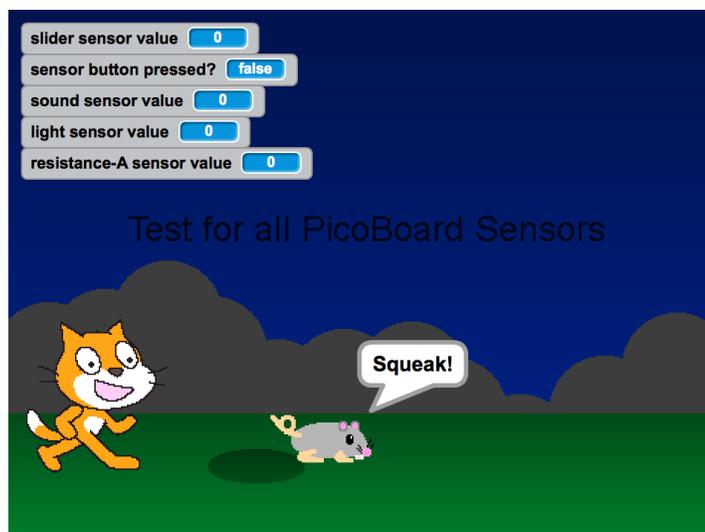


Image from <http://scratch.mit.edu>

- Check out the other SparkFun kits, activities and workshops your library has available.
- Visit learn.sparkfun.com to learn more on your own and see what others are doing.

Trouble Shooting

If you are having trouble getting your PicoBoard to work try these options:

- Make sure the USB cable is connected to the PicoBoard and the computer securely.
- Make sure that only one copy of Scratch is running.
 - Windows: Look at the Task Bar at the bottom of your Windows screen. Make sure there is only one Scratch window open. If there is more than one, close all the Scratch windows and then restart Scratch.
 - Mac: Look at the Dock located along one of the edges of your screen. Do you see more than one cat? If so, quit from all the copies of Scratch that are running, then restart Scratch.
- Check for port conflicts. Make sure nothing else is trying to use the same port.
- Have the drivers for the USB-serial cable been properly installed on your computer? This was outlined in the “Getting Started” section.
- Unplug and replug the USB-serial cable.
- Restart Scratch
- Restart you computer, then restart Scratch.
- If the entire Scratch screen goes white and does not respond to any mouse or keyboard commands it means that Scratch has gone into “standby mode” while it is communicating with your PicoBoard.
 - Simultaneously hold down <ctrl>+<alt>+<delete> to open the Windows Task Manager.

- Select “End Task” to close Scratch. Unfortunately you will lose any unsaved work in Scratch. Then restart Scratch.
- To avoid this problem in the future, go to the Windows Control Panel and select “Power Options.” Change the settings to prevent Windows from entering standby mode.
- If you cannot solve your problem post a question to the “Sensor Boards” forum at:
<https://scratch.mit.edu/discuss/>
- A really basic test would be to just use the ScratchBoard watcher.
 - Plug in the board.
 - Start up Scratch.
 - Go to the "Sensing" category.
 - Right-click (or control-click on a Mac) the "slider sensor value" block.
 - Select "show ScratchBoard watcher" from the menu that appears.
 - A widget should appear on the stage that displays the state of the attached board.
- Check out the Science Buddies Troubleshooting guide:
<http://bit.ly/16QMIJ8>
- If all else fails email: techsupport@sparkfun.com

Other Troubleshooting Tips

If you've created a script and it doesn't perform the way you expected, you might have forgotten to put in some blocks or

used the wrong blocks. Try one or more of the methods below to figure out what part of your script isn't working the way you anticipated.

1. If your script doesn't perform the way you expected, you can diagnose where the problem is by “stepping” through the project.
 - Under the "Edit" category, click on "Start Single Stepping." Now when you run your program, each block will be highlighted as the computer performs that instruction.
 - If you want to slow down how fast the blocks (instructions) are being executed, you can also choose "Set Single Stepping" and select "Flash blocks (slow)" from the Edit category. This will slow down the action (it's kind of like watching something in slow motion), so that you can better see what is happening in each part of the code and correct any problems.
 - Even with slow single stepping, it might be difficult at times to know "where you are at" and whether or not different scripts are being activated as you intended. To help keep track of this, you can add blocks to your scripts, like a "Say" block that says "hello" or "starting xyz script now," that can give you feedback about when a script is functioning.
2. If you had a script, or set of scripts, that were working, but stopped working after you added some additional blocks, you know that the problem lies somewhere in the new additions you made.
3. If you've saved an earlier version of your program (which is always a good idea!), you can go back to that and re-evaluate your changes.

4. If you don't have a saved working version, you can start breaking apart your script.
 - Break each script into smaller pieces and make sure they work as you expect.
 - When you find a piece that doesn't do what you expected, you've figured out where the problem is and can start trying other solutions.
5. If you are using variables in your script (symbols that can take on different values), it can be helpful to know what the values of these variables are as your script executes.
 - Under the Variables category, there is a "Show Variables" block that will allow you to see the values of different variables as the program runs.
 - You can also use the "Say" block under the Looks category to "say" the value of the variable.

Finding the Solution to the Problem:

Once you've figured out where your problem is, it might be obvious to you what the solution is. If so, great! At other times, you might be left scratching your head. If that's the case, it might be time to step away from the computer for a moment and grab a pencil and pad of paper.

Write down what you want each of your scripts to do. Think about the kinds of blocks you'd need to execute the task. Once you have the theory straight in your head, go back and look at your program again. Did you miss something the first time? Check out the Scratch cards or the "Getting Started with Scratch" Booklet. They might provide some more insight.