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- Step-by-Step Help Documents

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How To Wire Up Potentiometers to an Input Module

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[next](#) 

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Show Me ...

...How To Wire Up Potentiometers to an Input Module

Summary

This tutorial will show you how to wire up potentiometers to a SIM-board USB Input Module, and then show you how to test the potentiometer in the SIM-board Universal Controller, and how to assign an action to the potentiometer in the software to control the throttle in the default Cessna aircraft in Flight Simulator 2004.

You will need...

- a [SIM-board USB Master Module](#)
- a [SIM-board USB Input Module](#) (with potentiometer capability)
- 2 [USB cables](#)
- a potentiometer
- wire
- [crimping tool](#), some [crimps and crimp houses](#)
- wire strippers
- latest version of the [SIM-board Universal Control software](#)
- a registered version of FSUIPC

This "Show Me How..." tutorial is provided in addition to the [SIM-board USB Help Documentation](#). It is recommended you refer to both this tutorial and the Help Documentation for your modules.



Step 1: Connect your Potentiometer

(For best results, we recommend the use of 5K or 10K potentiometers where possible.)

A potentiometer is a simple "variable resistor", offering a defined range of movement of a shaft (rotational potentiometer) or of a slider (slide potentiometer). They are often referred to as "pots" for short. Both rotary and slide pots are capable of being connected to the SIM-board USB Input Module.

Pots have 3 terminals - the high terminal (H), the low terminal (L), and the wiper terminal (W). Usually these are arranged such that the middle pin of the 3 is the wiper terminal, while the high and low pins are on either side. This is not always the case, so you should refer to your pot's datasheet for the actual reference. In many cases, connecting the terminals of a pot to the wrong terminals on the SIM-board should not cause any great problem, other than the fact that your pot will not be reading correctly when

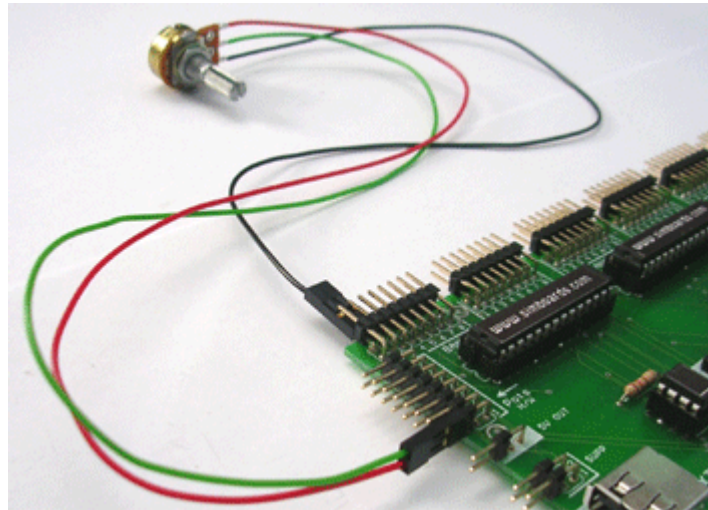
you test it. In this case, you should swap the pins around methodically until you find the right combination that gives the correct behaviour (see later steps).

Begin by connecting the wiper terminal of the pot to the top pin of the pin pair marked "1" of the bank marked "Pots H/W" at the top of the left hand edge of the SIM-board Input Module.

Next, connect the high terminal to the bottom pin of this "1" pin pair.

Finally, connect the low terminal to any bottom pin of any BANK A to BANK Z block. In the picture example, the low terminal is the black wire, the wiper is the green wire, and the high terminal is the red wire.

(The picture below shows a pot connected to the module using wires that have been crimped onto metal crimps, and then inserted into a 2-way plastic housing. This makes for an easy individual connection straight onto the pins of the module.)



Step 2: Connect the Master Module and Input Module together

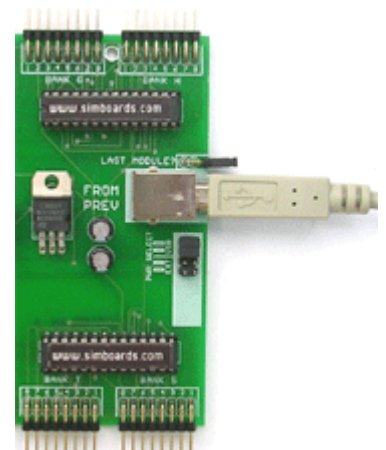
Now that we have made our pot connection, we can connect our SIM-boards together.

Using a USB cable (A-male to B-male), connect the A-male end of the cable (flat end) to the USB socket marked "TO FIRST SIM-BOARD" on the SIM-board USB Master Module.



Step 3: Connect the Master Module and Input Module together (part 2)

Connect the other end (the B-male or box end) to the USB socket marked "FROM PREV" on the SIM-board USB Input Module.

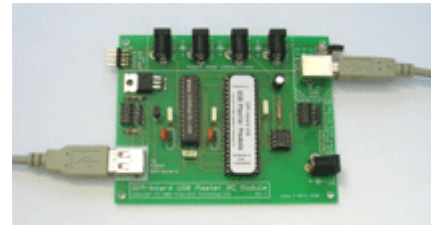




Step 4: Connect the Master Module to your PC

Using a second USB cable, connect the B-male (box) end of the cable to the USB socket marked "TO PC USB PORT" on the SIM-board USB Master Module.

Finally, connect the other end of the cable to a free USB socket on your PC.



Step 5: Install the SIM-board USB drivers

(If you have already installed the Windows driver file for SIM-boards USB, skip this step and go straight to Step 6).

If this is the first time that your SIM-boards have been connected to this USB port on your computer, Windows will attempt to identify the hardware item. A few seconds after you connect the Master Module to your PC, Windows will pop up a "Found New Hardware" dialog box.

You should follow the instructions detailed in the "[How To Install the SIM-board USB Windows Driver file](#)" tutorial, which you can access here (it will pop up in a new browser window).



Step 6: Load the SIM-board Universal Controller software

Now load the SIM-board Universal Controller application in the normal way.

A few seconds after loading, a new "USB Connection" will be listed in the left hand side of the window, and the Input Module will be listed as "Module 01".

Click on the "Module 01" Input Module entry in the list to display this module's nodes for configuration.



Step 7: Test the Pot

To test the potentiometer, select the tab titled "(Pots 1-8)" to reveal the pot nodes. Then click to expand "Node 1" to reveal the pot configuration settings.

Then click on the "Calibration Settings" text to reveal the calibration settings properties. Adjust the window so you can see all the settings available.

Next, change the "Active?" property to "Yes". This will activate this pot node for use. You will then see red and blue bars appear in the "Raw Signal" and "Calibrated Signal" areas. This represents the current position of the pot as detected by the SIM-board USB Input Module.

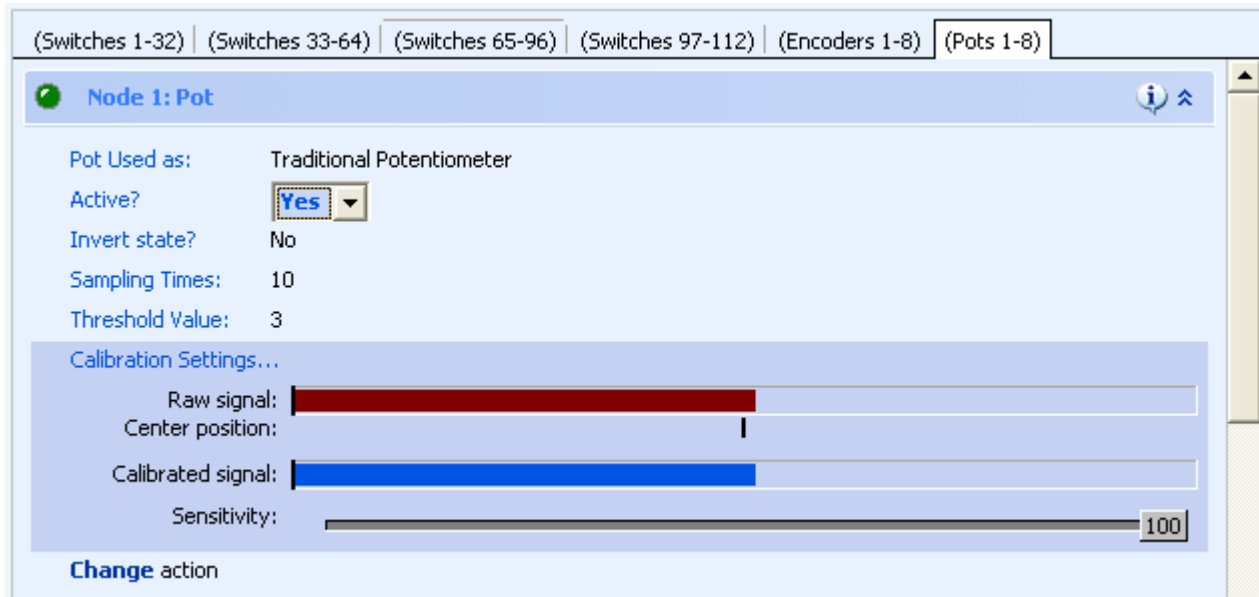
Twist your potentiometer through its range of movement, and notice the slider bars changing to reflect the new position of the pot.

If the pot bars do not appear to move, or are fixed fully red and blue, then the pot wires have been

connected wrongly. In this case you should swap the H, L and W pins to a different combination until the bar is representative of the current position of the pot.

If you find that twisting your pot in a clockwise direction produces a reducing red/blue bar combination, set the "Invert state?" property of the pot node to "Yes" which will reverse the signals in software.

If this test performs correctly, you have successfully wired up your pot to the associated node.



(Switches 1-32) | (Switches 33-64) | (Switches 65-96) | (Switches 97-112) | (Encoders 1-8) | (Pots 1-8)

Node 1: Pot ⓘ ⬆

Pot Used as: Traditional Potentiometer


Active? **Yes** ▾

Invert state? No

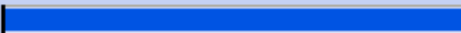
Sampling Times: 10


Threshold Value: 3

Calibration Settings...

Raw signal: 

Center position: |

Calibrated signal: 

Sensitivity:  100

Change action

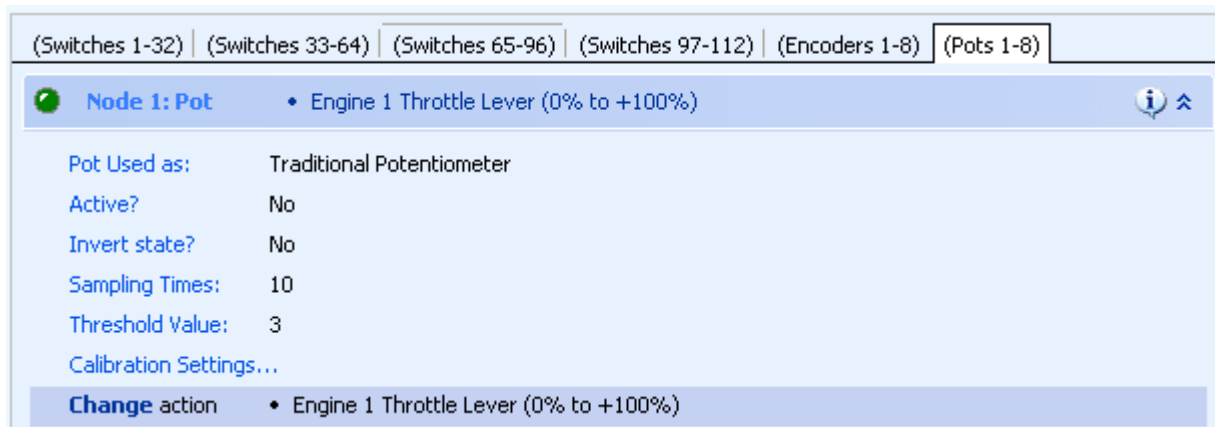


Step 8: Assign a Flight Simulator function

Having verified that the pot is operating correctly in test mode, you can now assign a function to have it control functions within flight simulator.

For this example, we will use the pot to control the throttle lever of the default Cessna 182 aircraft.

Click on "Change action" (just below the calibration settings area) and from the list that pops up, select "Engine 1 Throttle Lever (0% to +100%)" from the "FS : Engines" subsection. This action will command the pot to adjust the throttle when the pot is moved. Click "Select" to assign this action to this node.



(Switches 1-32) | (Switches 33-64) | (Switches 65-96) | (Switches 97-112) | (Encoders 1-8) | (Pots 1-8)

Node 1: Pot • Engine 1 Throttle Lever (0% to +100%) ⓘ ⬆

Pot Used as: Traditional Potentiometer

Active? No

Invert state? No

Sampling Times: 10

Threshold Value: 3

Calibration Settings...

Change action • Engine 1 Throttle Lever (0% to +100%)



Step 9: Load Flight Simulator

Load Flight Simulator on your PC, or if you are using WideFS over a network, ensure you have Flight Simulator and the appropriate applications of WideFS running and connected properly.

Once loaded, select the default Cessna 182 aircraft model as the active aircraft.





Step 10: Run your test project

From the left hand side of the SIM-board Universal Controller window, select the "Run Project" option. Your simple project will begin to run, meaning that it is now active. If there is a problem with the project, or an error occurs, the details will be shown in the message area at the bottom of the window.

To test your project, minimize the SIM-board Universal Controller window and twist your pot. As you do so, you should see the thrust lever move in flight simulator.

Congratulations! You have now made your first project using pots with a SIM-board USB Input Module.

To stop your project, click on "Stop Project".

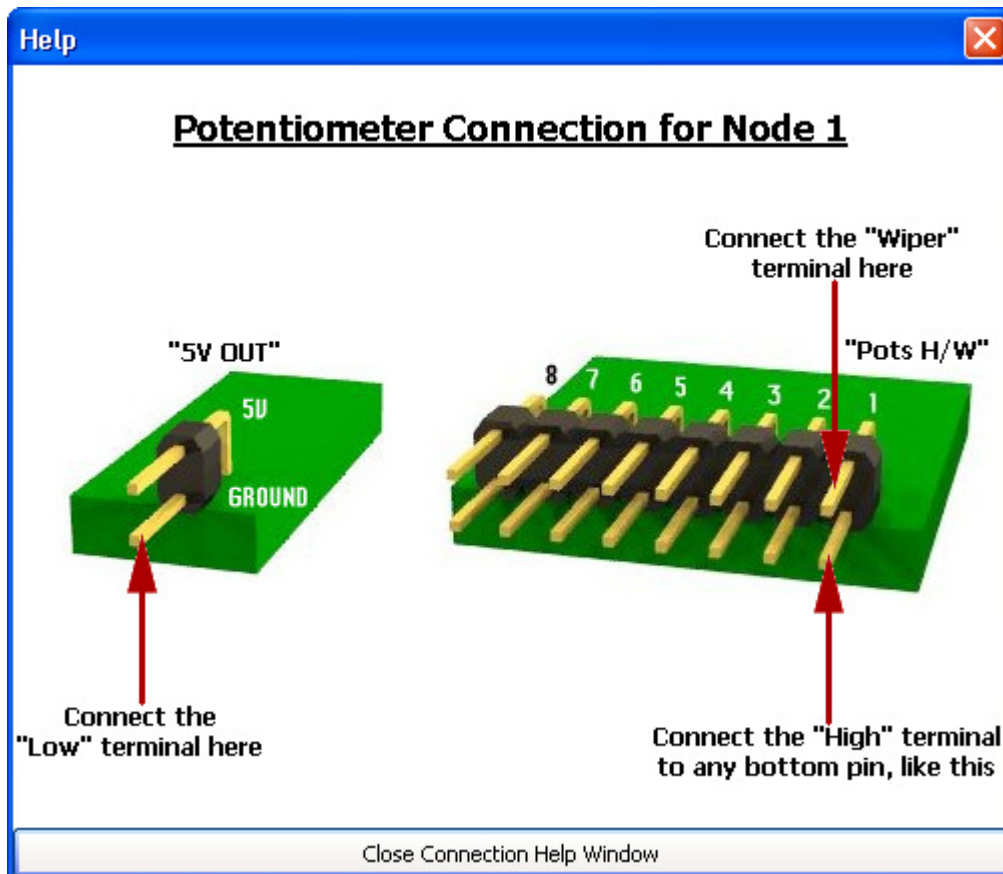
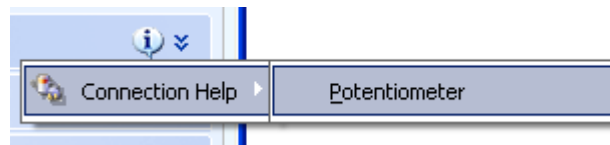


- [General Options](#)
- [Library Configuration](#)
- [Brightness Settings](#)
- [Run Project](#)



Step 11: Use the Floating Help Icon

You will notice that as you move your mouse over the nodes, a "floating help" icon appears which when clicked, offers you in-program help with connecting your devices. Help is provided for each node type for each module available in the SIM-board USB series, and will offer you further Step-by-Step instructions on how to wire the given node that you have clicked on.



15 August 2006
27th July 2006

Issue 2
Issue 1

Removed erroneous references to encoders
Initial Issue

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