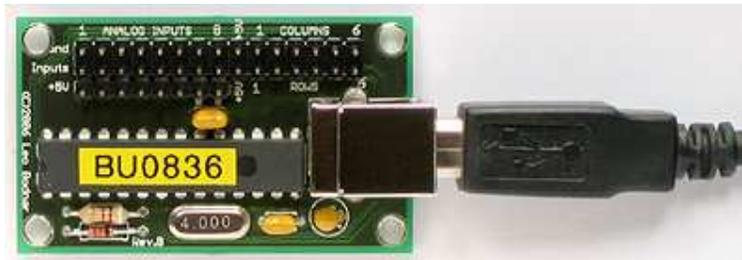


### **Connecting Your Rudder Potentiometers to The BU0836 Controller Card.**



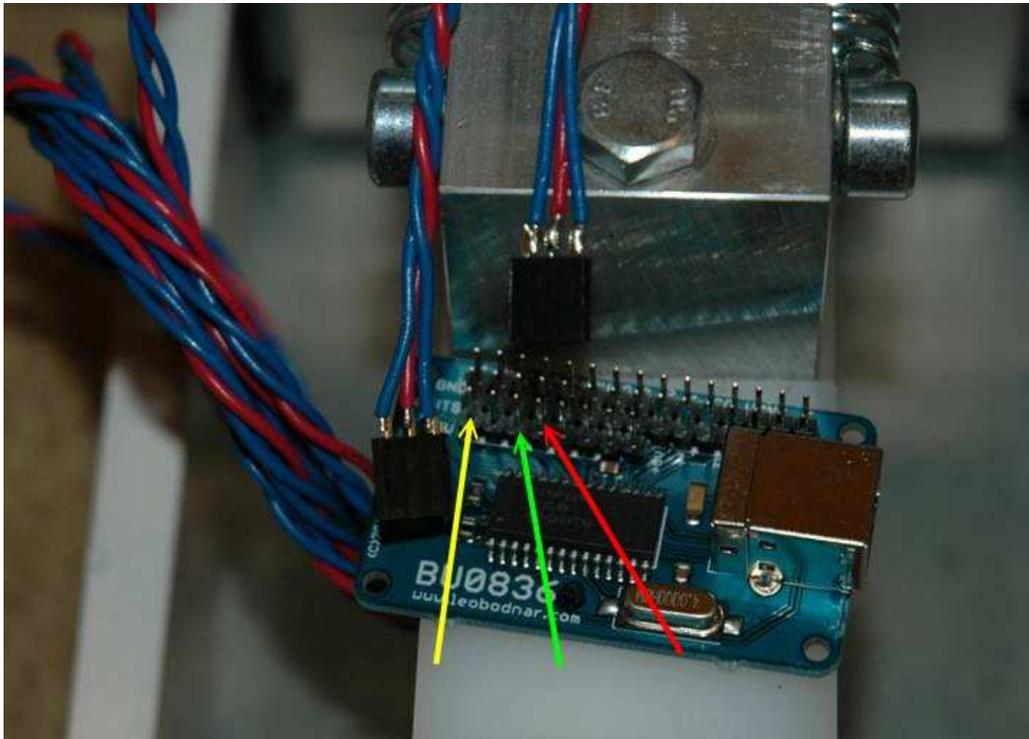
There are 3 Potentiometers fitted to the rudder pedals. Left Brake, Right Brake and the Rudder itself. This is how to connect them to the BU0836 controller card.

Each lead has a 3 pin connector plug fitted that will be pushed on to the 3 header pins that the BU0836 uses for the analog inputs. Looking at the image of the card above, each analog input has a GND (top), Input (centre) and 5v (lower) pin. The Analog inputs are numbered 1 to 8. The first 6 will be seen by Windows as the X, Y and Z axes and the X, Y & Z rotations.

Connect the Rudder potentiometer lead to Analog Input 1 (marked with the Yellow Arrow). This is the X axis to which a centre point can be assigned in the Windows Game Controllers calibration routine. This allows the rudders to have a 'centred' point where no input is being sent into your Flight Simulator or Aircraft.

Connect the Left Brake potentiometer lead to Analog Input 3 (marked with the Green Arrow).

Connect the Right Brake potentiometer lead to Analog Input 4 (marked with the Red Arrow).



**(Wire Colours in the above Image are for Display Purposes only. Your wire colours may differ from those shown)**

Looking at the above image, each of the connector plugs has 3 wires soldered to it. The outer two (Blue) connect to the 5v and GND while the centre wire (Red) is the Wiper (Variable) input from each axis.

At this stage, it is not important which way the connector is placed onto the 3 header pins on the card. The criteria is that it is placed correctly onto the three pins.

### **Setting Up Your REVOLUTION SIMPRODUCTS Rudder Pedals.**

First connect the USB lead to a spare socket on your PC. Your computer will recognise the Hardware and install any drivers it needs to work with the controller card.

Once your device has been installed by the operating system, we recommend that you now goto the Game Controllers properties page in the Control Panel and Calibrate the 3 Axes used in our Rudder Pedals being the Left & Right Brakes and the Rudders.



There are now two options for assigning the Brakes and Rudders. First you may simply assign them inside your actual Flight Simulator Menu. Or secondly, we recommend, that if you have a registered version of FSUIPC, you assign and calibrate the Brakes and Rudders using that method as described below.

### **IMPORTANT NOTE: For customers using FSUIPC for Assignment & Calibration**

FS9 & FSX are notorious for automatically assigning axes and button functions when it sees a new controller. When you connected the Joystick card to your PC, it will have installed it and reported the device name.

Before continuing, please goto your simulator assignments Menu section and ensure that all Button & Axes assignments for this card have been deleted. Shutdown your Flight Simulator to save the configuration file and re-start.

This prevents the likelihood of you having 'cross controls'. That is where the same button or axis is assigned in two places and may not be assigned to what you actually want. For example, you depress one of the Brake Pedals and the aircraft banks to the left. Makes for a bad day. Good Housekeeping on your inputs will save you a lot of time and hassle.

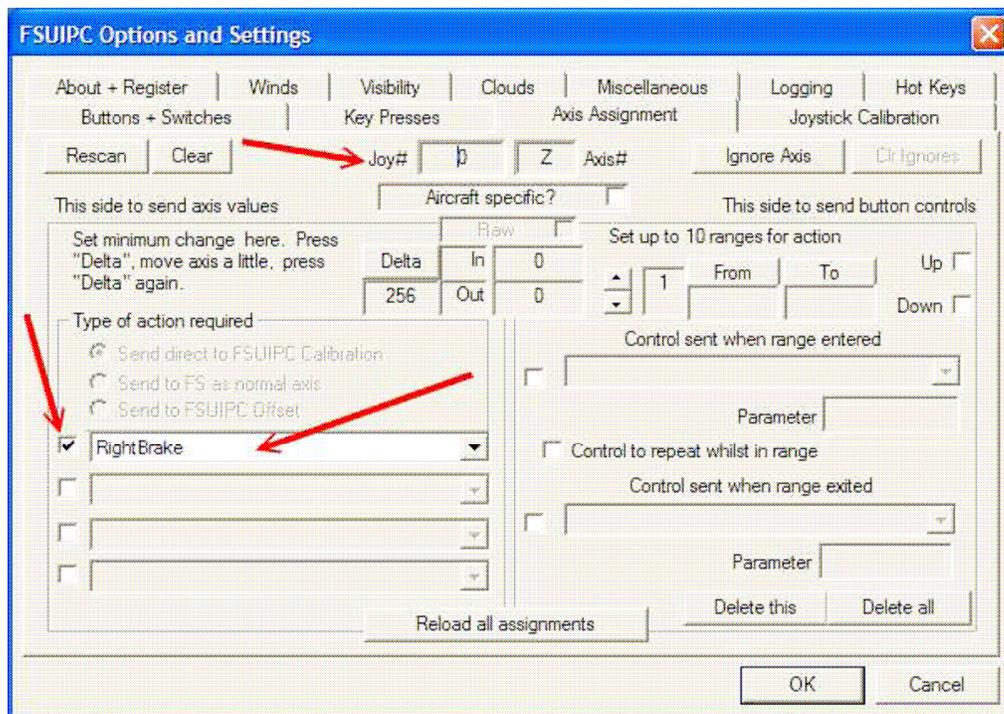
### **Assigning The Brake & Rudder Axis**

The first thing to do is to assign the 3 axes.

Open the FSUIPC Options & Settings/Axis Assignment Page as shown in the image. You will be presented with a blank page inviting you to MOVE LEVER. If that does not happen, FSUIPC has seen an axis. Simply press the Rescan button until you have a blank menu. FSUIPC will see any axis that is operated (e.g. when a brake pedal is depressed or the rudders are used) and report a Joy# and an Axis# as in our example.

Depress the Right Brake Pedal. FSUIPC will report the Joy & Axis#'s as indicated by the top red arrow.

On the Left Hand Side of the Options page there are 3 actions that can be chosen. Make sure that the 'Send direct to FSUIPC Calibration' is checked as shown.



You may now proceed to assign the axis. Choose the top checkbox beside the Dropdown menu as shown by the left red arrow. You may now select the Right Brake from the choices. That's it.

Now press the Rescan button to return to a blank options page and repeat for the Left Brake. Once done, press Rescan again for the blank options page and repeat for the Rudders.

We have assumed that anyone with a Registered Version of FSUIPC will have a working knowledge of how to use it. If you are unsure of exactly how to assign axes, then refer to the FSUIPC Users Guide under 'Axis Assignment'.

The Users Guide is 'bundled' with the FSUIPC download which you can find at [www.schiratti.com/dowson](http://www.schiratti.com/dowson).

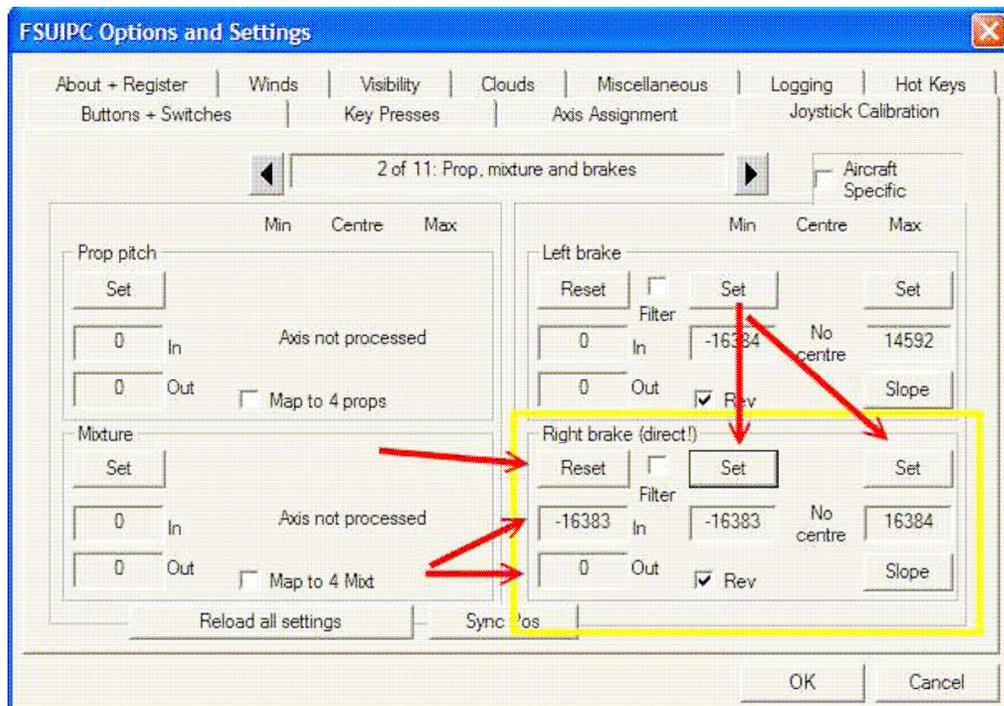
Or, if you have the latest version, you can find the User Guide in your Flight Sim Modules Folder in a Folder called FSUIPC Documentation.

## **Let's Calibrate the Axes:**

Open the Joystick Calibration Page as shown in our example for the Brakes. Our example is outlined in yellow for the Right Brake.

First, notice the Right brake label has (direct!) after it. This is telling us that this axis is being sent to FSUIPC for calibration. Any other axis that is being sent to FSUIPC will also have this legend after its name.

If the axis has not previously been used, you will be presented with the 'Axis Not Processed' message as in the left hand side of the page. If that is the case, click the Set Button and you will be presented with two boxes for Min and Max values that have a Set button above them as indicated by the red arrows. Or, if you have a Reset button, press that to set to the Set situation. Then press the button again to have a clean start.



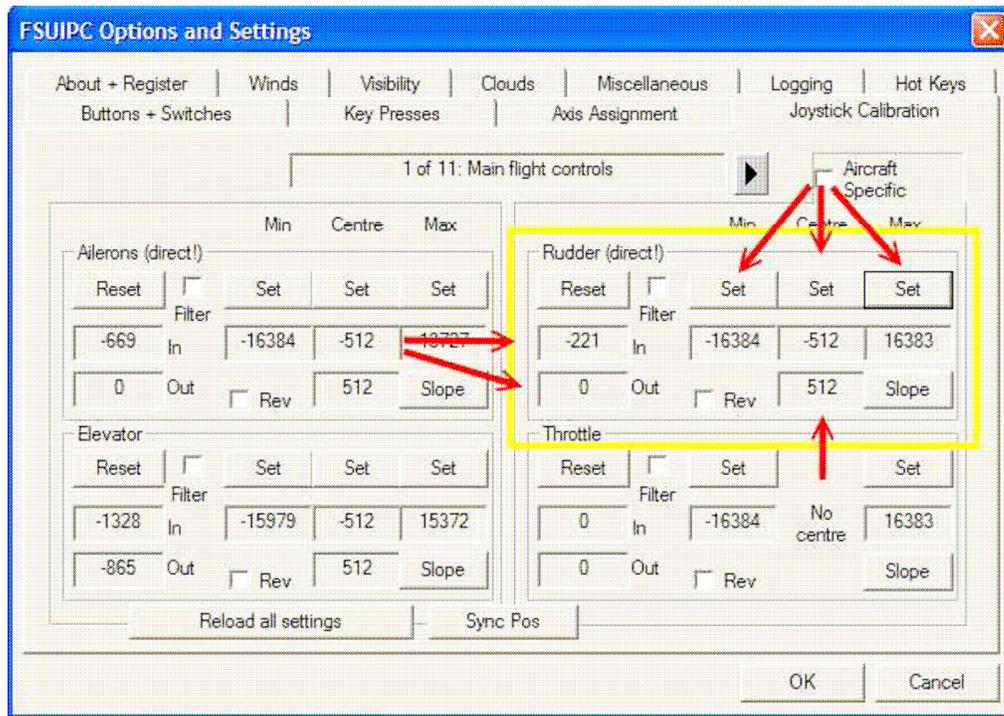
Depress the Right Brake Pedal and watch the values in the In & Out boxes change. With the Right Brake pedal fully depressed, note the value in the In box. If it is a positive figure (i.e. 16383) then click the set button that contains the positive figure. If it is a negative figure (i.e. -16383), then click the Set button above the negative figure on the left. Fully release the Brake Pedal and repeat for the other Set box.

We are now interested in the Out values. This is the actual value FSUIPC is sending to your sim. With the Brake Pedal fully depressed, the out value should read somewhere in the region of 16384 and when it is released, the Out Box value should read 0.

You will have noticed the 'Rev' box. If your brake pedal operates 'back to front', that is when it is in it's released position, the Brake is on, by checking this box you can reverse the axis. Now repeat for the Left Brake exactly as we have done with the Right Brake.

**See also the Note about Brakes at the End of the Document.**

## Now let's calibrate the rudders.



Calibrating the rudders is exactly the same as we did with the brakes. First you have to set the two extremes for Right and Left Travel as described in the section above by setting the values in the Min & Max boxes.

Push the Rudder Pedals all the way to one end of their travel. Look at the value being seen by FSUIPC in the In box. If it is a negative figure (i.e. -16384) then click the set button above the box containing the negative figure. If it is a positive figure (i.e. 16384) then click the set button above the box containing the positive figure. Push the Rudder Pedals to the other extreme of it's travel and click the Set button above the other box. You should now have values set somewhere near our example. It's not an exact science because no two potentiometers are going to give you 100% accuracy. But as long as your values are somewhere near ours, FSUIPC will manipulate the value that actually goes into your simulator.

The Rudder axis also gives us the opportunity to set the 'centre' of the range. This is null zone in the middle of the values where the rudder will not introduce any input to your simulator.

If you look at the two boxes under Centre, the default range is -512 to 512. Any value between these two numbers being seen by FSUIPC will result in a 0 output. That's where the rudders are 'centred'. Our example is showing a 'seen' value of -221. But because this value is within the Centre range, FSUIPC is sending a 0 or centred value to the simulator. It is possible to increase this range as directed in the FSUIPC Users Guide.

As no setup's are the same, you will need to adjust the sensitivity and response from your Rudder Pedals to suit your own preferences. By changing the response curve using the Slope function, you will be able to get your new pedals exactly how you want them.

## **BRAKES.**

Simple commercial potentiometers have a 'tolerance' that can be +/- 5%. This means that they can return different values on each successive rotation. FSUIPC will see this.

For example, depressing the right brake pedal may give you a seen value (in the In Box) of 16384 this time, but 16116 the next time or 16228 the third time.

If you experience this, we suggest that you SET the lowest value you see as the value FSUIPC will use as it's read value. FSUIPC 'manipulates' the seen value and adjusts the output accordingly.

What this means is that if you have 'differing values' being seen, by setting the lower value in the FSUIPC Set boxes, you will always reach the lower seen value and FSUIPC will adjust the output to suit.

When setting the 'Brakes Released' point, we recommend that you hold the brake pedal 3-4mm down from it's rest position. That way, when the Brake pedal is released, it will pass the point where we have taken the setting from the potentiometer and FSUIPC will adjust the Brake output to 0 (off).

## **USING TWO SETS OF RUDDERS TOGETHER**

When using two sets of rudders together, FSUIPC only lets us calibrate one axis for each of the Left/Right Brake and the Rudders. So, it becomes necessary to ensure that each matching axis input is working in the same sense. That is when each pot is rotated it sends the same range of values to FSUIPC. For example the Cpt. Left brake pedal when depressed goes thru a 0 to 16384 (or thereabouts) range. It then follows that the F/O Left brake pedal must do the same. If we have a situation where the two corresponding axes are sending opposite inputs, it will become necessary to reverse the range of one of the potentiometers.

## **REVERSING THE OUTPUT OF A POTENTIOMETER**

Potentiometers you will use on our Rudder Pedals are connected to 5v and GND on the two outer pins. The centre pin is the wiper (variable) that returns a value to the controller card. Lets say that by rotating the pot clockwise the value it returns increases.

By reversing the 5v and GND connections to the pot, it then 'reverses' the value sent to the controller card. That means we will now rotate the pot anti-clockwise to see an increase in value sent to the controller. This will allow us to 'synchronise' our inputs if one of the pots is returning a 'reversed' value compared to the other one.

Ian P.Sissons for **REVOLUTION SIMPRODUCTS** Jan 2011

[sales@revolution-simproducts.com](mailto:sales@revolution-simproducts.com)

[www.revolution-simproducts.com](http://www.revolution-simproducts.com)