Installing the Twin-Engine Saitek Pro Flight Quadrant

Installing, customising and troubleshooting the Twin-Engine Saitek Pro Flight Quadrant.

This product has been around for a few years and is acknowledged to be the PC flight simulation quadrant that provides the best value for money. It is affordable, well designed, reliable and is particularly useful if two units are simultaneously installed to be used as a twin-engine quadrant. Rather than yet another review, we will here provide solutions to some common installation hurdles. As for customisation, some users prefer the involved use of the FSUIPC utility, but the Saitek software with its simple Macro-capture allows for an easy and full programming of these units without using FSUIPC and with no knowledge about computer programming. The only skills needed are simple editing of text files.

Installing it and customising a single Saitek Quadrant is straightforward. However, installing two quadrants, catering for all single- and twin-engine aircraft, is much more difficult, and even Saitek instructions fail short of a full customisation. After extensive experimentation, the author has produced the following directions. They have been tested with FS2004 (but with minimal changes they should be valid for FSX), running under Windows 7 64-bit (but valid also for XP, Vista and 8).

Installing the hardware. Each quadrant comes with knobs inserted for the default one-engine setup: from left to right there is a black knob for throttle, a blue knob for propeller RPM and a red knob for mixture or condition. Quite obviously, for a twin quadrant you should exchange the handles so that you have, from left to right, two throttles, two propellers RPM and two mixtures or conditions.

Each quadrant comes with a clamp that the user can screw to either the bottom or the back of the unit, allowing to install the quadrant on the border of a table. This is good for permanent or occasional use, but is less than convenient if you need to install/uninstall the quadrant(s) quickly, for instance if you use the computer for other activities yet you wish every day to do some flightsimming.

TIP 1: The author has found it practical to ignore the clamps. You should screw joystick and quadrants to a wooden shelf with some rubber on its bottom. You will need 1-inch long screws, which are easy to procure as they have a common type of thread. You will normally store the shelf on the table behind the monitor: from there you can easily swap it with the PC keyboard.

Installing the software. The product includes an installation CD, but more recent software is available as a download from Saitek's site http://www.saitek.com/uk/down/drivers.php : each Window version has its own download. Mind however that, should you install the driver first, the software will reinstall it. Also, the two quadrants are identically listed by the software, by Flight Simulator and by the Device Manager, and it is not easy to identify them.

TIP 2: unless you are happy without the software (this seriously limits the available features, for example you cannot have separate reversers) you should install the software and ignore the driver installer. When you are requested to plug the USB unit, connect the Left quadrant only and let the installer to proceed with driver and software. After the software install is complete you will find installed the Saitek Smart Technology (SST). Only at this point should you plug-in the Right Quadrant, which will be duly USB-recognised by the PC. From now on, in the Calibration, Saitek and Flight Simulator lists, the Left quadrant will be on top and the Right quadrant will be below it. If for any reason you have to unplug them, reconnect them in the same order: Left first, Right second.

Calibration. Go to Control Panel, Game Controllers, or start Flight Simulator and go to Calibration. You will find the two quadrants and will be able to calibrate them separately. The three handles of a quadrant are conveniently assigned the letters X,Y,Z, but the calibration software (meant for a joystick-cum-throttle) assumes that X and Y are joystick axes: I tried "centering" either the central position or the neutral lower position, and both failed to produce a proper calibration for the X and Y axes. Calibration was instead perfect for axis Z, where the numbers were detected going from 0 to 255, i.e. the potentiometers fully cover the expected range.

TIP 3: Calibrate the Left quadrant, hastily for X and Y and carefully for Z. Repeat for the Right Quadrant. Now run regedit.exe and go to the Registry key

> KEY_CURRENT_USER\System\CurrentControlSet\Control\MediaProperties\
> PrivateProperties\DirectInput\VID_06A3&PID_0C2\Calibration

[It is possible, although unlikely; that your unit has another code: before proceeding, check it in Device Manager.] Anyway, twin quadrants are easy to recognise in the Registry: other joysticks, under the Registry key, have a folder for each axis, while twin quadrants have two folders "0" and "1" and inside each one the three Axes' folders. These are numbered 0,1 and 2, each one with a single "Calibration" key. Number 2 is Axis Z and has the Data string is "00 00 00 00 7f 00 00 00 ff 00 00 00". Copy this value into the other axes keys, and you are done. You cannot do anything terribly wrong: if you copy a wrong string you just have to recalibrate.

Back from Sleep or StandBy. In some computers the quadrant levers fail to work when the PC comes back from Sleep or StandBy, and the user has to unplug and plug again the USB connectors. In the process, the assigned Profiles (see below) are deleted from the quadrants, forcing the user to re-assign them individually. All this is very annoying.

TIP 4: The cause is lack of adequate power to the quadrants via the computer's USB plug. It is recommended that you plug the quadrants into an externally-powered USB 2.0 hub: this will resolve the problem permanently.

Issues after rebooting. Unlike the Sleep issue, after rebooting the levers work, but the buttons do not. It is possible to assign permanently a startup program but the same program will be loaded into the two quadrants.

TIP 5: Right-click on the left quadrant, right-click on the Profile you have programmed (see below) and select Set As Startup Profile. From then on, every time you reboot the PC, both quadrants will have the Left Profile loaded: you should go to the Right quadrant icon and assign the Right Profile: a minor annoyance. [Also sometimes the two quadrant icons are reversed: after assigning, test any key, e.g. in the right quadrant with our assignments (see below), pressing "Syncr.ø" should type an "F" and pressing "Auto-Feather" should type a "k".]

Flight Simulator Axes Assignment. A real piece of cake.

TIP 6: First back-up fs9.cfg or fsx.cfg just in case. Start FS, go into Assignments, select the top (left) quadrant and assign axis X to Throttle Engine 1, axis Y to Throttle Engine 2 and axis Z to Propeller RPM Engine 1. Then select the bottom (right) quadrant and assign axis X to Propeller RPM Engine 2, axis Y to Mixture Engine 1 and axis Z to Mixture Engine 2. Check the Sensitivities: they are easy to set to match the axes movement ranges. Close Flight Simulator and back-up the new fs9.cfg or fsx.cfg.

Commands available, and the others. For every thing you want your Saitek Quadrant buttons to do, you need a keystroke programmed in FS. Many commands are available and listed under FS Assignments. Many other commands are not listed (and not normally included in fs9.cfg or fsx.cfg) yet they are available.

You can download the full list for FS2004 from http://www.schiratti.com/dowson.html clicking on "FS2004 Controls" or else read a full list for FSX from http://msdn.microsoft.com/en-us/library/cc526980.aspx : all the commands used in this article appear identically in both FS2004 and FSX and even have the same default shortcuts, with only two exceptions clarified in the text further below] and you can insert them manually into fs9.cfg or fsx.cfg.

Yet other commands are not available at all (for instance separate reversers for individual engines) and you have to make do by programming sequences of several key presses.

Programming the Engine Reversers. This is easy for a single quadrant, but requires some fiddling for a twin-engine double quadrant. Every handle in its reverse position behaves like pressing a button. Most flightsimmers wish to have each Throttle reverser acting separately for its engine: programming this will be somewhat lengthy, because there is no command in FS that reverses a single engine. However, it can be done by selecting the engine and repeatedly pressing F2.

TIP 7-1: right-click the tray icon for the desired quadrant and select Profile Editor. Inside the editor, click on Programming: you will see lines for the nine buttons: "Toggle 1" to "Toggle 6" for the rocker switches and three "reversers". You wish the "X reverser" to act as Engine Reverser 1. Right click on the right arrow and select "New Advanced Command": a dialog opens with three sections labelled "Press", "Repeat" and "Release". [From now on "key-in" means to press and release a key", "hold" means to press and hold down a key, and "release" means to release a previously held key. Click on the empty "Press" row: hold E, key-in 1, release E (this will select Engine 1), key-in F2 16 times, hold E, key-in 1, key-in 2, release E (this re-selects both engines). Since Flight Simulator needs some time to recognise the E command, we also need to program this into the macro. Right click on any of the keys in the "Press" macro and select "Quantize Time": a dialog opens with the value 0.000. Click OK and you will see that all the keys have a zero value below them. Now left click on the first F2 to select it (it becomes blue), right click on it, select "Set Delay" and set a value of 0.300. Leave the "Repeat" line empty, click on the "Release" line and enter the following sequence (which sets the reverser off when you move the throttle back to neutral): hold E, key-in 1, release E, key-in F1, hold E, key-in 1, key-in 2, release E. Repeat the "zero quantize" and "Set Delay" procedure, this time for the F1. Now click on OK and enter a meaningful name like "Eng_Rev_1".

TIP 7-2: Repeat ALL the above for the "Y reverser", to be programmed as Engine Reverser 2, the only difference being that each sequence of key presses, instead of beginning with "hold E, key-in 1 …" begins with "hold E, key-in 2 …". Save your Profile (file extension .pr0) with a meaningful name such as "Left". If you find all this too complicated, I include further below directions to download my ready-made profile.

Programming the Engine Feathers. Most flightsimmers wish to have the Propeller RPM for Engine 1 (3rd lever of the Left quadrant) to reverse as Feather Propeller 1, and the Propeller RPM for Engine 2 (1st lever of the Right quadrant) to reverse as Feather Propeller 2. There is a Toggle Feather command for individual engines but (at least in FS2004) it does not work. However, it can be done by selecting the engine and repeatedly pressing Ctrl-F2.

TIP 8-1: For Feather Propeller 1 select the "Z reverser" of the Left quadrant, New Advanced Command, and enter the sequence: hold E, key-in 1, release E, hold Ctrl, key-in F2 16 times, release Ctrl, hold E, key-in 1, key-in 2, release E. Repeat the procedure in TIP 7 to introduce a Delay for the first F2. Leave blank the "Repeat" and "Release" lines, introduce a meaningful name and save the profile.

TIP 8-2: For Feather Propeller 2 you have to open the Profile Editor for the Right quadrant: select the "X reverser", new Advanced command, and enter the sequence: hold E, key-in 2, release E, hold Ctrl, key-in F2 16 times, release Ctrl, hold E, key-in 1, key-in 2, release E. Repeat the procedure as before to introduce a Delay for the first F2. Leave blank the "Repeat" and "Release" lines, introduce a meaningful name and save the new profile as "Right".

Programming the Engine Primers. Reversing a Mixture handle only makes sense if the engine is not running. Therefore, the choice of possible actions is limited: I have selected to Prime the engine. This is much easier than the other reversers because, although there is no assignment in the FS dialog, the command exists.

TIP 9: Edit in Notepad fs9.cfg (or fsx.cfg) and introduce anywhere in the [KEYBOARD_MAIN] section the following two lines: "TOGGLE_PRIMER1=116,10" and "TOGGLE_PRIMER2=117,10". (Check that no other lines have the above numbers). Now Primer 1 has been assigned to Ctrl-F5 and Primer 2 to Ctrl-F6. As before, right-click the Right quadrant icon to enter the Profile Editor. Select the "Y reverser" and enter the key presses: hold Ctrl, key-in F5, release Ctrl. Then select the "Z reverser" and enter the key presses: hold Ctrl, key-in F6, release Ctrl. Introduce meaningful names for the reversers and save the Right profile.

Programming the 1st and 2nd rocker switches for the Flaps and the Cowl Flaps. Let us now program your 6 rocker switches, i.e. 12 buttons. It is quite intuitive to leave any programmable buttons in your joystick to be used for simulator features such as views and panels, and to use the quadrants for aircraft control instead.

Tip 10: Let us use the first rocker switch for the Flaps and the 2nd one for the Cowl Flaps. Select in the tray the left quadrant and start the Profile Editor. For "Toggle 1" just enter the key press F6 (for Flaps Retract Incr.). For "Toggle 2" enter F7 (for Flaps Extend Incr.). For "Toggle 3" enter the key presses: hold Ctrl, hold Shift, key-in C, release Shift, release Ctrl (for Cowl Flaps Close Incr.). For "Toggle 4" enter the key presses: hold Ctrl, hold Shift, key-in V, release Shift, release Ctrl (for Cowl Flaps Open Incr.).

Programming the 3rd and 4th rocker switches for various tasks. Quite obviously, the 3rd rocker switch is Left quadrant "Toggle 5" and "Toggle 6", and the 4th rocker switch is the Right quadrant "Toggle 1" and "Toggle 2·.
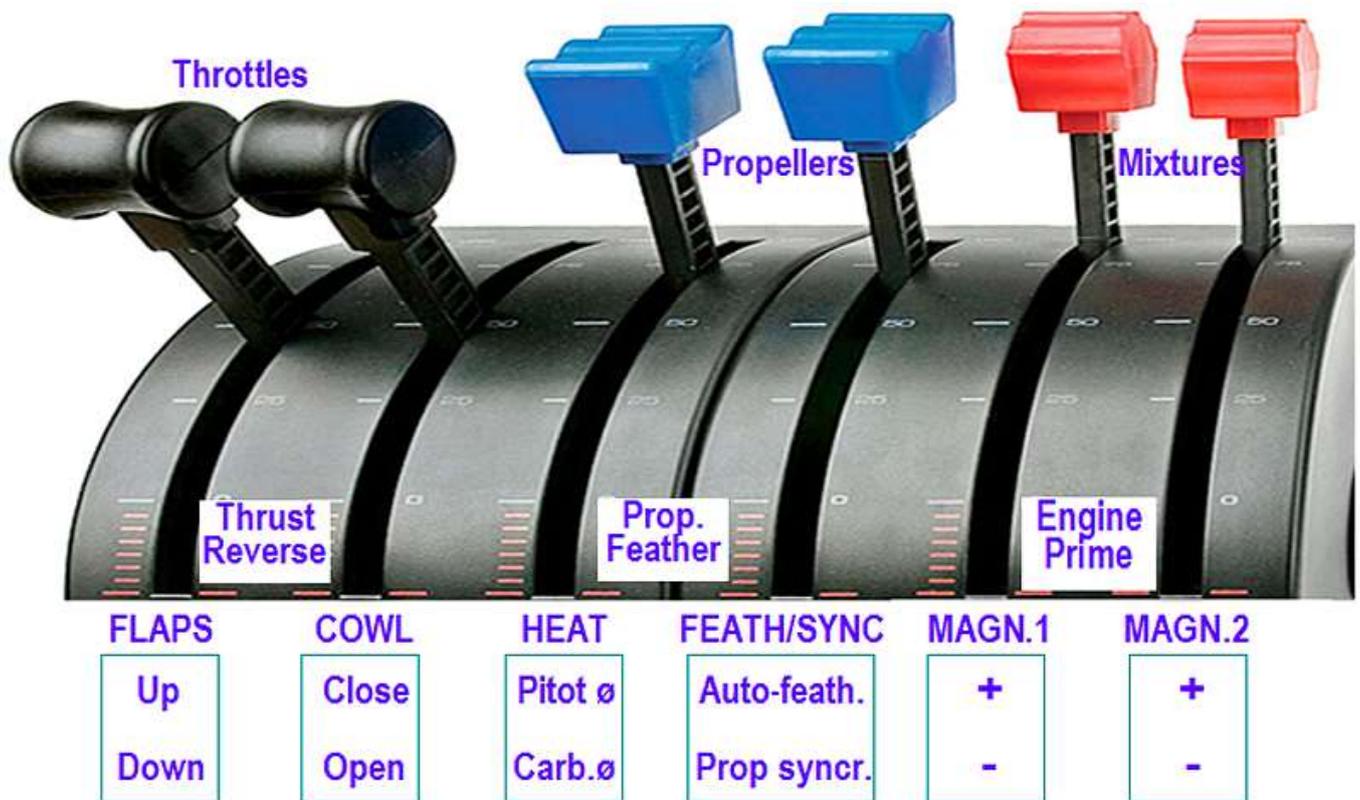
Tip 11: If you fly general aviation like myself, you will find it convenient to assign them to Pitot Heat toggle (Shift-H), Carburettor Heat or Anti-Ice (H), Auto-feather arm (K in FS2004, you have to manually assign it in FSX) and Propeller Synchro (Shft-F in FS2004, you have to manually assign it in FSX).

Programming the 5th and 6th rocker switches for the Magnetos. If you fly piston-engine aircraft, you wish the buttons below the Mixture levers to control the Magnetos.

Tip 12: Luckily there are special commands that can be added to the fs9.cfg or fsx.cfg for separate control of Magnetos. As before, within the section starting with [KEYBOARD_MAIN] insert anywhere the following four lines:

MAGNETO1_DECR=116,9

MAGNETO1_INCR=117,9

MAGNETO2_DECR=118,9

MAGNETO2_INCR=119,9

Now you can assign Toggles 3, 4, 5 and 6 respectively to Shift-F6, Shift-F5, Shift-F8 and Shift-F7. Save the Right Profile.
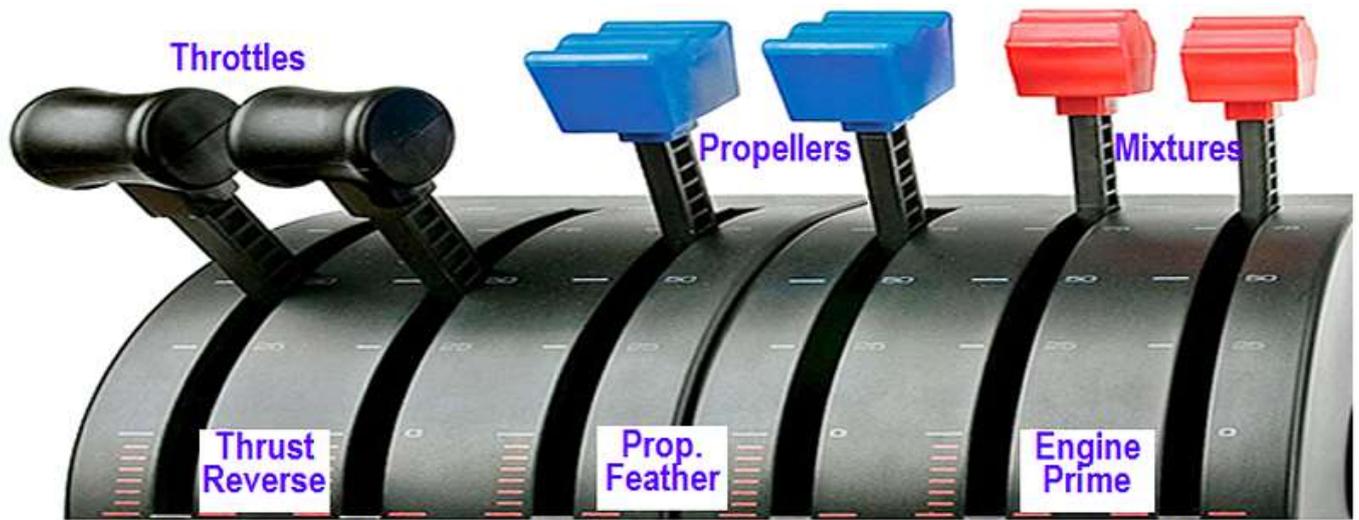
Downloading ready-made profiles. If your key assignments are the same as mine, my profiles will work for you; if not, you can easily edit one or two differences. Feel free to download my profiles "Left-noshift.pr0" and "Right-noshift.pr0", as well as the printout guide "Guide-noshift.tif" from http://cloudy.braybaroque.ie/cloudy_quadrants/ .

Shifted programming and Lights control. The SST allows to do even more than the above: any "toggle" in a quadrant can be defined as "shift" key, allowing to program different actions for the remaining two rocker switches and also for the three reversers, which I find not useful. I have found it practical to program the rocker switches to toggle each one of the usual 6 lights. Assigning the "shift" and programming for both shifted and unshifted buttons is very easy (read the manual!).

Tip 12: I have found it best to assign to "shift" the "Toggle 2" in both quadrants: this is the button nearest to the green light. A partial reprogramming is needed: Flaps and Cowl Flaps are moved "one rocker" to the right, Prop Sync is moved to Left Toggle 1, and Pitot and Carb. Heat are moved to the "shifted" set. Let us now go to the programming. Of the six usual Lights, only three have assignments via the FS9 or FSX menu: Landing (Ctrl-L), Panel (Shift-L) and Strobe (O). For the other three you have to add the following lines to fs9.cfg or fsx.cfg (as shown before):

TOGGLE_NAV_LIGHTS=84,9 (Shift-T)

TOGGLE_BEACON_LIGHTS=66,11 (Ctrl-Shift-B)

TOGGLE_TAXI_LIGHTS=84,10 (Ctrl-T)

Your assignments to shifted toggles will be as follows. LEFT quadrant, Toggle 3: Shift-H (Pitot), Toggle 4: H (Carb. Heat or Anti-Ice), Toggle 5: Shift-T (Nav lights) and Toggle 6: Shift-L (Panel lights). RIGHT quadrant, Toggle 3: Ctrl-Shift-B (Beacon lights), Toggle 4: O (Strobe lights), Toggle 5: Ctrl-L (Landing lights) and Toggle 6: Ctrl-T (Taxi lights). It could not be easier. See the final result in the scheme in the following page.

Throttles   **Propellers**   **Mixtures**

Thrust Reverse   **Prop. Feather**   **Engine Prime**

SYNC	FLAPS	COWL	FEATH	MAGN.1	MAGN.2
Prop-s.	Up	Close	Auto-f.	+	+
shift	Down	Open	shift	-	-

	HEAT	LIGHTS		L I G H T S	
	Pitot ø	Nav		Bcn	Land
	De-Ice ø	Panl		Strb	Taxi

Happy flying!