

to setup for a new plane, first **Reset the unit** (function 8), and then **Calibrate the unit** (function 7, transmitter must be on for this). Reset and calibrate the unit only once when starting fresh. If you want to start from scratch on a channel for some reason then make sure you have selected the correct channel then **Reset the channel** (function 6) and **Calibrate the channel** (function 5, your transmitter must be on for this). Next turn on **Endpoint Hold** (function 2) and lastly select your **Power Source** (function 1) and return the unit to **Run** (function 0).

- 2) Now is the time to reverse any servos that need to be reversed. To reverse servo A turn the function selector to 5 and push the increment button for about 1 second. The LED will go from a slow flash to a fast flash when the servo is reversed. You can do servos B, C and D the same way using function selector positions 6, 7 and 8.
- 3) Turn the power off and connect the servos. Turn the function selector to **Adjust Servo A** (function 1) and power on. Use the “Incr” and “Decr” buttons to adjust your center on servo A. Now move the stick all the way over and wait about 1 second. The surface will move to the endpoint and you can release the transmitter stick. Now you can adjust the throw you want on servo A in that direction, again using the “Incr” and “Decr” buttons. Move the stick all the way in the opposite direction you did before and let the surface move through neutral and then to the opposite endpoint. You can release the transmitter stick and adjust the throw you want in that direction on servo A. Now move the transmitter stick to the opposite extreme as before to return the surface to neutral.
- 4) Turn the selector to **Adjust Servo B** (function 2) and use the “Incr” and “Decr” buttons to adjust the center on servo B. Now move the stick all the way over and wait about 1 second. The surface will move to the endpoint and you can release the transmitter stick. Now you can adjust the throw you want on servo B in that direction, again using the “Incr” and “Decr” buttons. Move the stick all the way in the opposite direction as you did before and let the surface move through neutral and then to the opposite endpoint. You can release the transmitter stick and adjust the throw you want on servo B in that direction. Now move the transmitter stick to the opposite extreme as before to return the surface to neutral.
- 5) If you are doing 3 or 4 servos, now move the selector to **Adjust Servo C** (function 3) or **Adjust Servo D** (function 4) and adjust the center and endpoints on servo C or D the same way you did for servos A and B.
- 6) Setup is now complete.

Additional information, technical help, set-up hints and FAQs can also be found at www.Smart-Fly.com

Quest Engineering & Development
1328 East Cottonwood Lane
Phoenix, AZ 85048-4765
Ph: (480) 460-2652 Fax: (480) 460-2653



PowerExpander Eq10

Programming Guide

Thank you for purchasing the PowerExpander Eq10 from Smart-Fly!

This manual walks you through typical setups using the features of the PowerExpander Eq10 to obtain optimal results. This manual should be used in conjunction with the PowerExpander Eq10 Technical Reference.

A unique feature of the Smart-Fly PowerExpander Eq10 is the **Option Menu**. Use of the **Option Menu** makes the PowerExpander Eq10 more precise and faster to setup. Spending just a couple minutes in the **Option Menu** will save you time in setup and make any subsequent tweaks faster to implement.

Determining Optimal Servo Adjustment

There are several ways to determine when the servo is optimally adjusted. One method is to just listen to the servos' chatter and adjust it until this disappears or is minimized. A second, more accurate method is to monitor the current draw of the servos. You do not need to move your current monitor to each servo you adjust because when one servo is pulling against all the others they have to fight back and their current draw will increase. Using this little fact, all you need to do is monitor the current on any servo connected to the channel you are adjusting. Minimizing this current will mean the servos are at their optimal positions. Lastly, you can leave the screws out of the arms so they can be removed. When you think you have a servo at its optimal position you should be able to lift the arm off the spindle and replace it very easily. It should virtually drop onto the spindle. If you feel your servos are highly mismatched, you may want to remove the arms from the servos and only put the arm back on when the spindle has been adjusted to a position where the arm drops on with little or no effort. Move down the chain of servos putting the arms on as you adjust each servo's optimal position. If you feel the endpoints are also highly mismatched repeat this procedure for each of the endpoint adjustments.

Operating Precautions

The PowerExpander Eq10 performs a self-check each time it is turned on. If it discovers a failure it will not operate. Always perform a check on all surfaces to make sure that all servos are operating normally before releasing the plane. The unit normally takes between one to three seconds to come alive. If it does not respond after this time something is probably wrong with the unit and it should be replaced.

The PowerExpander Eq10 can only do so much. A lot depends on the quality of the mechanics of your system. It is strongly suggested that you keep the servo rotation below 50 degrees even at high rates. Travel beyond this rotation results in reduced mechanical advantage and a higher susceptibility to mechanical interference. Use good servo arms and high quality mechanical linkage. The linkage should be very, very smooth before attempting to align it.

Always range check your plane. Moving wires and adding additional wiring can change the behavior of your plane's antenna and the strength of the signal the receiver is getting from the transmitter. Never fly if you have a question about your radio system performance.

Setting Up A Channel With Multiple Servos On A Single Surface

The following method sets up multiple servos on a single surface (servos are ganged to a single moving surface). Examples of this are rudders with two or three servos, ailerons with two or three servos or elevator halves with two servos on each half. The options chosen from the **Option Menu** for this example make it easy for a single person to do the setup unassisted. It is suggested you set the options with the servos disconnected the first time.

- 1) First select the channel you want to program on the channel selector and enter the **Option Menu**. The **Option Menu** is entered by turning the function selector to position "9" **AND** holding both pushbuttons down **WHILE** powering the unit on. The LED will start to flash slowly when the request is recognized. If this is the first time using the unit or if you want to setup for a new plane, first **Reset the unit** (function 8), and then **Calibrate the unit** (function 7, transmitter must be on for this). Reset and calibrate the unit only once when starting fresh. If you want to start from scratch on a channel for some reason then make sure you have selected the correct channel then **Reset the channel** (function 6) and **Calibrate the channel** (function 5, your transmitter must be on for this). Next, turn on the **Output Priority** (function 4) option and the **Endpoint Hold** (function 2) option. Then return the unit to **Run** (function 0).
- 2) Turn the power off and connect the servos. Turn the function selector to **Adjust Servo A** (function 1), the channel selector to the channel you want to program and power on. At this point the servo on output A is being driven while the servos on outputs B and C (and output D channels 4 and 7) are turned off. Use the "Incr" and "Decr" buttons to adjust your center. Now move the stick all the way over and wait about 1 second. The surface will move to the endpoint and you can release the transmitter stick. Now you can adjust the throw you want in that direction, again using the "Incr"

and "Decr" buttons. Move the stick all the way in the opposite direction as you did before and let the surface move through neutral and then to the opposite endpoint. You can release the transmitter stick and adjust the throw you want in that direction. Now move the transmitter stick to the opposite extreme as before to return the surface to neutral.

- 3) Turn the selector to **Adjust Servo B** (function 2) and use the "Incr" and "Decr" buttons to adjust the center on servo B so that your current draw is at a minimum or the buzzing goes away. If you are doing 3 servos, now move the selector to **Adjust Servo C** (function 3) and use the "Incr" and "Decr" buttons to adjust the center on servo C. If you are doing 4 servos, now move the selector to **Adjust Servo D** (function 4) and use the "Incr" and "Decr" buttons to adjust the center on servo D. Turn the selector back to **Adjust Servo A** (function 1).
- 4) Move the transmitter stick all the way over and wait for the servos to move to an endpoint. Turn the selector to **Adjust Servo B** (function 2). Use the "Incr" and "Decr" buttons to adjust the endpoint on servo B so that your current draw is at a minimum or the buzzing goes away. If you are doing 3 servos, now move the selector to **Adjust Servo C** (function 3) and use the "Incr" and "Decr" buttons to adjust the endpoint on servo C. If you are doing 4 servos, now move the selector to **Adjust Servo D** (function 4) and use the "Incr" and "Decr" buttons to adjust the endpoint on servo D. Turn the selector back to **Adjust Servo A** (function 1).
- 5) Move the transmitter stick all the way over in the opposite direction and wait for the surface to go through neutral to the other endpoint. Turn the selector to **Adjust Servo B** (function 2). Use the "Incr" and "Decr" buttons to adjust the endpoint on servo B so that your current draw is at a minimum or the buzzing goes away. If you are doing 3 servos, now move the selector to **Adjust Servo C** (function 3) and use the "Incr" and "Decr" buttons to adjust the endpoint on servo C. If you are doing 4 servos, now move the selector to **Adjust Servo D** (function 4) and use the "Incr" and "Decr" buttons to adjust the endpoint on servo D. Turn the selector back to **Adjust Servo A** (function 1). Turn the selector back to **Run** (function 0).
- 6) Setup is now complete.

Setting Up A Channel With Single Servos On Multiple Surfaces

The following method sets up single servos on multiple surfaces. Examples of this are a split elevator with one servo per side or using separate servos for rudder and nose-wheel control. The options chosen from the **Option Menu** for this example make it easy for a single person to do the setup unassisted. It is suggested you set the options with the servos disconnected.

- 1) First select the channel you want to program on the channel selector and enter the **Option Menu**. The **Option Menu** is entered by turning the function selector to position "9" **AND** holding both pushbuttons down **WHILE** powering the unit on. The LED will start to flash slowly when the request is recognized. If this is the first time using the unit or if you want