

While you are adjusting the servos the unit will automatically save your latest change if you do not change the function or channel and do not enter a new change for 15 seconds. The current values will be saved so you do not lose them if you accidentally turn the unit off without changing the function or channel selectors. Each time you move to a new function or channel the settings for that function and channel will be saved also.

#	Name	Description
0	Running	This is the default position the unit should always be in when not adjusting the servo parameters.
1	Adjust Servo A	This function adjusts the centering and endpoints of servo A. When the LED is blinking slowly, the adjustment is the sub-trim (offset) of the servo. When the LED is blinking fast the adjustment is one of the endpoints. Pushing the "INCR" button will increase the travel arc and pushing the "DECR" button will decrease the travel arc when adjusting endpoints. If the LED stays on constantly while you are calibrating an endpoint you have exceeded 130% of the nominal electrical endpoint. When this happens, caution should be exercised since some digital servos can start misbehaving at values greater than this. The unit works in continuous or endpoint-hold modes when adjusting servo travel. If the endpoint-hold option is off the unit will follow the transmitter stick travel at all times. You need to be aware of the LED flash rate to see if you are adjusting the sub-trim (centering) or the endpoint travel. If the endpoint-hold option is on then the unit will have some movement in center so it can follow the center the transmitter is outputting. When you go to adjust an endpoint the unit will hold the servo at the endpoint it gets from the transmitter. When the transmitter stick is moved to one of its endpoints and held, the unit will recognize this and move to that endpoint. When at an endpoint and the stick is moved to the opposite endpoint then the unit will return to center. The rotary dial may be moved to adjust servos A, B, and C while at an endpoint. Also, if the output priority mode is set then when servo A is adjusted servos B, C and D will freewheel. When servo B is being adjusted servo A is also driven and servos C and D will freewheel. When servo C is being adjusted servos A and B will also be driven and servo D will freewheel. When servo D is adjusted all servos are driven.
2	Adjust Servo B	Adjust the centering and endpoints of B. See description of "Adjust Servo A."
3	Adjust Servo C	Adjust the centering and endpoints of C. See description of "Adjust Servo A."
4	Adjust	Adjust the centering and endpoints of D. See description of

#	Name	Description
	Servo D	"Adjust Servo A."
5	Reverse Servo A	Reverse direction of servo A. When the servo is normal, the LED pulse rate is slow. When the servo is reversed, the pulse rate is fast. Pushing "INCR" reverses the servos while pushing "DECR" returns the servo to normal. The buttons must be pushed for approximately 1 second to make the change. This is to prevent accidental reversal of servos.
6	Reverse Servo B	Reverse direction of servo B. See description of "Reversing Servo A".
7	Reverse Servo C	Reverse direction of servo C. See description of "Reversing Servo A".
8	Reverse Servo C	Reverse direction of servo D. See description of "Reversing Servo A".
9	No Function	No function in this position in run mode. Used to access the option menu with special power up sequence.

Receiver Failure or Interference Behavior

The PowerExpander Eq10 checks the validity of the servo signal coming from the receiver. The channel LED is on continuously when a valid servo signal comes from the receiver (transmitter must be on). If the PowerExpander Eq10 does not see a valid signal or any signal for one-half second, it turns the LED off and either continuously sends the last good position to the servo or stops sending a signal to the servo (see **Option Menu** item 3). When the PowerExpander Eq10 recognizes a good signal from the receiver, the unit turns on the LED and begins updating the servo position again. PCM receivers will output the last good position or a programmed failsafe position when they lose the transmitter signal. FM receivers will stop sending a signal to the servos. If you have an FM receiver you can program the PowerExpander Eq10 to either continuously update the servo with the last good position received or discontinue updating altogether.

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

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PowerExpander Eq10

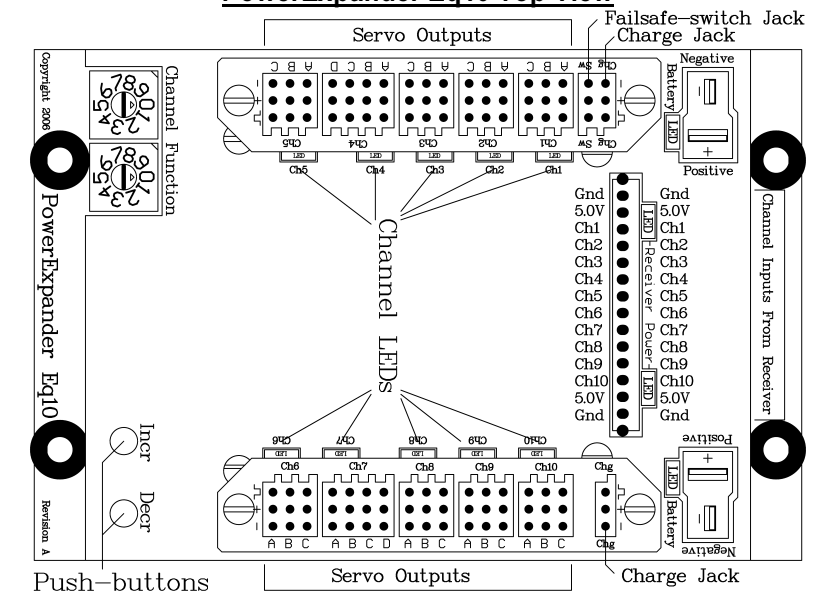
Technical Reference

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

What It Does

The PowerExpander Eq10 allows you to control your servos' centering and throw precisely on every channel. The positive and negative throws are independently controllable, which allows you to exactly match the servos, even with unequal positive and negative throw. The PowerExpander Eq10 can match servos on all 10 channels of the unit.

PowerExpander Eq10 Top View



PowerExpander Eq10 Programming

The PowerExpander Eq10 utilizes two rotary select switches (CHANNEL and FUNCTION) and two push buttons (INCR and DECR) to enable the user to control the centering and end-points of the servos. In addition there is an **Option menu** that allows you to set features that make the PowerExpander Eq10 easier and quicker to use.

Option Menu

The **Option Menu** is used to reset and calibrate the unit and set options that ease the use of the unit when adjusting the servos. The **Option Menu** is entered by turning the FUNCTION rotary dial to "9" AND holding both push buttons down WHILE powering on the unit. The LED for the channel selected by the CHANNEL rotary switch will flash slowly when the request has been recognized. The rotary switch settings are given in descending order since this is the direction you have to turn the switch to go through all the options. Returning the rotary switch to "0" returns the unit to normal operation and you must go through the special power up procedure again to get back into the option menu. While in the option menu you can freely go between channels and functions as long as you do not set or go past FUNCTION selector position "0".

#	Name	Description
9	Option Menu Entry	When the unit is powered on with the FUNCTION rotary switch set to "9" AND both push buttons held down the unit will enter the Option Menu . The selected channel's LED will start flashing slowly when the unit has recognized the request.
8	Reset All	This function resets all parameters on ALL channels to the default parameters. The Reset All function requires a double confirmation by holding both push buttons down for two seconds, releasing the pushbuttons in between each confirmation. When this function is entered all the LEDs will flash very slowly. After the first confirmation the LEDs will blink a bit faster. When the reset has been completed all the LEDs will change to a fast flash.
7	Calibrate All	This function calibrates ALL the channels' neutral to match the neutral the transmitter is outputting for each channel. Ideally, neutral is a pulse exactly 1.5 milliseconds wide. This is rarely the case because of manufacturing tolerances in the transmitter. Calibrating the unit for the actual neutral on each channel will result in enhanced ability to match centering and endpoints for all the servos. This function requires that you have your transmitter turned on. This is the only function in the option menu that requires the transmitter be on. The Calibrate All function requires a double confirmation by holding both push buttons down for two seconds, releasing the pushbuttons in between each confirmation. When this

#	Name	Description
		function is entered all the LEDs will flash very slowly. After the first confirmation the LEDs will blink a bit faster. After the second confirmation all the LEDs will go out. The unit will then start calibrating all the channels, starting with the current channel. When a channel is calibrated the LED will change to a fast flash. If the channel is not calibrated for some reason the LED will slow blink. Two possible reasons exist for not calibrating a channel. First, the calibration range is plus or minus 125 microseconds of ideal neutral (1.5 milliseconds). If the pulses for this channel are outside this range then the channel will not be calibrated. A reason a channel may be outside this range is if the channel is on a toggle switch. In this case you would not want to calibrate the channel. The second reason a channel may not calibrate is that there is no signal from the receiver. This might be because you have a 9-channel receiver and the channel is the one you do not have connected. The other reason could be the connector is not seated well in the receiver. Lastly, if none of the channels calibrate you may not have your transmitter on. Your transmitter must be on so the unit will receive pulses from the receiver. The function is completed when all channels' LEDs are blinking again. Calibration should only be done once, when the unit is first installed. A possible reason to re-calibrate may be if you change transmitters or have your transmitter serviced. Both these things may affect where neutral is on the channels.
6	Reset Channel	This function resets all a channel's parameters to the default parameters. The Reset Channel function requires a confirmation by holding both push buttons down for two seconds. When the channel reset has been completed the LED will change to a fast flash.
5	Calibrate Channel	Please see "Calibrate All" for an explanation of what the Calibrate Channel function does. The Calibrate Channel function requires a confirmation by holding both push buttons down for two seconds. When calibrated the LED will change to a fast flash. This should only be done once, when the unit is first installed on a receiver channel. A possible reason to re-calibrate may be if you change transmitters or have your transmitter serviced. Both these things may affect where neutral is on the channels.
4	Output Priority	This option allows you to set ganged servos in sequential order (A, B, C and D) with no interference from the servos you have yet to calibrate. Other units require you to unplug servos leads while adjusting ganged servo centering and endpoints. When this option is set the unit will freewheel

#	Name	Description
		servos B, C and D when adjusting servo A, servos C and D when adjusting servo B and servo D when adjusting servo C. If you set the servos in the sequence A, B, C and then D, you will be able to precisely align the servos with no interference from servos yet to be calibrated. To turn the option ON use the "INCR" button and to turn the option OFF use the "DECR" button. When this option is OFF the LED will pulse at a slow rate, when the option is ON the LED will pulse at a fast rate.
3	Pulse During Failsafe	This option is only useful for FM Receivers. This option determines if the servos freewheel or are driven during the absence of pulses from the receiver. If this option is not set the servo will freewheel when no pulses are detected from the receiver. If this option is set then the servo will continue to be updated with the last valid position. To turn the option ON use the "INCR" button and to turn option OFF use the "DECR" button. When this option is OFF the LED will pulse at a slow rate, when then option is ON the LED will pulse at a fast rate.
2	Endpoint Hold	This option changes the behavior of the unit when adjusting the endpoints of the servos (run settings 1, 2, 3, and 4). When this option is ON you can move the transmitter stick over a small range around neutral and the unit will pass that on to the servo. This allows the servo to show the actual center the transmitter is putting out. When you want to set your end-points you want to move the transmitter stick all the way to the end of its travel and hold it there for about two seconds. When the unit recognizes this endpoint request the servos will all be moved to their endpoint and held. The transmitter stick can be released at this point but the servos will remain at the requested endpoint. To return the servos to neutral move the stick to the opposite endpoint for about two seconds and the servos will return to neutral. To turn the option ON use the "INCR" button and to turn the option OFF use the "DECR" button. When this option is OFF the LED will pulse at a slow rate, when the option is ON the LED will pulse at a fast rate.
1	Not Used	This position is not used on the Eq10.
0	Return to Run	When the FUNCTION rotary selector is set to this position the unit will return to run. To re-enter the option mode you must follow the special power up procedure again.

Servo Adjustments

When the unit is powered on normally the servo adjustments can be made. It is suggested you enter the **Option Menu** the first time you connect the PowerExpander Eq10 to your system and perform a "Reset All", "Calibrate All" and then set any options that will help you perform your task faster and easier.