Spektrum SmartLink App ESC Update and Programming App Instructions



#### Items Needed to Perform Updates and Program your

Spektrum Smart Avian ESC

- $\rightarrow$  Desktop or Laptop computer running Windows 7 or higher
- $\rightarrow$  Micro USB to USB Cable (included with SPMXCA200)
- $\rightarrow$  Male to Male Servo lead (included with SPMXCA200)
- → Spektrum Smart ESC Programmer (SPMXCA200)
- $\rightarrow$  Battery to Power the ESC

#### Connecting your Spektrum Smart ESC to the SmartLink PC App

- 1. Download the latest Spektrum SmartLink updater app here
- Once downloaded, extract the .ZIP file to a location that you can easily find, we suggest the Desktop
- 3. Locate and open the Spektrum USB SmartLink application
- 4. You will see this screen  $\rightarrow$
- Connect your Firma or Avian Smart ESC to your SPMXCA200 Programmer via ESC port
  - a. plug male to male servo lead into your
    ESC fan port (Avian 80 amp and above)
  - b. Plug into 3 Pin ESC program port (3 pin connector on Avian 15-60 amp)
- Connect to your SPMXCA200
  Programmer to your PC with the micro
  USB cable
- 7. Power on your Avian Smart ESC
- The SmartLink app will connect to your Smart ESC





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#### Using the Spektrum SmartLink App

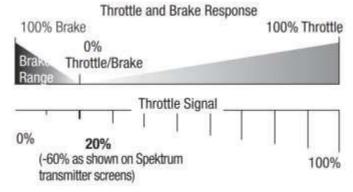




## GENERAL SETTINGS

• Flight Mode

- Fixed Wing (\*)Default For use with Aircraft and non-governed Heli models
- Helicopter Enables the Speed governing "Govenor" mode for fixed RPM motor speeds
- Brake Type
  - Disabled (\*) Default Motor will free wheel when throttle position is zero
  - Normal When throttle position is zero, the assigned brake force will be applied
  - Proportional With this option selected the throttle range changes so the ESC will not start below 20%. The throttle will operate as normal above 20%, but moving the throttle below 20% will apply the brakes, increasing in strength as the signal drops to 0%.



- **Brake Force** This option is adjustable from level 0 (\* Default) to level 7. The higher the level, the stronger the braking effect. Brake Force is only effective in the "Normal brake" mode.
- Voltage Cutoff Type
  - Soft Cutoff: Selecting this option will gradually reduce the ESC output to 50% of the full power within 3 seconds after the low-voltage cutoff protection is activated.
  - Hard Cutoff: Selecting this option will immediately cut off the ESC output when the lowvoltage cutoff protection is activated.
- LiPo Cells Select Auto Calc to cause the ESC to automatically calculate the number of LiPo cells based on a 3.7V/cell default. Alternatively, you can select a specific sell count to set the ESC to a fixed battery configuration.
- Cutoff Voltage Use this option to adjust the cutoff voltage from 2.8V to 3.8V/cell or disable the cutoff voltage completely. 3.0v is the default WARNING: Discharging a LiPo battery below 2.8V/ cell may damage the battery. Attempting to charge or discharge a damaged battery can cause a fire.



## Spektrum SmartLink ESC Programming App Instructions



## THROTTLE – CONTROL

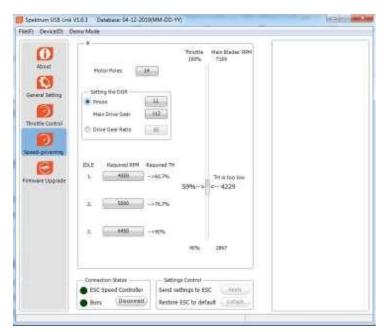
- **BEC Voltage** Select the BEC output voltage. Default and available settings per ESC.
- Start-up Mode
  - Normal Start-up: If this mode is selected, the motor will immediately increase in RPM to correspond to the throttle stick input.
  - Soft Start-up: If this mode is selected, the motor will gradually increase in RPM to correspond to the throttle stick input.

TIP: We recommend using this soft start-up mode when using large diameter motors or gear drives.

- **Timing** Select Low, Medium, or High motor timing.
- Motor Rotation Adjust the rotation direction of the motor without changing wires.
- Active Freewheeling This option can be set to Enabled or Disabled. Freewheeling can help provide better throttle linearity or smoother throttle response.

## GOVERNOR SETUP

If the governor mode is activated, the ESC will try its best to hold the rotor head speed at a fixed value that you assign. In order for your Avian ESC to calculate the speed of the main rotor blades of your helicopter, you need to know the motor poles number and the gear ratio of main drive gear vs. the pinion. Below is an example of this screen with an Avian 100 setup for a Blade Fusion 480 model running a 14 pole motor, 11 tooth pinion and 112 tooth main gear.



When you adjust the throttle curve, please make sure that the motor can run at this preset speed even if the motor load is heaviest. Please note that the governor mode function is automatically disabled if the throttle volume is less than 60% or more than 90% to allow for proper motor control in high and low load scenarios.



Spektrum SmartLink App ESC Update and Programming App Instructions





### FIRMWARE UPGRADE

Updating you Spektrum Smart ESC is easy. Simply download the latest version of the SmartLink app, go to the Firmware Upgrade Tab and click **Upgrade**. New ESC and Smart Technology features will be added in the future for applicable Smart ESCs. When that occurs a new SmartLink App version will be available. **Note: When a Firmware upgrade is performed, all settings on your Smart ESC will return to the defaults, please confirm the proper settings for your model before use.** 

 Select the top version from the "Available Versions" drop down box then click the "Upgrade" button to perform the update

Information	Upgrade
Device Type	CAR_ESC
Hardware Version	HW465_KZ2_V1.0
Firmware Version	B3.09
Available Versions	



 Once the Upgrade button has been selected to install the update on your Avian ESC, a progress bar will appear on your computer screen. Please allow the update to finish then click OK to save the settings. You can disconnect and use your Avian ESC with the improved firmware now.





#### **Latest AVIAN Series Firmware Version**

SPMXAE1015
SPMXAE1030
SPMXAE1045
SPMXAE1060
SPMXAE1080
SPMXAE1100
SPMXAE1120HV

New Firmware: 04.0.11 New Firmware: 04.0.21 New Firmware: 04.0.21 New Firmware: 04.0.21 New Firmware: 04.0.11 New Firmware: 04.0.26 New Firmware: 04.0.05

Change Log - November 5<sup>th</sup> 2020

- <u>Added</u>: Avian Smart ESC Programming/TextGen
  - Change Avian programmable settings via Spektrum DX \ iX \ NX transmitter and Smart receiver
    - See more about Smart ESC Prog./TextGen in the explanation section near the end of this document
  - Improved: Motor compatibility
- <u>Added</u>: Each of the following adjustable parameters:
  - Reverse brake type (item #2)
  - $\circ$  ~ Added "Surge" LVC option (item #4)
  - o Governor gain set up (item #12)
  - Auto restart time (item #13)
  - Restart acceleration time (item 14)
  - Thrust reverse channel (item #15)
  - <u>Changed</u>: Each of the following programmed defaults:
    - Cutoff voltage from 3.2V/Cell to 3.4V/Cell (item #6)
    - $\circ$  Active FreeWheel from Enabled to Disabled (item #11)

# Continue to the next page to see updated programming tables for all Avian Smart ESCs and descriptions of the firmware changes



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Avian 15 Amp Brushless Smart ESC 25 - 4S Current Firmware Version: 04.0.11								
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		A	vian 60 Amp Brush	less Smart E	SC 3S - 6S				
SPMXAE1060	Current Firmware Version: 04.0.21 Updates Highlighted Green								
Programmable Item	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
1. Flight Mode	Fixed-wing	Helicopter (Store Govenor)							
2. Brake Type	Disabled	Normal	Proportional	Reverse					
3. Brake Force	0	1	2	3	4	5	6	7	
4. Voltage Cutoff Type	Soft Cutoff	Hard Cutoff	Surge SW						
5. LiPo Cells	Auto Calculation	35	4S	5S	6S				
6. Cutoff Voltage	Disabled	2.8V / Cell	3.0V / Cell	3.2V / Cell	3.4V / Cell	3.6V / Cell	3.8V / Cell		
7. BEC Voltage	6.0V	7.2V							
8. Start-up Time	Normal	Soft							
9. Timing	Low (5°)	Medium (15°)	High (30°)						
10. Motor Rotation	CW	CCW							
11. Active FreeWheel	Enabled	Disabled							
12. Governor gain	Level 1	Level 2	Level 3						
13. AutoRestart Tmie	Os	45s	90s						
14. Restart accl	1.0s	1.5s	2.0s						
15. Thrust Rev	CH5	CH6	CH7	CH8	CH9				
		A	vian 80 Amp Brush						
SPMXAE1080			Current Firmwar	re Version: 04 hlighted Gree					
Programmable Item	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
1. Flight Mode	Fixed-wing	Helicopter (Store Govenor)	Option 5	Option 4	0000013	Option o	Option 7	Option 8	Option 9
2. Brake Type	Disabled	Normal	Proportional						
3. Brake Force	0	1	2	3	4	5	6	7	
	Soft Cutoff	Hard Cutoff	Surge SW	3	4	5	0	,	
4. Voltage Cutoff Type 5. LiPo Cells	Auto Calculation	35	4S	5S	6S	8S			
	Disabled	2.8V / Cell	43 3.0V / Cell		3.4V / Cell	83 3.6V / Cell	3.8V / Cell		
6. Cutoff Voltage	6.0V	7.4V	8.4V	3.2V / Cell	3.4V / Cell	3.6V / Cell	3.8V / Cell		
7. BEC Voltage		Soft	8.4 V						
8. Start-up Time	Normal		11iah (20%)						
9. Timing 10. Motor Rotation	Low (5°) CW	Medium (15°) CCW	High (30°)						
11. Active FreeWheel	Enabled	Disabled							
12. Governor gain	Level 1	Level 2	Level 3						
	_		90s						
13. AutoRestart Tmie	0s	45s							
14. Restart accl	1.0s	1.5s	2.0s	0110	0110				
15. Thrust Rev	CH5	CH6	CH7	CH8	CH9				
SPMXAE1100		A	vian 100 Amp Brus Current Firmwa						
			Updates Hig	hlighted Gree	en 📃 🗌				
Programmable Item	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
1. Flight Mode	Fixed-wing	Helicopter (Store Govenor)	ļ						
2. Brake Type	Disabled	Normal	Proportional						
3. Brake Force	0	1	2	3	4	5	6	7	
4. Voltage Cutoff Type	Soft Cutoff	Hard Cutoff	Surge SW						
5. LiPo Cells	Auto Calculation	35	4S	5S	6S				
6. Cutoff Voltage	Disabled	2.8V / Cell	3.0V / Cell	3.2V / Cell	3.4V / Cell	3.6V / Cell	3.8V / Cell		
7. BEC Voltage	6.0V	7.4V	8.4V						
8. Start-up Time	Normal	Soft							
9. Timing	Low (5°)	Medium (15°)	High (30°)						
10. Motor Rotation	cw	CCW							
11. Active FreeWheel	Enabled	Disabled							
12. Governor gain	Level 1	Level 2	Level 3						
13. AutoRestart Tmie	Os	45s	90s						
14. Restart accl	1.0s	1.5s	2.0s						
15. Thrust Rev	CH5	CH6	CH7	СН8	CH9				



SPMXAE1120HV	Avian 120 Amp HV Brushless Smart ESC 6S - 14S Current Firmware Version: 04.0.05 Updates Highlighted Green								
Programmable Item	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
1. Flight Mode	Fixed-wing	Helicopter (Store Govenor)							
2. Brake Type	Disabled	Normal	Proportional	Reverse					
3. Brake Force	0	1	2	3	4	5	6	7	
4. Voltage Cutoff Type	Soft Cutoff	Hard Cutoff	Surge SW						
5. LiPo Cells	Auto Calculation	65	85	10S	125	14S			
6. Cutoff Voltage	Disabled	2.8V / Cell	3.0V / Cell	3.2V / Cell	3.4V / Cell	3.6V / Cell	3.8V / Cell		
7. BEC Voltage	6.0V	7.4V	8.4V						
8. Start-up Time	Normal	Soft							
9. Timing	Low (5°)	Medium (15°)	High (30°)						
10. Motor Rotation	CW	CCW							
11. Active FreeWheel	Enabled	Disabled							
12. Governor gain	Level 1	Level 2	Level 3						
13. AutoRestart Tmie	Os	45s	90s						
14. Restart accl	1.0s	1.5s	2.0s						
15. Thrust Rev	CH5	CH6	CH7	CH8	CH9				

## Additions and Changes Explained

Added: Avian Smart ESC Programming via TexGen

Change and save Avian programmable options directly from your Spektrum DX, iX or NX transmitter and Smart receiver. Enter the Avian Prog. / TextGen menu on your Spektrum transmitter to review, change and save programmable options that were once only able to be updated via the SPMXCA200 Smart ESC programmer or by using the SmartLink app. Use the aileron and elevator to navigate the menu and make selections.

#### Added: "Reverse" Brake Type

To use "Reverse" brake type select the option and then set a channel to activate the reverse thrust (option 15 on all Avian ESCs). When the reverse function is activated using the channel designated the ESC will cause the motor to stop then spin in the reverse direction and increase with throttle input.
 Changed: The Cutoff Voltage (LVC) default was changed from 3.0V/cell to 3.4V/cell.

**Changed:** The <u>Active FreeWheel</u> default was changed from "Enabled" to "Disabled".

Added: "Governor Gain" (Heli Mode only)

- Controls how aggressively the governor maintains the set RPM
- Level 1 (less) to Level 3 (more)

#### Added: "Auto Restart Time" (Heli Mode only)

Set the auto-rotation bailout timing

#### Added: "Restart Accel." (Heli Mode only)

Controls how aggressively RPMs are recovered

#### Added: "Thrust Reverse Ch."

> \*\* Requires Brake Type set to "Reverse" \*\* Select the channel that will control the reversing function

