SPEKTRUM Avian Smart ESC Instructions

Contents

SPEKTRUM Avian Smart ESC

Product Information

Specifications:

- Brand: Spektrum
- Model: Avian ESC
- Compatibility: Smart ESC
- Programming Options: Normal Start-up, Soft Start-up, Auto-rotation bailout, Governor Setup

Product Usage Instructions

Updating Your Spektrum Avian Smart ESC:

1. Restart your computer.
2. Download the latest Spektrum SmartLink updater app from the provided link.
3. Extract the downloaded .ZIP file to an easily accessible location like the Desktop.
4. Open the Spektrum USB Link.exe.
5. Connect your Avian Smart ESC to the SPMXCA200 Programmer via the ESC port.
6. Connect the SPMXCA200 Programmer to your PC using a micro USB cable.
7. Power on your Avian Smart ESC.
8. Launch the SmartLink app on your PC and connect to your Smart ESC.
9. Navigate to the Firmware Upgrade tab and select the latest version from the drop-down menu.
10. Click the Upgrade button to initiate the update process.
11. Wait for the progress bar to complete, then click OK to save settings.
12. Restart your ESC for the firmware update to take effect.

Programming Your Spektrum Avian Smart ESC:

General Settings:

- Normal Start-up: Motor immediately increases RPM based on throttle input.
- Soft Start-up: Motor gradually increases RPM based on throttle input.

Auto-rotation Bailout:

Activate this feature for auto-rotation capabilities.

Governor Setup:

- Set rotor head speed for helicopter models.
- Adjust motor poles number and gear ratios for accurate speed control.
- Ensure motor can handle preset speed under heavy load.
- Governor mode automatically disables under specific throttle volume ranges.

FAQ

Q: What should I do if my Smart ESC settings reset after a firmware upgrade?

A: When a firmware upgrade is performed, all settings on your Smart ESC will return to defaults. Please reconfigure settings according to your model's requirements before use.

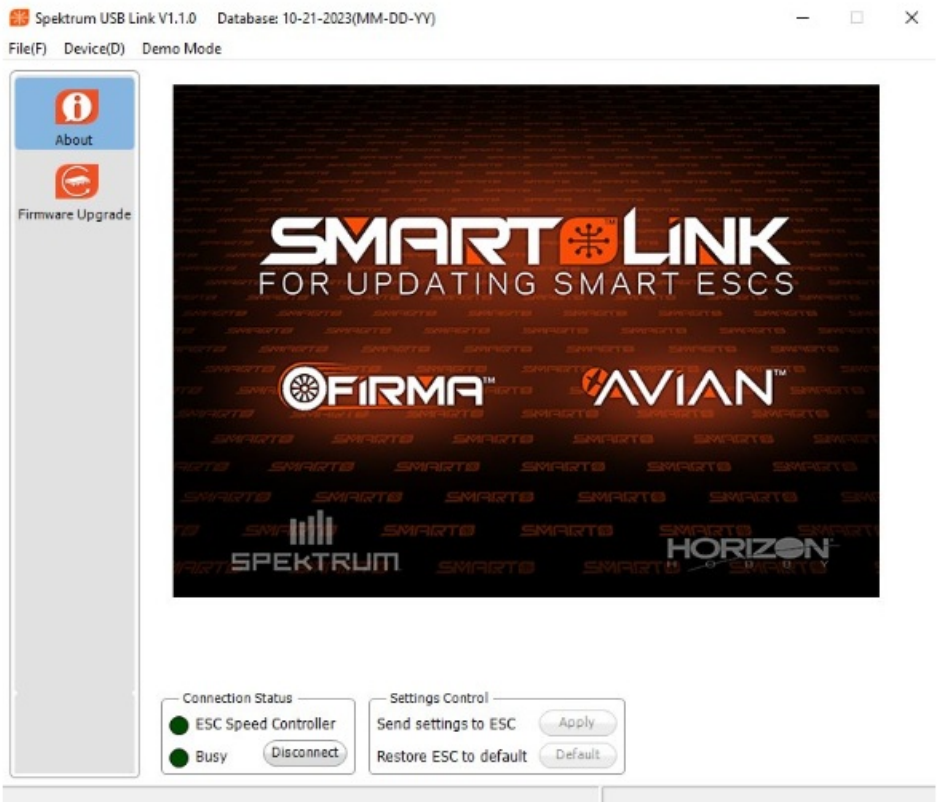
Update Instructions

Items Needed to Perform Updates and Program your Spektrum Smart ESC

- Desktop or Laptop computer running Windows 7 or higher
- Spektrum Smart ESC Programmer (SPMXCA200)
- Micro USB to USB Cable (included with SPMXCA200)
- This is a USB-C to USB on the V2 SPMXCA200
- Male to Male Servo lead (included with SPMXCA200)
- Battery to Power the ESC

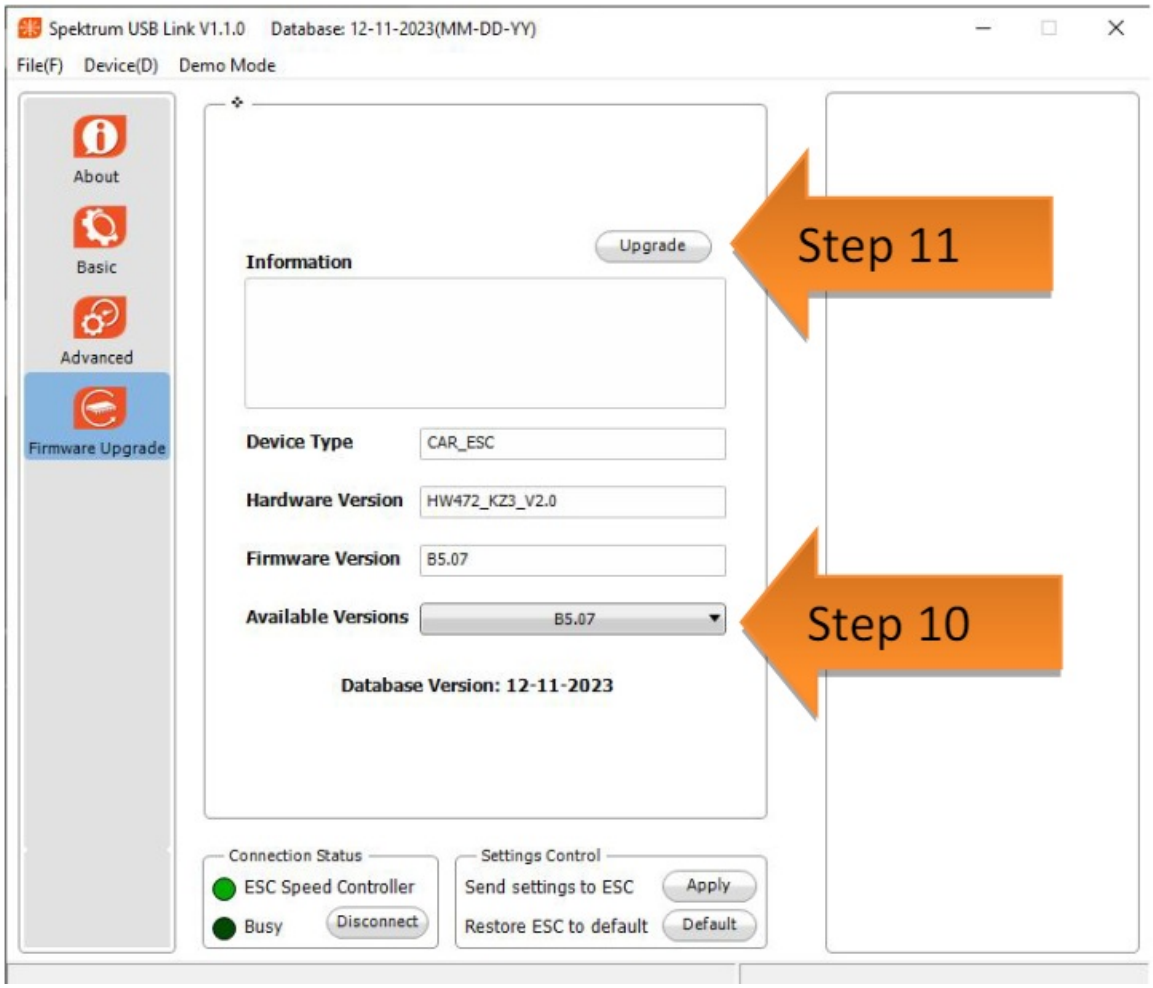
Connecting your Spektrum Smart ESC to the SmartLink PC App

1. Restart your computer
2. **Download the latest Spektrum SmartLink updater app here**
3. Once downloaded, extract the .ZIP file to a location that you can easily find, we suggest the Desktop
4. Locate and open the Spektrum USB the Spektrum USB Link.exe
5. You will see this screen



6. Connect your Avian Smart ESC to your SPMXCA200 Programmer via the ESC port
    - This may be a standalone lead or a port directly on the ESC case
7. Connect to your SPMXCA200 Programmer to your PC with the micro USB cable (USB-C to USB)
8. Power on your Avain Smart ESC
9. The SmartLink app will connect to your Smart ESC

10. Go to the “Firmware Upgrade” tab and select the top version from the “Available Versions” drop down box
11. Click the “Upgrade” button to perform the update

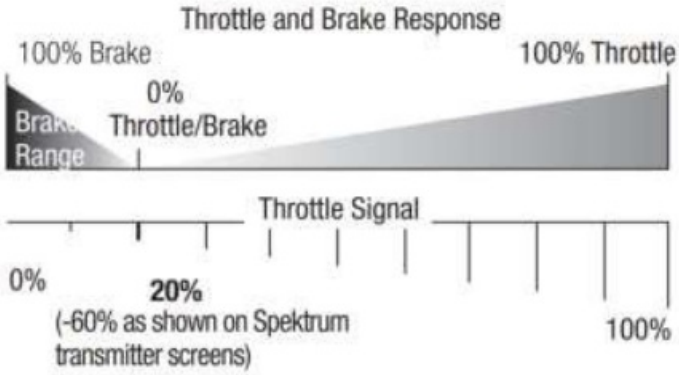


12. Once the “Upgrade” button has been selected to install the update on your Smart ESC, a progress bar will appear on your computer screen. Please allow the update to finish then click “OK” to save the settings. You can disconnect and use your Smart ESC with the updated firmware now.
    Note: When a Firmware upgrade is performed, all settings on your Smart ESC will return to defaults, please confirm the proper settings for your model before use.
13. Restart your ESC for the firmware version to be applied
14. Plug any disconnected fans back in

Programming Instructions

GENERAL SETTINGS

- Flight Mode
  - Fixed Wing (*) Default – For use with Aircraft and non-governed Heli models
  - Helicopter – Enables the Speed governing “Governor” mode for fixed RPM motor speeds
- Brake Type
  - Disabled (*) Default – The motor will free the wheel when the throttle position is zero
  - Normal – When the 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%.



  - Reverse – When the selected transmitter channel is positioned between 0 – 100% travel, the motor will run in reverse, allowing for braking during taxi/landing and reverse thrust
  - Please Note – Reverse mode needs to be assigned to an OPEN channel on your transmitter, this channel is selected in ESC menu item #15 using in conjunction with another function can cause unexpected behavior in flight.
- Brake Force – This option is adjustable from level 0 (* Default) to level 7. The higher the level, the stronger the braking effect. When running Reverse Brake Type, we recommend setting this to 7.
- 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 low- voltage 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.

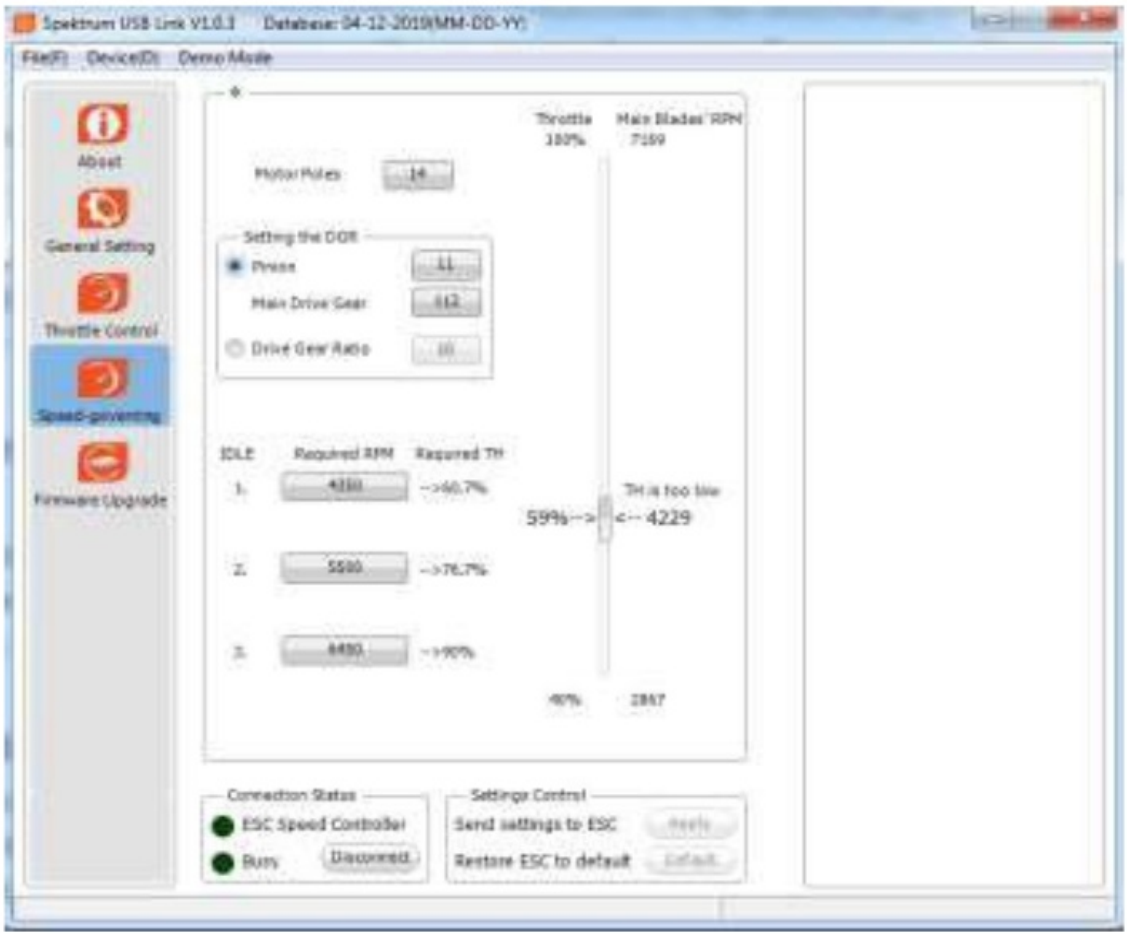
THROTTLE – CONTROL

- 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.
  - Please Note – 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.
- Thrust Rev – Use this option to select the channel used to activate motor reversing. Reverse must set in the Brake Type menu

- Governor Gain (Heli Mode only) – Controls how aggressively the governor maintains the set RPM – Level 1 (less) to Level 3 (more)
- Auto Restart Time (Heli Mode only) – Set the auto-rotation bailout timing
- Restart Accel (Heli Mode only) – Controls how aggressively RPMs are recovered when performing Auto-rotation bailout

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. 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% toallow for proper motor control in high and low load scenarios.



Documents / Resources

	**SPEKTRUM Avian Smart ESC** [pdf] Instructions Avian Smart ESC, Smart ESC, ESC

References

- **User Manual**