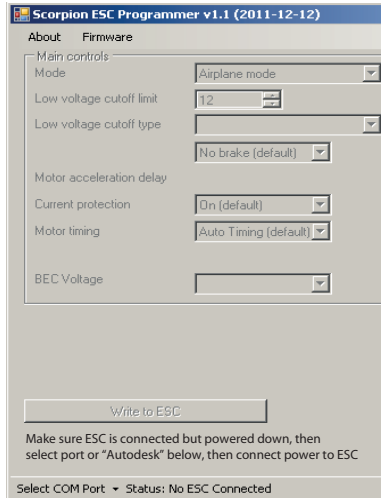




## Scorpion ESC Programming software



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Software developer Fredrik Melin

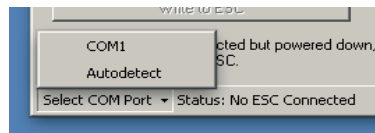
### USB Adapter installation

Before you start, install the Driver software for the Prolific USB-Serial hardware. If you have not downloaded the software it can be found here  
<http://www.prolific.com.tw/eng/downloads.asp?ID=31>

When you have installed the software drivers, insert the Prolific USB-Serial adapter into a free USB port, the Driver should now load correctly. If it does not find the drivers for some reason, please re-run the driver installation.

### Connecting the ESC

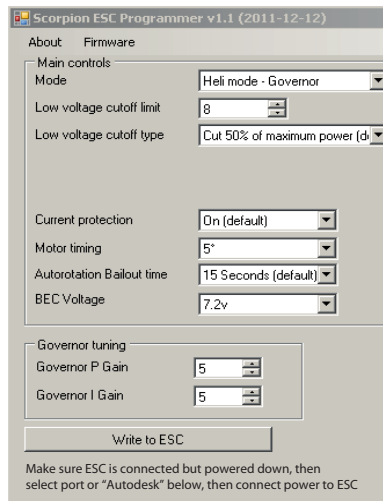
The ESC should be powered down at this step. First of all you need to select port, if you do not know which port is the ESC, you can select AutoDetect, that way it will listen to all Serial ports and use the one which the ESC is connected to.



Note: There will systems that might hang from using Autodetect as it's "intrusive", if you run into trouble, use task-manager to shutdown the Scorpion ESC Programmer and select only the port which the USB-Serial adapter use. Which one can be found in the Windows Device manager.

Now connect the serial cable to the ESC's serial connector.  
<picture of ESC + Serial adapter connection scheme>

Then connect battery to the ESC, you can use a 3s or more pack.



Make sure ESC is connected but powered down, then select port or "Autodesk" below, then connect power to ESC

When you power up the ESC, data will be read from the ESC, all fields will now be enable as shown in the picture above. You will also see "All data is read from ESC" in the status line, and you will see the Firmware revision number.

You are now free to change settings, when you are done changing settings press the button [Write to ESC] to save the changes to the ESC. Do note that some settings might not show, it depends on what mode you are using.

### Settings

#### Mode

- Airplane mode
- External governor mode
- Heli mode, No governor
- Heli mode, Governor

#### Low voltage cutoff level

Setting the LVC for the ESV, from 10v to 50v, 1v increment.

#### Low voltage cutoff type

- Cut to 50% of the maximum power (default setting)
- No cutoff, only warn via LED
- Pulse warning (pulse on power)

#### Brake type (Airplane mode only)

- No brake (default setting)
- Very soft brake
- Soft brake
- Hard brake
- Very hard brake

#### Motor acceleration delay

##### (Airplane / Ext gov mode only)

- 0.15 seconds (default for external governor mode)
- 0.30 seconds (default setting)
- 0.45 seconds
- 0.7 seconds
- 1.3 seconds

### Current protection

- On (default setting)
- Off (OBS Warranty voided)

### Motor timing

- Auto (default for most modes)
- 5 degree (default for external governor mode)
- 15 degree
- 20 degree
- 25 degree
- 30 degree

### Auto rotation Bailout time (Heli modes only)

- 15 seconds (default setting)
- 25 seconds
- 35 seconds

### BEC Voltage

- 5.4 volt (default setting)
- 6.2 volt
- 7.4 volt

### Governor setting

#### (Heli governor mode only)

Governor P gain (1-11)

Governor I gain (1-8)

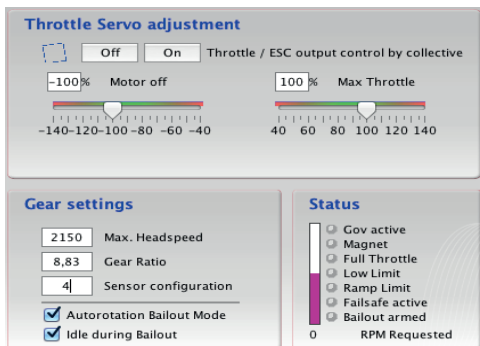
### External governor mode

The external governor mode allows the RPM to be governed by an external governor like the Mikado VBar system. The ESC has a built in Phase sensor that will produce the signal needed to let the external governor know which RPM it's running.

With this we suggest running Motor acceleration setting 0.15 seconds for best performance, and if you are using scorpion motor please use fixed 5 degree timing instead of AUTO. For other motors you have to experiment which setting is best for your combo.

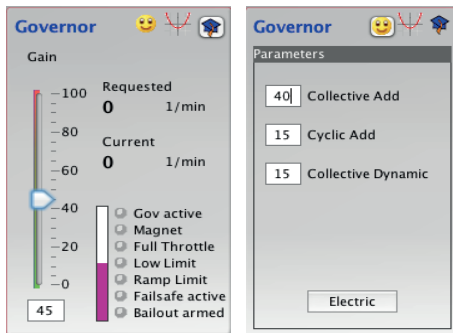


Recommended VBar settings are as follows:



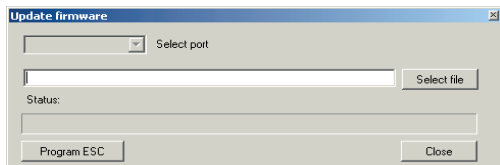
Governor II page:  
Motor Off/Max setting at default -100 to +100  
Sensor configuration: Motor pole pair count (motor poles / 2)

Governor settings (main screen)  
Governor gain: **30-40**  
Expert:  
Collective add: **40-50**  
Collective dynamic: set to **ZERO**  
Cyclic add: default



## Firmware update

To do a firmware update, please do make sure you have connection in the first screen as if you where to change settings, then go into Firmware -> Update firmware option.



Select the firmware file which you have downloaded from Scorpion, and press Program ESC, Press YES on the question to start update.  
The program will now restart your ESC and programming will start. The status will be updated with it's progress.  
After the update has completed your will be returned to the setting screen where you can change setting, do note that some firmware updates might reset settings to default.  
Do note, if you run into catastrophic failure during firmware update the process can be recovered, follow these guidelines:  
Start program, Go directly to firmware update instead of trying to connected ESC.  
Select correct COM port, select File, press Program ESC, press YES, and then connect power to ESC, this will force the bootloader to load a new firmware.

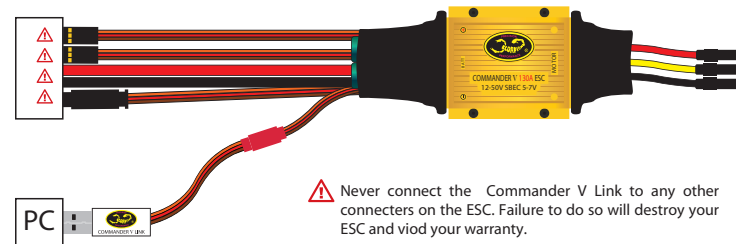
## BEC

The built in BEC in the 130A ESC is built to be very robust.  
It has been tested with the most powerhungry servos today.  
If you still want to run extra safety precautions you can run a capacitor system in paralell if you so choose to. Such systems are available from Fromeco among others.  
The BEC can be set to 5.4v/6.2v/7.4v, Make sure your servo and system is up for the task of running it at a certain voltage before you change the setting.

**IMPORTANT:** If you choose not to use the BEC, you **MUST** remove the red cable from the throttle cable otherwise you will burn the ESC.

## Video

You can watch the complete video on how to setup this ESC with the Mikado VBar system in external governor mode, this video can be found here:  
<http://www.youtube.com/watch?v=rnHGTuaclyw>



Please visit our website regularly for updates, news and support:  
[www.scorpionsystem.com](http://www.scorpionsystem.com)

