Scorpion Power System

www.scorpion-team.com

Scorpion User Guide for Vanguard S3-Series

S3-140 Modify Kit Set
S3-80 Super Stock Kit Set

V4.1

IMPORTANT
Update the ESC firmware to latest version.

Introduction
Thank you for purchasing Scorpion Vanguard Electronic Speed Controller. This ultimate ready to race ESC gives you a powerful range and reliable performance, even in the extreme conditions.

A high power system for RC model can be very dangerous, please read this manual carefully before installing your new ESC.

1.0 Features

- Wide input voltage range 3-14V (1S-3S LiPo)
- Sensored and Sensorless brushless motors (BLDC)
- Drive down to 4.5T motor (Scorpion Vanguard S3-140)
- Drive down to 8.5T motor (Scorpion Vanguard S3-80)
- High current, up to 140A continued current, with current protection (Scorpion Vanguard S3-140 Modify Kit Set)
- High current, up to 80A continued current, with current protection (Scorpion Vanguard S3-80 Super Stock Kit Set)
- Factory driver suggested setting (for use with Scorpion RS-3420 motor and Scorpion competition battery pack)
- Profession PC program and Android apps
- Store up to 8,000 data
- Aluminum heat sinks
- Build-in temperature sensor with adjustable temperature protection
- True DC-DC 3A/6V BEC for servo and receiver
- Multiple protection include: over current, over voltage, temperature protection AutoDetect mode
- Motor over temperature protection (for Scorpion RS-3420 motor)
- 2 x hall sensor connectors: each also can be used for PC connection
- Upgradeable Firmware
- Wide range of settings for different race courses

2.0 Specification

	S3-140-Modify	S3-80-Super Stock
Cont./ Brust Current, A	140/800	80/200
Motor Type Supported	Sensored and Sensorless Brushless Motor	Sensored and Sensorless Brushless Motor
Cars Applicable	1/8th & 1/10th on raod and off road	1/8th & 1/10th on road and off road
Motor Limit	>= 3.5T	>= 8.5T
Resistance	0.0004Ohm*2	0.00155Ohm *2
Voltage Input	1s-3s LiPo	1s-3s LiPo
BEC	6V@3A DC-DC	6V@3A DC-DC
Footprint	30,6 mm (W) x 35,6 mm (L)	30,6 mm (W) x 35,6 mm (L)
Size (w/o FAN)	35.8 x 35.6 x 21.8 mm	35.8 x 35.6 x 21.8 mm
Weight	40g	40g
FAN	6V@0.2A	6V@0.2A
External Programming Port Output	2	2

2.1 Vanguard Super Booster
- 470 uf x 4 = 1880 uf total
- Voltage: 16V
- Size: 5mm (L) x 9mm (W) x 15mm (H)
- Working Temperature: 105 °C

3.0 Preparation
- Choose a location for the ESC that is close to the motor, but away from the receiver and single cable to prevent radio interference
- If using double-side tape, clean the bottom of the ESC before applying for best result
- Keep the motor wire as short as possible for the best electric current
- Install cooling fan (included)
- Install Scorpion Vanguard Super Booster (included), placing the booster as close as

to the ESC, to keep the booster wire as short as possible
- Booster should be mounted directly to the positive (+) and negative (-) on the ESC, as shown in the diagram below
- Keep battery wire as short as possible to crate the best electric current efficiency
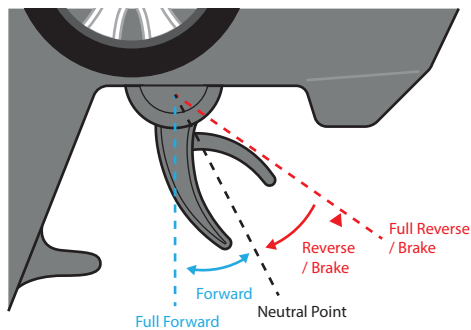
4.0 Soldering and Connection
- Always provide a steady working area and easy access to the solder posts
- Do not connect the car battery while working on soldering
- Cut the motor wires to desired length and strip the insulation about 3.2mm-6.35mm from the end. Apply solder to the exposed wire until it is thoroughly covered. ** Caution: Solder and iron tip are hot
- Place the iron tip in the notch on top of the post, and then apply small amount of solder to the post
- Hold the tinned wire contact with the notch of the post. Then use the iron tip to heat up the tinned wire and and the post for about 2 seconds, allowing the solder to flow. Then remove the iron and hold the wire in position for about 1-2 seconds allowing the solder to set. Caution: do not overheat the ESC
- Refer to the below diagram for proper connection
- Check with battery supplier for the battery connectors (excluded)

Scorpion Motor

BATTERY

OR

Vanguard Super Booster

Scorpion Vanguard

Receiver

TH
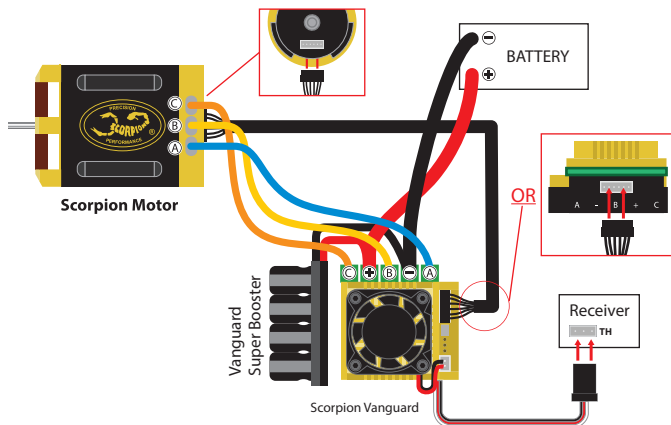
5.0 Radio Throttle Calibration
Calibration is necessary for any first use of the ESC, It is also necessary whenever it is used with a new/ different transmitter or when new firmware is updated.

- Make sure the ESC on/off button is " Off "
- Connect the battery, receiver and motor
- Turn on the transmitter
- Move and hold throttle trigger to full reserve/brake
  Important: if the full reserve/brake is not held, then the ESC will not activate to calibration mode.
- Press on/off button once to turn on the ESC
- Wait for the first beeping sound (Beep...), then the full reserve/brake will be set
- Pull and hold the throttle trigger to full forward
- Wait for second beep sound (Beep….Beep….), then the full throttle been set
- Hold the throttle trigger in neutral position
- Wait for third beep sound (Beep….Beep….. Beep……), the neutral been set
- Calibration finish, ESC will restart automatically

Full Reverse / Brake

Reverse / Brake

Forward

Full Forward

Neutral Point

6.0 Led & Motor Sound Indication

ESC turn on	Yellow / Green / Red - On
Calibration	• Neutral: Red - On / Green & Yellow - Off • Full Reverse / Brake: Yellow On / Green & Red - Off • Full Forward: Green-On / Red & Yellow - Off

Throttle Trigger in Neutral Position	Red	• Off if no errors, On if errors
	Yellow	• Blinks if zero timing (no boost, no turbo) • Off if zero timing, boost, turbo any of these setting is on • Battery voltage
	Green	• On if voltage is OK • Off if voltage is low
	Motor Sound	• ESC over heat - beep...beep...beep... • Motor over heat - beep beep...beep beep...beep beep... • ESC & Motor over heat - beep beep...beep beep...beep beep...

The motor is running or braking	Red	• Off if no errors, On if errors
	Yellow	• On
	Green	• On if voltage is OK (according to program setting value) • Off if voltage is low (according to program setting value)

Firmware Update Mode	When ESC in Update Mode - Yellow, Green, Red - On
	When Updating - Yellow, Green, Red - Blinks
	Update Fnish - ESC Restart, Yellow, Green, Red - On.

| Example of error indication	Conditions	• Red LED is ON • Throttle in natural position
	Example	• Green LED off - low voltage or cut off (according to program setting value) • ESC over heat - beep...beep...beep... • Motor over heat - beep beep...beep beep...beep beep... • ESC & Motor over heat - beep beep...beep beep...beep beep...
	Others	• Red LED is ON

Or connect to PC program locate the problem
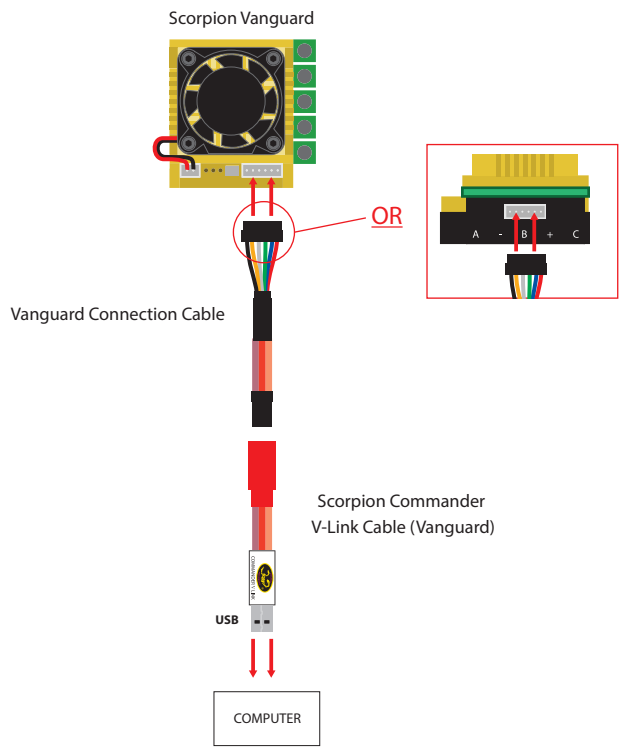
** Error Diagnosis Example !!   Signal lost

7.0 Connect ESC to Computer

Team Scorpion provides the most advance setting features or simply download factory driver setting form www.scorpion-team.com

- Download **RC Car ESC Program Installer** from www.scorpion-team.com, program available for Windows XP, Windows 7, Windows 8
  Double click the exe file to start installation

- Download "**Extension USB Cable Drivers**" from www.scorpion-team.com
  Double click the "**PL2303_Prolific_DriverInstaller_v1.5.0.exe**" to install the USB driver
  If you have any problem installing the USB driver, please read the manual thoroughly or ask an administrator for advice
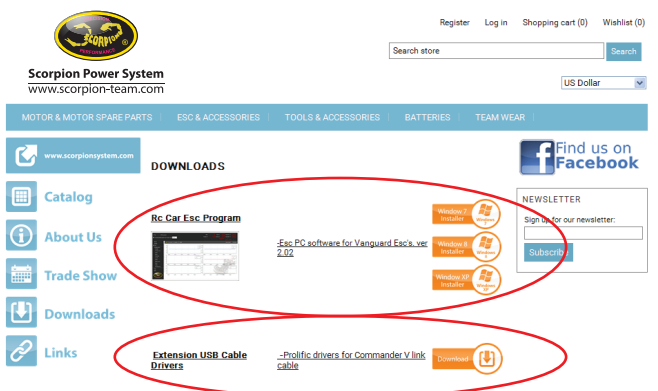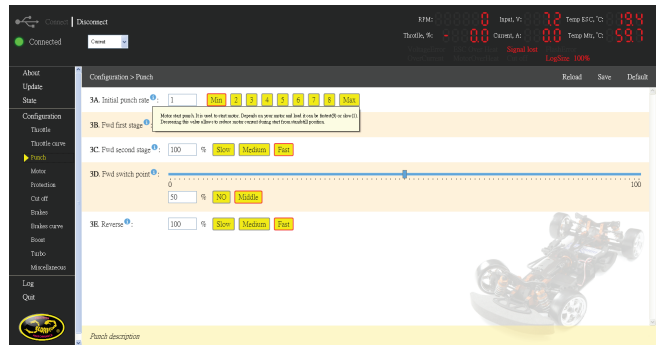

- Follow the below diagram to connect the ESC to computer, using the Scorpion V-link USB Cable (included)

Scorpion Vanguard

OR

Vanguard Connection Cable

Scorpion Commander
V-Link Cable (Vanguard)

USB

COMPUTER

- After the connection has been made successfully, the "Connected" display notification and the green light appears
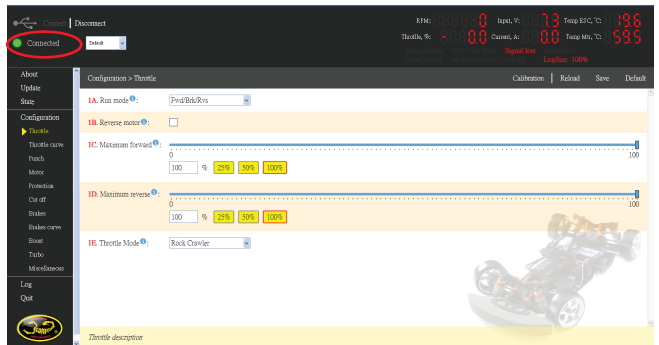
To know more about each setting description, simply point the mouse cursor to the blue exclamation mark next to the each setting item

8.0 Trouble Shooting

Trouble	Possible Reason	Solution
After powered on, the motor does not rotate and there is no signal light	Poor power connection	Check the power connections, replace the connectors if necessary.
After power on, the motor does not spin, but there is signal light	Wrong setting	Refer to **LED INDICATION** to indentify problem
Motor stops halfway	Multiple protection including • Over Current • Over Voltage • Low Voltage • Temperature Protection	Refer to **LED INDICATION** to indentify problem
No signs of recognizing from computer program	• ESC off • Cable failure • Poor connection • USB driver	• Turn on the ESC • Change a new cable • Check all the sockets • Replace the Windows® default USB driver with Scorpion provided USB driver

9.0 Warranty and Service

Scorpion Vanguard Speed Controller is guaranteed to be free from defected materials a dated, itemized sales receipt).

During the warranty period Scorpion will repair speed controller that are found to be defective, providing that it has no signs of damage or abuse. The user will be responsible for shipping charges back to an authorized Scorpion Repair Facility, and Scorpion will pay the return shipping charges. If the damage is the result of a crash or mis-use, the returned item will be repaired, but the cost of repairs will be billed to the user. Repairs will never exceed 50% of the cost of a new speed controller, and if the speed controller is badly damaged or non-repairable, a brand new ESC will be offered at 50% discount of the current retail price for the ESC, plus a nominal shipping charge. If the speed controller returned is no longer in production, Scorpion reserves the right to substitute any other speed controller of equal or better quality. In any event, Scorpion shall not be responsible for the damage that may result from the overuse of products, for consequential or special damages, or for any amount that exceeds the product value. If the motor product is purchased in clearance section, crash and dent section from www.scorpionsystem.com and www.scorpion-team.com, thenthe items are sold "AS IS". No refund or warranty policy will be covered with these products. It is because we do not have parts anymore to repair or replace. or replacement. Please obtain an RMA number by submitting a request by email to our RMA Department support@spihk.com or our distributors for the RMA number before

sending. The RMA process normally takes around 3 - 4 weeks.

RMA form can be found and download from
http://www.scorpion-team.com/downloads/

The Power System of Champions!!
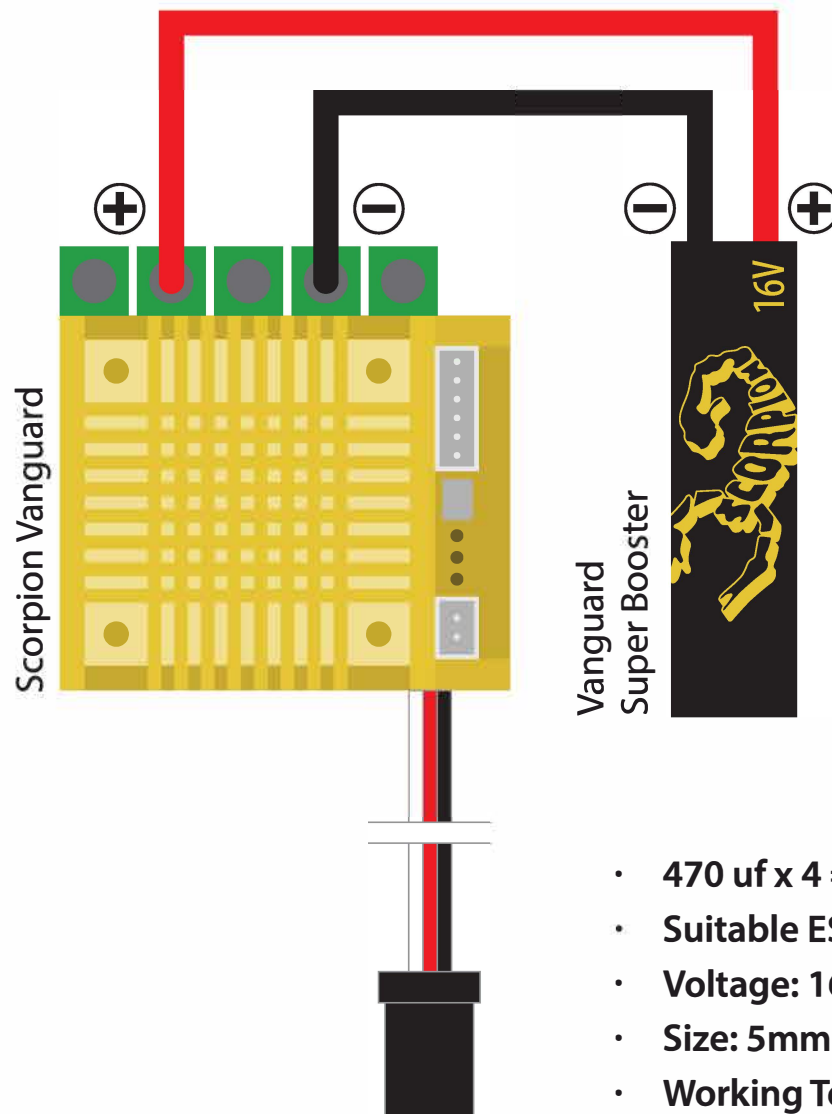
Scorpion Power System

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User Guide for Vanguard Super Booster

Features:

- Smoother power
- Cooler running speed control
- More punch to brushless system
- Small size and light weight

Note:
Installed as close to the ESC as possible.

Scorpion Vanguard

Vanguard Super Booster

16V

- **470 uf x 4 = 1880 uf total**
- **Suitable ESC: Vanguard Series**
- **Voltage: 16V**
- **Size: 5mm (L) x 9mm (W) x 15mm (H)**
- **Working Temperature: 105 °C**