

FALCON 8 VERSION 2

#90881

Dear customer,

Thank you for your trust in this NOSRAM product. By purchasing a NOSRAM Falcon 8 V2 brushless speed-control, you have chosen one of the most advanced and successful speed-controls of today. The new Falcon 8 V2 has been optimized with the following newly developed high tech features:

- Initial drive mode
- 2S to 6S operation
- 6.0V / 6.0A Switching BEC
- Internal-Temp-Check System 3
- USB Software Updatability
- Fully adjustable
- AutoCell System 2
- Multi-Protection System 3

Please read the following instructions carefully before you start using your speed control. This user guide contains important notes for the safety, the use and the maintenance of this product. Thus protecting yourself and avoid damages of the product.

Proceed according to the user guide in order to understand your speed control better. Please take your time as you will have more joy with your product if you know it exactly.

This user manual shall be kept in a safe place. If another customer is using this product, this manual has to be handed out together with it.

1. Specifications

Pure Brushless Competition	yes	Reverse Motor Rotation Mode	yes
Forward/Brake	yes	BR2-Brake	yes
Forward/Brake/Reverse	yes	Multi-Protection-System 3	yes
Size	55x40mm	Internal-Temp-Check System 3	yes
Height	25mm	Blue LED	yes
Weight (excl. wires)	62.0g	Power Wires	3.3mm ² + G4
Voltage Input	7.2-22.2V (2S-6S)	USB Software Updatability	yes
Typ. Voltage Drop* @20A	0.007V / phase	Plugged Fan	yes
Rated Current*	600A / phase	Adjustable Modes	4
Switching BEC	6.0V / 6.0A		

* Transistors rating at 25°C junction temperature. Specifications subject to change without notice.

2. Connections & Explanations

Receiver & Switch Connecting Wires:

The Falcon 8 V2 is equipped with pluggable NOSRAM Multicon receiver wire + pluggable switch wire. As supplied, it will easily fit in all ordinary receivers. Make sure you connect the receiver wire with correct polarity and use channel 2.

Sensor Connector: The bi-directional multipole sensor wire connects the speed-control and the motor. Always use the sensor wire and do not alter or modify this cable! There are replaceable/optional hall sensor wires available.

Through this sensor connector, the speedo can also be updated with the latest software updates using the optional „USB Bridge #92501“. Please refer to chapter „USB Software Updatability“ for details.

Power Wires: For maximum convenience and performance, the flexible silicone power wires are a plug-in design using high-power 4.0mm power sockets & connectors. There are replacement power wires available, please refer to complete line-up at www.NOSRAM.com.

Note: In high temperature and high load conditions we recommend to cut the 4mm plugs and solder motor cables directly to the motor. You should always check all connections that the connector plugs are tightly placed in power sockets. This protects your speedo from shutdowns and defects!

Heatsink: To achieve best performance even under extreme conditions, the heatsink is an integral part of the design and directly connected to the FETs. This ensures the best possible heat transfer away from the speed-control.

Plugged Cooling Fan: The Falcon 8 V2 comes with a high-performance low-profile (30x30x6mm) fan, protection cover and mounting screws. The fan can be mounted on top of the heatsink and should be used for tough applications in hot conditions. It gets plugged into the 3-pin connector on the front.

3. Installation Guide

- Position the speed-control where it is protected in the event of a crash and gives you easy access to the connectors and buttons.
- Mount the speedo using the supplied thick/black doubled-sided tape.
- Make sure there is enough clearance between the speed-control, power-wires, antenna and receiver. Avoid any direct contact between power components, the receiver or the antenna as this can cause interference. If interference occurs, position the components at a different place in the model.
- The aerial should be run vertically up and away from the receiver. Avoid contact with any parts made of carbon fibre or metal. If the aerial is too long, don't coil up the excess length. See also the instructions supplied with your radio control system.

The Falcon 8 V2 comes supplied with flexible 3.3mm² silicone power-wires and attached 4.0mm bullet connectors. Be very careful with the correct wire sequence/colors since an incorrect connection may damage the speed-control! Avoid creating solder bridges on the solder-tabs and isolate all connections carefully.

- Connect the speed-control to the receiver (position: Channel 2)
- Blue power-wire → Speedo MOT.A to motor „A“
- Yellow power-wire → Speedo MOT.B to motor „B“
- Orange power-wire → Speedo MOT.C to motor „C“
- Connect the hall sensor cable to the speed-control and the motor.
- Doublecheck all connections before connecting the speed-control to a battery.
- **CAUTION:** If battery is connected with reversed polarity it will destroy your speed-control!
- Red power-wire → Speedo BAT+ to battery „Plus“
- Black power-wire → Speedo BAT- to battery „Minus“

→ Your speed-control is now ready to be set-up.

LATEST V2.6 TEAM FIRMWARE
2S TO 6S LIPO CAPABILITY
6.0V / 6.0A SWITCHING BEC
USB SOFTWARE UPDATABILITY

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4. Calibrate Speed-Control to Radio

In setup mode the speed-control stores every step (e.g. learning your radios neutral and endpoints) by pressing the SET button. All the settings will be stored in the memory even if it will be disconnected from the battery.

TRANSMITTER SETTINGS: Setup the following basic functions on your transmitter (if available):

Throttle Travel	High ATV, EPA	100%
Brake Travel	Low ATV, EPA, ATL	100%
Throttle Exponential	EXP, EXP0	start with 0
Neutral Trim	SUB Trim	centre
Servo Reverse	Throttle Reverse	any setting, don't change after set-up procedure!

If your transmitter doesn't offer any of above functions, it's already in „basic setup“ mode.

- Ensure that the speed-control is not connected to the drive battery and is switched off.
- Remove motor pinion or ensure that the wheels of the model are free to rotate.
- Switch the transmitter on and set the transmitter throttle stick to neutral.

- Connect the speed-control to the battery and switch the unit on.
- Hold the SET button pressed for at least 3sec.
 → You entered setup mode and the SET LED flashes blue (it will flash until the setup is completed).

- Leave transmitter in neutral position and press the SET button once.
 → Neutral setting is stored, MODE LED flashes yellow and the motor beeps.
- Hold full throttle on transmitter and press the SET button once.
 → Full-throttle setting is stored, MODE LED flashes red.
- Hold full brake on transmitter and press the SET button once.
 → Brake setting is stored, LEDs glow red (MODE) and blue (SET).

- This completes the setup procedure and your Falcon 8 V2 is ready to use.
- If you make a mistake during the setup procedure, don't worry: Disconnect the battery for about 10sec and start again from the first step.
- At the start of each run switch on the transmitter first, then switch on the car.
- At the end of each run switch off the car, and then switch off the transmitter.
- For storage of the car, disconnect the drive battery at any time!

Check the LEDs when moving the throttle on your radio to doublecheck everything is setup correctly.

Function	Status	Mode LED	Set LED
Neutral	--	off	blue
Forward	partial full	yellow	off blue
Brake/Reverse	partial full	red	off blue

5. Multi Protection System 3

New and improved protection system „MPS3“ which also tells you the cause of the shutdown with a special LED flashing sequence. You can indicate that a shutdown occurred when blue SET LED flashes very fast and the „error code“ (= cause for shutdown) is indicated by the MODE LEDs as explained in the table below.

Error Code LED flashing sequences:

Error Code	Set LED	Mode LEDs	Reason	Possible Cause
#1	Blue (fast flashing)	Yellow	Speed-Control Thermal Shutdown	1. too strong motor or too high battery voltage for application 2. insufficient cooling of speed-control or motor. 3. too high gear ratio?
#2		Red	Motor Thermal Shutdown	
#3		Yellow/Red (alternate)	Battery Low Voltage Cut-Off	1. battery empty? 2. battery empty or weak? 3. motor too strong for battery discharge capability? 4. poor connection (bad connector, bad soldering joint)?
#4		Yellow/Red (same times)	Motor Failure	1. sensor wire missing or defective? 2. drivetrain stuck? 3. motor defective (locked rotor, damaged sensor)?

Internal-Temp-Check System 3: Allows you to read-out the maximum internal temperature that the speedo and motor have reached during the run. You can conveniently read-out the temperature back in the pits since it remains stored until you turn it on the next time regularly (which will reset the memory). This feature allows you to accurately check if all is running well or if you're close to shutdown already.

How to read-out the temperature:

- Switch at „OFF“ position.
- Keep MODE button pressed while you turn switch to „ON“ (then release button).
- At first speed-control temperature will be indicated.
- SET LED will start to flash blue (MODE LEDs are off)
- Count the number of flashes. The higher the number, the hotter the speedo ran (shutdown occurs at 10 flashes).
- To change to motor temperature read-out, press MODE button one more time.
- SET LED will start to flash blue (MODE LEDs are off) again, for motor the LEDs on time will be shorter.
- Count the number of flashes. The higher the number, the hotter the motor ran (shutdown occurs at 10 flashes).
- Every flash below 10 equals to 5°C temperature decrease.

Temperature chart (speed-control and motor temperature):

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
> -45°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	Shutdown
> -81°F	-72°F	-63°F	-54°F	-45°F	-36°F	-27°F	-18°F	-9°F	

CAUTION: motor temperature read-out only works if your motor has a built-in NTC temperature sensor!



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6. USB Software Updatability

Through the sensor connector the Falcon 8 V2 can be updated to the latest firmware available for download on www.NOSRAM.com.

The optional „USB Bridge - Speedo Firmware Update + PC-Link“ (#92501) and a Windows-PC or MAC are required to do so, please refer to the NOSRAM website and the manual which comes with the interface for exact details how to do software updates to your speed-control. Please check guide at www.NOSRAM.com for further details.

7. Mode Programming

The Falcon 8 V2 features 4 modes which enable you to adjust it 100% to your requirements.

- How to get into „programming the modes“ → Press MODE button for 3 or more seconds.
- How to check the stored values → Count the number of flashes of the blue SET-LED (* = value 1 | ** = value 2 | etc.).
- How to change the value → Press SET button to increase value by one step.
- How to get to the next Mode → Press MODE button once.
- How to leave the programming mode → If you are in MODE.4, press the MODE button one more time, which will also store the settings!

IMPORTANT: Do not turn the switch off before leaving Mode 4 (by one more press of MODE button) as otherwise your recent changes won't be stored in the memory of the Falcon 8 V2!

Table of settings, values and modes: see below (blue-shaded values show „works default settings“)

MODE	1	2	3	4
Red LED				
Yellow LED		Same time	Alternate	
Value Blue LED	Drive Mode Profile	Initial Drive	Power Profile	Protection
	[Reverse]	[Direction]	[%]	[Value]
0		1	1	Motor & Speedo
1	no	CCW (normal)	3	Speedo only
2	yes		6	
3	no	CW (reverse)	9	4
4	yes		12	5

White Factory settings

7.1 Mode.1 - Drive Mode Profile

Your Falcon 8 V2 can be adjusted for all applications. No matter which motor rotation direction you need and if you want reverse or not you can set it up accordingly.

You can disable reverse if you plan on using forward/brake only as you're used to from your nitro vehicle. CW motor rotation mode is available for models with reversed gearbox which normally cannot use a sensorless brushless system.

Intelligent Brake/Reverse 1.0:

This dedicated part of the firmware provides a new level of driving experience when switching between braking and driving backwards. At the same time reverse driving speed has been increased over previous version.

7.2 Mode.2 - Initial Drive

Initial Drive feature defines percentage of initial throttle power, which allows to adjust smooth or aggressive acceleration.

Suggested settings:

Smooth feel for low grip: 0-2

Aggressive feel for high grip: 2-4

Attention: Higher Initial Drive settings increase the motor temperature significantly. When you are running high Initial Drive settings, we recommend motor temperature protection should always be active! Please monitor motor temperatures in order to adjust correct Initial Drive values.

7.3 Mode.3 - Power Profile

This Mode allows you to adjust the Falcon 8 V2 to your likes. Whether you run on slippery or high traction surfaces, we have incorporated a suitable profile for you!

Higher value means more overall power and more aggressive throttle response.

Value 1 = minimum

Value 5 = maximum

7.4 Mode.4 - Protection

Defines the level of protection for your speedo and motor. Battery protection is automatic and always active. When cut-off voltage is reached, you will still be able to drive at reduced speed for an additional 30 seconds.

Note: In case motor temperature shutdown comes close before the end of the race, you might consider switching off the motor temperature protection. Be aware that the motor might overheat, resulting in a loss of warranty of the motor. Therefore motor protection use is highly recommended! Please note that depending on your battery pack's condition your speedo will automatically detect the perfect cut-off point.

8. Special Features

Changing Mode Settings without the Transmitter: Simply disconnect the receiver lead from the receiver and change the MODE settings on the speed-control as described under „Mode Programming“.

Works-Default-Settings: All NOSRAM speed-controls come factory-adjusted (defaults are blue-shaded). If you lose track of the modes, you can restore the works default settings easily. With your radio switched on, hold the SET button pressed while you switch on the speed-control. This returns the unit to our works default settings.

Sensored Brushless Technology: Advanced Digital allows the perfect knowledge of the brushless motor's magnet position. This results in perfect motor control at high and low RPMs, as well as perfect brake control.

9. Recommendations

Correct gearing: This is crucial for good performance and a healthy temperature of motor, speed-control and batteries. When making changes to gearing, battery voltage, motor or settings in Mode 2 and Mode 3 settings you need to monitor motor temperatures during the first minutes of running carefully.

A brushless motor should never exceed a temperature of 100°C (210°F).

BR2 Brake: A good starting point for the brake setting on your radio is 85% for all classes. Make sure you do the radio-setup with all settings on the radio on 100% and decrease them to 85% after you have completed the setup!

10. Troubleshooting Guide

To eliminate all other possibilities or improper handling, first check all other components in your model and the trouble shooting guide before you send in this product for repair. If products are sent in for repair, which do operate perfectly, we have to charge a service fee according to our pricelist. Always check error by checking LED error code first, this gives you a good indication where to search!

SYMPTOM	POSSIBLE REASON	SOLUTION
Motor overheats	Wrong number of cells for your motor Wrong Gear ratio Too little motor cooling	Decrease number of cells Adjust gear ratio Add cooling fan and/or heatsink
Insufficient performance. E.g. poor power, topspeed or brake	Wrong Gear ratio Wrong number of cells for your motor Transmitter settings changed after set-up Motor or sensor-board in motor defective Speed-control defective	Adjust gear ratio Adjust number of cells Repeat set-up procedure Replace sensor-board or motor Send in product for repair
Servo is working, no motor function	Speedo plugged in incorrectly Multiprotection System activated Wiring problem Sensor wire missing/defective Motor defective Speedo defective	Plug speedo to receiver as Ch.2 Check settings for your application Check wires and connectors Install/replace sensor wire Replace motor Send in product for repair
No servo and no motor function	Speedo connected to receiver with wrong polarity Wiring problem Battery defective Crystal, receiver or transmitter defective Speedo defective	Connect speedo with correct polarity Check wires and connectors Replace with different battery pack Replace components one by one Send in product for repair
Motor stutters while accelerating	Sensor wire defective Motor or sensor board in motor defective Radio interference Speedo defective	Replace sensor wire Replace sensor board or motor Change location of components Send in product for repair
Motor runs in reverse when accelerating forward on radio	Model with reversed gearbox!	Change settings in Mode.1 (CCW + CCW motor rotation direction)
Speed-control switches off frequently	Speed-Control overheats Model used too often without cool-down periods Motor too strong for input voltage Stuck drivetrain or ball-bearing Motor defective	Add cooling fan to speed-control Let cool down after every run Use lower kV motor or lower number of cells Maintain model Replace motor
Motor never stops, runs at constant slow speed	Transmitter settings changed after set-up Humidity/water in speedo Motor or sensor board in motor defective	Repeat set-up procedure Immediately unplug and dry speedo Replace sensor board or motor
Radio interference	Receiver or antenna too close to power wires, motor, battery or speedo. Receiver aerial too short or coiled up Receiver defective, too sensitive; Transmitter defective, transmitter output power too low, servo problem Poor battery connection Transmitter batteries empty	See „Installation Guide“ Replace components one by one Only use original manufacturers crystals Check plugs and connecting wires Replace / recharge transmitter batteries

11. Repair procedures / Limited warranty

All products from NOSRAM are manufactured according to the highest quality standards. NOSRAM guarantees this product to be free from defects in materials or workmanship for 90 days (non-European countries only) from the original date of purchase verified by sales receipt. This limited warranty doesn't cover defects, which are a result of misuse, improper maintenance, outside interference or mechanical damage.

This applies among other things to:

- Cut off original power plug or not using reverse polarity protected plugs
- Receiver wire and/or switch wire damaged
- Mechanical damage of the case
- Humidity/Water inside the speed control
- Mechanical damage of electronic components/PCB
- Soldered on the PCB (except on external solder-tabs)
- Connected speed-control with reversed polarity

To eliminate all other possibilities or improper handling, first check all other components in your model and the trouble shooting guide, if available, before you send in this product for repair. If products are sent in for repair, which do operate perfectly, we have to charge a service fee according to our pricelist.

With sending in this product, the customer has to advise NOSRAM if the product should be repaired in either case. If there is neither a warranty nor guarantee claim, the inspection of the product and the repairs, if necessary, in either case will be charged with a fee at the customer's expense according to our price list. A proof of purchase including date of purchase needs to be included. Otherwise, no warranty can be granted. For quick repair- and return service, add your address and detailed description of the malfunction.

If NOSRAM no longer manufactures a returned defective product and we are unable to service it, we shall provide you with a product that has at least the same value from one of the successor series. The specifications like weight, size and others should be seen as guide values. Due to ongoing technical improvements, which are done in the interest of the product, NOSRAM does not take any responsibility for the accuracy of these specs.

NOSRAM-Distributor-Service:

- Package your product carefully and include sales receipt and detailed description of malfunction.
- Send parcel to your national NOSRAM distributor.
- Distributor repairs or exchanges the product.
- Shipment back to you usually by COD (cash on delivery), but this is subject to your national NOSRAM distributor's general policy.
- check www.NOSRAM.com

