



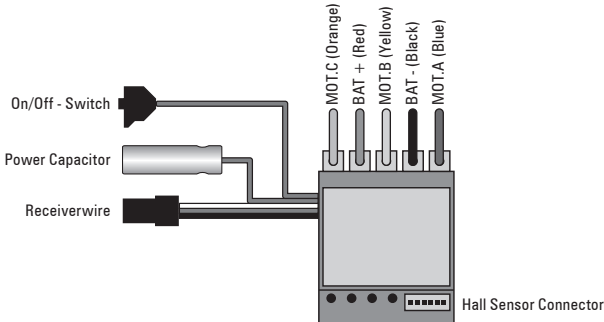
**Sensored Brushless Speed-Control
For True Stock Racing
„Boost 0“ Mode
>7.5T Motorlimit**

USER MANUAL

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CONNECTIONS & EXPLANATIONS



Receiver Connecting Wire: The SPX Zero is equipped with an LRP Multicon receiver wire. As supplied, it will easily fit in all ordinary receivers. Make sure you connect it to receiver 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, please refer to complete line-up at „Spare- & Optional-Parts“.

Power Wires: For maximum performance, flexible silicone power wires without any connectors are used. The unique splitted solder-tabs allow easy and convenient replacement of the power wires. Nevertheless some soldering skills are required. Avoid soldering longer than 5sec per soldering joint to prevent possible damage to the speed-control due to overheating of the components! There are replacement power wires available, please refer to complete line-up at „Spare- & Optional-Parts“.

INSTALLATION TIPS

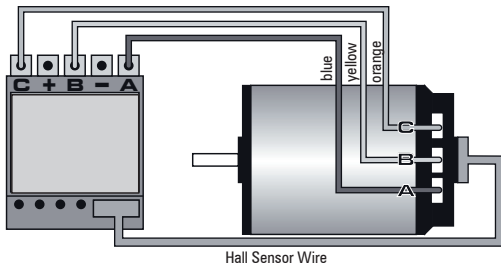
- Position the speed-control and capacitor where they are protected in the event of a crash and gives you easy access to the connectors and buttons.
- Mount the speedo and capacitor using the supplied thick/black doubled-sided tape
- Make sure there is enough clearance between the speed-control, power-wires, 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.

WIRES & INSTALLATION

The SPX Zero comes supplied with flexible 2.6mm² silicone power-wires without 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.

Caution: Avoid soldering longer than 5sec per soldering joint when replacing the power wires on the speed-control and motor to prevent possible damage due to overheating of the components!

- 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“
- The speed-control is now ready to be set-up (see section „Radio-/Speed-Control Setup“)

The crossed-out wheeled bin means that within the European Union the product must be taken to separate collection at the product end-of-life. Do not dispose of these products as unsorted municipal waste.

Dear Customer,

thank you for your trust in this LRP product. By purchasing a **LRP SPX Zero** brushless speed-control, you have chosen a highly advanced product aimed for true stock brushless racing. This speed-control with all of its high-tech features and specially selected electronic components is one of the best speed-controls currently available on the market.

- „Boost 0“ Mode for true stock racing
- Add. profiles for many classes
- Internal-Temp-Check system
- Sensored Design
- Multi-Protection System 3
- 100% Brushless Forward/Brake
- Advanced Digital
- AutoCell System
- 2.6mm² Power-Wires
- Small footprint

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 much 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.

SPECIFICATIONS

Pure Brushless	yes
Forward/Brake	yes
Size	33.1x37.6x14.9mm
Weight (excl. wires)	24.5g
Voltage Input	4.8-7.4V
Typ. Voltage Drop* @20A	0.026V / phase
Rated Current*	200A / phase
Compatible winding styles	Star
Rec. Motor Limit with 2S LiPo	over 7.5T

BEC	6.0V/3.0A
High Frequency	yes
Sensored Brushless System	yes
Multi-Protection-System	yes
Internal-Temp-Check System	yes
„Boost 0“ Mode	yes
Power Wires	2.6mm ²
4 adj. Modes (ACS, Powerprofiles, Initial- and Autobrake)	yes

* Transistors rating at 25°C junction temperature

Specifications subject to change without notice.

RADIO- / SPEED-CONTROL SETUP

In setup mode the SPX Zero 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):

Description	other names in radio	Required Setting
Throttle Travel	High ATV, EPA	100%
Brake Travel	Low ATV, EPA, ATL	100%
Throttle Exponential	EXP, EXPO	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 red (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 green 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, LED's glow red (MODE) and red (SET).
- This completes the setup procedure and your SPX Zero 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 end of each run switch off the car, and then switch off the transmitter.
- At the start of each run switch on the transmitter first, then switch on the car.
- For storage of the car, disconnect the drive battery at any time!

Team advise: A good starting point for the brake setting on your radio is 80% for all classes. Make sure you do the radio-setup with all settings on the radio on 100% and then decrease brake strength to 80%!

CHECKING THE FUNCTIONS: Check the LED's when moving your throttle stick and you will see if everything is setup correctly.

Function	Status	Mode LED	Set LED
Neutral	--	off	red
Neutral (when „Boost 0“ selected)	--	off	flashes red
Forward	partial throttle	green	off
	full	green	red
Brake	partial brake	red	off
	full	red	red

SPARE- & OPTIONAL-PARTS

LRP offers a comprehensive line of accessories, as well as particular spare- and optional items. Here you find an overview, for a full picture please visit our website at www.lrp.cc:

- #82505 Power-Wire Set Brushless 2.6mm² (red, black, blue, orange, yellow)
- #82506 Power-Wire Set Brushless 3.3mm² (red, black, blue, orange, yellow)
- #81907 3.3mm² Powerwire black (1.0m)
- #81908 3.3mm² Powerwire blue (1.0m)
- #82511 Low Profile cooling fan
- #819307 Sensor-Wire „HighFlex“ 70mm
- #819310 Sensor-Wire „HighFlex“ 100mm
- #819315 Sensor-Wire „HighFlex“ 150mm
- #819320 Sensor-Wire „HighFlex“ 200mm
- #82520 Radical Motor Heatsink + Fan

MODE PROGRAMMING

The *SPX Zero* features 4 modes which enable you to adjust it 100% to YOUR special requirements. The factory settings are shown in grey colour.

- 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 red 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 *SPX Zero*!

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

MODE.1 (AutoCell System): we recommend using value 2 for racing purposes with cells other than 2S/4.7V LiPo, which disables the cut-off function completely.

MODE LED	#1	#2
Green	LiPo/NiMH Automatic	Disable Cut-Off

Caution: the most common reason for „unexpected“ shutdown is using the wrong value in this mode!

MODE.2 (Power Profiles): this mode contains the new „Boost 0“ which is meant for true stock racing with brushless motors and no added speed-control timing and which is indicated by the flashing red LED in normal driving mode (when throttle is in neutral). Additionally the *SPX Zero* incorporates further profiles so you can adjust the feel to your likes. Either you run On-Road or OffRoad, on slippery or high-traction surfaces, we have incorporated a profile for you! Higher value means more aggressive throttle response.

MODE LED	#0	#1	#2	#3	#4	#5
Red	Boost 0 Mode	Going from mild to powerful profile (value 1 = minimum / value 5 = maximum)				

MODE.3 (Initial Brake): Allows you to set a certain level of „hand-brake-effect“.

MODE LED	#0	#1	#2	#3	#4	#5
Green/Red (alternate)	disabled	Going from lowest to highest automatic brake setting (value 1 = minimum / value 5 = maximum)				

MODE.4 (Automatic Brake): called auto- or drag-brake. This function allows you to set a slight braking action which is applied in the neutral range.

MODE LED	#0	#1	#2	#3	#4	#5
Green/Red (same time)	disabled	Going from lowest to highest automatic brake setting (value 1 = minimum / value 5 = maximum)				

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.

SYMPTOM	CAUSE	REMEDY
Servo is working, no motor function	Speedo plugged in incorrectly	Plug speedo to receiver as Ch.2
	Wiring problem	Check wires and connectors
	Sensor wire missing/defective	Install/replace sensor wire
	Motor defective	Replace motor
No servo and no motor function	Speedo defective	Send in product for repair
	Speedo connected to receiver with wrong polarity	Connect speedo with correct polarity
	Wiring problem	Check wires and connectors
	Battery defective	Replace with different battery pack
Motor stutters while accelerating	Crystal, receiver or transmitter defective	Replace components one by one
	Speedo defective	Send in product for repair
	Sensor wire defective	Replace sensor wire
	Motor or sensor board in motor defective	Replace sensor board or motor
Motor runs in reverse when accelerating forward on radio	Radio interference	Change location of components
	Power capacitor damaged	Replace power capacitor
	Speedo defective	Send in product for repair
	Model with reversed gearbox!	Can not use a sensored brushless system!
Insufficient performance. E.g. poor power, topspeed or brake	Wrong Gear ratio	Adjust gear ratio
	Transmitter settings changed after set-up	Repeat set-up procedure
	Power Capacitor damaged	Replace Power Capacitor
	Motor or sensor-board in motor defective	Replace sensor-board or motor
Speed-control switches off frequently	Speed-control defective	Send in product for repair
	Wrong setting in ACS (Mode.1)!	Change value of ACS (Mode.1) accordingly
	Model used too often without cool-down periods	Let cool down after every run
	Motor stronger than motorlimit or input voltage too high	Use only motors and batteries which are within the specifications of the speed-control.
Motor never stops, runs at constant slow speed	Stuck drivetrain or ball-bearing	Maintain model
	Motor defective	Replace motor
	Transmitter settings changed after set-up	Repeat set-up procedure
	Humidity/water in speedo	Immediately unplug and dry speedo
Radio interference	Motor or sensor board in motor defective	Replace sensor board or motor
	Receiver or antenna too close to power wires, motor, battery or speedo. Receiver aerial too short or coiled up	See „Installation Tips“ and „Installation“
	Receiver defective, too sensitive	Replace components one by one
	Transmitter defective, transmitter output power too low, servo problem	Only use original manufacturers crystals
Transmitter batteries empty	Poor battery connection	Check plugs and connecting wires
	Transmitter batteries empty	Replace / recharge transmitter batteries

REPAIR PROCEDURES / LIMITED WARRANTY

All products from LRP electronic GmbH (hereinafter called „LRP“) are manufactured according to the highest quality standards. LRP 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 on:

- 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 solderpads)
- 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 LRP 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

SPECIAL FEATURES

Power Profiles: the *SPX Zero* is not designed as a „highpower“ stock speed-control but for true stock racing with equal speeds. Nevertheless it's versatile for many racing classes, motors and personal driver preferences! Depending on the status of the car (start, acceleration, full speed) the software calculates the perfect motor management. Higher profiles mean more overall power and aggressive response.

Profiles 1-3 are meant for mild modified motors and 4+5 are mild stock profiles, as known from proven Sphere Competition speed-control. These relate as following

SPX Zero	Sphere Competition	Remark
#0	--	„Boost 0“ profile for true stock racing with disabled timing
#1	#1	mild profile, great control for OffRoad or OnRoad Modified
#2	#2	mild profile, great control for OffRoad or OnRoad Modifieds
#3	#3	mild profile, great control for OffRoad or OnRoad Modifieds
#4	#6	stock profile (1 st generation style!)
#5	#8	stock profile (1 st generation style!)

The great „Boost 0“ mode, for true stock racing with equal power can easily be recognised when the red LED flashes in neutral position in normal operation to indicate that entire timing advancement is disabled!

AutoCell System: LRP's exclusive and smart AutoCell System ensures that LiPo batteries can be used safely without accidentally deep-discharging of the cells. The motor function will be shut-off and the SET LED will flash if the system recognises very low battery voltage.

Internal-Temp-Check System: the *SPX Zero* allows you to read-out the maximum internal temperature that the speedo reached. To store it to the memory, briefly apply brakes after the run before you turn the switch off. 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 new 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)
- SET LED will start to flash red (MODE LED is off), now count the number of flashes.

Basics:

- Thermal shutdown of the speedo would occur at 5 flashes.
- The higher the number of flashes, the cooler the speedo ran (e.g. the better it is!)
- Every flash equals to ~8°C temperature decrease

Example:

- you count 10 flashes after the run
- 10 - 5 = 5 (e.g. 5 flashes „away“ from shutdown)
- 5 x 8°C = 40°C (e.g. you are 40°C away from thermal shutdown and therefore safe!)

Brake: superlinear feeling with a strong pushbrake and 6 fine steps for almost infinite adjustments of autobrake!

Team advise: A good starting point for the brake setting on your radio is 80% for all classes. Make sure you do the radio-setup with all settings on the radio on 100%!

Changing Mode settings without the transmitter: At race events you usually do not have access to your transmitter, but never mind since you can simply disconnect the receiver lead from the receiver and change the MODE settings as described at „Mode Programming“.

Works-Default-Settings: All LRP speed-controls come factory-adjusted (defaults are grey-shaded above). If you loose track of the modes, you can restore the works default settings. With the transmitter switched on, hold the SET button pressed while you switch on the speed-control. This returns the unit to the LRP works default settings.

Pure Brushless Forward/Brake Design: uncompromising and outstanding performance for top level competition was the target for the *SPX Zero*! Therefore the LRP engineering team developed a pure forward/brake brushless speed-control. There is no reverse function and no brushed operation.

Power Capacitor: Never run without a power-capacitor! It offers increased punch and additional protection,

Multi-Protection System: The perfect protection against short-circuits (motor), overload and overheating. If your speed-control faces overload, the motor function will be shut-off for protection and the SET LED will flash, although the steering function is maintained. Let the speed-control cool down for a few minutes. If you experience frequent shutdowns, check for the following:

- Correct gear ratio (refer to motor manual for gearing recommendations)
- Powerprofile setting too high (higher value will heat up motor and speed-control excessively)
- Motor is too strong or motor is damaged.

will be charged with a fee at the customers 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 LRP 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, LRP does not take any responsibility for the accuracy of these specs.

LRP-Distributor-Service:

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