

USER MANUAL



LRP electronic GmbH
Wilhelm-Enssle-Str. 132-134
73630 Remshalden
Germany
info@LRP.cc
www.LRP.cc

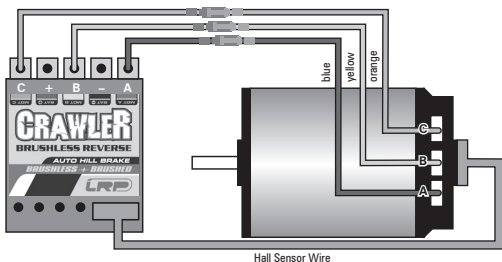
1. INSTALLATION

- Connect the speed-control to the receiver (position: Channel 2)

BRUSHLESS MOTOR:

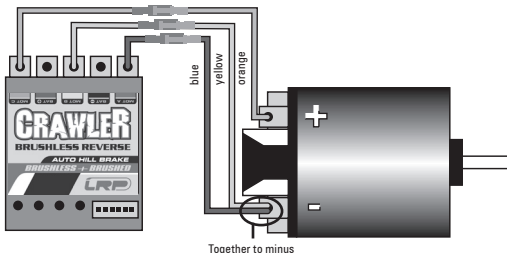
The *LRP Crawler Reverse* comes pre-wired using common JST motor connectors. It's simply „plug & play“ when you intend using a designated LRP Brushless motor, see picture below! You can of course also use optional 2.6mm² power wires for a „hardwired“ setup without connectors.

- 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.



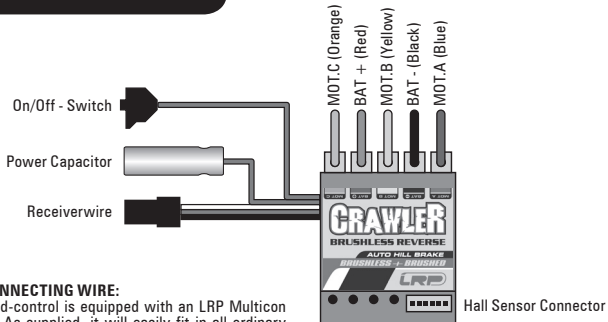
BRUSHED MOTOR:

- MOT.A (blue) and MOT.B (yellow) will be the combined „minus“ on the brushed motor.
- MOT.C (orange) wire will be „plus“ on the brushed 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 5).

2. CONNECTIONS



RECEIVER CONNECTING WIRE:
This LRP speed-control is equipped with an LRP Multicon receiver wire. As supplied, it will easily fit in all ordinary receivers.

HALL SENSOR WIRE:
This bi-directional multipole wire connects the speed-control and the motor. Do not alter or modify this cable! There are replaceable/optional hall sensor wires available: • #81910 (20cm) • #81920 (10cm)

POWER WIRES:
The *LRP Crawler Reverse* comes pre-wired using common Tamiya/JST battery connector and JST motor connectors. It's simply „plug & play“ when you intend using a designated LRP Brushless motor! There are optional 2.6mm² power wire sets available (#82505), which allow you to use a „hardwired“ wire setup. The unique splitted solder-tabs allow easy and convenient replacement of the power wires. Nevertheless some soldering skills are required. Talk to your local hobbyshop if you are concerned about replacing the wires yourself.

CAUTION: Be very careful with the correct wire sequence since an incorrect connection may damage the speed-control! Avoid creating solder bridges on the solder-tabs and isolate all connections carefully. Avoid soldering longer than 5sec per soldering joint.

Dear Customer,

thank you for your trust in this LRP product. By purchasing a *LRP Crawler Reverse* speed-control, you have chosen one of the most advanced speed-controls of today. 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.

- Special Crawler Software
- Super-strong 6.0V / 5.0A BEC
- AutoCell System
- Multi-Protection System
- No Reverse Delay
- Adjustable Auto-/Hill-Brake (10 steps)
- 4 unique Crawler throttle profiles
- Sensored Design
- Tamiya Style Connectors
- Small and lightweight design

Please read the following instructions carefully before you start using your *LRP Crawler Reverse* 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 *LRP Crawler Reverse* 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.

3. SPECIFICATIONS

Brushless + Brushed	yes	B.E.C.	6.0V/5.0A
Brushless + Brushed Adaption	Automatic	Voltage Drop Brushed @20A*	0.019V
Forward/Brake/Reverse	yes	Rated Current Brushed*	200A
Forward/Reverse	yes	Rec. Motor Limit Brushed	over 13 turns
Case Size	33.1x37.6x14.9mm	Auto-/Hill-Brake	yes
Weight (excl. wires)	24.5g	Optional Push Brake	yes
Voltage Input	4.8-7.4V	Motor Rotation Selection	yes
Voltage Drop Brushless @20A*	0.026V / phase	High Frequency	yes
Rated Current Brushless*	200A / phase	Sensored Brushless System	yes
Compatible winding styles	Star	Multi-Protection-System	yes
Rec. Motor Limit Brushless	over 7.5 turns	Tamiya Style Connectors	yes
4 adj Modes (NiMH/LiPo, Drive- & Motor Rotation-Selection, Throttle Profiles, Auto-/Hill-Brake) yes			

* Transistors rating at 25°C junction temperature Specifications subject to change without notice.
** measured at 7.2V

4. 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.
- 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.
- Mount the speedo and capacitor using the supplied thick/black doubled-sided tape.
- **ONLY FOR BRUSHED MOTORS!** Motors with no capacitors or not enough capacitors may interfere with the speed-control. To avoid this, solder the supplied capacitors to your motor.

5. RADIO / SPEED-CONTROL SET-UP

In stored mode the *LRP Crawler Reverse* stores every step when you press the SET button. All the settings will be stored in the speed-controls memory even if the speed-control 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 *LRP Crawler Reverse* 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 of 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!

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 (Auto-/Hill Brake disabled)	--	off	red
Neutral (Auto-/Hill Brake enabled)	--	red	off
Forward	partial throttle	green	off
Forward	full throttle	green	red
Brake	partial brake	red	off
Brake	full brake	red	red

6. MODE PROGRAMMING

All modes are available for brushless and brushed motors (speed adapts automatically). The *LRP Crawler Reverse* features 4 modes which enable you to adjust it 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!
- Table of settings, values and modes: see below (grey-shaded values show „works default settings“).

MODE.1 (AutoCell System):

MODE LED	#1	#2
Green	LiPo/NiMH Automatic	4-6cells NiMH (LiPo Cut-Off disabled)

MODE.2 (Drive Selection & Motor Rotation): the *LRP Crawler Reverse* allows you to select from two different drive modes (with or without manual brake) in both motor rotation directions.

MODE LED	#1	#2	#3	#4
Red	Fwd/Rvs (no Brake)	Forward/Brake/Reverse	Fwd/Rvs (no Brake) CW Motor Rotation	Forward/Brake/Reverse CW Motor Rotation

MODE.3 (Throttle Profiles): allows you to perfectly adjust the *LRP Crawler Reverse* to your likes. All profiles apply for forward and reverse direction.

MODE LED	#1	#2	#3	#4
Green/Red (alternate)	Expo Curve Super Smooth Ramp	Expo Curve Smooth Ramp	Expo Curve No ramp	Linear

MODE.4 (Auto-/Hill-Brake): allows you to set the amount of braking action which is applied in the neutral range of the throttle position.

MODE LED	#0	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Green/Red (same time)	none										

Going from lowest to highest automatic brake setting (value 1 = minimum / value 10 = maximum)

9. TROUBLESHOOTING GUIDE

EXPLANATION: If no remark, cause can be either with brushless or brushed motor. If „BM“ is indicated, cause only relating to brushed motor.

SYMPTOM	CAUSE	REMEDY
Servo is working, no motor function.	Speed-control plugged in incorrectly	Plug speed-control in Ch 2
	Wiring problem	Check wires and plugs
	Sensor Wire missing/defective	Install/replace sensor wire
	Motor defective	Replace motor
	BM - Motor brushes stuck	Check that brushes are moving freely
	Overload protection activated	Allow speed-control to cool down
	Speed-control defective	Send in product for repair
No servo and no motor function.	Speedo connected to receiver with wrong polarity	Connect speedo with correct polarity
	Battery defective	Replace with different battery pack
	Crystal defective	Replace components one by one.
	Receiver defective	
	Transmitter defective	
Motor stutters while accelerating	Speed-control defective	Send in product for repair
	Sensor Wire defective	Replace Sensor Wire
	Motor or Sensor Board in motor defective	Replace sensor board or motor
	Power Capacitor damaged	replace Power Capacitor
Motor runs in reverse when accelerating forward on the transmitter.	Speed-control defective	Send in product for repair
	Vehicle has reversed gearbox	Change motor rotating direction in Mode.2
	BM - Motor connected incorrectly	Connect motor correctly
	Motor pinion too big or gear ratio too long.	Use smaller motor pinion/shorter gear ratio
	Transmitter settings changed after set-up	Repeat set-up procedure
Insufficient performance. E.g. poor brake power, topspeed or acceleration..	Power Capacitor damaged	Replace Power Capacitor
	BM - Motor worn out	Maintain motor
	Motor defective	Replace motor
	Speed-control defective.	Send in product for repair
	Speed-control overheats or switches off frequently.	Motor stronger than motormlimit or input voltage too high
Motor never stops, runs at constant slow speed	Motor pinion too big or gear ratio too long.	Use smaller motor pinion/shorter gear ratio
	Drive train or bearing problems.	Check or replace components.
	Model used too often without cool-down periods	Let speed-control cool down after every run
	Transmitter settings changed after set-up	Repeat set-up procedure
Radio interference	Humidity/water in speed-control	Immediately unplug and dry speed-control
	Motor or Sensor Board in motor defective	Replace sensor board or motor
	BM - Motor suppressors not sufficient	Solder capacitors to motor
	Receiver or antenna too close to power wires, motor, battery or speed-control.	See „Installation Tips“ and „Installation“
	Receiver aerial too short or coiled up	
Poor battery connection	Receiver defective, too sensitive; Transmitter defective, transmitter output power too low, servo problem	Replace components one by one Only use original manufacturers crystals
	Transmitter batteries empty	Check plugs and connecting wires
	Transmitter antenna too short	Replace / recharge transmitter batteries
		Pull out antenna to full length



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.

8. SPECIAL FEATURES

AutoCell System: Ready for the next battery technology – LiPo batteries! 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.

Drive Selection & Motor Rotation: this versatile function allows you to adjust your *LRP Crawler Reverse* to all crawler-applications and -models. You can choose from from two different drive modes (with or without manual brake) and also reverse motor rotation direction for vehicles with counter-rotating gearboxes or opposed transmission.

Throttle Profiles: finest throttle control at low rpm was the aim and the LRP engineering team definitely succeeded! The *LRP Crawler Reverse* allows fine adjustments of the throttle curve with it's four individual „Crawler Special“ maps to your special requirement.

Auto-/Hill-Brake: the *LRP Crawler Reverse*'s high brake levels allow you to adjust the „drag“ of your vehicle perfectly to your application or crawler terrain. Higher settings mean higher amount of braking, up to „wheel locking“ brake action demanded by many crawler specialists!

Manual Brake: as a first for Crawler speeds, the *LRP Crawler Reverse* includes a mode with optional manual brake, which can be used in addition to the Auto-/Hill-Brake and gives you more tuning options to adjust your vehicle to the special crawler circumstances. The brake is applied evenly in both directions, no matter if you come from „forward to reverse“ or from „reverse to forward“ direction for maximum control on steep ramps. „Double Action“ on throttle is required to change from „brake to reverse“ mode, e.g. you have to return to neutral briefly to change function from brake to reverse.

Note: this brake function is available in Mode.2 profiles #2 and #4. When selecting #1 or #3 you will have no manual brake. This special „manual brake“ function will require slightly different driving style and you should practice with this function to fully benefit from it and to see if you like it or not.

5A BEC: the *LRP Crawler Reverse*'s super-strong 6.0V/5.0A BEC will power all your strong digital servos or even multi-servo vehicles with pleasure!

Automatic Brushless / Brushed Adaption: detects the connected motor type during turn-on/initialisation and adjusts the correct brushless or brushed operation automatically. No adjustments required by yourself, apart from the correct connection of each motor type (don't forget the hall-sensor-wire for brushless!).
Caution: Keep in mind, when swapping between brushless and brushed motors, that the chosen mode values will be identical!

Power Capacitor: Never disconnect the installed power-capacitor! It must be used with brushless and brushed motors. If the capacitor becomes damaged (dented, domed or swollen), speed-control failure may occur and therefore immediately replace a damaged capacitor.
Caution: longer wires to power-capacitor will decrease performance!

Changing Mode settings without the transmitter: At most 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 in section 6 „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.

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 RPM's, as well as perfect brake control.

Multi-Protection System, 3-way protection: 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 functions with troubleshooting guide.

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 countris 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 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 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 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.