

## OWNER'S MANUAL

### THE Mini RAGE



#### 18th SCALE BRUSHLESS SYSTEM



- Adjustable Drag Brake/Reverse Type
- Voltage Cutoff for LiPo Cells
- Throttle and Brake Profiles
- QuickTime™ Digital Setup
- Sensorless System



## INTRODUCTION

Congratulations on purchasing the *Mini RAGE*, Tekin's 18<sup>th</sup> Scale Brushless System. The QuickTime™ feature allows the user to quickly and accurately adjust all critical operating parameters.

## PRECAUTIONS

The following statements need to be understood before using the *Mini RAGE*:

- 1) Do not operate speed control in or around water.
- 2) Do not hook-up the battery backwards! No reverse voltage protection.
- 3) Turn on the transmitter first to avoid uncontrollable noise to speed control.
- 4) Disconnect battery from speed control when not in use.
- 5) Insulate exposed wires with heat shrink tubing to prevent short circuits.
- 6) The *Mini RAGE* is intended for 18<sup>th</sup> Scale vehicles only.

## CONNECTION SELECTION

The first step to prepare your speed control for installation is to ensure that it is compatible with the type of radio receiver you are using. The standard connector on this unit is the TEKIN/Futaba J plug. If using a different receiver, the side tab on the TEKIN plug can be removed to fit.

**IMPORTANT:** With some older style receivers, the wiring sequence in the housing connector must be changed (due to polarity) or damage will occur.

\*If a change is needed, follow the steps below to change plugs:

- 1) Remove the original plug housing. Using a small hobby knife, press in the three metal tabs far enough that each of the wires can be removed from the black plug housing (Figure 1: Step 1).
- 2) After removing the wires from the plug housing, use a hobby knife and carefully lift the metal tabs back up (Figure 1: Step 2).
- 3) Select the plug housing that matches your radio system and insert the wires into the housing matching the wire colors to the labels on the plug (Figure 1: Step 3).

## SPEED CONTROL SPECIFICATIONS

Controls		Fwd/Rev/Brk
Input Power (Cells)	4-12 NiCd/NiMH	2-4 LiPo
*Except 8 kV Motor	4-8 NiCd/NiMH	2-3 LiPo
Input Power for 8 kV Motor	2-3 LiPo	
Motor Limit	180 Size, 20mm Dia	
ON Resistance (Ohm)	0.002	
Max Current (Amps)	30	
BEC (Volts/Amps)	5/2	
Power Wires	16 GA Silicone	
Dimensions (Inch)	0.95 x 1.72 x 0.4 (24 x 43 x 10 mm)	
Weight (oz.)	0.9 (25.5g)	

## MOTOR SPECIFICATIONS

Performance - 5.4 kV  
Hi-Performance - 6.8 kV  
Extreme - 8 kV

Diameter - 0.79" (20 mm)  
Length - 1.3" (33 mm)  
Weight - 1.7 oz (48g)

## FIGURE 1: CHANGING PLUG TYPES

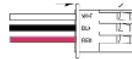
STEP 1: Press Tab Inward remove wires



STEP 2: Lift Tab Back Up



STEP 3: Push wires into the new plug housing



**IMPORTANT:** As long as the instructions are followed correctly and proper polarity is observed, changing the motor and battery plugs will not void warranty. Wiring the plug incorrectly may damage the speed control or radio receiver and void the warranty.

## SOLDERING CONT...

### ATTACHING:

- 1) Strip back the insulation of the wire by about 3/32" to 1/8" and "pre-tin" the wire by heating the end and applying solder until it is thoroughly covered. You may shake off any excess solder while it is still hot. Be very careful not to splash yourself with hot solder.
- 2) If there is no solder on the post, touch the tip of the iron to the top of the post and apply a small amount of solder to the post. Wipe the tip clean and apply a small amount of fresh solder to it.
- 3) Secure the speed control in place on the workbench. Hold the wire so the tinned end is in contact with the flat side of the post. Now touch the iron tip to the wire pressing towards the post. Wait about 2 seconds for the solder to flow, and then remove the iron while still holding the wire. You may let go after a second or two when the solder sets.

**NOTE:** It should only take a few seconds to solder the wire to the post. If you do not complete the solder joint in approximately 3 seconds, remove the iron, clean and tin the tip, and start over.

- 4) Inspect the solder joint for shorts or solder bridges between wires, and repair where necessary.
- 5) These same techniques may be used to solder the wires to the batteries. You may need to scrape or sand off the battery contact before the solder will stick.

## MOUNTING

- 1) Placement: Choose a location for the speed control that is protected from debris. To prevent radio interference place as far away from the radio receiver as possible and keep the power wires as short as possible.
- 2) Mounting: Clean the bottom of the speed control and chassis for best results. Using the double-sided tape, (included in accessory pack) mount the speed control to chassis.
- 3) Using a piece of double-sided tape mount the ON/OFF switch in a convenient place.

**IMPORTANT:** Take precautions if changing factory battery connector. Connecting the battery backwards will cause damage, and will void warranty.

**NOTE:** The speed control supplies power to the receiver and servo. No additional power supply should be used for the receiver.

## HOOKUP INSTRUCTIONS

**IMPORTANT:** Take precautions if changing factory battery connector. Connecting the battery backwards will cause damage, and will void warranty.

### \*Refer to Figure 2, Connection Diagram

**NOTE:** The Mini RAGE ESC is a sensorless system, but will also work with a sensor motor by simply not connecting the control wires.

- 1) CONNECT SPEED CONTROL TO RECEIVER  
After the correct plug has been installed according to your receiver, plug the speed control into the throttle channel of the receiver.
  - Channel 1: Servo
  - Channel 2: Speed Control
  - 1 to Turn, 2 to Brk

- 2) CONNECT SPEED CONTROL TO BATTERY

**CAUTION:** If the battery wires touch during the plug installation it will cause an electrical short circuit resulting in damage to the pack and possibly a fire hazard.

## HOOKUP INSTRUCTIONS CONT...

ESC	BATTERY
Black Wire	(-) Negative
Red Wire	(+) Positive

- 3) CONNECTS SPEED CONTROL TO MOTOR

SPEED CONTROL	MOTOR
Black Wire	Black
Red Wire	Red
White Wire	White

**NOTE:** Make sure all wires are secure and a safe distance from all moving parts using the zip-ties in the accessory pack.

## RADIO CALIBRATION

**NOTE:** Speed control is hooked up to the receiver, a charged battery is properly connected, and the transmitter is adjusted properly and turned on.

### Startup Sequence

When the power switch is turned ON the unit is looking for the neutral signal. If a neutral signal is found the Arming Sequence (flashes LEDs/chime) will occur followed by LED1 on steady. **NOTE:** If Arming Sequence does not occur see Trouble Shooting section of this manual before calibration.

### Calibration

- 1) Turn on transmitter.
- 2) Turn on speed control.
- 3) Press and hold the MODE button on the speed control for 3 seconds. All LEDs will blink red 3 times with 3 chimes.
- 4) The LED4 will flash and chime will sound when NEUTRAL position is recorded.
- 5) When the LED7 flashes, pull transmitter trigger to the full throttle position and hold until chime is sound.
- 6) When the LED1 flashes, push transmitter trigger to the full brake position and hold until chime sounds.
- 7) Release trigger and place in neutral position. The LED4 will flash with chime and the arming sequence will occur.
- 8) LED1 is now on steady. Calibration is complete and you are ready to drive!

**NOTE:** If any problems occur, refer to radio calibration.

**NOTE:** Once calibrated, the LEDs on the speed control will advance as the throttle or brake is applied.

### Throttle Trigger Response:

If you wish to have a very short trigger range, then only squeeze the throttle/brake trigger partially during the set-up procedure. Throttle/Brake response will not be quite as smooth, but you can pull full throttle very quickly.

## QuickTime™

Tekin's QuickTime™ electronic setup feature allows users to change every critical operating parameter in a quick, easy, and accurate fashion.

### QuickTime™:

- 1) Press the "MODE" button to access the desired setup mode. The LED starts blinking to indicate that mode selection is underway. Continue pressing the "MODE" button until the LED advances to the mode you wish to adjust. Do not wait longer than 5 seconds to select the mode, or the speed control will return to normal operation. Once the mode is selected, move on to step 2 within 5 seconds.

- 2) Press the "INCR" button to adjust the value. The first time "INCR" button is pressed, the LED(s) will indicate the existing setting. Each time the "INCR" button is pushed the value will advance towards MAX, and then start over again at the low end of the scale. If two LEDs are on at once, it indicates a value mid-way between the LEDs.

If you wish to set another mode, press the "MODE" button again. After 5 seconds pause, the values you selected will be saved in memory and the speed control will resume normal operation.

**PIT TUNING:** If you are in the pit area and cannot use your transmitter you may use pit tuning mode to adjust settings by following this procedure: Hold down either MODE or INCR button while turning the power switch on. An LED sequence will occur indicating you are in pit tune mode. The user settings will be active, but the motor will not run and the speed control will not respond to receiver signals. Unplug the steering servo from the receiver to avoid servo damage. Turn the speed control power off and back on to resume normal operation.

## SELF TEST

The *Mini RAGE* has a built-in self-test mode that checks all major systems on the speed control. Before using the self-test mode, be sure the rear wheels are free to spin (off the ground). To activate the self-test, turn the speed control on, then press and hold both MODE and INCR buttons simultaneously for 3 seconds. After 3 seconds, the LEDs will ramp up in sets of three. Circuits inside the speed control are tested to see if any problems have occurred. If the unit passes self-test, then LED1 will stay on steady. If problems occur turn the power off to the unit and verify all other connections are correct (motor, receiver, battery, plugs, etc). After verification, power the unit back on.

**NOTE:** Activating the self-test mode also sets all the mode selection and other set-up parameters to default values. The user's radio calibration settings do not change.

## QuickTime™ MODES

MODE	RANGE	DEFAULT
DRAG BRAKE (DRG B)	1-13	1
REVERSE/BRAKE STRENGTH (BS)	1-13	3&4
THROTTLE ADVANCE (TA)	1-13	2&3
REVERSE/BRAKE TYPE (RT)	1-3	1
VOLTAGE CUTOFF (VC)	1-5	1
THROTTLE PROFILES (TP)	1-7	1&2
BRAKE PROFILES (BP)	1-7	1&2

**LED1: DRAG BRAKE** control provides immediate braking action in the neutral zone. This gently slows the car down when you get off the trigger. It can allow a better cornering approach. Higher values increase the drag braking.  
**LED2: REVERSE/BRAKE STRENGTH** adjusts your maximum brake strength and reverse speed. A higher value increase brake strength and reverse speed.

**ADJUSTMENT MODES CONT...**

**LED3: TIMING ADVANCE** adjusts the throttle feel to accommodate your driving style or track setup.

**LED4: BRAKE/REVERSE TYPE**

- 1) Forward to Brake to Reverse (LED1 ON) The car will operate freely in forward and reverse. (Brakes to a stop before switching into reverse).
- 2) Proportional Brake with Reverse Delay (LED1-LED2 ON) The car will only go in reverse if the trigger has been in neutral for 1 second, otherwise operates like proportional brake with no reverse.
- 2) Proportional Brake with Reverse Lockout (LED1-LED3 ON) Proportional brake will be applied during reverse throttle.

**LED5: VOLTAGE CUTOFF**

- 1) NONE (LED1 ON)  
NiCd/NiMh Cells
- 2) 4 Volts (LED1-LED2 ON)  
NiCd/NiMh Cells
- 3) 6 Volts (LED1-LED3 ON)  
2 Cells LiPo
- 4) 9 Volts (LED1-LED4 ON)  
3 Cells LiPo

**RECEIVER BATTERY**

**NOTE:** Optional  
Connect a separate battery pack to the receiver using the "B" or "BAT" socket on the receiver. A small switch should be used on the receiver pack to operate the radio. The receiver pack should have no more than 5 cells. For operation turn on transmitter and turn on receiver switch. Leave the speed control switch in the **OFF** position.

**NOTE:** If the receiver does not supply a proper signal to the speed control, the speed control will blink all LEDs. In this case, check the radio system.

**ADJUSTMENT MODES CONT...**

- 5) 12 Volts (LED1-LED5 ON)  
4 Cells LiPo **\*DO NOT USE WITH 8 kV Motor**

**IMPORTANT:** If using Lithium Polymer (LiPo) batteries, DO NOT operate your vehicle with the factory default Cutoff Voltage setting.

**LED6: THROTTLE PROFILES**

- 1) Mildest profile, concave (LED1 ON)
- 2) Mild profile, concave (LED1-LED2 ON)
- 3) Linear profile (LED1-LED3 ON)
- 4) Aggressive profile convex (LED1-LED4 ON)
- 5) More aggressive profile, convex (LED1-LED5 ON)
- 6) More aggressive profile, convex (LED1-LED6 ON)
- 7) Most aggressive profile, convex, basically an on switch (LED1-LED7 ON)

**LED7: BRAKE PROFILES**  
-Same as Throttle Profiles.

**TROUBLESHOOTING**

**NO LIGHTS COME ON**  
Check for dead batteries. Check the connections between the batteries and the speed controller. Verify that there are no bad connections at the speed controller. Check that the switch is in the "ON" position.

**ALL LEDs FLASHING**  
Check receiver connection. Verify transmitter and receiver are functioning properly.

**BOTTOM OR TOP 3 LEDs FLASHING**  
\*Indicates neutral point from transmitter is out of expected range. Move transmitter trigger slowly in either direction until arming sequence occurs. Proceed to radio calibration.

**SERVO AND THROTTLE DEAD**  
Dead batteries. Bad connections to speed control. Bad receiver plug connection. Customer-installed receiver plug is wired wrong. Switch needs replacing. Broken wires. Bad crystal, radio equipment or blown fuse.

**OPERATING TIPS**

Listed below are a number of tips to ensure that you will get years of trouble-free performance from your Tekin speed

**PROPER ON/OFF PROCEDURE**  
Always turn your transmitter on first and then turn on your speed control. At the conclusion of your run, simply reverse the above procedure.

**BATTERY POLARITY**  
It is extremely important to ensure the battery pack is connected to the speed control properly. Connecting them backwards could cause severe damage to the battery pack and/or speed control.  
**DO NOT JAM GEARS**  
This will cause tremendous reduction in run time and excessive heat build-up.

**RADIO INTERFERENCE**  
Try to keep the receiver at least 1-2 inches away from any motor or battery wires.

**RECEIVER BATTERY**  
The built-in BEC (Battery Eliminator Circuit) is strong enough for 1 standard servo. If you are using a high power servo or over 7 cells, a separate receiver battery is needed.

**TROUBLESHOOTING CONT...**

**SERVO WORKS, THROTTLE DEAD**  
Speed control not adjusted correctly. Maybe in Pit Tune mode. Motor or connections to motor are bad. Receiver plug or connections are bad. Speed Controller not plugged into throttle channel on receiver.

**THROTTLE WORKS, SERVO DEAD**  
Bad servo. Disconnect servo. Wiring of plug is bad or incorrect.

**STUTTERING UNDER HEAVY ACCELERATION**  
Receiver is getting magnetic field interference. Try mounting receiver on its side and/or spacing it 3/16 inch up from the chassis. If this does not work, try mounting it on its other side. Move power wires away from receiver. Low current limiter setting.

**BRAKES DO NOT WORK AT ALL**  
Speed control improperly adjusted.

**AUTOCOUNT NOT WORKING**  
Mount transponder at front of car away from batteries and wires.

**TROUBLESHOOTING CONT...**

**NO REVERSE**  
QuickTune mode, Brake/Reverse Type is set to option 3. QuickTune mode, Brake/Reverse Type is set to option 2 (transmitter trigger must be in neutral position for 1 second before reverse is enabled).

**MOTOR WILL NOT SHUT OFF OR RUNS SLOWLY**  
Incorrect calibration. Moisture in speed control. Unhook batteries and let the speed control dry.

**MOTOR CUT OUT/RADIO INTERFERENCE /POOR RANGE**  
Transmitter batteries are low or damaged/mismatch crystals. Three-wire cable from speed control to receiver may also be too long; 6 inches is the maximum. This speed control radiates very low noise and you should have no trouble with interference. If you do have interference, mount the speed control in the pan, and mount the receiver and antenna at the top of the shock tower. Try to keep the receiver away from the batteries, power wires, metal or graphite.

**SERVICE AND REPAIR**

Before sending your Mini Rage in for service, please review the Instructions and Troubleshooting sections. After reviewing these instructions, if your MINI RAGE still requires service, please obtain the most current product service options & pricing by the following:  
WEBSITE: ([www.teamtekin.com](http://www.teamtekin.com)) Follow the instructions from the Service Request section of our website.  
PHONE/FAX: Contact our customer service department.  
WARRANTY SERVICE: For warranty work, you MUST CLAIM WARRANTY on PRODUCT SERVICE FORM & include a valid cash register receipt with purchase date and dealer name & phone# on it, or an invoice from previous service. If warranty provisions have been voided, there will be service charges. NOTES: Hobby dealers or distributors are not authorized to replace TEKIN products thought to be defective.

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**WARRANTY**

TEKIN, INC. guarantees speed controllers to be free from factory defects in materials and workmanship for a period of 120 days from date of purchase, when verified by sales receipt. This warranty does not cover: suitability for specific application, components worn by use or improper voltage (fuse provides protection in most cases), tampering, misuse, or shipping. Our warranty liability shall be limited to repairing unit to our original specifications. Because we have no control over the installation or use of this product, in no case shall we be liable for damages.  
Additionally, these items void the warranty:

- 1) Using the same polarity connectors on the battery and motor wires from the speed controller.
- 2) Allowing water or moisture into the speed controller.
- 3) Incorrect wiring.
- 4) Use inconsistent with the instructions.

**TEAM  
TEKIN**

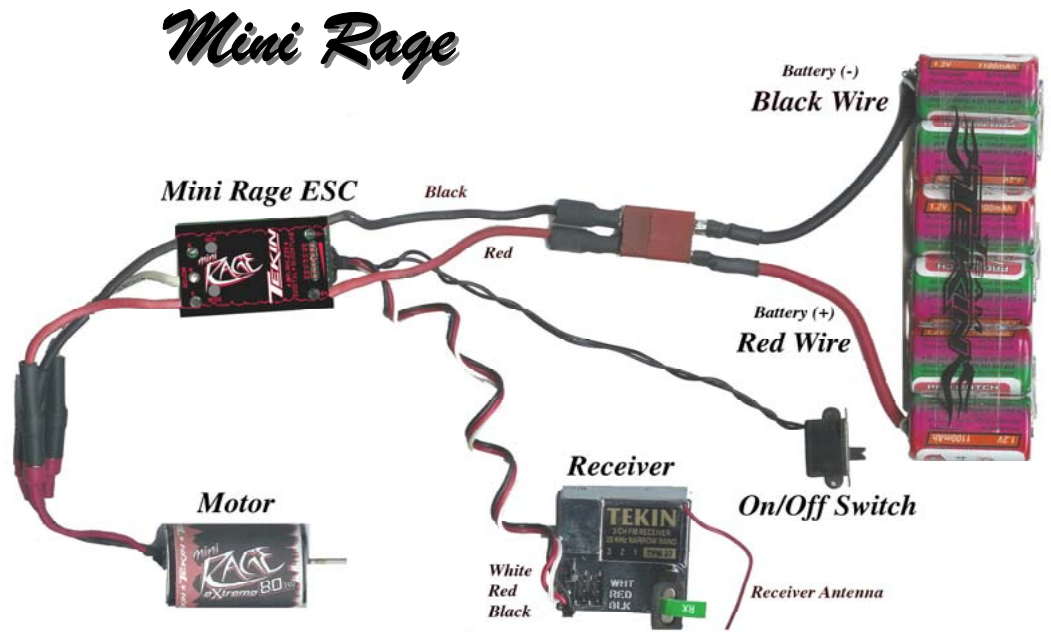


Figure 2. Connection Diagram