OWNER'S MANUAL

B1

Forward / Brake

B1-R

Forward / Brake / Reverse

PROFESSIONAL MINI BRUSHED SPEED CONTROL

- **Adjustable Drag Brake/Reverse Type**
- **Voltage Cutoff for LiPo Cells**
- **Push (Anti-Drag Braking)**
- **QuickTune™ Digital Setup**
- **Temperature Monitor**

INTRODUCTION

Congratulations on your purchase of the ***B1/B1-R***, Tekin's High Performance Mini Brushed Motor Electronic Speed Control. The QuickTune™ feature allows the user to quickly and accurately adjust all critical operating parameters. Just connect the speed control as described below, perform a quick radio calibrate, and you are ready to race!

PRECAUTIONS

The following statements need to be understood before using the *B1/B1-R*:

1. Turn on the transmitter first to avoid uncontrollable noise to speed control.
2. Disconnect battery from speed control when not in use.
3. Do not hook-up the battery backwards! No reverse voltage protection.
4. Do not operate speed control in or around water.
5. Insulate exposed wires with heat shrink tubing to prevent short circuits.
6. The *B1/B1R* is intended for Mini vehicles only.

SPEED CONTROL SPECIFICATIONS

Controls, B1	Fwd/Brk
Controls, B1-R	Fwd/Brk/Rev
Input Power (Cells)	4-8 NiCd/NiMh 2-3S LiPo
Motor Limit Size	370 Size or smaller
Motor Limit Turns	None
ON Resistance B1 B1-R	 0.0013 Ohms 0.0052 Ohms
Max Current B1 B1-R	 60 Amps 30 Amps
BEC	5 Volts, 1.5 Amps
Power Wires	16 GA Silicone
Dimensions	1.0 x 0.9 x 0.25 In. (25.4 x 23 x 6.3 mm)
Weight (with wires)	0.28 Oz (8g)

MOUNTING

For B1 Connection Diagram, Refer to Figure 2, For B1R Connection Diagram, Use Figure 3.

1) Placement: Choose a location for the speed control that is protected from debris. HINT: To prevent radio interference place the speed control as far away from the radio receiver as possible and keep the power wires as short as possible. If possible plan on routing power and motor wires away from the radio receiver and radio wires.
2) Mounting: For best results clean the bottom of the speed control and chassis. Using the doubled-sided tape, (included) mount the speed control to chassis.
3) Using a small piece of double-sided tape, mount the ON/OFF switch in a convenient place.
4) Determine how you would prefer to connect the motor and battery pack to the speed control. Using connector pairs is preferable for most applications as it allows you to easily switch battery packs and change motors. Whether using connectors or direct soldering, consider where your battery pack sits and how much wire will be needed to attach to the speed control.

SOLDERING, TOOLS NEEDED

The following items are needed to connect your speed control:

- Soldering Iron
- 60/40 Electric Grade Solder (or silver solder)
- 4 pieces 16 Ga. Wire (Included)
- Motor/Battery connectors (2 pair)

SOLDERING

IMPORTANT: Use extreme care and observe proper safety precautions when soldering. Always wear eye protection. Be sure that both wires are disconnected from the battery before soldering on the posts.

Never keep a hot soldering iron on the speed control solder posts for more than 3 seconds—the solder post may become de-soldered from the speed control and become damaged.

HINT: 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, then repeat the procedure below. Applying a small amount of solder paste flux can often help solder flow on a stubborn surface.

SOLDERING CONT...

ATTACHING WIRES TO THE SPEED CONTROL:

1) Red Wires are usually used to connect the speed control to the positive battery terminal and the positive motor terminal. Black wire is typically used for the battery negative terminal, and blue is used for the negative motor connection. Inspect the sticker on the speed control or refer to the diagrams to determine which color wire to attach to each post.
2) 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 of any excess solder while it is still hot. Be very careful not to splash yourself with hot solder.
3) If there is no solder on the post, place the tip of the iron in the notch on top of the post and apply a small amount of solder to the post. When the solder has flowed, remove the soldering iron, wipe the tip clean and apply a small amount of fresh solder to it.
4) Hold the wire so the tinned end is in contact with the notch of the post. Now touch the iron tip to the wire and 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 of the wire after a second or two when the solder sets.

SOLDERING CONT...

ATTACHING WIRES TO THE BATTERY:
The same techniques described in the preceding section may be used to solder the wires to the battery connectors.

IMPORTANT: Take precautions if removing factory battery connectors. Connecting the battery backwards will cause damage, and will void warranty. When soldering connectors to a battery pack, cut only one wire of the battery pack at a time to ensure that the exposed wires cannot short together.

HINT: If you are using Dean's connectors for both the battery and the motor, make sure that you have a male and a female attached to the speed control wires. That way, you cannot accidentally connect the battery to the motor wires or vice versa.

1) If using a connector between battery and speed control make sure that the ends will be mated together correctly, male to female, and that the wire colors match—red to red and black to black.
2) Solder the wires from the speed control to each of the connectors, then solder wires from the battery to each connector's mate.

SOLDERING CONT...

ATTACHING WIRES TO THE MOTOR:
The same techniques described in section 5 may be used to solder the wires to the motor.

1) If using a connector between motor and speed control make sure that the ends will be mated together correctly, male to female, and that the wire colors match—red to red and blue to blue.
2) Solder the wires from the speed control to each of the connectors, then solder wires from the motor to each connector's mate.

REMOVING WIRES:

1) Have a hot iron and the speed control secured. Clean the tip of the iron and apply a small amount of solder. While the tip is still smoking from the flux in the solder, touch the tip of the iron to the top of the post.
2) As the solder on the post melts, pull on the wire you wish to remove.

HINT: If there is excess solder remaining on the post, you may remove it by heating the post until the solder just starts to melt, then quickly tapping the speed control against the workbench to knock off the excess solder.

HOOKUP INSTRUCTIONS

DO NOT CONNECT BATTERY INCORRECTLY TO SPEED CONTROL, VERIFY THAT THE BATTERY POSITIVE WIRE WILL CONNECT TO THE SPEED CONTROL POSITIVE WIRE BEFORE CONNECTING!

1) CONNECT SPEED CONTROL TO RECEIVER
Plug the speed control into the throttle channel of the receiver.
   - Channel 1: Servo
   - Channel 2: Speed Control
     "REMEMBER: 1 to Turn, 2 to Burn"

2) CONNECT SPEED CONTROL TO BATTERY

Visually verify that the connector on the battery pack and the speed control match the chart below., then connect.
DANGER: 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. Tekin recommends the use of high quality battery connectors, such as Dean's Plugs, to improve power transfer and minimize the risk of short-circuits.

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

HOOKUP INSTRUCTIONS CONT...

3) CONNECT SPEED CONTROL TO MOTOR
Visually verify that the connector on the motor and the speed control match the chart below, then connect.

ESC	*MOTOR*
(M -) Blue Wire	(-) Negative
(M +) Red Wire	(+) Positive

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

RADIO CALIBRATION

NOTE: Before Radio Calibrating, ensure speed control is hooked up to the receiver, a charged battery is properly connected, and the transmitter is turned on. On your radio, set all trim adjustments to the middle, throttle/brake EPAs set to max and ensure that your throttle direction is set to "normal". Calibration is really very simple, you just press and hold the MODE button for 3 seconds to enter radio calibrate, let the speed control "find" your neutral, then let it "find" your full throttle and full brake. If you are unsure how to perform this procedure, follow the detailed steps outlined below.

Startup Sequence
When the power switch is turned ON the speed control begins looking for the neutral signal. If a neutral signal is found the Arming Sequence (flashes LEDs/chime) will occur followed by LED3 on steady. **NOTE:** If Arming Sequence does not occur see Trouble Shooting section of this manual before proceeding.

One Touch Radio 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. The speed control will make a pulsing chime as it looks for a neutral signal—you do not need to do anything yet.
4) When NEUTRAL position is found and recorded, LED3 will flash and a confirmation chime will sound.
5) The pulsing chime will begin again and LED6 will flash; pull transmitter trigger to the full throttle position and hold until the confirmation chime sounds.
6) The pulsing chime will begin again and LED1 will flash; push transmitter trigger to the full brake position and hold until the confirmation chime sounds.
7) Release trigger to return to neutral position. LEDs will flash and the arming sequence chime will sound.
8) LED3 is now on steady. Calibration is complete and you are ready to drive!

NOTE: If any problems occur, repeat radio calibration.
HINT: Once calibrated, the LEDs on the speed control will advance as the throttle or brake is applied.
Hairpin Trigger Response: If you wish to have a very short trigger range, then only squeeze the throttle/brake trigger partially during the radio calibration procedure. Throttle/Brake response will not be quite as smooth, but you can pull full throttle very quickly.

SELF TEST

The *B1 series* 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 5 seconds. After 5 seconds, the LEDs will ramp up in sets of two. Circuits inside the speed control are tested to see if any problems have occurred. If the unit passes self-test, then LED3 will stay on steady.
If problems occur turn the power off to the unit and verify all other connections are clean/tight/correct (motor, receiver, battery, plugs, etc). After verification, power the unit back on.

NOTE: Activating the self-test mode also resets all the user-programmable settings and parameters to their default values. The user's radio calibration settings are also reset to defaults.

QuickTune™

Tekin's QuickTune™ electronic setup feature allows users to change every critical operating parameter in a quick, easy, and accurate fashion. The basic operation is described as:

- Use MODE button to scroll to a Program Feature.
- Use INCR (increment) button to view/adjust the Feature.

QuickTune™ :

1) Press the MODE button to access the desired setup mode. The LED starts blinking to indicate that mode selection is under way. Each time the MODE button is pressed and released, the LED advances. For example, to get to the Voltage Cutoff adjustment, simply press and release the MODE button 6 times. **NOTE:** Do not wait longer than 5 seconds to adjust the selected MODE or the speed control will return to normal operation.
2) Press and release the INCR button to adjust the value. The first time INCR button is pressed, the LED(s) will display the existing setting. Each time the INCR button is pressed the value will advance, then after maximum, 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.

QuickTune Example: Let's say you want to use a 2 cell LiPo battery. To change the Voltage Cutoff from the default setting (1 = None) to setting 2 (2 = 6.0 Volt Cutoff), first follow step 1 above by pressing and releasing the MODE button 6 times. Now press and release the INC button, the LED should show the current setting of 1. Press and release the INC button again and the LED will move to position 2, indicating that Voltage Cutoff is now set to 6.0 Volts. Wait 5 seconds and the ESC returns to normal operation.
HINT: If you wish to set another Program Feature, 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 Tune Mode

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: Unplug the steering servo from the receiver to avoid servo damage. 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. Turn the speed control power off and back on to resume normal operation.

QuickTune™ MODES

MODE	*RANGE*	*DEFAULT*
DRAG BRAKE (DRG B)	1-11	1 (OFF)
NEUTRAL WIDTH (NW)	1-11	5
CURRENT LIMITER (LIM)	1-11	11 (OFF)
PUSH CONTROL (ANTI DRAG) (PC)	1-11	1 (OFF)
REVERSE TYPE—B1R (RT)	1-3	3
THROTTLE PROFILES-B1 (TP)	1-6	3
VOLTAGE CUTOFF (VC)	1-4	1 (NONE)

LED1: DRAG BRAKE control provides immediate braking action in the neutral zone. This gently slows the car down when you let off the trigger. Drag Brake can provide a better cornering approach. Higher values increase the degree of drag braking.

ADJUSTMENT MODES CONT...

LED2: NEUTRAL WIDTH adjusts your deadband around the neutral point. A low neutral width value provides more sensitive trigger response around neutral.
LED3: CURRENT LIMITER adjusts the throttle response during acceleration to control annoying wheelspin. Low values allow low amounts of current to pass to the motor, higher values allow higher amounts of current. The top value (11) turns OFF current limit.
LED4: PUSH CONTROL or ANTI-DRAG BRAKING overcomes the natural drag of the motor when you return to neutral. Racers refer to this as "creep" , this setting eliminates the need to trim the throttle forward to create a coasting (pushing) effect. Low values give you a short duration push, higher values a longer duration push
LED5: BRAKE/REVERSE TYPE **B1R ONLY**

1) Proportional Brake with Reverse Lockout (LED1 ON). Proportional brake will be applied during reverse throttle.
2) Forward to Brake to Reverse (LED1-2 ON). The car will operate freely in forward and reverse. (Brakes to a stop before switching into reverse)..
3) Proportional Brake with Reverse Delay (LED1-3 ON). The car will only go in reverse if the trigger has been in neutral for 1 second, otherwise it operates like proportional brake with no reverse.

TEMPERATUREE MONITOR

The On-Board Temperature Monitor works to provide you with important feedback on speed control temperature, helping you to adjust gearing and avoid long term heat damage. To use;

1) The speed control must be calibrated to your radio and the radio must be in the neutral position.
2) The middle LED will be on steady, and should blink out every 2 seconds.
3) At the moment that the center LED blinks out, one or more of the other LEDs will light up.
4) LEDs 1-3 lit is typical of light loads or a stock motor. LEDs 1-5 lit indicates heavy loads and is typical when running mod motors. LEDs 1-6 lit indicates high internal temperatures approaching thermal shutdown. Discontinue use until the speed control returns to normal operating temperature.

RECEIVER BATTERY

NOTE: Optional. Connect a separate battery pack to the receiver using the "B" or "BAT" socket on your receiver. A small switch should be used on the receiver pack to operate the radio., and the receiver pack should have no more than 5 cells. IMPORTANT: You must remove the red wire from the speed control servo plug and cover it with heat shrink tubing.

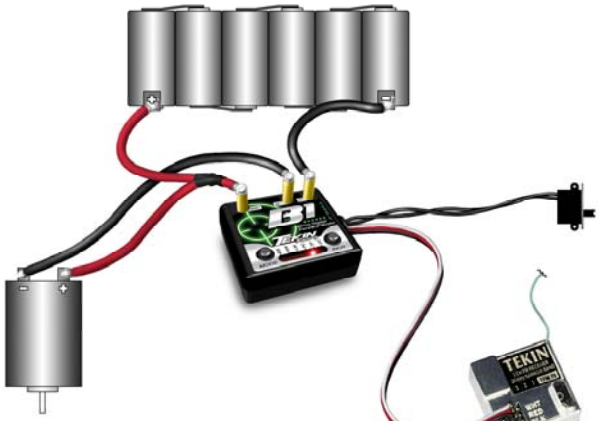

Figure 2.
B1 Connection Diagram

ADJUSTMENT MODES CONT...

LED5: THROTTLE PROFILES **B1 ONLY**

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) Custom— User Adjustable Using Tekin HotWire PC Connection (LED1-LED6 ON).

LED6: VOLTAGE CUTOFF

1) NONE (LED1 ON)
   NiCd/NiMh Cells.
2) 6 Volts (LED1-LED2 ON)
   2 Cells LiPo (2S)
3) 9 Volts (LED1-LED3 ON)
   3 Cells LiPo (3S)
4) Custom (LED1-LED4 ON)
   User Adjustable Cutoff, requires Tekin HotWire PC Connection.

IMPORTANT: If using Lithium Polymer (LiPo) batteries, DO NOT operate your vehicle with the factory default Cutoff Voltage setting (None).

TROUBLESHOOTING

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

ALL LEDs FLASHING
No radio signal can be found. Check receiver connection and verify that ESC is plugged into correct channel. Verify transmitter and receiver are functioning properly.

BOTTOM OR TOP 3 LEDs FLASHING
Radio signal found, but neutral point from transmitter is out of expected range. Speed control not calibrated properly or radio settings have been changed. Recalibrate speed control as described in the Radio Calibration section.

SERVO AND THROTTLE DEAD
Check for dead batteries, bad connections to speed control, dad receiver plug connection. Switch may need replacing. Broken wires, bad crystal, bad radio equipment.

THROTTLE WORKS, SERVO DEAD
Broken servo. Wiring of plug is bad or incorrectly wired.

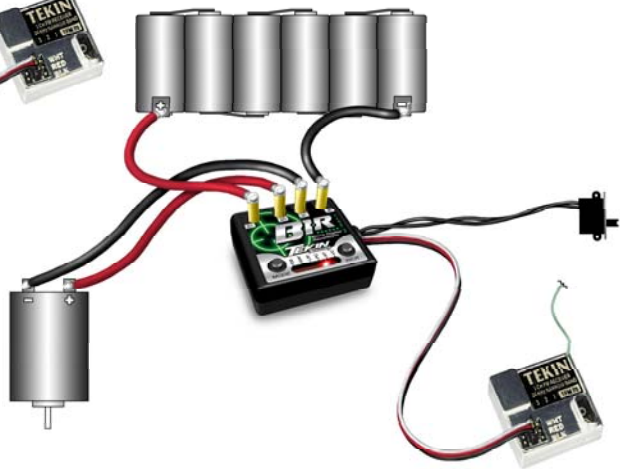

Figure 3.
B1R Connection Diagram

OPERATING TIPS

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

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 THROTTLE
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 you may need a separate receiver battery (see Receiver Battery section).

TROUBLESHOOTING CONT...

SERVO WORKS, THROTTLE DEAD
Speed control not adjusted correctly. May be in Pit Tune mode. If LEDs are flickering, may indicate that Voltage Cutoff is set above battery pack voltage. Check that cutoff is correctly set and that battery is fully charged. Motor or connections to motor are bad. Receiver plug or connections are bad. Speed control not plugged into throttle channel on receiver.

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. Check for low current limiter setting. Check for incorrect Voltage Cutoff setting.

BRAKES DO NOT WORK AT ALL
Speed control or radio transmitter improperly adjusted. Adjust EPAs on transmitter all the way out and recalibrate speed control to radio.

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 1. QuickTune mode, Brake/Reverse Type is set to option 3 (transmitter trigger must be in neutral position for 1 second before reverse is enabled). Speed control is a B1, not a B1R (not a reversing type).

MOTOR WILL NOT SHUT OFF OR RUNS SLOWLY
Incorrect radio calibration or throttle trim setting on transmitter. Check transmitter settings and recalibrate speed control. 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. Mismatched crystals. The 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 B1/B1-R in for service, please review the Instructions and Troubleshooting sections. After reviewing these instructions, if your speed control still requires service, please contact our customer service department for additional assistance. To obtain the most current product service options and pricing, consult the following:
WEBSITE: (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 A COMPLETELY FILLED OUT PRODUCT SERVICE FORM and include a VALID CASH REGISTER RECEIPT with purchase date, dealer name & phone# on it, or an invoice from previous service. If warranty provisions have been voided, there will be service charges.

NOTE: 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, 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.