TEKIN BXR

- **Element Proof Design**
- **Adjust Drag Brake via Radio**
- **Active Drag Technology**
- **QuickTune Digital Setup**
- **HotWire & Datalogging Capability**

INTRODUCTION

Congratulations and thank you for purchasing the BXR Element Proof Rock Crawling Speed Control! Compact Size, Element Proof Design and Active Drag Technology combine to give you the ultimate in scale brushed rock crawling performance. Adjust Drag Brake right from your radio with the auxiliary wire on most radio systems! When space is limited and you want to hide your electronics, the BXR is the perfect ESC for the job.

BEFORE YOU BEGIN

Read through this manual and familiarize yourself with the terms, error codes and general workings of the ESC. Keep this manual for future reference.

1) The BXR is intended for use in lightweight Scale Crawlers.
2) Make sure the motor/battery are within Tekin specs.
3) Check battery polarity! **NO** reverse Polarity Protection.
4) Check labeling of solder posts before soldering.
5) The BXR is water resistant, however we recommend using caution operating your vehicle in or around water. **DO NOT** submerge the BXR under water. Drive scale and do work!

POWER CAPACITOR

CAUTION: A power capacitor is supplied with the BXR and MUST BE MOUNTED on the ESC for proper operation (Figs. 2 & 3). Failure to use the power capacitor can cause irreparable damage to the ESC and void the warranty.

INSTALLING CAP:
The capacitor (TT3518 180uf) should be mounted directly to the Battery Positive BATT (+) and Battery Negative BATT (-) posts on the ESC, with the capacitor wires cut as short as possible. The capacitor polarity is indicated on the top of the capacitor by a colored half-circle which is the BATT (-) connection (Fig. 2).

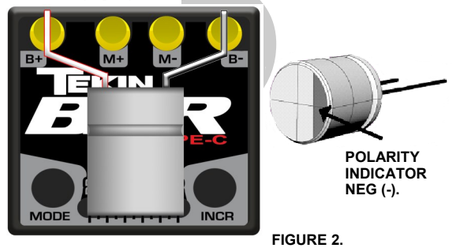


FIGURE 2.

SOLDERING

Wiring instructions refer to Fig. 4

Tips & Tricks
Use a stable work area to do a quality job (Figure 3). Attach the capacitor before the wires. The order for proper soldering is:

- Tin Posts
- Tin Wires
- Heat Posts
- Heat Wires
- Heat both and connect

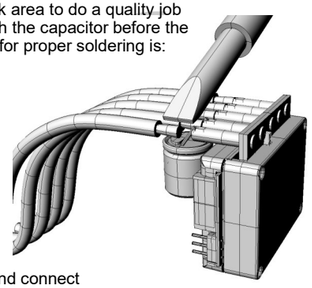


FIGURE 3.

Hint: If the wire is too hot to hold 2" away from the solder joint, the iron has been on for too long— stop, let everything cool and try again. Excessive heat can damage the ESC.

WIRING DIAGRAM

FIGURE 4.

WIRING INSTRUCTIONS

1) *CONNECT ESC TO RECEIVER*
Plug the ESC into the throttle (TH) channel of the receiver.

- Channel 1: Servo
- Channel 2: ESC

"REMEMBER: 1 to Turn, 2 to Burn"

2) *CONNECT ESC TO BATTERY*
Visually verify that the connector on the battery pack and the ESC match then connect.

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

3) *CONNECT ESC TO MOTOR*
Verify the polarity of the Motor soldering posts on the ESC. Refer to Figure 4 for wiring brushed motors.

RADIO CALIBRATION

NOTE: Before Radio Calibrating, ensure the ESC is hooked up to the receiver in Channel 2 (CH2), a charged battery is properly connected, and the transmitter is turned on and bound to your receiver.

Refer to Section 10 below.

1) On your transmitter, set all trim adjustments to the middle, throttle/brake EPAs and Dual Rate set to 100.

2) Press and hold MODE for 3-5 seconds or until the ESC gives a 4 chime confirmation. It is now in calibration mode and will start by looking for the neutral signal first, while blinking the center (#4) LED with a simultaneous "beep" with each blink.

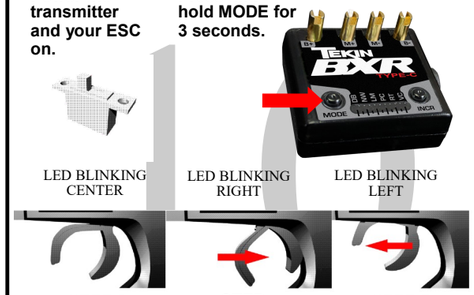
3) Once neutral is found, the 4 chime confirmation will sound again and the right (#7) LED will begin to blink, indicating the ESC is looking for a full throttle signal. Pull and hold full throttle until you hear the confirmation chime.

4) The ESC will then switch to the left (#1) LED and look for a full brake/reverse signal. Push and hold full brake until you hear the confirmation chime. After the confirmation, let go of the trigger and the ESC will arm, go to neutral and actively show the onboard temperature (Section 11).

5) If the ESC does not show the temperature monitor (LED 4 and 1 cycling back and forth) check section 8 to see if any Error Codes are present.

STEP 1.
Power the transmitter and your ESC on.

STEP2.
Press and hold MODE for 3 seconds.



STEP 3.
Leave trigger in Neutral.
WAIT FOR CHIME

STEP 4.
Pull and hold full throttle.
WAIT FOR CHIME

STEP 5.
Push and hold full brake.
WAIT FOR CHIME

Hint: If the ESC fails to recognize your full throttle signal, try reversing the throttle channel in the transmitter system menu.

INSTALLATION

Plan Speed Control Placement

1) Choose a location for the ESC that is protected from debris and moving parts. Plan ahead with wire routing and try to keep the motor leads about the same length. Motor leads should be short, but not tight. Leave some slack in the wiring to account for chassis flex and vibrations while driving.

2) Mock up your wire lengths for your planned ESC placement. It is recommended to solder the power cap and all leads to the ESC before mounting to the chassis.

3) Choose a wiring method for the motor and battery leads. Direct wiring uses no plugs and provides the best connection between the motor and the ESC. You can use Tekin 4.0mm Hi-Power bullet connectors (TT3054) for easy motor removal. Battery connector choice is up to you, use the female plug on the battery and the male on the ESC and double check the polarity.

4) To mount the ESC, clean the bottom with rubbing alcohol. NEVER use any chemicals such as motor spray or acetone as they will damage the plastic. Use the provided double sided tape or a 3M adhesive tape.

5) Secure the ON/OFF switch in a safe, accessible place away from moving parts and debris.

QUICKSTART

After properly installing your ESC, follow these steps for a quick setup:

1) With the ESC installed and properly wired, (Figure 4) connect the battery.

2) Turn the transmitter on FIRST, then the ESC.

3) Take note any codes that may be present. Refer to Section 8 for codes.

4) Set transmitter throttle trims to 0 and throttle EPAs to 100. You can access these features in the system menu on the transmitter.

5) Perform a Radio Calibration, refer to Sections 9 & 10.

6) Factory default voltage cutoff is set for a 2S LiPo battery @ 6.4V. Double check the battery you are using and adjust Voltage Cutoff if needed.

7) Optional: Updating Firmware via HotWire—see Section 20.

SPECIFICATIONS

Controls - BXR	Fwd/Brk or Fwd/Brk/Rev
Input Voltage - BXR	2-3S* LiPo (4-9S NiMh/NiCd)
Motor Limits - BXR Brushed **(2S)** Brushed **(3S)**	 20Turn 36mm Can 30Turn 36mm Can
Max Current BXR	 40 Amps
BEC	6V / 3.7Amp
Dimensions **Weight**	1..0 x .90 x .35" / 25.4 x 23 x 9mm .39oz / 11g

WARNING: Exceeding product specifications or using equipment outside of the specification ranges above automatically voids the 180-day manufacturer warranty. Any damage caused from misuse or use of equipment outside of the specifications will be subject to servicing and or replacement fees to be determined by the Tekin Service Department. For further warranty information, please refer to Section 22 or visit us on the web at www.teamtekin.com.

External BEC recommended when running 3S voltage. See Section 5 for more information.

BEC INFO

The BXR is equipped with an internal BEC that supplies power to your receiver and steering servo. For applications running only 2S 7.4V LiPO the BEC is usually sufficient powering a mid-level steering servo. If you notice the steering servo cutting out, it is from overloading the BEC. Try not to bind up the steering and move rocks, there is a limit to how much steering power you can have on tap.

If you choose to run 3S 11.1V LiPO, the BEC cannot supply the 3.7A it is rated for at 2S voltage. We strongly recommend an external BEC be used to take the servo and accessory load off of the BXR. This will decrease internal temperatures and increase the lifespan of your ESC.

It is not recommended to power accessories other than a servo off the internal BEC. Tekin recommends powering any LEDs, sound modules, winches or other powered accessories off of the main battery or a separate battery/ BEC.

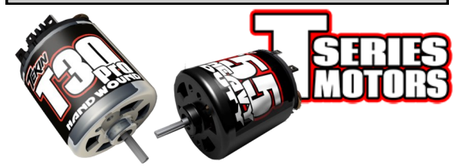
IMPORTANT LED CODES

Your ESC is an intelligent piece of equipment and can usually tell you exactly what the problem is. Refer to this section should your ESC show you any LED sequence out of the ordinary. You can also go to www.teamtekin.com/esc_codes.html to see these codes in action. Each code will FLASH rapidly:

ALL LEDS FLASHING	No signal from receiver. Check that receiver bind light is on and ESC is plugged into CH2.
LEDS 1, 2 & 3	LOW neutral signal. Adjust radio trims to center and perform radio calibration.
LEDS 4, 5 & 6	HIGH neutral signal. Adjust radio trims to center and perform radio calibration.
LEDS 1, 3 & 5	LOW VOLTAGE CUTOFF. Battery voltage is below programmed voltage cutoff. Charge battery.

Note that while in neutral your ESC will flash from LED 4 to LED 1 every 3 seconds. This is the internal temperature monitor display. As your ESC heats up the number of LEDs that show each time the temperature is displayed will increase. Please see Section 11 for more information on temperature readings.

T-SERIES BRUSHED MOTORS



Combo the BXR with a Tekin T-Series Brushed Crawler Motor for a premium system! Fully rebuildable design, dual ball bearings, and 3S LiPo capable, the T-Series motors are available in two different versions; the Pro Hand Wound and the Heavy Duty series. The Pro series are precision hand wound and balanced for professional performance. The HD series pack strong magnets to supply the torque you demand.

TT2113 - T55 HD Brushed Motor
TT2114 - T45 HD Brushed Motor
TT2115 - T35 HD Brushed Motor
TT2123 - T40 PRO Brushed Hand Wound Motor
TT2124 - T30 PRO Brushed Hand Wound Motor

TT3804 - HD T-Series Rebuild Kit: Brushes and Springs
TT3805 - PRO T-Series Rebuild Kit: Brushes and Springs

TEMPERATURE MONITOR

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

1) The ESC must be calibrated to your transmitter and must be in neutral.
2) The middle LED will be on steady then 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) LED Temperature readings:

LED1	LED1-2	LED1-3	LED1-4	LED1-5	LED1-6
Ambient	120*F	140*F	160*F	180*F	200*F

Should your ESC show all 6 LEDs, stop driving and let it cool. The ESC will go into Thermal Shutdown if it is not allowed to cool down. You may need to lower your gearing, change to a higher turn motor or repair any binding in the drivetrain. Continuous use at high temperatures and multiple "thermals" can damage the ESC.

QUICKTUNE™

PRESS MODE TO ACCESS:
LED1 - DRAG BRAKE
LED2 - REVERSE SPEED
LED3 - THROTTLE PROFILE
LED4 - BRAKE TYPE
LED5 - ACTIVE DRAG
LED6 - VOLTAGE CUTOFF

PRESS INCR TO:
Adjust the feature currently selected. Refer to the QuickTune adjustments table (section 13) for ranges of adjustment and what they accomplish.

LED1: DRAG BRAKE provides immediate braking action in neutral. This gently slows the car down when you let off the trigger. Higher values increase the drag brake strength.

LED2: REVERSE SPEED changes how strong (fast) your reverse is. Lower values will decrease speed, higher values will increase speed.

LED3: THROTTLE PROFILE changes how aggressive the throttle curve is. Lower values will de-tune the throttle curve and higher values will make it more aggressive. See Section 14 for more information.

LED4 ACTIVE DRAG is a drag brake enhancement that when turned on, gives you drag while driving. Normal drag brake only engages when the ESC is in neutral, whereas Active Drag is brake that is always on.

1) Active Drag OFF (LED 1 ON)
2) Active Drag ON (LED1-LED2 ON)

LED5: BRAKE TYPE allows you to choose between having only brakes, forward to immediate reverse or forward with brakes and reverse delay.

4) Brushed, Fwd/Brk (LED1 ON)
5) Brushed, Fwd/Brk/Rev (LED1-LED2 ON)
6) Brushed, Fwd/Brk/Rev Delay (LED1-LED3 ON)

LED6: VOLTAGE CUTOFF
IMPORTANT: **If using LiPo batteries, ensure a proper Voltage Cutoff is programmed.**

1) 3.2 Volts (LED1 ON). NiCd/NiMh
2) 6.4 Volts (LED1-LED2 ON). 2S LiPo
3) 9.6 Volts (LED1-LED3 ON). 3S LiPo

Cutoff can be set per cell through the HotWire. Default is 3.2V per cell. The 3.2V cutoff is highly recommended to avoid over discharging LiPO cells, which can cause irreparable damage.

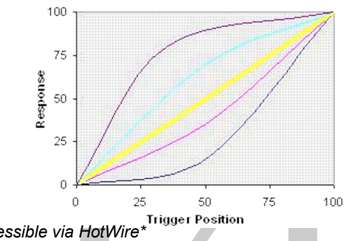
LED Display: The LED light bar displays values and settings on your speed control in a few ways. Settings with a range of 1-6 are shown by just one LED at a time. Settings with a wider range of 1-11 are shown by a combination of 1 and 2 LEDs at the same time. While adjusting, the LEDs will "walk" up the ladder in a way that 1 will be lit, followed by 1&2, then 2, then 2&3 and so on. Critical settings (such as Brake Type and Voltage Cutoff) are always indicated by multiple LEDs at a time to ensure proper adjustment.

QUICKTUNE™ SETTINGS

MODE	*RANGE*	*DEFAULT*
DRAG BRAKE (DB)	1-11	4 (50%)
REVERSE SPEED (RS)	1-11	11(100%)
THROTTLE PROFILE (TP)	1-11	2&3
BRAKE TYPE (BT)	1-3	3 (REV Delay)
ACTIVE DRAG (AD)	ON-OFF	ON
VOLTAGE CUTOFF (VC)	1-3	2 (6.4V)

The Tekin QuickTune system provides access to a few basic adjustments on your ESC. All the settings in section 12 are available and semi-adjustable through this onboard system, with more options and higher resolution of settings available through the HotWire software with on PC or a mobile device. Making trackside adjustments takes just a few seconds!

THROTTLE PROFILES



Accessible via HotWire

1) Mildest profile - concave
2) Mild profile - concave
3) **Linear profile (DEFAULT)**
4) Aggressive profile - convex
5) Most Aggressive profile - convex

Throttle profiles are available through the HotWire software and allow you to tune the aggressiveness of your ESC. Default is set to Linear which gives you consistent feel from low throttle to full. Profiles 1 & 2 will soften the feel in the low to mid throttle range and Profiles 4 & 5 increase the low to mid throttle aggressiveness.

TRANSMITTER PROGRAMMING

EXPO
Settings on your radio can also change the throttle curve and be used with or without the built-in profiles. Setting negative EXPO will soften the throttle and positive EXPO will make throttle more aggressive and reactive at low positions.

Typically EXPO settings around –45% on both high and low throttle will smooth out the first bit of trigger movement and soften the throttle engagement. This effectively lowers the sensitivity of the trigger, giving you some room for error without sending your vehicle off of an obstacle by accident.

THROTTLE REVERSE
Some radio signals are reverse that of others. Should you have difficulty performing a radio calibration (Sections 9 & 10) try reversing the Throttle channel BEFORE calibrating. Only do this BEFORE calibrating so the ESC knows that throttle is throttle and brake is brake. If you reverse the Throttle channel after calibrating to correct the motor rotation direction, the ESC will be driving in reverse and reversing in throttle. This will make features like Reverse Delay and Drag Brake fail to operate properly.

The correct way to calibrate is to do any channel reversing prior to calibrating and if the motor rotation is wrong, swap the positive and negative motor wires.

TROUBLESHOOTING

HINT: When powered on, the ESC emits an all-systems-go chime if it is connected correctly to the motor and radio. Check Section 8 on reverse side if any codes are displayed.

NO LIGHTS COME ON
- Check battery charge and polarity.
- Verify that the switch is in the ON position.
- Check all solder joints and plugs for a good connection.
- Unplug your servo from your receiver. A shorted servo can cause power up issues.
- Unplug sensor harness, possible sensor board short.
- Check ESC receiver plug for proper polarity.
- Re-flash ESC with HotWire. Incomplete or interrupted updates can "brick" the ESC.

ALL LEDS FLASHING
- Check that transmitter and receiver are properly bound.
- Check ESC receiver plug for correct polarity and that it is plugged into CH2.

WILL NOT CALIBRATE
- Check transmitter batteries and replace if necessary.
- Reverse throttle channel on transmitter if necessary.
- Check that transmitter and receiver are properly bound.
- Verify that radio End Points are set to maximum.

NO STEERING OR THROTTLE
- Check battery voltage and polarity.
- Check that transmitter and receiver are properly bound.
- Check receiver plugs for correct polarity or damaged wires.

STEERING WORKS, NO THROTTLE
- Check for Low Voltage Cutoff code (section 8).
- Check battery voltage.
- Check motor connections, try another motor if possible.
- Check ESC plug for correct polarity and damaged wires.
- Check motor brushes.

THROTTLE WORKS, NO STEERING
- Shorted or broken servo.
- Check servo plug for correct polarity and damaged wires.
- Replace servo.

MOTOR RUNS BACKWARDS
- Check transmitter throttle reverse setting.
- Verify motor wires are connected + to + and - to -. Wiring backwards will not cause damage and can be done if your transmission is mirrored.

MOTOR RUNS WITH NO THROTTLE INPUT
- Set transmitter throttle trim to 0. If anything other than 0 is needed, perform a radio calibration with the trim at 0.

NO REVERSE
- Motor Type set to MT1 (no reverse.)
- Motor Type set to MT3 (reverse delay). Needs 1 full second in neutral before reverse will activate.

NO BRAKES
- Check transmitter Low Throttle EPA adjustments.
- Check Brake Strength settings in the ESC.
- Check for proper radio calibration. All LEDs should flash at full throttle and full brakes/reverse.

DRAG BRAKE WON'T ADJUST ON RADIO
- Verify Auxiliary wire is connected to spare receiver channel.
- Verify radio is setup to use the spare channel.

ADJUST DRAG BRAKE VIA RADIO

Drag Brake strength can be adjusted on the fly via a spare channel on your radio. The auxiliary wire can be plugged into a spare channel in the receiver and allow you to adjust the Drag Brake from a 3-position switch on your radio. **NOTE:** Not all radios will have the proper switch and settings to use this feature.

For a full explanation and help setting this feature up, please visit www.teamtekin.com/adjustabledragbrake.html and view the video tutorial.

STEP 1. The first step is to plug the auxiliary wire into a spare channel on your receiver.

STEP 2. Set your desired Drag Brake Strength in the HotWire or with the buttons on the ESC. This will be the default every time the ESC is powered on.

STEP 3. Set up your radio so a 3-position switch talks to the spare channel your ESC AUX wire is now plugged into. This process will differ from radio to radio, so it is best to consult your user manual for radio programming.

ACTIVE DRAG

Active Drag is a Drag Brake enhancement. Normal Drag Brake only activates when the ESC is in neutral and you are not applying any brake or throttle. Active Drag applies Drag Brake all the time, not just in neutral. This gives you a greater sense of drag in your drive train and slows the vehicle down as you roll off throttle towards neutral. For rock crawling and scale vehicles this aids in controlling vehicle descent speed on slopes and increases control immensely. It eliminates the transition period from throttle to brake as they both happen simultaneously.

FACTORY RESET

All Tekin ESCs have a built-in factory reset mode that resets all user programmable settings to the default values. To activate, turn the ESC on, then press/hold both the INCR and MODE buttons simultaneously for 3-5 seconds. The LEDs will ramp up in sets of three, confirming Factory Reset **NOTE:** Performing a Factory Reset also resets all the radio calibration settings to their default values. A radio calibration will need to be done.

ELEMENT PROOF

The BXR is part of Tekin's Element Proof product line. Our Element Proof ESCs and Motors are suitable for use in wet, snowy or muddy conditions, but electronics are still vulnerable even when measures are taken to protect them from moisture.

Element Proof ESCs are designed to withstand splashes and some watery encounters. Take on the trails in wet, muddy or snowy conditions knowing that your ESC is up to the task! Please note that you will need to properly protect any plug connections with the included grease (brushless systems only).

Element Proof Motors are designed to withstand splashes and some watery encounters. Adventure confidently know that your motor is protected from the elements! Please note that you will need to properly protect any plug connections with the included grease (brushless systems only).

Tekin **DOES NOT** recommend submerging Element Proof products in liquid. Doing so will void any warranty described in Section 22. Please be responsible and use common sense when enjoying R/C in wet conditions, treat your vehicle like it belongs on land as it isn't a submarine!

HOTWIRE™ PROGRAMMING DEVICE

The HotWire PC/Bluetooth Interface (TT1452) unlocks the full potential of your Tekin ESC. Connect via Bluetooth to your iOS or Android device for full adjustability of your ESC settings on the fly. The HotWire 2.0 (TT1451) can also be used via USB connection on PC and compatible Android devices.

The BXR programs through USB connection only and if using the HotWire 3.0 TT3848 adapter cable is needed. Bluetooth connection is not available on the BXR.

Tekin frequently releases new firmware for ESCs, which can be downloaded from the website and flashed to the ESC. This means a longer lifespan for your ESC! With access to tons of features not fully accessible from the onboard interface, the HotWire is a must have item.

Check out more at

www.teamtekin.com/hotwire.html

You can connect to the BXR through the receiver wire. Verify plug polarity.

PARTS & ACCESSORIES

CASE KITS
TT3853 - BXR Case Kit

CAPACITORS
TT3518 - Power Cap 16V 180uf

TEKIN FLEXWIRE
TT3032 - FlexWire 14awg Red 3ft
TT3033 - FlexWire 14awg Black 3ft
TT3034 - FlexWire 14awg White 3ft
TT3035 - FlexWire 14awg Red 50ft
TT3036 - FlexWire 14awg Black 50ft
TT3037 - FlexWire 14awg White 50ft

HOTWIRE
TT1451 - HotWire 2.0
TT1452 - HotWire 3.0 BLE

WARRANTY / REPAIR

TEKIN, INC. guarantees ESCs to be free from factory defects in materials and workmanship for a period of 180 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 ESC.
2) Submerging the ESC in liquid.
3) Failure to attach the supplied capacitor.
4) Incorrect wiring or use inconsistent with the instructions.

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.

REPAIR: Before sending your speed control 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.

NOTE: Hobby dealers and distributors are not authorized to replace TEKIN products thought to be defective.

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