

BRUSHLESS + Turbo SPEED CONTROLLER

RC MODEL CARS
YOKOMO
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Yokomo Electric Speed Controller (ESC) BL-PRO3 + Turbo, BL-RS3 + Turbo Instruction Manual

- ★ Turbo Mode is enabled when using the "BL-PRO3" and "BL-RS3" modes.
- ★ Initially, the BL-PRO3 and BL-RS3 are configured to use the "BL-PRO2" and "BL-RS2" modes, respectively, which have the Turbo Mode disabled.
- ★ When using the "BL-RS2" mode on the BL-RS3, the programmer will display "BL-PRO2" mode.
- ★ The BL-YBP3 programmer can be used to easily configure the Turbo Mode settings. (It is possible to enable the Turbo Mode by only using the ESC, but configuring specific Turbo Mode settings can only be accomplished using the YBP3 programmer.)

- ☆ The red LED will blink when the ESC is in Turbo Mode (BL-PRO3/RS3)
- ☆ The green LED will blink when the Advance Timing setting is 0 on the BL-PRO2, BL-RS2, BL-PRO3, and BL-RS3.

■ Features

- Turbo mode increases the power delivered while in full throttle.
- Easily connects to the YBP3 programmer via the 3-pin connector located next to the Setup button.
- ESC modes ("BL-PRO2", "BL-PRO3" and "BL-PRO3 sensorless") can be easily changed using the YBP3 programmer, by pressing down the UP and DOWN keys simultaneously.
- Supports running on 1 LiPo cell. (Please set the cutoff voltage to 3 V.)
- Employs an aluminum casing to improve heat dissipation.
- Supports sensorless motors.

■ Specifications

1. Proportionally-controlled forward, brake, and reverse movement
2. Smooth throttle response
3. Compatible with sensored and sensorless brushless motors
4. Supports LiPo, LiFe, NiCd and NiMH batteries
5. Adjustable start current and current limits
6. Rich braking features (Speed mixing brakes, neutral brake, Min brake, Max brake)
7. Supports Forward only ("One way") and Forward & Reverse ("Two way") control modes
8. Easy configuration using the optional YBP3 programming card.
8. Built-in overheating protection
10. Support for single LiPo cells. (When using a single LiPo cell, the "LiPo" battery mode is used. No additional configuration is required, as the number of cells will be automatically recognized.)

■ Precautions

- ※ Be sure to understand the instructions fully before using this product.
- ※ Do not drive through water puddles, as it can cause the product to malfunction or break.
- ※ This product supports 4 to 6 NiCd or NiMH cells, 1 to 2 LiPo cells, or 2 LiFe cells.
- ※ Turn the power switch off after use.
- ※ Follow the proper order of turning on the ESC. First, verify that the ESC is properly connected to the receiver then turn the transmitter on. Finally, turn the ESC on.
- ※ Beware of the battery polarity. The ESC will be damaged if the polarity is reversed.
- ※ Do not touch the ESC and other parts after running, as they can become very hot.
- ※ Do not short circuit.
- ※ Do not attach to places where grease, moisture or oil can enter.
- ※ When drifting, please use a brushless motor which has a turn count of 10.5 T or higher.
- ※ (For BL-PRO3) When using a brushless motor with less turns than 4.5 T, be sure to use 5 cells (6V) or a single LiPo cell. Do not use 6 cells (7.2V) or 2 LiPo cells, as it may damage the ESC.

●ESC Throttle Setting Setup

1. Turn the transmitter on.

A note about throttle reversal settings:

- * Futaba and KO transmitters are usually in Reverse position, but some models may be in the Normal position.
- * Sanwa transmitters are usually in the Normal position, but some models may be in the Reverse position.

2. Connect the motor and the ESC, then turn the ESC on.

3. If ESC is properly connected, a beep melody ("♪Do Re ~ Do Re Mi") will play.

If the ESC is improperly connected, the melody will not play.

4. Press the Setup Button for over 1 second. The green LED will start blinking. At this point, let go of the Setup Button, and then the green LED will stop blinking and will stay lit. Then, a beep melody ("♪So So La La So So") will play. Now, place the transmitter's throttle to neutral, move to full forward, then full brake, then return to neutral.

5. The red and green LEDs will then alternate, and the melody ("♪So Fa Mi Re Do") will play, and the green LED will stay lit. At this point, the ESC setup is complete.

Caution:

1. When changing the transmitters or ESC settings, please repeat the above steps to configure the throttle position settings.

2. Please do not make throttle inputs on the transmitter from the time between turning the ESC on and pressing the Setup Button. Once the throttle is moved, the throttle position setup cannot be performed. To perform the throttle setup again, please turn the ESC off and turn it back on to commence to the setup mode.

3. When performing the throttle setup, please perform it in Normal mode. When performing it in High Response mode, the setup may not work properly.

4. Always connect the sensor cable.

Note: If the transmitter's throttle trim settings are changed after the throttle setup has been performed, the ESC will not operate. Please perform the ESC throttle setup again.

Advanced Usage

●Program Setup

1. Turn the transmitter on.

2. Connect the motor and battery to the ESC, and turn the ESC on.

(Program setup and the ESC throttle setup cannot be performed in succession. The ESC must be turned off once before performing a setup.)

3. If the connections are properly made, the ESC will play one of the following melodies to notify the throttle position:

"♪Do Re ~ Do Re Mi" ---Throttle trim is in the neutral position.

"♪Do Re ~" ---Throttle trim is not in the neutral position.

4. Press the Setup Button for over 1 second. The green LED will blink for 2 seconds, and the red LED will light up.

At this point, let go of the Setup Button, and a beep melody ("♪Mi Re Do Re Mi") will play and the red LED will blink once. The ESC is now ready to be programmed.

5. Throttle inputs from the transmitter will be used to change the program and the configurations.

●The number of times the red LED blinks will change by moving the throttle from full brake (full reverse) to full forward and back to full brake.

●The number of times the red LED blinks will indicate the selected program.

Program (# of times the red LED blinks)		Settings (# of times the green & red LED blinks)	Default Settings		
			BL-PRO2, BL-RS2	BL-PRO3 BL-RS3	BL-PRO3 BL-RS3 (S_LESS)
Select Mode	1	BL-PRO2(1) / BL-PRO3(2) / S_LESS(3)			
Select Battery	2	LiPo(1) / LiFe(2) / NiMh (NiCd) (3)	LiPo	LiPo	LiPo
Cut Off Voltage	3	Disable(1)Auto(2) / 3.0V(3) ~ 7.5V(12)	Auto	Auto	Auto
Power Curve	4	0(1) ~ 10(11)	5	5	5
Advance Timing * Turbo	5 YBP	0(1) ~ 10(11)	10 X	4 1	25 X
Acceleration	6	0(1) ~ 10(11)	5	5	5
Start Power	7	Lowest(1) / Low / Normal / High / Highest(5)	Lowest	Normal	Normal
Start Current Limit	8	Off(1), 1(2) ~ 10(11)	Off	Off	Off
Current Limit	9	Off(1), 1(2) ~ 10(11)	Off	Off	Off
Reverse Function	10	One Way(1)/Two Way(2)/Two Way2(3)/Two Way3(4)	Two Way	One Way	One Way
Reverse Delay	11	Off(1)/0.2(2)/0.5(3)/0.8(4)/1.3(5)/1.8(6)/2.5(7)	2.5s	2.5s	2.5
M-Reverse Amount	12	2(1)~10((9))	10	10	10
Neutral Width	13	Narrow(1) / Normal(2) / Wide(3)	Normal	Normal	Normal
Motor Direction	14	Normal(1) Reverse(2)	Normal	Normal	Normal
Speed Mixing Brk	15	0 (1) ~ 10(11)	0	0	X
Auto Brk Amount	16	0 (1) ~ 10(11)	0	0	0
Min Brake Amount	17	0 (1) ~ 10(11)	3	3	3
Max Brake Amount	18	0 (1) ~ 10(11)	5	5	10
Cut Off Temp	YBP	Disable / 100° ~ 135°	135	135°	135°
Cut Off M-Temp	YBP	Disable / 100° ~ 135°	135	135°	X
B.E.C. Voltage	YBP	6.0V / 7.4V	6.0V	6.0V	6.0V
Current Voltage	YBP	XX.X	Read Only		
Current Temp	YBP	0° ~ 135°	Read Only		
Max Temperature	YBP	0° ~ 135°	Read Only		
Motor Temp	YBP	0° ~ 135°	Read Only		X
Motor Max Temp	YBP	0° ~ 135°	Read Only		X
Max Current	YBP	0 A ~ 999 A	Read Only		
Motor Pole Num	YBP	2 ~ 20 Pole	2	2	2
Gear Ratio	YBP	2.0:1 ~ 15.0:1	2.0	2.0	2.0
Tire Diameter	YBP	40 ~ 200 mm	63	63	63
Motor-Wiring	YBP	A-B-C / C-B-A	A-B-C	A-B-C	X
Maximum Speed	YBP	XXX.X km/h	Read Only		
Average Speed	YBP	XXX.X km/h	Read Only		
Error History	YBP	M,T1,T2, S, V, R	Read Only		
Down Load	YBP	All parameters inside the setup card are downloaded to the ESC.			
Restore Memory	YBP	All setting information inside EEPROM are read via the RAM.			
Backup Memory	YBP	All setting information inside the RAM are stored at EEPROM			
Factory Setting	19 YBP	Reset all programs to factory settings	BL-PRO2		

※The number in the parenthesis indicates the number of times the LED blinks.

※The numbers in the second column indicates the number of times the red LED will blink to indicate which "Program" is selected. Programs which have "YBP" listed are available only on the optional YBP3 programmer.

※For a description of the programs and settings, please refer to the "Program Setup" section.

※When the "Cutoff Voltage" is set to "Auto", the following settings will be used:

LiPo - the higher of 3.2 V (1 cell) or 6.4 V (2 cell) or 66% of the fully-charged voltage, when the power switch is turned on.

LiFe - the higher of 4.4V (2 cell) or 67% of the fully-charged voltage, when the power switch is turned on.

NiMH/NiCd - the higher of 3.0 V or 50% of the fully-charged voltage, when the power switch is turned on.

- To change the configuration value of the selected program, place the throttle in full forward for 4 seconds. The red and green LEDs will blink. The number of times the LEDs blink indicates the current setting. (Please keep the throttle in full forward.)
- To change the configuration value, return the throttle to neutral, and within 4 seconds, move the throttle to the full forward position. While the throttle is in full forward, the number of times the red and green LEDs to blink will change.
(Please refer to the above table to determine the configuration indicated by the LEDs.)
- When the number of times the LEDs blinks corresponds to the desired configuration value, return the throttle to the neutral position. If the throttle is in neutral for more than 4 seconds, the ESC will play a melody ("♪Mi Re Do Re Mi"), and the selected configuration value will be stored.
- At this point, another program can be selected for configuration.
- Once you have finished programming the ESC, briefly pressing the Setup Button will place the ESC in standby mode. Please turn the ESC off if no further configurations are needed.

Caution: When entering the ESC throttle setup or programming setup, please press the Setup Button after turning on the ESC, before making any throttle inputs.

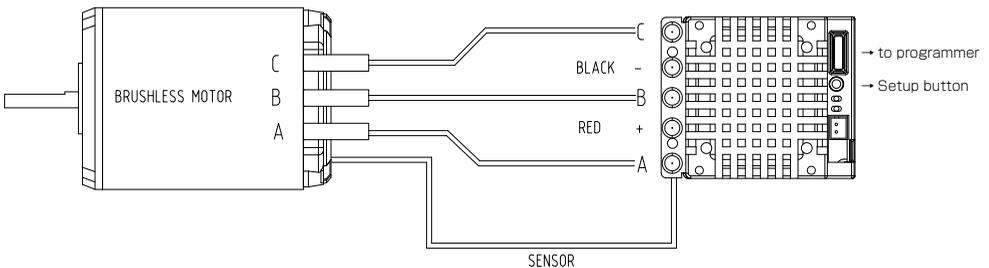
LED indicators when operating the ESC	
Full throttle	Red LED lit
Neutral	Green LED lit
Full reverse/brake	Both LEDs lit
Error	Red LED blinking

Error indications	
No signal	Red LED turns off for 1 sec., and blinks for 5 sec., then turns off.
Low battery	Red LED turns off for 1 sec., and blinks for 2 consecutive times
Sensor error	Red LED turns off for 1 sec., and blinks for 3 consecutive times
High temperature	Red LED turns off for 1 sec., and blinks for 4 consecutive times

- Even after returning all the programs to their factory settings, the motor type and throttle position settings will remain.
- The blinking LEDs when turning the ESC indicates the current Battery Mode.

Green LED blinking 3 times: LiPo mode	Red LED blinking 3 times: LiFe mode	Red and Green LEDs blinking 3 times: NiMH/NiCd mode
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■ Connection between the ESC and the motor



■ Be sure that the ESC and motor is connected correctly. Improper connections can cause damage to the ESC.

When attaching wires onto the ESC, please complete the soldering within 5 seconds. If soldering takes longer, it may damage the ESC.

Precautions when using Turbo Mode

By placing the ESC into "BL-PRO3" will enable the Turbo Mode.

- Using Turbo Mode may elevate the motor and ESC temperatures. To prevent excessive heating which can damage the ESC and motor, exercise caution when configuring the gear ratios, timing and Turbo settings.
- When using Turbo Mode while drifting, please be sure to use a motor with 10.5 T or higher (a lower kv value). Not doing so can lead to damage from overheating.
- Settings for Turbo Mode can only be set by the YBP3 programmer.
- After running in Turbo Mode, check the ESC temperature and current values via the programmer and make adjustments to the Turbo Mode settings. If the temperature is too high (maximum 134 degrees), ease back on the Turbo settings.
- Turbo Mode is not available for "BL-PRO2/RS2" modes.
- Do not increase the advance timing of the brushless motor too much.

Using Turbo Mode

※ Changing the ESC mode to "BL-PRO3" / "BL-RS3" from "BL-PRO2" / "BL-RS3" mode is possible by using the ESC and transmitter. However, configuring the individual Turbo Mode settings can only be performed by the BL-YBP3 programmer.

1. Connect the BL-PRO3/-RS3 to the brushless motor. Ensure that the sensor cable from the motor is connected to the ESC.
2. After confirming that the ESC is turned off, connect the battery to the ESC.
3. Connect the ESC to the programmer (using the bundled cable) via the 3-pin terminal located next to the Setup Button.
4. Turn on the ESC, and the programmer should turn on.
5. The ESC mode can be changed by pressing the UP and DOWN buttons simultaneously on the YBP3 programmer. The modes will cycle though (in order): "BL-PRO2", "BL-PRO3", and "S_LESS" (sensorless).

Setting up Turbo Mode

1. Display the "Advance Timing" program via the YBP3 programmer.
2. The setting should show the default value of "4+1". The number "4" is the timing value, and the timing can be selected from the range of 0 to 10. (By increasing the value, the motor timing will increase, causing the RPM to increase but the torque will decrease.)
3. The "+1" is the Turbo setting. This can be set from 0 to 5, and increasing the value will increase the amount of timing which will be boosted when full throttle is applied.

Reference Settings for Drifting		
<ul style="list-style-type: none">■ Yokomo Drift Package (constant velocity)■ Yokomo ZERO 10.5 T brushless motor (default advance timing)■ 2-cell LiPo batteries■ Gear ratio: 70/23 7.16 (asphalt) 80/23 8.16 (carpet)	Battery type	LiPo
	Cutoff Voltage	6.0 V
	Throttle Curve	1
	Advance Timing	3 + 3
	Power Curve	5
	Start Power	Lowest
	Start Current Limit	Off
	Current Limit	Off
	Reverse Mode	Two Way
	Reverse Delay	2.5 s
	Neutral Width	Normal
	Speed Mixing Brakes	5
Auto Brake Amount (neutral)	5	
Min. Brake Amount	3	
Max. Brake Amount	10	

- For a description of the programs and settings, please refer to the "Program Setup" section.

Program Setup

Select Mode	Select the ESC mode from "BL-PRO2", "BL-PRO3" or "S_LESS" (sensorless).
Select Battery	Select the battery type.
Cut Off Voltage	Sets the cutoff voltage of the battery.
Power Curve	With "5" being standard (linear), less than "5" will make a "-" curve, while higher than "5" will give a "+" curve.
Advance Timing	Sets the advance timing of the motor. By increasing the value, the timing will increase causing the RPM to increase, but the torque will decrease.
Turbo	Sets how much timing should be boosted (to give a higher RPM) at full throttle. (Only configurable using the YBP3 programmer.)
Acceleration	Higher values will improve the throttle response.
Start Power	Higher values will improve the acceleration at low speeds.
Start Current Limit	Lower values will limit the current delivered to the motor when starting up.
Current Limit	Lower values will limit the current delivered to the motor.
Reverse Function	One of the modes from "One Way" (forward only), "Two Way" (forward and reverse), "Two Way2", or "Two Way3" can be chosen. <ul style="list-style-type: none"> ● "Two Way" will start reversing after delaying for time set in "Reverse Delay" ● "Two Way2" will start reversing after waiting about 1 second after stopping. (Switching directions is possible in 6-7 sec. max.) ● "Two Way3" will brake when first moving the throttle into reverse, and will reverse only if throttle is moved into reverse one more time.
Reverse Delay	Delay time before going into reverse.
M-Reverse Amount	Higher values will allow higher maximum reverse speeds.
Neutral Width	Sets the width of neutral on the throttle.
Motor Direction	Changes the motor's rotational direction.
Speed Mixing Brk	Adjusts the amount of brakes applied according to speed. Brakes will be strong at high speeds, and weak at low speeds. Increasing the setting will change the braking response depending on motor speed. (This feature will emulate braking response of brushed motors in brushless motors.)
Auto Brk Amount	Higher values will strengthen the neutral brakes.
Min Brake Amount	Changes the amount of brakes applied at the beginning of the brake throw. Higher values will result in stronger brakes.
Max Brake Amount	Changes the amount of brakes applied at the end of the brake throw. Higher values will result in stronger brakes.
Cut Off Temp	Sets the ESC temperature at which the ESC should shutdown. (Only configurable using the YBP3 programmer.)

Cut Off M-Temp	Sets the motor temperature at which the ESC should shutdown. This feature cannot be used if the brushless motor does not contain a temperature sensor. (Only configurable using the YBP3 programmer.)
B.E.C. Voltage	Sets the voltage sent to the receiver from the ESC. The voltage will be set to 6 V when the battery voltage is lower than 7.4 V. Note: When using the 7.4 V setting, be sure to use a high voltage servo. Not doing so may result in servo damage. (Only configurable using the YBP3 programmer.)
Current Voltage	Displays the current battery voltage. (Available when connected to the YBP3 programmer.)
Current Temp	Displays the current ESC temperature. (Available when connected to the YBP3 programmer.)
Max Temperature	Displays the maximum ESC temperature of the previous run. (Available when connected to the YBP3 programmer.)
Motor Temp	Displays the current motor temperature. Not available for brushless motors w/o a temperature sensor. (Available when connected to the YBP3 programmer.)
Motor Max Temp	Displays the maximum motor temperature of the previous run. Not available for brushless motors w/o a temperature sensor. (Available when connected to the YBP3 programmer.)
Max Current	Displays the maximum current of the previous run. (Available when connected to the YBP3 programmer.)
Motor Pole Num	Sets the number of poles the brushless motor has. Most available R/C car motors have 2 poles. (Please check the pole count in the motor's documentation.) (Available when connected to the YBP3 programmer.)
Gear Ratio	Entering the gear ratio and tire diameter will allow the "Maximum Speed" and "Average Speed" values to be calculated and displayed. (Available when connected to the YBP3 programmer.)
Tire Diameter	Entering the gear ratio and tire diameter will allow the "Maximum Speed" and "Average Speed" values to be calculated and displayed. (Available when connected to the YBP3 programmer.)
Motor-Wiring	(This feature applies only to sensed brushless motors.) By default, the order is set to A, B, C.
Maximum Speed	Displays the maximum speed of the previous run. (Available when connected to the YBP3 programmer.)
Average Speed	Displays the average speed of the previous run. (Available when connected to the YBP3 programmer.)
Error History	If an error occurred in the previous run, it will be displayed. M=Motor Error, T1=ESC Temp. Error, T2=Motor Temp. Error S=Sensor Error, V=Voltage Error, R=Receiver Error.
Down Load	Downloads the settings on the YBP3 programmer to the ESC. Please be sure to "Download" the settings to the ESC after making setting changes.
Restore Memory	Restores the previous ESC settings stored using the "Backup Memory" function.
Backup Memory	Backs up the current ESC settings to the YBP3 programmer.
Factory Setting	Restores the ESC's factory settings.

■Customer Support

Our Customer Support staff can answer questions and address concerns regarding Yokomo products, including inquiries about repairs.

Customer Support can be contacted via e-mail at support@teamyokomo.com.

Caution: We do not provide any support for products which have been modified and/or disassembled. Hobby shops and distributors do not have the authority to decide whether a product is defective.

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