



BLC-80 BRUSHLESS MOTOR ELECTRIC SPEED CONTROL INSTRUCTION MANUAL

Item No. 8065

INTRODUCTION

Congratulations on selecting the ACE RC BLC series brushless motor electric speed control. The BLC-80 are designed for the mini to mid-size electric aircraft / helicopter. These brushless motor speed controls can satisfy all your flying needs. It's capable of supplying up to 80 Amps (BLC-80) of continuous motor current. It's small and lightweight, but includes a large heat sink surface area. It's the most suitable ESC for the Thunder Tiger OBL series brushless motors. For safety considerations, there are built-in safety features to prevent accidental motor startup when powering on. Before using this speed control, please read the manual carefully so that setup can be done properly.

FEATURES

- Low battery voltage protection
- Over-heat protection
- Throttle signal loss protection
- 3 kinds of Start Mode alternative: Normal/Soft/Super-Soft
- Motor timing adjustment
- Brake control
- Throttle response adjustment
- Airplane and helicopter modes alternative

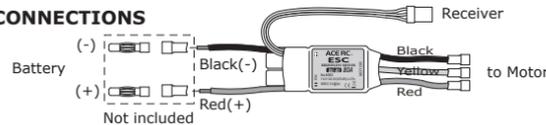
SPECIFICATIONS

| | |
|----------------------------|---------------------------------------|
| Item No. | 8065 |
| Product Name | BLC-80A |
| Applicability | Li-po 2~6-cell / NiMH, NiCd 5~18-cell |
| Continuous / Burst Current | 80A / 100A (>10-second) |
| BEC Voltage / Current | 5V / 3A |
| Brake | Yes |
| Governor Mode | Yes |
| Weight | 71.8-gram |
| Dimensions | 83 x 31 x 16 |

CONTENTS

- 80A Speed Controller x 1
- Ø4.0 mm Gold Connectors x 3 sets (factory welding for motor connection)
- Instruction Manual x 1

CONNECTIONS



NOTE

- 1) Ensure that all solder connections are of good quality.
- 2) Connect the ESC to the motor matching the corresponding wire colors. If the motor rotation is the opposite of what is desired, then simply reverse any two of the wires.
- 3) Make sure that the battery polarity is connected properly.

FUNCTION

BRAKE SETTING

Enabled / Disabled, default is Disabled

BATTERY TYPE

Li-xx (Li-ion or Lipo) / Ni-xx (NiMH or NiCd), default is Li-xx.

LOW VOLTAGE PROTECTION MODE(CUT-OFF MODE)

Soft Cut-Off (Gradually reduce the output power) or Cut-Off (Immediately stop the output power). Default is Soft Cut-Off.

LOW VOLTAGE PROTECTION THRESHOLD(CUT-OFF THRESHOLD)

Low / Medium / High, default is Medium.

- 1) For lithium batteries, the cells quantity of a battery pack is calculated automatically. Low / medium / high Cut-Off voltage for each cell is: 2.85V / 3.15V / 3.3V. For example: For a 3 cells lithium pack, when "Medium" Cut-Off threshold is set, the Cut-Off voltage of this battery pack will be: 3.15 x 3=9.45V.
- 2) For nickel batteries, low / medium / high Cut-Off voltages are 0% / 50% / 65% of the startup voltage (it means the initial voltage of a charged battery pack), and 0% means the low voltage Cut-Off function is disabled. For example: For a 10 cells NiMH battery, fully charged voltage is 1.44 x 10=14.4V, when "Medium" Cut-Off threshold is chosen, the Cut-Off voltage will be: 14.4 x 50%=7.2V.

STARTUP MODE

Normal / Soft / Super-Soft (300ms / 6s / 12s), default is Soft. Normal is preferred for fixed-wing aircraft. Soft or Super-Soft are preferred for helicopters. The acceleration of the Soft and Super-Soft modes are slower in comparison, usually taking 6 seconds for Soft startup or 12 seconds for Super-Soft startup from zero throttle advance to full throttle. If the throttle is closed (throttle stick moved to the bottom position, zero throttle) and opened again (throttle stick moved upward) within 3 seconds after the initial startup, the restart-up will be temporarily changed to normal mode to get rid of the chances of a crash caused by slow throttle response. This special design is suitable for aerobic flight when quick throttle response is needed.

TIMING

Low / Medium / High (3.75°/15°/26.25°), default is Low. Usually, low timing or medium timing is suitable for most motors. In order to get higher speed and bigger output power, please choose High timing.

CAUTION

After changing the timing setting, please test your RC model on ground before taking off!

SETTING PROCEDURE

CAUTION

Please always disengage the pinion gear from the main gear during this procedure for safety.

The following processes explain the throttle calibration and the setting of ESC. Please refer the FUNCTION MODE CHART and select which modes you wish to use since the setting procedure immediately follows the calibration procedure.

THROTTLE RANGE SETTING

This procedure must be performed if a new transmitter is being used.

1. Turn on the transmitter and put the throttle stick at full throttle position.
2. Turn on the receiver if do not use the built-in BEC.
3. Connect battery pack to ESC and wait for about 2 seconds.
4. You will hear 2 tones (Beep- Beep-) from the ESC, which means the full throttle position has been calibrated.
5. Move the throttle stick to the idle position (lowest position) for about 1 second, and then you will hear several tones. (depending on the cell numbers of battery pack you used)
6. A long Beep- tone means the idle throttle position has been calibrated and now the ESC is ready to go.

PROGRAM PROCEDURE

STEP A Enter Program Mode

1. Turn on the transmitter and put the throttle stick at full throttle position.
2. You will hear 2 tones (Beep- Beep-) from the ESC.
3. Stay and wait for 5 seconds, you will hear a special tone like "♪56712", which means you are in Program Mode.

STEP B Program Selecting

You will hear 8 kinds of tones in a loop with following sequence in the Program Mode; a specific function will be selected if moving the throttle stick to bottom within 3 seconds after one kind of tones.

STEP C Value Setting

1. You will hear 3 kinds of tones in loop consistently. Set the value per the tone referring the chart by moving throttle stick to the top position, and it means the value is set and saved if sound a special tone "♪1515".
2. Continuing to set other functions, please stay and wait the function go back to STEP B, and then select the other function you want to set.

FUNCTION MODE CHART

| Function | Sound | Sound | Setting Value |
|--------------------------|-----------------------|-----------------|----------------|
| Brake | Beep | Beep- | Off |
| | | Beep-Beep- | On |
| | | Beep-Beep-Beep- | |
| Battery Type | Beep-Beep- | Beep- | Li-ion / Li-po |
| | | Beep-Beep- | NiMH / NiCd |
| | | Beep-Beep-Beep- | |
| Cut-Off Mode | Beep- Beep-Beep- | Beep- | Soft-Cut |
| | | Beep-Beep- | Cut-off |
| | | Beep-Beep-Beep- | |
| Cut-Off Threshold | Beep- Beep-Beep-Beep- | Beep- | Low |
| | | Beep-Beep- | Medium |
| | | Beep-Beep-Beep- | High |
| Start Mode | Beep□□ | Beep- | Normal |
| | | Beep-Beep- | Soft |
| | | Beep-Beep-Beep- | Super-Soft |
| | | | |
| Timing | Beep□□Beep- | Beep- | Low |
| | | Beep-Beep- | Medium |
| | | Beep-Beep-Beep- | High |
| Restore factory settings | Beep□□Beep- Beep- | | |
| Exit | Beep□□Beep□□ | | |

STEP D Exit the Program Mode

There are 2 ways to exit Program Mode:
 Move the throttle stick to the bottom within 3 seconds after hearing the last kind of tones (#8; Beep----Beep----) at STEP B
 Moving the stick to bottom within 2 seconds after sounding the special tones (♪1515) at STEP C.

NORMAL STARTUP PROCEDURE

1. Put the throttle stick at the lowest position and turn on the transmitter.
2. Turn on the receiver if do not use the built-in BEC.
3. Connect battery pack to ESC and wait for about 2 seconds.
4. You will hear a special tone (♪123) from the ESC, which means the power supply is working correctly.
5. Several tones sounds which indicate the cell numbers of battery pack you used.
6. When the self-test completed, you will hear a long Beep- tone, which means the throttle stick is at bottom position and the ESC is ready to go.

CAUTION

High power motor systems could be very dangerous. High current could generate heat on wires, batteries, and motors. Always follow the instruction and use proper tools to set up the system within safe range. Always fly at a designed field with caution even though this controller is equipped with safety arming program.

TROUBLE SHOOTING

| Trouble | Possible Reason | Solution |
|---|--|---|
| After power on, motor does not work, no sound is emitted | The connection between battery pack and ESC is not correct | Check the power connection. Replace the connectors. |
| After power on, motor does not work, such an alert tone emits: "beep-beep-, beep-beep-, beep-beep-" (Every "beep-beep-" has a time interval of about 1 second) | Input voltage is abnormal, too high or too low. | Check the voltage of battery pack |
| After power on, motor does not work, such an alert tone is emits: "beep-, beep-, beep-" (Every "beep-" has a time interval of about 2 seconds) | Throttle signal is irregular | Check the receiver and transmitter Check the cable of throttle channel |
| After power on, motor does not work, such an alert tone emits: "beep-, beep-, beep-" (Every "beep-" has a time interval of about 0.25 second) | The throttle stick is not in the bottom (lowest) position | Move the throttle stick to bottom position, and make sure it is Zero throttle at this position. |
| After power on, motor does not work, a special tone "♪56712" emits after 2 beep tone (beep-beep-) | Direction of the throttle channel is reversed, so the ESC has entered the program mode | Set the direction of throttle channel correctly |
| The motor runs in the opposite direction | The connection between ESC and the motor need to be changed. | Swap any two wire connections between ESC and motor |
| The motor stop running while in working state | Throttle signal is lost | Check the receiver and transmitter Check the cable of throttle channel |
| | ESC has entered Low Voltage Cut-off Protection mode | Land RC model as soon as possible, and then replace the battery pack |

SERVICE

Thank you for purchasing the BLC series brushless motor ESC. Thunder Tiger strives to bring you the highest level of quality and service we can provide. We race and test our products around the world to bring you state-of-the-art items. Thunder Tiger guarantees that you should enjoy many hours of trouble free use from our R/C products. Thunder Tiger products have been sold worldwide through the authorized distributors that are supported directly and rapidly from Thunder Tiger. You may find that Thunder Tiger is always pursuing to explore new items creatively with highest quality. To update the latest product information and to get the best technical support, please feel free to contact your local hobby shops or Thunder Tiger authorized distributor



BLC-80 BRUSHLESS MOTOR ELECTRIC SPEED CONTROL INSTRUCTION MANUAL

產品編號: No.8065

產品說明

感謝您購買ACE RC BLC系列無刷馬達電子速控器。BLC-80適用於小型或中型電動直昇機及飛機上。此系列之無刷馬達及電子速控器能滿足您的飛行所需。能供應80Amps的馬達電流。體積小、重量輕，且有極大散熱表面積，使速控器擁有極佳的散熱性。它是最適合雷虎OBL無刷馬達系列的速控器。基於安全考量，速控器內建保護程式，以避免可能發生的危險。使用速控器之前，請詳細閱讀說明書，以便能正確使用並完成設定。

特點說明

- 電池低電壓保護
- 過熱保護
- 油門訊號丟失保護
- 3種緩啟動設定模式：普通、柔和、超柔和
- 馬達進角調整
- 煞車功能
- 油門反應調整
- 飛機和直昇機模式

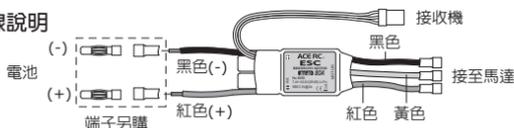
基本規格

| | |
|-------------|---------------------------------------|
| 產品料號 | 8065 |
| 產品名稱 | BLC-80A |
| 電壓範圍 | Li-po 2~6-cell / NiMH, NiCd 5~18-cell |
| 持續 / 瞬間電流輸出 | 80A / 100A (>10-second) |
| BEC電壓 / 電流 | 5V/3A |
| 煞車 | 有 |
| 定速模式 | 有 |
| 重量(g) | 71.8 |
| 尺寸(mm) | 83 x 31 x 16 |

內容物

- 80A速控器 x 1
- ϕ 4.0mm鍍金端子 x 3 組 (用於電池連接)
- 說明書 x 1

接線說明



注意

- 1) 確認所有端子均確實焊接。
- 2) 請根據導線顏色連接馬達速控器。如欲將馬達逆轉，可直接交換任兩條馬達導線即可。
- 3) 請確認電池兩極是否妥善連接。

產品功能簡要說明

剎車設定

無剎車 / 有利車，出廠值為無剎車。

電池類型

Li-xx (鋰電池) / Ni-xx (鎳鎘或鎳氫) 兩大類電池，出廠值為Li-xx (鋰電池)。

低壓保護模式

逐漸降低功率 / 立即關閉輸出，出廠值為逐漸降低功率。

(注：低壓保護過程中，電壓恢復到比低壓保護閾值高一定量後，可以退出低壓保護模式。低壓保護關閉油門輸出後，歸零油門再重新啟動，可再次驅動馬達；但因為仍處於低壓狀況，所以功率輸出不會太大)。

低壓保護閾值

低 / 中 / 高，出廠值為中截止電壓。

- 1) 當設定使用的是Li-xx電池，則自動判斷鋰電片數。低 / 中 / 高情況下每節電池的截止電壓分別為：2.85V/3.15V/3.3V。例如使用3-cell鋰電，設定為中截止電壓，則低壓保護閾值為：3.15 x 3=9.45V。
- 2) 當設定使用的是Ni-xx電池，低 / 中 / 高情況下截止電壓為開機時輸入電壓的0%/50%/65%。0%意味著不進行低壓保護。例如：使用6-cell鎳氫電池，充滿時電壓為：1.44 x 6=8.64V，當設定為中截止電壓時，則截止電壓閾值為8.64 x 50%=4.3V。

啟動模式

普通 / 柔和 / 超柔和啟動，啟動時間為300ms/6s/12s。出廠值為柔和啟動。普通啟動適用於固定翼，柔和啟動 / 超柔和啟動適用於直升機。柔和啟動和超柔和啟動的初始轉速都比較低，從啟動到全速分別需要6秒和12秒，但啟動後若關閉油門，3秒內再次啟動時則均以普通模式啟動，以免做特技飛行動作時因反應過慢而導致摔機。

進角

低 / 中 / 高，分別為：3.75度 / 15度 / 26.25度。出廠值為低進角。一般情況下，低進角可以適應較多的馬達。但是因為馬達結構差異很大，請試用各個進角以獲得滿意的驅動效果。為提高轉速，可以將進角設為高進角。

警告

改變進角後，建議先在地面進行測試，然後再飛行。

設定步驟

警告

安全起見，在進行設定時，請先將馬達齒脫離大齒盤。

以下設定步驟會說明油門校正及速控器設定程序。請參見功能模式說明表並依個人需求選擇適當的模式進行設定。

油門行程設定

當速控器與發射機首次搭配時，務必執行本設定程序。

1. 將油門撥桿置於全油門位置後，開啓發射機電源。
2. 如無內建BEC功能，請直接開啓接收機電源。
3. 將電池組連接上速控器，並等待2秒。
4. 當聽到速控器發出“嗶-嗶-”兩聲響，表示全油門位置已完成校準並紀錄。
5. 將油門撥桿移至最低點並等待1秒，此時速控器會發出數聲響響（響聲數取決於您所使用的電池組片數）。
6. 當聽到速控器發出一長“嗶-”聲時，表示油門最低點位置已完成校準並紀錄，此時速控器已完成校正程序並已可正常使用。

編程程序

步驟A 進入編程模式

1. 將油門撥桿置於全油門位置後，開啓發射機電源。
2. 您將會聽到速控器發出“嗶-嗶-”兩聲響。
3. 暫不動作5秒後，速控器會發出一連串響響“♪56712”，表示您已進入編程模式。

步驟B 選擇編程項目

進入編程模式後，會聽到8種音響響，按如下順序循環發出，在音響某個提示音後3秒內將油門撥桿撥至最低點，即可進入該編程項目。

步驟C 參數值設定

1. 每一編程項目下，皆會有3種音響響，按如下順序循環發出。在聽到特定響響後將油門撥桿撥打至最高點，表示為選擇該響響所對應的設定值，接著聽到一連串響響“♪1515”時，表示該參數值已完成設定並紀錄。
2. 繼續等待會自動退回步驟B，此時可繼續設定其他功能參數。

功能模式說明表

| 設定項 | 提示音 | 提示音 | 參數值 |
|-----------|------------|----------|-----------|
| 1. 剎車 | “嗶” | “嗶-” | 無剎車 |
| | | “嗶-嗶-” | 有利車 |
| | | “嗶-嗶-嗶-” | |
| 2. 電池類型 | “嗶-嗶-” | “嗶-” | 鋰電池 |
| | | “嗶-嗶-” | 鎳鎘 / 鎳氫電池 |
| | | “嗶-嗶-嗶-” | |
| 3. 低壓保護方式 | “嗶-嗶-嗶-” | “嗶-” | 逐漸降低功率 |
| | | “嗶-嗶-” | 立即關閉動力 |
| | | “嗶-嗶-嗶-” | |
| 4. 低壓保護閾值 | “嗶-嗶-嗶-嗶-” | “嗶-” | 低 |
| | | “嗶-嗶-” | 中 |
| | | “嗶-嗶-嗶-” | 高 |
| 5. 啟動模式 | “嗶-” | “嗶-” | 普通啟動 |
| | | “嗶-嗶-” | 柔和啟動 |
| | | “嗶-嗶-嗶-” | 超柔和啟動 |
| 6. 進角 | “嗶-” | “嗶-” | 低 |
| | | “嗶-嗶-” | 中 |
| | | “嗶-嗶-嗶-” | 高 |
| 7. 恢復出廠值 | “嗶-” | | |
| 8. 退出 | “嗶-” | | |

步驟D 退出編程模式

兩種方法退出編程模式：

- 在步驟B時，將油門撥桿置於最低點，3秒後會聽到第8種響響，即表示已退出。
- 在步驟C時，將油門撥桿置於最低點，2秒後會聽到一連串響響“♪1515”，即表示已退出。

正常使用開啓程序

1. 將油門撥桿置於最低點後，開啓速控器。
2. 如無內建BEC功能，請直接開啓接收機電源。
3. 將電池組連接上速控器，並等待2秒。
4. 當聽到“♪123”響響時，表示速控器電源已正確連接。
5. 接下來發出的數聲響響，表示已完成所搭配的電池片數偵測程序。
6. 當速控器完成所有自我偵測程序後，會發出一長“嗶-”聲時，表示油門撥桿位於最低點位置且速控器已可正常使用。

警告

高動力的馬達系統是非常危險的。高電流可能會在導線、電池和馬達上引發高溫。請遵照指示，在安全範圍內使用適當的工具設定系統。每次飛行時一定要在指定的區域內控制，以確定安全。

故障快速處理

| 故障現象 | 可能原因 | 解決方法 |
|--|------------------|------------------------------------|
| 通電後馬達無法啟動，無任何聲音 | 電源接頭接觸不良 | 重新插好接頭或更換接頭 |
| 通電後馬達無法啟動，發出“嗶-嗶-、嗶-嗶-、嗶-嗶-”警示音（每兩聲之間的時間為1秒） | 電池組電壓不正常 | 檢查電池組電壓 |
| 通電後馬達無法啟動，發出“嗶-、嗶-、嗶-”警示音（每聲之間的時間為2秒） | 接收機油門通道無油門信號輸出 | 檢查發射機和接收機的配合是否正常，油門控制通道接線是否插緊 |
| 通電後馬達無法啟動，發出“嗶-嗶-嗶-、嗶-嗶-”急促單音 | 油門未歸零或油門行程設置過小 | 將油門搖桿置於最低位置；重新設置油門行程 |
| 通電後馬達無法啟動，發出“嗶-嗶-”提示音，然後發出“♪56712”特殊提示音 | 油門通道“正/反”向錯誤 | 參考遙控器說明書，調整油門通道的“正/反”向設置 |
| 馬達反轉 | 電調輸出線和電機線連接的線序錯誤 | 將三根輸出線中的任意兩根對調 |
| 馬達轉動中途停轉 | 油門信號丟失保護 | 檢查遙控器和接收機的配合是否正常 檢查油門通道接線是否接觸良好 |
| | 電池電壓不足，進入低壓保護狀態 | 重新給電池充滿電 |
| | 接線接觸不良 | 檢查電池組插頭是否正常、電調輸出線和電機線連接是否穩固可靠 |

服務

非常感謝您購買BLC系列無刷馬達電子速控器。雷虎將更努力來為您提供最高的品質及服務。我們將不斷地測試，為您帶來最先進的技術水平之產品。雷虎保證您將會盡情地享用我們的R/C產品。在世界各處都能夠直接且迅速地透過雷虎之經銷商購買產品。您可以發現雷虎總是不斷地創新並提高產品品質。若欲獲得最新的產品資訊及最優的技術支援，請與雷虎授權代理經銷商聯繫。