Electronic Speed Controller
Users' Manual

PULSO™ Advance plus

I. Specification:

Model No.	Cont. Current (Amp)	BEC (Max.)	LIPO (Cell)	NICD NIMH (Cell)	Weight (g)
DL11A+	11 amp	2 amp	2-3	6-10	6g
DL22A+	22 amp	2 amp	2-3	6-10	16g
DL33A+	33 amp	2 amp	2-3	6-10	22g
DL40A+	40 amp	2 amp	2-3	6-10	36g
DL60A+	60 amp	2 amp	2-3	6-10	36g
DLU33A+	33 amp	No	2-3	6-12	22g
DLU40A+	40 amp	No	2-6	6-16	34g
DLU60A+	60 amp	No	2-6	6-16	34g
DLU70A+	70 amp	No	2-6	6-16	43g
DLU100A+	100 amp	No	2-6	6-16	45g
DLU50A++	50 amp	No	3-10	8-30	47g
DL40A	40 amp	2 amp	2-3	6-10	34g
DL60A	60 amp	2 amp	2-3	6-10	34g
DLU40A	40 amp	No	2-6	6-16	34g
DLU60A	60 amp	No	2-6	6-16	34g
DLU70A	70 amp	No	2-6	6-16	43g
DLU100A	100 amp	No	2-6	6-16	45g
UBEC		3A			11g
Prog-Card for Model DL + / DLU + / DLU ++					

II. Features:

1. Easy setting; easy operation.
2. Safe start-up system. (The motor won't be started no matter which position the throttle stick is on when the battery is connected).
3. Automatic power cut-off. (When the motor stops rotating or the radio signal loses for more than 3 seconds, the power will automatically be cut off.)
4. BEC (2.0 amps) provides power to receiver and servos (for ESC with BEC).
5. High rate switching Pulse Width Modulation (PWM): 8KHZ.
6. Over-heat protection. The power will be cut-off as it is heated up to 110℃.
7. Over-voltage protection. The motor won't be started if the voltage is higher than 18V (Expect for the OPTO series.)
8. Low-voltage cut-off. 3.0V/2.7V (selectable) for Li-ion/Li-polymer battery; 0.9V/0.7V (selectable) for Ni-CD/Ni-MH battery.
9. Timing mode.: Timing low mode--- providing highest efficiency suitable for motors with 2, 4, 6 poles; Timing high mode---providing highest rotation speed & biggest current suitable for motors with 6 or more poles and outrunning motors.
10. Programming Card: Programming can be done on the programming board easily.

III. Factory Default Setting:

1. Brake off.
2. Timing high---for outrunning motors and motors with more than 6 poles.
3. Throttle curve----linear.
4. Battery type: Li-ion/Li-Polymer battery.
5. Cut-off voltage: cut-off voltage low. 2.7V for Li-xx battery.
6. Cut-off type: cut-off soft, reduce the power when the voltage drops to the cut-off voltage.

IV. Operation—For ESC without Advance plus Prog-Card

1. Connection (Connect the motor & ESC / Connect the receiver & ESC)

2. Start-Up Mode

A: Normal Start-Up

1) Switch on the transmitter.
2) Put the throttle stick at position "Close" (Lowest Position)
3) Connect the main power pack to ESC (For ESC without BEC, switch on the power to receiver.)
4) 1 "single beeps" (Brake is on) or 2 "single beeps" (Brake is off) will be heard (Note: If you do not hear "beeps", please disconnect the battery & ESC. Wait for 5 seconds and repeat the connection.)
5) 5 seconds later, 5 "single beeps" (Timing low mode) or 5 "double beeps" (Timing high mode) will be heard.
6) Now you can move the throttle stick to begin the flight.

B: Programming and Start-Up

1) Setting the Brake: (Note: Factory Default Setting: Brake Off)

- How to change the Brake
  - Switch "on" the transmitter and move the stick to "full throttle" (highest position)
  - Connect the main power pack to ESC (For ESC without BEC, switch on the power to receiver.)
  - Wait 5 seconds, you will hear 4 beeps (··- ·)
  - Move the throttle stick to position "close" (lowest position)
  - After moving you will hear 1 "beeps" that means the brake is on; or 2 "beeps" that means the brake is off;
  - Now the brake setting is saved;
  - Hear 5 "double beeps" (Timing high) or 5 "single beeps" (Timing low), that means the ESC is ready for flight.

Note: If you want to change the brake again or set Timing mode, disconnect the motor battery pack and then repeat the procedure.

2) Setting the Timing mode: (Note: Factory Default Setting: Timing High)

- How to change the Timing mode
  - Switch "on" the transmitter and move the stick to "full throttle" (highest position)
  - Connect the main power pack to ESC (For ESC without BEC, switch on the power to receiver.)
  - Wait 5 seconds, you will hear 4 beeps (··- ·)
  - Wait 5 seconds, you will hear 5 "Single Beeps" or 5 "double Beeps" sounds
  - Swiftly move the throttle stick to position "close" (lowest position)
  - Now the brake setting is saved;
  - Hear 1 "single beep" (Brake is on) or 2 "single beeps" (Brake is off) and 5 "double beeps" (Timing high) or 5 "single beeps" (Timing low), that means the ESC is ready for flight.

Note: If you want to change the Timing mode again or set brake mode, disconnect the motor battery pack and then repeat the procedure.

V. Operation—For ESC with Advance plus Prog-Card

1. Connection (Connect the motor & ESC / Connect the receiver & ESC)

2. Using of Advance plus Prog-Card and Start-Up

1) Put the six black jumper connector to the required positions.
2) Plug JR connector (part of ESC) to the position "controller" on Prog-Card.
3) Connect the motor to the ESC.
4) Connect the power pack to the ESC.
   - For ESC with BEC , 1 "beep" will be heard, which means your setting has been saved.
   - For ESC without BEC, 1 "beep" will be heard after, connecting the 4.8V (receiver pack) to the position "external power for OPTO".
5) Disconnect the power pack.
6) Disconnect the Advance plus Prog-Card.
7) Plug JR connector (part of ESC) to the receiver-motor control channel.
8) Switch on the transmitter.
9) Put the throttle stick at the lowest position.
10) Connect the power pack to the ESC. (For ESC without BEC, switch on the power to the receiver.)
11) 1"single beep" (Brake is on) or 2 "single beeps" (Brake is off) will be heard.
(Note: If you do not hear "beeps", please disconnect the battery & ESC. Wait for 5 seconds and repeat the connection.)
12) 5 seconds later, 5 "single beeps" (Timing low mode) or 5 "double beeps" (Timing high mode) will be heard.
13) Now you can move the throttle stick to begin the flight.

VI. Option parameters Of the Programming Card:

1. Battery Type:

- ACCU Ni-XX (NICD or NIMH)
- ACCU Li-XX (Li-Pol or Li-Ion.)

2. Brake Mode: On / Off

3. Cut-Off voltage: High / Low

- High—0.9V for Ni-CD & Ni-MH; 3.0V for Li-ion/Li-polymer.
- Low—0.7V for Ni-CD & Ni-MH; 2.7V for Li-ion/Li-polymer.

4. Timing Mode: High / Low

- High (hard timing)—recommended for outrunner motors.
- Low (soft timing)—maximum efficiency for normal motors (2, 4, 6 pole motors).

5. Cut-Off Mode: Hard / Slow down

- Hard—the motor is fully off immediately as the voltage drops to the cut-off voltage.
- Slow down—the motor turns off slowly by power reduction (when the voltage drops)

6. Throttle Curve: Linear / Logarithm

- Linear---soft throttle curve. When the throttle at the mid-position, RPM=60% of Max RPM.
  (Be suitable for F3A, 3D models, etc.)
- Logarithm---sensible throttle curve. When the throttle at the mid-position, RPM=80% of Max RPM.
  (Be suitable for Glider models, etc.)