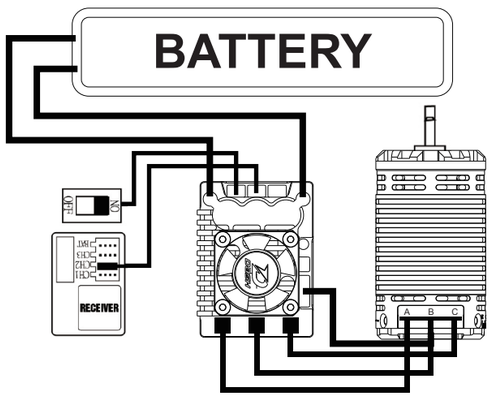

## Instruction Manual

Thank you for choosing Dash Products. Understand your needs in racing, Dash is proud to bring you the newest innovation in Conpetition Speed controller. Utilizing state of the art 32 bit (Micro- Controllers) MCUs right from the beginning, Dash AI is able to explore new technology and development in both software and hardware design. Dash AI allows Customization for Multiple programmable parameters (Using the ESC's Program Card which can be Purchased separately). Please read this manual thoroughly to familiarize yourself with the installation, setup and operation. By Operating this product, you accept the Dash Warranty Terms.

## Specification

| Model | DASH AIMAX 220A |
|---|---|
| PN#Model | DA–770005 |
| Cont.Current | 220A |
| Brust Current | 1000A |
| Suitable Car | 1:8 Car |
| Battery cell | 8–18 NM/NC or 3–6S LIPO |
| BEC Output | 6.0V/7.4V Adjustable/8A |
| Dimension(l*w*h) | 55*41*37mm |
| Weight(g) | 94.38g |

## Installation & Connectors




- Position the ESC where it is protected in the event of a crash. Use the supplied double sided tape to secure the ESC to the chassis.
- Install/Solder the relevant battery connector (Battery Specific) to the battery wires. RED to +ve and BLACK to –ve. (**WARNING!** Reversing the battery polarity will destroy your ESC and void the warranty.)
- Connect supplied BEC wire(180mm) to 3pin port match the "- + s" between the receiver connector and ESC.
- Connect supplied Switch wire to 2pin port (- o).
- Connect the 3 motor wires to the motor; you can either solder the wires directly to the motor or use your favorite connectors. Match the label of the ESC Output (A, B, C) to the Tab labels on the motor when soldering. Avoid soldering each joint for longer than 5 seconds. Prior to operation make sure you have not created a short by either creating a wire bridge or solder bridge on the solder tabs on the motor. (**WARNING!** Improper wiring may damage the ESC and void the warranty.)
- Connect the sensor cable between the ESC sensor plug and the Motor sensor plug.
- Connect the receiver plug to the CH2/throttle pin of the receiver.
- Secure the on/off switch in a place where it will not be accidentally knocked to the "off" position during a crash.
- The Fan port voltage is drawn directly from the battery.

## Sensored Mode

When using a Sensored Brushless motor, the Blue motor wire A, Yellow motor wire B and Orange motor wire C of the ESC must be connected with the Sensored motor wire A,B,C respectively. It is necessary to connect the Sensor wire to the "Sensor" socket on the ESC. Don't change the wires sequence optionally.

## Sensorless Mode

When using a Sensorless Brushless motor, the Blue motor wire A , Yellow motor wire B and Orange motor wire C of the ESC can be connected with the motor wires freely. If the motor runs in the opposite direction, please swap any two wire connections.

## Connection to the Receiver

Black wire RX-
Red wire RX+6.0V
White wire RX-Signal

## LEDs

◆ When the Power wires on ESC are connected with the battery pack, the ESC can automatically identify the motor type (Sensored/Sensorless) via indicated LEDs.
◆ If the ESC works in Sensored Mode, remove the Sensor wire and the ESC will automatically change to Sensorless Mode.

## Radio & ESC set-up

**Transmitter Settings:**

| | |
|---|---|
| Throttle Travel | Maximum / 100% |
| Brake Travel | Maximum / 100% |
| Throttle Exponential | Start with 0% |
| Throttle Neutral Trim | Center / 0 |
| Throttle Servo Reverse | Reverse (Futaba, KO, Sanwa) |

**Initial set-up of the throttle end-points of the ESC:**

- Connect the power wires of the ESC to a fully charged battery set; making sure the polarity is correct.
- Bind your receiver and transmitter first if your radio requires you to do so.
- Turn on the transmitter.
- Keep hold the SET switch and turn on ESC when the ESC light change to red.
- Hold on full brake position and listen for 1 beep.
- Hold on full throttle and listen for another 2 beeps.
- Release the throttle to neutral position and listen 3 beeps. ESC endpoints have been successfully set.
- Restart your ESC.

**Note!** If you do not hear the beeping sound as described above, try reversing the throttle reverse setting in the transmitter.

## Dash AI Max HD Programmer

Dash AI Max HD Programer is only applied to Dash AI Max. Racers can choose their prefer parameter at any time. using Program card to change and update parameters.

## Specification

PN#Model: DA-770016
Dimension: 91mm*54mm*18mm (L*W*H)
Weight: 68g
Power supply: DC 5.0V~12.0V

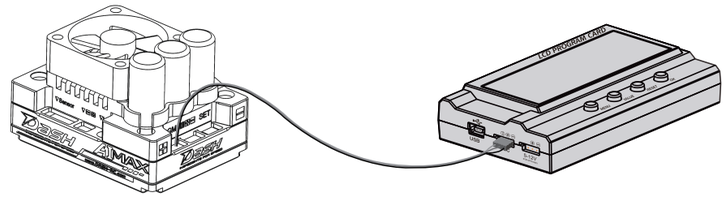
## How to connect the LCD program card

1. Disconnect the battery from the ESC;
2. Disconnect the signal wire of the ESC from the receiver; then plug it into the socket marked with(⊖ ⊕ ⊖)
3. Connect the battery to the ESC and turn on the ESC.
4. If the connection is correct, the following message（Turbo +Version+Date） will be displayed on the LCD screen. Press any buttons, the following message (Ready to connect ESC)will be showed on the LCD Screen. It signifies that the data connection between LCD and ESC is establishing.
   If the data connection between LCD and ESC is failed, the LCD Screen is always showing (Ready to connect ESC); Please check whether the signal wire is connected correctly and repeat step1,2 ,3.
5. If the connection is established successfully, the first programmable item will be displayed on LCD screen. It's ready to set the parameters now.

Note: Please strictly connect according to the above sequence. The sequence of step 2 and step 3 can not be reversed. Otherwise, the LCD program card will not work properly.

## Operation

Working as an individual device to program the ESC, the function of button is as follows:




| | |
|---|---|
| **Menu** | Change the programmable items circularly; |
| **Value** | Change the parameters of each programmable item circularly |
| **Note** | Keeping the "Menu" or "Value" button holding can select the desired parameters quickly. |
| **Reset** | Return to the default settings |
| **OK** | Save the current parameters into the ESC. If you don't press "OK" button, the |

**Misc. Tips:**

- Connect the ESC to the battery pack only when you are ready to run. This will avoid draining the battery pack. Always disconnect the battery after your run.
- A small spark may occur when the battery is initially connected to the ESC. This is normal and is due to the charging of the capacitors.

### Detailed Explanation of each ESC Menu items

### Quick Setup:

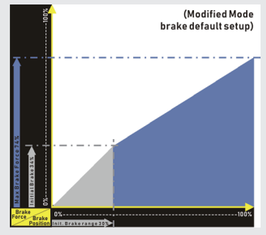
1) **Punch** – Allows you to change the feeling of the ESC (Level 1 to Level 15):• Level 1 has the least punch feeling and Level 15 has the highest punch feeling.
2) **Boost** (Except "Blinky Mode") – Allows you to adjust the timing of the motor (0º-100º Mode 1º increments) Boost is timing available depend on your pre-set range. This will directly affect the rpm of the motor. the higher the number, the more power.
3) **Turbo** (Except "Blinky Mode") – Turbo Timing a form of motor timing advance. While mechanical timing advance in a brushed motor system is limited by the physical phasing of the motor, brushless ESC timing advance can push beyond that physical limit. As a result, motors can run at a super-high RPM in the Turbo Timing mode, resulting in a sensation of having a 2nd gear/Turbo for top speed. This menu allows you to adjust the amount of Turbo Timing in your ESC in 1º increments. The higher the turbo, the more top end you will have.

| | Dash AI MAX setup sheet: | | | | |
|---|---|---|---|---|---|
| Start up Screen | Content | Range | Default | | |
| Page 1 | Dash AI Max ESC | | | | |
| | HD Program | | | | |
| Page 2 | DASH AI Firmware | | | | |
| | MAX 082019A | | | | |
| Page 3 | AI MAX Drive Mode | Blinky | Blinky | | |
| | | Modified | | | |
| Item Number | Quick Setup (reference) | Quick Setup | Range | Blinky Mode | Modifled Mode |
| A1 | Punch (Throttle Rate) | Punch | Level 1- 30 | 20 | 20 |
| A2 | PWM ( Drive Freq) | PWM | 1k | 8k | 8k |
| | | | 2k | | |
| | | | 4k | | |
| | | | 8k | | |
| | | | 16k | | |
| A3 | Compress (IP Limiter) | Compress | Level 1- 30 | 1 | 1 |
| Item Number | Quick Setup (reference) | Quick Setup | Range | Blinky Mode | Modifled Mode |
| B1 | Brake PWM (Brake Freq) | Brake Freq | 1k | 8k | 8k |
| | | | 2k | | |
| | | | 4k | | |
| | | | 8k | | |
| | | | 16k | | |
| B2 | Brake Range (brake Rate) | Brake Range | Level 1-20 | 10 | 10 |
| B3 | Initial Brake level (Initial brake) | Initial Brake Level | Level 1-20 | 10 | 10 |
| B4 | Brake Feel (I brake Response) | Brake Feel | Level 1-20 | 10 | 10 |
| B5 | Max Brake Force (Brake Force) | Max Brake Force | 0 | 75 | 75 |
| | | | 12.5 | | |
| | | | 25 | | |
| | | | 37.5 | | |
| | | | 50 | | |
| | | | 62.5 | | |
| | | | 75 | | |
| | | | 87.5 | | |
| | | | 100 | | |
| B6 | Drag Brake | Drag Brake | off - 30% | off | off |
| Item Number | Quick Setup (reference) | Initial Setup | Range | Blinky Mode | Modifled Mode |
| C1 | Boost (Boost Timing) | Boost | OFF - 100 | | 0 |
| C2 | Boost Start (Boost Trigger Level) | Boost Start | 0-50% | | 20 |
| C3 | Boost Ramp (Boost Trigger Rate) | Boost Ramp | 0-10% | | 5 |
| C4 | Turbo (Turbo Timing) | Turbo | OFF - 100 | | 0 |
| C5 | Turbo Start (Start RPM) | Turbo Start | 40-100% | | 90 |
| C6 | Turbo Delay (Turbo Delay) | Turbo Delay | 0ff- 0.10s | | 0.05 |
| C7 | Turbo Up Rate (Turbo Up Slope) | Turbo Up Rate | Level 1- 10 | | 5 |
| C8 | Turbo Down Rate (Turbo Off Slope) | Turbo Down Rate | Level 1- 10 | | 5 |
| Item Number | Quick Setup (reference) | Initial Setup | Range | Blinky Mode | Modifled Mode |
| D1 | Running Mode | Running Mode | Forward/Brake | Forward/Brake | Forward/Brake |
| | | | Forward/Brake/Rev | | |
| | | | Forward/Rev | | |
| D2 | Cut off voltage | Cut off voltage | Off | Auto | Auto |
| | | | Auto | | |
| | | | 3.0v - 11.1v | | |
| D3 | Esc Heat Protection | Esc Heat Protection | 95 | 130 | 130 |
| | | | 105 | | |
| | | | 130 | | |
| | | | No Protection | | |
| D4 | Neutral Range | Neutral Range | 4%- 15% | 4% | 4% |
| D5 | Bec Voltage | Bec Voltage | 6v | 6v | 6v |
| | | | 7.4V | | |
| D6 | Motor direction | Motor direction | CCW (Normal) | CCW (Normal) | CCW (Normal) |
| | | | CW (Reverse) | | |
| D7 | RPM Lock (Power Controler) | MAX Power | level 0 - 100 | 100 | 100 |

5) **Turbo Up Rate** (Except “Blinky Mode”) – let you adjust the time it take for the turbo to reach maximum , + get more aggressive and – get more smooth.
6) **Turbo Down Rate** (Except "Blinky Mode") – This is an opposite side Turbo up rate. The down rate apply when use turbo. This adjust how fast the turbo shut off. preset is normal, if you set the value to -3, this will result a smoother turbo shut off as you slowdown from top speed, if you value set to +3, this will have more drag brake feeling effect when you release throttle from top speed.
7) **Drag Brake** – Also known as trail braking - allows you to set the automatic brake force applied when the throttle returns to neutral position. the more -, the stronger the automatic brake feeling it has.

## Advance Setup:

1) **Pulse Width Modulation (PWM)** (This function can be found in the "Advance setup" except Blinky mode)– Allows you to change the forward drive frequency of the ESC (2K to 32K step by 500HZ) The 2K setup will give you good punch at the low end. The 32K setup will result in strong mid to top end. (Low PWM will make punchier and stronger feel. Lower temperature. Higher PWM will make the throttle smother but higher temperatures.)
2) **Compress** (found in "Advance Setup" menu, Except for Blinky mode where it can be found in "QuickSetup") - This is for throttle curve, the higher the number, the more responsive the throttle feels at bottom end. 0% is linear throttle response. That's mean throttle compress, then will course you more sensitive in the throttle bottom.
3) **Boost start** – Allows you to adjust early or later to add timing in bottom power, this will make it easy to get a smooth power band in bottom power. The higher the value, the later the boost will engage. The lower the value, the earlier boost will in engage.
4) **Boost range** – Allows you to adjust a how smooth the Boost engage. The lower the value, the more aggressive the boost engage. The higher the value, the smoother the boost engage.
5) **Turbo delay** – Delay how long to start your turbo timing when you touch the throttle turbo point.
6) **Turbo start** – Allows you to adjust which throttle point to start the turbo and not only full throttle to start turbo and let it easy to get a smooth power band for all kind of motors. Example, if turbo start set at 90%, then the turbo will engage at 90% of the throttle position (it’s also depend of the preset turbo delay).
7) **Brake Freq.** – Brake Frequency operates similar to PWM except it affects the braking instead of the throttle (100hz / step from 600hz to 5000hz) At 1k Hz, the Drag brake and the Brake force will feel the punchiest. At 5k Hz, the Drag brake and the Brake will feel very smooth.
8) **Initial Brake**
9) **Brake Range**
10) **Maxbrake Force** – see diagrams below.




**Caution! Always monitor motor and ESC temperatures closely when applying timing to the ESC or motor. Heat may build up very fast in both ESC and motor and may cause permanent damage to equipment.**

## Limited Warranties / Repair Proceedures

Dash guarantees this product to be free from defects in materials or workmanship for 60 days from the original date of purchase verified by sales receipt. With your original receipt showing the item and the date and place of purchase is required with your warranty service application. An ESC that is found to have been mishandled, Abused or used incorrectly, including use in an application other than that for which the ESC is intended, will not be covered under the warranty.

Since Dash has no control over the use of the ESC application with the other electronic devices such as motors and batteries. Dash cannot accept any liability for any damages resulting from the usage of this product. Therefore, using this product is at your own risk, and the user accepts all resulting liability from installing and using of the product.

For all technical questions, please visit www.Dash-RC.com & E mail your question to Support@Dash-RC.com