Thank you for choosing ORCA Products, and we welcome you to the power and convenience of Brushless RC. By purchasing the VTX V3 Competition brushless Electronic Speed Control ("ESC"), you have chosen one of the most advanced speed controls designed for all competition; allow multiple programmable parameters (per ESC’s Setting Card be purchased separately). Please read this manual thoroughly to familiarize yourself with the installation, setup, operation, and limitations of this unit. By operating this product, you accept the ORCA Warranty Terms.

SPECIFICATIONS

System: Brushless
Forward/Brake/Reverse: Yes (Factory preset at Forward/Brake)
Dimensions: 441(L)x380(W) x 20(H)mm
Weight: 48g (excluding wires)
Voltage Input: 6 Cells NiCD/NiMH
2-Cell LiPO / 2-3 Cell LiFe
Peak Current: 720A
Motor Limit: Over 4.5 Turns
B.E.C.: 6V / 3.0A
Multi Protection System: Yes

INSTALLATION & CONNECTORS

Solder the supplied wires to the soldering posts on the ESC according to the following scheme:

- Black wire: + post (+ Battery +ve)
- Black wire: - post (Battery -ve)
- Black wire: A* post (Motor A)
- Black wire: B* post (Motor B)
- Black wire: C* post (Motor C)
- Black wire: Switch wire: -o* Post (2pin port)
- BEC wire: + * post (+ve) and B black wire “A” post (Motor A)
- Capacitor Red wire: + post (+ve) and Black wire: - post (-ve)
- Capacitor Black wire: + post (+ve) and Black wire: - post (-ve)

(WARNING: Use good quality solder and avoid soldering longer than 5 seconds per solder joint)

Due to the different requirements of each type of racing, it is important to customize your ESC for a particular usage. Customization of the ESC is done using the setting card purchased separately. To start, simply unplug the ESC receiver wire from the receiver and plug it into the receptacle on the side of the setting card (as shown below), making sure that you plug it in correctly.

**BATTERY**

Connect the battery wires to a charged pack of battery, then connect supplied 3pin wire(200mm) to the ESC setting port(4pin port) and setting card. Turn on the ESC and the setting card will activate automatically. Note that the screen will show "Loading..." during initialization – indicating that the ESC is copying the current setup in the ESC to the setting card. Once loading is completed, the screen will show "TEAM ORCA Program" and current Firmware Version and Date codes e.g. Ver.3.1.0XXXAA. You can now start to program your ESC.

Press "Enter" to enter the Program Mode or Date Reading. (Detail please see the "OPERATION DIAGRAM" in page 2) We have provided a short guide from Menu 1 to Menu 15 in the Program.

Menus 1 to 12 are operational settings of the ESC. Each menu consists of its own set of Parameters. Detailed explanation of each menu and its parameter set is found later in this document. It is suggested that you familiarize yourself with these menu items in order to get the most out of your ESC.

Menu 14 allows you to save the Parameter you have selected in the setting card. Maximum of 2 sets of Parameters can be stored.

Menu 13 allows you to load the factory default Parameter or any previously saved Parameters back to the setting card memory.

Menu 15 allows you to send the current displayed Parameter on the setting card to the ESC – overwriting whatever is in the ESC.

Tips: Whenever in doubt, check your ESC setting by initializing the setting card again and check each menu setting.

Navigation around the Program Menu is done using the 4 buttons on the right hand side of the setting card. The function of each position varies depending on which screen the display is showing:

Team ORCA Ver. XX XXXXXXX...
"Enter" button - go to next page
Menu: Program Setup

Data Time Reading
"Enter" button - go to "Program Setup"

"Enter" button - go to "Date Reading"

Note: The setting card is not included the package, need to purchase separately.

Note! The setting card will compare the Parameters before writing. If no changes are made, the setting card will display "unchanged". If changes are made, you will hear a series of beeps and the setting card will display "Send OK".

Tips: Do not worry about making mistakes. You will not damage the ESC during setting. If in doubt, you can always re-load the default set up and start over again (Load Menu 13 Default and confirm Send on Menu 15).

OPERATING TIPS

Multi Protection System – Other than the Low Voltage Protection and the Overheat Protection that were described above, the ESC has 2 more build-in protections:

- Motor Lock Protection:
  - The ESC is protected against damage when the motor is stuck and does not turn at all. Power will not be applied in this situation.
  - Caution! Since the ESC relies on the feed back of the 3 motor wires to deploy this protection, it ONLY works if the motor does not turn AT ALL. If the motor has any rotation, the ESC will consider the motor to be operational and the power to the motor will not be cut off.

Fail Signal Protection:
- In case the radio signal to the ESC is interrupted for over 1 second during a run, the ESC will cut off until the signal resumes.

ROAR Stock Spec Racing:
ROAR has announced the new class of Stock Spec Racing using a zero degree timing ESC and 17.5 turn Motor. The VTX V3 Competition ESC satisfies the ROAR requirement showing a Blinking LED when set at 0 timing and 0 turbo timing.

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 at the connection when the battery is connected. This is normal and is due to the charging up of the capacitors.
**Detailed Explanation of each ESC Menu items:**

1. **Timing Start** — Allows you to adjust which throttle point to start to add timing, this will make easy to get a smooth power band for all kind of motors.

2. **Timing** — Allows you to adjust the timing of the motor (0-20 for Mod Mode and 0-40 for Stock Mode 1º increments):
   - Generally speaking, in brushless systems, increase in timing will result in increase RPM of the motor. However, increase in timing also decrease the efficiency of the system, thus generating heat on the ESC and motor.
   - Lower timing has the most torque and the lowest RPM; Higher timing has the least torque and the highest RPM.
   - With Mod motor start from Timing 6
   - With Stock motor start from Timing 15

   Caution! Always monitor motors and ESC temperature closely when applying timing to ESC or motor. Heat may build up very fast in both ESC and motor and cost permanent damage to equipment.

3. **Timing Interval** — Allows you to adjust the timing “ramp-up” fast and low, than will cause you can pick up more Smooth (+1~+2) or Aggressive (-1~+3) (Default in “Normal”)

4. **Turbo Delay** — Allows you to adjust the time gap between the Timing System to Turbo Timing system (0-0.15 sec in 0.01 sec increments):
   - Turbo Delay is needed because when the ESC is operating under the Turbo Timing mode, it drives the motor to very high RPM - however, with very low torque. With Turbo Delay, the motor has a chance to rev up before the Timing kicks in. Thus achieving higher top speed.
   - Proper adjustment of the Turbo Delay will result in smooth transition and continuous power band from regular Timing to Turbo Timing.

5. **Turbo Timing** — Turbo Timing is unique to brushless systems because the ESC can simulate motor timing advance. While mechanical timing advance in brush motor systems is limited by the physical phased 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. (This “Turbo Timing” never bigger than “Timing”).
   - Turbo Timing is applied at 98% throttle.
   - Higher Turbo Timing settings will increase top speed, but will drive motor and ESC temperatures up as well.

   Caution! Heat is ESC’s biggest enemy! Monitor your ESC and motor temperature to avoid equipment damage.

6. **Turbo Interval** — Turbo Interval is effective only when Turbo Timing is in operation. It acts as a “ramp-up” for the Turbo Timing (4-4.5, 4.5-5, 5-5.5, Normal, +1~+6):
   - Turbo Interval setup is important to ensure high top-end speed on long straightaways.
   - (-6 to -1) this will make the turbo more aggressive and early to top speed (Suitable for high traction)
   - (+1 to +6) this will make the turbo more smooth and less to top speed (suitable on low traction)

   Default in “Normal”

7. **Drag Brake** — Also known as trail braking - allows you to set the automatic brake force applied when the throttle returns to neutral position (25 steps from 0% to 25%):
   - Drag brake affects how a car handles off-throttle (entering a corner). With drag brake on, there will be more weight shift to the front tires thus increasing the front end grip when you let go the throttle.
   - Experiment with different settings to find the setting that fits your driving style best.

8. **Initial Brake** — Allows you to set the amount of brake during manual braking (Steps from OFF to 20%):
   - OFF — Brake linear base on transmitter
   - Adjust initial brake to set certain level of “hard brake” effect. (also can adjust your transmitter brake hi-point to get your need the brake force)

9. **Brake Frequency** — Brake Frequency operates similar to PWM except it affects the braking instead of the throttle (3 steps 1k, 2k, default, 4k):
   - At 1kHz, the Drag brake and the Brake force will feel the punchiest.
   - At 4 kHz, the Drag brake and the Brake will feel very smooth.

10. **Punch** — Allows you to change the punch of the ESC (Level 1 to Level 10):
    - Level 1 has the least punch and Level 10 has the highest punch.
    - Adjust punch level to maximize acceleration speed with minimum wheel spin.
    - With Mod Mode, start with Level 3
    - With Stock Mode, start with Level 6

11. **PWM** — Allows you to change the forward drive frequency of the ESC (2K, 4K, 8K and 64K):
    - The 2K setup will give you good punch at the low end.
    - The 32K setup will result in strong mid to top end. (not suggest use in MOD)
    - Experiment to find out what suits your driving style best.

12. **Save** — Allows you to save the setting card display Parameter to the selected memory Parameters in the setting card (2 user defined Parameters):
    - This feature allows you save Parameters for future use. It also allows easy sharing of ESC setup amongst team members.

13. **Load** — Allows you to load the saved Parameters in the setting card display menu (6) with user defined Parameters:
    - Load saved Parameter does not change the ESC setting. It only changes the setting card display Parameter. In order to change the ESC setting, you still need to “Send” the Parameter to the ESC (Menu 14).

14. **Send** — Allows you to send the setting card display Parameter to the ESC (Yes: No):
    - Yes to confirm or No to cancel sending.
    - Notice that the original parameter in the ESC will be lost after this operation.

15. **Exit** — Finish the setting and exit the menu return to previous menu.

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**BASIC SETTING FOR MOTORS**

<table>
<thead>
<tr>
<th>Level</th>
<th>Brake Frequency</th>
<th>Drag Brake</th>
<th>Initial Brake</th>
<th>Punch</th>
<th>Turbo Interval</th>
<th>Turbo Timing</th>
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<tr>
<td>Level 1~ Level 10</td>
<td>1kHz</td>
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<td>0%</td>
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<td>4.5</td>
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<td>2%</td>
<td>1%</td>
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<td>Level 1~ Level 10</td>
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<td>2%</td>
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<td>3%</td>
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<td>Level 1~ Level 10</td>
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<td>5%</td>
<td>4%</td>
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<td>7.5</td>
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<tr>
<td>Level 1~ Level 10</td>
<td>Default</td>
<td>6%</td>
<td>5%</td>
<td>18</td>
<td>8</td>
<td>Normal</td>
</tr>
</tbody>
</table>

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**Timming System**

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**Program Setup**

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