Thank you for choosing ORCA Products, and welcome to the power and convenience of Brushless RC. By purchasing the ORCA XX Competition Brushless Electronic Speed Control ("ESC"), you have chosen one of the most advanced speed controls designed for all competition. This speed control with the most linear power curve and advanced engineering brings drivers to a new experience of race, allow multiple programmable parameters (using the 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.

**OPERATING TIPS**

PT 1: To avoid radio glitches, arrange for the placement of the ESC such that the power wires and the receiver antenna wires do not cross over each other.

PT 2: Try to arrange for the receiver placement such that the receiver plugs are easily accessible. Use supplied extension cable if plugs are not accessible for ESC setup purposes.

PT 3: Position the ESC where it is protected in the event of a crash and use the supplied double sided tape to secure the ESC onto the chassis.

PT 4: Install/secure your favorite battery connector to the battery wires if you do not plan to direct solder your battery. RED to +ve and BLACK to –ve. (Warning! Reversing the battery polarity will destroy the ESC and void the warranty.)

PT 5: The connection between the ESC sensor plug and the motor sensor plug should be secure. The on/off switch in a place where it will not be accidentally knocked to the 'off' position during a crash.

PT 6: 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.

PT 7: 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.

PT 8: Connect the power wires of the ESC to a fully charged receiver. Secure the on/off switch in a place where it will not be accidentally knocked to the 'off' position during a crash.

**OPERATION DIAGRAM**

![Operation Diagram](image)

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>System</th>
<th>Brushless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward/Brake/Reverse</td>
<td>Yes (Factory preset at Forward/Brake)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>39(L) x31(W) x 21.5(H) mm</td>
</tr>
<tr>
<td>Weight</td>
<td>43g (excluding wires)</td>
</tr>
<tr>
<td>Voltage Input</td>
<td>(4.8 – 9.9V DC)</td>
</tr>
<tr>
<td>Peak Current</td>
<td>720A</td>
</tr>
<tr>
<td>Motor Limit</td>
<td>Over 4.5 Turns</td>
</tr>
<tr>
<td>Motor Type</td>
<td>Sensorized 540 sized brushless motors</td>
</tr>
<tr>
<td>B.E.C.</td>
<td>60 C</td>
</tr>
<tr>
<td>Multi Protection System</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**INSTALLATION & CONNECTORS**

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

- Red wire
  - "*" post (Battery +ve)
  - "-*" post (Battery +ve)
- Blue wire
  - "A" post (Motor A)
  - "B" post (Motor B)
  - "C" post (Motor C)
- Red wire
  - "+" post (Capacitor +ve)
  - "-" post (Capacitor +ve)
- Black wire
  - (Warning! Use good quality solder and avoid soldering longer than 5 seconds per solder joint)

**BATTERY**

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:

<table>
<thead>
<tr>
<th>Color</th>
<th>Pin 1</th>
<th>Pin 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>(+ve)</td>
<td>(+ve)</td>
</tr>
<tr>
<td>White</td>
<td>Red</td>
<td>Black</td>
</tr>
<tr>
<td>Black</td>
<td>Black</td>
<td></td>
</tr>
</tbody>
</table>

Connect the battery wires to a charged pack of battery. Turn on the Viritra VX Competition ESC and check if the ESC is properly connected. Note that the screen will show "Loading..." during initialization – indicating that the ESC is copying the current setup in the memory to the setting card. Once loading is completed, the screen will show "TEAM ORCA Program" and Current Firmware Version and Data code e.g. Ver3.0 1XXXXXXX. You can now start to program your ESC.

Press "Enter" to enter the Program Mode or Date Reading.

**OPERATION DIAGRAM**

![Operation Diagram](image)

**LIMITED WARRANTIES / REPAIR**

All ORCA products are manufactured according to the highest quality standards. ORCA guarantees this product to be free of defects in materials or workmanship for 60 days from the original date of purchase verified by sales receipt. This limited warranty does not cover damages that are results of normal wear, misuse or improper maintenance of the product.

To avoid unnecessary service and mailing charges, always eliminate all other possibilities and check all components for malfunctions before sending in your unit for repair. Products sent in for repair that operate perfectly will be charged a service fee.

When sending in the product, always pack carefully and include the original sales receipt, a description of the problem encountered, your return address and contact information.

Since we do not have control over the installation and use of this product, we 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.

**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 ESC 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.
**Detailed Explanation of each ESC menu items:**

1. **Timing Start** - Allows you to adjust which throttle point to start adding timing, this will make easy to get a smooth power band for all kinds 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 motor 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 or slow, as well as Time gap between the Timing System to Turbo Timing System (From 0.02 sec to 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 Turbo 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 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 "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 (-6, -5, -4, -3, -2, -1, Normal, +1, +2, +3, +4, +5, +6):
   - Turbo Interval setup is important to ensure high top-end speed on long straightaway.
   - (-6 ~ -1) this will make the turbo more aggressive and early to top speed. (Suitable on high traction)
   - (+1 ~ +6) this will make the turbo more smooth and least 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 most.

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, 4k).
   - At 1kHz, the Drag brake and the Brake force will feel the punchiest.
   - At 4Khz, 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 64).
    - The 2K setup will give you good punch at the low end.
    - The 32K setup will result in strong mid to top end.
    - Experiment to find out what suits your driving style best.

12. **Save** - Allow you to save the setting card display Parameter to the selected Memory Parameters in the setting card display menu (5 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:
    - Loading saved Parameter does not change the ESC setting. It only changes the setting display Parameter. In order to change the ESC setting, you still need to "Send" the Parameter to the ESC (Menu 14).

14. **Send** - Allow you to send the setting card display Parameter to the ESC (Yes / No):
    - Yes to confirm or No to cancel sending.
    - Note 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.