Thank you for choosing ORCA Products, and welcome to the power and convenience of Brushless RC. By purchasing the VTRa VX Competition Brushless Electric 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 our 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.

**SPECIFICATIONS**

- **System:** Brushless
- **Forward/Brake/Reverse:** Yes (Factory preset at Forward/Brake)
- **Dimensions:** 39(L) x 23(W) x 22.5(H) mm
- **Weight:** 45g (excluding wires)
- **Voltage Input:** 4.8 – 9.9V DC
- **Peak Current:** TBD
- **Motor Limit:** Over 4.5 Turns
- **Motor Type:** Sensored 540 sized brushless motors
- **Supply:** 30A
- **Multi Protection System:** Yes

**INSTALLATION & CONNECTORS**

Solder the supplied wires to the soldering posts on the ESC according to the following scheme:
- Red wire: “+” post (Battery +ve)
- Black wire: “-” post (Battery -ve)
- Blue wire: “A” post (Motor A)
- Blue wire: “B” post (Motor B)
- Blue wire: “C” post (Motor C)
- Red wire: “+” post (Capacitor +ve)
- Black wire: “-” post (Capacitor -ve)

*Warning! Use good quality solder and avoid soldering longer than 5 seconds per solder joint)*

**BATTERY**

- 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.
- To arrange for the receiver placement such that the receiver plugs are easily accessible. Use supplied extension when the plugs are not accessible for ESC setup purposes.
- 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.
- Install/Solder 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 your ESC and your warranty.
- 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 wires (A, B, C) to the labels on the ESC.
- Avoid soldering longer than 5 seconds per solder joint and avoid shorting the motor leads by creating a wire bridge or a solder bridge on the solder tabs on the motor. (Warning) Improper wiring may damage the ESC and void the warranty.
- Connect the sensor port between the ESC sensor plug and the motor sensor plug.
- Connect the receiver plug to the CH2/CH3 port 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 setting card is not included the package, so you will need to purchase one separately.

**OPERATING TIPS**

Multi Protection System - Either 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 to the ESC.
- **Caution:** The ESC will shut down the motor if it detects any signs of overheating or damage to the ESC. This is normal and is due to the changing up of the capacitors.

**OPERATION DIAGRAM**

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.

**RADIO & ESC SET-UP**

- Connect the battery 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.
- The battery is connected. This is normal and is due to the charging of the capacitors.

**LIMITED WARRANTIES / REPAIR PROCEDURES**

All ORCA products are manufactured according to the highest quality standards. ORCA 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. 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.
Detailed Explanation of each ESC Menu items:

1. **Timing Start** — Allows you to adjust the throttle point to start 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 (° 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 and low, then will cause you can pick up more punch. (+1 ~ +3) 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 (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 Timing System 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 position of the motor, brushless ESC timing advance can push beyond that physical limit. As a result, motors can run at 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 ° 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 decrease 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, 5, 6, 7, 8, 9, Normal, -1, -2, -3, -4, -5, -6). Turbo Interval (° increments):
   - Turbo Interval is important to ensure high top-end speed on long straightaways.
   - (-7 ~ -1) this will making the turbo more aggressive and early to top speed. (suitable on low traction)
   - (+1 ~ +6) this will making the turbo more smooth and least to top speed. (suitable on high 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, 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 64).
    - The 32K setup will result in strong mid to top end. (not suitable on low traction)
    - 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.

12. **Save** — Allows you to save the setting card display Parameter to the selected memory Parameters in the setting card (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 memory to the setting card display menu (6) with user defined Parameters:
    - Loading saved Parameter does not change the ESC setting.
    - Experiment to find out what suits your driving style best.

14. **Send** — Allows you to send the setting card display Parameter to the selected memory Parameters in the setting card display menu (6) with user defined Parameters:
    - Allows you to set the amount of Turbo Timing in your ESC in ° increments. (The "Turbo Timing" never bigger than "Timing").
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