

Raiden 7 PRO User Guide

ZESC



Thank you for choosing our products!

For better experience, please carefully read the following document.

Product Specifications:

Model	Raiden 7 pro
Phase current	Continuous 200A (with good cooling) 30 seconds 240A
Battery voltage and current	24-94V 100A, Peak 140A
Power rating	6KW max
Peripherals	Two ADC, Two UART, AUX output, PPM, CAN, HALL, USB-C
Size and weight	123x61x23mm 159g 123x61x38mm 320g (with water block)
Screw terminals	Three m4 screw terminals Fit up to 8 AWG wires
IMU	BMI160

NOTE:

Motor current depends solely on cooling conditions. Raiden 7 PRO can only safely operate with adequate cooling installed. Under ideal cooling conditions (water cooling), Raiden 7 PRO can run at 200A continuously and even higher. Battery current and power must be in the range. For simplicity, just set battery current as 100 and wattage as 6000 in vesctool. Software will dynamically calculate limit for you. If you want to hit 140A and 250A limit, please don't last long. Please make sure temperature of everything including cables and connectors below 80C. All limits in the table are recommended values. You can go beyond the limit, but take your own risk.

Battery voltage	Battery current
24V to 60V	100A max
61V to 94V	$I_{batt} = \frac{6KW}{V_{batt}}$

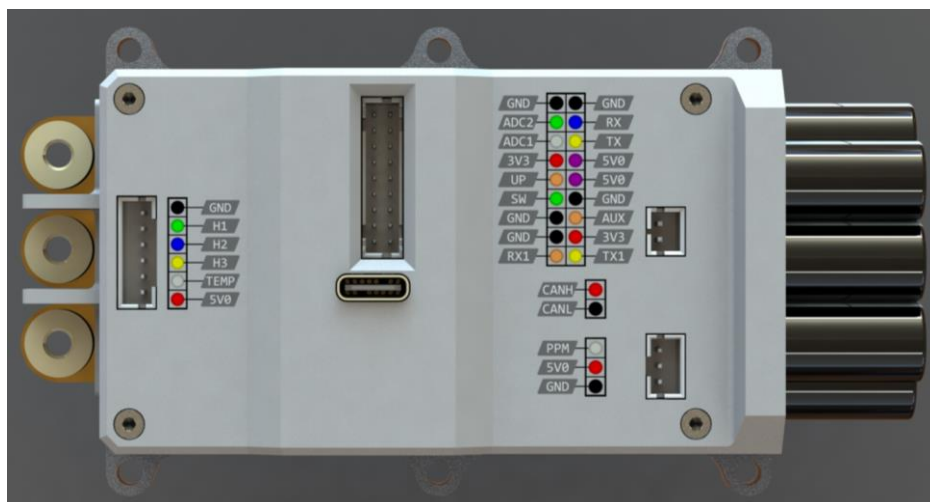
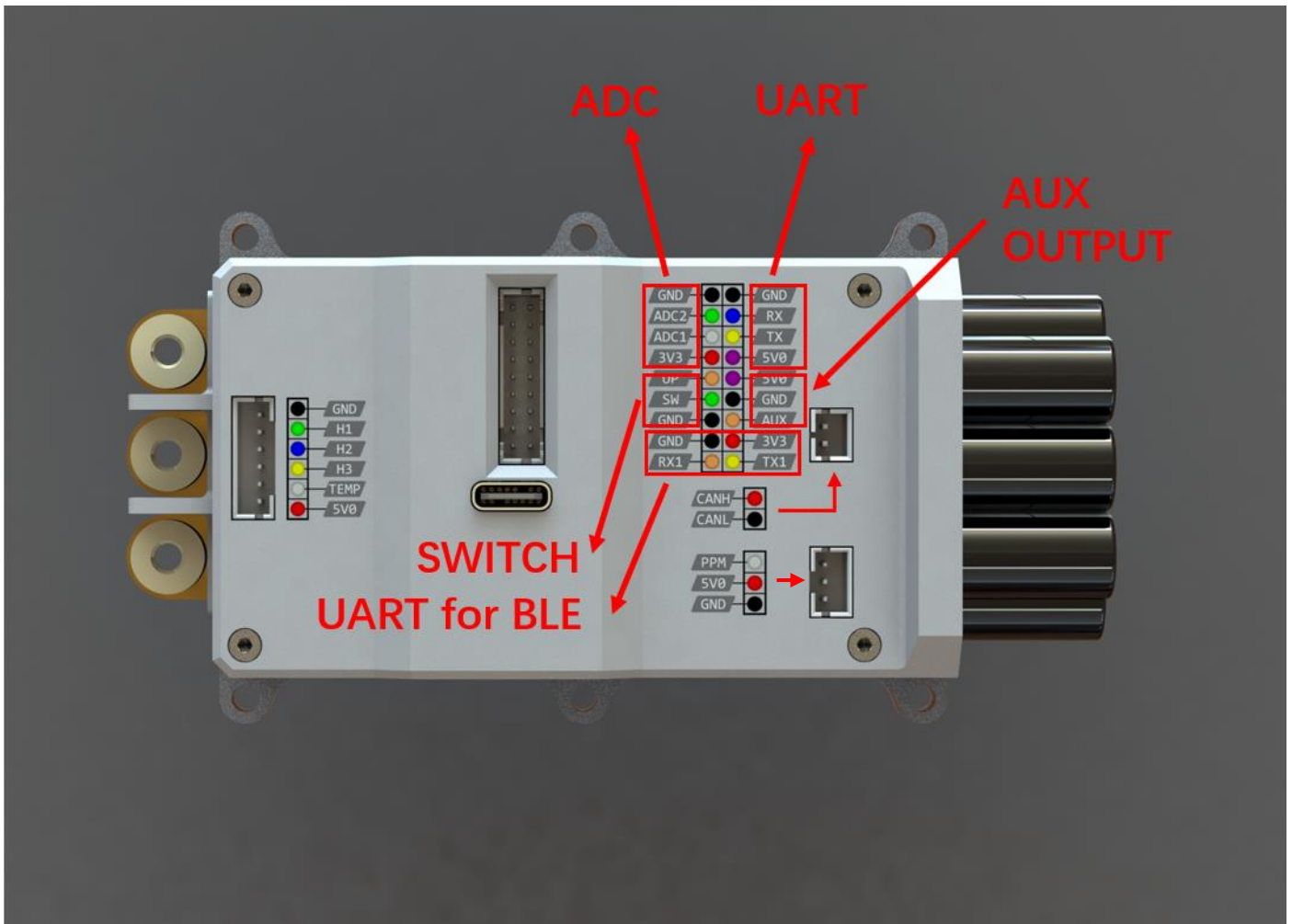
Guides for Moter current:

Heat is from conduction loss and switching loss of Mosfets. As the voltage increases, switching loss dominates. To make sure junction temperature is below the limit, please follow the table below to set max motor current. Motor current is also limited by motor itself. Don't supply 200A to a 50A motor.

Battery voltage	Peak motor current	Continuous motor current	FOC frequency
25.2V to 92.4V (6S-22S)	250A	200A	20Khz to 30Khz

Pinout:

Current version (Purchased after May 2023)



Good to know:

1. Always **double check the wiring** before powering on!
2. Please use **FOC mode**. It can drive motor smoothly and silently.
3. For **sensorless and sensored** FOC mode, FOC frequency between 20k and 40k are recommended.
4. If you feel unexpected vibration during high current motor start up, please disable saturation compensation mode in FOC->sensorless
5. Do not connect any load on 3v3 and 5v. Only Bluetooth module, receiver and lcd/oled panel are allowed. Something like RC servo motor is not allowed.
6. When input voltage is over 72v, please stay with 20khz (default value) FOC frequency. Higher switching frequency results extra switching loss which generates heat.

Caution:

1. **Be careful with high voltage!**

More Questions? We got you covered.

If you have any questions, contact us through email: discoverzesc@gmail.com or private message us on ESK8.

Again, thank you and be careful when riding!

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