buildkitboards

How to update the firmware and program the Xenith

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Step 1 — How to update the firmware and program the Xenith



- Download the VESC Tool from here: <u>https://vesc-project.com/node/17</u>
- Open the VESC Tool application on your computer
- Plug the included USB cable into your computer and the Xenith. Turn the Xenith on.
 - Some cheap USB cables do not have data wires inside. Make sure to use the provided cable if you end up not being able to connect to the Xenith in the next step

Step 2

| | | | | | PROFILES | | |
|--|---|---|---|-------------------------|-------------------|---|--|
| Korrente al la construir de la construir | Welcome To get started you can use the <i>Setup</i> M respectively.Otherwisey.ou can connect to the motor and app or | to VESC® Tool Transfs to configure the motor and upp settings year VISC in the <i>Connection</i> page and go throug infiguration pages manually | h | | | , , , , , , , , , , , , , , , , , , , | |
| BMS Data CAN-Devices CAN-Devices UNITY Iscat | AutoConnect | Setup Motors FOC | | | | E (| |
| | Multi Settings | L Invert Motor Directions | | осомятая та» 6.8 8.8 | 94TME 68:56:59 | | |
| 0.20 \$ O u 5000 R 3.00 A \$ O P 0.00 * | ™ © 18 3.08 A © 809 © HB 3.08 A © 809 � | Duty Current | | 0. | 0 % 00 A | B | |

- Click the auto connect button located on the Welcome and Wizards page
 - If you get a popup about the firmware not being compatible, click ok
- In left column, click the Firmware tab



- Click download button (DO NOT CLICK DOWNLOAD ALL)
 - Click yes on the confirmation box (if the erase times out, just click okay, it is a bug)
- When the update is complete, click the Welcome & Wizards tab in left column

Step 4



- Click auto connect
- Click set up motors FOC
 - Click no on load default parameters
 - Select E-Skate, click next in the bottom right corner
 - Select Medium Outrunner, click next
 - Click yes on pop up, click next, click okay on the next popup



- Click Run Detection (will be located in the same spot as the next button)
- **Before** clicking ok on the popup, make sure that the wheels can spin freely. This test will make a loud noise with the motors and then spin them. So make sure the board is upside down and nothing is blocking the wheels from turning
- Click okay on pop up, wait for the motor detection to finish



- Once the motor values populate, click Okay (bottom right corner)
- Select forward on both motors to see if they are spinning in the the forward direction. If you place a finger on top of the motor and then select forward, your finger should be pushed towards the truck. If it gets pushed towards the rear of the board, you need to reverse the motor direction
- If the motor is spinning the wrong way, select the inverted box next to the FWD button on the respective motor. It will likely be the bottom motor.
- Click finish

| | / General / Current / Voltage | V RPM V Wattag | e // Tempera | ature // BMS // Advanced / | |
|---|-------------------------------|----------------|--------------|----------------------------|-----------------------------------|
| TOOL | | | | Motor | |
| Welcome & Wizards | Motor Curren Max | 48.71 A | | | ◦±ಟ⊙ |
| S Connection | Motor Curren Max Brake | -48.71 A | | | - <u>+</u> 6 0 |
| Firmware Motor Settinge | Absolute Maximum Current | 401.00 A | | | ÷± 60 |
| ₩ General | Slow ABS Current Limit | Faise | | | * <u>1</u> & U |
| FOC MOTO PID Controllers MOTO | Max Current Scale | 100 % | | 1.00 | 180 |
| Additional Info MOTOR | Min Current Scale | 100 % 🗐 | | 1.00 | ISU |
| Experiments MOTOR | Battern Current May | | _ | Battery | - + P @ |
| 🖬 App Settings | Battery Current Max Decen | 60.00 4 | _ | | |
| 至 General APP | Battery Current Max Regen | -00.00 W | | DDV8201 | ÷⊥ € ∪ |
| VESC Remote APP | DRV8301 OC Mode | Current Limit | | URVOJUT | * † B @ |
| 00 Nrf APP | DRV8301 OC Adjustment | 16 | | | - + B. 0 |
| Presidence Data P | | | | | |
| D UNITY 38 | | | | | |
| 0 20 × 0 ·· 5000 1 | | - m - | | | |
| | 10 10 3.00 A | | STOP >= | Duty | 0.0 % |
| 3.00 A Q P 0.00 | . O 110 3.00 A | - w - | | Current | 0.00 A |
| | | | | | Connected (serial) to tty.usbmode |

- In left column, click General
- In the top bar, select Current
- If you have a 12s5p Duo Type R, change Battery Current Max to 80
 - If you have a 10s3p Duo or Tayto, change Battery Current Max to 60

Step 8

| Voltage Cutoff Start 40.80 Voltage Cutoff End 36.00 | ý 🔶 | | | | 0 ± 6 0 |
|--|---|---|--|---|--|
| Voltage Cutoff End 36.00 | , | | | | |
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| cutori calculator | | | | | |
| Lithium Ion (full at 4.2V/cell) | | | | | |
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| 30,37.20] | | | | | Apply |
| С 🖸 IB 3.00 А 🗘 В | a - | ſ | Duty | 0.0 % | |
| © HB 3.00 A ♀ E | a 🖤 🥗 | C. | irrent | 0.00 A | i |
| | | | | | |
| | 5/0/11 Calculator Lithium for (full at 4 2//ord) 12 0, 37 20) (0) 13 30 A (1) (0) 193 30 A (2) | Safoff Calculator Luthum Ion (full at 4.25Veet) 12 0,37.20] © 119 3.00 A ≅ 100 €€ 100 | South Calcolator Litheum for (uil at 4.22/net) 12 0, 17.20) (0) 183.00 A 2: 00 ↓ (0) 183.00 A 2: 00 ↓ | Safeff Culcularier Lithoum form (full at 4 20 Voold) 12 0, 07 20] (0) 15 3.0 4 ∧ 2 00 (0) 15 3.0 4 ∧ 2 00 (0) 1 | South Calcolator Lithium for (full al 4.22/nell) 12 0, 17.20] (0) 18 3.00 A 2 00 (0) 18 3 |

In the top bar, select Voltage

If you have a 12s5p Duo Type R, change the Start Value = **40.8** and End Value = **36.0**

- If you have a 10s3p Duo, or Tayto, change the Start Value = 31.0 and End Value = 28.0
- In right column, select down arrow M

| ••• | | | VESC To | | | |
|---|----------------------------------|---------------|-------------------------|-----------------|------------------------------|------------------------|
| | General // Current // Voltage | RPM / Wattage | // Temperature // BMS / | Advanced | | |
| | Battery Voltage Cutoff Start | 40.80 V 🧲 | - | | | ÷ 1 🗟 🛈 |
| | Battery Voltage Cutoff End | 36.00 V 💙 | | | | : 1 6 0 |
| Connection Firmware Motor Settings Motor Settings | | | | | | |
| CAN-Devices | | | | | | |
| | Battery Cutoff Calculator | | | | | ~ |
| | | | | | | \rightarrow |
| | | | | | | |
| | | | | | | Apply |
| 0.20 0 U 5000 3.00 A 0 P 0.00 | RPM © IB 3.00 A * © HB 3.00 A | • • • | 100 | Duty Current | 0.0 % 0.00 A Connected | (serial) to ttyusbmode |
| _ | _ | | _ | - | | |

- In right column, select CAN. It will stay highlighted when selected
 - (i) You are now communicating with the other side of the ESC (for the second motor), so the values will reset to default.
- In right column, select up arrow M
- In the Voltage tab, make sure that the values in step 31 are the same

Step 10

| | General Current Voltage | RPM | ge\/Tem | serature BMS Advanced | |
|-----------------------|---------------------------|-----------|---------|-----------------------|------------------------------------|
| | | | | Motor | |
| A Welesme & Wienele | Motor Curret Max | | | | ÷ 1 🗟 () |
| Connection | Motor Currel Max Brake | -48.70 A | | | ÷ 1 🗟 🛈 |
| Firmware | Absolute Maximum Current | 401.00 A | | | ÷±&0 |
| General MOTOR | Slow ABS Current Limit | False | | | <u> </u> |
| FOC MOTOR | Max Current Scale | 100 % | | 1.00 | <u>± & o</u> |
| Additional Info Motor | Min Current Scale | 100 % 😜 | | 1.00 | 1 & O |
| Experiments MOTOR | | | 1 | Battery | |
| App Settings | Battery Current Max | 80.00 A 🤜 | _ | | ÷±60 |
| 표 General APP | Battery Current Max Regen | -60.00 A | | | ÷ ± 🗟 O |
| VESC Remote APP | | | | DRV8301 | |
| 00 Nrf APP | DRV8301 OC Mode | | | | - <u>+</u> & O |
| IMU App App | DRV8301 OC Adjustment | | | | ÷±€0 |
| Realtime Data | | | | | |
| Sampled Data | | | | | |
| BMS Data | | | | | |
| CAN-Devices | | | | | |
| | | | | | |
| D UNITY 38 | | | | | |
| | | | | | — |
| | | | | | |
| | | | | | |
| 🗗 Scan CAN | | | | | |
| 0.20 ≏ O u 5000 | RPM 🗢 🕞 ТВ 3.00 А | ≤ 873 0 | | Dutu | |
| T 3 88 A * O P 8 89 | • • • • HB 3 68 A | | STOP | Surger | 0.00 |
| | | | | current | 0.00 A |
| | | | | | Connected (serial) to tty.usbmoder |

- In the top row, select Current
- If you have a 12s5p Duo Type R, change Battery Current Max to **80**
 - If you have a 10s3p Duo or Tayto, change Battery Current Max to 60
- In right column, select down arrow M
- In right column, click CAN (this will unselect CAN)

| | | | | VESC Tool | | | | | |
|--|--------------------------------|---------|--------|-----------------------------|-----------|----------------------------------|--------------|------------------|--|
| | General Throttle Curve | | | | | | | | |
| VESL | Control Type | Current | | | | | 60 | | |
| | Positive Ramping Time | 0.40 s | | | | ¢ 1 | 6.0 | | |
| Welcome & Wizards | Negative Ramping Time | | | | | ¢ 1 | a o | 2 | |
| Firmware | ERPM Per Second Cruise Control | 3000.00 | | | | ÷ 1 | 60 | | |
| Motor Settings General Motor | Input Deadband | 15% 🗘 | | 15 % | | 1 | 6 0 | | |
| Serveral Motor | Use Smart Reverse | | | | | | 6 0 0 | L | |
| PID Controllers MOTOR | Smart Reverse Max Duty Cycle | 7% | | 0.070 | | ± | to w | \triangleright | |
| Experiments MOTOR | Smart Reverse Ramp Time | | | | | ÷ 1 | 6 0 | | |
| Comparison MOTOR | | | | Multiple VESCs over CAN-bus | | | 6 | Ь | |
| App Settings 至 General APP | Multiple VESCs Over CAN | | | | | | 6 6 | r. | |
| UART AP | Traction Control | | | | | | 60 | | |
| Ø IMU APP ⇒ Data Analysis ■ Realtime Data Ø Sampled Data ⇒ IMU Data ■ BMS Data CAN-Devices | | | | | | | | | |
| | NRF Pairing | | | | | | | | |
| | Time: 10.0 s | | | | 0 | | | | |
| D 0.20 C 0 u 5000 | RPM 0 D IB 3.00 A 0 | 0 | | Duty | 0.05 | | | 6 | |
| T 3.00 A . P 0.00 | • • • HB 3.08 A • | m 🔹 | STOP - | Current | 0.0 % | | | ň | |
| | | | | current | Connected | Connected (serial) to ttyusbmode | | | |
| | | | | | | | | | |

- In right column, select up arrow A 1
- In right column, select up arrow M 1
- In left column, select VESC Remote
- Change control type to **Current**
- Change Use Smart Reverse to
 False
- In right column, select down arrow A

Step 12



If you are using a Voyager remote, you will need to change a setting on the remote to make sure the data is read properly. In the board parameter section, set Xenith FW23.46 to **DISABLE**