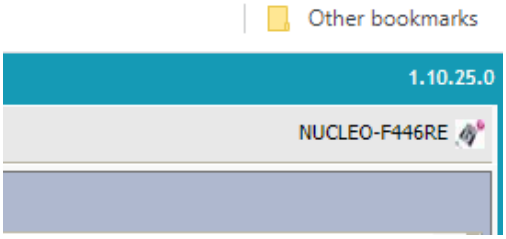
Hobby King Cheetah Motor Programming Instructions

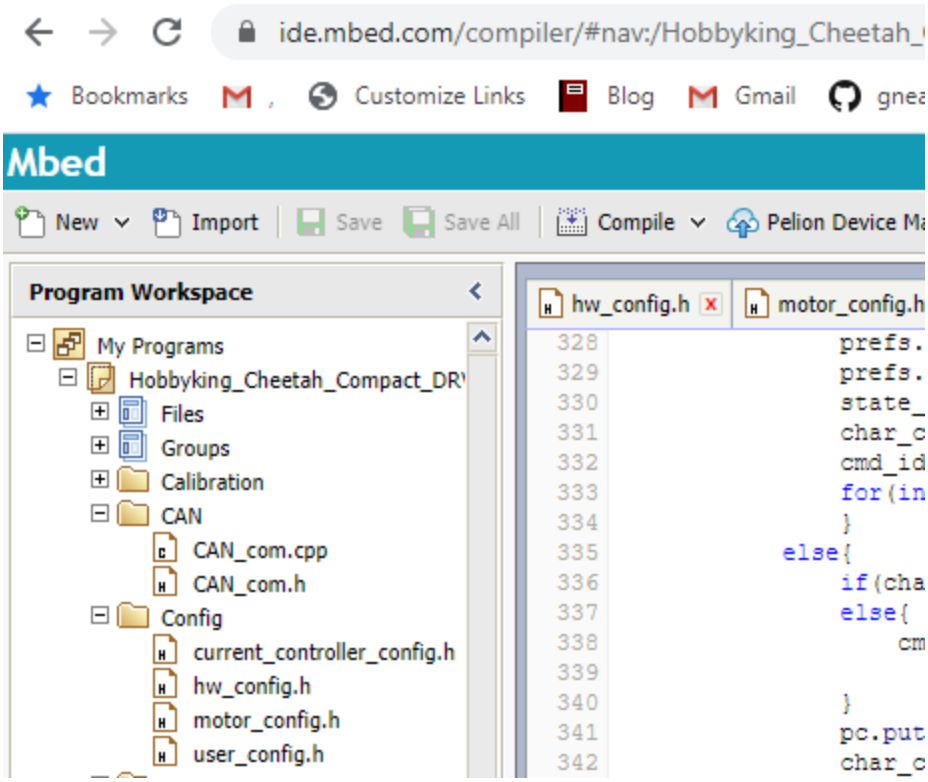
Overview

These are Hobby King Cheetah motors you can get from China. They are open source and can be reprogrammed. I have a doc with all the details I know about them. This doc details how to program them.

Compiling Firmware

The original firmware is here. It uses the mBed online compiler. Create your own account and import the original code into the editor/compiler. Make your changes, save, and compile. A bin file should download to your computer via the browser. Set the target to NUCLEO-F446RE.



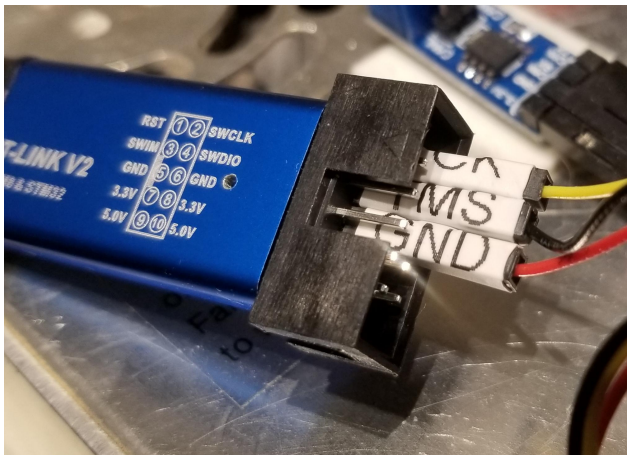


Programmer

I use the ST-Link V2. They only cost a couple of dollars.

Connect it to the motor like this.

Programmer Connections	
ST-Link V2	**Motor connector**
SWDCLK	TCK
SWDIO	TMS
GND	GND



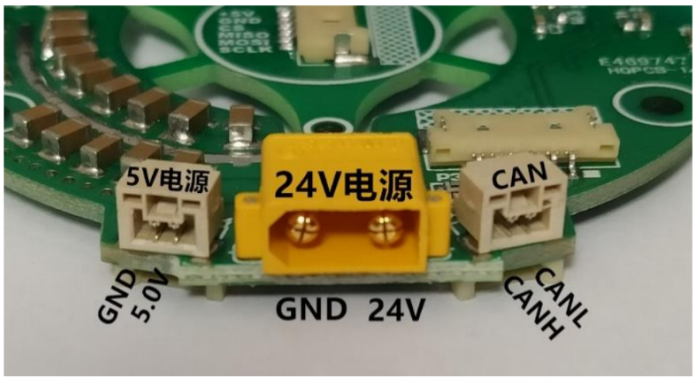
I bought 50 of the 3 pin cables from AliExpress for $8.50, because my motor did not come with one and they are really hard to make yourself.

Power the motor via 5V (make sure the 24V power is removed)

Note: I don't recommend powering 5V and 24V at the same time. When 24V is applied it generates its own 5V. I do not see any blocking diodes on the schematic, so I don't think you should have 2 sources of 5V.

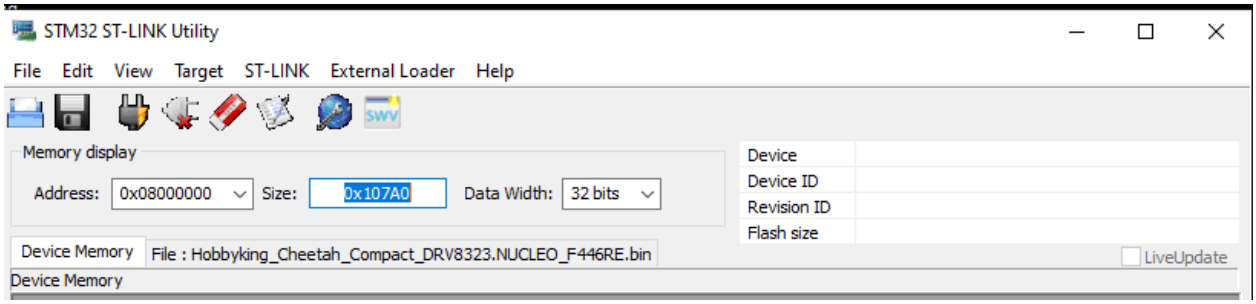
Edit: Lately I have been uploading with just the 24V on. Seems to work fine.

I received a 2 pin cable with my motors for the 5V connector. Apply power to the connector shown below. The motor's red LED should turn on. You will see a constant stream of errors on the UART port if you happen to be monitoring it. Most of them are due to the missing primary voltage.



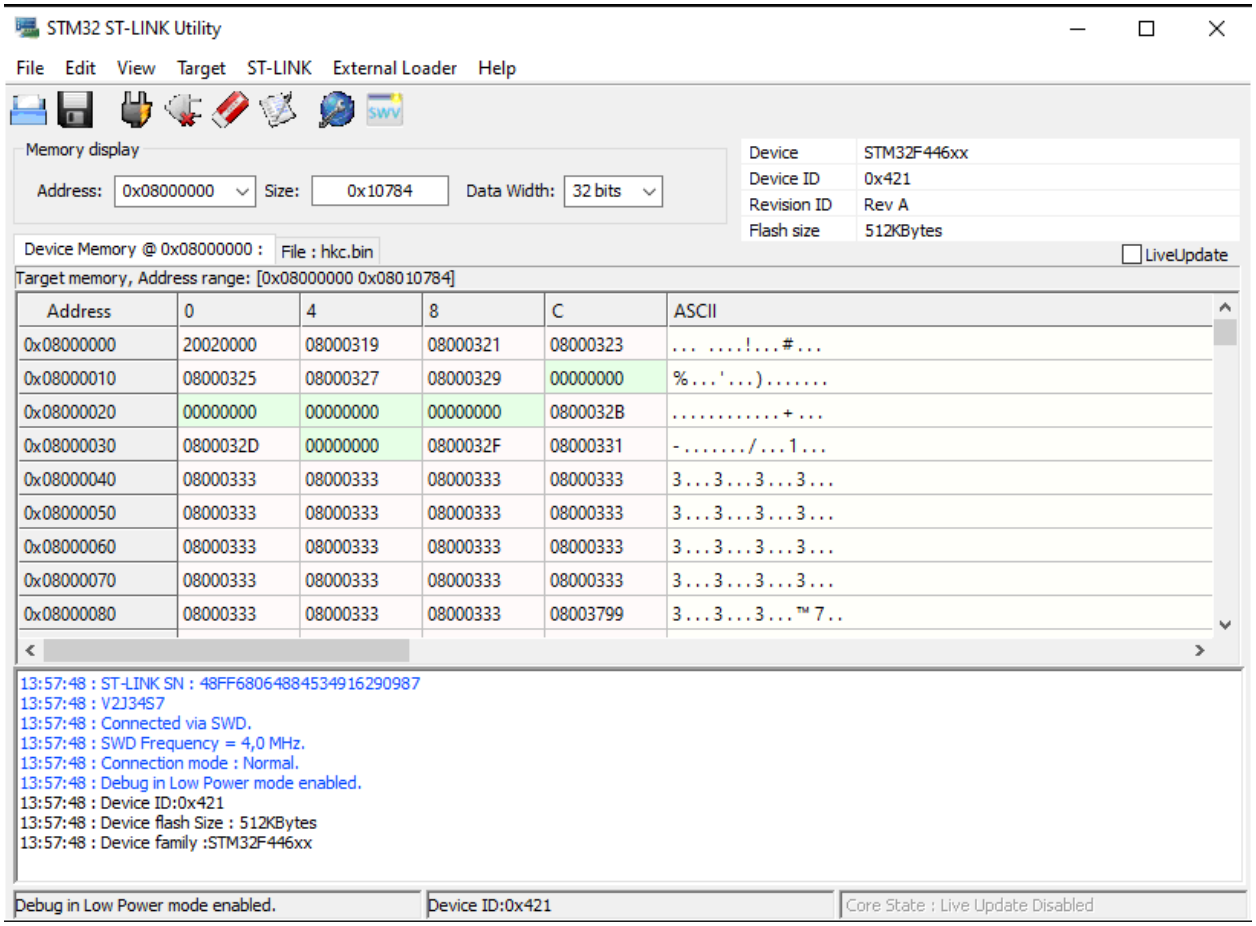
Programmer software

I used the STM32 ST-LINK Utility program.



Connect to Target

Use the **Target..Connect** menu to connect. You should see some connection info in the bottom panel

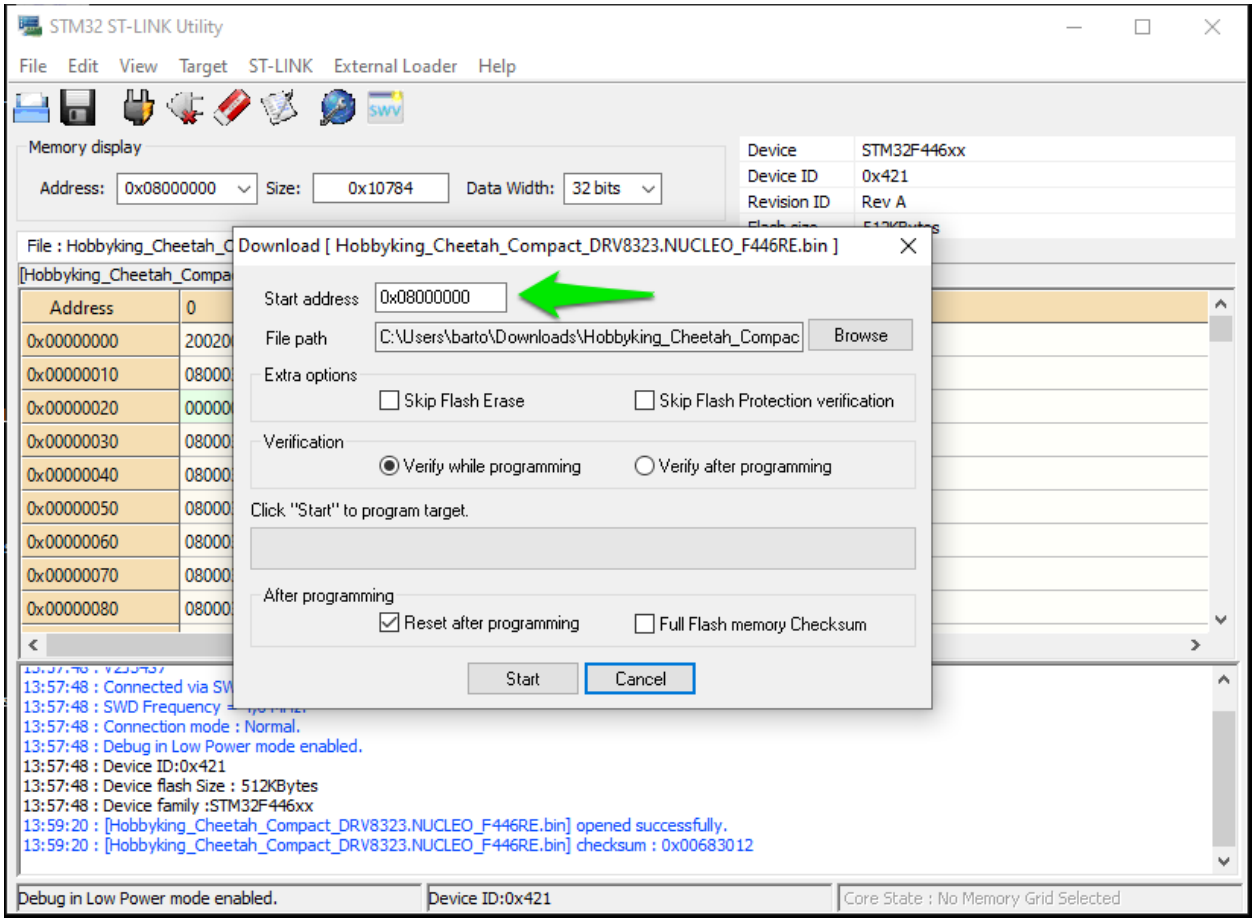


Open the .bin file

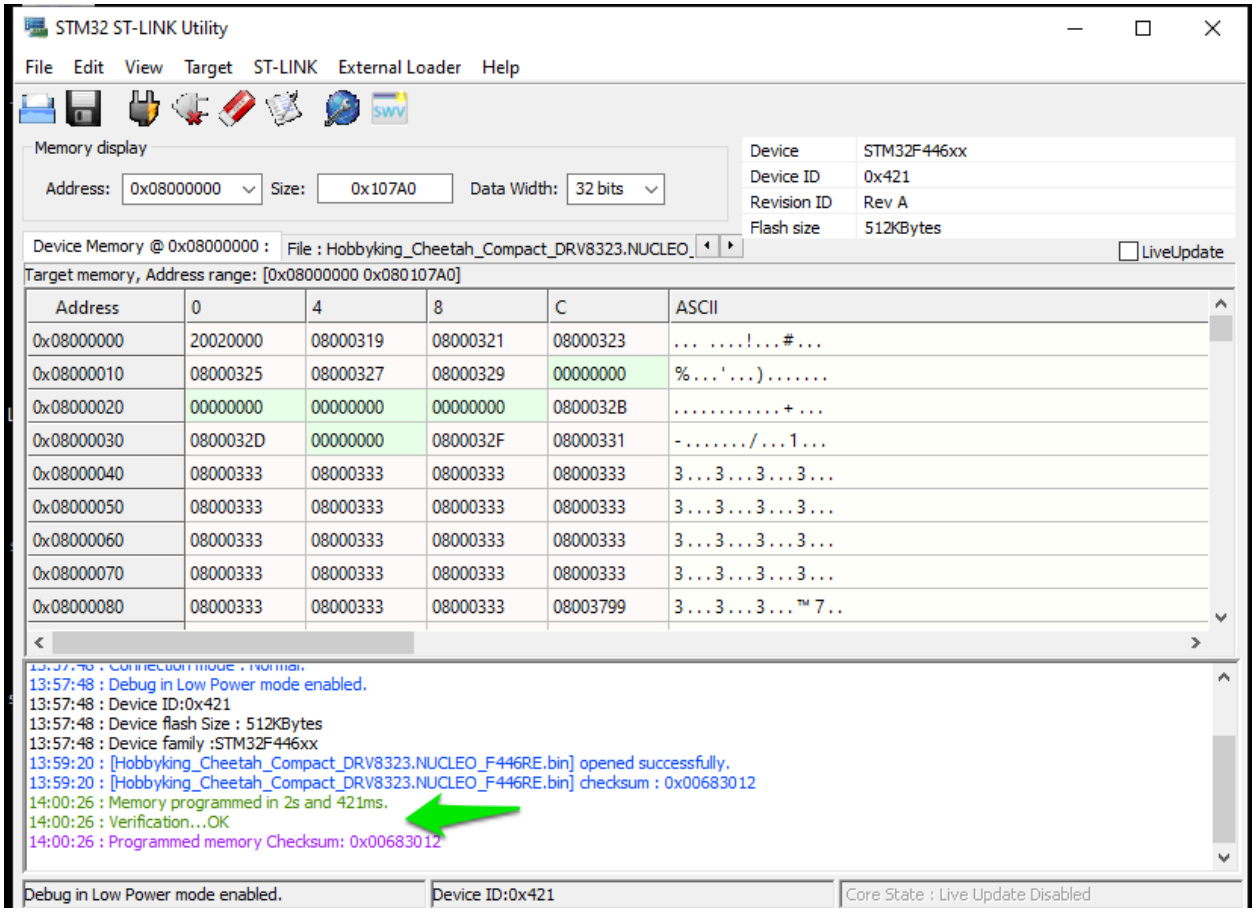
Use the **File...open** menus to open the .bin file you created when you compiled the firmware.

Upload the firmware

Use the Target...Program & Verify menu to bring up the programming dialog box. Make sure the start address is per below. (it is the default for me). Click the start button.



You should see some text confirming your upload after a few seconds.



My Firmware Changes so far….

- Changed the gear ratio from 1.0 to 6.0 (#define GR 6.0f) to match Steadywin design
- Moved some #defines out of .cpp files to allow other files to access them.
- Added additional debug info to startup text.
- ~~Added a CAN message that turns off the UART and enables those pins as step and direction inputs, with the step pin being an interrupt~~.Switching modes has proven to be unreliable. You pick one at compile time for now.
- Step and Direction control is working !!!!!.

FWIW: My version of the firmware is here. It compiles and runs the AliExpress motor fine, but it is far from done and littered with my recent experiments.

Discussion

If you have read this far you deserve a link to the Slack Channel. Use the bldc_servo_motors channel. **Lots of good stuff appearing on the Slack Channel !!!**

Donation

If you consider this doc helpful, please consider a donation to support my open source project via PayPal

Suggestions

I keep getting blank notices of suggestions. If you have a suggestion, do it on Slack.