



# 05 - E3D Hemera Current Adjustments (VREF)

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## Step 1 — 05 - E3D Hemera Current Adjustments (VREF)



- The standard Hemera motor has a rated motor current of 1.33A.
- This value is likely to be different from the motor you may have been previously using with your printer.
- In order to provide the Hemera motor with the correct amount of current, so as to have it's ideal torque level, and not over heat, it is required to make some adjustments to the VREF on your stepper drivers.
- This guide will provide the information needed for the 3 most common stepper driver types. A4988, DRV8825 and the TMC drivers.

## Step 2 — A4988



**i** A4988 calculation.

- $V_{REF} = \text{Rated Motor Current} \times 8 \times R_{sense}$
- $V_{REF} = 1.33 \times 8 \times 0.05$
- $V_{REF} = 0.532$

**i** It is advised to add a 10% safety margin to avoid any over heating, decreasing the lifespan of the driver.

- $0.532 - 0.0532 = 0.4788$

**i** In order to make the adjustment easier this figure can be rounded up to 0.5v

**!** For the A4988 driver, make sure to check the  $R_{sense}$  value on your mainboard or stepstick module.  $R_{sense}$  is not always 0.05 Ohm. Creality regularly uses a  $R_{sense}$  value of 0.10 Ohm on their mainboards for this driver. Using an incorrect  $R_{sense}$  value results in an incorrect current setting.

### Step 3 — DRV 8825



#### **i** DRV 8825 calculation

- $V_{REF} = \text{Rated Motor Current} / 2$
- $V_{REF} = 1.33/2$
- $V_{REF} = 0.665$

#### **i** It is advised to add a 10% safety margin to avoid any over heating, decreasing the lifespan of the driver.

- $0.665 - 0.0665 = 0.5985$

#### **i** In order to make the adjustment easier this value can be rounded up to 0.6v

## Step 4 — LV 8729



- LV 8729 calculation:

- $V_{REF} = \text{Max current} / 2$

- $V_{REF} = 1.33 / 2$

- $V_{REF} = 0.665$

**i** It is advised to add a 10% safety margin to avoid any over heating, decreasing the lifespan of the driver.

- $0.665 - 0.0665 = 0.5985$

**i** In order to make the adjustment easier this value can be rounded up to 0.6

## Step 5 — Duet



- Duet settings,
- In typical use cases the current setting should be 60% - 90% the rated current of the stepper motor.
- In the case of Hemera that would mean setting the current to between 0.798 A - 1.197 A.
- for more information please see: [https://duet3d.dozuki.com/Wiki/Setting\\_m...](https://duet3d.dozuki.com/Wiki/Setting_m...)

## Step 6 — TMC driver family



- The TMC driver series uses a root mean square (RMS) value for the calculations.
  - $\text{RMS} = \text{Max rated current} / 1.41$
  - $\text{RMS} = 1.33 / 1.41$
  - $\text{RMS} = 0.94$

## Step 7 — TMC 2100, 2208, 2130, 2209 (Standalone)



- TMC 2100 calculation:
  - $V_{REF} = (\text{RMS current} \times 2.5) / 1.77$
  - $V_{REF} = (0.94 \times 2.5) / 1.77$
  - $V_{REF} = 2.35 / 1.77$
  - $V_{REF} = 1.33$
- ⓘ It is advised to add a 10% safety margin to avoid any over heating, decreasing the lifespan of the driver.
  - $1.33 - 0.133 = 1.197$
  - $V_{REF} = 1.197$

## Step 8 — More information



- For more specific information regarding setting current with TMC drivers please refer to the datasheet for your specific step stick/ driver being used.