Writeup by Mxbrnr

E-Steps Calibration

1. Remove hot end from print head, but leave the wiring attached, and let the hot end hang out of the way. (Open the single extr. 3dp head and loosen the hex set screw, close head, pull out hot end).

2. In the Luban Workspace Command Console, set the nozzle “target temp” to anything over 170*C

*****Note: you must set a target to continue with the next steps; if the target is too low, the machine will give you an error.*****

3. Load filament into print head.

4. Starting from print head input hole toward spool, measure 120mm of filament and mark this location.

5. Using the Command Console, enter the following command:

M503

6. Check the response code for the line that says:

"M92...E###.##" (note this # for future use, it is the current e-steps calibration setting)

7. Enter the following commands to extrude 100mm of filament:

G91...then...G0 E100 F80

8. Once the print head has finished extruding the filament, measure the remaining length of filament that did not get pulled through the print head hole

9. Calculate e-step error using the following math formula:

100/(100 - leftover length) = error

10. Calculate new e-step setting using the following math formula:

(current e-step setting * error) = new setting

11. In the Command Console, enter and save the new e-step setting into the firmware typing in the following commands:

M503...then...M92 E###.## (this # is the new setting you just calculated)...then...M500...then...G90

12. Repeat steps 4 thru 11 as many times as necessary to get your e-steps setting as accurate as possible.

13. Re-install the hot end into the print head. Turn the nozzle heat off and wait for it to cool, or be very careful not to get burned.

NOTE: E-step calibration is specific to each print head and its internal parts. Unless you change to a new print head, you should only need to perform this once for your machine. After that, as long as you record the new e-step setting somewhere you can reference it later, it can be easily reprogrammed back into the machine using Step 11 any time the machine firmware is reset/updated. If the print head itself is changed for a new one, then you will need to perform the e-steps calibration again from the beginning.

E-steps is the amount of movement the extruder motor must perform in order to extrude a given distance of filament; it is not dependent on filament type, brand, color, or nozzle diameter. What is dependent on those things is what comes out of the nozzle; this is called the "volumetric flow" and is adjusted with the flow settings inside of the slicing software, but the e-steps calibration must be performed first in order for the flow settings to be accurate.