Creality CR-10 S4

- Specifications
  - **Build Area:** 400x400x400 mm (Roughly 15.75×15.75×15.75 inches)
  - Has a heated bed (heats slowly, max 75 C, see **Known Issues** section)
  - Can work PLA, ABS and other materials with upgrade
  - **Workflow:** Standalone, prints gcode via micro-SD card, can be connected to computer via USB
  - Marlin Firmware

- G-code Production
  - STL is converted to GCode using a *slicer program* which produces GCode of slices of the modeling file for the 3D printer to print. The CR-10 can use any slicer that exports g-code; Cura, Slic3r, Simplify3D, etc. Cura sample profiles for the CR-10 can be found here. They may require some experimentation to tune perfectly.

Adjusting the CR-10

1. Home the nozzle
2. adjust bed screw until you can just slide a piece of paper under the nozzle
3. raise the z axis
4. adjust x to 350
5. lower z axis
6. adjust bed screw unitl you can just slide a piece of paper under the nozzle
7. raise z axis
8. adjust y to 350
9. lower z axis
10. adjust bed screw until you can just slide a piece of paper under the nozzle
11. verify that at each corner you can still just slide a piece of paper under the nozzle
12. you are now ready to print

Printing on the CR-10

1. Use Cura to open your STL file.
2. Position the model on the virtual print bed (see known issues section), and make sure the scale and orientation are correct.
3. Make sure the extruder and bed temperatures are set properly (see below).
4. in the search bar, search "acceleration" and set all values at or below 500.
5. Make sure the slicer settings are configured properly.
6. Slice the file and save it to the micro-SD card
7. Insert the micro-SD card into the printer **Note:** The SD card goes into the printer upside down!
8. Navigate to "Print from SD card". You may need to refresh the list to find your file. **Note:** The display shows only the first 15 characters of the filename, so save your files accordingly.
9. Select your file and begin printing
10. ~~under "tune" on the printer select flow and set it to 180.~~ This issue has been resolved as of 1/13/19

11. In the event of a printing error, press the dial and navigate to **Stop Print** and wait for the printer to stop moving, then navigate to Prepare:Move Axis:Move Z:10 mm and turn the dial to move the extruder above the print bed.
12. After the print finishes, **wait for the bed to cool before removing it.**

Material	Extruder Temperature	Bed Temperature
PLA	205 C	50 C

Your filament may require some adjustment to these values, there are many calibration tools availible on Thingiverse to help in this process

Known issues

1. The bed heater is undersized and struggles to reach high temperatures
    1. The temperature can be raised by insulating the bed with cork or high temp foam, building an enclosure, replacing the heater, or a combination of the above
    2. Building an enclosure would also help with reducing distortion when printing larger models or when printing with ABS
2. The Y-axis is very heavy because it moves the bed, heater, and glass buildplate. If printing too fast, this can cause ringing or ghosting on the print surface and missed steps causing prints to fail
    1. Reduce the Y-axis acceleration and jerk settings in the slicer, you can try an acceleration of 800 and jerk of 5 as a starting point
    2. Replacing the buildplate with a lighter alternative, increasing the motor current, or increasing the size of the motor may also help
3. The build plate sags in the middle making it difficult to print large objects
    1. Currently, pieces of aluminum foil have been stacked between the bed carrige and the glass build plate to bring the center up
    2. A jack has also been printed to lift the center of the build plate, but is not in use
    3. A thicker build plate may also help, but would possibly worsen the ringing seen in prints
    4. A bed leving sensor could be added to perform mesh bed leveling

- The right side z-axis screw is known to go out of alignment from time to time, this can be corrected by manually adjusting the screw position

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