AuruMMS installation procedure: Creality K1 series

This installation procedure assumes you will be using USB to communicate between the AuruMMS unit and the printer.

Step 1:

Prepare the printer.

Firstly, you will need to have enabled root access on your K1 series printer. The easiest way to do this is using the "Creality Helper Script". To use this your firmware must be updated to **1.3.3.5** or newer.

Once the firmware is updated, you will need to accept Root Access on your printer. This is done on the printer itself, under the settings tab and pressing on the "Root Account Information" menu option, waiting for the message timer to count down and then accepting the terms.

From there it will tell you the login username and password.
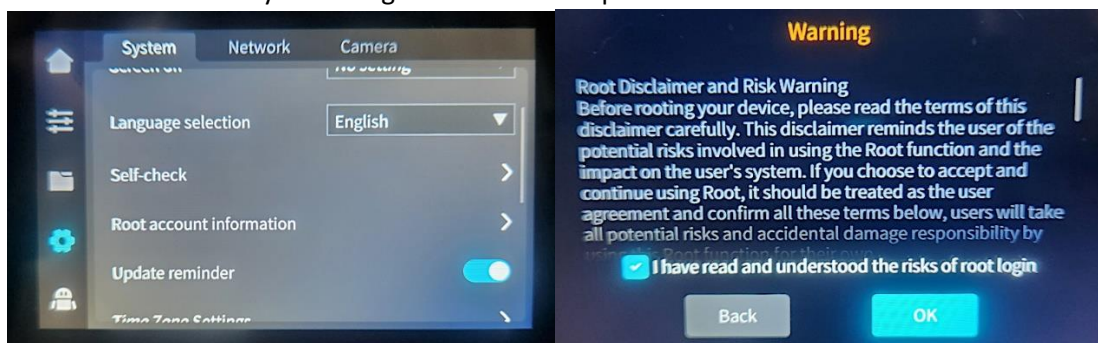
Your printer itself is now ready. The next steps are done via "SSH" on the computer. Use your chosen program (I recommend Putty)

You will need to enter the IP address of the printer (found under the network tab on the printer), and select port 22 for access.
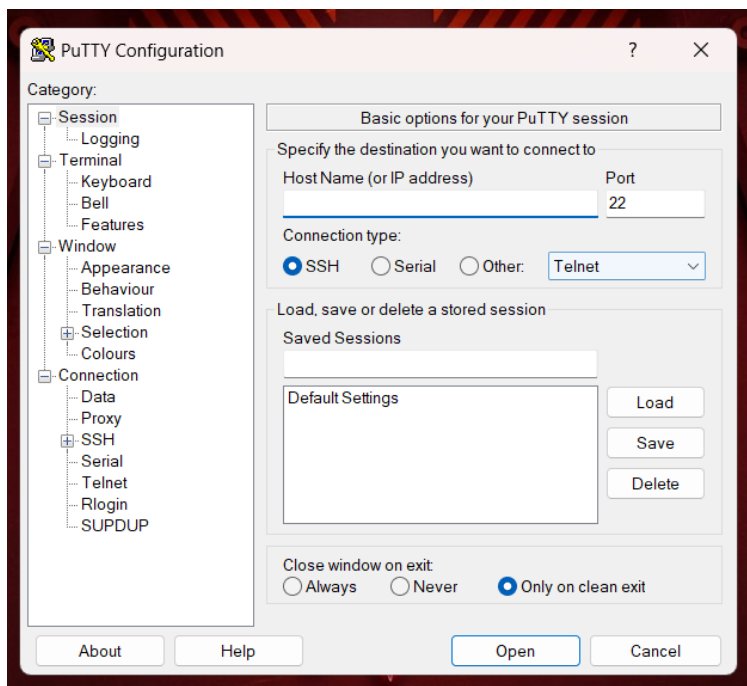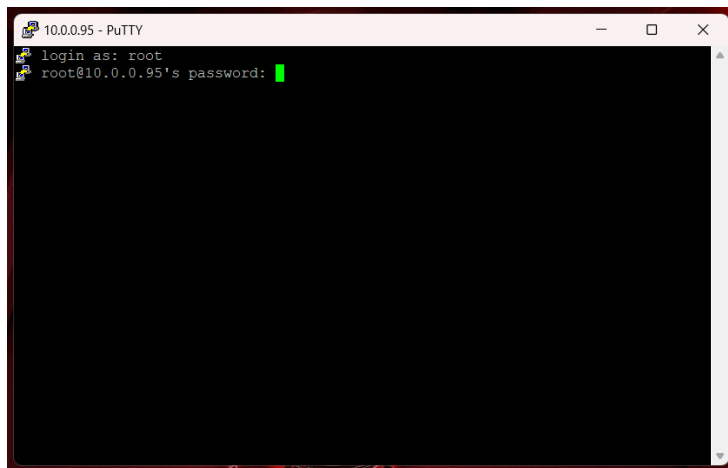
Logging in, your username will be "root", the password is "creality_2023"
Once you are in, you will need to install the "Creality Helper Script" to get access to most of the libraries needed to communicate with the unit. This is done by entering the following commands:

git clone https://github.com/Guilouz/Creality-Helper-Script.git /usr/data/helper-script

sh /usr/data/helper-script/helper.sh

It will take a little while to install the script before you can run them and start installing. If a menu option pops up to update the script do it before installing anything else.

Once this is up and running, you will need to install Moonraker first, and then whichever WebUI (Fluidd or Mainsail… both are good). Once those are installed, try to run the install for Entware to make sure it is all up to date, Klipper Gcode shell command, and then I also recommend KAMP to give you access to adaptive bed meshing and also single object cancellation mid print

.
From there you can install any of the other features, the improved input shaper is recommended but I would suggest not installing everything. The K1 series are very low on memory so the less load on the printer the better here.
Now that side is done. We can quit and save to return to the main command prompt. The final package to install will be downloaded with the command:

opkg install libftdi1

That's it, the printer is ready to receive the AuruMMS

To get your printer to recognize the AuruMMS, you will need to install the firmware for the controller inside it. The easiest way to do this is to download the pre-compiled version on the website:
https://github.com/bigtreetech/SKR-3/blob/master/Firmware/Klipper/README.md
I select the USB version of the firmware, save the firmware-USB.bin file onto a fresh and decent quality microUSB (ideally 32GB or smaller). Now the file needs to be renamed "firmware.bin"
Once that's renamed, eject the card from your computer, make sure the power is off with the AuruMMS and carefully insert the micro SD card into the board where shown below.

Carefully insert MicroSD card here
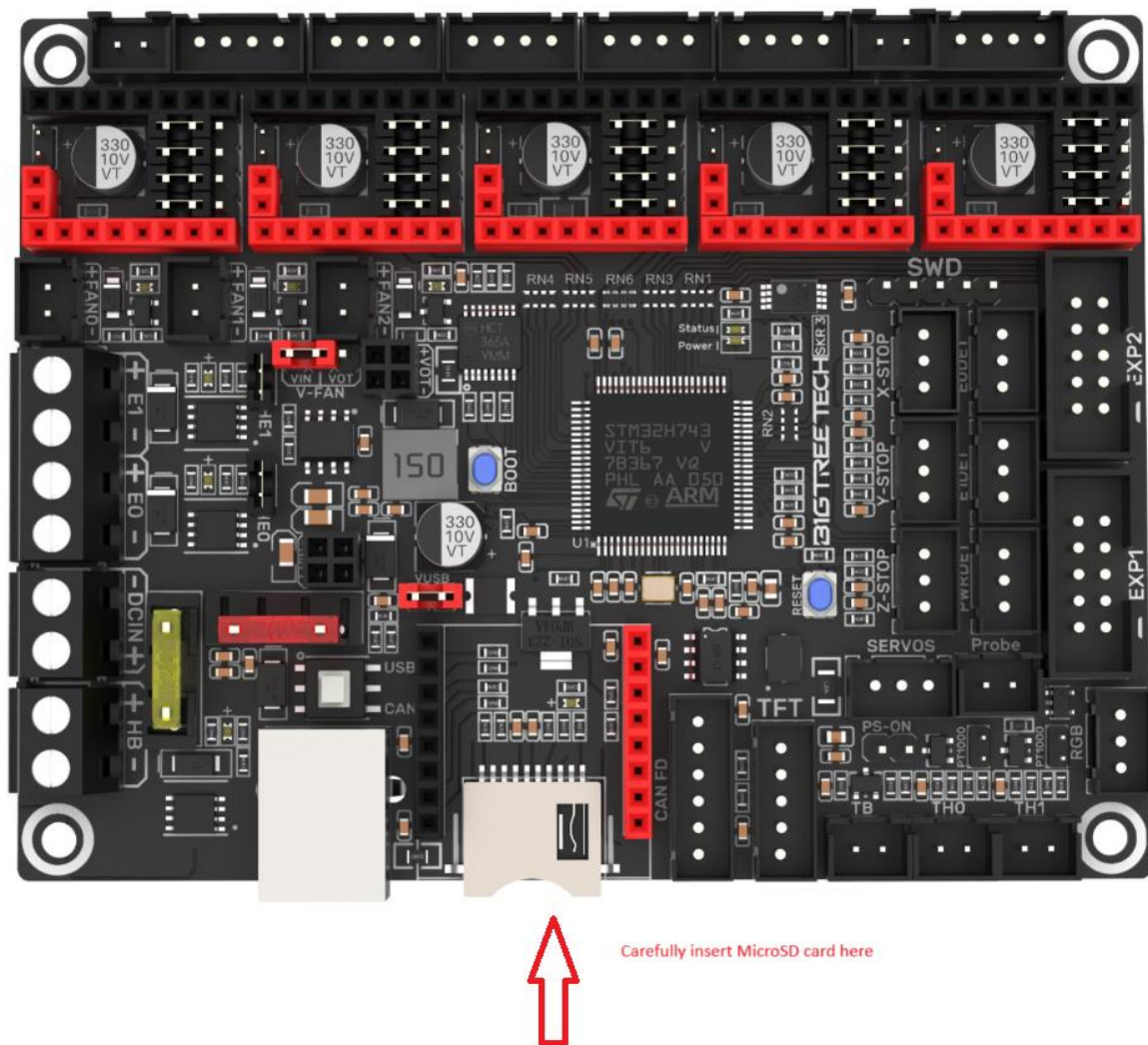
Once installed, the unit can be powered up. Leave it disconnected from the printer for now, leave it powered up for 30 seconds before disconnecting the power and remove the microSD card to check the contents using the computer. If the board successfully flashed then the file name will have changed to FIRMWARE.DAT

Assuming that this has worked, put the MicroSD car back into the slot on the AuruMMS control board, connect the USB from the control board to the USB slot on the front of the printer and power up the AuruMMS unit.

To confirm the connection to the board, in the Putty window type the following command:

dmesg

It will return a lot of information about the internal connections and communications on the printer but we are looking for a mention of ttyACM0 or similar with a label of a USB ACM device or similar. This will be the assigned ID of your AuruMMS unit.

Now that is done, we need to alter the config files on the printer itself. This will be done through the web browser on your computer. Type the IP address of the printer in but don't press return yet...
If you installed Fluid, add ":4408" after the IP address and press return.

If you installed Mainsail, add ":4409" after the IP address and press return.
This will bring up the full WebUI for your printer.

For Fluidd, on the left press on the "configuration" tab, and then we need to click add. Select the AuruMMS files "mmumacro.cfg" and "auruMMS.cfg"

For Mainsail, on the left press on the "Machine" tab, and then we need to click add. Select the AuruMMS files "mmumacro.cfg" and "auruMMS.cfg"

We can now edit the file "auruMMS.cfg"
Just update line 2 with the assigned ID number from your printer.
Save and close the "auruMMS.cfg file"

Now edit the "printer.cfg" file of the printer
You will need to add the 2 lines at the start of your file to import them when the printer loads up:

[include auruMMS.cfg]

[include mmumacro.cfg]

Now you will need to Save and Restart using the menu option at the top.
Doing this will return you to the home screen and a red error message will show up that wasn't there previously. This is displayed as the printer and the AuruMMS are connecting and syncronising, it usually takes less than 30 seconds to clear, but can take a minute or 2.
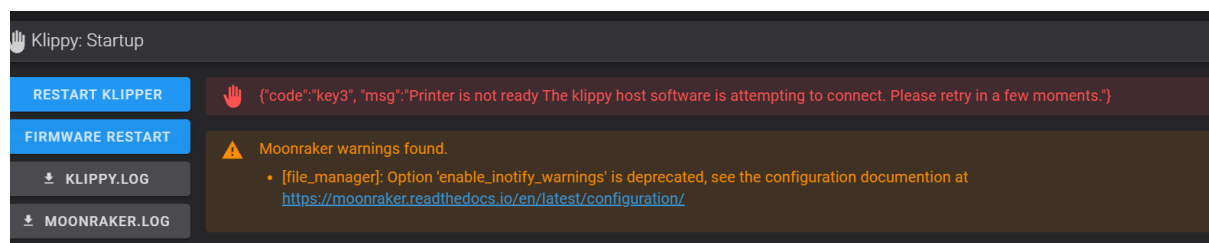
If everything is successful the red message bar will disappear, and your printer is ready to go.

If the red bar changes its message, it will suggest that either the MCU could not be found, or something else. Not finding the MCU could mean that the ID has changed, in which case, finding the ID in Putty with "dmesg" and updating the "auruMMS.cfg" file will fix it. Power cycling the printer and AuruMMS unit together can help with connectivity issues.

The folder mmumacro.cfg contains all the commands for controlling the unit and printer. The lengths for loading and unloading will need to be adjusted to suit your printer and the connecting Bowden tube between the AuruMMS and the toolhead.

Line 12 will tell the AuruMMS to quickly feed the filament to the gears of the extruder. Adjust this to suit.

Line 14 will slowly feed the filament until it reaches the nozzle. Adjust this to suit.

Line 4 is the E value from Line 14 -20

Line 5 is the E value from Line 12 -10

These variations on numbers aren't necessary but proved to make changes more reliable in testing by feeding slightly more than retracted.

The CUT macro tells the printer how to cut the filament.

Line 36 moves the toolhead near the cutting point. Adjust this to your cutting location on your printer, the tested printer used the right hand rear tensioner block to actuate the cutter arm. Line 37 is the slower cutting move, adjust this to push the cutting arm to its full travel point, but not too far or it can damage the arm.

Line 39 releases the cutter by returning to the position set at Line 36

Line 40 moves the printer to your loading point. During testing we were able to get the nozzle just past the side of the bed to purge off below the build plate. This will change depending on how you would like to purge.

You may need to alter the settings in the "printer.cfg" to be able to move the nozzle further past the bed than the factory firmware allows. Line 98 of the tested printers config was set to "position_min: -6" and gave the slightest gap off the bed at full travel. Again, your printer may differ.