

How to get VAMMS running again:

**Hardware:**

- Hopefully VAMMS is reasonably intact. Please reference photos for the actual physical construction. Most parts were sourced from OpenBuildParts. Attached is a list of selected parts and links in case anything needs to be replaced.
- VAMMS will need a 12-24V power supply. Any unit that provides adequate current should work. Connect the power supply to the main board's power headers (ground on the outside).
- The main board is an SKR Mini e3 v3. Schematics/pinout available online, and a photo of our setup is attached.
  - Connect the X and Y axis stepper motors to their respective headers. The motor on the moving gantry is X. Connect the vertical actuator stepper to the Z motor header.
  - Connect each limit switch to its respective limit switch header. Again, reference the board pinout. Polarity does not matter. Check these connections, as they've been problematic.
- Tighten all connections on the frame and the connection between gantry and actuator. Ensure wheels sit firmly on V Slot rails, adjust eccentric nuts. Check belt tension.
- Replace dowel rods ( $\frac{1}{2}$  in) that are too tight or too loose.

**Software/firmware:**

- Download software from <https://github.com/youareyou64/vamms>
  - Ensure Python 3 is installed on device. The internet can help you with this.
  - Dependencies will need to be installed from requirements.txt
    - Open project in an IDE (we use pycharm), and run  
`pip install -r requirements.txt`
  - Create run config that runs `main.py`
- If the mainboard already has a micro SD card installed and you do not experience firmware issues, you can ignore the following steps. If firmware must be recompiled, read on
  - A custom version of Marlin needs to be run on the SKR Mini to get around a few default limitations. This should be available in repository, but in case it must be compiled from scratch, be sure to remove spatial limits (like max x, y, and z positions), and feedrate limits. Also ensure limit switches are left ON during operation.
  - This guide provides instructions on the easiest way to compile the firmware:  
[https://marlinfw.org/docs/basics/install\\_platformio\\_vscode.html](https://marlinfw.org/docs/basics/install_platformio_vscode.html)
  - Place the firmware file onto the microsd card and insert into SKR Mini.

Good luck! If you run into issues or have any questions, please feel free to contact us!

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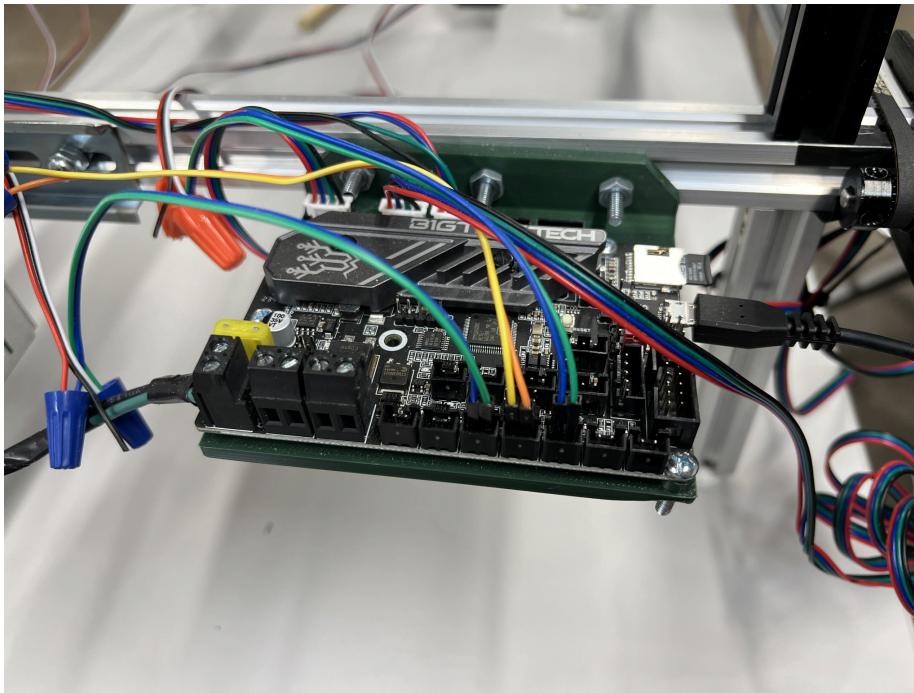
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<https://openbuildspartstore.com/v-slot-20x20-linear-rail/>

Aluminum Rails

<a href="https://openbuildspartstore.com/v-slot-gantry-kit-20mm/">https://openbuildspartstore.com/v-slot-gantry-kit-20mm/</a>	Bearings/Gantry
<a href="https://openbuildspartstore.com/motor-mount-plate-nema-17-stepper-motor/">https://openbuildspartstore.com/motor-mount-plate-nema-17-stepper-motor/</a>	Motor Mounts
<a href="https://openbuildspartstore.com/drop-in-tee-nuts-10-pack/">https://openbuildspartstore.com/drop-in-tee-nuts-10-pack/</a>	Drop in Nuts
<a href="https://openbuildspartstore.com/tee-nuts-m3-10-pack/">https://openbuildspartstore.com/tee-nuts-m3-10-pack/</a>	Tee Nuts
<a href="https://openbuildspartstore.com/gt2-2m-timing-belt-by-the-foot/">https://openbuildspartstore.com/gt2-2m-timing-belt-by-the-foot/</a>	GT2-2M Timing Belt
<a href="https://openbuildspartstore.com/set-screw/">https://openbuildspartstore.com/set-screw/</a>	M5 Set Screws
	M3 Button Head Screws
<a href="https://openbuildspartstore.com/button-head-screws-m3-25-pack/">https://openbuildspartstore.com/button-head-screws-m3-25-pack/</a>	
<a href="https://openbuildspartstore.com/inside-hidden-corner-bracket/">https://openbuildspartstore.com/inside-hidden-corner-bracket/</a>	Corner Bracket

<a href="https://openbuildspartstore.com/xtension-limit-switch-kit/">https://openbuildspartstore.com/xtension-limit-switch-kit/</a>	Limit Switch
<a href="https://openbuildspartstore.com/nema-17-stepper-motor/">https://openbuildspartstore.com/nema-17-stepper-motor/</a>	NEMA 17 Steppers
<a href="https://www.amazon.com/BIGTREETECH-Control-TMC2209-Stepper-Upgrade/dp/B09LC34SCK/">https://www.amazon.com/BIGTREETECH-Control-TMC2209-Stepper-Upgrade/dp/B09LC34SCK/</a>	Main Board



To actually run—connect microusb cable to computer USB port. If connection fails, try different ports. Turn on VAMMS, and then run python program. Follow prompts (hit enter for default values). Runner must be FULLY STOPPED between runs (red stop button in pycharm). Restarting the main board will fix many issues.