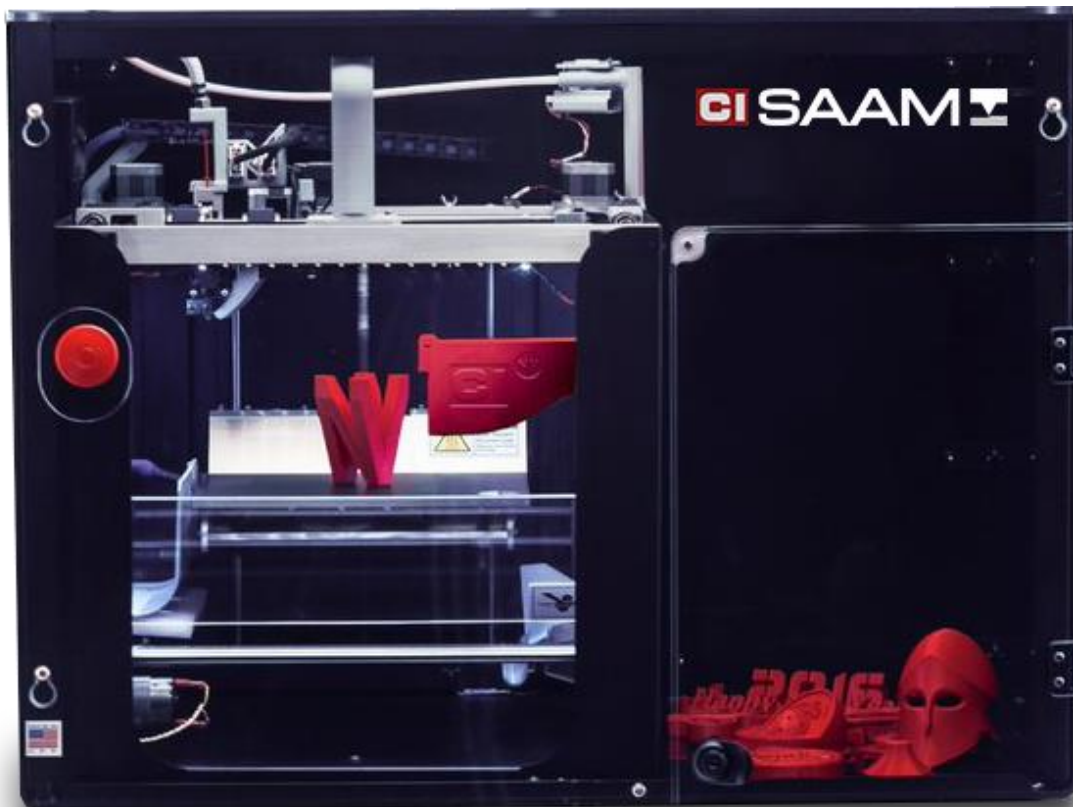


# CININNATI<sup>®</sup>

CI SAAM<sup>™</sup>

## Equipment Manual

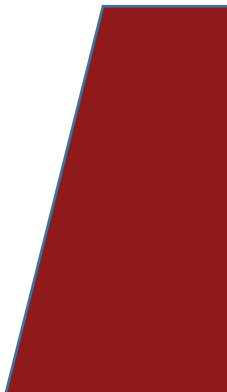


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# Introduction

SAAM is a Fused Filament Fabrication (FFF) 3D printer. Plastic filament is extruded via a mechanical drive through a hot nozzle as the print head is moved in X, Y, and Z axes to form a part. SAAM is controlled with NVCloud, accessed at my.NVBOTS.com. NVCloud converts manifold .STL files into toolpaths that are pushed to SAAM. After a print job is successfully printed, the part removal mechanism will remove the print job to the part collection bin readying SAAM to begin the next print job.

SAAM 3D printer is Built to Share™. It offers the only automated part removal in the industry, and is paired with NVCloud software that allows users to print parts anytime, from any cloud-connected device – while providing administrators with full control of print queues and workflows typical in a shared-use scenario. This combination of capabilities makes SAAM uniquely suited for continuous 24-7 operation in multi-user environments.

To start printing on your SAAM, visit [my.NVBOTS.com](https://my.NVBOTS.com).

# Identification

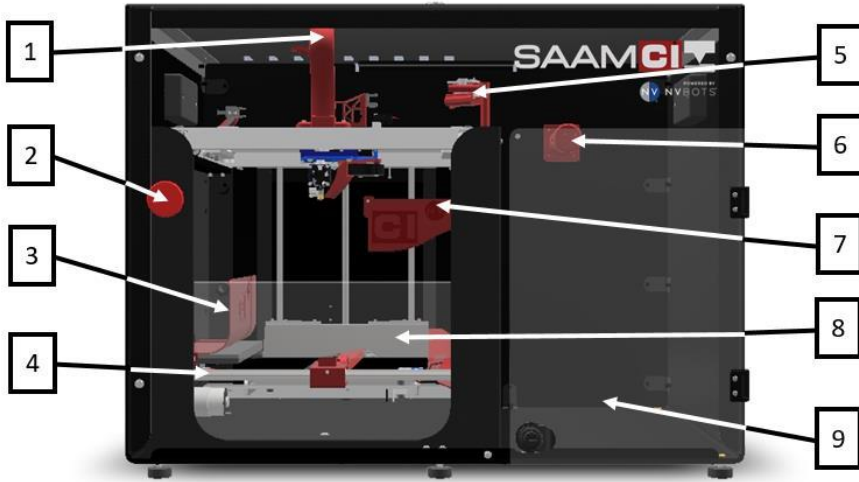


Figure 1) SAAM Front View

**Figure 1**

1. Camera
2. Emergency Stop
3. Removal Barrier
4. Removal Mechanism
5. Filament Detector
6. Spool Mount
7. Purge Collector
8. Z Carriage Barrier
9. Part Collection Bin

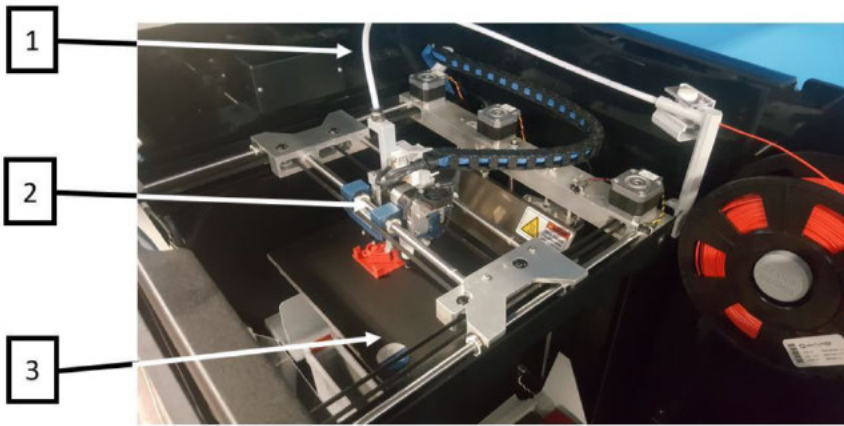


Figure 2) SAAM Top View

**Figure 2**

1. Filament Guide Tube
2. Extruder
3. Print Plate

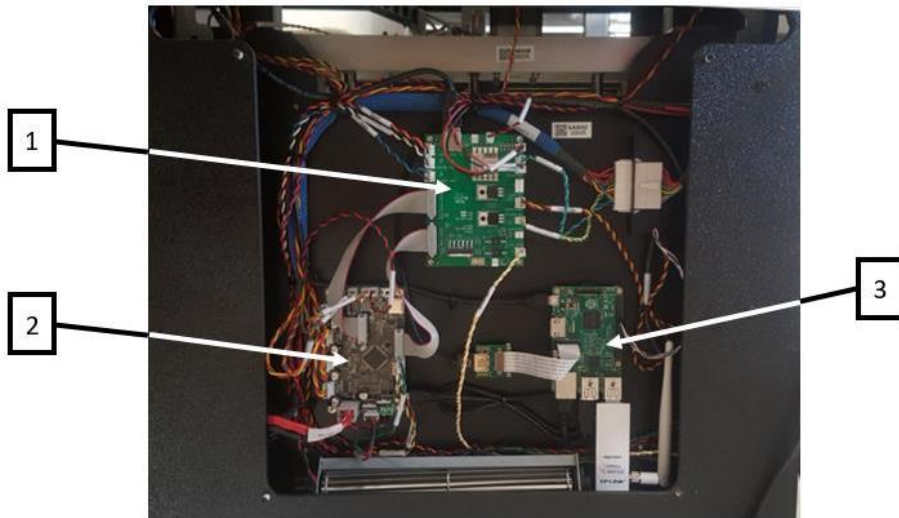


Figure 3) SAAM Electronics Panel

**Figure 3**

1. Expansion Board
2. Printer Board
3. Onboard Computer

# Installation

## Packing List

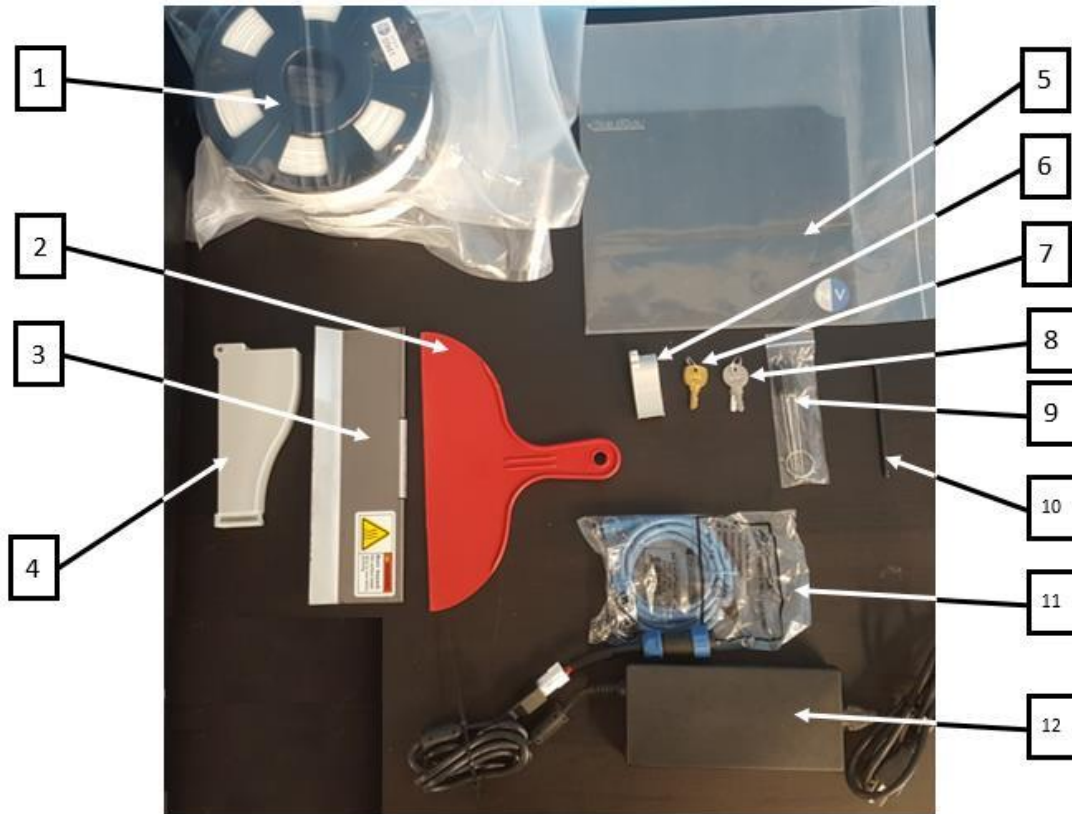


Figure 4) SAAM included supplies

### Figure 4

- |                                 |   |
|---------------------------------|---|
| 1. Filament Spools              | 8. Front Door Key                         |
| 2. Buildtak Applicator          | 9. Wire Brushes                           |
| 3. Z-Carriage Cover             | 10. 4mm Allen Key                         |
| 4. Purge Collector              | 11. Ethernet Cable                        |
| 5. Buildtak                     | 12. Power Supply                          |
| 6. Blower Duct ( <i>spare</i> ) | 13. SAAM ( <i>not shown</i> )             |
| 7. Top Lid Key                  | 14. Equipment Manual ( <i>not shown</i> ) |

# Initial Setup

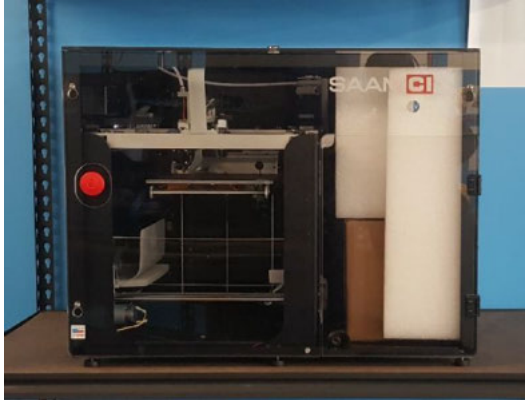


Figure 5) Un-created SAAM on table

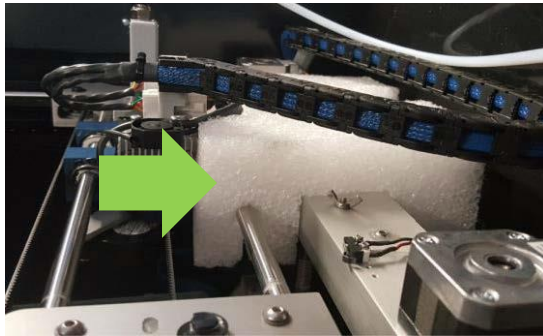


Figure 6) Packing foam securing print head

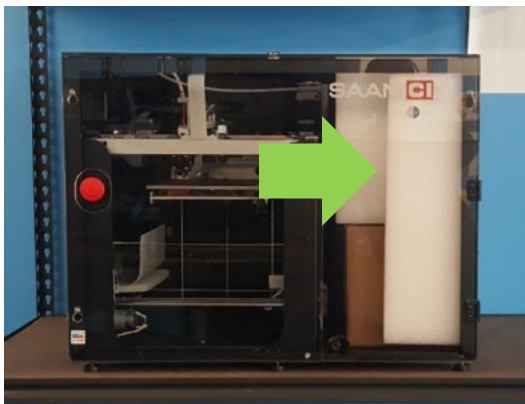


Figure 7) Packing foam securing supplies box



Figure 8) Z-Carriage barrier placement

1. Remove printer from crate and place on stable surface.
2. Unlock the top lid with the included keys.
3. Unlatch the top lid by sliding it toward the front of the printer.
4. Remove the top lid by lifting upwards. Set top lid aside.
5. Remove the WHITE FOAM packaging blocks and printer supplies box from the printer.
6. Place the Z-Carriage Cover on the top-back of the Z-Carriage as indicated in Figure 8.
7. Insert the purge collector into the slot at the front of the printer as indicated in Figure 9.
8. Plug in Ethernet and power cables on the bottom-left side of the printer.



Figure 9) Purge collector placement



Figure 10) Ethernet and power jacks

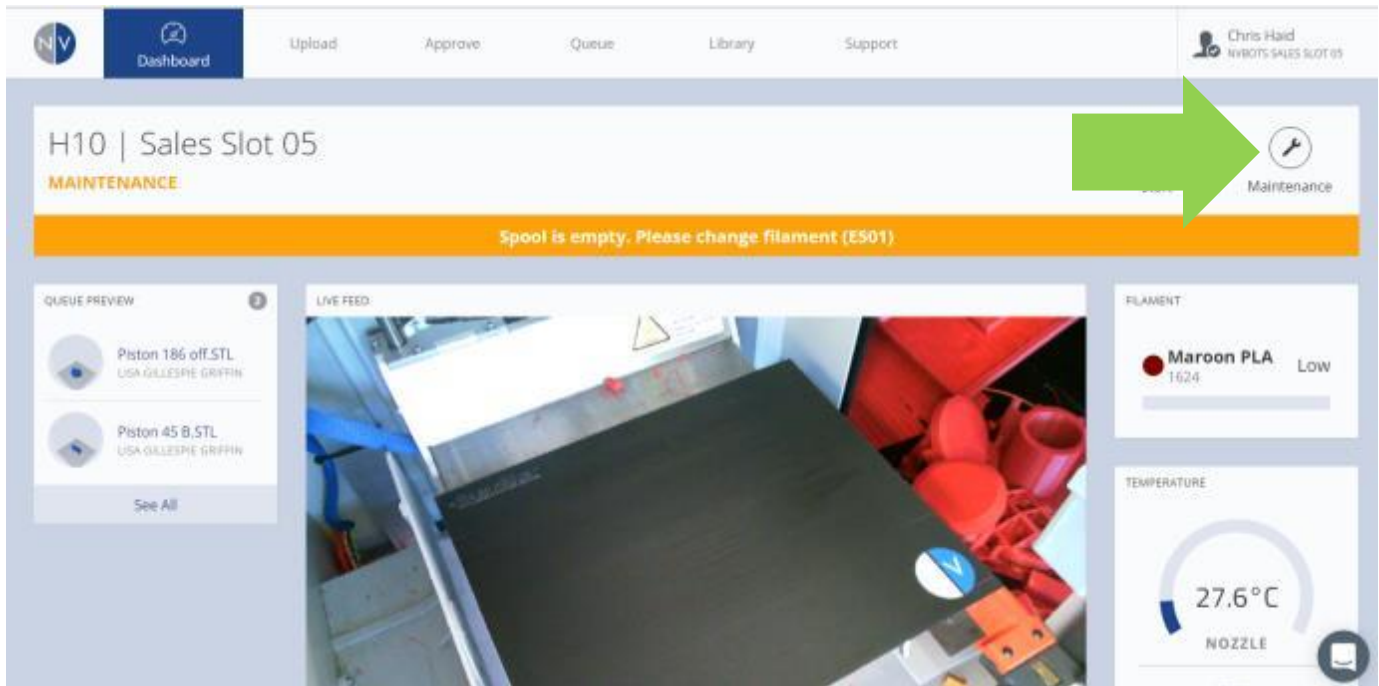


Figure 11) Change Filament routine is located under Maintenance on my.NVBOTS.com/dashboard.

9. Power on the printer at the red emergency stop button by pulling outwards. The printer should connect and boot in 0 - 5 minutes. The printer has successfully connected when the part removal routine begins.
10. Sign in to [my.NVBOTS.com](https://my.NVBOTS.com) with your account credentials. If you do not have an account, please contact [support@NVBOTS.com](mailto:support@NVBOTS.com).
11. Run the “Change Filament” routine from the Dashboard page to load a new spool of filament into the printer. Click the Maintenance button and then the Change Filament button. Follow the on-screen instructions.
12. Start printing. See Operation.

# Safety

## Pinch Points

The print head motion system can cause pinching. Keep hands clear and tie back long hair while the system is in motion.

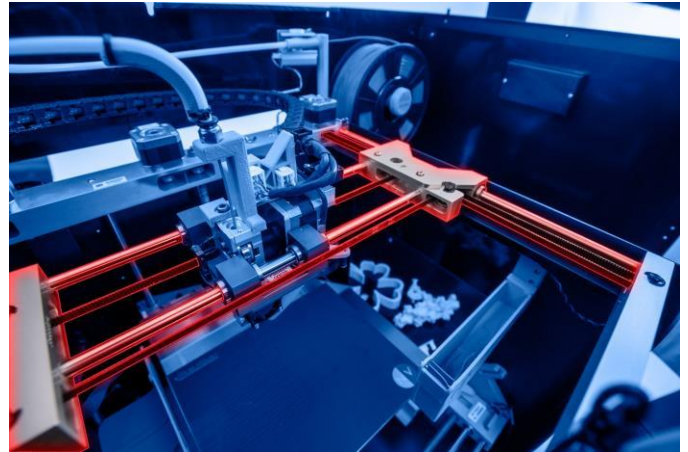


Figure 12) Print head motion system pinch point hazard

## Sharp Components

The part removal system contains a sharp blade. Use caution to avoid cuts.

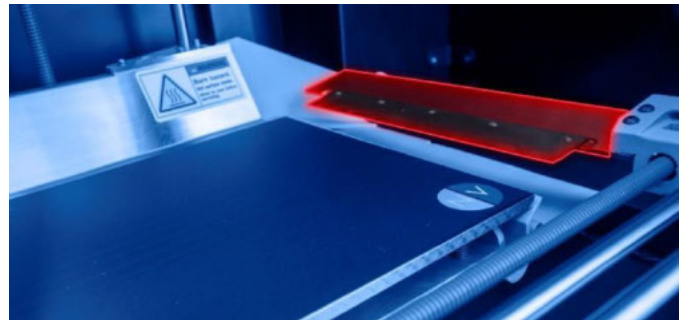


Figure 13) Part removal system cutting hazard

## Burn Hazards

The hot end and the print plate operate at temperatures which may cause burns. Only touch surfaces colder than 45 °C to avoid burns.



Figure 14) Hot-end burn hazard

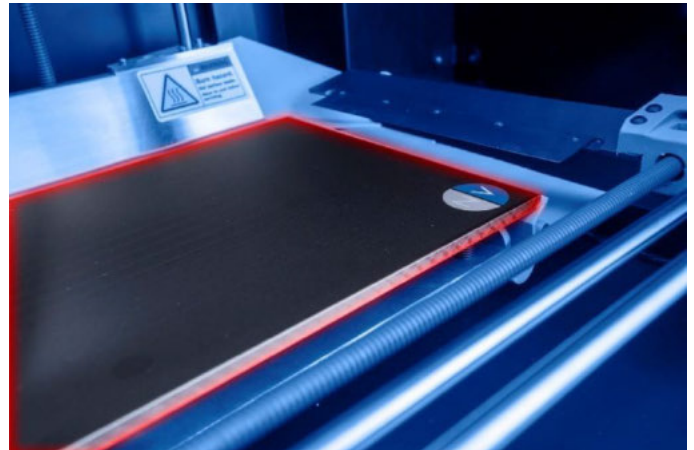


Figure 15) Print plate burn hazard



# Specifications

- **Build Envelope:** 7.9" x 7.4" x 9.4" (20 cm x 19 cm x 24 cm)
- **Printer Dimensions:** 30" x 22" x 23" (76 cm x 56 cm x 59 cm)
- **Maximum Printing Speed:** 0.16 lbs / hr (72 grams / hr)
- **Layer Height (Z Resolution):** Standard (0.007") / Fast (0.012") *Standard (0.2 mm) / Fast (0.3 mm)*
- **Nozzle Diameter:** 0.016" (0.4 mm)
- **Build Material:** Polylactic Acid (PLA)
- **Material Delivery:** 2.2 lb spool (1 kg spool)
- **Power Requirements:** 240 W
- **Connectivity:** Ethernet
- **Software:** NVCloud

# Operation

- SAAM is managed and operated through the interface at [my.NVBOTS.com](https://my.NVBOTS.com).
- For tips, best practices, and getting started, visit [my.NVBOTS.com/support](https://my.NVBOTS.com/support).

# Troubleshooting

For troubleshooting information, please visit [my.NVBOTS.com/support](https://my.NVBOTS.com/support).

Have the following information ready before making contact with a Support Representative:

- Company Name
- Machine Serial Number
- Error Code
- Have this manual available for reference

You may contact customer support via the instant chat icon at the bottom-right of the NVCloud interface at [my.NVBOTS.com](https://my.NVBOTS.com).