SIMPLY TECHNOLOGIES

ACADEMY SERIES
OWNER'S MANUAL

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WELCOME TO THE ACADEMY SERIES

Congratulations on your purchase of a Simply Technologies **ACADEMY Series** CNC machine. You have chosen a fully integrated, education-focused platform designed to deliver safe, consistent, and reliable CNC performance in classroom and training environments.

The ACADEMY Series is built as a complete, plug-and-play solution. Your machine arrives fully assembled and ready for operation, with no complex setup or installation required. Designed specifically for schools and shared learning spaces, it features a fully enclosed system and simplified controls that allow students and educators to focus on learning, not configuration.

At Simply Technologies, we believe CNC technology in education should be structured, accessible, and dependable. This manual will guide you through safe operation, best practices, and ongoing maintenance, so you can confidently integrate CNC into your classroom and focus on teaching real-world skills.

If you have any questions, visit www.simplytechnologies.xyz/support or contact us directly at steve@simplytechnologies.xyz.

SECTION 1: SAFETY INFORMATION

Safety is everyone's responsibility. Please read and understand this section before operating your machine.

1.1 General Safety

- Read this manual in full before using the machine.
- Only trained and qualified personnel should operate this machine.
- Do not bypass any safety systems or operate the machine with guards removed.
- Always wear appropriate Personal Protective Equipment (PPE) including:
    - Safety glasses or face shield
    - Hearing protection
    - Dust mask or respirator when cutting materials that generate fine dust
- Tie back long hair, remove jewelry, and avoid loose clothing.

- Keep children, visitors, and untrained personnel away from the work area.

1.2 Electrical Safety

- The ACADEMY Series requires 110V, Single Phase 15A (or optional 220V, Single Phase, 10A) power with proper grounding.
- Do not use adapters or modify the supplied plug.
- Only qualified electricians should perform wiring changes.
- Inspect all cords regularly for damage and replace if necessary.
- Avoid using extension cords. If unavoidable, use a heavy-duty, grounded cord no longer than 10 feet.

1.3 Workspace Safety

- Ensure the floor can support the machine's weight and workpieces.
- Keep the area clean, dry, and free of obstacles.
- Avoid placing materials on or leaning against the gantry or rails.
- Properly secure dust collection hoses to avoid drag on the gantry.
- Ensure adequate clearance around the machine for safe material handling.

1.4 Operational Safety

- Never leave the machine unattended while running a program.
- Always be ready to activate the Emergency Stop button.
- Ensure all workpieces are properly clamped before starting.
- Avoid touching moving parts, especially the spindle and cutting tools.
- Let tools cool before handling after use.
- Regularly inspect bits and collets for wear or damage.

SECTION 2: E-STOP & LOCKOUT PROCEDURE

2.1 Emergency Stop (E-Stop) Function

Your DISCOVERY Series is equipped with an Emergency Stop Button located on the back panel. Use this button to immediately stop all machine motion and spindle operation in the event of unsafe conditions or unexpected behaviour.

How to Activate the Emergency Stop

1. Press the Red Emergency Stop Button firmly.
2. Assess the situation to ensure no one is at risk and that the machine is safe to restart.

How to Reset After Emergency Stop

1. Twist the Emergency Stop Button clockwise to release it.
2. Reinitialize the machine by performing a Home operation.
3. Verify all workpiece clamps and tool settings before restarting any job.

2.2 Lockout Procedure

To prevent unauthorized or accidental operation—especially in schools or shared workspaces—the Emergency Stop Button can be locked out with a standard padlock.

How to Lock Out the Machine

1. Press the Emergency Stop Button to engage it.
2. Insert a padlock through the designated hole in the button.
3. Secure the lock and remove the key, storing it in a safe location.

Note: Only authorized personnel should have access to the lockout key. Locking out the machine ensures that it cannot be restarted until the lock is removed, adding an extra layer of safety in environments with multiple users.

SECTION 3: MACHINE SPECIFICATIONS

The ACADEMY Series is engineered to provide reliable CNC capabilities with a strong focus on educational, prototyping, and light production environments.

Below are the general specifications across ACADEMY models. Specific details may vary slightly depending on model number and spindle configuration.

	ACADEMY 1	ACADEMY 2	ACADEMY 4
SKU	ACADEMY1 / ACADEMY1E (EDU)	ACADEMY2 / ACADEMY2E (EDU)	ACADEMY4 / ACADEMY4E (EDU)
X-Axis Travel	12" (305mm)	24" (610mm)	24" (610mm)
Y-Axis Travel	12" (305mm)	12" (305mm)	24" (610mm)
Z-Axis Travel	5.5" (140mm)	5.5" (140mm)	7.87" (200mm)
Spindle Type	1HP Air Cooled	1HP Air Cooled	1HP Air Cooled
Spindle Configuration	ER11 (1/8" & 1/4")	ER11 (1/8" & 1/4")	ER20 (1/4" & 1/2")
Controller	eCNC (7" Screen)	eCNC (7" Screen)	eCNC (7" Screen)
Rapid Feed Rate	150ipm (3.81m/min)	150ipm (3.81m/min)	150ipm (3.81m/min)
Resolution	± 0.00393" (0.10mm)	± 0.00393" (0.10mm)	± 0.00393" (0.10mm)
Power Requirements	AC 110V, 50-60Hz, 15A, 1-Phase (Optional 220V, 50-60Hz, 10A, 1-Phase)	AC 110V, 50-60Hz, 15A, 1-Phase (Optional 220V, 50-60Hz, 10A, 1-Phase)	AC 110V, 50-60Hz, 15A, 1-Phase (Optional 220V, 50-60Hz, 10A, 1-Phase)
Machine Base	High Rigidity Aluminum Extrusion	High Rigidity Aluminum Extrusion	High Rigidity Aluminum Extrusion
Working Table	High Rigidity Aluminum Extrusion	High Rigidity Aluminum Extrusion	High Rigidity Aluminum Extrusion
Gantry Bridge	High Rigidity Aluminum Extrusion	High Rigidity Aluminum Extrusion	High Rigidity Aluminum Extrusion
Gantry Supports	Steel Plate	Steel Plate	Steel Plate
Machine Dimensions	23.76"L x 23.23"W x 28.11"H (603.5mm x 590mm x 714mm)	23.76"L x 36.22"W x 29.07"H (603.5mm x 920mm x 738.5mm)	36.22" L x 36.22" W x 33.64" H 1603.5mm x 920mm x 854.5mm)

SECTION 4: GLOSSARY OF TERMS

Term	Definition
CNC	Computer Numerical Control – the automation of machine tools via a computer executing pre-programmed sequences of commands.
G-Code	The programming language used to control CNC machines, defining toolpaths, movements, and operations.
Toolpath	The route or path a tool follows to cut or engrave a part.
Spindle	The rotating component that holds and spins the cutting tool.
Workpiece	The material being machined.
Fixture	A device used to securely hold the workpiece in place during machining.
Z-Axis	The vertical axis in a 3D coordinate system, typically representing up and down movement.
X-Axis	The horizontal axis (left to right movement on most machines).
Y-Axis	The depth axis (front to back movement on most machines).
Router Bit	A cutting tool used in CNC routing, typically for woodworking.
Feed Rate	The speed at which the cutting tool moves through the material, typically in inches or mm per minute.
Plunge Rate	The speed at which the tool lowers into the material.
RPM	Revolutions Per Minute – how fast the spindle or cutting tool rotates.
Step-Over	The horizontal distance the tool moves over between passes.
Pass Depth	The maximum depth the tool will cut in a single pass.
Home Position	The machine's reference point, often set at the start of a job (0,0,0).
Origin	The starting coordinate for the toolpath, often set by the operator on the workpiece.
Zeroing	The process of setting the machine's tool to the origin point.
Post Processor	A software component that translates CAM toolpaths into G-code specific to a CNC machine or controller.
CAM	Computer-Aided Manufacturing – software used to create toolpaths from CAD designs.
CAD	Computer-Aided Design – software used to create precise drawings and models for manufacturing.
Stepper Motor	A type of motor commonly used in CNC machines that moves in fixed steps for precise positioning.
Controller	The hardware and software interface that interprets G-code and drives machine movement.

SECTION 5: GETTING STARTED (PLUG & PLAY)

5.1 What's Included

When unboxing your **ACADEMY Series CNC Machine**, ensure you have the following components:

Machine Components:

- ACADEMY Series CNC Router, Enclosure, and Vacuum System
- eCNC Controller with 7" Touchscreen
- ER-21 Collets (1/8" and 1/4")
- Tool Touch-Off Puck
- Collet Wrenches (2)
- Hold Down Clamps (2)
- Dust Shoe

Note: Do not discard packaging until assembly is complete. Inspect all parts before disposing of shipping materials.

Your **ACADEMY Series** CNC machine is designed to be ready for use right out of the box. There is no mechanical assembly or complex setup required.

Before powering on the machine, complete the following quick checks:

- Ensure the machine is placed on a stable, level surface.
- Verify proper power connection based on your facility requirements.
- Confirm that all packaging materials have been removed from the machine and enclosure.
- Check that the emergency stop is accessible and functioning properly.

SECTION 6: ELECTRICAL CONNECTIONS

⚠️ **WARNING:**
All electrical connections must comply with local electrical codes. Installation should be performed by a qualified electrician if you are unsure of your power source or wiring requirements. Improper installation can result in equipment damage, fire, or serious injury.

6.1 Power Requirements

- **Voltage:** 110V AC / 220V
- **Amperage:** 15A / 10A
- **Phase:** Single Phase
- **Plug Type:** NEMA 6-20 (Pre-installed)

Important: This machine requires a dedicated 110V / 220V circuit. Do not use power bars, adapters, or modify the supplied plug.

6.2 Grounding Instructions

Proper grounding is essential for safe operation.

- This machine is equipped with a grounded power cord and NEMA 6-20 plug.
- Ensure the outlet is properly installed and grounded in compliance with national and local codes.
- Never remove the ground pin or use ungrounded adapters.

If you are unsure about grounding or circuit requirements, contact a licensed electrician.

6.3 Extension Cords

⚠️ **Warning:** Extension cords are not recommended.If absolutely necessary:

- Use only a 10-gauge or heavier, grounded, 3-conductor cord.
- Limit length to 10 feet (3 meters) or less.
- Inspect regularly for damage.
- Avoid creating a trip hazard.

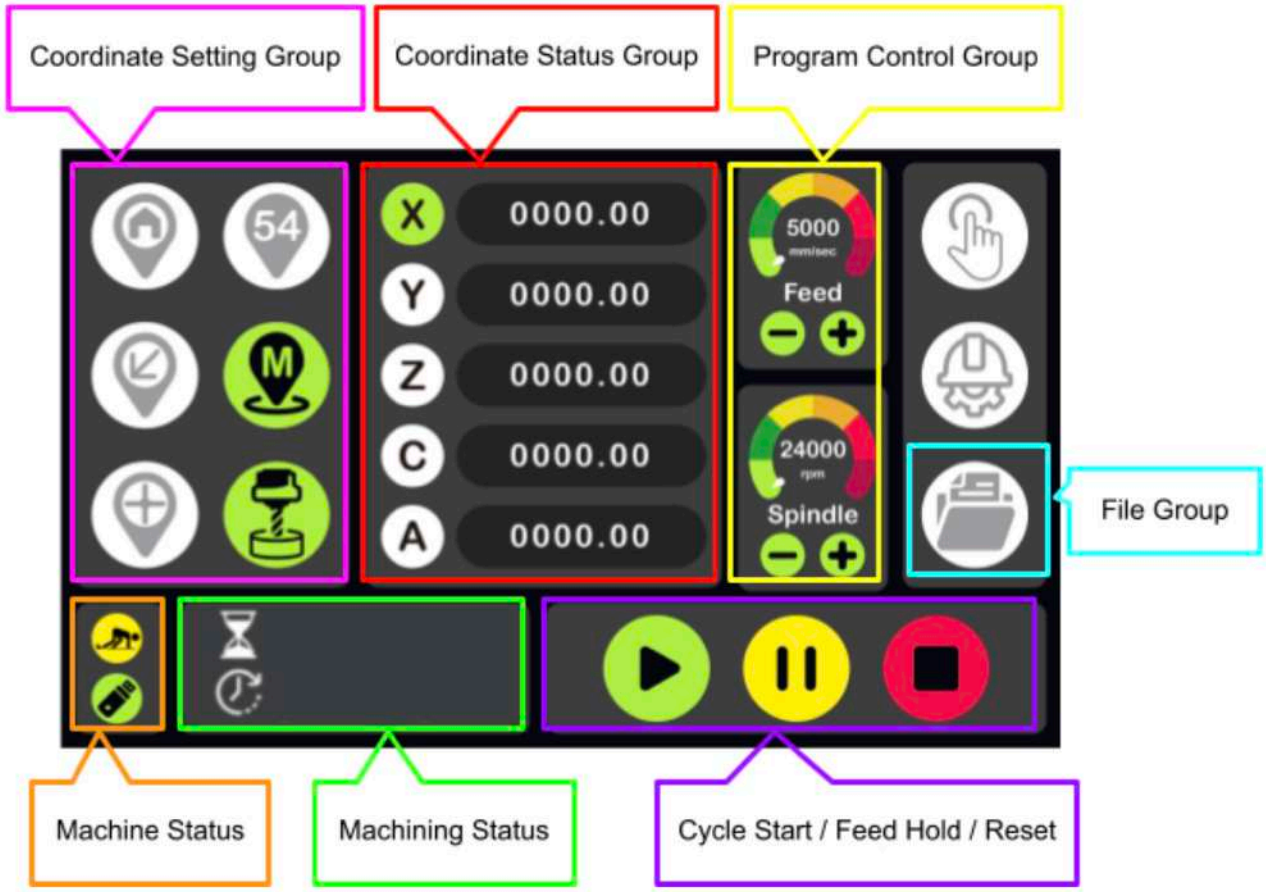
6.4 Cable Management

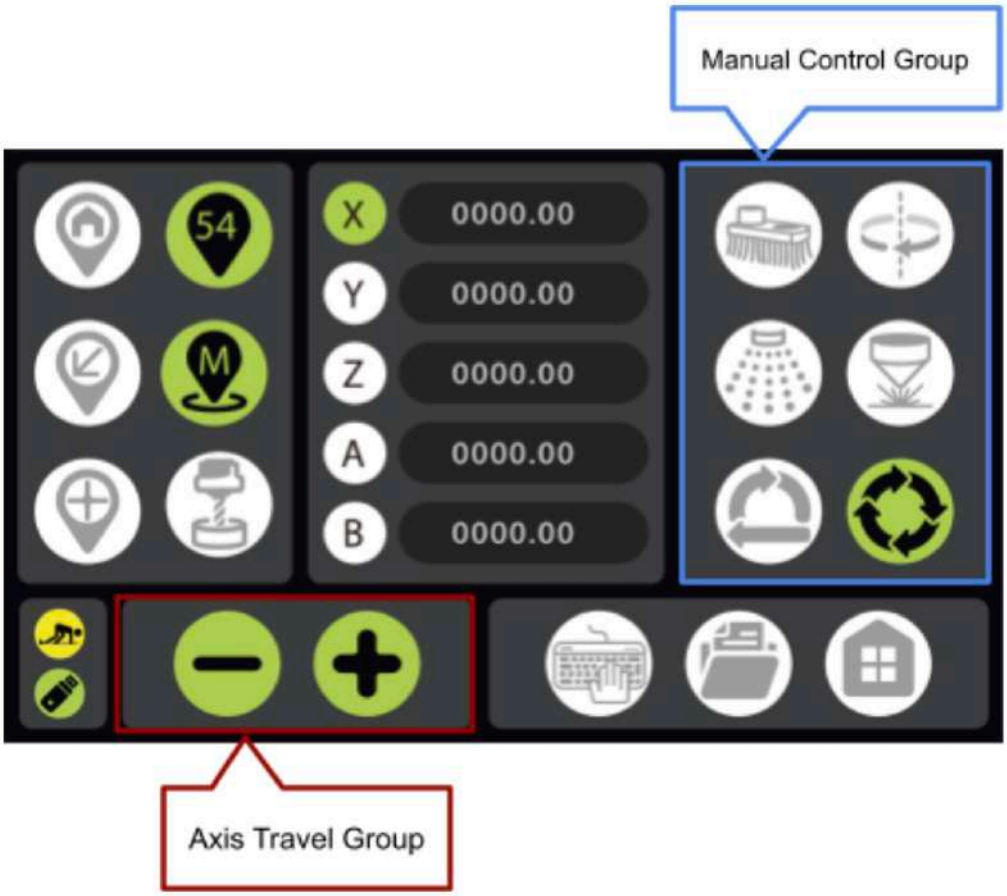
- Route all cables safely to prevent damage or tripping.
- Do not place heavy objects on power cords.
- Ensure cables are not stretched, pinched, or exposed to heat.

SECTION 7: CONTROLLER OVERVIEW (ECNC)

The ACADEMY Series uses the **eCNC Controller**, a streamlined interface designed for straightforward machine control. This section introduces the key screens, functions, and workflows to help you confidently navigate the controller.

7.1 Controller Layout





Cycle Start / Feed Hold / Reset

Icon	Name	Function
	Home	Execute Machining File
	Feed Hold	In the course of program execution, the temporary pause of the feed function.
	Reset	Off State: Clicking will trigger an alarm and stop the machine. On State: Clicking will reset the alarm and clear errors.

File Group

Icon	Name	Function
	Open	Open the File
	Load File	Load the File

Coordinate Setting Group

Icon	Name	Function
	Home	Homing all axes
	G54	Coordinate System Selection - G54
	G55	Coordinate System Selection - G55
	G56	Coordinate System Selection - G56
	G57	Coordinate System Selection - G57
	G58	Coordinate System Selection - G58
	G59	Coordinate System Selection - G59
	Zero	Move to the work origin
	Machine Coordinate	Switch to Working Coordinate
	Working Coordinate	Switch to Machine Coordinate
	Set Zero	Set working origin (The coordinate values will be zero.)
	Probe	Set the tool to zero (Z0) position.

Machine Status

Icon	Name	Function
	Standby	Machine Status: Standby
	Stop	Machine Status: Stop
	Run	Machine Status: Processing
	USB	Read USB Drive

Program Control Group

Icon	Name	Function
	Feed Rate	Current Feed Rate
	Spindle Speed	Current Spindle Speed
	Increase Magnification	Increase magnification by pressing the "+" button.
	Decrease Magnification	Decrease magnification by pressing the "-" button.

JOG Operation Group

Icon	Name	Function
	Positive	Control axial JOG movement.
	Negative	Control axial JOG movement.

Manual Control Group

Icon	Name	Function
	Manual	Switch to the Manual Page
	Spindle	Manually Start the Spindle Spindle Status Display (Flashing indicates the spindle has not reached the set speed)
	Step Mode	Switch to Step Mode
	Cont. Mode	Switch to Continuous Mode

7.2 Adjust Machine Coordinates, Center Point & Tool Setting

Power on and wait for the system to complete the startup process before proceeding with equipment operation.

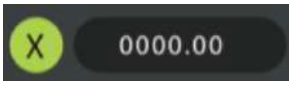
1. Press RESET and ensure the RESET button is not flashing.
2. HOME all Axes.
3. Enter the JOG OPERATION Page
4. Switch the MACHINE COORDINATE to WORKING COORDINATE
5. Move the X and Y Axes to set the work origin using + and − keys.

   NOTE: You may choose between STEP mode and CONTINUOUS mode

   In STEP mode, you can adjust the step distance by selecting , adjusting the step distance 

and selecting again to confirm the move distance.

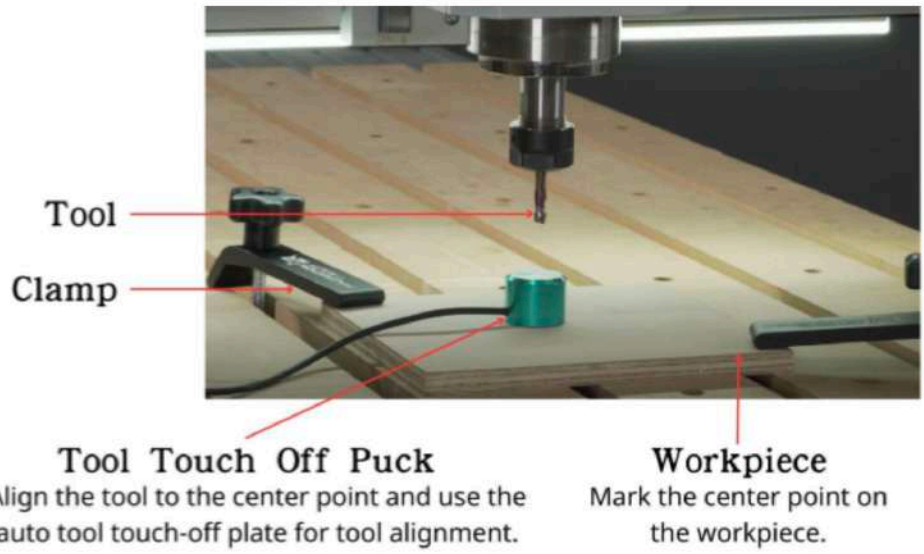
   In CONTINUOUS mode, select the icon, adjust the movement speed, 

and select again to confirm the speed.
6. After confirming the machining position, press SET ZERO . The selected coordinate will reset to zero 

7. After setting the working origin for X and Y, ensure your material is secured to your machine, and that the correct tool in installed. Plug in the Tool Touch Off Puck and place it on your workpiece or spoilboard (depending on where you set your Z Origin in your design software. Manually jog the Z-Axis down towards the puck until you are 10-20cm above it. Select PROBE The Z-Axis will slow descend until the tool tip touches the puck. At this point, the machine will automatically set the Z-Axis working origin.

CAUTION: While using the Tool Touch Off Puck procedure, it is recommended that you place your finger on the RESET button, allowing for an immediate stop in case of emergency.

NOTE: You may also choose to manually set your Z-Axis working origin using the same instructions as the X and Y origins. You will manually jog the tool until it is barely touching your workpiece/spoilboard, and then select SET ZERO to reset the coordinate to zero.



7.3 File Selection & Machining

1. Save your machining file in the CNCfile folder on your USB Stick. Insert the USB into your machine's USB Port. You can ensure that the USB Stick is recognized by checking for the icon at the bottom-left corner of the HOME page.

   NOTE: If you are using a new USB Stick, insert it into the machine's USB Port prior to use. After powering on the machine, remove the USB Stick. This process will automatically create the CNCfile and Update folders on your USB Stick. Then, save

your machine files in the CNCfile folder. Only files stored in this folder can be read by the eCNC Controller.

2. Open the file folder.
3. Select the machining file and press LOAD FILE Once the file is loaded, the system will automatically return to the HOME page.
4. START machining.

   NOTE: The machine will immediately begin operation. Ensure that there are no safety issues prior to beginning.

7.4 Adjust Machining Speed & Feed Rate

Feed Rate (F-Value) Adjustment
Press the + and - keys to adjust the feed magnification, corresponding to the F-Value set in your design file. Recommended machining speed adjustment (cutting speed) to begin: 2000-3500 mm/min.

Spindle Speed (S-Value) Adjustment
Press the + and - keys to adjust the spindle speed magnification, corresponding to the S-Value set in your design file. Recommended machining speed adjustment (cutting speed) to begin: 18000-24000 RPM.

SECTION 8: SPOILBOARD SURFACING

Why Surfacing Matters

Your machine comes with a pre-installed **MDF spoilboard** mounted to the aluminum T-slot table.
While the MDF board is machined flat at the factory, slight variations can occur during shipping, installation, or environmental changes (humidity, temperature).

Surfacing your spoilboard ensures:

- A **flat reference plane** for consistent cutting depths.
- Improved accuracy when cutting through materials.
- Extended spoilboard lifespan by resetting the surface.

Recommended Surfacing Tool

Use a **large diameter surfacing bit (e.g., 1.5" or 2")** for best results.
Ensure the tool is sharp and properly secured in the collet.

Creating a Surfacing Toolpath

You can create a surfacing toolpath using software like **VCarve or Aspire**.

Toolpath Parameters Example:

- **Tool**: 1.5" Spoilboard Surfacing Bit
- **Cut Depth**: 0.5mm (0.02") per pass
  (Use multiple passes if needed)
- **Stepover**: 80% of tool diameter
- **Feed Rate**: 150 IPM
- **Spindle Speed**: 18,000 RPM (or as recommended by bit manufacturer)

Note: Ensure the toolpath is slightly **larger than the spoilboard area** to cover the full surface.

Running the Surfacing Toolpath

1. **Secure the spoilboard** to the machine table if it has been removed.
2. **Load the toolpath file** onto your USB drive.
3. **Set XY zero** to the front-left corner of the spoilboard.
4. **Set Z zero** to the surface of the spoilboard using the touch-off puck.
5. **Run the toolpath**, monitoring the process at all times.

Spoilboard Maintenance Tip

After surfacing, check your **hold-down methods (clamps, screws, etc.)** and re-adjust them if necessary.
Repeat surfacing periodically to maintain a flat working surface as needed.

SECTION 9: MAINTENANCE

9.1 Maintenance Schedule

Proper maintenance ensures optimal performance and extends the life of your CNC machine.
Use the following **checklists** to maintain your machine.

Daily Maintenance (Before or After Use)

- Visually inspect **cables, hoses, and connections** for damage.
- Remove dust and debris from **rails, ball screws, and spindle area**.
- Ensure **spindle collet and nut** are clean and free of debris.
- Check for **loose bolts or fasteners** on the machine frame and gantry.

Weekly Maintenance

- Apply **light machine oil** to linear guide rails and ball screws.
- Inspect **spindle cooling system** (check coolant level if applicable).

- Confirm **gantry moves smoothly** without hesitation or grinding.
- Check **tool touch-off puck** for functionality.

Monthly Maintenance

- Perform a **full machine cleaning**, removing all dust from electrical enclosures.
- Inspect **belt tension** (if applicable) and adjust if necessary.
- Verify **controller buttons and display** are functioning properly.
- Test **emergency stop and safety features** for reliability.
- Inspect **spindle cooling system hoses and fittings** for leaks.

Quarterly Maintenance

- Check **spindle bearings** for noise or rough operation.
- Verify **controller firmware** is up to date (contact support if unsure).
- Review **machine level** and re-level if needed.

9.2 Bearing and Rail Lubrication

Use **light machine oil** or **rail-specific lubricant** on:

- **Linear Guide Rails**
- **Ball Screws**

Do not over-lubricate, as excess oil attracts dust. Wipe off any buildup after application.

SECTION 10: FUSE LOCATIONS AND ELECTRICAL SAFEGUARDS

10.1 Fuse Protection Overview

Your Performance Series CNC machine is equipped with **fuse protection** to safeguard the control system and spindle from electrical faults.
If the machine becomes **non-responsive** or **fails to power on**, inspect the fuses before seeking service.

10.2 Fuse Locations

Main Controller Box Fuses:

- Located inside the **main control box** (lower access panel).
- Protects:
    - **eCNC Controller Board**
    - **Power Supply Circuitry**
    - **Spindle VFD (Variable Frequency Drive)**

Spindle VFD Fuses:

- Located inside the **VFD enclosure**.
- Protects:
    - **Spindle motor and VFD circuits**

10.3 Replacing Fuses

⚠️ **Warning:**
Always **disconnect power** before opening the control box or VFD enclosure.

1. Turn off the machine and **unplug from power**.
2. Open the **control box panel** using appropriate tools.
3. Locate the **fuse holders**.

4. Carefully **remove and inspect** each fuse.

5. Replace **only with the same type and rating** as specified on the fuse label or in the electrical diagram.

6. Reassemble the panel and restore power.

Note:
Repeated fuse failures indicate an **underlying electrical issue**. Contact Simply Technologies Support before proceeding with further operation.

10.4 Electrical Safeguards Summary

- Always use a **dedicated 110V, 15A / 220V, 10A, single-phase circuit** with proper grounding.
- Do **not** bypass fuses or safety devices.
- Avoid exposing the controller to **moisture, excessive dust, or heat**.
- Regularly inspect **cables, plugs, and connectors** for wear or damage.
- Keep the **control box closed** during operation to prevent contamination.

SECTION 11: MACHINE TROUBLESHOOTING GUIDE

Even with proper use and maintenance, issues can occasionally arise. Use this guide to identify and resolve common problems.

15.1 Mechanical Issues

Problem	Possible Cause	Solution
Gantry moves unevenly or jerks	Dirty or dry rails/ball screws	Clean and lubricate rails and ball screws
Machine loses position or skips steps	Loose couplers or motor connections	Inspect and tighten all mechanical couplings
Inconsistent cut depth across material	Uneven spoilboard or improperly set Z origin	Resurface spoilboard and reset Z zero
Unusual noises during movement	Dry bearings or misaligned rails	Lubricate and inspect alignment

15.2 Electrical / Controller Issues

Problem	Possible Cause	Solution
Controller does not power on	Blown fuse, disconnected power	Check and replace fuse, verify power connection
No display or frozen screen	Controller cable loose or damaged	Reseat or replace controller cable
Machine won't Home or loses connection	Controller communication fault	Power cycle the machine, check cables
Spindle stops mid-job without error	Power interruption	Check eCNC for possible error messages, power cycle the machine, ensure G-Code is correct
USB files not recognized	Unsupported file format or corrupt USB	Ensure file is proper G-Code, try a different USB
Breakpoint not resuming correctly	Incorrect origin reset after power loss	Re-home machine and verify origin before resuming
Emergency Stop won't reset	Button not released or damaged	Twist to release, inspect for mechanical failure

Tip:
If you encounter a problem not listed here, visit **www.simplytechnologies.xyz/support** or contact **steve@simplytechnologies.xyz** for further assistance.

SECTION 12: WARRANTY INFORMATION

Limited Warranty Coverage

Simply Technologies warrants your **ACADEMY Series CNC Machine** to be **free from defects in materials and workmanship** for a period of **12 months** from the date of delivery.

What's Covered

- Frame and Structural Components
- eCNC Controller (hardware only)
- Motors and Drives
- Spindle Motor
- Electrical Components
- Included Accessories (Touch-Off Puck, Wrenches, etc.)

What's Not Covered

- Consumable Parts (Spoilboard, Bits, Collets)
- Cosmetic Damage or Normal Wear and Tear
- Damage Caused by:
    - Improper installation
    - Unauthorized modifications
    - Power surges or improper electrical setup
    - Abuse, misuse, or negligence
    - Operation outside specified guidelines
- Software or File Errors
- Third-party accessories not sold or approved by Simply Technologies

Warranty Claims Process

1. Contact **support@simplytechnologies.xyz** with a detailed description of the issue, including:
    - Machine serial number
    - Purchase date
    - Photos or videos of the issue (if applicable)
2. Our support team will assess the claim and provide instructions.
3. Replacement parts or repair services will be provided at Simply Technologies' discretion.

NOTE: Customer is responsible for shipping costs on non-warranty repairs.

SECTION 13: CONTACT & SUPPORT INFORMATION

Simply Technologies Support Team

📧 **steve@simplytechnologies.xyz**

🌐 **www.simplytechnologies.xyz/support**

Thank you for trusting **Simply Technologies** with your CNC production needs.
We are committed to helping you succeed for years to come.