Noztek Nexus

User manual

Noztek Nexus introduction

Noztek Nexus: Redefining Desktop Extrusion with Servo-Powered Precision.
The Noztek Nexus is a revolutionary desktop filament extruder bringing industrial-grade precision to compact research environments. Powered by a DC Servo Motor with a planetary gearbox delivering 24 NM of torque, it overcomes traditional desktop limitations with ±0.1% speed accuracy and output speeds up to 4.5 m/min—more than double conventional systems. Designed for research labs developing novel polymers and composites, as well as production environments handling everything from prototyping to aerospace-grade materials, the Nexus offers the precision, throughput, and automation compatibility that demanding applications require.

Precision-Driven Performance: The Servo Motor and Gearbox Advantage
Unlike conventional DC or stepper motor extruders, a servo motor and gearbox system delivers unmatched precision and reliability for filament production. Here's why it matters:

Exceptional Speed Accuracy Servo motors use closed-loop feedback to maintain exact RPM regardless of material resistance or load changes. This translates directly into consistent filament diameter with minimal tolerance variation—critical for research-grade and production applications.

High Torque at Low Speeds The planetary gearbox multiplies motor torque while reducing speed, enabling smooth extrusion of high-viscosity and demanding materials without stalling or speed fluctuation. Process everything from standard PLA to engineering-grade polymers with confidence.

Responsive and Adaptive Real-time feedback allows the system to instantly compensate for changing conditions, maintaining stable output throughout your run. No more babysitting the extruder or accepting inconsistent results.

Energy Efficient and Quiet Servo motors draw only the power needed, reducing energy consumption and heat generation. Combined with smooth gearbox operation, this results in quieter, cooler, and more reliable performance.

Automation-Ready Precise, repeatable control makes servo-driven extruders ideal for integration into automated workflows and robotic systems—essential for modern research environments and production lines.

Built for Longevity Fewer mechanical stresses and optimised power delivery mean less wear on components, resulting in a longer service life and reduced maintenance requirements.

Noztek Nexus extruder manual

Warranty

We guarantee outstanding quality for our products and services. Customers who purchase Noztek-manufactured equipment for professional use are guaranteed that they will be free from defects in workmanship and materials for 1 year from date of shipment. If your machine is found to be faulty, we will repair or replace the machine. The warranty and functional guarantee does not cover damages caused by wear and tear or improper use.

TO INSURE THAT YOUR WARRANTY IS HELD IN EFFECT, PROPER OPERATION PROCEDURES MUST BE OBSERVED. NOTE: READ THE SAFETY PRECAUTIONS BEFORE OPERATING THIS MACHINE.
For a full breakdown please read our Limitations of Warranty Cover below.

Limitations of Warranty Cover:
• You must own the machine
• The original invoice is decisive as this is your warranty claim (please keep a copy of this)
• Repair or replacement of machine will be determined by Noztek
• Warranty only covers manufacturing or material defects

Warranty does not cover:
• Incorrect use of machine /damage due to misuse
• Damage from force or fall
• Foreign objects inside of machine
• Water damage or dirt
• User failing to follow proper usage instructions
• Normal wear and tear in machine's lifespan
• Unauthorized repairs by consumer

While we stand by the quality of our products, it's important to note that our liability is limited. This warranty represents your sole remedy, and there are no other expressed or implied warranties. In the rare instance of a covered defect, we offer remedies such as repair or replacement after assessing the reported fault. Noztek have the right to reject any warranty claim if we feel the request falls outside of our limitations

Filing a Claim: Need assistance? Our customer support team is ready to help. Refer to the contact information provided in this manual to start the claims process.

Safety

Caution: Injury Risk

This equipment contains moving parts. To prevent injury, keep hands, fingers, and other body parts clear during operation. Avoid wearing loose clothing or jewellery that may become entangled in moving components. Tie back long hair and secure loose items before using the equipment. Always follow safety instructions provided in the user manual.

Caution: Hot Surface

This equipment can reach high temperatures during operation. Avoid direct contact with exposed surfaces to prevent the risk of burns. Allow the equipment to cool before handling or performing maintenance. Exercise caution and keep out of reach of children. Follow all safety guidelines provided in the user manual.

Caution: High Voltage Zone

This equipment contains high-voltage components. To avoid the risk of electrical shock: Do not use liquids near the machine: Keep all liquids, including water, away from the equipment. Liquids can conduct electricity and increase the risk of electrical shock. Do not modify internal wiring: Modifying internal wiring or electronic components poses a serious hazard. Only authorized personnel should perform any maintenance or modifications.

Caution: Material guidelines

Ensure familiarity with the material being extruded, including melting temperatures and ventilation requirements of the space. Failure to do so may lead to damage to the machine and pose health risks to the consumer.

Safety guidelines

- Before operating, ensure you have a thorough understanding of the equipment. Carefully review the provided instruction manual for complete guidance.
- Understand the proper, safe usage and limitations of the equipment.
- Never use this equipment for any purpose other than its intended use.
- Do not modify the equipment in any way.
- Do not make adjustments or perform maintenance while the system is in operation or energized.
- Non-Flammable Cleaning: Refrain from cleaning the equipment with flammable solvents.
- Extruder Vent Precautions: Avoid probing into the barrel pallet feed section while the machine is running. Never use a metal probe in the barrel pallet feed section; a wooden probe is recommended.
- Personal Protective Gear: Wear a face shield and heat insulated gloves while operating or being near the extruder during operation. These protective items are also necessary when adjusting the die or cleaning the screw. The extruder temperatures are extremely high, and not using protective gear may lead to serious injury.
- Hopper Installation: The feed hopper must be installed on the extruder feed section at all times when in operation.
- Material Removal Safety: Never put your hands into the feed section or vent to remove material.
- Motor Activation: Only switch on the motor when the recommended temperature has been reached.

Product Specification Sheet

1. Product Information

- Product Name/Model: Noztek Nexus Version: 1
- Brand/Manufacturer: Noztek
- Serial Number: See invoice
- Date of Manufacture: 2025

2. General Description

The Noztek Nexus is a desktop filament extruder that delivers industrial-grade precision through its 750W servo motor, 24 NM torque, and ±0.1% speed accuracy—doubling conventional output at up to 4.5 m/min. Built for research labs and production environments alike, it enables reliable extrusion of everything from standard polymers to aerospace-grade composites with full automation compatibility.

3. Technical Specifications

- Voltage Requirements: 220VC or 110VC
- Power Rating: 10A
- Frequency (Hz): 50 Hz or 60 Hz.
- Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)
- Dimensions (including weight and size): 68cm x 24cm x 24cm. 20 KG.
- Material Composition: Steel or stainless steel.
- Color/Finish: Black powder coat or brush stainless steel.
- Motor: DC Servo, 150 RPM, 24VDC, 24NM

4. Key Features

- Program Memory: The system retains the most recently used target temperature, speed settings, and timer configurations even after a system restart.
- Noztek Nexus controller software: The Noztek Nexus comes complete with Noztek's proprietary integrated software, seamlessly connecting to a computer to provide real-time performance monitoring, complete with detailed temperature and speed charts.
- Warm-Up Function: The warm-up feature is engineered to ensure the barrel reaches optimal operating temperature within 10 minutes. This minimizes the risk of unmelted materials obstructing the motor, thereby preventing potential damage to the motor or the machine.

- Emergency Shutdown Capability: In cases of urgency, the system offers a rapid electrical shutdown mechanism for immediate cessation of all operations.
- Motor Block Management: Should the motor face any operational hindrance, the system promptly issues a notification message and halts the motor to prevent further complications.
- Sensor Anomaly Detection: The system incorporates sensor malfunction detection, which promptly communicates deviations from correct temperature readings by issuing a notification message.
- 7-Inch TFT Touchscreen Control Panel: The machine features a sophisticated 7-inch Thin-Film Transistor (TFT) touchscreen, providing an intuitive and responsive interface for operating and configuring the equipment.

5. Safety Information

- Warnings: See safety sheet
- Recommended Safety Gear: See safety sheet
- Emergency Shutdown Procedures: In the event of an emergency, firmly press the red emergency button located at the front of the machine. This action will swiftly deactivate the power supply, bringing all ongoing processes to an immediate halt.

6. Operating Instructions

- Step-by-step instructions for safe and proper use of the product: See safety sheet and guide.
- Start-up and Shutdown Procedures: See guide.
- Control Panel Layout: See guide.
- Maintenance and Cleaning Guidelines: See maintenance sheet.

7. Technical Diagrams

- Available upon request.

8. Performance Data

- **Heating:** Each heaterband is independently controlled, capable of reaching temperatures up to 500°C. An upgrade to 750°C is available on request.
- **Quick release:** For convenient and frequent cleaning requirements, we offer the option of quick release heater bands upon request.
- **Screw:** The Noztek Nexus features a proprietary stainless steel screw meticulously designed, developed, and manufactured by Noztek. Its primary function revolves around the generation of substantial barrel pressure, ensuring the extrusion process yields a uniform and flawless filament.
- **Servo motor:** A servo motor and planetary gearbox system delivers significant advantages over conventional DC or stepper motor extruders. Closed-loop feedback ensures exceptional speed accuracy, maintaining exact RPM regardless of load changes for consistent filament diameter with minimal tolerance variation. The gearbox multiplies torque while reducing speed, enabling smooth extrusion of high-viscosity and demanding materials without stalling. Real-time feedback allows instant compensation for changing conditions, while efficient power delivery reduces energy consumption, heat generation, and noise. This precise, repeatable control makes servo-driven extruders ideal for automated workflows and robotic integration, with fewer mechanical stresses resulting in longer service life and reduced maintenance.
- **Hopper capacity:** 750 gram maximum, 50 gram minimum.
- **Extrusion Output Rate:** The Noztek Nexus demonstrates an impressive extrusion capacity, capable of producing approximately 6-8 meters of filament per minute. This translates to an estimated output of 360-480 meters or 2 kilograms of filament per hour.

9. Accessories and Included Items

- Mains cable
- A-B USB cable
- Hopper
- Spare nozzle

10. Warranty Information

- See warranty sheet.

11. Compliance and Certifications

- CE

12. Technical Support and Contact Information

info@noztek.com
https://noztek.com/contact
44 (0) 203 384 6208
Noztek Head office Unit C3
Dolphin Enterprise Centre
Evershed Way
Shoreham
West Sussex
BN43 6QB
ENGLAND

Set-up Instructions

1. Unpacking and Placement

Caution: Do not plug the machine into the mains or turn it on during set-up. Carefully unpack the machine and accessories. Place the machine on an even, stable surface, ensuring there are no flammable materials nearby as the heater bands can reach temperatures of up to 600°C.

2. Hopper Attachment

Begin by attaching the hopper. Locate the four bolts in the barrel's designated holes. Unscrew these bolts, position the hopper over the holes, and securely screw the bolts back in place.

3. Power Connection

Once the initial steps are completed, you can plug in the mains cable into the machine. Before doing so, double-check that the mains voltage (e.g., 220VAC or 110VAC) matches the voltage specified on the machine (refer to the sticker on the machine).

Note: Always follow these set-up instructions meticulously to ensure the safe and effective operation of the machine. If you encounter any issues or have questions, refer to the comprehensive user manual for further guidance.

4 (Optional) USB Connection

To utilize this machine with our Noztek Nexus software, use the provided A-B USB cable. Connect the cable from the back of the machine to your computer. Please note that the controller software is compatible only with Windows machines.

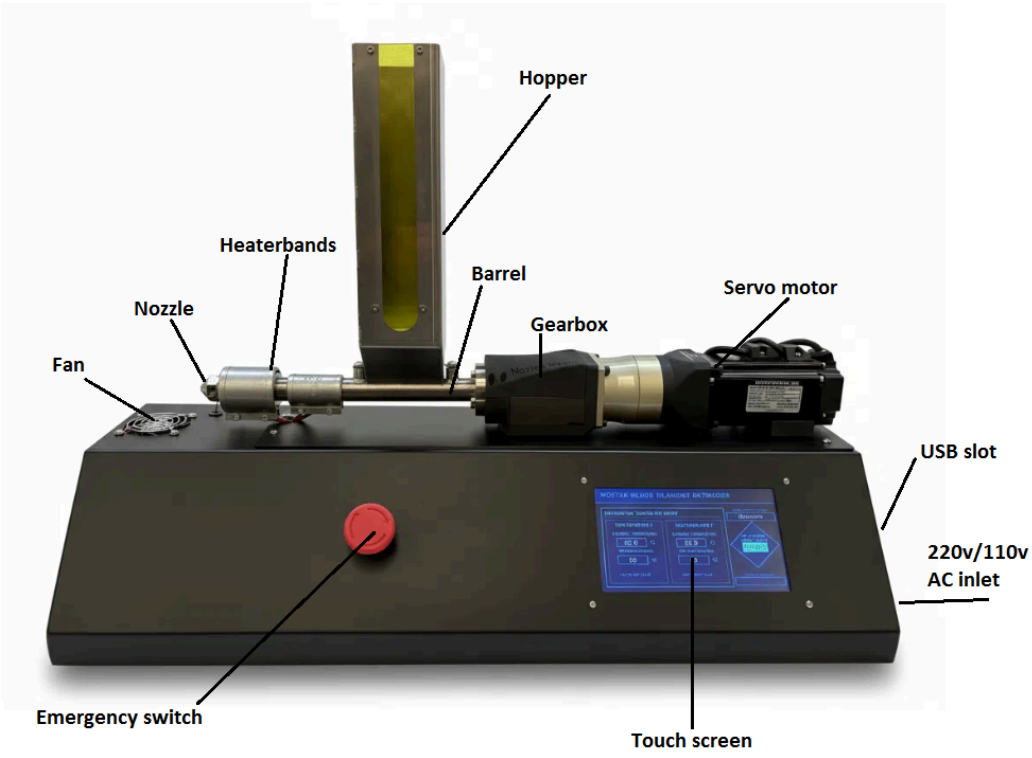
Operation Instructions

Important Note: Ensure that you acquaint yourself with the proper handling guidelines for the material you are using, particularly its melting point. Neglecting to do so may compromise the functionality and potentially damage the equipment.
Please bear in mind that the quality of the extruded filament is influenced by factors beyond just the operation of the machine. Considerations such as room humidity, room temperature, material humidity, and ensuring the correct temperature settings all play crucial roles.

STEP 1. Familiarization

Familiarize yourself with the following;

- Touch screen
- Emergency power switch
- 220/110 AC inlet power switch
- USB connector
- Barrel
- Hopper
- Nozzle
- Heaterband
- Fan
- Servomotor
- Gearbox

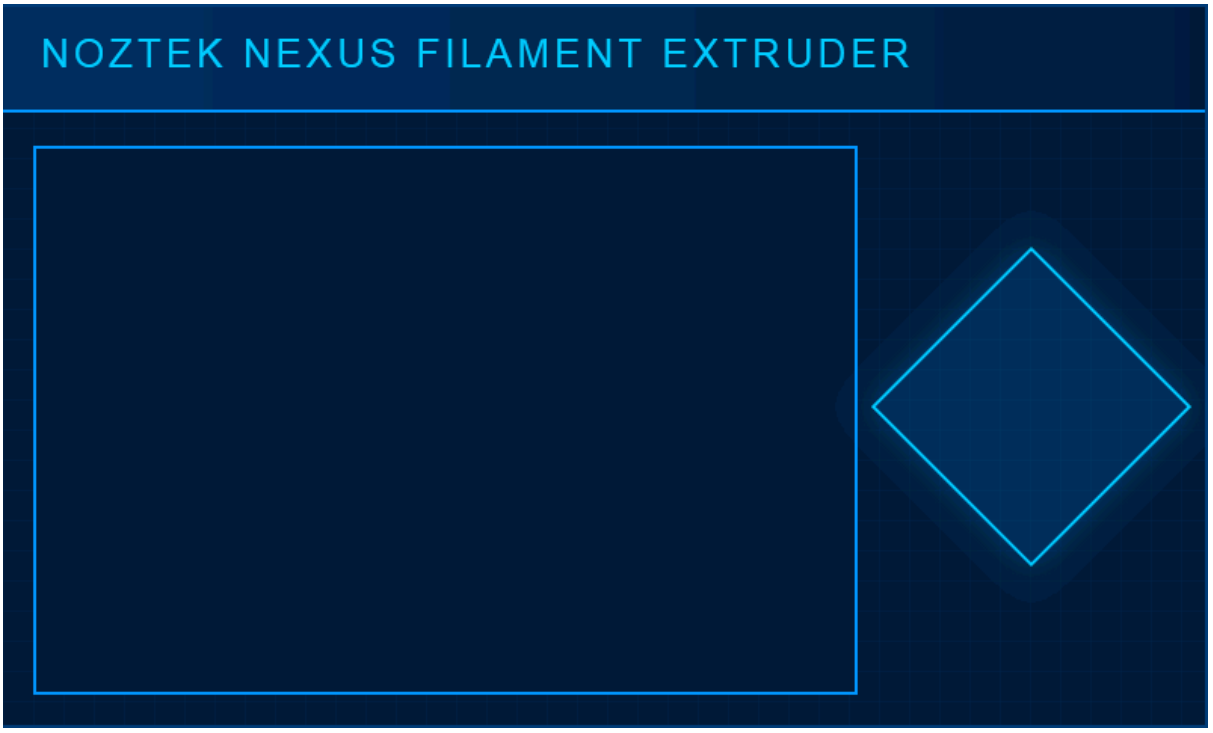


STEP 2. Start up procedure

To turn on the machine, use the illuminated 220V/110V AC inlet switch located at the back.

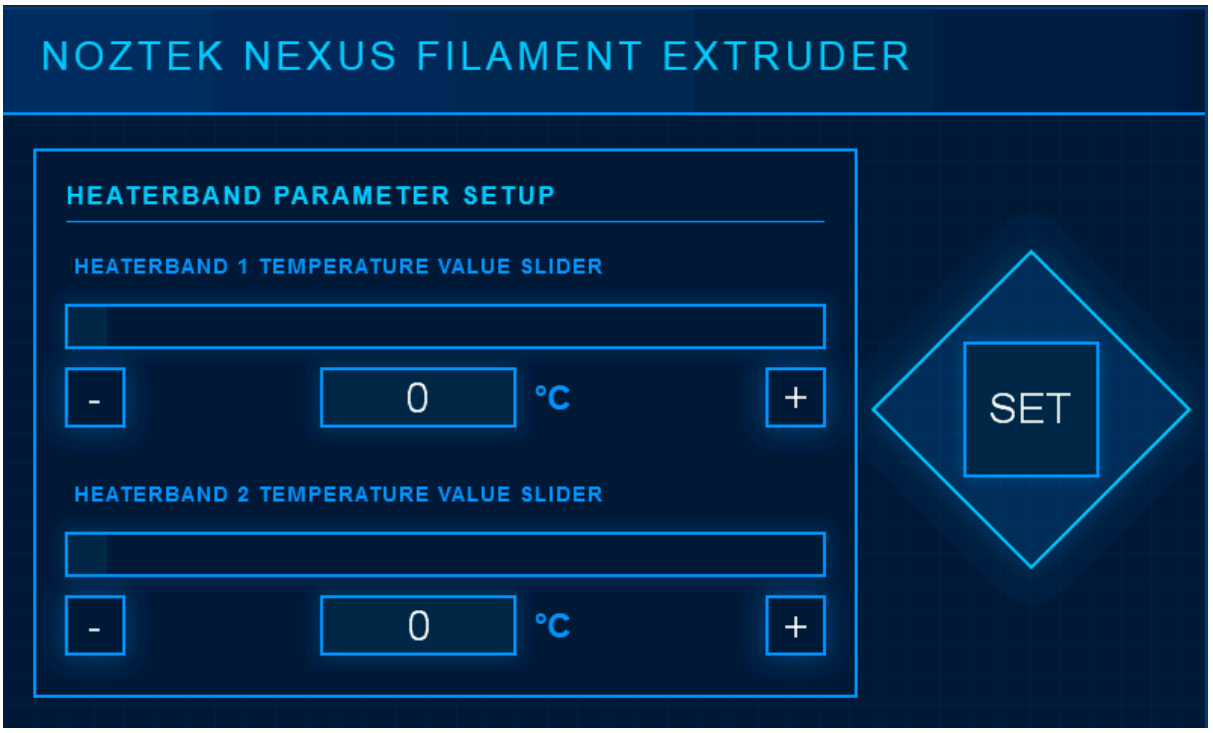
STEP 3. Initialization

After switching the machine on, the logo appears on the touch screen before automatically proceeding to the initialisation page. No user input is required here—the machine will briefly verify that all systems are functioning correctly and display status messages in the rectangular box. If any issues are detected, detailed information will appear and the machine will remain on this page until the problem is resolved. Once all checks pass, it will automatically proceed to the next page.



STEP 4. Heater band set-up.

On this page you can set the temperature values in Celsius for your heaterbands—depending on the model, the number of heaterbands will vary. Use either the slider or the + and - buttons to adjust your required temperature setting. When you are happy with your values, press Set to confirm them. This will then take you to the next page.

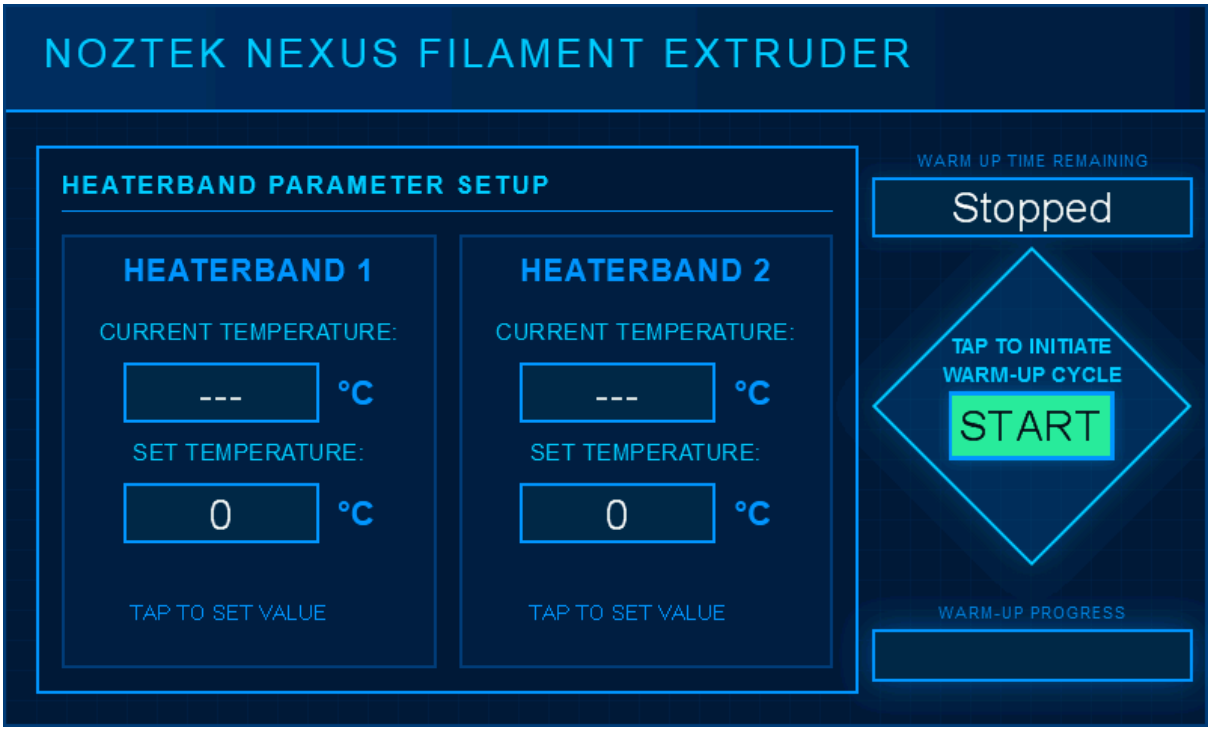


STEP 5. Warm up screen

This is the warm-up section. Press the Start button to begin a 15-minute warm-up cycle. A timer and loading bar will appear to keep track of the warm-up progress. Once the timer finishes, the page will automatically switch to the next page. This warm-up is essential to ensure the barrel reaches the correct temperature before the motor can run safely.

If you need to adjust your values during warm-up, press the Stop button and then tap the Set Value button—please note that the warm-up timer will restart when you begin again. You can also adjust the values after the warm-up has finished on the next page.

Under each heaterband section you can track the current live temperature of each band and its corresponding set temperature.



STEP 6. Main control screen

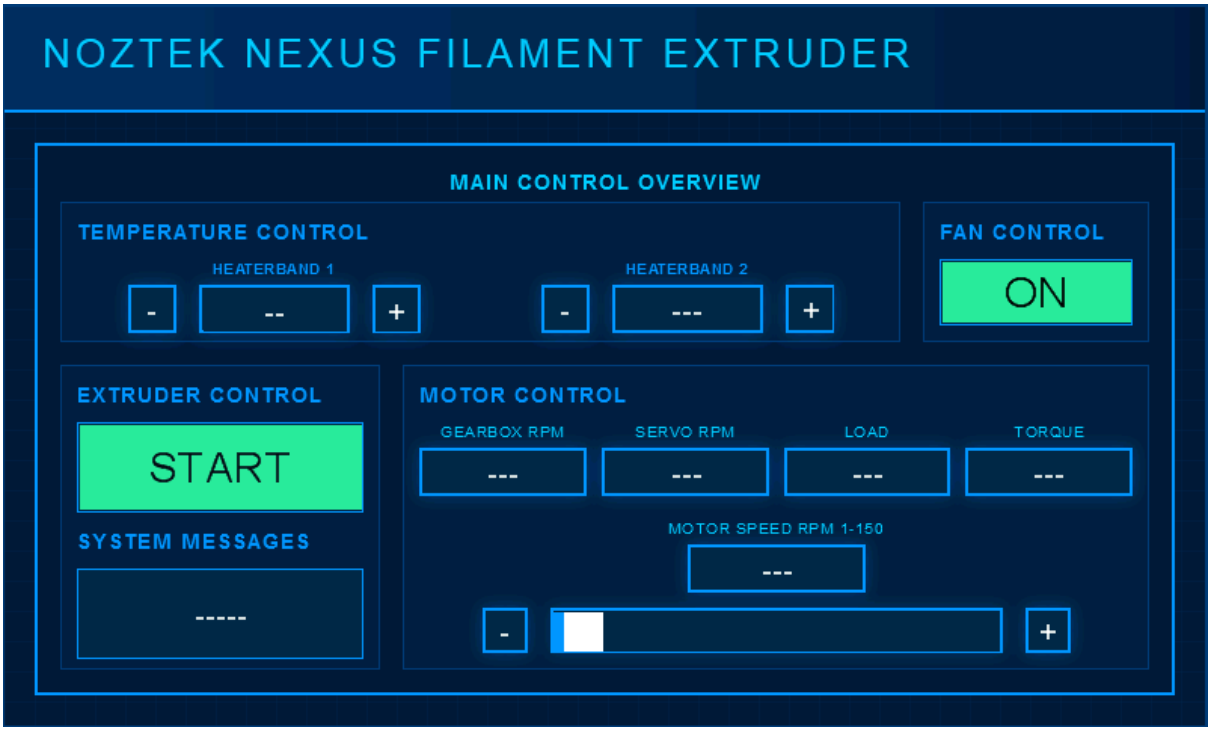
On this screen you can operate the extruder. Press the Start button to run the motor and begin the extruding process. The extruder will first perform a quick check at low RPM to detect any issues. If a problem is found, the motor will stop and a troubleshooting message will appear in the system message box. If all checks pass, the machine will become fully operational and start extruding your material.

You can now set your desired operating speed in the Motor Speed section using the slider or the + and - buttons. The speed range is 1–150 RPM and can be adjusted at any time during operation. Please note that the motor ramps up and down slowly to ensure safe operation, so it will take a moment to reach your desired speed.

In the Motor Control box you can track several motor-related stats such as gearbox RPM, servo RPM, load, and torque. The gearbox RPM shows the actual live motor speed.

In the Temperature Control section you can see the live temperatures for each heaterband that was set up before warm-up. Using the + and - buttons, you can make micro adjustments to the temperature while the extruder is running if necessary. There is a 5°C upper and lower limit calculated from the live value, so you may need to wait until the new temperature is reached before adjusting again. Please note: never stray too far from the required material temperature, as incorrect temperatures can damage the machine. The Fan Control button switches the cooling fan on or off—by default it is off.

Happy extruding!



Additional Information

- **Initiating Extrusion**
  After a short duration, the plastic will emerge from the nozzle. Pull the filament through the guide. The extruded filament will be hot, so use heat-resistant gloves. Some materials may require immediate cooling after extrusion; turn on the fan using the Fan On/Off button to facilitate this. The operational setup is now complete.
- **Shutdown Procedure**
  When finished, turn off the machine using the power switch at the back. These instructions ensure safe and efficient operation of the Noztek Nexus.
- **Colour Mixing**
  Adding colours is a straightforward process. Mix the natural pellets and colorant at the given ratio, then pour the mixture into the hopper. It will take a few minutes to observe changes in colour.
- **Temperature Adjustments**
  Adjusting the temperature also affects filament tolerance. Higher temperatures result in thinner filament, while lower temperatures result in thicker filament. Make adjustments in 1-2 °C increments.
- **Connecting to a Computer**
  The Noztek Nexus Controller Software empowers you to control the extruder and gather data through a USB connection. Please refer to our Nexus Software Manual for a more in-depth understanding of the software and detailed instructions.
- **Cleaning**
  We recommend using purge agents to clean out the barrel, preferably after each run. The manufacturer of your material should be able to recommend the right purging agent.

Maintenance

- **Changing the Nozzle**
  Before attempting this operation, ensure you use heat-insulated gloves. To switch between nozzle sizes, heat the unit to the temperature required to melt the material previously used. Wait for 10 minutes to ensure all material is molten. Unscrew the nozzle using a spanner, clean any excess plastic from the internal threads, and then screw on the new nozzle.
- **Maintenance**
  Regular cleaning of your plastic extrusion tooling is crucial for prolonging machine life, reducing waste, and maintaining tighter tolerances for your final product. We recommend running purging agents like polypropylene through the barrel for cleaning. If you are unsure how to clean the barrel, please contact the Noztek helpdesk for assistance.
- **Barrel Jam**
  Depending on the material type, you may occasionally encounter a barrel jam. The motor will not start or stop automatically if it detects a barrel jam. To free the jam, increase the temperature to approximately 25-50 degrees Celsius above the recommended melting temperature of the material and leave it for 5-10 minutes. Then switch on the motor again; this should allow the screw to rotate, purging the barrel.

Contact Noztek

For more in-depth troubleshooting assistance, we encourage you to explore our FAQ help section on our website at www.noztek.com. In the event that your specific query is not addressed within this resource, please do not hesitate to reach out to our dedicated Noztek expert team for direct support and guidance.

Noztek Ltd
Unit C3 Dolphin Industrial Estate
Evershed Way
Shoreham by Sea
West Sussex
BN43 6QB
ENGLAND

44 (0) 203 384 6208
info@noztek.com
www.noztek.com