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ELEGOO Neptune FDM 3D Printer

ELEGOO Neptune Max 3D Printer Instruction Manual

Brand: ELEGOO | **Model:** Neptune FDM 3D Printer

This manual provides essential information for setting up, operating, maintaining, and troubleshooting your ELEGOO Neptune Max 3D Printer.

1. Product Overview

The ELEGOO Neptune Max is a high-performance FDM 3D printer designed for large-scale and high-speed printing. It features a massive build volume, precise printing capabilities, and a user-friendly interface.

- **Massive Build Volume:** 16.53”x16.53”x18.89” / 420x420x480mm, enabling the creation of large models or multiple smaller objects simultaneously.
- **High Printing Speed:** Up to 500mm/s, powered by Klipper firmware for efficient and rapid production.
- **Precise & Excellent Printing:** Equipped with acceleration sensors on X and Y axes for automatic calibration, reducing vibration impact and ensuring high accuracy.
- **Direct Drive Extruder:** Self-developed dual-gear direct drive extruder with a 5.2:1 reduction ratio for powerful and smooth filament feeding, minimizing clogging risks.
- **300°C High-temp Nozzle:** Extended hot end design with a 60W ceramic heating element for faster melting and extrusion, compatible with various filaments including PLA, PETG, ABS, TPU, and nylon.
- **Efficient Cooling:** Powerful double-sided cooling fans and model cooling blower fans prevent warping and enhance print quality.



Figure 1: ELEGOO Neptune Max 3D Printer. This image shows the overall structure of the printer, highlighting its large build volume and robust frame.

2. Setup

2.1 Unboxing and Initial Assembly

The ELEGOO Neptune Max comes partially assembled. Follow the included quick start guide for detailed assembly instructions. Most users find the assembly process straightforward.

2.2 Firmware Update

It is crucial to update the printer's firmware upon initial setup to ensure optimal performance and access to the latest features and bug fixes. This process involves updating both the mainboard and screen firmware.

1. Prepare a USB drive and a Micro SD card.
2. Download the latest firmware from the official ELEGOO website.
3. Follow the instructions in the video below to update the firmware. Ensure both the mainboard and screen firmware are updated to matching versions.

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Video 1: How to Update Firmware. This video provides a step-by-step guide on updating the firmware for the Neptune 4 Plus/Max, including preparing tools, installing fix packs, and updating mainboard and screen firmware.

2.3 Bed Leveling

Accurate bed leveling is essential for successful prints. The Neptune Max features 121-point auto-leveling and auxiliary leveling. It is recommended to perform auxiliary leveling first, especially if the bed is significantly uneven.

1. Power on the printer and ensure the nozzle and hotbed are clean.
2. Navigate to the "Level" menu on the touchscreen.
3. Perform auxiliary leveling using an A4 paper to adjust the six points on the platform.
4. After auxiliary leveling, the printer will automatically perform a 36-point leveling probe on the hotbed surface.
5. Observe the leveling data and perform Z-axis compensation adjustment if necessary.

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Video 2: Leveling Tutorial - Neptune 4 Plus/4 Max. This video demonstrates the bed leveling process, including auxiliary leveling and automatic leveling, and how to adjust Z-offset.

3. Operating Instructions

3.1 First Layer Printing Z-axis Compensation Value Fine-tuning

The first layer is critical for print success. Fine-tuning the Z-axis compensation value ensures optimal adhesion and print quality.

1. Start a test print (e.g., a square block model).
2. Observe the printing result:
    - If the nozzle is too far from the platform, the lines will be thin or not stick. Adjust the Z-offset downward.
    - If the nozzle is too close, the lines will be squished or the nozzle will drag. Adjust the Z-offset upward.
3. Adjust the Z-offset in 0.1mm increments via the "Settings" -> "Adjust" menu during printing.

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Video 3: First Layer Printing Z-axis Compensation Value Fine-tuning Tutorial. This video demonstrates how to fine-tune the Z-axis offset during the first layer print for optimal adhesion.

3.2 File Transfer and Printing

The Neptune Max supports multiple file transfer methods:

- **USB Disk:** Transfer G-code files directly via a USB drive.
- **WIFI/LAN:** Utilize the built-in Klipper firmware's web interface (Fluid) for wireless file transfer, print monitoring, and control. Find the printer's IP address in the "About Machine" settings.



Figure 2: Klipper High-speed Motherboard. The integrated Klipper firmware allows for advanced control and high-speed printing.

4. Maintenance

4.1 Nozzle Oozing Cleaning

Filament oozing from the nozzle can accumulate and affect print quality. Regular cleaning is recommended.

1. Power off the printer.
2. Unplug the rear fan assembly port cable and remove the fan assembly.
3. Loosen the screws of the cable fastener and the print head assembly.
4. Carefully remove any oozing filament debris around the nozzle using diagonal pliers. If difficult, you can slightly heat the nozzle (e.g., to 220°C) to soften the filament.
5. Clean the heating block and nozzle surface with a paper towel.
6. Reassemble the print head components, ensuring all screws are tightened to prevent further oozing.

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Video 4: How to clean nozzle oozing. This video details the process of disassembling the print head, cleaning accumulated filament, and reassembling it.

4.2 General Cleaning and Lubrication

- Regularly clean the build plate with isopropyl alcohol to ensure good adhesion.
- Inspect and clean the lead screws and smooth rods periodically. Apply a thin layer of lithium grease to the lead screws for smooth movement.
- Check belts for proper tension and wear.

5. Troubleshooting

This section addresses common issues you might encounter with your 3D printer.

5.1 Common Printing Issues

- **Poor First Layer Adhesion:** Ensure the bed is properly leveled (refer to Section 2.3) and the Z-offset is correctly tuned (refer to Section 3.1). Clean the build plate thoroughly.
- **Filament Clogging:** Check for debris in the nozzle (refer to Section 4.1). Ensure proper filament loading and temperature settings for your material.
- **Layer Shifting:** Check belt tension and ensure the printer is on a stable surface. Reduce print speed if necessary.
- **Print Warping:** Ensure proper bed temperature for the filament type. Consider using a brim or raft in your slicer settings.

5.2 Firmware Update Failures

If a firmware update fails, refer to the following checks:

- Check the system and memory of your USB drive/SD card.
- Ensure the mainboard system works and can be booted.
- Verify that the local disk memory is over 500MB for the update files.

6. Specifications

Feature	Detail

Feature	Detail
Build Volume	420x420x480mm (16.53”x16.53”x18.89”)
Max Printing Speed	500mm/s
Max Nozzle Temperature	Up to 300°C
Firmware Type	Klipper
Hotbed Power/Temp	320W, 85°C
Bed Leveling	121 points auto leveling and auxiliary leveling
Filament Compatibility	PLA, ABS, TPU, PETG, Nylon, etc.
File Transfer Method	WIFI, USB, LAN
Equipment Dimensions	658x632x740mm
Item Weight	39.9 pounds (18100 Grams)
Material	Metal

What's in the Box:

- Neptune 4 Max FDM 3D Printer

7. Warranty and Support

ELEGOO provides dedicated customer service and technical support for its products. For warranty information, technical assistance, or troubleshooting beyond this manual, please visit the official ELEGOO website or contact their customer support directly.

Official Support: www.elegoo.com

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