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ELEGOO Saturn 4 Ultra & Smart Mini Heater

ELEGOO Saturn 4 Ultra Resin 3D Printer and Smart Mini Heater User Manual

Comprehensive Guide for Setup, Operation, and Maintenance

1. Introduction

This manual provides detailed instructions for the setup, operation, and maintenance of your ELEGOO Saturn 4 Ultra Resin 3D Printer and ELEGOO Smart Mini Heater. Please read this manual thoroughly before using the products to ensure proper function and safety.

2. Safety Information

Always prioritize safety when operating 3D printers and handling resin. Failure to follow safety guidelines can result in injury or damage to equipment.

- Wear appropriate Personal Protective Equipment (PPE), including nitrile gloves and safety glasses, when handling liquid resin.
- Operate the printer and heater in a well-ventilated area to minimize exposure to resin fumes and airborne particles.
- Keep resin away from direct sunlight and heat sources. Store it in opaque, sealed containers.
- Do not ingest resin. In case of accidental ingestion, seek immediate medical attention.
- Keep children and pets away from the printer and resin.
- Ensure the power supply is stable and correctly connected. Do not use damaged power cords.
- Do not touch moving parts of the printer during operation.
- The Smart Mini Heater operates to maintain optimal resin temperature. Do not block its air inlets or outlets.
- Dispose of cured resin and waste materials according to local regulations.

3. Package Contents

Verify that all components are present and undamaged upon unboxing.

- ELEGOO Saturn 4 Ultra 12K Resin 3D Printer
- ELEGOO Smart Mini Heater

- Power Adapter and Cable for Printer
- Power Cable for Heater
- USB Drive (contains user manual, slicing software, test print file)
- Tool Kit (Allen wrenches, scraper, plastic spatula)
- Resin Vat with FEP Film
- Build Plate
- Funnel and Filters
- Nitrile Gloves
- Mask



Image: The ELEGOO Saturn 4 Ultra 3D Printer and the ELEGOO Smart Mini Heater, shown together as a complete bundle.

4. Product Overview

4.1 ELEGOO Saturn 4 Ultra 12K Resin 3D Printer

The Saturn 4 Ultra is a high-resolution resin 3D printer designed for detailed and precise prints. It features a 10-inch 12K monochrome LCD for exceptional clarity and a fast printing speed of up to 150mm/h. Its smart automatic leveling system simplifies the setup process.

- **12K Monochrome LCD:** Offers a resolution of 11520x5120 pixels, enabling highly detailed prints.
- **Smart Automatic Leveling:** Simplifies calibration, ensuring consistent print quality.
- **Fast Printing Speed:** Achieves speeds up to 150mm/h, reducing print times.
- **Tilt Release Technology:** Facilitates easier detachment of printed models from the release film.
- **Wi-Fi Cluster Printing:** Supports networked printing for enhanced efficiency and productivity.
- **Build Volume:** 8.62 x 4.84 x 8.66 inches (219 x 123 x 220 mm).



Image: The ELEGOO Saturn 4 Ultra 3D Printer positioned next to a large, highly detailed resin print, showcasing its capability.



Image: A close-up view of a highly detailed resin print, emphasizing the clarity and precision achieved with the 12K monochrome LCD.



Image: A visual representation of the Tilt Release Technology, showing how the print bed tilts to facilitate easier detachment of models from the FEP film.

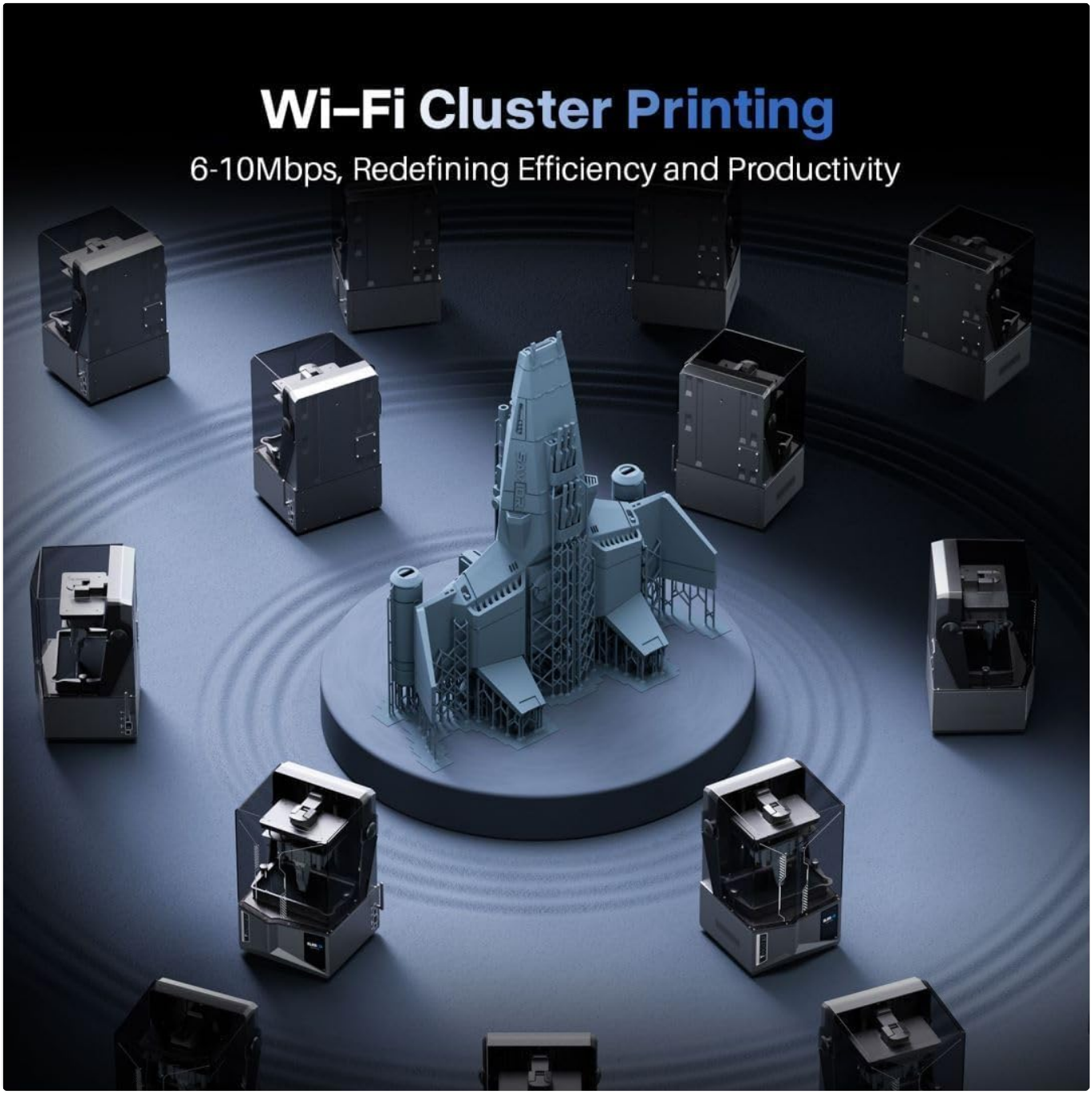


Image: An illustration depicting multiple ELEGOO 3D printers connected in a Wi-Fi cluster, demonstrating the capability for networked printing.

4.2 ELEGOO Smart Mini Heater

The Smart Mini Heater is designed to optimize the resin printing environment by maintaining an ideal temperature and filtering the air. This helps prevent common printing failures caused by temperature fluctuations and improves air quality.

- **Intelligent Temperature Control:** Automatically heats the printing area when the temperature drops below 25°C and stops heating when it reaches or exceeds 25°C.
- **Air Filtration:** Equipped with a filtration system to remove 3D printing impurities and purify the workspace environment.
- **Real-time Temperature Feedback:** Displays the current temperature for easy monitoring.



Image: The ELEGOO Smart Mini Heater shown as a standalone white unit with a digital display indicating temperature.



Image: An illustration demonstrating the Smart Mini Heater's real-time temperature feedback, showing heat radiating from the unit and a digital display.



Image: A cutaway diagram of the Smart Mini Heater, illustrating its internal air filtration system and the flow of purified air.

5. Setup Guide

5.1 Initial Unboxing and Placement

1. Carefully remove all components from the packaging.
2. Place the printer and heater on a stable, level surface in a well-ventilated area, away from direct sunlight and heat sources.
3. Remove all protective films and packaging materials from both devices.

5.2 ELEGOO Saturn 4 Ultra Printer Setup

1. **Install Build Plate:** Secure the build plate onto the Z-axis arm. Ensure it is firmly attached.
2. **Install Resin Vat:** Place the resin vat into the printer's platform, ensuring it sits correctly and is locked into place if applicable.

3. **Power Connection:** Connect the power adapter to the printer and then plug it into a power outlet. Turn on the printer using the power switch.
4. **Automatic Leveling:** The Saturn 4 Ultra features smart automatic leveling. Follow the on-screen prompts to initiate the leveling process. This typically involves the build plate descending to calibrate its position relative to the LCD screen.
5. **Software Installation:** Insert the provided USB drive into your computer. Install the recommended slicing software (e.g., Chitubox) from the USB drive.

5.3 ELEGOO Smart Mini Heater Setup

1. **Placement:** Position the Smart Mini Heater near your 3D printer, ideally within the enclosed printing area or close to the resin vat, to ensure effective temperature control and air filtration.
2. **Power Connection:** Connect the heater's power cable and plug it into a power outlet. The heater will power on and display the current ambient temperature.

6. Operating Instructions

6.1 Preparing for Print (Saturn 4 Ultra)

1. **Prepare 3D Model:** Use the slicing software to load your 3D model. Adjust settings such as layer height, exposure time, lift speed, and add supports as needed.
2. **Slice Model:** Slice the model and save the generated `.goo` or compatible file to the USB drive.
3. **Add Resin:** Carefully pour resin into the resin vat, ensuring it does not exceed the maximum fill line. Wear gloves and eye protection.

6.2 Starting a Print (Saturn 4 Ultra)

1. Insert the USB drive into the printer's USB port.
2. On the printer's touchscreen, navigate to the "Print" menu.
3. Select your desired print file from the USB drive.
4. Confirm the print settings and press "Start" to begin printing.
5. Monitor the first few layers to ensure proper adhesion to the build plate.

6.3 Using the Smart Mini Heater

The Smart Mini Heater operates automatically to maintain an optimal resin temperature of approximately 25°C (77°F). This temperature is crucial for consistent resin viscosity and successful prints.

- Once powered on, the heater will display the ambient temperature.
- If the temperature drops below 25°C, the heater will automatically activate to warm the air around the resin vat.
- When the temperature reaches or exceeds 25°C, the heating function will pause, and the air filtration will continue to operate.
- Ensure the heater's vents are unobstructed for proper airflow and filtration.

7. Maintenance

7.1 ELEGOO Saturn 4 Ultra Printer Maintenance

1. **After Each Print:**
    - Remove the build plate and carefully detach the printed model using the provided scraper.
    - Clean the build plate with isopropyl alcohol (IPA) and wipe it dry.
    - Inspect the resin vat for any cured resin bits. Use a plastic spatula to gently scrape the bottom of the vat. If significant debris is present, filter the resin back into its bottle using a funnel and filter mesh, then clean the vat with IPA.
2. **LCD Screen Cleaning:** If resin spills onto the LCD screen, immediately clean it with a soft cloth and IPA. Avoid scratching the screen.
3. **Z-axis Maintenance:** Periodically apply a small amount of lubricant to the Z-axis lead screw to ensure smooth movement.

7.2 ELEGOO Smart Mini Heater Maintenance

1. **Filter Replacement:** The air filtration system contains replaceable filters. Refer to the heater's specific instructions for filter replacement frequency (typically every 3-6 months depending on usage).
2. **Exterior Cleaning:** Wipe the exterior of the heater with a soft, dry cloth. Do not use abrasive cleaners or immerse the unit in water.

7.3 Resin Handling and Disposal

- Always wear gloves when handling liquid resin.
- Unused liquid resin should be stored in its original opaque bottle in a cool, dark place.
- To dispose of liquid resin, expose it to direct sunlight until it fully cures into a solid. Once solid, it can be disposed of as regular plastic waste according to local regulations. Do not pour liquid resin down drains.
- IPA used for cleaning should be collected and allowed to evaporate in a well-ventilated area, or disposed of according to local hazardous waste guidelines.

8. Troubleshooting

This section addresses common issues encountered during resin 3D printing and with the Smart Mini Heater.

8.1 Common Printing Issues (Saturn 4 Ultra)

Problem	Possible Cause	Solution
Print Not Sticking to Build Plate	Insufficient bottom exposure time, cold resin temperature, dirty build plate, incorrect leveling.	Increase bottom exposure time, ensure resin is at optimal temperature (use Smart Mini Heater), clean build plate thoroughly, re-level the build plate.
Failed Prints / Partial Prints	Incorrect exposure settings, insufficient supports, FEP film damage, resin contamination, low resin temperature.	Adjust exposure time, add more/thicker supports, inspect and replace FEP film if damaged, filter resin, ensure optimal resin temperature.
Warping or Deformation	Temperature fluctuations, insufficient supports, model design issues.	Maintain stable ambient temperature (use Smart Mini Heater), add more robust supports, hollow large models and add drain holes.
Layer Lines / Poor Detail	Incorrect exposure time, Z-axis wobble, old resin.	Fine-tune exposure settings, check Z-axis for stability and lubricate, use fresh resin.

Problem	Possible Cause	Solution

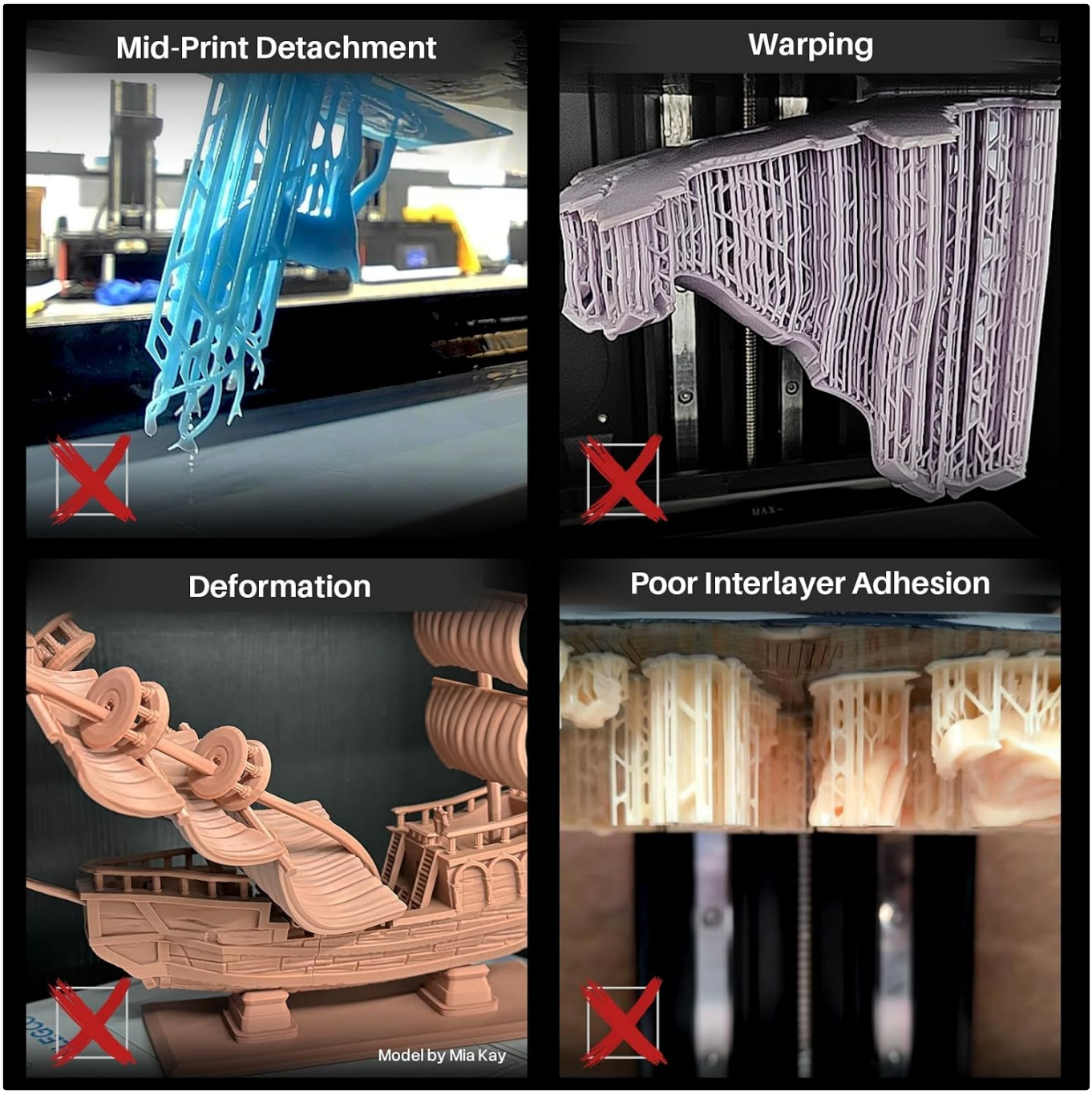


Image: A collage showing visual examples of common resin 3D printing failures, including mid-print detachment, warping, deformation, and poor interlayer adhesion, often caused by suboptimal environmental conditions.

8.2 Smart Mini Heater Issues

Problem	Possible Cause	Solution
Heater Not Turning On	No power, faulty power cable.	Check power connection and outlet, try a different power cable if available.
Temperature Not Reaching 25°C	Large room volume, extreme ambient cold, obstructed vents.	Ensure heater is placed close to the printer, operate in a reasonably insulated room, clear all vents.

Problem	Possible Cause	Solution
Unusual Noise from Heater	Fan obstruction, internal issue.	Check for any foreign objects near the fan. If noise persists, contact support.

9. Specifications

9.1 ELEGOO Saturn 4 Ultra 12K Resin 3D Printer

- **Technology:** MSLA (Masked Stereolithography Apparatus)
- **Light Source:** UV Integrated Light
- **LCD Screen:** 10-inch 12K Monochrome LCD
- **LCD Resolution:** 11520 x 5120 pixels
- **XY Resolution:** Approximately 19µm
- **Printing Speed:** Up to 150mm/h
- **Build Volume:** 219mm (L) x 123mm (W) x 220mm (H) / 8.62in (L) x 4.84in (W) x 8.66in (H)
- **Z-axis Accuracy:** 0.01mm
- **Layer Thickness:** 0.01-0.2mm
- **Connectivity:** USB, Wi-Fi
- **Leveling:** Smart Automatic Leveling

9.2 ELEGOO Smart Mini Heater

- **Function:** Intelligent Temperature Control, Air Filtration
- **Optimal Temperature Range:** Maintains resin temperature around 25°C (77°F)
- **Compatibility:** Compatible with most ELEGOO MSLA/DLP/LCD 3D Printers
- **Display:** Digital temperature display
- **Filtration:** Replaceable air filter

10. Warranty and Support

ELEGOO products come with a standard manufacturer's warranty. For specific warranty terms and conditions, please refer to the warranty card included with your product or visit the official ELEGOO website.
For technical support, troubleshooting assistance, or spare parts, please contact ELEGOO customer service through their official website or the contact information provided in your product packaging. When contacting support, please have your product model number and purchase information ready.
Official ELEGOO Website: www.elegoo.com

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