ELEGOO Saturn 4 Ultra, Mars Mate

ELEGOO Saturn 4 Ultra 12K MSLA Resin 3D Printer and Mars Mate Air Purifier User Manual

Comprehensive instructions for setup, operation, and maintenance.

1. Introduction

This manual provides detailed instructions for the safe and efficient operation of your ELEGOO Saturn 4 Ultra 12K MSLA Resin 3D Printer and ELEGOO Mars Mate Air Purifier. Please read this manual thoroughly before using the products to ensure proper setup, operation, and maintenance. Retain this manual for future reference.



Figure 1.1: The ELEGOO Saturn 4 Ultra 12K MSLA Resin 3D Printer (left) and the ELEGOO Mars Mate Air Purifier (right). The printer features a transparent cover and a touchscreen interface, while the purifier is a compact white unit.

2. Safety Information

Always observe the following safety precautions to prevent injury or damage to the equipment:

- Wear appropriate personal protective equipment (PPE), including gloves and safety glasses, when handling resin.
- Operate the 3D printer in a well-ventilated area to minimize exposure to resin fumes.
- Keep the printer and purifier away from direct sunlight, heat sources, and flammable materials.
- Ensure the power supply is correctly rated for your region and properly grounded.
- Do not touch moving parts during operation.
- Keep out of reach of children and pets.
- Dispose of uncured resin and waste materials according to local regulations.

3. Product Components

3.1. ELEGOO Saturn 4 Ultra 3D Printer

- **Printer Unit:** Main body with build platform, resin vat, and LCD screen.
- **Build Platform:** Surface where prints are formed.
- **Resin Vat:** Container for liquid resin.
- **UV Cover:** Protects resin from ambient UV light.
- **Power Adapter:** For printer power supply.
- **USB Drive:** For transferring print files.
- **Tool Kit:** Includes scraper, wrenches, and other accessories.

3.2. ELEGOO Mars Mate Air Purifier

- **Purifier Unit:** Main body with fan and filter compartment.
- **Activated Carbon Filter:** For odor and fume absorption.
- **USB-C Cable:** For power supply.

4. Setup

4.1. ELEGOO Saturn 4 Ultra 3D Printer Setup

1. **Unpacking:** Carefully remove all components from the packaging. Inspect for any damage.
2. **Placement:** Place the printer on a stable, level surface in a well-ventilated area.
3. **Power Connection:** Connect the power adapter to the printer and then to a power outlet.
4. **Initial Leveling (Automatic):** The Saturn 4 Ultra features an automatic leveling system. Power on the printer, and it will perform an initial self-calibration.
5. **Resin Vat Installation:** Place the resin vat securely onto the printer's platform.
6. **Build Platform Installation:** Attach the build platform to the Z-axis arm.

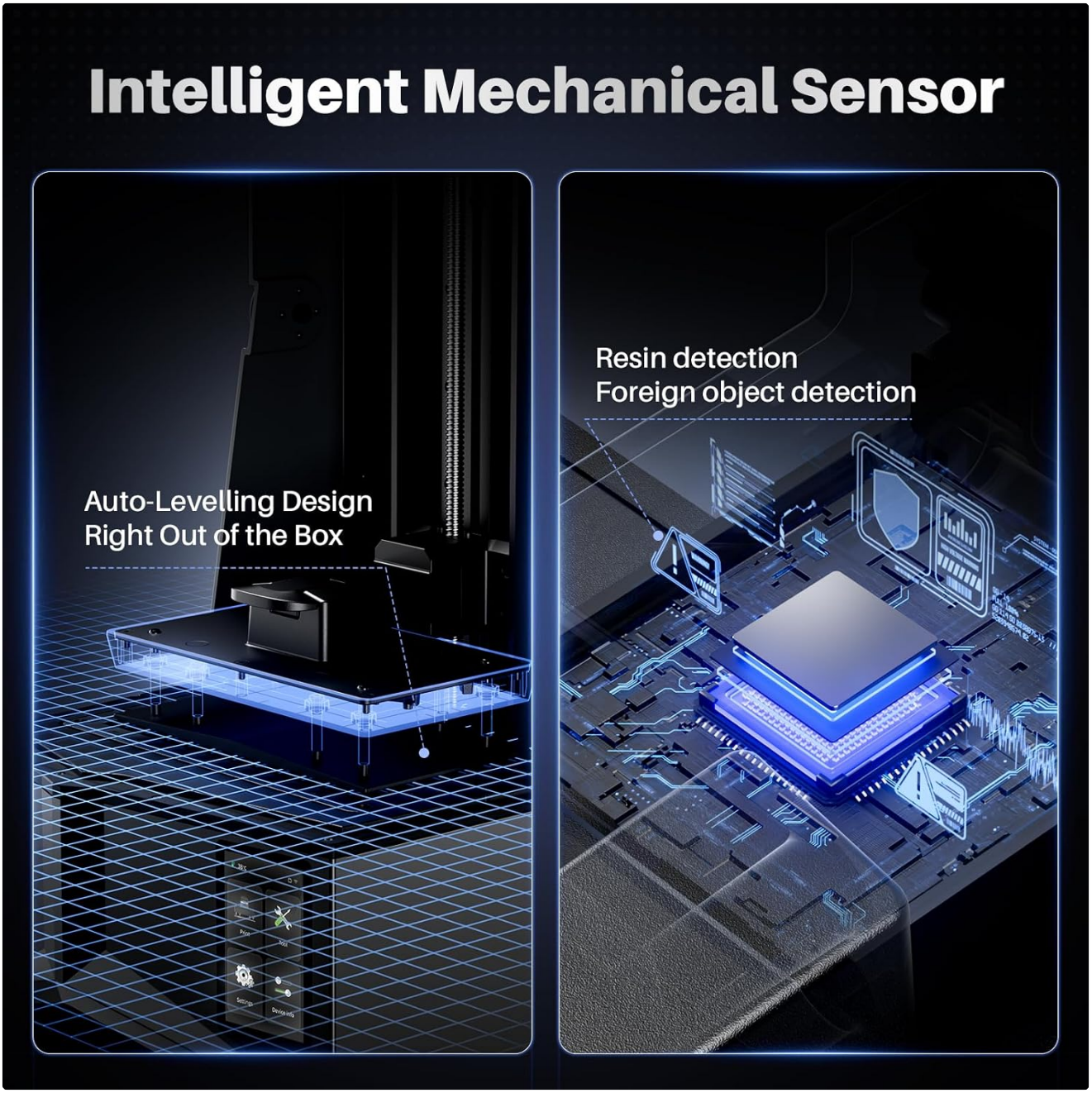


Figure 4.1: Illustration of the intelligent mechanical sensor and auto-leveling design. The left panel shows the auto-leveling mechanism, while the right panel highlights resin and foreign object detection capabilities.

4.2. ELEGOO Mars Mate Air Purifier Setup

1. **Filter Installation:** Open the purifier's cover and insert the activated carbon filter. Ensure it is seated correctly.
2. **Placement:** Position the Mars Mate Air Purifier near the 3D printer, ideally within the enclosed printing area if applicable, to maximize its effectiveness.
3. **Power Connection:** Connect the USB-C cable to the purifier and then to a suitable USB power source (e.g., a USB wall adapter or a USB port on the printer if available).



Figure 4.2: The ELEGOO Mars Mate Air Purifier positioned next to an ELEGOO Saturn 3 3D printer, demonstrating its intended use for air purification in the photocuring environment.

5. Operating Instructions

5.1. ELEGOO Saturn 4 Ultra 3D Printer Operation

1. **Prepare Model:** Use slicing software (e.g., Chitubox) to prepare your 3D model. Slice the model, add supports if necessary, and save it to the USB drive.
2. **Add Resin:** Pour resin into the resin vat, ensuring it does not exceed the maximum fill line.
3. **Insert USB Drive:** Insert the USB drive into the printer's USB port.
4. **Select and Print:** On the printer's touchscreen, navigate to the file, select it, and initiate the print.
5. **Monitoring:** Monitor the printing process. The Saturn 4 Ultra features an AI camera for real-time monitoring and time-lapse photography.



Figure 5.1: The AI Camera integrated into the ELEGOO Saturn 4 Ultra, enabling real-time monitoring of the print process and time-lapse recording.

5.2. ELEGOO Mars Mate Air Purifier Operation

- **Power On:** Once connected to power, the Mars Mate Air Purifier will typically activate automatically or via a simple button press. Refer to the purifier's specific controls for activation.
- **Continuous Operation:** Allow the purifier to operate continuously during printing and for a period afterward to effectively reduce resin fumes and odors.

6. Advanced Features

6.1. Fast Printing with Tilt Release Technology

The Saturn 4 Ultra incorporates Tilt Release Technology, which significantly reduces the peeling force during printing. This allows for faster print speeds, up to 150mm/h, without compromising print quality.



Figure 6.1: Diagram illustrating the Tilt Release Technology mechanism, which enables ultra-fast printing speeds of up to 150mm/h by minimizing adhesion between the print and the FEP film.

6.2. 12K High Precision Printing

Experience exceptional detail with the 12K monochrome LCD screen, offering a resolution of 11520x5120 pixels and an XY resolution of 19x24µm. This enables the creation of highly intricate and precise models.



Figure 6.2: A detailed 3D printed model showcasing the high precision and intricate details achievable with 12K resolution (11520x5120px) and 19x24µm XY resolution.

6.3. AI Camera and Smart Mechanical Sensor

The integrated AI camera provides real-time monitoring and time-lapse capabilities. The smart mechanical sensor assists with automatic leveling and can detect resin levels and foreign objects in the vat, enhancing print success rates and safety.

7. Maintenance

7.1. ELEGOO Saturn 4 Ultra 3D Printer Maintenance

- **Clean Build Platform:** After each print, remove the build platform and clean it with isopropyl alcohol (IPA).
- **Clean Resin Vat:** Carefully remove any cured resin particles from the vat using a plastic scraper. If changing resin types or storing the printer, clean the vat thoroughly with IPA.
- **FEP Film Inspection:** Regularly inspect the FEP film at the bottom of the resin vat for damage or cloudiness. Replace if necessary.
- **Printer Exterior:** Wipe down the printer's exterior with a soft cloth and IPA to remove resin residue.

- **Z-axis Lubrication:** Periodically apply a small amount of lubricant to the Z-axis lead screw to ensure smooth operation.

7.2. ELEGOO Mars Mate Air Purifier Maintenance

- **Filter Replacement:** The activated carbon filter has a limited lifespan. Replace the filter regularly, typically every 3-6 months depending on usage, or when you notice a decrease in odor absorption.
- **Exterior Cleaning:** Wipe the exterior of the purifier with a dry or slightly damp cloth. Do not use harsh chemicals.

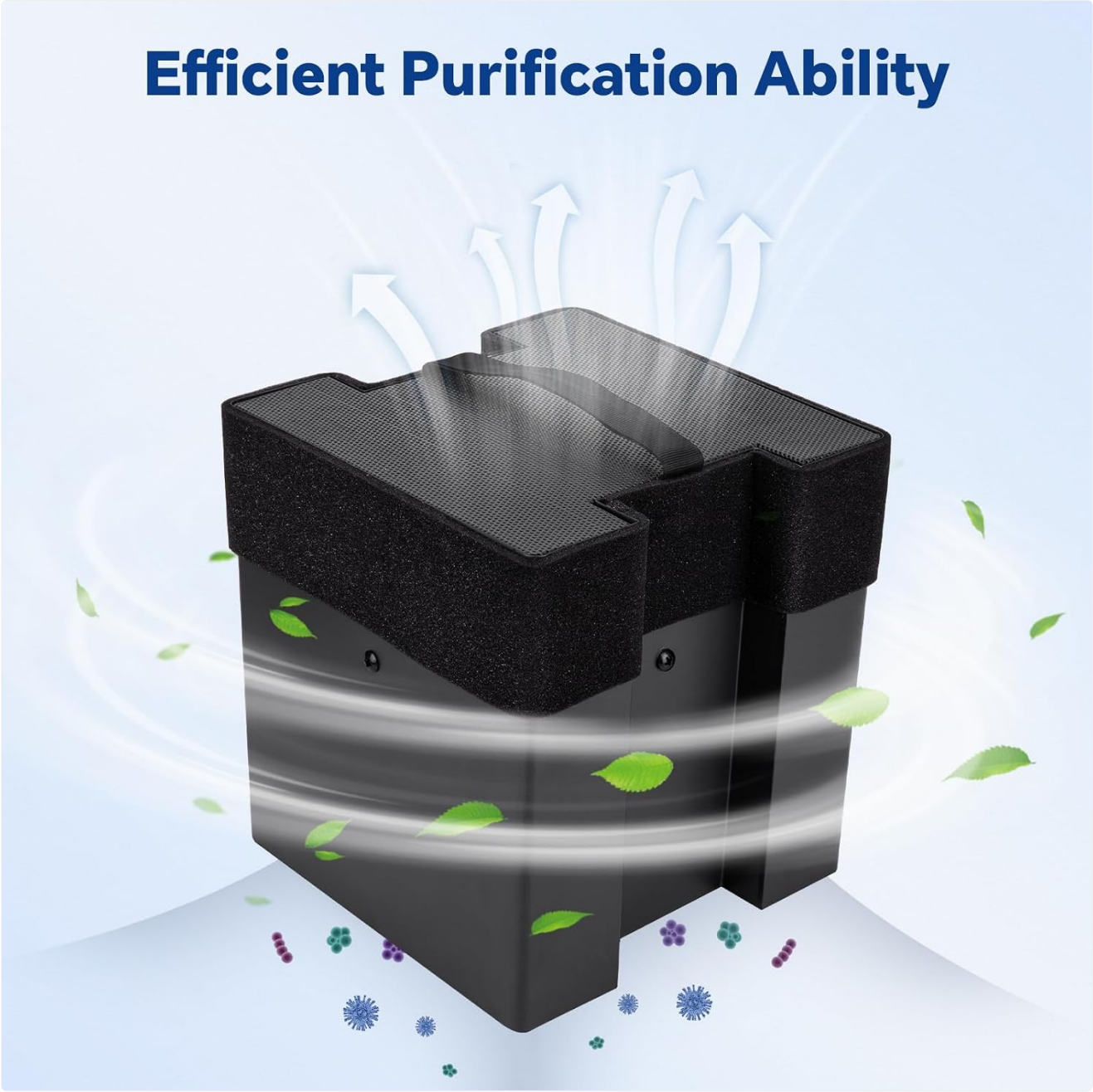


Figure 7.1: Internal view of the ELEGOO Mars Mate Air Purifier demonstrating its efficient purification ability through the activated carbon filter, capturing resin fumes and odors.

8. Troubleshooting

Problem	Possible Cause	Solution

Problem	Possible Cause	Solution
Print Fails to Adhere to Build Platform	• Improper leveling • Insufficient bottom exposure time • Cold resin temperature • Dirty build platform	• Re-level the build platform. • Increase bottom exposure time in slicing software. • Ensure ambient temperature is suitable for resin printing (20-25°C). • Clean the build platform thoroughly with IPA.
Print Has Layer Lines or Deformations	• Incorrect exposure settings • Loose build platform • Worn FEP film	• Adjust exposure time in slicing software. • Ensure build platform is securely tightened. • Inspect and replace FEP film if necessary.
Strong Resin Odor Persists	• Mars Mate filter needs replacement • Poor ventilation	• Replace the activated carbon filter in the Mars Mate. • Ensure the printing area is adequately ventilated.

9. Specifications

9.1. ELEGOO Saturn 4 Ultra 12K MSLA Resin 3D Printer

- **Technology:** MSLA (Masked Stereolithography)
- **Light Source:** COB (Chip-on-Board) UV LED
- **Build Volume:** 218.88 x 122.88 x 220 mm^3 (L x W x H)
- **LCD Screen:** 12K Monochrome LCD
- **Resolution:** 11520 x 5120 pixels
- **XY Resolution:** 19 x 24 µm
- **Printing Speed:** Up to 150 mm/h
- **Connectivity:** USB, WiFi
- **Features:** Automatic Leveling, Smart Mechanical Sensor (Resin/Foreign Object Detection), AI Camera



Figure 9.1: The ELEGOO Saturn 4 Ultra 3D Printer displaying a highly detailed printed model, highlighting its capability for intricate designs.

9.2. ELEGOO Mars Mate Air Purifier

- **Filter Type:** Activated Carbon
- **Dimensions:** 210 x 247 x 410 mm (L x W x H)
- **Power:** USB-C
- **Compatibility:** Suitable for Saturn 3 Ultra, Mars 4 Ultra, and other LCD 3D Printers.



Figure 9.2: The ELEGOO Mars Mate Air Purifier, a compact white unit, recognized with a design award, designed to reduce fumes during 3D printing.

10. Warranty and Support

For warranty information and technical support, please refer to the official ELEGOO website or contact their customer service directly. Keep your purchase receipt as proof of purchase for warranty claims.

ELEGOO Official Website: www.elegoo.com