xTool S1

xTool S1 20W Enclosed Diode Engraver and Cutter User Manual

Model: S1

1. INTRODUCTION

This manual provides essential information for the safe and effective operation of your xTool S1 20W Enclosed Diode Engraver and Cutter. Please read this manual thoroughly before using the device to ensure proper setup, operation, and maintenance. Keep this manual for future reference.

Image: The xTool S1 20W Enclosed Diode Engraver and Cutter, a compact laser processing machine.

2. SAFETY INFORMATION

The xTool S1 is a Class 1 (FDA certified) laser engraving machine designed with multiple safety features. Adhering to these guidelines is crucial for user safety.

- **Enclosed Design:** The machine features an enclosed and eye-friendly design that filters both diode and infrared laser emissions.
- **Lid-open Safety Stop:** Operation automatically stops if the lid is opened, preventing laser leakage.

- **Emergency Stop:** An easily accessible emergency stop button is provided to halt operations immediately.
- **Enhanced Flame Detection:** Equipped with five flame sensors and one temperature sensor to detect potential fire hazards during engraving or cutting.
- **Bottom Plate Safety:** The machine will automatically stop if the bottom plate is removed or tilted.

Image: Diagram illustrating the xTool S1's safety features, including enhanced 5-direction flame detection, emergency stop design, enclosed and eye-friendly casing, and lid-open safety stop.
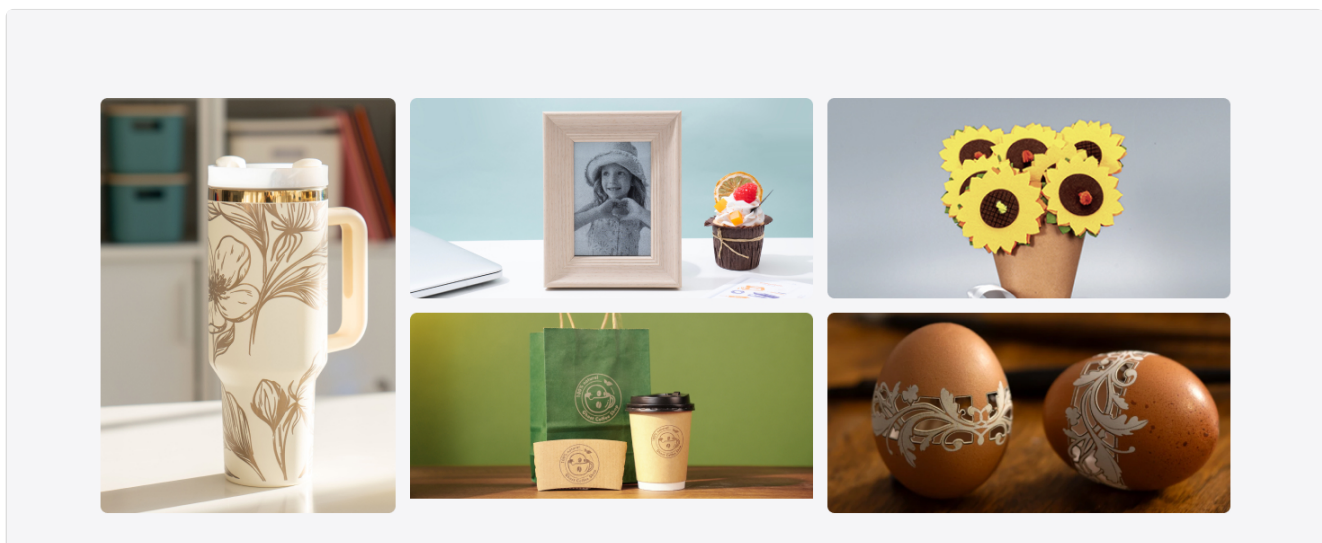

Image: Comparison showing the xTool S1's enclosed design and safety features versus an open laser machine with visible smoke and laser exposure.

3. Setup Guide

3.1 Unboxing and Component Check

Carefully remove all components from the packaging. Verify that all items listed in the packing list are present and undamaged. The standard bundle includes the S1 20W machine, Smart Air Assist, Honeycomb Panel, and a 1064nm Infrared Module.

3.2 Machine Placement

Place the xTool S1 on a stable, level surface in a well-ventilated area. Ensure adequate space around the machine for operation and maintenance.

3.3 Power and Connection

1. Connect the power adapter to the machine and then to a power outlet.
2. Connect the machine to your computer via USB cable or establish a Wi-Fi connection.

3.4 Software Installation

Download and install the xTool Creative Space (XCS) software from the official xTool website. Follow the on-screen instructions for installation and initial setup.

Image: Screenshot of the xTool Creative Space (XCS) software interface, showing design tools and project parameters.

4. OPERATING INSTRUCTIONS

4.1 Powering On and Off

- To power on, press the power button located on the machine.
- To power off, press and hold the power button until the machine shuts down, or use the emergency stop button for immediate shutdown.

4.2 Material Loading

Open the lid and place your material securely on the honeycomb panel. Ensure the material is flat and within the working area of 498x330mm.

4.3 Laser Module Installation

The xTool S1 supports interchangeable laser modules. To install a module (e.g., 20W Diode or 1064nm Infrared), carefully align it with the carriage and secure it according to the instructions provided with the module. The 20W diode module is suitable for cutting and engraving various materials, while the 1064nm infrared module is ideal for engraving metals, plastics, and opaque acrylics.

Image: Illustration showing different laser modules (2W IR, 10W, 20W, 40W) for the xTool S1, highlighting their interchangeability.

4.4 Focusing

The xTool S1 features dynamic auto-focus for precise engraving and cutting.

- **One-click Auto-focus:** In the XCS software, use the one-click auto-focus function. This system intelligently guides the laser beam for optimal focus without manual screw adjustments.
- **Dynamic Auto-focus for Curved Surfaces:** For uneven or curved materials, the system automatically adjusts the Z-axis and constructs a 3D model to maintain focus across the surface, ensuring consistent results.
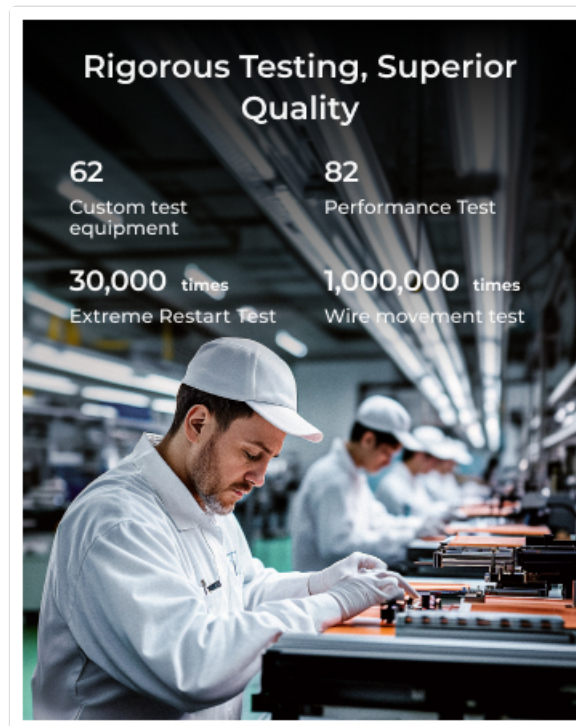

Image: Diagram illustrating the xTool S1's auto-focus system, showing the laser beam adjusting to cut through a 10mm thick material.

We've Got Your Back, Any Way

Multi-Channel Service

Email   Live chat   Call   Facebook group

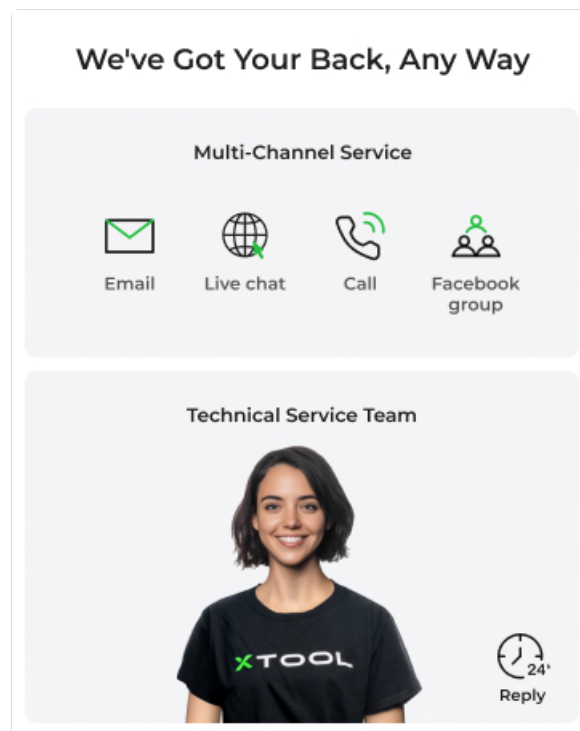### Technical Service Team

xTOOL

24'
Reply

Image: The xTool S1 laser module engraving a pattern onto a curved plate, demonstrating its dynamic focus capability for uneven surfaces.

Image: Comparison of one-click precise autofocus in XCS software versus a four-step manual focus process, highlighting the ease of use of the S1's system.

4.5 Project Creation and Execution

1. **Design in XCS:** Use the xTool Creative Space software to create or import your design.
2. **Material Settings:** Select the appropriate material type and thickness in the software. The software offers over 500 preset parameters for various materials.
3. **Positioning:** Utilize the twin-point positioning technique for precise placement of your design on the material. This advanced algorithm determines the exact processing location and tracks the light head's position in real-time.
4. **Start Process:** Initiate the engraving or cutting process from the software. The machine operates at speeds up to 600mm/s for efficient production.

Image: Comparison of pinpoint positioning on the xTool S1 versus an obvious offset from a single-camera system, demonstrating superior accuracy.
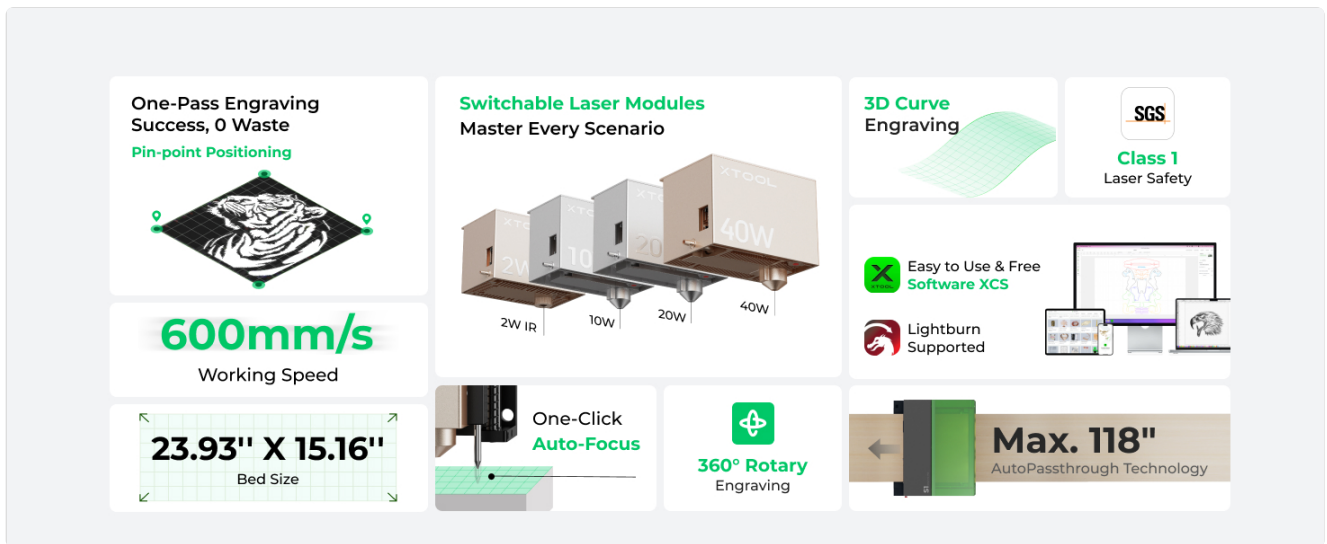
One-Pass Engraving Success, 0 Waste
Pin-point Positioning

600mm/s
Working Speed

23.93" X 15.16"
Bed Size

Switchable Laser Modules
Master Every Scenario

2W IR   10W   20W   40W

One-Click
Auto-Focus

360° Rotary
Engraving

3D Curve Engraving

Class 1
Laser Safety

Easy to Use & Free
Software XCS

Lightburn
Supported

Max. 118"
AutoPassthrough Technology

Image: Close-up view of the xTool S1's laser module and a detailed engraving on wood, highlighting the 0.06*0.08mm light spot for ultra-fine results.

Never Limited By Size, Go Big for Long-Term Gains

The xTool S1 offers a 19.6" x 12.5" work area on a 23.93" x 15.16" bed, letting you create big and do more.

23.93" × 15.16"

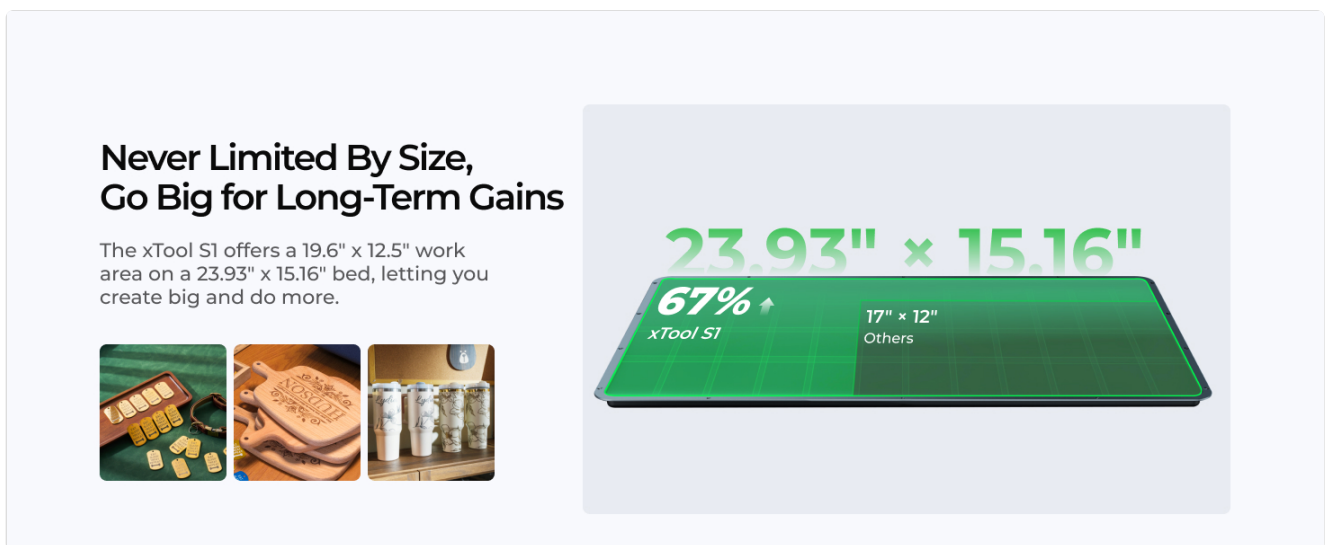**67% ↑**
xTool S1

17" × 12"
Others

Image: A hand installing a laser module into the xTool S1, emphasizing the machine's 600mm/s working speed.

4.6 Supported Materials and Modules

The xTool S1, with its dual module capability, supports a wide range of materials:

- **20W Diode Laser:** Suitable for wood, leather, rock, black acrylic, glass, and stainless metal.
- **1064nm Infrared Laser (2W):** Ideal for silver, plastic, solid color acrylic, gold, other metals, and stainless steel.

Your Treasure Deserves Next-Level Precision

S1 features **Pin-point Positioning,** 10x* more accurate than single-camera systems.

*The data is sourced from the xTool laboratory and obtained under specific testing conditions.

Image: The 2W 1064nm infrared module installed in the xTool S1, with swatches of gold, silver, copper, and titanium indicating compatibility.

Image: A visual guide showing various materials (wood, leather, rock, silver, plastic, acrylic, glass, metals) and which laser modules (diode or infrared) are suitable for them.

4.7 Accessories

The xTool S1 can be enhanced with various accessories (sold separately unless part of a bundle):

- **Automatic Conveyor Feeder:** Extends the working area for projects up to 118 inches using AutoPassthrough™ Technology.
- **4-in-1 RA2 Pro:** For versatile rotary engraving on cylindrical objects.
- **Riser Base:** Increases the working height up to 4.92 inches.
- **Smart Air Assist:** Provides 30L/min airflow for cleaner cuts and engravings.
- **Honeycomb Panel:** Included for better heat release and material support.
- **Smoke Purifier:** For managing fumes and odors during operation.

Image: The xTool S1 machine surrounded by its various accessories, including the automatic conveyor feeder, honeycomb panel, screen printer, smart air assist, and 4-in-1 RA2 Pro.

Image: The xTool S1 with the automatic conveyor feeder, demonstrating its capability to process materials up to 118 inches long.

Image: The xTool 4-in-1 RA2 Pro rotary attachment shown with various objects like tumblers, baseball bats, and rings, illustrating its versatility for rotary engraving.

Image: Visuals of the Riser Base for increased height, the Smart Air Assist for cleaner results, and the Honeycomb Panel for better heat release.

5. MAINTENANCE

Regular maintenance ensures optimal performance and longevity of your xTool S1.

- **Cleaning:** Regularly clean the interior of the machine, especially the laser lens and the honeycomb panel, to prevent residue buildup that can affect laser performance and air assist efficiency. Use a soft, lint-free cloth and appropriate cleaning solutions as recommended by xTool.
- **Laser Module Care:** Handle laser modules with care. Ensure they are free from dust and debris. When not in use, store them in a protective case.
- **Air Assist System:** Check the air assist nozzle and tubing periodically for blockages. Clean as needed to maintain consistent airflow.
- **Honeycomb Panel:** Clean the honeycomb panel to remove small cut pieces and debris. This helps maintain a flat working surface and prevents fire hazards.

6. TROUBLESHOOTING

This section addresses common issues you might encounter with your xTool S1.

6.1 Common Issues and Solutions

- **Machine Not Powering On:**
  Solution: Check power cable connections. Ensure the power adapter is securely plugged into both the machine and the wall outlet.
- **Laser Not Firing/Weak Output:**
  Solution: Verify the laser module is correctly installed and secured. Check material settings in XCS software. Ensure the laser lens is clean. Perform auto-focus again.
- **Poor Engraving/Cutting Quality:**

Solution: Adjust power and speed settings in XCS. Ensure the material is flat and properly focused. Clean the laser lens. Check for material inconsistencies.

- **Machine Disconnects from Computer:**
  Solution: Check USB cable connection or Wi-Fi signal strength. Restart the machine and computer. Update XCS software and machine firmware.
- **Safety Sensor Triggered (Machine Stops):**
  Solution: Check if the lid is fully closed. Ensure the bottom plate is correctly in place. Inspect for any signs of flame or excessive temperature inside the enclosure. Address the cause and reset the machine.

For persistent issues, refer to the official xTool support resources or contact customer service.

7. SPECIFICATIONS

Feature	Detail
Model	xTool S1
Laser Power (Diode)	20W (standard), 10W, 40W (optional)
Laser Power (Infrared)	2W (1064nm)
Working Area	498mm x 330mm (19.6" x 12.5")
Bed Size	23.93" x 15.16"
Processing Speed	Up to 600mm/s
Laser Spot Size (20W)	0.06mm x 0.08mm
Max Cut Thickness (20W Diode)	10mm Basswood (one pass)
Max Cut Thickness (40W Diode)	18mm Wood, 15mm Black Acrylic, 0.1mm Stainless Metal (one pass)
Safety Class	Class 1 (FDA Certified)
Safety Features	Enclosed design, lid-open safety stop, emergency stop, 5-direction flame sensors, temperature sensor
Connectivity	USB, Wi-Fi
Software	xTool Creative Space (XCS)
Dimensions (Machine)	765mm x 561mm (30.12" x 22.09")
Riser Base Height (Max)	4.92"
Air Assist Flow	30 L/min

Image: Table comparing specifications for 40W, 20W, 10W diode lasers and 2W IR laser modules, including max cut thickness, working speed, and laser spot size.

Image: Diagram showing the dimensions of the xTool S1 machine and its various accessories like the riser base.

8. WARRANTY INFORMATION

For detailed warranty information regarding your xTool S1, please refer to the warranty card included with your product or visit the official xTool website. Warranty terms and conditions may vary by region and purchase location.

9. SUPPORT

If you require assistance or have questions about your xTool S1, please utilize the following support channels:

- **Email Support:** Contact xTool customer service via email for technical inquiries.
- **Live Chat:** Access live chat support on the official xTool website for real-time assistance.
- **Phone Support:** Call the xTool support line for direct communication.
- **Online Community:** Join the xTool Facebook group or other online forums for peer support and shared knowledge.

xTool provides a dedicated technical service team to assist users with any issues.

Image: Icons representing multi-channel service options: Email, Live chat, Call, and Facebook group, alongside an image of a technical service team member.