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› LONGER Ray5 5W Laser Engraver User Manual

Longer 5W

LONGER Ray5 5W Laser Engraver User Manual

Higher Accuracy DIY Laser Engraving Machine with 3.5" Touch Screen

1. INTRODUCTION

The LONGER Ray5 5W Laser Engraver is a versatile and high-precision tool designed for both hobbyists and professionals. Equipped with a cutting-edge 240MHz ESP32 chipset, it offers impressive speeds and superior compatibility. Its advanced laser technology ensures intricate designs and detailed patterns on a wide range of materials. This manual provides essential information for setting up, operating, and maintaining your laser engraver, ensuring safe and efficient use.



Figure 1: The LONGER Ray5 5W Laser Engraver, showcasing its design and an example of an engraved wooden piece.

2. SAFETY INFORMATION

Operating a laser engraver requires strict adherence to safety protocols. The LONGER Ray5 5W is a Laser Class II device, and while it includes built-in safety features, user vigilance is paramount.

- **Eye Protection:** Always wear the provided protective goggles when the laser is in operation. The laser beam can cause severe eye damage.
- **Protective Cover:** Ensure the protective cover is in place during operation to contain the laser beam within the specific area of the material.
- **Emergency Shutdown:** The machine is equipped with an emergency shutdown button. Familiarize yourself with its location and use it immediately in case of any malfunction or emergency.
- **Motion Protection:** The device features motion protection, which automatically shuts down the laser if abnormal movements are detected during operation.
- **Thermal Protection:** Overheating detection and temperature monitoring are integrated. The machine will automatically stop if it detects a flame or if the engraving area overheats.
- **Ventilation:** Operate the engraver in a well-ventilated area to dissipate fumes and smoke generated during the

engraving or cutting process.

- **Supervision:** Never leave the laser engraver unattended while it is operating.



Eyes Protection

Equipped with a protective cover and glasses, avoid eye irritation.



Thermal Protection

Auto shutdown if it detects a flame of the engraving area overheats.



Movement Protection

If the laser machine move while in use, the move protection will auto shutdown.



Power off/on Button

Longer laser engraver has a power switch button, which is more convenient and safer.

Figure 2: Overview of the LONGER Ray5's integrated safety features, including eye protection, thermal monitoring, motion detection, and the power button.

3. SETUP

The LONGER Ray5 5W laser engraver is designed for easy assembly. All necessary tools and detailed guides are included in the package. Follow the step-by-step instructions provided in the Quick Start Guide to assemble the frame, attach the laser module, and connect the control unit.

1. **Unpacking:** Carefully unpack all components and verify against the packing list.
2. **Frame Assembly:** Assemble the main frame components using the provided screws and tools. Ensure all connections are secure.
3. **Laser Module Installation:** Mount the laser module onto the gantry. Ensure it slides smoothly along the axis.
4. **Control Unit Connection:** Connect the control unit to the main frame and the laser module.

5. **Power Connection:** Connect the power adapter to the control unit and plug it into a suitable power outlet.
6. **Initial Power On:** Press the power button on the control unit. The 3.5-inch touch screen will illuminate, indicating the device is ready.
7. **Focus Adjustment:** Adjust the laser focus according to the material thickness. The laser module typically has a focus adjustment knob.

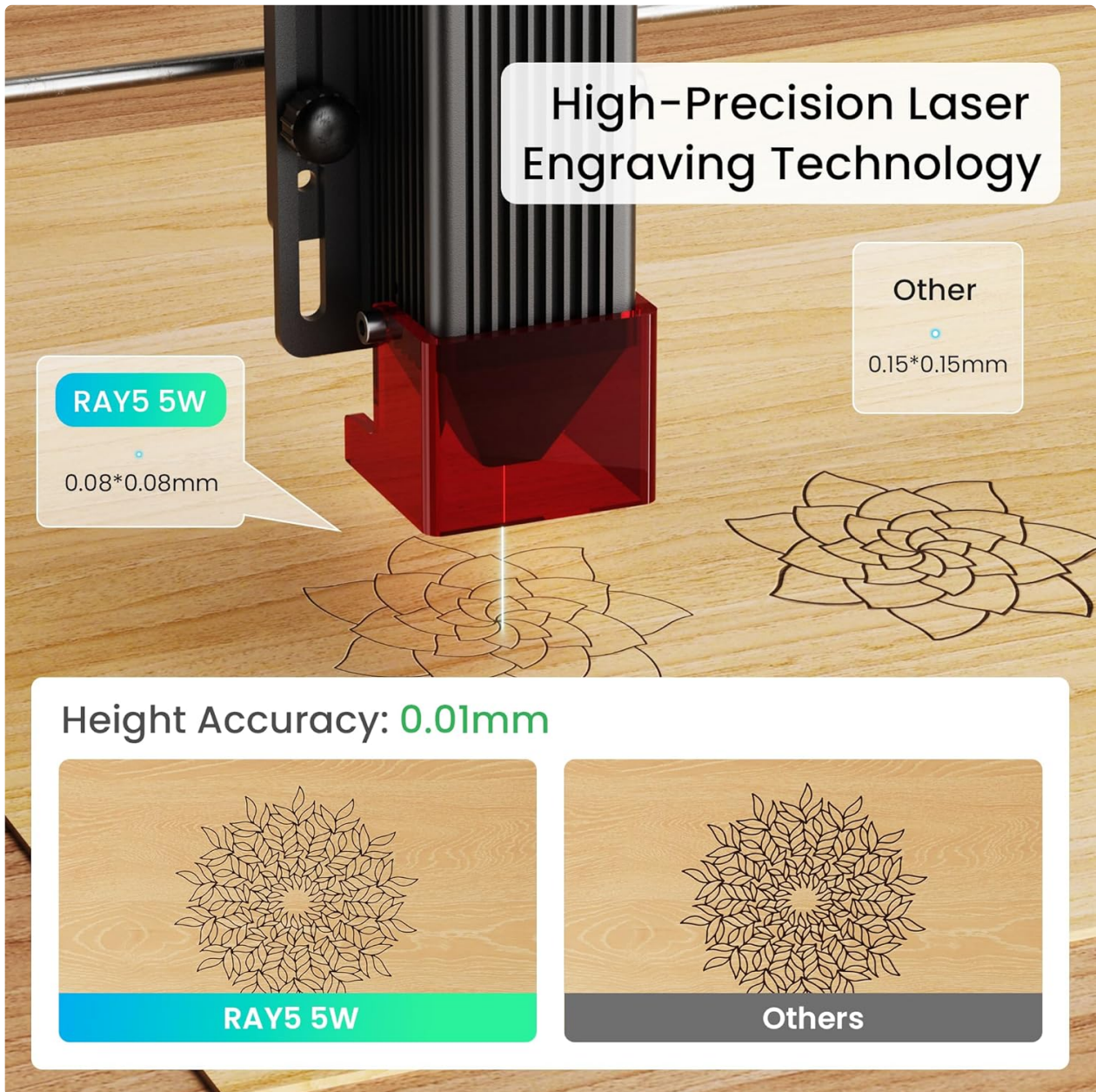


Figure 3: All components of the LONGER Ray5 5W Laser Engraver laid out, ready for assembly.

4. OPERATING INSTRUCTIONS

The LONGER Ray5 5W offers multiple connectivity options and a user-friendly interface for seamless operation.

4.1 Connectivity Options

- **USB Connection:** Connect directly to your computer via USB for real-time control using compatible software.
- **TF Card:** Load design files onto a TF card for offline engraving, allowing operation without a continuous computer connection.

- **WiFi Connection:** Connect the engraver to your local WiFi network for wireless control and file transfer.
- **Mobile App:** Utilize the dedicated mobile application for convenient control and monitoring from your smartphone or tablet.

4.2 Software Compatibility

The engraver is compatible with popular laser engraving software:

- **LaserGRBL:** Recommended for Windows users, offering a straightforward interface for basic engraving tasks.
- **LightBurn:** A powerful and versatile software compatible with Windows, macOS, and Linux, providing advanced control and design capabilities.

Compatible with Multiple Software and 4 Connection Modes

Operating System Supported:

LaserGRBL: Windows Lightburn: Windows, macOS, Linux

Input Image Format:
 JPG PNG BMP GIF SVG etc AI

Connection Supported
 WIFI USB APP TF CARD

LONGER

Figure 4: The LONGER Ray5 supports multiple software platforms and connection modes for flexible operation.

4.3 Engraving Process

1. **Design Creation:** Create or import your design using LaserGRBL, LightBurn, or the mobile app.
2. **Material Placement:** Place your material within the 400x400mm working area. Ensure it is flat and securely positioned.
3. **Focus Adjustment:** Fine-tune the laser focus for optimal engraving quality based on your material.
4. **Preview and Positioning:** Use the touch screen or software to preview the engraving path and adjust the

laser's starting position. The 3.5-inch touch screen allows for intuitive control and real-time monitoring.

5. **Start Engraving:** Initiate the engraving process. The LONGER Ray5 can achieve speeds up to 10,000mm/min, ensuring efficient project completion.

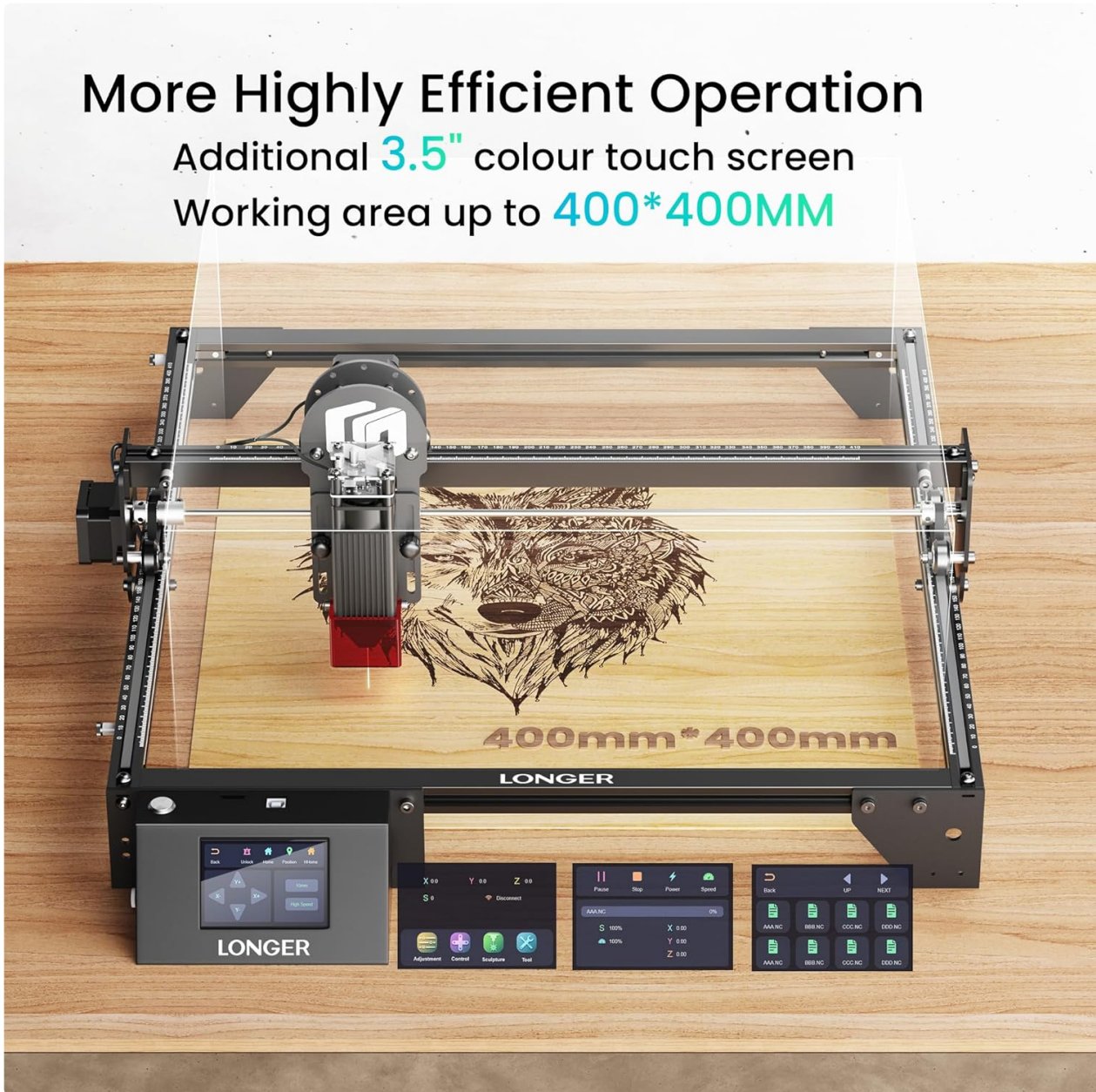


Figure 5: The 3.5-inch color touch screen provides intuitive control and real-time monitoring of the engraving process.

4.4 Material Compatibility and Settings

The LONGER Ray5 5W is capable of engraving and cutting a variety of materials with high precision (0.08x0.08mm laser spot, 0.01mm accuracy). Refer to the table below for recommended settings. These are starting points and may require fine-tuning based on specific material variations and desired results.

Products Informations

Laser Module (5w)	
Laser Module Model	: LC20F30
Laser Technology	: Single Diode Laser with FAC
Wavelength	: 450-460 nm
Max Power input	: 12 V2 A
Optical Power Output	: 5-5.5 W
Focus Type	: Fixed Focus- 30 mm Focal length
Dot Size at Optimal Focus	: 0.08 x 0.08 mm
Laser Class	: FDA Class IV, or Class 4 IEC standard
Applicable Materia	: Engraving: Plywood, Basswood, Acrylic,Hardwood, Pinewood, Kraft paper,Ceramics, Stainless steel, Aluminum alloyetc. Cutting: 6mm Basswood, 3mm Acrylic,2mm Bamboo, Kraft paper, etc.

Figure 6: Recommended settings for various materials, including basswood, plywood, stainless steel, leather, and acrylic.

MODEL	Material	Action	Thickness	Power	Speed	Cycles	Remarks
LONGER RAY5 5w	Basswood	Engrave	-	100%	2000 mm/min	1	-
LONGER RAY5 5w	Plywood	Engrave	-	100%	2000 mm/min	1	-
LONGER RAY5 5w	Pine	Engrave	-	100%	2000 mm/min	1	-
LONGER RAY5 5w	Stainless Steel	Engrave	-	100%	2000 mm/min	1	Color with dark paint before engrave.
LONGER RAY5 5w	Anodised Aluminium	Engrave	-	100%	3000 mm/min	1	Dark color. It need to be adjusted based on different colors.
LONGER RAY5 5w	Cotton Cloth	Engrave	-	100%	1000 mm/min	1	White color,It need to be adjusted based on different colors.
LONGER RAY5 5w	Leather	Engrave	-	100%	3000 mm/min	1	White color,It need to be adjusted based on different colors.
LONGER RAY5 5w	Powder Coated Metal	Engrave	-	100%	500 mm/min	1	Dark color.It need to be adjusted based different colors.
LONGER RAY5 5w	Solid wood	Engrave	-	80%	3000 mm/min	1	It need to be adjusted based on different woods.
LONGER RAY5 5w	Glass	Engrave	-	100%	700 mm/min	1	Color with dark paint before engrave.
LONGER RAY5 5w	Basswood	Cut	2 mm	100%	300 mm/min	1	-
LONGER RAY5 5w	Plywood	Cut	4 mm	100%	100 mm/min	1	-
LONGER RAY5 5w	Pine	Cut	6 mm	100%	120 mm/min	2	-
LONGER RAY5 5w	Acrylic	Cut	2 mm	100%	120 mm/min	2	-
LONGER RAY5 5w	Paperboard	Cut	2 mm	100%	1000 mm/min	2	-
LONGER RAY5 5w	Kraft Paper	Cut	0.15 mm	80%	3000 mm/min	1	-
LONGER RAY5 5w	KT Board	Cut	5 mm	100%	300 mm/min	2	White color.It need to be adjusted based on different colors.
LONGER RAY5 5w	Non-wovenFabrics	Cut	0.5 mm	100%	800 mm/min	1	White color.It need to be adjusted based on different colors.
LONGER RAY5 5w	CottonCloth	Cut	1 mm	100%	400 mm/min	1	White color.It need to be adjusted based on different colors.
LONGER RAY5 5w	Leather	Cut	0.7 mm	100%	500 mm/min	1	White color.It need to be adjusted based on different colors.

Figure 7: The LONGER Ray5 5W is compatible with a wide range of materials, including wood, leather, metal, and acrylic.

5. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your LONGER Ray5 5W Laser Engraver.

- **Cleaning:** Regularly clean the laser lens and the working area to prevent debris buildup, which can affect laser performance and engraving quality. Use a soft, lint-free cloth.
- **Belt Tension:** Periodically check the tension of the timing belts. They should be taut but not overly tight to ensure smooth and accurate movement of the laser module.
- **Lubrication:** Apply a small amount of lubricant to the guide rails and lead screws as recommended in the detailed product manual to ensure smooth motion.
- **Firmware Updates:** Check the official Longer website for any available firmware updates to ensure your device has the latest features and performance improvements.

6. TROUBLESHOOTING

If you encounter issues with your LONGER Ray5 5W, refer to the common troubleshooting steps below:

Problem	Possible Cause	Solution
Laser not firing or weak	Incorrect focus, low power setting, dirty lens, loose connection.	Adjust laser focus. Increase power setting in software. Clean the laser lens. Check all cable connections.
Engraving is blurry or uneven	Material not flat, incorrect focus, loose belts, excessive speed.	Ensure material is flat and secured. Re-adjust focus. Check and tighten timing belts. Reduce engraving speed.
Machine not moving or skipping steps	Loose motor cables, obstructed movement, software error.	Check motor cable connections. Clear any obstructions on the rails. Restart the software and engraver.
Cannot connect via WiFi/App	Incorrect network settings, firewall issues, app outdated.	Verify WiFi credentials. Check router settings. Update the mobile app. Try USB connection as an alternative.

7. SPECIFICATIONS

Feature	Detail
Product Dimensions	12.2 x 23.6 x 5.9 inches
Item Model Number	5W
Item Weight	8.26 pounds
Manufacturer	Longer
Country of Origin	China
Date First Available	March 28, 2024
Laser Module Model	LC20F30
Laser Technology	Single Diode Laser with FAC
Wavelength	450-460 nm
Max Power Input	12V 2A
Optical Power Output	5-5.5 W
Focus Type	Fixed Focus - 30 mm Focal length
Dot Size at Optimal Focus	0.08 x 0.08 mm
Laser Class	FDA Class IV, or Class 4 IEC standard
Applicable Engraving Materials	Plywood, Basswood, Acrylic, Hardwood, Pinewood, Kraft paper, Ceramics, Stainless steel, Aluminum alloy, etc.
Applicable Cutting Materials	6mm Basswood, 3mm Acrylic, 2mm Bamboo, Kraft paper, etc.



Figure 8: Detailed technical specifications of the LONGER Ray5 5W laser module.

8. WARRANTY AND SUPPORT

LONGER is committed to providing excellent customer support. The LONGER Ray5 5W Laser Engraver comes with a standard manufacturer's warranty. For specific warranty terms and conditions, please refer to the warranty card

included in your product packaging or visit the official Longer website.

Should you require any assistance with installation, operation, maintenance, or troubleshooting, our dedicated support team is available 24/7. You can reach them through the contact information provided in your product documentation or on the Longer official website.

For additional resources and community support, consider visiting the Longer Store on Amazon or relevant online forums dedicated to laser engraving.