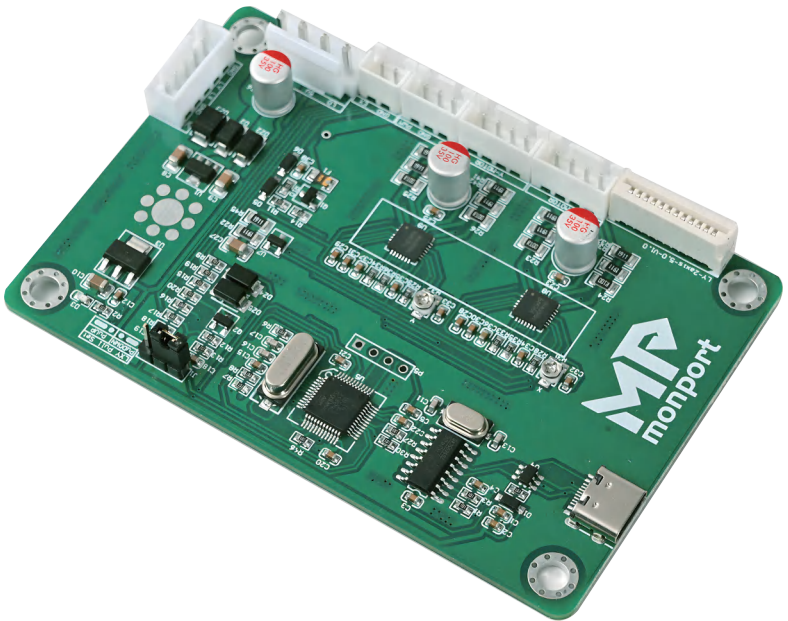# 40W Laser Engraver Controller User Manual

Read Carefully Before Use And Keep For Future Reference

PREFACE

Thank you for choosing MONPORT laser control board.

Read this manual carefully before operation. It covers the details of correct installation, adjustment, and safe operation of your laser's new control board. It is intended to be used in conjunction with the manuals for your laser engraver and its
engraving software. You and any other users of your laser should thoroughly understand ALL these manuals before attempting to install this control system or operate the laser. When correctly installed and used in accordance with these instructions, your laser should operate safely but some components remain extremely dangerous. Be sure that you have correctly connected your laser's preinstalled safety devices. Never disable or deactivate them. Always use your laser safely and responsibly.

This manual should be included with the others if your engraver is given or sold to a third party. If you have any questions or require more information after reading this manual, please contact us and our support department will address your concerns as soon as possible.laser
safely and responsibly.

CONTENTS

1.Introduction

1.1 Overview

Once you have fully connected this control board to your engraver, you will be able to operate your laser directly from its control panel or through a direct connection with your computer. For details on safe use of your laser, see its separate manual. For details on operating your engraving software, see its separate manual.

1.2 Symbol Guide

The following symbols are used on this machine's labeling or in this manual:

⚠ These items present a risk of serious property damage or personal injury.

⚡ These items address similarly serious concerns with regard to electrical components.

CE This product is sold in conformity with applicable EU regulations.

🗑 This product contains electrical components that should not be disposed of with regular garbage.
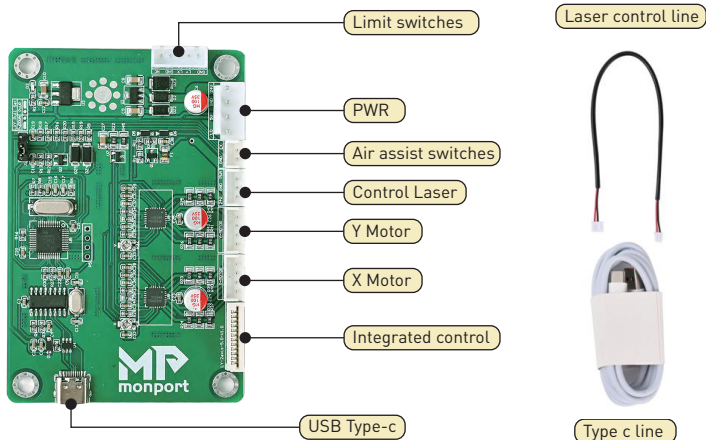
1.3 Designated Use

This control board is intended for use with MONPORT's low-wattage laser engravers and cutters using glass (DC) or metal (RF) carbon dioxide (CO_2) tubes. Its firmware and ports can also be used to control similar engravers from other manufacturers and some CNC machines, although such configurations are outside the scope of this manual and must be done at the user's own risk. This board must be installed, operated, maintained, and repaired by personnel familiar with its field of use and the dangers both of the machine and its components.

Laser engravers and CNC machines are dangerous. The manufacturer and/or seller bear(s) no responsibility and assume(s) no liability for any improper use of this device or for any damage or injury arising from such use. The operator is obliged to use this control system only in accordance with its designated use and to use its engraver only in accordance with the instructions in all its manuals and all applicable local and national laws and regulations.

1.4 Technical Specifications

Model	40w laser engraver&cutter 2.0
CPU Type	ARM
Board Dimensions	2.4″ x3.7″ x0.3″ (6.1cmx9.4cmx0.8cm)
Input Power	24V DC
Output Power	24V DC
Signal Output	0-5V
Max. Clock Frequency	120 MHz
Firmware	GRBL
Compatible Software	LightBurn (Windows/Linux/MacOS)
Compatible File Systems	FAT32
Maximum USB Speed	USB 2.0 (480 Mbit/sec.)

1.5 Product Diagram

Limit switches

Laser control line

PWR

Air assist switches

Control Laser

Y Motor

X Motor

Integrated control

USB Type-c

Type c line

2.Safety Information

2.1 Disclaimer

Your control board may differ somewhat from those shown in this manual due to options, updates, etc. Please contact us if your device came with an outdated manual or if you have any other questions.

2.2 General Safety Instructions

Use this device only in accordance with this instruction manual, the manuals for your laser engraver and its engraving software, and all applicable local and national laws and regulations. Only allow this device to be installed, operated, maintained, repaired, etc. by others who are familiar with these manuals and have read and understood all their warnings and safety information. Ensure that this manual is also included with your engraver if it is ever given or sold to a third party

• **DO NOT** install this control board if it arrives or becomes damaged. Contact customer service for help with repair or replacement.

• **DO NOT** leave this device separate from your engraver or loosely housed within it. Make all connections securely and then firmly secure the device to your engraver's casing.

• After any adjustment of this device's electrical connections with your engraver and its accessories, carefully test that the connections have been made correctly and the engraver and accessories are responding properly to your commands. Be especially careful of any connections to the water cooling system, heat sensors, and other safety equipment. If your engraver did not come with an interlock sensor that automatically cuts power to the laser when the work bay's protective cover is opened, it is highly recommended that you get and install one.

2.3 Electrical Safety Instructions

• **ONLY** use this device with a compatible and stable power supply with less than 5% fluctuation in its voltage. If your engraver's power supply is unable to maintain such consistency, replace the power supply before further use.

• Adjustment, maintenance, and repair of this device and other electrical components of your engraver must be done **ONLY** by trained and skilled professionals to avoid fires and other malfunctions, including potential radiation exposure from damage to the laser components. Because specialized techniques are required for testing the electrical components of your engraver, it is recommended such testing only be done by the manufacturer, the seller, or a specialized repair service.

Unless otherwise specified, ONLY undertake adjustment, maintenance, and repair of this device and its electrical connections when it, your engraver, and any connected accessories are turned off and disconnected from their power supplies.

• **ALWAYS** check that the electrical polarities are correct at every stage of installation. Reversing the polarity of power inputs can damage or destroy your board and other components. Use of a multimeter to ensure correct installation is recommended, especially for use with custom projects. Also ensure that new connections are properly grounded.

• **DO NOT** allow anything metallic to come into contact with this device while it is powered. Allowing a metal tool or fastener to fall against the board during use can cause short circuits, damaging or destroying the board.

2.4 Fire Safety

• **NEVER** leave your engraver alone during use.

• **Always** keep a fire extinguisher, water hose, or other flame retardant system nearby in case of accidents. Ensure the local fire department's phone number is clearly displayed nearby. In the case of a fire, cut electrical power before dousing the flame. Familiarize yourself with the correct range of your extinguisher before use, as its high pressure can produce blowback.

3.Installation

3.1 Unpacking Your Control Board

Your control board should arrive protected by an antistatic bag and insulating foam. If you find any damage during unboxing or installation, please contact us immediately. Do not continue with installation until customer service can confirm the devices' safety or provide safe replacement(s).

You may keep the packaging in case of future return but, if you dispose of it or any part of these devices, be sure to do so in compliance with applicable waste disposal regulations.

3.2 Preparation

DO NOT install this device while your engraver is connected to its power supply.

Turn off your laser engraver and fully disconnect it from its power supply. Open the part of your engraver's casing that holds its control panel. Place the cover to the side while taking care not to pull or damage its wiring.

IIt is recommended that you use a few pieces of tape to join the various sets of wires connected to your engraver's current control board. Add labels similar to those shown in the picture below.

Here, "PWR" is used for the main power input, "Y" and "X" for the motor drivers, and "END" for the limit switches. Any clear phrasing is fine. If your old board already has other connections in addition to these, use its manual or the board's markings and the diagram in §1.5 as well.
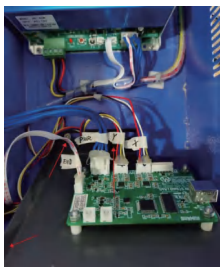
3.3 Replacing the Old Control Board

1.Remove the 3 bolts(Marked with A, B, C) which is holded on your engraver.
2.Remove the plate and remove the four bolts(Marked with a,b,c,d) at the corners of the old control board.
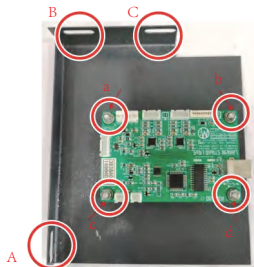
You can mount the new control board into place now (being careful to position its USB port beside your casing's access hole) or make all the necessary electrical connections first before bolting it into place.

3.4 Electrical Connections

Only install this board while your engraver and all components are turned off and disconnected from power. Always check that the polarities of your connections are correct, with a multimeter if needed.

3.4.1 Control Board Power

As shown below find the "PWR" terminal on the control board. Connect the "PWR" terminal block previously removed from your old board to this terminal.
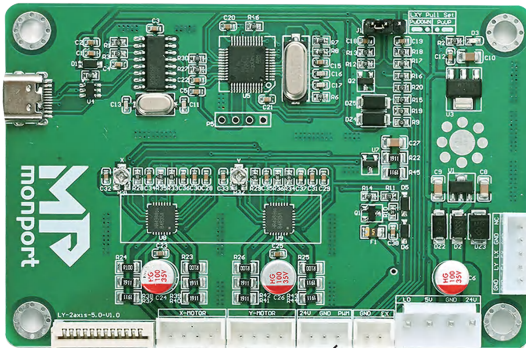

PWR
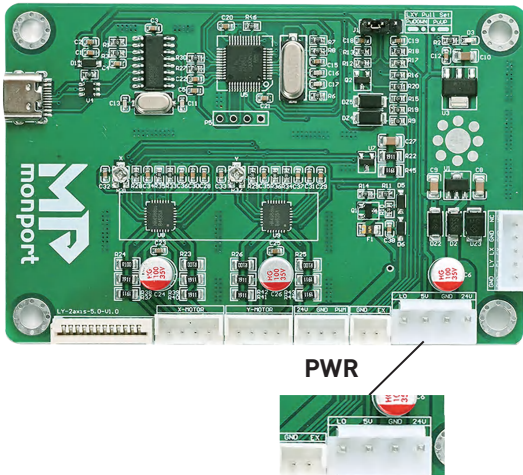
3.4.2 Laser Tube Connection

This control board does not directly connect to your laser tube.

3.4.3 Control Laser Connection

As shown below find the "Control Laser" terminal on the control board. Connect the "Control Laser" terminal block previously removed from your old board to this terminal.
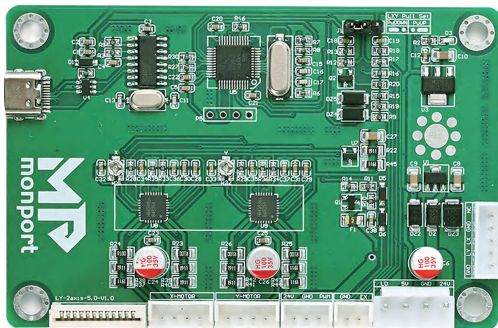
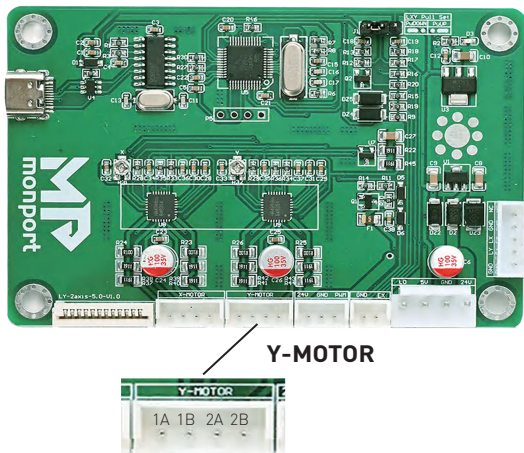**Control Laser**

3.4.4 X–MOTOR & Y-MOTOR Connection

As shown below find the "X-MOTOR" terminal on the control board. Connect the "X-MOTOR" terminal block previously removed from your old board to this terminal.

If there is no such terminal, please ignore it.
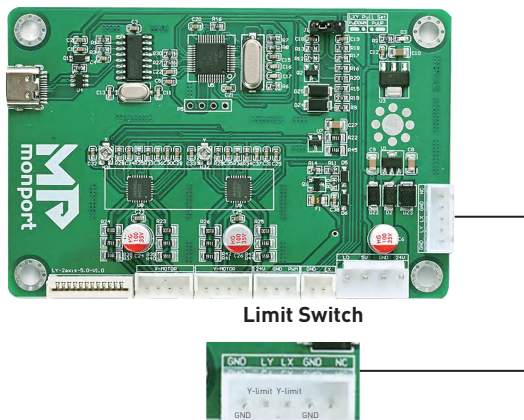

X-MOTOR

As shown below find the "Y-MOTOR" terminal on the control board. Connect the "Y-MOTOR" terminal block previously removed from your old board to this terminal. If there is no such terminal, please ignore it.
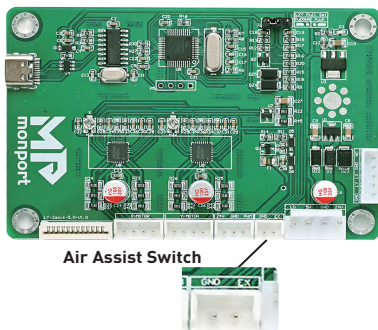

Y-MOTOR

3.4.5 Limit Switch Connection

As shown below find the "Limit Switch" terminal on the control board. Connect the "Limit Switch" terminal block previously removed from your old board to this terminal.

Limit Switch

3.4.6 Air Assist Switch Connection

As shown below find the "Air Assist Switch" terminal on the control board. Connect the "Air Assist Switch" terminal block previously removed from your old board to this terminal.

Air Assist Switch

3.4.7 Integrated Control Connection

As shown below find the "Integrated Control" terminal on the control board. Connect the "Integrated Control" terminal block previously removed from your old board to this terminal.

If there is no such terminal, please ignore it.

Integrated control
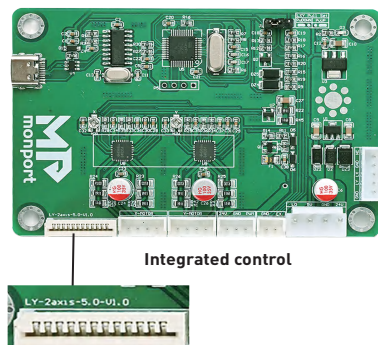
It does not need to be connected,if your original machine does not have some terminal listed above.

Please connect the terminals according to the actual situation.If you have any questions, please do not hesitate to contact us as soon as possible, and we will solve the problems you encounter as soon as possible.
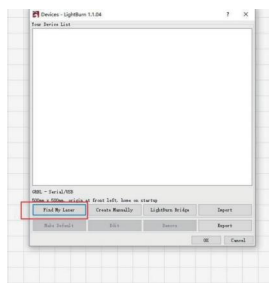
3.5 Software Configuration

Step 1: Check out whether the USB cable is connected to the PC.
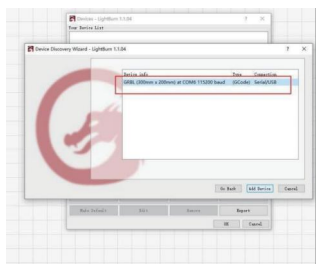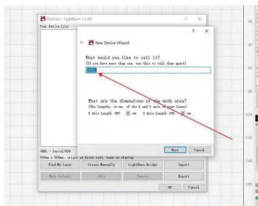**Step 2:** Open the Lightburn Software.
Step 3: Choose the device
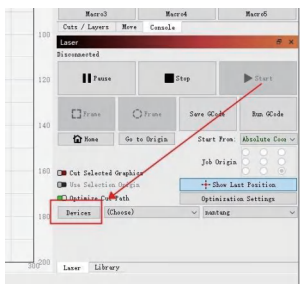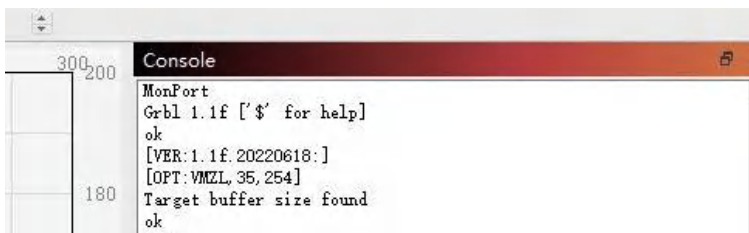
Step 4: Find my laser

Step 5: Add devices

Step 6: Name whatever you like.

Step 7: Enjoy your new journey

4.Maintenance

Always disconnect your engraver from its power source before any adjustment, cleaning, or other maintenance of these devices.

You can remove dust from these devices with a soft cloth. Do not use harsh chemicals or allow any electrical components or connections to become wet. If they accidentally become wet, immediately use your engraver's emergency stop button, disconnect your engraver from its power source, and leave it disconnected until all water has completely dried.

For maximum safety and best results, leave all other adjustment, maintenance, and repair to trained and skilled professionals. If this control system is ever damaged or malfunctions during use, immediately use your engraver's emergency stop button, disconnect your engraver from its power source, and leave it disconnected until all damage or malfunctioning equipment has been fully repaired or replaced.

5.Common Problem

FAQ 1: The software controls the movement direction to be opposite to the actual movement direction.

ANSWER1:
Option 1:Move the axis in the opposite direction, exchange its 1A and 1B.

Option 2:Modify the grb1 parameter \$3. If the x-axis motion is opposite, adjust \$3=0. If the Y-axis motion is opposite,adjust \$3=3.

FAQ 2: The hard limit cannot be used correctly.

ANSWER2:
Check that the limit connection wire is correct and confirm that the limit is a normally open switch or a normally closed switch.

If the normally open switch confirms that the jumper cap on the controller is in PuUP, modify \$5=0.
If the normally closed switch confirms that the jumper cap on the controller is in PuUP, modify \$5=1.

FAQ 3: Prompt ERROR: Travel exceeded.

ANSWER3:
Confirm the grbl parameter $20=1.

FAQ 4: How to view grbl parameters?

ANSWER4:
Option 1:Use Lightburn Software by default, edit - machine settings.
Option 2:Console Window Send $$.

Contact Info

Thank you for choosing this controller to upgrade your 40w machine! Welcome to join in the official facebook group or visit our Monport website at **www.monportlaser.com** for more information! If you need any after-sale support, please do not hesitate to contact customer service with your order number at help **support@monportlaser.com** or visit **https://app.helpdesk.com/tickets.**Our teams will respond within 12 hours to make things right. Thank you and we hope you will choose us again for all your laser needs.