

CNC-LS2320 Hardware Manual

(Standard Edition)

Version 1.0



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Involving CNC-LS2320system graphics software details, please refer to the laser graphics software manual. If the product involving upgrades and the content needs to change, prior notice will not be given, LeadCNC retains the final explanation rights of the data. For more information, please visit the company website.



Please pay attention to the safety when debugging the machine. In order to avoid accidental loss, it's a must for users to design effective safety device on the machine, error handling procedures in the software is more necessary.

Contents

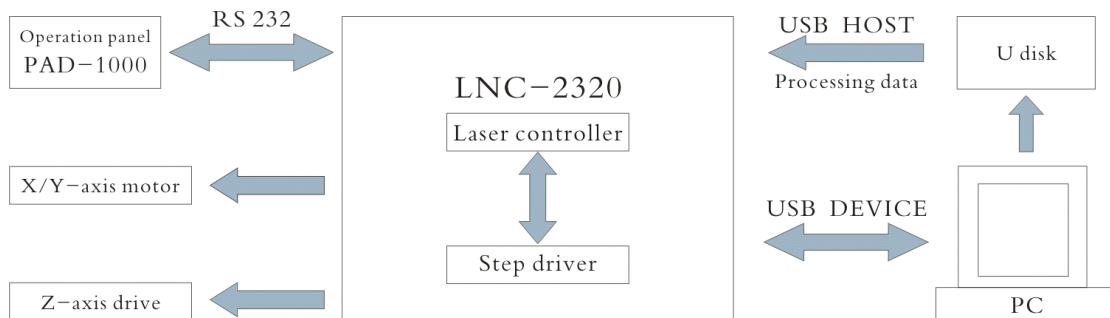
CNC-LS2320 Hardware Manual.....	1
(Standard Edition)	1
1 At a Glance.....	5
1.1 Product Description.....	5
1.2 Technical Indicators.....	6
1.3 Typical Applications.....	6
1.4 Order Model Description.....	6
2 Interface Specifications.....	7
2.1 Interface Definition of PAD-1000 Operation Panel.....	7
2.2 Control Panel Interface.....	8
2.2.1 Definition of Control Panel Interface.....	8
2.2.2 System Power Supply of Control Panel.....	11
2.3 Driver Board Interface.....	12
2.3.1 Definition of Driver Board Interface.....	12
3 Interface Circuit.....	14
3.1 PWM Pulse of the Laser Circuit.....	14
3.2 Interface Circuit of Original Switching Signal.....	15
3.3 Interface Circuit of Limit Switching Signal.....	16
3.4 Interface Circuit of General Input Switching Signal.....	17
3.5 Interface Circuit of General Output Switching Signal.....	18
4 Method of connecting Typical Peripheral with the Laser Controller.....	19
4.1 Connected to a Stepper Motor Driver.....	19
4.2 Connection of the Proximity Switch.....	20
4.3 Connection with the Photoelectric Switch.....	20
4.4 Connection with the Intermediate Relay.....	21
4.5 Problems and Solutions.....	22
4.6 Wiring Specification.....	22
5 PAD-1000 Operation Panel.....	23
5.1 Boot Screen.....	23
5.2 Reset.....	23
5.3 Standby Interface.....	24
5.3.1 Z-axis Operation.....	25
5.3.2 Run Frame.....	25
5.3.3 Processing Operation.....	25
5.4 Main Menu.....	26
5.4.1 Cutting Frame.....	27
5.4.2 File Selection.....	27
5.4.3 Fire and Jog.....	27
5.4.4 Language Selection.....	28
5.4.5 Alarm Set.....	29

5.4.6	Backlight Settings.....	29
5.4.7	Version.....	29
5.5	U Disk.....	29
5.6	Error Alarm Interface.....	30
5.6.1	Reset ERR.....	31
5.6.2	Software Limit.....	31
5.6.3	Hardware Limit.....	31
5.6.4	Not Enough Memory.....	32
5.6.5	Maturity.....	32
5.6.6	About to Expire.....	32
5.6.7	Communication ERR.....	32
5.6.8	Water ERR.....	33
5.6.9	Cover ERR.....	33
5.6.10	File ERR.....	33
5.6.11	Download ERR.....	34
5.6.12	Continue Process.....	34
5.7	Update.....	34
5.7.1	Update Finish.....	35
Appendix1 Reference Chart of CNC-LS2320 Installation Size.....		36
Appendix2 Wiring Diagram of CNC-LS2320 Control Panel.....		38
Appendix3 Wiring Diagram of CNC-LS2320 Driver Board.....		39

1 At a Glance

1.1 Product Description

CNC-LS2320 is a new generation of laser control system developed by LeadCNC, Which can support three-axis motion control, embedded dual stepper drive. X/Y axis needn't connect an external drive. The pulse direction signal of Z-axis leads to output port, and can connect an external drive. X/Y/Z-axis has functions of resetting and the maximum and the minimum limit coordinate. CNC-LS2320 has a variety interface, including the X/Y/Z-axis origin, positive and negative limit; USB HOST, USB DEVICE master-slave device port; RS232 asynchronous serial port; four general-purpose input ports and four general-purpose output ports; Two-channel laser pulse, DA and enable output. CNC-LS2320 comes with a LCD control panel, the PAD-1000. CNC-LS2320 control system components as shown below:



Features

- Three-axis motion control
- Z axis pulse output types is the direction pulse, and X/Y axis output can directly drive a stepper motor
- Four general-purpose input ports, four general-purpose output ports, two-channel laser PWM pulse, and enable output
- Maximum output current is up to 300mA and output can directly drive solenoid valve
- 1 USB interface
- 1 U-disk interface
- 1 channel RS232 interface
- 1 128X64 dot matrix LCD PAD-1000 operation panel

1.2 Technical Indicators

Motor control

Control motor number:	3
Motor control commands:	Pulse
Frequency range:	1Hz~1.0 MHz
Frequency accuracy:	±0.1 Hz
The number of pulses:	-2,147,483,647~+2,147,483,648 (32 位)

I/O Signals

General-purpose output ports:	4
General-purpose input ports:	4
General ,Dedicated digital input:	With RC low-pass filter
General ,Dedicated digital output:	Maximum output current of 500mA

PWM Signal:

Two-channel PWM pulse width modulation interface (Take Up output)

Work environment:

Operating temperature:	0℃~50℃
Storage temperature:	-20℃~80℃
Humidity:	5~85%, non-condensing

Power supply: Working voltage is DC 24V, power dissipation of the laser controller is 10W,
According to the actual size of the load (solenoid valve, cylinder, etc.), appropriate DC power is to be selected

1.3 Typical Applications

- ▲Laser engraving machine small equipment
- ▲Other stepping motors, servo motor control, etc
- ▲Other equipment

1.4 Order Model Description

Products Code	Description of Goods	Remarks
	LNC-2320 Laser Controller V1.0	Standard accessories
	PAD-1000 Operation Panel V1.0	Standard accessories
	CNC-LS2320CD-ROM	Electronic files
	USB Cable (Length of 3m)	Standard accessories

	RS232 Cable (9Pin, length of 1.5m)	Standard accessories
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2 Interface Specifications

2.1 Interface Definition of PAD-1000 Operation Panel

Interface of the PAD-1000 operation panel as shown in figure 2-1. Compared to the physical circuit board and identify every part of the interface.



Figure 2-1 Interface Distribution of CNC-LS2320 Laser PAD-1000 Operation Panel

RS232 INTERFACE

Pins	Pin Name	Explanation
1	TXD	Date sending
2	RXD	Date receiving
3	GND	Serial cable shielding access
4	GND	Internal power ground
5	DC5V	Internal power supply 5V (DC5V)

RV1 INSTRUCTION

Pins	Pin Name	Explanation
	RV1	change the luminance of LCD screen backlight (counterclockwise to brighten)

Note:

1. The RS232 serial line which connect the laser control panel and laser operation panel must use a custom cable.

2. The working voltage that supplied by the RS232 cable is DC5(GND), which belongs to the same group of inner system power

2.2 Control Panel Interface

The distribution of the motor drive signal interface, general-purpose I/O interface, dedicated signal interface, RS232 interface, USB interface, U-disk interface, and power interface is shown in figure 2-1

2.2.1 Definition of Control Panel Interface

Interface of the laser control panel as shown in figure 2-2. Compared to the physical circuit board and identify every part of the interface.

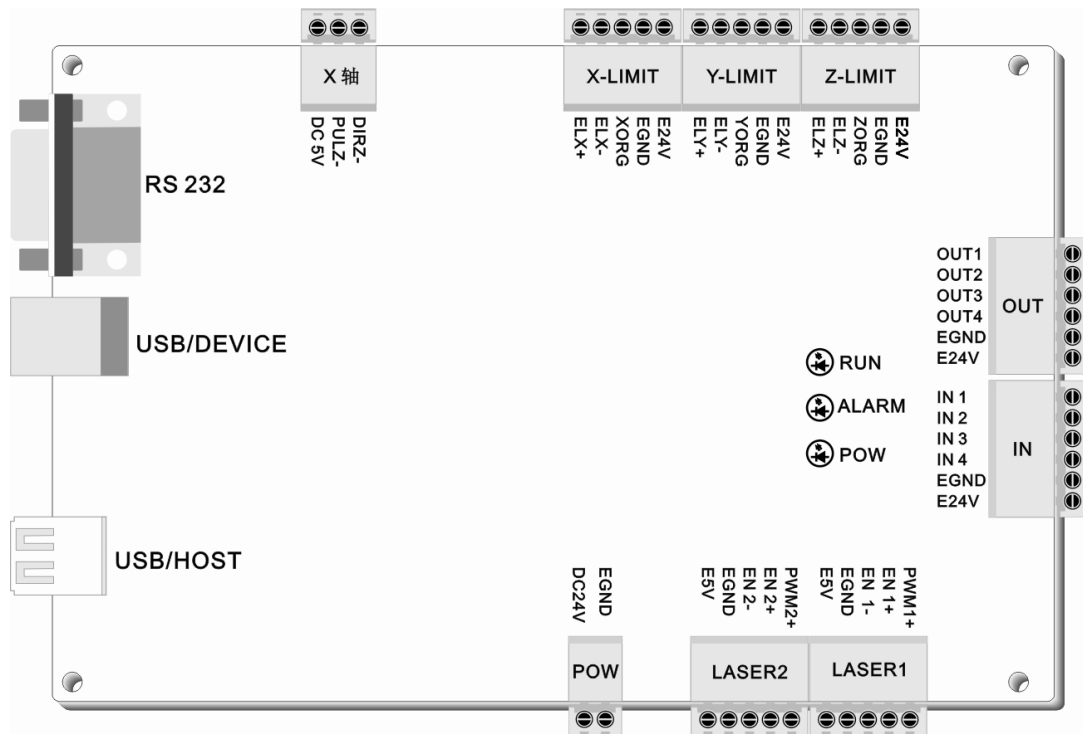


Figure 2-2 Interface Distribution of CNC-LS2320 Laser Control Panel

Note: 1. External power supply: Working voltage DC 24V, the controller of the laser power of 10W, According to the actual size of the load (solenoid valve, cylinder, etc.), select the appropriate DC power.

2. Please read the definition of the interface and the interface before using

POW Interface of External Power Input

Pins	Pin Name	Explanation
1	DC24V	External power supply DC24V
2	GND	External power ground

X-LIMIT X-axis Origin/Limit Interface

Pins	Pin Name	Explanation
1	ELX+	X-axis limit signal+
2	ELX-	X-axis limit signal-
3	ORGX	X-axis origin signal
4	EGND	External power ground
5	E24V	External power supply 24V

Y-LIMIT Y-axis Origin/Limit Interface

Pins	Pin Name	Explanation
1	ELY+	Y-axis limit signal+
2	ELY-	Y-axis limit signal-
3	ORGY	Y-axis origin signal
4	EGND	External power ground
5	E24V	External power supply 24V

Z-LIMIT Z-axis Origin/Limit Interface

Pins	Pin Name	Explanation
1	ELZ+	Z-axis limit signal+
2	ELZ-	Z-axis limit signal-
3	ORGZ	Z-axis origin signal
4	EGND	External power ground
5	E24V	External power supply 24V

IN General-purpose Input Interface

Pins	Pin Name	Explanation
1	IN1	Footswitch
2	IN2	Cover Err
3	IN3	Water Err
4	IN4	Reservation
5	EGND	External power ground
6	E24V	External power supply 24V

OUT General-purpose Output Interface

Pins	Pin Name	Explanation
1	OUT1	Blowing
2	OUT2	Processing state
3	OUT3	Reservation
4	OUT4	Reservation
5	EGND	External power group

6	E24V	External power supply 24V
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Interface of Z-AXIS Drive Signal

Pins	Pin Name	Explanation
1	DC5V	External power supply 5V
2	PULZ-	Z-axis pulse signal
3	DIRZ-	Z-axis direction signal

Interface of LASER1 Power/Enable Signal

Pins	Pin Name	Explanation
1	E5V	Laser power supply 5V
2	EGND	Laser power ground
3	EN1-	Laser1 high on
4	EN1+	Laser1 low on
5	PWM1+	Laser power 1

Interface of LASER2 Power/Enable Signal

Pins	Pin Name	Explanation
1	E5V	Laser power supply 5V
2	EGND	Laser power ground
3	EN1-	Laser1 high on
4	EN1+	Laser1 low on
5	PWM1+	Laser power 1

RS232 Interface

Pins	Pin Name	Explanation
2	UART1TX	Date sending
3	UART1RX	Date receiving
5	GND	Internal power ground
9	DC5V	Internal power supply 5V (DC5V)

Note: RS232 socket for the female

USB/DEVICE Interface

Pins	Pin Name	Explanation
1	USB_5V	+5V power supply of PC output
2	USB_DM	Differential data
3	USB_DP	Differential data
4	GND	Internal power ground

Note: USB/DEVICE socket for the square

USB/HOST Interface

Pins	Pin Name	Explanation
1	+5V	+5V Internal power (power supply of U disk)

2	D-	Differential data D-
3	D+	Differential data D+
4	GND	Internal power ground

2.2.2 System Power Supply of Control Panel

The relationship of CNC-LS2320 laser control panel system power as shown in figure 2-3

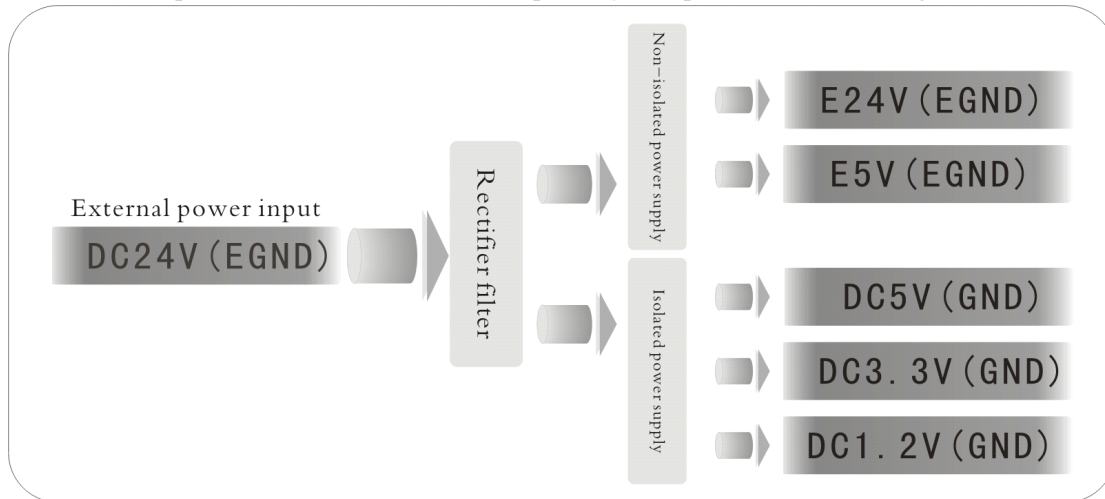


Figure 2-3 Power Diagram of Laser Control Panel System

As can be seen from the figure, CNC-LS2320 laser controller uses an external DC24 power supply (EGND) , Which is distributed to two routes after dealing with some of the interference signal source through the rectifier filter

One way outputs a DC 24V power directly, the other way outputs E5V (EGND) through the DC-DC module, it is mainly used for the isolation of the two laser power control signal and drive.

These two sets of power supply, mainly used in isolation and other circuit.

In addition all the way, after the isolation of DC-DC module power output of a group of DC5V power, a group of DC3.3V (GND) power supply, and a group of DC1.2V (GND) power supply.

These three group of DC power, mainly for the internal circuit of the core control system.

CNC-LS2320 core control system completely adopt the isolated power, which can effectively prevent a variety of accidents happening from the external connection device interference

Note:



1. When connected to peripheral devices, do not put the EGND and GND together. Otherwise, the external interference signal will affect the laser controller.
2. Screen printing DC5V cover on the CNC-LS2320 laser controller is the internal power supply, Must not be used in conjunction with an external power supply to GND.
3. The voltage of External power supply is DC24V. The static power of the CNC-LS2320 laser is lower than 10W. You can choose the DC supply based on the total load on the actual IO ports to match the machine.

2.3 Driver Board Interface

The distribution of the motor driver interface, stepper motor power connector, interface of RS232 serial debug, interface of external power input, and DIP switch as shown 2-3.

2.3.1 Definition of Driver Board Interface

Interface of laser driver board as shown in figure 2-4. Compared to the physical circuit board and identify every part of the interface.

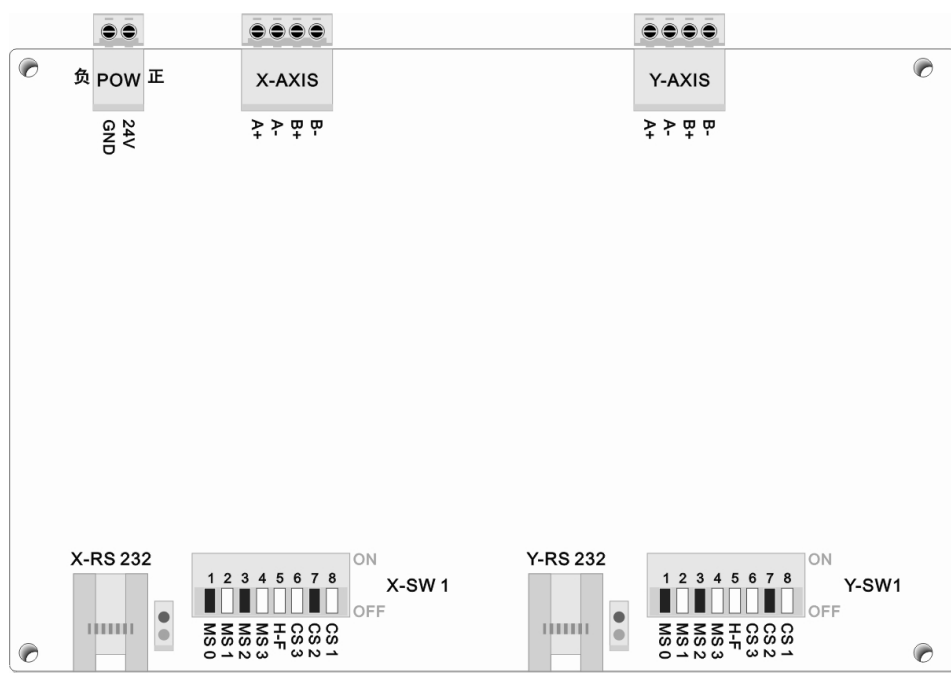


Figure 2-4 Interface of CNC-LS2320 Laser Driver Board

POW Interface of External Power Input

Pins	Pin Name	Explanation
1	24V	24V power of the drive system
2	GND	Internal power ground of the drive system

X-AXIS Stepper Motor Power Connector

Pins	Pin Name	Explanation
1	A+	Motor A-phase coil+
2	A-	Motor A-phase coil-
3	B+	Motor B-phase coil+
4	B-	Motor B-phase coil-

Note: The definition of the power supply interface of X-AXIS is the same

X-RS 232 Serial Debug Interface

Pins	Pin Name	Explanation
1, 6		
2	VCC5	Internal power supply 5V
3	TXD	Date sending
4	RXD	Date receiving
5	GND	Internal power ground

Note: The definition of Y-RS 232 interface is consistent with the X-RS 232 interface's, mainly used for debugging.

LED Indicator Descriptions

Pins	Pin Name	Explanation
1	RL1	Alarm indicator, Red
2	GL1	Run indicator, Green

Note: XY LED indicators have the same meaning.

X-SW1 DIP Switch

Pins	Pin Name	Explanation
1, 3, 7	NO	Factory state is set to ON
2,4,5,6,8	NO	Factory state is set to OFF

Note:

1. The definition of Y-SWI interface is consistent with Y-SW1's, mainly used for configuring the parameter of stepper drive
2. DIP switch is used to configure the stepper motor parameters. In order to avoid stepper drive circuit being damaged, the factory state can't be changed privately. For more information, please refer to 《Appendix3 CNC-LS2320 Driver Board Wiring Diagram》.

Note:



1. When connected with peripheral devices, EGND and GND separate ground; otherwise, external interference will affect the laser controller.
2. DC24V(GND) input power supply of Laser drive board and DC24V(EGND) input of control panel should be used separately. In order to guarantee the two systems work properly, you must provide two completely independent power supply of DC24V. The relationship between them is shown in Figure 2-3.
3. External power supply input voltage range from DC18V to DC36V, typical voltage is DC24V. The static power of the laser controller depends on the total load on the stepper motor, the appropriate DC power supply should be selected.

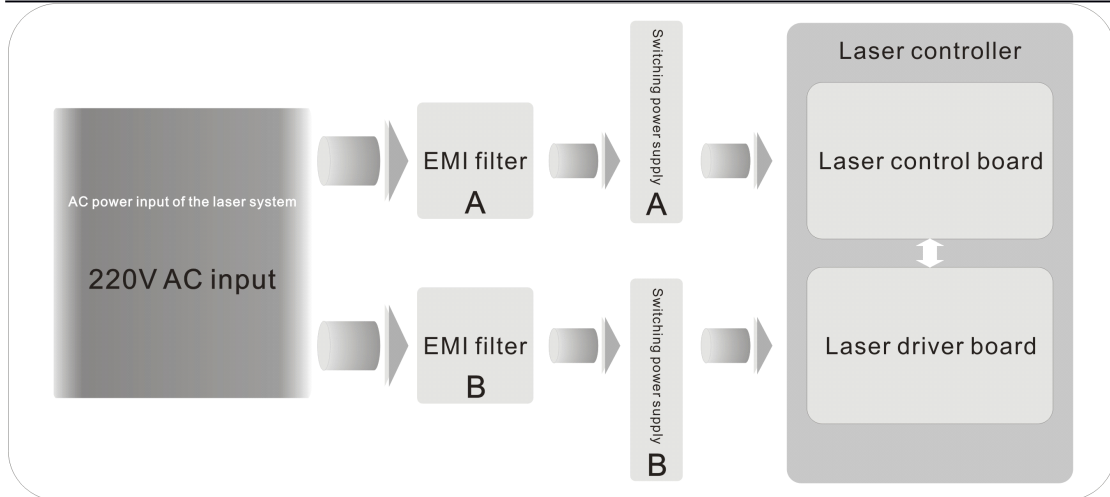


Figure 2-3 the Relationship between Laser Control Panel and Driver board power supply

3 Interface Circuit

3.1 PWM Pulse of the Laser Circuit

The CNC-LS2320 laser controller can control 2-way laser power, laser power of each path controlled by two signals: the command pulse signal PWM and the enable signal EN. According to actual needs of customers, the two types of output signals can be connected into a signal pulse output. Associated output terminal of PWM pulse and EN Enable signal as shown in Table3-1.

Table 3-1 Output Terminal of PWM Pulse and EN Enable Signal

Name	Explanation
E5V	Laser power supply 5V
EGND	Laser power ground
EN1-	Laser1 high on
EN1+	Laser1 low on
PWM1+	Laser power 1
E5V	Laser power supply 5V
EGND	Laser power ground
EN2-	Laser2 high on
EN2+	Laser2 low on
PWM2+	Laser power 2

As shown in figure 3-1, the PWM+ pulse of The CNC-LS2320 laser and interface circuit of EN+ enable signal adopt single-pulse drive.

As shown in figure 3-2, the PWM+ pulse of The CNC-LS2320 laser and interface circuit of EN-

enable signal adopt single-pulse drive.

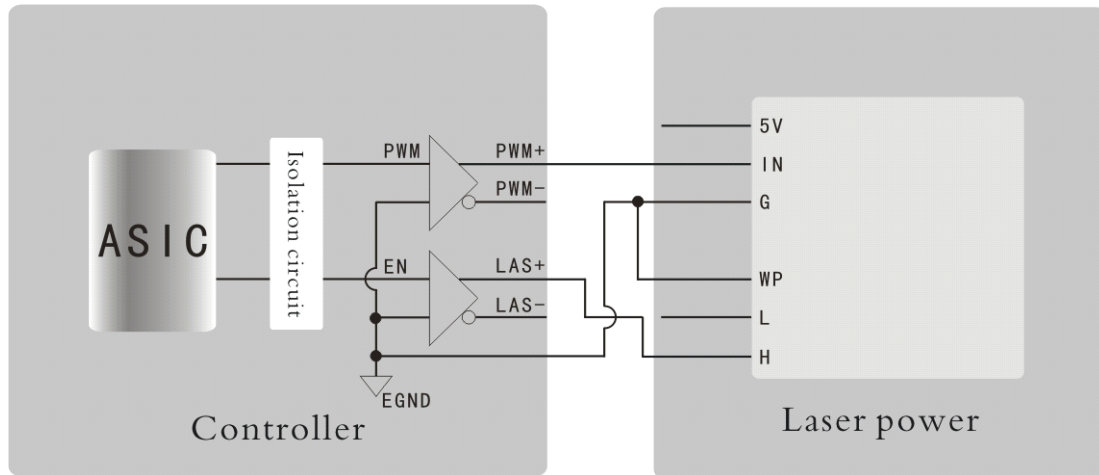


Figure 3-1 Schematic of PWM+ and EN+ Output Mode

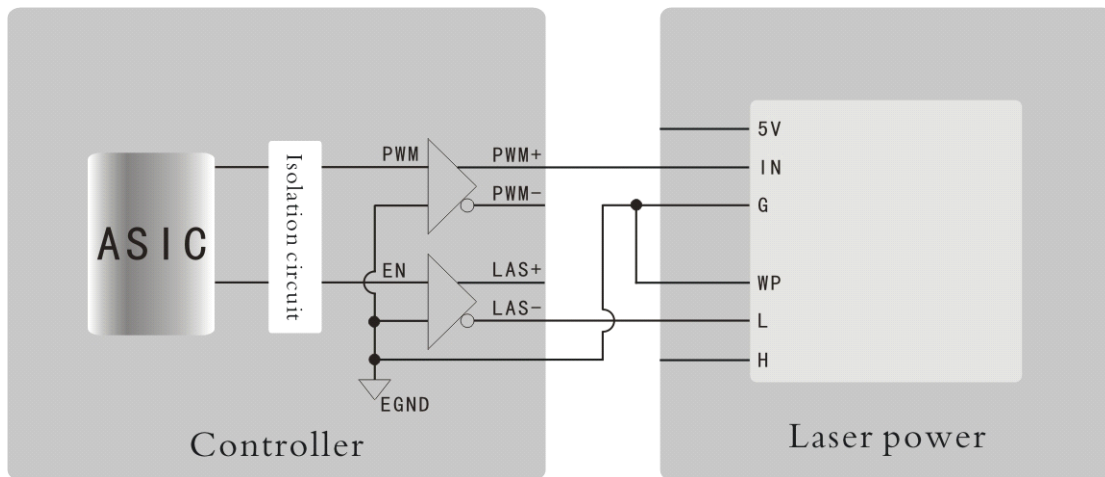


Figure 3-2 Schematic of PWM+ and EN- Output Mode

3.2 Interface Circuit of Original Switching Signal

Original switch is used to detect the absolute origin of the mechanical motion platform. Input circuit of Original Switching Signal as shown in figure 3-3 below. The controller contains coupler and filter, which can isolate interference signal and improve system reliability.

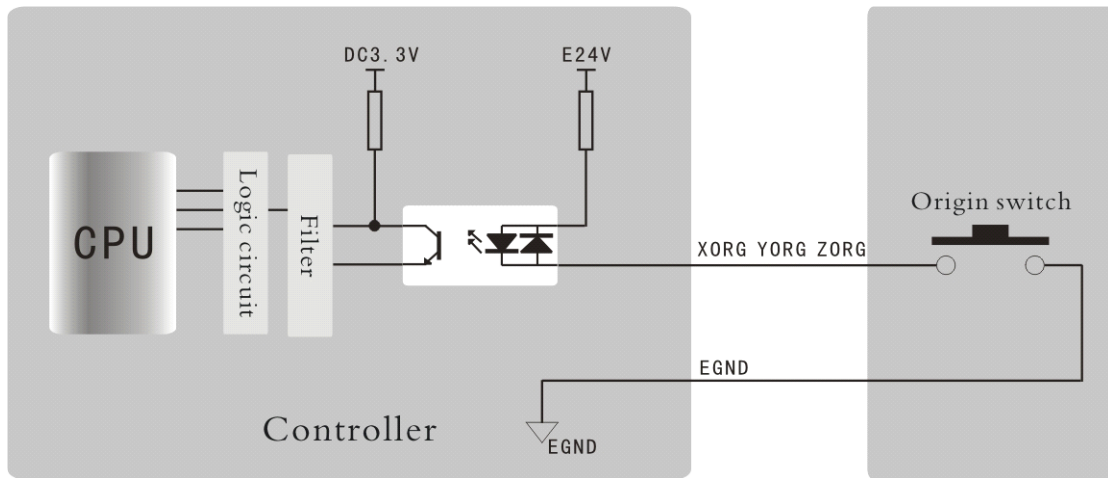


Figure 3-3 Interface circuit of Original Signal

Input terminals of original Switching Signal as shown in table 3-2.

Table 3-2 the Origin Signal Input Terminal Table

Name	Explanation
ORGX	X-axis origin signal input
ORGY	Y-axis origin signal input
ORGZ	Z-axis origin signal input

3.3 Interface Circuit of Limit Switching Signal

Each axis of the CNC-LS2320 laser controller has two limit signal inputs EL+ and EL-. The EL+ is the positive limit signal, and the EL- is the reverse limit signal. Circuit diagram of limit Switching Signal input in figure 3-4.

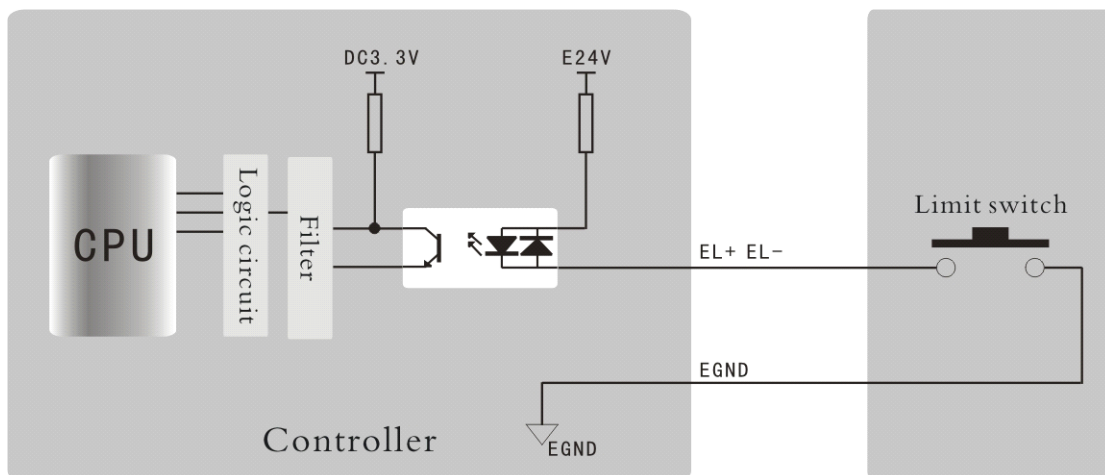


Figure 3-4 Input Circuit Diagram of Limit Switching Signal

The EL± signal level can be set by software: If the switch is normally open switch, the EL± signal is active when it is set low. When limit switches contacted by an external mechanical parts, the switch closed, and the EL± effective, movement towards the original direction of the mechanical parts will be prohibited. If the switch is normally closed switch, the EL± signal is active when it is set high. When limit switches contacted by an external mechanical parts, the switch opened, and the EL± effective, movement towards the original direction of the mechanical parts will be prohibited. Input terminals of the limit Switching Signal as shown in Table 3-3.

Table 3-3 Terminal Table of Limit Switching Signal Input

Name	Explanation
ELX+	X-axis forward limit signal input
ELX-	X-axis reverse limit signal input
ELY+	Y-axis forward limit signal input
ELY-	Y-axis reverse limit signal input
ELZ+	Z-axis forward limit signal input
ELZ-	Z-axis reverse limit signal input

3.4 Interface Circuit of General Input Switching Signal

The CNC-LS2320 laser controller provides the user with four general-purpose input ports, which can be used for switches, sensors or other signal input.

Port schematic of general-purpose input as shown in Figure 3-5

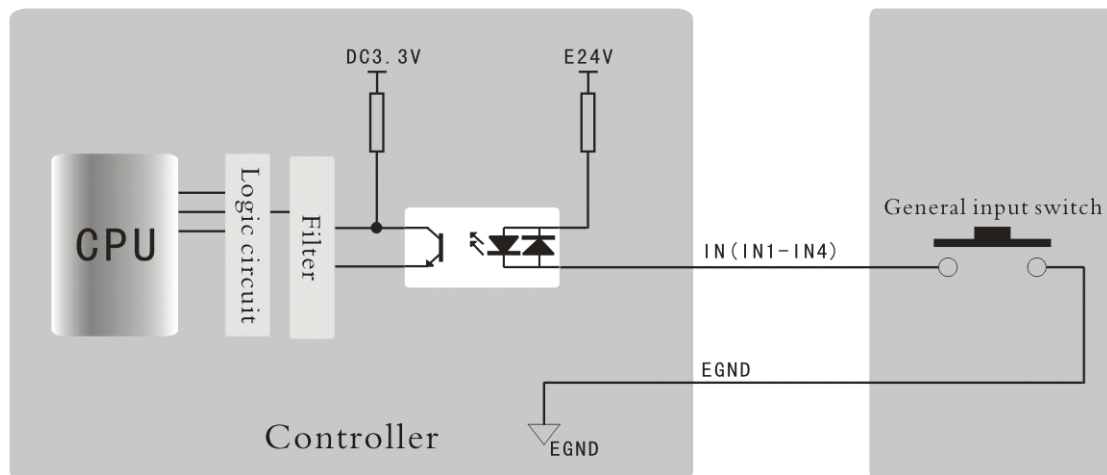


Figure 3-5 Interface Circuit of General-Purpose Input Switching Signal

Terminal of general-purpose input switching signal as shown in Table 3-4

Table 3-4 Terminal Table of General-Purpose Input Switching Signal

Name	Explanation
------	-------------

IN1	Footswitch
IN2	Cover Err
IN3	Water Err
IN4	Reservation
EGND	External power ground
E24V	External power supply 24V

3.5 Interface Circuit of General Output Switching Signal

The CNC-LS2320 laser controller provides the user with four general-purpose output ports. The four general-purpose ports with integrated power driver IC output. OUT1~OUT4, output current up to 500mA, can directly driver small relays, solenoid valves and other peripherals; The circuit diagram as shown in Figure 3-6, Table 3-5 shows the general-purpose output port terminal.

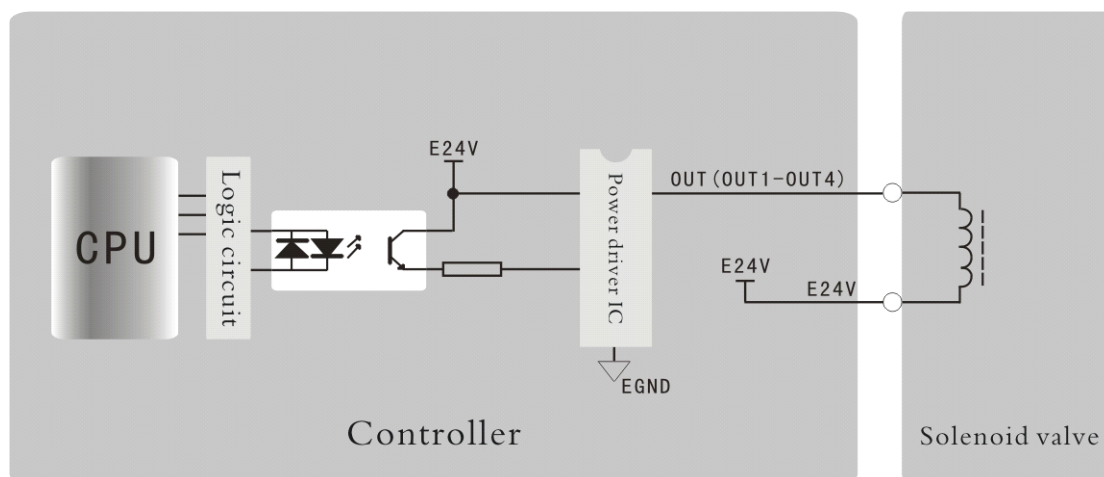


Figure 3-6 Interface Circuit of General-Purpose Output Signal

Table 3-5 Terminal Table of General-Purpose Output Ports

Name	Explanation
OUT1	Blowing
OUT2	Processing state
OUT3	Reservation
OUT4	Reservation
EGND	External power groupn
E24V	External power supply 24V

Methods of connecting general-purpose output ports with a small relay as shown follows:
Relay as inductive load, which must be parallel with a free-wheeling diode to protect the output drive components. Relay wiring diagram as shown in Figure 3-7.

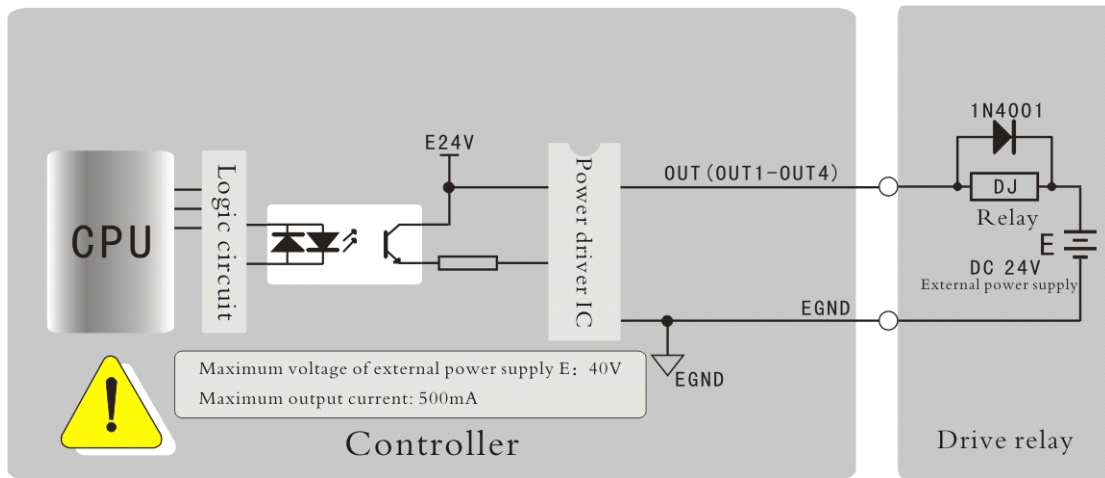


Figure 3-7 Small Relay Connected to Output Port

Note: Don't connect the external power supply with the general-purpose digital output port directly when output port is used. Otherwise the power driver IC will be damaged.

4 Method of connecting Typical Peripheral with the Laser Controller

4.1 Connected to a Stepper Motor Driver

Outside of the CNC-LS2320 laser controller access to Z-axis stepper drive, each axis consists of two motor control signals: command pulse signal PUL and direction signal DIR. The two output signals connect the stepper drivers in the mode of single-pulse output, stepper pulse/direction of related signal output terminals as shown in Table 4-1.

Table 4-1 Output Terminal Table of the Z-axis Stepper Pulse/Direction Signal

Name	Explanation
DC5V	External 5V
PULZ-	Z-axis pulse signal-
DIRZ-	Z-axis direction signal-

Motor drive only can use single-end input signal, which is connected with negative of pulse command signal, as shown in figure 3-9. Drive power is provided by external DC 5V. The PUL and DIR current can't exceed 20mA, and operating current of the motor drive opto-coupler range 8-12mA, so you should select the appropriate current-limiting resistance. Single-ended output circuit of Z-axis external stepper motor drive shown in Figure 4-1

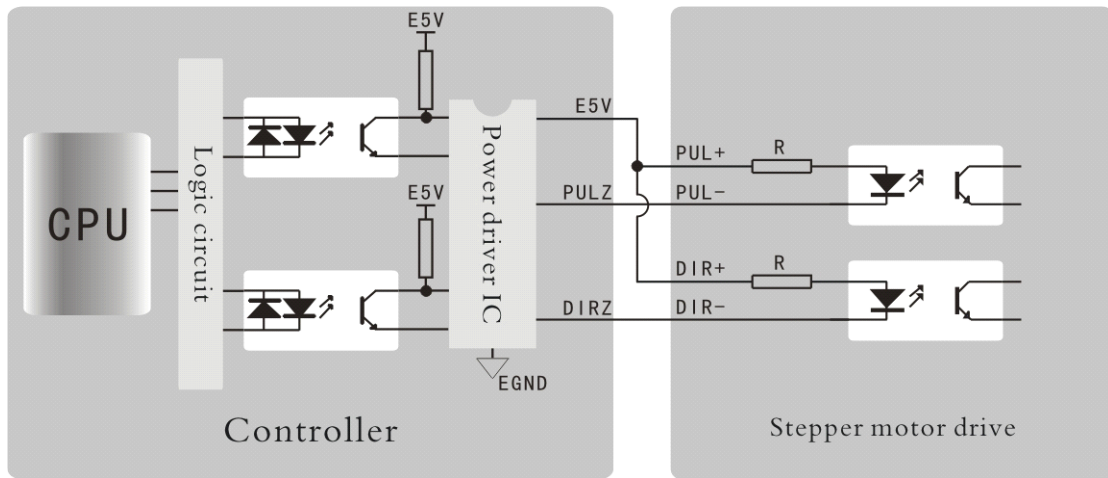


Figure 4-1 Single-ended Output circuit

Note: Drive signal of Z axis is provided by inner system of controller.

4.2 Connection of the Proximity Switch

Circuit of the CNC-LS2320 laser controller connecting with proximity switch(OMRON TL-Q5MC2) as shown in Figure 4-2. (proximity switch TL-Q5MC2 for DC 3-wire, NPN type, supply voltage of DC12-24V, open-collector output)

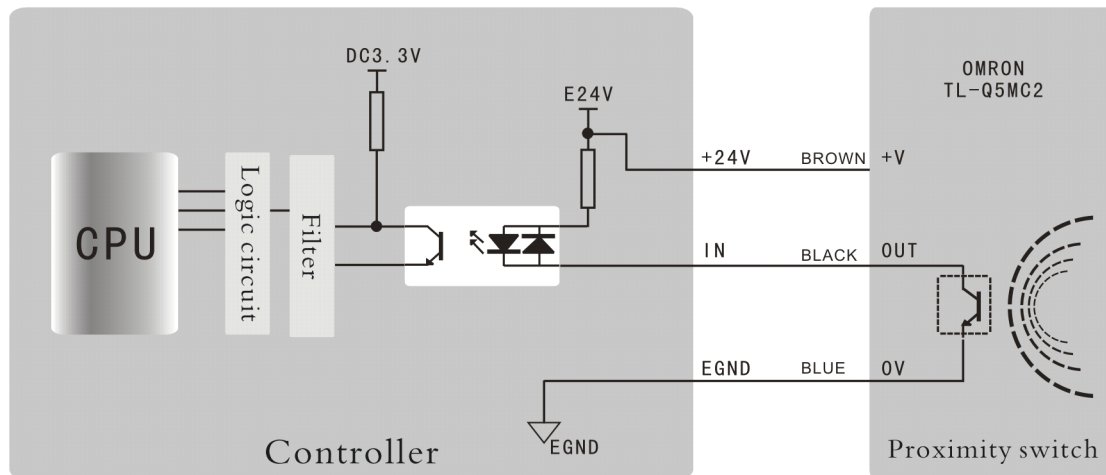


Figure 4-2 Wiring Diagram of CNC-LS2320 and Proximity Switch

4.3 Connection with the Photoelectric Switch

Circuit of the CNC-LS2320 laser controller connecting with photoelectric switch(RG150-8) circuit as shown in Figure 4-5. (RG150-8 light-emitting diode maximum current of 50mA, NPN type,

open-collector output)

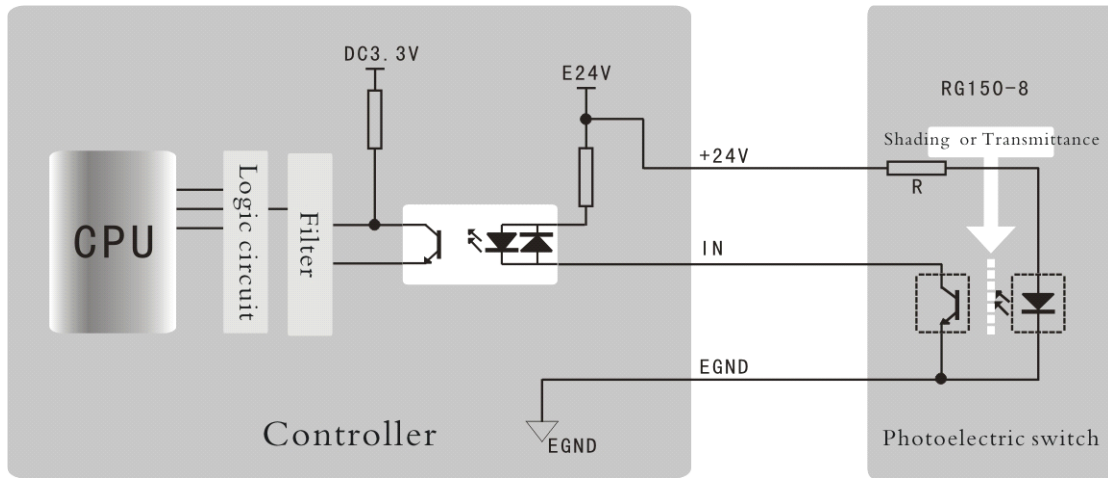


Figure 4-5 Wiring Diagram of CNC-LS2320 and Photoelectric Switch

4.4 Connection with the Intermediate Relay

Circuit of the CNC-LS2320 laser controller connecting with intermediate relay (OMRON LY1J 24VDC) as shown in Figure 4-6

Relay as inductive load, the coil must be parallel with a current-limiting diode to protect CNC-LS2320 output drive components from breaking down by the coil induced electromotive force at the moment of turning off relay. (OMRON LY1J intermediate relay coil voltage of 24VDC, maximum switching voltage of 250VAC or 125VDC, maximum switching current of 15A)

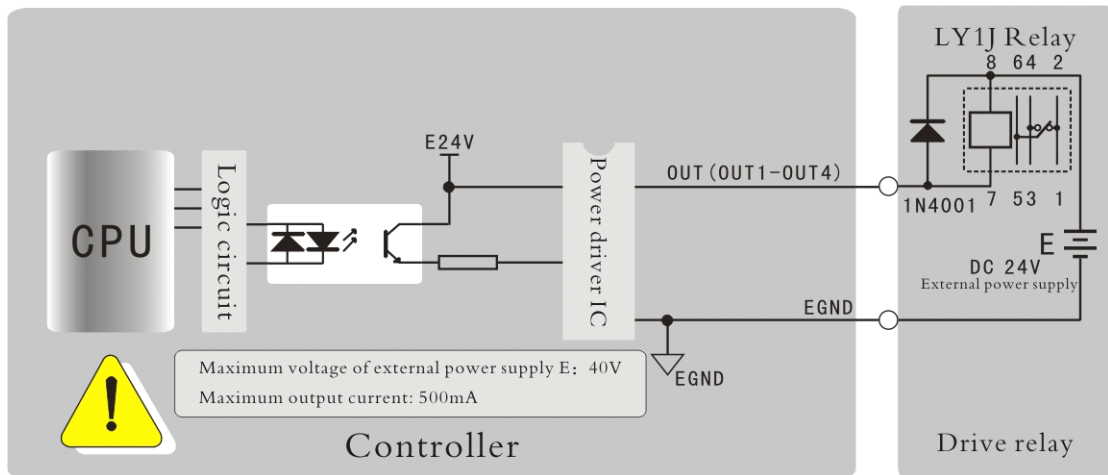


Figure 4-6 Wiring Diagram of CNC-LS2320 and intermediate relay

4.5 Problems and Solutions

Problem	Recommendations to solve the problem
when a pulse coming, the motor doesn't move after laser controller and drive motor connected	Make sure the way of sending pulses and the way of input pulse of drive is match; Observe pulse count is normal or not by testing software
The laser controller is working properly and sending pulses, but the motor doesn't rotate	Check drive and motor is connected correctly by testing software; Make sure the drive is working properly, no alarm
The motor can rotate, but it is not working properly.	Check the laser controller and drive is properly grounded, ensure that anti-interference is good; The current-limiting resistance is too large of the Photoelectric isolation circuit and working current is too small in the pulse and direction signal output.
The motor is controlled normally, but it appears oscillation or overshoot	Drive parameters are set incorrectly and check the drive parameters settings; ACC, DEC and velocity set unreasonable in the application software
The motor is controlled normally, but the origin location is not accurate when it returns	Check the shield wire is grounded; Origin signal switch is working properly; The origin signal is disturbed.
The limit signal doesn't work	Limit sensor is not working properly; Limit sensor signal is disturbed.

Note: The list is not an exhaustive list of all problems. Please call LEADCNC if you have any other questions.

4.6 Wiring Specification



In order to prevent interference and ensure the machine work safely, user wiring must be carried out in accordance with the following specification.

1. Power lines, electrical lines and signal lines should be separated, keeping a certain distance
2. The Chassis and machine of laser controller should be well grounded.

5 PAD-1000 Operation Panel

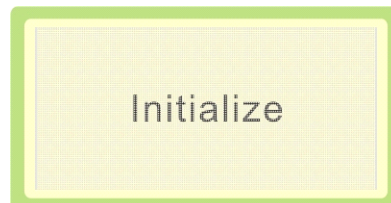
The PAD-1000 operation panel schematic as shown in Figure 5-1



Figure 5-1 PAD-1000 Operation Panel of the CNC-LS2320 Laser

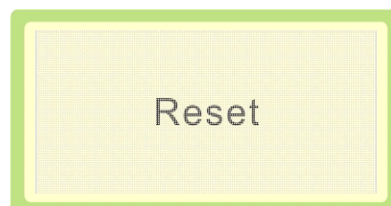
5.1 Boot Screen

When the system is powered on, the PAD-1000 operation panel displays as follows:



5.2 Reset

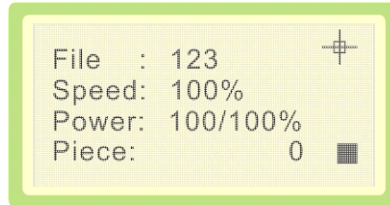
If the system is set boot reset, X/Y-axis return to origin at the same time when charged in or the “reset” key is pressed. As shown below



After X/Y-axis has reached the Original Switch position or press ”stop” key, then the system returns to the main interface.

5.3 Standby Interface

Normal communication with the controller, enter the main interface to set parameters, as shown below



The upper right corner of the icon is defined as follows:

⊕ : Indicates that the workpiece coordinate has been set, press “location” again, and icon disappears immediately.

■ : Indicates that use of the workpiece coordinate on the PC, showing only one between ⊕ and ■ at the same time

Black: Indicates that the current location of the laser head as the origin

File: The name of the current processing file

Velocity: Percentage of the speed in the processing file

Power: Percentage of processing power in the processing file, the first corresponds to the low-speed power; and the second corresponds to the high-speed power.

Piece: The number of duplicate processing of the current file

When the screen appears a cursor

Press the “↑” and “↓” to move the cursor.

Set the values of processing speed, low-speed power, high-speed power, and processing quantity by “↑” and “↓”, step value is 1;

Press the “start/pause” key to start the current file processing;

Note:

The values of the processing speed, the minimum laser power, the maximum laser power, and the processing quantity are not effective until the “ok” is pressed.

Processing speed, processing power(including low-speed power and high-speed power) and processing quantity can be save in the case of power cutting after the ”ok” key is pressed.

Press the “ESC” key and the cursor disappears.

In this state

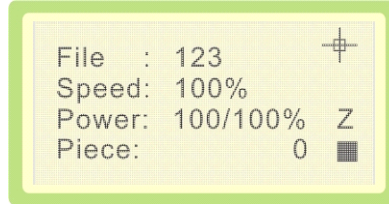
The key of “↑”, “↓”, “→” and “←” correspond to the laser head to move up, down, left, right.

Long press the ”Fire” key and then press “↑”, “↓”, “→”, or “←”, the state of light transforms into Jog, used to draw lines.

Press the “Fire” and set the light parameters.

5.3.1 Z-axis Operation

Press the “Z” key, and then the LCD displays Z-axis.



Z-axis Jog and reset operation can be performed in the state.

Press the “↑” or “↓”, then Z-axis inch.

Press the “reset”, then the Z-axis back to origin

The display as follows when the Z-axis resets

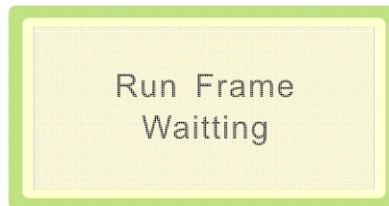


When the “stop” key is pressed or the Z-axis has reached the Original Switch position, the Z-axis stops at the origin position and returns to operation state.

Press again the “Z” key, the display switches back to the standby interface.

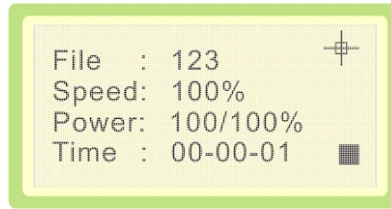
5.3.2 Run Frame

Press the “test”, and then enter run frame interface as shown below



5.3.3 Processing Operation

Press the “start/pause” to start the current file processing and into the processing interface in the standby mode.



■ 、 ■■ 、 ▲ respectively indicates the state of stop, pause, and run

The meanings of the parameter are as follows:

File: the name of the currently processing file.

Velocity: Percentage of the speed in the processing file

Power: Percentage of processing power in the processing file, the first corresponds to the low-speed power; and the second corresponds to the high-speed power.

Time: completion of the processing time.

In the process

The key of “start/pause”, ”stop”, ”↑”, ”↓”, ”→”, ”←”, and ”ESC” are valid.

Press the ”↑”, or ”↓” to change the processing speed, step value is 1; the range of 0~100.

Press the ”→” or ”←” to change the high-speed power, step value is 1; the range of 0~100.

If the number of keystrokes is odd, press the ”start/pause” to enter pause interface.

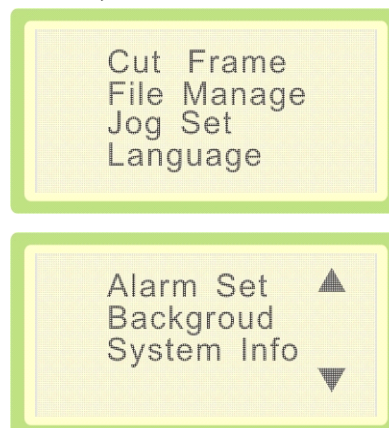
Press the “ESC”, and the controller temporarily displays standby screen; interface changes when the key is released. Excluding time in a paused state

Press the “stop”, then stop processing and back to the standby screen.

If completion of the automatic processing, and displaying “■”, press the “ESC” to return to the standby.

5.4 Main Menu

Press the “menu” key to enter main menu, as shown blow





Backlight settings

Often bright: bright key

Double-click the “menu” key can circularly switch to a different menu.

When the cursor appears on the screen

Press the “” or “” to move the cursor

When the “ok” is pressed, choice of projects become effective.

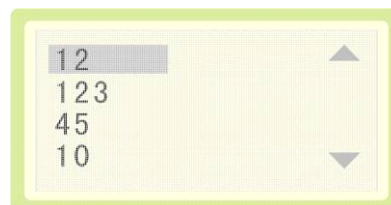
Press the “ESC” to back to main interface.

5.4.1 Cutting Frame



If the cursor to select cutting frame, press the “ok” to enter cutting frame interface, as follows



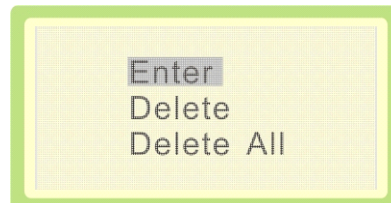
5.4.2 File Selection



When the cursor appears on the screen

Press the “” or “” to move the cursor

Press the “ok” to show the file menu



Press the “ESC” to back to the file selection interface.

Press the “ok” to select different functions.

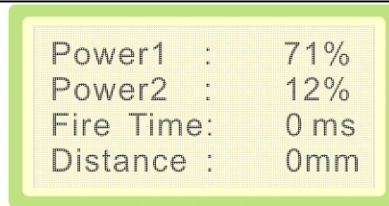
Select the “ok”, and then return to standby interface.

Select the “delete”, and then return to file selection interface, file menu refresh.

Select the ”delete all” key ,and return to file selection.

5.4.3 Fire and Jog

If the cursor to select the “Fire” key, press the “ok” to enter the settings of Fire and Jog; as shown below



Fire time of default is 0mS; Fire power is 100%, Jog distance of 0 mm(Jog distance is not a fixed value).

Press the “←” or “→” key to move cursor , and it switches between “time” and “power”.

Press the “↑” or “↓” to set the corresponding parameters value, step value is 1, Jog distance of 0.1. The time range is 0 to 99999mS, and the power range is 0 to 100.press the “ok” to come into effect.

Up ,down, left, and right move the laser head in the main interface(the cursor doesn’t appear),then the Jog distance (laser head movement distance) is the setting. Press the “Fire” key, and then the Fire time and power is the settings. When the time value in the “Fire set” is 0, laser emits light in the “Fire” key pressed, while light goes out in the key released. If you only set a value, then click once, light is lit once, the time unit is milliseconds.

The default value of Jog distance is 0, and it is not a fixed value. Press the “←”, “→”, “↑”, or “↓” to begin to inch, and motion stops when the key released. If you hold the “←”, “→”, “↑”, or “↓”, the laser head continuously moves. If the parameter is not 0, it begins to high-speed motion in accordance with the set distance. Low-speed and high-speed has a corresponding value in the “machine set” of the software.

Press the “ESC” key to return to main menu.

5.4.4 Language Selection

If the cursor indicates the “language selection”, press the “ok” to select language, as shown below



Press the “↑”, or “↓” to move the cursor, and when the language selection is completed, press the “ok” to enter main menu.

If no button operation within 30 seconds, screen automatically switches to the main menu.

5.4.5 Alarm Set

Double-click the “menu” key to enter the following page in the main interface



If the cursor indicates the “alarm set” key, and press the “ok” to set the parameters

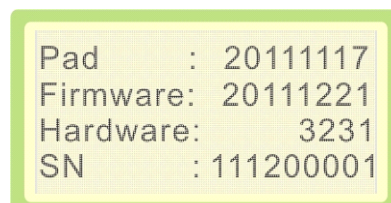


5.4.6 Backlight Settings



5.4.7 Version

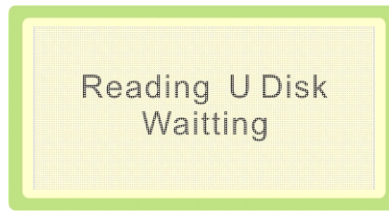
If the cursor indicates the “version”, press the “ok” to check the version information, as shown below



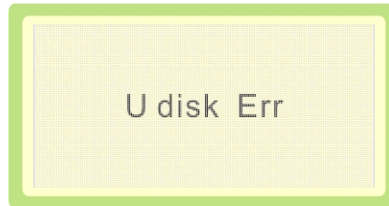
5.5 U Disk

When U-disk is pulled out, the interface comes into the standby mode.

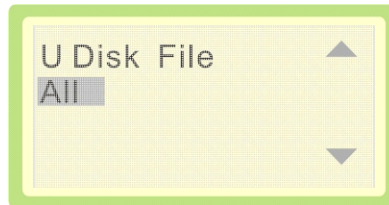
Only the main is in the standby mode, interface displays the following when a U-disk is inserted



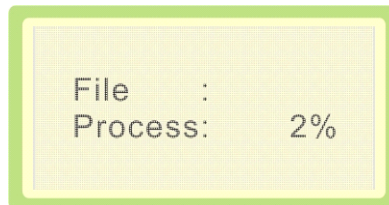
If the test fails, as shown below



If the U-disk is distinguished normally, the file download screen is displayed, as shown below



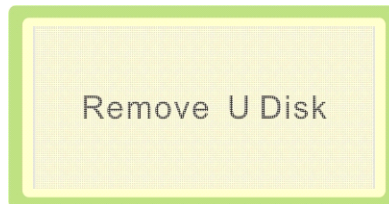
The system detects the storage space before downloading, if it isn't enough, buzzer alarms. It starts to download processing file, when the file has been selected, as shown below



When the file download completed, the interface returns to file list.

The downloaded file is no longer displayed.

If you press the "ESC" key, the system prompts to unplug the U-disk, returning to main interface (displaying in the interface middle)

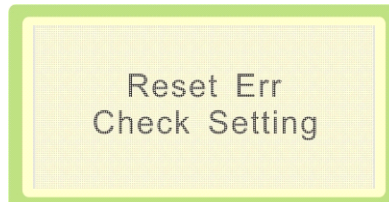


5.6 Error Alarm Interface

In order to facilitate customers timely informed the error state of the machine and quickly resolve the various issues that arise due to improper operation, all the alarm information is displayed in the error alarm interface. Alarm message and motherboard internal indicator are consistent.

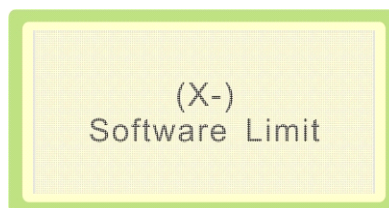
5.6.1 Reset ERR

If reset sensors or system installation is abnormal, and it doesn't detect the origin in the reset process, as shown below



Press the “ESC” key to enter the processing interface.

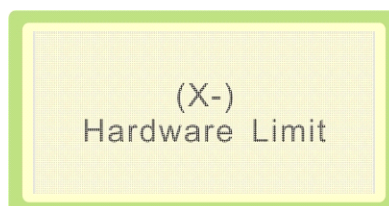
5.6.2 Software Limit



The system found that the range of graphics processing beyond the scope of the workbench.
Solution: move the position of the laser head and make sure the graphic is located within the workbench.

When this occurs, press the “ESC” to return to standby interface.

5.6.3 Hardware Limit



Solution: move the position of the laser head and make sure the graphic is located within the workbench.

If this appears, the system stop running and alarm; press the “ESC” to return to standby interface.

5.6.4 Not Enough Memory



The causes of the problem:

The number of files downloaded more than the number of total memory storage.

The downloaded file is too large to exceed the total amount of storage memory.

Solution:

Ensure that the downloaded file should not exceed the total amount of storage memory.

Remove the extra processing file and release the space.

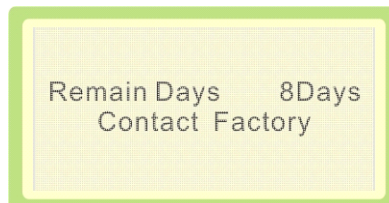
Press the "ESC" key to return to U disk file list.

5.6.5 Maturity



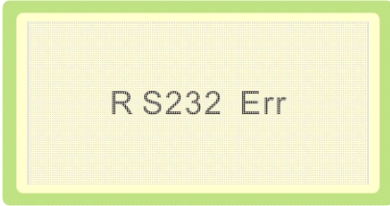
Key is invalid.

5.6.6 About to Expire



5.6.7 Communication ERR

Host and controller connection fails, as shown below



R S232 Err

Key is invalid.

Solution: detection of serial connection is working.

5.6.8 Water ERR



Water Err

Solution: detection of Water Err input is valid.

5.6.9 Cover ERR

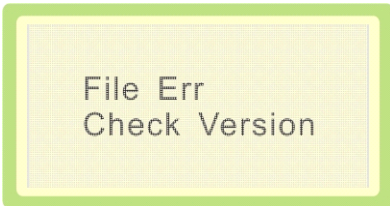


Cover Err

The cause of the problem: cover is closed in working, and protection is active. When the cover is open, the protection is ineffective and processing in a suspended state, buzzer alarms.

Automatically return to the previous processing after the fault is cleared.

5.6.10 File ERR

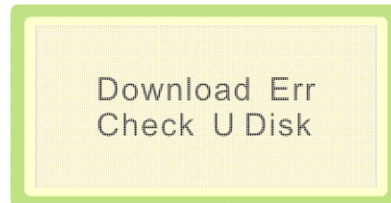


File Err
Check Version

Press the “ESC” to enter standby mode.

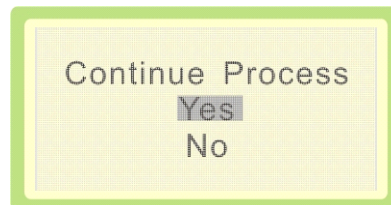
5.6.11 Download ERR



File Download Err, as shown below



Press the “ESC” to enter standby mode.

5.6.12 Continue Process



Press the “”, or “” to move the cursor.

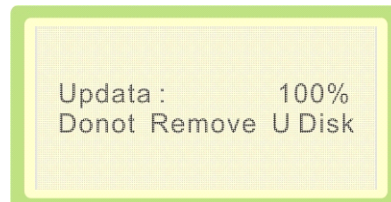
Press the “ok” to make a choice.

Don't return to the origin, and process immediately.

5.7 Update

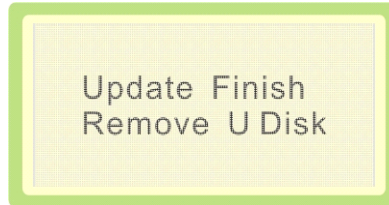
The Update process as follows: Run the laser.exe, and then load the firmware file(.lxf).

The system will automatically detect whether the U disk Update at boot time.



Enter the Update interface, and then automatically restart after the upgrade is completed.

5.7.1 Update Finish



The Update process as follows: Run the laser.exe ,and then load the firmware file(.lxf).

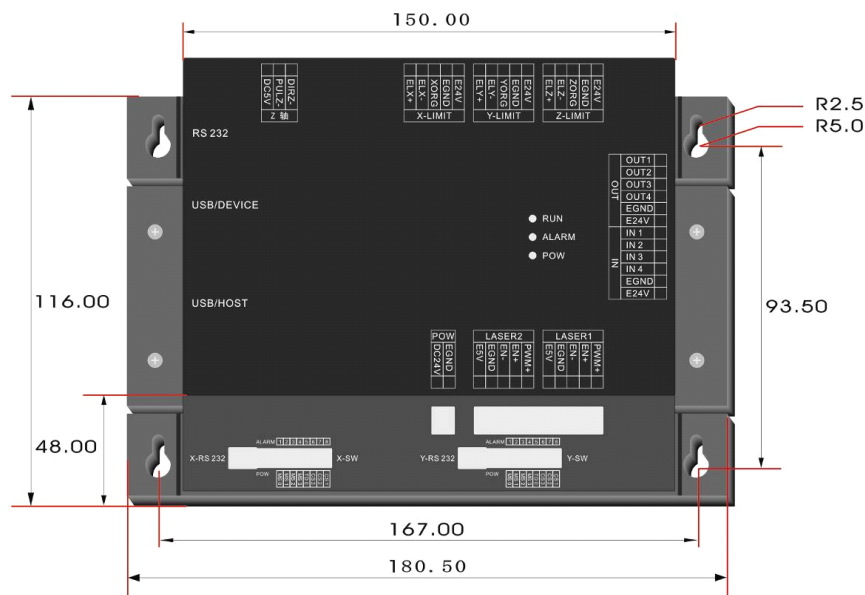
The system will automatically detect whether the U disk Update at boot time.

Key is invalid before you pull out of the U disk, and the system is to automatically restart when the U disk is extracted.

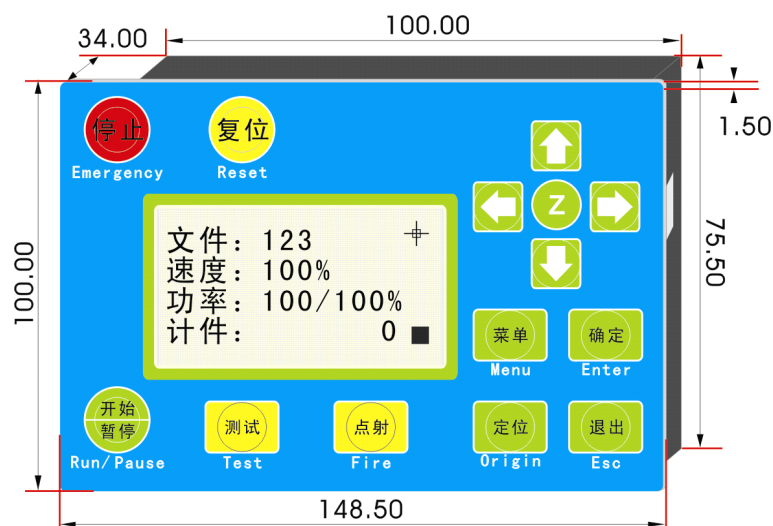
Appendix1 Reference Chart of CNC-LS2320

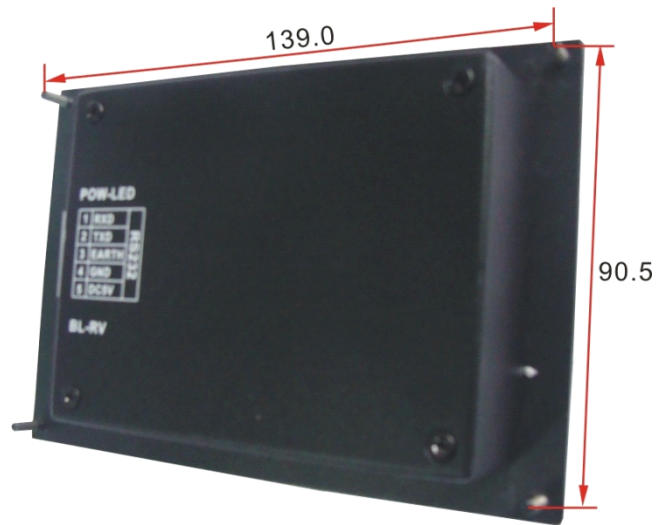
Installation Size

Installation dimensions of the CNC-LS2320 laser controller as shown in attached Figure-1. The PAD-100 is standard accessories, and the installation dimensions as shown in attached Figure-2.



Attached Figure-1 Installation Dimensions of the CNC-LS2320 Laser Controller



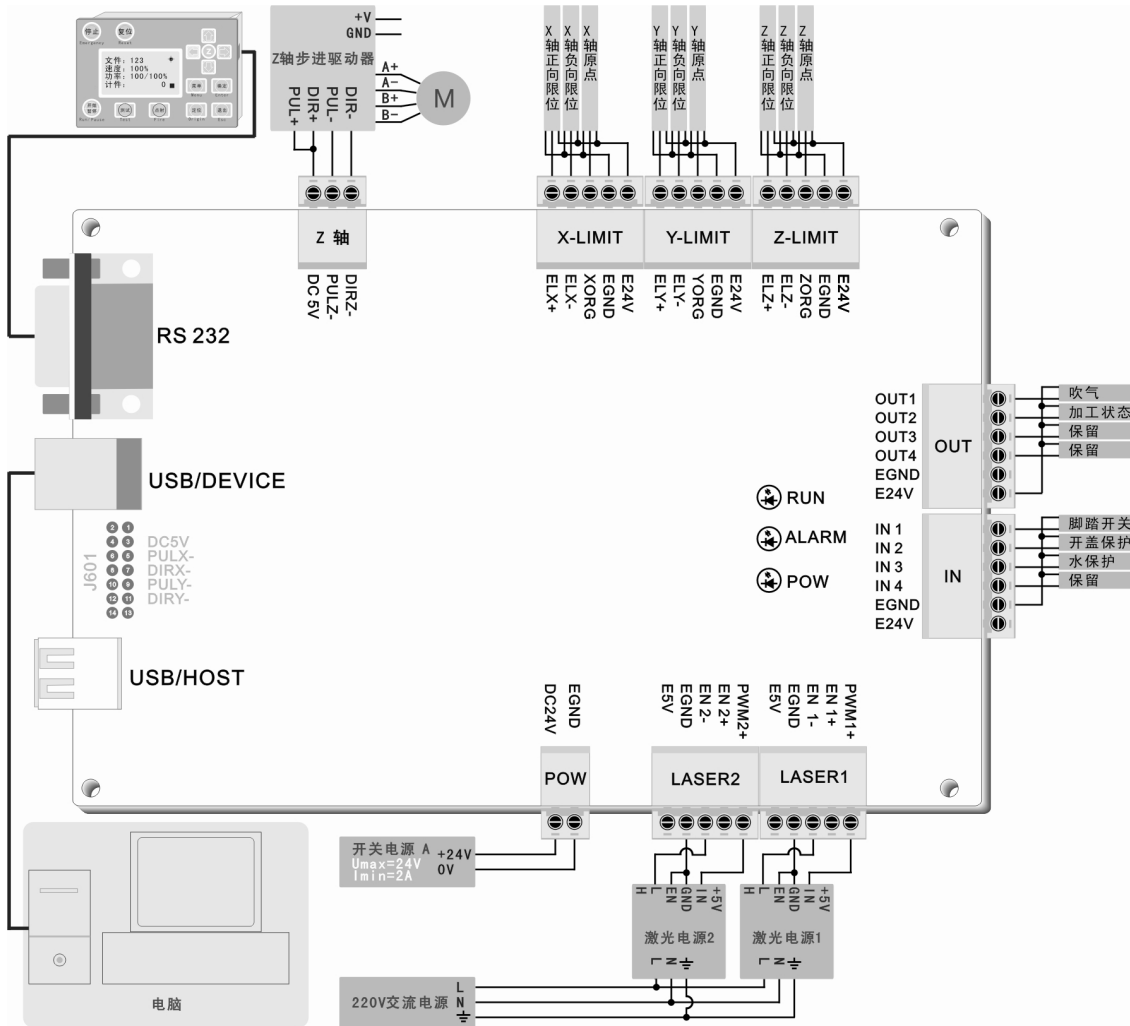


Attached Figure-2 Mounting Dimensions of the Laser PAD-1000 Operation Panel

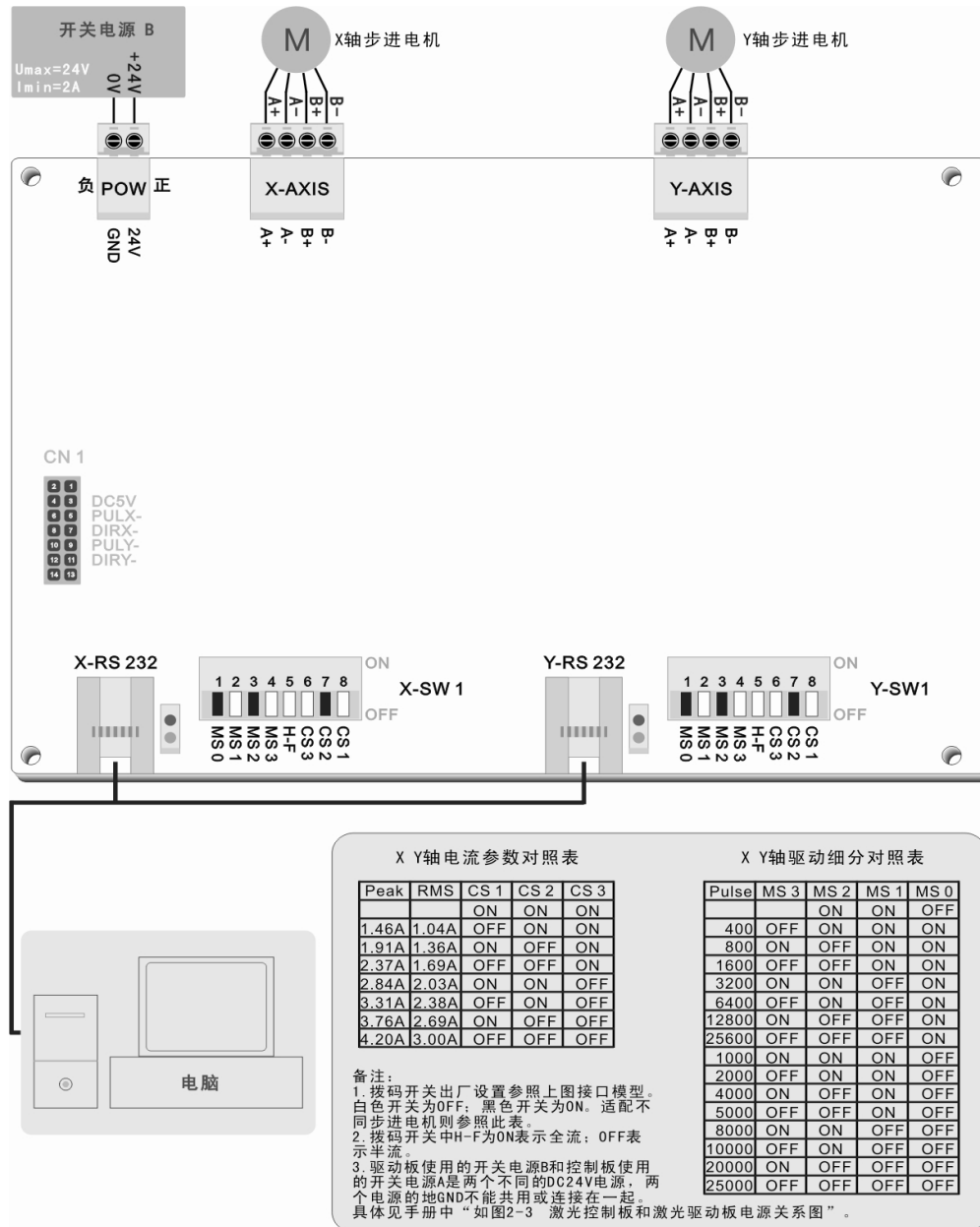
Note:

In this reference image, the size of millimeters; if the design changes without notice, the user should take the initiative to consult the R&D manufactures.

Appendix2 Wiring Diagram of CNC-LS2320 Control Panel



Appendix3 Wiring Diagram of CNC-LS2320 Driver Board



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