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TF-6225 Motion Control
User Manual

Laser Motion Control

RV1.0

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Introduction

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User Manual

By reading this instruction, the users will know the basic composition, installation and how to use TF-6225.

For Who

This manual is applicable to engineers who have a certain understanding

of laser mechanical automation and electrical circuits.

Main Content

The composition, installation and use of TF-6225 are introduced in detail

Relevant Document

《LaserCAD User Manual》

Content

1. Product Introduction

1.1 System Introduction

TF-6225 is a universal motion controller for laser cutting, laser engraving and other fields developed by Shenzhen Trocen Automation Tech co., LTD. This controller is compatible with various brands or power of laser with CO2 laser in low/medium power cutting metal/nonmetallic materials, based on fiber laser cutting and integrated with auto height-sensing system, used for fiber laser cutting, metal/nonmetallic materials cutting and multi-metal materials in various thickness such as metal cutting, gifts, advertising and kitchenware. This system is used by LaserCAD software and motion controller, which greatly improves the production efficiency and reduces the production cost.

Features of LaserCAD

- User-friendly and versatile.

- Support CorelDraw, Auto CAD and other professional drawing software.

- Support the file format: AI, PLT, DXF, SVG, PDF, NC, DST, DSB, UD5, BMP, GIF, JPG, JPEG, PNG.

- Simple graphics drawing function.

Features of Wiring Board

- High DSP, quick calculating and optimal algorithm.

- 4.3'' color TFT LCD display with concise operation interface.

- Optical coupler, anti-electromagnetic interface and system stability.

- Faster reading files under USB, U Disk and network.

- Auto height-sensing with 0.1mm accuracy.

- One-click calibration.

1.2 Terms and Explanation

Table1-2-1 Terms and Explanation

Term	Explanation
LaserCAD Software	LaserCAD is a complementary software with auto typesetting for laser motion control.
TFT LCD Panel LCD Panel Control Panel Panel (Mainboard)	4.3" color TFT LCD control panel. The panel is used for specific display and control operations and it is an important part of the system.
Wiring board (Baseboard)	The baseboard is the control board of the integrated signal (input and output) control and the motor drive connection.
Hardware	Includes: mainboard, wiring board, wire and so on.

1.3 Unpack

After receiving the product, please confirm whether the product and accessories are complete. If there is a lack of accessories, please contact the after-sales service of Trocen company.

Table1-3-1 Wire Introduction

Name	Appearance	Introduction
Panel (Mainboard)		The panel (mainboard) of TF-6225.
Wiring Board		The wiring board of TF-6225.
USB Cable (3m)		Connect computer and panel by USB.
Amplifier		Amplifier
Network Cable (5m)		Connect computer and panel by network.
CN1 (1.6m)		Connect the CN1 port of main board and panel.

DB9 (1.6m)		Connect the CN2 port of main board and panel.
8 PIN (1m)		Patch cord with USB and network port.
15cm Copper Cable (0.15m)		Connect amplifier.
Amplifier Cable (10m)		Connect amplifier and main board.

1.4 Panel Preview

There are LCD display, soft keys and U disk slot on panel.

Figure1-4-1 Panel Preview

Figure1-4-2 Size of Main Board
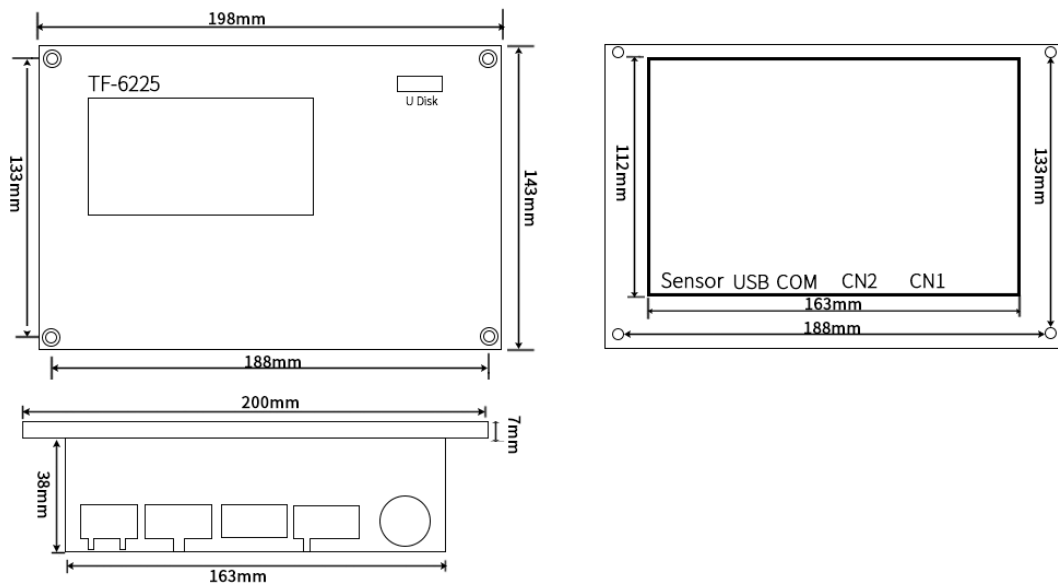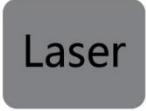
1.5 Buttons

According to the different use of keys, all keys are roughly divided into three categories: function keys, number keys and direction keys.

1.5.1 Function Keys

Function key is designed to directly realize a specific operation function.

Table1-5-1 Function Keys Instruction

Name	Icon	Instruction
Reset	Reset	No matter what the state of the machine is in, pressing this button will make it enter the resetting state.
Follow ON/OFF	Followon/off	Switch follow function.
Menu	Menu	Show the main menu.
File	File	Browse the files stored in the control board.
Shift	Shift	Combine function key.
Laser	Laser	Test usage. Press the key, the laser tube will give out light. It's used to adjust optical path.
Box	Box	Frames the working area from the origin point of the current file.

Origin	Origin	Setting machine's starting point of the current file.
Stop	Stop	Once pressed, the machine will stop its current function and move back to its origin. Press 【Stop】+ direction keys to switch the speed of axis movement, quick to slow or slow to quick.
Start/Pause	Start/Pause	Pause the machine and keep it stay at location. Press again to resume.
Esc	Esc	Exit edit mode (Exit cursor). Return to previous menu.
Enter	Enter	Enter edit mode (Start cursor). Confirm the current operation.
Hand		The speed switching (fast/slow) of moving axis manually.

On the main page, press【File】and you could see the memory files stored in the mainboard.

Figure1-5-1 File Interface
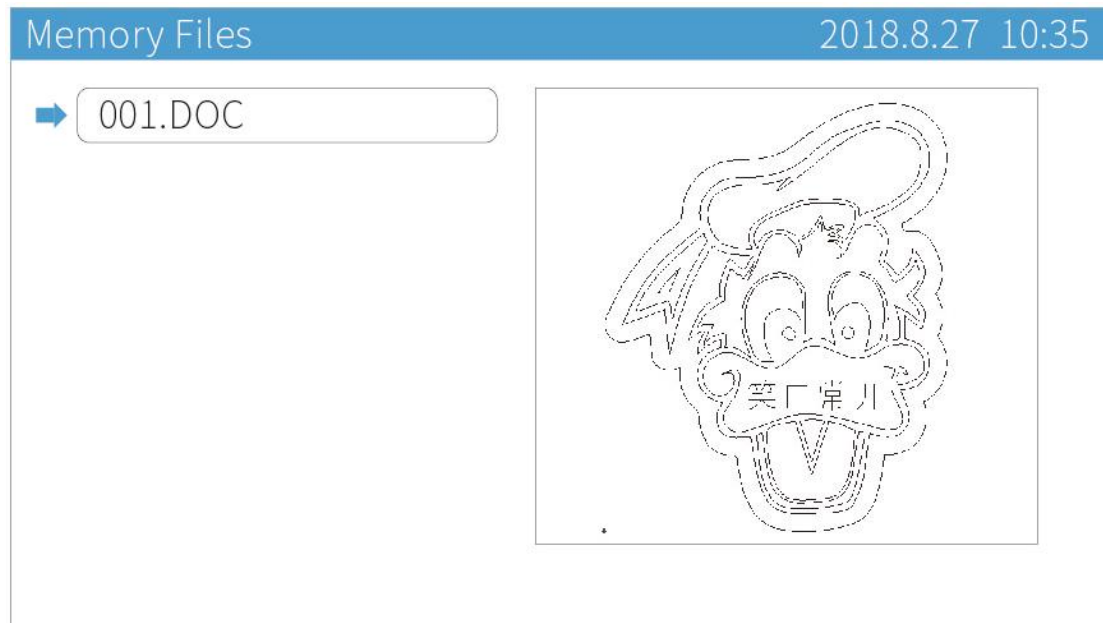
Move cursor to the file you need, press【Enter】, you could set the file

parameters.

Figure1-5-2 File Parameters Setting Page
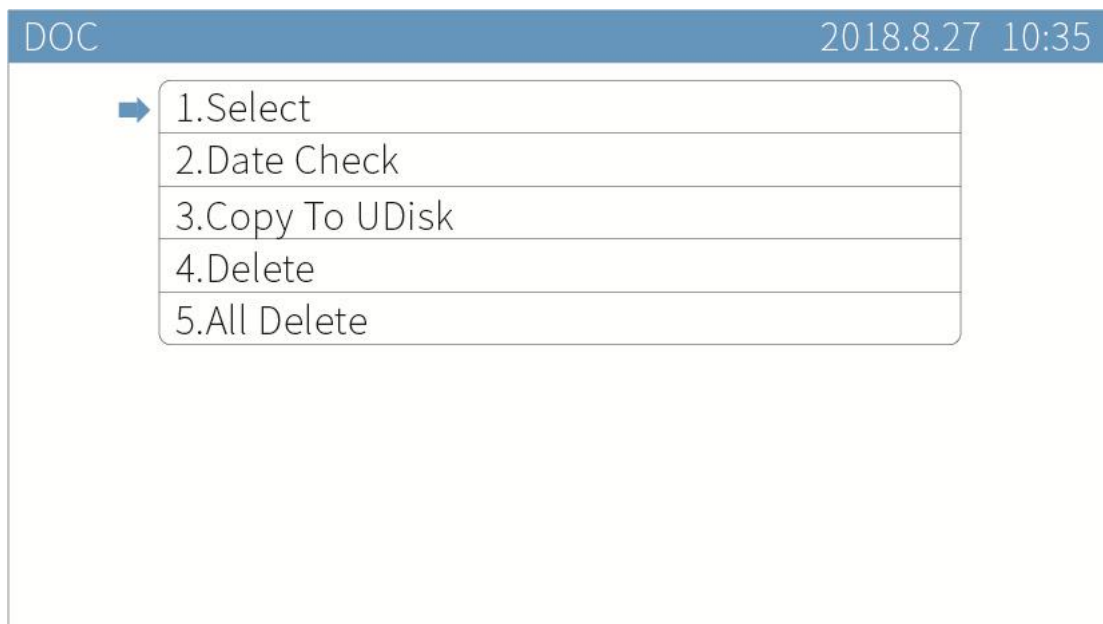
● Move cursor to【Select】, press【Enter】and set current file as work

file.

- Move cursor to【Data Check】, press【Enter】. If the graphics is the same as that in PC, the system will prompt "File Data OK!", then the graphics will be allowed to process. If not, the machine won't process this graphics.

Figure 1-5-3 File Format Test
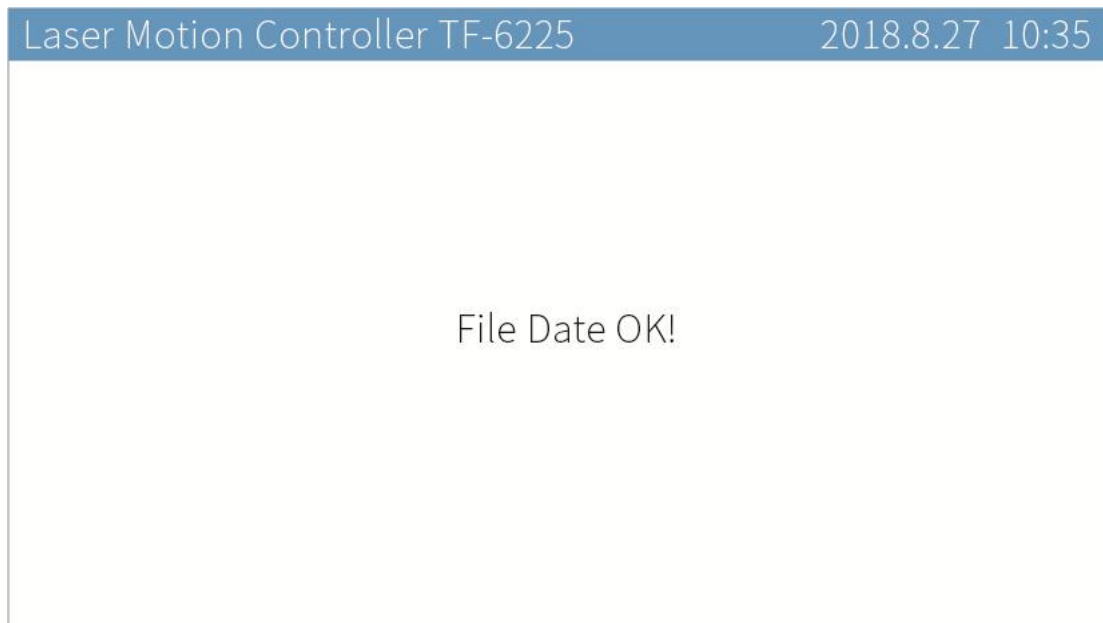
Users could set other parameters as need.

1.5.2 Direction Keys

● 【↑】【↓】【←】【→】

They are used to move the motion axis and cursor, also used to modify options in the current view.

● 【z↑】/【0】 【z↓】/【C】

Move cursor when the direction keys 【↑】【↓】【←】【→】 are occupied, and these keys are used to move Z axis directly.

1.5.3 Number Keys

Used to modify parameter values. They are also designed to directly realize a specific operation function on the main page.

Table1-5-2 Number Keys Instruction

Name	Icon	Instruction
1	1	Enter Technological Parameters interface.
2	2	Test tracking function.
3	3	Adjust position slightly.

5		Check signal output of I/O ports manually.
7		Continue cutting from previous position.
9		Adjust position slightly.

1. On the main page, press【1】to enter *Technological Parameters* interface. Move cursor with【↑】【↓】to select a sub-option, press number keys to modify parameters and press【Enter】to save settings.

Figure1-5-4 Technological Parameters Interface

2. On the main page, press【2】and press【Enter】to start tracking. Manually raise and lower the steel plate, if the laser head moves following the steel plate automatically, the tracking function is normal, or you need to calibrate again.Press【ESC】and return to the main page.

Figure1-5-5 Tracking Interface
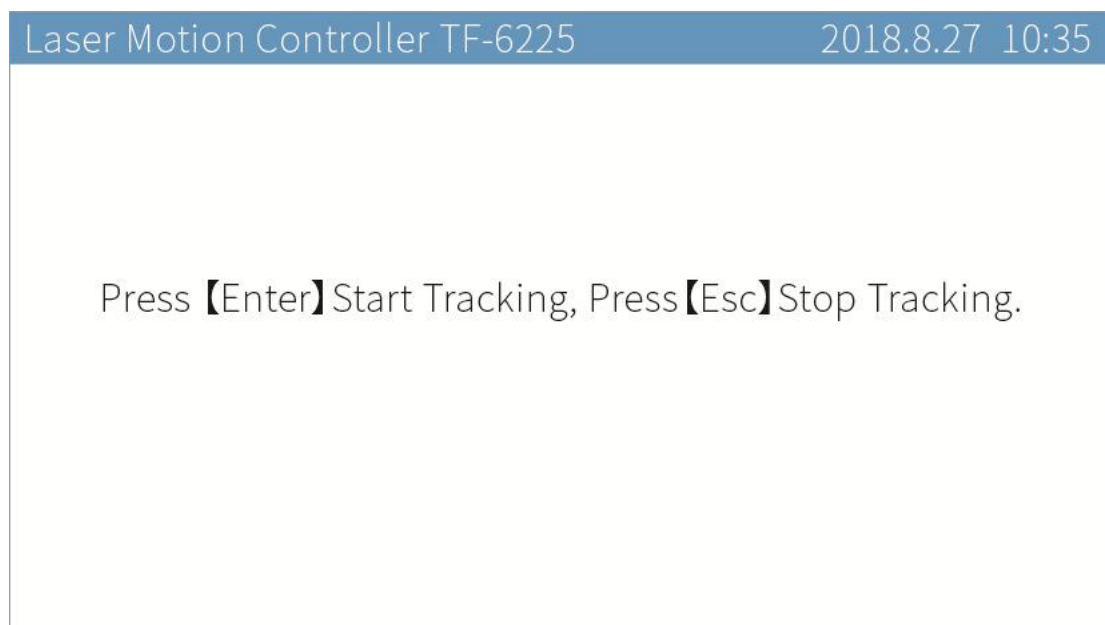
3. On the main page, press【5】to enter *Manual To Control IO* interface, then operate as following diagram to test I/O ports manually.

Figure1-5-6 I/O Test Interface
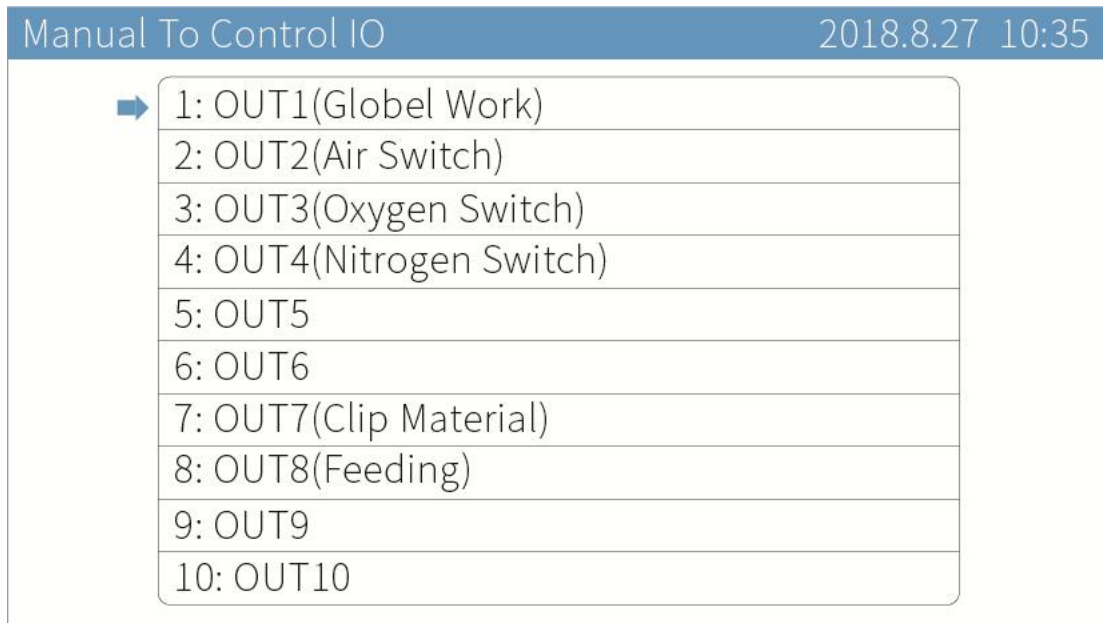
4. On the main page, press【7】and press【Enter】to continue cutting or press【ESC】to quit.

Figure1-5-7 Continue Cutting Interface
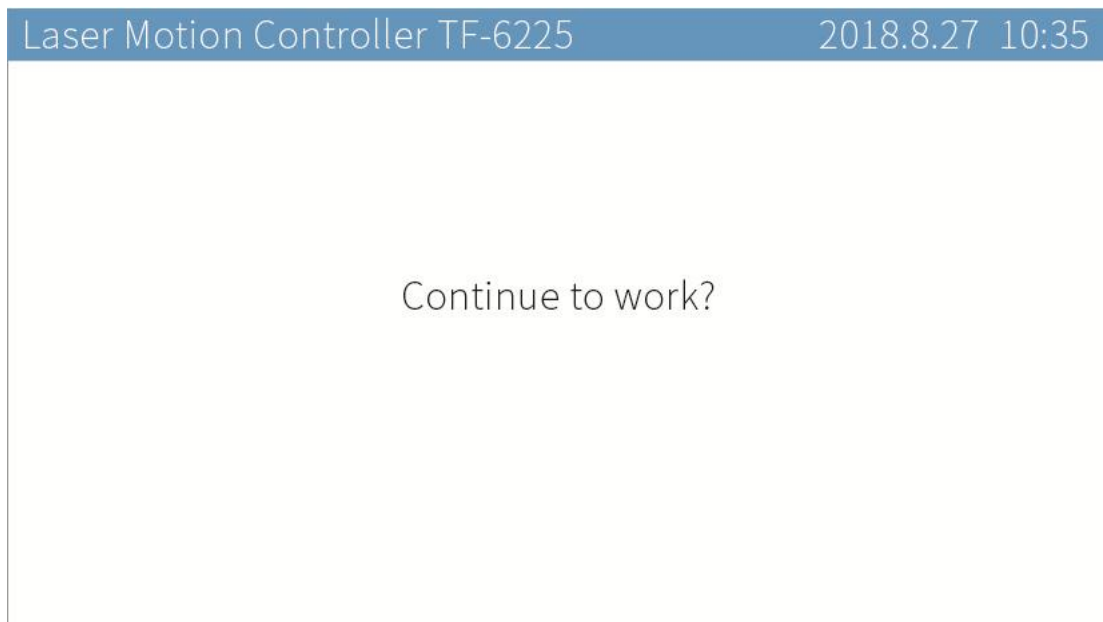
1.6 Wiring Board

The panel and other parts of machine are connected by wiring board.

The components as below:

- Connect motor driver

- Detection of motion axis limit signal

- Input signal detection

- Output IO control signal and corresponding power supply

1.6.1 Wiring Board Appearance

Figure1-6-1 Wiring Board Appearance
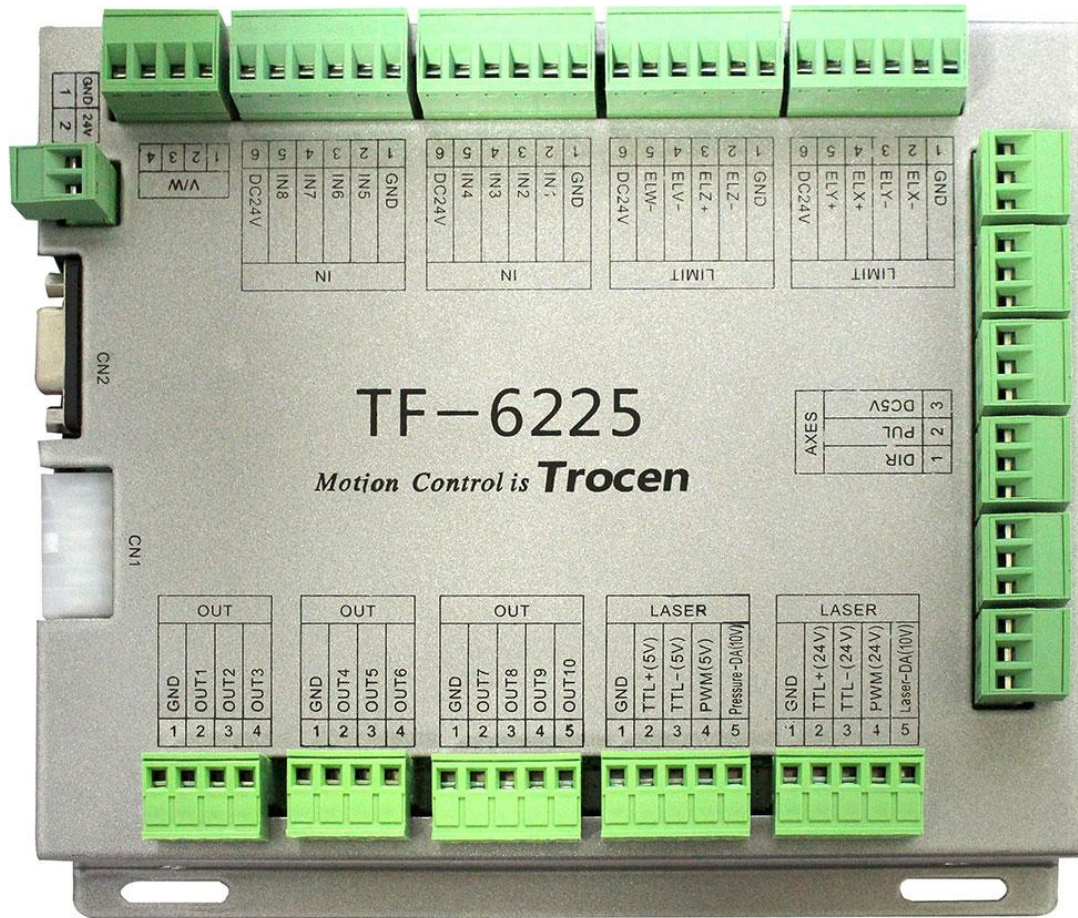
Figure1-6-2 Wiring Board Ports Introduce
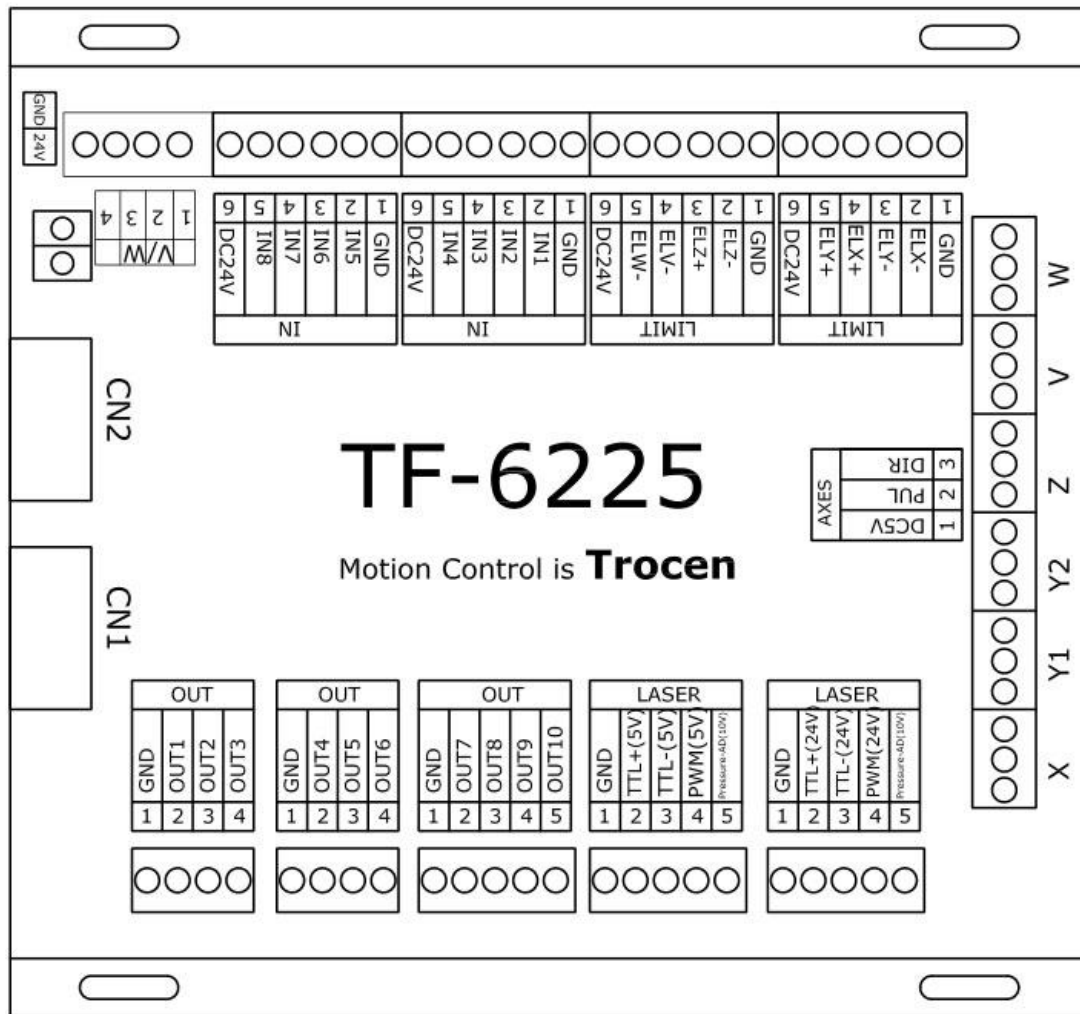
1.6.2 Port Instruction

1.6.2.1 Power Supply Port

The power supply ports provide power to wiring board and panel. Please pay more attention to polarity when connect them. Don't make the polarity reverse.

Table1-6-1 Instruction of Wiring Board Power Supply Port

Pin	Name	Introduction
1	+24V	24V positive polarity.
2	GND	Negative pole.

1.6.2.2 Port of Panel and Wiring Board

Connect panel and wiring board with CN1 and CN2 cables.

Table1-6-2 Port of Panel and Wiring Board

Name	Introduction
CN1	Connect CN1 port of panel and wiring board with CN1 cable.
CN2	Connect CN2 port of panel and wiring board with DB9 cable.

1.6.2.3 Signal Input

There are two groups of signal input ports.

Table1-6-3 Wiring Board Signal Input Port Instruction

	PIN	Name	Instruction
IN	1	GND	Power ground
	2	IN1	Door open protection signal (This function needs to be turned on in the panel to be effective).

	3	IN2	Foot switch (This function needs to be turned on in the panel to be effective).
	4	IN3	Driver alarm signal.
	5	IN4	Reserved
	6	DC24V	Output DC voltage (24V)
IN	1	GND	Power ground
	2	IN5	Water protection.
	3	IN6	Reserved
	4	IN7	Reserved
	5	IN8	Reserved
	6	DC24V	Output DC voltage (24V)

Wiring diagram of signal input:

Figure1-6-3 Wiring Diagram for Signal Input
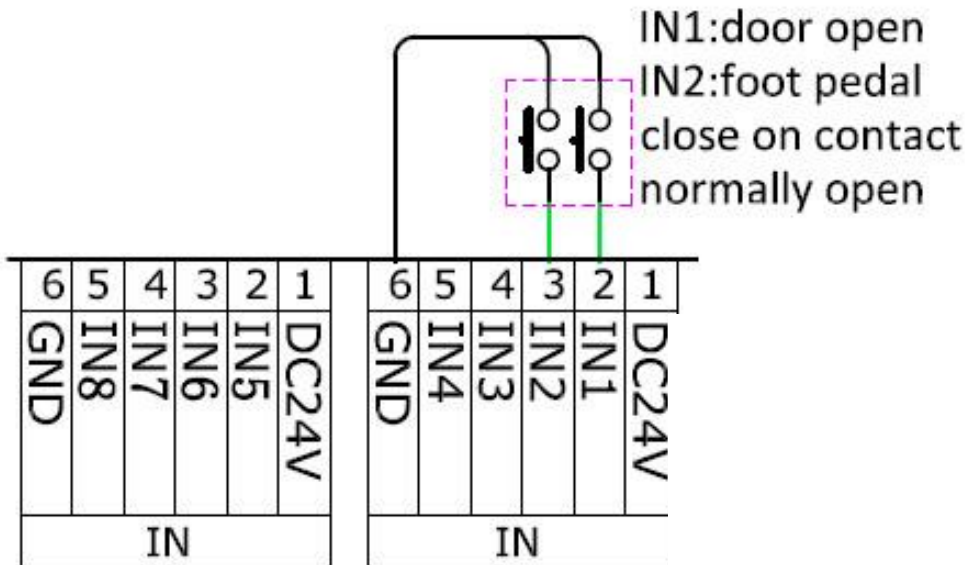
1.6.2.4 Signal Output

There are 3 groups of output ports to supply power and control signals. If you choose OUT2 (Blow when laser is power on), you must set the parameters of【Blow Open Delay】or【Blow Close Delay】on the ***Common Parameter*** interface, with the minimum value of 0.01.

Table1-6-4 Output Port Instruction

	PIN	Name	Instruction
OUT	1	GND	Power ground (OUT).
	2	OUT1	Blowing signal (blow all the working time): OUT1 Blowing when output is high logic level.

			OUT1 Do not blow when output is low logic level.
	3	OUT2	Blowing signal (blow when laser is powering on): OUT2 Blowing when output is high logic level. OUT2 Do not blow when output is low logic level.
	4	OUT3	Blowing signal (blow O2 when laser is powering on): OUT2 Blowing when output is high logic level. OUT2 Do not blow when output is low logic level.
OUT	1	GND	Power ground (OUT).
	2	OUT4	Blowing signal (blow N2 all the working time): OUT2 Blowing when output is high logic level. OUT2 Do not blow when output is low logic level.
	3	OUT5	Reserved
	4	OUT6	Reserved
OUT	1	GND	Power ground (OUT).
	2	OUT7	Stuffing signal.
	3	OUT8	Reserved
	4	OUT9	Feeding signal
	5	OUT10	Reserved

Output signals control laser blowing generally. The wiring diagram is

shown below (blow all the working time).

Figure1-6-4 Blowing Control Diagram
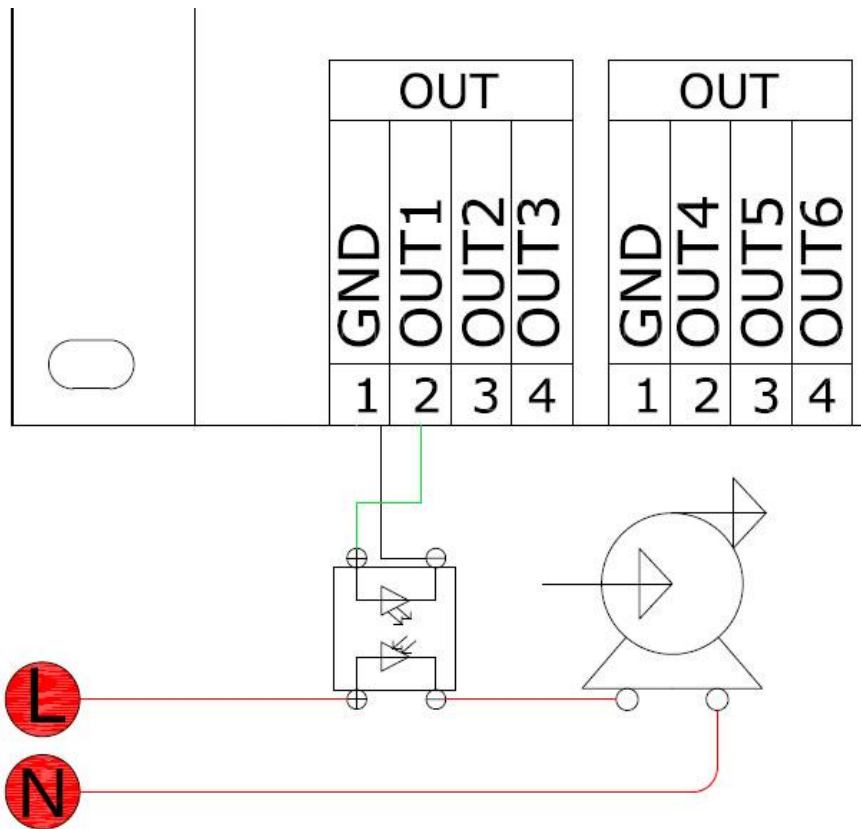
1.6.2.5 Laser Power Supply Port

The wiring board provides 2 groups of laser output control ports.

Table1-6-5 Laser Controller Output Instruction

	PIN	Name	Instruction
LASER	1	GND	Power ground.
	2	TTL+(5V)	Laser switch signal, 5V high level light output.
	3	TTL-(5V)	Laser switch signal, 5V low level light output.

	4	PWM(5V)	Digital signal. The output voltage is 0-5V, and it will change according to the power.
	5	Pressure-DA (10V)	Air pressure control, 0-10V analog signal.
LASER	1	GND	Power ground.
	2	TTL+(24V)	Laser switch signal, 24V high level light output.
	3	TTL-(24V)	Laser switch signal, 24V low level light output.
	4	PWM (24V)	Digital signal. The output voltage is 0-24V, and it will change according to the power.
	5	Laser-DA (10V)	Air pressure control, 0-10V analog signal.

Different lasers have different connection modes. Take ordinary glass tube laser as example. The optical signal of ordinary glass tube laser is 5V, and set low level for light emitting. The power signal PWM of mainboard is connected to the IN pin of laser power source and TTL to the L pin of laser power source. All signals have uniqueness, which is connected to this group of signals, other pins do not need to be connected. For the RF tube laser power supply, only connect the PWM of the main board to the IN pin, GND to G pin, and no need to connect TTL pin. Please refer to Appendix 2 of this article for the connection of different types of lasers.

Figure1-6-5 Ordinary Glass Tube Laser Diagram
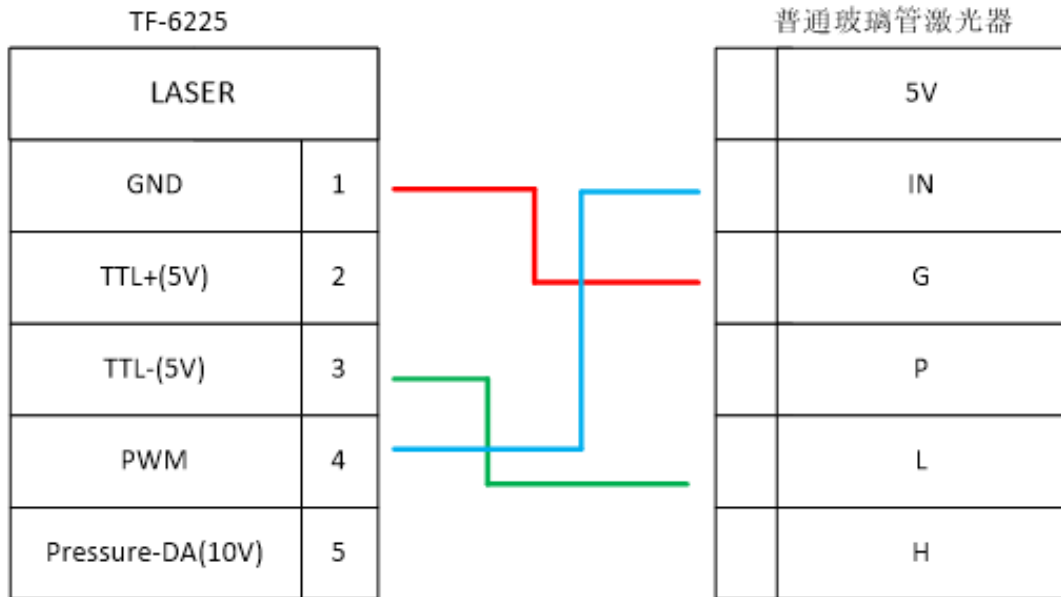
Figure1-6-6 Pins of Laser Power Source
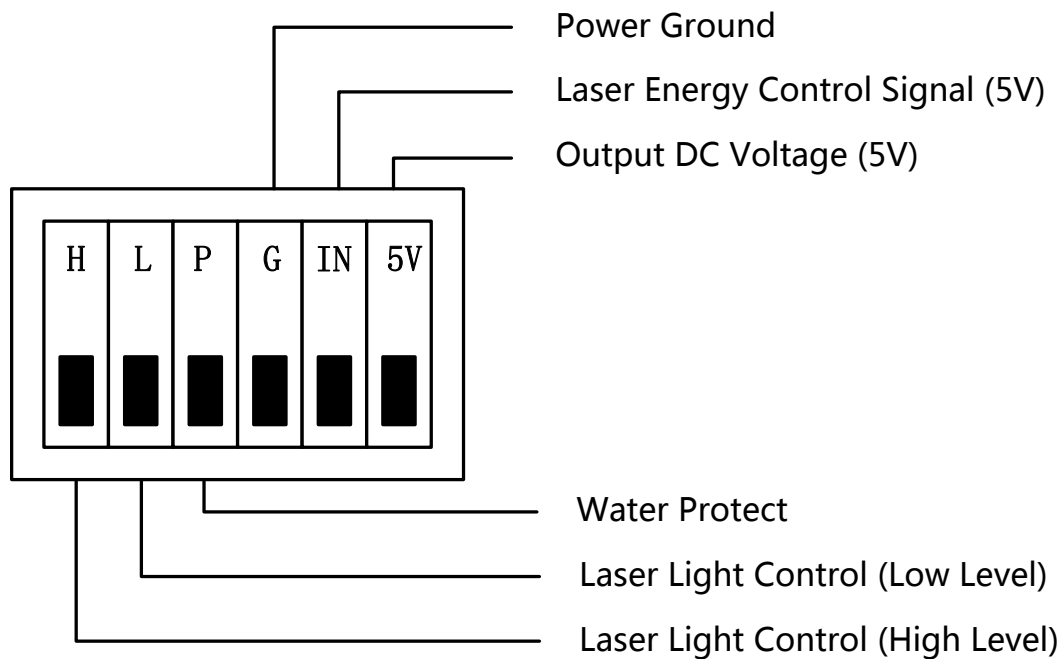
If the laser light control signal is low level, connect the L pin of laser

power, and if the laser light control signal is high level, connect the H pin of laser power.

1.6.2.6 Motor Drive Control Port

The wiring board can provide up to 6 motor driver connections, and users can choose step driver or servo driver according to the need. The servo driver has higher control accuracy than step driver. Users can choose the appropriate driving mode according to the usage scenario, cutting precision requirements and cost factors. We take the step driver as an example. Various types of servo driver wiring diagram, please refer to Appendix 1 of this article.

Y1 and Y2 can be used to control Y axis. Users can choose single or double motors for Y axis.

Table1-6-6 Motor Driver Connection Instruction

	PIN	Name	Instruction
X	1	DIR	Direction signal
	2	PUL	Pulse signal
	3	DC5V	Output DC voltage (5V)
Y1	1	DIR	Direction signal
	2	PUL	Pulse signal
	3	DC5V	Output DC voltage (5V)

Y2	1	DIR	Direction signal
	2	PUL	Pulse signal
	3	DC5V	Output DC voltage (5V)
Z	1	DIR	Direction signal
	2	PUL	Pulse signal
	3	DC5V	Output DC voltage (5V)
V	1	DIR	Direction signal
	2	PUL	Pulse signal
	3	DC5V	Output DC voltage (5V)
W	1	DIR	Direction signal
	2	PUL	Pulse signal
	3	DC5V	Output DC voltage (5V)

The diagram below shows the connection of step driver.

Figure1-6-7 Diagram of Driver Connection
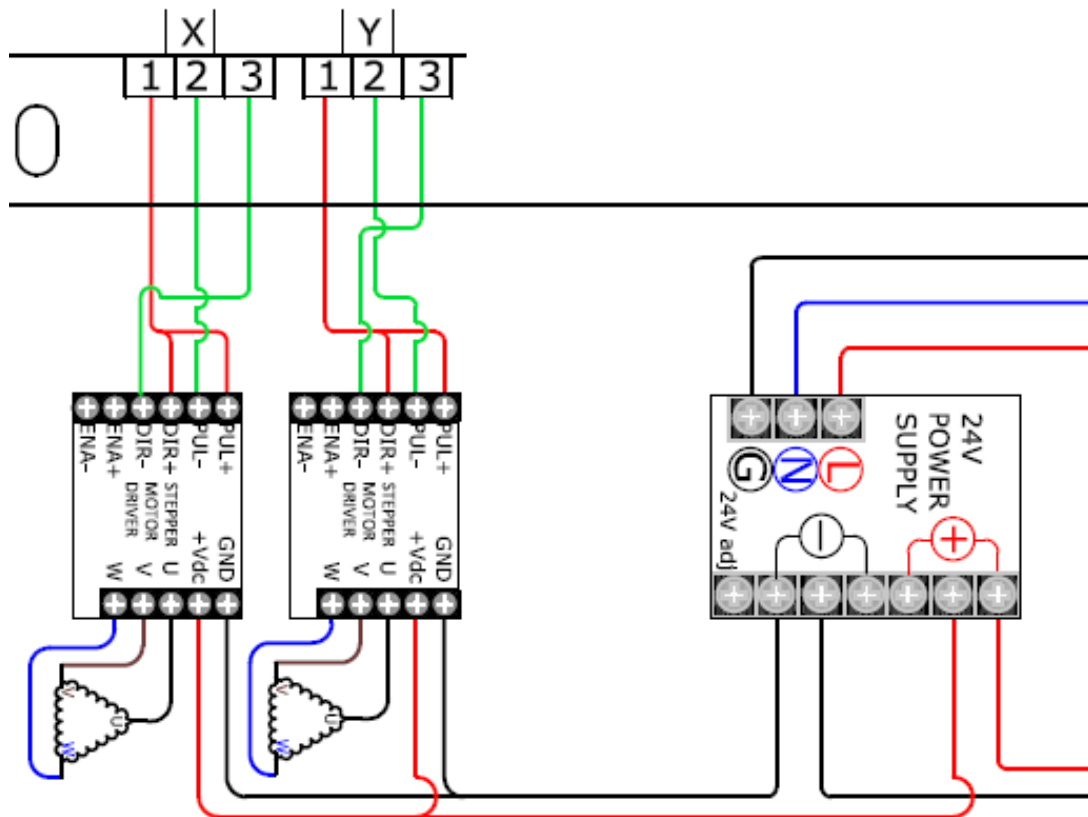
1.6.2.7 Limit Signal

The wiring board provides 5 sensor limit signal access. Each axis supports maximum and minimum coordinate limit signal input. This system supports working range limitation, so users do not need to install hard limit sensor, just set the【Range】parameter on the *Axis Parameters* page. More details about【Range】, please refer to the Chaper 3.6 of this article.

Table1-6-7 Limit Signal Input

	PIN	Name	Instruction
Limit	1	GND	Power ground.
	2	ELX-	The origin limit of the X axis. The input signal of origin limit sensor, when the X axis moves to the minimum coordinate position (zero position).
	3	ELY-	The origin limit of the Y axis. The input signal of origin limit sensor, when the Y axis moves to the minimum coordinate position (zero position).
	4	ELX+	The hard limit of X axis. The input signal of hard limit sensor, when X axis moves to the maximum coordinate position.
	5	ELY+	The hard limit of Y axis. The input signal of hard limit sensor, when Y axis moves to the maximum coordinate position.
	6	DC24V	Output DC voltage (24V).
Limit	1	GND	Power ground.
	2	ELZ-	The origin limit of the Z axis. The input signal of origin limit sensor, when the Z axis moves to

			the minimum coordinate position (zero position).
	3	ELZ+	The hard limit of Z axis. The input signal of hard limit sensor, when Z axis moves to the maximum coordinate position.
	4	ELV-	The origin limit of the V axis. The input signal of origin limit sensor, when the V axis moves to the minimum coordinate position (zero position).
	5	ELW-	The origin limit of the W axis. The input signal of origin limit sensor, when the W axis moves to the minimum coordinate position (zero position).
	6	DC24V	Output DC voltage (24V).

Figure1-6-8 Diagram of Limit Signal

Limit Switch
ELY+: Limit switch on another side
     opposite origin on Y axis.
ELY–: Limit switch on origin on Y axis.
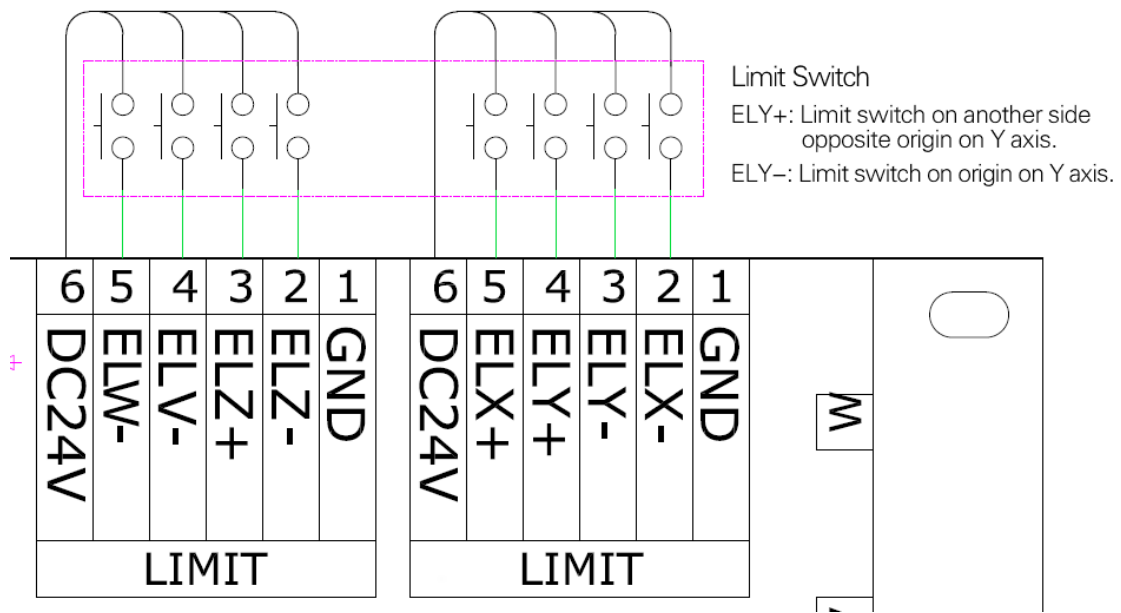
2. LaserCAD Installation

You can go through 《LaserCAD User Manual》 for more details about installation and how-to-use LaserCAD.

3. Simplified Installation

The content of this chapter is mainly about the hardware initial installation of the product and the setting of basic software parameters. Please refer to the following chapters for the detail settings and descriptions of other parameters.

3.1 Hardware Connection

Figure3-1-1 Integral Wiring Diagram
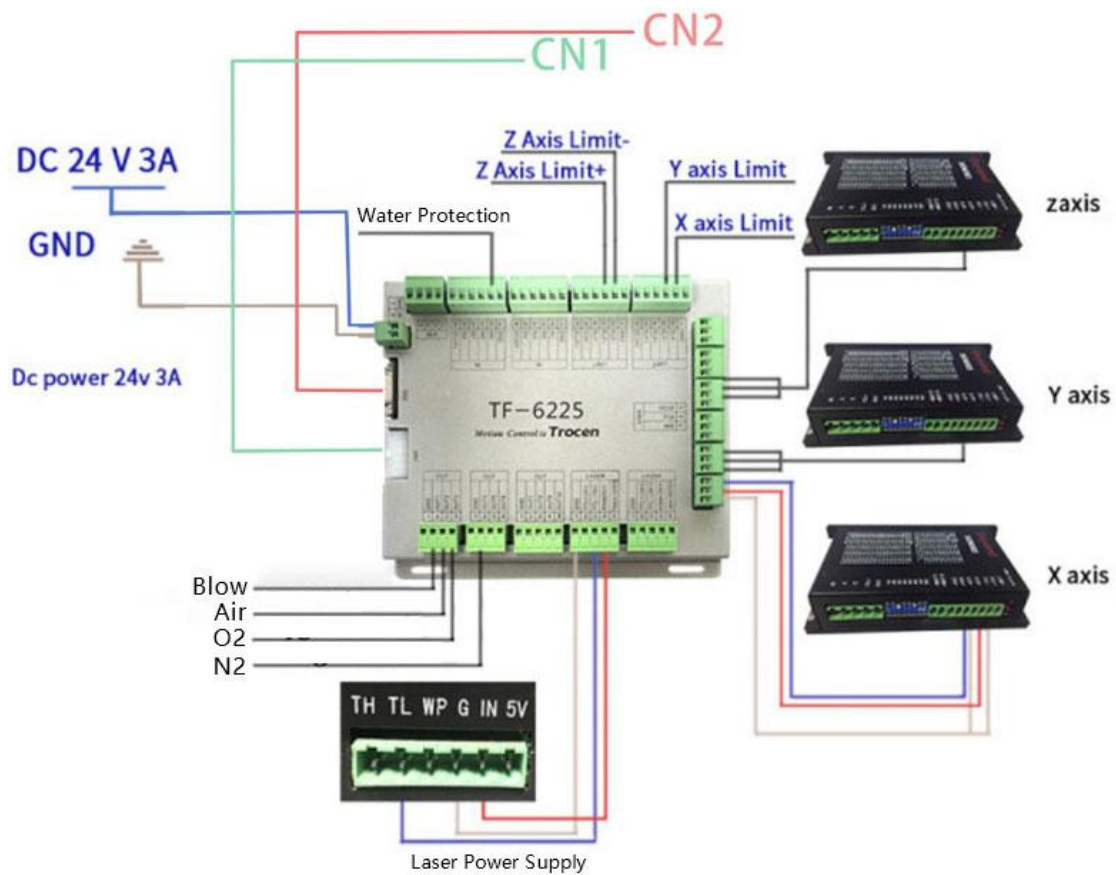
- Figure 3-1-1 shows the diagram of ordinary glass tube laser. The diagrams of other kinds of lasers, please refer to the content of Appendix 2.

- Connect the blow control ports to corresponding electromagnetic valves to control blow.

- Connect the axis limit ports to corresponding axis limiters.

- Please refer to the Chapter 1.6.2.6 to know more detail about X/Y/Z/V/W motor driver connection.

3.2 Input Test

On the main page, press【Stop】and press【Menu】two times at the same time, you will see the *Input Test* interface.

Figure3-2-1 Input Test Interface

2018.8.27 10:35			
X-限位	1	IN2	1
X+限位	1	IN3	1
Y-限位	1	IN4	1
Y+限位	1	IN5	1
Z-限位	1	IN6	1
Z+限位	1	IN7	1
V-限位	1	IN8	1
W-限位	1		1
IN1	1	t	1

According to different types of sensors, you could choose metal products

or other shielding objects to close to the sensors in order to detect whether the signals changes, so as to confirm whether the wiring is accurate and effective.

3.3 Set the Origin Point of Machine

Connect machine and wiring board as Figure3-1-1. Power on and observe the motion of axis. If the axis moves random, please press 【Stop】 at once. Check your installation and wiring of limiters, if no mistake, then modify the direction of origin point and reset machine.

On the main page, press【Stop】and【Shift】at the same time to enter the *Manufacture Parameters Settings* page. Users could set axis parameters (Datum direction/Key direction/Limit Polarity and so on) on the *Axis Parameters* page.

Figure3-3-1 Axis Parameters Interface

X Axis Parameters	2018.8.27 10:35
➡ Distance Per Pulse (um) ...	06.500000
Valid Pulse Edge	Failling Edge
Datum Direction	Negative
Key Direction	Negative
Limit Polarity	Negative
Range (mm)	00500
Start Speed (mm/s)	15.0
Max Acc (mm/s2)	10000
Max Speed (mm/s)	0500.0

Reset the machine, and observe the motion direction of axis again. Before start, please make sure to enable the axis auto reset function. Detail settings refer to Chapter 7.4.

3.4 Key Direction

On the main page, press【↑】【↓】【←】【→】to move motion axis, and check whether the motion direction is the same as key direction. If not, please modify the【Key Direction】on the axis parameters page.

3.5 Distance Per Pulse

Distance per pulse refers to the actual distance of motion axis for each pulse instruction sent by the controller. The calculation is as below and take X axis as example.

1. Open the【XY AutoReset】function, and reset machine, then mark the current position of laser head with A.

2. On the main page, press【Menu】and enter the *Jog Control* page. Set the【Jog Distance】to 200mm as example. Then press【Enter】to save your modification. If you did not set the【Range】on *Axis Parameters* page, please do not set the【Jog Distance】value too large.

3. On the *Jog Control* page, move cursor to【X/Y Jog】, then press direction key (【←】/【→】) one time to make the laser head move a jog distance on the X direction. Mark the current position of laser head with B.

4. Measure the distance between A and B, then input the value into 【Actual Length】.

5. On the main page, press【Stop】+【Shift】at the same time to open the *Manufacture Params Settings* page. Then move cursor to【Axis Parameters】option and press【Enter】. Then open the *X Axis Parameters* page and move cursor to【Distance Per Pulse】, press 【Enter】. Input 200mm into【Expected Length】and input the distance between A and B into【Actual Length】. Then press【Enter】, the distance per pulse of X axis will be calculated.

6. The calculation methods of other axis are the same as X axis.

⚠	When the pulse distance value of any axis is close to or less than 1, the pulse distance can't be adjusted and is always 1. Users need to adjust pulse of motor driver first, then measure the distance per pulse again. The recommended pulse distance value is 5 or more.

3.6 Hard Limit and Range

On the main page, press【Stop】+【Shift】at the same time to open the *Manufacture Params Settings* page. Then move cursor to【HardLimit Settings】and press【Enter】, users can enable or disable the hard limit parameters. TF-6225 supports range function, so users do not need to install hard limit sensors, just need to set the【Range】parameters on the relevant axis parameters page.

Set the distance per pulse of X/Y/Z/v/W axis according to the content of

the Chapter 3.5. Then move motion axis to the maximum distance towards positive direction. You can set the coordinate value on the panel as 【Range】.

3.7 Floating Head Calibration

The purpose of floating head calibration is to measure the capacitance and position relationship between floating head and plates. The float must be calibrated before cutting, otherwise the machine cannot start to work. During calibration process, it is necessary to ensure that the z-axis travel distance is greater than 20mm, otherwise, the calibration will fail.

Please refer to the Chapter 6.3.4 of this manual for detail operation of floating head calibration.

Before floating head calibration, please confirm that the distance per pulse of Z axis has been accurately input. If the distance per pulse is wrong, the calibration may fail.

4. Main Interface Preview

Figure4-1 Main Interface
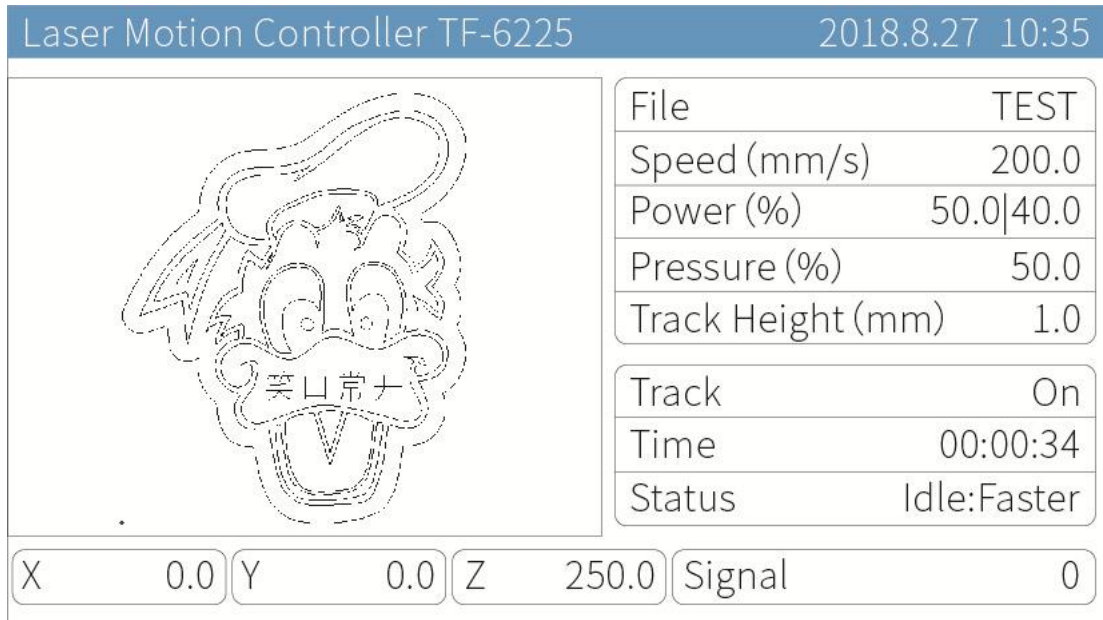
	Speed/Power/Time/Status: Work: Working parameters; Idle: Laser power.

Table4-1 Main Interface Introduce

Name	Instruction
Top Bar	Display the type of control card, local date and time.
File	Display the file name currently being processed.
Speed (mm/s)	Displays the work speed of this current file (Related to work state).

Power (%)	Power when cutting materials (Related to work state).
Pressure (%)	Pressure when cutting materials (Related to work state).
Track Height (mm)	The distance between cutting head and material.
Track	Switch state by function key 【Follow ON/OFF】: Cutting metal materials —— ON; Cutting non-metal materials —— OFF.
Time	Display how long the machine has been working.
Status	Display the work state of machine, Work, Idle or Pause. The processing progress of the graphics will be displayed as percentage at the state of working.
X/Y/Z	The X/Y/Z axis coordinate of working machine.
Signal	The strength of copper plate signal that amplifier detected and the normal value is about 70,000: Normal: The last two numbers change in the value; Abnormal: The first two numbers change in the value; Zero: When the value becomes zero, it means the equipment damage, etc.

5. Main Page Function Introduction

5.1 File

5.1.1 Document Params Settings

On the main page, press【Enter】to make the file name highlighted as shown below. Then press【Enter】to open *Document Params Settings* interface.

Figure5-1-1 Select File Name
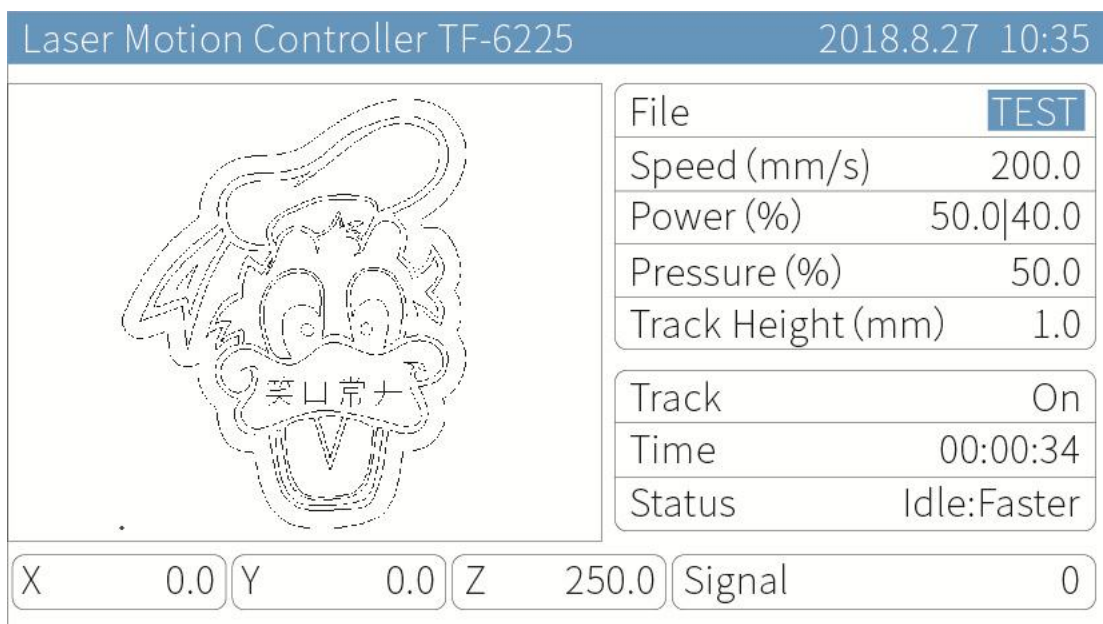
Figure5-1-2 Document Params Settings
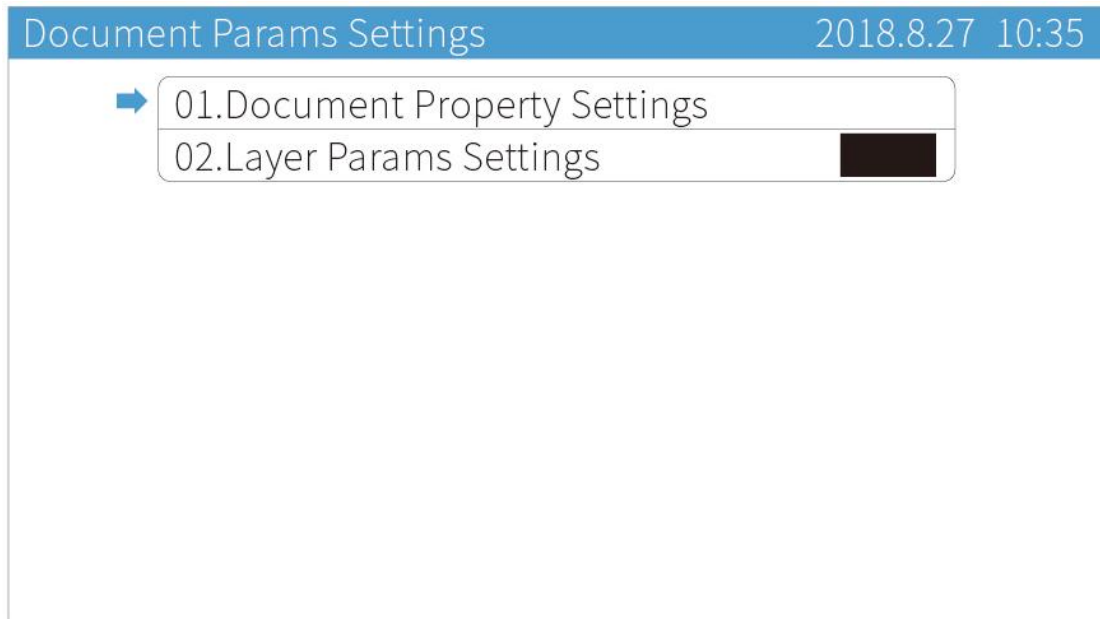
Move the cursor to【Document Property Settings】, press【Enter】. Press direction keys to move cursor, press number keys to modify parameters, and press【Enter】to save settings.

Figure5-1-3 Set Document Property
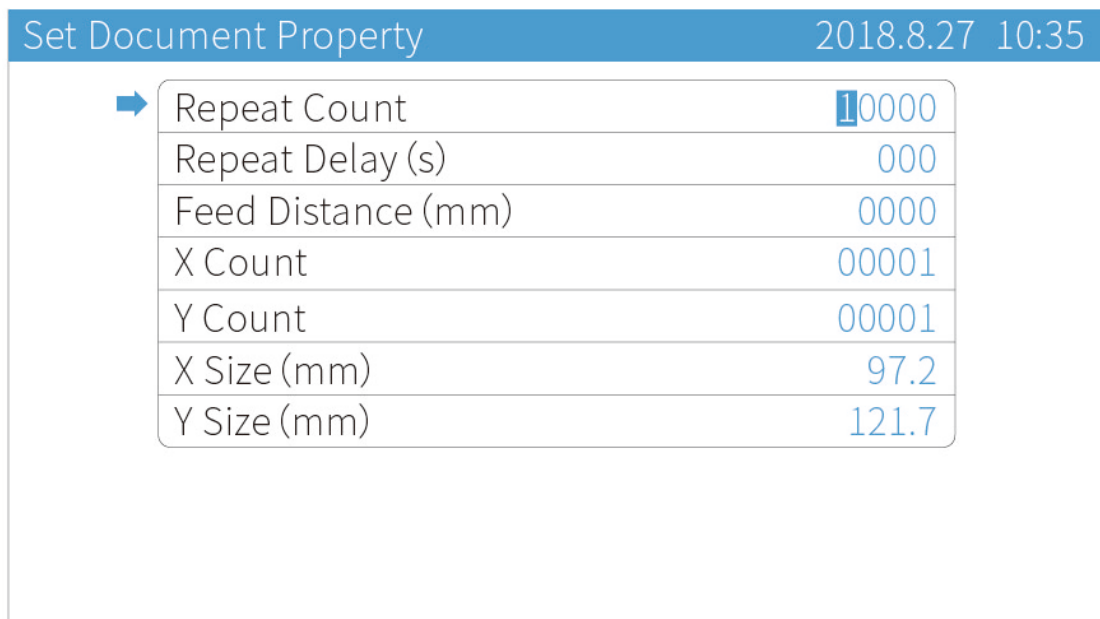
Table5-1-1 Set Document Property Instruction

Name	Instruction
Repeat Count	Machine repeat working times.
Repeat Delay (s)	The interval between the initial file being finished and the next one of the same.
Feed Distance (mm)	Distance of each movement of the feeding axis.
X Count	The number of graphics s processed by machine in the X direction.
Y Count	The number of graphics s processed by machine in the Y direction.
X Size (mm)	The size of graphics in X direction.
Y Size (mm)	The size of graphics in Y direction.

5.1.2 Layer Params Settings

On the **Document Params Settings** page, move cursor to 【Layer Params Settings】 and press 【Enter】. On the **Layer Params Settings** page, press direction keys to move cursor, press number keys to modify parameters, press 【Enter】 to save settings.

During cutting current layer, if the cutting lines are uneven (different cutting depth), the maximum and minimum power of the laser head shall be adjusted to ensure the best cutting effect. If the maximum and minimum power is set too high, the cutting material may be damaged. If set too low, may cause incomplete cutting. Users could set appropriate maximum and minimum power values according to different cutting materials.

Figure5-1-4 Layer Params Setting
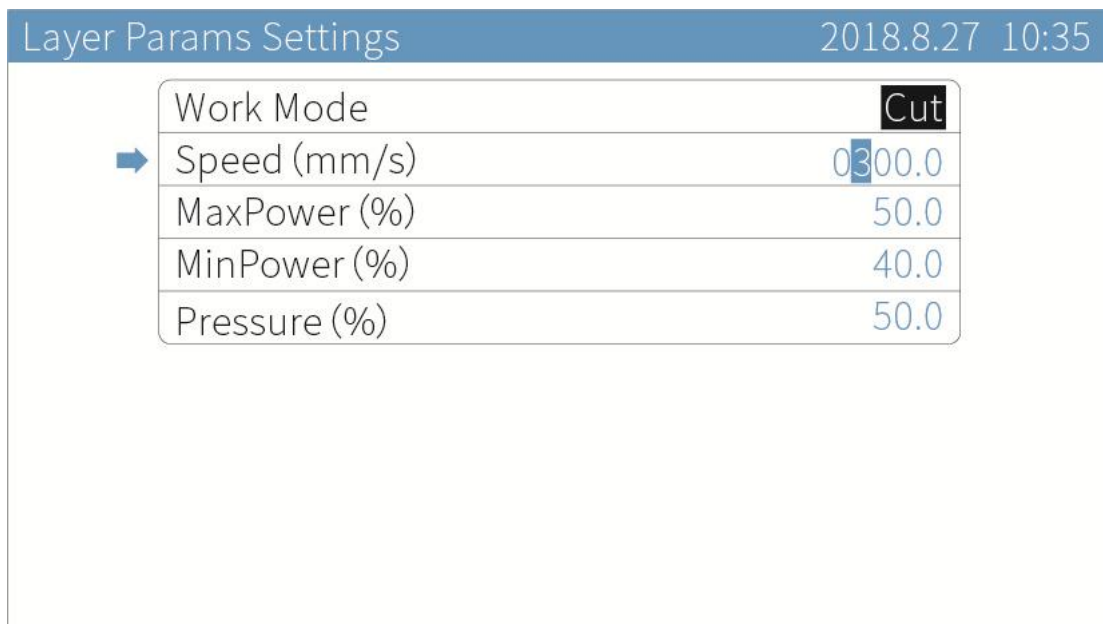
Table5-1-2 Layer Params Setting Instruction

Name	Instruction
Work Mode	The mode of processing graphics.
Speed (mm/s)	The speed of processing graphics.
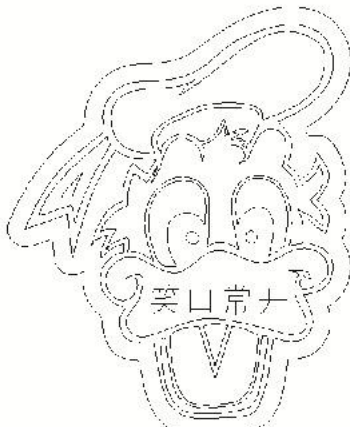
Max Power (%)	The max power of laser head (working power).
Min Power (%)	The min power of laser head (turning power).
Pressure (%)	Blowing pressure value of processing graphics.

5.2 Working Property

On the main page, press【Enter】to make the cursor highlighted and move

cursor to【Speed】. Press【Enter】to open *Set Laser Power While Idle*

page.

Figure5-2-1 Select Speed Option

Press direction keys to move cursor, press number keys to modify parameters, and press【Enter】to save settings.

Fiugre5-2-2 Idle Laser Power Setting Page

Table5-2-1 Idle Laser Power Instruction

Name	Instruction
Speed	The working speed of machine.
Max Power (%)	Laser power.
Track Height (mm)	The distance between cutting head and material.

6. System Menu

6.1 U Disk Files

Insert a U disk into the U disk slot on the panel. If your U disk has a "light indicator" (shows connectivity) and shows that it's connected, press 【Menu】 to enter the main menu, move the cursor to 【U Disk Files】 then press 【Enter】 to enter U disk files management.

Figure6-1-1 Main Menu Interface
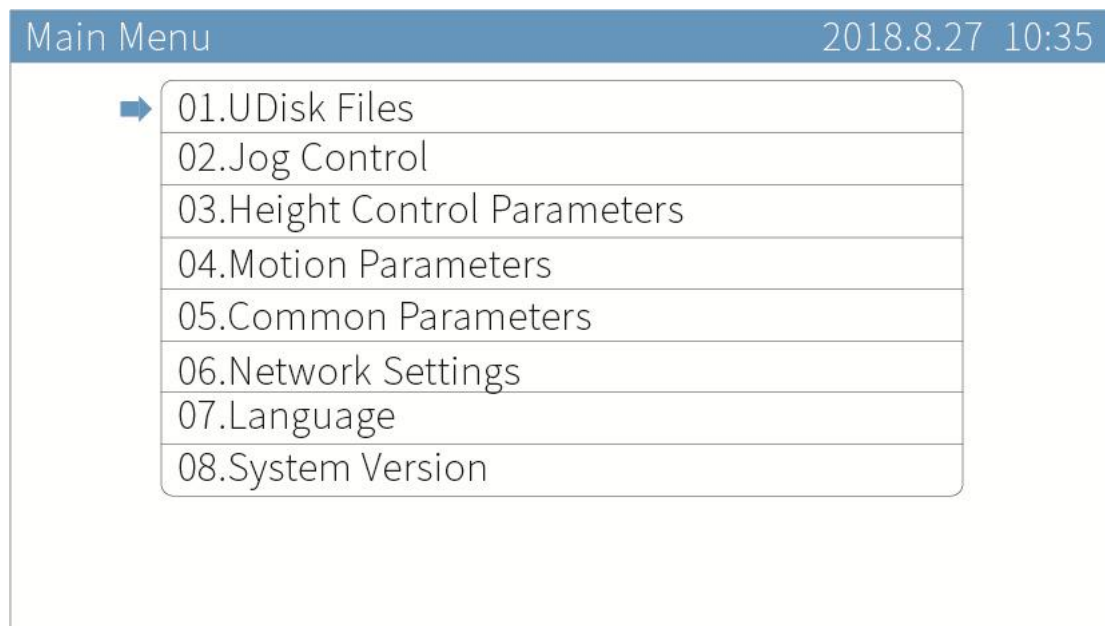
Figure6-1-2 U Disk Files
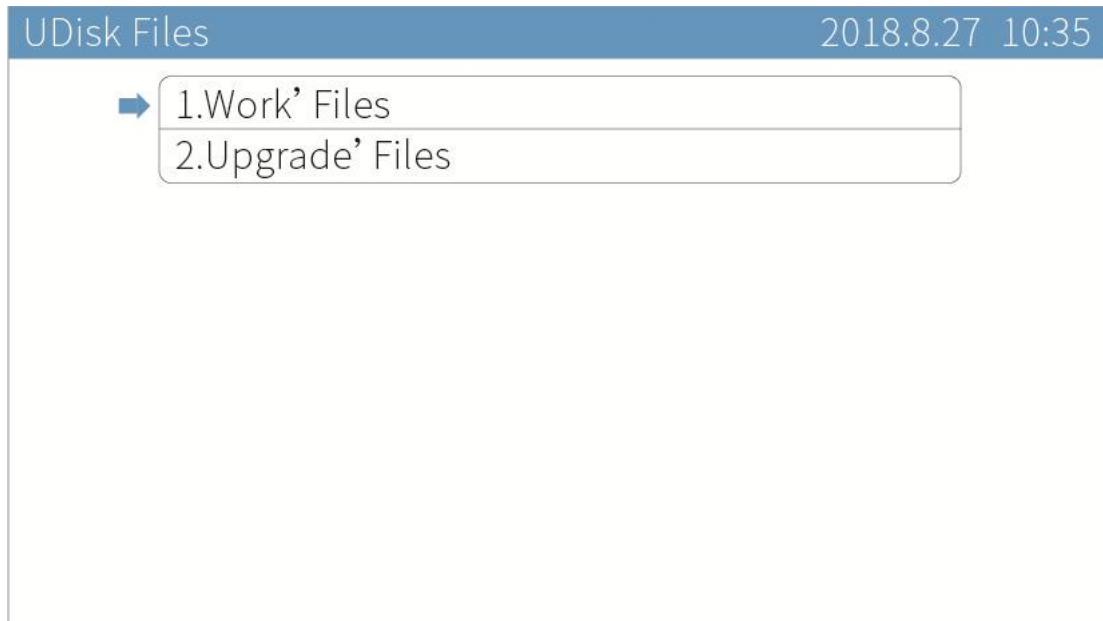
	① The U disk must be formatted to FAT32 File system in advance. Quick Format is forbidden. Any other files formations are not supported.
	② Recommend using a U disk with a "light indicator" to ensure if the U disk is connected successfully with the main board
	③ When the U disk has never been able to read, try using a different U disk.
	④ The U disk can't be used to install system.

If the U disk can't be read, you will see the interface below.

Figure6-1-3 No U Disk Interface

6.1.1 Work Files

Move the cursor to【Work Files】and press【Enter】. On the panel, the working file in the U disk will be presented. The right side shows the working file previewing. Press 【↑】【↓】 to move cursor and press 【Enter】to copy the working file from U disk to main board storage.
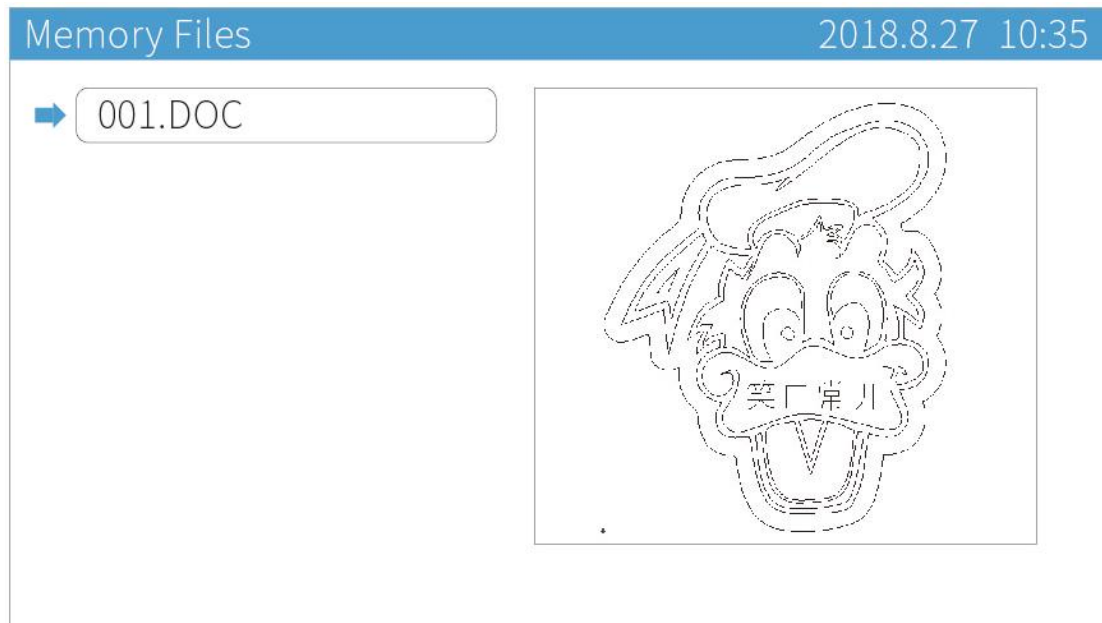
⚠️	The working file in the U disk is saved with a suffix of UD5. Files other than the ".UD5" file extension will not readable.

6.1.2 Upgrade Files

Move cursor to【Upgrade Files】and press【Enter】. Move the cursor to the file you need, press【Enter】then it will start the upgrading process.

Figure6-1-5 Upgrade Files
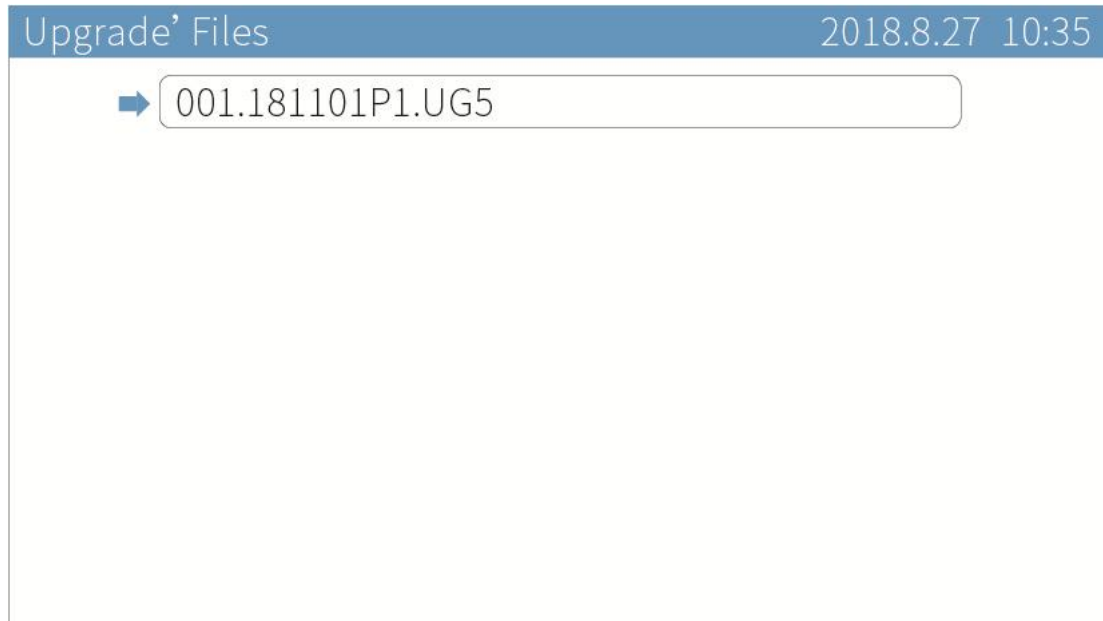
⚠	Don't turn off the power during upgrade, otherwise it will cause damage to the mainboard. The upgrade will take about 30s. After finishing upgrade, the mainboard will reset automatically.

6.2 Jog Control

On the main page, press【Menu】, move cursor to【Jog Control】and press 【Enter】to enter *Jog Control* page. Then press number keys to modify

the distance. Do not set too large【Jog Distance】, please make sure it within the working range.

On the *Jog Control* page, press number keys to modify the jog distance, press【Z↑】【Z↓】to move cursor, press direction keys【↑】【↓】【←】【→】to make motion axis jog.

The jog control can move axis accurately and adjust the distance per pulse of axis. Please check the Chapter 3.5 to know more about distance per pulse.

Fiugre6-2-1 Jog Control Interface
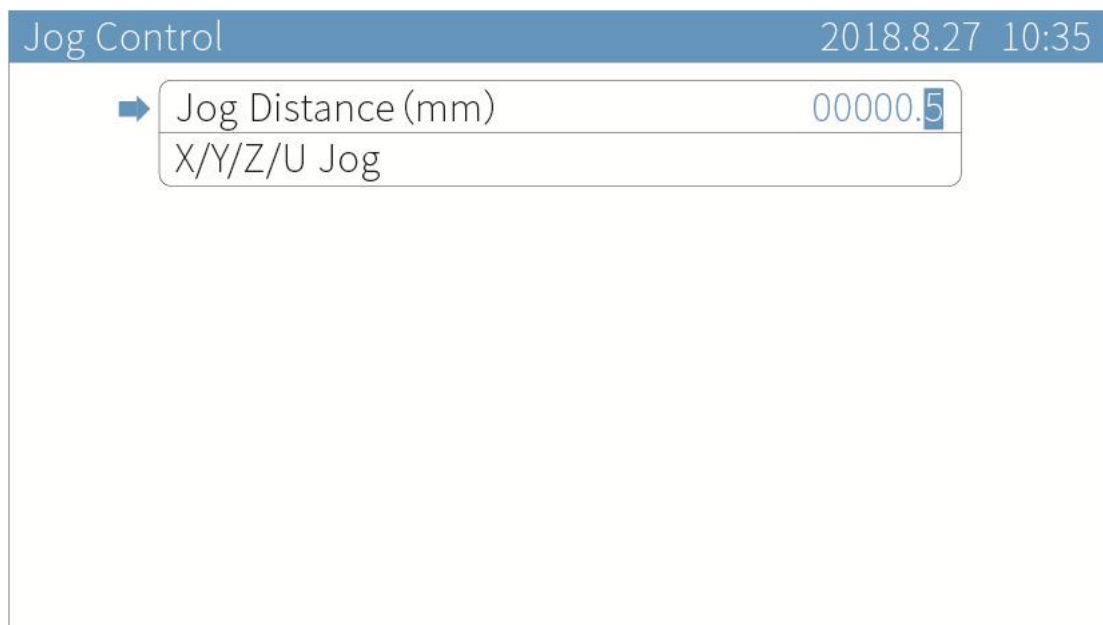
6.3 Height Control Parameters

On the main page, press【Menu】and move cursor to【Height Control Parameters】. Press【Enter】. Move cursor to【Technological Parameters】and press【Enter】to open *Height Control Parameters* page. On the main

page, press number key【1】, you can open the **Height Control**
Parameters page directly.

Figure6-3-1 Height Control Parameters

Height Control Parameters   2018.8.27 10:35

➡ 01.Technological Parameters
02.Normal Configuration Parameters
03.Z-Axis Motion Parameters
04.Floating head Calibration(No Calibrated)
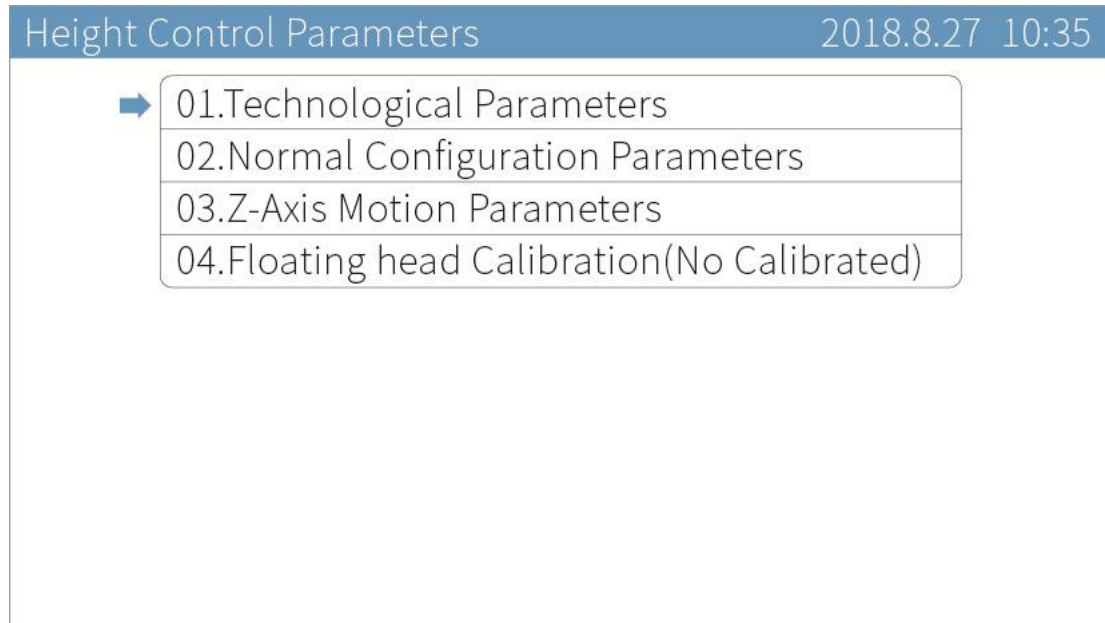
6.3.1 Technological Parameters

Press direction keys to move cursor, press number keys to modify parameters and press【Enter】to save settings.

Figure6-3-2 Technological Parameters Setting

```
Technological Parameters          2018.8.27  10:35
  ➡ Gas                                        Air
    Punch Power(%)                            80.0
    Punch Pressure(%)                         80.0
    Punch time-delay(ms)                      0100
    Punch height(mm)                          002.5
    Waiting height(mm)                        015.0
```

Table6-3-1 Technological Parameters Instruction

Name	Instruction
Gas	According to need, users can choose Air, O2 or N2.
Punch Power (%)	The power of punching the steel plate.
Punch Pressure (%)	The pressure of punching the steel plate.
Punch Time-delay (ms)	It will take some time to wait for light out when punching. The time is lower, and the speed of punch is faster.
Punch Height (mm)	The laser head drops to the tracking height at a certain point, slowing down with a punch time-delay.

Waiting Height (mm)	The distance that laser head rises to a point after cutting a complete graphics.

6.3.2 Normal Configuration Parameters

On the【Height Control Parameters】page, move cursor to【Normal Configuration Parameters】, press【Enter】. Then press direction keys to move cursor, press【←】【→】to modify options, press number keys to modify parameters, and press【Enter】to save settings.

Figure6-3-3 Normal Configuration Parameters Interface

Normal Configuration Parameters	2018.8.27 10:35
➡ Sensitive level	1-Level(Maximum)
Sticking Plate Time-Delay(ms)	0200
Close-Blow-Distance(mm)	0010.0

Table6-3-2 Normal Configuration Parameters Instruction

Name	Instruction
Sensitive Level	The sensitivity of detecting steel plate: The first level is the highest, the fourth level is the lowest. Overtop：The laser head rises frequently, and the panel displays sticking plate signal with alarm. Low over：The laser head doesn't rise. You can modify the level according to need.
Sticking Plate Time-Delay (ms)	Too short：The laser head rise immediately. Too Long：The laser head doesn't rise. You can modify the time according to need, we suggest 200 - 300ms.
Close-Blow-Distance (mm)	After the laser head completes cutting, it will go an idle distance, then turn off the air.

6.3.3 Z-Axis Motion Parameters

On the【Height Control Parameters】page, move cursor to 【Z-Axis Motion Parameters】and press【Enter】. Then press direction keys to move cursor, press number keys to modify parameters, and press【Enter】to save setting.

Figure6-3-4 Z-Axis Motion Parameters Interface

Table6-3-3 Z-Axis Motion Parameters Instruction

Name	Instruction
Tracking Speed (mm/s)	The speed of tracking rising and falling.
Up speed(mm/s)	The rising speed of laser head.
Start Speed (mm/s)	The initial speed of a laser head from rest to motion.
Min Accel (mm/s2)	The minimum acceleration value of the motion axis when it increases or decreases speed in units of 50 or 100 at a time.
Max Accel	The maximum acceleration value of the motion axis when it

(mm/s2)	increases or decreases speed in units of 500 at a time (under normal circumstances the factory default value can work well, also it can be modified according to your need).
Jerk (10000mm/s3)	The change of acceleration increases or decreases in units of 10000 at a time.

6.3.4 Floating Head Calibration

Before cutting, you must do floating head calibration. During calibration, the calibration distance must be more than 20mm. Otherwise, the calibration will fail.

On the【Height Control Parameters】page, move cursor to【Floating Head Calibration】and press【Enter】to calibrate.

Figure6-3-5 Calibrating
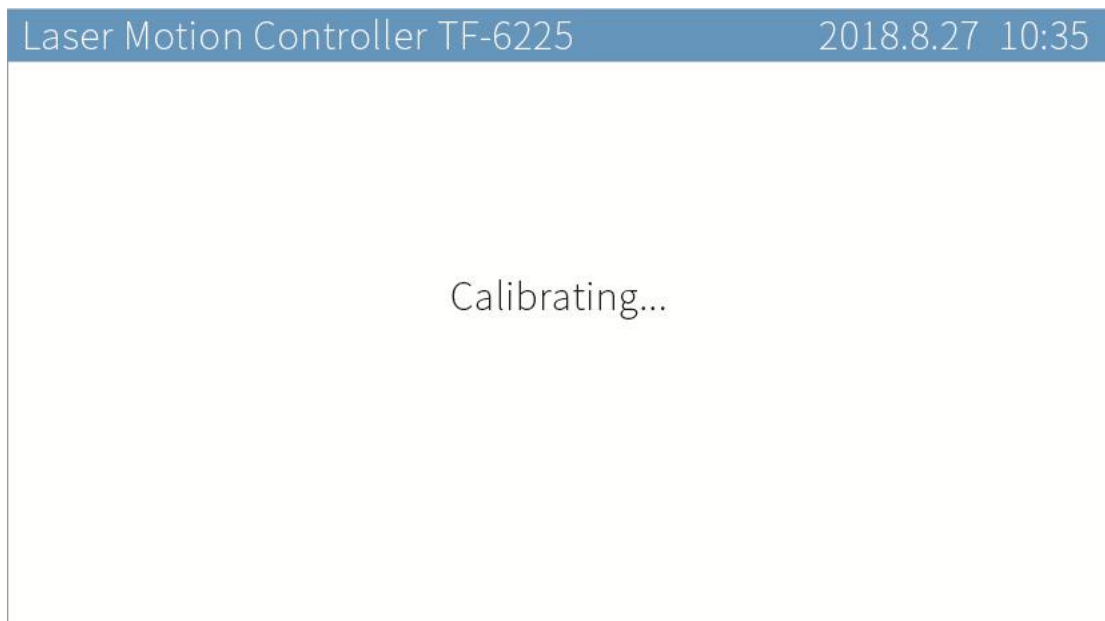
Figure6-3-6 Calibrate OK

Figure6-3-7 Calibrate Fail

6.4 Motion Parameters Settings

On the main page, press【Menu】and move cursor to【Motion Parameters Settings】, press【Enter】to enter *Motion Parameters Settings* page. Press direction keys to move cursor and press number keys to modify parameters, press【Enter】to save settings.

Fiugre6-4-1 Motion Parameters Settings Interface

The settings of these parameter items will affect the cutting effect, please adjust according to your requirements.

Table6-4-1 Motion Parameters Instruction

Name	Instruction
Space Speed (mm/s)	The movement speed of laser head when there is no laser output.
Cut Jerk	The variation of cutting acc increases or decreases in unit of 10

(mm/s3)	thousand each time.
Space Jerk (mm/s3)	The variation of movement acc when there is no laser output and it increases or decreases in unit of 10 thousand each time.
Min Acc (mm/s2)	The acceleration of laser head when it turns and this value increases or decreases in unit of 50 or 100 each time.
Engrave Acc (mm/s2)	The variation of engraving speed and it is only effective to engrave.
Start Speed (mm/s)	The initial speed of laser head from rest to motion.
Speed Factor	Parameter changes throughout the system. We suggest that lower speed is going to be filled in with 0.5 or 1, while regular speed with 2 and high speed with 3 or 4. This option should be filled in with 0.05 when cutting acrylic or wood. It also has an impact on smoothness when turning.

During cutting process, if the actual cutting speed is far less than the working speed users have set, it indicates that the【Cut Jerk】is set too small, so that the laser head cannot reach the set working speed quickly. If the actual cutting speed is relatively fast, the cutting line will jitter, this case indicates that the【Cut Jerk】is set too high and the parameter value should be reduced. In the same way, if the【Space Jerk】is set too small, the speed of laser head will not reach the set speed when there is no

laser output. If the parameter is set too large, the initial position of cutting (after the laser head moving without laser) will jitter.

The start speed is the initial speed of the laser head from rest to start movement. If the cutting line is too thick at the initial position of cutting, it indicates that the parameter value is too small. If the line jitters at the initial position of cutting, this parameter value is set too large.

The speed factor controls the speed of turning during cutting. If the cutting line is too thick when turning, the parameter is too small. If the cutting line is too thin when turning and the graphics cannot be cut completely, this case indicates that this parameter value is set too large, users should set a smaller value.

The 【Engrave ACC】 is the change rate of speed during engraving. This parameter is only valid during engraving. During the engraving process, if the space distance of laser head is too large, then the 【Engrave ACC】 is set too small and should be adjusted appropriately. If the space distance of laser head is too small and the edge of graphics is not carved completely, it indicates that the【Engrave ACC】is set too large and should be reduced appropriately.
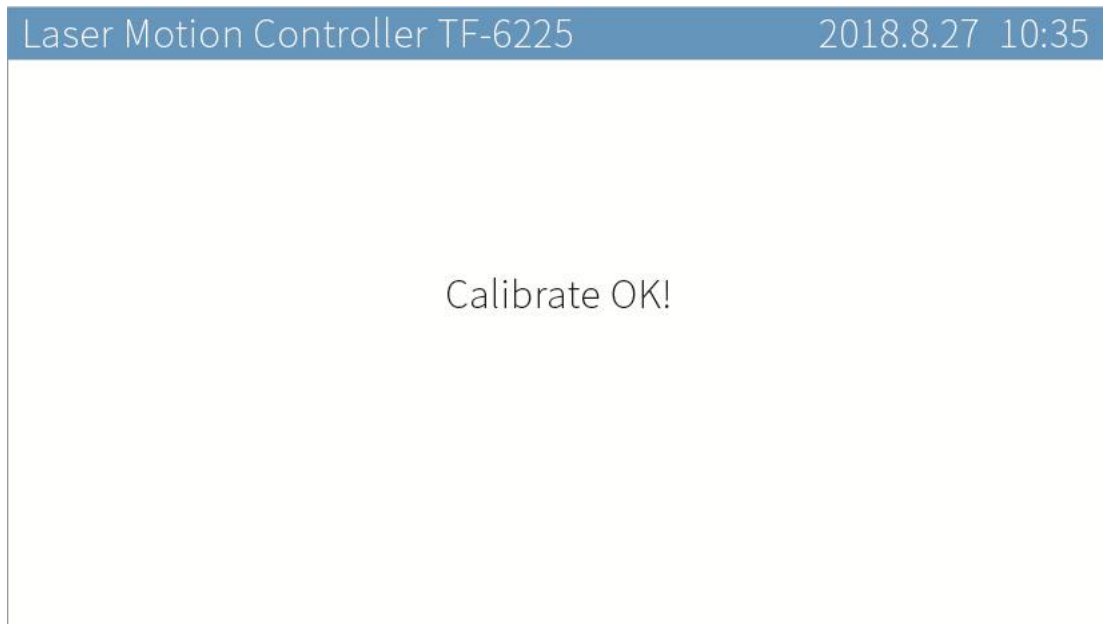
6.5 Common Parameters Settings

On the main page, press【Menu】and move cursor to【Common Parameters Settings】, press【Enter】.

Fiugre6-5 Common Parameters Settings Interface

Common Params Setting	2018.8.27 10:35
➡ 01.Work Mode	
02.Common Parameters	
03.Axis Speed parameters	
04.Rotate Engraving&Cutting	
05.CCD Config	
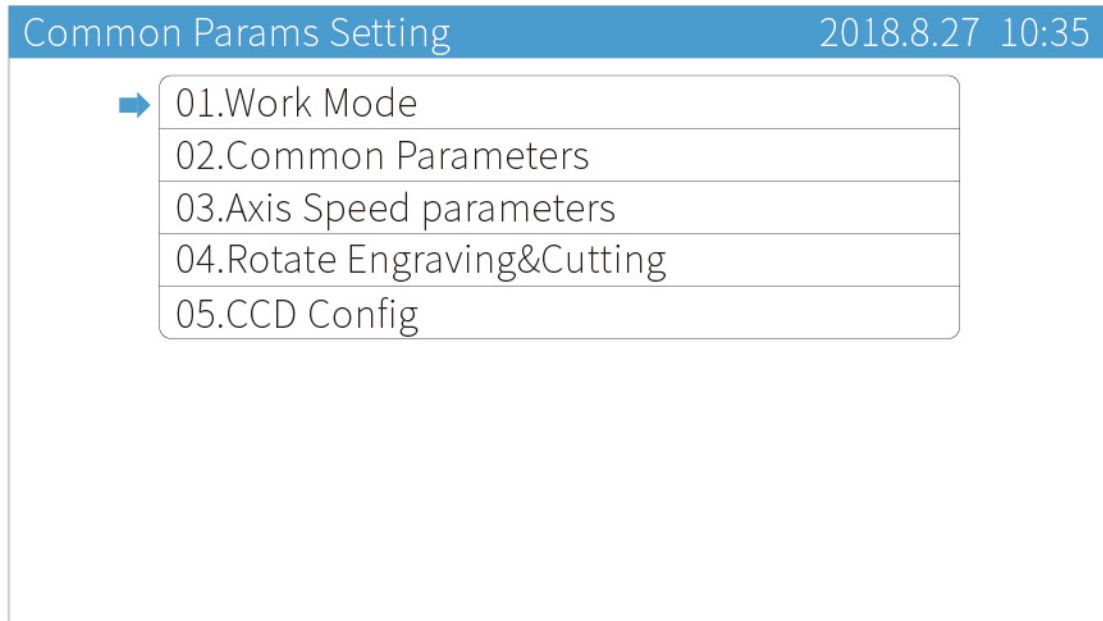
6.5.1 Work Mode

On the **Common Params Settings** page, move cursor to【Work Mode】 and press【Enter】. Press direction keys to move cursor, press【←】【→】 to modify options and press【Enter】to save settings.

Fiugre6-5-1 Common Parameters Settings Interface
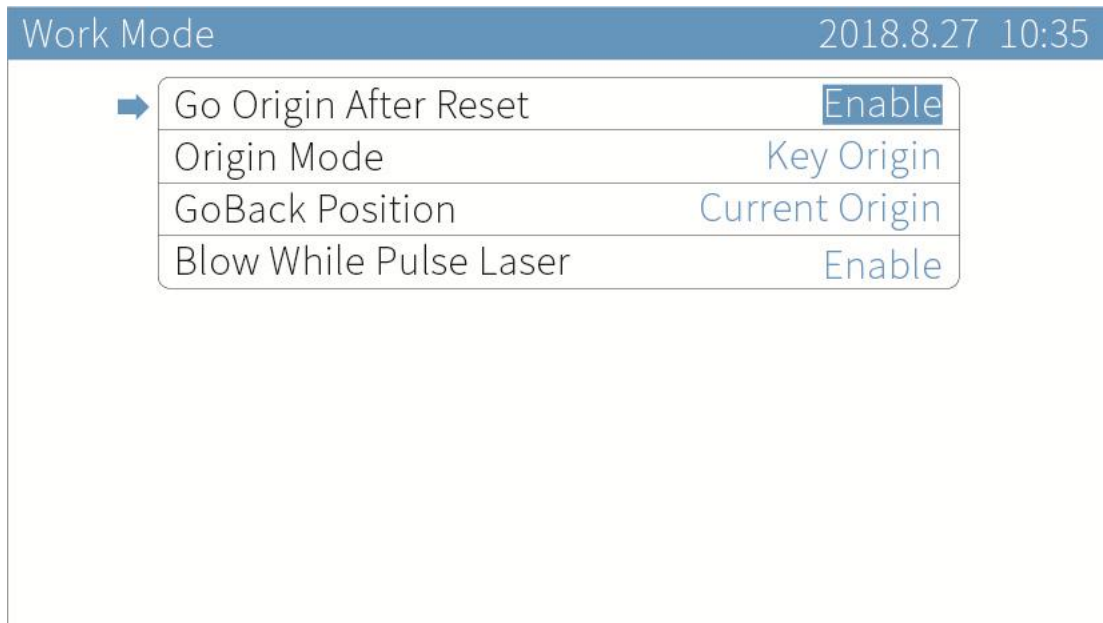
Table6-5-1 Work Mode Instruction

Name	Instruction
Go Origin After Reset	**Enable**: the laser head will be back to Origin after resetting. **Disable**: the laser head will stay at the machine origin point (zero point) after reset.
Origin Mode	**Current Position**: keep the current position of laser head and set this position as origin point to start cutting. **Key Origin**: press panel【Origin】button after the laser head moved to the chosen position. **Soft Origin**: set the origin point when drawing a file on LaserCAD software. **Machine Zero As Origin**：set the machine zero point as

	origin point.
Go Back Position	**Current Position**: laser head will stay at where task finished. **Current Origin**: go back to Origin point after finishing work. **Zero Coord**: laser head goes back to machine zero point since all finished.
Blow While Pulse Laser	Enable or disable the function.

6.5.2 Common Parameters

On the **Common Params Settings** page, move cursor to【Common Parameters】and press【Enter】. Press direction keys to move cursor and press number keys to modify parameters, press【Enter】to save settings.

Fiugre6-5-2 Common Parameters Interface

Table6-5-2 Common Parameters Instruction

Name	Instruction
Auto Focus Distance (mm)	The distance between the laser head and working platform.
Key Move Speed (mm/s)	The motion speed of axis when press the direction keys on panel.
Run Box Speed (mm/s)	The speed at which the laser head runs along the outer frame of graphics without laser output.
Cut Box Speed (mm/s)	The speed at which the laser head cuts along the outer frame of graphics.
Blow Open Delay(s)	The period between laser head optical output and air blowing started.
Blow Close Delay(s)	The period between laser head optical output stopped and air blowing stopped.

6.5.3 Axis Speed Parameters

On the **Common Params Settings** page, move cursor to【Axis Speed Parameters】and press【Enter】. Press direction keys to move cursor and press number keys to modify parameters, press【Enter】to save settings.

Fiugre6-5-3 Axis Speed Parameters Interface
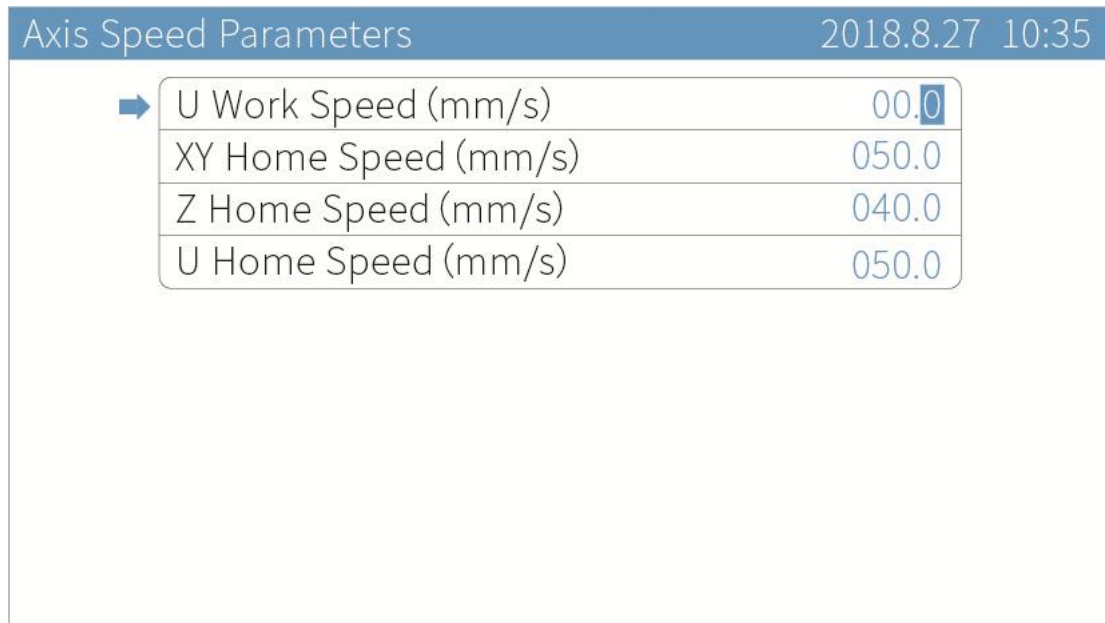
Table6-5-3 Axis Speed Parameters Instruction

Name	Instruction
U Work Speed (mm/s)	The work speed of U axis.
XY Home Speed (mm/s)	The reset speed of XY axis.
Z Home Speed (mm/s)	The reset speed of Z axis.
U Home Speed (mm/s)	The reset speed of U axis.

6.5.4 Rotate Engraving & Cutting

On the **Common Params Settings** page, move cursor to【Rotate Engraving & Cutting】and press【Enter】. Press direction keys to move cursor, press【←】【→】to modify options and press number keys to modify parameters, press【Enter】to save settings.

Fiugre6-5-4 Rotate Engraving & Cutting Interface

Rotate Engraving&Cutting	2018.8.27 10:35
➡ Rotary	Disable
Rotary Axis	X
Pulse Count Per Rotate	010000
Current Diameter(mm)	100.0
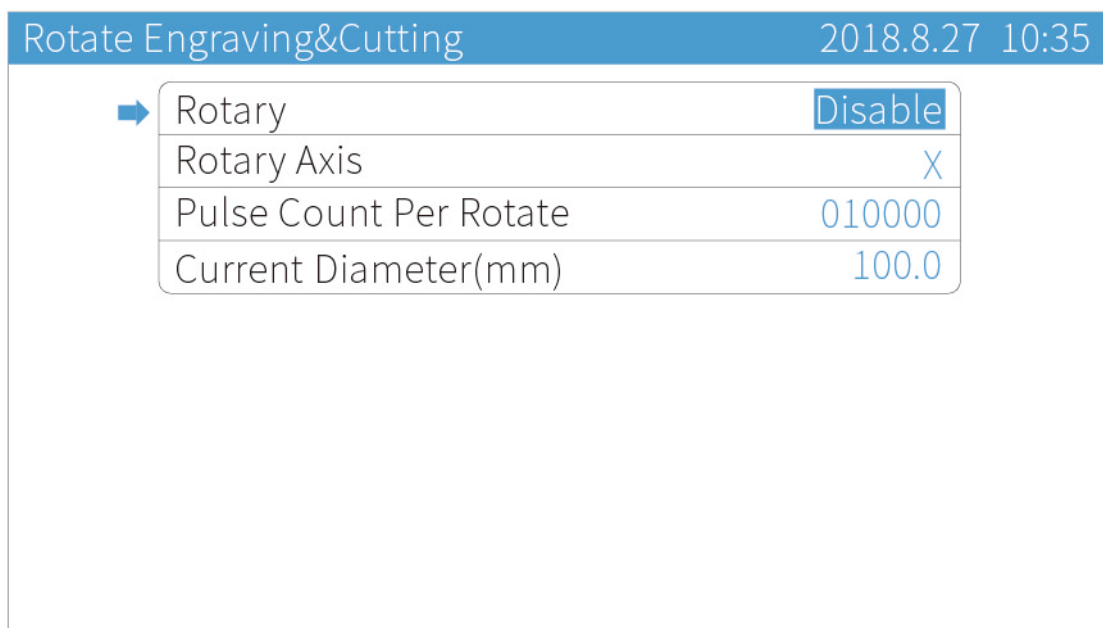
Table6-5-4 Rotate Engraving & Cutting Instruction

Name	Instruction
Rotary	Enable or Disable rotary engraving function.
Rotary Axis	The axis which rotary engraving uses.
Pulse Count Per Rotate	The pulse parameters for the motor to make the rotary axis rotate one circle.

Current Diameter (mm)	The diameter of the material being processed.

After enable the【Rotary】function, reset the machine, the panel prompts "Rotary is Enabled!". If the current machine does not support the rotate engraving function, the distance per pulse of rotary axis will change, and the machine cannot cut the graphics normally. After turning off the function, reset the machine again, users do not need to set axis parameters (like distance per pulse) the machine can work normally.

Fiugre6-5-5 Enable Rotate Engraving & Cutting Function
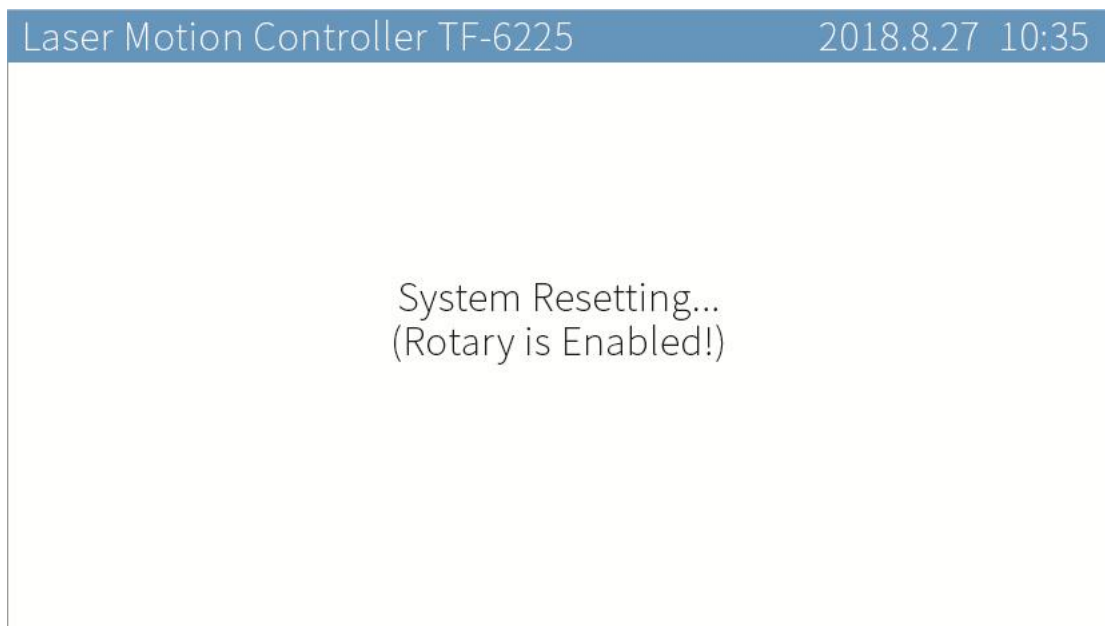
Rotate engraving includes fixture type and roller type, as shown in Figure 6-5-6/6-5-7. The fixture rotate engraving cutting only needs to input the pulse count per rotate and current diameter. The calculation formula of pulse count per rotate is as follows:

Pulse Count per Rotate = Pulse Number of Motor * (Number of Gears in Gear1 / Number of Gears in Gear2)

Figure6-5-6 Fixture Rotate Engraving

Current diameter=80mm

Pulse Count per Rotate = Pulse Number of Motor * (Number of gears in gear 1 / Number of gears in gear 2)
= 6400　　　　　*　3　　=19200
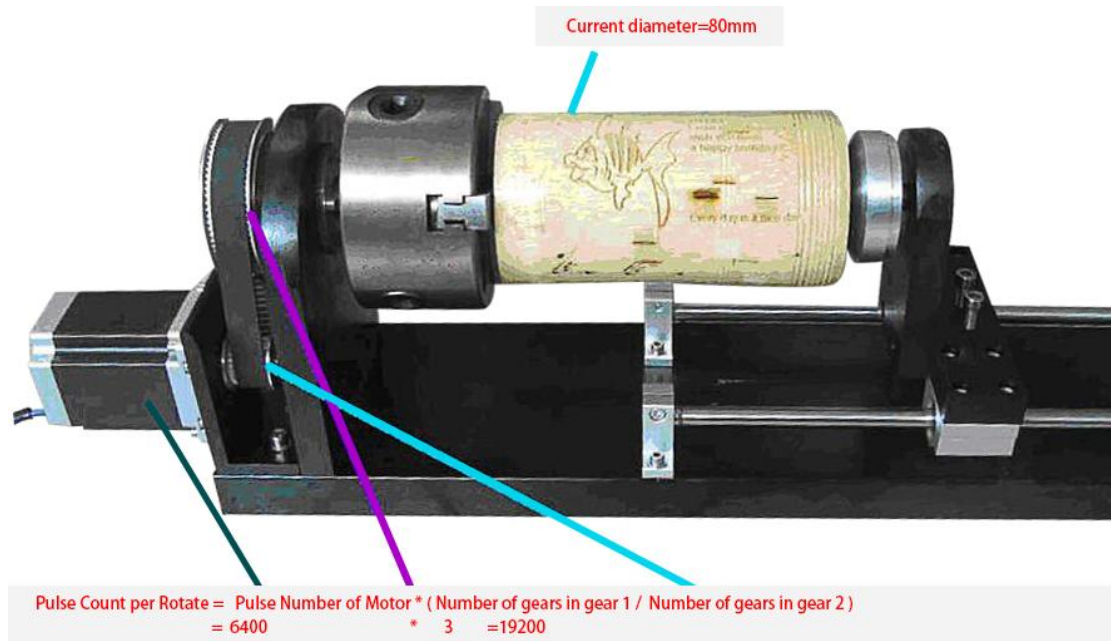
Users should adjust distance per pulse of rotary axis for roller type rotate engraving & cutting (Pulse count per rotate is noneffective). Take X axis as rotary axis as example.

1. Wrap a layer of paper around the roller.

2. In the computer software LaserCAD, draw A straight line section with fixed length as "A" (less than the current cutting object girth).

3. Press【Start/Pause】key to cut the line on the paper.

4. Take the same length of the cut trace along the roller with one wool or other convenient object, and measure the length of this wool segment as "B" accurately with a ruler.

5. Enter the *X Axis Parameters* interface, move the cursor to【Distance

per Pulse】, press【Enter】key to enter the *To Calculate the Pulse Distance* interface, fill A into the【Expected Length】option, fill B into the【Actual Length】option, and click【Enter】key to calculate the distance per pulse of X axis (rotary axis).

Figure6-5-7 Roller Rotate Engraving & Cutting

6.5.5 CCD Config

On the **Common Params Settings** page, move cursor to【CCD Config】and press【Enter】. Press【↑】【↓】to move cursor, press【←】【→】to modify options and press【Enter】to save settings.

Figure6-5-8 CCD Config
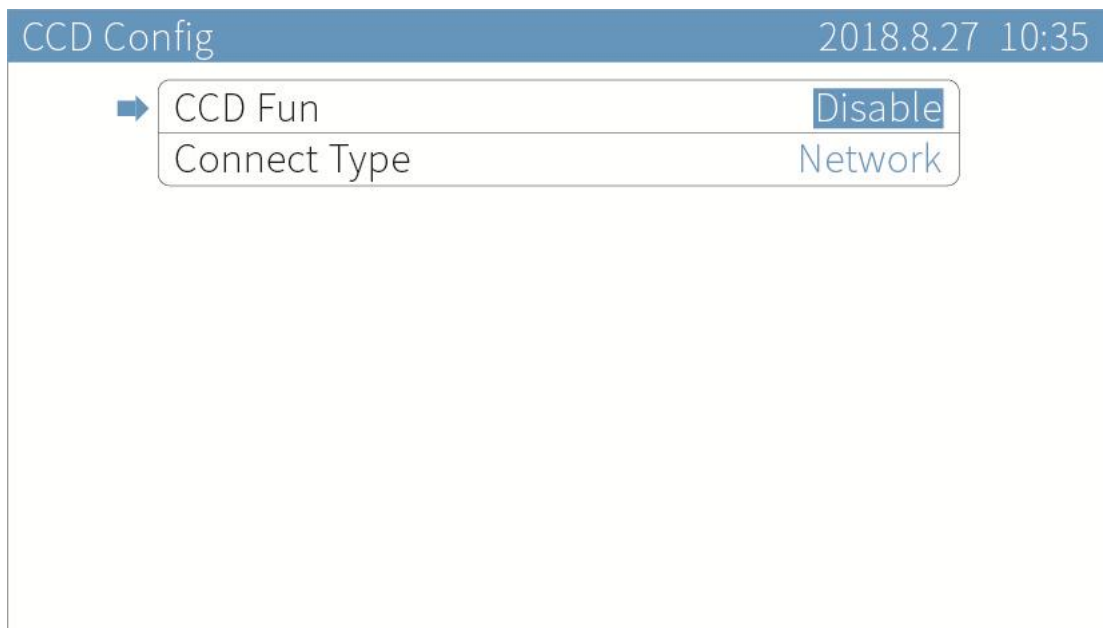
Table6-5-5 CCD Config Instruction

Name	Instruction
CCD Fun	The switch of CCD function.
Connect Type	Set USB or network connection type.

6.6 Network Settings

On the main page, press【Menu】, move cursor to【Network Settings】and press【Enter】. Press direction keys to move cursor, press number keys to modify parameters and press【Enter】to save settings.

Figure6-6-1 Network Settings

The default IP address of mainboard is 192.168.8.8. When connecting the main board and PC terminal through network cable, the computer IP should be modified to make the computer IP address and IP address of the main board in the same network segment. For example, the computer IP address can be set to 192.168.8.28.

Based on the Windows7 system, users can modify the native IP address in the following ways. First, open the Control Panel, select Network and Internet options, and click View Network Status and Tasks. Then, double-click the Local Connection, click the Property button, and

double-click the TCP/IPv4 option to open the IP address modification interface. Finally, input the corresponding IP address, click OK button to save, other parameters do not need to fill in.

Fiugre6-6-2 Modify IP Address
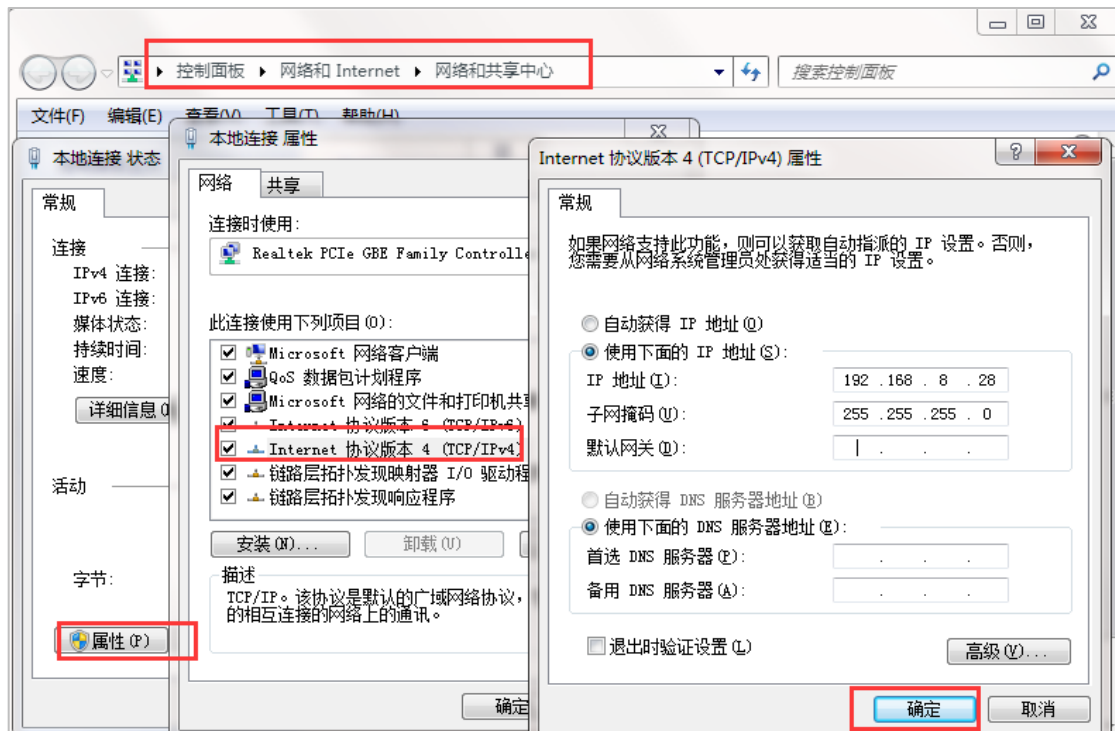
6.7 Language

On the main page, press【Menu】and move cursor to【Language】, press 【Enter】. Press【←】【→】to change language and press【Enter】to save settings. TF-6225 now supports 3 kinds of languages, Simplified Chinese, English and German.

Fiugre6-7-1 Language Interface

```
Language                    2018.8.27  10:35
    ➡ Language                      English
```

6.8 System Version

On the main page, press【Menu】and move cursor to【System Version】, press【Enter】to see the system information.

If the encryption or decryption of the mainboard is successful, the product ID will change.

Fiugre6-8-1 System Version Interface

Move cursor to【User authorization code】and press 【Enter】. Press direction keys to move cursor, press number keys to modify parameters and press 【Enter】to save settings.

The user authorization code is used for encryption or decryption. If you don't need encryption, there is no need to modify it. If you need encryption, please see the detail in encryption manual.

Fiugre6-8-2 User Authorization Code Interface

7. Manufacture Params Settings

On the main page, press【Stop】+【Shift】together, you will see *Manufacture Params Settings* page.

Figure7-1 Manufacture Params Interface
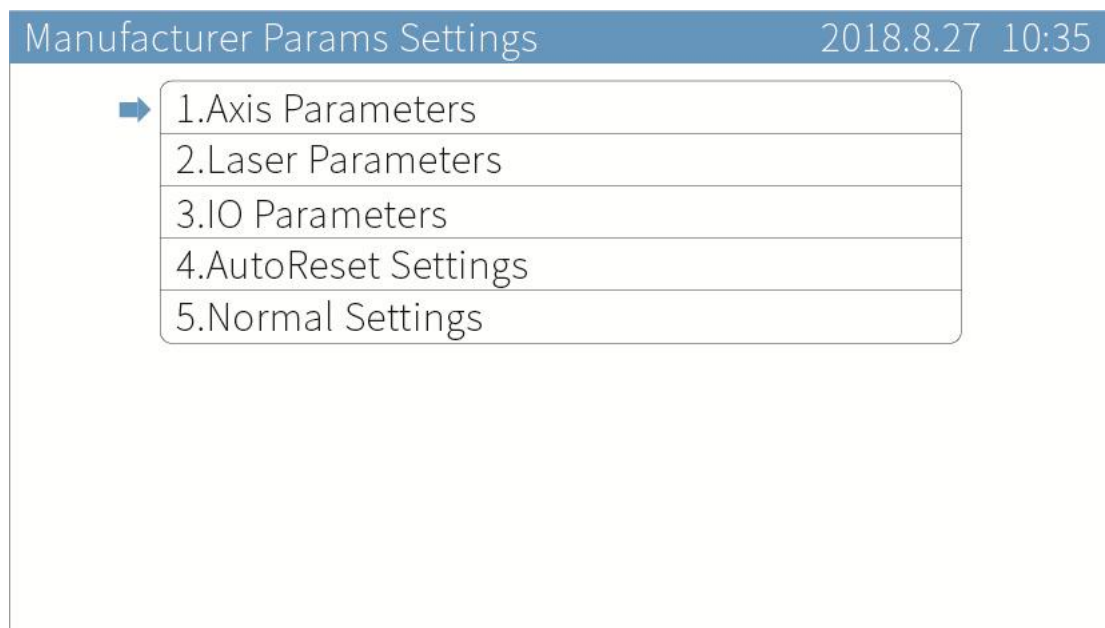
7.1 Axis Parameters

Move cursor to【Axis Parameters】and press【Enter】. Take the X axis parameter setting as an example, other axis parameter settings are the same.

Figure7-1-1 Axis Parameters Interface
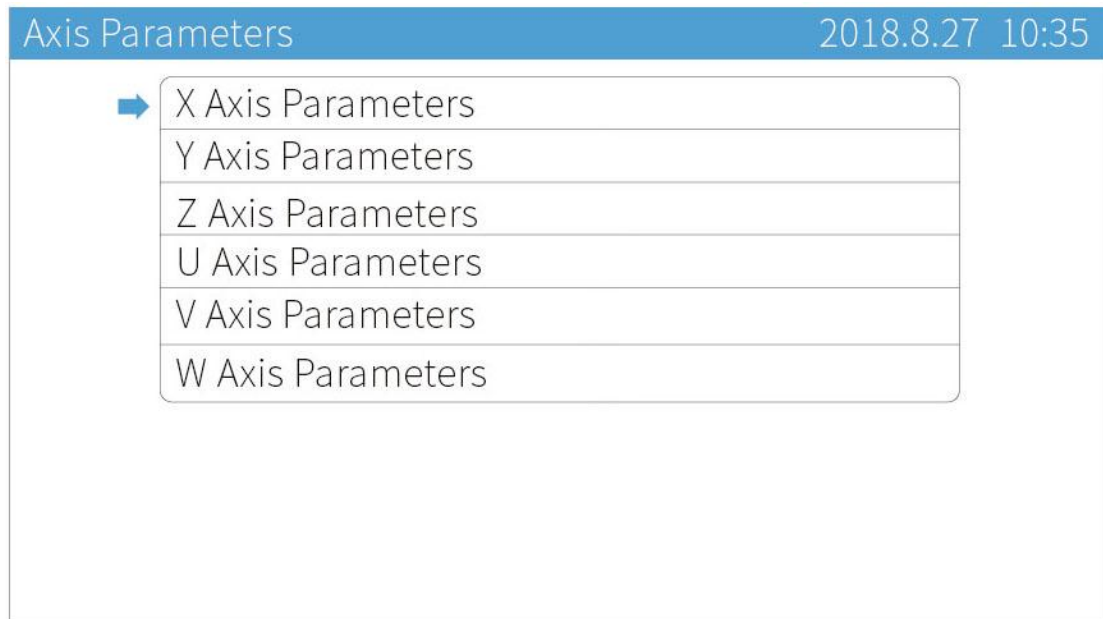
On the *X Axis Parameters* page, press direction keys to move cursor, press【←】【→】to modify options, press number keys to modify parameters and press【Enter】to save settings.

Figure7-1-2 X Axis Parameters Interface
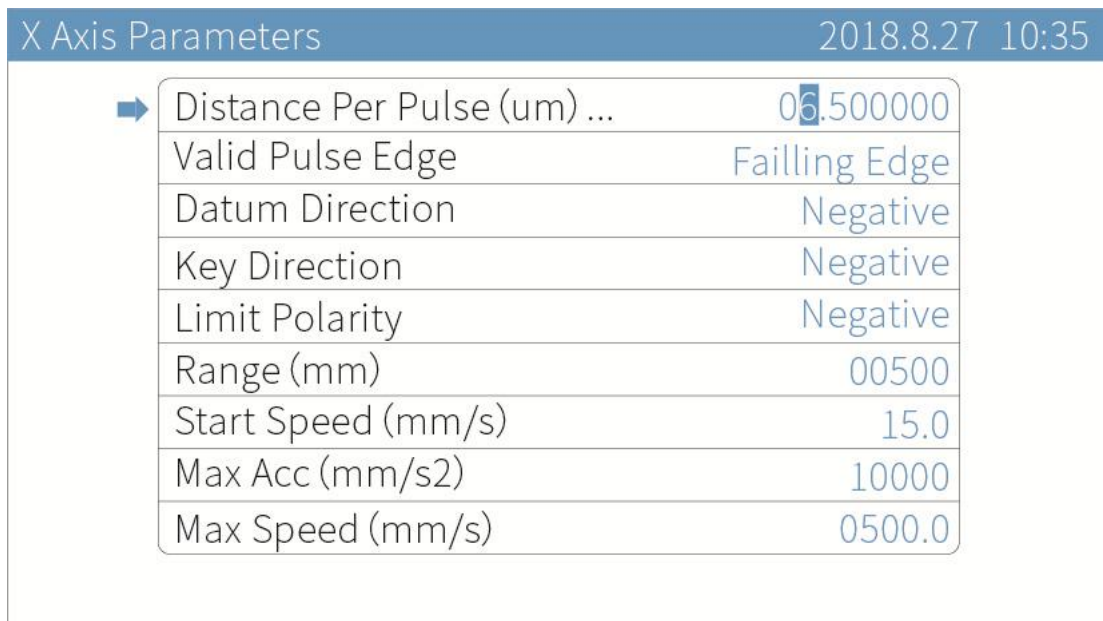
Move cursor to【Distance Per Pulse】, press【Enter】to enter the *To*

Calculate the Pulse Distance page. Press direction keys to move cursor, press number keys to modify parameters, and press【Enter】to calculate the distance per pulse. The calculation of distance per pulse, please refer to the Chapter 3.5 for more details.

Figure7-1-3 Calculate the Distance Per Pulse
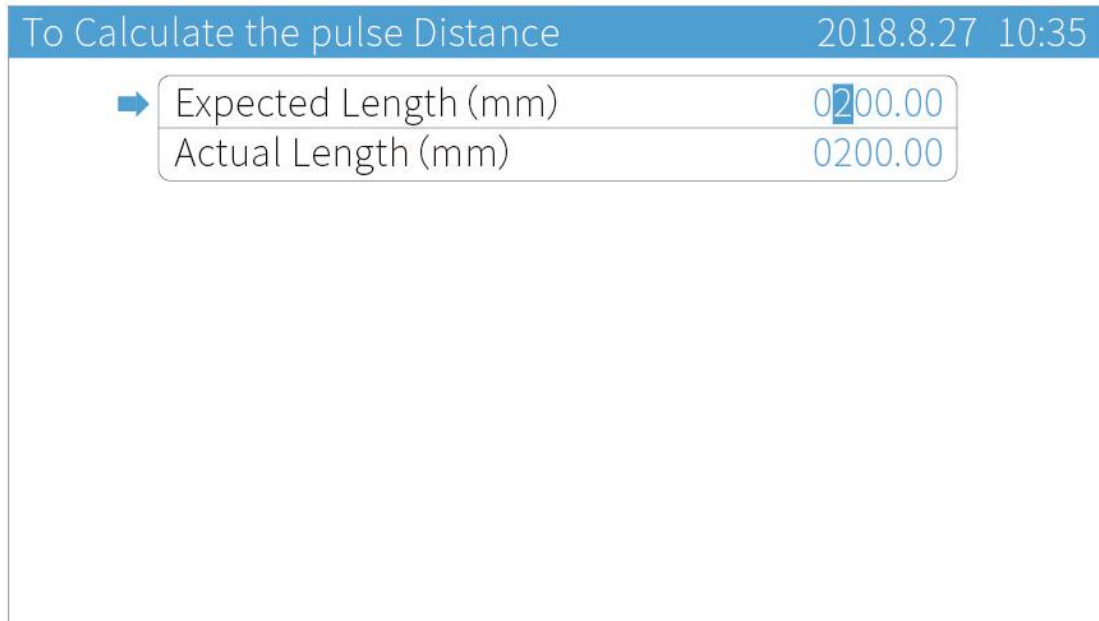
Table7-1-1 X Axis Parameters Instruction

Name	Instruction
Distance Per Pulse (um)	The single distance or angle which the motor moves, when the controller sends a pulse signal. If set incorrectly, the graphics will change.
Valid Pulse Edge	Effective values for driver level to change, Falling Edge or Rising Edge.
Datum Direction	The direction in which the machine moves when reset. If set incorrectly, the axis moves against origin direction.
Key Direction	The direction in which the axis moves when press keys on

	the panel. When set incorrectly, the axis moves opposite direction.
Limit Polarity	The control level that limit switch passes to the control panel. When set incorrectly, the limit will fail. If the limit sensor is NPN, the limit polarity is negative. If the limit sensor is PNP, the limit polarity is positive.
Range(mm)	The working range of machine.
Start Speed (mm/s)	The initial speed at which the axis moves from rest to motion.
Max ACC (mm/s2)	The maximum acceleration value of the motion axis when the axis increases or decreases speed.
Max Speed (mm/s)	The maximum speed which the motion axis supports.

7.2 Laser Parameters

On the **Manufacture Params Settings** page, move cursor to【Laser Parameters】and press【Enter】. Press direction keys to move cursor, press 【←】【→】to modify options, press number keys to modify parameters and press【Enter】to save settings.

Figure7-2-1 Laser Parameters Interface
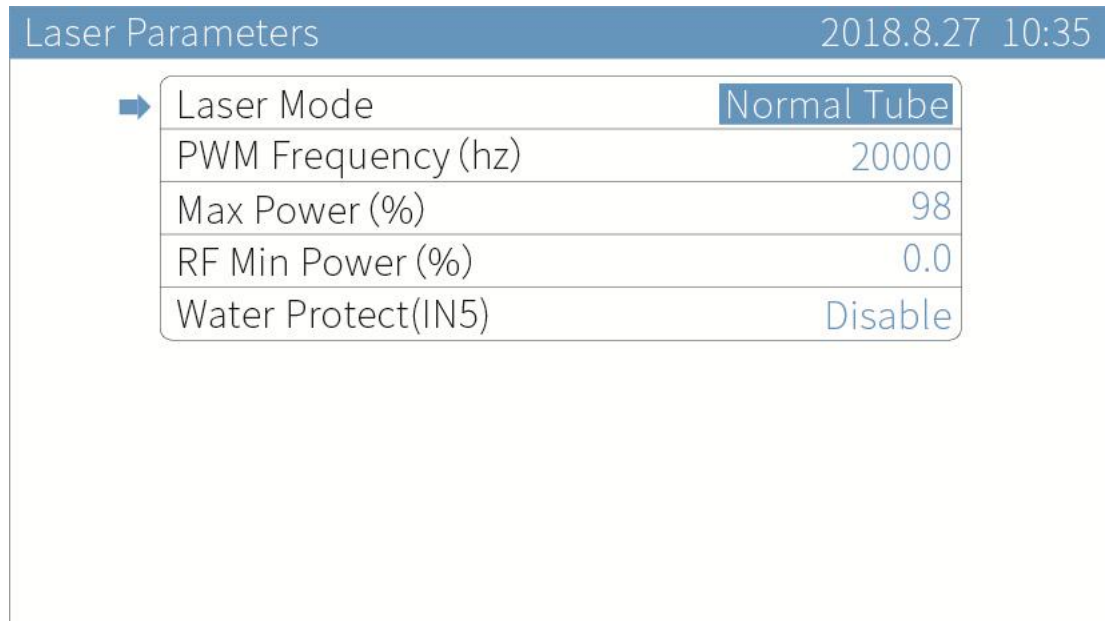
Table7-2-1 Laser Parameters Instruction

Name	Instruction
Laser Mode	Laser tube type: CO2 Glass Tube, RF tube.
PWM Frequency (Hz)	Set the pulse frequency of control signal used by laser.
Max Power (%)	The maximum power of laser tube. The maximum power value set by user can't be higher than this value and the laser power is displayed as a percentage.
RF Min Power (%)	The min power of RF laser. (refer to the manual of RF laser)
Water Protect(IN5)	Water protection switch. If enable this function, the machine will stop working when the machine detects the signal of water stopping.

7.3 I/O Parameters

On the **Manufacture Params Settings** page, move cursor to 【IO Parameters】and press【Enter】. Press direction keys to move cursor, press 【←】【→】 to modify options and press 【Enter】 to save settings.

Figure7-3-1 I/O Parameters Interface
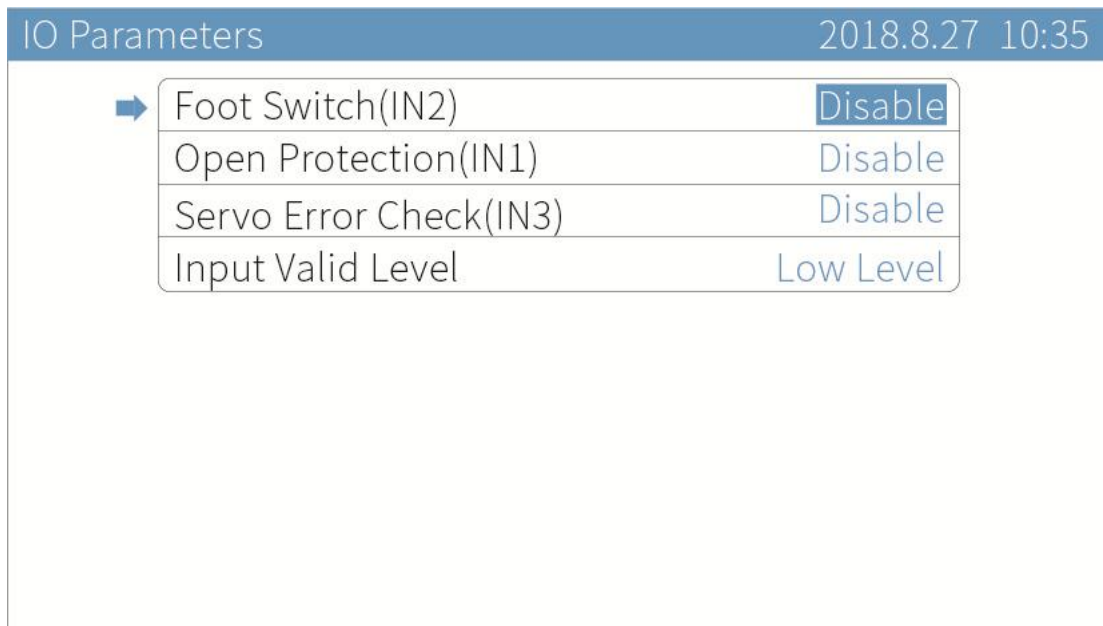
Table7-3-1 I/O Parameters Instruction

Name	Instruction
Foot Switch	Enable or disable the foot switch function.
Open Protection	Enable or disable the open protection function.
Servo Error Check (IN3)	When detect a low level (zero volts) , the system will alarm.
Input Valid Level	Set input IO to low level or high level.

7.4 Auto Reset Settings

On the ***Manufacture Params Settings*** page, move cursor to【Auto Reset Settings】and press【Enter】. Press direction keys to move cursor, press 【←】【→】to modify options and press【Enter】to save settings.

In general, we suggest users to enable axis AutoReset function, and disable the feed axis AutoReset.

Figure7-4-1 Auto Reset Setting Interface

AutoReset Settings	2018.8.27 10:35
➡ XY AutoReset	Enable
Z AutoReset	Disable
U AutoReset	Disable
V AutoReset	Disable
W AutoReset	Disable
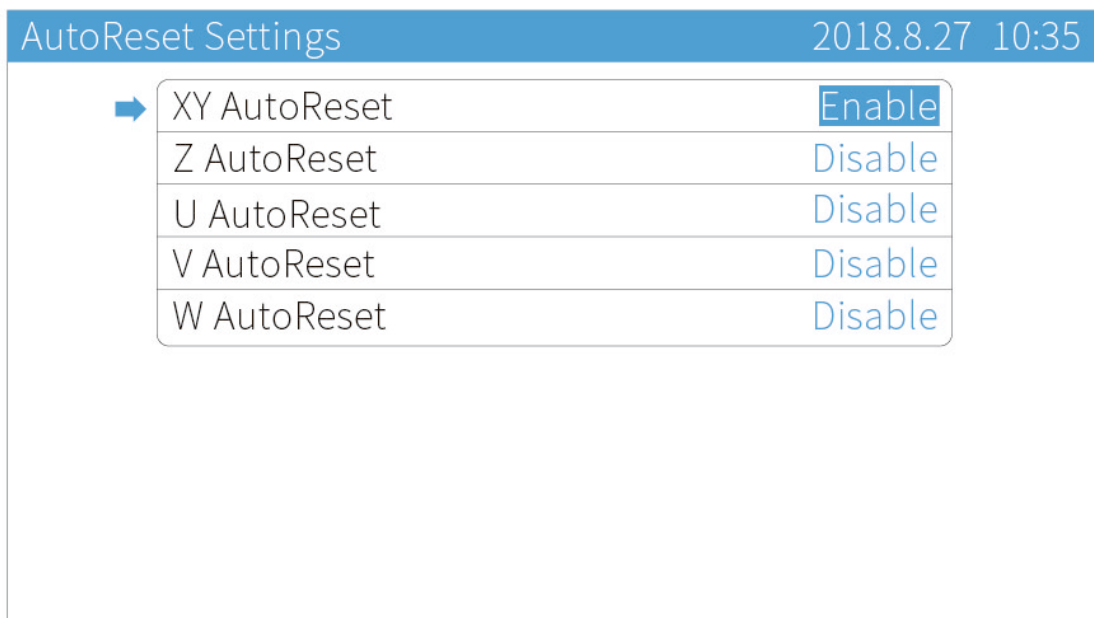
Table7-4-1 Auto Reset Settings Instruction

Name	Instruction
XY Auto Reset	If enable this function, when power on or reset the machine, the XY axis will reset to origin point.
Z Auto Reset	If enable this function, when power on or reset the machine, the Z axis will reset to origin point.

U Auto Reset	If enable this function, when power on or reset the machine, the U axis will reset to origin point.
V Auto Reset	If enable this function, when power on or reset the machine, the V axis will reset to origin point.
W Auto Reset	If enable this function, when power on or reset the machine, the W axis will reset to origin point.

7.5 Normal Settings

On the **Manufacture Params Settings** page, move cursor to【Normal Settings】and press【Enter】. Press direction keys to move cursor, press 【←】【→】 to modify options and press【Enter】to save settings.

TF-6225 supports working range limit, users do not need to install hard limiter in general, just set the【Range】on the axis parameters page.

Figure7-5-1 HardLimit Setting Interface

Normal Settings	2018.8.27 10:35
➡ Z-Range Check	Disable
X HardLimit	Disable
Y HardLimit	Disable
Z HardLimit	Disable
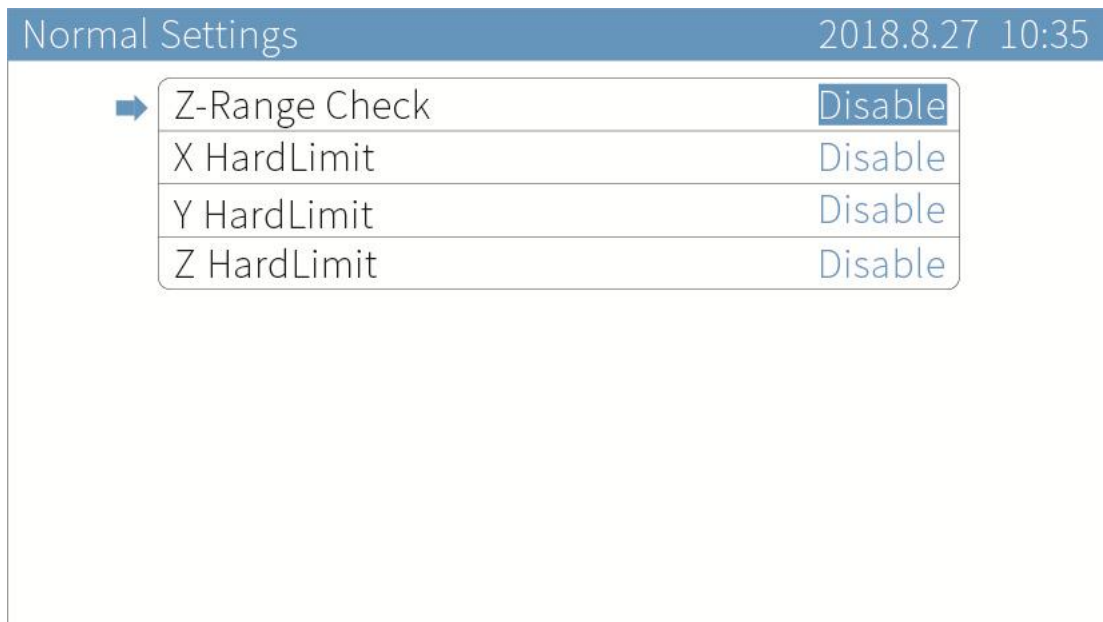
Table7-5-1 Auto Reset Settings Instruction

Name	Instruction
Z Range Check	Range of Z axis.
X HardLimit	HardLimit switch of X axis. If use HardLimit, enable the function here.

Y HardLimit	HardLimit switch of Y axis. If use HardLimit, enable the function here.
Z HardLimit	HardLimit switch of Z axis. If use HardLimit, enable the function here.

If the Z-range check is Disable, when the machine loses steps, there will no sticking plate alarm. And the Z axis coordinate is always "0" and no change.

8. FAQ

1. The top bar displays local date and time. The date and time can be modified, which requires the cooperation of encryption software. If the time changes to 0.0.0, it means the battery in the panel has run out of power and can't set password for control card. The clock doesn't support power off relay function.

2. When the file name is in Chinese, it can only show 4 Chinese characters at most, and they are in common Chinese character library. A file name can display up to 8 characters when it uses number or English characters.

3. Pulse distance can't be modified.

   When the pulse distance value of any axis is close to or less than 1, the pulse distance can't be adjusted and is always 1. The recommended pulse distance value is 5 or more.

4. Wrong laser mode.

   When the power of loading graphics is larger and the power of cutting is smaller, it indicates the laser mode is wrong. Please reset the correct laser mode.

5. The alarm signal of the servo drive available in the system is IN3, which is generally effective at low level.

Appendix 1. Wiring Diagram of Servo Driver

1. Panasonic A5 High Speed Pulse Wiring Diagram

Figure 1-1 Panasonic A5 High Speed Pulse Wiring Diagram

TF-6225 Servo Control Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

Panasonic MINAS-A 50PInterface

PIN	Signal
44	PULSH1
45	PULSH2
46	SIGNH1
47	SIGNH2
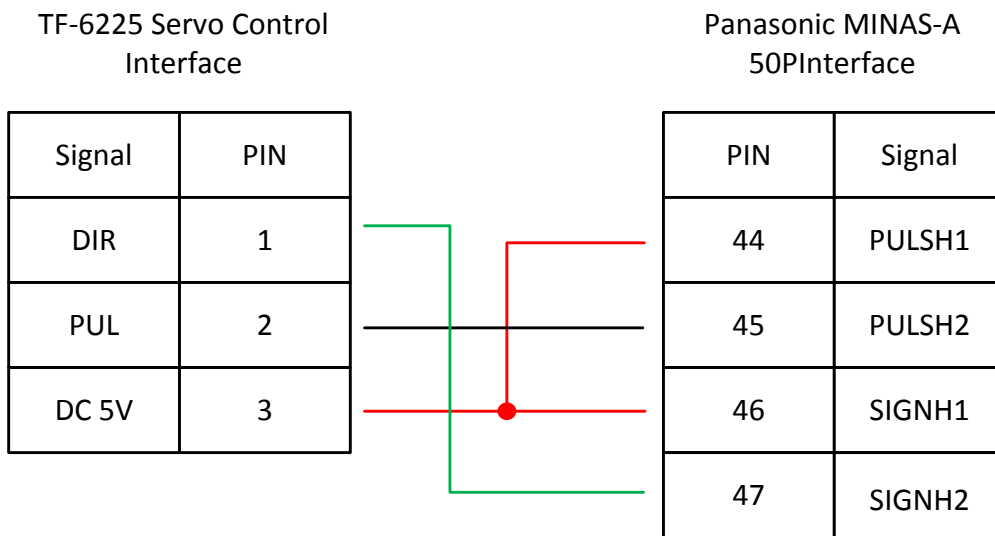
Figure 1-2 Panasonic A5 Low Speed Pulse Wiring Diagram

TF-6225 Servo Control Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

Panasonic MINAS-A 50P Interface

PIN	Signal
3	PULSH1
4	PULSH2
5	SIGN1
6	SIGN2
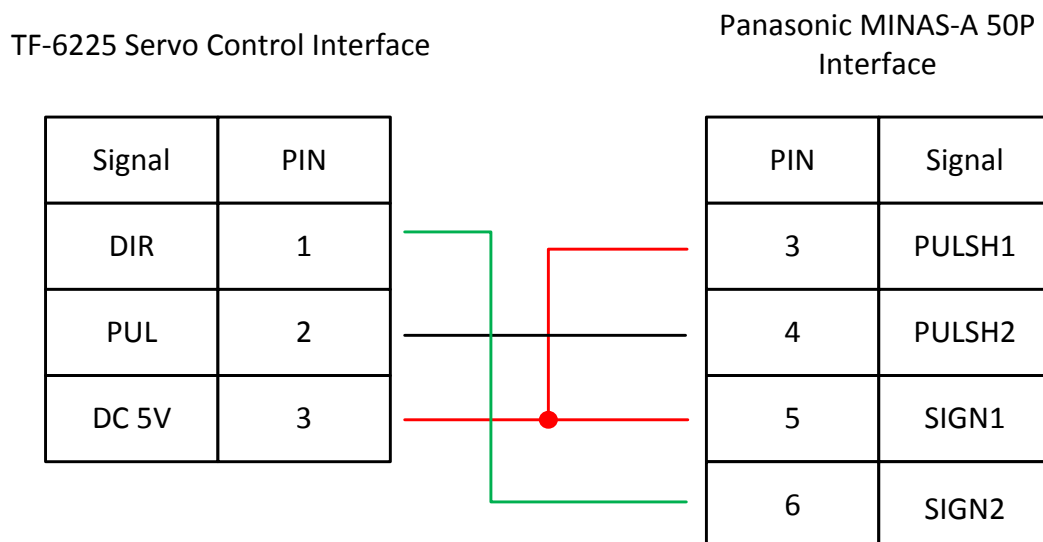
Table1-1 Panasonic A5 Series Basic Setting Parameters

Mode	Value	Instruction
Pr001	0	Control mode, must be set to position mode.
Pr007	3	Must be "Pulse + Direction" mode.
Pr005	1	High-speed pulse connection mode, the parameter is set to "1", and the maximum pulse frequency is 3Mpps. Low speed pulse connection mode, the parameter is set to "0", and the maximum pulse frequency is 500Kpps.

2. Yaskawa Wiring Diagram

Figure 2-1 Yaskawa Wiring Diagram

TF-6225 Servo Control Interface

YaskawaΣSeries 50P Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

PIN	Signal
7	PULSH
8	*PULSH
11	SIGN
12	*SIGN
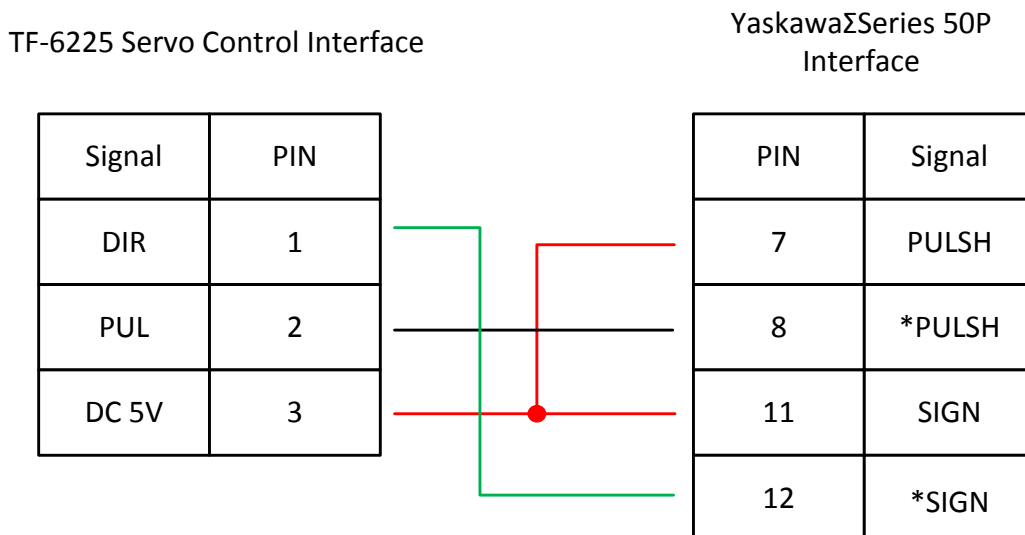
Table2-1 Yaskawa Σ Series Basic Setting Parameters

Mode	Value	Instruction
Pn000	001X	Position mode.
Pn00B	None	When single-phase power input, the parameter is set to "0100".
Pn200	2000H	Positive logic: Pulse + Direction; 0005H negative logic: Pulse + Direction; When the pulse frequency is less than 1Mpps, please select "0000H". When the pulse frequency reaches 1Mpps~4Mpps, please select "2000H".
Pn50A	8100	Positive rolling side can be driven.
Pn50B	6548	Negative rolling side can be driven.

3. Delta A Series High Speed Pulse Wiring Diagram

Figure 3-1 Delta A Series High Speed Pulse Wiring Diagram

TF-6225 Servo Control Interface   Delta ASD-A 50P Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

PIN	Signal
38	HPULSE
29	/HPULSE
46	HSIGN
40	/HSIGN
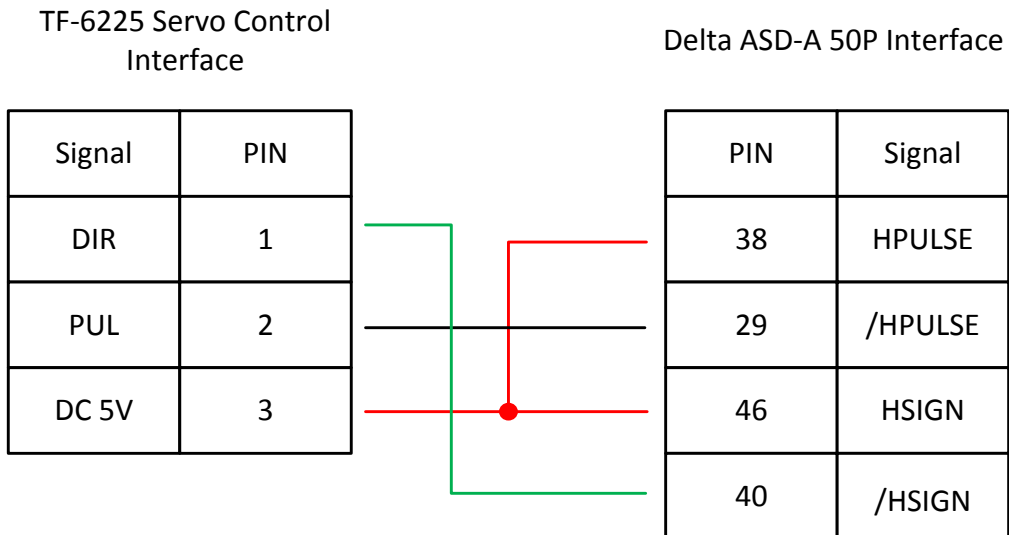
Figure 3-2 Delta A Series Low Speed Pulse Wiring Diagram

TF-6225 Servo Control Intrface   Delta ASD-A 50P Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

PIN	Signal
43	PULSE
41	/PULSE
36	SIGN
37	/SIGN
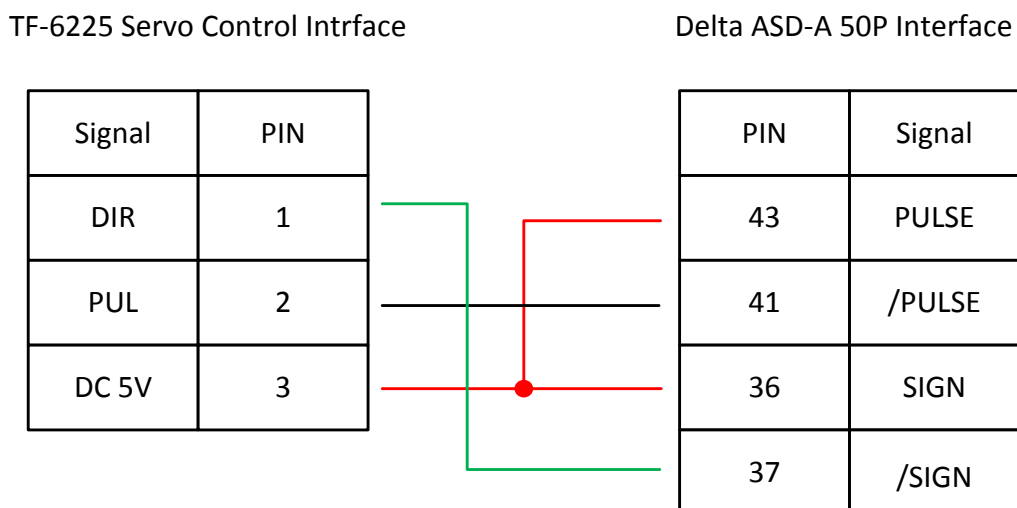
Table3-1 Delta ASD-A Series Basic Setting Parameters

Mode	Value	Instruction
P1-00	1102H	Position control mode, negative logic: "Pulse + Direction". Set the parameter to "1102H" to open the high-speed differential signal, and the maximum pulse frequency is 4Mpps; Set the parameter to "0102H" low-speed pulse signal, and the maximum pulse frequency is 500K.
P1-01	00	Select the location mode controlled by the external instruction.
P2-10	101	DI1 is set to SON servo enablement, and the logic is normally open.
P2-14	102	DI5 is set as ARST clear alarm function, the logic is normally open.
P2-12	007	DO5 is set as ALRM servo alarm function, the logic is normally closed.

4. Sanyo R Series Wiring Diagram

Figure 4-1 Sanyo R Series Wiring Diagram

TF-6225 Servo Control Interface

Sanyo R Series 50P Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

PIN	Signal
28	R-PC
29	R-PC
26	F-PC
27	F-PC
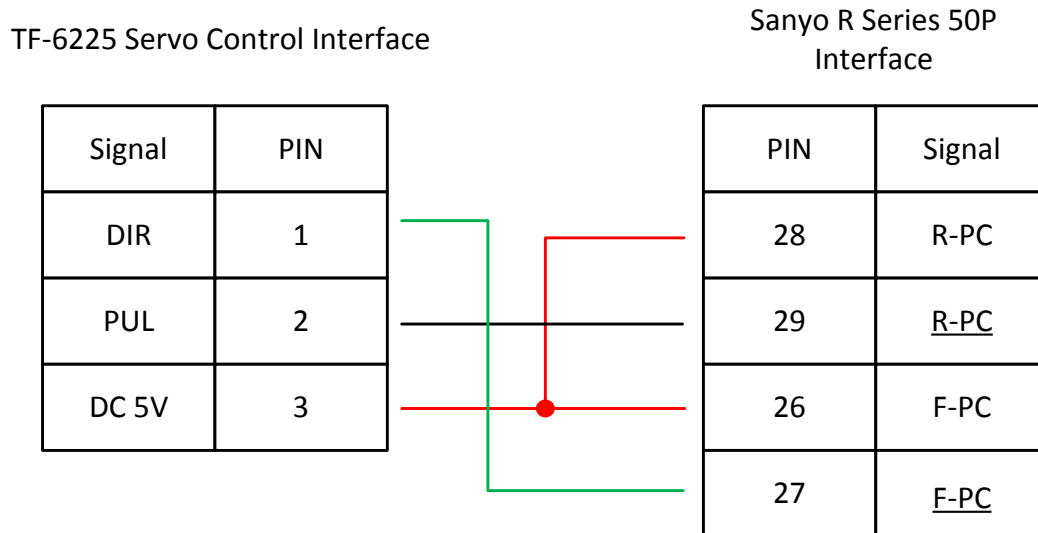
Table4-1 Sanyo R Series Basic Settings Parameters

Mode	Value	Instruction
SY08	00	Position mode.
Gr8.11	02	Pulse signal mode: Pulse + Direction.
Gr9.00	00	Positive rolling side can be driven.
Gr9.01	00	Negative rolling side can be driven.

5. Schneider 23A High Speed Pulse Wiring Diagram

Figure 5-1 Schneider 23A High Speed Pulse Wiring Diagram

TF-6225 Servo Control Interface

Schneider 23A-50P Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

PIN	Signal
38	HPULSE
29	/HPULSE
46	HSIGN
40	/HSIGN
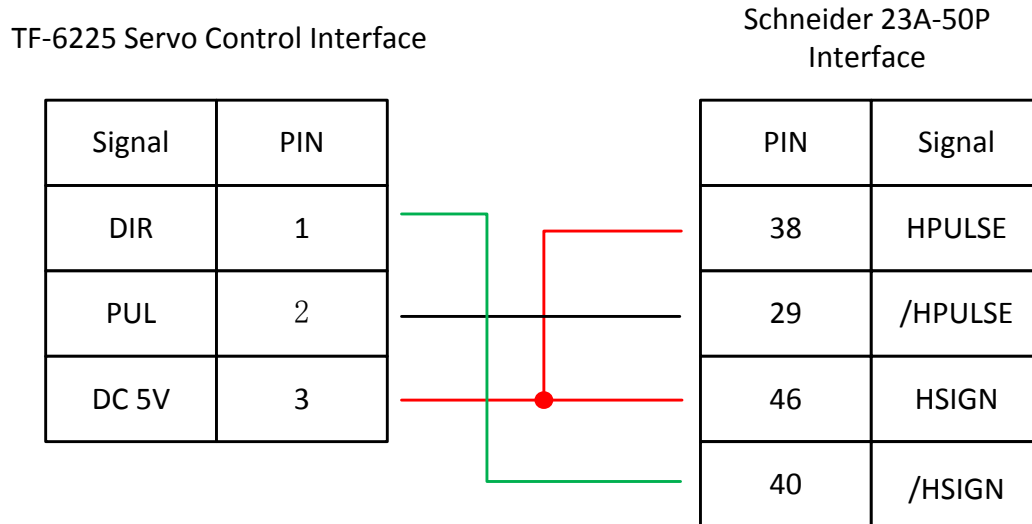
Figure 5-2 Schneider 23A Low Speed Pulse Wiring Diagram

TF-6225 Servo Control Interface

Schneider 23A-50P Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

PIN	Signal
41	HPULSE
43	/HPULSE
37	HSIGN
36	/HSIGN
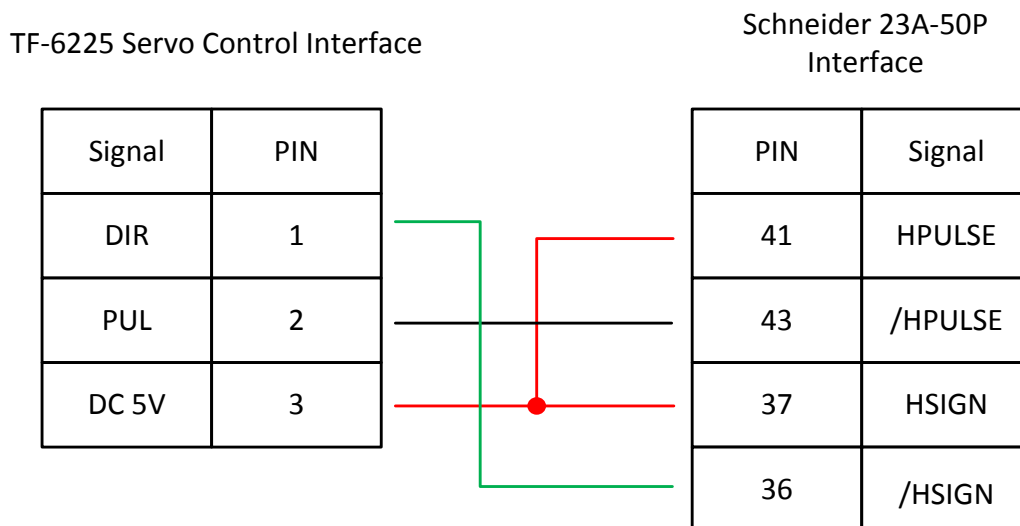
Table5-1 Schneider Lexium 23D Series Basic Settings Parameters

Mode	Value	Instruction
P1-00	1102H	Position control mode, negative logic: "Pulse + Direction". Set the parameter to "1102H" to open the high-speed differential signal, and the maximum pulse frequency is 4Mpps; Set the parameter to "0102H" low-speed pulse signal, and the maximum pulse frequency is 500K.
P1-01	X00	Select the location mode controlled by the external instruction.
P2-10	101	Change the servo IN1 to SON function.
P2-11	0	We do not use IN2。
P2-13~P2-17	0	We do not use IN4~IN8。

6. Fuji A5 Series Wiring Diagram

Figure 6-1 Fuji A5 Series Wiring Diagram

TF-6225 Servo Control Interface   Fuji A5-26P Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

PIN	Signal
7	CA
8	*CA
20	CB
21	*CB
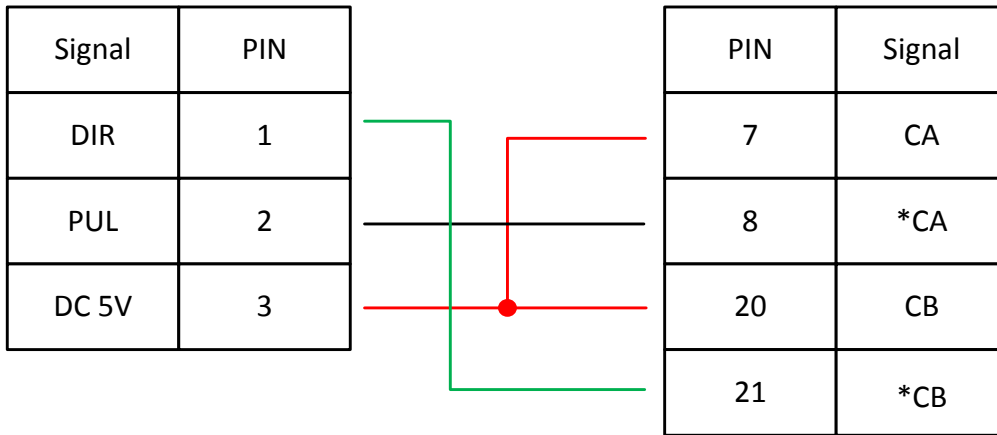
Table6-1 Fuji ALPHA 5 Series Basic Setting Parameters

Mode	Value	Instruction
PA-101	0	Position control mode.
PA-103	0	Pulse + Direction, the maximum pulse frequency is 1Mpps.

7. Mitsu Series Wiring Diagram

Figure 7-1 Mitsu J3 Series Wiring Diagram

TF-6225 Servo Control Interface

Mistu MR-J3-A 50P Interface

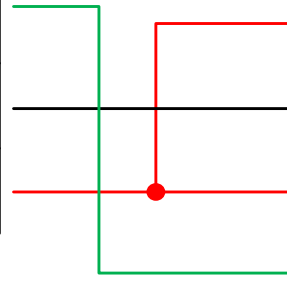| Signal	PIN
DIR	1
PUL	2
DC 5V	3

PIN	Signal
10	PP
11	PG
35	NP
36	NG

Figure 7-2 Mitsu E Series Wiring Diagram

TF-6225 Servo Control Interface
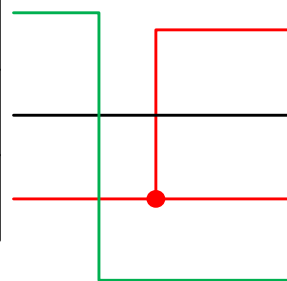
Mistu MR-E-A 26P Interface

Signal	PIN
DIR	1
PUL	2
DC 5V	3

PIN	Signal
23	PP
22	PG
25	NP
24	NG

Table7-1 Mitsu MR-J3—A Series Basic Setting Parameters

Mode	Value	Instruction

PA01	0	Control mode: Position mode.
PA13	0011	Negative logic: Pulse + Direction.

Notice: The maximum pulse frequency of Mitsu J3 Series is 1Mpps.

Appendix 2. Wiring Diagram of Laser

1. IPG-YLR Series Diagram

Figure1-1 IPG-YLR Series Diagram
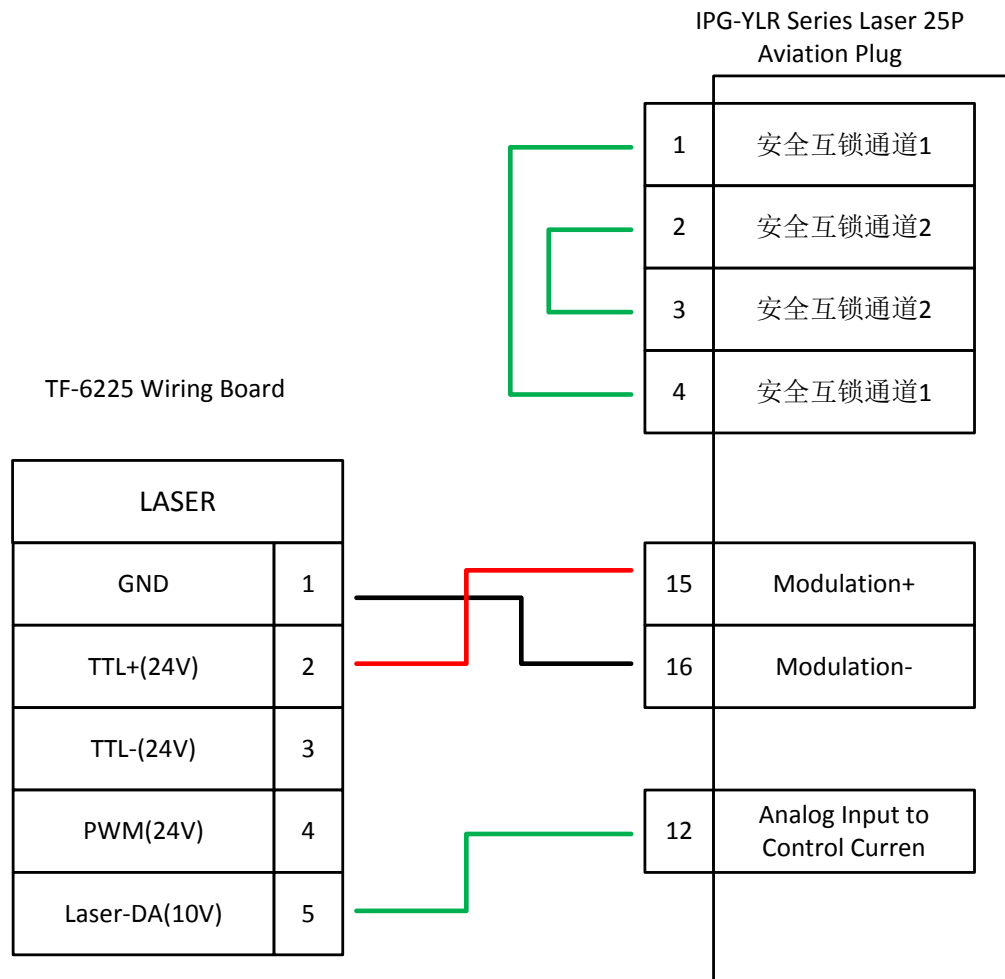
Notice: You don't need to connect remote start button, especially when the laser is not well grounded, which may cause laser damage (PWM selects 24V control).

2. SPI-500W R4 Diagram
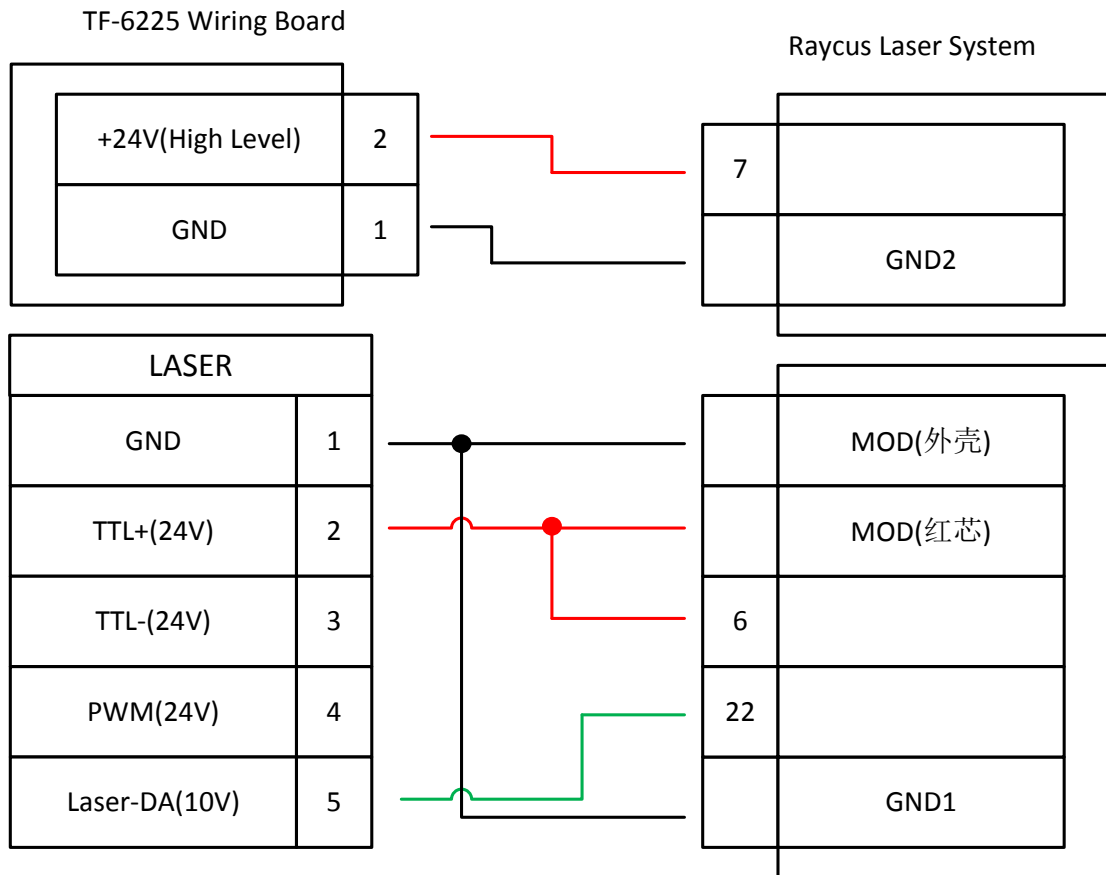
Figure2-1 SPI-500W-R4 Diagram

TF-6225 Wiring Board
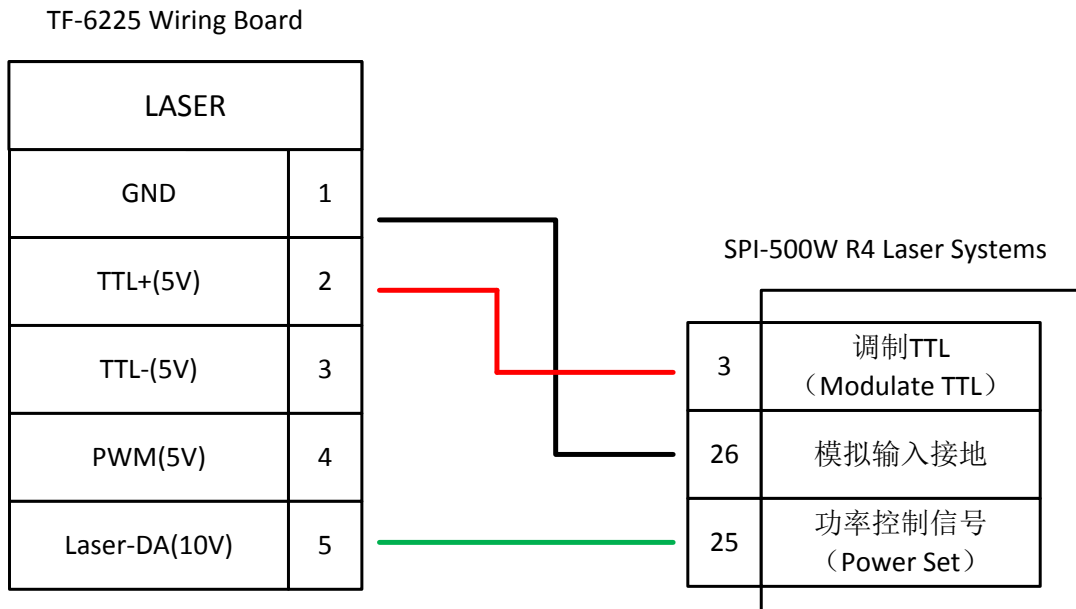
Notice: If you select Mod Input TTL interface as modulation signal, then you should select PWM 5V for control. If you select I/O 1, then you should select PWM 24V for control.

3. Raycus Laser Diagram

Figure3-1 Raycus Laser Diagram

TF-6225 Wiring Board

Raycus Laser System

+24V(High Level)	2
GND	1

7	
GND2	

LASER	
GND	1
TTL+(24V)	2
TTL-(24V)	3
PWM(24V)	4
Laser-DA(10V)	5

MOD(外壳)	
MOD(红芯)	
6	
22	
GND1	

Notice: The new Raycus laser uses 24V PWM control signal, the old one uses 5V PWM signal, and only when you switch the new laser key to REM, you can use serial port control. While the old one is set to ON. The PWM interface of the laser will indicate whether it is a 24V control. 5V control method shall be adopted for all controls not marked or marked 5V.

4. Max Laser Diagram

Figure4-1 Max Laser Diagram

Max Fiber Laser Iterlock

TF-6225 Wiring Board

LASER		
GND	1	
TTL+(24V)	2	
TTL-(24V)	3	
PWM(24V)	4	
Laser-DA(10V)	5	

GND	
外部出光-	
Input调制输入-	
Input使能输入-	
外部出光+	
Input调制输入+	
Input使能输入+	
0-10V输入+	