Online visual laser control

software

- Operation instruction -

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Chapter 1 Driver and software of installation

1.1 CNC system software profile

PowerCut ordinary laser cutting control software is a laser cutting CNC quality goods, which is carefully orchestrated by famous R&D team with many years' industry experience in company. This software is easy to learn , with mature and steady movement control arithmetic , complete cutting process, friendly man-machine interface, and it can be applied in garment, acrylic, furniture and other non-metal laser cutting controls.

1.2 composition of the control system

The control system is composed of hardware(motion control card and parts) and software.

File or child directory nan	ne Con	tents		Instructions
PowerCut folder	Control	system	installati	on
	procedure			Сору
Driver folder	visual driver			

Softwares' contents and file instruction:

Form 1.1.1.1 software contents and file instruction Hardware equipment composition:

Item	Quantity	Instruction	
Control card	1	Display and main board	
USB cable,	1	USB cable 1. Net cable 1	
network cable			
Camera	1	Including camera, lamp,	
Cantera		transmission line and other parts	

Form 1.1.1.2 hardware equipment composition

1.3 Driver and software of installation

Hardware requirements : CPU Celeron more than 2.1G memory :more than 1G hardware :more than100G

Software requirement: Microsoft Windows operation system (WinXP、WIN7)

1.3.1 vision driver MIL installation and uninstallation

Click the 🎴 PowerCut then	🍌 Clean 🍌 Setup	will appear the two folder	📙 Clean	is the
	uninstalla	tion file		
Open this folder ^I Setup				
 MIL of installation 				
Betup double click this fol	lder, please	change the compatibility	before in:	stalling
, select this setup.exe then click th	ne right button	of mouse to choose the co	mpatibility	:

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🔆 Favorites	Name	Date modified	Туре	Size	
🌉 Desktop	📕 Matrox Imaging	1/8/2016 10:03 PM	File folder		
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🗓 Recent Places	autorun 👔	6/2/2005 6:07 AM	Setup Information	1 KB	
	🚭 instmsiw	3/11/2002 7:06 AM	Application	1,780 KB	
詞 Libraries	🔂 ISScript9	11/11/2003 7:32 AM	Windows Installer	805 KB	
Documents	🔂 Matrox Imaging	6/16/2005 7:25 AM	Windows Installer	2,908 KB	
J Music	MilRT_~1	6/16/2005 7:25 AM	Cabinet File	1,943 KB	
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11 items					



Double click setup. exe to install it ,as shown below picture:



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ttrox Imaging Setup 8.00	1230.	
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	Select the features you want to install, and deselect the features you do not want to install.	
	MI Runtime 38 MB	
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	Space Required on C: 46 MB Space Available on C: 7500 MB IntelSheld	
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1.1.2.4.2 installation interface 1

Click Next, go to the next step :

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1.1.2.4.3 installation interface 2

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installation interface 4 Click I AGREE, when you finished it and you must be restart your computer

:

	MilConfig	
	Default Values Libraries Video Hardw Information Licensing Non-paged Memory	are Acceleration Troubleshooting
	🚰 Mil8.00 (build 1230) Full	
	🚺 Update(s): None	
	👿 Installed Products: MIL, ActiveMIL	
	C:\Program Files (x86)\Matrox Imaging\	
	💋 Kost	
	1 OMB of non-paged memory.	
	🕒 License type: Development	
	Computer must be rebooted after	MATRIX
🖉 Matrox Imaging Setup	ОК	Cancel Apply
Matrox Imaging Setup	8.00.1230 . Matrox Imaging Setup	
	Mi8.00(build 1230)	
	Setup has completed installing Mattox Imaging.	
	Yes, I want to restart my computer now.	
	C No, I will restart my computer later. Click Finish to exit Matrox Imaging setup.	
	< Back Finish Cancel	

installation interface 5

Click Finish, Matrox Imaging mini of installation, restart the computer to select\



🛃 MiConfig

Video Hardware Acceleration choose 4 to 6 ,then click "OK".

	ensing Nor	-paged Memory	Troubleshooting
Default Values	Libraries	Video Hard	ware Acceleration
MIL Video Hardware Accele	ration		
Manually control how MIL	uses the hardware a	acceleration supplie	d by your graphics
Use this slider if you en	counter display		
- No image displayed - Corrupted images o - Unexpected color p - Windows blue scree	, at all times or d n the display. ixels in a mono ima n caused by display	buring nge. / driver.	
MIL Video Hardware	None .	2 4	Ful 6 ' ' Ful
Disable Matrox Graphics s	pecific Live DDraw	Overlay.	
DMA Transfers with PCI-X 1	Boards		
	grabber and/or a P h display updates b	CI-X video card and ecause of a hardwar sabling DMA transfe	are e limitation rs from the
<pre>if you have a PCI-X frame experiencing problems wit due to PCI-X bus segments Disable DMA transfers</pre>	, you should try al from the frame grab	ber to the v	
1f you have a PCI-X frame experiencing problems wit due to PCI-X bus segments Disable DMA transfers	, you should try at	ober to the v	

MIL of uninstallation : when you the first installation of vision driver fails, you need to
Image: Cleanmil.exe

reinstall the vision driver, please double click , after the uninstall is complete computer system will be reboot ,please install the vision driver again.

🕞 🌙 🗢 🕌 🔸 issue driv	ven ▶ powercut ▶ Clean ▶	• •	Search Clean		Q
Organize 🔻 Include in	n library 🔻 Share with 👻 New folder			= -	0
🔆 Favorites	Name	Date modified	Туре	Size	
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	🖳 drvmanage	5/5/2010 9:54 AM	Application	675 KB	
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Documents	readme	6/17/2009 3:58 AM	Text Document	1 KB	
J Music	SSDCleanup	6/17/2009 3:58 AM	Application	62 KB	
Pictures					
Videos					
👰 Computer					
🗣 Network					
	Matrox Imaging Unins	stall	X		
	Are you sure you wa	nt to uninstall N	/IL?		
	ОК	Ca	ancel		

1.3.2 vision software of installation



Double click PowerCut_7020-1800.exe installation package, enter the installation

interface click on the "next" to complete the installation .

nstalled? w. To select a different location, either type in a folder. <u>Change</u>
w. To select a different location, either type in a folder.
C <u>h</u> ange
C <u>h</u> ange
<u>N</u> ext > <u>C</u> ancel
×
34//
Cancel



Select the appropriate language and click "next" to complete the installation.



Program will be generated on the desktop ,after installation is complete .please send



the shortcut to the desktop.

Please click the right button of the mouse, please click on the pop-up dialog box with the

mouse Properties In compatibility mode ,select wind XP be compatible ,otherwise the software can be opened ,as shown below .



PowerCut_7020-1	800 Properties		×						
Security	Details	Previous Versions							
General	ral Shortcut Compatibility								
If you have problems with this program and it worked correctly on an earlier version of Windows, select the compatibility mode that matches that earlier version.									
Help me choose t	Help me choose the settings								
	•								
Run this prog	gram in compatibility mod	de for:							
Windows XP (S	Service Pack 3)	-							
Settings									
Run in 256 c	olors								
Run in 640 x	480 screen resolution								
Disable visua	al themes								
Disable desk	top composition								
Disable displ	ay scaling on high DPI s	settings							
Privilege Level									
Run this prod	aram as an administrator								
🕒 😚 Change setti	Change settings for all users								
	ОК	Cancel Apply							

1.4 Software features

- Large-format automatic recognition
- > Automatic boundary cutting function.
- > The interface is friendly, easy to learn and convenient to operate.
- The AI, BMP, PLT,DXF,DST and other many kinds of graphics data formats are all compatible.
- > It can make simple graphics and words. And it can edit and mark the lead-in data.
- > It can do multistage stratified processing and definite the output sequence.
- It can set the machining process and precision personalization, and has the laser head operation trajectory simulation display.
- It has a variety of path optimization functions and pause function during the processing process.
- > A variety ways of graphics and processing parameters and its repeated usage,
- > Unique double laser system intermittent work and their respective independently

work and motion trajectory compensation control function.

- Set the processing starting point, working path, laser head dock position, etc., according to the different needs of processing
- It can be compatible with many kinds of communication mode. Users can adopt USB port communication or network communication according to the actual situation.
- > Play the function of adjusting speed during the processing process.
- It has power-off protection function. System can remember the breakpoint if it is power-off suddenly during the processing.while restoring the power, system can find this breakpoint and continue to process.

1.5 SLR using step

1.switch on the SLR, select"ON",Camera mode as"P"files。 (P files: Program Auto Exposure) as shown below :



2.Found on the camera lens AF (Auto focus), MF (Manual focus) and STABILIZER(Antishake switch), The first to select "AF" Auto focus files, Anti-shake switch as "ON".As shown below :



3.open the vision software, click on ^{Open Camera} button, pop-up dialog box camera Then manually rotate the camera lens while observing whether the shooting range of the camera dialog and equipment consistent format.

4.After the scope and equipment consistent format camera , click on the button of

Calibration, pop-up dialog then click on the button of Photograph, then the camera lens automatically rotates autofocus, after completion of observation to be photographed picture clarity, if meet the requirements, you need to select the camera mode as MF" manual focus.



1.6 Interface instruction



below (green area).



Revocation the marquee area : click on the button of , marquee the whole

area, click the left button of the mouse to revocation ,as shown below (green area).



Chapter2 Equipment parameter setting



	SYS PARA
	Software Process Para Device Para User para
	Device Ctrl
	X Width: 800 mm X-Pulse: 0.001884
	Y Width: 500 mm Y-Pulse: 0.001578
	Z Width: 0 mm Z-Pulse: 0.02323(
	Laser: 12 % X-Pulse(B) 0.0025
	Laser Time: 200 ms Y-Pulse(B) 0.0025
	WPW1: 0 % PWM Fre: 5 KHz
	Max Power: 100 % X axial play: 0 um
	Home Speed: 100 mm. Y axial play: 0 um
	Moving Speed: 300 mm. Coordinate: Top left 💌
he software	Z-Acc: 500 mm/ss Z-Speed: 180 mm/s
ction when the	GO O: XY 🔽 Z 🔄 Protect Ctrl 🗌 Limit switch
synchronous ntrol system is	Read Machine Para
displayed	
Γ	
	Save Para: Apply Load Para:

Equipment control:

- Machine format X: refer to the movement range of table X axis, that is, the max range of the laser head lateral movement(mm).
- Machine format Y: refer to the movement range of table Y axis, that is, the max range of the laser head longitudinal movement(mm).
- Machine format Z : refer to the movement range of the table Z axis. Mainly used to left and right push board machine. The Z axis range is effective push board length minus the X axis format(put X axis as an example, unit mm), continous feeding machine is out of the limitation of this parameter.
- X axis pulse equivalent : Relative to the each pulse singal, the displacement of the machine moving parts are called pulse equivalent.
 Also it is called smallest setting unit. Click to set pulse equivalent, just as the following picture:

Pulse		X
Theory Cal	n	1
Len of One circle	0	calculate
Real Cal		
Theory Len	0	
Real Len	0	Calculate
PulPerMm	0.00578	
ОК		Cancel

The are two ways to calculate the pulse equivalent: The theoretical calculation and practical calculation.

A、 theoretical calculation:

The pulse quantity of one circle of motor: step motor: put the 1.8°, 32 subdivision driver as an example, the pulse quantity of one circle of motor: 360/1.8*32=6400 (pulse). Servo motor: put the panasonic servo motor A5 as an example, The motor turns a circle while the PR008 parameter default epistatic machine send ten thousand pulse.

The real go length of motor tuning one circle: This value has been confirm, while the machine is designed. Ask the value from the machine design department.

Click calculate, calculating the pulse equivalent automatically. Click

, set this value to the X axis pulse

equivalent.

OK

B、Practical caculation:

Theoretical length: draw a 100mm straight level. The theoretical length is 100mm to form processing file's cutting.

Real length: Actual length measured by the measuring instruments. Such as 50mm.

Click , caculate the pulse equivalent automatically. Click

OK

set this value to X axis pulse equivalent.

- Y axis pulse equivalent : the caculating method is the same as the X axis pulse equivalent.
- Z axis pulse equivalent : the caculating method is the same as the X axis pulse equivalent.
- > Fixed fire power: set the preset(fixed power) power percentage.

- > Fixed fire time: set the preset (fixed power) optical time.
- > Pre-drive 1: set the laser tube 1 pre-drive power persentage.
- > Pre-drive 2; set the laser tube 2 pre-drive power persentage.
- > The max power: set the laser tube max power percentage.
- PWM frequency: set the PWM wave frequency. Pls set it according to the laser machine's features.
- Back to original point speed : set the speed of backing to the original point.
- > Board going speed: set the board going speed.
- > Back to the zero axis: set backing to the zero axis.
- Water conservation: check the water conservation while checking, or do not check.
- Read the equipment parameters: read the setting parameters in the control device.
- Double head independent control: when the software detects the asynchronous control system is enabled when the function, and vice versa is not enabled:
- At the same time check the AB platform in the process of processing AB platform at the same time work enabled, if only check one of the platform is only one beam work.
- asynchronous shaft: According to the different structure of the machine, sub-double Y double X axis to select the appropriate machine structure.
- Origin Offset: After setting the asynchronous axis to the origin, whether the origin position between the asynchronous axes is at the same horizontal position is not necessary. If you want to set the offset value, you do not need to set it.
- minimum spacing: set the asynchronous axis back to the origin, the minimum distance between the asynchronous axis.
- efficiency priority: in the cut when the graphics automatically interrupt, asynchronous axis at the same time to improve work efficiency.
- balance: both efficiency and not splicing, when the cutting graphics do not splicing processing, will lead to another head can not process any graphics, then this time I will interrupt the graphics splicing.
- not stitching: no stitching is as long as a head can be processed, then it will not interrupt

7S PARA
Software Process Para Device Para User para
Work Setting
Start Speed: 5 mm/s Curve Speed Rate: 30
None Speed: 400 mm/s None Acc: 3000 mm/ss
X Corner Speed: 15 mm/s Y Corner Speed: 10 mm/ss
Start Acc: 300 Jerk: 30000
Camera Camera 90degree(Software restart) Material thick: 0
Apply

Process setting:

- > The movement speed(fast): set the speed of movement by hand.
- Coordinate system: choose the coordinate system(original point switch place, at the upper left or upper right).
- Start-up speed: set the start-up of the motor.
- Curve rate; set the curve's speed ratio. Bigger this value, faster the cutting curve. Otherwise it is slower.
- > Travelling speed: set the machine's empty running speed.
- X axis corner speed: set the speed when X axis go through the corner.
- Y axis corner speed: set the speed when Y axis go through the corner.
- > Z axis speed: set the movement speed of Z axis.
- > Z axis acceleration: set the acceleration when the Z axis moves.
- Save the parameter files: click this command, save the parameter files to the appointed place.
- Application: click this command, download the already parameters to the controller(must control the controller, otherwise, it will display wrong.)
- Read the parameter files: read back the parameters files saved

before to the control system.

2.2 "Help" menu items

Click the	Help(H)	icon	on	the	menu	bar	to	open	the	"Help"	pull-down
menu.											

Help(H)	
Help	(H)
Abo	ut PowerCut(A)

Choose

Pop-up registration/upgrade window,

showing the registration/upgrade information.

Help(H)

Reg/Update				X
Register	3701	7480	5687	9746 Copy
New				Register
Update Path				Update

Registeration method: After the original registeration code expired, acquiring the new registeration code from the manufacture. Input the new 16 bits registeration code into the box, and then click "register".

> Upgrate method: Aquire the update documents from the manufacture ,

and then save to the computer appointed position. Click while updating to find the updated file which deposited in the appointed place, and then click Update. Choose About PowerCut(A)... , pop out "about" window, which showing the company's related information.

2.3 Machine connection

Click on the button of appear the device connection dialog: as shown below

Nu	Туре	Device name	Address	State
	Net	POWERCUT	192. 168. 1. 168	OK

> Device list: machine mode 、machine name IP address condition thc

Click on the button of	Connected	, connect to this machine .
Chick on the button of	Cut	disconnect to this machine .
Click on the button of	Refresh	refresh this machine connection.

Chapter3 working face plate

The work panel includes the contents of the options, layer management, device control and manual control. The working face tab can be fixed or automatically hide the red box for the working panel by clicking [¶] on the right side.

3.1 Layer management

Lay	Speed	Engery	Ouput	
	250.00	48.0	Ouput	
	300.00	20.0	Ouput	
	150.00	30.0	Ouput	

Layer management including the color, processing mode, speed, power, whether the output and other information and click on the right mouse button will have a prompt box to move up, down, top, bottom, select and so on the operation command button.



Click a color layer, the layer information is highlighted, click botton, The layer moves up one layer; click ^{Down} button, The layer moves down one layer; click ^{Top} button, The layer moves up to the top; click ^{Bottom} button, The layer moves down to the bottom of the; click ^{Select} button, The color layer object is selected.

Tip: the order of the processing sequence is based on the order of the layers, and the order of the layers is changed .Double click a color layer to open the layer of information, set the box, as shown below:

Number Color	Now goler:	
	NOW COLOF.	
	Work mode: Cut	×
	🔽 Out	put
	Cutting para	
	Speed:	250
	Acc:	2500
	Max.Power 1:	48
	Min.Power 1:	45
	Max.Power 2:	1
	Min.Power 2:	1
<	Open delay:	0
	Close delew.	0

Layer information setting box on the left side of the display of all the layers and the order, the right side of the display of the current layer related information

- Current layer color: the selected current layer colors, the mouse click on the left side of the different layers, the corresponding changes in the current layer.
- > The working mode, as shown below:

Work mode:	Cut	~
	🔽 Output	

Output: check the output. Output, Output of the layer object when generating

laser processing. Do not check the output, the layer object is not output, the

processing process of the layer object is not processed.

- The cutting parameters:
 - processing speed.: The processing speed of the graphics object
 - processing acceleration: processing, laser, laser head acceleration operation.
 - Laser energy 1: percentage of laser energy laser power laser tube highest speed corresponding processing time.

- corner laser energy 1: laser power percentage of laser tube a corner speed corresponding processing time
- click
 Application
 button , click
 Save/Quit
 button, Exit layer
 information settings.

3.2 Manual control



- > Click the button to control the X axis and the reverse movement.
 - ¥- ¥+

: Click the button to control the Y axis and the reverse movement.

- B Axis: According to the different system control system, the software checks to the asynchronous cutting control system, the function keys will be enabled and displayed, check the mouse point after the XY can control the B platform to move.
- > Z+, Z-: click this button to control the Z axis is mobile, reverse.
- The precise movement: In this input value and then press the direction key, the laser head in the direction of accurate movement.

Starting point: the current position is the location of the laser head as the starting point, the user is to set up a processing starting point in the laser

head to the best starting point for you to start the process^{SetStart}, The laser head will be back to the starting point after processing, ^{GoStart}

- > Is to return to the starting point.
- > The return to zero: refers to the laser head back to X, Y, axis is zero.
- > The laser spot: Click Laser Button, laser burst command execution device.
- Open the camera : Click^{Open Camera} Button, bomb to frame as below. In order to prolong the life of the camera, in the confirmation after opening the camera off camera on the frame.



picture quality: click on the button, sub-color and automatic two, according to the material color contrast contrast ratio of different reasonable choice, by adjusting the image contrast to improve the template cutting and finding edge cutting probability

Colow	V Auto	Recovery
Contrast:		0
Black and		
□底色	220	

, With the mouse to move the slider to operate, the limit black and white is used to cut the lace material cutting edge with, through the slider to adjust.

		×
Colow	V Auto	Recovery
Contrast:		0
☑ Black and		102
	[]	10
□底色	220	

3.2.1 Calibration management

Click	Calibration	Button, bom	b to frame a	as below.			
χ O	у О		х 0 у 0		X O	ү 0	Pixel Calibration
	1170 1040	910 780	650	520 390	260 13	BO 0	Col Nums 27
	-						Row Nums 19
							Distance 25
	8-						Cut Lines
							Photograph
						x	Area
x	8					0	
Y						Y	Auto Cal
	8						Cal
							Distance
							x: 0
	8-						¥: 0
	4						
	8						smart cut cal
	8						Smart cal
	1						
χ O	у О		X 0 Y 0		X O Y	0	All clear

The number of columns: width to equipment calibration divided by the spacing equal to the number of columns.

The number of rows: long distance divided by the format equipment calibration is equal to the number of rows to.

The pitch: the rows, columns of the distance between. (The proposal 30MM--50MM)

To draw the line: the number of columns, rows, spacing after count, click

Cut Lines The button, immediately began to draw equipment model calibration line.

The photo: after the line is completed, click The button, pop-up on the frame. The following chart.

<u></u>								🔼
χ 0	γ 0			х 0 у 0		х 0 у 0		Pixel Calibration
		180	360	540 7	20 900	1080 1260	1440	Col Nums 7
	_							Row Nums 5
				0				Distance 100
								Cut Lines
	8-							Photograph
		2					x	Area
0	8						0	Auto Cal
Y O							Y	
	8							Distance
				~				A. 0
								Y: 0
	R-	pp Bassis						
								smart cut cal
	8							Smart cal
x O	¥ O			χ Ο γ Ο		х 0 ү 0		ALL Clear
					ne stad i			

The designated area: Area to select the format calibration equipment. Figure.
 Green area is the effective area of calibration.

The automatic correction: click on the designated area

- > Button As shown in the following figure, is the success of the calibration.
- If automatic correction is not successful, it will appear as shown below. So you need to manually double click the left button to add the feature points to the missing.
 Press Delete key to delete the extra points.

X O	y O			X 0	у <mark>О (</mark>			X O	γ 0		Pixel Calibration
		 180	360	540	720	900	1080	1260	1440		Col Nums 7
	0-	Lange of the same					TATA AND ADDRESS OF				Row Nums 5
	4										Distance 100
	8										Cut Lines
	-										Photograph
					PowerCut	×				x	dres .
X	8-									0	
Y					- 🔔 Si	iccess!				Y	Auto Cal
											Cal
	<u>~</u>					确定				1.000	Distance
											X: 143.746
	8-										¥: 42.007
	4										
											smart cut cal
	б.										Smart cal
	1										All clear
X O	ү О			x 0	£ 0 C			χ Ο	Υ		

Manual correction: after the confirmation of the target site added, then press Cal button , Will appear as shown in the following figure, the manual correction of success.



χ O		Pixel Calibration
	0 180 360 540 720 900 1080 1260 1440	Col Nums 7
		Row Nums 5
		Distance 100
	8	Cut Lines
		Photograph
w	PorerCut	X Area
х О		0 Auto Cal
Y		Y COL
	8-	
	通信 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Distance x: 143.746
		χ: 42.007
		smart out cal
	8-	
		Smart cal
	1	All clear
X O]

Tip: after the completion of the correction is best to backup the next software to prepare for the next time the software update, so that you can avoid the next need to recorrection, the method is to use the right mouse button to click on the desktop shortcut

icon select properties, click Open File Location find Model and PREFERENCES Copy it, and then cover the two files directly to the installation file after the next installation:

Security	D	etails	Previous Versions
General		Shortcut	Compatibility
Po	owerCut_70	20-1800	
Target type:	Application	n	
Target location	: PowerCut	_7020-1800	
Target:	ogram File	s\PowerCut_	7020-1800\PowerCut.ex
Start in:	"C:\Progr	am Files\Pow	erCut_7020-1800''
Shortcut key:	None		
Run:	Normal w	indow	
Comment:			
Open File L	ocation	Change Ico	on Advanced

Organize 👻 🛛 🔭 Ope	n New folder			•
🛠 Favorites	Name	Date modified	Туре	Size
E Desktop	鷆 Ing	1/9/2016 12:29 AM	File folder	
Downloads	퉬 model	1/9/2016 1:24 AM	File folder	
📃 Recent Places	PREFERENCES	1/9/2016 12:29 AM	File folder	
	퉬 styles	1/9/2016 12:26 AM	File folder	
🔚 Libraries	퉬 Uninstall	1/9/2016 12:26 AM	File folder	
Documents	🚳 Base.dll	11/30/2015 8:19 PM	Application extens	328 KB
J Music	🚳 Cnc.dll	1/8/2016 4:56 PM	Application extens	112 KB
Pictures	🚳 cximage.dll	12/27/2010 6:50 PM	Application extens	1,196 KB
🛃 Videos	🚳 dxf.dll	2/1/2015 4:48 PM	Application extens	7,712 KB
_	EasyUSBD13.dll	5/29/2014 1:06 AM	Application extens	44 KB
🖳 Computer	🚳 ET199_32.dll	6/6/2012 7:51 PM	Application extens	200 KB
	S FCAM.dll	3/15/2012 9:07 PM	Application extens	140 KB
📬 Network	🚳 freetype6.dll	8/12/2009 3:08 AM	Application extens	445 KB
	🚳 ftd2xx.dll	8/25/2011 2:13 AM	Application extens	199 KB
	🚳 ImgProc.dll	3/31/2009 1:32 AM	Application extens	68 KB
	🚳 kern.dll	1/8/2016 4:57 PM	Application extens	872 KB
	MotionControl.dll	10/19/2015 1:41 AM	Application extens	48 KB
	PowerCut	1/9/2016 12:26 AM	Application	1,192 KB

> correction offset: sometimes in the edge cutting and template cutting in the machine
closer to the location of the four sides of the machine cutting is not very accurate, through the intelligent cutting correction correction cutting accuracy, here is the camera calibration of the effective area is divided into eight effective areas, The location of the cut when the offset with the mouse to the corresponding location check box tick, point (in the position to be modified to pull the white paper, the laser head will cut a mark need to use), mark cut out after the point, The camera will take pictures to match, automatically get the offset value, each region has a corresponding coordinate value input number box.



Check and focus on intelligent cutting effect



Point Smart Correction Get the coordinates automatically

3.2.2 Template cutting settingsTemplate Management: click on the control panel of the

software.	Model	Enable templ	ate mana	gement fui	nctions as fol	lows:		
Model								
software.	High: 0	Enable templ	ate mana	gement fur	for the second s	Model Fi Index 0 1 2 3 4 5 Load mo New Mo Del Mo Sig Temp ✓ Fast ✓ 180 Alpply All Temp	le Name 145 4 414 451 471 5 	Export Model Save Model Save EMP Similarity% 60 All Model s grade ' 1 99 S0
8-							OK/Qu	uit

In the template management interface

, The view area in a

picture of the current camera position by making the new bitmap, edges after cutting border line directly into.Ptl/.dxf file sets, in no cutting border line cases, the stroke function is enabled, the stroke function introduction is as follows:

Stroke operation process:

The first step, click the left mouse button to select "stroke" button, in the template of the bitmap corresponding location, click the left mouse button create a node. (node can create multiple)

The second step , when the node is created, click the right mouse button once to generate a control point.

Third step, move the mouse to the control point, press the left mouse button to drag the control point, the corresponding edge data will automatically follow the mobile, until the edge of the data is satisfied when the left mouse button, so that each of the control points can be edited to obtain satisfactory edge data. The fourth step, completed after the third step, click the right mouse button once, then you can create a second stroke object nodes, if do not need to create a node, then click the right mouse button once can exit the stroke function.

Edit stroke data flow:

The first step, if the completion of the stroke, the stroke data not satisfied need to modify please click the left mouse button and select "Edit" button, then edit function of stroke data enabled. In view of the data editing on stroke need to click the left mouse button can be selected for this object. Note: only click the left mouse button to select stroke data objects, select or non stroke objects cannot be selected.

The second step and elected stroke object after that object of this stroke control points will be automatically displayed, this time using the stroke in the operation process of the third step to edit, when finished editing, click the right mouse button once. At the same time, choose another need to edit the stroke of the object editor. If all the editing has been completed, then again, click the right mouse button to exit the "Edit stroke data" function.

The following is a detailed description of each step of the operation:

The stroke function, stroke edge feature of trademark template manually painted, template data users need to cut. When the user through the establishment of a template to get the required template model.bmp (bitmap) can be in the trademark cutting software, the view of the manual, graphics are as follows:



Click on the picture to stroke tool buttons and in view of the bitmap template click the left mouse button to create nodes, generate cutting line.



The following figure is a good graphics node



Control points are edited by the method above the right click the right mouse button two times or click the mouse button to select the function keys are also available \Bbbk , We get the template edge data that we need, the software automatically put the template data as the red layer, the image is the final generated edge data.



Stroke data editing:

If to stroke out the template data are not satisfied with the need to modify (shown in Figure in the red region), by using the "Edit stroke data" button click the left mouse button below violet region of the, and then to view to edit the stroke data using the mouse to click, then the node will re displayed in the node using the mouse to click to edit the node will appear two control points that need to be revised from time to time use the mouse to drag the node or control point to edit (shown in Figure 2). After the completion of the editing, click the right mouse button to get the satisfaction of the template data two. (shown in Figure 3)

(2)

If you just want to adjust a node location can be used to click the node and then press the keyboard arrow keys to move as the following figure





Please click the right mouse button to generate the data. Build data then click ______, Edit the complete frame selection feature, the following red boxes become the final cut line.



And the feature definition:

Box selection panel features first with the mouse point^{MI} And then use the mouse to select the picture frame characteristics, the touch plate is used to cut the target location, the following figure in the blue lines for the extraction of the characteristics of the plate



And save the template:

Point save template



The input file name as 1234 arbitrary name can be as long as you don't repeat



Set and template parameters:

Sig Temp Para	Similarity%
✓ 180	60
Apply Para to All	Model
All Temp para Smoothness gr	ade 0
Smoothness 40	Overlap% 50
OK/Quit	

"A single template parameter": all the parameters in the range are only applied to a single template that is currently selected.

1 "parameter is used for all templates": apply a single template parameter to the template that has been checked in all of the template lists.

2 "similarity ratio": the similar proportion of template matching, the object of which will not be able to match.

3. "Fast mode": tick refers to the match object in the counter clockwise rotation of 20 degrees clockwise rotated 20 degrees between the angle range can match, while more than the angle range of object did not match the success. General point of view control in the range of 20 to match the speed will be faster, no tick refers to the maximum rotation angle between the matching object and template. Matching objects in inverse clockwise rotation of 180 degrees clockwise rotated 20 degrees between the angle range can match in matching speed will be low.

All the template parameters: all the parameters in the range apply to the template that was checked in all the template lists.

4 "positive and negative 180": when the graph is rotated 180 degrees when the speed matching

5 "smoothing coefficient": refers to the template after the definition of template characteristics of the filter parameters. The more template features, the lower the matching efficiency, so it is necessary to filter out some of the template features. Under normal circumstances is 50~70, if the template features more and more miscellaneous, this time it is necessary to improve the smooth coefficient. Drag the slider to adjust the size of the 10 integer times, but also can be manually input any integer value.

6 "overlap": refers to the need to be matched to the need to cut the template contour data and the surrounding area has been cutting the material overlap area ratio, the following figure 2 object and 1 object will need to set up 100% of the overlap ratio, otherwise the object will not be cut 2. This parameter is to prevent the object that has been cut to bad.



Selection process template:



3.2.3 Cutting edge setting

> The profile settings: set with cutting edge contour extraction of contour parameters

ting.	Click	Button, pop-u	up on the frame a	as below.
Edge	es Setup			
P	arameter lis	t		
	Index	Name	Size(mm)	Error (%)
	₽ 0	001		
	1	2		
	Accession	Delete	Accession	Delete
S	moothness 7	0 % (0-100)	Curve 10	% (0-100)
L	ink 2	mm (0-100)	Min length 1	mm (0-10)
M	in size 4	0 mm	Max size 120) mm
0	dd Offset O	mm (0-20)	Even 0	mm (0-20)
C	lose 🔽]	Outside 🔽	

> The smoothing coefficient: refers to the filter parameters on the feature points. The

more features, the lower the matching rate, so it is necessary to filter out some of the redundant feature points. The smoothing coefficient always set for 50—70. If the feature points are more and more complex, it will be improved.

- > The curve fairing: refers to the change curve of uniform, reduce the inflection point and the small line, so that the processing equipment running more smoothly.
- The connection length: when the contour line with minor damage, here filled with a suitable size, so that damage can be connected.
- The minimum wire length: the extracted edge curve between two points of minimum distance, its main role is allowed to walk in the process of equipment more smoothly.
- minimum size: in the edge searching process, the graph with the maximum diagonal size less than minimum size setting value, software will not be found.
- The maximum size: in the edge searching process, the graph with the maximum diagonal dimension is greater than the value of maximum size is set, software will not be found.
- The contraction expansion: the overall size of the original graphics to enlarge or shrink. (in the example, please fill in the negative).
- > A closed contour: only the completely closed contour line extraction.
- Is the Outline: only the outermost contour graph. Figure. (the red line, in the picture is the outline).



> The outline of the parameter list:

la	 ALA A CA CIC/
0 001	
1 2	

- Index: File serial number
- Name: File name
- Size: Dimensions. The maximum diagonal dimension to be extracted from the graphics. (a file can be added to a number of dimensions).
- Error: Percent. As long as the "Size" is in the size of the positive and negative ten percent graphics are extracted from the contour line. (for example, the picture is in line with 90~110).

Matching test: after the completion of the "template set" or "contour settings", click Mach Test

, Check whether the matching to the graphics meets the requirements.

3.2.4 Cutting function to material requirements

- 1. Have the processing pattern of each edge along the edges, and the line width of not less than 3mm, the color to be separated from the background area.
- > 2. At least 5mm between graphics and graphics.
- 3.cutting graphics background colors and graphics are not nearly color
- 3.3 feed settings

Click the button	Send	. Figure:			
_		-			
	Sending setu	P		· · ·	
	Index	Name	Index	Length(mm)	
	0	3	0 1	300 200	
			2	300	
	Accession	Delete	Accession	Delete	
	🗌 Auto sei	nd	Start in	dex: $0 \rightarrow = 0$	
	📃 Smart s	end	Correct len	gth: 0 mm	
	🗹 Up-Down		Send de	lay: 0 s	
	Send on	ce			
		OK		Cancel	

Add: new file name.

Delete: Click the folder will turn blue before they can be deleted.

Automatic feeding: Check automatic feeding, the need to feed in the input size.

Tip: Automatic feeding support different lengths of feeding a cycle of several

ersion.	Index	Length(mm)
	0	200
	1	300
	2	400

Starting version: Choose from the edition start feeding.

Smart Feeding: own calculation software feed length, Y-cut long to send long. Correct length with intelligent feed applications, when the cutting insert graphics, the length of the insert portion sizes to fill in the correct form of negative numbers in length.

Single Feeding: Check single feed, feed devices send only once. Feeding Delay: After feeding is completed, how long to stay, and then the next processing.

3.4 Equipment control

Control Model cut Edges cut Validate
Cut Stop
Stencil cutting: when you need to cut the template on the hook
Edge cutting: need to find the edge of the cut when the hook
Post confirmation: if checked , Software will be matched to graphics, etc.
Equipment to start cutting. The following chart.

Control	
│ Model cut ✓ Edges cut ✓ Validate	Continue
Cut	Stop

3.5Processing information

-WorkInfo		
Model Num:	0	
Edge Num:	542	Clear
Work Time:	00:00:04	

- > Template number / number of the number: processing full version of the re count.
- Working time: total processing time.

Bottom software/hardware operation instruction and line connection Chapter 1 Summary

1.1、System function

PowerCut laser CNC cutting system is mainly used in laser engraving , cutting and marking.

System's operation and display are all having step function window to reminder. For example: under the main window menu , after calling a certain

function, the system will bounce up this function's child window menu. Step setting according to the operation instruction.

1.2、System features

- 1: Embedded industrial host: high performance ARM processor, 4 inch high brightness industrial LCD screen, 4 inch resistence touch screen, support touch screen control.
- 2: Strong system reliability, strong anti-jamming ability
- 3: External interface: USB2.0, RS232, 100M network interface
- 4: The system provide road 2 photoelectric isolation input, and road 2 photoelectric isolation output.
- Linkage shaft number: 3 axises
- Working temperature: $0 \degree$ +40°C, atorage temperature 25°C-

+60°℃

1.3、Software function

- 1. Use one key to switch the Sino-British double language version.
- 2. Support the file format cut.

3. There is power-off protection function. If it is power off during the processing, system can remember this breakpoints, and find the breakpoints to continue processing,

- 4. Conduct the speed adjustment function in the course of processing.
- 5. Registration code protection function
- 6. Bottom software U disk upgrate function.
- 7. continous feeding function.
- 8. left-right direction push board function.
- 9. double-head mutual movable function
- 10. network setting function

Chapter 2 Operating Instructions

2.1 Operation panel and key function introduction



(2.1 operation panel)

2.1.2 Key Function Introduction

LASER (Laser / laser) key: laser preset key, test laser use, click once, light once. Used to adjust the laser.

2.

1.

(File / File) key: Enter the memory file information settings interface. Has been long press to enter the file information interface.

FILE

SET (Set / Set) key: Enter the setup menu and set the parameters. Long press the set key, the "offline" and "online" switch.

4.

3.

USB (U disk / U Disk) key: enter the U disk file interface.



5. ORIGIN (Origin / origin) key: for the laser head back to the mechanical origin.



(Frame / Frame) key: Make a border preview.

7. (Exit) key: Defines the key to cancel the operation and return to the previous

interface.



processing interface can adjust the rate in real time.

- Z-axis key: for Z-axis feed device before and after the move feed. 10.
- 2.2 System main menu introduction
 - 2.2.1 boot interface

Boot interface as shown in Figure (2.2.1)



2.2.1 boot interface

2.2.2 Standby interface

After initialization, enter the standby interface (Figure



2.3 Home Screen

Figure 2.3C shows the X / Y axis real-time coordinate values.

Figure 2.3A shows the graphics of the processed file. The working state of the system.

Figure 2.3B shows the parameters of the system processing, including the name, total, complete, interval, power, speed.

File name: The name of the file to be processed.

Completed number: The number of processing files has been completed.

Number of processing required: number of processing documents to be processed.

Power magnification: The power mode used by the laser light signal when processing the document.

Rate override: Percentage of speed when processing the file (press the X axis direction key during processing to adjust the rate in real time).

Processing count: the number of processing.

Processing time: how long has been processed?

2.2.3 File interface

Press the [File] key on the operation panel in the standby interface to enter the file interface. As shown in Figure 2.4

Unused: C	File Num:	
Α	B	PGUP
		SELECT
		PGDN
		Î INF

Figure 2.4 File community

Figure 2.4A shows the graphics of the selected file.

Figure 2.4B shows a list of the names of the files contained in the memory.

Figure 2.4C shows the size of the remaining memory stored in the file. The system currently stores the number of files.press



Figure 2.5.

File Inf[1\1]		
Vratio English	Starty	
PRatio	StopMode	POUP
Need	StopX	
Complete	StopY	SELECT
Interval	CMode	
start Mode Curren	Zlength	.
StartX	Cout	PGDN
4		
ESC		SAVE

Figure 2.5 File action item

(1) Speed ratio: Percentage of current speed, in the range of 0 to 100.

(2) Power ratio: Percentage of current power used.

(3) Total number of processing: the number of times the current document needs to be processed, ranging from 0 to 20000.

(4) Completed: The number of times the current file has been processed, in the range 0 to 20000.

(5) time interval: the current file multiple processing, the processing is completed after the next processing from the beginning of the interval, in seconds, ranging from 0 to 999 between.

(6) start mode: the beginning of the current file processing starting point, including fixed-point, immediately, custom, origin four modes.

Fixed point: the parameter setting in the positioning point X, positioning point Y set the parameters as the starting point of processing.

Immediately: the current location of the laser head as the starting point for processing.

Custom: the starting point of the starting point X in the file information and the starting point Y as the starting point of the machining.

Origin: the origin of the machine as a starting point for processing.

(7) Start point X: Sets the coordinates of the starting point of the X axis when the laser head is started, in the range of 0.0 to 9999.999, and is valid when the start mode is in the custom mode.

(8) Starting point Y: Sets the coordinates of the starting point of the Y axis when the laser head starts machining, in the range of 0.0 to 9999.999, and is valid when the start mode is in the custom mode.

(9) docking mode: after processing the laser head docked, including the starting point, custom, origin three modes.

Start point: After processing, the laser head stops at the starting point X, the position set by the starting point Y.

Custom: After the processing is completed, the laser head is docked

at the point where the stop point X and the stop point Y are set. Origin: After processing, the laser head stops at the origin position. (10) Stop point X: Sets the coordinates of the X-axis docked after the laser head is processed, in the range of 0.0 to 9999.999, and is effective when the docking mode is in the custom mode. (11) Stop point Y: Set the coordinates of the Y-axis that is docked after the laser head is processed, in the range of 0.0 to 9999.999, when the docking mode is in the custom mode. (12) count mode: split version of the count and a single count of two.

Full size: Accumulated count after machining full format graphics.

Single: A finished graphics count.

(13) Feeding length: Feeding size of the current drawing.

2.2.4 U disk file interface

Insert the U disk in the operation panel directly by "U disk" button, directly into the U disk



interface. As shown in Figure 2.6

Figure 2.6U disk interface

Figure 2.6A shows the graphic of the file

Figure 2.6B area shows the U disk can copy the file name list Figure 2.6C shows the U disk: the system in the U disk state Number of files: Number of files that can be copied in U disk



interface. press SELECT Key to jump out of the operation of this file, as



Figure 2.7 File action item

1. OK :That this file will be copied to the system, you can copy the current file to the file storage area, and set the current processing file.

2.2.5 Set the interface

Press the "Settings" button on the operation panel to enter the setup interface, as shown in Figure 2.8.



Figure 2.8 Set the first page of the interface

- 1. Language / Language: Replace the display language, optional "Chinese" and "ENGLISH" two.
- 2. Move speed: the speed of the laser head to move, the greater the value, the faster, ranging from 0 to 500.

3. Border speed: the speed used to move the border, the greater the value, the faster, ranging from 0 to 500.

4. Positioning point X: Sets the coordinates of the X-axis starting from the start of the start of the laser head, in the range of 0.0 to 9999.999, when the start mode is in positioning mode.

5. Positioning point Y: Sets the coordinates of the Y-axis starting at the beginning of the start of processing of the laser head, in the range of 0.0 to 9999.999

6. Z-axis speed: Z-axis movement speed, the greater the value, the faster, the range between 0 to 500, the starting mode is valid for the custom mode.

7. IP address: The system IP address number, and the computer connection will be applied to this address number.

8. Registration code: registration code provided by the supplier, and then enter the prompt area can be. The registration code can be developed for any period of time. After the expiration of the system will stop using, if prompted

"registration code expired" to contact the supplier, to obtain a new registration code to continue to use.

9. Double-headed spacing: the distance between two laser heads.

10. Track display: display graphics processing side of the trajectory, divided into points and lines in two ways.

11. Z Axis Focus: Set the focus distance of the laser autofocus.

- 12. Load the parameters file: use U disk to load the upper software parameters (please refer to the upper case software instructions)
- 13. System upgrade: U disk upgrade system with the current software (only for the underlying software upgrades).

The

14. Touch screen correction: through touch screen correction to enhance the touch sensitivity.

(See Section 2.26 for Chapter 2).

2.2.6 modify the parameters of the method

1 Modify the language class parameters

Click on Language English Select Chinese or English, click to change Key

to change the state of the language class parameters.

 $2\ {\rm Modify}$ the numeric class parameters

Double-click the dialog box to display the digital class options dialog box, as shown in Figure 2.11 Digital dialog box. At this point click on the touch screen on their own numbers, clickClick Save to change the value of the selected numeric class parameter.



Chapter3 The instruction of the installation and wiring

3.1 Installation sizeClick on



Display panel installation size(unit: mm)



Main board installation size (unit: mm)

3.2 Wiring instruction

3.21 Interface board



3.22 Wiring diagram

1. power supply port wiring diagram



2. XYZ axis port wiring diagram



3. Outlet port wiring diagram



4. .Limited /Home signal port wiring diagram



5. Inlet port wiring diagram



6. laser control port wiring diagram



3.3 Port definition instruction

3.31 Power supply signal (This system adopt the direct current 24V supply the power) $\ _{\circ}$

24V power supply interface JP1 in the system (switch power supply interface port)

PIN	Definition
1	24VI Inner 24V power supply positive (input)
2	GND Inner 24V power supply negative(input)
3	GND outer 24V power supply (input)
4	24VI outer 24V power supply positive (input)

2.32 U disk interface port

Marking U-disk. You can directly insert the U disk to read and write.

2.33 PC interface port

Marking PC. You can use the USB connection wiring to connect the computer to read and write the files.

2.34 Network port

Marking the NETWORK. You can use the network cable to connect computer to read and write the files.

2.35 port definition

X port definition

PIN	Definition
1	X1 DIR X2 axis directional signal (output)

2	X1 PUL X2 axis pulse signal (output)
3	5V outer The 5V power supply positive (output)
4	X2DIR X1 axis directional signal (output)
5	X2PUL X2 axis pulse signal (Differential signal negative
	terminal) (output)
6	5V outer The 5V power supply positive (output)

Y axis Z port definition

PIN	Definition
1	YDIR Z axis directional signal (output)
2	YPUL Z axis pulse signal (output)
3	D5V outer The 5V power supply positive (output)
4	ZDIR Z axis directional signal (output)
5	ZPUL Z axis pulse signal (output)
6	D5V outer The 5V power supply positive (output)

OUTPUT port definition

PIN	Definition
1	24 24V Inner 24V power supply positive (output)
2	OUT1 Blowing (output)
3	OUT2 Paint (output)
4	OUT3 (output)
5	OUT4 (output)
6	AGND 24V Grounding (output))

X1axis Home/Limited port definition

PIN	Definition
1	24V (output)
2	XLM- X origin and X negative limit multiplexing signal (input)
3	XLM+ X axis positive limited position signal (input)
4	GND (output)

X2 axis Home/Limited port definition

PIN	Definition
1	GND (output)
2	X2LM- X2 origin and X negative limit multiplexing signal (input)
3	X2LM+ X2 axis positive limited position signal (input)
4	24V (output)
	·

Y LIMIT port definition

PIN	Definition
1	24V (output)
2	YLM- Y origin and Y negative limit multiplexing signal (input)
3	YLM+ Y axis positive limited position signal (input)

4	GND (output)
Z LIMIT port definition	
PIN	Definition
1	24V (output)
2	ZLM- Z origin and Z negative limit multiplexing signal (input)
3	ZLM+ Z axis positive limited position signal (input)
4	GND (output)

INPUT port definition

PIN	Definition
1	24V 24V power supply positive (output)
2	IN1 water protection switch (input)
3	IN2 Door protection switch (input)
4	IN3
5	IN4
6	GND 24V Grounding (output)

LASER1 port definition

PIN	Definition
1	GND
2	TTL1- realeasing light can show the negative signal(output)
	(light: 0V,light off 5V)
3	TTL1+ realeasing light can show the positive signal(output)
	(light: 0V,light off 5V)
4	PWM1- light signal (differential signal negative port)
5	PWM1+ light signal (differential signal positive port)
6	AOUT1 The light analog signals (output) (0 to 5 v)

LASER2 port definition

PIN	Definition
1	GND
2	TTL2- realeasing light can show the negative signal(output)
	(light: 0V,light off 5V)
3	TTL2+ realeasing light can show the positive signal(output)
	(light: 0V,light off 5V)
4	PWM2- light signal (differential signal negative port)
5	PWM2+ light signal (differential signal positive port)
6	AOUT2 The light analog signals (output) (0 to 5 v)

Chapter 4Common problems instruction

3.1 the computer connecting problems The problems' performance phenomenon:

1. 1remind the communication breakdowns

2. It can not read and write the parameters.;

3. The transferring files is ineffective.

Solving steps:

1. To check if the USB line is connected correctly and good. To check if the port of the USB line

is connected with the PC.

2. To check if the USB driver program are installed rightly. To install the driver program again.

1. Insert a good USB port again from the computer.

2. Close the machine power one minute and open it again.

3.Restart the computer, and connect equipment and the computer to the ground.

4.Exchange a computer.

3.2 U disk reading and writing problems

Click the U disk files and showing "the U disk is blank or wrong" Answer: U disk error

Resolution:

Step 1: check the U disk if it is correct

Step 2: replace another U disk

3.3 Camera connection problem

Problem phenomenon:

(1) the camera is not changed after the completion of the processing;

(2) the green light will not be fully open to the camera;

Solution method:

(1) check the interface between the camera and the USB connector is loose, and check the connection line and the computer's USB port is in good contact, check the camera connection line is broken, for the old computer, please check the computer's USB port driver is reliable, if it is to replace the computer.

(2) check the camera connection line is bad, check whether the camera is broken, for the old computer, please check the computer's USB port driver is reliable, if it is to replace the computer.

Light control problem

- 3.4 Problem phenomenon:
- (1) a burst but no light;
- (2) no light is produced in the process;
- (3) the size of the light can not control;

Solution method:

- (1) no burst of power or power set is too small.
- (2) no setting power or power setting is too small.
- (3) check the circuit wiring and control card with no signal output.
- (4) check the laser power supply or laser tube

3.5 Machine no action

Problem phenomenon:

- (1) the machine cannot move in the direction of the arrow keys;
- (2) after the start of the power can not automatically return to zero;
- (3) return to zero error;
- (4) move in one direction only;

(5) the machine returns to zero after the start of the machine, and the control panel prompts the system to start up.

Solution method:

(1) check the control card has no pulse output and check the line and the driver is in good contact, the key is not failure.

(2) please check the control card back to zero switch and control card control port has no pulse output.

(3) check whether the return to zero has been bad.

(4) check the direction of the control card control port signal and check whether the line is in good contact with the driver

(5) check the cable port on the panel to the control card Display port link is open
Chapter5Classic laser cutting machine wiring diagram

5.1 ordinary laser cutting machine wiring diagram





5.2 The wiring diagram of the double-heads mutual movable laser cutting machin

(one head wiring diagram)