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1. Description

Connection method	Driver Version	Patch version	Card	Software version
USB	V3	V3	V3K1,V3K2	1.2.3 test6.4
USB	V6	V6	V3K1, V3K2 V6K2, V6K3	$1. 2. 3 \\ 6. 4 , 6. 5 \\ 7. 4 , 7. 5$
PCIE	V6	V6	PCIE	1.2.3 6.4 , 6.5 7.4 , 7.5

Note: When installing the software, select the corresponding driver and patch according to the table above.

Dongle	Software
standard software	Without vision
Vision software	With vision

Note: The dongle needs to be used in conjunction with the software.



2. Software installation

2.1. Installation steps

1. Find the location of the software installation package downloaded from the website.

名称	修改日期	类型	大小
PDUMotionV8.1_CCD	2023/4/21 星期五 10:	应用程序	437,734 KB

2. Double click with the left mouse button to pop up the following window.

选择安装	 長语言	\times
3	选择安装时要使用的语言:	
	简体中文	~
	确定	取消

3. Please select the language used during installation before installation.

选择安装时要使用的语言:
English
English

4. Please click on the Next> step with the left mouse button.

🔂 Setup - PDUMotion	×
	Welcome to the PDUMotion Setup Wizard
	This will install PDUMotion version V8.1_CCD on your computer.
	It is recommended that you close all other applications before continuing.
	Click Next to continue, or Cancel to exit Setup.
R	
	Next > Cancel



5. Please enter the password in the Password field and click Next>

			×			
Password						
This installation is password protected.			JA A			
Please provide the password, then click Next to continue. Pa	sswords are					
case-sensitive.						
Password:						
•••••• Password: JK0803						
				-		
< Back	Next >	Ci	ancel	-		
< Back	Next >	Ca	ancel			
< Back	Next >	Ca	ancel			
Setup - PDUMotion -	Next >	Ca	ancel			
Setup - PDUMotion —	Next >	Ca	ancel			
Setup - PDUMotion	Next >	Ca wse For F	older			
Setup - PDUMotion — Select Destination Location Where should PDUMotion be installed?	Next >	Ca wse For F lect a folder	older	elow, then dick OK.		
Setup - PDUMotion	Next >	Ca wse For F lect a folder r;\8.1\PDUM	older in the list be lotionV8.1_C	elow, then dick OK.	5	
Setup - PDUMotion — Select Destination Location Where should PDUMotion be installed? Setup will install PDUMotion into the following folder.	Next >	Ca wse For F lect a folder :\8.1\PDUM	older in the list be lotionV8.1_C 00AAA尚招	elow, then dick OK.		
Setup - PDUMotion — I Select Destination Location Where should PDUMotion be installed? Setup will install PDUMotion into the following folder. To continue, click Next. If you would like to select a different folder, click Browse.	Next >	Ca wse For F lect a folder :\8.1\PDUN >	older in the list be lotionV8.1_C 00AAA尚招 1A视频	elow, then dick OK.		
 Setup - PDUMotion — Select Destination Location Where should PDUMotion be installed? Setup will install PDUMotion into the following folder. To continue, click Next. If you would like to select a different folder, click Browsee D:\UWTEST\PDUMotion\7.5 CCD Browsei Browsei Browsei Setup Will install PDUMotion PDUMotion Into the following folder. Setup Will install PDUMotion Into the following folder. Setup Will install PDUMotion PDUMotion Into the following folder. Setup Will install PDUMotion PDUMotion Into the following folder. Setup Will install PDUMotion Into Into the following folder. Setup Will Install PDUMotion Into Into Into Into Into Into Into In	Next >	Ca wse For F lect a folder :\8.1\PDUM >	older in the list be lotionV8.1_C 00AAA尚招 1A视频 11E (测试词	elow, then dick OK. CCD 互交软件在里面)		
Setup - PDUMotion Select Destination Location Where should PDUMotion be installed? Setup will install PDUMotion into the following folder. To continue, dick Next. If you would like to select a different folder, dick Browsee D:UWTESTVPDUMotionV7.5_CCD Browse First click Proves coloct file	Next >	Cz wse For F lect a folder :\8.1\PDUM >	older in the list be lotionV8.1_C 00AAA尚招 1A视频 1IE (测试路 6.4CCD	elow, then dick OK. CCD 章 英文软件在里面)		
Setup - PDUMotion – Setup - PDUMotion Select Destination Location Where should PDUMotion be installed? Setup will install PDUMotion into the following folder. To continue, click Next. If you would like to select a different folder, click Browse D:\UWTEST\PDUMotionV7.5_CCD Browse first,click Browse,select file files campit be placed on the	Next >	Ca wse For F lect a folder	older in the list be lotionV8.1_C 00AAA尚招 1A视频 1IE (测试题 6.4CCD 7.4华工天將	elow, then dick OK. CCD 互 英文软件在里面) 军		
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< Back	Next >	Ca wse For F lect a folder :\8.1\PDUN > > >	older in the list be lotion/8.1_C 00AAA尚招 1A视频 1IE (测试道 6.4CCD 7.4华工天將 7.5 7_zip 3.1	elow, then dick OK. CCD 互 英文软件在里面) 军		
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< Back	Next >	Ca wse For F lect a folder :\8.1\PDUM > 	older in the list be lotionV8.1_C 00AAA尚招 1A视频 1IE (测试路 6.4CCD 7.4华工天將 7.5 7_zip 8.1 ates8轴划》	elow, then dick OK. CD 章 英文软件在里面) 章		
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Setup - PDUMotion Setup - PDUMotion Select Destination Location Where should PDUMotion be installed? Setup will install PDUMotion into the following folder. To continue, dick Next. If you would like to select a different folder, dick Browsee D:\UWTEST\PDUMotionV7.5_CCD Browsee first,click Browse,select file files cann't be placed on t At least 947.3 MB of free disk space is required.	Next >	Ca wse For F lect a folder :\8.1\PDUM	older in the list be lotionV8.1_C 00AAA尚招 1A视频 1IE (测试 6.4CCD 7.4华工天將 7.5 7_zip 8.1 ates8轴划) Backup BaiduNeto	elow, then dick OK. CD 英文软件在里面) 章		

7.





10.



Setup - PDUMotion — 🗆 🗙
Installing Please wait while Setup installs PDUMotion on your computer.
Extracting files D:\8.1\PDUMotionV8.1_CCD\depends.exe
waiting for software installation to complete
Cancel
1. After the installation is completed, the following interface will pop up. If the plugin is no
nstalled, the continue button
ਯ Microsoft Visual C++ 2010 x64 Redistributable 安装程序
安装程序检测到,此计算机不满足安装此软件的要求。必须先解决以下问题,然后才 能安装 Microsoft Visual C++ 2010 x64 Redistributable 安装程序 软件包。
请解决以下问题:
已在此计算机上检测到 Microsoft Visual C++ 2010 Redistributable 的更新版本。
if your computar already has Microsoft Visual C++ 2010 Redistributable ,please click
if your computar doesn't have Microsoft Visual C++ 2010 Redistributable, please click
有关详细信息,请参见 <u>Microsoft Visual Studio</u> 网站。
→ 继续(C) 关闭(L)
2. If you click the continue button 维续(c) , the following interface will pop up.Pleas ollow the picture to operate.





13. After waiting for the plugin installation to complete, please follow the instructions in the picture.



14. If the computer has never installed this software before, follow the instructions shown in the

下一步

figure. If the software has been installed before, click





欢迎使用设备驱动程序安装向导! 此向导帮助您安装软件驱动程序。没有这些驱动程 序,有些计算机设备无法运行。
要继续,请单击"下一步"。 click < 上一步(B) 下一步(N) > 取消

16.



正在完成设备驱动程序安装向导
驱动程序名 ✓ USBDevice (09/04/ 可以使用了
驱动程序名 状态 ✔USBDevice (09/04/ 可以使用了 click
驱动程序名 状态 ✔USBDevice (09/04/ 可以使用了 click

17. Install the motion control card driver, select different cards, and click (if you

2021 安装引导程序	×
未查找到GTS卡硬件信息	安装外接运控卡驱动
	外扩展轴运动控制卡类型
	click
	上一步下一步

do not need software to control the axis, default selection, directly click

下一步).

18. If this computer h	has never installed t	his software before,	please follow the	following steps
------------------------	-----------------------	----------------------	-------------------	-----------------



until the dongle driver is installed. If you have previously installed the dongle driver, clicking

1000		
<u> </u>	E	
_ p-	- 12	

will bring up the following interface.

💀 2021 安装引导程序	×
安装最新加密狗驱动	安装加密狗驱动
	依照加密狗驱动依次安装即可,当不 存在加密狗驱动文件时,软件默认为 超级狗免驱模式
	☑ 重新安装加密狗驱动
	please √ in □, Click
	上一步下一步



Sentinel Runtime - Ir	tallShield Wizard
	Preparing to Install Sentinel Runtime Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait. Extracting: HASP_Setup.msi
	Cancel
Sentinel Runtime Application Mainter Select the maintena	Setup — — X nce ce operation to perform.
Repair	Reinstall missing or corrupt files, registry keys, and shortcuts. Preferences stored in the registry may be reset to default values.
	Uninstall Sentinel Runtime from this computer.
if there is no o before wher agreement, clice	ongle driver, in the pop-up interface,please √ I have read and agreed to the relevant c next .on this interface,simply click next
	< Back Next > Cancel

 $19. \ {\rm Waiting}$ for the installation of the dongle driver to be completed.



😥 Sentinel Runtime Setup	Ø <u></u>		×
Updating System The features you selected are currently being installed.			
Repair drivers			
		Cano	el
20. After the installation is completed, click Finish.			



21. Install the visual dependency library, click "Next", and then proceed with the installation (without visual support).







22.





$23. \ {\rm Click} \ {\rm Finish}$ to complete the software installation.





2.2. Problem investigation

Error code	Solution		
H0007	No encryption dog		
H0033	Dongle driver not installed		
H0031	Wrong encryption dog model		
H0041	The software has been infected. After antivirus, reInstall the software and replace the ini folder		
H0042	Installing a dongle driver		
H0027 or the encryption dog is disconnected	Remote operation requires opening the software in advance before enabling remote operation		

Here is an example of a pop-up window without a dongle inserted:



When the motion control card fails to open, the software interface will not display the motion axis control menu.



Posit	i	÷	Positi	÷
wi dti	h	÷.	÷	
angl	e	(*	🗌 Pro	portiona
Bench nark			Fill	~ Settings
	Obj	ect 1		~ 0
	Cent	ered	Appli	cation>
MOO				Axi
<-	IO	0.000	0.00	->
<-	T 1	43.83	0 0.00	->
	fast		r	elative
move			stop	Zeroi





Failed to open the motion control card				
Check if the hardware connection is normal	Troubleshooting hardware connections			
Check if the driver is installed correctly with the fixed high card	Reinstall the driver			
PDS card checks if network connection is configured correctly	Reconfigure the network port IP corresponding to the PDS card, 192. 168. 1. 12			
Is the platform sports card type selected correctly for software platform card parameter settings	Reset the platform control card type, tool ->platform Sports card settings Platform operation control card settings Mumber of Operation control IO display Basic Settings Axis parameter settings Platform Control Card PDS DExtended ID The light curtain safety door is effective for inching			

Note: If both the driver and IP are normal, refer to 7.2

When the laser card fails to open, there will be a red font prompt in the upper right corner of the software.

— □ × PDU_00Card opening failed PDU series laser control card failed	- @ × PDU_00Card opened successfully
Check if the hardware connection is normal	Troubleshooting hardware connections
Check if the PDU series laser control card driver is installed correctly	Reinstall the driver, locate the CCDVER test 7.4\Drivers\PengDin path in the root directory of the marking software, and then select the corresponding driver for USB or PCIE. (If the



	driver has been installed before, it needs to be		
	uninstalled before installing a new one)		
	Re select the card library version, find the		
	CCDVER Test 7.4\Drivers\PDU card library path		
Software PDU_ Is the patch	in the root directory of the marking software,		
selection for the 1000 library	then select the corresponding driver for V_3 or		
version number correct	V6, select all files in the folder, copy to the root		
	directory of the marking software, and replace		
	the original files.		

3. Software interface and tools

3.1. Interface layout

1. The basic menu is a software system level setting that includes visual, camera, laser, BOX 2, correction, platform motion card, IO, and other settings functions;

2. Marking process bar: edit marking tool parameters and sort processes;

- 3. Marking toolbar: Contains tools such as graphics, bitmaps, CAD, CCD, etc;
- 4. Canvas: display graphics;
- 5. Information prompt bar: displays marking information and CCD information;
- 6. Document list;
- 7. Connection status of the galvanometer card;
- 8. Graphic editing: edit the size, position, and fill of process objects;
- 9. Control axis movement;
- 10. Process object layer;
- 11. Laser parameters: Adjust the laser marking process.



file tool set up UI switching about 1 Basic Menss		
⊕ < Q Q @ 🛗 器 A > ↓ 🗶 2000 🗑 🗑 🗣 坐 🕂 📅 🗧 📽 🐨 🗑 🖉 🚰 😭	7.Card Status	PDU_00(OK) 01(OK)
Document Process Decu () Base file	Tenporary das Positi	🗘 Positi 🔅
A Character N A 1-52.50 H-45.00 H-27.50 H-30.00 H-22.50 H-35.00 H-7.50 N.00 H-7.50 H-30.00 H-22.50 H-35.00 H-7.50 H-35.00 H-7.50 H-35.00 H-7.50 H-35.00 H-35.0	: 00	0 height 0
	angle	C Propertion
2.Frocess	Band	000
	nurk	Fill Setting
	8.G	raphic Editing
0	Cr	entered Application)
	0001-0	tion Shaft Control
COD STATES	5.101	0 0,000 0.00 ->
din 3 Tools	- 1	43 830 0.00
		ant relative
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4 Canyas	7	in his block datasets
callvas	Pen au	nber nane colour
	00	Layer00
<u> </u>	01	Layer01
	02	Layer03
		Layer04
	Laver	parameters
S.Information Tip's 🖳	11.lsas	er Parameters
		Layer Name Layer00
		layer color
		Bunber et 1
		Speed (nm/s 100.0
	Pas	ver nercentere 10.00
1001. tah	24	aveform number 0 0
and the second sec	Fr	equency (KHz) 10.000
b.A list of Documents	D)aty sysle (%) 50.000 🗘
		Turn on delay 50 🗘
	06	.E light delay 50
	2.	ed light mend 2000
	App	lication>> senior

3.2. Legend

Legend	ΤοοΙ	Instructions
•	Point	Click on the "single point" icon, determine the location of the point on the canvas, and then click the left mouse button to display a "point" object.
	Line	Click on the "Line" icon, click the left mouse button on the canvas to determine the starting point of the line. Move the mouse and click the left mouse button again to determine the endpoint of the line. Click the right mouse button to "complete"; If you need to draw a continuous curved line, just click the left mouse button multiple times.
0	Polygon	The default is a rectangle. Click the icon to select other polygonal shapes $\bigcirc \diamond \bigstar \triangle$
0	Circle (arc)	The default is a circle. Click the icon to use other arc drawing tools
*** *** ***	Array point	Click on the "Array point" icon, determine the position of the array point on the canvas, click the left mouse button, and a pop-up window will appear. In the pop-up window, set the number of rows and spacing of the array point.



IA	Character	Edit character text to enable text variables such as serial number, date, time, serial communication, network communication, etc
***	QR code	Select bar code type (one-dimensional code and two-dimensional code) and set the code content
CAD	CAD	Import completed CAD drawings, currently available in .dxf, .plt format files
ø.	BMP	You can import images in .bmp format.
Θ	Delayed	Marking delay tool.
	Platform motion	Set the platform motion position (X, Y).
\oplus	Mark	Mark a Mark point.
SCR	SCR	Edit SCR
SCR	SCR Altimetry/bar code	Edit SCR Used for height measurement compensation Z-axis or triggering code scanning gun code scanning, Debugging is similar to a serial assistant
SCR	SCR Altimetry/bar code Event variables	Edit SCR Used for height measurement compensation Z-axis or triggering code scanning gun code scanning, Debugging is similar to a serial assistant General script or custom variable usage
	SCR Altimetry/bar code Event variables Marking rectangular ROI	Edit SCRUsed for height measurement compensation Z-axis or triggering code scanning gun code scanning, Debugging is similar to a serial assistantGeneral script or custom variable usageOnly execute the graphics inside the box selection section, not outside the box selection
	SCR Altimetry/bar code Event variables Marking rectangular ROI Flight settings	Edit SCRUsed for height measurement compensation Z-axis or triggering code scanning gun code scanning, Debugging is similar to a serial assistantGeneral script or custom variable usageOnly execute the graphics inside the box selection section, not outside the box selectionUsed during flight marking
	SCR Altimetry/bar code Event variables Marking rectangular ROI Flight settings Call Sub document	Edit SCRUsed for height measurement compensation Z-axis or triggering code scanning gun code scanning, Debugging is similar to a serial assistantGeneral script or custom variable usageOnly execute the graphics inside the box selection section, not outside the box selectionUsed during flight markingCall other documents while executing this document



@@	Array photography	Take multiple positions at once to record the corresponding offset, and then hit the corresponding positions with light (recommended for use in multiple product placement rules)
÷.	Laser following	Follow the light when the axis moves (currently only in a straight line)
×	Run	Run the current document, shortcut key F6
•	Teach	Move the galvanometer through the mouse and keyboard, find the position to be welded, and generate points at the corresponding positions on the canvas
Note: The first	time vou click o	n a tool a tool editing non-up window will non up

Note: The first time you click on a tool, a tool editing pop-up window will pop up. When the tool has been added to the process bar, double-click on the tool in the process bar to edit it again.

3.3. Layers and Parameters

Pen number name		colour	^
00	Layer 00		
01	Layer01		
02	Layer02		
03	Layer03	1.0	
04	Layer04		
05	Layer05		
06	Layer06		
07	Leyer07		
08	Layer08		
09	Layer09		
10	Layer10		
11	Layer11	1.00	
12	Layer12		
13	Layer13		
14	Layer14	1	
15	Layer15		
16	Laver16		

Layer parameters Set as default Layer Name Layer00 layer color Number of 1 ÷ Speed (nm/s 100.0 ÷ Air travel speed 2000.0 ٥ Power percentage 10.00 \$ Waveform number ¢ Frequency (KHz) 10.000 + Duty cycle (%) 50.000 \$ Turn on delay 50 ٥ Off light delay 50 + Corner delay 50 ÷ Red light speed 2000 ٥ Application>> senior

1. Number of processing: represents the number of repeated processing times

2. Speed: indicates the speed of processing. Under the same conditions, the faster the speed, the lower the laser energy density acting on the surface of the work piece being processed, resulting in insufficient laser energy, and vice versa.

3. Idle speed: refers to the speed at which a solder joint jumps to the next solder joint after welding is completed.

Parameters



4. Power percentage: The total power of the laser multiplied by the power percentage is the maximum peak output power of the laser.

5. Waveform number: Call the built-in waveform of the laser (applicable to some lasers)

6. Frequency: Refers to the number of times light is emitted in one second, and the larger the number of times light is emitted, the greater the laser energy output (the matching relationship between frequency and built-in pulse width, power, and other corresponding limitations is shown in the figure below)

7. Duty cycle: NA, only valid for continuous lasers.

8. Red Light Speed: The speed of the red light preview

9. Built-in pulse width: Click Advanced to enter, see 3.11 to see the built-in pulse width. The larger the pulse width, the greater the single point energy.

Parameter correspondence:

Peak power=total laser power * power percentage

Pulse width * peak power=single point energy

Single point energy * frequency=output power

Output power/speed=power density

Explanation: Each layer corresponds to a set of laser parameters, and we can also change the name and color of the layer in the parameters. Click on the name of the layer, and the parameter bar will display the layer name, color, and corresponding parameter data of the current layer. The parameter data includes processing number, processing speed, power, etc. After changing the parameters, click Apply to save the parameters to the current layer.

3.4. Creating and Running Documents

Note: Without creating a .tnh document, the scanning tool cannot be used a.Open the software and create a new .tnh document



b.Use the tools on the toolbar to create the process, as shown in the following figure





Document Process Docum • •	K	Image file Photo
🗛 Character N 🥥 ^		
Drocese	~	
Process	-	
	Y	
	O	N
	2	Canvas
	COD	
	CHD	15.0
	₩	
~	A	IQOIS
< >	0260	<u>त्र</u> 5
~	83	
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Document List	H	
Concerning of the second second second	•••	0-

c.Running documents; Click the Run button or press (F6) to pop up the Run box, where you can choose the mode for running the document. The "Work Mode" laser will emit light, while the "Red Preview" laser will not emit light. Only the red light will run. In the "Select Work" mode, only the selected tool on the canvas will be executed

Run Box		×
Number of 280550	Single execut	ms
) Work (F6) O F Select Job	ed Light Previ⊖ Offline □ Cyclic operation Cy	Download der Prev vole int ⁵⁶ 🗘
Start	Abort (FS)	Exit (Esc)

3.5. Run multiple documents

a.Open the "Multiple Document Run" function in the system settings; Set the system settings to check "Multiple Document Run" and click "Save" to exit;





		and pa		
Workin	ng mode (* P)	Scan marking \sim		
Canvas Settin	gs		Main control parameters	log file printing
Canvas width Canvas height Canvas Center Canvas Center Bottom fabrio Canvas Color Operation mod Automatics CCD during Grid opera CCD photog Automatic	3000 3000 0.00 0.00 e settings lly switch C ; processing ttion praphing imag	☐ Display reverse in X directi ☑ Display reverse in Y directi Millimeters mm Millimeters mm	 ✓ display I name display (*) PDU Delay before CCD 10 ms Minimum cycle interval time 10 ms ✓ Enable global registration shortcuts Operation mode when F6 is Continue running ∨ Enable startup and shutdown sor: F7 Red Light Cycle Enable User Rights Management Administrator automatically switches to operator valuematic switching time 2 Password format restrictions Parameters Spins Card Lagin 	 Trite Log Open Card Close card Marking data Error output Operation records debug information Customized output Parameter modified Execution Record Log retention ⁻¹ To not automatically
	Matching			Defente Por Ar
System Color :				Dergmi umi M2
System Color Upper toolbar		edit	Close software operation Automatically sa \sim	Single Docume 🗸
System Color Upper toolbar Tool List		edit edit	Close software operation Automatically sa 🗸	Single Docume 🗸 🗹 Single Document Run
System Color Upper toolbar Tool List Document List		edit edit edit	Close software operation Automatically se 🗸 Start up pre run once process Manual operation No verification 🗸	Single Docume 🗸 🗹 Single Document Run 🗹 Multi document operati
System Color Upper toolbar Tool List Document List Object		edit edit edit edit	Close software operation Automatically sa Start up pre run once process Manual operation No verification Manual operation OK? ?	Single Docume V V Single Document Run Multi document operati Array operation
System Color Upper toolbar Tool List Document List Object Layer		edit edit edit edit edit edit	Close software operation Automatically sa V Start up pre run once process Manual operation No verification V Manual operation OK? ?	Single Docume V V Single Document Run Multi document operati Array operation
System Color Upper toolbar Tool List Document List Object Layer Operations		edit edit edit edit edit edit edit	Close software operation Automatically sa V Start up pre run once process Manual operation No verification V Manual operation OK? ?	Single Docume V Single Document Run Multi document operati Array operation Array running upgraded Parallel operation

Click on the "Multiple Document Run" button to pop up the "Multiple Document Run" box;

Click to select multiple document sequences, and then click the "Add" button to add documents





	1 0	OMultiple	Docum 🗸	Relat	ive motion
				3	
					prese
					rvati
					<u>explain</u> <u>Refresh I</u>
Number of 280)550	Sing	le execut)	ms
	1. 🗆 Dama	metration		norotion - il	56 🔺

Click the "Add" button, double-click on the document in the pop-up window to add it. After the document is added, close the pop-up window; If you need to clear excess documents, double-click on the document in the multiple document sequence to clear it; Click Save to save the current multiple document sequence;



		OOMultiple Docum 🗸	Kelative motion
	00Docu 01Docu 02Docu	ment5-28. tnh ment2. tnh ment1. tnh	Click
Nu	D: \8. 1\test\do D: \8. 1\test\do D: \8. 1\test\do D: \8. 1\test\do Double clic	pument\5-28. tnh pument\2. tnh pument\1. tnh k to add docume	nt solution explain <u>Refresh</u> ms 56 (Tere)
			$i \neq (W = -)$

	ODDocument5-28_tnb	incre
	01Document2 trb	
	double click to delete	
	click save	prese rvati on
	CIICK SUVE	<u>explain</u> Refresi
Number	of 280550 Single execut	ms
	ect Tob 🗖 Demonstration work c operation nt56	- I÷



The "demonstration work" laser does not emit light and will perform red light work, while the "loop work" document will be executed in a loop;

		—
	OOMultiple Docum 🗸	Relative motion
ODDa ODDa ODDa Green Opera	ocument5-28. tnh ocument2. tnh light indicates succ tion	:essful
		prese rvati on
		explain
		Refresh
Number of 280550	Single execut	ms
		unting 156
Derect lop	Demonstration work c op	eration 150
Stort (RG)	About (F8)	Exit (Esc)

3.6. Array operation

Legend (Explanation)



	🖷 Array Operation - Platform Array X
	Edit array Array Settings Area
	Array grou SectionODarray
	013 012 011 010 003 003 007 1/F03 30.000 0.000 Delete
	11F04 40.000 0.000 1 [↑[05 50.000 0.000 1 Clear all
	☐/₽06 60.000 0.000 ' Double click ☐/₽06 60.000 0.000 ' Double click ☐/₽07 60.000 10.000 '
	工作D3 50.000 10.000 1 Number of 工作D3 40.000 10.000 1 delayed
	工作10 30.000 10.000 1 工作10 30.000 10.000 1
	027
	Display Data (Left Box Display)
	220 03 03 03 03 03 03 03 03 03 03 03 03 03
The manual or IO	Blanking 0.000 h X 0.000 Enable
cianal triagoring	041 040 033 037 036 035 (Acard and 40 0 and 800 0
signal unggening	UNUVERE AL NO. O REU OV. O
method executes	End Docume \mathcal{T}_{N} · · · Abort Docu \mathcal{T}_{N} · ·
the machining	
process according	Multiple Unoice Refresh Display te multiple photos of a single document Number of executions Single execut
to the edited	Select Job Demonstration work lic operation nt 56 🜩
platform	Start (F6) Abort (F8) Exit (Esc) Double oli delet o. Save/Refresh
traiectory.	
	Tick the 'Enable' option to enable the trajectory completed by the curren
	editing; Checking the "Left Box Display" option indicates that the position an
	running trajectory of the current array will be displayed. The white area wi
	to have been analy will be displayed. The white area will
	display the coordinates of each station in the current array and the documen
	number used (the document number is the document in the bottom left corner c
	the software, counting from o. Multiple documents can be typed in the sam
	position); Array group numbers can store different edited trajectories. Whe
	switching array group numbers, be sure to remove the "Enable" option from
	other array group numbers and only check the "Enable" option for the curren
	edited trajectory array group number
	In the white area, select a group of data to delete the selected data individually
	Double click on a single group of data to modify its basic properties. At the sam
	time click Clear All Data to delete the entire array parameters
Add individual data	When the workplace is irregularly distributed, it can be added by adding
	individual data.





	💀 Array data generation 🛛 🕹					
	Single co T作 Defeult sequential numbering in Coordinate 0.000 Array rows 7 Array row 10.00 Document 00 Document 元No Document 无No Preservation					
Add array data	When the work location is arranged in a regular manner, it can be added by adding array data. Set the number of rows and columns according to the actual situation, and set the row height and column width according to the actual situation (positive and negative values can be set according to the actual movement direction of the axis); Click to refresh the array operation trajectory, click Save to see the execution					
	Click to retresh the array operation trajectory, click Save to see the execution trajectory in the array operation interface, select the trajectory to save and exit; The document number is selected as the serial number (starting from oo) in the document list. When each workstation needs to execute two processes, document number 2 can be added (note: in array data, the first document is executed from ooo until the last workstation in the array, and after the execution is completed, the process in document number 2 can be executed from document number 2 can be					
Delete selected data	Select a single data deletion					
Modifying Array Data	Select a single data to modify					
Clear all data	Clear all generated array data for the current array group number					
Blanking position	Enable the unloading position. After the work is completed, move to the unloading position and set the stable delay, speed, and acceleration appropriately;					
End Document Number	After the array runs, execute the process in the end document					
Abort Document	When there is a manual termination signal during the operation of the array, the termination document will be run immediately;					
Initial Document Number	Before the array runs, execute the process in the initial document first;					
Select Work	When checking multiple options, multiple array positions can be selected and the process at the selected positions can be executed in sequence of serial numbers;					
Demonstration	Red light preview work					



Cycle Work

Circular operation array;

3.7. 10 OUT Or IN

IO output tool. Double click on the icon to add an IO output tool to the document process. The following figure shows the output settings interface. If the document needs to be downloaded offline, you need to check "Buffer Output". In the IO system selection, you can select "Main Control IO System" and "Auxiliary Operation Control IO System". IO output number 8 shown in the figure. If you need to output a set of IO signals, check multiple IO (both the marking card and the operation control card are valid at low levels, just check "mask"). You can also use the "IO Delay Reset" function to automatically reset.

IO output settings		×
🗌 Buffer output	IO system Main control IO syste \sim	
	06 07 08 09 10 11 12 13 14 15 16 17 18 19 twentynty-one two three ar ive ix seven ght n	e yrd Iask ralue
🗌 IO Delay Reset Tim	(ms) 300 determi	ine

IO input judgment. Double click in the icon to add an IO input judgment tool to the document process. The following figure shows the output settings interface. The working mode can be selected from "Waiting for IO Input" and "Judging IO Input". The following is an example of waiting for IO Input No. 8 (valid at low level). If the waiting time is exceeded, the document will terminate. If wireless long wait is selected, the program will continue to wait for IO Input No. 8. Jump cursors can be set in the judgment of IO input.

IO input signal judgme	ent						×
operation mode	Waiting for IO input	~	🗌 Buffe	red data inp	ut		
IO system selection	Main control IO system	\sim					
00 01 02 03 04 05	06 07 08 09 10 11 12 1	3 14 15 16	17 18 19	twenty aty-o	ne two thr	eeurivei	x seven ght ne y
							Mask
							U U Valu
Timeout 3000 Mi.	llisecond Infinite wait:	ir					
							determine



operation mode	Determine IO	input	\sim	🗌 Buffe	red data inpu	t		
) system selection	Main control	IO system	\sim	v.				
00 01 02 03 04 0	5 06 07 08 0	9 10 11 12	13 14 15	16 17 18 19	twenty aty-on	e two three ur	ive ix sev	en ght n
								M
								v

3.8. Multiple Document 10 Trigger Run

Open 'Input Response Settings'. set up -> IO Communication Settings(F4) -> Input Response Settings.

Handwheel sel	ection X		
🗌 input	00 01 02 03 04 05 06 07 08 09	10 11 12 13 14 15 Mask Value	IO system selection PDU_IO ~
	16 17 18 19 twentyity-one:wo:	hree ir .ve .x ;even ;ht ie /=one Mask value	
O function se Three color	ttings light1		
0 function se Three color Three color Three color	ttings light1 light1 light1	Machine safety response mode suspension	door/safety light

The sequence number sorting method for multiple documents starts from multiple document oo. The first .tnh file in the engineering file list corresponds to multiple document oo, and the



second corresponds to multiple document o1.

file tool set up UI switching about	
€ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
Document Process Docum () The Inage file	Tennor arv. day
Quadratic	15.00 17.50 20.00 22.50 2
O Circle Galvo control card number 00号卡 V	
ID display Input Response Settings Complete signal setup Software event display	
Hulti Document 00	
V is Prays 00 ^	1
5 06 07 08 09 10 11 12 13 14 15 ID system relation	-
All ti locument 01 Hulti locument 02 Hulti locument 02	
Halt Bounest OJ Halt Bounest OJ Kalt Bounest OJ kyty-une-workser variateranhter-rone	
Hill i Douwest 00 Anex	
IA Boundation	
Nal 14 Downest 10	
Barni persent i decenent	
Recurs Decement 01	
Barus Decimant 00	
R Note the continue 1 W	
Torreite a new doument # 🕑	
Treates a new document v T	
T:Create a new dorument v Svitching Multimer Sultimer Botel -1 is an invalid Do.	
Switching multiple solutions * which means that the	
Note: The parameter is for soft restart to take effect	
(m) the Eldouwent 00	
International In	
10314. mil Cocument 03	
Indjs. ma 🖾 document 04	
toste 🖬 🖾 document 05	
Number of selecte X-026.22 Y:001.42 W:000.000 H:000.000 BT:0000.000 ms 💫 🔷 💽 Laser is normal 🔾 Security alarm Card version	n number:FLBER()-4C Software version n

Combined IO input response settings (example):

The combined IO input response is generally used for triggering multiple document operations. Assuming there are four IO input points (01, 02, 03, 04), the low level is effective. Among them, (01, 02, 03) is used for document switching, and (04) is used for triggering operations. It is necessary to trigger 7 multiple document operations. The following is the method for setting "multiple document oo", which can be used to set other multiple documents.



display Input Response Settings Comp Multi Document 00 Sele	ete signal setup Software event display e <mark>ct Trigger Event</mark>
Multi Document 00	10 system relaction
	08 09 10 11 12 13 14 15 PDU_IO ~
Minput 2000000	Value
	e so in een ve Arevenjin ter one
set to ingger and and a	
IO function settings	
IO function settings Three color light1 Three color light1 Three color light1	Machine safety door/safety light response mode
IO function settings Three color light1 Three color light1 Three color light1 Three color light1	Machine safety door/safety light response mode suspension
IO function settings Three color light1 Three color light1 Three color light1 Three color light1	Machine safety door/safety light response mode suspension Program automatically calls IO reverse Note: -1 is an invalid IO, which means that the

Note: The combination 10 setting needs to ensure the uniqueness of each group's 10 response and avoid setting it as the initial state of the combination 10

Event Name	10 Input poir	nt settings
multiple document 00	Multi Documen	t 00 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 00 01 00 00 00 00 00 00 00 00 00 00 00 0
multiple document 01	Multi Documen ☑ input	t 01 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15



	Multi Document 02
multiple document 02	00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 ✓
	Multi Document 03
multiple document 03	00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 Image: Strategy of the strate
	Multi Document 04
multiple document 04	00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 Imput Imput 16 17 18 19 twenty itymone :wo three in .ve .x seven sht is mask Imput
	Multi Document 05
multiple document 05	00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 Image: Mask I
	Multi Document 06
multiple document 06	00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 ✓

3.9. Extension button

Open the main interface of the function. Tools -> Expand buttons and output, and add, delete, edit, and reorder buttons on the main interface.

(The default sorting of buttons is: top to bottom, left to right)





🛃 User defined button settings



Delete: Click to select a function, then click 'Delete an object', and then click 'OK' to delete a button.

Reorder ranking: If the buttons in the front row are deleted, the buttons in the back will not automatically move forward, and manual ranking is required.


Operating Instructions for Laser Software

Three new buttons added



3

3

2	
3	

After rearrangement

3.9.1. Input display

_	Card number	-1号卡 ~	
ſ	Button VI Param	eters	
	button	10	
_	button	3	
2	button size W	75	
	button size H	24	
Ĩ	button color		edit
3	low-level		edit
1	10 h	0	7
	4 10 number	<u> </u>	





Customize the button name, set the input "main control IO" or "auxiliary control IO", and select the input card number;

Set the button position so that it does not need to be changed by default;

Set the "low-level color" to the color of the button when receiving an IO signal; Set IO number

3.9.2. Custom Output

Cr	eate a new input	Galvanometer ∨]]]
Ļ	tard number		
1	Button VI Param	eters	1
	button	10	
	button	28	1
-	button size W	75	
l	button size H	24	
-	button color		edit
	3 low-level		edit
	IO number	0	
4	4 Initial state	1 ~	
			determine

Customize the button name, set the output "main control IO" or "auxiliary control IO", and select the output card number;

Set the button position so that it does not need to be changed by default;

Set the "button color" and "low-level color" to refer to the button color and the color of the button when outputting IO signals;

Set IO number and IO status "0" or "1"



3.9.3. Custom Function Button

Button VI Param	eters		
button	3	-	
button size W	75		
button size H	24		
button color		edit	
4	Function Scr	ipt	

Custom button name;

Set the button position so that it does not need to be changed by default; Set the 'button color':

Set the 'button color';

Click on "Function Script" and edit the script content in the pop-up script pop-up window.

3.10. Laser Workmanship

Why do we need a delay?

Due to the fact that the scanning system is composed of a drive plate, motor, and lens, there is a delay in the transmission of motion signals between these components, and the lens has mechanical inertia, there is an uncertain delay between "marking card control galvanometer" and "true movement of the lens". Due to these uncertain delays, debugging the laser process requires setting five types of delays: Laser on delay, Laser off delay, jump delay, mark delay, and poly delay.

Unified workmanship debugging graphics: In marking practice, the marking graphics generally do not have directionality, making it difficult to diagnose which process parameter is unreasonable when the marking effect is not ideal. Therefore, we can draw a directional graph specifically for adjusting process parameters. Line 1 and Line 3 are used as reference, mainly



Operating Instructions for Laser Software

studying the welding effect of Line 2. This group of lines can be roughly drawn according to the required accuracy of the process, and can also be shaped through position and size parameters.



Laser On Delay. Abbreviation: LOnD

The delay of turning on the laser occurs when the galvanometer jumps to the specified position and starts to move, but the laser does not emit light at the same time but after delaying LOnD. This value can be set to a negative value. When set to a negative value, it means that when the galvanometer reaches the specified position, the light will first emit LOnD and then start Mark movement.

When setting the LOnD too small, it can be seen that there is a burst point at the opening point (the reason for this situation is that due to the low starting speed of the scanning and the low LOnD, the light emitted causes the laser to gather at the beginning and cause the burst point).



When setting the LOnD to be too large, it can be seen that there is a portion of the light source that has been turned on for a while (the reason for this situation is that due to the scanning starting to move and the LOnD being too large, the light will come out after a long time, causing the laser to leave the starting point far away, resulting in a portion of less welding).







Laser Off Delay. Abbreviation: LOffD

The off light delay occurs when the scan is turned off. When the scan is welded to the designated position and ends its movement, but the laser is not turned off at the same time. Instead, the value of off light after delaying LOffD can be set to a negative value. When set to a negative value, it means that the light has been turned off before the scan reaches the designated position before LOffD, which means that the light has been turned off in advance.

When the LOffD is set too small, it can be seen that there is a short period of time at the end of the off light position (the reason for this situation is because there is a time difference between the command and the motion when the scan ends moving, which means that the command thinks it has been in place, but the actual position has not yet arrived, and the LOffD is too small, which causes the laser to weld a short section at the end of the off light position).



When setting the LOffD to be too large, you can see a burst point at the light off point (the reason for this situation is that when the scan stops moving, the scan is already in place, and the LOffD is too large, and the light is not yet turned off, causing the laser to produce a burst point at the end point)





Jump Delay. Abbreviation: JumpD

JumpD occurs after the galvanometer jumps, and when the galvanometer jumps to the specified position, it delays the time of JumpD before starting other movements.

When the JumpD is set too small, it can be seen that there is an unstable phenomenon at the beginning of the next movement after the Jump (the reason for this situation is because when the galvanometer ends the Jump movement, the galvanometer motor is not yet stable, and the JumpD is too small, which causes this phenomenon to occur when the galvanometer is still in an unstable state during the next movement).



When setting JumpD too large, there will be no instability, but it will affect efficiency. The setting of JumpD is generally related to the galvanometer jump speed and the weight of the galvanometer lens. Generally, if the galvanometer jump speed is higher and the weight of the lens is higher, the JumpD also needs to be larger.

Mark Delay. Abbreviation: MarkD

After the galvanometer completes the light welding, delay the MarkD time before starting the jump command.

When the MarkD is set too small, it can be seen that the next Jump movement has started before reaching the end position of the welding, resulting in a corner at the off light position (the reason for this situation is due to the time difference between the theoretical and actual positions of the galvanometer. The theoretical movement is already in place, but the actual position is not yet in place, and the MarkD is too small. At this time, the next Jump movement has already started, causing this phenomenon to occur).





When setting the MarkD too large, there will be no instability, but it will affect efficiency.

Poly Delay. Abbreviation: PolyD

PolyD occurs at the corner of two consecutive welding lines, which is the time it takes to wait for PolyD after the previous line has moved, and then the galvanometer moves to the next line, during which the laser continuously emits light.

When setting PolyD too small, it can be seen that there is an arc transition at the corner between two consecutive Mark movements, which does not match the actual demand graph (the reason for this situation is that due to the end of the previous Mark segment, the galvanometer motor is not in place, and PolyD is too small, at this point in the next Mark segment, the galvanometer can only take a shortcut path, causing this phenomenon to occur).



When setting PolyD to be too large, it can be seen that there is a burst point at the corner between two consecutive Mark movements (the reason for this situation is that due to the end of the previous Mark segment, the galvanometer motor is already in place, and PolyD is too large, the next Mark segment has not yet started, but the laser is still emitting light, causing the burst point to occur).



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3.11. Advanced laser parameters

and the second	10000	Microsecor	Built in pulse	eidth 0	nanosec	
Maximum jump	1000	Microsecor		0.44	Description of	
Minimum jump] 500	Microsecor	YAG laser freq	uency 10		
Maximum jump	10.000	millimeter				
		_	SPI threshold cu	rrent 0.0		
Single point	1 1.0000	Willisegor				
	1					
Extension	1 0.000					
] [0:000					
Platform axis	No adjustment	t ~	Waveform X-axis	data time	~	
Platform axis Axis target	No adjustment	t v	Waveform X-axis Average power of 2	data time	~	

Marking delay: the delay of the galvanometer during laser output

Maximum jump delay: Used in conjunction with the maximum jump delay distance. If the set maximum jump distance is exceeded, the delay used is the maximum jump delay

Minimum jump delay: As long as the galvanometer jumps, at least use this delay. If the maximum jump delay distance is not exceeded, the jump delay used is between the minimum and maximum. The relationship is a linear change

Maximum jump delay distance: Used in conjunction with jump delay (maximum/minimum).



If it is 0, the minimum jump delay does not take effect, and the maximum jump delay is used instead

Jump delay: When the galvanometer jumps to the specified position, delay the JumpD time before starting other movements

Single point time: The continuous light output time of a single point in the process

Extension line length: A distance of acceleration or deceleration before and after the beginning and end of each line (on and off), where the laser will not emit light during the extension line.

3.12. Laser progression and gradual exit

For example, the welding line or welding spot time is 200MS: the welding spot is the spot welding time set in the advanced section, and the welding time is the line length/speed.

The waveform settings of the welding line are as follows:



0-20ms progressive: initial light output section

The first period of time cannot be set, and energy signals need to be given in advance;

20ms is progressive: within 20ms, the energy increases from 30% to 50%, and multiple stages can be set according to specific needs



Operating Instructions for Laser Software

20-60ms is the automatically calculated light output time: this section only displays so much time, and the actual light output time is the line length/speed. If the total light output time is 200ms, 50% of the actual light output time here is 165ms (200-20-10-5); If the total light output time is 2000ms, it will only display 30-70 here, but the actual light output time at 50% power is 1965ms (2000-20-10-5)

60-75ms gradually emerging: the time period when the last light appears 60-70ms: Laser reduced from 50% to 30% within 10ms

70-75ms: Laser energy from 30% to 0 in 5ms

Progressive: A total of 8 segments from 02 to 09 can be set, with time referring to the light output time and power referring to the power within the corresponding time. For example, in the 02 segment, 0-20ms, the corresponding power varies from 30% to 50%, and it is best to gradually change the power from small to large over time.

Just set the progressive and gradual exit times, and the software automatically calculates the uniform power output time in the middle. The gradual exit stage is the off light stage, and only nine segments are open. If the final solder joint energy is particularly high, the last period of time will be extended.

Note: a. The total time for gradual (gradual) progress alone cannot be greater than the total time for light output, and the time for gradual+gradual progress cannot be greater than or equal to the total time for light output; The total light output time is less than the single point time set in the "Basic Parameters";

Single point 1.0000 Millisecor

b. Just set the gradual (starting stage) and gradual (ending) stages, and the intermediate time will be automatically calculated based on the total light output time; When setting the waveform, consider the delay time (corner delay, marking, jump, and on/off light).

The reference waveform for spot welding is shown in the following figure:





3.13. Enable text for characters and QR codes

Note: When using character tools and QR code tools at that time, static text was generated by default. If real-time updates of text content were needed, "enable text variables" were needed.

Example: Add date+serial number (self updating)

a. Open the Character (QR Code) tool, check "Enable Text Variable", and then click "Add" to pop up the "Text Variable" edit box; Each time an edit box pops up, a "text variable type" can be added.





b. Select 'Date', then select the format of the year, or you can customize the format of the year. Users can customize the 'Name of Text Variable' and use the same method to add months and days



1			
Variable type	data		
O Fixed Text		custon	
O serial number	🖲 Year 2017	1990=1990	^
	O Tear 17	1992=1992	
• date	Orala	1993=1993 1994=1994	
🔾 tine	O Month UI	1995=1995 1996=1996	
O Serial commu	🔿 Zhou-Ol	1997=1997 1998=1998	
O	○ Day O1 (naximum of 31	1999=1999 2000=2000	
O hervory count	O Day 01 (up to 365 days	2001-2001	
() file	0	2003=2003	
O Script editor	O Week-1	2005-2005	
O keyhoard ents	Date offs Annually 🗸	2006=2006	
C Reyboard entr	0	2008-2008 2009-2009	~
O Inherit the I			
ser defined name			
e ar			
edit			
		2	deternine
Text variables /ariable type O Fixed Text	date C	🖉 custon	
 Text variables Variable type Fixed Text serial numbes date time Serial communication Network communication 	date Year 2017 Year 17 Month 01 Zhou-01 Day 01 (naximum of 31 Day 01 (up to 365 dave	✓ custon 1990-1990 1991-1991 1992-1992 1993-1993 1995-1995 1996-1996 1997-1997 1998-1998 1998-1998 2000-2000 2001-2001 2002-2007	
 Text variables Variable type Fixed Text serial numbes date time Serial communication Hetwork communication file 	date Year 2017 Year 17 Month 01 Zhou-01 Day 01 (maximum of 31 Day 01 (up to 365 days	✓ custon 1990=1990 1991=1991 1992=1992 1993=1993 1994=1994 1996=1996 1996=1996 1998=1998 2000=2000 2001=2001 2001=2002 2004=2002 2004=2004	
 Text variables Variable type Fixed Text serial numbes date time Serial communic Hetwork communic file Soript editor 	date Year 2017 Year 17 Month 01 Zhou-01 Day 01 (maximum of 31 Day 01 (up to 365 days Neek-1	✓ custon 1991=1991 1992=1992 1993=1993 1994=1994 1996=1996 1996=1996 1997=1997 1998=1998 1998=1998 2000=2000 2001=2001 2002=2012 2003=2003 2004=2004 2005=2005	
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 Text variables Variable type Fixed Text serial numbes date time Serial communic Network comminication file Seript editos keyboard entis 	date (ate) Year 2017 Year 17 Month 01 Zhou-01 Day 01 (maximum of 31 Day 01 (up to 365 days Week-1 Date offs Annually V	Custon 1990-1990 1991-1991 1992-1992 1993-1993 1995-1996 1996-1996 1996-1996 1996-1996 2000-2000 2001-2001 2002-2001 2003-2003 2004-2004 2005-2005 2006-2006 2006-2006 2008-2009	
 Text variables Variable type Fixed Text serial numbes date time Serial communication file Script editos keyboard ents Inherit the 1 	date • Year 2017 • Year 17 • Month 01 • Zhou-01 • Day 01 (maximum of 31 • Day 01 (up to 365 days • Week-1 Date offs Annually	vuston 1990=1990 1991=1991 1992=1992 1993=1993 1994=1994 1996=1996 1996=1996 1998=1999 2000=2000 2001=2001 2002=2002 2004=2004 2004=2005 2005=2006 2005=2008 2009=2009 2009=2009 1990	
 Text variables Variable type Fixed Text serial numbes date time Serial communication file Soript editos keyboard ents Inherit the press 	date • Year 2017 • Year 17 • Month 01 • Zhou-01 • Day 01 (maximum of 31 • Day 01 (up to 365 days • Week-1 Date offs Annually	vuston 1990=1991 1991=1991 1993=1992 1993=1993 1994=1994 1996=1996 1996=1996 1996=1996 1998=1998 2000=2000 2001=2001 2002=2002 2003=2003 2004=2004 2005=2006 2006=2006 2006=2006 2006=2006 2008=2009 2009=2009 1990	
 Text variables Variable type Fixed Text serial numbes date time Serial communic Network commins file Soript editos keyboard ents Inherit the I 	date • Year 2017 • Year 17 • Month 01 • Zhou-01 • Day 01 (naximum of 31 • Day 01 (up to 365 days • Week-1 Date offs Annually •	vuston 1990-1990 1991-1991 1992-1992 1993-1993 1994-1994 1996-1996 1996-1996 1996-1996 1999-1990 2000-2000 2001-2001 2002-2002 2003-2003 2004-2004 2005-2006 2006-2006 2008-2009 2009-2009 1990 to update	, ,
 Text variables Variable type Fixed Text serial numbes date time Serial communic Hetwork communic file Soript editos keyboard ents Inherit the present the present to the	date • Year 2017 • Year 17 • Month 01 • Zhou-01 • Day 01 (maximum of 31 • Day 01 (up to 365 days • Week-1 Date offs Annually v • • • • • • •	vuston 1990-1990 1991-1991 1992-1992 1993-1993 1994-1996 1996-1996 1996-1996 1997-1997 1998-1998 2000-2000 2001-2001 2002-2002 2003-2000 2004-2004 2005-2006 2007-2007 2008-2008 2009-2009 1990 to update	
 Text variables Variable type Fixed Text serial numbes date time Serial communic Hetwork communic file Script editor keyboard entri Inherit the part of the part of	date Year 2017 Year 17 Month 01 Zhou-01 Day 01 (maximum of 31 Day 01 (up to 365 days Week-1 Date offs Annually	vuston 1990=1990 1991=1991 1992=1992 1993=1993 1994=1994 1995=1996 1997=1997 1998=1998 2000=2000 2001=2001 2002=2002 2004=2004 2005=2005 2005=2006 2005=2006 2005=2008 2009=2009 1990 to update	
 Text variables Variable type Fixed Text serial numbes date time Serial communication file Seript editos keyboard ents Inherit the providents ser defined name ear edit 	date • Year 2017 • Year 17 • Month 01 • Zhou-01 • Day 01 (maximum of 31 • Day 01 (up to 365 days • Week-1 Date offs Annually •	vuston 1990=1990 1991=1991 1992=1992 1993=1993 1994=1994 1996=1996 1996=1996 1999=1990 2000=2000 2001=2001 2002=2002 2003=2003 2004=2006 2005=2006 2005=2006 2005=2008 2009=2009 1990 to update	

c. Select "Serial Number" to set the length and starting number of the serial number. Special requirements can also set the decimal system of the number





d.After setting the characters, you can preview them first and then set the method for updating the text, usually using 'Update after marking'

Character	editing			×
Character typ TrueType font typeface Agency YB Warking size wi(0.200] Enable Tex 20230529000 Update n Updat Year Nonth day Serial	pe ts ~ B I ratio hi(0.200 t Variables te before ~ e before afte dupare afte delet Hove	2023	805291	
	Nove	Character interval t default ~ Character spacing 0.00	ypeaster sir{0.00_adS □X Reverse □Fixed height	terting (0.00 Y reverse Show origine
	modif		Refresh>>	determine



3.14. Combined linear array tool

a.Hold down the CTRL key, select two circles, and then click the group object button

file tool set up UI switchin	ing about
87 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	· · · · · · · · · · · · · · · · · · ·
Document Process Docum	Insge file 2 Photo
Circle To read Circle To read Circle To read Circle To read Circle To read Circle To read Circle To read To read Circle To rea	

b.Two circular objects, becoming a composite object







c.Select the combination object and then click 'Split Object' to split the combination object







3.15. Curve alienation

a.Select a straight object and click on the Curve Alienation tool;



b.Select the corresponding alienation tool in the curve alienation pop-up window, and then set the parameters

Sine line	√ 6	🛛 Delete original data
Sine line helical line Point column	4.000	
Point column Point rotation curve Vertical 8 spiral Horizontal 8 spiral Dashed Line Alienation	1.000	Alienation cannot
	0. 500	be reversed
Res	olu 0.000	
	$\overline{\mathbf{A}}$	7

	legend	illu	ustrate	
1		Select th graphic click alienatic	ne mach object on on tool	ining and the



2	Helical point Spiral 200 Ellipse 1.00 Spiral 0.50 Resolu 0.00 Minimum z0.10 Number of 0 Number of 0 Increment 0.00 From Ø 0. Extracting	X 0 1 is a 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	As shown in the figure, select the dissimilation parameter spiral point, click on the dissimilation tool, and select to display the original image.
		acres arres	
3	parameter	describe	When you modify
	Spiral radius	The size of the spiral point	parameters, there
	Spiral spacing	Line spacing	are different
	Resolution	Smoothness	changes in the
	Minimum radius	The radius size of the innermost circle	graphics
	Number of outer rings	Welding frequency of outer ring	
		trajectory	
	Number of inner rings	Welding frequency of inner ring	
	, C	trajectory	
	Incremental radius	The value of increasing radius	
		when the number of spiral turns	
		increases	
	Direction issues	Is welding done from the outside	-
		in or from the inside out	

Example: Helix parameters

Spiral Alienation Effect under Default Parameters





1

hannannannannannan	000000000000000000000000000000000000000	000000000000000000000000000000000000000	000000000000000000000000000000000000000
	<pre>## helical line Spiral 0.500 Spiral 0.500 Besolution 0.5500 The length ratio of the outry is: The length of the alienated 12:48 outry is: The length of the alienated 649.0 curve is: 2 date points (9650) Baable relative speed synthesis spi Extracting date</pre>	Lay 8.43 27 26 30744 467 e Iternine	

1.Spiral spacing: The smaller the numerical value, the smaller the distance between left and right dissimilation, and the denser the lines. The effect of changing the value to 1 (default 0.1) is as follows



2.Spiral radius A: The larger the numerical value, the larger the dissimilation radius (X direction straight line, Y direction radius). The effect of numerical value 1 (default 0.5) is as follows:



2	<pre>\$\$ helical line \$\$ \$piral 100 \$\$ \$pira</pre>
3 W:000.000 H:000.000 BT:0000.000 ms	Extracting determine Card version number:FLBER0-4C Software version

3.Spiral radius B: The smaller the value, the smaller the dissimilation radius (X direction straight line, X direction radius), with a value of 0.1 (default 1). The effect is as follows:



4.Resolution: The smaller the resolution, the smoother the curve, but the larger the data volume. Change the number to 0.3 (default 0.05), and the effect is as follows:



	F0.75F0.50F0.25	
	₩ helical line ×	
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Spiral 000 Spiral 0.500 Spiral 1.000 Resolut 0.500 V Original inege display	
2	Ine length ratio of the original line to the alignated curve is: The length of the alignated 641.83 curve is: 2 data points (1609)	-
2 3	Enable relative speed synthesis speed synthesis speed and the speed synthesis of the speed synthesynthesis of the speed synthesis of the speed synthesis of the	

3.16.Offline Download

1.Set the 'number of offline documents', the software defaults to 4, with a maximum support of 16;

Settings ->System Settings ->Interface Functions and Display; Select the number of offline documents from the drop-down box.



2.Click the "Run" button, or press "F6" to pop up the Run box; Select 'Offline Download' and then



click 'Start';

Run Box		×
Number of 280587	Single execut	ns
(F6) (F6)	Red Light Prev 🖲 Offlin	ie Download der Prei
🗌 Select Job	🗌 Cyclic operation (Cycle int ⁵⁶ 🖨
Start	Abart (F8)	Exit (Esc)

3.The pop-up window 'Offline Download Document Number Selection' appears, and we choose '00 Offline Document' as an example;

O 000ffline I	ocument No filine Document No	
0 020ffline 1	ocument No Hime Document No	
O Initialize	(abort) offline documents	

4.After the offline download is completed, close the run box and open "Tools>Advanced Tools>Offline Download Settings"



5.We can see the offline document named "platform" that was just downloaded offline. Click the "File Parameter Settings" button under the offline document to set the trigger to run the document;



Operating Instructions for Laser Software

D settings
iltering time: 10 (us)
Offline Document Ol- Empty Document Ol File
Offline Document 03- Empty Document 03 renove
File

6.Set the corresponding triggering conditions and click Save.

Offline Document	Parameters ×
Offline Docu	men 0
Offline docu	men 1
Scan offset	
X: 32768	¥: 32768
00 01 0 Mask velue	
Edge trigger co	ndition
100 01 02 Mask () () ()	03 04 05 06 07
Rising edge	tri) Falling edge trig

3.17. Flight marking

1. Activate the flight function. Tools - Attack Tools - Flight Marking Settings;



2. Tick 'Auto fly when marking starts'. X-axis Y-axis flight pulse equivalent, modify



the graphic effect of the marking pattern in the XY axis direction. The "encoder counting range" means the flight marking interval.

Card number selection	-1号卡 ~				
Encoder Position	0]	0	Set	encoder positio
Flight Mode	直线飞行 ~		Straight flight parame X-axis flight p	eters ulse	0.000000
	76		Y-axis flight p	ulse	1.200000
Encoding source selection	Inner Coder 🗸 🗸		-Rotating flight parame	eters	
🗌 Enab	le internal encod	ler	Rotation ce	nter	3. 300000
Time interval between	200	us	Rotation ce	nter	2. 750000
Internal coding direction	Forward ~		Flight angle compense	tion	1.000000
xternal encoding direction	Forward 🗸 🗸		Auxiliary calculation X/Y before rotation	tool	for rotation —
Enco	der range valid		X/Y/Angle after rotati	on (c	ounterclockwise
Encoder counting range	10.000	mm	Rotation center X/Y		
Unit pulse count	1000	P		Cald	mlatio

3. Double click to add a flying tool. We need to add four flight tools to complete a complete flight marking process. Reset encoding counter "-" Wait encoding counter "-" Turn on flight mode "-" Turn off flight mode ". Add a marking graphic between "Open Flight Mode" and "Close Flight Mode", as shown in the following process.

Flight 1	() flight	1
Flight 2) flight	
Flight3) flight	Ì
straight <mark>Ma</mark>	ark 🔍	
7. Flight 4	() flight	

a.Reset encoding counter



Flight parameter b	uffer settings			×
Flight Mode				
Regular Flight	() Fly	ving cutti	ng	
Reset encoding	counter			
) Jump to the wai	ting encoder posit	ionr of	1	~
🔿 buffer zone fli	ght			
🔵 buffer off flig	ht			
○ Waiting for end	coding counter		Auxiliary	/
Encoder	Forward waiting	8	1	π _{min}
Encoder	100	pulse	Caloul	lation
			coni	Eirm

b.Wait for the encoding counter (marking starts when the encoder moves to this position)

Flight parameter b	uffer settings		×
Flight Mode			
Regular Flight	() F1	ying cuttin	ε
O Reset encoding	counter		
O Jump to the wai	ting encoder posit	ionr of 1	۰ v
🔾 buffer rone fli	ght		
🔘 buffer off flig	cht		
• Waiting for end	oding counter		Auxiliary
Encoder	Forward waiting	1	1 ^r mn
Encoder	100	pulse	Calculation
			confirm

c.Turn on flight mode



Flight parameter b	ouffer settings			×
Flight Mode				
Regular Flight	() Fl	ying cutti	ng	
O Reset encoding	counter			
O Jump to the wai	iting encoder posi	tion r of	1	~
🖲 buffer rone fli	ight			
🔿 buffer off fli	ght			
○ Waiting for end	coding counter		Auxiliar	y
Encoder	Forward waiting	4	1	r nan
Encoder	100	pulse	Calor	alarion
			cor	afirm

d.Turn off flight mode

Flight parameter b	ouffer settings		×
Flight Mode			
• Regular Flight	() Fly	ing outt	ing
O Reset encoding	counter		
O Jump to the way	ting encoder posit	ionr of	1 ~
🔿 buffer zone fl	ght		
() buffer off fli	sht		
○ Waiting for en	coding counter		Auxiliary
Encoder	Forward waiting -	1	1 ² mm
Encoder	100	pulse	Calculation
			confirm

3.18. Host Response Settings

Open "Host Response Settings", Settings -> Host Response Settings, which includes "IO System", "TCP System", and "Custom System" (which needs to be developed separately).





3.18.1. 10 System

In the 10 system, 10 input signals can be configured and corresponding response actions can be set.

Example: Configure 'System Termination'. This function can terminate program operation, and alarm the red light and buzzer at the same time (the 10 number corresponding to the three color light and buzzer needs to be configured in "10 Communication Settings - Input Response Settings").

1. Select 'System Termination' and then click 'Add a Group of Responses'



2. At this point, "System Termination" has been added to the feature list, which is



not yet enabled. It is necessary to configure 10 response for the feature. Click on the "System Termination" function in the selected list, and we can rename, configure 10, and delete the function.

Host Response Settings CO system TCP system Custom	zed system			>
Function Name 系统终止	state not enabled	Function	系统终止	∼ Add a set of
click to select the fu	nction	Configure IO termination before contin Functional Function No 系统终止 Custom Delete a	narron: func response, which in the set IO s nuing to start parameters ame name set	tion description ch can respond to system state and require a rese
系统终止 IO config □ input 16 17 18 19 t	4 05 06 07 08 09 10 wenty.ty-one:wo:hre	11 12 13 14 1	.5 Mask value ght 1e r=one Mask value	IO system selection PDU_IO ~ Card number O

3. Configuration is divided into several small steps for 10. First select the card number, then select the 10 system (Main control card 10, Auxiliary control card 10, Expansion card 10), check "Input", then check the corresponding 10 number, and click OK.



	TOT SYSTEM	customited		Function	ر در حدر کر		411+ -f
Function 系统终止	Name		state not enabled	Function System termi: Configure IO termination before conti: Functional Function N: 系统终止	国正义 nation: response, whi in the set IO nuing to start parameters ame	ch can re state and	xaa a set or spond to system require a rese
系统终止 3 ☑ ir	pu 00 01	02 03 04 05	06 07 08 09 11	Delete a	set Mask 4 value ght ue mone Mask value	IO syst PDU_IO Card nu O	confirm tem selection 2 ~ umber 1



3.18.2. TCP System

Host Resp	oonse Setting	js.				×
IO system	TCP system	Customized syste	n			
Host Ser Host Ser Enable PDMarki PDDA	rwice (*) le the host IP, Port MultipleOffs. CDD(0, dx, dy oto position (0, dx, dy, o Abs(0, mx, my (0): Stop wi File(D:\1.tal ayer(0, 0);	server 127.0.0.1 et(0, data): Exec y, da, cx, cy, px, da): Set relative y, ma): Execute d ith parameters: St h): Load the specif Obtain the specif	5000 ute document (py): Execut offset Dx Dy ocument 0 to op document 0 ified path of ied layer par	D, data can b e document O Da for exect set absolute without para the image fi ameters for t	be parsed from doct to set relative of uting document O position and angle ameters: Stop all o lle the specified docum	ument SCR ffset and rotation e x y a documents ment
						confirm

Set the server IP and port, check 'Enable Host Server', click 'Confirm', and restart the software service to take effect. Sending corresponding instructions from the client to the server can trigger the software to run or stop, and the offset of the galvanometer can be set in the running instructions. For example:_PDMark (0, 20, 20, 90), this instruction means to run document 0, with an offset of 20mm in the X direction and 20mm in the Y direction, and an angle rotation of 90 °.

3.19. Multiple Card and Multiple Software

3.19.1. Multiple Card

The default card number for PDU cards at the factory is card number 0. It is not possible to open duplicate card numbers on the same industrial computer at the same time. Therefore, if multiple cards need to be opened at the same time, the card number needs to be changed. Let's take opening two cards simultaneously as an example (a software can support opening up to 4 cards).

1. Connect the industrial computer separately to a card that requires changing the card number. Open the software, and the software displays that the card has been





successfully opened. Next, you can change the card number. Settings - System Settings - Control Card Advanced Parameters.

system parameter setting				
System settings Interface function and	display Advanced parameters of control card s	Special advanced pa	arameters User ;	permission settings
Type of Scan control PDU 🗸	∠ Enable o	ard card number After modification	1 the software mu	Artificial selection ust be restarted
Connection method (*) PCIE	✓ ✓ Has the board	l been configured	The maximum	n number of 100
Record running data	Collection function	2		
🔽 OutO is a dedicated IO in operation	Border preview speed	3000		
🖂 Out1 is a specialized IO for optical	. output DA range of PDU card	10.0		
Allow pauses between light outputs (not allowing pauses can improve efficiency)	10.0		
	Laser AD range			
Marking thread priority high	DA range of the second PDU	10.0		
End stop method of the Scan Fixed o	oordir 🗸 Second laser AD range	10.0		
Fixed point 0.000	0.000 Maximum marking data	100	The recommended	value for new cards is 100.
		Test USB tra	nsfer speed	1
Special processing of upper computer - Enable long waveform editing Enable point energy editing	How many microse download and run 1000000 The cache data v for marking data 0.400	olume of the board and 100% memory o	the PC cache be L [0.01,1], is [ache for marking	fore starting to using 1% memory cache ; data]
	The download thr for marking data 0.999	ead cache data vol 1 and 100% memory c	ume, [O.01,1], i ache for marking	s [using 1% memory cache ; data];
OCard number setting OOID card (*) 00	The size of the dbValideBufferSp 0.800	PC cache, used in acePercentage, inc:]	conjunction with reases the frequ	ency of queries and
Modify the card bur	mare Board triggered	running cache size]	, value range: 1	~99
				preservatio
				preservatio

2. Click "Modify Card" - "Fill in New Card Number" - click "Confirm(restart)", and then click "perservation".



3. After modifying the card number, close the software, power off the card, and the new card number will take effect when powered on again.

4. After modifying the card numbers for all cards, set the number of cards that need to be opened simultaneously in the software. Settings -- System Settings -- Control Card Advanced Parameters. After filling in the number of cards, click Save to exit (this setting requires restarting the software to take effect) and close the software.

System settings	Interface	function	and display	Advanced parameters of control card	Speci	al advanced p	arameters	User pe	ermission settings	
Type of Scan	control	PDU	~	🗹 Enable	card	card number	1		🖂 Artificial selectio	on of
master control	other				Afres	modification	the soft	ware nus	st he restarted	

5. All cards are powered on, the industrial computer connects all cards, and opens the software



6. In the software startup interface, there will be a prompt for the card number that needs to be opened. By default, the software will open card number 0, so select a card other than card number 0. Click on the dropdown box, select the card number, and then click OK. If there are multiple cards, the software will prompt multiple times to select the card number.



7. After entering the software, the successfully opened card number will be displayed in the upper right corner.



Note: If the software is set to open multiple cards, but only one card is connected to the industrial computer, it will not affect the functional use of a single card. The software has opened multiple cards, and each card needs to be individually calibrated for BOX. When running the marking program, it is also necessary to select a card.





🛃 PD Card Box Correction		×
Correction card 00号卡 🗸		
Correction 9 point cor 🗸	Layer	Layer0 🗸
Automatically recognize BOX	Laser speed	300
	Red light	40 🔹
1. Standard calibration	Red light te	aching
	position tes	Central
2. Multipoint correction	50 50	Custom
4. Red light ratio	5. Manual o	ompensation
4. Red light ratio	5. Manual d	ompensation
Document parameters		
Galvo control OOID c V Motion control OID ca V		
🗌 Enable linkage		
🗌 Enable area splicing		
preservation		

3.19.2. Change Card Number

In 3.19.1, the steps for connecting an industrial computer to a single card and changing the card number are introduced. The following steps are for connecting multiple cards to an industrial computer and changing the card number.

1. Open the "CardWriter. exe" application program in the software directory, and you can see all the boards connected to the industrial computer (drivers need to be installed correctly)



检测到以下 PI	DV1000 ★
00号PDV1000- 00号PDV1000-	
	打工上
	打开卡

2. Click to select a card and then click 'Open Card'

检测到以下 PD 00号PDV1000卡	₩1000 卡 E
	打开卡

Fill in the card number that needs to be changed, click on "Modify Card Number", and according to the prompts, power off and then power on the board.





检测到以下 PDV1000 -	ŧ		
00号PDV1000卡 00号PDV1000卡			
			>
		修改成功,清将板卡断电重启	
	打开卡		
			1

3.19.3. Multiple Software

The marking (welding) software of PD can only open one client by default. If multiple clients need to be opened at the same time, multiple software functions need to be enabled. Settings--System Settings--Special Advanced Parameters ", check" Support opening multiple software at the same time ", save the settings, and restart the software to take effect.

system parameter setting	×
System settings Interface function and display Advanced parameters of	f control card Special advanced parameters User permission settings
Special settings (do not change without special applications) Supports opening multiple software Pseudo coaxial camera Scan 40.00 40.00 Objects can be moved during red light teaching Only the grating and safety door are Maintain the last image in the coaxial CCD Non destructive termination Single point time delay for spiral points Enable new loop filling algorithm Enable no contour filling method 2 Modulated signal displayed as pulse width Apply to selected objects when viewing layer parameters	Special parameters (please do not change without special reminements) Brable layer parameter non zero start valid start layer Automatic GC. Collect() to reclaim memory Enable increasing the number of filling parameter groups (3 groups - Serial port sending layer parameters when offline Insure nume parameters, please do not enable tribout special customization requirements Enable template scaling correction Solidify existing filled data when combining linear arrays Number of documents when not displaying 1 Enable second path log file open
 Feedback document thread execution results Load default document 	Number of photo 20 Number of layer 20

3.20. Rights Management

Default account password Administrator: 7777 Password: 7777 Engineer: 6666 Password: 6666



Operator: 8888 Password: 8888

a.Enable permission function. Click on "Settings System Settings", check "Enable User Rights Management", then check "Password Format Restrictions", save and restart the software.

file tool set up UI sv	witching about			
	아 邢 등 속 뤽 🥱	🔐 🗬 🖬 🖬 (1997)	🗓 🗮 🏣 🕨 \lt 🛝 🎛 👑 🖉 🔍	⊕⊕
Document Process Docum · ·	Image file	Ph	1000	Temporary dat Positi
🖵 Flight 🥥 ^	system parameter setting			×
COO Flight	System settings Interface fun	ction and display Advanced pa	rameters of control card Special advanced parameters User	permission settings
	Working mode (* P) S	can marking 🗸		
	Canvas Settings		Main control parameters	log file printing
	Canvas width 3000] Display reverse in X directi	🗹 display name display (*) PDU	Trite Log
	Canvas height 3000	Display reverse in Y directi	Delay before CCD 10 ms	🗌 Open Card
	Canvas Center 0.00 M	- illimeters mm	Minimum cycle interval time 10 ms	🗌 Close card
	Canvas Center 0.00 M	illimeters mm		🗌 Marking data
	Bottom fabric	edit	🗹 Enable global registration shortcuts	🗹 Error output
	Canvas Color	edit	Operation mode when F6 is Continue running \vee	🗌 Operation records
			Enable startup and shutdown sor F7 Red Light Cycle	🗌 debug information
	Operation mode settings		Rhable script blocking execution Light	Customized output
	Automatically switch CCD p	page when there is	Enable User Rights Management 3	Parameter modificat
	Grid operation		Administrator automatically switches to operator	w Execution Record
	CCD photographing image er	diting interface display	Automatic switching time 2	
	Automatic resumption of or	peration after safety shutdown	Password format restrictions 4	-1: Do not automatically cl
		in a constant of the second second second	Permission Swipe Card Login	Run Mode Settings
	System Color Matching		Enable laser alarm indicator light	Default Run As
< >	Upper toolbar	edit	Close software operation Automatically sa 🗸	Single Docume 🗸
^	Tool List	edit	Start up pre run once process	🖂 Single Document Run
	Document List	edit	Manual operation No verification \checkmark	🖂 Multi document operation
	Object	edit	Manual operation 请确认是否继续	Array operation
	Layer	edit		Array running upgraded v
~	Operations	edit		l'arallel operation
< >	custom button	edit		Number of parallel running
[00]5-28. tnh 🔛 📤				2 V
[01]2. tnh 🔀	Note: The parameters with (*)	indicate that the restart soft	ware	. 1
[02]1. tnh	About the Display of Middl	e Logo		preservation

b.Edit permission range. Click on "User Permission Settings - Enable Editing" and enter the administrator password. The default administrator account is 7777 and password is 7777.


System settings Interface function and display Advance Administrator (non editable) Te		
Administrator (non editable) Te	ed parameters of control card Special advance	ed parameters User permission settings
 (00) Menu (01) Upper toolbar (02) Frocess List - View (03) Frocess List - Edit (04) Document List - View (05) Document List - Edit (06) Display all document lists (07) Object Editing Box - View (08) Object Editing Box - Edit (09) Layer Parameters - View (10) Layer Parameters - Edit (11) Operation control teaching (12) Operation control inching and h (13) Tool Addition Bar (15) Cyclic operation (16) To to to to to View 	ed parameters of control card Special advance control i (T) (00) Menu (01) Upper toolbar (02) Process List - View (03) Process List - Edit (04) Document List - View (04) Document List - View Swipe card Amme 7777 determine f (14) Change in operating conditions (15) Cyclic operation (10) Z	ed parameters User permission settings Operator (00) Menu (01) Upper toolbar (02) Process List - View (03) Process List - View (03) Process List - Edit (04) Document List - View (05) Document List - Edit (06) Display all document lists (07) Object Editing Box - View (08) Object Editing Box - View (09) Layer Parameters - View (10) Layer Parameters - View (11) Operation control teaching (12) Operation control inching and ho (13) Tool Addition Bar (14) Change in operating conditions (15) Cyclic operation

c.Assign permissions to technicians and operators, check the corresponding permissions. Save it.

Administrator (non editable)	Technician (T)	Operator
🔽 (00) Menu	↓ (00) Menu	(00) Menu
─ ✓ (01) Upper toolbar	— ☑ (01) Upper toolbar	 (01) Upper toolbar
── ✓ (02) Process List - View	 ☑ (02) Process List - View	(02) Process List - View
🗹 (03) Process List - Edit	🔽 (03) Process List - Edit	🗌 (03) Process List - Edit
🗹 (O4) Document List - View	🖂 (04) Document List - View	🗌 (O4) Document List - View
🗹 (05) Document List - Edit	🗹 (05) Document List - Edit	🗌 (05) Document List - Edit
🔽 (06) Display all document lists	🔲 (06) Display all document lists	🗌 (06) Display all document lists
🔽 (07) Object Editing Box - View	🔲 (07) Object Editing Box - View	🔲 (07) Object Editing Box - View
🗹 (08) Object Editing Box - Edit	🔲 (08) Object Editing Box - Edit	🗌 (08) Object Editing Box - Edit
🗹 (09) Layer Parameters - View	🔲 (09) Layer Parameters - View	🗌 (09) Layer Parameters - View
🗹 (10) Layer Parameters - Edit	🔲 (10) Layer Parameters - Edit	🗌 (10) Layer Parameters - Edit
🗹 (11) Operation control teaching	(11) Operation control teaching	(11) Operation control teaching
🖂 (12) Operation control inching and ha	🔲 (12) Operation control inching and ha	(12) Operation control inching an
🗹 (13) Tool Addition Bar	🔲 (13) Tool Addition Bar	🔲 (13) Tool Addition Bar
🗹 (14) Change in operating conditions	(14) Change in operating conditions	(14) Change in operating condition
🔽 (15) Cyclic operation	🔲 (15) Cyclic operation	🔲 (15) Cyclic operation
🗹 (16) Important parameter display	🔲 (16) Important parameter display	🗌 (16) Important parameter display
☑ (15) Cyclic operation ☑ (16) Important parameter display	(15) Cyclic operation (16) Important parameter display	(15) Cyclic operation



d.Switch users. Click on the user in the upper left corner of the software to pop up a pop-up window for user login. Select the permission type, and then enter the account password to log in to switch users.

	🖳 User login	×
	User Operator perm 🛇	/ Swipe card
	user name 8888	
	password ****	
	determine	
administrators 7777	log off	<u>Password modif</u> user managemen

e.Change password. Click on "Change Password", select User Permissions in the pop-up window, and enter the account, old password, and new password in sequence.

🖶 User logir	6	×
User	Operator 🗸 🗸	Swipe card
user name		
password		
	determine	
log off		Password modi



Vser	Operator 🗸 🗸 🗸	
user name		
Original		
New		
Confirm		



4. Set up laser

4.1. Debugging the laser

a. Connect the board, laser, and galvanometer properly

b. Open the software and the green "PDU card opened successfully" appears in the upper right corner, indicating that the software has successfully connected to the card

```
PDU 00Card opened successfully
```

c. Create a new project

file	tool set up	UI sv								
Г	newly build	6								
	open	× .	file	tool	set up	UI switc	hing	about		
	preservation	•	87		80	50	100	串		
	Save As		Docum	ent Proc	ess Docu		Imag	ge file	ř.	

d. Draw a graph, cycle out light, adjust the height of the galvanometer, and find the focus of the laser based on the intensity of the marking laser



4.2. BOX calibration method 1: manual calibration

a Correction Manual cali V	Layer	Layer0	-
Automatically recognize BOX	Laser speed	800	¢
	Red light	40	4
	position to	Centre	1
2 Multipoint correction	50 50	Centre	1
3. High precision correction			

a. Select 'Manual calibration' (PDU-1000V3K2 Card does not have this option, defaults
to 'Manual calibration');

b.Select 'Standard Calibration';



Standard correction	>
Scan parameters	
Maximum BOX 174.33 🜲	
Center offset X 0.000	🔿 Scan 1=X 🗌 reverse
Center offset Y 0.000	◉ Scan 2=X 🗌 reverse
Rotation angle 0.000	
Scan 1	Scan 2
proportion 0.864 🔶 >>	proportion 0.935 🔹 >>
-0.1100	0.3000
0.0000	0.0000
0.0000	0.0000
🗌 Red light 🔲 Laser	
Test 100.00	CONFILM
Laser eme	rgency stop

c. Set the value of "Test Rectangle Size" to the actual required marking size;d. Set "Max BOX", it is recommended that the value of "Max BOX" be slightly larger than the value of "Test Rectangle Size";

e.Check to turn on the laser;

f.Click to confirm and laser print;

g. Use a ruler to measure whether the length of the X and Y axes is equal to the "test rectangle size" set in c. If the measured lengths are not equal, find the corresponding galvanometer for the X (Y) axis, click the button

0.864	+	>>
	0.864	0.864

as shown in the figure, fill in the measured



	🖳 Calculating Box Ratio	×
	Current length	
	Calculation	
length in the pop-up w	i ndow	

, and click

"Calculate". Click on "Laser Test" again to repeat the test until the measured length is equal to the set "Test Rectangle Size" length;

h.Click "OK" at f and laser print. (1) If the printed rectangular line is curved, find the corresponding galvanometer on the X (Y) axis and adjust the value

in the galvanometer; ② If the printed rectangle is a parallelogram, find the corresponding galvanometer on the X (Y) axis and adjust the

0.0000 + value

in the galvanometer; \Im If the printed rectangle is

trapezoidal, adjust the value in the galvanometer; Adjust repeatedly until the desired rectangle is printed out;

i.Click "OK" at f to observe whether the printed coordinates of the X and Y axes meet the requirements. You can adjust them by setting the corresponding relationship between the galvanometer and X (Y). If the direction of the X (Y) axis is reversed, check "Reverse";

j. The default center point of the galvanometer is (0, 0). The position of the galvanometer center point can be changed according to actual needs, but the offset should not be too large. Do not change the "center offset" unless there are special requirements; The function of "rotation angle" is to adjust the angle of the galvanometer coordinate system, which can be changed according to the marking direction requirements. Do not change it unless there are special requirements.

4.3. BOX correction method 2: 9-point correction

1. Correct Direction



💀 PD Card Box Correction			×
Correction 9 point cor v Automatically recognize BOX type, please restart the	Layer Laser speed	Layer0 800	~ •
b 1. Standard calibration	Red light	40	•
2. Multipoint correction	50 50	Centro Custo	l n
3. High precision correction			
4. Red light ratio	5. Manual	compensati	on

a.Select '9-point correction' (PDU1000-V6K3 and PCIE-V3K1 Version card has this option);

b.Select 'Standard Correction' (set the direction of the galvanometer);

🗹 Laser 🛛 🔽 🖸	 Marking L trajectory (uncorrected)
1. Mark L trajectory	2. Please select the trajectory shape you see (choose one out of eight) The software will recognize the coordinate
Select the marking pattern (click on the pattern to	mapping relationship shape based on the shape selected by the user
swi d	 Verify if the L direction is correct The software will modify the graphic outpu based on the previous configuration, and the user should see a correctly placed "L" shap
e ^{3. Verify} if the L	 If the L-shape seen in the previous step is correctly placed, the orientation mapping is completed, and the subsequent multi-point
Regional Settings	
Maximum BOX 174.33 🖨	Center offset X 0.000 🚖 👩 confirm
	Center offset Y 0.000 🖨 🎴

c.Place a piece of black paper under the galvanometer, click on "Mark L trajectory" (Will emit laser), and view the style of "L" on the black paper at the observation position of the machine;



d. Click on the pattern to switch the style of the pattern until it matches the pattern observed in the previous step

e. Place a piece of black paper under the galvanometer, click on "Verify if the L direction is correct" (Will emit laser), and check the "L" style on the black paper at the machine observation position. If you do not observe a correct "L" letter style pattern, please check if the two steps above are correct;

f. If it is necessary to modify the galvanometer, the angle value can be modified; g. If it is necessary to modify the center position of the galvanometer, the offset in the XY direction of the galvanometer can be filled in; h. Click 'Confirm' to save.

2. Correct size



a. Select '9-point correction';

b.Select 'Multiple point correction';





c.Set the value of "Test Rectangle Size" to the actual required BOX size;

d. Set the maximum BOX size, where the value is the ratio, with a range of 8000-32000; e. Click 'Run' and adjust the value at point c based on the size of the laser printed rectangle. It is recommended that the maximum BOX be slightly larger than the value in point c;

f.Click on the Run Print Rectangle at e, find the same edge as the graph at f, measure the length with a ruler, and fill the measured length in the corresponding image at f. Use this method to fill in the length of other edges at once;

g.Click to confirm and save;

h.Click on Run, laser print the run result, and use a ruler to measure whether the printed result meets the length set by c;

4.4. BOX correction method 3: 25 point correction

1. Correct Direction



🖳 PD Card Box Correction			×
Correction 25 point cc ~	Layer	Layer0	~
type, please restart the	Laser speed Red light	40	1
2. Multipoint correction	Red light t position to 50 50	ceaching tot Centro Custo	al m
3. High precision correction			
4. Red light ratio	5. Manual	compensat	i on

a.Select '25 point correction' (PDU1000-V6K3 and PCIE-V3K1 Version card has this option);

b.Select 'Standard Correction' (set the direction of the galvanometer);

Z Laser C	1. Marking L trajectory (uncorrected)
1. Mark L trajectory	 Please select the trajectory shape you see (choose one out of eight) The software will recognize the coordinate
2. Select the marking pattern (click on the pattern to	mapping relationship shape based on the shape selected by the user
swi d	3. Verify if the L direction is correct The software will modify the graphic outpu based on the previous configuration, and the user should see a correctly placed "L" shap
e ^{3. Verify} if the L	 If the L-shape seen in the previous step is correctly placed, the orientation mappin is completed, and the subsequent multi-point
Regional Settings	
Maximum BOX 174.33 🌻	Center offset X 0.000 🖨
on	Center offset Y 0.000 🖨 🗧

c.Place a piece of black paper under the galvanometer, click on "Mark L trajectory" (Will emit laser), and view the style of "L" on the black paper at the observation position of the machine;



d. Click on the pattern to switch the style of the pattern until it matches the pattern observed in the previous step

e. Place a piece of black paper under the galvanometer, click on "Verify if the L direction is correct" (Will emit laser), and check the "L" style on the black paper at the machine observation position. If you do not observe a correct "L" letter style pattern, please check if the two steps above are correct;

f. If it is necessary to modify the galvanometer, the angle value can be modified;g. If it is necessary to modify the center position of the galvanometer, the offset in the XY direction of the galvanometer can be filled in;h. Click 'OK' to save.

2. Correct size



a. Select '25 point correction';

b.Select 'Multiple point correction';





c.Set the value of "Test Rectangle Size" to the actual required BOX size;

d. Set the maximum BOX size, where the value is the ratio, with a range of 8000-32000; e. Click 'Run' and adjust the value at point c based on the size of the laser printed rectangle. It is recommended that the maximum BOX be slightly larger than the value in point c;

f. Click on the Run Print Rectangle at e, find the same edge as the graph at f, measure the length with a ruler, and fill the measured length in the corresponding image at f. Use this method to fill in the length of other edges at once;

g.Click to confirm and save;

h.Click on Run, laser print the run result, and use a ruler to measure whether the printed result meets the length set by c;

4.5. BOX correction method 4: Manual high-precision

correction

Note: Before performing high-precision calibration, complete regular BOX calibration first. High precision correction is a hierarchical correction, which requires completing the lower level correction before proceeding to the next level correction. The following is an example of the 3 * 3 step, which is the same as other hierarchical correction operations.

a. Open high-precision menu



🚽 PD Card Box Co	rrection			×
Correction	9 point cor ↓ ecognire BOX start the	Layer Laser speed Red light	Layer0 800 \$0	> <u>+</u>
1. Standard o 2. Multipoint	dibration correction	Red light t position te	eaching st Central Custom	
3. Migh precisio	n correction			
4. Red ligh	t ratio	5. Manual	compensatio	n

b. Set the calibration range and number of calibration points, starting from the minimum level of 3 * 3. Click on Generate Calibration List to refresh the calibration list



Co:	calibration) rrection range 20.00 📫	Correction poir	ats 3×3	~	Reset correction
leasur	rement correction				
Marki	ng verification graphics The long side (of the directional	Theor		
cross	Crosshair 5.0		(E) Laser		Marking
					, married
Autom	atioally import (or manually in	uput) calibration de	ta .		Import to
	X reverse import	🗌 Y reverse impor	t 🗹 Automatica	ally sort o	n import
umb	Original coordinates	Neasurement c	Measurement	0 ^	
	(-10.0000, -10.0000)	-10.0000	-10.0000		
	(-10.0000, 0.0000)	-10.0000	0.0000		
_	(-10.0000, 10.0000)	-10.0000	10.0000	refi	esh data
	(0.0000, -10.0000)	0.0000	-10.0000		
	(0.0000, 0.0000)	0.0000	0.0000		
	(0.0000, 10.0000)	0.0000	10.0000		
	(10.0000, -10.0000)	10.0000	-10.0000		
	(10.0000, 0.0000)	10.0000	0.0000		
	(10,0000,10,0000)	10.0000	10.0000		
				-	D. C.
					Perform

c.Select the marking pattern (cross, circle, point), Click on the marking and the laser will emit light.



	rrection range 20.00 🖨	Correction p	oints 3×3	✓ Reset correction
Measur	ement correction			
Marki	ng verification graphics The long side of	of the directional	Laser	
cross	Crosshair 5.0			Marking
Autom	atically import (or manually in	uput) calibration	data	
_				Import to
	X reverse import	∐ Y reverse imp	ort 🖂 Automatically	sort on import
numbi	Original coordinates	Measurement	c Measurement c	^
)	(-10.0000, -10.0000)	-10.0000	-10.0000	
L	(-10.0000, 0.0000)	-10.0000	0.0000	
2	(~10.0000, 10.0000)	-10.0000	10.0000	
3	(0.0000, -10.0000)	0.0000	-10.0000	
	(0.0000, 0.0000)	0.0000	0.0000	
ł		0.0000	10.0000	
4 5	(0.0000, 10.0000)			
ł S	(0. 0000, 10. 0000) (10. 0000, -10. 0000)	10.0000	-10.0000	
1 5 6 7	(0. 0000, 10. 0000) (10. 0000, -10. 0000) (10. 0000, 0. 0000)	10.0000	-10.0000	
1 5 7 3	(0, 0000, 10, 0000) (10, 0000, -10, 0000) (10, 0000, 0, 0000) (10, 0000, 10, 0000)	10.0000 10.0000 10.0000	-10.0000 0.0000 10.0000	
4 5 7 3	(0, 0000, 10, 0000) (10, 0000, -10, 0000) (10, 0000, 0, 0000) (10, 0000, 10, 0000)	10.0000 10.0000 10.0000	-10.0000 0.0000 10.0000	





d. Put each marked point on the anime element to measure the position, and then fill each position in the measurement coordinates.

numb	Original coordinates	Measurement c	Measurement c
0	(-10.0000, -10.0000)	-10.0000	-10.0000
1	(-10.0000, 0.0000)	-10.0000	0.0000
2	(-10.0000, 10.0000)	-10.0000	10.0000
3	(0.0000, -10.0000)	0.0000	-10.0000
4	(0.0000,0.0000)	0.0000	0.0000
5	(0.0000, 10.0000)	0.0000	10.0000
6	(10.0000, -10.0000)	10.0000	-10.0000
7	(10.0000, 0.0000)	10.0000	0.0000
8	(10.0000, 10.0000)	10.0000	10.0000

e. You can also record the measured coordinates in a txt document and import them into the calibration data.

f.After completion, click to perform calibration, and finally check to enable high-precision.

Note: In the case of importing with TXT documents, write the TXT document from the



first point in the negative direction of the X and Y axes, in order of each line.

文件(E) 编辑(E) 格式(Q) -19.929,-20.066 -14.942,-20.057 -9.938,-20.038 -4.918,-20.038 0.072,-20.009 5.053,-19.998 10.074,-19.983 15.067,-19.968 20.066,-19.952 20.063,-14.967 15.053,-14.968

4.6. Red light ratio

a.Select 'Red Light Ratio'





ied right correc	tion	
Center offset	5.000 🜲	0.000 🜲
b		
Zoom ratio (X,	1.000	1.000 🚔
🗸 Red light 🛛	Laser	Ê
Test	100.00	confirm

b.Check "Enable Red Light", fill in the

value of "Test Rectangle Size" at position c, and click "Confirm"; c.Observe whether the red light running trajectory coincides with the rectangle printed by the laser. If it does not, set the "scaling ratio (X, Y)" to adjust the red light running trajectory; Click on "Red Light Test". If the spot does not coincide with the origin of the laser printing, set the "Center Offset (X, Y)" to adjust the position of the spot.

5. Motion Axis Application

5.1. Connecting the motion axis

a.Connecting the board and motion axis

b.Set motion axis control, tool->platform Sports Card settings, Basic Settings->Platform Control Card, select PDS, click "preservation", close the setting interface, and close the software;





Representation control card settings		×
Number o	f cards currently opened by the 1 preservation	
Operation control IO display Basic Settings Axis parameter set	ttings Zero return settin After modification, the software must be restarte	d
Platform Control Card PDS 🧹		
Extended IO	Enable platform vertic Correction 0.000	
The light curtain safety door is effective for inching	🗌 Enable axis limit alarm	
🗌 Won automatic start invalid	Reset all axes when clearing alarms	
Display encoder feedback position	Handwheel 1.0 🗢	
🗹 Zeroing (setting software origin) verificat: Mandwheel VJ	I display method display \lor	
The main interface displays zero return	Forced return to zero after system alarm	
	Zero return Verificati 🗸	

c.Open the software again, and the operation axis control bar will appear in the right column of the software main interface, indicating that the axis connection is successful.

100				Axi
<-	XO	0.000	0.00	->
<-	¥1	43.830	0.00	->
	fast		🗌 r	elative
mov	•		stop	Zeroi

5.2. Configure axis parameters

a.Open the axis parameter setting interface. Tool platform sports card settings, you can also use the F3 shortcut key;



b. Axis parameter setting interface



	Nun	ber of cards currently opened by the	1 preservation
ration control IO di	isplay Basic Settings Axis paramete	r settings Zero return settin Afrer	modification, the software must be restarted
utput status		Input Status	
0100	I 08	00	00108
1 01	O 109	D 101	D 109
0102	110	0102	I 10
1 03	○ 111	I 03	○ 111
0104	☐ I12	I D4	I12
0105	◯ 113	0105	◯ 113
010 6	I 14	00 106	I 14
107	I 15	0107	115
] Test output		Test Input twe twe twe twe nty nty nty nty	twe twe twe twe nty nty nty nty nty

c.Configure Axis Equivalent

🖳 Platform oper	ation control card se	ttings					×
			Number of cards currently o	opened by the 1		preservation]
Operation control	IO display Basic S	ettings Axis par	ameter settings Zero return	settinAfter modi	fication	the software mu	st he restarted
Number of axles:	Axis 1 parameters					ar means in an	
3	Axis name	XO	(Limited to two letters or	numbers)	Effect	ive left and rig	ht limit positions
Axis number:	Axis corresponding	1	(Axis 1-8)		Revers	e the effective	level of the left :
1 ~	Axis mode	Translation $\epsilon \sim$			Axis d	river alarm vali	d (for driver input
	Axis feedback mode	Internal puls \sim	(Step by step is usually an	internal count)	🗹 The ef	fective level of	the axis driver al
Maximum speed:	Number of pulses	10000	(must correspond to the set	tings on the drive	e Is the	pulse output in	werted (default nor
200.000	pitch	10	(Generally 1, 2, 5, 10, 15, 20)	Inching speed se	tting		
W ()		62 EE0	10.2 00		Revers	e the direction	of the jog button
2000 000	Fadius	62.000	(Unly affects the speed equ	High speed	30.00	nm/s	
2000.000	Reduction ratio	1.000		High speed	500.00	nm/s*2	
	Axis return to	1- Using the neg	ative limit as t \sim	I am emond ing	10.00		
				Tos sheer los	10.00	nm/ s	
	Zero return sett	ing		Low speed	200.00	nm/s"2	
🗌 Enable gantry	dual drive peed retur	n 30.0	nm/s		Enable sof	tware limit	
Spindle number:	High speed retur	n 200.0	mm/s*2	Left limit	-10.00	Right limit 1	0.00
1	Low speed retur	n 5.0	nm/s				
From axis number	Low speed return	n 200.0	mm/s^2				
2	Number of time	2					
	Zero retur	n 2.00	nm				preservation

Axis parameters			
Axis corresponding motor serial number	The control card axis number corresponding to the current axis number, which defaults to the axis number		
axis mode	Currently supports' translation axis' and 'rotation axis'		
Axis feedback mode	Currently supports "internal pulse counting" and "external		



	encoder "		
Pulses per revolution	Set the number of pulses per revolution consistent with the corresponding driver, that is, the number of pulses that the motor needs to send per revolution		
pitch	Set the pitch of the shaft drive screw		
radius	Only the rotation axis is effective. Set the maximum radius of the rotating part, and the software calculates the circumference of the rotating part using this parameter. The running speed of the rotating shaft is linear velocity, and the smaller the radius, the shorter the circumference. Under the same linear velocity, the angular velocity of the rotating shaft increases, which affects the speed of the rotating shaft		
reduction ratio	When the motor directly drives the shaft, the reduction ratio is 1, while when the motor drives the shaft through the reducer, the reduction ratio of the reducer is set		

Signal and level parameters				
Limit	Set the limit signal and signal level, check "Left and Right Limit Valid" to enable the limit signal, and check "Left and Right Limit Valid Level Inverted" to invert the limit signal level			
Axis driver alarm Axis Driver Alarm Valid" to enable the alarm signal, check "Axis Driver Alarm Valid Level Inverted" to invert				
ls the pulse output reversed	Set pulse reversal, check "Pulse output reverse" to reverse the pulse direction, that is, the axis running direction			

d.Zero return setting

Zero return parameter			
Axis return to mechanical origin mode	Currently supports multiple zero return modes: " Positive limit as origin" " Negative limit as origin" " Positive limit HOME point as origin" " Negative limit HOME point as origin" " Positive limit Z-direction" " Negative limit Z-direction" " Positive limit reverse Z-direction"		



	" Negative limit reverse Z-direction"			
	Set the number of zeros to 2 by default. The first time is			
Number of times to	for high-speed zeroing to improve the efficiency of zeroing,			
return to zero	and the second time is for low-speed zeroing to ensure the			
	accuracy of zeroing			
	Set the return distance to zero to avoid the limit switch			
Zero return distance	when the limit is at the origin mode. After finding the			
	origin, move for a certain distance to avoid the limit switch			
	(the return distance is negative when returning to the			
	positive limit, and positive when returning to the negative			
	limit)			

e.Return to mechanical origin



step	illustrate
Single axis zero return test	Click the "Add" button, add an axis, and then click the "Return to Mechanical Origin" button to test whether the return to zero of a single axis is effective
All axis return to zero test	Add axes in order. Check 'Blocking waiting', and the next axis will only begin to return to zero after the current axis completes its return to zero.





Power on reset	When the zero return operation is confirmed to be correct, you
setting	can check "Power on Zero Return" as needed.
	Check the "Enable zero return completion signal" option and set
	the specified 10 port number for completing signal output in
Enable zero return	the completion signal bit. When the axis is reset to the
completion signal	mechanical origin, the zero return completion signal will be
	output. When the axis is reset, the zero return completion
	signal will be automatically cleared.

Note: After the settings are completed, restarting the software will take effect.

5.3. Configure 10

a.Open the laser control card IO settings interface. Set IO communication settings, or use the shortcut key F4.



b.Laser control card 10 interface. The input and output states correspond to the input terminals 11~120 and output terminals 01~018 of the laser control card. After checking 'Test Output', you can manually test a single port for the output. Attention: The first three output ports are occupied by the system (00, 01, 02).



Handwheel sel	sotion X ~ Select	t IO function
🗹 input	00 01 02 03 04 05 06 07 08 09	9 10 11 12 13 14 15 10 system selection PDU_IO ~ three r.ve.xieven fht is rone Mask configure signal
0 function se Three color	ttings light1 light1	Machine safety door/safety light

c.Laser control card 10 special function customization selection settings In the 10 parameter setting interface, open the drop-down list of "10 input response settings", select the 10 response object as needed, and check the enable "input" option box. Users can choose the input port number on the corresponding motion control card between serial numbers 00 and 15 based on the actual wiring method. Select the level mask value based on the signal wiring trigger method and set the trigger method. Taking input as an example: "01 input low level, 02 input high level, 03 low level", this state is valid when this set of signals is met.

As shown in the following figure:

00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 Mask value / input en cht ie mone Mask value





The input response setting provides several commonly used 10 response output objects, and users can customize the 10 output port indication. For example, waveforms 1-6, three color lights, buzzer, red light indication, external control switching, and laser alarm clearing. These 10 settings are set to '-1' as invalid states. The response mode of the machine safety door/safety grating can be set to indicate whether the software enters the stop or pause state when there is a signal input. Check "Program automatically calls 10 reverse" to invert all 10 states. Users can customize and edit according to the actual signal, and save and restart the software after modifying the parameters to take effect. As shown in the following figure.

Three color light $ -1$	Machine safety door/safety light response mode	
Three color light $=$ -1	suspension 🗸	
	🖂 Program automatically calls IO revers	
	Note: -1 is an invalid IO, which means that the	
Note: The parameter is for soft restart t	o take effect	

Attachment: List of 10 Input Response Settings

Function	Function Description
Handwheel	Set IO handwheel signal
Machine ready	Set the machine safety door signal, triggering this signal will terminate program operation, and there will be a safety alarm indication.
Machine safety door	Set the machine safety door signal, triggering this signal will terminate program operation, and there will be a safety alarm indication.
Safety grating	Set a safety grating signal, trigger this signal to stop program operation, and there is a safety alarm indication.
Emergency stop button	Set the emergency stop button signal to trigger this signal to abort program

on



	operation.
Platform return to mechanical zero point	Set IO trigger to directly return to mechanical zero point.
Clear alarm	Set manual 10 trigger to clear the alarm.
Laser alarm	Set the laser alarm signal.
Suspension	Set IO trigger to directly terminate operation.
Run	Set one or more IO triggers to directly trigger operation.
Run red light	Set 10 trigger to execute red light.
Suspend	Set one or more IO triggers to directly trigger a pause.
Run suspend	Set one or more 10 triggers pauses and signal cancellation resumes.
Multiple documents	By calling different document numbers for different IO signals, execute the process content of different document numbers.
Rerun the current document	When the document is paused, 10 can be triggered to continue running the current document.
Rerun Document	Set one or more IO triggers a signal to continue running after multiple documents are paused.
Foot pedal	Set foot IO to trigger the current displayed process.
Manual	
Automatic	
Teaching demonstration	Set the current display position of the 10 trigger record axis and add it to the process.
Switch multiple solutions	Set IO trigger to automatically switch multiple solutions.

d.Customize and modify the 10 name of the laser control card. Check the 'Edit 10 Name' checkbox to customize the 10 name. After making the modifications, click 'Save'. As shown in the following figure:



IO parameter settings × IO display Input Response Settings Complete signal setup Software event display output Dedicated to o Text_Output10 Booster_Gate 🛞 D7 Caser state sp Text_Output11 MD-Enable Latch Card alarm ded 🔵 Text_Output12 Laser triggeri: Text_Output03 Text_Output13 D0 Text_Output04 Text_Output14 🔘 D1 Text_Output05 Text_Output15 **D**12 Text_Output16 Text_Output06 D3 Text_Output07 Text_Output17 D4 Text_Output08 Text_Output18 0 15 Text_Output09 RED D6 Test output input Text_Input30 Text_Input00 Text_Input10 Text_Input20 Text_Input01 Text_Input11 Text_Input21 Text_Input31 Text_Input02 Text_Input12 Sto0 Text_Input03 Text_Input13 Stal Text_Input04 Text_Input14 Sta2 Text_Input05 Text_Input15 Sta3 Text_Input06 Text_Input16 Text_Input26 Text_Input17 Text_Input07 Text_Input27 Text_Input08 Pause (offline) Text_Input28 Text_Input09 Stop (offline C Text_Input29 X:0000.0000 Y:0000.0000 FBX:0000.0000 FBY:0000.0000 Z Edit IO Hame preservati



6. Appendix

6.1. Change software Logo

1. Change the display information of the software startup interface. Open the directory where the software is installed, find the "UserSkin" folder, replace or edit the "LOGO.bmp" image, or change the content in the "工程名称.txt" file to change the display information of the software startup interface.



2. Change the information about version and copyright. Open the "UserSkin" folder, replace or edit the "AboutLogo .bmp" image, or change the content in the "AboutLogo .txt" file.





Click "Settings" - "System Settings", and you can see that the words displayed in the bottom left corner of the system settings menu are "About displaying middle logos". At this time, press Ctrl+"U" to change the words "About displaying middle logos" to "About not displaying middle logos" and save the settings. Restart the software again, and the software logo information will be changed.

6.2. Required libraries for Windows systems

1. The PDS control card function requires the installation of Microsoft Visual C++2010 Redistributable

2. CCD visual software functionality requires the installation of Microsoft Visual C++2015-2019 Redistributable

3. The main function of the software requires the installation of .NET Framework 4 (included in the Win10 system, no additional installation is required)

Note: The required support libraries mentioned above all have installation packages in the galvanometer software installation directory. Open the folder with the corresponding name for installation, and the installation of 32-bit or 64-bit





versions should be consistent with the system version.

6.3. Board update firmware

.Open "Settings" → "System	Settings" \rightarrow "Advanced Parameters of Control Card"
set up UI switching about	
System settings	
Box correction	
Box correction	
CCD camera position setting	
IO Communication Settings (F4)	
Host Response Settings	
DXF Map Settings	
Regional splicing settings	
Laser host settings	
system parameter setting	
Tume of Scan control PDU	Special advanced parameters User permission settings
nester control	After modification, the software must be restarted
Connection method (a) PCIE	✓ Has the board been configured The maximum number of 100 +
Record running data	Collection function 2
Utto is a dedicated 10 in operation Dutt is a specialized IO for optical output	Border preview speed
Allow pauses between light outputs (not allowing p	DA range of FDU card 10.0 pauses can improve efficiency) Laser AD range
Marking thread priority high \sim	DA range of the second PDU 10.0
End stop method of the Scan $$ Fixed coordir \sim	Second laser AD range 10.0
Fixed point 0.000 0.000	Maximum marking data 100 The recommended value for new cards is 100.
	Test USB transfer speed
Special processing of upper computer Enable long waveform editing	How many microseconds of data does the PC cache before starting to download and run
Enable point energy editing	The cache data volume of the board, [0.01, 1], is [using 1% memory cache
	0.400
	The download thread cache data volume, [O.OI,1], is [using 1% memory cache for marking data and 100% memory cache for marking data]; [O.999
OCard number settings	The size of the PC cache, used in conjunction with
00ID card	dbValideBufferSpacePercentage, increases the frequency of queries and 0.800
(*) 01 Firmware	Board triggered running cache size, value range: 1~99
Modify the card Durning	10
	preservation

2. Click on the "Firmware Burn" button to log in with administrator privileges (default account: 7777 Password: 7777)



system parameter setting						×
ystem settings Interface func	tion and display	Advanced parameters of control card	Special advanced p	arameters User pe	rmission settings	
Type of Scan control PDV	~	🖂 Enable -	card card number	1	🗹 Artificial se	lection
master control other			After modification	the software aus	t be restarted	
Connection method (*)	PCIE ~	✓ Has the boar	d been configured	The maximum :	number of 100	(
Record running data		Collection function	2			
🗹 OutO is a dedicated IO in o	peration	Border preview speed	3000			
🗹 Outl is a specialized IO fo	r optical output	DA range of PDU card	10.0			
Allow pauses between light	outputs (not allow	ving pauses can improve efficiency) Laser AD range	10.0			
Marking thread priority	high \checkmark	DA range of the second PDU	10.0			
End stop method of the Scan	Fixed coordir ~	Second laser AD range	10.0			
Fixed point	0.000 0.000		100	72	The Contract of the	- 100
They point		Maximum marking data	100	ine recommended v	alue for new caras i	12 100,
			Test USB tra	nsfer speed		
Special processing of upper or Enable long waveform editin	omputer S	How many micros download and run 1000000	econds of data does n	s the PC cache befo	ore starting to	
haale point energy editing		The cache data for marking dat 0.400 The download th for marking dat 0.999	volume of the board a and 100% memory of sand tooche data vol a and 100% memory of	l, [0.01,1], is [un sache for marking o ume, [0.01,1], is sache for marking o	sing 1% memory cache data] [using 1% memory ca data];	che
OCard number settings OOID card (*) 01 Modify the card	Firnware burning	The size of the dbValideBufferSy 0.800 Board triggered 10	PC cache, used in pacePercentage, inc running cache size	conjunction with reases the frequer , value range: 1~9	ncy of queries and 19	
					prese	rvation
🖳 User login		×				
User Admini	strator \sim	Swipe card				
user name 7777	·					
password 7777	7					
det	ermine					
log off						

3. Click 'Browse' and select the BIN file corresponding to the board model



🚽 固件升级	×	
说明: 1.请选择正确的文档		
2. 写入过程中请勿断电中止		
3. <mark>若写</mark> 入不成功,请联系供应商处理 请选择固件升级文件		
	浏览	
	写入	

!脑 > 桌面 > 新建文件夹 (2)		~	ڻ /	搜索"亲
	修改日期	类型	大/	N
FiberV3K2.bin	2022/4/6 14:44	BIN 文件		1,451 KB

4. After selecting the firmware file, click "Write" and wait for the firmware to be written.



5. After the burning is completed, a prompt will appear saying "Write successful, please power off and restart". If there is no prompt for a long time, check for any abnormal pop-up windows.



🖳 固件升级	×
说明: 1.请选择正确的文档	
2. 写入过程中请勿断电中止	
3. 若写入不成功,请联系供应商处理	
请选择固件升级文件	
[sers\PD_10033\Desktop\新建文件夹(2)\FiberV3K2.bin	浏览
医心成功 建新中垂白	
	写入

Note: If the board is a USB card, it is necessary to disconnect the 15V power supply of the board; If the board is a PEIC card, it is necessary to shut down the industrial computer connected to the main card, and then turn on the industrial computer after 10 seconds.

烧录异常提示	<
error flash,task is faulted	
确定	

6.4. Encryption dog time expired

*When encountering the expiration of the encryption dog time, inform the supplier of the encryption dog ID and need to obtain the decryption file from the supplier to unlock it. After obtaining the decryption file, follow the following steps to unlock it.

a.Open the software and click on "About" ->"About Software and Encryption"



b. After receiving the .tch file, click on "Import Release or Add Time File" and follow the steps to import the .tch file to unlock the encryption dog.





当前PDV1000卡ID:6D 62 3B F7 0D B8 11 ***	^	Refresh dog
>>>一共发现以下1个加密狗<<<<<		Incornection
D号加密狗ID:1758181441		
英型为FASFFIL 可期定:6张卡(已经绑定0张卡)		Unhind Dog
<己绑定卡ID列表>		outrai 105
(J)能口列表) 約功能(000)ID:00 →(對认功能) 約功能(002)ID:02 →(即标准指请CCD) 約功能(002)ID:02 →(即标准指请CCD) 約功能(002)ID:03 →(通用功能)=1) 約功能(005)ID:05 →(通用功能)=2) 約功能(005)ID:05 →(何标准指语) 約功能(006)ID:06 →(定制)=20(图) 約功能(006)ID:06 →(定制)=20(图) 約功能(006)ID:06 →(常有)=20(图) 約功能(006)ID:06 →(常有)=20(图) 約功能(006)ID:06 →(常有)=20(图) 約功能(006)ID:06 →(常有)=20(图) 約功能(006)ID:06 →(软件定制ID:10000) 約功能(010)ID:10 →(软件定制ID:15000) 約功能(011)ID:11 →(20(平标系))	*	
ftware runtime control Enable software runtime		
	~	

After activa be cancelled expires, con supplier, pr	tion, it o L. After th itact the rovide the	annot le time
obtain the r Enter the ve	release fil rification e box to e	e. code nable
Code	bern	
Runable Time	berp	hour
	determine	



🛃 About software and encryption		×					
***当前PDU1000卡ID:6D 62 3B F7 0D 83 11 *** >>>>>一共发现以下1个加密狗<<<<<<	^	Befresh dog information					
第00号加密狗ID:1758181441 类型为:NASP-NL 可算定:6张卡(已经绑定0张卡)	-	Tabled Bas					
<己绑定卡ID列表>		outring pog					
(功能10列表) 海功能(000)ID:00 →(割认功能) 海功能(001)ID:01 →(通用功能) 海功能(002)ID:02 →(PD标准提镜CCD) 海功能(003)ID:03 →(通用功能一主) 海功能(003)ID:04 →(软件定制ID:6000 海功能(005)ID:05 →(PD标准提镜) 海功能(005)ID:05 →(PD标准提镜) 海功能(006)ID:06 →(定制)一建設) 海功能(006)ID:06 →(定制)一建設) 海功能(009)ID:09 →(软件定制ID:1000 海功能(009)ID:09 →(软件定制ID:1500 海功能(01)ID:11 → (次坐标系)) 0)						
Software runtime control Enable software runtime Inport release or overtime 王劭时间单位:14400000 If you need to increase the running time	emaining runnir 0000 hour or clear the ti	ng time of the so					
***当前PDU1000卡ID:6D 62 38 F7 0D B8 11 ***	₩ 打开						×
>>>>>-共发现以下1个加密狗‹‹‹‹·	$\leftarrow \rightarrow - \uparrow \square $	此电脑 > 文档(E:) > CehTEST >	*	Ğ	在 CehTEST 中提起	奕	٩
第00号加密狗ID:1758181441	· 组织 · 新建文件夹				8==	•	0
司領是: 6%未(已经绑定0%未) Unbind Dog	_ Upan (F:)	* 名称	修改日期		类型	大小	
(功能10列表)	DBC	PDUMotionV7.5_CCD	2023/6/1 18:19	4	文件夹		
海功能(000)10:00 ->(第1人功能) 海功能(001)10:01 ->(通用功能) 海功能(001)10:01 ->(通用功能)	LaserMove	PDUMotionV8.1_NC	2023/6/2 10:08		文件夾		
編功能(003)ID:03 →(通用功能→圭) 病功能(004)ID:04 →(软件定制ID:6000)	PDU5000加密测	PDUMotionV8.1ENGLISH	2023/5/31 18:3	8	文件夹		4.100
Software runtime control	PDUMotionV7. PDUMotionV8. 联动-载 平台波形更新 双波形更新最新		2023/0/3 11349		ICH XH		1 N.D
Inable software runtime	→ 网络						
The remaining running time of the so	-	48(N): 1758181441 CIR		_]	tch文件		~
Banio tine unit: 14399968 099999 hour 00 minut		in a line of the local sector of the local sec			打开(0)	BV 144	
如是項加至17mg间的時間的1月控制,增符当前例如1017681814417后之供应简以 教職範密文件					3171(0)	-XiH	


☆当前PDU1000卡ID:6D 62 3B ₹7 0D B8 11 ***	^	Refresh dog
·>>>>一共发现以下1个加密狗<<<<<		Intermetron
00号加密狗ID:1758181441 米别为:0458=00		
可期差:6张卡(已经绑定0张卡)		Unhind Dog
<己绑定卡ID列表>		outring pog
(功能10列法) 初功能(000)1B:00 ->(默认功能) 何功能(001)1B:01 ->(通用功能) 何功能(002)1B:02 -> 何功能(003)1B:03 -> 何功能(003)1B:03 -> 何功能(005)1B:05 -> 何功能(005)1B:05 -> 何功能(006)1D:06 -> 何功能(006)1D:06 -> 何功能(006)1D:08 -> 何功能(009)1D:09 -> 何功能(011)1D:11 -> 何功能(011)1D:11 -> 何功能(011)1D:11 -> 何功能(011)1D:11 -> 何可功能(011)1D:11 -> 何可功能(011)1D:11 -> 何可称(011)1D:11 -> 何可称(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可能(011)1D:11 -> 何可能(011)1D:11 -> 何可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可能(011)1D:11 -> 何可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可可能(011)1D:11 -> 何可能(011)1D:11 -> 何可能(011)1D:10 -> 何可能(011)1D:10 -> 何可能(011)1D:10 -> 何可能(011)1D:10 -> 何可能(011)1D:10 -> 何可能(011)1D:10 -> 何可能(011)1D:10 -> 何可能(011)1D:10 -> 何可能(011)1D:10 -> 何能(011)1D:10 -> (011)1D:10 -> (011	~	
Enable software runtime		